

BRITISH MEDICAL JOURNAL

THE JOURNAL OF THE BRITISH MEDICAL ASSOCIATION



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HUGH CLEGG, M.A., M.D., F.R.C.P.

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TAVISTOCK SQUARE, W.C.1

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BRITISH MEDICAL JOURNAL

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TOWARDS A SOLUTION OF THE TOBACCO-CANCER PROBLEM

BY

E. L. WYNDER, M.D.

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Human Evidence

Statistical and epidemiological evidence linking smoking to cancer of the lung and also to cancer of other sites of the upper respiratory tract is so extensive that it hardly needs to be recited for the physician and the scientist who have followed these data. Sixteen separate investigations from seven different countries, studying smoking habits of over 6,000 patients with lung cancer, are all in agreement that lung-cancer patients smoke significantly more than any group of controls and that the relative risk of developing lung cancer rises in proportion with the amount of tobacco and particularly of cigarettes consumed. Two prospective studies, carried out in England and in the United States, that followed population groups whose smoking habits were known, also showed that the heavy cigarette smoker has a far greater chance of developing lung cancer than the non-smoker. In fact, the study by Hammond and Horn (1954 and personal communication) indicated that for a person smoking 40 cigarettes a day this chance was 70 times greater than for a non-smoker. To account for such magnitude of difference on the basis of statistical errors would require errors of equal magnitude. Such errors have so far not been demonstrated.

The belief that smoking is a major cause of lung cancer is not only based upon statistical evidence but it also is supported by the general epidemiological pattern of lung cancer. In countries, such as Great Britain and the United States, with a high cigarette consumption already 30 years ago, the present lung-cancer rates are high, while in countries, such as Iceland, where the cigarette consumption was low, the current rate of lung cancer is low. Among males in every country lung cancer is more common than among women. This fact has always presented a particular challenge. Any factor found to be significant statistically has to account, at least in part, for this sex difference. In a recent study we have shown that the present sex ratio of lung cancer is quite consistent with the long-term smoking habits of the two sexes. For instance, while some 20% of American males over the age of 50 smoke in excess of one packet a day, only 2% of the women in this age group smoke this amount. This study also showed that, among women who had smoked, the risk of developing epidermoid cancer of the lung or its undifferentiated types is about the same as that for men (Wynder *et al.*, 1956).

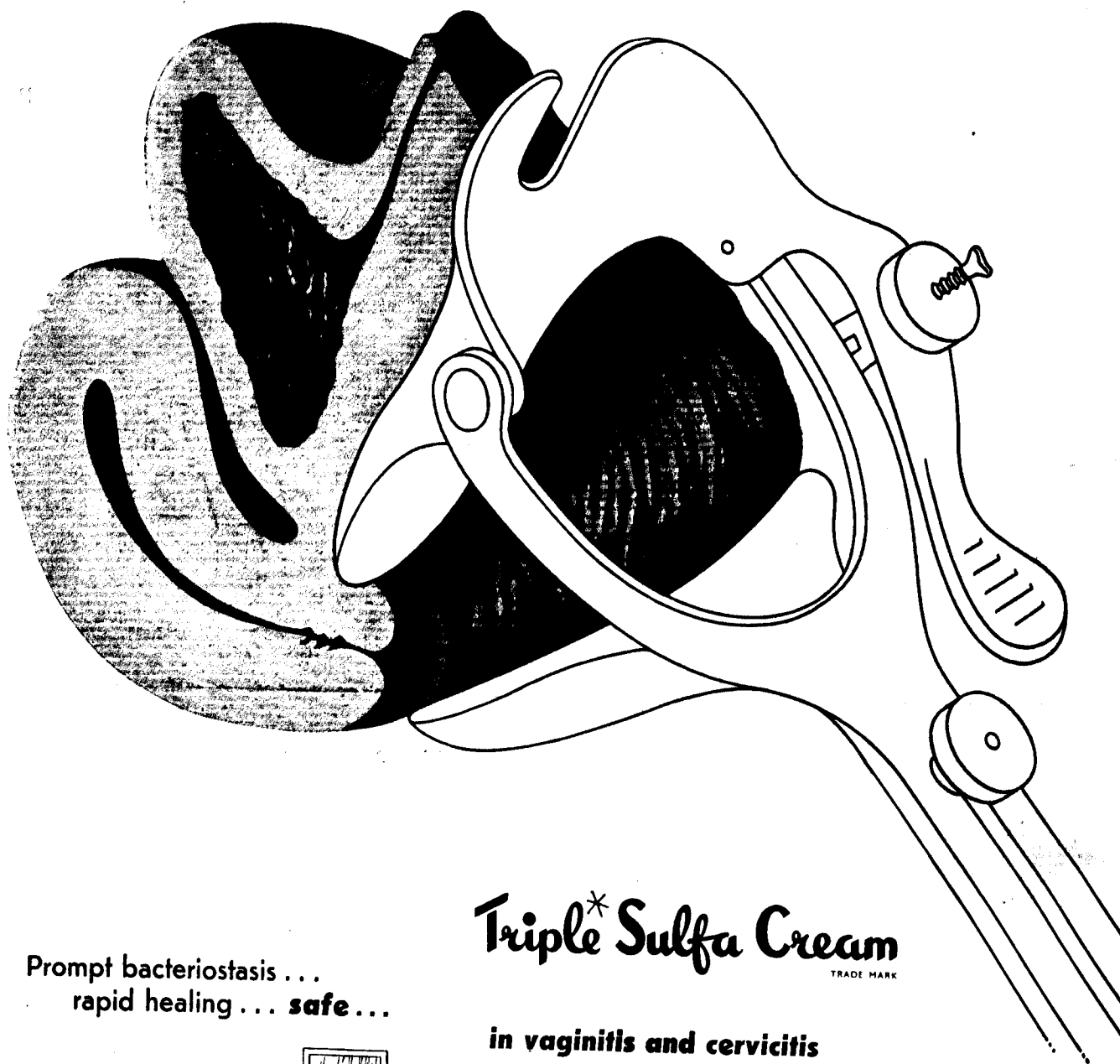
To consider smoking as a major cause of lung cancer does not mean that it is the only cause of this disease. Obviously there is the factor of internal predisposition

which must exist, since not everyone who smokes develops lung cancer. Obviously, too, there are other exogenous factors that may produce cancer of the lung. Among these are a number of occupational exposures. There is also evidence that general air pollution and/or motor exhaust fumes may be a contributing factor (Stocks and Campbell, 1955; C. Mills, personal communication). However, with the possible exception of a few isolated cities, such as Liverpool, air pollution is at best only a secondary factor. This belief is based on the fact that among non-smokers lung cancer occurs but rarely, that the incidence of lung cancer among women, who are also exposed to city air, is low, and that the age distribution of epidermoid lung cancer with its peak in the fifth to sixth decade and its subsequent decline is more compatible with an exogenous factor to which only a certain population group was exposed some 30 to 40 years ago rather than with air pollution, which would expose an entire population group at the same time (Levin, 1953).

While most students of the problem of the aetiology of lung cancer admit to an association between smoking and lung cancer, some question whether this association also represents causation. Until proved otherwise, an association means at least a contribution toward if not a causation of a disease. For any given patient it matters little whether a factor has contributed to or caused a disease. In either case the elimination of this factor will lead to reduction of the disease. In this sense, smoking, and especially cigarette smoking, is to be regarded as an important factor in the development of lung cancer. In fact, among the exogenous factors that influence the development of this disease it represents the most important one. Present incidence data indicate that some 80% of all lung-cancer cases occurring in males to-day would not have occurred were it not for tobacco smoking, and that about 10% of males over the age of 25 who smoke in excess of 20 cigarettes daily will develop lung cancer by the age of 75.

In view of these data, which gain significance because lung cancer represents the most common cause of cancer death among males in many countries, it becomes paramount to ask what we can do about solving this problem. Ideally this problem could be largely overcome by abolishing the use of tobacco. It is evident, however, that because of economic factors and because of firmly entrenched habits such advice is not likely to be heeded, regardless of how strong the evidence. For this reason we became interested in experiments that might lead to a reduction of carcinogens in tobacco and its products.

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Animal Evidence

Experimental work is not carried out to prove that smoking causes cancer in man. Such proof can come only from human statistical and epidemiological studies. The purpose of an animal experiment is to define the mechanism by which a given agent produces cancer and to determine the specific substances responsible for this activity. In a series of experiments with different strains of mice we have demonstrated that condensed cigarette tar obtained in a manner simulating human smoking habits will produce skin cancers in a significant number of animals, varying from 10 to 44%, depending upon the strain of mice used (Wynder, Graham, and Croninger, 1953, 1955; Wynder, Lubberger, and Grener, 1956). Preliminary data show that some 20% of rabbits whose ears have been painted with tobacco tar for more than five years also develop cancer (Graham, Croninger, and Wynder, unpublished data). Thus carcinogenic activity of cigarette tar has been demonstrated in two species of animal and in several strains of mice. By itself, this observation might be only of academic significance, but taken together with the human evidence already at hand it gains practical significance.

Among the well-established principles of carcinogenesis is the relationship of dose to the latent period and number of tumours that may be obtained. The fulfilment of this principle is one of the reasons smoking is regarded as a cause of lung cancer in man. The risk of developing lung cancer rises in proportion to the amount of tobacco smoked. It has been of interest to determine whether with tobacco this principle could also be established for the experimental animal. Preliminary work leaves no doubt that this is the case (Wynder, Kopf, and Ziegler, unpublished data). When tar was applied to the back of Swiss mice twice a week, instead of three times weekly as is standardly followed in our laboratory, only 10% of 40 mice developed papillomas and 3% cancers at the end of 17 months. Of the animals painted three times a week for the same interval, 58% had developed papillomas and 26% cancers. The first papilloma in the group painted twice a week occurred two months later than in the group of animals painted three times a week. 40 mice painted once a week for 17 months developed only one papilloma.

A comparable reduction in tumour formation and lengthening of latent periods is also noted when one decreases the amount of tar applied. A 33% solution produced about 20% fewer cancers and increased the latent period by three months over that obtained with a 50% solution.

In still another way we can demonstrate the dose-response principle by stopping the painting after a given period of months. Painting animals three times a week for only three months and then stopping produced no tumours after 16 months of observation; painting 50 mice for six months produced two papillomas which subsequently regressed; nine months' painting produced a significant number of papillomas and cancers, but this was exceeded if animals were painted for one year.

Thus, animal experimentation has demonstrated a definite relationship between the amount and duration of tar applied to an animal and the total number of tumours and the duration of the latent period observed. The importance of this demonstration serves not so much as an example for those investigators who report negative results after painting animals with insufficient amounts of tar or over a too short time period, but serves chiefly to re-emphasize the existence of a threshold value for tobacco tar below which tumours will not or but infrequently occur after a long latent period. Here again human and animal data confirm one another. The realization of this principle has practical aspects that are discussed below.

Tobacco Carcinogens

Having established the carcinogenic activity of cigarette tar, one needs to determine the nature of the carcinogens responsible for this activity. The benzpyrene content of

cigarette tar is not more than 2 p.p.m., which, according to our experiments, is not sufficient to produce the type of activity noted in our animals painted with tobacco tar (Wright and Wynder, 1955, 1956). The arsenic content of our tar sample is about 35 p.p.m. Again this is not sufficient to induce the number of skin cancers produced. Cooper and Lindsey (1955) have found traces of 1:2-benzpyrene, and G. L. Wright (unpublished data) observed spectrographic evidence of traces of 2 methyl,3:4-benzphenanthrene. At present there is no evidence of a known carcinogen in tobacco tar in quantities large enough to account for the observed animal activity. A summation effect of the substances just mentioned or perhaps a co-carcinogenic effect of other substances remains to be ruled out. It seems more likely, however, that there are carcinogenic substances in tobacco tar which are as yet unestablished.

Most, though not all, of the carcinogenic activity of the cigarette tar lies in the neutral fraction (Wynder and Wright, 1956). Within the neutral fraction the carcinogenic components are those that are eluted by hexane and particularly by carbon tetrachloride or solvents of similar polarity. Both of these fractions proved highly active for the rabbit, and the latter particularly potent for the mouse (Wynder and Wright, 1956). The benzpyrene content of both fractions is low. In the concentration as applied to the animals it was not more than 2 p.p.m. In these fractions there is spectrographic evidence of other higher aromatic hydrocarbons which are present in 50 times the concentration of benzpyrene. We are currently engaged in various separation schemes trying to isolate these substances.

Formation of the Tobacco Carcinogens

Present evidence suggests that the majority, though not all, of the carcinogens in tobacco are formed during pyrolysis. Human statistics comparing the risk of cancer among tobacco chewers with that of tobacco smokers, and our own experimental work comparing the activity of cigarette tar obtained by extracting cigarettes with methanol and hexane with that of condensed cigarette smoke, indicate far greater activity for the latter in each case (Wynder and Wright, 1956). Thus there is good reason to believe that the majority of the carcinogens are formed during combustion. In fact, ever since the classical work of Kennaway (1925) and his associates showing that under pyrolytic conditions by which they are formed the pyrolysis of isoprene and that of acetylene in turn form potent carcinogens, it has been apparent that higher aromatic hydrocarbons can be formed by the pyrolysis of saturated or terpinoid aliphatic hydrocarbons. Most recently this was again demonstrated by Lam (1956a, 1956b), who obtained such substances upon pyrolysis of dicetyl as well as of aliphatic tobacco hydrocarbons. In this respect one recalls Kennaway's recent remark (personal communication) that in view of the high temperatures associated with smoking he was surprised that tobacco smoke was not more carcinogenic than present evidence indicates.

It is our working hypothesis that a major proportion of the tobacco-tar carcinogens are formed through pyrolysis of substances naturally occurring in tobacco, which thus serve as precursors to tobacco-tar carcinogens. The practical aspects of research in this field must be directed towards reducing the exposure to and the formation of carcinogens in tobacco tar.

Practical Aspects

Practical aspects of solving the tobacco-cancer problem centre in the following suggestions and research programmes.

1. *Moderation of Smoking Habits.*—All a physician can do is to present the facts to the public. In general, of course, the public is unable to evaluate the present facts fully, in part because of the confusion that special interests in some countries have added to this situation. In the final instance it must become the function of the public health services of different countries to evaluate the data at hand, and, if convinced by the evidence that tobacco plays a part in the development of lung cancer, decide whether lives are more

important than economic considerations. In view of the apparent difficulty that may be foreseen in arriving at a decision on this issue, research must be carried forward that may give a practical solution to the problem at hand.

2. *Effective Filtration.*—During recent years filtered cigarettes have become increasingly popular, initially because of "supposed health protection" and to-day because of a combination of factors, which include large advertising campaigns, the perhaps more pleasant feeling of a filtered tip, and a somewhat "milder smoke." According to present knowledge, filtration to remove specific components from tobacco smoke to pass, a minimum of tobacco smoke to pass, a satisfactory pressure drop and tobacco taste. In the United States some tobacco companies have taken advantage of the public's desire for filtered cigarettes and its equal wish for good tobacco flavour by marketing increasingly ineffective filters. Since both human and animal evidence indicates that the risk of developing cancer is directly related to the amount of tar exposure, it stands to reason that a given filter which will permit x milligrams of tar to pass is more effective than one which will permit the passing of 3x milligrams of tar. Sooner or later, regulations must be passed that establish criteria for the amount of tar which may pass through a given filter and that will make it a requirement for the manufacturer to state the effectiveness of a given filter. Present work indicates that it is entirely possible to develop a filtered cigarette with a good pressure drop and satisfactory tobacco taste which will remove about 40% of nicotine and tar from a given cigarette. Uniform acceptance of a filter in this range will be a partial answer to the present problem, provided, of course, that the smoker does not decide to smoke twice as many cigarettes, and provided, too, that the tobacco selection, cut, or packing is not altered in such a way as to yield increasingly more tar.

3. *Removal of Precursors.* If the hydrocarbons naturally occurring in tobacco represent one of the major precursors of tobacco-tar carcinogens, a reduction of such substances occurring in tobacco, a reduction of such substances may have a direct effect in reducing the carcinogens. Most of the aliphatic hydrocarbons are in the waxes that cover the tobacco leaf. Terpenes are also present. It may be practicable to remove all or part of these substances from tobacco by washing it with eluents such as hexane. Experiments testing this hypothesis are now in progress.

4. *Modification of Pyrolysis.*—Since pyrolysis plays an important part in the formation of carcinogens, modifications of pyrolysis may affect the formation of carcinogens. This problem can be studied from the point of view of all those factors that affect the process of pyrolysis of tobacco. This includes the amount of oxygen supply, the temperature levels reached and maintained, the catalysis available, the cut of the tobacco leaf as such, the length to which a cigarette is smoked, and even the cigarette paper used. Experiments are now in progress for studying the interrelation of these factors so as to determine how a modification of the factors might lead to a reduction of the carcinogens formed during pyrolysis.

In this respect recent work of Lam (1956a, 1956b) is of particular interest. Pyrolysing aliphatic tobacco hydrocarbons, he found smaller amounts of aromatic compounds formed at 700° C. than at 800° C. At the latter temperature Lam found 3,4-benzpyrene to account for 1.3% of the total aromatic compounds and at 700° C. for 0.5%. The respective figures in parts per million were 340 and 30. At 600° C. Lam was unable to find evidence of aromatic substances, but studies by Wright indicate that some polynuclear aromatics are found even at lower temperatures (G. Wright, unpublished data).

Conclusion

The practical aspects outlined above may not individually lead to a tobacco tar that will have less tumorigenic activity, but a combination of these factors may be effective.

This discussion has dealt only with the problem of carcinogens and not with the equally important problems of nicotine and its apparent effect on the cardiovascular system. Jointly with work carried out toward reducing the carcinogens in tobacco tar to a subthreshold level, work should also be carried out on nicotine effects to determine whether it can also be brought to a subthreshold level so far as its effects on man are concerned.

A final point concerns a comparison of human and animal data referred to in the beginning of this discussion. It was there stated that the proof that smoking is the cause of cancer in man rests entirely upon human statistical and epidemiological data. Animal data chiefly serve to indicate the nature of the carcinogens in tobacco tar. Obviously they can only indicate the nature of a carcinogen to a specific animal strain, species, and tissue. This truism applies not only to this specific instance but to all phases of cancer research. In cancer chemotherapy, as in carcinogenesis, many similarities and also many differences are known to exist between human and animal data. On having identified the specific carcinogens in tobacco tar as they apply to the experimental animal, one can only assume that these carcinogens are also responsible for the human cancer problem. If an agent has been found to be carcinogenic to a variety of animals, and human epidemiological data are not inconsistent with this finding, then the burden of proof lies upon those who claim that these substances are not carcinogenic to man. For that reason we should try to establish measures, if at all practicable, that can reduce established carcinogens from tobacco tar and apply these to the manufacturing of smoking products and the smoking habits of the population. This problem, as any other problem in life, cannot be solved by ignoring its existence or depreciating its importance. It can only be solved by facing it directly. In view of the work already completed and the investigations in progress now, a satisfactory solution should be attainable. The lives of people everywhere who will in years to come die from cancer of the lung and cancer of the upper respiratory tract demand that we give this problem our fullest attention.

REFERENCES

- Cooper, R. L., and Lindsey, A. J. (1955). *Brit. J. Cancer*, 9, 304.
Hammond, E. C., and Horn, D. (1954). *J. Amer. med. Ass.*, 155, 1316.
Kennaway, E. L. (1925). *British Medical Journal*, 2, 1.
Lam, J. (1956a). *Acta path. scand.*, 39, 198.
— (1956b). *Ibid.*, 39, 207.
Levin, M. L. (1953). *Acta Un. Int. Cancer.*, 9, 531. Personal communication to author.
Stocks, P., and Campbell, J. A. (1955). *British Medical Journal*, 2, 923.
Wright, G. F., and Wynder, E. L. (1955). *Proc. Amer. Ass. Cancer Res.*, 2, 55.
— (1956). *Ibid.*, 2, 159.
Wynder, E. L., Bross, I. J., Cornfield, J., O'Donnell, W. E. (1956). *New Engl. J. Med.*, 225, 1111.
— Graham, E. A., and Croninger, A. B. (1953). *Cancer Res.*, 13, 855.
— (1955). *Ibid.*, 15, 445.
— Lubberger, A., and Grener, C. (1956). *Brit. J. Cancer*. In press.
— and Wright, G. F. (1956). *Cancer (N.Y.)*. In press.

Reporting to the Waikato Hospital Board, Hamilton, North Island, on the shortage of house-surgeons in New Zealand, the medical superintendent of the Waikato Hospital, Mr. R. S. A. GRAHAM, said that early marriage or projected marriage was one of the three predominant causes of the early loss of senior house-surgeons from the hospital service to better-paid positions in private practice. Mr. Graham said he understood that the marriage rate among medical students was increasing rather than diminishing. In 1956 nearly 30% of final-year students at the University of Otago would have married by the end of the year, as against 10 to 12% in previous years. Of the two other main causes for the loss of senior house-surgeons, one was the desire to get overseas—or at least to take a locum to accumulate funds for overseas work, he said.

THE MILD ENDOGENOUS DEPRESSION*

BY

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General Practitioner

In a recent paper on endogenous depression (Watts, 1956) it was suggested that not more than one-quarter of the cases occurring reached the psychiatrist, and that the disease was essentially one of general practice. It is probably one of the most common misdiagnoses, frequently being labelled either an anxiety state or an organic illness. The typical mental-hospital type of endogenous depression is easy to identify. To wait for this severe state of affairs to be reached in order to clinch the diagnosis is like waiting for cavity formation before deciding that a case is one of tuberculosis. There is one big difference between these two diseases. Tuberculosis is a chronic progressive condition which will in time compel recognition, whereas endogenous depression is a self-limiting disease which in 85% of cases remits after a few months or years, and once the patient has recovered the problem of diagnosis is forgotten. Only about one case in every six is a classical deep depression. The other five are milder types, and more difficult to diagnose. Twenty years ago, at the very end of a list of possible aetiologies, one found "hysteria." This clause should be amended to "anxiety states, endogenous depression, and other psychiatric disorders."

The first step in making the diagnosis is to realize the possibility. The mild depression has to be sought for. The presenting symptoms in 100 cases are shown in Table I.

TABLE I.—Presenting Symptoms in 100 Cases

Depression	9	Muscular pains	2
Cough	8	Injury	2
Run down	7	Strange behaviour	2
Insomnia	7	Palpitations	1
Headache	6	Tinnitus	1
Vague complaints	4	Globus hystericus	1
Dyspepsia	4	Urticaria	1
Nervousness	4	Tremor	1
Tight feeling in chest	4	Tonsillitis	1
Giddiness	4	Pseudocyesis	1
Pain in chest	4	Bad smell in nose	1
" " back	3	Plles	1
Belching of wind	3	Diarrhoea	1
Pregnancy	3	Constipation	1
Attempted suicide	3	Haematemesis	1
Vaginal bleeding	3	Collapse	1
Dysuria	2	Dysphagia	1
Fainting	2		

If all the cases with symptoms that could possibly be called neuro-psychiatric are collected together, the total number of the cases will amount to 60% of the whole (Table II). In other words, two-fifths of the cases present as a possible organic disease.

TABLE II

Nervous and psychiatric symptoms	60
Respiratory system	12
Gastro-intestinal system	12
Urogenital system	9
Muscular	8
Ear, nose, and throat system	5
Injury	3
Skin diseases	2
	1
	100

To approach the problem of diagnosis another way, it is suggested that mild endogenous depressions appear in four ways. (1) Some of the patients exhibit overt evidence of a depressive disorder, and the problem is to

*This article and its predecessor (Watts, 1956) were the substance of the Sir Charles Hastings Prize essay for 1955.

decide whether the case is endogenous or reactive. (2) Some present as cases of psychiatric disorder, but the depression is heavily disguised. (3) Some present as a "depressive equivalent"; that is to say, the case simulates an organic illness, and the latter has to be excluded before the diagnosis can be made. (4) The depression may be grafted on to genuine organic illness. To illustrate these points, typical cases in the various categories are described.

1. Overt Depression

This kind of case is often presented in general practice as the respectable good patient who suddenly goes "neurotic" and becomes really troublesome. For weeks or months he is a constant attender at the surgery with vague complaints which have no adequate physical basis. He tends to exchange one set of symptoms for another and his outlook is irrational. Then just as suddenly as he started his trips to the surgery, they cease, and once again he becomes the perfect patient, requiring no attention.

A man of 50 presented himself in an apologetic way. He wasn't really ill; he just felt queer. He had never been like it before and just could not understand himself. He could not read as he used to, found it very difficult to make up his mind about things, was restless, and could not sleep, having difficulty in dropping off. There was no obvious reason for any anxiety or depression. Testosterone was ineffective, but he found great help from quinalbarbitone on retiring and dexamphetamine in the mornings. He was unable to work for four weeks, and when better admitted he had had ideas of poverty he had never spoken about. When seen six months later he had quite recovered.

A woman in her forties was very prone to this condition. She usually came to the surgery with some fairly trivial complaint, but if given a sympathetic ear she was prepared to pour out her troubles. "Doctor, I don't know what is the matter with me. I have a good husband, a nice home, and three lovely children. I have everything that a woman can want and yet I'm utterly miserable."

A married woman aged 44 came to see me because of dizzy bouts. She said she could not understand herself, as the least thing upset her. Some days she felt on top of the world, and the next useless. She kept waking up in the early hours of the morning and what sleep she had was broken with bad dreams. She could not concentrate, and found her memory was going. She could not settle to do jobs which at one time gave her great satisfaction. There was no wish to be dead, but she was given to weeping bouts.

2. Depression Disguised as an Anxiety State

The following case illustrates the difficulty in making a diagnosis. While three doctors were agreed on the psychogenic nature of the problem it was not until psychotherapy was started that the case was shown to be one of endogenous depression.

A man of 31 was passed on to me as a psychiatric case by one of my partners. He had already been seen at the hospital out-patient department, where the diagnosis was considered to be "psychogenic." His story was that in June, 1955, while working a crane, a giddy feeling came over him and he had palpitations. He felt very frightened and thought he might drop dead. He had been sleeping badly for some time before this attack. When seen by me in February, 1956, he was complaining of headaches and vertigo, and my first diagnosis was one of anxiety state. Financial worry seemed to offer some explanation for his troubles, but he had no insight into his condition and he was unresponsive to psychotherapy. Attention was then turned to probe for depressive feelings. Inquiry showed that he was in very low spirits and often wished he was dead. He felt it was all his own fault that he had allowed himself to slip, and he had distinct ideas of guilt. Powers of concentration had gone, he could no longer read books,

and noise upset him. He found the children a problem and the wireless unbearable. The world, he said, looked different, a less pleasant place than it had been. He was referred to a psychiatrist, who agreed with the diagnosis, and he entered a mental hospital as a voluntary patient.

3. The Depressive Equivalent

The type of case in which the depression simulates an organic illness was called by Kraines (1943) a depressive equivalent. A selection of these cases is given to illustrate how deceptive the disease can be, and not because equivalents are more numerous than other types of depression.

Simulating Gastric Carcinoma.—A man aged 52 sent for me in August, 1946, because he had had a haematemesis. I did not see the blood, but he was obviously very ill. He was pale but not exsanguinated. He had a marked anorexia, was very thin, but had no pain whatsoever. I could find no physical signs in his abdomen, but I suspected carcinoma of the stomach. As soon as he was fit enough he was sent for x-ray examination, with negative results. In November he was a living skeleton. He could not sleep, and felt he was a living skeleton. He was morose and could not bring himself to speak to his family. He admitted he was very depressed, and when I asked him if he wished he was dead he replied, "I have indeed, but I would never have told you had you not asked me." He stated he still could eat nothing before dinner, but felt better by evening. At bed-time he felt much better, but could not get off to sleep. This morning depression and evening vigour is fairly common in melancholics. A week later he was very depressed and admitted that but for his family responsibilities he would get out of it. I persuaded him to see a psychiatrist, who reported as follows: "This patient has, as you say, a typical involuntional depression of something like 12 months' duration. He should have E.C.T., but refused to go to a mental hospital. His haemorrhage is indeed difficult to account for, though it did follow vomiting. Did the strain of retching rupture a vessel?" The patient was very satisfied with this second opinion, although he poured scorn on the idea of a mental hospital. By July, 1947, he had recovered enough to go back to work.

This man presented a typical picture of gastric neoplasia: but he proved to be a case of depression.

Simulating Asthma.—An old man of 84 sent for me because he was having attacks of nocturnal dyspnoea. I found him setting potatoes in his garden, so he was by no means an invalid. He actually lived alone and cared for means an invalid. He actually lived alone and cared for himself. His story was that at 2 a.m. he awakened short of breath. He had to get out of bed and open the window, and there was no more sleep. I thought he probably had cardiac asthma, but there was no evidence of either heart or kidney disease. Linctus and cough medicines were ineffective in helping his dyspnoea. He pressed me to let him know the worst, and all his family felt it was the end. The early waking and his deep concern over himself made me suspect depression. I gave him a barbiturate hypnotic each night, and once his sleep had returned to normal he greatly improved. He never had a return of his symptoms and he lived to the ripe old age of 92.

I have called this incident a depression. It was certainly no organic or progressive disease. There was no history of asthma, and I never found any evidence of bronchospasm. He had a very fine health record. My view is that this was a very mild depression which fortunately came and went fairly quickly, lasting in all about two months.

Simulating Rectal Growth.—A man aged 45 came to see me in February, 1947, complaining of diarrhoea. His stools were running from him in the surgery, so that I had to send him home and go there to examine him. There was a history of alternating diarrhoea and constipation with marked loss of weight. Nothing was found on physical examination either per rectum or per abdomen. He was referred to hospital, where investigations were again negative, but later, when his diarrhoea had ceased, he complained of diffi-

culty in falling off to sleep, bad dreams, and awaking unrefreshed. He said he felt awful in the mornings and had done so for at least three months. Everything was too much trouble; but he denied being depressed. He was irritable at home and his sexual desires had gone. I returned him to hospital with the suggestion that he was depressed. This view was confirmed by the physician. By April he was worse, neither eating nor sleeping. In May his wife came to see me. She was very worried about him and was sure he was suicidal. She agreed to his going to a mental hospital, but we could not persuade him to go. Fortunately he began to improve, and by July was back at work, having been "on the club" for five months.

Simulating Intestinal Obstruction.—A woman aged 57 came to see me in April, 1947, complaining of abdominal pain. Physical examination revealed that her abdomen was distended, and she presented a picture of subacute obstruction. I sent her to see a surgeon privately, and he admitted her to hospital at once and performed a laparotomy, to find nothing abnormal. I saw her again in May, when she came out of hospital. All her abdominal symptoms had gone and she complained of insomnia, early waking in character. She was depressed and lacrimose, but admitted no death wish. Her memory was bad and she could not stand noise. She told me she had been very depressed 27 years previously, after the death of a child. She had visited the grave twice daily and once filled a tub in which to drown herself. A week after this interview she was somewhat better, having good days and bad days. The depression gradually lifted, and in October, 1947, she said she would not come again as she was quite well, and her recovery appears to have been maintained for the past nine years.

This case is of interest because the depression did not become obvious until after the laparotomy; but it must have given rise to the obstructive signs and symptoms. Autonomic upsets are not infrequent in depressive illness, as shown by sweating, tremors, fainting, and even ague.

4. Depressive Grafts

In my opinion few chronic sick are more cheerful in adversity than the victims of severe forms of rheumatism.

A man of 27 had been confined to his bed for seven years with a poker back and ankylosing arthritis of both his hips. He was usually cheerful and contented in spite of his crippling and sometimes painful complaint. He seemed to have accepted the bad prognosis and adjusted himself to the limited little world in which he was compelled to live. He revelled in the praise he got from his family and friends for his uncomplaining attitude. His bedside became a social centre. But periodically a cloud descended and he lost his tranquil frame of mind. He grew restless and demanded further investigation of his condition or a new treatment. He became complaining, morose, and difficult to live with. He felt his life in his deplorable state was not worth living, and suicidal ideas were not far away. He was broody and had difficulty in sleeping. He refused to eat, was depressed, and at times lacrimose. He was full of symptoms, and each new pain had an ominous significance. His whole attitude to his suffering became illogical and quite the reverse of his usual fortitude.

I saw this man in only one of his attacks, but my partner, who had been looking after him ever since his illness began, said he had had three or four similar attacks. These usually lasted for about a month, and then the cloud lifts and he becomes his old self again, seemingly adjusted to his physical limitations.

A man of 64 had very severe chronic bronchitis and marked emphysema. Only on his best days could he walk very slowly along the village street. Most of his life was spent in his chair in the kitchen. He was a man of character. Starting life as a collier, he had continued at that work until his chest had stopped him five years previously. But besides his mining he had saved money and bought property. He was a fine gardener and owned a sizable poultry farm. He was always an interesting man to visit, although he was

so short of breath that even speech was difficult at times. He was philosophical about his illness, and usually said little about it. He preferred to talk about gardening or hens. When I called to see him in March, 1946, he had left his place in the kitchen and was sitting in a chair in his downstairs bedroom. He looked thoroughly miserable and depressed. He felt his end had come, and, although he had no ideas of suicide, he wished he could die. Life was a burden to him and he could see no future. His sleep was bad, as he was given to early waking. He made a good response to phenobarbitone and amphetamine, and in about three weeks the depression had passed. He came back to the kitchen and was his old cheerful self until he died in an emphysematous crisis some eight months later.

A married woman of exceptional personality and ability lived alone and did all her own housework at the age of 82. In August, 1947, I was called out to see her in the night as she had an attack of renal colic. I gave her morphine, and the next day she was much better. I noticed she had auricular fibrillation and a fast pulse, so I kept her in bed for a few days. She developed oedema and became seriously ill. Her son took her to his home, and there she became very depressed. She did not weep, but felt she was finished, and actually asked me to put her away. She could neither eat nor sleep, and it was difficult to control her oedema. Slowly she improved, but she remained profoundly depressed. In ordinary times she knitted, did the *Daily Telegraph* crossword puzzle every day, and enjoyed jigsaw puzzles, but she could settle to none of these things. She even lost interest in her own home, and she had always been of a very independent nature. Just after Christmas she was persuaded to go to her other son in a distant town for a few weeks. She hated every minute of the change and must have been a very difficult guest. The doctor who looked after her wrote and told me that, while her fibrillation was under control, she was very much a "cracked pot." She came back in February, and an improvement soon became obvious. She had started knitting and listening to the wireless. By Easter she was well enough to go home and take up her own life again, including her crossword puzzles. She kept remarkably well for two years and then had a stroke and died in two days.

Symptomatology

The severe depression is expressed in the triad of symptoms—namely, difficulty in thinking, depression, and psychomotor retardation. In the profound case these are often obvious at a glance, but with mild cases they have to be sought for.

Difficulty in Thinking

This is expressed in the patient with mild depression in two different ways. First, as a feeling of tiredness and exhaustion. The "reading test" is quite a useful measure of its magnitude. The reader of books finds he cannot concentrate enough to enjoy a book, but he can read the newspaper. Patients with more severe depression cannot even take an interest in the newspaper. One collier who could raise enough interest at midday to drink his beer and make a bet, could not by nightfall raise the interest to look at the results in the evening paper.

The second way in which this basic symptom is expressed is an illogical approach to the problem. As Robert Burton (1628) put it 300 years ago, "Reason as well as imagination is at fault." One man blamed a quarrel with the foreman for his troubles. Argument could not convince him that this explanation was phony, but a week later he decided that the real cause of his trouble was he needed glasses. The quarrel was forgotten. Often there is an element of self-blame in these phony explanations. An engineer blamed worry over a haulage cable which he had not tested to his satisfaction, but there was no real evidence that his fear about the cable was valid. He could never forgive himself if it ever broke. The mind of the anxious patient is rational and he can follow with interest a logical argument. That of the depressed patient is irrational. His thoughts and ideas are repetitive. He will say the same thing over again, and

ask the same questions; he makes no progress with superficial psychotherapy.

Depression

The victim of a mild depression does not look depressed, but he will readily admit he feels in low spirits. The colour has gone out of life, and the future, if not black, is at least grey. The sense of humour goes. He "is not himself" in a very real way, and he feels isolated and misunderstood. The tolerance of noise drops in depression, and, as wireless is an almost universal noisemaker, the patient's reaction to it is significant. The patient who used to work to a background of wireless programmes now switches the set off. The row made by his children upsets him in a way it never used to.

1. *Suicidal Ideas*.—These ideas are an expression of this symptom. In a depressive with suicidal feelings the depression is not mild, but even in the mild cases the seeds of the suicidal urge may be evident. This is expressed first as a fear of dying. The patient feels he has some mortal illness such as cancer or tuberculosis, or he is going to have a stroke. This same feeling may be expressed not as a fear of any disease, but as a feeling of apprehension as if something terrible is going to happen. "Every time a car stops outside, I think they are bringing my husband back from the mine," or, "Every time the 'phone rings I feel it is bad news." As the depression deepens, the patient expresses not so much a fear of death as a wish to be dead. This is still not the same as a true suicidal urge which occurs in the worst types of depression. If a true suicidal urge is suspected the patient should be sent to a mental hospital for treatment. Occasionally even the apparently mild depressive may be more suicidal than one thinks.

2. *Phobias and Obsessions*.—Just as the suicidal urge has forerunners in such symptoms as a fear of impending disaster, a fear of death, or a wish to be dead, so the frank delusions of the profound depressive may start as simple phobias or obsessions. A fear of venereal disease is a not uncommon symptom of depression.

One of the village fathers, a venerable man of 65, came to ask me for a tonic, as he was run down. His symptoms were all very vague and indefinite. During this first consultation he confided in me that as a young man he had had gonorrhoea. He concluded by saying, "I have never told anyone about that before. I have been wondering lately what my children would say if they knew, or what my friends and their wives would think of me." This was in fact the beginning of a depression which lasted for about three months. Soon after recovery he had a coronary thrombosis which ultimately killed him, but during the physical illness he was never morbid or depressed, and no mention was ever made of venereal disease.

The phobia which persists may become an obsession, so that the patient can think of nothing else. The obsession may be about disease, as in a case of cancerphobia, or it may be about some misdeed, as in the case of a mother who felt she had killed her child. Phobias are common among mild depressives, but if the patient becomes obsessed the depression is getting deeper, and it is as well to get the advice of a psychiatrist, as such cases often need E.C.T.

3. *Insomnia*.—This in one form or another is an essential feature of endogenous depression. While the most common form of sleeplessness is that the patient awakens in the early hours, this is by no means always true. When a series of 100 cases was analysed early-waking insomnia was evident in only 44% of the patients. A more general form of insomnia is not uncommon. The patient finds difficulty in getting off to sleep, and, once asleep, sleeps only fitfully, to wake in the morning more exhausted than when he went to bed. A further 22% had difficulty in dropping off to sleep, but then slept reasonably well. Most patients with endogenous depression awaken with a heavy head and they feel useless for several hours. Bad dreams occurred in 21% of the cases, and in two the dreams were so awful as to account for the insomnia. "I dream of terrible and shameful things," "I never had such dreams in my life," or, "I am always

dreaming of death and dead people," are examples of how such dreams are described. Two patients could not sleep because of their bad coughs, and another woman, who was suffering from pseudocyesis, was unable to sleep because of the "movements inside her."

Psychomotor Retardation

In the case of mild depression psychomotor retardation may be expressed by minor habit changes. This symptom is a most subtle measure of depression. It happens for a variety of reasons. Sometimes the habit change is because there is a falling off of powers of concentration and application. The pianist never opens her piano, and the keen gardener lets his weeds grow unheeded. The tidy person tends to neglect personal hygiene and look unkempt, but with mild depression this is not likely to be marked.

The social habits of the patient are very prone to alter. The normally affable person tends to stay at home because people are apt to ask questions about his health or pass remarks about him which only make him more depressed. The music-hall and the cinema no longer amuse him, and his inability to laugh with others only underlines his troubles. On the other hand, some timid normal unsociable types begin to seek company. They are so fearful of their own thoughts that they prefer and feel safer with other people.

Bizarre forms occasionally arise. One depressed woman who was obsessed with the idea of a growth in her back used to wear holes in all her clothing by rubbing the affected part against suitable articles of furniture. The habit was noticed long before the depression was diagnosed or the reason for the back-rubbing was elucidated. Another reason for habit changes is that the patient is always on the look-out for an explanation for his symptoms, and, like the drowning man, he will clutch at a straw. If he happens to blame the habit of a lifetime for his symptoms, it is dropped. One man of 56 ceased to take his ritual purge on Sundays in case that was upsetting him. The regular drinker may in case that was upsetting him. The regular drinker may in case that was upsetting him. The regular drinker may in case that was upsetting him. One thoroughly reliable and normally abstemious patient developed delirium tremens, as he took to relying on alcohol to get him off to sleep.

The Feel of the Case

The classical melancholic oozes depression, so that the observer feels depressed himself, in much the same way as the merry "drunk" readily transmits his cheerful state of mind to responsive company. There is no aura of depression about mild cases, and yet they have a definite quality of their own. Their attitude of mind is one of injured bewilderment. "Why am I like this"; "I have never been like this before in my life"; "I don't know what has come over me"—all these are the patient's ways of describing his feelings. He is pained and worried by his change of outlook. He seems to want reassurance, but does not appear to accept it at the time, as with monotonous regularity he goes over his symptoms again and again. He is in fact assisted by reassurance.

A man of 56 appeared to have a mild depression. After a full history and careful examination he was reassured, and the disease was explained to him. He was told that in a few weeks, or perhaps months, his troubles would all disappear. He was seen weekly for some time and then six months later he came down to the surgery. He had quite recovered, but was still able to give a vivid description of his depressive feelings. He had felt hopeless, and the doctor's reassurance, although viewed with considerable doubt and misgiving when it was given, had helped. In fact, now that he was well he was prepared to admit that all forecasts of recovery, disbelieved at the time, had been fulfilled, and he was grateful for such reassurance.

The depressed mind, besides being somewhat rigid, appears to work in an illogical manner. The melancholic is unimpressed by a reasoned explanation of his feelings. He may, in fact, feel worse if told too much. On the other hand, a perfectly intelligent depressive will ascribe his state

to quite absurd possibilities. An innocent pimple has fearful significance, some distant peccadillo is now bringing retribution, and so on. In spite of this rather difficult frame of mind, the patient is at heart grateful for all attention and sympathy. One woman who has in eight years had five severe but short-lived depressions come along or sends to the doctor if she feels an attack coming on. She must know by now that no medicine the doctor can give her will help. She evidently feels that his knowledge of her suffering and his understanding in some way helps to make the burden lighter. Even if the recurrent case knows it may lead him back to a mental hospital, he usually comes back to his doctor when he feels the clouds are descending on him.

Treatment of the Mild Depression

The factors which should make the general practitioner pass a depressive case on to the psychiatrist are twofold. First, if he can detect a suicidal urge, or symptoms such as agitation or delusions are emerging, then the depression is no longer mild, and E.C.T. is probably indicated. Secondly, if the illness lasts more than three months, further advice should be sought, to confirm the diagnosis and to consider physical treatment. If these two points are borne in mind the treatment of the mild types of depression is safe and simple and within the scope of general practice.

The most important factor in treatment is to establish a good rapport. The patient is so often spurned and misunderstood, especially by well-meaning relatives, that it is a great relief for him to find a sympathetic ear. His feelings of guilt, if not overt, are latent, and he tends to feel a very inferior creature and thoroughly ashamed of his symptoms. The doctor who can assure him he is suffering from a common and well-understood disease makes him feel less lonely. If added to this the practitioner can show real interest and encourage him to come again once or twice each week, the patient is greatly relieved. He expects to feel he is a burden, a waster of the doctor's time. Have not his family told him that only he himself can help himself? He comes to the surgery expecting to be snubbed and feeling that the busy doctor will have no time for cases such as his. To find himself the centre of interest and understanding is a pleasant surprise in the grey world of depression.

Symptomatic Treatment

Insomnia is the most obvious symptom to treat. Barbiturates have a wide range of action. For the early-waking types butobarbitone, 3-6 gr. (0.2-0.4 g.), is indicated. Barbitone sodium, 7½-10 gr. (0.5-0.65 g.), is very useful, but it is so prolonged in its action that it tends to cause a hang-over the following day. For those who have difficulty in dropping off to sleep the quick-acting barbiturates such as quinalbarbitone, 1½-4 gr. (0.1-0.3 g.), should be given. The general insomnia or fitful sleep needs a mixture of both, such as quinalbarbitone, 1½ gr. (0.1 g.), and barbitone sodium, 7½ gr. (0.5 g.). Hypnotics should be looked on as a temporary measure, and if a habit is being formed the patient should be switched to the safer and less appetizing chloral hydrate, 30 gr. (2 g.). All hypnotics should ideally be given to a relative, who should administer them to the patient and see that he takes them, as the capsules and tablets are such an easy method for the would-be suicide. This is a council of perfection. It should be applied to the moderate and severe cases, but the patient with mild depression rarely brings a relative: the ritual of bringing the next of kin, and giving him a private session to discuss the patient's symptoms, and so on, only tend to increase the patient's apprehension about his troubles. In a series of 289 cases of endogenous depression four actually did use the barbiturates with suicidal intent. Only one patient was seriously ill and eventually died. On the other hand, it must be admitted that three of the four cases were viewed before this episode as cases of mild depression. In the early stages, when the patient is being seen twice weekly, the drugs need only be prescribed in small quantities to last three or four days.

As euphorants and dispellers of the morning headache the amphetamine group of drugs are still the most useful. In a small proportion of cases, probably not more than one in ten, they work like a charm, and yet in others serve no useful purpose. They can be used in combination with barbiturates or aspirin in certain cases.

Malleson (1953) recommends the use of small doses of natural oestrone, ethisterone, and methyltestosterone in cases of premenstrual and menopausal depressions. If one hormone fails to work another is tried, or two are tried alternately. No adequate series has so far been established, but a few most gratifying results have been recorded, and further work on the subject is certainly indicated. There are many drugs on the market which claim to be useful in cases of depression, such as rauwolfia, chlorpromazine hydrochloride, pipradrol hydrochloride, benactyzine, and methyl phenidate hydrochloride, but again none have been given an adequate trial so far in the mild depressions of general practice.

Light work or work devoid of responsibility is to be encouraged, but the patient should not be physically exhausted by his labours, or weighed down by an overactive sense of duty. If work is a burden, it should be abandoned for a while. A change of scenery or company may help those with a mild depression, whereas it is definitely contraindicated in those with the severe type, who need to be kept under constant observation. Very few housewives, who form a big proportion of these cases, ever allow themselves to be put off work altogether.

Summary

The mild endogenous depression accounts for 60% of the cases which occur. The symptoms are usually so mild that the patient is not likely to get past his general practitioner into the hands of a psychiatrist. It is essentially a disease of general practice. The condition is frequently disguised, and is often misdiagnosed either as an anxiety state or as an organic illness. It can also occur as a graft on to established organic disease, and if such a patient is to receive adequate treatment the depression must have due recognition. These disguised forms of endogenous depression are illustrated by typical cases. The severe mental-hospital type of depression, with the classical triad of symptoms, is easy to diagnose. The case of mild depression has to be sought out. Difficulty in thinking, depression, and psychomotor retardation are all evident in an early and modified form. The evolution of such symptoms as suicidal ideas and delusions is observed in the various grades of depression. The mild depression has a distinct "feel" of its own. The patient presents a picture of "injured bewilderment."

Most of these mild cases can be treated at general-practice level. If a suicidal urge emerges, or the patient becomes agitated or deluded, a psychiatrist should be called in. It is as well to pass even a mild uncomplicated case on to a specialist if the depression shows no signs of improvement after three months' observation.

Symptomatic treatment is described, but the most potent weapon in the hands of the general practitioner is a good rapport with his patient. The sympathetic understanding of the doctor goes a long way to tide him over the dreary and painful weeks or months of depression. This is confirmed by the way in which patients with recurrent depression come back as soon as they feel the clouds descending.

REFERENCES

- Burton, R. (1928). *The Anatomy of Melancholy*, 3rd ed. Kraines, S. M. (1943). *Therapy of Neuroses and Psychoses*. Philadelphia. Malleson, J. (1953). *Lancet*, 2, 158.
Watts, C. A. H. (1956). *British Medical Journal*, 1, 1392.

TRIAL OF RESERPINE IN TREATMENT OF SCHIZOPHRENIA

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This is a report on the immediate results of a clinical trial of the use of reserpine in the treatment of 119 cases of schizophrenia. The study covers a period of 18 months. An assessment of the cases was made on December 31, 1955. Only patients whose response to the drug was regarded as decisive by this date were included. The follow-up period ranges from a few weeks to ten months.

Inquiry into the efficacy of a new treatment in psychiatry is notoriously difficult. A controlled investigation satisfactory to statisticians is difficult to obtain, especially with a drug which has marked side-effects. Psychiatric diagnosis is inexact, and descriptive terms may have widely different meanings for different psychiatrists. The natural illness is often fluctuating and subject to remission. Enthusiasm for a new treatment, a new interest in the patient, and a favourable change in the environment can all react markedly on the patient, and influence results.

We have divided our cases into five groups, and the order in which we report on them reflects the history of our attitude to the drug. Thus the first group consists of chronic deteriorated patients who were long since regarded as past any hope of improvement. Results with this group encouraged us to treat a group of cases which had failed to respond satisfactorily to other better-tried methods of treatment. Later, we used the drug as the first line of treatment in cases considered unlikely to respond to these better-known methods. Finally, we report the results in two groups of acute cases in which the immediate prognosis with other methods had been thought likely to be good.

Regime of Treatment

The preparation of reserpine used throughout the trial is marketed under the trade name "serpasil."

When we began to use reserpine it was available only in tablet form, and in group I the dosage varied from 2 to 8 mg. daily by mouth. In the other groups we were guided by Kline's scale of dosage (Kline and Stanley, 1955; Barsa and Kline, 1955), and the following amounts were used: 3 mg. orally daily throughout; 5 mg. intramuscularly on the first evening; and 10 mg. intramuscularly nightly for three to seven weeks, reducing this to 5 mg. on alternate nights for two weeks, and finally 2.5 mg. on alternate nights before discontinuing the injections. If side-effects were troublesome the dosage was reduced earlier. In the most severely and chronically ill the intramuscular dosage was continued as a maintenance dose on every second or third night indefinitely. The giving of the injections at night minimizes absenteeism, due to side-effects, from occupational therapy classes and recreational and social events. Each case must be treated individually, and dosage modified according to the side-effects and the mental

state. Our present tendency is to decrease the dosage rather more slowly than at first, and to keep the patient on an oral maintenance dose for many months after symptoms have disappeared. All discharged patients are encouraged to attend the out-patient department regularly, and, if they live at a distance, to keep under the care of their local doctor and to report to us by letter. Sometimes a patient should untoward symptoms arise. Sometimes a patient who has improved relapses when the drug is reduced, and a return to bigger doses is indicated. A number of patients who subsequently did well showed this tendency to relapse, from the fourth to the seventh week.

The drug was the focal point of the treatment of these patients. They were interviewed at least once weekly and their symptoms elicited. Usually the patient was told directly that he was mentally ill, and simple explanations were given of paranoid ideas, delusions, and hallucinations, with their mode of development. A full programme of occupational therapy, games, work parties in the open, and social events was provided. As soon as possible week-end parole was given.

Effects of the Drug

Often in the first few days, and almost always in the first week, there is evidence of a tranquillizing effect. The patients are more relaxed and sociable, and less preoccupied with their symptoms. Disturbed behaviour is lessened. In some a mild elation replaces confusion and preoccupation. By the end of the first week previously withdrawn or suspicious patients may be anxious to talk to the doctor about themselves and their symptoms. It is often easier to elicit symptoms. Patients who had previously been evasive or secretive about their condition may discuss their abnormal ideas quite freely. Sometimes from then onwards there is a progressive lessening of delusions and hallucinations, and a gain in insight. The patients may for the first time accept explanation and reassurance about the nature of their symptoms. The course varies widely, and, as with other treatments, the most recent symptoms disappear first, and the oldest ones last.

In many patients in the acute schizophrenic group, satisfactory improvement with good insight had been achieved by the 21st day, whereas similar improvement in patients of the chronic group might take 60 days, and occasionally much longer. Sometimes insight appears to be gained as a result of patient and persistent explanation; in others there may be a sudden change for the better, symptoms subside, and patients appear to gain insight overnight, almost as if some crisis had been passed. Several chronic patients said spontaneously that they had suddenly realized for the first time that they were mentally ill. One patient who had written scores of paranoid abusive letters, over years, wrote a letter in the alleged illegal detention, over years, wrote a letter in the third month of treatment saying that he had just realized that what had been done was in his best interests, and that he would like to change his status to that of a voluntary patient for the remainder of his treatment. The patient, a paranoid schizophrenic of seven years' duration, has achieved a very good remission, and has been symptom-free for more than nine months.

A highly intelligent woman with a three-years schizophrenic history was convinced of the reality of her "voice," and admitted it without reserve. After a month's treatment she flushed angrily when it was suggested that the voice was a hallucination, and com-

plained in a letter to her husband that the doctors suggested she was "mental." She had then achieved sufficient insight to wish to avoid discussion of her symptom. A month later she could discuss her symptom objectively, admit that it was a product of her illness, expressed pleasure at the fact that it sometimes went away altogether, and inquire anxiously when it was likely to go away permanently.

A number of patients expressed fear that their "voices" would come back again when they stopped taking reserpine, and for this reason were loath to give up taking it.

Side-effects

In the first few days of treatment flushing, tremor, nasal stuffiness, and drowsiness occur. Sometimes there is dizziness and vomiting. In a few patients short periods of elation occur, but more often there are periods of tension and depression. These may coincide with the drowsiness which tends to come on from one to three hours after an intramuscular dose of the drug. After about seven to nine days restlessness appears, and within a few days, in varying degrees, the other side-effects—pains in the calves and forearms, pains in the lumbar region and neck, loss of natural mobility of the face and arms with increase of salivation—appear. These latter may progress to a well-developed picture of Parkinsonism.

Rigidity may be so marked that spoon-feeding is required within two weeks of the beginning of treatment. Often sleep is disturbed, and early waking may be a troublesome feature, even in patients who are not depressed. A curious combination of drowsiness and restlessness appears. Drowsiness makes the patient want to lie down on his bed, while the restlessness impels him to pace up and down the ward. Those of a phlegmatic temperament bear it grimly, while the more volatile clamour for attention and relief. Nasal stuffiness may result in nose-bleeding, and we have seen sinus infections in two cases. Breathlessness and, rarely, a sensation of smothering may occur. Rarely, too, a patient may feel weak to a degree he interprets as "paralysis." Frequency of micturition and nocturnal incontinence are fairly common. Delay in initiating micturition, subjective impairment of accommodation, and unexplained oedema of the face and ankles have been noted. We have had no difficulty from postural hypotension. If for any reason electroplexy is given, adequate relaxants and preliminary atropine are necessary. Otherwise excessive salivation and possibly nose-bleeding might cause difficulty in maintaining the airway. We have, however, had no worry from any of these.

One patient, after discharge from hospital on a daily dosage of 2 mg. orally, had an attack which may have been epileptic. This is our only experience of that complication, which is described by Barsa and Kline (1955). We have given reserpine to several epileptics, not included in this series, without any increase in their attacks.

One patient, not in this series, died while on reserpine. She was suffering from schizophrenia and thyrotoxicosis. The cause of death was a thyroid crisis, which may have been precipitated by a maxillary sinusitis due to reserpine.

Appetite is often increased, and some patients get up in the middle of the night to appease their hunger. When side-effects become marked, reduction in appetite and difficulty in swallowing may lead to loss of weight. In a few cases diarrhoea has occurred.

Provided explanation and encouragement are given, the side-effects present no great problem in the average case. An antazoline-naphazoline nitrate ("antistin-privine") nebulizer is useful when nasal symptoms are severe; too great restlessness is usually relieved by one of the short-acting barbiturates or chlorpromazine hydrochloride ("largactil"). Tincture of belladonna is a help in lessening the salivation of Parkinsonism. All the side-effects lessen if the dose is reduced. Indeed, these side-effects, although

troublesome, appear to have their value; they create a bond between the patient and his fellows; they provide a topic of conversation, and many seem almost relieved to complain of physical rather than mental symptoms. In some cases they seem to distract the patient from preoccupation with his fantasies and delusions. Patients turn to the doctor to ask for relief of their physical symptoms, and sometimes this is the beginning of a more satisfactory doctor-patient relationship.

Barsa and Kline (1955) have described a turbulent phase of variable duration following on a sedative phase in the first week. In this, they state, the patients become more deluded, hallucinated, and disturbed. We have not been able to confirm this observation. In our experience the turbulent phase, except in the rare patient, is one of physical disturbance rather than mental turbulence. It is due to the side-effects of the drug—in particular, restlessness—rather than any increase in the psychotic process. In a few patients who appeared to have a low tolerance for tension the physical restlessness led to impulsive behaviour, such as breaking cups or a window. These few patients described sensations of something about to snap in their heads.

Trouble from side-effects varies widely, but is generally more pronounced in patients with neurotic or psychopathic personality traits. Some leucotomized patients seemed to be very tolerant of the side-effects of the drug.

Depression

The most serious complication of the treatment is the development of severe depression. This has been noted by physicians treating hypertension with—by our standards—small doses of the drug (Freis, 1954; Doyle and Smirk, 1955; Smirk and McQueen, 1955). Transient depression may come on a few hours after an injection, but in most cases it passes off again. In our experience, persistent deep depression has developed as early as the 27th day and as late as five months after treatment has started. A number of those who developed depression after a long period on the drug did so when the dose had been substantially reduced—sometimes when an oral dosage only was being given.

The picture is usually characteristic of the endogenous type of depression—early wakening, a sense of hopelessness, often a sense of guilt, with suicidal preoccupation. Although there is a retardation and deep dejection, the patient is usually able to express his thoughts, and admits to thoughts of suicide. Sometimes there is a fear of giving way to a suicidal impulse rather than a desire to be dead.

When depression occurs we feel that reserpine should be discontinued and sedatives given for relief of tension and insomnia. In a few cases symptoms have subsided within a week or two; in others a course of electroplexy has been given with success. A few patients proved resistant and required several courses of electroplexy before the depression finally cleared up.

Two of our patients in this series made determined suicidal attempts after discharge from hospital and while on maintenance dosage of 2 mg. daily. Fortunately neither suffered serious injury. Both were depressed, but neither showed any return of the schizophrenic symptoms for which the treatment had been given originally. It may be significant that the pre-psychotic personality make-up of both these patients showed definite evidence of immaturity and instability. The attempt was an impulsive desire to be rid of an intolerable feeling of tension and depression; it was not premeditated, nor was it the result of delusional thinking or in response to a hallucination.

It seems probable that the risk of suicide in this reserpine-induced depression is greatest in personalities with a poor tolerance for tension. *It must be emphasized that this is a very serious complication of the treatment. It is quite unsafe to prescribe the drug unless the patient can be seen regularly by a doctor aware of the dangers involved.* Some out-patients may require admission to hospital.

Group 1. Chronic Deteriorated Schizophrenics

Our first group of cases were chosen from a small ward of chronic deteriorated patients who had been in hospital for many years. Twenty-two patients were included (11 male and 11 female). Their average age was 45 years and their average stay in hospital 13.5 years. The shortest stay was one year, but in her case there was evidence that she had been ill for ten years. The patients were chosen because of one or more undesirable features in their behaviour, such as resistiveness, aggressiveness, noisiness, or destructiveness. Only with three could one establish contact or make conversation. Some were having maintenance electroplexy to control their disturbed behaviour. Some had been on chlorpromazine hydrochloride, and in all cases the usual sedative drugs had been tried over the years.

Regime.—Reserpine was given orally in dosage of 2–8 mg. daily for an average period of 75 days. The initial dosage was 2 mg., but if there was no beneficial effect this was increased. Following this, control tablets were substituted without the knowledge of the medical staff—with the exception of the physician in charge of the clinical trial. The control tablets were given for an average period of 45 days, when reserpine was resumed in all the patients and dosage adjusted within the limits of 2–8 mg. to obtain the best response. Otherwise the routine of the patients was unchanged, except that any fresh interest in occupational therapy or social events was encouraged.

Side-effects were comparatively mild. Increased appetite and weight gain were frequent. Twelve of these very chronic patients improved on the drug, a few strikingly. Ten of them relapsed on controls, and two of these failed to regain improvement on a second course of reserpine. Most of those who improved did so in the first two weeks of treatment. A sedative effect, sometimes with drowsiness, was noted, beginning most usually from the second to the seventh day. Those in whom drowsiness was well marked did best.

These figures give an indication of the results, but cannot really convey the general improvement of the group in morale, in hygiene, in the standard of occupational therapy, and in the general happiness of both patients and staff in this section of the hospital.

There is general agreement in the published literature that reserpine is of value as a sedative in some patients of this type (Kline, 1954; Glynn, 1955; Noce *et al.*, 1955).

Group 2. Chronic Treated Schizophrenics

For the intensive treatment we chose first a group of patients whose illness was more recent than that of Group 1 but none the less chronic. None was ill for less than two years; the average duration of symptoms was 7.5 years (range 2–29 years). The average age was 35.5 years (range 18–52 years). In every case one or more of the physical methods of treatment had been tried and had failed to produce a sustained remission. The average duration of reserpine treatment was 193 days (range 53–470 days).

TABLE I.—Treatments Previously Given to the 38 Patients (23 Male, 15 Female) in Group 2

Previous treatment	No. of Cases
E.C.T.	37
Insulin	27
Leucotomy	19
Intravenous acetylcholine	12
Leucotomy was planned for 9 patients if reserpine failed to produce remission.	

Table I shows the treatment previously given to the 38 patients in this group. In none had a sustained remission been produced. Leucotomy was projected in nine cases because of the continued failure to respond to treatment. All patients were classifiable as chronic hospital invalids or likely to fall into this class if projected leucotomy did not produce a remission. Twenty patients presented serious nursing problems because, under the influence of their delusions or their "voices," they became aggressive or negativistic.

All but four of these cases had been under our own observation in hospital for at least a year, many for much longer periods. Of the four patients treated in other hospitals, one had been leucotomized and three had had insulin and electroplexy combined. These patients were known intimately by the staff of the hospital, and every effort had previously been made, without success, to achieve a sustained remission. Thus this group of patients could act as their own controls. In none of these cases was the diagnosis in any doubt—all showed active schizophrenic process symptoms. Seventeen of the patients admitted to auditory hallucinations when reserpine treatment started; 31 were deluded, without insight; 24 had ideas of reference or influence; 22 showed marked affective blunting or incongruity.

In assessing results we tried to make our criteria as objective as possible. A clinical impression that the patient had improved was not regarded as valid unless it could be shown that specific psychotic symptoms had disappeared. The term "recovered" was deliberately avoided, in view of the short-term nature of the results. We classified the results into three groups: much improved, improved, and no improvement. These terms are defined in the legend below Table II.

Of the 17 patients who were hearing voices when the treatment started, 11 lost their hallucinations, but in two they returned. Of the 24 who had clear-cut ideas of reference or influence, 11 lost them. Of the 31 who had frank delusions, 15 lost them or showed considerable diminution in delusional ideas. Ten gained fairly good or good insight.

This group was a most instructive one because the case material was so well known to us, the symptomatology so clear-cut, and, since no other physical method of treatment was used once reserpine therapy started, improvement when it occurred could be attributed with reasonable certainty to the drug. The statistical details of this group are given in Tables II, III, and IV. One patient became depressed.

TABLE II.—Response of Patients in Group 2

	Much Improved	Improved	No Improvement	Total
Whole group	17	10	11*	38
Leucotomy	7	6	6	19
Insulin—E.C.T.—Leucotomy projected	4	6	3	13
Leucotomy	7	2	—	9

* Includes one case of depression.
Much improved = Free of all psychotic symptoms—that is, delusions, hallucinations, ideas of reference or influence, thought disorder, affective incongruity, or marked blunting; some insight.
Improved = Better, but with some residual symptoms, chiefly emotional flattening or incongruity.

TABLE III.—Response of Patients in Group 2 Related to Age at Time of Treatment

Age	Much Improved	Improved	No Improvement	Total
30 and under	6	6	4	16
31–40	9	4	3*	16
41 plus	2	—	4*	6

Average age, 35.5 years. Range, 18–52 years.
* Includes one case of depression.

TABLE IV.—Response of Patients in Group 2 Related to Duration of Symptoms

Duration of Illness	Much Improved	Improved	No Improvement	Total
Less than 5 years	5	4	2	11
5–10 years	11	6	4*	21
More than 10 years	1	—	5*	6

Average age, 7.5 years. Range, 2–29 years.
* Includes one case of depression.

Group 3. Chronic Untreated Schizophrenia of Insidious Onset

The third group of cases also could act to some extent as their own controls. The group consisted of recent admissions who were regarded as unsuitable for insulin treatment

by reason of long history, insidious onset, or lack of florid features. It comprised 17 patients (14 male, 3 female), 16 of whom had never been in hospital before and none had been ill for less than two years. One had been in hospital for 22 years but had never been treated by any of the physical methods because permission was refused by relatives.

In this group the average age was 29.4 years, ranging from 17 to 56 years. The length of illness ranged from 2 to 22 years, with an average of 6 years.

Five of the group had been given electroplexy since admission to hospital. In such chronic cases this was not given in the hope of any long-term benefit, but in order to obtain initial sedation or co-operation. Five patients had auditory hallucinations and nine had persecutory delusions. Nine showed apathy, withdrawal, lack of initiative, and marked affective blunting. Six cases might be termed "simple schizophrenia."

The dosage and general regime was the same as in Group 2, and the criteria used in assessing results were also the same. Nine patients were regarded as much improved and six as improved. Twelve have been discharged, and nine are known to be back at work. Details are given in Table V.

TABLE V.—Response of Patients in Group 3

	Much Improved	Improved	Not Improved	Total
Whole group	9	6	2*	17

* Much improved and "improved" as defined in Table II.
* Includes one case of depression.

The results here are in some respects more unexpected than those in group 2, because the symptomatology was less florid, the pre-morbid personalities were less good, and the onset was more insidious. Although none had been thoroughly treated by the physical therapies, they had all been rated as unlikely to respond to these methods when reviewed by the staff at case conferences.

Group 4. Acute Schizo-affective Psychosis

The fourth group in this series were diagnosed as suffering from schizo-affective psychosis. It consisted of 21 patients (7 male, 14 female) who presented predominantly manic (7 cases) or depressive (14 cases) features. In addition, all cases showed some schizophrenic features such as auditory hallucinations or paranoid delusions. Seven depressed and five manic patients had had previous psychotic episodes, either with electroplexy (7) or electroplexy combined with insulin coma therapy (5). All but one had been treated in St. Patrick's Hospital. All the patients in this group were thought to have a good prognosis for the present episode. With two exceptions, patients were given reserpine because the expected remission did not follow one or more courses of electroplexy—the patient either did not improve or relapsed within a few weeks of treatment. All had been ill for less than one year. The average age was 39 years (range 18–61 years).

The two patients who went straight on reserpine therapy were recent admissions, but both had had previous episodes, one having achieved a remission following electroplexy and insulin, and the other having achieved a remission on reserpine given a year previously in an American hospital. Both these patients improved with reserpine alone, and they are both out of hospital and back at their work.

Because the illnesses reported in this group were of much shorter duration, a more rigid standard of assessment was used. The term "recovered" was again discarded, in view of the lack of follow-up period. Cases were classified as much improved only if free of all psychotic symptoms and if their pre-psychotic personality had been restored as judged by clinical observation. Cases regarded as improved were

better but had some residual symptoms or personality defects. The results are shown in Table VI.

TABLE VI.—Response of Patients in Group 4

	Much Improved	Improved	Not Improved (All Depressed)	Total
Depressed Manic	1	1	8	14
			1	7

Much improved=Free of all psychotic symptoms; pre-psychotic personality restored.
Improved=Better, but with some residual symptoms.

It is instructive to note that the incidence of depression was much higher in this group. This observation, if confirmed in larger series, would seem to indicate that this serious complication may occur chiefly, if not entirely, in those constitutionally predisposed to endogenous depression.

Group 5. Acute Schizophrenia

The last group under review consisted of 21 acute schizophrenics (5 male, 16 female). All had a history of under one year. Patients with marked manic or depressive features, and who might thus be regarded as suffering from a schizo-affective psychosis, were excluded. All showed active process symptoms. All had been ill for less than one year. Average age was 30 years (range 19-52 years).

In general the immediate prognosis in this group was regarded as very good. Six of the group had suffered from previous schizophrenic episodes (one or more). Five of them had remitted following insulin coma therapy, and one following electroplexy. Five other patients had recently completed full courses of insulin coma therapy without sustained improvement. In two cases a course of insulin treatment had been stopped—one because of hypersensitivity to insulin, and one because of her violent behaviour during sopor. Three were not given insulin because of a history of pulmonary tuberculosis, and one because she was considered too old. The remaining five patients were given reserpine as a first choice.

All patients in this group had been given a course of electroplexy on admission to hospital to control acute symptoms. They were given reserpine only when clear-cut schizophrenic symptoms persisted after electroplexy.

TABLE VII.—Response of Patients in Group 5

Much Improved	Improved	Not Improved	Depressed	Total
18	3	—	—	21

"Much improved" and "improved" as for Table VI.

The results were assessed by the same criteria as in group 4 and are shown in Table VII. The average duration of treatment in this group was 80 days. On the completion of treatment, 18 of the 21 patients were regarded as much improved and 3 as improved. Twenty of these patients have been discharged from hospital, and 15 are known to be back at their former occupations.

Since December 31, 1955, when the table was drawn up, two patients placed in the much improved group have been readmitted—one was brought back by her relatives in a state of deep depression, the other was noted to be rather depressed on a routine follow-up visit and was readmitted for observation. There has been no return of schizophrenic symptoms in either case.

Discussion

The results we have had are encouraging and justify the continued use of the treatment. Not only have some schizophrenics with all the characteristics associated with chronicity lost their process symptoms, but in many cases they have gained a surprising degree of insight.

A woman civil servant aged 35 was referred for inefficiency and absenteeism in 1952. She had the delusion that she was hypnotized by a strange man whom she had met some years previously, and his voice dominated her life. In 1952 a full course of insulin coma therapy (60 comas) made her less withdrawn and more sociable. She never lost her hallucination or gained insight. She has been seen by one of us (J.N.P.M.) periodically as an out-patient since then, but the picture has remained unchanged. In October, 1955, she was given a last chance by her employers and told that if she was late or absent again she would be dismissed from the service. She was readmitted to hospital and started on intensive reserpine therapy. After 10 weeks she spontaneously said in a shamefaced way—"Whether it is a good thing or not, at last I believe you when you say I am mentally ill." "Thank goodness the voice goes away sometimes—do you think I can get rid of it altogether?"

In this type of case the drug does not merely act as a sedative. Sometimes the psychotic process remits after reserpine therapy. Such a remission of symptoms occurred in a convincing number of cases. It occurred to patients, such as those in group 2, who had resisted other standard treatments, and in a regime unchanged except for the addition of the drug. We can offer no explanation of how this remission is achieved, but we would suggest that the drug has a central effect on schizophrenic patients. These become less influenced by their delusions and hallucinations. Fresh delusions and hallucinations cease to form. They can view their symptoms more objectively, and psychotherapy can play a part in bringing them into true perspective. They are more able to take interest in their surroundings, and active rehabilitation therapy is more likely to be successful.

Enthusiasm for a treatment in psychiatry always has a favourable influence on the patient. This factor plays much less a part when one has been dealing with psychotics, as we have in this study. Lavish enthusiasm and a placebo could not have produced the changes, often striking, which are reflected in our results. This is particularly true of patients in group 2 who were resistant to all other forms of treatment. The fact that this drug will in some patients produce a typical endogenous depression indicates that it has an action on some centre of fundamental importance in the development of mental illness. The associated effects on the pulse, blood pressure, and pupil, with the production of Parkinsonism, suggest that this may be in the region of the hypothalamus and basal ganglia. Experimental work tends to confirm this (Plummer *et al.*, 1954; Winsor, 1954).

A most impressive feature of the use of the drug is the quality of the remission. Insight into their morbid ideas, friendliness towards staff and fellow-patients, and a healthy interest in occupational and social activities is a usual rather than exceptional result of the treatment. This insight is reflected in the readiness with which patients agree to report for follow-up talks after leaving hospital. Appointments have been kept punctiliously, even though in some cases it meant a long journey by train or car. Liberal parole was granted as soon as improvement began and when side-effects permitted, and only a few have not returned to hospital.

Besides using the drug in the intensive way described in this series, we have given smaller oral dosage to a number of chronic schizophrenics. We are not reporting in a detailed way on these cases here. A number of well-preserved chronic hospital patients, as well as a number of ex-patients who attend our out-patient department for general advice and supervision, have benefited greatly by small doses of the drug—for example, from 1-4 mg. daily. A few have improved dramatically. Some have been able to remain out of hospital when otherwise admission seemed inevitable.

Another problem for the future, therefore, is to decide whether or not the large doses prescribed by Kline and Stanley (1955) and Barsa and Kline (1955), and followed in this work, are necessary. Our present impression is that where an active progressive schizophrenic process is present the intensive dosage may be necessary. It seems, too, that length of history may be an important factor in deciding both the length and the intensity of the treatment required.

For example, the average length of treatment in the acute group was 80 days, whereas in the chronic treated group it was 195 days.

Apart from the treatment of schizophrenia, we have used reserpine in a number of other psychiatric conditions. In general the results have not been so dramatic. Patients with endogenous depression are not improved (and may be made worse). We noted in the early stages of this trial (before we became aware of the danger of depression as a side-effect) that some patients who were restless, unsettled, and discontented after a course of electroplexy did become more settled on 1-3 mg. daily. It seems wiser, however, never to use the drug in cases of endogenous depression or in those with a past history of depression. Cases of anxiety neurosis were given the drug mainly by mouth on an out-patient basis. Rarely do they get any immediate subjective relief of their symptoms, and many are put off by the side-effects, such as nasal stuffiness or drowsiness, and stop the drug. Patients with chronic anxiety states who are underweight seem most helped by the drug. They may put on weight, and this is accompanied by a feeling of well-being and reduction in tension rather similar to the improvement one gets with modified insulin. Classical cases of anorexia nervosa appear to respond very well to the drug. Seven patients who showed the characteristic mixture of hysterical and obsessional traits in their personalities, with anorexia, amenorrhoea, emaciation, and restlessness, lost their symptoms and put on weight. Details of this group will be published elsewhere.

Apart from the statistical results given in the tables and mentioned in the text, the introduction of reserpine treatment has greatly changed the character of the hospital. Negativistic or impulsive behaviour has been much diminished, and the general morale of the wards has been correspondingly improved. Maintenance electroplexy is now seldom used.

Although patients do not like the treatment because of the irritating side-effects and the numerous injections involved, little difficulty is experienced in encouraging them to carry on with it. It does not arouse the fear and antagonism sometimes evoked by electroplexy and insulin treatment.

The restlessness induced by reserpine must be helped not only by sedation but by organized activity. Many more patients than formerly are well enough to take an active part in occupational, recreational, and social therapy. Classes of all kinds have had to be greatly increased. Physical training classes, relaxation classes, and organized games are particularly helpful in combating reserpine-induced restlessness. In the same way, outdoor work parties, digging, cutting grass, sawing logs, etc., are beneficial and mostly welcome activities, except where the patient is heavily under the influence of the drug.

With awakening insight, patients are in particular need of psychotherapeutic interviews, and the work of the medical staff in this respect has been greatly increased by the treatment. The fact that memory is not disturbed makes explanation and reassurance more rewarding as well as more necessary. Although we have not used group therapy in any formal way, it seems probable that, in future, only by this means can the medical staff cope adequately with the patient's needs.

It must be stressed that the results given here are the immediate results. Few cases have been in a state of remission for more than six months. We have satisfied ourselves that the drug can favourably influence a schizophrenic process, at least temporarily. Only a long-term follow-up can decide the drug's eventual place in the treatment of schizophrenia.

Summary

Reserpine given orally may benefit deteriorated chronic hospitalized schizophrenics with troublesome symptoms.

Chronic schizophrenics who have failed to achieve a sustained remission following E.C.T., insulin coma, or leucotomy may improve remarkably with intensive reserpine therapy. As a result of our experience we have made it a rule that no schizophrenic should be leucotomized without first having a prolonged trial on reserpine.

Patients with schizophrenia of insidious onset but without florid symptoms or gross personality deterioration may respond favourably to intensive reserpine therapy. It is probably necessary to continue on an oral maintenance dose for a prolonged period.

Immediate results of reserpine therapy in acute schizophrenics are impressive. Observation over a prolonged period alone can determine whether in these early cases it is a better therapeutic agent than insulin coma therapy.

Severe depression of the endogenous type with characteristic early morning waking and suicidal pre-occupation is the most serious complication of the treatment. The incidence of this complication was greatest in the schizo-affective type of psychosis. A past history of endogenous depression is a contraindication to the use of the drug.

Some chronic schizophrenics improve on oral dosage only. Intensive and prolonged treatment seems necessary in most cases of progressive schizophrenia.

Some patients with chronic anxiety states, especially if underweight, may benefit from oral reserpine. The results in most cases are not so dramatic as in schizophrenia.

Most patients on reserpine eat better and put on weight. Cases of anorexia nervosa may improve rapidly on the drug.

The extensive use of reserpine alters the character of a psychiatric unit considerably. Negativistic, aggressive behaviour is greatly diminished. Patients can enjoy more freedom and take a more active part in the hospital routine. It places an increased demand on hospital staff for individual psychotherapy.

We are indebted to Ciba Laboratories Ltd. for liberal supplies of reserpine in the form of "serpasil" and for supplies of "antistin-privine."

ADDENDUM

A follow-up of the 109 cases described above was undertaken from November 1, 1956. About half of these patients were interviewed either by one of us or by other members of the medical staff of St. Patrick's Hospital. Information about the remainder was obtained by letter from the patients, their relatives, or their family doctor. The results for groups 1 to 5 are shown in Tables Ia, IIa, IIIa, and IVa. The assessment criteria are the same as in the main paper.

TABLE Ia.—Response of Patients of Group 2—Chronic Treated Schizophrenia

Much Improved	Improved	No Improvement or Relapsed	Untraced	Total
16*	2	19	1	38

* One relapsed and was given a second course of reserpine.

TABLE IIa.—Response of Patients of Group 3—Chronic Untreated Schizophrenia of Insidious Onset

Much Improved	Improved	No Improvement or Relapsed	Untraced	Total
9	4*	2	2	17

* Three relapsed and were given a second course of reserpine.

TABLE IIIa.—Response of Patients in Group 4—Schizo-affective Psychosis

Case Type	Much Improved	Improved	No Improvement or Relapsed	Untraced	Total
Depressed	2	0	11	1	14
Manic	5*	0	2	—	7

* One relapsed and was given a second course of reserpine.

TABLE IVa.—Response of Patients of Group 5—Acute Schizophrenia

Much Improved	Improved	Relapsed	Untraced	Total
15*	2*	4	—	21

* One relapsed and was given a further course of reserpine.

It will be seen that the results confirm in a general way the trends of the initial assessment and encourage us to continue trial of this method of treatment.

A further year's experience suggests that smaller doses may give similar results with less distressing side-effects. At present an intramuscular dosage of 10 mg. daily is the exception rather than the rule. Our usual maximum dosage is 3 mg. orally and 5 mg. intramuscularly daily.

We hope to publish a further paper on a larger series with a detailed analysis of the factors influencing good or bad response, the relapse rate, and the incidence of depression.

REFERENCES

- Barsa, J. A., and Kilne, N. S. (1955). *J. Amer. med. Ass.*, 158, 110.
 Doyle, A. E., and Smirk, F. H. (1955). *Practitioner*, 174, 135.
 Freis, E. D. (1954). *New Engl. J. Med.*, 251, 1006.
 Glynn, J. D. (1955). *J. Neurol. Neurosurg. Psychiat.*, 18, 225.
 Kline, N. S. (1954). *Ann. N.Y. Acad. Sci.*, 59, 107.
 — and Stanley, A. M. (1955). *Ibid.*, 85, 61.
 Noce, R. H., Williams, D. B., and Rapaport, W. (1955). *J. Amer. med. Ass.*, 158, 11.
 Plummer, A. J., Earl, A., Schneider, J. A., Trapold, J., and Barrett, W. (1954). *Ann. N.Y. Acad. Sci.*, 59, 8.
 Smirk, F. H., and McQueen, E. G. (1955). *Lancet*, 2, 115.
 Winsor, T. (1954). *Ann. N.Y. Acad. Sci.*, 59, 61.

IDIOPATHIC OR HYPERCATABOLIC HYPOPROTEINAEMIA

CASE EXAMINED BY ¹³¹I-LABELLED ALBUMIN

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Hypoproteinaemia is not an uncommon clinical finding, and is nearly always caused by an external loss of protein—for example, proteinuria, skin disease, bleeding—or a reduced protein synthesis (hepatic or intestinal disease, starvation, etc.).

In a few exceptional cases such low serum protein has been entirely inexplicable—idiopathic. A critical review of the literature shows that the reported cases which can be designated idiopathic hypoproteinaemia do not amount to more than 25.^{1 2 4 6-18 21 22} Despite this small number of cases the syndrome appears to be well defined.

The main sign of this disease is oedema formation caused by and varying with the hypoproteinaemia, which (nearly) always affects the albumin and globulin fractions equally. In most instances the disease has persisted for months and often for years. Practically all the reported cases of idiopathic hypoproteinaemia have been particularly well studied. In addition to the low serum

protein some of them have exhibited eosinophilia (4 out of 10 cases so examined) and several have been allergic, but all other tests have failed to show abnormalities.

Attempts at raising the serum protein level by oral administration of protein in large amounts have proved ineffective, although a highly positive nitrogen balance may be obtained thereby.⁷

Most authors have merely concluded that in idiopathic hypoproteinaemia protein synthesis is impaired. It has been suggested that this reduced protein synthesis is due to hepatic disease, but what kind of hepatic disease is not quite clear, as no patient with genuine idiopathic hypoproteinaemia has shown other signs of hepatic involvement.

The Degradation Theory

As no external loss of protein can be demonstrated and as there is no obvious cause why the production of protein should be reduced, the reason for the low serum protein might theoretically be imagined to be an internal loss—an increased degradation of protein.

Only a few authors have dwelt on this idea. As early as 1935, however Cope and Goadby⁷ stated: "The possibility that unduly rapid breakdown of plasma protein was occurring could not be excluded, but was considered to be improbable."

In recent years, however, reports on four patients with idiopathic hypoproteinaemia indicate that in these patients there has been a question of increased breakdown of protein. In 1949 Albright, Bartter, and Forbes¹ (1 patient) and in 1955 Hennemann and Albright¹¹ (2 patients) studied the fate of intravenously administered albumin. These extremely difficult and painstaking investigations will not be described in detail here: suffice it to mention that during the experiment the patients received 52 g. of serum albumin intravenously every day for more than two weeks.

The results of these balance experiments unequivocally showed that, compared with normal persons, the patients retained only a small proportion of the administered albumin during the experimental period, whereas an excessive amount must have been burned or converted into protoplasm. These authors conclude¹ that "the disorder in albumin metabolism was not a decreased rate of synthesis, but an increased rate of destruction."

Kinsell *et al.*¹⁴ studied the fate of intravenously administered ³⁵S-labelled methionine in some patients, including one with idiopathic hypoproteinaemia. This study also failed to show any signs of reduced plasma protein synthesis—rather the opposite. The rate at which ³⁵S disappeared from plasma protein by far exceeded that in normal people. Similarly, the urinary excretion of ³⁵S was increased compared with normal persons. Kinsell *et al.* sum up that "the basic defect is one of hypercatabolism."

Against the studies of Albright *et al.* it may be objected that intravenous administration of 50 g. of albumin daily for 16 days is rather an unphysiological procedure, and against the technique of Kinsell *et al.* that it may be difficult to assess the results of experiments with labelled amino-acids because of the possibility of their re-utilization. As patients with idiopathic hypoproteinaemia present special possibilities of elucidating the largely unknown mechanism which regulates serum proteins, it seemed to us of great interest to study the serum protein turnover, using directly labelled

protein. By this method only a few milligrams of protein are administered, and re-utilization is of no importance.

Such a study was carried out in the case reported below.

Case Report

A 25-year-old woman was first admitted to the Central Hospital, Silkeborg, on June 13, 1955, because of oedema of the legs. Her family history was negative. She had possibly had "jaundice" in childhood, but was otherwise in good health. Menstruation was normal. From the age of 17 she had been suffering from swelling of the ankles and lower legs, gradually ascending to the knees. The swelling had been most pronounced in the right foot and lower leg, but during recent years it had also involved the left hand. Facial oedema had never been observed. Apart from these swellings, there were no complaints. At another hospital the serum protein level was found to be 5.5% (albumin 3.7%, globulin 1.8%), when she was 20 years of age. At 22 she was treated in a surgical department for crural oedema by paste bandage. Phlebography as well as oscillometry showed normal findings.

The patient had spent a total of 113 days at the Central Hospital, Silkeborg, during which the condition had remained entirely unchanged, characterized by moderate but persistent oedema of the feet and lower legs. Upon bed rest they subsided slightly. Apart from the oedema nothing abnormal was found: development and nutrition were normal. Radiological examination of the stomach and small intestine gave normal findings. Chest radiography and E.C.G. were normal. X-ray films of sella turcica: small, measuring 10 by 7 mm. Ophthalmological examination normal.

Laboratory Tests.—Height, 154 cm.; weight, 48.9 kg. Haemoglobin, 90%; R.B.C., 4,560,000; colour index, 0.96; E.S.R., 1 and 2 mm./hour; W.B.C., 8,690 (staff cells 17%, polymorphonuclears 59%, eosinophils 8%, lymphocytes 13%, monocytes 3%). Sternal marrow: slight eosinophilia, no other definite abnormality. Urine: no albumin (several tests) or sugar. Blood urea: 20, 28, and 18 mg. per 100 ml.; blood urea clearance, 75% of normal. Serum bicarbonate, 27.6 mEq; serum chloride, 105–102 mEq; serum phosphorus, 6.6–6.8 mg. per 100 ml.; serum calcium, 9.3–8.6 mg. per 100 ml.; serum potassium, 16.7 mg. per 100 ml.; serum cholesterol, 122, 105, and 180 mg. per 100 ml.; total lipid in serum, 690 mg. per 100 ml.; alkaline phosphatases in serum, 2.5–3.0 units (Buch). Icterus index, 3. The bromsulphthalein, thymol turbidity, and Takata-Ara tests were negative. Faeces: no blood; excretion of fat normal. Adrenal cortical hormones in urine: 24-hour excretion of 17-ketosteroids, 6.2 mg.; reducing corticoids, 1.07 mg. (normal). Thorn's test with adrenaline, 50% decrease in eosinophils, with corticotrophin 25%, decrease (?). Skin tests with various allergens, all negative. Histamine test meal, free acid present. Glucose tolerance, normal curve. Serum protein: 4% (albumin 2.6%, globulin 1.4%). Paper electrophoresis: total protein 4.1% (albumin 53%, alpha₁ 7.3%, alpha₂ 13.6%, beta 13.1%, gamma 13.1%). Fibrinogen 650 mg. per 100 ml. (normal 200–400 mg.). Oedema fluid 0.2% (albumin).

Thus the essential result of the numerous laboratory tests was a marked decrease in serum proteins, a decrease which affected all fractions equally. In addition there was slight eosinophilia, whereas no other tests showed definitely abnormal values.

The patient had been tentatively treated with a high-protein diet for two weeks, with testosterone for three weeks and with corticotrophin for 18 days without the slightest effect. During the observation period the serum protein values have remained about 4% and there have been no changes in the individual fractions.

Serum Albumin Turnover

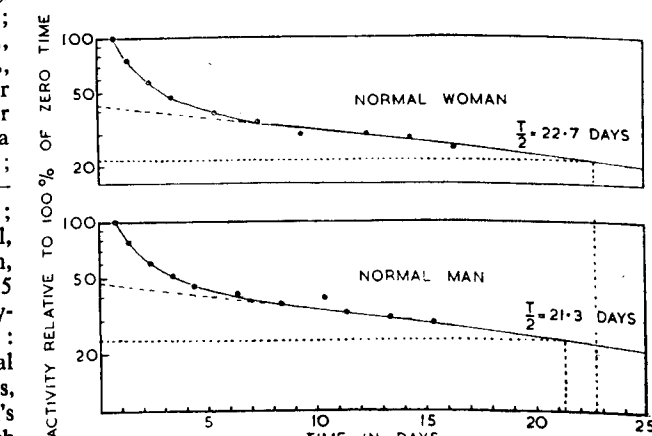
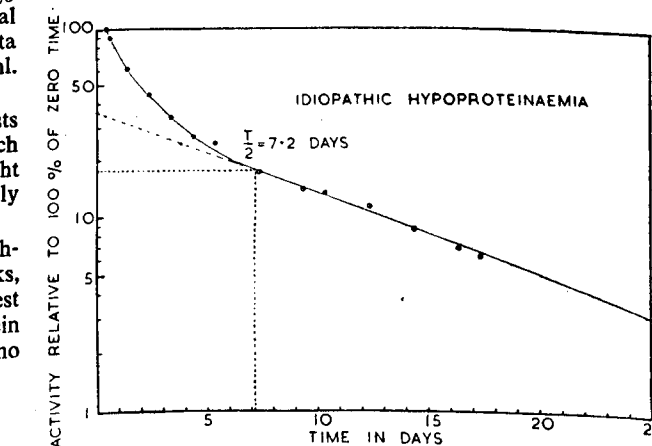
For this study we used human serum albumin prepared at the State Serum Institute by the method of Cohn (more than

99% pure albumin), and labelled with ¹³¹I by the method of Veall *et al.*²⁰ The finished iodinated albumin contains 5 atoms of iodine per molecule of protein; upon paper electrophoresis it is indistinguishable from non-iodinated albumin. The non-protein-bound radioactivity was <0.5%. Studies of the albumin turnover by ¹³¹I-labelled albumin have been described on several occasions.^{5 19} The rationale of this method is that the labelled albumin will be dealt with by the organism just as its own albumin. When the labelled albumin has mixed with the subject's native albumin the plasma radioactivity will act as an indicator of the albumin's rate of degradation, which will also be reflected by the urinary excretion of ¹³¹I.

Since the turnover rate of iodine-labelled proteins is more rapid than that of biologically labelled proteins, and since it may also vary within certain limits, presumably because, in spite of everything, proteins change slightly during iodination, the determination is relative rather than absolute. Each batch of labelled protein must therefore be tested on a number of normal persons in addition to the patients being investigated.

In our study the albumin turnover was determined in three normal persons as well as the hypoproteinaemic patient. All four subjects were hospitalized, given ordinary diet, and permitted moderate activity. In order to secure a rapid excretion of iodine and inhibit thyroid uptake of ¹³¹I, we administered a 3% solution of potassium iodide, 30 g. daily.

The labelled albumin was injected intravenously (30 mg. of albumin with an amount of radioactivity of about 90 microcuries), and heparinized blood samples were drawn every day or every other day for more than two weeks, the first sample being obtained 10 minutes after the injection.

FIG. 1.—Plasma disappearance curve of ¹³¹I-labelled albumin in two normal subjects.FIG. 2.—Plasma disappearance curve of ¹³¹I-labelled albumin in patient with idiopathic hypoproteinaemia.

The plasma radioactivity was determined on 0.4-ml. samples dried in aluminium dishes and counted with a Geiger counter and a Brüel and Kjær scaler. No correction was made for self-absorption (all specimens from the same subject were of the same weight).

The measurements of radioactivity (counts per minute) were corrected for decay if necessary, and converted to percentages of the 10-minute sample, which was also used to determine the plasma volume.

Fig. 1 gives the disappearance curve for the labelled albumin in a semilogarithmic scale for two of the three normal subjects, and Fig. 2 for the patient with idiopathic hypoproteinaemia. The curve consists of two parts: a curved portion extending over the first five to six days, corresponding to the mixing of the labelled albumin with the native albumin—that is, the “albumin phase”—and a straight line representing the degradation of the injected iodinated albumin (or the rate at which labelled albumin is replaced by unlabelled albumin).

The slope of the straight line indicates the rate of albumin turnover—the steeper the curve the quicker the turnover. The half-time ($T_{1/2}$) of the administered albumin may be determined graphically as seen from the figures, and from the equation representing exponential decay the decay constant (λ) may be calculated.

On the basis of the values shown on the curve and the serum albumin percentage it is now easy to compute the total amount of albumin in the body as well as its distribution into intravascular and extravascular sites (cf., for example, Sterling¹⁹).

The Table sets out these values for the three normal subjects and for the patient with idiopathic hypoproteinaemia.

Data Pertaining to Distribution and Degradation of ¹³¹I-labelled Serum Albumin in Three Normal Persons and Patient with Idiopathic Hypoproteinaemia

	Persons Studied			
	Normal			Idiopathic Hypoproteinaemia
	M.	F.	F.	
Age (years)	26	40	47	25
Weight (kg.)	83	70	53	50
Plasma volume (ml.)	3,970	3,460	2,780	2,200
Serum protein (%)	7.1	7.4	6.8	4.3
“ albumin (%)	5.47	5.03	4.50	3.01
Total exchangeable albumin (g.)	440	407	308	190
Intravascular albumin (g.)	217	174	125	65
Extravascular	223	233	183	125
Albumin turnover half-time (T _{1/2}) in days	21.3	22.7	23.9	7.2
Albumin degradation %/day	3.26	3.06	2.90	9.64
“ “ g./day	14.3	12.4	8.94	18.3
“ “ g./day kg.	0.172	0.177	0.169	0.366
Total renal excretion of injected dose ¹³¹ I in first 14 days following injection of labelled albumin			50%	91.9%

The result of the study is unequivocal. The patient with idiopathic hypoproteinaemia has a greatly increased albumin turnover. In our case the degradation rate for albumin was more than three times that in the normal subjects. Despite the greatly reduced amount of protein at her disposal the patient with idiopathic hypoproteinaemia degraded and synthesized over twice the amount of albumin per kilogram of body weight formed by normal persons. That the albumin is not merely removed, but also broken down, is shown from the fact that in our patient the renal excretion of iodine was about twice that in the normal subjects.

Discussion

The result—that idiopathic hypoproteinaemia is associated with marked protein catabolism—is in keeping with previous findings by Albright *et al.* as well as by Kinsell *et al.* The technique used by us cannot in any way affect the albumin metabolism as such. Only 30 mg. of albumin is administered, and the label substance (¹³¹I) is not re-utilized, but

excreted. The entire picture reminds one of that found by the same technique in nephrotic patients, apart from the fact that in the latter the lost protein is recovered in the urine. The old designation of idiopathic hypoproteinaemia “nephrosis without nephrosis” is in fact not out of place, although a linguistic monstrosity.

Now, three different methods of studying the protein turnover in a total of five patients with the rare disease idiopathic hypoproteinaemia have given the same result. It seems reasonable, therefore, to postulate that it is increased protein catabolism and not reduced synthesis which is the basal defect in all cases of this disease. A better name would therefore perhaps be “hypercatabolic hypoproteinaemia.” Still, this result does not solve the mystery of idiopathic hypoproteinaemia, but it must alter the approach of future studies. The mechanism which regulates the protein concentration of the blood is largely obscure. Perhaps the hormones of the adrenal cortex are operative, but we do not know how such regulation is effected. Messinger’s¹⁸ patient was apparently cured after having become pregnant, and Messinger interpreted this as a sign that the disease was due to temporary disturbance of anterior pituitary function (the patient had previously suffered from mild thyrotoxicosis).

A defect in the regulation of, at any rate, serum albumin may be seen from the fact that serum albumin remains low in these patients.

Balance at a low but not at a high albumin level must be interpreted on the supposition that the albumin level *per se* influences the catabolism, which must fall with a decreasing albumin concentration, or—presupposing a uniformly high albumin degradation regardless of the albumin concentration—that albumin synthesis increases with decreasing albumin concentration.

It is of particular interest that among the proteins of the body the plasma proteins appear to be affected selectively by the rapid degradation. The haemoglobin turnover, for instance, appears to take place at the usual rate, and experience from paediatric practice does not indicate a reduced rate of growth in children with idiopathic hypoproteinaemia. It must be mentioned also that these patients may well acquire a positive nitrogen balance. This would be difficult to explain if the protein catabolism in all tissues were increased to several times the normal.

Serum-protein hypercatabolism may remind one to a certain extent of the conditions in haemolytic anaemia, and this raises the question of how much serum protein the organism can produce. The present experiments determined only the albumin turnover. Kinsell *et al.* determined the total plasma protein turnover, so it is not yet known whether the rate of globulin turnover is increased as well. Since the present method utilizing ¹³¹I-labelled albumin must be presumed to afford a relative rather than an absolute measure of the albumin turnover rate, this question must await investigations using biologically labelled proteins.

Summary

Until recently it was believed that the low serum protein level in the rare disease idiopathic hypoproteinaemia was due to reduced protein synthesis.

Recent studies comprising a total of four patients indicate, however, that the basic defect is one of hypercatabolism.

A typical case of idiopathic hypoproteinaemia of eight years’ duration is reported. In this patient, too, a study of the albumin turnover with ¹³¹I-labelled serum albumin showed a greatly increased catabolism of albumin. We therefore suggest that the disease be called hypercatabolic hypoproteinaemia.

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REFERENCES

- Albright, F., Bartter, F. C., and Forbes, A. P. (1949). *Trans. Ass. Amer. Phys.*, **62**, 204.
- Bálint, P. (1943). *Klin. Wschr.*, **22**, 540.
- Bjald, W. H., Fields, M., and Goldman, R. (1955). *J. Lab. clin. Med.*, **46**, 747.
- Binger, M. W., and Keith, N. M. (1937). *J. Amer. med. Ass.*, **109**, 1.
- Berson, S. A., Yalow, R. S., Schreiber, S. S., and Post, J. (1953). *J. clin. Invest.*, **32**, 746.
- Bound, J. P., and Hackett, W. R. (1953). *Arch. Dis. Child.*, **28**, 104.
- Cope, C. L., and Coadby, H. K. (1935). *Lancet*, **1**, 1038.
- Ehregut, W. (1954). *Z. Kinderheilk.*, **74**, 141.
- Forbes, A. P. (1944). In *Conference on Metabolic Aspects of Convalescence*, 6th meeting, p. 144. Josiah Macy Jr. Foundation.
- Hecht-Johansen, A. (1938). *Acta path. microbiol. scand.*, Suppl. **37**, p. 272.
- Henneman, P. H., and Albright, F. (1955). *J. Lab. clin. Med.*, **46**, 825.
- (Abstract.)
- Hertzog, F. W., and Faust, O. A. (1950). *J. Pediat.*, **36**, 641.
- Homburger, F., and Petermann, M. L. (1949). *Blood*, **4**, 1085.
- Kinsell, L. W., Margen, S., Tarver, H. M., Frantz, J., Flanagan, E. K., Hutchin, M. E., Michaels, G. D., and McCallie, D. P. (1950). *J. clin. Invest.*, **29**, 238.
- Messinger, M. J. (1946). *Canad. med. Ass. J.*, **55**, 381.
- Meyer-Bisch, R. (1925). *Klin. Wschr.*, **4**, 588.
- Ryland, D. A. (1942). *Arch. Intern. Med.*, **69**, 251.
- Salomonsen, L. (1945). *Nord. Med.*, **25**, 727.
- Sterling, K. (1951). *J. clin. Invest.*, **30**, 1228.
- Veal, E. N., Pearson, J. D., Hanley, T., and Lowe, A. E. (1954). *Radionuclide Conference, 1954*, edited by J. E. Johnston, **1**, 183. Butterworth, London.
- Wuhrmann, F., and Leuthardt, F. (1941). *Helv. med. Acta*, **7**, 565.
- Wynngaarden, J. B., Crawford, J. D., Chamberlin, H. R., and Lever, W. F. (1952). *Pediatrics*, **9**, 729.

ORAL ADMINISTRATION OF PENICILLIN

WITH A NOTE ON METHODS OF ASSAY

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It has been noted that all preparations of penicillin, when given by mouth, are unstable in the acid medium of the stomach and are poorly absorbed from the gastrointestinal tract. Oral penicillin therapy has thus been of value only in children, in whom the gastric acidity is lower (Cathie and MacFarlane, 1953).

In 1940 it was established that by the addition of various chemicals to the medium in which the mould was grown a variety of penicillins could be obtained, differing widely in their physical and antibacterial properties. Behrens *et al.* (1948), by using N-(2-hydroxyethyl)-phenoxymethyl penicillin. However, the *in vitro* isolated phenoxymethyl penicillin. The effect of this differed only slightly from that of penicillin G, and it was not until Brandt *et al.* (1953) demonstrated its acid stability that its use as an oral penicillin was realized. Several articles appeared on the Con-
tinent confirming its value (Giovannini, 1954; Sjöberg *et al.*, 1955; Spitz, 1955), and the preparation was marketed under the name of “distaquaine V.” The recent work in America (Jones and Finland, 1955; Martin *et al.*, 1955; Wright *et al.*, 1955) has been the subject of two leading articles (*B.M.J.*, 1956; *Lancet*, 1956), and we have already reported a preliminary survey of the serum levels obtainable (Henry and Meynell, 1956). Most papers have demonstrated that adequate and reliable absorption can be obtained with distaquaine V, but comparison is usually made with oral crystalline penicillin G. The latter is known to be

inadequately absorbed, the amount recoverable in the urine being in the region of 12% (Wright *et al.*, 1955). It was thus felt that injected penicillin would give a better basis for comparison.

The object of this paper is to compare the serum levels and urinary excretion rates obtained with phenoxymethyl penicillin (distaquaine V) and benzathine penicillin (“penidural”) given orally, with crystalline penicillin G, and procaine penicillin (“avloprocil”) given by intramuscular injection. In addition, the accuracy of the two standard methods of assay has been compared—the serial broth dilution method using *Staphylococcus aureus* (Oxford strain) and the plate method using *Sarcina lutea*.

Method

Six subjects were given 200,000 units of each preparation in turn, and thus acted as their own controls. The dose was given before meals and blood withdrawn at $\frac{1}{2}$, 1, 2, 3, and 4 hours, except in the case of procaine penicillin, when the intervals were $\frac{1}{2}$, 1, 2, 6, and 24 hours.

The bladder was emptied before the administration of the penicillin, and thereafter a 24 hour specimen of urine was collected; the volume was measured and an aliquot retained for assay. Serum levels were estimated on the same day by both methods, but in the case of the urine assays the *Staph. aureus* method was found to be unsuitable and the *Sarcina lutea* method only was used.

Staph. Aureus Method.—Serial dilutions of the serum are made in 1% glucose broth, containing Andrade’s indicator, and to each tube is added one drop of an overnight culture of the Oxford strain of *Staph. aureus* (sensitive to 0.02 unit of penicillin per ml.). Readings are taken after 18 hours’ incubation at 37° C. and the end-point is read according to colour change in the medium and visible growth, both being compared with a control estimation, using normal serum containing a known amount of penicillin. The end-point is sometimes difficult to judge, and it may be necessary to subculture the tubes on to a solid medium.

Sarcina Lutea Method.—Two media are used—a “base” layer with a “flood” layer superimposed. The base layer is made up of 1.5 g. of “lemco,” 3 g. of “bacto” yeast, 6 g. of bacto peptone, and 15 g. of agar, suspended in 1 litre of water.

The flood layer is the same as the base layer with the addition of 1 g. of dextrose. The organism used is *Sarcina lutea* CPI—1001 (N.C.T.C. 8340). This is grown on slopes of flood layer agar, and after 18 hours’ incubation is washed off with normal saline and the opacity is adjusted to that of a No. 8 Burroughs Wellcome opacity tube. If a standard Petri dish is used, base medium is poured in 10-ml. amounts and allowed to set. The flood medium is brought to 50° C. and is inoculated with the *sarcina* suspension, 2 ml. per 50 ml. of flood layer medium. Immediately after inoculation 4 ml. amounts of the medium are poured on to each plate containing the base medium. The plates are allowed to set and four holes punched in each, a No. 5 cork-borer being used, although the method is actually independent of the size of the hole.

Assay Procedure

Three plates are used for each assay. A standard solution of penicillin containing 0.1 unit per ml. is prepared, and the serum to be assayed is diluted to approximately the same strength with pH 7.5 phosphate buffer. Both these solutions are then diluted further (usually twice) with buffer, and four drops of a given dilution are introduced into the four holes on each plate, using a pipette delivering 70 drops per ml.

The plates are incubated at 26° C. for 18 hours, when the diameters of the clear areas are measured with a millimetre steel rule, and the average of the readings on the three plates is used in the calculation.

Calculation

The concentration of penicillin which diffuses through the agar diminishes exponentially with increasing distance from the punched hole. Since all four readings are on the same plate and are taken at the same time, the size of punched hole can be eliminated.

This leads to a formula of the type:

$$T_2 = S_2 \lambda \frac{(R_2 - r_2)(R_1 - r_1)[(R_2 - R_1) + (r_2 - r_1)]}{(r_2 - r_1)(R_2 - R_1)[(R_2 - r_2) + (R_1 - r_1)]}$$

which, on taking logs, becomes

$$\log_{10} T_2 = \log_{10} S_2 + \left[\frac{(R_2 - r_2)(R_1 - r_1)[(R_2 - R_1) + (r_2 - r_1)]}{(r_2 - r_1)(R_2 - R_1)[(R_2 - r_2) + (R_1 - r_1)]} \right] \log_{10} \lambda$$

However, if $\lambda=2$ and the diameters are similar, a simpler formula may be used, thus:

$$\log_{10} T_2 = \log_{10} S_2 + \left[\frac{(R_2 - r_2) + (R_1 - r_1)}{(R_2 - R_1) + (r_2 - r_1)} \right] \log_{10} \lambda$$

where T_2 is concentration of test solution; S_2 is concentration of standard solution; λ is the dilution ratio used; r_2 is radius of clear area using solution S_2 ; r_1 is radius of clear area using diluted solution S_2/λ ; R_2 is radius of clear area using solution T_2 ; R_1 is radius of clear area using diluted solution T_2/λ . The diameters can be used in place of the radii without any alteration in the formula.

Results

The serum levels and urinary excretion rates for each preparation are given in Tables I-IV. The figures obtained with the *Sarcina lutea* method are given first, the corresponding levels for the *Staph. aureus* method being given in parentheses.

Side-effects were not noted in any subject.

Discussion

From the tables it is clear that parenteral penicillin is well absorbed from the site of injection, whether in the crystalline form or as a depot preparation. In the former a

TABLE I.—Crystalline Penicillin G, 200,000 U. (I.M.)

Subject	Serum Penicillin Levels (U./ml.)*					24-hour Urine			
	½ Hr.	1 Hr.	2 Hr.	3 Hr.	4 Hr.	Vol. (ml.)	U./ml. Conc.	Total Amount	% Excreted
L.H.	6.2 (5.12)	4.19 (2.56)	0.632 (0.32)	0.18 (0.16)	0.021 (0.08)	1,930	95	183,350	91.1
G.W.	3.9 (5.12)	2.97 (2.56)	0.44 (0.32)	0.17 (0.16)	0.027 (0.08)	1,125	88	99,000	49.5
M.J.M.	4.3 (5.12)	3.9 (2.56)	0.41 (0.32)	0.16 (0.16)	0.15 (0.08)	1,820	92	167,440	83.7
P.J.D.	4.2 (5.12)	3.5 (2.56)	0.38 (0.32)	0.15 (0.16)	0.042 (0.08)	905	208	188,240	94.1
A.L.T.	3.9 (5.12)	2.6 (2.56)	0.13 (0.32)	0.076 (0.32)	0.021 (0.08)	815	180	146,700	73.3
B.J.B.	5.7 (5.12)	4.6 (2.56)	0.47 (0.32)	0.25 (0.16)	0.03 (0.08)	1,710	88	150,480	75.2
Average	4.7 (5.12)	3.63 (2.35)	0.41 (0.29)	0.16 (0.19)	0.042 (0.09)				77.8

* Results with *Sarcina lutea* method are given first. Those with *Staph. aureus* method are given in parentheses.

TABLE II.—Procaine Penicillin, 200,000 U. (I.M.)

Subject	Serum Penicillin Levels (U./ml.)					24-hour Urine			
	½ Hr.	1 Hr.	2 Hr.	6 Hr.	24 Hr.	Vol. (ml.)	U./ml. Conc.	Total Amount	% Excreted
L.H.	0.62 (0.64)	0.88 (0.64)	0.74 (0.64)	0.48 (0.64)	Nil	1,620	110	178,200	89.1
G.W.	0.79 (0.32)	0.83 (0.64)	0.98 (0.64)	0.37 (0.32)	"	1,814	82	66,748	33
M.J.M.	0.5 (0.32)	0.75 (0.64)	0.86 (0.64)	0.43 (0.64)	"	1,600	95	152,000	76
P.J.D.	0.78 (0.64)	1.02 (0.64)	0.93 (0.64)	0.23 (0.16)	"	730	248	181,040	90
A.L.T.	0.24 (0.16)	0.30 (0.16)	1.52 (1.28)	0.30 (0.16)	"	740	210	155,400	77
B.J.B.	0.56 (0.32)	0.72 (0.32)	0.48 (0.32)	0.31 (0.16)	"	820	180	155,800	77
Average	0.58 (0.40)	0.75 (0.51)	0.92 (0.69)	0.35 (0.38)	"				73.7

See footnote to Table I.

TABLE III.—Phenoxymethyl Penicillin, 200,000 Units Orally

Subject	Serum Penicillin Levels (U./ml.)					24-hour Urine			
	½ Hr.	1 Hr.	2 Hr.	3 Hr.	4 Hr.	Vol. (ml.)	Conc. U./ml.	Total Amount	% Excreted
L.H.	0.88 (1.28)	4.82 (5.12)	0.72 (0.64)	0.18 (0.16)	0.02 (0.04)	2,280	15	34,200	17
G.W.	1.26 (2.56)	2.43 (1.28)	0.37 (0.32)	0.14 (0.16)	0.026 (0.08)	1,500	49	73,500	36.5
M.J.M.	1.8 (1.28)	0.14 (0.32)	0.137 (0.16)	0.19 (0.16)	0.147 (0.16)	1,800	40	72,000	36
P.J.D.	Nil (0.04)	2.67 (2.56)	0.228 (0.32)	0.14 (0.16)	Nil (0.04)	710	53	37,630	18
A.L.T.	Nil (0.04)	0.24 (0.16)	3.8 (1.28)	0.77 (0.64)	0.05 (0.16)	1,100	55	60,500	30
B.J.B.	2.6 (2.56)	2.5 (1.28)	0.52 (0.32)	0.18 (0.16)	0.05 (0.04)	1,620	54	87,480	43
Average	1.09 (1.29)	2.13 (1.79)	0.63 (0.51)	0.27 (0.23)	0.05 (0.09)				30.1

See footnote to Table I.

TABLE IV.—Benzathine Penicillin, 200,000 Units Orally

Subject	Serum Penicillin Levels (U./ml.)					24-hour Urines			
	½ Hr.	1 Hr.	2 Hr.	3 Hr.	4 Hr.	Vol. (ml.)	Conc. U./ml.	Total Amount	% Excreted
L.H.	0.06 (0.08)	0.120 (0.16)	0.026 (0.08)	Nil (0.08)	Nil (0.08)	1,210	9.6	11,616	6
G.W.	0.029 (0.04)	Nil (0.04)	Nil (0.04)	" (0.04)	" (0.04)	730	27	19,710	10
M.J.M.	0.13 (0.08)	0.18 (0.16)	0.052 (0.04)	0.013 (0.04)	" (0.04)	1,290	11.4	14,706	7
P.J.D.	0.26 (0.16)	0.063 (0.04)	0.035 (0.04)	" (0.04)	" (0.04)	720	17.1	12,312	6
A.L.T.	0.045 (0.08)	0.13 (0.04)	0.012 (0.04)	" (0.04)	" (0.04)	720	16.2	11,664	6
B.J.B.	0.21 (0.16)	0.14 (0.08)	0.03 (0.04)	0.01 (0.04)	Nil (0.04)	820	12.6	10,332	5
Average	0.12 (0.10)	0.11 (0.09)	0.026 (0.003)	0.004 (0.003)	" (0.003)				6.7

See footnote to Table I.

high level is reached after half an hour, falling below the therapeutic concentration of 0.1 unit per ml. after three hours; in the latter the levels are lower, but the effect lasts for over six hours. In both, approximately 75% of the injected penicillin (in terms of biological activity) can be recovered in the urine.

In contrast, oral penicillin is affected by a number of variable factors. These include the gastric acidity, the rate of stomach emptying, and the absorptivity of the intestinal mucosa. With phenoxymethyl penicillin this was reflected by the demonstration of only 30% of the ingested penicillin in the urine. The serum levels were correspondingly lower, but were still adequate, and remained above the therapeutic level (0.1 unit per ml.) for over three hours, although the rate of absorption varied in individual subjects.

With benzathine penicillin the results were much less satisfactory. Only 5-10% of the ingested dose was recoverable in the urine, and even when a therapeutic level was reached this was in no case sustained for over one hour. The levels obtained were in no way comparable with those of injected penicillin or phenoxymethyl penicillin.

Note on Methods of Assay.—The method using *Sarcina lutea* is reliable and has an accuracy within 5%, but it is laborious to carry out and requires an incubator set to 26° C. The *Staph. aureus* method is much simpler and requires no special equipment, but, being a serial dilution method, has an inherent accuracy of only 50% in that the actual concentration of penicillin lies somewhere between the end-point tube and the tube containing the next highest dilution. In no case should the level obtained with the *sarcina* method be lower than that with the *Staph. aureus* method. However, on comparing the results of both methods, in 44 out of 120 readings the *Staph. aureus* method failed to give levels even within this wide range of accuracy, and can thus be discounted as a method of assay when the absolute concentration of penicillin is to be determined. However, its simplicity renders it the method of choice when the sensitivity of an infecting organism is known, and assays are carried out

to ensure that a certain minimum concentration of penicillin is being obtained, the actual level being unimportant provided it is above the therapeutic one for the organism concerned.

Owing to the possible contamination of the urine, the *Staph. aureus* method is unsuitable for urine penicillin assays and the *Sarcina lutea* method must be used.

Summary and Conclusions

Serum penicillin levels and urine excretion rates were measured in six subjects, using two intramuscular and two oral preparations of penicillin. The two standard methods of assay are described in some detail, and the results obtained with both methods are compared.

The results obtained clearly indicate that oral penicillin is no substitute for parenteral therapy when consistently high levels are required. Where oral therapy is indicated phenoxymethyl penicillin gives adequate and reliable blood levels. Benzathine penicillin appears to give disappointing results in adults, and it is probably of more value in children.

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REFERENCES

- Behrens, O. K., et al. (1948). *J. biol. Chem.*, **175**, 794.
Brandl, E., Giovannini, M., and Margreiter, H. (1953). *Wien. med. Wschr.*, **103**, 602.
British Medical Journal, 1956, **1**, 282.
Cathie, I. A. B., and MacFarlane, J. C. W. (1953). *British Medical Journal*, **1**, 805.
Giovannini, M. (1954). *Wien. med. Wschr.*, **104**, 910.
Henry, L., and Meynell, M. J. (1956). *Postgrad. Med. J.*, **32**, 297.
Jones, W. F., and Finland, O. M. (1955). *New Engl. J. Med.*, **253**, 754.
Lancet, 1956, **1**, 272.
Martin, W. J., Nichols, D. R., and Heilman, F. R. (1955). *Proc. Mayo Clin.*, **30**, 467, 521.
Sjöberg, S. G., Brante, G., and Regner, K. G. (1955). *Svenska LäkT.*, **52**, 83.
Spitz, K. H. (1955). *Wien. klin. Wschr.*, **67**, 212.
Wright, W. W., Kirshbaum, A., Arret, B., Putnam, E., and Welch, H. (1955). *Antibiot. Med.*, **1**, 490.

RAPID INTRAVENOUS TRANSFUSIONS
IN CHILDREN

BY

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Bayliss and Starling (1894) showed that rapid injections of crystalloid solutions and blood caused a rise in venous pressure in dogs. Previous cord transections at the level of T I had increased the capacity of their vascular system by one-quarter. In 1918 Starling pointed out that transfusions in anaemic patients caused the heart to behave as an overloaded heart-lung preparation, giving further rise to an already elevated venous pressure. This resulted in a fall of cardiac output and pulmonary oedema. Cabot (1926), Ellis and Faulkner (1939), and Sharpey-Schafer (1944) found the cardiac silhouette enlarged on radiological examination, electrocardiographic changes, and increased cardiac weight at necropsy in

anaemic patients. Sharpey-Schafer and Wallace (1942b) found increased cardiac diastolic size and electrocardiographic changes after transfusions in normal patients. In fatal cases necropsy has shown pulmonary oedema and cardiac dilatation (Plummer, 1936; Fishberg, 1937; Drummond, 1943). According to Riddell (1939) the commonest cause of fatality following blood transfusion is circulatory failure secondary to overloading.

This paper is a report on three anaemic children to whom 16 very rapid transfusions—35-50 ml. a minute—were given under general anaesthesia. There were no ill effects.

Case Reports

Case 1.—A boy aged 6, weighing 2 st. 1 lb. (13.2 kg.) and 3 ft. 8 in. (112 cm.) in height, with congenital hypoplastic anaemia, had a systolic murmur most clearly audible in the pulmonary area, and a liver enlarged to three fingerbreadths below the right costal margin. By May, 1955, he had received a total of 51 transfusions. Initially these consisted of 50 ml. of whole blood, but later he was being transfused with the packed cells from 1 pint (570 ml.) of blood. These earlier infusions were administered under basal narcosis—rectal thiopentone, 1 g. per 50 lb. (22.5 kg.) body weight—given in 20-30 minutes. Splenectomy in March, 1955, brought no improvement. Since June, 1955, he has received nine rapid transfusions under general anaesthesia, each consisting of the fresh packed cells from 2 pints (1,140 ml.) of blood. Blood-volume estimations were performed on three occasions.

Case 2.—The patient was a boy aged 7 weighing 3 st. 11 lb. (25 kg.) and 3 ft. 6 in. (107 cm.) in height, with congenital hypoplastic anaemia, probably of the Fanconi (1927) type—that is, with small head and pigmentation, though this latter may have been due to early haemochromatosis. The heart and respiratory systems appeared normal, but the liver was enlarged to two fingerbreadths below the right costal margin. By June, 1955, he had received a total of 93 intravenous blood infusions consisting of 50 ml. of whole blood, and later the packed cells from 1 pint (570 ml.) of blood. The operation was conducted under basal narcosis—rectal thiopentone, 1 g. per 50 lb. (22.5 kg.) body weight—and completed in 20-30 minutes. Splenectomy in May, 1953, produced no improvement. Since June, 1954, six very rapid transfusions have been given under general anaesthesia, each consisting of the fresh packed cells from 2 pints (1,140 ml.) of blood. On three occasions blood-volume estimations were performed and venous pressure changes were recorded manometrically once.

Case 3.—A girl aged 4, weighing 2 st. (12.7 kg.) and 3 ft. 3 in. (99 cm.) in height, had a neuroblastoma of the left adrenal gland. The cardiac and respiratory systems were normal. She had received two previous slow transfusions each consisting of 1 pint (570 ml.) of whole blood. We transfused her rapidly once under general anaesthesia with 1 pint (570 ml.) of whole blood.

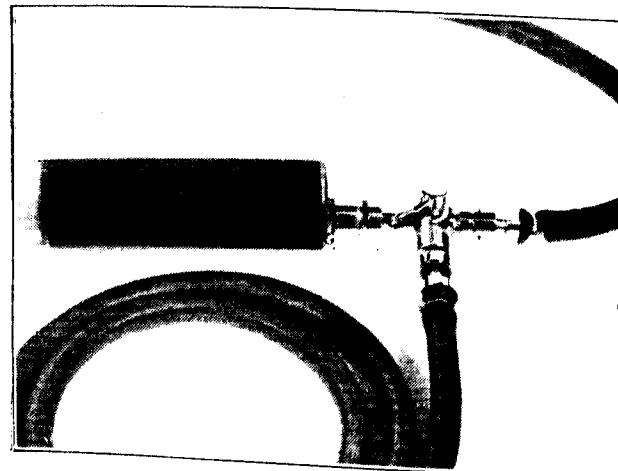
Method

Each child was given a fat-free diet for 18 hours before transfusion. Pentobarbitone sodium, 0.6 gr. per stone (6 mg. per kg.), was given one hour before operation, and atropine, 1/100 gr. (0.65 mg.) hypodermically, half an hour pre-operatively. A quiet induction of anaesthesia was achieved with nitrous oxide, oxygen (30%), and trichlorethylene, and maintenance was with nitrous oxide, oxygen (30%), and ether. A Dinsdale (1954) respirator was used in order to assure minimal resistance to respiration. A high flow of gases was maintained in order to prevent accumulation of carbon dioxide.

The apparatus for transfusion was of a modified scalp vein type with Luer-Lock fittings (see Fig.) (Black et al., 1951; Mollison, 1951). The packed cells were usually

given into the back of the hand. On one occasion (Case 1) the blood was given direct into the internal jugular vein.

Blood-volume estimations were performed, using 1% Evans blue (T.1834)—16 mg. diluted to 10 ml. with distilled water. A baseline specimen of blood was collected, after which the dye was injected. A second specimen of blood was taken after 10 minutes to allow adequate mixing (Gibson and Evans, 1937). The child was then transfused and three further blood specimens were taken, preferably from the opposite arm at intervals of 7, 15, and 30 minutes. The plasma volumes were calculated photoelectrically (Harington *et al.*, 1940) using a wavelength of 620 and a red filter. The average plasma volume at 10 minutes after transfusion was obtained by plotting a time/concentration graph. From



these results and estimations of packed cell volume the total blood-volume changes were determined. Blood-volume estimations were also performed in Cases 1 and 2 without transfusion, to show that rapid excretion of the Evans blue dye via the reticulo-endothelial system and biliary tract (Gibson and Gregersen, 1935) occurred neither during mixing nor for 30 minutes afterwards (Crooke and Morris, 1942). The plasma volume at zero time had to be assumed to be the same as that at 10 minutes after injection of the dye. This implies a calculated error of less than 2% (Russell, 1949).

Results

The results of the investigation are shown in Table I. During the first three transfusions in Cases 1 and 2 continuous electrocardiographic recordings showed no change apart from slight slowing of pulse on two occasions. Before transfusion the jugular venous pressure was not elevated, but this was probably because the haemoglobin was seldom allowed to fall below 45%. An increased venous filling became

obvious after anaesthesia had been induced. After the transfusion the jugular veins looked fuller, but, as the children were anaesthetized and lying supine, no accurate assessments of the jugular venous pressure were made. Direct manometric readings in a peripheral vein showed no change in venous pressure. In Case 1 the pulmonary systolic murmur was much less audible after the transfusion.

Discussion

The children with congenital hypoplastic anaemia were losing one week's schooling in six in order to be transfused. Under the method described above they could be in and out of hospital and return to school in 24–48 hours.

Anaesthesia

We considered preliminary anaesthesia essential because of the marked apprehension resulting from regular six-weekly transfusions. Anaesthesia also made venepuncture easier owing to the increased venous filling. The supine position, however, was not ideal, as there is evidence that the propped-up position lowers the right auricular pressure (Sharpey-Schafer, 1945; Paul Wood, 1950). Ether is the anaesthetic agent of choice. Changes in the central venous pressure in adults are said to be negligible with thiopentone and nitrous-oxide-oxygen sequence (Fieldman *et al.*, 1955). A thiopentone induction, however, is impracticable in small, feeble children. Fletcher and Pender (1954), reporting on studies of venous pressure in adults, under ether anaesthesia, state that the venous pressure remained significantly raised during a three-hour period. This has not been our experience during ether anaesthesia in children. The impression that transfusions are particularly dangerous while the patient is anaesthetized does not seem justified. There is only the minimal danger of incompatibility (Wiener, 1943).

Total Blood Volume Changes

McMichael *et al.* (1943) found a reduced blood volume in chronically anaemic adults. Sharpey-Schafer (1944) confirmed this and found that right auricular pressure, cardiac output, and percentage utilization of available oxygen were increased. Patients with the highest venous pressure had the lowest haemoglobin and a reduced blood volume. One case, however, with the highest venous pressure and cardiac output and lowest haemoglobin, had a blood volume which was not as low as in some cases. Four days after transfusion, in this particular instance, the blood volume was lower still, although the patient had improved as judged by a falling venous pressure. In chronic anaemia the cardiac output is maintained by greater minute output secondary to an increased venous filling on the right side of the heart, and a tachycardia. Barcroft *et al.* (1944) thought the increased right auricular pressure must be at the expense of the

TABLE I.—Results of Rapid Transfusion

Case No.	Blood Volume Given (ml.)	Time Taken		Haemoglobin		Plasma Volume			P.C.V.		Total Blood Volume				Blood Vol. Increase (ml.)	Vol. Change Compared with Vol. Given (ml.)	
		Min.	ml./Min.	Pre-transf. (%)	Post-transf. (%)	Zero Time (at 10 Min.) (ml.)	10 Min. Post-transf. (ml.)	Increase (%)	Pre-transf. (%)	Post-transf. (%)	Pre-transf. (ml.)	Post-transf. 10 Min. (ml.)	Rise (%)	Expected Rise (%)			
1	410	10	41	50	98	1,000	1,125	12.5	24	43	1,316	1,940	47.4	31	624	+224	
	590	17	35	55	99	1,250	1,375	10.0	26	44	1,716	2,440	42.2	34.3	724	+134	
	550	17	32	60	93	1,115	1,315	13.5	28	46	1,665	2,423	45.5	33	758	+208	
	510	15	34	45	77												
	550	13	46	50	94												
	400	12	33	36	85												
	540	10	54	56	95												
	400	10	40	60	93												
510	12	43	58	97													
2	500	13	36	44	92	1,780	2,010	12.9	20	35	2,136	2,871	34.4	23	735	+235	
	490	13	35	54	92	1,260	1,352	7.8	21	35	1,592	2,174	36.5	30.8	582	+98	
	480	16	30	50	88	1,206	1,214	0.7	20	36	1,507	1,959	30.0	31.2	452	-28	
	510	14	36	45	79												
	540	12	45	50	82												
	500	14	36	42	89												
3	490	10	49	50	87												

capillary and venous systems. Their findings were based on observations on the pulse, skin circulation, and total peripheral resistance following acute haemorrhage. Altschule and Gilligan (1938) noted skin flushing and a bounding pulse after transfusions in adults, and Russell (1947) observed skin flushing and local heat without venous engorgement after giving blood to children at the rate of 5 ml. a minute.

Sharpey-Schafer and Wallace (1942b), however, had produced evidence to show that the peripheral and pulmonary capillaries and veins dilate to accommodate the increased blood volume. The reason for administering venous transfusion slowly to anaemic patients is to enable the slow adjustment of venous filling pressure to the extra volume given (Sharpey-Schafer, 1945). We believe that ether anaesthesia may lower venous vasomotor tone in children so that the venous side can not only accommodate the blood much more quickly but is probably adjusted to receive it before the transfusion is given. Furthermore Fieldman *et al.* (1955), in a study of 11 adult cases, found a decrease in blood volume on induction of anaesthesia—calculated from the Stewart (1921) formula. A further significant decrease in blood volume occurred on deepening the anaesthesia. There was no significant increase in blood volume on emergence from deep anaesthesia.

The decrease in blood volume in chronic anaemia is an active process by which available haemoglobin is concentrated. This increases the availability of oxygen (Sharpey-Schafer, 1944), allowing the minimum necessary minute-volume cardiac output. Our results showed that in the anaemic phase in children the blood volume was approximately average or actually increased compared with the heights and weights of normal control children (Russell, 1949) (see Table II). Russell's figures and those of Bakwin and Rivkin (1924), however, show a wide range of normality in healthy children.

TABLE II

Case No.	Weight	Height	Average Blood Vol. for Patient's Weight	Average Blood Vol. for Patient's Height	Lowest Blood Vol. Pre-transfusion
1	13.2 kg.	112 cm.	1,100 ml.	1,600 ml.	1,316 ml.
2	25 "	107 "	2,100 "	1,400 "	1,959 "

Russell (1949) thought that the blood volume related to height was more valuable than when related to weight, as when the volume is increased owing to congestive failure the weight would rise automatically. Russell (1947), using the weight would rise automatically. Russell (1947), using a concentrated corpuscle-haemoglobin method for determining blood volumes (Hill, 1941; McMichael *et al.*, 1943), found that blood transfusion to an anaemic child with an initial low blood volume for its height and weight resulted in an increased total circulating volume. In another anaemic child with a high initial blood volume, transfusion resulted in a shift of fluid to the tissues. In our Cases 1 and 2, where the initial blood volume was average or high, transfusion resulted in an increase in the total circulating volume. The percentage increase in volume (Table I) was higher than expected from the quantity of blood given (on all occasions except one in Case 2). A low blood volume does not occur in chronically anaemic children as it does in adults. If the haemoglobin is allowed to fall below 25%, the blood volume may then follow the adult pattern. It can be argued that if the blood volume is reduced before transfusion then the infusion will give a relatively big increase in circulating fluid; if, however, the blood volume is normal or high to begin with, the proportional increase in volume will be less and so the risk of overloading diminished.

Plasma Changes

Sharpey-Schafer and Wallace (1942a) have shown that when blood volume is at a normal level transfused serum leaves the circulation in from one to two hours. Where the initial blood volume is reduced the transfused serum is retained in the circulation. Marriott and Kekwick (1936)

found that where whole blood is transfused in patients with chronic anaemia the added plasma may disappear even during the transfusion, and particularly if it is given slowly. Following our transfusions of packed cells the plasma volume was always increased ten minutes after the termination of the infusion. Russell (1947) suggests this increase in volume may be partly due to differences in the plasma protein levels of the blood of the donor and recipient. Mellett (1944) found that, in dogs, if the blood of the donor has a higher protein content than that of the recipient, fluid is likely to be withdrawn from the tissues to equalize the osmotic pressure. Conversely, transfused blood of lower osmotic pressure would tend to cause a shift of fluid to the tissues.

Sharpey-Schafer and Wallace (1942a) showed that the rate of disappearance of injected serum depended upon the initial blood volume and not on its protein content. Boycott and Oakley (1934), using cats, and Hayward and Jordan (1942), using human subjects, showed that movement of plasma proteins probably occurs simultaneously with the fluid shift. There is no plasma protein change during haemodilution following acute haemorrhage (Wallace and Sharpey-Schafer, 1941). As we used packed cells the plasma protein content is probably not the main cause of the extra fluid shift from tissues to circulation. Furthermore, there is no substantial loss of injected red blood cells for the first two days after blood transfusions, any volume change being one of plasma (Boycott and Oakley, 1934). The extra plasma could not have come from the spleen in Cases 1 and 2 as they had been splenectomized. Splanchnic or hepatic blood (both cases had large livers) is a possible source. It is unlikely to come from the venous side because of the reduced vasomotor venous tone resulting from the ether anaesthesia.

Quantity and Rate of Transfusion

The signs of an overloaded circulation are an elevated jugular venous pressure (Lewis, 1937) and basal rales (Drummond, 1943). DeBaKey (1938), in over 5,000 transfusions, never once observed the so-called phenomenon of speed shock (Hyman and Hirschfeld, 1931), and not infrequently 650 ml. was transfused in three minutes. In normal hearts Caughey (1935) found that 1,500 ml. of saline at 50 ml. a minute gives no venous pressure rise, but Altschule and Gilligan (1938) found that when more than 500–1,500 ml. of fluid is injected at greater than 26 ml. a minute the venous pressure, cardiac output, and blood volume increased. The faster the rate and the larger the quantity of fluid given, the higher was the venous pressure. Beattie and Collard (1942) found no changes of venous pressure by direct measurement in cases of diabetic coma and post-operative shock receiving similar large transfusions. Sharpey-Schafer and Wallace (1942b) found that 2,000 ml. of saline, serum, or blood can be given to normal hearts at 160 ml. a minute, but again with some rise in venous pressure. Previous reduction of blood volume by venesection prevented this rise. Marriott and Kekwick (1940) advised 1 ml. per 1 lb. (450 g.) body weight per hour to severely anaemic patients (haemoglobin less than 25%), uncomplicated by acute haemorrhage, and did not think it was safe to increase the rate if packed cells instead of whole blood were used. Sharpey-Schafer (1945) showed that 500 ml. at moderate rates (18 ml. a minute) may overload the anaemic heart.

We have found in three cases that 500 ml. could be safely given under general anaesthesia to children in approximately 10–15 minutes—that is, 35–50 ml. a minute. On one occasion this quantity was given direct into the internal jugular vein in ten minutes. This involves infusing two to four times faster than that thought likely to overload the chronically anaemic adult heart. We would not entertain such a rapid transfusion in proved pathologically abnormal hearts—for example, a case of pernicious anaemia—where rapid transfusions under any circumstances would be dangerous. Anginal symptoms may occur in severe anaemia even in normal hearts (Pickering and Wayne, 1934). Hunter (1946) found that, after correction of chronic anaemia,

cardiac pain and enlargement and electrocardiographic changes may persist and be almost identical to the signs of organic heart disease. Thus in chronic anaemia, even when the heart appears normal, ischaemic changes may already have occurred. This, however, seems unlikely to be the case in children.

Summary and Conclusions

A method is described of rapid intravenous transfusions to children. The procedure is regarded as safe in children with clinically normal hearts. It may be particularly indicated where regular transfusions are required during the child's life.

In children with chronic anaemia the blood volume does not fall as in adults. The relative volume increase after transfusion is thus small.

More blood can be given and at a faster rate owing to a reduced blood volume resulting directly from other anaesthesia, and probably a release of venous vasomotor tone.

The young chronically anaemic heart can withstand fast transfusions better than adult hearts. In selected children transfusions can be given with safety two to four times faster than the rate causing a falling cardiac output in chronically anaemic adults.

The blood volume soon after transfusions is greater than can be accounted for by the volume of blood given: the extra volume may come from the splanchnic or hepatic pools.

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REFERENCES

- Altschule, M. D., and Gilligan, D. R. (1938). *J. clin. Invest.*, **17**, 401.
Bakwin, H., and Rivkin, H. (1924). *Amer. J. Dis. Child.*, **27**, 340.
Barcroft, H., Edholm, O. G., McMichael, J., and Sharpey-Schafer, E. P. (1944). *Lancet*, **1**, 489.
Bayliss, W. M., and Starling, E. H. (1894). *J. Physiol. (Lond.)*, **16**, 159.
Beattie, J., and Collard, H. B. (1942). *British Medical Journal*, **2**, 301.
Black, M. L., Carré, J. J., and Wolff, O. H. (1951). *Lancet*, **2**, 19.
Boycott, A. E., and Oakley, C. L. (1934). *J. Path. Bact.*, **38**, 91.
Cabot, R. C. (1926). *Facts of the Heart*. Philadelphia.
Caughey, J. L. (1935). *Proc. Soc. exp. Biol. (N.Y.)*, **32**, 973.
Cooke, A. C., and Morris, C. J. O. (1942). *J. Physiol. (Lond.)*, **101**, 217.
DeBakey, M. (1938). *Surgery*, **3**, 914.
Dinsdale, T. (1954). *Anaesthesia*, **9**, 206.
Drummond, R. (1943). *British Medical Journal*, **2**, 319.
Ellis, L. B., and Faulkner, J. M. (1939). *New Engl. J. Med.*, **220**, 943.
Fanconi, G. (1927). *Jb. Kinderheilk.*, **117**, 257.
Fieldman, E. J., Ridley, R. W., and Wood, E. H. (1955). *Anesthesiology*, **16**, 478.
Fishberg, A. M. (1937). *Heart Failure*. London.
Fletcher, G., and Pender, J. W. (1954). *Fed. Proc.*, **13**, 354.
Gibson, J. G., jun., and Evans, W. A., jun. (1937). *J. clin. Invest.*, **16**, 851.
— and Gregersen, M. I. (1935). *Amer. J. Physiol.*, **113** (Proc.), 50.
Harrington, C. R., Pochin, E. E., and Squire, J. R. (1940). *Clin. Sci.*, **4**, 311.
Hayward, G. W., and Jordan, A. (1942). *British Medical Journal*, **1**, 462.
Hill, D. K. (1941). *Lancet*, **1**, 177.
Hunter, A. (1946). *Quart. J. Med.*, **15**, 107.
Hyman, H. T., and Hirschfeld, S. (1931). *J. Amer. med. Ass.*, **96**, 1221.
Lewis, T. (1937). *Diseases of the Heart*. London.
McMichael, J., Sharpey-Schafer, E. P., Mollison, P. L., and Vaughan, J. M. (1943). *Lancet*, **1**, 637.
Marriott, H. L., and Kekwick, A. (1936). *Proc. roy. Soc. Med.*, **29**, 337.
— (1940). *British Medical Journal*, **1**, 1043.
Metcalfe, W. (1944). *J. clin. Invest.*, **23**, 403.
Mollison, P. L. (1951). *Blood Transfusion in Clinical Medicine*. Oxford.
Pickering, G. W., and Wayne, E. J. (1934). *Clin. Sci.*, **1**, 305.
Plummer, N. S. (1936). *British Medical Journal*, **2**, 1186.
Riddell, V. H. (1939). *Blood Transfusion*. London.
Russell, S. J. M. (1947). *Arch. Dis. Child.*, **22**, 50.
— (1949). *Ibid.*, **24**, 89.
Sharpey-Schafer, E. P. (1944). *Clin. Sci.*, **5**, 125.
— (1945). *Lancet*, **2**, 296.
— and Wallace, J. (1942a). *Lancet*, **1**, 699.
— (1942b). *British Medical Journal*, **2**, 304.
Starling, E. H. (1918). *Linares Lecture on the Law of the Heart*. London.
Stewart, G. N. (1921). *Amer. J. Physiol.*, **58**, 20.
Wallace, J., and Sharpey-Schafer, E. P. (1941). *Lancet*, **2**, 393.
Wiener, A. S. (1943). *Blood Groups and Transfusion*. Springfield.
Wood, P. (1950). *Disease of the Heart and Circulation*. London.

GREAT AURICULAR NEUROTOMY FOR TIC DOULOUREUX

A CONTROLLED CLINICAL TRIAL

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Tic douloureux can at present be cured by any of several methods, all of which depend on interruption of those pain-conducting nerve fibres which pass from the ganglion of the trigeminal to the nucleus of its descending tract. All therefore cause some lifelong trigeminal sensory loss, which in most cases entails lifelong facial dysaesthesiae, and each has at least one of these further drawbacks: a more than negligible death rate, an insufficiently high success rate, and a risk of neuromyolytic keratitis or of lesions of other cranial nerves besides the fifth. For many years there has been a search for a cure—or even a means of prolonged relief—without such drawbacks, the two latest operations, which are both still unproved, being trigeminal “decompression” and compression.

Wyburn-Mason (1953) reported that he had treated about 56 patients suffering from tic douloureux by interruption of the great auricular nerve. Each of them first received an alcohol block of that nerve, and about half were completely relieved, “provided the tongue was not involved. . . . The treatment does not relieve the pain in the tongue.” Regarding the periods of complete relief thus obtained, he wrote: “In cases treated by alcohol block alone the pain may return after 6 to 18 months.” When the pain had returned, or if it had not been initially relieved, he treated it in some cases by a further alcohol block and in others by surgical section of the nerve.

Twenty-five of his patients received this surgical treatment, of whom two, at the time when he wrote, had had some return of pain, one two and a half years and the other three and a half years after nerve section. His follow-up was for as long as five years, which presumably means that five years was the maximum, but he did not state the minimum period.

Here, one might think, is the long-sought remedy without serious drawbacks, except for its failure to relieve pain in the tongue. Of the two ways of interrupting the great auricular nerve, Wyburn-Mason evidently prefers surgical section, and we agree with him, for with only a little more trouble than alcohol injection it produces a more certain interruption and a permanent one. Anything which it fails to do, injection likewise will fail to do. We have therefore subjected great auricular neurotomy to a controlled clinical trial on the lines recommended by Hill (1951).

Present Trial

Definitions.—Throughout the remainder of this paper neurotomy means great auricular neurotomy, and injection means alcohol injection of the trigeminal sensory root. Entry-injection interval means the interval between the date of a given patient's entry into the trial and the date of his injection.

Purpose of Trial.—The trial was primarily designed to answer the following question. Suppose that a patient with tic douloureux (1) after hearing the pros and cons of injection,

decides for himself when to undergo it, and (2) agrees to try neurotomy while awaiting or considering injection. What difference will neurotomy make to the entry-injection interval?

Collection of Patients

Out-patients with “trigeminal neuralgia” were referred to one of us (J.P.) for injection, but only those who fulfilled five diagnostic criteria (Penman, 1950) were accepted as having tic douloureux. To each of them an explanation of injection and its results was given, with emphasis on three points: that permanent cure was probable, that it would mean permanent and uncomfortable numbness of the affected side of the face, and that there would be a small risk of temporary trouble with the eye on that side. Each patient was then asked: “At present, are you sure you want injection, or sure you don't want it, or not sure either way?” Not infrequently he tried to make the doctor, or the relative or friend whom he had with him, decide this question for him, but he was told that he must decide for himself, since no one else could judge how severe his pain was. His answer having been recorded, he was asked: “Suppose you were suitable for another, milder treatment, which is certainly harmless, but which is still unproved and may turn out to be useless; would you be interested in that?” If he answered yes, an explanation of neurotomy was given to him, but it was stressed that this treatment, being unproved, could not be given to everyone who wanted it. If he said that he would be willing to try it he thereby entered the clinical trial. Whether in fact he was to be neurotomy or not was determined randomly, by the method described below under the headings “classification” and “treatment groups,” and he was immediately told the result of this random determination.

Fifty-one patients were thus collected, and eight more in the following different way. At the beginning of the trial there were eight patients who had previously been given the same explanation of injection, had said that they definitely wanted it, and were already waiting for it. To be brought into strict conformity with the other 51 they would have had to be interviewed again and specifically offered the opportunity of entering the trial; instead, their acceptance of it was assumed, and a date soon after the beginning of the trial was taken as the date of entry for all eight. When their treatment was randomly determined, all eight, when their treatment was randomly determined, were offered it in the five proved to be for neurotomy, and underwent the same terms as the other 51, accepted it, and underwent it; the remaining three were not neurotomy.

To this second method of collection it can be objected that any of the three unneurotomy patients, if specifically

offered entry into the trial, might perhaps have declined it. However, these eight cases gave results so similar to the rest that we think it justifiable to include them.

During the period of collection one patient was seen who had tic douloureux limited to the tongue, and was therefore excluded. Eighteen patients were included who had pain in the tongue as well as in other structures.

Classification

One of these 59 patients had bilateral tic douloureux which was almost equally severe on the two sides, and each side of his face was regarded as a separate case. In many places, therefore, we shall refer to our 60 cases instead of our 59 patients.

The cases were analysed at entry into the trial with regard to six features which might be held to influence the course of the disease (see Table I, part 1).

Severity of Pain at Time of Entry.—By their responses to the offer of injection the patients divided themselves into three classes, which finally contained the following numbers: class 1, certainly wanting injection (38 patients, 39 cases; class 2A, uncertain (18 patients); class 2B, certainly not wanting injection (3 patients). In randomly allocating treatment by neurotomy we preserved this division into three classes, but for all other purposes we have combined class 2B, since it was so small, with class 2A to make a single class 2.

Sex.—There were 34 women and 25 men.

Age on Date of Entry.—The patients were divided into those below the age of 60 years, who numbered 25, and those aged 60 years or over, who numbered 34.

Side of Face Needing Treatment.—Forty patients needed treatment on the right side, 18 on the left, and 1, already mentioned, on both.

Duration of Tic Douloureux at Time of Entry.—The cases were divided into those of less than four years' duration, which numbered 28, and those of four years' duration or more, which numbered 32.

Previous Attempts at Radical Treatment.—The cases were divided into those in which one or more attempts at injection, trigeminal sensory rhizotomy, or other forms of trigeminal surgery had already been made, which numbered 12, and those in which none had been made, which numbered 48.

In Table I, part 2, the features of patients in more severe pain (class 1) are compared with the features of those in less severe pain (class 2). Even with these small numbers it

TABLE I.—Classification, Treatment Groups, and Results

Features Possibly Influencing Results	Primary Groups	All Cases	Part 1		Part 2		Part 3		Part 4				Part 5. Results							
			Class 1	Class 2	Neuro-tomized	Unneuro-tomized	Neuro-tomized	Unneuro-tomized	Classes 1 and 2 Subdivided into Treatment Groups				Class 1				Class 2			
									Class 1		Class 2		Neuro-tomized		Unneuro-tomized		Neuro-tomized		Unneuro-tomized	
									Neuro-tomized	Unneuro-tomized	Neuro-tomized	Unneuro-tomized	Injected	Not Injected	Injected	Not Injected	Injected	Not Injected	Injected	Not Injected
Severity of pain (see text)	Class 1	39	18	18	11	7	16	7	11	9	8	6	10	1	9	0	4	4	2	4
	“ 2A	3	3	3	1	2	10	12	7	4	3	3	12	0	5	2	3	1	1	2
	“ 2B	3	3	3	1	2	16	10	13	10	5	4	13	0	9	1	3	2	1	3
Sex	Female	26	19	7	16	10	15	10	10	6	7	5	13	0	9	1	3	2	1	3
	Male	35	23	12	9	15	10	16	11	5	7	7	15	1	10	4	6	1	2	5
Age at entry	60 or more	25	16	9	15	10	16	11	5	5	2	7	7	0	4	1	1	4	1	1
	Under 60	41	27	14	23	18	7	7	5	5	2	7	0	4	1	1	4	2	1	1
Side of face	Right	19	12	7	12	7	10	9	8	5	10	0	8	1	6	1	6	2	1	4
	Left	32	19	13	18	14	13	7	7	4	4	12	1	6	1	1	3	2	2	2
Duration of illness	4 years or more	28	20	8	25	23	17	14	8	9	9	16	1	12	2	4	4	3	6	0
	Under 4 years	48	31	17	10	2	6	2	4	0	0	6	0	2	0	3	1	0	0	0
Previous radical treatment	Not attempted	12	8	4	10	2	6	2	4	0	0	6	0	2	0	3	1	0	0	0
	Attempted	48	31	17	10	2	6	2	4	0	0	6	0	2	0	3	1	0	0	0
	Total	60	39	21	35	25	23	16	12	9	22	1	14	2	7	5	3	6		

is worth noting that of the patients who were sure that they wanted injection, practically one-half were men, but of those who were uncertain or against injection only one-third were men. Also the shorter histories of tic douloureux were associated with a greater tendency to want injection. (The men did not tend to have shorter histories than the women.) In other respects the two classes did not differ.

Treatment Groups

Classification of the cases in relation to all the six features listed in Table I leads to 96 subgroups. Though some of these subgroups were bound to remain empty, 96 lists were prepared, each with spaces for ten names. Opposite each space, before the trial began, was written either A, signifying treatment, or C for control, the order of A's and C's on each list being determined by random sampling numbers. As soon as each case had been classified, the patient's name was written in the first vacant space on the appropriate list, and the presence of A or C opposite it determined whether neurotomy should be carried out or not. The resulting distribution of cases is shown in Table I, part 3. The aim of this method of determination of treatment was to obtain neurotized and unneurotized groups that were equivalent in their main features, and it was achieved except as regards previous treatment (and as regards the very small class 2B). Even for classes 1 and 2 separately there was a reasonable equivalence between the neurotized and unneurotized groups (see Table I, part 4). In order simultaneously to achieve equal numbers of neurotized and unneurotized cases, a larger total than 60 would have been needed.

The patient needing bilateral treatment proved to have his right side among the neurotized cases and his left among the unneurotized.

Of the 18 patients with pain in the tongue as well as in other structures, 12 were neurotized and 6 unneurotized.

Neurotomy

As soon as it had been determined that a given patient was to be neurotized, his name was put on a list, and the neurotomies were carried out in the order in which the names had been listed. The names of all patients in class 1 and of some in class 2 had on the day of entry into the trial been put also on a second waiting-list, for admission to hospital and injection. Whenever this second list was short—and it was seldom long—there was a danger that a patient's injection might have to be delayed in order to find time for his neurotomy. To reduce this danger, most neurotomies were carried out within five days of entry, some one day after it, and a few on the day of entry; but, even so, there were some cases in which injection was thus delayed for a short while. Such delays could only weight the results slightly in favour of neurotomy.

Just before each neurotomy we applied pressure, as recommended by Wyburn-Mason, to the great auricular nerve of the affected side through the intact skin. A few patients, all of whom had been having paroxysms of tic douloureux just before this pressure, had them also just after it, but none was relieved of pain by it.

All 35 neurotomies were carried out by one of us (L.S.W.) and nearly all were witnessed throughout by the other. Only local analgesia was used, and Wyburn-Mason's directions were strictly followed. The great auricular nerve was identified where it crossed the posterior border of the sternomastoid muscle, freed from neighbouring structures, and traced as far centrally as possible. In 31 cases the most central portion of the nerve that could be reached was squeezed and tugged with a forceps; 4 of these 31 patients felt nothing, doubtless because of the preliminary infiltration of the operative field with local analgesic; 25 felt painful or other sensations in the ear; two felt them only in the neck; but none felt any sensation in the trigeminal area. (In the remaining four cases of neurotomy we inadvertently did not record whether this stimulation of the nerve was carried out or not.)

A length of at least 1 cm. of the nerve was excised and sent for microscopy, which in each of the 35 cases confirmed that it was a portion of a peripheral nerve. A few patients felt the same sensations during the cutting of the nerve as they had felt during the squeezing and tugging of it, and in the same areas. One patient, when re-examined just before injection, had no sensory loss on the ear; presumably the great auricular nerve was either exceptionally small and had a correspondingly small territory, or else proximally to the site of operation it had already divided into two or more branches, of which only one was found and cut. In all other cases there was permanent analgesia or anaesthesia in the lobe of the ear and in immediately adjacent areas, but in none was there any sensory loss within the trigeminal area.

Thus the great auricular nerve was stimulated in 31 cases and completely cut in either 34 or 35 cases, but no support was found for Wyburn-Mason's view that it must partly innervate the trigeminal area.

Follow-up

Patients whose names were on the waiting-list for injection were told that if by the time they were sent for they no longer wanted it they would be welcome to postpone it. Those whose names were not on the waiting-list were told that whenever they wanted injection they might send word, and their names would at once go on the list. Both these instructions were given whether neurotomy had been carried out or not, but in addition the neurotized patients were told that if they really wanted injection they should not postpone it because of the neurotomy. However, the inclination to wait a little longer and give the neurotomy "time to work" must have been strong in some cases, and it is doubtful whether our instruction entirely counteracted it. One patient to our knowledge was persuaded by his general practitioner to postpone injection for that reason, and others may have been similarly persuaded. This is a second inevitable factor which tended to weight results somewhat in favour of neurotomy, especially in class 2.

Injections were carried out in the order of the waiting-list. So far as was possible, all uninjected patients were followed up every two calendar months from the date of entry, on the first two occasions by interview and thenceforth by letter. On five occasions we had to be content with a letter instead of an interview, and on three with a telephone message instead of either. Twice we lost touch with patients temporarily, but none defaulted entirely, and a few had extra interviews at their own request. The first entry was on August 16, 1954, the last on May 4, 1955, and the follow-up was closed on August 16, 1955.

Results

One criterion of failure or success with the 35 neurotomies is the subsequent need or absence of need for injection, as compared with the same need or absence of it in the 25 unneurotized cases. In injected cases another criterion is the entry-injection interval, and in uninjected cases the period for which each patient was followed up without needing injection.

Injection had to be carried out in 36 of 39 cases, or 92.3%, in class 1, but in only 10 of 21 cases, or 47.6%, in class 2, and all results must therefore be considered separately for these two classes.

In class 1 there were 23 neurotized cases, 22 of which had to be injected, and 16 unneurotized cases, 14 of which had to be injected. In class 2 there were 12 neurotized patients, seven of whom had to be injected, and nine unneurotized patients, three of whom had to be injected. For details see Table I, part 5. The maximum, average, and minimum entry-injection intervals are given in Table II, which shows that in class 1 the average intervals for neurotized and unneurotized cases differed by less than one day. In class 2 the average entry-injection interval was 75 days longer for the neurotized than for

TABLE II.—Injected Cases: Number of Days Elapsing Between Entry into Trial and Injection

		Class 1		Class 2	
		Neurotized	Unneurotized	Neurotized	Unneurotized
No. of cases	Entry-injection interval (days)	22	14	7	3
	Maximum	85	148	204	25
	Average	21.4	22.1	93	18
	Minimum	4	0	12	16

the unneurotized, but here the total of 21 patients, injected and uninjected, was too small for this comparison to be very significant.

Uninjected cases numbered 14. In class 1 they represent one "success" out of a possible 23 for neurotomy and two "successes" out of a possible 16 for doing nothing; in class 2, five "successes" out of a possible 12 for neurotomy and six out of a possible nine for doing nothing. The follow-up periods, for what little they are worth with so few cases, can be compared in Table III; the three

TABLE III.—Uninjected Cases: Length of Follow-up

		Class 1		Class 2	
		Neurotized	Unneurotized	Neurotized	Unneurotized
No. of cases	Individuals	1	2	5	6
	Length of follow-up (days)	250	321	—	—
	Maximum	—	322	314	271
	Average	—	—	256	184
	Minimum	—	—	189	125

patients in class 1 all happened to enter the trial before any of the 11 in class 2, which is the only reason why they were followed up longer.

The patient needing bilateral treatment said when first interviewed, and again on the day of his right-sided neurotomy, that the left side needed treatment rather more than the right, so that it was for left-sided injection, as we thought, that he was admitted to hospital. He then said, however, that the right-sided pain had become worse than the left, and asked for a right-sided injection, which was given. About three and a half months later he began to have a bout of severe left-sided pain, which continued for two to three weeks and then abated. During that bout he asked for left-sided injection, but changed his mind before it could be given. Thereafter until his latest follow-up, 322 days after entry, his left-sided pain was not severe enough to make him want injection.

In all of those 12 cases in which the pain had both affected the tongue and been treated by neurotomy, it continued not only in the tongue but also in other structures, and in 10 out of the 12 cases injection was carried out.

A few neurotized patients found the numbness in and round the ear unpleasant, especially when lying in bed with the affected area in contact with a pillow. The 29 neurotized patients who required injection nearly all said in effect that neurotomy had been worth trying, but had made no difference whatever to their pain.

Comment

Controls apart, it would be hard to praise any treatment for tic douloureux which in 22 out of 23 severe cases left the patient in need of injection within 85 days.

The search for a cure without trigeminal sensory loss must continue, but each proposed new remedy ought, in the very first cases in which it is used, to be subjected to a controlled clinical trial. This precaution is especially necessary in any disease which is so chronic and remittent as tic douloureux. The two features of the present inquiry which we have found most valuable are (1) preliminary classification of the severity of each case by the patient himself, through his response to a standard offer of radical treatment, and (2) assessment of the efficacy of the method

under trial by the patient himself, through his decision when to undergo radical treatment. By these means, and with an adequate supply of patients, reliable results can be obtained within 12 months.

Summary

Between August, 1954, and May, 1955, 23 severe cases of tic douloureux, strictly diagnosed, were treated by great auricular neurotomy, and 16 other severe cases, comparable in all essentials with the first 23, were left untreated. In each of these 39 severe cases the patient when first interviewed had his name put on a waiting-list for trigeminal injection, which he was left free to postpone if his pain had abated enough. In 22 of the 23 neurotized cases (95.7%) trigeminal injection had to be carried out at most 85 days later, and in 14 of the 16 unneurotized (87.5%) it had to be carried out at most 148 days later. The average interval between entry into this clinical trial and injection was 21.4 days in the 22 neurotized and 22.1 days in the 14 unneurotized cases. One severe neurotized case and one equally severe unneurotized case, instructively, were on the right and left sides of a single patient. Twenty-one other patients with milder tic douloureux were similarly divided into 12 neurotized and 9 unneurotized and left to decide when they must undergo trigeminal injection, with similar results. Great auricular neurotomy, to judge from this trial, has no effect on tic douloureux.

We thank Mr. Wylie McKissock for encouraging us to do this work in his department, Professor A. Bradford Hill for valuable guidance and criticism, Professor T. Crawford and Dr. N. F. C. Gowing for microscopy of the excised portions of nerves, Miss Audrey Gear for her skill and patience in organizing the case records and the follow-up, and members of the almoners' department of the Royal South Hampshire Hospital for their prompt efficiency in tracing a psychiatrically ill patient who would otherwise have defaulted.

REFERENCES

- Hill, A. B. (1951). *Brit. med. Bull.*, 7, 278. (Republished in revised form as chapter 20 of A. B. Hill's *Principles of Medical Statistics*, 6th ed., 1955. Lancet Ltd., London.)
Penman, J. (1950). *Postgrad. med. J.*, 26, 627.
Wyburn-Mason, R. (1953). *British Medical Journal*, 2, 119.

HAEMOGLOBIN C DISEASE AND TRAIT REPORT OF A FAMILY IN ENGLAND WITH HAEMOGLOBIN C

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Abnormal, genetically determined haemoglobins are being recognized with increasing frequency as the cause of certain anaemias, generally of the haemolytic type. Their discovery has followed the application of electrophoretic techniques to the study of sickle-cell haemoglobin (S) by Pauling, Itano, Singer, and Wells (1949). The other human haemoglobins so far described are A (adult), C, D, E, F (foetal), G, H, I, and J; and the list is doubtless incomplete. The hereditary haemoglobinopathies occur almost exclusively in people of non-European descent, and principally in negroes.

Haemoglobin C was described by Itano and Neel (1950). Their cases were North American negroes, and the haemoglobin C was in the heterozygous state, with A or S. Homozygous haemoglobin C (haemoglobin C disease) was reported, again in North American negroes,

cases of aneurysm of the heart, of which four were in natives. Zuidema (1941) stated that cases are seen in Europeans, Indo-Europeans, and Chinese, but rarely in natives of Java, although hypertension and arteriosclerosis are common. He reported the cases of two Javanese, one of whom was a doctor. An extensive review of heart disease in Thailand was made by Bisal (1938). He analysed 530 cases admitted to Siraraj Hospital in Bangkok, of which 4.5% were described as arteriosclerotic in type. Although this group was further broken down the diagnosis of cardiac infarction was not mentioned.

Sengupta (1940) collected the cases seen at the Medical College Hospital, Calcutta, from 1931 to 1936. The total in this period was only 21, which was 2.1% of all cardiac cases. From correspondence I have had with Indian physicians I find the condition is not regarded as rare to-day, and Vakil (1949) has published a series of cases. In Ceylon the disease also seems fairly common now, Jayewardene and Jayasekera (1954) having collected 270 cases from the General Hospital, Colombo, during 1952 and 1953.

Scope of Investigation

This investigation covers the four years 1952-5. During this time all patients attending the Penang General Hospital who were found to have suffered from cardiac infarction were studied. Those with an old infarction diagnosed for the first time as well as those seen during an attack are included. The hospital is the main medical centre in the Settlement of Penang and Province Wellesley, which is situated in the north of the Malay Peninsula. Accommodation is graded into first, second, and third class. For third-class accommodation a small charge may be made, but most of the patients are treated free. The general medical beds of the hospital are divided into two medical units, each of which has 60 third-class beds and further beds in the better-class wards as required. Nearly all the cases were inpatients, but a few out-patients were seen in consultation. The diagnosis of cardiac infarction was based on definite changes in the QRS complex of the electrocardiogram, and a series of tracings was taken from each patient when that was possible. The customary twelve leads, occasionally more, were usually recorded at each examination. Post-mortem examinations are rarely permitted, and in only 4 of the 18 deaths was necropsy performed, and in these the diagnosis was confirmed.

In the four years 89 cases of cardiac infarction were diagnosed, an average of only 22 a year. During the same period a yearly average of 562 E.C.G.s were taken. The population of the Settlement from which these patients were drawn was 527,770 (estimation for 1954) and the average yearly admissions to the hospital were 9,396. The figure of 89 cases in four years is probably a little less than it should be, as fewer cases were diagnosed in the earlier part of the investigation. This may be attributed to shortage of staff and difficulties with the electrocardiograph, resulting in rather fewer recordings being taken.

Distribution by Sex, Age, Social Class, and Race

Of the 89 patients only 13 were women. Although this low figure for women may be partly due to the fact that fewer women than men are admitted to hospital, this explanation is quite inadequate, and the difference can be attributed to the different sex incidence for the disease. The ages of the men, by decades, are given in Table I.

TABLE I.—Age Incidence of 76 Male Patients

Age	No. of Cases	Age	No. of Cases
20-29 years	2	50-59 years	30
30-39 "	7	60-69 "	13
40-49 "	20	70+ "	4

The average age of the men was 52 and of the women 57. The youngest patient was an Indian Moslem aged 25 who worked as a boatman, and the oldest an Indian cowherd who gave his age as 81. The average age of the men by nationality was: Chinese, 55 years; Indians, 51; Malays, 50; and Europeans and Eurasians, 52. Thirty-two of the patients were admitted to first-class wards, nine to second-class wards, and 48 to third-class wards. The total admissions by class are not recorded in the hospital, but it is estimated that there are at least four times as many third-class admissions as first and second in the medical units.

The great diversity of races in Malaya gives an opportunity of comparing the incidence of cardiac infarction among them. Table II shows the estimated population of each

TABLE II

Race	Population of Penang and Province Wellesley (1954)	Average Yearly Admission	No. of Cases in 4 Years	Yearly Rate per 10,000 Admissions
Chinese	291,252	4,971	24	12
Indians	70,845	2,721	44	40
Malays	157,873	1,141	8	17.5
Europeans and Eurasians	5,226	454	11	60.5
Others	2,574	107	2	
Total	527,770	9,396	89	

race for 1954. As these races do not make comparable use of the hospital facilities the average yearly admissions by race are also given. The significance of the figures in Table II are discussed below. It should be pointed out that nearly all the Chinese originally came from South China, those from the Fukien Province being the commonest. Some of the Chinese patients were born in Malaya and most of the others have spent many years there. The Indians are mostly from South India, and include both Hindus and Moslems. Although the habits of these two religious groups differ it is not possible with such small numbers to make any subdivision. Like the Chinese, most have spent many years in Malaya.

Symptoms

A comparatively large number of patients in whom sound electrocardiographic evidence of infarction was found were unable to give a history of any definite episode to indicate the attack (Table III). Of those included under "typical

TABLE III

Class	Typical Episode	No Episode
First	30	2
Second	9	0
Third	26	22
Total	65	24

episode," two collapsed suddenly and died within three days, and one became unconscious but recovered. A fourth collapsed a week after childbirth, and the F.C.G. demonstrated infarction. Soon after this she suffered from hemiplegia. Practically all these patients had electrocardiographic tracings which indicated a recent infarction. A few gave a history of chest pain some time before coming to hospital. On the other hand, among the 24 without a history of an acute episode most of the tracings suggested old infarctions. This group usually presented with symptoms of cardiac failure, but one presented with a hemiplegia, one with cirrhosis of the liver and heart failure, and one with a vague history of weakness and oedema.

Two factors that are related to atheroma and so to cardiac infarction are diabetes and hypertension. Both these conditions are common in Malaya, but I do not know of any

significant figures regarding their incidence. Of the 89 patients with cardiac infarction, 11 were noted to have glycosuria, and consisted of six Indians, four Chinese, and one Eurasian. It is not so easy to assess the incidence of hypertension in the series, as many cases were on the borderline. If the diagnosis is based on the blood-pressure readings and E.C.G. tracings taken after an attack, there were only 15 with clear evidence of hypertension. This number is probably too small, and little weight can be attached to it.

Cases Outside the Hospital Practice

During the inquiry into cardiac infarction it became evident that the total number of patients with the disease was small and that the incidence seemed particularly low among the Chinese. It was therefore decided to seek further information on the subject from the 54 private practitioners of the Settlement. A simple questionnaire was sent to each asking for the number and nationality of patients with cardiac infarction that they had seen in the previous twelve months, excluding all who had been referred to the hospital. Answers were obtained from 44. Twenty-six had no cases, but the other 18 had seen 48—38 Chinese, 7 Indians, 2 Malays, and 1 other.

A further source of information was in the coroner's cases investigated by the Government pathologist. The only figures available were for a period of two years. In this time there were 16 cases—6 in Chinese, 4 in Indians, 5 in Malays, and 1 in Europeans.

When these figures are added to the hospital figures of Table II a more complete picture can be obtained (Table IV).

TABLE IV

	Population	No. of Cases per Year	No. of Cases per 100,000 of Population per Year
Chinese	291,252	47	16
Indians	70,845	20	28
Malays	157,873	6.5	4
Europeans and Eurasians	5,226	2.75	55

Discussion

The number of patients found suffering from cardiac infarction is not large or complete enough to allow of any dogmatic statements about the incidence of the disease among the peoples of Malaya. Other factors influence the value of some of the figures, and these are mentioned below. It is, however, interesting to note that the same trends for age, sex, and social status appear in Malaya as elsewhere. The distribution of hospital patients according to class shows that those of higher social classes are more often sufferers. There were nearly as many patients in the first- and second-class wards as in the third-class wards, in spite of the great difference in numbers admitted to these respective wards. About a third of those admitted to the third-class wards were engaged in the less strenuous or better-fed occupations such as coffee-shop keepers, clerks, etc. It should be added, however, that in some cases age or early heart failure may have driven them from manual work. More patients were treated by private doctors than were admitted to hospital, and this fact supports the opinion that the rich are more likely than the poor to be affected.

Is the disease less common in Malaya than in the United Kingdom? In comparing figures for these two countries a correction must be made for age because cardiac infarction is a disease of older people. In the last Malayan Census Report (1947) the number of the population aged 40 years and over is given as 219 per 1,000. This is only a little over one-half of the corresponding figure for England and Wales as given in the report of the Ministry of Health for 1953. My estimate for the Settlement of Penang and Province Wellesley is 78 cases in a population of 527,770. If an increase is allowed for the age distribution one has an inci-

dence of about 30 per 100,000 to compare with any United Kingdom figures. Unfortunately it is not easy to find in the literature suitable statistics for comparison. However, through the courtesy of Dr. G. M. Fyfe, who is studying coronary sclerosis in a Scottish county, I can make use of some of his observations. In a total population of 219,502 there were 429 cases in one year. This incidence is six to seven times greater than that which I have found in Malaya. Dr. Fyfe's figures were, however, obtained by a special scheme of notification by the medical practitioners of the area and should be more accurate and more complete than mine. They also include angina pectoris in the 429 cases. The difference, therefore, is probably less than the figures indicate.

The comparison of hospital figures is most difficult. The Penang General Hospital admits patients suffering from pulmonary tuberculosis, infectious diseases, and tropical diseases as well as those with general medical and surgical complaints. In two small hospitals in Scotland the average yearly admission for coronary sclerosis (mostly cardiac infarction) was 110 out of a total admission of 1,840. The Penang figures were 22 out of a total admission of 9,396. This difference is very great, but probably can be taken as little more than evidence of the different use that is made of the hospitals in these countries.

A further point of interest is the racial incidence. The impression gained in hospital work was that it was commoner among the Indians than among the Chinese. Further considerations modify this opinion and demonstrate how many fallacies there may be in attempting to analyse statistics in such a country as Malaya. For example, tuberculosis was one of the common causes for admission to hospital, the figures by nationality being available. In 1954 there were 491 Chinese admissions to 98 Indian. Whatever the cause of this difference it means that for other diseases the Chinese were even more reluctant to use the hospital than the figures in Table II indicate. Furthermore, the age incidence in hospital for these two races also differs, there being comparatively fewer Chinese in the middle group of 30-49 years. Out of 500 Chinese admissions, 196 were over 39 years of age and 124 over 49. The corresponding figures for Indians were 203 and 93. The number of patients reported by the general practitioners was dependent upon memory and cannot be accepted as more than approximately accurate. As nearly all the doctors work in the municipal area of Penang, and as the percentage of Chinese in this area is higher than in the Settlement as a whole, the figures have limited value in demonstrating incidence. The figures shown in Table IV, based on total population, indicate that the incidence among the Indians is nearly twice as high as among the Chinese, but this apparent higher susceptibility of the Indian must remain only a suspicion, as the evidence collected here is not good enough to offer statistical support.

In proportion to their numbers the Malays use the hospital less than the other races. It is certain, too, that they make little use of the services of the general practitioners. The figures available can be accepted only as evidence that infarction does occur in this race. The majority of Malays living a traditional country life as farmers or fishermen have little representation in the figures given in this paper.

One would like to give particulars of the diets and the people concerned. Some figures are available for the poorer section of the community, and these indicate that the intake of fat is low; but among the middle and upper classes the intake is probably quite high. Financially Malaya is more prosperous than most other Asian countries and the diet therefore correspondingly richer. So far as racial incidence is concerned it is of no value, however, to add inadequate diet figures to my own inconclusive incidence figures.

Lastly, it is of interest to consider the difference in symptoms as shown by the large number of patients who did not give a history of an acute episode. Parkinson and Bedford as long ago as 1928 described the type with dyspnoea and

heart failure without pain. In two recent papers (Papp, 1952; Roseman, 1954) on painless cardiac infarction the incidence is given as 4.6% (7 out of 150) and 4.5% (10 out of 220). In the present series it was 27% (24 out of 89), and this painless infarction was much commoner in the patients in the third-class wards; while Hunter (1946), in the U.S.A., found painless infarction commoner in the poor negro than in the poor white patient. The cause for this high proportion of painless infarctions must be conjectural. Perhaps some patients had forgotten the pain. To the educated man of to-day a pain in the chest is alarming, but to one who has never heard of coronary thrombosis and in whose life there have been many pains and hardships it may, unless very severe, be passed over as of little importance. One of the patients included here as a typical case came to hospital complaining of dyspnoea and swelling of the feet. It was only when the history was fully taken that it was learnt that he had had a pain in the chest two weeks earlier. It may be, too, that the pain in the poorer man is actually less severe; that just as the disease is less common, each attack may also be on the average less acute. Possibly the explanation is a combination of both suggestions. Whatever the reason may be, it is evident that the painless cardiac infarction is one of the causes of the not infrequent cases of heart failure of obscure aetiology found in the poor Asian patient.

Summary

The literature on cardiac infarction in South-East Asia is reviewed.

A series of cases in a Malayan hospital is described and further figures of patients seen by private practitioners are also given.

The difficulties in comparing the incidence either between Malaya and the United Kingdom or among the races of Malaya are discussed.

The figures that are given show that the disease is not a rarity in Malaya, but suggest that it may be less common than in the United Kingdom.

Among the different races of Malaya the figures available for Malays are too few for comparison. There is a suspicion that the incidence is higher among the Indians than among the Chinese.

In the symptomatology a high incidence of painless infarction is noted.

I wish to thank Dr. H. A. Reid, who has allowed me to include all his cases and has given other help; all the doctors of the Settlement who so kindly replied to my questionnaire; Dr. J. T. Boyd, of the London School of Hygiene and Tropical Medicine, for advice on statistics; Dr. G. M. Fyfe for figures of incidence in the U.K.; Dr. H. I. Williams for necropsy figures; and the following for answering other inquiries: Drs. F. R. Dieuaide, H. S. Gear, C. Gopalan, E. W. Graham, C. K. Menon, R. Subramaniam, and I. Simpson. I am indebted to Dr. R. E. Anderson, Director of Medical Services, Federation of Malaya, for permission to publish.

REFERENCES

- Bisal, P. A. (1938). *Trans. Far East Ass. trop. Med.*, 2, 1.
 Gear, H. S. (1936). *Chin. med. J.*, 50, 949.
 Hunter, W. S. (1946). *J. Amer. med. Ass.*, 131, 12.
 Jayewardene, R. P., and Jayasekera, H. T. W. (1954). *Ceylon med. J.*, 2, 163.
 Karcher, J. F. (1936). *Chin. med. J.*, 50, 705.
 Kouwenaar (1937). *Geneesk. T. Ned.-Ind.*, 77, 1254.
 Papp, C. (1952). *Brit. Heart J.*, 14, 250.
 Parkinson, I., and Bedford, D. Evan (1928). *Lancet*, 1, 4.
 Roseman, M. D. (1954). *Ann. intern. Med.*, 41, 1.
 Sengupta, P. C. (1940). *Calcutta med. J.*, 37, 359.
 Snapper, I. (1941). *Chinese Lessons to Western Medicine*. New York.
 Tjokronegoro, S. (1940). *Geneesk. T. Ned.-Ind.*, 80, 983.
 Tung, Chen-Lang (1948). *Chin. med. J.*, 66, 587.
 Vakil, R. J. (1949). *Indian Heart J.*, 1, 201. Quoted by Jayewardene and Jayasekera (1954).
 van Wesel, R. (1939). *Geneesk. T. Ned.-Ind.*, 79, 275.
 Zuidema, P. J. (1941). *Ibid.*, 81, 2541.

Medical Memoranda

Toxic Psychosis Caused by "Preludin"

"Preludin," a new drug for controlling the appetite, is, I believe, gaining popularity among those who for a number of different reasons try to slim. It was discovered in 1953 and first marketed in Germany in 1954. It has been on sale in this country for about twelve months. Below is reported the case of a young woman who took Preludin in large doses for its central stimulant effect, and as a result developed a toxic psychosis. This was at first thought to be a schizophrenic illness. I have not seen this danger reported before.

CASE REPORT

The patient, aged 29, was an assistant matron at an infants' boarding school run by her mother. She suddenly began to complain that the floor was magnetized and her jewellery electrified. In an attempt to insulate herself she had cut up her hot-water bottle. Her family looked after her at home until her admission to hospital three days later. On admission she was dishevelled, tense, depressed, and emotional, but otherwise there were no abnormal findings. Formal psychometric testing showed no confusion, no clouding of consciousness, and no disorder of perception. She was co-operative and expressed remorse for all the trouble she had caused. Chlorpromazine was given, and within a few days she calmed down.

On her third day in hospital her father telephoned to say that he had found amongst her belongings at home a large number of empty Preludin tablet containers. He estimated that she must have taken at least 1,400 tablets during the previous 12 weeks. He said that three months previously he had discovered she was taking dexamphetamine sulphate ("dexedrine") tablets, and had asked the near-by chemist shops to stop supplying her with this drug. The patient, when asked about the Preludin, admitted that her father was quite right. She had taken Preludin tablets in order to forget everything and to be able to go off and enjoy herself with her friends. She had needed about a dozen Preludin tablets to get the same effect as a few dexamphetamine tablets gave her.

A review of her behaviour over the three months before she had startled her family with her complaints that the floor was magnetized and her jewellery electrified revealed that she had been very irritable and suspicious. Her fiancé had commented that she seemed to "babble" at times. It had been noticed that she had seemed restless at night and unduly fearful of burglars. In fact, she had gone to the trouble of putting talcum powder on her window-sill so that fingerprints of any intruder would be readily available, and had placed small articles against the inside of her bedroom door in order to have warning if it was being opened.

Her previous personality was that of an unstable erratic girl who from childhood had been unreliable. Her personal history showed that thread of instability, lack of conscience, and disregard for others in her behaviour so characteristic of a psychopathic personality.

COMMENT

Preludin is claimed to produce early satiety of the appetite without disturbing side-effects. Any central effect is said to be only that of a very mild elation. Its chemical formula shows that it is an oxazine derivation of ephedrine, which is more closely related to caffeine than amphetamine. However, it is known that a toxic psychosis may occur when excessive quantities of either of these drugs are taken.

The toxicity of Preludin has been studied in mice by Thomä and Wick (1954), who found that, compared with amphetamines, the lethal dose of Preludin by the oral route is nearly five times as great. They also found that to produce the same degree of excitement in unanaesthetized dogs the amount of Preludin needed was six times that of

amphetamine. These last findings were confirmed in the human by my patient. As stated above, she needed many more Preludin tablets to obtain the same stimulant effect as a few of dexamphetamine gave her.

Preludin has been used in the treatment of psychiatric conditions. Spiegelberg (1954) has reported favourably on its use for "psychiatric conditions, psychopathic reactions, and endogenous depressive states." There are also reports on Preludin in the treatment of obesity by Berneike (1954) and Rostalski (1954) from Germany and by Gelvin, McGavack, and Kenigsberg (1956) from the U.S.A. In none of these series of cases are toxic manifestations reported.

Amphetamines were placed on the Schedule I list of poisonous drugs a few months ago. The occurrence of a toxic psychosis as a result of taking excessive doses of toxic Preludin—which is without some of the protective unpleasant side-effects of amphetamine—shows that the latest "slimming drug" is not without hazard and should also be placed on the Schedule I list.

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REFERENCES

- Berneike, K. H. (1954). *Med. Klin.*, 49, 478.
 Gelvin, E. F., McGavack, T. H., and Kenigsberg, S. (1956). *Amer. J. digest. Dis.*, 1, 155.
 Rostalski, M. (1954). *Medizinische*, p. 1110.
 Spiegelberg, U. (1954). *Nervenarzt*, 25, 276.
 Thomä, O., and Wick, H. (1954). *Arch. exp. Path. Pharmacol.*, 222, 540.

Haemorrhage from Primary Carcinoma of the Liver Complicating Pregnancy

Primary carcinoma of the liver is a rare neoplasm. Of even greater rarity is sudden haemorrhage from such a growth complicating a pregnancy.

CASE REPORT

A Chinese woman aged 43, in the 30th week of her 13th pregnancy, was admitted to the Kandang Kerbau Hospital, Singapore, on June 23, 1956, complaining of abdominal pain, dyspnoea, and general malaise. Nothing abnormal was known of her previous medical and obstetrical history.

On examination her general condition was poor and she looked anaemic. There was some oedema of the feet and ankles. The heart sounds were normal and the blood pressure 140/80 mm. Hg. Several spider angiomas were present over the shoulders. On abdominal examination the size of the uterus corresponded to the period of amenorrhoea. A single foetus was presenting by the head, and the foetal heart was heard. No definite diagnosis was made.

Two days later her dyspnoea increased and engorgement of the neck veins was noted. The liver was thought to be of the neck veins was noted. The liver was thought to be palpable to a distance of two fingerbreadths below the costal margin. Some crepitations could be heard at the lung bases. Her temperature was 102.2° F. (39° C.). A provisional diagnosis of incipient cardiac failure was made and appropriate treatment instituted, including systemic penicillin.

The next day jaundice developed. Her haemoglobin was 42% (Sahli) and the total white-cell count 10,200 per c.mm. The urine contained albumin. Urobilin and urobilinogen were present. The icteric index was 40 and she had a direct triphasic van den Bergh reaction. A physician thought the condition was basically a lung infection with a superimposed infective hepatitis and mild cardiac failure due to her liver.

For the next four days her condition remained much the same. To counteract her anaemia a transfusion of packed red blood cells was given, and by July 6 she seemed rather better, although the jaundice had remained constant. A week later she became quite drowsy and complained of pain in the right hypochondrium. Her temperature was still raised. The liver was still palpable below the costal margin and tender. The possibility of amoebic hepatitis was considered. X-ray examination of her chest confirmed an upward enlargement of the liver as judged by an elevation of the right dome of the diaphragm.

On July 20 she developed severe upper abdominal pain, and a very tender mass was palpable in the right hypochondrium. The blood pressure fell and her pulse rate started to rise. The clinical picture suggested an "acute abdomen," and it was decided to perform a laparotomy. On opening the abdomen free blood and clots were found. The uterus looked normal. To facilitate the search for the source of the haemorrhage a classical caesarean section was performed and a live female infant, weighing 3 lb. 12 oz. (1,800 g.), was delivered. The bleeding was found to be coming from the liver. This organ was much enlarged and cirrhotic, and its capsular surface was covered with large clots of blood. It was obvious that nothing surgical could be done for the condition. A small portion of liver was removed for histological examination and the abdomen closed. The patient's condition was now grave and she died 14 hours later. Permission for a post-mortem examination was refused.

The pathologist's report on the biopsy specimen was: "The normal architecture of the liver columns is lost in many areas and the cells are many layers deep, with much mitotic activity. Areas of haemorrhage are also seen. Diagnosis: hepatoma."

COMMENT

All investigators are agreed on the comparative rarity of primary carcinoma of the liver. In a review of 76,776 necropsies performed in the United States of America, Blatchford (1952) found only 183 cases. Tull (1932) found 134 cases in a total of 17,664 necropsies performed in Singapore—an incidence of 0.76%. The disease appears to be less common in races living under the conditions of Western civilization and to be more common among tropical and Eastern peoples—for example, the Bantus of Africa, the Japanese, the inhabitants of South China, the Philippine Islands, and the Malay States (Webb, 1945).

It has long been recognized that primary carcinoma of the liver arises, almost invariably, in livers which are already cirrhotic. Muir (1908) pointed out that it is particularly prone to develop in that type of hepatic fibrosis characterized by conspicuous nodular hyperplasia. The racial and geographical incidence of the condition does suggest that primary carcinoma of the liver and "tropical cirrhosis" are associated, and the latter is now generally believed to result from a diet deficient in protein. There is good reason to suspect that this patient's diet, in common with that of many others in this part of the world, was deficient in protein, although containing enough carbohydrate to prevent marked wasting. In searching for aetiological factors attempts have been made to implicate infestations with intestinal parasites such as *Entamoeba histolytica*, *Schistosoma*, and *Clonorchis sinensis* as precursors of primary carcinoma of the liver, but no convincing evidence is available (Trevathan, 1954).

Haemorrhage from rupture of the liver in pregnancy has been reported in the literature in a number of cases, but the complication has usually been the result of the hepatic lesions of eclampsia. Rupture of the normal liver from direct trauma, unless of severe degree, is said to be unlikely. In the abnormal liver even minor trauma might precipitate a break in a capsule weakened by disease (Schnabel, 1935). Therefore, in any case of known disease of the liver, rupture of the organ should be thought of in the presence of a picture simulating a sudden acute surgical condition in the abdomen.

I thank Professor B. H. Sheares for permission to publish this case report.

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REFERENCES

- Blatchford, F. W., jun. (1952). *Gastroenterology*, 21, 238.
 Muir, R. (1908). *J. Path. Bact.*, 12, 287.
 Trevathan, R. D. (1954). *Amer. Pract. (Philad.)*, 5, 272.
 Tull, J. C. (1932). *J. Path. Bact.*, 35, 557.
 Schnabel, T. G. (1935). *Ann. Surg.*, 101, 613.
 Webb, A. C. (1945). *Arch. Path. (Chicago)*, 40, 382.

Reviews

ROYAL NAVAL WAR MEDICINE

Medical History of the Second World War: Royal Naval Medical Services. Volume II—Operations. Edited by Surgeon Captain J. L. S. Coulter, D.S.C., R.N. (Pp. 543+xvii; illustrated. 57s. 6d.) London: H.M. Stationery Office. 1956.

"History," as Lord Acton said, "is better written from letters than from histories." And here the editor has followed that dictum, selecting from the wealth of detailed reports available among official records not only those which called for comment or prominence because of their special naval medical significance but also those which, in proper sequence and with due emphasis, gave rise to a balanced and just account of the work of the Royal Naval Medical Services in the second world war. Essentially it is the record of the doctor's work at sea in wartime, for that was the lot of most naval doctors, and this is portrayed by reproducing his own account of his experiences. Thus a graphic and accurate picture of the stress and hazards of the naval warfare of the time, and of the medical lessons to be learnt from them, is set forth quite simply in the log of a doctor in a cruiser guarding a Russian convoy. The medical consequences of submarine attack, of aerial bombardment, of bitter cold weather, and of the strain of prolonged action are thereby illustrated.

The war in the Mediterranean and in the Far East is treated similarly, and one may select some items of outstanding interest. These include accounts of specialized medical units ashore; of the fate of prisoners in Japanese hands as viewed by the medical officers who shared their captivity; and, perhaps most important of all, the account of what happened to a group of 48 men shipwrecked on a tropical island. Without a doctor and without an elementary knowledge of hygiene, these men suffered from much preventable disease, from apathy and loss of morale, and 20 of them died in a period of 14 weeks. How vitally important is the instruction of all naval personnel in the simple rules of preventive medicine! A wonderful story, too, is that of the Royal Naval Hospital at Hong Kong, which was overrun when that colony was captured by the Japanese. It is a record of quiet fortitude, unrelenting work, and brilliant improvisation under appalling conditions. And from defeat the story changes to the medical preparations for the landings on the Normandy coast, and so it goes on as the war ran its course.

This is the most readable official history I have encountered, and it is as far removed from historiography as could be imagined. It is to be recommended not only to those concerned with the Royal Navy and with medicine but also to everyone interested in a stirring chapter in our country's history.

W. D. W. BROOKS.

ANALYSIS OF PERCEPTION

Analysis of Perception. By J. R. Smythies, M.A., M.D., M.Sc., D.P.M. Preface by Sir Russell Brain, Bt., D.M., LL.D., D.C.L., P.R.C.P. (Pp. 170+xiii. 21s.) London: Routledge and Kegan Paul. 1956.

This is a rather short book dealing with a very complex topic. The author points out that the study of perception has been carried out by specialists in many different fields, such as philosophy, neural physiology, neurology, and experimental psychology. He adds, with some show of justification, that there has been little liaison between these various endeavours. He is concerned about the fact that most neurologists and neural biologists with philosophical interests adhere to a representational theory of perception which is rejected by most contemporary philosophers. In this book he has attempted to make the representational theory more acceptable to professional philosophers, and he illustrates his account with experimental data from mesca-line intoxication work and from experiments with the stroboscope.

The book will probably be of interest to philosophers rather than to scientists, who may occasionally wonder precisely what Smythies is trying to prove. His style is excessively abrupt and curtailed, making his presentation very uneven and difficult to follow. Whole chapters, such as Chapter 6, are included without any obvious reason, and might have been left out without altering the argument. On the other hand, certain important definitions are presented without sufficient discussion to make it very easy for the reader to see the rationale for the writer's choice, nor does he give a detailed discussion of the relevant psychological evidence. Thus take, for instance, his definition of "sense-datum": "If the boundary J of the after-sensation (hereafter y) can be observed to describe a Jordan curve in the total field composed of x and y such that it divides this total field into one *inside* and one *outside*, then x is a sense-datum." The writer nowhere makes clear why he chooses this definition rather than another; he never explains what a Jordan curve is (how many neurologists will be familiar with the *Cours d'Analyse*?); and he never touches on the difficulties raised for his definition by such phenomena as "Bidwell's ghost." Altogether an interesting but excessively undisciplined book, which may with advantage be read by the expert philosopher but will give little to the experimentalist.

H. J. EYSENCK.

THE RECOVERY ROOM

The Recovery Room—Immediate Postoperative Management. By Max S. Sadove, M.D., and James H. Cross, M.D. Contributions by 24 authorities. (Pp. 597+xxi; illustrated. 84s.) London: W. B. Saunders Company Ltd. 1956.

Writing the first chapter in this book, an administrator suggests that the intensive therapy unit, which is the natural progeny of the post-operative recovery room, is capable of three things: it improves nursing care, utilizes equipment and personnel more effectively, and assures the patient and his family that everything humanly possible is being done. The writer maintains, too, that such a service results in the lowest morbidity and mortality rates at lowest cost to the patient and hospital. Nothing in the way of figures is adduced in the text to substantiate this claim.

The joint editors have organized several recovery rooms; the large amount of information they have so gathered has, they humorously say in the preface, prevailed over their better judgment and impelled them to present it in this volume. In this enterprise they have been assisted by 24 authors representing some dozen specialties; nearly all are associated with the University of Illinois, Chicago. The management of patients in a recovery room is considered in detail. The control of pain and infection, of shock and nutrition, are first dealt with. There follow chapters dealing specifically with the post-operative management of patients in all specialties. Indeed, the book provides a manual of post-operative care. There is an additional chapter on the treatment of medical emergencies. The contributions are of variable quality and there is of necessity much repetition. Views differ on which patients should go to the recovery room. Some hold that every patient after even small procedures should be so treated; others that the service should be used only for complicated cases. Among the instructions given, the recommendations for the use of intravenous therapy and of antibiotics will seem to many over-elaborate; some drugs are difficult for British readers to identify from the trade names freely used.

There is a need for careful study of the principle presented by this book, in which much useful material has been assembled.

C. J. LONGLAND.

Brompton Hospital Reports, Vol. XXIII, 1954, contains 20 papers selected from among those published during the year by members of the staffs of the Hospitals for Diseases of the Chest and of the Institute of Diseases of the Chest. It also includes an index to all the previous volumes, and can be obtained from the hospital, price 15s.

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PREPARATION FOR ACTION

The Negotiating Committee, under the joint chairmanship of Sir Russell Brain and Dr. A. B. Davies (acting for Dr. A. Talbot Rogers), is meeting the Minister of Health and the Secretary of State for Scotland on Friday of this week. This is nearly a year after the B.M.A. informed the Minister that the profession intended to make a claim for more pay in view of the increase in the cost of living since March, 1951. Since February last year the two sides have exchanged several letters, the Ministers have met the profession's negotiators on one occasion only, and the profession has backed up its insistence that the Government has a moral obligation to continue acting on the Spens recommendations by sending the Ministers a carefully argued legal statement of the case. But the Ministers have refused to acknowledge that the translation of the Spens recommendations into the changing post-war value of money was to be a continuing operation. In fact they have followed the example of a succession of Ministers who since 1948 have tried to ignore what is implicit in the reports of two interdepartmental committees, the recommendations of which were accepted by both Government and profession, and which persuaded a reluctant body of medical men and women to take part in the National Health Service in 1948. Doctors are united in considering that the Government, by its apparent repudiation of the Spens reports, has broken faith with the profession. The employees have lost all trust and confidence in their monopoly employer. One sign of the present discontent with the Government's attitude and the conditions of the N.H.S. is the fact that in recent months the number of doctors inquiring at B.M.A. House about possibilities of practice in the Dominions and elsewhere has increased from an average of three a week to about five a day.

This *Journal* went to press in advance of the meeting with the Ministers this Friday. In view of their attitude during the past year we shall be surprised if they do anything more than find another formula for saying "No!" Our negotiators have shown exemplary patience and great persistence, but, unless the

omens are brighter this Friday than anticipated, it may soon be time to admit that negotiations have failed to make any impression on the Ministers. The Negotiating Committee's powers are, of course, limited to negotiation on an increase in pay in terms of the Spens recommendations. If the Ministers bring these negotiations to a halt, then the organized profession as a whole will have to decide what its policy should be and what action it should advise. At the moment the important thing is to take the machinery for action out of moth balls. The recent meeting of the Council of the B.M.A. was followed by a meeting of the Trustees of the British Medical Guild, the membership of the latter being almost identical with that of the former. Both the Council and the Guild Trustees considered preparation for action to be urgent, and the Secretary of the Guild, Dr. A. Macrae, has invited doctors in different parts of the country to set up local committees of the Guild with membership representing all branches of the profession. It is proposed, too, that these local committees, when formed, should appoint local conveners or group organizers. The area covered by a Guild committee corresponds with the area of a local division of the B.M.A.

The Guild was established in 1949 to do those things which by its constitution the B.M.A. is prohibited from doing. The B.M.A. cannot undertake what would be held to be trade-union activities. The Guild can. The Guild cannot determine policy. The B.M.A. can and does. The Guild is an instrument for action, for carrying out legally policies decided by others. If, for example, the Representative Body of the Association decided to advise withdrawal from the National Health Service it would be the Guild which would organize and finance such action and compensate any member suffering serious financial hardship as a consequence. The money for this comes from the Trust Funds of the three main branches of the profession. It should be stressed that the activating of the Guild machinery is a precautionary measure—an obvious measure to neglect which would expose those responsible to justifiable criticism. If the profession is forced by the Government's failure to honour its word to consider withdrawing from the National Health Service—eventually, as some have suggested, to work in a new and better form of service—then the mechanism must be geared for action and well lubricated. This is what is being done now, no more and no less. No decision to act has been taken. When the Council of the B.M.A. meets at the end of January it will then know the outcome of this week's meeting with the Minister and the views of the Negotiating Committee on it. The profession may well be on the eve of a severe

conflict with the State, its present employer. That this has become possible is in itself an indictment of the N.H.S. To find the right answer to this and many other defects of the Service will call for an "agonizing reappraisal," and none are in a better position to do this than those who work in the Service. To find the right answers will require ripe wisdom, far-sighted statesmanship, and a determination to stick to principles in the face of possible sources of disagreement. In a conflict the Minister of Health, who by the nature of his office is first and foremost a politician, will undoubtedly take advantage of any division of opinion within the profession, a profession whose strong sense of individualism makes this at times seem easy. But a profession really united on the things that matter will win the day, however long the struggle.

ABNORMAL HAEMOGLOBINS

It has been known for more than 90 years that the haemoglobin of newborn infants differs from that of adults.^{1,2} Körber reported in his inaugural lecture at Dorpat University that placental haemoglobin differs from that of the adult in being resistant to denaturation by alkaline reagents. At birth more than half of the haemoglobin is of the "alkali resistant" type; from then on the concentration falls steadily, and usually none can be found after 4-6 months. The production of foetal haemoglobin is under a different genetical control from that of adult haemoglobin; it does not cause a disease, but its presence after the age of 6 months indicates that there is some interference with the production of normal adult haemoglobin. The inherited haemoglobinopathies cause anaemia within a few months of birth, and in cases of sickle-cell anaemia³ and thalassaemia¹ foetal haemoglobin is almost invariably found. It is present in some children with spherocytic anaemia, leukaemia, or even malnutritional anaemia of early onset.^{3,4,5} The haem is the same in both haemoglobins, but the globin moiety is different. Until recently no other human haemoglobins were known.

Then in 1948 H. Hörlein and G. Weber⁶ described a family with hereditary methaemoglobinaemia in which the behaviour of the globin was abnormal. On separating the globin from the haem and on reuniting them with those from normal persons it was seen that the patients' globin was incapable of forming a haemoglobin with the iron in the reduced form. In 1949 L. Pauling and his colleagues made the fundamental discovery that sickle-cell anaemia is caused by an abnormal haemoglobin.⁷

In 1910 J. B. Herrick⁸ noted that some negroes suffered from an anaemia which was associated with "peculiar elongated and sickle-shaped red corpuscles." It was then found that some healthy negroes had red cells which were normal *in vivo* but which became sickle cells on incubation *in vitro*.^{9,10} The sickling phenomenon was found to be familial and to be inherited as a single Mendelian dominant.^{11,12} At first it was assumed that the same gene produced in some persons an asymptomatic condition, the sickling trait, and in others a severe disorder, sickle-cell anaemia. J. V. Neel first suggested in 1947¹³ that there might be an alternative hypothesis, according to which the first was the heterozygous and the second the homozygous condition. In 1949 he presented convincing evidence,¹⁴ and simultaneously and independently the same hypothesis was advanced by E. A. Beet.¹⁵ Pauling's discovery of the sickle-cell haemoglobin fully supported the genetical theory. Carriers of the sickle-cell trait possess both the normal and the new abnormal haemoglobin, but in patients with sickle-cell anaemia only sickle-cell haemoglobin and no normal adult haemoglobin was found. The method by which sickle-cell haemoglobin was discovered was electrophoresis. In this technique proteins are dissolved in a buffer solution and an electric current is passed. The charge of the protein and therefore the speed at which it will migrate towards the anode or the cathode will depend on the difference between the pH of the buffer and the pH at which the protein is iso-electric. Normal haemoglobin is iso-electric at pH 6.9 and sickle-cell haemoglobin at pH 7.1; hence on electrophoresis in

an alkaline buffer normal haemoglobin migrates towards the anode faster than sickle-cell haemoglobin. The application of electrophoresis to haemoglobin has led to the discovery of seven, possibly eight or even nine, further haemoglobin variants. Fortunately at an early stage rules for their nomenclature were adopted. Normal adult haemoglobin is named haemoglobin A; sickle-cell haemoglobin, which was at first called B or b, is haemoglobin S; and foetal haemoglobin is designated by the letter F. All other haemoglobins are assigned letters of the alphabet in order of their discovery beginning with the letter C (since B or b had at one time been used for the sickle-cell haemoglobin) unless as in the case of the first three haemoglobins there is a letter with a special mnemonic association. Haemoglobins C, D, E, G, H, I, J, and possibly K and M (for the methaemoglobin of Hörlein and Weber) have been recognized. Apart from S and D they all differ in their electrophoretic properties. S and D cannot be told apart by electrophoresis, but the first causes sickling and the second does not. Not all these variants have been examined with equal thoroughness; some have been seen in only one or two families. It seems that they all are inherited as simple Mendelian characters, though H may not be present in the phenotype of the AH genotype unless formation of haemoglobin A is partly suppressed by additional thalassaemia.¹⁶ The haem is the same in all the haemoglobins; only for M has a specific difference been claimed in the visible spectrum, and only F has a specific spectrum in the ultra-violet region; no differences have been found in either the visible or invisible spectra. Haemoglobin S differs from all the others by its low solubility in the reduced form,¹⁷ but otherwise only very minor chemical and physical differences have been described. V. M. Ingram¹⁸ has recently compared the polypeptide chains—some thirty in number—which make up the haemoglobin A and S molecules. One chain from haemoglobin S differed in its electrophoretic and chromatographic properties from its counterpart in haemoglobin A. The difference between the two molecules seems to lie therefore not in the folding of the polypeptide chains but in the amino-acid sequence in one part of one of these chains. This is of genetical interest, because the formation of S must be due to the mutation of a single gene, and we may visualize gene action as directly affecting this aspect of haemoglobin synthesis.

Red cells which do not contain any haemoglobin A seem to be thinner than normal cells, with the exception of those of the one homozygote for G described so far.¹⁹ All the other homozygotes for abnormal

haemoglobins suffer from a haemolytic anaemia. Target cells are prominent in the blood smear, and Dr. H. M. Rice describes in this issue of the *Journal* (p. 25) a patient in whom this phenomenon led him to an examination for abnormal haemoglobin. The anaemia may be compensated in some instances. H. Lehmann and his colleagues²⁰ described recently two Burmese who were presumed to be homozygous for haemoglobin E. Though the mean corpuscular haemoglobin was greatly reduced, a compensating polycythaemia had restored the haemoglobin level to nearly normal. Dr. Rice's patient turned out to be homozygous for haemoglobin C, but once her anaemia of pregnancy was successfully treated her haemoglobin level rose to 14.7 g. per 100 ml., yet the proportion of target cells remained unaltered. Heterozygotes are usually quite unaffected, unless the single gene for haemoglobin A cannot find its full expression because of the presence of an additional thalassaemia gene. In thalassaemia no abnormal haemoglobin is found, but formation of haemoglobin A is suppressed. A severe haemoglobinopathy results in the thalassaemia homozygote—thalassaemia major—but even the heterozygote may present with anaemia of varying degree—thalassaemia minor.

Patients with haemoglobin S suffer pathological changes due to intravascular sickling in addition to the haemolytic anaemia. The crises and other thrombotic and infarctive events are restricted to the sickling homozygote or to sickling heterozygotes in whom the proportion of haemoglobin S is high; this is frequently the case in heterozygotes for S and C (sickle-cell-haemoglobin-C disease) and in AS heterozygotes with an additional thalassaemia trait (microdrepanocytic disease). Heterozygotes for S and D also suffer from a modified sickle-cell anaemia with sickle-cell crises. Cases have recently been reported of splenic infarcts even in simple AS heterozygotes who were exposed to anoxia as it occurs in high flying,²¹ and both sickle-cell homozygotes and heterozygotes are often unable to produce a concentrated urine,²² presumably because of intravascular sickling in the kidneys.

The geographical distribution of the abnormal haemoglobins suggests that mutations for a new haemoglobin gene must be rare. Haemoglobin C, the subject of Dr. Rice's paper, is found at high frequency in West Africa, and it has been found wherever West Africans have been brought. It is therefore seen in American negroes, in North Africa, and in South Africa, but not in East Africa.²³⁻²⁵ Haemoglobin S is found both in East and in West Africa and wherever African slaves have been brought

¹ Betke, K., *Der menschliche rote Blutfarbstoff bei Fetus und reifen Organismus*, 1954, Berlin.

² Chernoff, A. I., *New Engl. J. Med.*, 1955, **253**, 332.

³ Singer, K., Chernoff, A. I., and Singer, L., *Blood*, 1951, **6**, 413.

⁴ Liguori, A. M., *Nature*, 1951, **167**, 950.

⁵ Beaven, G. H., and White, J. C., *ibid.*, 1953, **172**, 1006.

⁶ Hörlein, H., and Weber, G., *Dtsch. med. Wschr.*, 1948, **73**, 476.

⁷ Pauling, L., Itano, H. A., Singer, S. J., and Wells, I. C., *Science*, 1949, **110**, 543.

⁸ Herrick, J. B., *Arch. intern. Med.*, 1910, **6**, 517.

⁹ Hahn, E. V., and Gillespie, E. B., *ibid.*, 1927, **39**, 233.

¹⁰ Diggs, L. W., Ahmann, C. F., and Bibb, J., *Ann. intern. Med.*, 1933, **7**, 769.

¹¹ Emmel, V. E., *Arch. Intern. Med.*, 1917, **20**, 586.

¹² Taliaferro, W. H., and Huck, J. G., *Genetics*, 1923, **8**, 594.

¹³ Neel, J. V., *ibid.*, 1947, **32**, 38.

¹⁴ ———, *Science*, 1949, **110**, 64.

¹⁵ Beet, E. A., *Ann. Eugen. (Camb.)*, 1949, **14**, 279.

¹⁶ Motulsky, A. G., *Nature*, 1956, **178**, 1055.

¹⁷ Perutz, M. F., Liguori, A. M., and Elrich, F., *ibid.*, 1951, **167**, 929.

¹⁸ Ingram, V. M., *ibid.*, 1956, **178**, 792.

¹⁹ Edington, G. M., Lehmann, H., and Schneider, R., *ibid.*, 1955, **175**, 850.

²⁰ Lehmann, H., Story, P., and Thein, H., *British Medical Journal*, 1956, **1**, 544.

²¹ Smith, E. W., and Conley, C. L., *Bull. Johns Hopk. Hosp.*, 1955, **98**, 35.

²² Keitel, H. G., Thompson, D., and Itano, H. A., *J. clin. Invest.*, 1956, **35**, 998.

²³ Edington, G. M., and Lehmann, H., *Trans. roy. Soc. trop. Med. Hyg.*, 1954, **48**, 322.

²⁴ ———, *Man*, 1956, **36**.

²⁵ Lehmann, H., *J. clin. Path.*, 1956, **9**, 180.

²⁶ ———, *Eugen. Rev.*, 1954, **46**, 101.

²⁷ Bird, G. W. G., and Lehmann, H., *Man*, 1956, **1**.

²⁸ Chernoff, A. I., Minnich, V., *et al.*, *J. Lab. clin. Med.*, 1956, **47**, 455.

²⁹ Lehmann, H., and Singh, R. B., *Nature*, 1956, **178**, 695.

³⁰ Lie Inju Luan Eng, *ibid.*, 1955, **176**, 469.

in the past. In Asia haemoglobin S is also found in some of the older populations of Arabia and India.²⁶ This has led to the suggestion that haemoglobin S arose in the Middle East in prehistoric times and that it found its way from there into Africa and India. Haemoglobin D is present in low frequency in India,^{27 27} and haemoglobin E is found further east in Siam,²⁸ Burma,²⁰ Malaya,²⁹ and Indonesia,³⁰ as well as in Ceylon, Bengal, and Cambodia. The influx of West Indians into Britain, as well as the presence of visitors of many races, makes it necessary to look for abnormal haemoglobins in likely patients with an obscure anaemia. Numerous target cells in the blood smear are in Britain usually associated with cirrhosis of the liver; as Dr. Rice's article shows, they may also be the first indication of a haemoglobinopathy.

SMEGMA AS CARCINOGEN

From time to time the suspicion has been canvassed that human smegma is carcinogenic. A preliminary report has recently appeared on a series of well-controlled experiments designed to throw light on this problem.¹ Human smegma was collected in sterile saline and centrifuged; the deposit was ground into a paste and stored in the refrigerator. This material was applied directly by specially devised instruments to the upper vagina and cervix of female mice of different ages and belonging to a special strain. In one group of mice one dose only of smegma was used; this was retained permanently by suturing the vaginal orifice. Two other groups received weekly and bi-weekly injections respectively. In yet other groups some of these procedures were supplemented by injection of oestrogen. In parallel experiments, the contents of human dermoid ovarian cysts, which closely resemble smegma in physical and chemical constitution, were used instead of smegma. Two groups of mice received bi-weekly vaginal injections of methylcholanthrene, a known carcinogen. Out of twelve mice receiving bi-weekly injections of smegma for an average period of 19½ months, four had frank invasive carcinomas, one had early carcinoma with borderline invasion, and two had changes identical with intra-epithelial carcinoma. The remaining six showed epithelial hyperplasia. A similar

change but without definite invasion was produced in eleven of twenty-six mice receiving weekly injections for an average period of 15½ months. A single injection of smegma with vaginal ligature also gave a few positive results, including one carcinoma, one possibly malignant papilloma, and two sarcomas. Oestrogen appeared to inhibit the action of smegma. A comparable number of positive results was obtained with the contents of ovarian dermoid cysts and by methylcholanthrene. The gross and microscopical features of the lesions produced are comparable to those found in the human cervix. These experiments show that human smegma has a carcinogenic effect on the squamous epithelium of the vagina and cervix of the mouse. The possibility that it may be a factor in causing cancer of the penis and of the cervix uteri in the human subject must therefore be seriously considered. It has been suggested that certain bacteria—for example, *Mycobacterium smegmatis*—may act upon cholesterol (a lipid found in smegma) and convert smegma into a carcinogen. Experiments along these lines are not yet completed. I. Hieger and S. F. D. Orr² have reported the occurrence of sarcomata in mice following injection of commercial and purified cholesterol, after a long latent period.

The effect of circumcision on the subsequent development of carcinoma of the penis is well known. F. Homburger and W. H. Fishman³ give the incidence as follows: In Jews, in whom circumcision is performed during the first eight days of life, 0%; in Mohammedans, in whom circumcision is practised between the ages of 3 and 14 years, 1.5 to 2.1%; in the Chinese, non-circumcised, 15% of all cancers. In contrast, the rate in Europeans is considered to be less than 5%. E. L. Kennaway,⁴ after an extensive inquiry, reached similar conclusions, and stated that the difference in susceptibility between the Jews and Moslems was due to the fact that "the train of events leading to the malignant growth is set going early in life, and that removal of the cause does not then avert the development of cancer at a much later date." He does not consider that the protection given by the Jewish operation is due to the removal of the cancer-bearing area but that "the influence of phimosis in predisposing to cancer of the penis suggests that the carcinogenic agent is formed in material between the prepuce and glans." Homburger and Fishman suggest that a long period of contact between the penis and the carcinogen contained in the smegma of the penis is necessary to foster the susceptibility of the penile tissue to undergo cancerous transformation at a later date. It has also been suggested that circumcision may be an important factor in the prevention of carcinoma of the cervix uteri. The rarity of this condition among Jewish women has been noted by several authors, and F. Gagnon,⁵ and later J. E. Towne,⁶ have described a low incidence in nuns. W. Sampson Handley⁷ found that in the Fijian Islanders cervical carcinoma was eight times commoner among a group of Indian immigrants not practising circumcision than among the natives who do. On the other hand, recent statistics collected by J. M. Montpellier⁸ in Algiers showed that cancer of the cervix is not rarer in

the Jewish and Mohammedan women than in the European, and figures quoted from Constantine showed a similar trend.

In a recent review of the aetiology of cervical carcinoma W. L. Williams and C. C. Erickson⁹ discuss three possible causative factors— inflammation, pregnancy, and hormones. Cervicitis is prevalent among women and is often associated with cervical laceration and erosions following childbirth. The long-continued irritation in consequence of the inflammation may increase the susceptibility to the development of cancer. The importance of pregnancy is indicated by the fact that carcinoma of the cervix is much more frequent in women who have borne children than in nulliparae. Some authorities hold that oestrogen may play a part in the production of carcinoma of the uterus in humans, not only of the body but also of the cervix, but further work is required on the subject. W. U. Gardner and his associates,^{10 11} however, have reported the appearance of metastasizing cancer of the cervix in mice following injections of oestrogens. These considerations suggest that a carcinogenic action of human smegma in relation to carcinoma of the cervix uteri would appear to be less direct and more remote than in the case of carcinoma of the penis.

OCCUPATIONAL MORTALITY IN SCOTLAND

No regular relation between social class and general death rates is to be seen in the figures for Scotland covering the years 1949–53. The latest Annual Report of the Registrar-General for Scotland,¹ which includes a section on occupational mortality based on the 1951 census population, shows that the comparative mortality for adults aged 20–64 for social classes 1 to 5 was 107.9, 86.2, 102.5, 90.3, and 112.6 respectively (in comparison with 100 for the whole of this population). Within the social classes there was considerable variation between occupations; in social class 3, for instance, mineworkers and clerical workers had a mortality above the average with rates of 137.9 and 124.9, while agricultural workers in class 4 had the low rate of 71.9. The high rate for clerical workers was largely due to the heavy mortality from respiratory tuberculosis and from coronary thrombosis, with rates of 123 and 143. Mineworkers had a very high rate from accidents, 203, while clerical workers had a very low rate, 58. Other high comparative mortality rates for violence, for males aged 15–64, were 209 for water transport workers and 200 for fishermen. Social class 1 had the high comparative mortality of 113 from accidents at ages 15 and over; this is rather surprising, since this class has little occupational risk. The rates for accidents for social classes 2 to 5 were 85, 94, 110, and 124.

The comparative mortality for males aged 15 and over from tuberculosis was over twice as high in the lowest social class as in the top classes, the rates for social classes 1 to 5 being 61, 59, 102, 90, and 143. The rate

for tuberculosis varied widely in the various occupational groups, from 39 for agricultural workers to 187 for unskilled workers. Other high tuberculosis rates were 159 for tanners and leather-goods makers and 145 for those professionally engaged in entertainment and sport; low rates were 46 for persons in administrative occupations and 65 for professional occupations. The mortality from coronary thrombosis declined continually with descending social class from 167 in social class 1 to 79 in social class 5, and within the social classes the sedentary occupations had the largest rates. The mortality from vascular lesions showed a similar trend, falling from 128 in social class 1 to 95 in social class 5. The trend was reversed for bronchitis and pneumonia, the rate rising from 63 in social class 1 to 135 in social class 5; the highest rates were found among unskilled workers, 174, and the lowest were those of fishermen, 51, and agricultural workers, 52. Cancer was not related to social class. The rates were 104, 93, 109, 96, and 106 for social classes 1 to 5, respectively, and ranged from 88 to 167 within the main occupational groups.

HEALTH OF SCHOOLCHILDREN

Twenty-five years ago a medical officer examining the children in an elementary school in an industrial area might have expected to find about 5% of them suffering from malnutrition and about 25% in need of medical or surgical treatment.¹ Since then the change for the better in the health of children has been as remarkable as it has been gratifying, and the Chief Medical Officer of the Ministry of Education is now able to report² that in 1955 "the physical condition of the great majority of the children was found by school doctors to be satisfactory, only 1.45% being regarded . . . as unsatisfactory." Not only are the average heights and weights of children still increasing, but in Liverpool, for instance, the average weights of 8- and 12-year-old boys and girls considered to be in good health in 1925–7 were less than those of boys and girls of similar age but judged to be in poor physical condition in 1953–5. There is now some evidence that the number of children who are grossly over-weight is increasing.

So far as respiratory diseases are concerned, asthma and bronchitis are still easily the commonest disorders found at medical inspections, and about 1,000 children with asthma are in schools for delicate children. The decreasing prevalence of juvenile rheumatism is reflected in the reduction in the number of children with rheumatic heart disease in special schools. Even so, the Chief Medical Officer estimates that there are probably about 2,000 new cases a year in England and Wales, though only a small minority of the children are left with a damaged heart. Tuberculosis has also greatly declined as a killing disease of children: between 1938 and 1955 deaths fell from 973 to 54. Education authorities

¹ Pratt-Thomas, H. R., Heins, H. C., Latham, E., Dennis, E. J., and McIver, F. A., *Cancer*, 1956, 9, 671.

² Hieger, I., and Orr, S. F. D., *Brit. J. Cancer*, 1954, 8, 274.

³ Homburger, F., and Fishman, W. H., *The Pathobiology of Cancer*, 1953, London.

⁴ Kennaway, E. L., *Brit. J. Cancer*, 1947, 1, 335.

⁵ Gagnon, F., *Amer. J. Obstet. Gynec.*, 1950, 60, 516.

⁶ Towne, J. E., *ibid.*, 1955, 69, 606.

⁷ Handley, W. S., *Lancet*, 1936, 1, 987.

⁸ Montpellier, J. M., 1955, quoted in *Excerpta med. (Amst.)*, Sec. xvi, 1956, 4, 743.

⁹ Williams, W. L., and Erickson, C. C., *Sth. med. J. (Bgham, Ala.)*, 1956, 49, 101.

¹⁰ Allen, E., and Gardner, W. U., *Cancer Res.*, 1941, 1, 359.

¹¹ Gardner, W. U., Smith, G. M., and Strong, L. C., *J. Amer. med. Ass.*, 1938, 110, 1182.

¹ Annual Report of the Registrar-General for Scotland, 1955, 1956, H.M.S.O. 16s.

² The Health of the School Child. Annual Report of the Chief Medical Officer of the Board of Education for the Year 1930, 1931, H.M.S.O., London.

³ The Health of the School Child. Report of the Chief Medical Officer of the Ministry of Education for the Years 1954 and 1955, 1956, H.M.S.O., London.

should now be well aware of the possible danger of children contracting tuberculosis from their teachers, and in 1955 about 1,000 teachers (out of 250,000) were under supervision because of pulmonary tuberculosis. From the mortality figures it might be thought that diphtheria is becoming an insignificant disease, only 5 deaths being reported in 1955, compared with 1,733 in 1938. But towards the end of 1955 there were three small outbreaks of the disease, one of them occurring in a residential school for 80 educationally subnormal boys. In this outbreak there were 19 cases, and 18 carriers were found. Only 40% of the boys had been immunized. This should serve as a warning of what might happen if the proportion of children immunized against diphtheria became dangerously low.

About a quarter of a million children are still found with verminous heads, and in some schools the percentage of verminous children is as high as 15. High infestation rates occur for the most part in areas where the housing is poor and overcrowding at home is common. In contrast to some of the other infections of childhood, both food-poisoning and dysentery are tending to increase rather than decrease. There were 60 outbreaks of food-poisoning in schools in 1955, and in more than half of these the cause was not discovered. At one school there were two outbreaks of food-poisoning due to *Cl. welchii* in five days. On both occasions meat was cooked 24 hours or more before being eaten cold, and an important factor in both outbreaks was a faulty refrigerator.

Urging close and friendly co-operation between the school health service and the family doctor, the Chief Medical Officer recommends that a précis of a child's school medical history should be sent to the family doctor when the child is about to leave school: this, he writes, "should be a permanent feature of the school health service everywhere."

TRIBUTE TO A CARDIOLOGIST

The British Cardiac Society has paid Professor Crichton Bramwell an unusual compliment by dedicating to him the fourth issue of the *British Heart Journal* in 1956 (vol. 18, No. 4), on the occasion of his election to honorary membership of the society. In an introductory note, Dr. Maurice Campbell, the editor of the *British Heart Journal*, describes Professor Crichton Bramwell's services to the society and mentions some of his more important contributions to cardiology. He became a member of the Cardiac Club, the predecessor of the Cardiac Society, in 1923, the year after the club came into existence. From 1928 to 1932 he was secretary of the club, and in 1937 he presided at a special meeting at which the decision was taken to launch the larger Cardiac Society. Shortly after this the society asked the B.M.A. to publish a journal that would meet its special needs, and, the Association having agreed, the first number of the *British Heart Journal* appeared early in 1939, with Professor Crichton Bramwell as one of the original members of the editorial board. It is fitting

that the first four articles in the issue dedicated to him should come from the department of cardiology at Manchester, of which he was the distinguished chief until his retirement in 1955.

NEW YEAR HONOURS

Four medical men received knighthoods in the New Year Honours List—Professor G. L. Brown, F.R.S.; General W. A. D. Drummond; Mr. C. D. Read; and Sir Arthur Porritt—and Dr. Janet Vaughan is made a D.B.E.

Professor Brown succeeded Sir Charles Lovatt Evans as Jodrell Professor of Physiology at University College, London, in 1949, and a year ago was elected biological secretary of the Royal Society on the retirement of Sir Edward Salisbury. During the last war he brought to the study of the efficiency of naval personnel a deep experience of neurophysiology gained during the 1930's at the National Institute for Medical Research, partly in Sir Henry Dale's laboratory. He has been a member of the Medical Research Council since 1951 and chairman of its Royal Naval Personnel Research Committee, and his interests have naturally been centred on studying the transmission of nervous impulses. General Drummond was appointed Director-General of Army Medical Services just over a year ago. Commissioned into the R.A.M.C. in 1925 (in the last batch of candidates to be put through a special entrance examination), Drummond early took a special interest in E.N.T. surgery, becoming adviser to the Army in otolaryngology during 1946–51. In the second world war he served in the Middle East, and in addition to British distinctions received a Polish Order for many services to the Polish Army, under General Anders, both in Perthshire and in the Middle East. He was appointed Deputy Director-General in 1954. Sir Arthur Porritt, who received the K.C.M.G. in 1950, is now made a K.C.V.O., an additional honour that will evoke a ready welcome among his innumerable friends throughout the British Commonwealth, and indeed in many countries beyond it, for his travels have been extensive, whether to lecture on surgery or to give advice on sporting affairs. Sir Arthur holds the appointment of Sergeant-Surgeon to the Queen. Mr. C. D. Read was elected President of the Royal College of Obstetricians and Gynaecologists in 1955. Since 1950 he has been Director of the Institute of Obstetrics and Gynaecology at the Postgraduate Medical School, London, a post created on the retirement of Professor James Young from the professorial chair. Like Sir Arthur Porritt, Mr. Read is a New Zealander. Dr. Janet Vaughan has been Principal of Somerville College, Oxford, since 1945. She carried out many studies of blood diseases at the Postgraduate Medical School in the 1930's, and during the war played a leading part in organizing the country's blood transfusion services. Latterly her researches have been mainly into the experimental absorption, deposition, and excretion of radioactive strontium and yttrium. This recognition of her great gifts, both academic and administrative, will be widely acclaimed.

COMMON INFECTIOUS DISEASES IN GENERAL PRACTICE: CLINICAL*

BY

G. I. WATSON, M.D.

Infection is a reminder that our existence in this world is constantly challenged by our microscopic neighbours. They came first, and our capacity to resist them is a prime condition of our survival. Consideration of this may help us to keep in focus the nature of parasitic invasion and the importance of the body's response to infection. The better we understand, the more useful we can be to sick people during these not infrequent episodes of their lives. In my practice in January, 1955, infectious diseases accounted for 70% of 113 new visits—50% in children and 20% in adults. Even in July they accounted for 50% of 90 new calls—40% in children but only 10% in adults.

The prevalence of these different infections has varied throughout history. In this country infectious diseases fall broadly into two main groups, those due to viruses and others due to bacteria. Some of protozoal origin, which remain common in tropical countries, are to-day rarely encountered here. Those variations reflect the barrier that we have successfully put up between ourselves and the insect parasites since the time when malaria, plague, and typhus were frequently seen in English homes.

In more recent years another barrier has been created—namely, chemotherapy and the antibiotics. These selective weapons have brought us temporary respite from most of the pathogenic bacteria—for how long we cannot yet clearly foresee. Against what are possibly man's older enemies, the viruses, we still have only our natural resistance to rely on. The responses of the body to parasitic invasion and the damage done by the invaders together make up the varied clinical picture of infectious illness.

Identification over the Centuries

Over the course of centuries first one and then another of these common patterns have been identified and described (Osler, 1912; Encyclopaedia, 1952; Walker, 1954). Plague, (Osler, 1912; Encyclopaedia, 1952; Walker, 1954). Plague, leprosy, malaria, phthisis, and probably cholera had all been mentioned or described before 500 B.C. Tapeworm infection was known to the Jews of the Captivity, and the diphtheria with paralysis of the palate is referred to in the Talmud. Pneumonia with pleurisy, and mumps with its orchitis, were described by Hippocrates 300 years B.C. The association of rabies in dogs with hydrophobia in man was known to Celsus 100 years B.C. On the other hand, although smallpox has been recognized as affecting an Egyptian mummy of about 1000 B.C. (Osler, 1912), the first extant clinical description of it dates only from about A.D. 900 by Rhazes, of Basra. He also first described measles, but as a mild form of smallpox, not as a separate disease. It was Sydenham, in 1675, who first showed that these two were distinct, who also named scarlatina and mentioned its variations in virulence. Just before his time three other common diseases had been first identified—syphilis in 1493, chickenpox in 1553, and whooping-cough in 1578. After Sydenham there was another lull until German measles was described in 1752. The early nineteenth century saw several more diseases separated from the general welter of infection

*Opening paper in the Section of General Practice at the Annual Meeting of the British Medical Association, Brighton, 1956.

—cerebrospinal fever in 1805, typhoid in 1813 and 1829, herpes zoster in 1831, and infantile paralysis in 1840.

All these descriptions were based on man's unaided senses, but during the second half of last century microscopy helped to quicken the pace, and provided doctors with a means of detecting hitherto invisible differences between one man's illness and another's. Then with the discovery of filterable or ultramicroscopic forms of parasitic life a new chapter was opened, written in a language difficult to read. We in our lifetime are at long last seeing what is known about viruses translated into practical help for the clinician, by means of serology linked with modern tissue culture.

While the discovery of antibiotics has opened the way for the virtual elimination of bacterial diseases as a major cause of human suffering, viral infections—which so far remain largely outside the control of antibiotics—have assumed a fresh importance (Andrewes, 1953). The clinician has once more been thrown back upon his own resources, and must needs study these infections minutely as of old in order to see if he can detect any further differences between the clinical patterns of many undiagnosable epidemics. An accurate description of such a pattern still remains an important duty of every family doctor; the encouragement and collection of these reports is a main objective of the Epidemic Observation Unit of the College of General Practitioners.

Evidence of Infection

First let us consider how we decide that a patient's illness is due to an infectious agent. Evidence falls into two broad categories—that from the patient and that from his associates. In the patient we find first a general reaction—fever and its symptoms. I hold the opinion that we should aim at teaching someone in every household to read a thermometer and to record their measurements on paper for us. I transfer such figures on to a usefully small pocket chart, which covers four weeks. The pattern of fever can be of diagnostic value and may guide us, too, in the duration of our treatment. Speaking of charts, I also encourage my patients with pertussis to keep "cough charts" for me, showing the total number of coughs, whoops, or vomits which occur each day. Such records occupy the children and give a good visual guide to their progress and to the value of one's treatment.

In our patient we next look for evidence of local tissue changes and their symptoms. The meaning of some physical signs is not yet fully understood—for example, painless enlargement of the posterior cervical lymph nodes. A pilot survey among children carried out at his surgery by Dr. J. R. Robertson showed that palpable enlargement of the post-cervical lymph nodes was seldom found in infants, became increasingly common in children of 5–8 years, and was less frequent again in the "teens." This subject is now being further studied in the S.E. England Faculty of the College of General Practitioners, with the help of Dr. I. M. MacDougall, County Medical Officer of Health for Hampshire.

The old physicians examined their cases with the greatest care, discovering, for example, the friction rub of pleurisy, the sweet taste of glycosuria, and Koplik's spots, which are still taken on trust by some of us. The importance of searching for physical signs can be exemplified if we consider how difficult it would be, even now, to distinguish measles without its rash. We need to study the non-exanthematous viral diseases more closely, looking and feeling for fresh abnormal signs. Blood examinations, including serology in the acute and convalescent stages, throat swabs, or throat washings of the patient and his immediate contacts, the collection of sputum for bacteriology or of faecal specimens for both bacteriology and sometimes for virus isolation—these can all on occasion be important laboratory aids, but not short cuts, to diagnosis. Nothing can take the place of regular and frequent examination of our puzzling cases of infectious disease, for it is at the bedside that we will detect our first glimpse of a new syndrome.

A Fruitful Field

Another fruitful field for inquiry and research in general practice is the evidence which we can gain from our patient's associates. Contacts, incubation periods, and quarantine are the stock-in-trade of our young patients and their parents, both in term-time and in holidays. But what a lot we still have to learn. For example, just how long before or after the rash of measles and chicken-pox or the swelling in mumps is a patient really infectious? Does the duration of contact matter? Does it differ indoors from out-of-doors? I make a plea for the publication of every good example of a single short contact before or after the primary illness which leads to infection of the secondary cases. I have seen measles spread by a 10-minute contact out-of-doors on the day before the rash. Such records would help to fill in many gaps. For example, are we sure yet that the incubation period of glandular fever is short—5 to 12 days, as is usually stated (Price, 1946)—rather than a much longer one, as in mumps or hepatitis? In this respect we should take care to use the term "serial interval," rather than incubation period, when we measure, for example, from rash to rash, rather than from contact to the onset of illness.

Infectivity seems to vary from one outbreak to another, especially in mumps. I am familiar with the family contacts of this disease going down one by one throughout the summer holidays. An epidemic in my practice went through 11 generations of infection. I have heard, too, of a family in Mauritius, with 12 children and many servants, who were in quarantine for mumps for more than a year. Once, however, I had a schoolboy return with mumps into a large family, none of whom had had the disease. My usual forecast was confounded when his mother and her five other children all developed mumps on the same day, the day they were moving house. They all went by ambulance.

As regards quarantine, is it not time that our profession challenged the schoolmasters, or rather mistresses, particularly over the question of German measles? I would like to encourage "German measles tea parties" to which an infected girl might invite her non-immune school friends, or a holiday camp run by the Medical Research Council, where an attempt could be made to keep a culture of the disease going by constant replenishment among the young volunteer visitors.

Seasonal Prevalence

Consider, now, another aspect of the differential diagnosis of infections of unknown origins—namely, the value of learning the seasonal prevalence of some of the diseases that are less well known. Winter vomiting disease is coming to be recognized for what it is—a common disease among our patients. It appears to occur sporadically throughout the year, becoming epidemic in the autumn, perhaps decreasing in the coldest weather, and increasing somewhat again in the spring. The spread of winter vomiting disease has been traced by collective reports from 158 family doctors, each of whom saw a few cases for only a few days or weeks. The reports gave details, not of patients, but of the presence or absence of an outbreak in the district.

The season for Coxsackie virus infections is not yet well established. In several years, about April, I have seen little groups of cases of sudden dry pleurisy that may have been Bornholm disease. During the late summer and autumn I have followed an outbreak of Coxsackie virus infection from Oxford to Shere, through seven generations of infection. None of these cases really looked like non-paralytic poliomyelitis: the onset of high fever was very sudden—one boy took ill while on a swing; the children neither felt nor looked as ill as their temperatures suggested; many of them had unduly pink-looking eyes but no photophobia; there was headache but no dorsal spasm; the fever ceased without drugs in 24–48 hours; and convalescence was rapid (College of General Practitioners, 1954).

A.P.C. Group of Viruses

In June, 1955, I was privileged by their medical officers to visit two public schools where outbreaks due to viruses of the adenoidal-pharyngeal-conjunctival group, recently identified in America (Huebner *et al.*, 1954; *Lancet*, 1955), were occurring. Serological tests in a family in my own practice then showed that an outbreak of conjunctivitis among them just previously had also been due to a similar virus. We have no idea yet how prevalent these A.P.C. virus infections really are. In the following September and October an epidemic among schoolchildren at another village in my practice, associated with high fever, headache, mild sore throat, abdominal pain, and glandular enlargement, was proved almost certainly to be due to a virus of this same group; and in May, 1956, a boy with "pink eye" and high fever was also found to be positive. Here, then, were three such outbreaks in one practice within a year.

I had a chance to make use of my clinical observations about the autumn epidemic which I saw. During it one of the schoolboys, not yet affected, broke his leg and was admitted to hospital. I phoned the house-surgeon later and warned him that if the boy suddenly developed a temperature of 104° F. (40° C.) there might be no need for alarm. He duly did so, and it was in fact from him that we obtained serological proof of the nature of his infection. The first boy to take ill in this epidemic was admitted to hospital and had his appendix removed, being afterwards labelled as acute non-specific mesenteric lymphadenitis. On the day after he was taken ill several more of his schoolmates went down, and it was clear that we were dealing with an epidemic. Perhaps we should test future cases of mesenteric lymphadenitis serologically for evidence of recent infection by A.P.C. viruses.

Before leaving the subject of differential diagnosis of infections of unknown origins, I would like to emphasize this reddening of the conjunctivae. It is a feature of several virus diseases; measles, of course, is the best-known example, but the reddening of the eyes in some patients with A.P.C. virus infection is even more striking. Injection of the conjunctivae in a feverish child should put us on guard that we may be dealing with a viral rather than a bacterial infection.

I now raise the subject of the comparative severity of viral illnesses in primary and secondary cases, and in children of different ages. For some years I have had the impression that secondary cases of chicken-pox are more severely affected than the primary, if all are in the same house. This factor of house contact seems to override the factor of age in determining severity, especially in chicken-pox, and may be due to a heavier infection contracted over a longer period; otherwise both in chicken-pox and in measles I observe that the younger children suffer a lighter attack, while teenagers and adults are usually more severely ill (Watson, 1954).

Problems in Treatment

A mother often first recognizes that her child is feverish between tea-time and going to bed, or because he cannot get to sleep. It follows that in general practice a doctor frequently starts his treatment of infectious disease towards nightfall. What can he do to help? When I diagnose a bacterial infection likely to respond to an antibiotic—for example, acute sore throat or otitis media—I consider that immediate treatment should be given, whenever possible, with penicillin by injection. I prefer this to a sulphonamide because of its rapid action without the risk that vomiting may delay the start of effective therapy. The pain of early acute otitis media may cease within three hours after an injection of 500,000 units of penicillin G without any other drugs being given. Later doses of penicillin can be given orally. If, however, the diagnosis is in doubt, or where I suspect I am dealing with a viral infection, I prefer to see what the morrow brings. During the summer or autumn I tend particularly to avoid parenteral penicillin

in a child with fever until the need for it is clear; at that season I prefer to give penicillin in liquid or tablet form rather than by injection, especially if poliomyelitis is prevalent locally.

At my first visit, before leaving I shall be asked for "something for the night." Until recently I was as content as anyone to prescribe aspirin for this purpose in a feverish patient, but three years ago a case "went wrong," which made me stop to think. We are all familiar with the similarity between aspirin and cortisone in suppressing the inflammatory reaction of the body in rheumatic disease. Cortisone also suppresses the body's reaction against all parasitic infection, and, for example, may liberate a latent tuberculous focus. Has aspirin this danger too? I believe that recovery from influenza may be delayed by aspirin, and that a sore throat can become more extensively affected. Some of the prostration in those who have dosed themselves with aspirin compounds before asking for our help is due, I believe, to their reduced resistance. This is a problem, however, which needs much more clinical and laboratory investigation. For example, is aspirin dangerous in poliomyelitis? Can it, like cortisone, increase the susceptibility of healthy rhesus monkeys to infection by poliomyelitis virus? Can it influence the amount of paralysis resulting from invasion by this virus? Should we warn our patients against their ready use of aspirin for fever and headache, especially during the summer and autumn?

I try now to avoid prescribing aspirin at night except in hyperpyrexia, and am looking for a good sedative and analgesic for children which is not antipyretic.

While on the subject of symptomatic treatment, there is a use of antihistamine drugs to which I would like to draw attention. For several years I have been using full doses of mepyramine maleate in children with chicken-pox for the irritation which characteristically accompanies the rash (Watson, 1954). In children who were expecting an attack and who have been able to start taking their tablets as soon as the rash appeared I have found that the eruption is as the rash appeared in two respects: first, a smaller proportion of the spots go on to form blisters by the fourth day, and, secondly, around each blister the ring of erythema is smaller. In one family the mother was kind enough to attempt a measurement of the first difference for me on her two boys. The elder was not treated with mepyramine, as I was away; on his front he had 154 spots, of which 45 blistered (29%), and on his back 211, of which 39 blistered (18%). His younger brother had a heavier crop of spots, (or 18%). His younger brother had a heavier crop of spots, as I expected, being the secondary case, and fever to 102° F. (38.9° C.) for four days. But of his 286 spots in front only 31 (or 11%) blistered and only 28 (9%) out of 314 on his back (see Table).

Effect of Mepyramine Maleate on Blistering in Chicken-pox

	Age	Number of Spots			
		Front		Back	
		Total	Blistered	Total	Blistered
D.C.	9	154	45 (29%)	211	39 (18%)
P.C.	7	286	31 (11%)	314	28 (9%)

College of General Practitioners' Report

On the subject of treatment, I want finally to refer to the prophylactic use of sulphonamides and antibiotics, particularly in measles. Three years ago about 130 of us in general practice agreed to keep records about our cases of measles in a way that could subsequently be analysed. We hoped to measure some of the influences which affect the likelihood of complications arising in any particular child, to see how these could be prevented. The results of this investigation, based on 4,728 records, have been published by the College of General Practitioners (1956).

In children who were healthy at the onset of their measles we found that it was the severity of the measles itself which mainly determined the incidence of complications. Among

mild cases the rate was only about 4%, among the average cases it rose to about three times, and among severe cases it was ten times this figure. There were proportionately more mild cases of measles among infants and young children than among those of school age. In children under 5, the proportion of mild cases was slightly but significantly higher among those who were breast-fed than among those who were not. If complications did arise in young children they were more likely to affect the chest than the ear; among previously healthy children, acute otitis media was not seen under the age of 2. For each grade of severity the incidence of complications scarcely varied in different types of practice—urban, mixed, or rural; but gross overcrowding in any house nearly doubled the incidence of complications compared with an ordinary house. If instead of being healthy the child showed at the first visit physical signs that were not normal in measles, the incidence of complications rose from 4% to about 20% in mild cases, to about 40% in an ordinary attack, and to 66% if the measles was severe. Even a past history of infections of the ear or chest increased the complications rate, particularly when the measles itself was mild; this was also true if the child was one whom we would call "catarrhal." These differences, however, were less striking among the average cases and not noticeable where measles was severe.

Instead of lowering the total incidence of complications in measles, the use of sulphonamides as routine, without reference to any of these factors, raised it slightly in all types of practice and for all grades of severity. In measles of average severity, however, the incidence of acute otitis media and other aural complications was lowered by the routine use of sulphonamides, though only at the cost of doubling the rate for pulmonary complications. The routine use of oral penicillin or other antibiotics lowered the total incidence of complications slightly. It had least effect upon the rate for otitis media in the ordinary case and most upon the rate for pulmonary complications in severe measles.

To sum up, the routine use of antibacterial drugs confers little or no benefit on a healthy child undergoing an ordinary attack of measles, and indeed it may do harm. If, however, the child is not healthy; if its attack of measles is judged to be severe; particularly if there are already abnormal signs present in its ears or chest; then antibacterial treatment will probably be required. In deciding the most suitable drug to use for any such child we must bear in mind that the action will be curative, not strictly prophylactic. We should therefore wait for clear indications of the need for such treatment, rather than embark upon an expensive and sometimes harmful routine. These drugs can help us to resist the challenge of our bacterial neighbours, but only when appropriately used.

Summary

Infectious diseases may account for more than 50% of new visits in an English country practice. Since before 500 B.C. descriptions of epidemics based on man's unaided senses have survived, but in the last century microscopy provided a new means of differentiating between one infection and another. The control of bacterial diseases by antibiotics has brought viral infections into fresh prominence. A description of epidemic diseases of unknown origin based on careful examination still remains an important duty of every family doctor.

Much work remains to be done in the biometrics of infectious diseases. Useful records of temperature and progress charts in whooping-cough can be kept in many homes. Some physical signs need revaluation—for example, enlargement of the posterior cervical lymph nodes.

In general practice, treatment of infectious disease often starts towards nightfall, and some possible arguments against the widespread use of aspirin are given.

The report of the College of General Practitioners on the complications of measles is summarized, and the need for clear indications for antibacterial drugs is emphasized.

REFERENCES

- Andrews, C. H. (1953). *Brit. med. Bull.*, 9, 169.
 College of General Practitioners (1954). *Research Newsletter*, No. 4, Supplement.
 — (1956). *Ibid.*, No. 11, Supplement.
 Encyclopaedia (1952). Lord Horder, Editor, *The British Encyclopaedia of Medical Practice*, 2nd ed. (Various chapters.) Butterworth, London.
 Huebner, R. J., Rowe, W. P., Ward, T. G., Parrott, R. H., and Bell, J. A. (1954). *New Engl. J. Med.*, 251, 1077.
Lancet, 1955, 1, 289.
 Osler, W. (1912). *The Principles and Practice of Medicine*, 8th ed. (Various chapters.) London.
 Price, F. W. (1946). *A Textbook of the Practice of Medicine*, 7th ed., p. 313. Oxford Univ. Press, London.
 Walker, K. (1954). *The Story of Medicine* (various passages). Hutchinson, London.
 Watson, G. I. (1954). *Practitioner*, 173, 578.

MEDICAL NEW YEAR HONOURS

The names of the following members of the medical profession were included in the New Year Honours List published in the *London Gazette* on January 1.

K.C.V.O.

Sir ARTHUR ESPIE PORRITT, K.C.M.G., C.B.E., LL.D., M.Ch., F.R.C.S. Sergeant-Surgeon to the Queen. Honorary Consulting Surgeon to the Army

K.B.E. (Military Division)

WILLIAM ALEXANDER DUNCAN DRUMMOND, C.B., C.B.E., F.R.C.S., D.L.O. Lieutenant-General, late R.A.M.C. Director-General, Army Medical Services.

D.B.E. (Civil Division)

JANET MARIA VAUGHAN (Mrs. Gourlay), O.B.E., D.M., F.R.C.P. Principal, Somerville College, Oxford.

Knighthood

GEORGE LINDOR BROWN, C.B.E., M.Sc., M.B., Ch.B., F.R.S. Jodrell Professor of Physiology, University College, London.

CHARLES DAVID READ, M.B., Ch.B., F.R.C.S., F.R.C.S.Ed., F.R.A.C.S. President of the Royal College of Obstetricians and Gynaecologists.

C.B. (Military Division)

ALFRED EDWARD CAMPBELL, M.D., D.P.H. Major-General, late R.A.M.C. Honorary Physician to the Queen. Director of Army Health.

JOHN CONRAD NEELY, C.B.E., D.M., D.O., D.O.M.S. Air Vice-Marshal, R.A.F. Honorary Surgeon to the Queen. Consultant in Ophthalmology, R.A.F.

C.B. (Civil Division)

Sir WELDON DALRYMPLE-CHAMPNEYS, D.M., F.R.C.P., D.P.H. Lately Deputy Chief Medical Officer, Ministry of Health.

C.M.G.

JOHN GEORGE HUNTER, M.B., Ch.M. General Secretary of the Federal Council of the British Medical Association in the Commonwealth of Australia

C.B.E. (Military Division)

DAVID HERBERT KERNOHAN, M.B., B.Ch. Surgeon Captain, R.N. (retired).

LIONEL LOCKWOOD, M.V.O., D.S.C., M.D. Surgeon Rear-Admiral, Royal Australian Navy.

C.B.E. (Civil Division)

HAROLD MAURICE COHEN, M.D., D.P.H. Principal School Medical Officer for the City of Birmingham.

HUMPHREY FRANCIS HUMPHREYS, O.B.E., M.C., T.D., M.B., Ch.B., F.D.S. R.C.S. Formerly Vice-Chancellor of the University

of Birmingham and Emeritus Professor of Dental Surgery in the University. For services to dental surgery.

JOHN McQUEEN JOHNSTON, M.D., F.R.C.S.Ed., M.R.C.P.Ed. Principal Medical Officer and Pharmacologist to the Department of Health for Scotland.

RONALD EPEY LANE, M.D., F.R.C.P. Nuffield Professor of Occupational Health in the University of Manchester. Member of Industrial Health Advisory Committee.

JOSEPH ANTOINE RENÉ LAVOPIERRE, M.D., D.P.H., D.T.M. Director of Medical Services, Mauritius.

JOHN FREEMAN LOUTIT, D.M., F.R.C.P. Director, Radiobiological Research Unit, Harwell.

GEORGE WILLIAM JOHN MACKAY, M.B., Ch.B., D.P.M. Medical Superintendent, Rampton Hospital, near Retford, Nottinghamshire.

WILLIAM NORMAN PICKLES, M.D., D.Sc., F.R.C.P.Ed., M.R.C.P. Lately President of the College of General Practitioners.

RALPH WHISHAW, M.B., Ch.M., F.R.A.C.P., F.R.C.P. A prominent physician in Hobart, Tasmania.

CHARLES FRANCIS WHITE, O.B.E., M.D., D.P.H., D.T.M. Lately Medical Officer of Health for the City of London. Recently President of the Society of Medical Officers of Health.

O.B.E. (Military Division)

JOHN GEOFFREY WAUGH, L.R.C.P.&S.Ed. Lieutenant-Colonel, R.A.M.C., T.A., now Territorial Army Reserve of Officers.

O.B.E. (Civil Division)

LESLIE WILSON BANKS, M.B., Ch.B. Senior Medical Officer (Clinical), Western Region, Nigeria.

WILLIAM JOSEPH BRANDAY, M.R.C.S., L.R.C.P. Superintending Medical Officer (Specialist), Trinidad.

WILLIAM MICHAEL COURT BROWN, M.B., Ch.B., F.F.R. Director, Group for Research on General Effects of Radiation, Medical Research Council.

ARTHUR BARRETT CARDEW, M.C., M.B., B.S., F.R.C.S.Ed. Commissioner, St. John Ambulance Brigade, Gloucestershire.

WILLIAM RICHARD SHABOE DOLL, M.D., M.R.C.P. Senior Member, Statistical Research Unit, Medical Research Council.

HENRY JOHN CHADWICK HANRAHAN, M.B., B.S. A medical practitioner of Albany, Western Australia. For services to the community.

RICHARD WILLIAM DAVID MAXWELL, M.B., Ch.B. Lately Deputy Director of Medical Services, Fiji.

SYDENHAM FREDERICK MOORE, B.M., B.Ch. British subject lately resident in Egypt.

HAYDN JONES MORRIS, M.R.C.S., L.R.C.P. For public services in the Federation of Rhodesia and Nyasaland.

ERIC PARRY, M.B.E., M.B., Ch.B., F.R.C.S., F.R.C.S.Ed. Chief Medical Officer to the Kuwait Government.

WALTER LAING MACDONALD PERRY, M.D. Director, Department of Biological Standards, National Institute for Medical Research.

JOHN CHARLES ROBB, M.D., M.Ch. Consulting Surgeon, Downe Hospital, Downpatrick, Co. Down.

GEORGE SIMPSON, M.B., B.S., F.R.C.O.G., M.R.C.P., of Ivanhoe, Victoria. For services to the Flying Doctor Service of Australia.

WILLIAM ARTHUR LEIGH TUCKER, F.R.C.S.Ed., F.R.F.P.S. Surgeon Specialist, Aden.

M.B.E. (Military Division)

JOHN VAUGHAN-BRADLEY, T.D., M.B., B.Chir., F.R.C.S.Ed. Major, R.A.M.C., T.A.

M.B.E. (Civil Division)

OLIVE GUMPRICH, M.B., Ch.B. For social welfare services in Southern Rhodesia.

SYDNEY DOUGLAS GUN-MUNRO, M.B., B.S., D.O. Resident Surgeon, Colonial Hospital, St. Vincent, Windward Islands.

SEBASTIAN BYEKWASO KYEWALYANGA. For medical services in Uganda.

ALEXANDER DAVID BAIN MACKIE, M.B., Ch.B. Chairman, Birmingham "Stirling" Sea Cadet Corps Unit.

GEORGE DAVIS McLEAN, M.R.C.S., L.R.C.P., D.T.M.&H. Medical Officer, St. Kitts, Leeward Islands.

ROBERT CUTHBERT OGG, M.B., Ch.B. Formerly a Medical Officer in Basutoland.

FRANK BLACKLOCK THOMSON, M.B., Ch.B. Deputy Chairman, Dundee National Service Medical Board.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Cholesterol and Vascular Disease

SIR,—I was glad to read Sir John McNee's letter (*Journal*, November 17, 1956, p. 1172) on this subject. By the time this reaches you others will doubtless have pointed out that cholesterol feeding (or stuffing) can produce vascular lesions in other animals than the rabbit—e.g., in chicks, dogs, and under certain experimental conditions, the rat and the monkey. But these are slim pickings in return for years of work on this subject, and, if I read correctly between the lines of Sir John McNee's letter, I suspect that he is as weary as I am of the dreary and uninspired feeding of what must now amount to many tons of cholesterol to many thousands of assorted birds, beasts, and, it may be, fishes during the past few years. And as regards the serum cholesterol levels of the South African Bantu—heavens! There will soon be as many nutritionists out there as Bantus.

Over here in the States a remarkable situation has developed since President Eisenhower's attack of coronary thrombosis. It is now easy—too easy—to get vast sums of money for the support of research on vascular disease. Now there is nothing wrong with this except that these funds tend to be given to a small number of ringmasters who are fanatically conducting large cholesterol circuses to the exclusion of other studies that would appear at least as worthy of attention. I know of one department—that previously had a fine and diverse record of work in experimental nutrition—which now, alas, has become a cholesterol circus. How this came about is simple: an enormous grant was awarded for vascular studies, and that was the finish of those sturdy individualists who flatly refused either to add cholesterol to their experimental diets or, alternatively, to study serum cholesterol levels in their experimental animals. It is interesting to speculate what might happen if a future President were to die of gastric cancer—one suspects that the study of possible, and impossible, dietary carcinogens would boom alarmingly, and that this would have a disastrous effect on other equally promising lines of attack.—I am, etc.,

L. R. C. AGNEW.

Cambridge, Mass., U.S.A.

Hyperparathyroidism and Steatorrhea

SIR,—In a letter by Drs. Russell Fraser and B. E. C. Nordin (*Journal*, December 8, p. 1363), they query, quite rightly, the report of a low urinary calcium excretion associated with a serum calcium level of 11.4 mg. per 100 ml. in the presence of a normal blood urea. They suggest that an error in the serum calcium estimation or possibly a raised protein-bound calcium fraction might explain the discrepancy. We recently had a similar experience in the laboratory of the Courtauld Institute of Biochemistry, and, unable to reconcile the serum and urinary calcium figures, we repeated both determinations only to obtain comparable figures.

It was suspected that in this case it was the urinary calcium figure which was unreliable, since the estimation had been carried out on a 200 ml. aliquot, supplied by the ward, taken from a 24-hour urine specimen collected in a clean Winchester containing toluene as a preservative. It seemed possible that the aliquot was taken from the upper part of the Winchester without adequate mixing, so that precipitated calcium phosphate remained undisturbed at the bottom of the bottle. Under such circumstances the aliquot clearly would not be representative of the calcium content of the entire 24-hour specimen. This hypothesis was tested by allowing a 24-hour specimen to stand in the laboratory overnight, after which it was found that the calcium content of the clear supernatant urine was equivalent to only 30 mg. in the 24-hour urine volume, whereas that of urine from the bottom of the Winchester was equivalent to 200 mg.

It seems therefore that inadequate mixing of 24-hour specimens of urine submitted for calcium and phosphate determinations may be an important source of error if the reaction of the urine is alkaline. This may be avoided by using 10 ml. of concentrated hydrochloric acid as a preservative when collecting such specimens, so that precipitation of calcium phosphate is prevented. Alternatively, specimens collected using other preservatives should be acidified before the aliquot used for the estimation is taken.—We are, etc.,

E. T. KNUDSEN.
A. L. MILLER.

London, W.1.

Varicose Ulceration

SIR,—Some years ago I published the results of some 100 cases of varicose ulceration treated with an aqueous solution containing 1% silver dinaphthylmethane disulphonate.¹ I have continued to use the solution during the past five years along the lines suggested in that article and with the same success. This solution does, however, exhibit the following disadvantages: (1) In certain cases it causes a stinging sensation for some minutes after application; (2) gauze impregnated with the solution tends to adhere to the ulcer, causing pain on removal when some granulations or early epithelization may be torn off; (3) it produces a thick firm scab round the edges of the ulcer which causes pressure pain when covered by tight supportive bandaging with localized pressure pad; (4) it is necessary to renew dressings of the solution twice daily, which is an inconvenience to the patient.

In an endeavour to find some agent which would retain the properties of silver dinaphthylmethane disulphonate but without these disadvantages, trials were carried out in my varicose ulcer clinic with an oil-in-water emulsion containing 1% of this compound ("viacutan" emulsion). Dressings were applied once daily by pouring a little of the emulsion on to 4-6 layers of white gauze which were placed on the ulcer and covered with cotton-wool and a built-up pad of plastic foam. The whole leg from the webs of the toes to the knee was then tightly, firmly, and uniformly compressed with a cotton elastic non-adhesive bandage. The patients were taught this technique—fully described in my original article; they came for inspection once weekly or fortnightly.

During the past six months I have treated 61 cases of gravitational and ischaemic ulcers with this emulsion. Thirty-two cases were healed outright, 20 improved, and nine cases showed no response. Those of my colleagues who are using the aqueous solution will doubtless be interested to learn that the emulsion has proved to be superior in that it caused no pain on application; dressings were applied only once daily and were removed without discomfort; there was less pain on pressure bandaging because of the smaller softer scab which was formed; and, most important of all, the healing time was shortened.—I am, etc.,

Liverpool, 1.

STUART MCAUSLAND.

REFERENCE

¹ McAusland, S. D., *Med. Press*, 1951, 226, 483.

SIR,—I agree with Dr. B. FitzGerald (*Journal*, December 22, 1956, p. 1484) that it is often necessary, and indeed desirable, to treat varicose ulcers without putting the patient to bed. I would, however, sound a note of warning about the use of chloramphenicol as a local application. Some years ago it was a common practice in our department to treat those varicose ulcers, in which secondary infection appeared to be an important factor, with chloramphenicol cream. Although results were good at the time, a considerable number of the cases were found to have acquired sensitivity to chloramphenicol when they were again treated later. I have since abandoned the use of chloramphenicol as a local application for any skin condition, as it appeared to be a potent sensitizer. That it is so is borne out by a

I shall be interested to hear his observations on this. Further correspondence from Dr. Margaret S. M. McGregor (*Journal*, December 15, 1956, p. 1427) under the same heading suggests that "heat spots" may be due to an acarus. It should be quite easy to prove this by repeated scrapings from early vesicles placed in two drops of 20% liquor potassae and examined under the microscope. I have done this many times with negative results, but, believing that the "heat spots" of papular urticaria were parasitic in origin, I turned my attention to other species in collaboration with Dr. E. T. Burt (*Journal*, May 19, 1956, p. 1130). We feel that most cases of papular urticaria can be explained on the basis of bites by fleas of various species, or even possibly by lice from certain animals, such as the dog, pig, or cattle. This is often difficult to prove, and neither patients nor doctors are easy to convince, but further work is being carried out in this connexion with visits to the homes of the sufferers. Children who have experienced repeated crops of heat spots for years with severe irritation obtain complete and lasting relief from these distressing symptoms if the search for the source of infestation is persisted in till it is traced, and then adequate treatment is

Mr. Hajnal's criticism of our test goes beyond this, since he maintains that we should have included, as giving "mixed" responses, those patients who failed to give two clear preferences. We feel, however, the questions answerable by reference to the "don't knows" and to the "mixed" are different. A full treatment of the data would certainly have classified each of the two responses of each subject as a preference for N.A.P.A.P., a preference for codein. co., or an inability to decide between the two. However, the main purposes of the trial were (1) to see whether preferences for N.A.P.A.P. were expressed more, or less, frequently than those for codein. co., and (2) to see whether there was any evidence that the relative frequency with which these preferences were made varied from one subject to another. It is a different question that the "don't knows" provide evidence about—that is, the frequency with which subjects are able to make up their minds which of these two drugs they prefer. It is true that the subjects who gave a clear preference on one of the two occasions provide some evidence on (1), and it may be worth recording that, of these single preferences, 7 were in favour of codein. co. and 1 in favour of N.A.P.A.P.; but in view of the clear evidence on (1) provided by the double preferences these figures were not presented in the paper. Subjects failing to give two clear preferences provide no information on (2), which is really the point at issue.

If we assume for the sake of discussion that a significant interaction has been established, it remains to consider how the data should be interpreted. The null hypothesis under test is that each patient who is willing to make two decisions has a certain probability p of expressing a preference for (say) codein on any one occasion, and that p is constant from one patient to another; this hypothesis (which, when explicitly stated, is perhaps not very plausible) we assume to be rejected by the data. As an alternative hypothesis, we may consider the probability distribution of p over the population of patients from which our sample was drawn. Various theoretical forms for this distribution suggest themselves; if we assume a *beta* distribution, we can estimate that about 20% of the population have values of p less than one-half—that is, prefer N.A.P.A.P. more often than not—though, on the small numbers involved, this estimate is doubtless very inaccurate. Mr. Hajnal's alternative suggestion that two groups of patients existed, one with a stable disease consistently preferring codein. co., the other making random responses under the influence of variation in their disease and other factors, amounts to assuming a distribution concentrated at the two points $p=1.0$ and $p=0.5$. These two forms of distribution have actually been proposed for use in inspection problems in industry, problems for which sequential techniques were first developed.^{1,2} The point is of more than theoretical interest, since the sampling scheme can be improved if the form of the distribution is known.

It is clearly impossible in practice to distinguish the two alternative forms of distribution from the present limited amount of data, and we must therefore concede that we have not established beyond any possible doubt the superiority of N.A.P.A.P. for a minority of patients. More importantly, the distinction between different forms of distribution is theoretically impossible. Any extension of the rejected null hypothesis uses up the one remaining degree of freedom and leaves nothing over to test goodness of fit. Thus our assumption of patient-drug interaction is not based on the excess of "N.A.P.A.P.-N.A.P.A.P." responses alone, but is intended as an explanation of the whole body of data once the original null hypothesis has been rejected. As it seems impossible to get any further with data of the present kind, it remains to consider improved methods of investigating patients' preferences for alternative treatments. Some improvement might result from using a 5-point scale of preference, asking the patients whether one drug was much better, better, the same, worse, or much worse than the other. But probably the most important step would be the inclusion of a placebo, a course we originally rejected on the grounds that patients would give unreliable responses if asked to compare as many as three weeks at a time. The alternative design of having three two-week periods instead of two we also rejected, on the grounds that the longer the trial lasted the more it would be upset by variations in the disease process. Mr. Hajnal's valuable discussion shows how very carefully one must try to reconcile the often conflicting demands of practical and theoretical requirements in work of this kind.

Another correspondent has drawn our attention to the fact that our labelling of the bottles with + and - signs would in theory have enabled a patient to spot which drug on the second comparison was the same as his preferred drug on the first. This could have led to spurious consistency of choice. In practice we do not believe this occurred, because the patients only had one bottle at a

time in their possession (the bottles were handed back at the end of each week), and because the + and - signs were typed in immediately after the number and the - sign was not obviously identifiable as such. We think it exceedingly unlikely that any patient recognized the nature or even existence of this code, particularly as they did not know two drugs were being compared and none even in fact inquired as to whether the bottles contained different preparations. However, we feel this is a very valid criticism of our procedure, and wish to draw attention to the fact that in any future trials of this sort the labels bearing the numbers should be torn off the bottle as the tablets are handed to the patient.—We are, etc.,

London, W.C.1.
Harpenden, Herts.
London, S.E.1.
London, W.C.1.

P. ARMITAGE.
M. J. R. HEALY.
D. R. L. NEWTON.
J. M. TANNER.

REFERENCES

1. Champenow, D. G., *Appl. Statist.*, 1953, 2, 118.
2. Barnard, G. A., *J. roy. statist. Soc.*, 1954, 16B, 151.

Prevention of Tuberculosis

SIR, As one would expect, Professor F. Heaf's article (*Journal*, December 15, 1956, p. 1383) is both refreshing and stimulating. In addition to recommending a miniature chest x-ray film for all patients attending hospital out-patients, I suggest that certain categories, such as diabetics and patients who have had gastrectomies for peptic ulcers, should have annual chest x-rays.

Professor Heaf has pointed out that the response in mass radiography surveys is better when some compensation is possible on discovery of the disease. I believe that the way to overcome the objection to compulsory chest x-rays for certain groups is to devise a scheme whereby old-age pensioners and those on National Assistance are offered annual chest x-rays. In return they would be assured of a liberal disability pension on the discovery of tuberculous disease, provided the appropriate medical advice was accepted and followed. We have profitably invested large sums of money in controlling tuberculosis in cattle. How much more profitable an investment, both in terms of hard cash and human happiness, would it be if we could control the pool of infectious tuberculous cases in this country. I am, etc.,

Bournemouth.

D. J. AP SIMON.

Delayed Emptying of the Gastric Stump

SIR,—I have followed the correspondence on this subject with great interest, having encountered my share of the complication—this in spite of using plain clamps applied solely to the jejunal wall, as described by Mr. Harold Burge (*Journal*, December 15, 1956, p. 1428). I subscribe personally to the view of Mr. Maurice Lee (*Journal*, December 8, p. 1364) that this condition—and, for that matter, "vicious circle vomiting" after gastro-enterostomy—originates in a paralysis of the gastric muscle; that, in fact, it is a manifestation of a gastric ileus, which name I prefer to attach to this complication. I do not think it is necessary to invoke small-bowel paralysis to explain it. In any gastro-jejunostomy the piece of small intestine actually used in the anastomosis has had its muscle coats cut completely through and has, therefore, no propulsive power. This being the case, we are relying in these patients on gastric peristalsis to "inject" the contents of the stomach into the efferent loop. Paralyzed gastric muscle will not only fail to do this but will allow a functioning afferent loop to pump its contents into an atonic stomach, whence they are vomited. Theories involving "oedema of the stoma" I cannot take seriously.

Like Mr. Burge, I have given a barium meal to a couple of my cases, with findings similar to his. On screening the patients, I was impressed by the way the gastric stump distended like a flaccid sac, and by the absence of any flicker of peristalsis in it while it was under observation. In one case a film taken four hours later showed no onward passage of barium. Most of my cases (like most cases of

intestinal ileus) have been transient, settling down after about 48 hours' suction and intravenous fluid replacement. In about half a dozen, however, encountered during the past ten years the gastric retention has persisted much longer, for periods of 6–12 days—incidentally, with remarkably little deterioration in the patient's condition; one of these was a case of simple gastro-enterostomy. In these obstinate cases of retention, acting on the presumption of gastric ileus, I have used a posterior splanchnic block (Kappis technique) to abolish sympathetic activity. The results of this have been uniformly satisfactory. The usual effect has been to produce a rapid diminution in the volume of the aspirate, so that the tube could be discarded within 24 hours. In one case the result was more dramatic; this patient, after over a week's retention, complained bitterly of hunger within an hour of induction of the block, and had no difficulty in keeping down the light meal upon which he insisted. I think, therefore, that this simple procedure should be given a trial before resorting to further surgery such as jejunostomy. It would be interesting to have the time and facilities to test it radiologically.

Finally, there has been considerable discussion on gastric intubation in this correspondence, and I am afraid I must confess that during the past year I have given up using it in any form, even in gastric operations when a vagotomy has been performed. When intubating routinely I was impressed by the small quantities aspirated, especially after Billroth I gastrectomies. Since abandoning it, it is only occasionally that I have had to have a tube passed in the post-operative period; most patients vomit not at all or very little. I think that they cough better for the absence of the tube, and that both patients and nursing staff seem less harassed without it.—I am, etc.,

Brighton.

KEITH POWELL.

Pregnancy Sickness

SIR,—Dr. Doreen S. Ball should speak for herself alone when she says, "I regarded these cases, as most doctors seem to, as . . . psychological" (*Journal*, December 22, 1956, p. 1487). Surely most obstetricians nowadays realize and teach that vomiting of pregnancy is due to a combination of several factors such as the distension of the gravid uterus with the products of conception, and the considerable hormonal upset that takes place in a woman at that time, to mention only two. Another small point arises later in her letter in which one infers that her own vomiting of pregnancy could have been aggravated by getting up in the morning after 14 hours' fasting. As far as I know, dry toast and tea in bed as soon after awaking as possible is well known as a valuable deterrent of vomiting of pregnancy.—I am, etc.,

Winchester.

P. G. CRONK.

SIR,—I was most interested to read the letter by Dr. Doreen S. Ball on her own experiences of pregnancy sickness (*Journal*, December 22, 1956, p. 1487). I have had two children and during both pregnancies also suffered from this a great deal.

During my first pregnancy I started to vomit six weeks after my last menstrual period. At that time my periods were irregular, and I did not then realize that I was pregnant. This vomiting continued several times daily, and often at night, for two to three months; a feeling of nausea persisted throughout pregnancy and disappeared completely immediately after delivery. During my second pregnancy I again started to vomit six weeks exactly after my last menstrual period. This time I was admitted to hospital with hyperemesis. At about three months I had a threatened abortion. The day preceding this I did not have any nausea or vomiting. The symptoms then continued as before. The only treatment which had any effect was the taking of small meals every two hours. Nausea again persisted throughout pregnancy and disappeared on delivery.

I was treated, quite obviously, mainly as a psychological problem. This I am perfectly convinced I was not. Why should I suddenly change from a normal individual to a

"psychological problem," in one instance even before I knew I was pregnant? I have no criticism whatsoever to make of my treatment. I also, before being pregnant, considered the cause of hyperemesis to be psychological, because that is what I had been taught to believe. Since these experiences I now consider that the cause of hyperemesis can be hormonal in origin for the following reasons: (1) The sudden onset of vomiting, and the time of onset in both cases being exactly the same; (2) absence of vomiting and nausea previous to the threatened abortion; (3) sudden and complete disappearance of symptoms following delivery.

The above could quite obviously be explained in some other way, but, until I am offered a more tenable theory than that usually given, hormones, in my case also, are to blame.—I am, etc.,

Marple, Cheshire.

MURIEL DALBY.

Diagnosis of Early Pregnancy

SIR,—In calculating that the average general practitioner sees some 23 pregnancies per year, Mr. D. G. Wilson Clyne (*Journal*, December 22, 1956, p. 1489) assumes that there are 460,000 births per annum in the United Kingdom. In fact, there were 673,651 live births in 1954.¹ Allowing for stillbirths and abortions, the number of pregnancies may well have been over 800,000. Some "general practitioners" have limited lists and attend only staffs of hospitals. Pregnancies are spread among the practices of true general practitioners at an average of about 47 each, of which about 40 reach viability. There is ample maternity work in the average general practice. It is, perhaps, because this fact has been misrepresented so often that Mr. Wilson Clyne did not realize that there was a fairly gross error in his calculations.—I am, etc.,

Hucclecote, Gloucester

IVOR COOKSON.

REFERENCE

1. *British Medical Journal*, 1956, 1, 1309.

SIR,—I read with great interest the letter of so distinguished a gynaecologist as Mr. D. G. Wilson Clyne, published in your issue of December 22, 1956 (p. 1489), and commenting on my letter in the *Journal* of November 10 (p. 1118). Statistics have been likened to bikinis, in that they reveal matters of interest but conceal vital parts. There are many general practitioners with a large proportion of young patients who see many more than twenty-three pregnancies per year, and I am one of them. Therapeutic abortion is an exceedingly controversial subject, and I propose to spare the Editor of the *Journal* a protracted correspondence on the subject.—I am, etc.,

Ruislip.

T. DAVID LAMBERT.

Bancroftian Filariasis Simulating Lumbar Disk Lesions

SIR,—Apart from symptoms of lymphangitis, funiculitis and orchitis, and fever, filariasis produces generalized aching pains, the latter being a common mode of presentation on Niue Island, where the entire population takes a single 50-mg. tablet of diethylcarbamazine ("hetrazan") every month. This scheme of mass dosage has not only a very definite suppressive action but also indicates, by producing aching pains, a considerable number of positive cases.

Another interesting symptom, unrelated to the diethylcarbamazine mass therapy, is not uncommon—namely, the sudden onset of very severe pain simulating a lumbar disk lesion, and crippling in its intensity. The pain is referred to the ankle of the affected side, and there is a point of tenderness one inch (2.5 cm.) from the midline at the level of the second or third lumbar spinous process. There is no appreciable depression of the knee jerk or tendo-Achillis jerk, and no fever. Blood examination invariably shows numbers of microfilariae, and treatment by diethylcarbamazine 50 mg. three times a day produces a somewhat dramatic alleviation of symptoms within 24 hours and a negative blood after seven days. I wonder if any other readers have come across this distressing variety of filariasis.—I am, etc.,

Niue, S. Pacific.

E. J. B. SIMPSON.

Obituary

W. G. BARNARD, C.B.E., F.R.C.P.

Professor W. G. Barnard, professor of pathology at St. Thomas's Hospital and dean of the medical school, died at the hospital on December 20, 1956. He was 64 years of age.

William George Barnard was born at Tangier, Morocco, on December 9, 1892, the second son of a missionary, Mr. E. U. Barnard, of Bath. He was a medical student at the London Hospital at the outbreak of the first world war, and for two years he served in the Royal Field Artillery in France. Gazetted out of the Army in 1917,



(Elliott and Fry Ltd.)

he returned to the London Hospital and qualified M.R.C.S., L.R.C.P. in 1920. He captained the hospital's Rugby fifteen for two years, playing full-back, and after he had given up playing he took to refereeing. Among the junior appointments he held at the London were those of house-surgeon, pathological assistant, and junior assistant director of the pathological institute. From 1923 to 1931 he was pathologist to University College Hospital and lecturer in morbid anatomy and curator of the museum in the medical school. In 1927 he went to Freiburg-im-Breisgau for six months to work with the late Professor Ludwig Aschoff. Becoming consultant histologist to the London County Council in 1931, he was also appointed pathologist in charge of the council's Central Histological Laboratory at the Archway Hospital. Professor Barnard was appointed to the chair of pathology at St. Thomas's Hospital Medical School in 1939, and eight years later he succeeded the late Professor B. A. McSwiney as dean of the medical school. He held both appointments until his death, and he was also a member of the hospital's board of governors. Only last year he was appointed dean of the Faculty of Medicine in the University of London, and was to have held this appointment until 1958. He was also a member of the senate of the university and an examiner in pathology. In 1948 he was one of the vice-presidents of the Section of Pathology at the Annual Meeting of the B.M.A. Before the recent war he at times reported for this *Journal* the proceedings of the Section of Pathology and Bacteriology at the Annual Meetings of the B.M.A. His reports were models of accuracy and brevity, and he was punctilious in producing his "copy" on time. His book, *Elementary Pathological Histology*, was first published in 1928 (3rd edition in 1953), and he was the author of numerous papers on pathological subjects in specialist journals. His work on "oat-celled sarcoma" of the mediastinum, published in 1926, was an important study, for he was able to show that this tumour was a primary carcinoma of lung. As a teacher he was rather reserved, but as dean of St. Thomas's the students found him very approachable and a wise and kindly adviser. Certainly he spared no pains in his work for the medical school,

which benefited from his administrative skill and wide professional experience.

Barnard gave unstintingly of his time and energy to the Royal College of Physicians of London. Elected a Fellow in 1938, seven years after taking his Membership, he served on the council of the College from 1942 to 1944 and was then elected treasurer. In that capacity he proved to be a wise and prudent custodian of the College's financial affairs during a period of great difficulty. But Barnard was much more than a treasurer responsible for seeing that a proper balance was kept between income and expenditure. He was one of a small group advising the President of the College on a wide range of matters relating not only to the welfare of the College as an institution but also to problems affecting the profession as a whole, in particular, of course, those taking part in the Health Service as consultants and specialists. Most Fellows will recall at this time his genial and friendly presence at the College dinners, for Barnard was a connoisseur of food and wine, and he saw to it that for a modest price the Fellows could dine off good fare chosen with a rare discrimination. As a man he was forthright and determined in his views, and, if at first acquaintance he seemed to be a bit formidable in aspect, this impression soon disappeared in moments of relaxation which revealed a man who believed above all things in the good fellowship of professional colleagues.

A very capable administrator, Barnard gave much of his time to committee work, not only at his hospital and at the College but on other bodies as well. From 1948 to 1950 he was a member of the Central Health Services Council, and he had been a member of the Joint Consultants and Specialists Committee for seven years. He also served on the Staff Side of Committee "B" of the Medical Whitley Council from 1953 until his death. At one time he was honorary secretary of the Medico-Legal Society, and for the past year he had represented the Royal College of Physicians on the council of the Imperial Cancer Research Fund.

Professor Barnard married Miss Margaret R. Osler in 1930 and had one son, who has recently qualified at St. Thomas's Hospital.

A memorial service to Professor Barnard will be held in the chapel of St. Thomas's Hospital at 12 noon on Thursday, January 17.

ROBERT CARMICHAEL, M.B.

By the tragic death of Dr. Robert Carmichael at Leeds on December 19 scientific pathology and the Leeds medical school have lost prematurely a highly skilled and experienced member. He was 55 years of age. Many generations of medical students, as well as his colleagues, will long recall with warm affection his wide knowledge, sound teaching, transparent sincerity, and his humour and kindness. A native of Falkirk, Robert Carmichael studied medicine at Edinburgh, graduating with honours in 1923. He won the Lesley gold medal and the Ettles scholarship, which enabled him to study for a time in Paris. On his return to Edinburgh he held appointments as assistant in pathology in the university and Royal Infirmary and as pathologist to the Royal Edinburgh Hospital for Mental and Nervous Disorders. Here he acquired a special taste for neuropathology and published his classical paper on the cerebral lesions in the chronic stage of epidemic encephalitis, a paper which was illustrated by beautiful water-colour drawings by his wife.

Appointed to the university department of pathology in Leeds, first as a lecturer and then as a senior lecturer, he spent the remainder of his life, over twenty years, there. Here he took a major share in teaching, and in the development, and especially the post-war revision and re-cataloguing, of the museum of pathology. He also participated as co-author in valuable papers on adenolymphoma of the salivary glands and on metaplastic changes in the cervix uteri. But his first love for neuropathology was maintained, as shown by his scholarly papers on cerebral aneurysms. His published work, however, excellent in quality though it was, was not the greater part of his contribution to the Leeds medical school and to British pathology. This was more intangible; it was his systematic thoroughness, his uncompromising love of accuracy and truth, and his scorn of slipshod, hurried, and untidy work of hand or mind. He himself refused to be a victim of routine mediocrity, and he set an example of care and precision for which his colleagues, students, and technicians alike will increasingly realize their imponderable indebtedness to him. Both in and outside Leeds his opinion on difficult histopathological problems was often sought, for his fellow pathologists well knew the value and maturity of his judgment. They will affectionately remember also his humorous twinkle, and the telling quip or epigram with which he often castigated ponderousness, pomposity, or insincerity. His work was his hobby and his happy home life his recreation.

For the last six months or more his friends anxiously saw his health decline; but, with a characteristic stoic cheerfulness, he carried on his work as though nothing was wrong until only a fortnight before his death. This was due to a retroperitoneal tumour, which there is no doubt he himself correctly diagnosed some weeks earlier and knew was irremediable. To the very last he smilingly sustained the courage of his friends, rather than they his. In some measure they share with his wife and daughter a unique sense of personal loss.—R. A. W.

F. S. F. writes: I first met Robert Carmichael when he came to Leeds as lecturer in the department of pathology in 1931. I was already in the same department as reader in the chemical pathology, and we quickly became friends, and the friendship deepened with the passing of the years. His outstanding characteristics were his innate modesty, his friendliness, and his sense of humour, which had a delightful flavour all its own. He never really hankered after a chair; this was partly on account of the modesty I have referred to, but perhaps mainly because he disliked the idea of having what he considered his real work frequently interrupted by the claims of administration which must inevitably have been made on him as a professor. Yet on three occasions he was called on to assume charge of a department until a permanent incumbent should be appointed, and each time he gave unstinted time and effort to administrative duties, so that he was able to hand over his charge in a healthy, flourishing condition. His last period as acting head of a department lasted for a little over a year, and taxed his strength greatly, for it was during this period that the illness which was to cause his death first manifested itself. Characteristically he ignored it and remained at his post to within three weeks of his end, which he faced with truly amazing courage. He will be sadly missed in Leeds, not least by those who, like myself, have enjoyed the inestimable privilege of his friendship.

C. D. LOCHRANE, M.D., F.R.C.S. Ed., F.R.C.O.G.
Mr. C. D. Lochrane, formerly consultant surgeon to the Derbyshire Hospital for Women, died after a short illness on December 13, 1956, at Nairn. He was 75 years of age.

Born at Busby, near Glasgow, Charles Damien Lochrane was educated in Catholic seminaries in Scotland and England, and his medical training took place for the greater part at Edinburgh University, though his final year was spent at Glasgow University. He graduated M.B., Ch.B. at Edinburgh in 1904, and proceeded to the M.D., with high commendation, in 1908. After graduation he had the good fortune to serve as house-surgeon at Glasgow under Sir William Macewen, some of whose aphorisms he was fond of quoting and whose teaching made a great impression upon him. Later he held the appointment of senior resident medical officer at the Royal Infirmary. His elder brother, Frank, had been honorary surgeon to the Women's Hospital, Agard Street, Derby, and on his sudden death Charles was appointed honorary surgeon there in 1907, having in the previous year obtained the F.R.C.S. of Edinburgh. At the same time he took over his brother's general practice. The hospital at that time only had about 20 beds, but he worked assiduously to perfect his surgical technique, and built up a large out-patient department. His patients were devoted to him, and so were the nurses. By wide reading he kept himself well informed of progress in his specialty, and he himself wrote a number of papers, mainly on obstetric subjects.

During the first world war Lochrane was appointed surgeon in charge of the military hospital at Etwell, where he worked with his accustomed enthusiasm and where he had the happiness to meet his future wife. Shortly after the war he developed a renal calculus, from which, however, he made a good recovery, but he determined to give up his general practice and devote himself entirely to his specialty. Becoming a member of the old Midland and Western Counties Obstetrical and Gynaecological Society, he was shortly afterwards elected to its presidency. He was also a past-president of the Derby Medical Society. When the Women's Hospital at Derby became too small for its many patients Lochrane was mainly instrumental in building the new Derbyshire Hospital for Women, which opened in 1929 with 60 beds and which has so abundantly fulfilled the purpose for which it was built. Elected an original Fellow of the Royal College of Obstetricians and Gynaecologists in 1929, Lochrane filled many appointments, so that his time was very fully occupied. Besides being on the staff of the City Hospital in Derby, he was consultant obstetrician to the Derbyshire and Staffordshire county councils. From 1939 to 1947 he was president of the Derby Branch of the B.M.A. A few years ago he developed acute appendicitis, which was followed by complications. This illness obliged him to give up his life's work—for him a most difficult decision. He retired to Scotland, but unfortunately his health remained indifferent.

Charles Lochrane was a man steadfast of purpose but governed by his faith. Our deep sympathy is extended to his devoted wife and two sons.—J. C. G.

Dr. D. G. McROBBIE died at his home at Turriff, Aberdeenshire, on November 20, 1956, at the age of 41, after battling manfully with ill-health for some time. An Aberdonian born and bred, Donald Graham McRobbie was an able family doctor blessed with patience, determination, and courage. At Aberdeen Grammar School he developed a great interest and facility in the classics and an enduring love of good music, but later decided to

study medicine at Aberdeen University. After graduating M.B., Ch.B. in 1938 he held hospital appointments in Aberdeen and at the Royal Hospital for Sick Children, Glasgow. This work with children seemed to help him master a long-established shyness of manner, which he never quite lost. In 1941, immediately after joining the R.A.M.C., he found himself in the Middle East. During much of his four years of active service in the Western Desert, Sicily, and Europe he was regimental medical officer to the 5th battalion of the Black Watch Regiment. His constancy in battle earned him the admiration and affection of all his comrades-in-arms. A fellow officer wrote about him: "While the rest of us were scrambling to get below ground level, Donald would go on treating the wounded." This strength and courage came not from a lack of fear but from overcoming fear. Devotion to duty often led him to neglect his own medical needs in attending to those of others. He adhered firmly to Christian principles throughout his life. After demobilization Dr. McRobbie worked as a house-surgeon at Aberdeen Royal Infirmary, and in 1946 took up general practice in Turriff. He followed a simple rule—the needs of the patients come first. In all matters of professional care and behaviour he set himself the highest of standards and was shocked by any attempt to abandon honourable traditions. His steadfastness in the face of illness and adversity was worthy of a true son of the north-east. We extend our deepest sympathy to his wife and to his mother in their sad loss.—W. R. C. I.

Dr. E. W. ROUTLEY died at Aldershot on December 5, 1956, at the age of 90. Edwin Walter Routley was born at Bath on October 27, 1866, and was educated at King Edward VI Grammar School, Bath, where he was a scholar. After leaving school he became a pharmacist and an expert photographer before taking up the study of medicine rather late in life. He received his medical training at Guy's Hospital, where he won the Golding-Bird gold medal and a scholarship in bacteriology in 1905. In 1902, while still a medical student, he was awarded a prize for an essay on consciousness by the Guy's Hospital Physical Society. He qualified M.R.C.S., L.R.C.P. in 1904, taking the Brussels M.D. in the same year and the Cambridge D.P.H. in 1905. He became a Member of the Royal College of Physicians of London in 1911. After qualification he held the post of assistant demonstrator in bacteriology at Guy's Hospital. In 1905 he was appointed medical officer of health for Aldershot, a post he retained until his retirement in 1931. He was also assistant tuberculosis officer to the Hampshire County Council and lecturer in sanitary law and administration at King's College, London. Other appointments he held at Aldershot included those of honorary bacteriologist and pathologist to the local hospital, medical superintendent of the isolation hospital, and medical officer to the education committee. During the second world war he reassumed the duties of medical officer of health while his successor, Dr. J. Craig Lindsay, was in the R.A.M.C. In the intervening period of eight years (1931-9) he was employed as a civilian medical practitioner with the R.A.M.C. and was medical officer to the 1st Guards battalion at Aldershot. By nature Dr. Routley was quiet and gentle, with a great love of children. He married twice and was a widower for the last 34 years of his life. He is survived by one daughter and two sons, one of whom is also medically qualified and a Guy's man.

Dr. W. A. ANDERSON, formerly senior surgeon to the Benn Eye, Ear, and Throat Hospital, Belfast, and chairman of the board of management of the Belfast Ophthalmic and Benn Hospitals, died on December 9, 1956, at the age of 71. From the Royal Belfast Academical Institution William Arthur Anderson went on to Clare College, Cambridge. He received his clinical training at the Royal Victoria Hospital, Belfast, and qualified by taking the London Conjoint diploma in 1910. After holding the appointment of house-surgeon at the Royal London Ophthalmic Hospital he graduated M.B., B.Chir. in 1914, and shortly afterwards joined the staff of

the Benn Hospital. During the first world war he served in the R.A.M.C. as an ophthalmic specialist in France, Belgium and Italy for four eventful years. He was mentioned in dispatches, and in 1919 was awarded the Médaille des Épidémies (d'Or) by the French Government. After the war he proceeded to the M.D. in 1921. When he returned home the Benn Hospital was a small establishment of twenty beds doing an immense amount of work with very scanty resources and struggling from deficit to deficit. Dr. Anderson, being a man of great energy, was a valuable acquisition, and for over thirty years he was to provide the additional force needed to secure the enlargement of the hospital. When he retired in 1950, as senior surgeon, it was an institution of which he could be proud. On his retirement he became honorary consulting surgeon to the hospital and was presented with an illuminated certificate on his election as an honorary governor. His services were also retained as a member of the Belfast Ophthalmic and Benn Hospitals management committee. Dr. Anderson had held office as president of the Irish Ophthalmological Society and of the Ulster Medical Society and as vice-president of the Ophthalmological Society of the United Kingdom. He was a member of the Ophthalmic Group Committee of the British Medical Association from 1945 to 1949, and for many years he was a deputy lieutenant for the city of Belfast. He was a skilled operator, and his opinions were always inspired by common sense and were respected and sought after by all his colleagues. He ultimately became chairman of the board of management of the Belfast Ophthalmic and Benn Hospitals and guided their fortunes successfully in a very difficult time. A true and sincere friend, he could always be relied on in any difficulty. He was always loyal to medicine, but farming was his second love. In 1945 he contributed an article to the *Ulster Medical Journal* on soil and nutrition. He took farming seriously with sound common sense and success until failing health compelled him to take life more easily. He is survived by his wife and two sons, to whom we extend our sincere sympathy in their loss.

Universities and Colleges

UNIVERSITY OF ABERDEEN

At a graduation ceremony on December 12, 1956, the following degrees were conferred:

M.D.—J. Watt (with honours), Jessie C. Yorston (née Millar) (with commendation).
 Ch.B.—T. L. Carr.
 M.B., Ch.B.—C. C. Constantinides, A. E. Silbergh, H. G. Tough, A. Tullett, A. J. Watt, D. Wilkinson.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the College held on December 12, 1956, with Sir Walter Mercer, President, in the chair, the following candidates, having passed the requisite examinations, were admitted Fellows:

J. E. B. Ailing, A. M. H. Y. Ansari, A. W. Beasley, F. H. Beddow, J. Blundell, S. P. Chandra, D. B. Chrisp, J. M. D. Crook, S. K. Das, H. L. Dunthie, T. J. El-Gailani, D. C. Evans, A. V. Foote, A. K. Ganapadhyay, E. R. Ghabbour, H. M. Hathout, W. R. Holmes, J. Hughes, A. E. Ikomi, T. K. Jagose, T. S.-B. Kelly, K. S. Kochhar, J. McArthur, I. W. A. McFarland, A. H. D. McJannet, I. J. MacQueen, G. A. Marin, A. Mulholland, J. Nayman, M. K. Panandikar, R. C. Patel, K. N. Pathak, R. Paton, J. A. Riedel, J. B. Ritchie, W. V. Rowe, T. L. Sarkin, C. H. Schulman, C. L. Shah, R. P. Singh, Mary E. O. Skinner, A. N. Smith, R. Stranz, E. C. Watson, C. U. Webster, C. H. Wolpe.

ROYAL AUSTRALASIAN COLLEGE OF PHYSICIANS

At a meeting of the Council of the College held at Melbourne on October 9 the following candidates, who were successful at an examination by the Australian Board of Censors, were admitted to Membership of the College: Dr. A. G. Zaver, of Queensland; Dr. C. S. H. Reed, Dr. D. E. Smith, and Dr. N. J. Yorkston, of New South Wales; Dr. C. W. Baird, Dr. R. H. D. Bean, Dr. J. L. Blunt, Dr. A. C. L. Clark, Dr. R. K. Doig, and Dr. W. H. Orchard, of Victoria; Dr. N. D. Abbott, Dr. R. G. Gold, and Dr. P. M. Last, of South Australia; Dr. D. D. Letham, of Western Australia.

Vital Statistics

Infectious Diseases

The largest variations in the notifications of infectious diseases in England and Wales during the week ending December 15 were increases of 515 for measles, from 5,978 to 6,493, and 72 for food-poisoning, from 247 to 319, and decreases of 147 for whooping-cough, from 2,126 to 1,979, and 80 for scarlet fever, from 846 to 766.

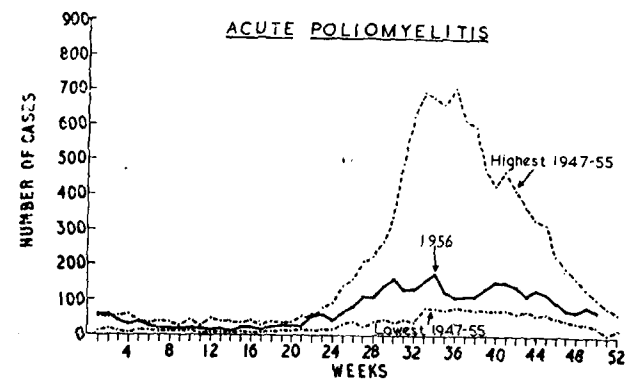
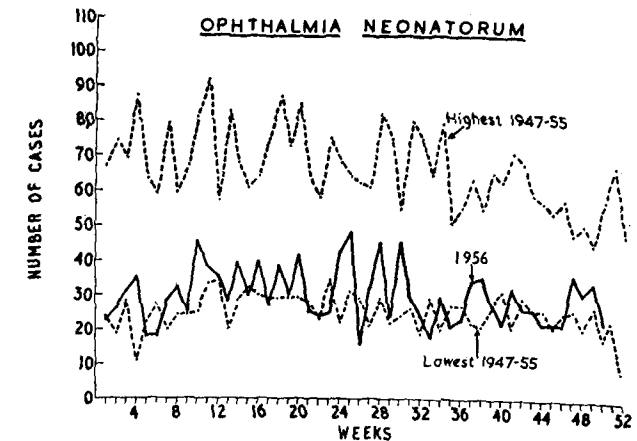
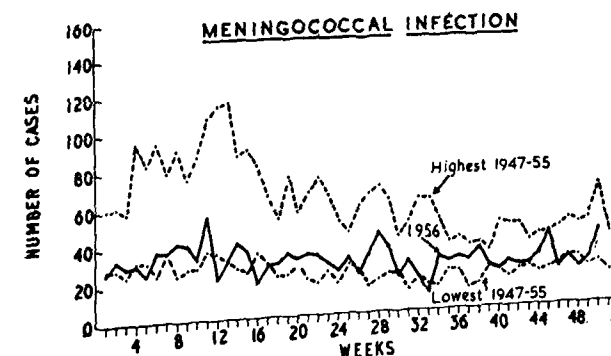
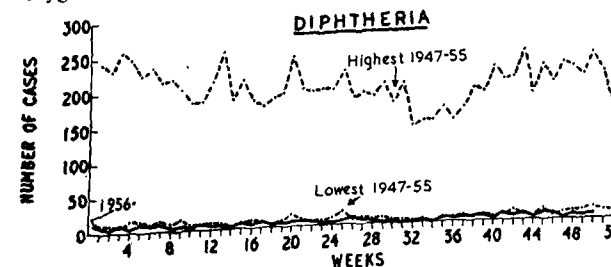
The largest rises in the incidence of measles were 188 in Lancashire, from 1,501 to 1,689, 109 in Staffordshire, from 200 to 309, and 57 in Gloucestershire, from 187 to 244; the largest fall was 48 in Kent, from 148 to 100. No large fluctuations were recorded in the local trends of whooping-cough. The largest decrease in the number of notifications was 39 in Durham, from 81 to 42. 6 cases of scarlet fever were notified, being 2 more than in the preceding week; 3 of the cases were recorded in Staffordshire, Coseley U.D.

73 cases of acute poliomyelitis were notified, and these were 6 fewer for paralytic and 3 fewer for non-paralytic cases than in the preceding week. The largest returns were London 12 (Lambeth 3, Lewisham 2, Wandsworth 2), Middlesex 9 (Tottenham M.B. 2), Lancashire 8 (Clitheroe M.B. 2), Surrey 5 (Sutton and Cheam M.B. 4), and Sussex 5 (Brighton C.B. 3).

The notifications of dysentery numbered 808 and were 22 fewer than in the preceding week. The largest centres of infection were Yorkshire West Riding 119 (Sheffield C.B. 26, Leeds C.B. 20, Huddersfield C.B. 13, Colne Valley U.D. 13), Warwickshire 109 (Coventry C.B. 94), Lancashire 88 (Salford C.B. 13, Wigan C.B. 13, Blackburn C.B. 11, Bury C.B. 10, Liverpool C.B. 10), Essex 69 (Chigwell U.D. 25, Romford M.B. 12, Thurrock U.D. 12, Ilford M.B. 10), Surrey 57 (Esher U.D. 19, Mitcham U.D. 10), London 50 (Islington 18), Kent 44 (Chislehurst and Sidcup U.D. 17, Bromley M.B. 14), Orpington U.D. 10), Bedfordshire 39 (Luton M.B. 39), Nottinghamshire 21 (Nottingham C.B. 19), and Middlesex 20.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1947-55 are shown thus -----, the figures for 1956 thus ———. Except for the curves showing notifications in 1956, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Food-poisoning in 1955

A review of food-poisoning in England and Wales during 1955¹ shows that 8,961 incidents were recorded—an increase of 2,945 on the total for 1954. The number of notifications (uncorrected) received by the Registrar-General was 12,717, but in the outbreaks reviewed here there were over 20,000 cases. Of the 8,961 outbreaks 7,626 were sporadic cases, 723 family outbreaks, and 612 general outbreaks. The causal agent was not established in 3,447 incidents. *Salmonella typhi-murium* was responsible for 47% of all incidents and 76% of the known causes, and other salmonellae were responsible for 12% of all incidents and 19% of the known causes. The fatal cases reported numbered 39; 25 of these were due to *Salm. typhi-murium* and 9 to other salmonellae. Four of the 34 fatal cases due to salmonellae were patients aged under 50 years; 20 were aged 50 and over.

The vehicle of infection was meat in 255 of the 312 outbreaks for which information was available; 228 of these were due to processed and made-up meat dishes. Reheated meats were the largest class in this group with 49 outbreaks, meat pies were second with 41 outbreaks, and in descending order cold meats, cold ham and bacon, and pressed meats. There was a close association between reheated meat and *Clostridium welchii* and between cold ham and bacon and staphylococci. The places where contaminated food was eaten or bought was known in 287 outbreaks; they were canteens 109, hospitals 69, shops 37, institutions 31, restaurants, cafés, etc., 24, and private parties 17.

Salmonellae were isolated in 5,383 incidents; 4,879 of these were due to 17 endogenous types (recognized before 1940), 443 to 65 exogenous types (recognized in 1940 or later), and 61 were unidentified or unnamed types. The most frequent among the endogenous types were *Salmonella typhi-murium* 4,276, *Salmonella thompson* 164, and *Salmonella stanley* 101. The largest groups among the exogenous types were *Salmonella heidelberg* 77, *Salmonella anatum* 50, and *Salmonella saint-paul* 37.

¹ Monthly Bull. Minist. Hlth (Lond.), 1956, 15, 263.

The high proportion of incidents with undiscovered causes was probably due to failure in reporting and delay in investigating these outbreaks. Recent experience suggests, says the report, that food-handlers cannot be incriminated as the cause of outbreaks, since they are generally infected at about the same time as the other patients. The latest food regulations may help to decrease food-poisoning from organisms other than salmonellae but can make little difference to the general picture so long as foodstuffs contaminated by salmonellae are allowed to be distributed.

Clean Air

Certain provisions of the Clean Air Act, 1956, came into operation on December 31. Similar provisions apply to Scotland. They enable local authorities to create smoke-control areas by Orders subject to confirmation by the Minister of Housing and Local Government. All new furnaces other than small domestic boilers must be, so far as practicable, smokeless. The Minister is empowered to make regulations requiring furnaces to be fitted with smoke density meters. The height of new chimneys, other than those of houses, shops, and offices, will require approval by the local authority. Owners of colliery spoilbanks must employ all practicable means for preventing combustion of refuse and for preventing or minimizing the emission of smoke and fumes from the refuse. Local authorities may make building by-laws requiring the provision in new buildings of such arrangements for heating and cooking as are calculated to prevent, so far as practicable, the emission of smoke.

Venereal Diseases

In England and Wales during the quarter ending June 30, 1956, 1,284 new cases of syphilis were reported as attending the clinics. Of these, 188 were classified as primary, secondary, or latent in the first year of infection. 10 cases of congenital syphilis in children aged under 1 year were reported, and 139 cases in persons over that age. New cases of gonorrhoea numbered 4,964, of chancroid 88, and of non-gonococcal urethritis (males only) 3,798.—*Monthly Bulletin of the Ministry of Health*, December, 1956.

England and Wales in Third Quarter, 1956

The number of live births in England and Wales in the quarter ending September 30, 1956, was 173,586, giving a rate of 15.5 per thousand population. This was 0.6 above the rate for the corresponding quarter of 1955. Stillbirths numbered 4,007, a rate of 22.6 per thousand live and stillbirths. This rate is 0.4 lower than that for the corresponding quarter of 1955. The number of deaths registered was 104,118, a rate of 9.3 per thousand population. The rate for the September quarter of 1955 and also the average rate for the corresponding quarters of the preceding five years 1950-4 was 9.1 per thousand population. The infant mortality rate was 20.3 per thousand related live births. This is the lowest quarterly rate ever recorded in England and Wales.

A new Table gives figures of accidental deaths in the March quarter. Of 4,670 deaths registered as accidental, 2,297 resulted from home accidents, 1,489 from transport accidents, and 884 from other accidents. Of the home accidents, 277 deaths were caused by coal-gas poisoning, 324 by burns and scalds, and 195 by choking and suffocation. Included in the 1,489 deaths from transport accidents were 222 of motor-cyclists, 126 of pedal cyclists, 621 of pedestrians, and 286 of motor-vehicle occupants. Of the total of 192 accidental deaths of children aged under 1 year, 154 were recorded as due to choking and suffocation.

Week Ending December 22

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 735, whooping-cough 1,732, diphtheria 10, measles 6,575, acute pneumonia 465, acute poliomyelitis 60, dysentery 696, paratyphoid fever 2, and typhoid fever 1.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending December 15 (No. 50) and corresponding week 1955.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire. A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1956					1955				
	Eng. & Wales	Land.	Scot.	N. Ire	Eire	Eng. & Wales	Land.	Scot.	N. Ire	Eire
Diphtheria	6	0	6	0	4	17	2	5	0	7
Dysentery	808	50	245	6		837	36	142	9	
Encephalitis, acute	5	1		0		3	1		0	
Enteric fever:										
Typhoid	1	0	0	0	1	9	1	0	1	
Paratyphoid	2	0	3(B)	0		4	3	5(B)	0	
Food-poisoning	319	29	22	0		210	11		4	
Infective enteritis or diarrhoea under 2 years										
Measles*	6,493	397	542	189	161	2,952	13	74	9	30
Meningococcal infection	39	3	14	1	1	29	4	3	1	4
Ophthalmia neonatorum	23	0	10	1		18	1	4	0	
Pneumonia†	550	42	264	4	2	549	29	264	14	3
Poliomyelitis, acute:										
Paralytic	49	8				58	5			
Non-paralytic	24	4		0	9	31	2		5	1
Paraperal fever‡	188	18	10	3		204	34	8	2	
Scarlet fever	766	56	70	18	23	1,035	80	125	41	25
Tuberculosis:										
Respiratory	578	64	134	27		537	49	111	24	
Non-respiratory	88	4	16	6		73	5	13	2	
Whooping-cough	1,979	101	354	16	35	1,068	71	99	85	88

DEATHS In Great Towns	1956					1955				
	Eng. & Wales	Land.	Scot.	N. Ire	Eire	Eng. & Wales	Land.	Scot.	N. Ire	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	2
Dysentery	0	0		0		1	0		0	
Encephalitis, acute		0			0		0			0
Enteric fever	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	7	0	1	0	0	10	0	3	0	1
Influenza	12	1	1	0	1	17	1	0	0	0
Measles		0	0	0	0		0	0	0	0
Meningococcal infection		0	0				0	0		
Pneumonia	279	40	14	11	6	291	59	27	10	9
Poliomyelitis, acute	2	1			0	4	0			0
Scarlet fever		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory	59	10	10	0	4	90	6	6	1	2
Non-respiratory		0	1	0	1		1	1	0	0
Whooping-cough	1	0	0	0	0	1	0	0	0	0
Deaths 0-1 year	225	26	17	8	12	214	28	40	5	10
Deaths (excluding stillbirths)	5,316	769	529	220	150	5,718	823	647	105	174
LIVE BIRTHS	7,108	1,059	895	115	355	6,802	962	880	154	292
STILLBIRTHS	183	20	26			222	21	21		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenza pneumonia.
‡ Includes puerperal pyrexia.

Medical News

B.M.J. Centenary.—On January 3, 1857, the *British Medical Journal* first appeared under its present title. Before that it had been the *Association Medical Journal*. The new name was a natural corollary of the Association's own change of title. This had been a time of evolution in the Association's affairs. After the annual meeting in York in 1855 voting papers were issued to the 2,094 members of the then Provincial Medical and Surgical Association, so that they could record their views on how their Association should be named. A thousand votes were cast in this poll, the title "British Medical Association" being advocated by a majority of 260. Next a special general meeting, convened at Birmingham in November, 1855, set up a committee to revise the Association's laws. The new code of laws it produced, which among their other provisions named the Association as the British Medical Association (Law No. 1) and its journal as the *British Medical Journal* (Law No. 24), was finally passed after discussion and some amendment at the next annual meeting—the Association's 24th—held at Birmingham in July, 1856. From being headed "*Association Medical Journal*: being the Journal of the Provincial Medical and Surgical Association" on August 2, at the next issue, on August 9, 1856, the *Journal's* title had become "*Association Medical Journal*: being the Journal of the British Medical Association." However, the final retitling had to wait upon formalities at the Stamp Office, and it was not until January 3, 1857, that the *Journal* first appeared under its present name.

Assistant D.-G. of W.H.O.—Dr. P. M. KAUL, formerly director of W.H.O.'s division of external relations and technical assistance, has been appointed Assistant Director-General in charge of the department of advisory services, in place of Dr. VICTOR SUTTER, who has become Minister of Public Health and Social Assistance in El Salvador. Dr. Kaul was born in India in 1906. He graduated in medicine from the King Edward Medical College, Lahore, later obtaining the D.P.H.(Eng.) and the M.R.C.P.(London) after postgraduate study in London at Guy's Hospital and King's College. From 1934 to 1945 Dr. Kaul was in the Indian Medical Service, latterly with the rank of acting colonel. Then he became additional deputy public health commissioner with the Government of India until joining the World Health Organization in 1948. For some years Dr. Kaul served as chief of the W.H.O. liaison office with the United Nations in New York. He then went to Geneva as head of the external relations division.

Schistosomiasis in Africa.—Under the auspices of the World Health Organization a conference of 30 experts met at Brazzaville, French Equatorial Africa, from November 26 to December 8 to discuss the problem of bilharziasis in Africa. Since 1950 W.H.O. consultants have been surveying the incidence of the disease there and studying the distribution of the intermediate snail hosts of the schistosome cercariae. These surveys have shown that infection is rife in most African territories, on both East and West Coasts, in Egypt, the Union of South Africa, and Madagascar; but it is thought to be absent from South-west Africa, Ruanda Urundi, Basutoland, and Mauritius; a single focus was reported in Bechuanaland. Animal bilharziasis is generally far more widespread than human disease, being found in cattle, sheep, goats, camels, rodents, dogs, equines, antelopes, buffalo, and even elephants. But the importance of the animal reservoir of infection remains rather uncertain; in the Philippines, for instance, epidemiological studies were stated to have shown that man is responsible for up to 75% of the production of the parasites, domestic animals accounting for the remaining 25%. Besides the epidemiology of the disease, the conference also discussed control measures of the disease, and by improving sanitation. Among those who attended the conference were Dr. W. ALVES,

Dr. D. M. BLAIR, and Mr. H. V. DE VILLIERS CLARKE, from Southern Rhodesia; Dr. BOTHA DE MEILLON and Dr. R. J. PITCHFORD, from South Africa; Dr. P. L. LE ROUX and Dr. J. NEWSOME, from Great Britain; and Dr. E. T. ABDEL MALEK, from the Sudan.

St. John Ambulance Brigade.—Major-General J. M. KIRKMAN has been appointed commissioner-in-chief of the St. John Ambulance Brigade in succession to the late Sir OTTO LUND. General Kirkman has had a distinguished military career. Before and during the second world war he was in Military Intelligence, and attended the Washington, first Quebec, Cairo, and Teheran conferences on the staff of the British chiefs of staff. In 1944 he was on the staff at Salisbury during the launching of operation "Overlord"; and then was appointed chief of staff to the British Forces in Greece and subsequently in Palestine. In 1948 General Kirkman became chief of staff, Land Forces Far East, until 1950, when he took up the post of chief of the intelligence division in Germany. He retired from the Army in 1954.

Chair of Physiology at Middlesex Hospital.—London University announces the appointment of Dr. E. NEIL to the John Astor Chair of Physiology at the Middlesex Hospital Medical School. The previous occupant of this Chair was the late Professor SAMSON WRIGHT. Dr. Neil, who until his present appointment held the university readership in physiology at the Middlesex Hospital Medical School, is a graduate of Leeds University. He obtained the B.Sc., with first-class honours in physiology, in 1939, graduated M.B., Ch.B. in 1942, and proceeded to the M.D., with distinction, in 1944 and the D.Sc. in 1953. He has carried out research on the reflex control of the circulation and respiration.

Release of "Prednisone" and "Prednisolone."—The Ministry of Health in conjunction with the Department of Health for Scotland and the Ministry of Health and Local Government, Northern Ireland, have made arrangements with United Kingdom manufacturers of prednisone and prednisolone which will enable preparations of these substances to be supplied on prescription from February 1.

Public Health Engineering.—A co-ordinating committee has been set up to deal with problems of public health engineering. The chairman is Sir ALLEN DALEY, and the constituent bodies, each of which has one representative on the committee, are: the Institute of Sewage Purification; the Institutions of Municipal Engineers, Public Health Engineers, and Water Engineers; the Royal Society of Health; the Royal Institute of Public Health and Hygiene; the Sanitary Inspectors Association; and the Society of Medical Officers of Health. The committee, whose address is 90, Buckingham Palace Road, London, S.W.1, will be pleased to consider appropriate questions put to it through the councils of other organizations.

Aerial Bactericides.—The British Standards Institution has published a British Standard describing a technique for the preliminary assessment of aerial bactericides (B.S. 2796: 1956, price 3s. 6d. from the sales branch, 2, Park Street, London, W.1). In addition to its primary purpose as a screening test for potential aerial bactericides, the technique is also recommended for "quality control" in manufacture. Details are given of the test-chamber, test-organism, and culture medium, physical conditions during testing, how to produce the bacterial spray; and of serial sampling, interpretation of results, and checking the technique by means of a "reference" bactericide.

Cambridge University.—Dr. L. B. COLE, senior physician of Addenbrooke's Hospital, has been appointed deputy for the Regius Professor of Physic until further notice, for all purposes except that of acting as head of the department of medicine. Dr. F. G. J. HAYHOE, university lecturer in medicine, has been appointed deputy head of the department of medicine from December 5 until further notice.

Reader in Pharmacology at Guy's.—Dr. J. A. NISSIM, senior lecturer in pharmacology at Guy's Hospital Medical

School, has had conferred on him the title of reader in pharmacology in the University of London.

Professor W. W. Mushin, professor of anaesthetics at the Welsh National School of Medicine, is going to the University of California Medical Centre during March as visiting professor of surgery (anaesthetics). On his way he will address the New York State Medical Society at its sesquicentennial celebrations in February.

First Southern Rhodesian African to Qualify.—The Secretary of Health of the Federation of Rhodesia and Nyasaland, Dr. R. M. MORRIS, announces that Mr. S. PAREREN-YATWA, who graduated in medicine last month at Witwatersrand University, Johannesburg, is the first African from Southern Rhodesia to qualify as a doctor. Mr. Pareren-yatwa also holds the B.Sc. (Hygiene) of Fort Hare University, Cape Province.

COMING EVENTS

United Hospitals Catholic Society.—Course of seven lectures in medical ethics on alternate Mondays, 6.15 p.m., at 13, Devonshire Place, London, W.1, starting January 7. Fee 5s. for non-members of the society.

Institute of Diseases of the Chest, London.—Clinical demonstrations open to medical practitioners will be held on Fridays at 5 p.m., January 11 to March 29. No fee.

Marc Daniels Lecture.—Dr. W. D. W. BROOKS will deliver the Marc Daniels lecture on January 15 at 5 p.m. at the Royal College of Physicians, Pall Mall East, London, S.W.1. His subject will be "The Prevention of Tuberculosis."

Goulstonian Lectures.—Dr. RAYMOND DALEY will deliver the Goulstonian lectures on January 17 and 22 at 5 p.m. at the Royal College of Physicians, Pall Mall East, London, S.W.1. His subject will be "The Autonomic Nervous System in its Relation to Some Forms of Heart and Lung Disease."

Disorders of Bone.—Details of a week's course (January 28-February 2) on disorders of bone, arranged by the Institute of Orthopaedics, London University, are given at p. 53 of the advertisements this week.

"Education for Motherhood."—Seminar for medical officers and divisional assistant medical officers will be held at St. John House, Collingham Gardens, London, S.W.5, February 26 to March 1. Professor W. C. W. NIXON will deliver the inaugural address. Details from the Medical Director, Central Council for Health Education, Tavistock House, Tavistock Square, London, W.C.1.

NEW ISSUES

British Journal of Ophthalmology.—The new issue (Vol. 40, No. 12) is now available. The contents include:

PERMEABILITY OF THE CORNEA AND THE BLOOD-AQUEOUS BARRIER TO OXYGEN. Kathleen Heald and Maurice E. Langham.
OCULAR ALBINISM WITH CHANGES TYPICAL OF CARRIERS. Václav Ohl.
VASCULARIZATION OF THE OPTIC PATHWAY. V. CHIASMA. J. François, A. Nectens, and J. M. Collette.
ECZEMA OF THE EYELIDS. Peter Borrie.
OXYPHENONUM BROMIDE AS A MYDRIATIC. H. Fraser.
ANOMALOUS DEVELOPMENT OF RETINAL VESSELS. Marjory B. Snodgrass.
PARAPHIMOSIS ORBICULARIS. Lloyd M. Weerekoorn.
RHABDOMYOSARCOMA OF THE ORBIT. N. S. Jain, D. V. Sethi, and K. C. Mahajan.
HERPES OPHTHALMICUS. R. S. MacLachly.
CORRESPONDENCE, BOOK REVIEWS, NOTES.

Issued monthly; annual subscription £4 4s.; single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Ophthalmic Literature.—The new issue (Vol. 10, No. 2) is now available. It contains a comprehensive selection of abstracts of the literature on ophthalmology and related subjects. Six issues and a volume index each year; annual subscription £4 4s. (or in combination with *British Journal of Ophthalmology*, £7 7s.); single copy 25s.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Saturday, January 5

E.E.G. SOCIETY.—At National Hospital, Queen Square, W., 10 a.m. to 4 p.m., meeting. Scientific papers.

Monday, January 7

MARLBOROUGH DAY HOSPITAL.—8.15 p.m., Dr. H. C. Beeble: Role of the Medical Superintendent in Modern Psychiatry.

● UNITED HOSPITALS CATHOLIC SOCIETY.—At 13, Devonshire Place, W., 6.15 p.m., The Reverend John McDonald: The Moral Law and Medicine.

Tuesday, January 8

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Sir Solly Zuckerman, F.R.S.: Biological Systems.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. Phyllis Wade: Radiation Treatment of Skin Cancer (Part I).

Wednesday, January 9

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Significance of Yeasts in Skin Diseases.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Mr. D. S. M. Barlow: Oesophageal Obstruction.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION: PSYCHOTHERAPY AND SOCIAL PSYCHIATRY SECTION.—At 11, Chandos Street, W., 8 p.m., Dr. M. Balint: General Practice and Psychiatry. (Open to members and their guests.) SOCIETY FOR ANALYTICAL CHEMISTRY: MICROCHEMISTRY GROUP.—At "The Feathers," Tudor Street, E.C., 6.30 p.m., London discussion meeting.

Thursday, January 10

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, W., 8 p.m., Dr. E. Weissmann: The Unconscious in Adlerian Psychology and Psychotherapy.

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor Geoffrey Hadfield: Role of the Endocrine System in Breast Cancer.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. Phyllis Wade: Radiation Treatment of Skin Cancer (Part II).

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., symposium: Advances in Control of the Circulation during Surgery. Dr. T. Cecil Gray: Induced Hypotension and Hypothermia; Dr. J. W. Dundee: Hypothermia in Neurosurgery; Mr. L. J. Temple: Development of Heart-Lung Pumps for Cardiac By-pass during Operations on the Heart.

LONDON UNIVERSITY.—At Wright-Fleming Institute Lecture Theatre, St. Mary's Hospital Medical School, 5 p.m., special university lecture in medicine by Professor C. A. Janeway (Harvard): Physiology of the Plasma Proteins.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Watson Smith Lecture by Dr. R. M. B. MacKenna: Acne Vulgaris.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor J. I. P. James: Paralytic Scoliosis.

Friday, January 11

● INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. C. D. Calnan: clinical demonstration.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. K. Robson: clinical demonstration.

INSTITUTE OF LARYNGOLOGY AND OTITIS.—3.30 p.m., Mr. A. R. Dingley: Cancer of the Mouth and Pharynx.

LONDON UNIVERSITY.—At Wright-Fleming Institute Lecture Theatre, St. Mary's Hospital Medical School, 5 p.m., special university lecture in medicine by Professor C. A. Janeway (Harvard): Physiology of the Plasma Proteins.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Ophthalmology Lecture by Professor A. Sorsby: Neomycin in Ophthalmology.

ROYAL MEDICAL SOCIETY, EDINBURGH.—8 p.m., dissertation by Mr. R. J. Wilson: Neoplasia.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Jones.—On December 26, 1956, at St. David's Hospital, Bangor, to Mary (formerly Snelling), wife of Dr. Ellis Jones, a son.

Watson.—On October 3, 1956, to Moira, wife of John S. Watson, M.D., M.R.C.P., of 22, Cambait Road, Putney, London, S.W., a sister for William.

Watts.—On December 18, 1956, at the Royal Free Hospital (Liverpool Road Maternity Annex) to Joan (formerly Lambert), M.B., B.S., M.R.C.O.G., wife of Richard W. E. Watts, Ph.D., M.B., B.S., M.R.C.P., a son—Richard Arthur.

MARRIAGES

Burrell—Osselton.—On December 12, 1956, at Newcastle-upon-Tyne, James T. J. C. Burrell, LL.B., to Bridget A. W. Osselton, M.B., B.S.

DEATHS

Brown.—On December 4, 1956, at Byron Bay, New South Wales, Australia, James Alexander Spence Brown, B.Ch., aged 57.

Hornby.—On December 13, 1956, at The Limes, Walkden, near Manchester, Mary Kate Hornby (formerly Carroll), M.B., B.Ch.

Lowe.—On December 10, 1956, at his home, 8, Alexandra Road, Burton-on-Trent, William Pickering Lowe, M.B., B.Ch.

Mills.—On December 2, 1956, at Downside, Bexhill-on-Sea, Sussex, Reginald Peter Mills, M.R.C.S., L.R.C.P., aged 41.

Patterson.—On December 8, 1956, at Dunedin Nursing Home, Deal, Kent, Thomas Charles Patterson, M.B., Ch.B., Surgeon Captain, R.N., retired, of Kingsdown, Deal, late of Christchurch, New Zealand.

Routley.—On December 5, 1956, at Aldershot, Hants, Edwin Walter Routley, M.D., M.R.C.P., D.P.H., aged 90.

Topping.—On December 8, 1956, at Catterick Military Hospital, York, Robert Ashley Ramsay Topping, M.R.C.S., L.R.C.P., D.T.M.&H., Lieutenant-Colonel, R.A.M.C., son of the late Professor Andrew Topping.

Waters.—On December 11, 1956, at his home, 176, Goring Way, Goring-by-Sea, Sussex, Alfred Charles Stanley Waters, M.R.C.S., L.R.C.P., late of March, Cambs.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Doctors with Cancer

Q.—Much stress is being laid on the importance of the early diagnosis of cancer in obtaining the best five-year cure rate. As doctors are themselves the best observers of the earliest symptoms of cancer, are there any figures to show that the cure rate of cancer in doctors is substantially better than in laymen?

A.—There are two facets to this very pertinent question: (1) Is the "cure rate" in doctors better than in laymen? (2) Do doctors seek investigation for suspected cancer sooner than laymen? Dublin *et al.*¹ investigated the first of these questions in the United States and found that "the death rate from cancer for each of the important sites is lower among physicians than among white males generally." The rate per 100,000 was 198 doctors to 245 laymen, a ratio of 0.81.

To the second question, Robbins *et al.*² were not able to return such an optimistic answer. They found, when comparing figures of 1923-8 with those of 1948, that there was during this time an improvement of 20% in the delay in seeking advice attributed to the patient, whereas the "culpability of the first physician consulted did not improve, in fact worsened from 17 to 23.4%." This "startling discovery" led them to wonder what sort of patient a physician himself would prove to be with regard to the early diagnosis of cancer. The answer was that there was no difference at all between a group of 229 physicians and 2,000 laymen, 39% of each group being considered to be blameworthy for delay in diagnosis and treatment.

REFERENCES

1. Dublin, L. I., Spiegelman, M., and Leland, R. G., *Postgrad. Med.*, 1947, 2, 188.
2. Robbins, G. F., Macdonald, M. C., and Pack, G. T., *Cancer*, 1953, 6, 624.

Treatment of Ringworm in the Tropics

Q.—What treatment is advised for long-standing ringworm in tropical climates? What is the prospect of eventual cure?

A.—This is a very wide question and does not indicate the site affected by ringworm. Here ringworm of the scalp will be excluded and only some of the epidermophytoses considered.

Chronic tinea pedis may become troublesome in hot climates as a result of active blistering, secondary infection, and lymphangitis. In such an acute phase soaking in potassium permanganate solution (1 in 8,000) and the application of the following ointment are helpful: Gentian violet 0.5%, acid. salicyl. 1%, and equal parts of ung. emulsificans and paraf. moll. to 100%. Sulphonamide by mouth may be indicated for lymphangitis, and rest in bed is usually essential. In the more chronic phase microscopic examination of scrapings from the scaling areas should be carried out and cultures made from them. In the Tropics *T. rubrum* is common and is usually rather resistant to treatment. Locally ung. acid. benzoic. co. (Whitfield's ointment) is still as effective as most, though in the absence of the blistering dithranol (0.1%) in Lassar's paste is useful. The latter should not be applied to the tender skin of the instep. The nails of both the feet and hands should be carefully inspected and scrapings from any which are dystrophic examined for fungus. Infected nails require removal, but it is best to wait until the skin infection has been controlled. Within a day or two of removal the nail base should be treated with fungicidal ointment.

Tinea infection may be present in other sites. Tinea cruris usually clears readily with Whitfield's ointment, and more irritant preparations should be avoided. Pruritus ani may occur in a patient with tinea pedis as a result of infection in the perianal skin. Roughness of the palms of one or both hands resulting from hyperkeratosis may indicate infection with *T. rubrum*, and, indeed, it is now appreciated that smooth skin in any part of the body may become infected.

The prospect of cure is not good, though the infection can be kept controlled especially if care is taken in the toilet of the feet—daily washing with soap and water, especially between the toes, careful drying, and the use of fungicidal powders as a routine. The difficulty is to prevent re-infection either from socks, shoes, and slippers or from bath mats, duck-boards, etc.

Cheirpompholyx

Q.—What treatment would be likely to cure a case of cheirpompholyx? Local treatment with hydrocortisone ointment has not been successful in preventing recurrence.

A.—Cases of cheirpompholyx are among the most difficult with which a dermatologist has to deal. Some cases appear to depend upon chronic ringworm of the feet, and if this is present it should be treated along the usual lines. In most cases, however, no other lesion of the skin is present. The disorder may be associated with excessive sweating of the palms, and attacks may be brought on by hot weather or by emotional factors. In spite of this, drug treatment intended to reduce sweating seldom affects cheirpompholyx, and any psychiatric upset cannot usually be precisely defined and treated. Sedatives seem to be of no benefit. Treatment therefore resolves itself into a trial of various therapeutic measures which may from time to time help individual cases. Chief among these is x-ray treatment which is given during a period of quiescence with a view to preventing fresh attacks. Hydrocortisone is often unsuccessful, but in the worst cases the systemic administration of steroids—e.g., 30-40 mg. prednisone daily by mouth for a few days—will often cut short an attack. Provided the prednisone is given early in the attack, the lesions will often disappear completely within a few days or perhaps a week. After this, the prednisone must be gradually withdrawn, another week or ten days being taken over the process. Prednisone should not be given in the presence of pulmonary tuberculosis, high blood pressure, intestinal ulceration, and other usual contraindications. With a short treatment such as this, many of the complications of more prolonged treatment do not arise. The treatment is relatively trouble-free, though naturally reserved for the more serious case.

Two Anencephalic Monsters

Q.—A healthy woman in her early twenties has given birth to two anencephalic monsters. These resulted from her first and second pregnancies, during which she kept well. Neither in her own nor in her husband's family is there a history of any similar defect. How is anencephaly inherited, and what environmental factors are known to play a part in its aetiology? What is the prognosis as regards further affected children in the family cited?

A.—It is not known how anencephaly is inherited. No environmental factors have been shown to play any part in its causation in man.

A good estimate is available for the risk of anencephaly or spina bifida to later children of a mother who has had one child with anencephaly; the risk is about 1 in 30. But no well-founded estimate is yet available for a woman who, as here, had had two such malformed children. However, the risk is certainly not great. It is probably better than 1 in 10, and may be no more than the risk after one such child.

Sunbathing and Pulmonary Tuberculosis

Q.—*Is there any truth in the view that direct sunlight is harmful to patients suffering from pulmonary tuberculosis, even if the disease is quiescent?*

A.—After an earlier period of enthusiasm for sunlight in the treatment of pulmonary tuberculosis, medical opinion settled down to the general view that, on the contrary, sunlight was deleterious. The position is reviewed by Mayer.¹ More recently a number of cases of tuberculous pleural effusion have been described following sunbathing. Prolonged sunbathing, especially to the inhabitants of these islands who can indulge in it only occasionally, is apt to be exhausting, and any lowering of the body's resistance to the tubercle bacillus may be purely non-specific. Although it is not easy to prove a harmful effect, patients with pulmonary tuberculosis are probably wise to avoid erythematous doses of sunlight on their body.

REFERENCE

- ¹ Mayer, E., *Amer. Rev. Tuberc.*, 1921, 5, 75.

Progressive Cerebral Arteriosclerosis and Hypertension

Q.—*My patient, aged 46, has been suffering from progressive slowing of the mental processes since a left hemiplegia eight years ago, presumably due to cortical thrombosis. The blood pressure has remained constant during this time around 200/110. His vision has begun to fail and memory is now extremely defective. Syphilis has been excluded. The diagnosis is progressive cerebral arteriosclerosis. Is there any specific treatment which might benefit this man? Would large doses of oestrogen be of help?*

A.—In the present state of our knowledge treatment of progressive cerebral arteriosclerosis with hypertension is at best experimental. Stellate ganglionectomy has been tried, but without result. Milder hypotensive agents like reserpine and hydralazine may be tried. Powerful ganglion-blocking agents (methonium, pentolinium) usually reduce cerebral blood flow when the pressure is very low and may aggravate the symptoms. Oral mecamylamine may be used in a dose which reduces the systolic pressure from 200 to about 150-160, but no attempt should be made to bring it down to normal figures. If symptoms become aggravated these drugs must be stopped. The subject of mental disturbance in malignant hypertension is discussed in a recent paper by Clarke and Murphy.¹

Large doses of oestrogens are under trial to limit the development of coronary atheroma. If proved successful they may later find a place in cerebral atherosclerosis. It should be remembered that no treatment will repair the destruction of brain tissue which has already occurred, and the best that could be anticipated would be arrest of the progression of the cerebral damage.

REFERENCE

- ¹ Clarke, E., and Murphy, E. A., *British Medical Journal*, 1956, 2, 1319.

NOTES AND COMMENTS

Scientific Basis for Antenatal Relaxation Exercises.—Dr. ANTHONY RYLE (London, N.W.5) writes: May I comment on the reply on the question of the scientific basis for antenatal relaxation exercises ("Any Questions?" November 24, p. 1251)? There is, I feel, adequate scientific evidence that antenatal education, combined with careful handling of the labour, can reduce the pain of labour in a large proportion of women. The most significant report on this aspect is that of van Eps,¹ whose control series had no analgesia. Considerable reductions in forceps and caesarean rates, in perineal tears, and in neonatal asphyxia are reported by French and Russian writers summarized by Vermorel.² It is possible that these improvements, which are relative to previous experience of the writers, reflect no more than the ill effects of analgesics. They are none the less valuable. As regards pain relief, the mechanism is probably cortical rather than peripheral, and Vermorel gives a full explanation in Pavlovian terms of how this might act. Preparation should therefore be regarded as a combination of rational education and suggestion, and controlled series which lack the element of suggestion and

which ignore the importance of labour-ward atmosphere can clearly expect to achieve no demonstrable results.

REFERENCES

- ¹ van Eps, L. W. St., *Lancet*, 1955, 2, 112.
² Vermorel, H., *L'Accouchement sans Douleur par la Méthode Psychoprophylactique*, 1956. Camugli, Lyons.

OUR EXPERT replies: The original reply to the question made a clear distinction between the effect of relaxation and antenatal exercises on the course of labour and on the pain of labour. The latter is extremely difficult to assess scientifically, and for this reason only a guarded statement was made concerning it. The effect on the duration of labour, on the incidence of perineal tears, and on the need for operative intervention is easier to judge by controlled observations—although, even in this connexion, certain fallacies can arise. Dr. Ryle says that there is "adequate scientific evidence" to substantiate his claims, but gives no details of it. Why is the report by van Eps "the most significant"? Is it because the results support Dr. Ryle's contention, or is it because the inquiry leading to the report was better planned than the many others whose results are opposite? A careful and fair appraisal of the literature on this matter, as well as a detailed analysis of the results obtained in his own hospital, has been made by C. W. L. Burnett.¹ Those who consult his article will have little doubt where the truth lies.

REFERENCE

- ¹ Burnett, C. W. L., *J. Obstet. Gynaec. Brit. Emp.*, 1956, 63, 40.

Infirmity Mice.—Dr. A. J. K. DREW (Ramsgate) writes: With reference to the disappearance of the infirmity mice ("Any Questions?" November 17, p. 1190), rats are known to make occasional sudden departures from old haunts, and it may be that mice do the same thing—especially if given a formal invitation, as the following true story illustrates.

When my father was a young man his parents' stables at the end of a long garden in a small country town were infested with rats, no doubt attracted by the horses' oats and fodder. One day, when talking to the son of the corn merchant, my father mentioned the old Dorset belief or legend that rats could be induced to move if they were sent a polite invitation to a better hole. "If that is all," said the other, "I will write and ask the rats to come to our commodious corn stores, where they will find far more to eat than in your stables. But I shall be surprised if they accept." So a note to that effect was written and pushed into the largest rat-hole. As might have been expected, nothing appeared to happen at first. About two weeks later, however, a few friends returning home in the small hours reported that they had seen a large number of grey rats (definitely not pink ones) making their way along the street going east, that incidentally being the direction to the corn-shop from the stables. It is a fact that from that time our stables, and also another adjoining, became free from rats for many years, while what the corn merchant described as a great plague of rats attached themselves to his premises.

The above is an unvarnished account of what happened. Readers can judge for themselves as to cause and effect. If there are any doubters, let those with suitable premises write and deliver welcoming letters inviting the rats (or mice) from an infested house which is not too far away to their own, and await the result. If they do not like it when it happens—they have been warned.

Correction.—We are informed that the sum given by the Pharmaceutical Society to the Lord Mayor's Fund for Hungarian Refugees was 250 guineas, not 25 guineas as was previously stated (*Journal*, December 29, p. 1542).

Books of "Any Questions?" and Refresher Course Articles.—The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices include postage. *Any Questions?* Volumes 2 and 3 (8s. each); *Refresher Course for General Practitioners*, Volumes 2 and 3 (26s. 6d. each inland, 26s. overseas); *Clinical Pathology in General Practice* (22s. 3d. inland, 21s. 9d. overseas).

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VACCINATION AGAINST POLIOMYELITIS WITH LIVE VIRUS VACCINES**1. A TRIAL OF TN TYPE II VACCINE**

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The successful immunization of children with an orally administered attenuated type II poliovirus has been described by Koprowski, Norton, Jervis, Nelson, Chadwick, Nelsen, and Meyer (1956). The virus used was the TN type II rodent-adapted strain (Koprowski, Jervis, and Norton, 1952; Koprowski *et al.*, 1956). One hundred and fifty children in institutions in the United States of America were vaccinated with this virus between 1950 and 1955. Prior to vaccination all children were without antibody to type II poliovirus; after vaccination nearly every child (in one series 86 out of 87) developed antibody. Reasonably high antibody titres were found and this antibody was shown to persist in a small number of children who were studied over a period of five years. No reactions or illnesses attributable to vaccination were observed in any subject vaccinated.

The TN vaccine virus which had been adapted to growth in mouse C.N.S. did not produce cytopathogenic changes when inoculated on to monkey-kidney-tissue cultures. Only when it was inoculated in large amounts intraspinally or intracerebrally into monkeys did TN vaccine virus cause paralysis or histological lesions. Virus was found in the faeces of about half the children vaccinated, and, like the vaccine virus, it was found to be non-cytopathogenic for tissue culture. For this reason it was detected by the intraspinal inoculation of mice. The last day after vaccination on which virus was found in the faeces was the 23rd day. The highest titre of virus found in any faecal specimen was 10 mouse-paralysing doses₅₀ (MPD₅₀) per gramme (Koprowski *et al.*, 1956). No further information was available about the nature of the faecal virus, but, in view of the very small amounts of virus excreted, transmission from vac-

cinated subjects to their contacts seemed highly improbable. TN virus was never recovered from the throats or from the blood of vaccinated children.

These results were encouraging. The TN type II vaccine appeared, so far as could be judged from the laboratory data and the relatively small numbers vaccinated, to be both safe and immunogenic. With this background a small trial was planned in Northern Ireland to confirm Dr. Koprowski's findings. The possible value of an attenuated type II vaccine in reducing the rate of paralytic poliomyelitis caused by all three poliovirus types is quite unknown, but it seemed reasonable to conduct initial studies with type II virus on general grounds of safety both to the individuals vaccinated and to the community.

The trial was executed in the following manner. In the first place the laboratory characteristics of the vaccine virus as described by Dr. Koprowski were confirmed, then a small number of adults were fed with the vaccine. These adults were members of the laboratory staff and medical students. Later a few infants and the children of the investigators were vaccinated. Finally, the vaccine was fed to a larger group of children. The parents of most of these children were medical practitioners or members of the university staff. A total of 190 individuals were vaccinated between February and July, 1956. Many of the children were vaccinated without prior knowledge of their immune status, and among these there were some already immune to type II poliovirus; however, the majority of children and all the adults were without type II antibody at the time of vaccination. Laboratory investigations and clinical observations were planned in the light of available data. Due allowance had to be made for the fact that normal volunteer subjects leading normal lives were being studied. While in some ways this increased the value of our observations, it meant that the collection of specimens

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¹Consultant Paediatrician, Midway and Gravesend Group of Hospitals.

²Technicians paid with grants from National Fund for Poliomyelitis Research, Medical Research Council, and World Health Organization respectively.

lacked the precision that might have been attained in an institution or penitentiary. Also such studies as the detection of viraemia, which involved daily bleeding, could not be carried out with volunteer children.

Materials and Methods

The vaccine was supplied by Dr. H. Koprowski. It had been prepared from a pool of mouse brain and cord suspension representing the 29th passage in PRI mice of TN type II poliovirus.

Tissue-culture Techniques.—Second-passage monkey-kidney-cell monolayers in roller tubes were used in the virus neutralization tests and for the isolation of cytopathogenic viruses. Lactalbumin medium described by Melnick (1955) was employed throughout.

Virus-neutralization Tests.—These were performed by the method described previously (Dane, Dick, Connolly, Briggs, and McLeod, 1956) using 100 TCD₅₀ of virus. British Standard immune serum against type II poliovirus was used as a control. The titre of this serum was 1 in 640. In this study donors of sera which did not neutralize 100 TCD₅₀ of virus at a 1 in 4 dilution were regarded as being without antibody.

Virus Isolations.—The techniques employed for the isolation of virus from faeces, throat swabs, and blood specimens are described elsewhere (Dick, Dane, Fisher, Connolly, and McKeown, 1957).

Storage of all specimens was at -20° C. The vaccine was stored at -65° C.

Monkeys.—Rhesus monkeys of approximately 7 lb. (3.2 kg.) weight were employed. They were anaesthetized with thiopentone sodium. Intracerebral inoculations were made by the method described by Bodian, Morgan, and Schwerdt (1950). Intraspinal inoculations were made into the lumbar enlargement by placing the inoculum between the second and third lumbar spines. Monkeys were examined each day up to 28 days after intracerebral inoculation and for 14–18 days after intraspinal inoculation. On most days the monkeys were removed from the cages and tested manually for evidence of paralysis. The power of the muscles of the upper and lower limbs was recorded, following the method described by Bodian (1948).

Mice.—The mice were of the VSBS strain of Swiss mice. Intracerebral and intraspinal inoculations were done by the usual methods.

Histology.—Animals were perfused by the method described by Bodian (1948), using 10% formalin containing 10% acetic acid. The usual blocks from brain, brain stem, and cord were embedded in paraffin and stained with gallocyannin.

Laboratory Tests of the Vaccine

The batch of vaccine used in this trial was tested in the following manner by Dr. H. Koprowski at Lederle Laboratories, Pearl River, New York: (1) Monkeys were inoculated by the intraspinal and the intracerebral routes with the vaccine. (2) Guinea-pigs were inoculated subcutaneously and intracerebrally. (3) The vaccine was inoculated onto a variety of bacteriological media.

These tests were repeated in our own laboratory. No evidence was obtained in either laboratory that any micro-organism other than TN type II virus was present in the vaccine.

Results of the inoculation of monkeys with the vaccine are shown in Table I. Our results were similar to those of

Dr. Koprowski; we found that large amounts of virus given by the intracerebral route caused no paralysis. But when given by the intraspinal route the vaccine virus did cause paralysis in some monkeys.

We found that the vaccine virus did not produce cytopathogenic changes in monkey-kidney-tissue culture; neither did it appear to interfere with the growth of small amounts of a cytopathogenic type II poliovirus in tissue culture.

TABLE I.—Pathogenicity of TN Vaccine for Monkeys

Source of Virus	Vol. of Inoculum and Route	Log ₁₀ MPD ₅₀ inoculated	No. of Monkeys			Remarks
			Inoculated	With Paralysis	With Lesions of Polio in CNS	
Mouse brains and cords of 29th passage in PRI mice	1.0 ml. i.c.	5.6	6	0		Not examined for lesions
	0.5 ml. i.c.	4.5*	4	0	1	1 not examined for lesions
	0.5 " "	3.5	4	0	1	
	0.5 " "	2.5	4	0	0	
	0.5 " "	1.5	4	0	0	1 not examined for lesions
(- Vaccine used for trial)	0.5 ml. i.s.	5.3	4	2		Not examined for lesions
	0.1 ml. i.s.	3.1*	3	1	1	Paralysed, not examined for lesions
	0.1 " "	2.1	3	1	1	
	0.1 " "	1.1	3	1	1	1 not examined for lesions
	0.1 " "	0.1	3	0	0	1 not examined for lesions
29 passes in PRI and 1 pass in VSBS mice	1.0 ml. i.c.	5.4	6	0	1	
	0.5 ml. i.s.	5.1	6	2	4	

* Titration by Dr. H. Koprowski in New York. i.c. = intracerebral. i.s. = intraspinal. MPD₅₀ = mouse intraspinal paralyzing dose 50.

Vaccination of Adults

Twenty-one adults were fed 500,000 MPD₅₀ of TN vaccine virus diluted in 4 ml. of milk. Tests have been completed for 18 (10 men and 8 women); their ages ranged from 20 to 50 years. None had type II antibody prior to feeding and nine had no antibody to any of the three poliovirus types. Only four subjects had developed type II antibody when their blood was tested two to three months after vaccination (see Fig. 1). Six of the non-reactors were fed a second time with the same dose of virus contained in gelatin capsules. Once more none of these subjects developed antibody. Of the four subjects who did develop antibody two were men aged 21 and 22, and two were women aged 44 and 50 years. No common factor has yet been found which might explain the failure of vaccination in 14 out of the 18 adults.

Throat swabs and blood samples were collected daily for the first 10 days after vaccination from 10 of the adults, and faecal specimens were also obtained during the first two weeks (see Table II). No viraemia was detected in any subject. A trace amount of virus was recovered from the throat of one subject from a pool of swabs taken during the first three days after vaccination. This virus was detected by mouse inoculation, but could not be detected in tissue culture. No virus was recovered in any faecal specimen either by mouse inoculation or in tissue culture, but in the light of later experience we consider that too few specimens were collected for too short a period for any conclusions

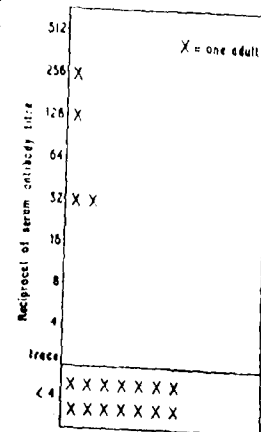


FIG. 1.—Type II antibody response in 18 adults fed with TN vaccine.

to be reached on the faecal excretion of TN virus by adults. In addition, it must be noted that only 3 of the 10 adults in whom these investigations were made developed antibody.

TABLE II.—Summary of Results for Adults Vaccinated with TN Vaccine

Group	No. in Group	No. with Virus in Faeces	No. with Virus in Throat*	No. with Virus in Blood*	No. who Developed Antibody
Tested for virus excretion and viraemia	10	0	1†	0	3
Not tested for virus excretion	8	N.T.	N.T.	N.T.	1

* Daily throat swabs and blood samples for 10 days after vaccination.
† Trace of virus in pool of throat swabs from days 1–3, not recovered from individual specimens days 1, 2, and 3.
N.T. = Not tested.

Vaccination of Children

One hundred and fifty-five children between the age of 10 months and 15 years were fed TN vaccine (500,000 MPD₅₀ in 4 ml. milk) during May and June. Paired specimens of sera, the first taken at the time of vaccination and the second six or more weeks later (see Table III), were available.

TABLE III.—Time of Post-vaccination Bleeding for 124 Children Whose Antibody Response is Shown in Fig. 2

Weeks after vaccination	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
No. of children	2	3	6	25	5	4	1	1	6	8	1	3	1	—	—	1	3

TABLE IV.—Ages of 124 Children Whose Antibody Response is Shown in Fig. 2

Age in years	<1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
No. of children	3	7	13	16	12	30	11	4	4	12	4	2	2	2	1	—	1

able for testing from 124 who had no type II antibody at the time of vaccination. The ages of the children in this group are shown in Table IV; there were 58 boys (this group are shown in Table IV); there were 58 boys and 66 girls. Twenty-eight children (23%) failed to develop type II antibody after vaccination. The remaining 96 (77%) developed antibody titres ranging from a trace to 1 in 2,048 (see Fig. 2). The geometric mean antibody titre for these 96 children is 1 in 66.

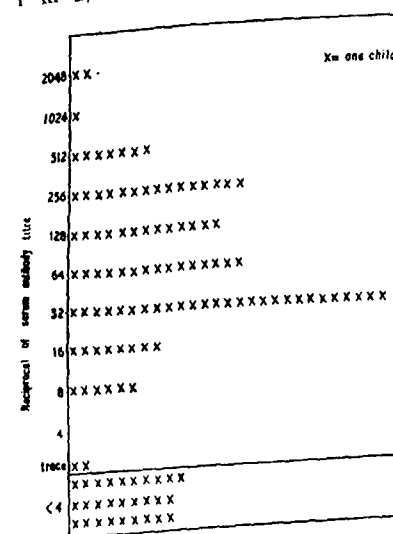


FIG. 2.—Type II antibody response in 124 children fed with TN vaccine. All children had <1/4 type II antibody at time of vaccination.

sibling developed antibody. If all the individuals in this group of siblings had responded independently then it would have been expected that 13.5 of the pairs of siblings would

have developed antibody, 1.5 pairs would have developed no antibody, and in 9 pairs one sibling would have developed antibody. The difference between the observed and expected antibody response of the siblings is highly significant ($\chi^2 = 8.7111$; $0.01 > P > 0.001$).

Of the 20 pairs of siblings where either or both children developed antibody, the higher titre was found in the younger child in 15 cases. In one case the titres were equal and in the remaining four the elder child developed the higher titre. If the antibody titres had not varied with age we would not have expected this difference ($\chi^2 = 5.0$; $0.05 > P > 0.02$).

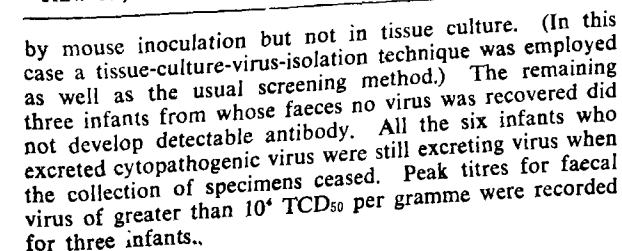
It was not practicable to collect throat swabs or daily blood samples from any of the children. Faecal specimens obtained from 18 of them during the first few weeks after vaccination were tested for the presence of virus both by the intraspinal inoculation of mice and in tissue culture. The results of these tests are shown in Fig. 3. The pattern of virus excretion was varied and cannot be assessed fully because specimens were collected over too short a period on the assumption that our findings would be broadly similar to those of Dr. Koprowski. Of the 18 children studied, 15 developed antibody in response to vaccination and faecal virus was detected in these 15 children both by mouse inoculation and in tissue culture.

No virus was found in the faeces of the three children who did not develop antibody. The titres of the faecal virus tended to be higher in tissue culture than when estimated by mouse inoculation. Comparative titrations of early and late faecal specimens from one child in tissue culture and in mice showed that the virus from the early specimen had a higher titre by mouse inoculation than in tissue culture, but that the virus from the late specimen had a higher titre in tissue culture. Peak titres of 10^4 TCD₅₀ per gramme of faeces or higher were recorded for three children. One girl aged 10 months excreted $10^{4.4}$ TCD₅₀ of virus on the fifth day after feeding, and at this time her brother aged 2, who was vaccinated on the same day, was excreting $10^{3.1}$ TCD₅₀ per gramme of virus in his faeces. Unfortunately it was not possible to obtain further specimens from these children until the 55th day, when neither was found to be excreting virus. (It is possible, but improbable, that these siblings were infected naturally with a wild type II virus at about the time of vaccination.) Six other children were still excreting virus when collection of specimens ceased during the fourth or fifth week after vaccination. In Fig. 3 nine siblings have been grouped in the left-hand column. The pattern of their faecal excretion and their antibody response serve to illustrate the trend already mentioned that siblings responded to vaccination in a similar fashion, and that the younger sibling responded better.

Vaccination of Infants

Ten infants were fed TN vaccine. They received the same dose as that given to adults and children. The virus was administered in milk in a rubber-teated bottle. A blood sample from each infant was tested for type II antibody a few weeks prior to vaccination, on the day of vaccination, and again 6 to 11 weeks later. On the first occasion blood was also taken from the mother and tested for type II antibody. Six infants had antibody titres of greater than 1 in 16 when first tested. Antibody titres found in the blood of their respective mothers were of the order that might have been expected when allowance was made for the age of the infant. For this reason it was concluded that the antibody present in the blood of the six infants was passively acquired maternal antibody. At the time of vaccination three of these six infants still had antibody titres greater than 1 in 16. In response to vaccination 5 of the 10 developed antibody titres greater than 1 in 16 (see Fig. 4). A sixth infant (No. 287) had a rise in antibody from less than 1 in 4 on the day of vaccination to 1 in 6 seven weeks later. There was insufficient serum

Faecal excretion of virus was studied in all infants (see Fig. 5). Specimens were collected daily for periods ranging from 8 to 28 days. Six infants, all of whom developed antibody, excreted virus which was detected both by mouse inoculation and in tissue culture. One infant who did not develop demonstrable antibody excreted virus detectable



The Monkey Pathogenicity of Excreted TN virus was available. At the time of this trial no information was available about the pathogenicity of faecally excreted TN virus for monkeys inoculated intracerebrally or intraspinally. For this reason we decided to compare the relative virulence of the vaccine virus with that of the excreted virus by the intracerebral inoculation of monkeys. In view of the very low titres of virus found in stools by Koprowski *et al.* (1956) we thought that it would be advisable to investigate excreted virus in two ways; firstly, by the direct inoculation of stool suspensions; and, secondly, by the inoculation of first-mouse-passage faecal virus. The object of the second method was to raise the titre of virus inoculated to levels comparable with that of the virus used in the original monkey tests of the vaccine. At this time we were unaware that faecal TN virus was cytopathogenic and that tissue-culture-passage of faecal virus could have been used instead of mouse-passage virus. The results of the intracerebral inoculations of monkeys with faecal virus from two infants and one child are shown in Table V.

It will be seen that the mouse passage of faecal virus was unnecessary and could have been misleading. Mouse passage

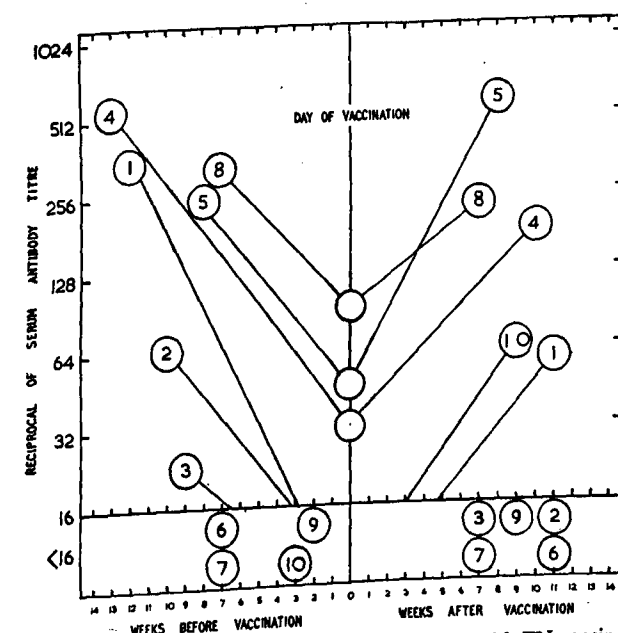


Fig. 4.—Type II antibody response in infants fed with TN vaccine. Antibody prior to vaccination was passively acquired maternal antibody. Serial numbers and age at time of vaccination:

Antibody prior to antibody.	Serial numbers	and age at time of	No.	Age in months
No.	Age in months		Six—286	2
One—254	3		Seven—287	2
Two—258	5		Eight—288	5
Three—264	3		Nine—381	6
Four—265	3		Ten—439	
Five—272	2			

Three specimens of serum from each infant were tested: one was taken a few weeks before vaccination, one on the day of vaccination, and one a few weeks later.

FIG. 5.—Faecal excretion of virus in infants fed with TN vaccine. Each O or X represents one specimen or pools of two or three specimens. X --- X = level of excreted virus detected in mice. O --- O = level of excreted virus detected in tissue culture. S.L. = Screening level is of excreted virus detected in mice. $10^{4.0}$ TCD₅₀ for tissue culture and $10^{3.4}$ PD₅₀ for mice.

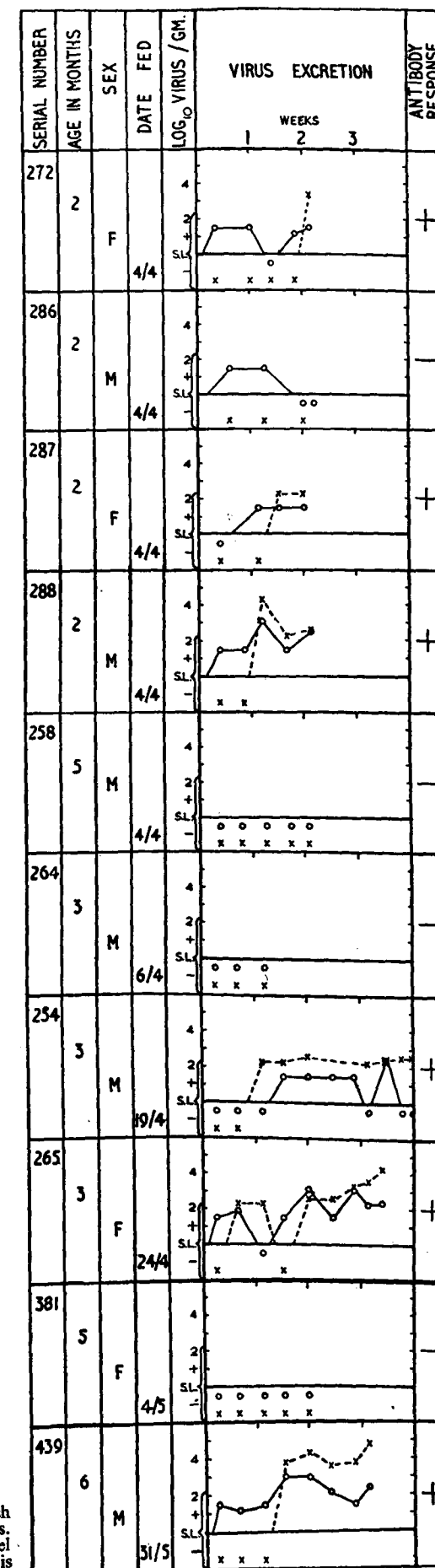


TABLE I.—Pathogenicity of SM Vaccine for Monkeys

Source of Virus	Vol. of Inoc. and Route	Log ₁₀ TCD ₅₀ Inoculated†	No. of Monkeys			Remarks
			Inoculated	With Paralysis	With Lesions of Polio in C.N.S.	
SM (N-90). Type I vaccine—chick-embryo-tissue culture.	*1 ml. i.c.	6.8	8	0	1	Transient weakness
SM virus—13 chick-embryo-tissue culture plus 6 alternating monkey-kidney chick-embryo tissue culture passages)	0.5 ml. i.c.	5.0 4.0 3.0	4 4 4	0 0 1	1 0 3	
		2.0 1.0	4 4	0 0	2 0	
	*0.5 ml. i.s.	6.5	6	4	4	1 paralytic not examined for lesions 1 paralytic possible bacterial infection on histological examination
	0.1 ml. i.s.	3.6	3	1	2	
		2.6 1.6	3 3	1 1	1 2	
		0.6 0.06	3 3	0 0	0 0	

* Vaccine passed one additional time in monkey-kidney-tissue culture to enhance titre.
† TCD₅₀ = tissue-culture dose₅₀.
‡ Titration by Dr. H. Koprowski in New York.
i.c. = intracerebral. i.s. = intraspinal.

possessed the same pathogenicity for monkeys by the intracerebral route as the SM vaccine virus. A final reason for limiting the size of the trial was that we were dealing with type I virus.

Our trial was planned to answer two questions. Was SM virus likely to be transmitted within a normal family? And did SM faecal virus possess the laboratory characteristics of attenuation shown by SM vaccine virus? The vaccine was first tested in the laboratory and then fed to a small number of adults without type I antibody (the investigators, their colleagues, and medical students). The home contacts of these adults were studied to see whether or not virus transmission occurred. It did not. Then two infants possessing maternal type I antibody were fed and their contacts studied. No transmission was observed. Finally, one child in the family of one of us was fed SM vaccine to see whether transmission occurred in a normal family living under normal conditions. Originally it was planned to increase gradually the number of family contact studies, but in view of the results obtained with the first family further investigation along these lines seemed unnecessary.

Materials and Methods

The vaccine used in this trial was SM (N 90) type I attenuated poliomyelitis virus vaccine (Koprowski). The virus which had originally been adapted to PRI mice by the intraspinal route had subsequently been given 13 chick-embryo tissue-culture passages plus six alternating passages in monkey-kidney and chick-embryo tissue culture.

The tissue-culture techniques, virus neutralization tests, monkey inoculation experiments, and methods of storage were similar to those described for the trial of TN type II vaccine (Dane, Dick, Connolly, Fisher, and McKeown, 1957).

Methods Used for Isolation of Viruses

Faecal Specimens.—Twenty per cent. suspensions were prepared by shaking faeces with tissue-culture medium or distilled water in the cold and then centrifuging this mixture at 4,000 r.p.m. for one hour. These suspensions were

diluted for inoculation into tissue-culture tubes to give a screening level of 10^{2.5} TCD₅₀ per gramme of faeces. Selected specimens were titrated. Tubes were examined daily for six days for signs of degeneration. The direct method of virus isolation described by Dane and Briggs (1956) was also used for screening most of the specimens. Negative results by the latter method were checked by the quantitative screening method.

Throat swabs were broken off into bijoux bottles containing 1 ml. of tissue-culture medium. 0.5-ml. amounts of this fluid were inoculated into roller tubes containing monkey-kidney monolayers from which the maintenance medium had been removed; the tubes were then incubated for 30 minutes, after which the throat-swab medium was removed and replaced by maintenance medium. Tubes were examined daily for 10 days.

Blood Specimens.—Heparinized blood was inoculated direct on to monkey-kidney monolayers in the manner described for the specimens of throat swabs. Tubes were examined daily for at least 10 days.

Laboratory Tests of SM Vaccine Virus

The SM (N 90) type I vaccine was supplied by Dr. H. Koprowski, Lederle Laboratories, Pearl River, New York. Dr. Koprowski tested the pathogenicity of the vaccine virus for monkeys inoculated by the intracerebral and the intraspinal routes. He also conducted appropriate tests to exclude the presence in the vaccine of micro-organisms other than type I poliomyelitis virus. These were similar to the tests described elsewhere for TN vaccine (Dane, Dick, Connolly, *et al.*, 1957).

Similar laboratory studies were carried out with SM vaccine in Belfast. The results of the monkey pathogenicity tests done in New York and in Belfast are shown in Table I. They are comparable, and demonstrate that, while the SM vaccine virus did not cause paralysis of monkeys when inoculated in large amounts by the intracerebral route, it was able to cause paralysis when moderate amounts were inoculated by the intraspinal route.

Vaccination of Adults

During February, 1956, three adults were fed 54 TCD₅₀ of SM type I vaccine virus in capsules. Only one (No. 235) (see Tables II and III) excreted the virus and developed antibody; the other two (Nos. 193 and 218) did not on this occasion become infected.

During March and April a further seven adults were vaccinated and the two who had failed to respond on the first occasion were revaccinated. Another adult was vaccinated in June. All these subjects received 3,500 TCD₅₀ of vaccine virus in capsules given by mouth. Faecal specimens were examined (except in the case of No. 314), and all subjects were found to be excreting virus (see Table II). Intestinal carriage lasted for up to 36 days and some specimens contained moderately high titres of virus. These results are in general similar to those reported for children by Koprowski *et al.* (1956). The homotypic antibody responses in vaccinated adults are shown in Table III. Every subject produced antibody, but the post-vaccination antibody levels showed wide variation. Tests on sera taken from seven of these individuals, six to nine months after vaccination, showed that the antibody titres had in most cases fallen. No estimate of the future rate of decline of antibody can be made at present.

An analysis of the relationship between height and duration of virus excretion with antibody production is not possible with such a small number of observations. However, we may speculate that there is some relationship. For example, the two poorest virus excretors (Nos. 326 and 330) produced very low levels of antibody, and the four subjects (Nos. 235, 193, 212, and 218) who excreted for the longest periods had late peak antibody titres (see Tables II and III).

TABLE II.—Excretion of Faecal Virus by Adults Fed SM Vaccine

Subject No.	235	193	212	218	353	207	326	330	331	284
Sex	M	M	M	M	F	M	M	M	M	M
Age in years	25	41	21	39	24	21	53	46	31	20
Antibody before feeding*	—	—	—	—	—	—	—	—	—	—
Type I	—	—	—	—	—	—	—	—	—	—
Type II	—	—	—	—	—	—	—	—	—	—
Type III	—	—	—	—	—	—	—	—	—	—
Amount of virus fed†	54	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Date fed	14/2	19/3	19/3	4/4	4/4	4/4	9/4	9/4	9/4	11/4
Days after feeding	—	—	—	—	—	—	—	—	—	—
7	+	+	+	+	+	+	+	+	+	+
14	+	+	+	+	+	+	+	+	+	+
21	+	+	+	+	+	+	+	+	+	+
28	+	+	+	+	+	+	+	+	+	+
35	+	+	+	+	+	+	+	+	+	+
42	—	—	—	—	—	—	—	—	—	—
49	—	—	—	—	—	—	—	—	—	—

* Antibody before feeding: + = titre of > 1 in 4; — = titre of < 1 in 4.
† Dose of virus expressed as TCD₅₀.
Each faecal specimen tested is represented by + or —.
+ = titre per gramme faeces > 10^{2.5} TCD₅₀.
— = titre per gramme faeces < 10^{2.5} TCD₅₀.
Where individual specimens have been titrated the result is shown as log to the base of 10, TCD₅₀ per gramme.

TABLE III.—Antibody Response in Adults Fed with SM Vaccine

Serial No.	Age	Sex	Antibody Prior to Vaccination	Time After Vaccination													
				Days		Weeks						Months					
				I	II	III	7	14	3	4	5	6	7	8	9	3	4
235	25	M	—	+	—	—	4*	6	32	22	—	—	—	—	—	—	—
193	41	M	—	+	—	—	<4	>16	8	16	—	—	—	—	—	—	—
218	39	M	—	+	—	—	<4	8	89	179	—	—	—	—	—	—	—
353	24	F	—	+	—	—	<4	>16	256	16	—	—	—	—	—	—	—
207	22	M	—	+	—	—	<4	128	6	4	—	—	—	—	—	—	—
284	20	M	—	+	—	—	<4	Trace	6	4	—	—	—	—	—	—	—
212	20	M	—	+	—	—	<4	Trace	6	4	—	—	—	—	—	—	—
326	53	M	—	+	—	—	<4	Trace	6	4	—	—	—	—	—	—	—
330	46	M	—	+	—	—	<4	Trace	6	4	—	—	—	—	—	—	—
331	31	M	—	+	—	—	<4	Trace	6	4	—	—	—	—	—	—	—
314	28	M	—	+	—	—	<4	Trace	6	4	—	—	—	—	—	—	—

* Reciprocal of serum antibody titre.
+ = > 1 in 4. — = < 1 in 4.

Daily throat swabs and blood samples were taken from 10 of the 11 adults for the first 10 days after vaccination. No throat virus was isolated, but one individual (No. 212) had a trace amount of virus in his blood on the eighth day. This isolation was repeated for confirmation. In connexion with his viraemia it is of interest to note that subject No. 212, unlike the other nine subjects, had no type II antibody and that he also produced the highest type I antibody titre. Studies of heterotypic antibody responses are incomplete, but it is worth mentioning that No. 212 developed low-titre type II antibody as well as the high-titre type I antibody after vaccination.

Vaccination of Infants with Maternal Antibody

Two infants (aged 2 and 3 months) who had maternal passive immunity were fed 6,400 TCD₅₀ of SM vaccine in milk. Three specimens of serum were obtained from each infant, one a few weeks before vaccination, one at the time of vaccination, and one five weeks later. Their mothers were also bled on the first occasion and a comparison of infant and maternal type I antibody titres demonstrated that the infants' immunity was passively acquired. Both infants became faecal virus carriers and both developed active immunity to type I poliovirus (see Table IV). The rises in antibody titre between the time of vaccination and five weeks later were small, but significant when allowance is made for the rate of decline of passive immunity. One infant (No. 242) excreted virus for at least 35 days (the negative specimen obtained on the 40th day is not by itself sufficient evidence of the cessation of virus excretion), and the other infant (No. 349) excreted faecal virus for at least 50 days. Peak titres of 10^{2.5} (No. 242) and 10^{4.5} TCD₅₀ (No. 349) of virus per gramme of faeces were recorded.

Vaccination of Family

Family and household contacts of the vaccinated adults and infants were investigated for signs of infection with SM virus. No evidence of transmission was found. However, we considered the crucial test of whether SM virus could spread within a family would come only when we vaccinated one young child in a family having other non-immune siblings. The family chosen for this study consisted of a father aged 41 who had been successfully vaccinated three months previously with SM type I vaccine, a mother aged 38, a son aged 2, and two daughters aged 4 and 6. Another son aged 8 was away at boarding school. All the family had naturally acquired immunity to type II poliovirus, but only the father had antibody to type I. When the father had been vaccinated he had failed to transmit SM virus to any other members of the family.

The daughter aged 4 was fed 6,400 TCD₅₀ SM virus in milk on May 3, 1956. She became a faecal virus carrier for about the next eight days (see Table V). A peak titre of 10^{6.5} TCD₅₀ virus per gramme of faeces was found on the fifth day after vaccination. No poliovirus was isolated from

her throat, and by the sixth week she had developed a type I antibody titre of 1 in 256. Her younger brother aged 2, who had not been vaccinated, became a faecal carrier of type I virus on the fifth day after his sister had received the vaccine. He continued to excrete virus in his faeces for about a week. The peak titre recorded for virus in his faeces was $10^{2.5}$ TCD₅₀ per gramme on the fifth day of excretion. No throat swabs were collected from this child. He developed type I antibody with a titre of 1 in 32 six weeks after his sister had been vaccinated. Insufficient specimens of faeces were collected from the mother to determine whether or not she became a faecal carrier of type I virus, but during the six-weeks study period she did develop low titre (1 in 6) antibody to type I. Her paired sera were tested on two separate occasions with the same result, and we consider that she became infected as a result of contact with one of the children. In view of the low titre of antibody which she developed she may have excreted faecal virus for only a

short period, like some of the vaccinated adults. The other child living at home, a daughter aged 6, did not develop detectable type I antibody. In our opinion SM virus spread within the family by the faecal-oral route. The children of this family had fairly close contact with children from two other families. The infection did not spread to these other children.

When considering the significance of this study we should remember that it was conducted during the time of year when notified cases of poliomyelitis were at a low level. We do not know whether the chain of infection would break as readily during the later months of the year.

Monkey Pathogenicity of SM Faecal and SM Blood Viruses

Monkeys were inoculated intracerebrally with faecal SM virus from an infant (No. 242), an adult (No. 212), the

TABLE IV.—Faecal Excretion of Virus and Antibody Response in Two Infants Possessing Maternal Antibody who were fed SM Vaccine

Serial No.	Age	Sex	G.	Days After Vaccination						
				7	14	21	28	35	42	49
242	3 months	M	Virus in faeces	4.0	5.5	3.5	5.0	5.0	4.0	
			Antibody*	68			4.0	4.5		
349	2 months	F	Virus in faeces	++	+++	+++	++			
			Antibody	48			4.5	3.5	3.0	3.5

* $> 10^{2.5}$ TCD₅₀ per gramme of faeces. — = $< 10^{2.5}$ TCD₅₀ per gramme of faeces. Where specimens have been titrated log₁₀ TCD₅₀ per gramme of faeces is given. * Reciprocal of serum antibody titre.
Note.—No. 242 had antibody titre of 1 in 512 twelve weeks before vaccination. No. 349 had antibody titre of 1 in 89 two weeks before vaccination.

TABLE V.—Spread of SM Vaccine Virus within a Family

No. 337 female aged 4 years Fed 6,400 TCD ₅₀ SM Type I vaccine on 3.5.56	Antibody*	Days After No. 337 Received SM Type I Vaccine				6 Weeks After
		7	14	21	28	
No. 338 male aged 2 years. Contact	Throat virus†	4				256
	Faecal virus‡	+++	6.5	2.3		
No. 347 female aged 38 years. Contact	Antibody	<4				32
	Faecal virus‡	—	4.8	5.6		
No. 289 female aged 6 years. Contact	Antibody	<4				6
	Faecal virus‡	—				

* Reciprocal of serum antibody titre. † Sensitivity of test described in methods. ‡ $> 10^{2.5}$ TCD₅₀ per gramme of faeces. — = $< 10^{2.5}$ TCD₅₀ per gramme of faeces. Where specimen has been titrated log₁₀ of titre per gramme faeces is given. § Taken 11 weeks after.

TABLE VI.—Pathogenicity of SM Faecal Virus for Monkeys

Sample of Faeces from	No.	Age	Day After Vaccination	Treatment of Faeces for Inoculation	Log ₁₀ TCD ₅₀ Inoculum	No. of Monkeys Inoculated	Incubation Periods (Day)	Monkey Died With No Paralysis (Day)	No. of Monkeys with Paralysis of Grade			Paralytic Ratio of Survivors	Lesion Ratio	Notes
									0-1	2-3	4			
242	3	12	35	1 tissue culture passage	6.6	4	6, 9, 13, 20	—	Severe	Moderate	Mild	3/4 (74/4)	4.4	In 3 monkeys paralysis graded as 4 only
									1	0	2.1			
337	4	5	5	4% faecal suspension	5.1	5	7	8, 17	1	0	0	1/3	3.5	Day 8 death histology neg.; day 17 death histology pos. for polio
									1	0	0			
212	20	9	9	1 tissue culture passage	6.4	5	20, 21	6	0	1	1	1.4 (22/4)	4.5	Day 6 death histology neg.
									1	0	0			
338	2	2	2	Contact, infection, see text	4.9	5	6	—	0	1	1	1.3 (22/3)	3.3	
									0	1	1			

All monkeys inoculated intracerebrally with 1 ml. of virus suspension. Non-specific deaths within 72 hours of inoculation have been excluded from the table. Monkeys showing mild transient weakness and their incubation periods are shown in bold type.

vaccinated child (No. 337), and her brother, whom she infected (No. 338) (see Table VI). The infant's faecal virus was from a late specimen taken on the 35th day after vaccination. The adult's faecal virus was from the specimen collected the day following his viraemia. The specimens from the two children were both taken on the fifth day after the commencement of virus excretion. Three specimens were given a single passage in monkey-kidney-tissue culture to enhance their titres before being tested. Twenty-two monkeys were inoculated and seven became paralysed (Table VI). Typical lesions of poliomyelitis were found in the central nervous system of 18 of the 22 monkeys. The amounts of virus inoculated into the five groups of monkeys varied from $10^{4.6}$ to $10^{5.1}$ TCD₅₀, but there was no difference in the numbers of monkeys paralysed or showing typical histological lesions between the five groups. There was no apparent difference between the SM faecal virus recovered from the child (No. 337) who was vaccinated and that recovered from the child (No. 338) who became infected after contact.

These results of the intracerebral inoculation of monkeys with faecal virus can be compared with those obtained with the vaccine virus (see Table I). Of 12 monkeys inoculated intracerebrally with large amounts ($10^{4.6}$ and $10^{5.1}$ TCD₅₀) of SM vaccine virus none showed paralysis, but two had histological lesions. A direct numerical comparison between the results obtained with the vaccine and faecal SM viruses is not possible because of the variations in titre of the different inocula. However, if these differences are ignored we may express the results of the intracerebral inoculations in the following manner: SM vaccine virus paralysed 0 out of 12 monkeys, and SM faecal virus paralysed 7 out of 22 monkeys. Histological lesions were found in 2 of the 12 monkeys inoculated with SM vaccine virus, and in 17 out of the 22 inoculated with SM faecal virus. The interpretation of these data may be open to argument, but we conclude from them that SM faecal virus is more paralytogenic than SM vaccine virus when inoculated intracerebrally into monkeys.

Another comparison of SM vaccine and faecal viruses was made by the intraspinal inoculation of monkeys. The faecal virus used in this experiment was from the child infected by his vaccinated sister and thus represented the second human passage of SM virus. The two viruses were inoculated in titres ranging from $10^{4.6}$ to $10^{5.1}$ (see Table VII). The results of these two titrations are broadly similar and show that the intraspinal pathogenicity of SM virus had not increased after two human passages.

TABLE VII.—Comparative Intraspinal Monkey Pathogenicity of SM Vaccine Virus and Second Human Passage SM Faecal Virus

Source of Virus	Log ₁₀ TCD ₅₀ Inoculated	No. of Monkeys Inoculated	Paralytic Ratio
SM N-90 Type I poliomyelitis virus vaccine	4.6	6	4/6
	3.6	4	3/4
	2.6	4	3/4
	1.6	3	2/3
	0.6	4	0/4
Second human passage SM faecal virus	4.6	5	3/5
	3.6	6	4/6
	2.6	4	2/4
	1.6	4	2/4
	0.6	4	0/4

Only a trace amount of virus was recovered from the blood of one subject (No. 212), but because of the possible importance of viraemia in the pathogenesis of paralytic poliomyelitis this virus, or more correctly its progeny, was inoculated into monkeys. Sufficient virus for the inoculation could be obtained only by using second-monkey kidney-tissue-culture passage of the blood virus. Eleven monkeys were inoculated intraspinally with amounts of virus ranging in titre from $10^{4.6}$ to $10^{5.1}$ TCD₅₀ (see Table VIII). None of these monkeys became paralysed. Assuming that two tissue-culture passages did not greatly alter the

nature of the virus, we may conclude that the virus isolated from the blood of subject No. 212 on the eighth day after vaccination was not of high intracerebral virulence for monkeys.

TABLE VIII.—Pathogenicity for Monkeys of Second Tissue-culture Passage SM Virus from Blood of Subject No. 212

Dilution of Tissue Culture Fluid	Log ₁₀ TCD ₅₀ Inoculated	No. of Monkeys Inoculated	Paralytic Ratio	Remarks
Undiluted	5.9	3	0/3	
10^{-1}	4.9	4	0/4	
10^{-2}	2.9	4	0/4	1 monkey died day 9; weak monkey

All monkeys inoculated intracerebrally with 1 ml. of virus suspension.

Reactions

All subjects vaccinated were under continual medical observation during the month following vaccination. No serious illnesses were reported, but minor illnesses or symptoms were recorded in 9 of the 16 persons who were successfully vaccinated or who were infected by contact (Table IX). A cytopathogenic virus was recovered from the throat of one child (No. 337) who had a fever following vaccination, but this proved not to be a poliovirus.

TABLE IX.—Clinical Observations in Individuals who had Minor Upsets after Vaccination with SM Vaccine

No.	Age	Sex	*Temp. (°F.) Rise, on Day ()	Symptoms and Signs on Day ()	Remarks
349	2 12	M	None	Colic (8)	
242	3 12	M	None	Off feed (8)	
338	2	M	101° (3)	Off colour for 8 weeks	Contact of 337 (see text)
337	4	F	103° (6, 7)	Fever	Non-polio virus recovered from throat (day 6) (see text)
235	25	M	None	Sore throat (4)	No virus in throat
353	24	F	..	Backache (2-4)	
331	31	M	..	Feeling unwell (0-3)	Anxiety
218	39	M	..	Occasional loose stool (3-5)	
326	53	M	..	Easily tired (0-14)	

* Twice-daily temperature records for 10-14 days after vaccination.

It is quite impossible to draw any conclusions from the small numbers observed. In our opinion the question of whether minor signs and symptoms may follow the administration of SM vaccine has still to be answered.

Summary and Conclusion

Eleven adults, two infants, and one child were fed SM type I poliomyelitis virus vaccine. In addition one adult and one child became infected in a study of the transmissibility of the vaccine virus.

None of these 16 subjects developed any serious illness. It was impossible to be certain whether or not some of the minor illnesses recorded were due to vaccination.

All subjects were without type I antibody at the time of vaccination and all developed antibody after vaccination. The two infants possessed moderate titres of maternal antibody at the time of vaccination, but this did not prevent them becoming faecal virus carriers and developing an active immunity. A decline in circulating antibody from the highest titre reached was observed in the majority of adults during the months following vaccination.

All subjects became faecal carriers of virus. The duration of faecal excretion varied from one week to

more than seven weeks, and high titres of virus were found in early faecal specimens from some individuals.

A trace amount of virus was recovered from the blood of one adult on the eighth day after vaccination. No throat virus was recovered from any of the vaccinated individuals.

SM virus was shown to spread within a normal family living under normal conditions of hygiene following the vaccination of one child in the family.

SM faecal virus was found to cause paralysis in some monkeys inoculated intracerebrally, whereas monkeys inoculated by this route with SM vaccine virus were not paralysed.

SM type I poliomyelitis virus was considered suitable for trial as a vaccine because it did not cause paralysis in monkeys when inoculated by the intracerebral route. However, the virus underwent a change after multiplication in the human gut, and SM faecal virus caused paralysis in a proportion of the monkeys inoculated by this route. In addition SM virus can spread from the vaccinated to the unvaccinated.

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REFERENCES

- Dane, D. M. S., and Briggs, E. Moya (1956). *Lancet*, 2, 851.
 — Dick G. W. A., Connolly, J. H., Fisher, O. D., and McKeown, Florence (1957). *British Medical Journal*, 1, 59.
 Dick, G. W. A., and Dane, D. S. (1957). *British Medical Journal*, 1, 70.
 Koprowski, H. (1955). *S. Afr. med. J.*, 29, 1134.
 — Norton T. W., Jervis, G. A., Nelson, T. L., Chadwick, D. L., Nelsen, Doris J., and Meyer, K. F. (1956). *J. Amer. med. Ass.*, 160, 954.

3. THE EVALUATION OF TN AND SM VIRUS VACCINES*

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There are three approaches to active immunization against micro-organisms. The first of these is to inactivate the micro-organisms by chemical or physical means and to infect the host with measured amounts of the inactivated organism. Formalized tissue-culture poliovirus vaccines, which are now commonly referred to as Salk-type vaccines, are of this type. The second method is to immunize with living micro-organisms which have been rendered avirulent for their original host. This type of vaccine is exemplified by B.C.G. or the 17D strain of yellow fever. Attempts to produce attenuated strains of poliovirus have been undertaken by several investigators, and trials of attenuated living poliovirus vaccines in human beings have been described by Koprowski, Norton, Jervis, Nelson, Chadwick, Nelsen, and Meyer (1956), by Sabin (1955a), and in the preceding papers by Dane, Dick, Connolly, Fisher, and McKeown

(1957) and Dick, Dane, Fisher, Connolly, and McKeown (1957). The third method of immunization is to employ micro-organisms from a different species which are immunogenically related to the micro-organisms against which protection is required. The Jennerian method of vaccination with cowpox to protect against smallpox employed this approach, but it has not yet been investigated in the poliomyelitis field.

The reasons for using attenuated viruses for immunization against poliomyelitis are based primarily on the hope that they will produce long-lasting immunity, for there is as yet no evidence that the immunity which will follow immunization with inactivated (Salk-type) vaccines will be durable. Attenuated poliovirus vaccines can be given by mouth and thus present a considerable administrative advantage and dispense with the use of syringes. Furthermore, the cost of attenuated poliovirus vaccines should be very much less than that of inactivated vaccines.

Before attempting to evaluate TN and SM attenuated poliomyelitis virus vaccines some epidemiological aspects of a trial of these vaccines (Dane *et al.*, 1957; Dick *et al.*, 1957) are discussed: in conclusion we shall present the criteria which we, at present, consider are required for attenuated poliovirus vaccines.

Some Epidemiological Aspects of Trials of TN and SM Virus Vaccines

Antibody Production

While comparing the response of children and adults to vaccination it was found that 28 of 124 children (23%) and 14 of 18 adults (78%) who were devoid of type II antibody before vaccination failed to develop antibody after feeding with TN (type II) vaccine (diff./S.E. diff. = 4.7081). Part of the explanation of this significantly different response might be thought to be due to a higher proportion of the adults having had previous experience with heterotypic polioviruses which prevented infection with the TN strain. This does not, however, seem likely from tests of the heterotypic antibodies in the vaccinated adults.

All individuals who were fed with 3,500 or more TCD₅₀ of SM (type I) vaccine developed antibody, but only one out of three adults who were fed 54 TCD₅₀ developed antibody.† On the other hand, Koprowski *et al.* (1956) found that they were able to infect two out of three children with two plaque-forming particles (PFP)* of SM virus and that 20 PFP were adequate to infect four out of four children.

This difference in the response of adults as compared with children to infection with the TN and SM viruses suggests that in certain population groups some adults may develop barriers other than homotypic circulating antibody to infection with some strains of poliovirus. We stress certain population groups, for this did not appear to be so in adults of the inbred Eskimos of Chesterfield Inlet, in the Canadian Arctic (Peart, 1949), who may have been genetically highly susceptible to poliomyelitis.

There is a suggestion from our studies that in families where one sibling failed to develop antibody after vaccination with TN vaccine the other sibling also failed to respond (Dane *et al.*, 1957). We have already indicated in antibody surveys in Northern Ireland (Dane, Dick, Connolly, Briggs and McLeod, 1956) that siblings usually show the same pattern of antibody to the three types of poliovirus: thus if one sibling had either antibody or no antibody to one or other of the types, it was usual to find a

*Before vaccination each of these three adults had type II antibody and one of them who failed to become infected had also type III antibody.

†Comparative titrations have shown that one plaque-forming particle by the technique of Koprowski and his associates = 1 TCD₅₀ by our methods.

similar picture in the younger siblings. It may be, then, that some families are less susceptible to infection with poliovirus than others, and if such families are the least susceptible members of the community then the vaccination failures which we found with TN live virus vaccine may be of little consequence.

We do not know how far it is possible to draw an analogy between the response of an individual to an attenuated strain as compared with a wild strain. If some families are

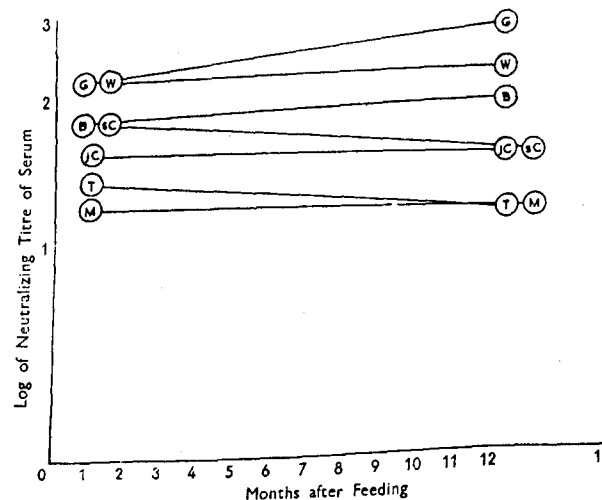


FIG. 1.—Antibody levels months after vaccination with SM type I virus. (Drawn from results presented by Koprowski, 1955).

genetically relatively resistant to infection with wild strains of poliovirus then it may be that in serological surveys a proportion of the individuals devoid of antibody may nevertheless be resistant to infection. Thus a population group in which 80% of the individuals have antibody to type II virus could represent a group who are all resistant to infection with that virus.

Koprowski (1955) has claimed that the circulating antibody which follows vaccination with TN vaccine is durable for at least five years. After vaccination with SM vaccine he showed that none of seven subjects who were tested had

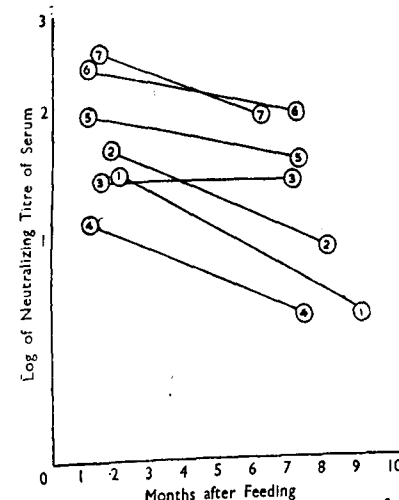


FIG. 2.—Antibody levels months after vaccination with SM type I virus. (Dick *et al.*, 1957).

any decline in the level of antibody induced by vaccination over a period of 12 to 15 months. These individuals (who were presumably children) had antibody titres at three weeks and at 12–15 months after vaccination as shown in Fig. 1.

In seven adults whom we vaccinated with SM virus and whose sera were tested at varying intervals up to nine months after vaccination, it was found that, with one excep-

Excreted Viruses

The most important disagreement between our results and those of Koprowski *et al.* (1956) is in the character of the virus which is excreted after vaccination and also, in the case of TN virus, in the duration of virus excretion. Koprowski *et al.* were of the opinion that TN faecal virus was, like the TN vaccine virus, non-cytopathogenic for tissue-culture-grown fibroblasts or epithelium of either simian or human (normal or neoplastic) origin. Their tests for faecal virus were accordingly made by inoculating faecal extracts intraspinally in mice. We have shown that TN faecal virus is also cytopathogenic for monkey-kidney-tissue culture (Dane *et al.*, 1957). In all individuals whom we tested (with one exception) the virus which was excreted after vaccination was not only paralytogenic for mice inoculated intraspinally but also cytopathogenic for tissue cultures. Since Koprowski *et al.* had stated that TN vaccine was never excreted for more than 23 days we did not collect many specimens for longer than that period. It is clear, however, from our results that virus continues to be excreted for periods in excess of 23 days after TN vaccination, and in many individuals for at least a month. Koprowski *et al.* were of the opinion that the excretion of TN faecal virus was sporadic and of low titre (never exceeding 10 mouse PD₅₀ per gramme of faecal material) and that it occurred in only about half of the successfully vaccinated individuals.

Quite apart from the tissue-culture tests we were able, by mouse inoculation, to detect TN faecal virus in all but one of the individuals who were successfully vaccinated, and titres of 10³ or more mouse PD₅₀ per gramme were found in some faecal specimens. We do not consider that the difference in our results compared with those of Koprowski *et al.* is due to minor differences in the techniques used in preparing stool samples, for we have found no significant differences in the titre of virus in stools prepared by the method of Dr. Koprowski (personal communication) and the method we employed. It may be, however, that the strain of mice which we used (VSBS) were more susceptible than the PRI strain used by Koprowski *et al.* Although the majority of individuals whom we tested excreted TN virus which was of relatively low titre in mice and in tissue cultures, there were individuals who were excreting from 10⁵ to more than 10⁶ TCD₅₀ of virus within five days of vaccination. The TN virus which is excreted by vaccinated individuals differs from the TN vaccine virus in its cytopathogenicity, and in some individuals this change from non-cytopathogenic to cytopathogenic virus occurs very rapidly. In addition, our results have clearly demonstrated that after multiplication in the alimentary tract the TN faecal virus is paralytogenic for monkeys inoculated intracerebrally (Dane *et al.*, 1957).

The majority of individuals whom we vaccinated with SM virus were adults (Dick *et al.*, 1957), and therefore our results on the excretion of SM virus are not strictly comparable with those of Koprowski *et al.*, whose studies were made mainly in children. It appears that, after vaccination with SM virus, excretion of virus in adults is usually of shorter duration than in infants or children. In our studies, SM faecal virus was present in highest titre during the first week after vaccination. By analogy this may explain why the natural disease is most infectious during the early stages of infection.

SM faecal virus is different from SM vaccine virus in its ability to paralyse monkeys after intracerebral inoculation (Dick *et al.*, 1957). The change found with SM virus after multiplication in the human gut is not so marked as that found with TN virus. The examination of stools taken on a single day may not, however, be sufficient to show any marked change, as it is possible that there are variations in the proportion of paralytogenic particles at different times.

Viraemia and Throat Virus

Koprowski (1955) found no viraemia or throat virus in any subject vaccinated with SM or TN viruses. Among

We have not yet considered the antibody response which is the primary object in evaluating a poliomyelitis vaccination procedure. The proportion of individuals developing antibody after TN vaccine is less than after Salk-type vaccine, but we have already noted that the failure to respond may be in those individuals who are relatively

insusceptible to infection with polioviruses. The fact that all individuals who were vaccinated with SM virus developed antibody is probably a reflection of the large dose of cytopathogenic virus which was fed to them; the wide range in their antibody titres may indicate the variation in their susceptibility.

Acceptable Attenuated Strains

Although we consider, with our present knowledge, that the TN and SM strains are not at the moment acceptable for mass immunization, this does not mean that suitable strains will not be developed. We have formulated what we believe are the minimum requirements for attenuated poliovirus vaccines. These are as follows:

1. The vaccine virus and any excreted virus should be intracerebrally avirulent for monkeys and perhaps also intraspinally avirulent. Intracerebral avirulence alone may be acceptable provided the other requirements are fulfilled.
2. The virus should not be transmissible from vaccinated to non-vaccinated individuals. This may be difficult to achieve with viruses which are given by mouth and excreted. Sabin (1955a) showed that after intramuscular injection of the KP34 type III strain there was no immunogenic response unless the virus localized in the alimentary tract, where it multiplied and was excreted. This does not mean that strains of poliovirus might not be found which would multiply in tissues other than the alimentary tract but not in the C.N.S. Lack of transmissibility is a characteristic of all established attenuated vaccines. Thus 17D yellow fever vaccine is not transmissible by mosquitoes, the spread of vaccinia is rare and limited, B.C.G. does not spread like naturally occurring *Myc. tuberculosis*. If oral vaccines are used, then the duration of faecal excretion of virus should be at such a low level and for such a limited duration (as was claimed for TN virus by Dr. Koprowski) that transmission would be unlikely to occur.
3. The vaccine virus and any of its progeny which are excreted should have some marker which differentiates them from naturally occurring wild strains of virus.
4. The vaccine virus should preferably not multiply in the throat.
5. The vaccine should prevent paralytic poliomyelitis in those who are susceptible. This may not require 100% antibody response in vaccinated individuals.

A live virus vaccine with these properties should be safe to the individual vaccinated and to the community.

Future of Attenuated Poliovirus Vaccines

The future for the types of attenuated viruses developed by Koprowski and by Sabin is not clear. Although Sabin (1955a) states that his KP34 type III strain which he fed to volunteers came out as avirulent as it went in, the KP33 (type I) and KP51 (type II) strains after multiplication in the alimentary tract "yielded a certain proportion of virus particles with increased virulence for brain-stem neurones of monkeys." Sabin indicated that he was continuing his studies to find better attenuated strains. In the evaluation of his published trials, which were done in adults, it should be remembered that the alimentary tract of the small child is probably a better milieu for polioviruses than that of the adult.

As already noted, it would seem to us that if strains are found which fulfil laboratory criteria for safety, then they must also be shown to have properties which make them different from wild strains. If these vaccine strains differ from wild strains only in their monkey or chimpanzee pathogenicity, and if they are transmissible, then trials in increasing numbers of people are rendered impracticable because of lack of control. While preliminary trials may be done in institutions, their final evaluation must be in children living in normal environments. There can be no assurance of how the vaccines will behave in a community, for it would seem that mutants of the less virulent naturally occurring strains may occasionally cause paralysis. How else can one explain the sporadic cases of poliomyelitis which occur in communities where extensive inapparent infections are occurring? We have no knowledge of how often mutants arise from naturally occurring avirulent strains, and whether or not they can cause epidemics. No one can

predict what may happen if a community is heavily seeded with a transmissible avirulent virus.

The risks involved in large-scale trials of avirulent poliovirus vaccines may be justifiable in communities where severe epidemics are common. Such trials should only be undertaken step by step, and never without careful laboratory control, however difficult this might be.

REFERENCES

- Bodian, D. (1952). *Amer. J. Hyg.*, **55**, 414.
 Dane, D. S., Dick, G. W. A., Connolly, J. H., Fisher, O. D., and McKewen, Florence (1957). *British Medical Journal*, **1**, 59.
 ———, Briggs, E. Moya, and McLeod, W. J. (1956). *Lancet*, **1**, 481.
 Dick, G. W. A., Dane, D. S., Fisher, O. D., Connolly, J. H., and McKewen, Florence (1957). *British Medical Journal*, **1**, 65.
 Koprowski, H. (1955). *S. Afr. med. J.*, **29**, 1134.
 ———, Norton, T. W., Jervis, G. A., Nelson, T. L., Chadwick, D. L., Nelsen, Doris J., and Meyer, K. F. (1956). *J. Amer. med. Ass.*, **160**, 954.
 Peart, A. F. W. (1949). *Canad. J. publ. Hlth.*, **40**, 405.
 Ramos-Alvarez, M., and Sabin, A. B. (1954). *Proc. Soc. exp. Biol. (N.Y.)*, **87**, 655.
 Sabin, A. B. (1955a). *British Medical Journal*, **2**, 160.
 ——— (1955b). *Ann. N.Y. Acad. Sci.*, **61**, 924.

EFFECT OF HYPERMETABOLISM ON THE GOITRE OF A SPORADIC CRETIN

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It is well known that non-toxic nodular goitres may decrease in size as the result of thyroid administration, though to a much less degree than diffuse thyroid enlargements. That this response may be especially evident with hypothyroid nodules was the subject of two of our own recent communications (Zondek *et al.*, 1955; Zondek and Leszinsky, 1956). It was shown that in two siblings with familial sporadic cretinism and large, partly diffuse, and partly nodular goitres the induction and maintenance of a euthyroid state succeeded in one case in considerably reducing the size of the nodules, and in the other in causing the disappearance of four out of five nodules. The diffuse enlargement subsided entirely in both patients.

The purpose of this communication is to show how hypothyroid nodules respond to short-termed overdosage—that is, to the induction of "spurious alimentary hyperthyroidism."

Case Report

The subject of the study was one of the above-mentioned siblings, a girl aged 14. She was first seen at the age of 12. At that time she had, together with the typical features of childhood myxoedema, a large diffuse goitre in which three nodules varying in size between large plums and peaches were embedded. The heart shadow was greatly enlarged (transverse diameter 14 cm.), the B.M.R. was -13% and the blood cholesterol was 310 mg. per 100 ml. Electrocardiography was within normal range. After 1.020 µg. of tri-iodothyronine given within eleven days the clinical picture had in every respect reverted to normal. Both the diffuse and nodular parts of the goitre had at that point greatly decreased in size, and continued doing so during the subsequent four months of maintenance therapy (though irregularly carried out) with tri-iodothyronine and desiccated thyroid. The nodules failed, however, to disappear completely. The patient stopped substitution therapy entirely during the following twelve months.

When she returned to us she was in every respect worse than before treatment: her external appearance and behaviour were even more noticeably myxoedematous, the heart shadow was larger (transverse diameter 15.7 cm.), the electrocardiogram showed definite low voltage and a prolonged Q-T, and the B.M.R. was -25% (oxygen consumption 140 ml. per minute). The blood cholesterol was again 310 mg. per 100 ml. The goitre had increased in size, the neck circumference being 39.5 cm. and the nodules varying in size between a large plum and a goose-egg (Fig. 1). Radio-iodine uptake after two hours was 63%, after twenty-four hours 26%, and after forty-eight hours 14%. These figures indicate that the thyroid was unable to hold and convert iodine into a biologically active protein-bound compound. Radio-iodine excretion was 51% after twenty-four hours and 73% after forty-eight hours. The conversion ratio after twenty-four hours was 30% and serum P.B.I. was 1.8 µg. per 100 ml.

After receiving 8 mg. of tri-iodothyroacetic acid ("triac") (Pitt-Rivers, 1953) in two days the patient showed prompt overall response. Within the next ten days she lost her puffiness and lethargy, the heart shadow grew progressively smaller, the E.C.G. became normal, the B.M.R. rose to normal values (oxygen consumption 198 ml. per minute = +8%) twelve hours after the first dose, and blood cholesterol fell to around 240 mg. per 100 ml. Since the ninth day oxygen consumption had dropped to 158 ml. per minute. A further 8 mg. of triac administered within two days raised the B.M.R. once more, although less so than after the first dose (gradual rise of oxygen consumption to 177-191 ml. per minute during the subsequent four days). A third dose of 10 mg. of triac had practically no effect at all on the B.M.R. (oxygen consumption remaining at 175-179 ml. per minute). During the period of observation the goitre steadily grew smaller from the second day onwards (Figs. 2-4). As in the smaller from the second day onwards, the diffuse parts responded first trial with tri-iodothyronine, the diffuse parts responded first, and the nodules somewhat later. After seventeen days the diffuse goitre was no longer palpable (neck circumference 35 cm.), and the nodules had decreased to the size of a small cherry and large olives respectively (Fig. 4).

At that time we tried to make the patient temporarily hyperthyroid (the transient nature of triac activity having already been established) with a view to finding out whether this might lead to complete disappearance of the nodules. For this purpose a total of 30 mg. of triac was given within three days, whereupon the B.M.R. quickly rose to +42% (oxygen consumption 252 ml. per minute) two days after the last dose. Within the following four days the B.M.R. gradually dropped to the baseline. The other indices of thyroid function (external appearance, weight, blood cholesterol, pulse rate, etc.) remained, however, in the euthyroid range during the entire hypermetabolic phase, the E.C.G. even showing a partial relapse. There was neither

tremor nor exaggerated sweating. Whereas the diffuse parts of the goitre were still absent, we were surprised to find a steady increase in the size of the nodules, which within six days almost reached their pre-treatment size (Fig. 5). Thereafter, along with a further decrease of oxygen consumption, they again started to regress. A control investigation with radio-iodine at the height of the hypermetabolic phase showed marked hyperactivity over all parts of the gland with regard to iodine collection (55% after twenty-four and 60% after forty-eight hours). Radio-iodine excretion was 35% after twenty-four and 37% after forty-eight hours, and the conversion ratio was 18% after twenty-four hours.

Discussion and Conclusions

It is generally accepted that the ultimate cause of thyroid enlargement, no matter whether of diffuse or of nodular nature, and whatever its primary cause, is to be sought in increased T.S.H. secretion or activity. Conversely, regression of diffuse and nodular goitres alike is ascribed to T.S.H. suppression. The quantitatively different response of diffuse and nodular goitres to T.S.H.-suppressing agents—that is, thyroid substances—indicates that a specific genetic factor should be postulated for the development and regression of thyroid nodules. This factor may probably be ascribed to a focal hypersensitivity of certain areas of thyroid tissue towards growth-stimulating influences (Zondek and Leszinsky, 1956). Circumscribed variations of thyroid function may be ruled out on the strength of isotope studies in this and previously reported observations, no differences having been found in the functional behaviour of diffuse and nodular areas. Neither is it probable that structural differences are of account. It could be shown that excised nodules of this patient and her brother showed uniformly colloid structure.

On the strength of this reasoning it was postulated that the hypersensitivity of the nodular areas towards T.S.H. might best be overcome by raising the levels of circulating thyroid hormone to such an extent as to remove the last vestige of T.S.H. from the circulation—that is, by creating a state of hyperthyroidism. Contrary to our expectations, however, the nodules not only failed to decrease but they even increased greatly in size, thereby indicating that another mechanism which counteracted T.S.H. suppression had come into play. In fact, it became clear that the nodules, in contrast to the diffuse goitre, showed a uniform behaviour with regard to size (Figs. 1 and 5) during the hypothyroid phase and the "alimentary hyperthyroid" phase, which was associated with hypermetabolism and actual, though incomplete, hyperfunction of the thyroid gland. The overall increase of radio-iodine uptake over the thyroid also came as a surprise, it being rather expected that thyroid activity would be entirely suppressed after the ingestion of thyroid substances (see above).



FIG. 1.—A 14-year-old girl with familial sporadic cretinism and goitre, before therapy. B.M.R. -25%. Note the three large nodules within voluminous diffuse goitre. FIG. 2.—Same girl 48 hours after 8 mg. of triac. Note volume decrease of diffuse goitre. FIG. 3.—Same girl seven days after above therapy. Note further volume decrease of goitre. FIG. 4.—Same girl three days after a second dose of 8 mg. triac. Note absence of diffuse goitre as contrasted with conspicuous volume increase of nodules. FIG. 5.—Same girl two days after a third dose of 10 mg. of triac in three days. Note absence of diffuse goitre as contrasted with conspicuous volume increase of nodules.

The paradoxical behaviour of the nodules with regard to size, and of the entire thyroid tissue with respect to function, can in our opinion best be understood in the light of the peripheral theory (Zondek, 1924, 1935), which postulates that primary rise of oxygen consumption in the peripheral tissues may result in secondary hyperfunction of the thyroid, eventually with corresponding increase of its volume. It may therefore be assumed that in our case the artificially induced hypermetabolism led to a secondary stimulation of thyroid function as far as a response of the seriously damaged thyroid tissue could be expected. (Increased formation of an active thyroid hormone was regarded as all the more unlikely, since the B.M.R. subsequently fell.) At the same time only those parts of the gland which exhibited hypersensitivity towards growth-stimulating influences—namely, the nodules—would and did also increase in size. The fact that functional increase was evident throughout the whole thyroid tissue, whereas the increase in size was restricted to the nodules, confirms the claim that function and growth within the thyroid are not necessarily correlated (see above).

It may therefore be assumed that complete regression of thyroid nodules cannot be achieved either in the hypothyroid or in the hyperthyroid respectively hypermetabolic stage, but only if and when a euthyroid state is maintained through adequate and prolonged substitution therapy.

Summary

The case of a 14-year-old girl with familial sporadic cretinism and a very large goitre of partly diffuse and partly nodular nature is reported in which the induction of a euthyroid state resulted in the disappearance of the diffuse goitre and a decrease in the size of the nodules. On the strength of the generally accepted thesis that nodular and diffuse thyroid enlargements are ultimately due to increased T.S.H. secretion and activity, and their regression to T.S.H. suppression, attempts were made to reduce the size of the nodules further by achieving the utmost degree of T.S.H. suppression—that is, by making the patient artificially hyperthyroid. Following the ingestion of large amounts of active thyroid substances (30 mg. of tri-iodothyroacetic acid—"triac"—in three days) a steep but spurious rise of the B.M.R. was obtained, whereas the other indices of thyroid function remained in the euthyroid range. Simultaneously the nodules not only failed to decrease but actually considerably increased in size, almost attaining their pre-treatment volume within six days. Radio-iodine uptake, which before treatment had been very low (with the exception of the two-hour value), rose to abnormally high "hyperthyroid" levels at the height of the hypermetabolic phase; hormone synthesis was not affected.

The unexpected and paradoxical behaviour of the nodules with regard to size and of the entire thyroid tissue with regard to function during the hypermetabolic phase is discussed.

In the light of our observations, regression of thyroid nodules may be expected to take place only in euthyroid conditions, and it must be the aim of treatment to maintain clinical euthyroidism through adequate and prolonged maintenance therapy.

We are greatly indebted to Dr. R. Pitt-Rivers, F.R.S., of the National Institute of Medical Research, for the supply of "triac." Our thanks are also due to Drs. Hochman and Stein, of the Isotope Unit, Hadassa Medical School, Jerusalem, for the ¹³¹I examinations.

REFERENCES

- Pitt-Rivers, R. (1953). *Lancet*, 2, 234.
Zondek, H. (1924). *Disch. med. Wschr.*, 50, 364.
— (1935). *The Diseases of the Endocrine Glands*, p. 26. Arnold, London.
— and Leszynsky, H. (1956). *Lancet*, 1, 77.
— and Zondek, G. W. (1955). *Acta endocr. (Kbh.)*, 18, 117.

ATRIAL SEPTAL DEFECT IN THE AGED

BY

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Atrial septal defect accounted for 17% of a series of 200 cases of proved congenital heart disease described by Wood (1950). In his series of cases a sex incidence of 4:1 in favour of the female was encountered and the average age at death was stated to be about 36 years.

Recent advances in anaesthesia and surgical technique (Edwards *et al.*, 1955) have resulted in the inclusion of atrial septal defect among the increasing number of congenital heart lesions now amenable to surgical treatment.

Whilst recognizing the value of surgery in the treatment of a congenital lesion which hitherto has carried such a gloomy prognosis, we feel that this is an opportune time to describe five cases of atrial septal defect in elderly patients which have come to our notice during the past twelve months. All our patients have lived full and active lives, and two of them are still capable of a degree of physical exertion compatible with their advancing years.

Case 1

A widow aged 79 was admitted to the cardiac centre on July 7, 1955, in congestive cardiac failure. She stated that her first episode of cardiac failure had occurred when she was 54 years of age. Prior to that time she had enjoyed good health and was unaware of any cardiac defect. During the last 25 years she had three further attacks of congestive failure, and for the past 10 years dyspnoea on effort had forced her to limit her activities considerably. One month before admission her dyspnoea had increased and was accompanied by swelling of her feet, legs, and abdomen.

On examination she was an alert, intelligent patient who looked younger than her stated age. Slight cyanosis was noted, but she was not anaemic, and there was no finger-clubbing. The pulse rate was 74 a minute, and irregular owing to auricular fibrillation. The brachial blood pressure was 110/80 mm. Hg. The apex beat was difficult to locate and presented as a tumultuous heave extending beyond the midclavicular line. There were no palpable thrills. Marked jugular venous engorgement was noted. On auscultation the abnormalities found were a grade I systolic murmur together

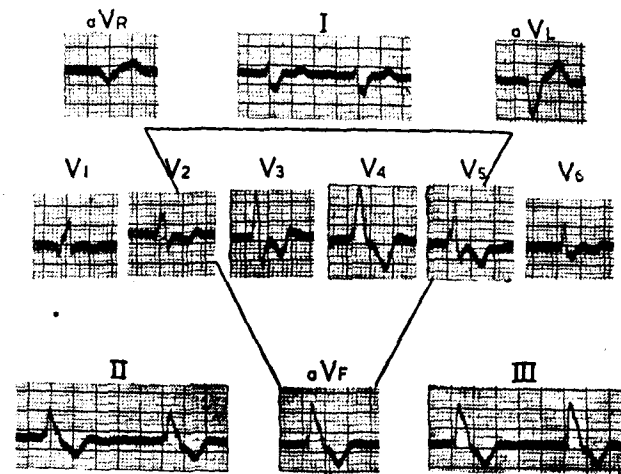


FIG. 1.—Case 1. Auricular fibrillation and right bundle-branch block.

with a third heart sound at the apex. The second sound over the pulmonary area was accentuated and widely split. No diastolic murmurs were heard. The liver was enlarged, sacral and ankle oedema was noted, and moist rales were present at both lung bases.



FIG. 2.—Case 1. Generalized cardiac enlargement with enlarged pulmonary arteries.

Investigations.

An electrocardiogram revealed auricular fibrillation and a right bundle-branch block (Fig. 1). Chest x-ray film showed marked cardiac enlargement with prominent pulmonary arteries (Fig. 2). Cardioscopy confirmed the presence of pulmonary plethora, right ventricular enlargement, and vigorous pulsation of the pulmonary arteries. No selective left auricular enlargement was detected.

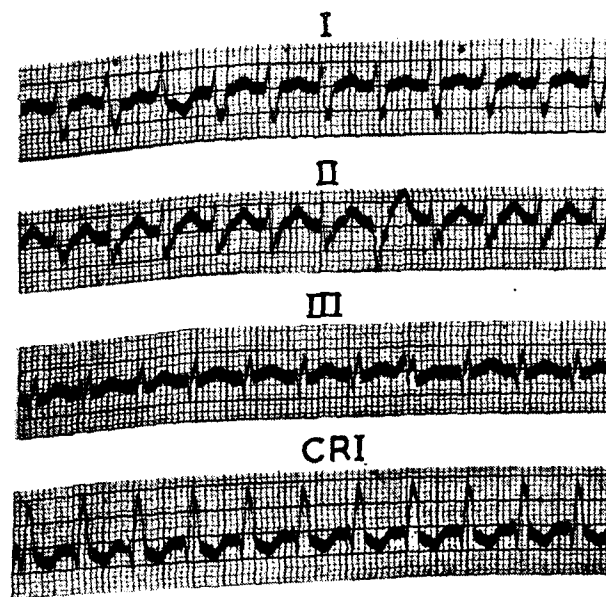


FIG. 3.—Case 2. Supraventricular paroxysmal tachycardia and right bundle-branch block.

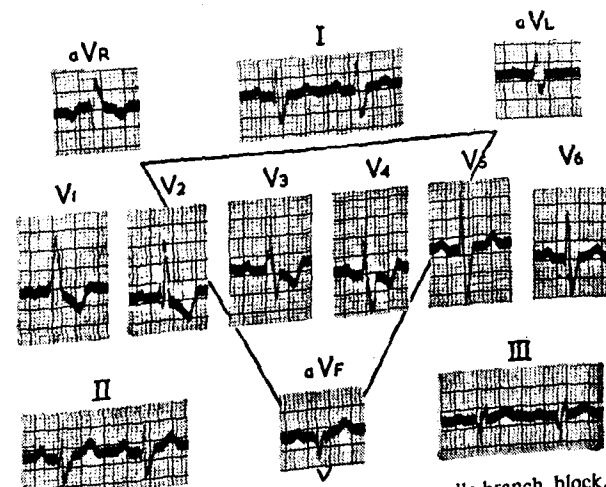


FIG. 4.—Case 2. Sinus rhythm and right bundle-branch block.

Case 2

A retired butcher aged 68 attended a surgical clinic in March, 1955, complaining of prolapsing haemorrhoids. Routine examination revealed a marked tachycardia, and he was referred to the cardiac centre for further investigation.



FIG. 5.—Case 2. Generalized cardiac enlargement with pulmonary plethora and prominence of the pulmonary conus.

On examination he was seen to be a short thick-set man of cheerful disposition and in no obvious distress whilst at rest. Slight jugular venous engorgement was noted, together with slight pretibial oedema. The pulse rate was regular at 160. The brachial blood pressure was 160/100 mm. Hg. Because of his obesity and emphysematous chest contour, the apex beat could not be defined. No thrills

or murmurs were detected. An electrocardiogram showed a supraventricular paroxysmal tachycardia with right bundle-branch block (Fig. 3). The paroxysm terminated spontaneously, the pulse rate falling to 96. Sinus rhythm was confirmed by electrocardiogram, the right bundle-branch block remaining unchanged (Fig. 4). Further examination revealed a grade II systolic murmur over the pulmonary area, a third heart sound at the apex, and accentuation of the aortic and pulmonary second sounds. In addition wide splitting of the pulmonary second sound was noted.

Investigations.—An electrocardiogram revealed sinus rhythm with right bundle-branch block. Chest x-ray examination showed generalized cardiac enlargement, pulmonary plethora, and prominence of the pulmonary conus (Fig. 5). Cardioscopy confirmed these findings, and vigorous pulsation of the pulmonary arteries was seen. Cardiac catheterization was performed, when evidence of moderate pulmonary hypertension was obtained and blood sampling confirmed the presence of atrial septal defect (see Table).

Catheter Studies in Case 2

Catheter Tip	Pressure (mm. Hg)	Blood O ₂ Saturation (%) (Van Slyke)
Superior vena cava	—	59
Right auricle, high	—	62
mid	—	72
Inferior vena cava	—	56
Right ventricle	40/0	66
Pulmonary artery	50/20	67

Case 3

A man aged 67 was referred to the heart clinic of the Liverpool Royal Infirmary in August, 1954, with a request from his general practitioner that his dyspepsia and tachycardia be investigated. So far as the patient could recollect, he had suffered no serious illness in the past. When he was a child some cardiac enlargement had been noted, but the cause was not specified.

He was working a 40-hour week as a fitter, the work involving moderate physical exertion, and he had lost no time off work in 40 years. During the previous four months he had suffered from recurrent attacks of dizziness, associated with a feeling "as if my heart missed a beat." There had been no chest pain, dyspnoea, cough, or haemoptysis.

On examination there was no cyanosis, finger-clubbing, jugular venous engorgement, or oedema. The pulse rate

was 80, with a regular rhythm. The brachial blood pressure was 140/80 mm. Hg. The apex beat was difficult to locate because of emphysema, but was maximal in the left fifth interspace, 4 in. (10 cm.) from the midline. No right ventricular heave could be felt.

The first and second sounds were normal at the mitral, tricuspid, and aortic areas. No third heart sound could be

heard. The pulmonary second sound was accentuated and widely split, the second component being the louder. A grade I systolic murmur was confined to the apex; no diastolic murmurs could be heard.

Investigations.—An electrocardiogram revealed a sinus rhythm with a right bundle-branch block (Fig. 6). Cardioscopy showed a moderately enlarged heart, mainly right ventricular, with unfolding of the aorta (Fig. 7). There was also some calcification in the aortic arch. The lung fields were plethoric and there was a well-marked "hilar dance."

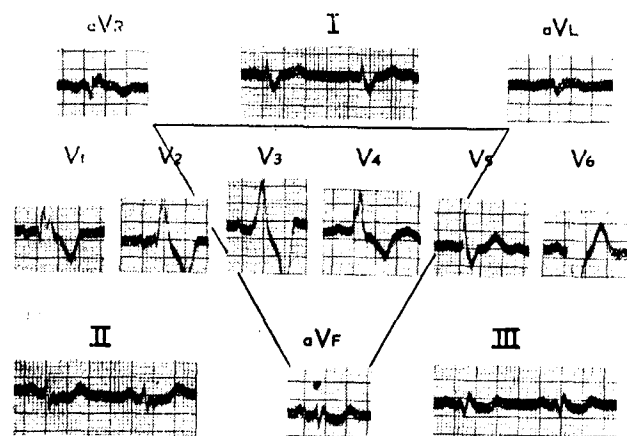


FIG. 6.—Case 3. Sinus rhythm and right bundle-branch block.

Investigations.—An electrocardiogram revealed sinus rhythm with a right bundle-branch block (Fig. 6). Cardioscopy showed a moderately enlarged heart, mainly right ventricular, with unfolding of the aorta (Fig. 7). There was also some calcification in the aortic arch. The lung fields were plethoric and there was a well-marked "hilar dance."

Case 4
A man aged 58 suffering from pulmonary tuberculosis was referred to the cardiac centre in September, 1955. Previous x-ray examinations of his chest had revealed an abnormality of the cardiac contour and pulmonary vessels. He had been in hospital twice during the past three years. On the first occasion a gastric ulcer was treated conservatively, and on the second he had lobar pneumonia. No comment was made about his heart on either occasion.

On examination he was seen to be a short, thin man of sallow complexion with a marked dorsal kyphoscoliosis and "pigeon chest." He had a high arched palate, but no finger-clubbing or arachnodactyly. He appeared slightly cyanosed, but there were no signs of congestive cardiac failure.

His pulse rate was regular at 108, the brachial blood pressure was 130/70 mm. Hg. The apex beat was felt as a tumultuous heave in the anterior axillary line in the sixth left interspace. No parasternal pulsation was detected. At the apex a grade II systolic murmur was heard together with a third heart sound. The second sound over the pulmonary

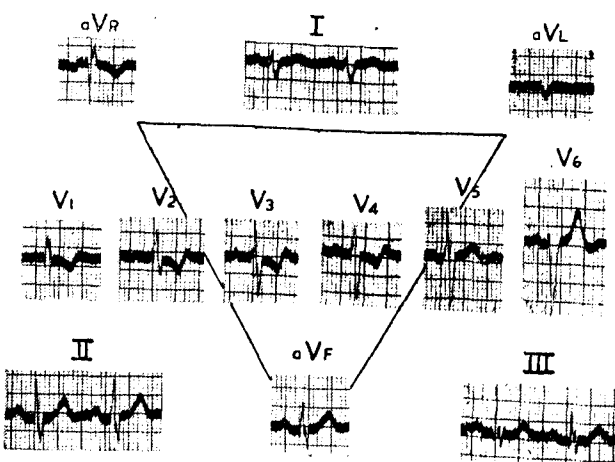


FIG. 8.—Case 4. Sinus rhythm and right bundle-branch block.

Case 5

A housewife aged 58 first developed congestive cardiac failure in July, 1950. Prior to that time she had enjoyed good health and her five pregnancies had been uneventful. She was alleged to have had rheumatic fever when aged 11 years, but could recall no other significant illness. A survey of her case notes recorded in 1950 revealed that she had auricular fibrillation with severe congestive cardiac failure. Cardiac enlargement, gallop rhythm, and a loud apical systolic murmur were heard. A pericardial friction rub maximal over the pulmonary area and left parasternal region was also noted, and was still audible three months later when she was discharged. The brachial blood pressure was 180/120 mm. Hg. Her electrocardiogram showed a right bundle-branch block with auricular fibrillation, and this record remained unchanged during the next five years (Fig. 9). Chest x-ray examination in 1950 was reported as showing "generalized cardiac enlargement with prominence of the pulmonary conus, and selective enlargement of the left

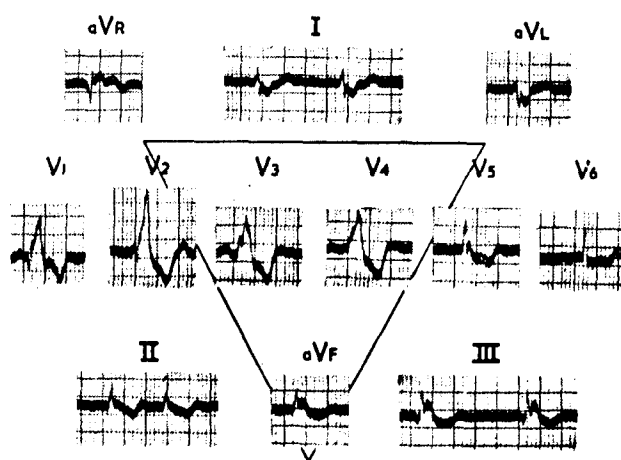


FIG. 9.—Case 5. Auricular fibrillation and right bundle-branch block.

auricle. Congestive changes are shown in the lung fields." A diagnosis of congestive cardiac failure secondary to rheumatic heart disease and hypertension was made. Between 1950 and 1955 she was readmitted to hospital on four occasions in severe congestive cardiac failure. The pericardial friction rub remained a constant finding throughout, and the diagnosis of rheumatic heart disease and hypertension was not questioned. Her last admission to hospital was in July, 1955.

On examination she was cyanosed, with marked jugular venous engorgement. No finger clubbing was noted. Pitting oedema of the legs and lumbar region was apparent, together with gross ascites. The apex beat was located in the sixth left interspace, in the anterior axillary line. There was no palpable right ventricular heave, but the pulmonary second sound was accentuated and widely split. The mitral and aortic sounds were normal, and no diastolic murmurs could be heard. The curious pericardial friction rub previously recorded was still present over the left parasternal area. The brachial blood pressure was 180/110 mm. Hg.

Investigations.—An electrocardiogram was similar to the first record taken in 1950, showing a right bundle-branch block with auricular fibrillation. Cardioscopy revealed generalized cardiac enlargement, pulmonary plethora, and vigorously pulsatile dilated pulmonary arteries. No selective left auricular enlargement was seen.

In view of these findings the previous diagnosis of rheumatic heart disease seemed unlikely; the right bundle-branch block, dilated pulsatile pulmonary arteries, and auricular fibrillation all being more compatible with a diagnosis of atrial septal defect.

The patient died in November, 1955, but unfortunately permission for necropsy was not granted.

Discussion

In this paper we have described five cases of atrial septal defect occurring in elderly patients. Their ages ranged from 58 to 79 years. All the patients were seen by us during a period of 12 months, a surprising fact when it is recalled that most patients with this type of congenital heart disease succumb before the age of 40 years (McGinn and White, 1933).

The criteria for diagnosis have been based mainly on radiological and electrocardiographic findings, as it is generally agreed that a purely clinical diagnosis cannot be made with certainty (Burrett and White, 1945).

All five cases showed the typical radiographic findings associated with atrial septal defect, as described by Roesler (1934) and Bedford *et al.* (1941)—namely, dilatation of the right auricle and ventricle, with marked dilatation and pulsation of the pulmonary artery and its branches. Associated left auricular enlargement was alleged to be present in Case 5, but we were unable to confirm this; the left ventricular enlargement noted in this case was thought to be due to the coincident systemic hypertension. Unfolding of the aorta with atheroma was present in Case 3, but otherwise the first four cases in the series showed no enlargement of the left auricle, left ventricle, or aorta.

The electrocardiographic pattern of right bundle-branch block was present in each case, thereby satisfying the criteria laid down by Barber *et al.* (1950), who pointed out that the diagnosis of atrial septal defect in the absence of partial or complete right bundle-branch block is almost untenable. In Case 5, negative T waves in leads V5 and V6 were thought to be due to the systemic hypertension. Two patients were shown to have auricular fibrillation, and one had episodes of supraventricular paroxysmal tachycardia.

Catheter studies were performed in only one patient (Case 2), and we are indebted to this man for his willing co-operation in a procedure from which he could derive no benefit. They revealed the presence of a left-to-right shunt in the atria and a mild degree of pulmonary hypertension,

the pulmonary artery systolic pressure being 50 mm. Hg. We did not consider catheterization justifiable in the other four cases, since it could have had no therapeutic application.

Apart from finding a widely split and accentuated pulmonary second sound in all our cases, clinical examination was of little help in establishing the diagnosis. No evidence of arachnodactyly was found in any patient, the only skeletal abnormality being a dorsal kyphoscoliosis in two patients. A high arched palate was found in only one patient, and finger-clubbing was uniformly absent.

Two patients, both of whom had auricular fibrillation, were in severe congestive cardiac failure when seen, two had marked dyspnoea on effort, and one (Case 3), apart from vague "palpitations," had no symptoms referable to his heart. In fact, three of the five patients were still capable of a degree of physical exertion compatible with their advancing years.

Apical or basal systolic murmurs (Grades I-III) were heard in all cases, but none had either pulmonary or apical diastolic murmurs, and in only three was a third heart sound audible. Splitting of the pulmonary second sound was a constant finding, and in three cases the tumultuous type of apex beat described by Barber *et al.* (1950) was found. The presence of the alleged pericardial friction in Case 5 deserves special mention, as it persisted for so long, and caused considerable confusion when first heard. It may have been mistaken for a "to-and-fro" pulmonary murmur due to relatively pulmonary incompetence, but it appeared to have a superficial quality and to become louder by increasing the pressure on the stethoscope on the chest wall. It seems probable, therefore, that the sound may have been produced by the enormously dilated pulmonary artery coming into contact with the anterior chest wall, its vigorous pulsation producing the friction sound.

In differential diagnosis, the presence of the bundle-branch block, together with peripheral pulmonary plethora and marked splitting of the pulmonary second sound, excluded the presence of idiopathic dilatation or of post-stenotic dilatation of the pulmonary artery. The absence of left ventricular enlargement in all except Case 5 excluded so far as was possible the existence of ventricular septal defect and persistent ductus arteriosus. Case 5 showed some left ventricular enlargement, but this was thought to be due to the systemic hypertension present in this case.

We have already stressed the difficulties in establishing the diagnosis of atrial septal defect on purely clinical grounds. In the present series Case 1 had been regarded as a case of congestive heart failure for over 25 years, presumed to be due to coronary artery disease until the diagnosis of atrial septal defect was made, and Case 5 had at varying times been thought to have coronary artery disease with hypertension and mitral stenosis. Case 4 had been thought to have chronic cor pulmonale, and Cases 2 and 3 had not been diagnosed. With these facts in mind the purpose of this paper has been to show that atrial septal defect and longevity are not incompatible; and we would therefore stress the importance of excluding this not uncommon congenital anomaly as a cause of obscure congestive cardiac failure in the older age groups. We suspect that many cases of this type occurring in the sixth and seventh decades have been missed in the past because the possibility of encountering a congenital heart lesion in an aged patient has not been entertained. It is all too easy in such patients to ascribe auricular fibrillation, when present, and bundle-branch block to coronary artery disease, and the pulmonary plethora to congestive cardiac failure or even uraemia occurring as a terminal event in an aged patient.

Summary

Five cases of atrial septal defect with clinical, radiological, and electrocardiographic findings are described in patients between the ages of 58 and 79 years.

The possibility is stressed of this anomaly being present in older patients with congestive cardiac failure of obscure origin.

It has been shown that atrial septal defect and longevity are not incompatible.

We are indebted to Drs. E. Noble Chamberlain, E. Wyn Jones, C. S. McKendrick, H. Fuld, and F. C. Crawley for allowing us to publish details of patients under their care at Sefton General Hospital, Liverpool, and the Royal Infirmary, Liverpool.

REFERENCES

- Barber, J. M., Magidson, O., and Wood, P. (1950). *Brit. Heart J.*, 12, 277.
Bedford, D. E., Papp, C., and Parkinson, J. (1941). *Ibid.*, 3, 37.
Burrett, J. B., and White, P. D. (1945). *Amer. J. med. Sci.*, 209, 355.
Edwards, F. R., Farquhar, H. G., Hay, J. D., and Rees, G. J. (1955). *British Medical Journal*, 2, 1463.
McGinn, S., and White, P. D. (1933). *Amer. Heart J.*, 9, 1.
Roesler, H. (1934). *Arch. intern. Med.*, 54, 339.
Wood, P. (1950). *Diseases of the Heart and Circulation*. Eyre and Spottiswoode, London.

EPIDEMIC OF PULMONARY TUBERCULOSIS IN A CLOSED COMMUNITY

BY

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The first scientific study of the epidemiology of tuberculosis was made by Villemin in 1868. He stressed the high incidence of the disease among those living in closed communities, such as prisoners, inmates of mental institutions, soldiers, and religious bodies. Tuberculosis among troops living in barracks was very common compared with those in the field or those living at home. He quoted, as an example, the Allied armies before Sebastopol during the winter of 1854-5. Although these troops were living under most unhygienic conditions, with poor food, and subjected to severe cold and excessive fatigue, cases of tuberculosis were rare. At this time the mortality rate in the Army due to tuberculosis varied between 5 and 12.5 per 1,000.

To-day we have the same modes of spread of the disease. It is only by the detection of early cases and by adopting strict precautions to prevent its transmission by the occasional "open" cases that we are able to improve on these figures. The following is an account of its rapid spread in a comparatively closed community in which normal precautions are taken but in which the opportunities for spread are so great.

The Closed Community

This community was a military band which returned to the United Kingdom from a tropical station at the end of September, 1954. Its members were given leave for four weeks before returning to barracks. In February, 1955, they went to Germany.

In peacetime, military bands have approximately forty members, mainly between the ages of 16 and 25 years. Few are married and live in quarters; the rest live together in barracks. Occasions arise, such as touring, when they all live together. Sleeping accommodation varies from station to station; while in the United Kingdom these men lived in rather old barracks and slept sixteen to a room, in Germany their barracks were excellent, and they slept four to a room. Food was good and there were ample facilities for recreation. These men are specialists and have little in common with other members of the regiment; their friends are usually other bandsmen.

The regiment to which a military band belongs has little bearing on the background of its bandsmen. They originate

from all parts of Britain, mainly large industrial cities. There is no reason to believe these people lacked natural immunity. When Mantoux tests were performed at the end of March, 1955, only one person under 21 years was Mantoux-negative. Of the seventeen members joining since, all are Mantoux-positive, none having received B.C.G.

The practice-room usually allocated to the band is a small one on the outskirts of the station, where their music does not interfere with other military activities. Rarely have they large particularly well-ventilated rooms.

On returning from tropical conditions to the wintry conditions in the United Kingdom, approximately half of the band developed some form of minor respiratory tract infection. Six of the finally proved cases experienced this change, which may have played a small part in lowering their resistance.

Presentation of Cases

On March 22, 1955, Case 1, a youth aged 17, reported sick with pleuritic pain in the right side of his chest. Clinically and radiologically he had a large right-sided pleural effusion. E.S.R. (Westergren) 38 mm./hour. White cells, 10,900 per c.mm. (polymorphs 69%, lymphocytes 27%, monocytes 4%). Aspirated pleural fluid: white cells, 4,900 per c.mm. (lymphocytes 80%); red cells, 6,400 per c.mm.; specific gravity, 1.012. Gram stain: no organisms seen. Ziehl-Neelsen stain of concentrated fluid: scanty distribution of *Mycobacterium tuberculosis*. These organisms were later cultured. This patient produced no sputum, and no organisms were detected in his resting gastric juices. Mantoux 1:10,000 was positive.

There was no family history of tuberculosis or any known contact with the disease. He had joined the band four months previously while in the United Kingdom, and his contacts were confined to the members of the band and the bandmaster's family, whom he visited frequently. These contacts were x-rayed and two further cases found—Case 2 and the bandmaster's wife.

Case 2, a man aged 23, had an advanced fibro-caseous lesion spread throughout the left upper lobe. There were two medium-sized cavities, one at the apex and the other in the mid-zone. He gave a history of having had cough with sputum for four months, and on one occasion a small haemoptysis. For some time he had noticed that playing his clarinet had become more exhausting. E.S.R. (Westergren) 30 mm./hour. Sputum contained a scanty distribution of acid/alcohol-fast bacilli. He had slept in the next bed to a man with pulmonary tuberculosis in Hong Kong in 1952. The band had been x-rayed in Hong Kong and again in the United Kingdom in the summer of 1953, but no further cases were detected.

The bandmaster's wife had an early infiltrative lesion at the right apex. She had no symptoms and no signs. No organisms were isolated from her sputum or resting gastric juices. Case 1 was a frequent visitor to the bandmaster's home, and she had met Case 2 socially on several occasions.

Further cases presented as shown in the accompanying Table, either clinically or with abnormal chest x-ray finding during follow-up examination. The last cases (Nos. 9 and 10) were admitted to hospital at the beginning of May, 1956. There were no cases when mass miniature radiographs were taken at the end of December, 1955.

All family contacts of infected bandsmen have been examined radiologically. No cases have been found. Case 2 had regularly seen his wife until going to Germany. She remains well.

Source of Infection

Myco. tuberculosis was isolated from three cases of this series. It was seen in the Ziehl-Neelsen stain and later cultured. In Case 1 the organisms were found in the pleural fluid; he produced no sputum, and no organisms were found in his resting gastric juices. X-ray examination revealed no pulmonary lesion to suggest he had had "open" pulmonary tuberculosis at any time. Case 2 had organisms in his sputum, and x-ray appearances were compatible with

"open" pulmonary tuberculosis. Case 6 was admitted to hospital for further investigation because a very faint shadow was seen at the left apex during follow-up x-ray examination. He had no symptoms and there were no chest signs. E.S.R. (Westergren) 2 mm./hr. A Ziehl-Neelsen stain of his first early-morning specimen of sputum showed a scanty distribution of acid/alcohol-fast bacilli identical with *Myco. tuberculosis*. These organisms were later cultured from this specimen. None were isolated from numerous other specimens, and after further scrutiny of x-ray films, bronchoscopy, and laryngoscopy, no further evidence of a tuberculous lesion could be found. Cases 4 and 5 were in hospital at the time, but there is no reason to believe their sputum specimens were confused with that of Case 6, and, anyhow, there has been no reason to consider either of these cases as being "open." I cannot explain this.

Of the group, only Case 2 has been proved capable of infecting others. He probably contracted the disease in Hong Kong in 1952, but only recently had his lesion broken down and resulted in dissemination of bacilli. It will be noted that all the cases in this series were men attached to

the band before April, 1955, when Case 2 was admitted to hospital. There is no radiological evidence of active disease in any of the seventeen joining since.

Methods of Spread of the Disease

Via Musical Instruments.—Many older musicians have the impression that oboe and bassoon players are more prone to pulmonary tuberculosis than other members of the band—presumably because these instruments have a double reed and it was thought that they retain organisms. There appears to be no actual evidence to support this theory, and the type of instrument played is of no significance. Bandsmen are dissuaded from playing each other's instruments, but a certain amount of interchanging is carried on. However, this mode of spread probably had little part in the present minor epidemic, as the clarinet played by Case 2 was his personal property, and he was very reluctant to allow others to play it and was himself very reluctant to play other instruments. Case 10 was the instructor on the clarinet, and did occasionally play Case 2's instrument. Reeds last for one to two weeks, and there is no way of

Details of Cases

Case No., Age, Married, etc.	Date of Joining Band and Countries Visited Before Germany	Any Known Previous Contact with Tuberculosis	Instrument	Date of Admission to Hospital and How Detected	Type of Disease Symptoms	Living Accommodation
1. 17 yrs. Not married	Nov., 1954. U.K. only. Germany Feb., 1955	None. Mantoux 1:10,000+	Oboe	22.3.55: Reported sick with symptoms and admitted to hospital	Pleuritic pain in right side of chest and breathlessness for five days. Clinically and radiologically a large right-sided pleural effusion	Lived in barracks

Band and contacts x-rayed at end of March, 1955 (large plates).

2. 24 yrs. Married	1948. Canal Zone, 1948-9. Hong Kong, 1949-52. Brit. Guiana Feb.-Nov., 1954. Germany, Feb., 1955	In contact with case of pulmonary tuberculosis in Hong Kong in 1952. Slept in same room. X-rayed—n.a.d.	B♭ clarinet	1/4.55: Picked up when band x-rayed	Cough and sputum 4 months. Haemoptysis on one occasion. Had noticed he could not play his instrument as well. E.S.R. 30 mm./hr. Radiologically fibro-caseous lesion with cavities in left upper lobe	Lived in barracks during his one month in Germany and for part of time in U.K. Shared a room with three others; Cases 4 and 9 were in this room
3. 23 yrs. Married	1948. Canal Zone, 1948-9. U.K. Brit. Guiana, Feb.-Nov., 1954. U.K. Germany, Feb., 1955	None	E♭ clarinet	26.5.55: Reported sick with symptoms and admitted to hospital	Pleuritic pain in left chest, fever and anorexia of 12 hours' duration. Clinically and radiologically a large left-sided pleural effusion	Lived with his family in quarters

Band and contacts x-rayed at beginning of June, 1955 (large plates).

4. 20 yrs. Not married	1954. Brit. Guiana, Feb.-Nov., 1954. U.K. Germany, Feb., 1955	None. Mantoux 1:10,000+ 31/3/55	French horn	11.6.55: Picked up when band x-rayed	Symptom-free. No signs. E.S.R. 2 mm./hr. Very early infiltrative lesion right apex	Lived in barracks. Slept in same room as Case 2 while in Germany—i.e., 1 month
5. 24 yrs. Married	1952. Hong Kong, 1952. Brit. Guiana, Feb.-Nov., 1954. U.K. Germany, Feb., 1955	Not in contact with case in Hong Kong	Cornet	11.6.55: Picked up when band x-rayed	Symptom-free. No signs. E.S.R. 17 mm./hr. Early infiltrative lesion right apex	Lived in barracks
6. 25 yrs. Married	1945. Canal Zone, 1948-9. Hong Kong, 1949-52. Brit. Guiana, Feb.-Nov., 1954. U.K. Germany, Feb., 1955	In Hong Kong, 1952. Contact of case there. X-rayed—n.a.d.	B♭ clarinet, saxophone	11.6.55: Picked up when band x-rayed	Symptom-free. No signs. E.S.R. 2 mm./hr. Admitted because of two faint opacities seen at left apex on x-ray examination. Sputum x 3—A.A.F.Bs. seen and cultured from one. Sent to U.K. for further investigation. No lesion found	Lived in married quarters

Whole band had chest x-ray films taken at end of September, 1955 (large plates).

7. 19 yrs. Married (Aug., 1955)	1953. Brit. Guiana, Feb.-Nov., 1954. U.K. Germany, Feb., 1955	None. Mantoux 1:10,000+ 31/3/55	B♭ clarinet	26.9.55: Picked up when band x-rayed	Symptom-free. No signs. E.S.R. 5 mm./hr. Small segmental collapse right middle lobe with pronounced hilar shadow	Lived in barracks. Married 3 months before development of disease
8. 16 yrs. Not married	1955. U.K. Germany, Feb., 1955	None. Mantoux 1:10,000+ 31/3/55	B♭ clarinet	30.9.55: Picked up when band x-rayed	Symptom-free. Diminished movement at left apex, otherwise no signs. E.S.R. 7 mm./hr. Early infiltrative lesion left infraclavicular region	Lived in barracks

Band and contacts x-rayed at end of December, 1955 (M.M.R.). No cases

Band and contacts x-rayed at beginning of May, 1956 (large plates)

9. 22 yrs. Married (Dec., 1955)	1954. U.K. Germany, Feb., 1955	None. Mantoux-neg. in Oct., 1954	Saxophone	5/5.56: Picked up when band x-rayed	Slight fatigue, otherwise symptom-free. No signs. E.S.R. 5 mm./hr. Radiologically an early infiltrative lesion left apex	Lived in barracks. Slept in same room as Case 2 while in Germany—i.e., 1 month
10. 24 yrs. Married	1946. Hong Kong, Brit. Guiana, U.K. Germany, Feb., 1955	2 brothers with tuberculosis. Last saw them in Aug., 1953	B♭ clarinet	5/5.56: Picked up when band x-rayed	Symptom-free. No signs. E.S.R. 3 mm./hr. Radiologically an early infiltrative lesion	Lived in married quarters 1 year. Slept in same room as case in Hong Kong in 1952

When seen in February, 1955, the patient complained of some tightness of the chest, but was otherwise well. A radiograph showed a right spontaneous pneumothorax. In March, while sitting in a chair at home, she had felt a

sharp pain in the left chest. A radiograph showed a small left spontaneous pneumothorax. The right side had re-expanded. She was admitted to hospital, where a left thoracotomy was performed. This showed the visceral pleura to be somewhat injected; there were a number of fine bullae over the surface and a few larger scattered bullae. The lung felt very firm and nodular, and a biopsy of lung showed pathological appearances typical of sarcoidosis. Pleurodesis was performed with camphor. There has been no recurrence of pneumothorax.

Case 4

A man aged 34 was admitted to hospital in January, 1954, for investigation of a painless swelling in the right groin. There was a history of shortness of breath over the previous six years. His medical history and family history were non-contributory. Examination revealed bilaterally enlarged lymphatic glands in occipital, supraclavicular, axillary, epitrochlear, and inguinal regions. The liver and spleen were not enlarged. The E.S.R. was 25 mm. at 1 hour (Westergren), and a tuberculin test was negative to 1/100 O.T. Laryngeal swabs were negative for tubercle bacilli. Other investigations, including blood count and plasma proteins, were normal or non-contributory. Chest radiographs showed massive hilar adenopathy, a large paratracheal mass in the right superior mediastinum, and diffuse reticular shadows throughout the lungs, most pronounced in the upper zones. Radiographs of the bones of the hands showed no abnormality. Biopsy of a gland showed appearances typical of sarcoidosis. The patient was discharged from hospital and kept under observation.

In March he complained of shortness of breath of some weeks' duration. A left spontaneous pneumothorax was found on physical examination and confirmed radiographically. Hospital admission was delayed for six weeks at the patient's request, and repeated x-ray pictures taken subsequently when he was an out-patient showed that the lung had failed to expand. He was then admitted with pyrexia and a pleural rub at the left base. Laryngoscopy, performed because of a history of hoarseness, revealed a left recurrent nerve palsy. The E.S.R. was 50 mm. at 1 hour (Westergren). Chlorotetracycline was prescribed and the lung gradually re-expanded over a total period of two months. Apart from shortness of breath, he has remained symptomatically well.

Discussion

During the last decade it has become obvious that sarcoidosis is a much commoner disease than was previously thought. It is certain also that many cases of pulmonary sarcoidosis were diagnosed in the past as pulmonary tuberculosis with a sputum negative for tubercle bacilli. The scarcity of reports of spontaneous pneumothorax complicating pulmonary sarcoidosis is difficult to explain. A number of such pneumothoraces have no doubt been regarded as complications of pulmonary tuberculosis, but this cannot be the only explanation. Either it is really uncommon or its occurrence has been taken for granted by many clinicians and hence not described. The occurrence of two patients with this complication among the 52 cases of pulmonary sarcoidosis reported by Riley (1950) possibly suggests the latter hypothesis. Until we searched the literature we had no idea that it had been reported only five times previously.

The underlying pathological changes in pulmonary sarcoidosis, both in its infiltrative stage and in its chronic fibrotic stage, are likely to be accompanied by areas of emphysema, and, apart from the absence of caseation and cavitation, are not unlike those of pulmonary tuberculosis. It is probable that when spontaneous pneumothorax occurs in sarcoidosis it is due to the rupture of an emphysematous bulla. This may happen in tuberculosis also, but the frequent presence of caseous lesions and cavities provides additional causes for spontaneous pneumothorax and an explanation of its commoner occurrence in tuberculosis.

Summary

Four cases of spontaneous pneumothorax complicating pulmonary sarcoidosis are reported. In two patients it was bilateral. Although this complication has been reported previously in only five patients, reasons are given for thinking that it may not be rare.

We are indebted to Dr. E. D. H. Cowen for permission to include the records of his patient, Case 4.

REFERENCES

- Dressler, M. (1947). *Schweiz. Z. Tuberk.*, 4, 229.
Gendel, B. R., and Luten, E. F. (1951). *Amer. Practit. (Philad.)*, 2, 339.
Isbister, J. (1945). *Med. J. Aust.*, 1, 275.
Riley, E. A. (1950). *Amer. Rev. Tuberc.*, 62, 231.

HERPES ZOSTER, CHICKEN-POX, AND CANCER IN GENERAL PRACTICE

BY

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The belief is prevalent that an association exists between herpes zoster and chicken-pox, and recently it has been suggested that there is a relationship between cancer and herpes. Provided accurate and continuous note-taking is undertaken any such relationship should be capable of being investigated by the family doctor.

In my practice of some 2,400 patients I have kept accurate and complete records of all ailments since July 5, 1948. The practice is two-thirds suburban and one-third rural. The following information is based upon an analysis of the records of these illnesses in question during the seven-year period from July 5, 1948, to July 4, 1955.

Herpes Zoster

It is possible that all patients with herpes zoster consult their family doctor. This, of course, is due to the discomfort and sometimes severe pain that it causes, associated with the blemishing of the skin. During the seven-year period of this review I had 81 cases of herpes zoster. Table I shows that, while the frequency varies slightly between the sexes in different age groups, the overall picture is that the sexes are equally involved. In both sexes the older age groups are more often affected.

Table II shows the location of the disease; the sex is included for possible variations. In both sexes the thoracic wall is the area most frequently involved. The head and

TABLE I.—Age Incidence of Herpes Zoster

Age	Male	Female	Total	Per 1,000 at Risk	
				Male	Female
0-4 years	0	0	0	0	0
5-14 "	2	2	4	19.0	14.8
15-44 "	10	6	16	19.0	12.0
45-64 "	20	17	37	71.0	45.8
65+ "	9	15	24	62.0	81.0
Total	41	40	81	34.1	31.0

TABLE II.—Location of Herpes Zoster

	Male	Female	Total
Head and neck	11	6	17
Upper and lower extremities	2	10	12
Thoracic wall	20	20	40
Abdominal wall	7	4	11
Not known	1	0	1
Total	41	40	81

neck are next in importance, and in this area the male takes precedence, while the extremities are more often involved in the female.

Table III shows the habitat of these 81 patients. It will be seen that this disease affects the rural patients just as often as it does the town dwellers.

Some observers have noted the occurrence of epidemics of herpes. Table IV clearly displays the endemic nature of the disease, and while variations do occur between years the

TABLE III.—Habitat of Patients with Herpes Zoster

	Male	Female	Total
Town	26	29	55
Country	15	11	26
Total	41	40	81

TABLE IV.—Seasonal Incidence of Herpes Zoster

	1948	1949	1950	1951	1952	1953	1954	1955	Total
January	—	3	2	0	0	0	0	1	6
February	—	0	1	1	3	1	1	5	14
March	—	0	1	1	1	2	1	1	7
April	—	0	0	0	0	1	0	0	1
May	—	2	1	2	1	1	1	1	8
June	—	0	3	1	1	0	4	—	7
July	—	0	1	3	2	0	0	—	7
August	0	2	0	0	2	0	0	—	4
September	0	2	0	0	2	0	1	—	6
October	2	0	0	1	1	1	0	—	7
November	3	0	0	2	1	1	—	—	4
December	0	2	0	0	0	1	—	—	4
Total	5	10	10	11	15	13	9	8	81

differences are not large. Where differences are present it is not because of any individual month having an undue proportion but rather because of fewer months when no cases were seen. Over the seven-year period the month of February has accumulated the most cases, but the numbers are not large enough for this to be considered a defined seasonal variation.

Infectivity of Herpes Zoster.—The infectivity of herpes zoster must be very low. This conclusion is derived from the fact that in no household were two cases affected concurrently or at an interval which would suggest one affecting the other. My records show that three households had more than one occupant with the infection during the seven years of the survey, but in each case the occurrence was separated by a period far beyond what would be regarded as an incubation limit. In one of these households two as an incubation limit. In one of these households two sisters who invariably slept together each had the infection. They were aged 15 and 16 years when they were attacked, and one was first seen for this on May 6, 1949, and the other on June 27, 1952. In the second household a husband and wife were affected. The husband was first seen for it on October 20, 1952, and the wife on August 12, 1953. The third household involved an elderly couple who lived alone in a one-roomed house. The wife, who was recovering from an attack of severe biliary colic, developed herpes on July 9, 1950, but the husband did not have herpes until May 13, 1952. In the case of the right lower zoster was in the area of distribution of the right lower intercostal nerves. In five female and in two male cases the victims lived alone and had very little contact with the outside world. In all the other cases there was ample opportunity to spread the infection either from the proximity of a husband and wife occupying the same bed or from other normal household contacts.

Chicken-pox

Unlike herpes zoster, it is possible that not every case of chicken-pox is seen by the family doctor. A mother with several children may seek advice about the first one or two cases, but when she finds that no treatment is prescribed she may elect to treat succeeding cases herself. During the seven years 147 cases of chicken-pox have been recorded, and I should estimate that not more than another 5% escaped my observation.

The slight variations between males and females (Table V) are of doubtful significance. The important point displayed is that chicken-pox is a disease of infancy and early childhood, with the adult only rarely involved. Table VI shows the habitat of the sufferers. It is seen that the rural dweller was not so readily infected as the town dweller in comparison with herpes zoster, but the numbers are too small to be of any significance.

Seasonal Distribution.—Table VII shows that, while each year has had a complement of cases, there are wide variations, and explosive outbreaks of considerable severity occur in some years. This was seen in 1952. This epidemic

TABLE V.—Age Incidence of Chicken-pox

Age	Male	Female	Total	Per 1,000 at Risk	
				Male	Female
0-4 years	23	29	52	217	325
5-14 "	53	37	90	376	272
15-44 "	2	1	3	3.8	1.9
45-64 "	1	0	1	3.5	0
65+ "	1	0	1	6.8	0
Total	80	67	147	66.6	51.9

TABLE VI.—Habitat of Patients with Chicken-pox

	Male	Female	Total
Town	60	47	107
Country	20	20	40
Total	80	67	147

TABLE VII.—Seasonal Incidence of Chicken-pox

	1948	1949	1950	1951	1952	1953	1954	1955	Total
January	—	1	1	1	22	3	0	0	28
February	—	1	0	1	6	2	0	3	13
March	—	0	1	0	14	0	1	0	16
April	—	0	0	0	7	1	4	0	12
May	—	0	1	0	0	0	5	0	6
June	—	0	1	0	0	0	2	0	3
July	2	9	5	0	0	3	7	—	26
August	0	7	0	0	0	0	1	—	8
September	0	0	2	1	0	0	0	—	3
October	1	1	2	4	0	0	1	—	9
November	0	2	1	9	3	0	0	—	15
December	0	0	0	6	2	0	0	—	8
Total	3	21	14	22	54	9	21	3	147

started in September, 1951, and reached its height in January, 1952. A secondary flare-up occurred in the March, and it was May before it had completely settled down. Minor outbreaks occurred in July–August, 1949, and in the spring and early summer of 1954. January and July seem to be the months in which the condition is most prevalent.

Infectivity.—Chicken-pox is highly infectious: in this series there were 33 families two or more members of which developed the disease simultaneously or within the usually recognized incubation period. In a few families, however, there is no record of some member having had the infection. For reasons already given, this information is not reliable, and to confirm the absence of the infection would mean jogging the memory of the patient or parent—an untrustworthy procedure. In at least two families, however, the infection was present at intervals far beyond the accepted incubation period. Thus in the case of a brother and sister there was an interval of 10 months, and only two years separated their ages. In the second case the sister had the infection when she was 13 months old, while the brother, who was 3 years older, did not get it until two years later. It is possible, therefore, for individual members of a family to escape the infection at a particular period.

Relationship of Herpes Zoster and Chicken-pox

For many years it has been assumed that there is a close relationship between herpes zoster and chicken-pox. It was first suggested by Bokai, a Budapest physician, in 1888, on

clinical grounds. Serological tests by Amies (1933) confirmed this, and their similarity under the electron microscope appears to give final proof. A number of writers have described epidemics of chicken-pox which appeared to follow contact with a case of herpes. Pickles (1939), a shrewd observer of infectious diseases, is sure that two of his epidemics of chicken-pox followed such a contact, and he states that the epidemic peaks of the two diseases "roughly correspond." Cases in which herpes zoster follows contact with chicken-pox are thought to be very rare.

In my series the relationship of the two diseases is obscure. The totals of the two diseases occurring each year during the seven-year period (Tables IV and VII) show no real relationship between the peak period of herpes zoster and that of chicken-pox except in the year 1952, when each disease showed the highest number of recorded cases. The greatest number of herpes zoster cases occurred during the six months when no chicken-pox was seen, and in the month when chicken-pox was most rife there were no cases of herpes.

It is possible for the two diseases to attack the same patient simultaneously. This occurred in an elderly man. The rash of herpes was first seen on July 23, 1954; on July 28 the widespread rash of chicken-pox also appeared. This has been observed by other writers, but it is not a frequent occurrence. My notes show the case of a child who had chicken-pox on February 15, 1952, along with her brother. On December 15, 1952, she developed a one-sided rash on the inner thigh and labia majora. My assistant diagnosed herpes zoster, but when I saw the patient two days later I was rather doubtful, and I regret not having had this diagnosis confirmed. It is, however, retrospective examination of notes that reveals the lost opportunities and acts as a guide for further observation. Otherwise, my notes show no record of a patient who definitely had chicken-pox and, at a much later date, herpes zoster. The reverse sequence also applies.

In three households chicken-pox and herpes zoster were seen to affect different members of the same family during the seven-year period. In the first family a boy is recorded as having had herpes zoster on July 20, 1949. This was followed by two sisters with chicken-pox—one starting on July 30 and the other on July 31. At this period, however, a small epidemic of chicken-pox was present in the community, and the infection of these three occurred midway through it. In the second family the father developed herpes zoster on November 19, 1952, and although one of his two children was susceptible at the time she did not get chicken-pox until May, 1954. The girl was 7 years of age when she had chicken-pox, and the boy was only 2½ years at the time of infection. In the third family, of three girls, one had chicken-pox on January 19, 1953, the second on February 26, and the third child—the eldest—developed herpes zoster on March 5.

Malignant Disease

There is never any doubt about patients with cancer reporting to their family doctor. Sooner or later they all arrive. The pity is that some are rather late. During the seven-year period of this investigation 54 cases of some form of malignant disease have been encountered. The age and sex incidence and the rates per thousand at risk are given in Table VIII. It will be seen that the females suffered slightly more often from this killing disease than

TABLE VIII.—Age Incidence of Malignant Disease

Age When Diagnosed	Male	Female	Total	Per 1,000 at Risk	
				Male	Female
0-4 years	0	0	0	0	0
5-14 "	0	0	0	0	0
15-44 "	3	6	9	5.7	11.9
45-64 "	10	12	22	35.6	32.3
65+	10	13	23	69.0	70.3
Total	23	31	54	19.1	24.0

TABLE IX.—Habitat of Patients with Cancer

	Male	Female	Total
Town	15	22	37
Country	8	9	17
Total	23	31	54

the males and that those involved were predominantly elderly.

It is of interest to note that in 15 of these 54 cases of cancer the patients (13 females and 2 males) were alive at the end of seven years. This discrepancy is to a large extent due to the survival rate of cancer of the breast. Eight of the female survivors had cancer in this site. Table IX shows the habitat of the patients. The proportions in town and country correspond very closely with the proportions of suburban and rural patients in the practice, and suggests that cancer has occurred with equal frequency in the town and rural dweller.

Relationship of Cancer and Herpes Zoster

Wyburn-Mason (1955) investigated the frequency with which malignant change arises in tissues affected by herpes zoster. He found that 26 cases out of a total of 2,925 skin cancers and 2,580 breast cancers had had a previous attack of herpes varying in time from a few months to many years. Twenty-three other cases had a doubtful relationship. He states that no figures are known of the frequency of herpes in any community and that patients must be specifically asked about it, otherwise they will not volunteer a previous history of the disease. My figures of 81 cases in seven years correspond very closely with those of Pickles (1939), who saw 77 in the same length of time. It is possible that his practice is similar in size. I have not questioned the patients for the purposes of this paper, since I think it is an unreliable method of investigation. I have confined myself to information recorded in my notes. Therefore the period of time before the diagnosis of malignancy was made varies from one to seven years.

In this series 2 of the 54 cases of malignancy are recorded as having had herpes zoster. One man was first diagnosed as having had a lung cancer in 1951, and he developed herpes of an intercostal nerve root two years later, in 1953. The second case was that of a man in whom rectal carcinoma was diagnosed on February 12, 1953, and who showed the typical lesion of herpes zoster along an intercostal nerve root on February 19. None of the remaining 79 cases of herpes zoster followed up from one to seven years have so far shown any evidence of developing a malignant growth.

Discussion

While the virus of herpes zoster and that of chicken-pox may closely resemble each other, the clinical manifestations of the two diseases differ widely. Herpes zoster is a painful ailment, particularly in the elderly. The rash is confined to the distribution of one or more posterior nerve roots and the infectivity is very low. It is a disease of the elderly. Chicken-pox, on the contrary, is not painful, has a generalized rash over the whole body, and is highly infectious. It is a disease of the very young. The two diseases may affect the one individual simultaneously.

In one case of this series herpes zoster preceded an attack of chicken-pox on other members of the household, but, as already stated, an epidemic of chicken-pox was already in existence. The reverse sequence was also seen in one family. It is to be noted, also, that in the family where the father developed herpes zoster his daughter of susceptible age did not get chicken-pox until two years later, when her younger brother was also affected.

Both diseases occur with considerable frequency and some overlapping is inevitable. Indeed, it would be strange if it were not so. The final judgment must await a more prolonged period of note-taking, but the study of this series suggests that there is no epidemiological evidence of the virological relationship between these diseases.

Malignancy and herpes zoster affect the same age groups. Herpes occurs with greater frequency than does cancer.

The series of 54 cases of malignancy and 81 of herpes zoster do not show any tendency for malignancy to develop following herpes. In the two cases where herpes and cancer occurred in the same person the herpes followed the diagnosis of cancer and suggests that the herpes is caused by irritation of the posterior nerve root either by the original cancer or by concealed secondaries in the spinal column. It could also, of course, be unrelated.

Conclusion

A study of 81 cases of herpes zoster and 147 cases of chicken-pox occurring over a period of seven years failed to show any epidemiological association between the two diseases. While neither showed substantial sex or urban/rural variations, the diseases differed widely in age groups involved, in susceptibility, and in the annual and seasonal variations observed over this time.

The study of 54 cases of cancer and 81 cases of herpes zoster over a similar period does not suggest that a herpes zoster infection has any carcinogenic properties. In fact, in the only two cases in which both diseases occurred the cancer antedated the herpes.

My thanks are due to my assistant, Dr. T. C. Morton, for help in getting this information out and to my secretary, Mrs. Potts, for care with my notes.

REFERENCES

- Amies, C. R. (1933). *Lancet*, 1, 1015.
Pickles, W. N. (1939). *Epidemiology in Country Practice*.
Wyburn-Mason, R. (1955). *British Medical Journal*, 2, 1106.

PYLORIC OBSTRUCTION DUE TO PANCREATIC HETEROTOPIA IN A CHILD

BY

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Pyloric obstruction in childhood is rarely encountered except within the first few months of life. The following is an account of a child aged 5 years who died and in whom pyloric obstruction due to pancreatic heterotopia was discovered at necropsy.

Case Report

A girl aged 5 years 2 months was admitted to hospital in December, 1954. There was a history of recurrent attacks of vomiting for approximately one month, and at the onset of her illness she had suffered from dysuria and frequency of micturition. Since infancy the child had been undernourished and caused her parents considerable anxiety on account of frequent refusal to take food. This was regarded as part of a functional disturbance—for during a previous prolonged hospital admission for atopic dermatitis she was emotionally very upset and suffered from mutism.

On admission the patient was underweight (28 lb. 2 oz.—12.75 kg.) and was slightly dehydrated. She appeared extremely nervous and had badly bitten fingernails. There was an extensive monilia infection of the mouth; the urine contained numerous pus cells, and *E. coli* was cultured from the urine. There was a mild normochromic anaemia.

The thrush and urinary infection responded rapidly to treatment and the general condition improved. As the child was emotionally disturbed it was decided to discharge her home. However, before this could be done she developed a relapse of the urinary infection and the vomiting recurred. In the early hours of January 10, 1955, the child vomited copiously, collapsed, and died quite suddenly.

Post-mortem Examination.—The external appearances were those of a poorly nourished female child. There was bilateral pulmonary oedema. The air passages were clear. The stomach was dilated and there was an obvious tumour at the pyloroduodenal junction. On opening the stomach it was found that the pyloric canal would only admit a probe, 3 mm. in diameter. The pyloric tumour, which almost completely encircled the pyloric canal, measured 1 cm. in thickness and 1.6 cm. in its long axis. It was a hard tumour, and the cut surface resembled that of a leiomyoma. The other organs appeared normal to the naked eye. Microscopy showed the tumour to consist of pancreatic glandular tissue,



FIG. 1.—Section of the pyloric tumour which illustrates the marked muscle hyperplasia. (×10.)

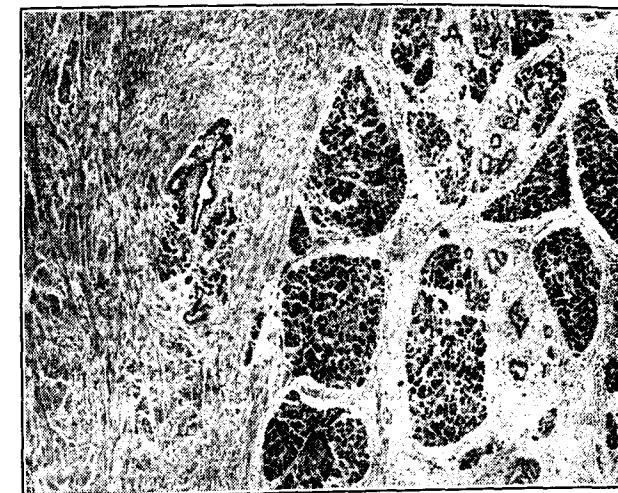


FIG. 2.—Higher-power view of the pyloric tumour showing pancreatic tissue supported by a muscle stroma. (×50.)

Reviews

HISTAMINE AND SIR HENRY DALE

Histamine. Joint symposium of the Ciba Foundation, the Physiological Society, and the British Pharmacological Society, in honour of Sir Henry Dale. Editors for the Ciba Foundation: G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., and Cecilia M. O'Connor, B.Sc. (Pp. 472 + xvi; illustrated. 50s.) London: J. and A. Churchill Ltd. 1956.

The book bears witness to the fecundity of Sir Henry Dale's early observations, to the assiduousness and originality of those who now carry out research in an interesting and important field, to the significance of histamine in nature, and to the inspiration of those who arranged and recorded the various meetings. In the preface the statement is made that research on histamine is at a point at which important advances can be expected. For those who wish to prepare themselves for still further publications in an ever-growing subject this volume is confidently recommended.

F. G. YOUNG.

BIOLOGICAL EFFECTS OF RADIATION

Proceedings of the International Conference on the Peaceful Uses of Atomic Energy. Vol. XI: Biological Effects of Radiation. (Pp. 402; illustrated. 58; 57s.; 34 Sw. fr.) London: H.M. Stationery Office. 1956.

When we went to school we were given anthologies of verse and prose. Study of these was supposed to give us a review of the styles and to a less extent the modes of thought of great writers. Now that we are grown up we find books being published recording the papers presented at conferences. Literary style in scientific papers is good, bad, and indifferent (seldom good). The object of publishers therefore, apart from profit, must be to make readily available to us the thoughts and deeds of the great in specific scientific disciplines.

This particular volume records some of the papers—about half of those of medical and biological interest—from one of the most memorable scientific conferences of all time. The importance of the Geneva meeting in August, 1955, was that it brought East and West together after years of scientific as well as ideological divorce. It led to declassification of much in science and technology relating to nuclear energy that formerly was secret. In the biological field, however, there had been little or nothing classified, so in this field there was no spate of revelations as, for instance, in reactor-engineering. Instead we have the leading doctors of medicine and science of the various countries philosophizing on how ionizing exerts its biological effects or reporting what they considered their most significant but not necessarily latest research. The papers are grouped—as were the sessions—into biological effects of radiation; modes of radiation injury; carcinogenesis and metabolism of bone-seeking isotopes; effects on reproductive system and on foetus; mechanisms of radiation injury; protection and recovery; genetic effects—human implications.

J. F. LOUITT.

GREAT NEUROLOGISTS

Grosse Nervenärzte. Edited by Kurt Kolle. (Pp. 284+vii; illustrated. D.M. 29.40.) Stuttgart: Georg Thieme, 1956.

To medical historians with a facility in German this collection of short biographies will prove valuable as well as interesting. Professor Kolle, of the Ludwigs-Maximilian University of Munich, has edited a beautifully printed and illustrated volume written by a team of distinguished medical authors. An account is given of the careers of some 21 neurologists. This term is employed in the widest possible sense, for included are such psychiatrists as Freud, Jung, Bleuler, Kraepelin, and Wagner von Jauregg, among others; Cushing and Foerster among neurosurgeons; and Pavlov, Berger, and Sherrington among physiologists. The emphasis has fallen, naturally enough, upon the German-speaking neurologists. Great Britain is represented by two names only, including of course Hughlings Jackson, whose biographical essay has been contributed by Sir Gordon Holmes. France is represented by Charcot and Pinel. America's sole figure is Cushing, written up by Professor Fulton. Portraits are reproduced in almost every case, and there are a particularly charming photograph of Otfried Foerster and a striking likeness of Konrad Rieger. An unusual but very useful appendix lists the various holders of the chairs in neurology and psychiatry at most of the German, Austrian, and Swiss universities.

MACDONALD CRITCHLEY.

27 Hours.—There was now definite improvement: left ankle and left triceps jerks were present, there were more spontaneous movements, pupillary reflexes were present though sluggish, and the patient reacted strongly to supraorbital pressure. In these circumstances bemegride ("megimide") and amiphenazole ("daptazole"), which were considered probably the best drugs to use in this condition, were withheld.

40 Hours.—Now fully awake but disoriented and very ataxic. The ataxia slowly diminished, and five days after taking the primidone the boy was again normal.

The urine collected 24 hours after the drug had been swallowed appeared to be clear at first, but as it cooled to room temperature shimmering white crystals began rapidly to form in it until a very heavy crystalline precipitate had collected. The crystals were filtered off, washed with water, and dried *in vacuo*. They had a melting-point of 280° – 282° C., and chemical examination showed them to be pure primidone, as much as 21.5 mg. of the drug being obtained. No albumin, cells, or casts were present, and despite the marked crystalluria there was never any evidence of kidney damage. So far there has been nothing to suggest injury to the bone marrow, but neither the blood nor the marrow has been examined.

The results of acute primidone poisoning in this case, as in the cases reported by Arnold and Ceranke-Höfermayer and by Sciarra *et al.*, appear to confirm the opinion that this drug has a remarkably low toxicity. The heavy primidone crystalluria does not appear to have been observed in man before. Primidone is soluble in urine to the extent of 60 mg. per 100 ml. at 37° C. In the present case 21.5 mg. was filtered off from 10.5 ml. of urine—that is, more than three times the quantity of primidone which could normally be held in solution in that volume of urine at 37° C. Despite this there was no evidence of any effect on the kidneys.

We have been unable to find any references in the literature to specific antidotes against primidone poisoning. The commonly used analeptics could, of course, be tried, but we are of the opinion that the chemical structure of primidone is such that the new barbiturate antagonists bemegride and amiphenazole should be as effective in the treatment of acute poisoning with this drug as they are in acute barbiturate poisoning.

We are most grateful to Professor S. D. M. Court, of the Department of Child Health, for permission to publish this case and for help in preparing the paper. We also wish to thank Drs. A. S. R. Stewart and A. Spinks, of Imperial Chemical (Pharmaceuticals) Ltd., for information and for supplying a specimen of pure primidone for comparison with the crystals excreted in the urine in this case.

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REFERENCES

- Arnold, O. H., and Ceranke-Höfermayer, S. (1953). *Wien. med. Wschr.*, 103, 697.
- Bogue, J. Y., and Carrington, H. C. (1953). *Brit. J. Pharmacol.*, 8, 230.
- Goodman, L. S., Swinyard, E. A., Brown, W. C., Schiffman, D. O., Grewal, M. S., and Bliss, E. L. (1953). *J. Pharmacol.*, 108, 428.
- Handley, R., and Stewart, A. S. R. (1952). *Lancet*, 1, 742.
- Sciarrà, D., Carter, S., Vicalè, C. T., and Merritt, H. H. (1954). *J. Amer. med. Ass.*, 154, 827.

CASE REPORT

A boy of 4½ years had been treated for epilepsy and disturbed behaviour since he was 20 months old. For part of this period he had been treated with phenobarbitone, but for the last 2½ years he had been given 0.25 g. primidone twice daily. At 9.30 a.m. on January 1, 1956, the boy was seen playing with his box of primidone tablets. Later, it was clearly established that by this time he must have swallowed at least 50 tablets—that is, not less than 12.5 g.—of primidone. In the following account the times are reckoned from the time of ingestion of the drug.

30 Minutes.—His mother noticed he was sleepy, but thought this was due to a restless night and to a tablet of carbromal he had been given in the early hours of the morning. He went to sleep and was returned to bed.

4 Hours.—Found to be deeply asleep; the family doctor called in.

8 Hours.—Admitted to hospital. On examination found to be deeply unconscious; no reflexes elicited and no response to painful stimuli. Respirations 20 and pulse 120 per minute, blood pressure 80/65 mm. Hg, rectal temperature 97° F. (36.1° C.).

12 Hours.—Some improvement now apparent. There were occasional spontaneous movements, and painful stimuli produced slight stirring. Temperature had risen to 98.4° F. (36.9° C.) and pulse rate to 140 per minute; the blood pressure was 85/60 mm.

16 Hours.—Very little change in the condition, but the blood pressure had risen to 100/55 mm.

24 Hours.—Pulse rate now varying between 120 and 140 per minute and temperature 100° F. (37.8° C.). Lumbar puncture produced normal C.S.F. with 6 cells per c.mm.

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NEGOTIATIONS CONTINUED

The Negotiating Committee met the Minister of Health and the Joint Parliamentary Under-Secretary of State for Scotland on Friday last week. The deputation from the Committee was composed of Sir Russell Brain and Dr. A. B. Davies, the two joint chairmen, together with Dr. S. Wand, chairman of the B.M.A. Council, and Dr. J. D. S. Cameron.

Sir Russell Brain summed up the position at a press conference subsequently when he said that this was not merely a pay claim but a crisis of confidence that went to the roots of the relations between the Government and the medical profession. And this, indeed, is the keynote of the widespread comment in the national press. A leading article in *The Times* considers that "the Government ought to be ready to discuss some adjustment of rewards now." The article ends thus: "If deadlock ensues—the omens are unfavourable—the Government will be as much to blame as anyone else for a dispute that could only injure the public." The *Manchester Guardian* concludes a leading article with these words: "It is the Government's bleakly negative attitude so far (*even before Suez*) which has stirred the doctors to their present wrath." (Our italics.) The *Economist* observes that doctors "know only too well that the Government will always be as firm with professional organizations as it will be weak with trade unions," adding: "On the whole, therefore, the main responsibility for breaking the present deadlock lies with the Minister of Health." The *New Statesman and Nation* notes that "the Minister of Health's stupidly brusque rejection of it [the present claim] has roused an ugly mood." "Legalistically," it adds, "the doctors have a strong case; the pledge to honour the Spens formula was repeatedly given when the Health Service was launched. The least the Government can do is to offer to re-negotiate it."

Conservative, Liberal, and Socialist comment is aimed accurately at these two things: the Govern-

ment's obligation, whether legal or moral, to consider the profession's strong case for taking a stand on the Spens formula, and the Minister of Health's curt and brusque rejection of a patient and painstaking presentation of it. And this is quite apart from some press opinion that doctors may generally be better off than some professions, or that, under the Spens terms, doctors would apparently be given immunity against the effects of rises in the cost of living; the punitive action of income tax at least takes care of this, apart from its deadly levelling effect and discouragement of that extra effort without which a society sinks into a condition of apathetic mediocrity. The medical profession is properly concerned with its own welfare. And this is not just financial. It is worried to see more and more of its number trying to emigrate to other countries; and these are not only the younger men fretting at the present frustrations of contemporary England and finding it hard to make their way in the world and support growing families. In their exasperation with the present, doctors are no less worried about the future of medicine and its power to attract able men and women into the profession and to hold them in it, here in this country. They see this present conflict, and all that is involved in it, as part and parcel of the position of the professional classes as a whole. No Minister and no Government would dream of treating the powerful trade unions as they have the doctors and the teachers, for example. After all these months of patient negotiation the Ministry of Health last Friday issued a statement to the press which, among other things, said: "Nothing he [the Minister] had said expressed any opinion one way or another on the merits of the claim. It simply was that it could not be afforded under present conditions. . . . He [the Minister] regretted that the claim could not be examined on its merits at the moment." The statement ended: "He [the Minister] invited the representatives to meet him again shortly."

The Minister of Health, Mr. R. H. Turton, is now implying that the economic consequences of the Government's action over Suez make it impossible to meet the present claim for more pay. But, as the *Manchester Guardian* has pointed out, the Government's "bleakly negative attitude" antedates the Suez intervention. Inflation is just one more excuse—not a reason. The reason is the Government's firm determination, so far, not to admit that the Spens recommendations still hold good, a mere eight years after the introduction of the N.H.S. in 1948. Mr. Turton and his advisers apparently still fail to comprehend that the profession attaches the highest importance to the principles of the Spens reports. They still fail to comprehend that in 1948 the profession made with

much misgiving a huge sacrifice of professional independence in return for a promise that their status and standard of living would be maintained. Now the profession is in the Service the Government is trying to go back on its promise—and its only response, so far, is to say: "Test it in the courts." At the press conference last week Dr. S. Wand, the Chairman of the B.M.A. Council, said that no drastic measures would be taken by the profession during the present month, and that no action would be taken until after the next promised meeting with the Minister. He gave the warning that anxiety and indignation in the profession would continue to grow, claiming, surely with justice, that doctors were reasonable people anxious that last words should not be said too easily. Whether or not the last word of the Minister of Health is "No!", many more words will have to be said about the National Health Service before it is something in which doctors can give of their best to their patients. Medicine is part of society, and, according to a remarkable article in that learned weekly periodical *The Times Literary Supplement* (December 28), "Human society is sick and convulsed as never before." The writer of the article sees, in the name of liberty, equality, fraternity, a flourishing of "as many unfreedoms, injustices, and enmities as humanity has ever had to bear." And he continues: "Everywhere, on both sides of the Iron Curtain, they are imposed by force of the State upon the sentient, patient individuals composing those societies." The writer, it is clear, includes Britain among those societies. In reacting against "the insignificance and frustration felt by individuals," and "the repressions imposed on them by States," the doctors of this country will bring some heart and encouragement to other professions as well as to their own.

LIVE POLIOMYELITIS VACCINES

A poliomyelitis vaccine in Utopia would be absolutely safe, confer complete protection against paralysis for life, and be administered in a single course. This stage has not yet been reached, and at present the comparative merits of the existing killed and attenuated vaccines have to be considered in the light of the two most crucial requirements—safety and persistence of immunity. In the last few years considerable progress has been made with the development of the killed type of vaccine, sometimes referred to as the Salk-type. Resistance to paralysis in vaccinated persons has been established,¹ and the problem of safety is now largely a matter of surveillance. The problem of the duration

of immunity still remains, though recent work by J. E. Salk on this aspect is distinctly encouraging.^{2,3} It is mainly to obtain durable immunity that the use of attenuated vaccines has been proposed as an alternative, and the work of A. B. Sabin and H. Koprowski and his colleagues in the development of this type of vaccine has been reviewed in this *Journal*.^{4,5} The rationale of this method is to produce an asymptomatic alimentary infection with subsequent formation of antibody by giving strains of virus which have lost their capacity to invade and cause paralysis. Recently Koprowski and his colleagues have shown that a total of 225 non-immune subjects, given either the type 1 (SM virus) or type 2 (TN virus), developed type-specific antibody without ill effect.⁶ In more recent articles these workers have shown that active immunity can be induced in infants in the presence of maternal antibody⁷ and in older children given immune serum globulin by injection at the same time as the virus was given by mouth.⁸

Koprowski's work raised a number of questions, of which the excretion of virus in the faeces of vaccinated subjects was the most important. During the last year a study along the same lines has been carried out by a team of workers in Belfast under the direction of Professor G. W. A. Dick using type 1 (SM) and type 2 (TN) attenuated vaccines supplied by Koprowski. Reports of their findings appear in the opening pages of the *Journal* this week. The organization of the trial was different from Koprowski's in that the study population consisted of normal people—infants, children, and adults, leading normal lives. The value of the trial was enhanced as a result, though at the same time laboratory tests were made more difficult, since the final evaluation of this type of vaccine must be carried out in a normal environment. In all, 190 subjects were given type 2 (TN) vaccine virus in milk. In the first report (p. 59) D. S. Dane and others show that the antibody response was much less regular than in Koprowski's series⁶; only 4 adults (22%) and 96 children (77%) developed antibody. The pattern of virus excretion was also different. Virus was excreted in the faeces for several weeks, and in some cases in high titre, but, what is more important, the character of the excreted or

¹ Langmuir, A. D., Nathanson, N., and Hall, W. J., *Amer. J. publ. Hlth.*, 1956, **46**, 75.

² Salk, J. E., *Ann. N.Y. Acad. Sci.*, 1955, **61**, 1023.

³ ———, *Amer. J. med. Sci.*, 1956, **232**, 369.

⁴ *British Medical Journal*, 1955, **2**, 186.

⁵ *Ibid.*, 1956, **2**, 407.

⁶ Koprowski, H., Norton, T. W., Jervis, G. A., Nelsen, T. L., Chadwick, D. L., Nelsen, D. J., and Meyer, K. F., *J. Amer. med. Ass.*, 1956, **160**, 954.

⁷ ———, Stokes, J., Jr., Hummeler, K., Hunt, A. D., Jr., and Flack, A., *ibid.*, 1956, **162**, 128.

⁸ ———, McGee, E. L., and Nelsen, D. J., *Amer. J. med. Sci.*, 1956, **232**, 378.

⁹ Sabin, A. B., *British Medical Journal*, 1955, **2**, 160.

faecal virus had regained paralytogenic properties after passage through the human alimentary tract and had also become cytopathogenic in tissue culture.

Koprowski and his colleagues⁶ had shown that transmission of type 1 (SM) virus could occur from vaccinated to non-immune subjects. The Belfast trial was designed to answer two important questions. Could SM virus be transmitted within a normal family, and would excreted or *faecal* virus maintain the same properties as the vaccine virus? Answers to both questions were obtained, and in the second paper (p. 65) G. W. A. Dick and others discuss their findings on giving type 1 (SM) virus. Of the 14 subjects who volunteered for the trial, all excreted virus and all developed antibody. In the majority of adults a decline in the antibody level was noticeable after a few months. As with the type 2 virus a number of minor illnesses were reported, though their true significance is not understood. The relation of these illnesses to vaccination is not yet proved. In one case evidence was obtained of transmission of virus from a vaccinated girl to her younger brother, and also, possibly, though with less certainty, to her mother. Virus was recovered from the blood of one adult without previous immunity to any of the three virus types on the eighth day after vaccine was administered. Again virus was excreted in the faeces, sometimes in high titre, for periods ranging from one to seven weeks. SM *faecal* virus, unlike the vaccine virus, was found to cause paralysis in monkeys inoculated by the intracerebral route.

The most important aspect of this work is concerned with the altered character and behaviour of the excreted virus, and in the third paper (p. 70) Dick and Dane discuss the implications of these findings. A distinct difference was demonstrated between the vaccine virus and the *faecal* viruses, particularly as regards the type 2 strain. Indeed, there appeared to be little to distinguish the latter from the wild virus strains. A. B. Sabin⁹ also found that a certain proportion of virus particles of his attenuated type 1 and type 2 strains had developed increased virulence for brain-stem neurones of monkeys after passage through the human alimentary tract. This work from Belfast quite rightly lays emphasis on the safety requirements of attenuated virus vaccines. In developing new strains for use in this way more attention will clearly have to be paid to the problem of transmissibility and to the character of *faecal* virus. What goes into the alimentary tract should come out the same. In the meantime, as Dick and Dane conclude, "such trials should only be undertaken step by step, and never without careful laboratory control, however difficult this might be."

PROGNOSIS OF PULMONARY TUBERCULOSIS

Though the treatment of tuberculosis has advanced fast in a few years, the stage is only just being reached where a first estimate is possible of the changes that chemotherapy have brought into the long-term prognosis of the disease. In a recent report to the Medical Research Council W. Fox and I. Sutherland¹ give the results of a five-year follow-up of three groups of patients in the Medical Research Council's trial of streptomycin (S), *para*-aminosalicylic acid (P), and streptomycin + P.A.S. (SP) in pulmonary tuberculosis. These patients, all of them young adults with recently acquired progressive pulmonary tuberculosis, had received in hospital for three months one of these three methods of treatment and for a further three months any method of treatment the clinician felt to be suitable—for instance, further chemotherapy, or surgical or other treatment. All were in bed in hospital during the whole period of six months, and regular clinical, bacteriological and radiographic observations were made. The report states that "by the end of five years 31% of the S, 36% of the P, and 19% of the SP patients had died; 53% of the S, 54% of the P, and 70% of the SP patients had arrested or quiescent disease." The benefit to the patients who had had streptomycin + P.A.S. is stated not to reach statistical significance, but it does reflect a consistent trend throughout the five years. Fox and Sutherland conclude that a number of patients in the trial have become "stabilized in a state of persistent active disease with cavitation" and they describe the serious medical and social problems created by such persons.

This report has been prepared with great care and skill and much work has been put into it, but the results are not altogether easy to interpret. As the authors point out, the prescribed course of treatment was followed for three months only in all patients. After that time there was considerable variation in the treatment different patients had. The better results seen with the SP patients may indeed be due not so much to their initial course of treatment as to the fact that these patients received considerably more additional chemotherapy during the first two years than the patients in the S series. It is certainly hard, however carefully the figures are analysed, to disentangle the events of the first three months of controlled chemotherapy from all the events occurring

¹ Fox, W., and Sutherland, I., *Quart. J. Med.*, 1956, 25, 221.

² Joiner, C. L., Maclean, K. S., Marsh, K., Carroll, J. D., and Knox, R., *Lancet*, 1956, 2, 165.

³ Carroll, J. D., Joiner, C. L., Maclean, K. S., and Marsh, K., *Amer. Rev. Tuberc.*, 1955, 71, 302.

⁴ Hoyle, C., Nicholson, H., and Dawson, J., *Lancet*, 1955, 2, 1310.

⁵ Muschenheim, C., Panel Discussion on "Long-term and Prophylactic Use of Antibiotics," *Antibiotics Annual*, 1955-6, p. 942, New York.

in the course of a disease such as tuberculosis over the whole 5-year period.

In a recent paper C. L. Joiner and his colleagues² have reported successful results in a small group of patients with chronic pulmonary tuberculosis who received a "rotating" form of chemotherapy and whose progress has now been followed for two years. Treatment consisted of isoniazid 250 mg. daily by mouth and intramuscular streptomycin 1 g. twice weekly for the first month, isoniazid 250 mg. by mouth and P.A.S. 10 g. by mouth daily for the second month, and P.A.S. 10 g. daily by mouth and intramuscular streptomycin 1 g. twice weekly for the third month. This cycle of treatment was then repeated. Treatment was continued for 36 weeks after the last positive sputum had been obtained. Treatment was started again if there was a bacteriological relapse. Of 13 patients receiving this treatment, only one was classed as a failure (being still sputum-positive after six weeks of chemotherapy). The other 12 were classed as successes; they were all sputum-negative at two years although they had ceased having any chemotherapy for periods from a few weeks up to several months. In contrast, in a group of 14 patients who received isoniazid 250 mg. + P.A.S. 10 g. daily by mouth throughout treatment, there were 9 failures and only 5 successes. The authors discuss the possible reasons for the difference between the response of the two groups and conclude that the rotating therapy is safer, at least in this type of patient with chronic pulmonary tuberculosis, many of whom are likely to have had previous chemotherapy, if only with P.A.S. It remains to be seen whether these results will be maintained over longer follow-up periods and with larger series of cases. But certainly the need for prolonged treatment is clearly shown in this trial.

The very fact that we can now think in terms of chemotherapy extending over several months is almost certainly the result of acquiring a uniquely powerful drug in isoniazid, properly used. P.A.S. + streptomycin, though it represented the best form of combined chemotherapy five years ago, cannot be given for long periods continuously because relapse often occurs during treatment, accompanied by the development of drug resistance. Follow-up figures are not yet available for much more than two to three years for the results of treatment with some of the newer combinations of drugs, including isoniazid or its derivatives, but, judged by short-term results only, these combinations are far better than P.A.S. + streptomycin. One thing, however, has become clear in recent years, that in many forms of tuberculosis chemotherapy can and should be much more prolonged than was at one time thought to be safe or desirable.^{3 4 5} The dangers of prolonged therapy are

obvious, but the rotating method advocated by Joiner and his co-workers certainly seems to have produced excellent results over at least a two-year period. The figures for a five-year follow-up cannot be expected to be as good as this, since in contrast to the patients in the Medical Research Council trials these patients were suffering from advanced chronic pulmonary tuberculosis. But certainly the results up to date are much closer to the ideal of stabilizing the disease not in a state of persistent activity but in a state of quiescence more like that of an extinct volcano. If the mechanical damage such patients have suffered in their lungs is not too severe, many of them can continue to lead active lives, and because their sputum is no longer infectious they are not a danger to other people.

The ideal form of chemotherapy in pulmonary tuberculosis is still elusive, but it seems reasonable to suppose that it should be some form of combined treatment administered in such a way as to reduce the development of drug resistance (as, for example, by rotating treatment), that whenever possible isoniazid should be one of the drugs used, and that treatment should be prolonged in order to lessen the chances of relapse when it is stopped.^{3 4}

NEDERLANDSCH TIJDSCHRIFT VOOR GENEESKUNDE

There are only a few general weekly medical journals which have stood the pace for a hundred years or more. Last week, in Amsterdam, our professional colleagues in Holland celebrated the hundredth birthday of the *Nederlandsch Tijdschrift voor Geneeskunde*, with ceremonial addresses in the Senate Chamber of the University, and a banquet attended by leading members of the Netherlands medical profession, of the society which owns the *Tijdschrift*, the editors of the *British Medical Journal*, the *Lancet*, and the *Ugeskrift for Læger*—all centenarians—and by Dr. Charles Mayer, representing the Union Internationale de la Presse Médicale.

The *Nederlandsch Tijdschrift voor Geneeskunde* took the place a hundred years ago of a number of smaller periodicals, and the society which has since owned it came into being at the same time. Though separately owned, the *Nederlandsch Tijdschrift* was for very many years the official journal of the Netherlands Medical Association. But it ceased to be this towards the end of the war, and the *Medisch Contact*, dealing only with what we could call medico-political problems, became the official journal of the Royal Netherlands Medical Association.

The first number of the second century of the *Nederlandsch Tijdschrift* appears in an attractive new dress. Its size is enlarged to that of the *New England Journal of Medicine*—another centenarian. The contents list now appears on the front cover, for all to read at a quick glance. The text is printed in two columns instead of full out across the page, and a number of

other improvements in lay-out make our contemporary in the Netherlands one of the most attractive-looking medical periodicals now being published.

The editor, Professor J. R. Prakken, aided by his deputy, Professor J. W. Duyff, their staff, and the secretary, Dr. M. M. Hilfman, have collected in their centenary number a most interesting series of articles published in the *Tijdschrift* about a hundred years ago. With much ingenuity they have preserved the usual sections of the journal, but have, apart from the introduction by Professor Prakken and the advertisement columns, included in it nothing published later than 1866. Among them are papers by the great ophthalmologist Frans Cornelis Donders on paralysis of accommodation in "diphtheritis faucium" (1860), and by Hermann Snellen, of the test types, on "neuroparalytic ophthalmia" in trigeminal neuralgia. This centenary number of the "Netherlands Medical Journal" will be a collector's piece for all those interested in the history of medicine. Also in commemoration of the centenary is a magnificently produced history of the past fifty years of the *Nederlandsch Tijdschrift* by Dr. C. T. van Valkenburg, who has been a member of the Netherlands Medical Society since 1917.

During the ceremony at the University last Saturday the editor, Professor Prakken, was awarded the order of the Dutch Lion, and a former editor, Professor J. J. van Loghem, the Gold Medal of the Society, being the sixth recipient of this rare honour. And then the editor of this *Journal*, on behalf of the *B.M.J.* and the *B.M.A.*, had the pleasure of presenting the editor of the *Nederlandsch Tijdschrift voor Geneeskunde* with a gavel and block made from the mulberry tree which used to stand in Dickens's garden on the site now part of the Association's building in Tavistock Square.

CERVICAL MYELOPATHY

Chronic degenerative disease of the cervical vertebrae is exceedingly common. C. Pallis, A. M. Jones, and J. D. Spillane¹ showed this in a study of fifty hospital patients over the age of 50 admitted to hospital for conditions not related to the spine or central nervous system. Three-quarters of these patients were found to have radiological evidence of narrowing of the vertebral canal by osteophytes, subluxation, or loss of lordosis. The condition is usually symptomless, but occasionally it damages the spinal cord and roots. More than half these patients had neurological abnormalities, though all were not necessarily attributable to the cervical lesion.

The effects of cervical spondylosis on the spinal cord have recently received further exhaustive study by E. Clarke and P. K. Robinson,² who reviewed 120 cases. This series included patients who were treated either medically or surgically, or who received no treatment at all. They excluded from consideration all patients with acute herniation of cervical intervertebral disks. Also excluded were cases of ankylosing spondylitis, a condition which occasionally produces a similar myelopathy to that which follows cervical spondylosis. J. Sharp and D. W. Purser, as reported at p. 101 of the *Journal*

this week, recently described neurological complications of this nature produced by spontaneous atlanto-axial dislocation occurring in ankylosing spondylitis, but bony overgrowth and vertebral deformity alone may be sufficient to bring about damage to the spinal cord and roots.

The primary lesion in cervical spondylosis is a defect of the intervertebral disk; osteophytes are formed and may project into the vertebral canal or intervertebral foramina; these in turn produce chronic inflammatory changes in adjacent tissues, apart from any effects they may have on the spinal cord or roots.

The onset of signs and symptoms related to the spinal cord is insidious. Weakness of one or both legs is the commonest initial complaint, but sensory symptoms in the upper limbs and pain in the neck, shoulders, or arms come next in frequency. Important factors in the aetiology are chronic cervical trauma, which explains the higher incidence in men, the presence of congenital anomalies of the cervical vertebrae, and age—for this is a disease of the late middle-aged and elderly. Progress of the condition is often very slow but almost invariably unrelenting. It is usually episodic, and every newly acquired symptom or sign persists. A fifth of the cases show steady deterioration. Signs of the disease are due to a mixture of cord and root lesions, which are always found in association, so that it may be almost impossible to distinguish one from the other. A lesion at a single level is rare, but appropriate focal motor and sensory signs can usually be found. Multiplicity of lesions is partly responsible for the diversity of the clinical picture, but symptoms are most commonly referable to abnormalities at the intervals between the 5th, 6th, and 7th cervical vertebrae. Reflex and motor functions are nearly always abnormal, and there is usually subjective or objective evidence of sensory impairment. Motor abnormalities are generally in the lower limbs and sensory changes are most frequent in the arms. The sensory abnormalities are usually found in the fourth and fifth fingers and on the ulnar border of the hand, where two-point discrimination and postural sense are particularly affected. Sometimes a Brown-Séquard picture may be produced, perhaps in association with paraparesis, or sensory changes may be at the thoracic level (seldom higher); sensory abnormalities in the upper limbs usually enable the level of the lesion to be correctly assessed. Slightly more than a third of the patients have bladder symptoms, but these are seldom severe.

Plain radiographs will assist the diagnosis, but conclusions must not be drawn on this evidence alone. Manometric examination revealed blocks in 27 cases in Clarke and Robinson's series, but they found many more when the neck was extended during the test of jugular compression; this point was emphasized by A. R. Taylor,³ who drew attention to the additional constriction of the vertebral canal that occurs in this position. The level of protein in the cerebrospinal fluid is usually not raised, and, when it is, rarely exceeds 100 mg. per 100 ml. Myelography will confirm the degree and situation of thecal distortion and is necessary before surgery is undertaken.

Acute protrusions of a cervical disk occur in younger people, usually in association with trauma. Symptoms

may be similar to those of the chronic lesion, but there is a soft protrusion of disk material, which should be removed surgically. The frequency with which cervical spondylosis is diagnosed means that it may be a coincidental finding in other conditions. Clarke and Robinson stress the need for careful differentiation of disseminated sclerosis, pseudo-bulbar palsy, and spinal tumour from cervical myelopathy, because therapy and prognosis differ.

The changes which take place in the cervical cord and roots have been ascribed to various mechanisms, acting as intermediaries between the myelopathy and spondylosis. The more important among these are compression and trauma to the spinal cord (or more particularly the roots) by osteophytes, distortion of the cord produced by traction on dentate ligaments, adherence of the ligamenta flava to the dura, and compression by these ligaments when the neck is extended. Adhesions within and outside the dural envelope aggravate these factors, and further softening of the spinal cord may be produced by compression of the anterior spinal artery. More than one of these mechanisms is generally operating.

Clarke and Robinson recommend immobilization of the neck by means of a cervical collar for at least three months. If the patient's condition does not deteriorate, this treatment may be continued for a further three months, but any worsening or failure to stop the progress of signs or symptoms should lead to surgery being considered before the disability becomes too severe. Operation should consist of laminectomy to decompress the theca, and division of dentate ligaments to free the cord. This should cover a vertebra above and below the area of the main lesion. Bony protrusions anterior to the cord should not be removed, but root compression can sometimes be relieved by enlargement of constricted intervertebral foramina. Treatment is at present directed to relief of damage to the spinal cord and roots. The results are disappointing, though progress of the disease can generally be arrested even if improvement is seldom obtained. Future effort must surely be directed to discovering a means of arresting the vertebral disease.

RHYTHMICITY OF EPILEPSY

It is a common experience to be told by a female patient with epilepsy or migraine that her attacks are more frequent at or about the time of the menstrual periods. A possible relationship between epilepsy and menstruation was first suggested by W. A. Turner¹ in 1907, but W. Dickerson,² after a careful study of 270 women with epilepsy, found a positive correlation in only 10%. Furthermore, E. Toulouse and L. Marchand³ found that their patients had as many fits in the second half of the menstrual cycle as in the first (including the period of menstrual flow). R. Almqvist⁴ has recently studied 400 consecutive patients with epilepsy who were admitted to a Swedish State hospital, paying special attention to the rhythmicity of seizures. Some of these patients had too few attacks for an assessment to be made, while in others whose attacks were minor the frequency could not be recorded with certainty. However, 146 cases were selected for analysis, all having been under observation

for at least three years. Almqvist used an ingenious method of charting attack frequency, so designed as to reveal rhythmicity if it existed. In 47 cases the charts showed clearly that the occurrence of fits tended to follow a recurring pattern; this was true in 18 of 62 male cases and in 29 of 84 females. Almqvist concluded that rhythmicity was equally common in the two sexes and that it was unrelated to age. The charts revealed characteristic intervals between attacks, and these were specific to the individual; in addition there was often a simple mathematical relationship between intervals of different lengths in the same case. For example, one patient might have a regularly recurring interval between attacks of 8 days, another of 28 days, while in yet another attacks were seen to occur on the 4th, 8th, or 16th days. Even when the pattern was complex, the intervals were usually multiples of some figure which could be regarded as the basic number of days between attacks. The evidence, supported by detailed statistical analysis, suggested that the rhythmicity was not an expression of a refractory period after a "peak" of several attacks.

A critical review of Almqvist's female cases suggested that the relationship between the interval between attacks and the menstrual cycle followed a definite rule, both being multiples of one and the same basic interval. Thus, of 23 women in whom menstruation was regular, there was a definite relationship between the duration of the menstrual cycle and the interval between attacks in 17. It was apparent that the rhythmicity of epileptic attacks did not depend primarily on menstruation, since the phenomenon occurred equally as often in males as in females and also in children. There was certainly a relation in some women between menstruation and epileptic attacks, but it seemed that both may be manifestations of a single basic biological rhythm. In this connexion the recent report of P. C. B. MacKinnon and I. L. MacKinnon⁵ is of interest, for they showed that death from accident, suicide, or disease was much more common in the fourteen days preceding menstrual bleeding than in the other half of the cycle.

Other paroxysmal disorders of the nervous system sometimes show rhythmicity. For instance, H. Richter⁶ found a tendency for migrainous attacks to occur at 7-, 10-, or 14-day intervals, while E. Kraepelin⁷ described a type of confusional state with psychomotor agitation which recurred abruptly at remarkably regular intervals and which he called periodical catatonia. In two cases of this disorder studied recently by J. S. B. Lindsay⁸ the intervals between attacks were similar to those observed in some of Almqvist's epileptics. These observations support Almqvist's supposition that epileptic attacks occurring at relatively regular intervals may prove to be due to cyclical changes in cerebral metabolism, which, in turn, may possibly reflect a diffuse biochemical change in the entire organism.

¹ Turner, W. A., *Epilepsy: a study of the idiopathic disease*, 1907, London.

² Dickerson, W., *J. nerv. ment. Dis.*, 1941, 94, 160.

³ Toulouse, E., and Marchand, L., *Rev. Psychiat.*, Paris, 1913, 17, 177.

⁴ Almqvist, R., *The Rhythm of Epileptic Attacks and its Relationship to the Menstrual Cycle*, *Acta psychiat. neurol. scand.*, 1955, suppl. 105.

⁵ MacKinnon, P. C. B., and MacKinnon, I. L., *British Medical Journal*, 1956, 1, 555.

⁶ Richter, H., in *Handbuch der Neurologie*, edited by O. Bumke and O. Foerster, 1935, 17, 166.

⁷ Kraepelin, E., *Psychiatrie*, 1913, 3, 806, Leipzig.

⁸ Lindsay, J. S. B., *J. ment. Sci.*, 1948, 84, 590.

¹ Pallis, C., Jones, A. M., and Spillane, J. D., *Brain*, 1954, 77, 274.

² Clarke, E., and Robinson, P. K., *ibid.*, 1956, 79, 483.

³ Taylor, A. R., *Lancet*, 1953, 1, 717.

EPIDEMIOLOGICAL ASPECTS OF COMMON INFECTIOUS DISEASES*

BY

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My terms of reference are epidemiological aspects of the common infectious diseases. If I were to try to say something about all of them I should end by having said very little about any of them. I am therefore going to limit my remarks to two groups of common infections.

Haemolytic Streptococcus

The first is infections caused by the haemolytic streptococcus belonging to Lancefield's Group A. I shall refer to this streptococcus as *Streptococcus pyogenes*. The commonest infection in the group is streptococcal throat infection. When fresh cases prove to be nasal carriers the infection is particularly apt to spread to others.

An untreated case commonly harbours *Str. pyogenes* for several weeks after clinical cure. It is not very surprising, therefore, that when a mass swabbing is done at a school during a fairly large outbreak most of the ambulant carriers detected are earlier victims of the outbreak who have since returned to normal school life. It may be inferred from this that I am an advocate of laboratory screening of convalescents. That would be a correct inference within limits, but I cannot overemphasize the point that, when laboratory screening is used, findings must not be allowed to form the basis of a rigid regime of exclusion from school life. Many highly reputable institutions make no attempt to screen convalescents, and many of these fare no worse than other institutions which do make this attempt.

How can these conflicting facts be reconciled? A clue is provided by the work of Brown and Allison (1935) and others some 20 years ago. These workers made a study of scarlet fever cases in hospital. They showed that something like 50% were carrying *Str. pyogenes* on discharge. In spite of this the return-case rate was low, in the region of 2%, though higher with children than with adults. Not surprisingly, it was found that heavy carriers were more often associated with return cases than light carriers. But it was also found that patients discharged from hospital during the fifth, sixth, and seventh weeks were more infective than those discharged earlier. By the use of serological typing it was shown that in these hospital cases the primary infecting strains disappeared on average just before the end of the third week. Of 47 hospital cases investigated, 33 became cross-infected with other strains present in the ward at that time, some being infected with as many as four different types in succession.

There is a weight of epidemiological evidence which indicates that the great majority of patients with streptococcal throat infections become relatively harmless to their fellows within three to four weeks. Griffith (1934) has plausibly suggested that this may be due to a process of antigenic degradation with loss of virulence occurring in the throat of a person who has acquired a type-specific immunity to the particular streptococcus with which he is infected. Such specific immunity would not be expected to cause loss of virulence in a cross-infecting strain until immunity had been built up against the latter strain also. Occasionally we encounter a case of scarlet fever or streptococcal tonsillitis which not only continues to harbour *Str. pyogenes* for months or years but also gives rise to return cases throughout the whole period the organism is carried.

Chronic Carriers

The existence of persistent carriers such as these is an embarrassment when one is asked whether a carrier convalescent for three to four weeks should be allowed to return to school. Various pointers help in this decision: the great majority of chronic carriers of virulent streptococci have an abnormality in the nose or throat, such as enlarged tonsils; unhappily, one cannot place total reliance on the absence of clinical abnormality, because normal-looking tonsils removed from chronic carriers have occasionally been found after excision to have been bags of pus with thin coverings of normal-looking tissue. An important pointer is the heaviness of the carrier state: the dangerous carrier yields abundant *Str. pyogenes* in almost all swabs taken. You will remember that the heavy nasal carrier is especially infective. When in doubt about whether or not to recommend that a known carrier of three to four weeks' duration should go back to school, as a calculated risk, I ask that the child should be sent to the laboratory. When the clinical examinations and the nose swab are negative and when I fail to isolate *Str. pyogenes* from the clothing, I recommend that the risk is a justifiable one, even though streptococci in the throat may be quite numerous.

I am sure many children are kept away from school unnecessarily. One girl I know of who yielded very scanty *Str. pyogenes* intermittently from her nose was kept away from school for three months on that account. There must also be instances when children return to school too soon for the safety of their schoolmates. The bugbear to this problem is that no laboratory test has yet been found which will give a direct answer to the question, "Is this particular strain of *Str. pyogenes* virulent?" The only court of appeal is the human community itself. It is not exceptional to find carriers of *Str. pyogenes* in a community clinically free from streptococcal infections. Other communities with no higher carrier rates may become victims to high, intermediate, or low streptococcal case morbidities which cannot reliably be predicted. But once clinical cases of streptococcal infection have occurred, it is reasonable to assume that contact-carriers of the type-strain causing the cases are infectious.

Str. pyogenes is a versatile organism and causes infections as diverse as scarlet fever and tonsillitis on the one hand, and as erysipelas, puerperal fever, cellulitis, rheumatic fever, acute nephritis, septicaemia, otitis media, and impetigo on the other. Any particular strain of *Str. pyogenes* may under appropriate conditions give rise to more than one of the varied types of infection just mentioned. In any outbreak one should therefore be on the look-out for more than one clinical manifestation of the infection. A familiar example is puerperal pyrexia following a case of streptococcal tonsillitis.

In spite of their versatility, individual strains of streptococci have predilections. A case of scarlet fever is more likely than a case of streptococcal tonsillitis to give rise to a further case of scarlet fever. This is not a good example, because in scarlet fever the clinical result of the infection also depends largely upon the individual patient. A person who has circulating antitoxin as a result of a previous attack of scarlet fever will not develop a second scarlet rash no matter what strain of streptococcus he picks up, though he can and does succumb to streptococcal throat infections. In some instances the association between the infecting strain and the site of election is stronger; haemolytic streptococci isolated from impetiginous lesions fall predominantly into two closely related serological groups, one of which is rarely encountered in other situations. An equally close strain relationship exists between acute nephritis and *Str. pyogenes* of serological type 12.

Reservoirs of Infection

In an outbreak that has become established there are three reservoirs of infection to be taken care of. Firstly, the clinical cases themselves; secondly, the convalescent carriers

and chronic carriers; and thirdly, bedding, floor dust, etc. Spread of infection from these reservoirs is facilitated by overcrowding, so often seen in class-rooms and dormitories to-day, and by inadequate ventilation. If one could eliminate all the reservoirs the outbreak would die out rapidly. In practice total elimination is never possible, but the more complete the elimination the greater the chance of success. The balance between the hosts and the infecting organisms is often critical, and only a partial elimination of the reservoirs of infection may be sufficient to tilt the scales in favour of the community.

Laboratory aid for the elimination of ambulant carriers is sometimes sought after an outbreak has given rise to substantial inconvenience or anxiety. When this state of affairs has been reached it is worth while removing from the community all heavy carriers of the type-strain which has given rise to the clinical cases. Removal of these carriers does not necessarily entail their segregation; a similar result is obtained if the carriers can be rendered non-infective. This is possible temporarily in most, and in some carriers permanently, by an umbrella of parenteral penicillin held over them for a week or two. The penicillin umbrella is imperfect and leaky, but it does enable ambulant carriers to continue their normal occupations, and it may tilt the scales firmly in the right direction, provided the other reservoirs are not overlooked. Long-acting penicillin, such as benzathine penicillin, has considerable theoretical possibilities in this field, but I think its main practical disadvantage is that the injections are painful.

I hope I have conveyed reasons why I have discussed streptococcal outbreaks in general terms. Each outbreak is influenced by many variables, and each must be judged on its own merits as it gradually unfolds. The pattern of the big outbreaks in schools has generally been a gradual build-up of infection over several weeks. I am convinced that these outbreaks would have been brought under control more easily if the schools concerned had started taking serious preventive measures sooner.

Bacterial Infections of the Bowel

The second group of infections I have chosen are bacterial infections of the bowel, including typhoid and paratyphoid fevers, salmonella infections, and Sonne dysentery.

Typhoid and Paratyphoid Fevers

The key to the epidemiology of typhoid fever lies in the fact that, unlike paratyphoid, a few viable typhoid bacilli taken in food or drink are able to set up disease in man. This explains the differences in the epidemiology of the two diseases. A polluted drinking-water may readily give rise to an outbreak of typhoid fever, as it did in Croydon, but, though water supplies are polluted with paratyphoid bacilli as often as they are with typhoid, water-borne outbreaks of as often as they are with typhoid, water-borne outbreaks of paratyphoid fever are very uncommon. This is because pollution in drinking water is highly diluted and the number of pathogenic organisms in a gallon is small, high enough to infect with typhoid bacilli, but not high enough for paratyphoid. For the same reason typhoid fever, but not paratyphoid, is spread by lettuce and by watercress which has been exposed to remote pollution. Shellfish can spread both diseases, the reason being that they filter large volumes of water in a day and thus ingest a large number of organisms. Though these various means of typhoid infection are mentioned in textbooks they do not together account for a very significant proportion of typhoid fever cases. Typhoid fever is conveyed by means other than sewage. Owing to the permeability of toilet paper, typhoid bacilli can readily get on to the fingers of carriers, and thence directly or indirectly on to foods not destined for further cooking.

The channels by which paratyphoid infection is spread are necessarily more limited. An article of food is seldom at the outset contaminated by a sufficient number of bacilli to produce clinical paratyphoid fever. For the latter to

ensue a chain of circumstances must act together. Firstly, the food must become infected; secondly, the conditions must be favourable for bacterial multiplication in food; and, thirdly, the food must be consumed without a further period of cooking sufficient to kill the paratyphoid bacilli.

For bacterial multiplication to take place various conditions must obtain together; the food must contain a sufficiency of moisture and nutrients for bacterial growth, it must remain at a suitable temperature for a long enough time, and it must not be too acidic. When the temperature of the food is above 70° F. (21.1° C.) half a day may suffice for the necessary bacterial multiplication. When the temperature is near to blood-heat multiplication takes place within a few hours; below 50° F. (10° C.) multiplication is slow, and at refrigerator temperature it is negligible. These facts explain why paratyphoid fever is mainly prevalent during late summer and autumn, though we must remember that food does not always remain at atmospheric temperature. When a large mass of food is warmed up, cooling takes place slowly and the temperature-time combination in the centre is often favourable for multiplication of those bacteria that have not been destroyed by the cooking. An article of food often incriminated in outbreaks of paratyphoid fever is cream cakes. The reason for this is that the cream filling acts as a culture medium and unlike most bakery products is not subjected to baking. Cream cakes are often eaten after a lapse of hours or days from the time the cream fillings are prepared in the bakery.

Though both in typhoid and in paratyphoid fever the reservoir of infection is always human, careful examination of the staff of a bakery implicated in a paratyphoid outbreak often fails to reveal the presence of the carrier. Paratyphoid bacilli can enter bakeries in imported foodstuffs, especially in egg products used in confectionery. Working conditions may be crude. Appliances such as muslin strainers are infrequently sterilized, and are used for straining successive mixes of different kinds. It may thus happen that infection in one kind of mix passes to another kind of mix not destined for baking. Cream cakes may thus leave a bakery infected, although the ingredients from which they were made were free from infection and there were no carriers in the bakery.

Cream cakes are only one vehicle for the dissemination of paratyphoid infection. Similar principles apply to others—namely, a breakdown of hygiene leading to contamination, multiplication of the bacilli in the contaminated food, and consumption of the food in the absence of adequate cooking. I have used the word adequate because some cooking processes sterilize only the surface of the food. The uncoagulated yolk of a soft-boiled egg and the unaltered haemoglobin in the centre of a lightly done steak bear eloquent testimony to the absence of severe heating. A sausage must be very well grilled or fried if vegetative organisms near its centre are to be destroyed.

Salmonella Infections; Sonne Dysentery

Salmonella infections were formerly associated with names such as Aertryck or Gaertner. They are referred to now as *Salmonella typhi-murium*, *Salmonella enteritidis*, or as *Salmonella x*, *x* being a place-name. The epidemiology of salmonella infections has much in common with that of paratyphoid, for the reason that a relatively large number of salmonellae have to be ingested before clinical infection ensues. Apart from the shorter incubation period, the difference lies in the reservoirs of infection. In the case of salmonellae there is an extensive animal reservoir, especially rats and mice, poultry, pigs, and cattle. Other animals, including unlikely ones such as the tortoise, harbour salmonellae: cats and dogs occasionally fall victims to salmonella infection, and both have been known to pass this infection to man, but fortunately this is rare. Infected rats and mice leave droppings in any food to which they have access. An infected farmyard animal may itself become an article of food, and poultry eggs may carry infection. Hen eggs are rarely infected, but when brooded in large numbers, as in the preparation of dried egg, frozen liquid egg, or egg

*Read in the Section of General Practice at the Annual Meeting of the British Medical Association, Brighton, 1956.

albumen, the risk of salmonella infection is increased proportionately. Duck eggs are notorious for their association with *Salmonella typhi-murium*. In any large collection of hen eggs a few duck eggs are often to be found; this adds to the risk of salmonella infection in bulked-egg products. One would expect pork sausages to be a good vehicle for the spread of salmonella infections, and this is so in practice.

The most prevalent type of dysentery in Britain by far is Sonne dysentery. It accounts for over 95% of the cases. As in salmonella infections, the incubation period is a short one, from one to three days. In common with typhoid and paratyphoid fever there is no animal reservoir. As in typhoid fever the infective dose is probably a small one. Bacterial multiplication in food is not an important factor in its transmission, and it is noteworthy that this disease is now commoner in Britain in the early spring than it is in the summer. The factors which govern its spread are not yet fully understood, though soiling of lavatory seats by children is believed to play a part. In Scandinavia it is still a summer disease, as it was in Britain until the end of the war. There is a closer case-to-case linkage than with salmonella infections, and it is uncommon for an outbreak of Sonne dysentery to involve widely scattered households between which there is no link, as occurs in typhoid and paratyphoid outbreaks.

Discussion

In outbreaks of all these intestinal infections it is the rule and not the exception to find that there are persons exposed to risk but clinically unaffected who are excreting the organisms in their stools. In common with streptococcal infections of the throat, convalescents remain infective to others after clinical recovery. In intestinal infections these periods of infectivity tend to be long. The tendency for a prolonged carrier state is greatest with typhoid and paratyphoid, intermediate with salmonella, and least with Sonne dysentery bacilli, in which a carrier state lasting more than three months is rare. An outbreak of paratyphoid fever in Eastbourne was followed up eight years later. At the end of 18 months, 5% of the patients were still excreting paratyphoid bacilli. These persistent excretors were mainly among the under 5's and over 70's. One of the over 70's is still alive and still excreting paratyphoid bacilli.

One might wonder, in view of the long period convalescents remain infective, why it is that these diseases are not universal. Some of them are indeed at times widespread, and there is always a submerged number of undiagnosed cases the size of which we can only guess. But even taking this into consideration, only a minute fraction of the total population is ever infected at one time. The main limiting factor apart from hygiene is, I believe, natural immunity. We have much evidence that the ingestion of small numbers of paratyphoid and salmonella bacilli is followed by no undesirable clinical effects. Though with typhoid fever and Sonne dysentery the threshold of infection is lower, the prevalence of symptomless excretors in both these diseases is also strongly indicative of the natural resistance.

Further evidence of this resistance is the rarity of outbreaks in which the morbidity of adults exposed to risk reaches 50%. Similar evidence of a more direct kind is provided by the sauce chef of one of Brighton's leading hotels. There is retrospective evidence that this chef remained a heavy excretor of *Salmonella typhi-murium* for several months before he infected the residents and visitors to the hotel, although sauces, which are his whole-time professional occupation, may be an excellent vehicle for the dissemination of salmonellae.

Now a few words only on the treatment of intestinal carriers. Cholecystectomy is sometimes successful for typhoid and paratyphoid carriers, but not by any means always. Antibiotic treatment has in the main proved disappointing in its long-term results for chronic carriers. It is true that many temporary intestinal carriers appear to have responded permanently to antibiotic treatment, but we must not forget that the great majority of intestinal

carriers stop excreting in their own good time, whatever it may be, without treatment. An attitude of healthy scepticism rather than of blind faith is called for.

Before I end there is one more fact I should mention: the sauce chef I spoke of has now disappeared from Brighton and has not been traced by our health department. Doubtless he is now pursuing his culinary art in some other town.

In preparing this paper I should like to acknowledge my indebtedness to Topley and Wilson's *Principles of Bacteriology and Immunity*, by Wilson and Miles (4th edition, 1955), for some of the information relating to streptococcal infections.

Summary

Two groups of infections have been considered, those due to *Str. pyogenes* and those due to enteric bacilli.

Str. pyogenes, though versatile, has predilections. The most frequent site of infection is the throat, but nasal carriers are more infective. Throat cases usually become non-infective within three weeks, but exceptions occur and are discussed. In outbreaks there are three reservoirs of streptococcal infection. Though complete elimination of all the reservoirs is never possible, partial elimination, including removal or neutralization of contact carriers of the type-strain causing the clinical cases, may limit the outbreak. If these measures are applied early enough an outbreak may be prevented.

An attempt has been made to rationalize the known epidemiological facts concerning typhoid and paratyphoid fevers, salmonella infections, and Sonne dysentery. This has been made in relation to the relative infective doses of the organisms concerned, their reservoirs of infection, natural immunity in the population at risk, and current hygienic (and unhygienic) practices.

REFERENCES

- Brown, W. A., and Allison, V. D. (1935). *J. Hyg. (Camb.)*, 35, 283.
Griffith, F. (1934). *Ibid.*, 34, 542.

RHEUMATIC DISORDERS

HEBERDEN SOCIETY MEETING

Among the topics discussed at the Heberden Society's two-day scientific and annual general meeting last month were the reason for the persistently high E.S.R. sometimes found in patients with degenerative arthritis and a hitherto little commented upon complication of ankylosing spondylitis—namely, spontaneous atlanto-axial dislocation, of which 10 cases were reported. The meeting was held in London on December 14 and 15 at University College Hospital Medical School and the Wellcome Foundation, under the presidency of Dr. ERNEST FLETCHER. On the first day Professor R. E. TUNBRIDGE, of Leeds, delivered the Heberden Oration, on this occasion a review of recent advances in our knowledge of the connective tissue and its constituents. In the evening the society's annual dinner was held at the Apothecaries' Hall (*Journal*, December 29, 1956, p. 1557). Eight scientific papers were presented during the meeting, and here we summarize a few of them.

Unexplained Elevation of the E.S.R.

Dr. B. M. ANSELL and Dr. E. G. L. BYWATERS described a three-year study at the Postgraduate Medical School of London of patients with an unexpectedly high erythrocyte sedimentation rate. Sometimes, they said, routine estimation of the E.S.R. by the Westergren technique in new patients attending the rheumatic clinic had revealed a reading which could not be explained on the basis of the original diagnosis—for example, degenerative joint disease. Of 51 patients with such readings, out of approximately 900, they had now satisfactorily investigated and followed 45. These

fell into two groups: in 14 the E.S.R. returned to normal within a month; but in the remaining 31 it persisted at a high level. Besides a full clinical examination, investigation of these cases had included tests for C-reactive protein, plasma proteins, fibrinogen, and L.E.-cells, and, in some, numerous radiographs, electrocardiographic examination, and bone-marrow and synovial biopsies also.

As a result, it had been possible to make a definitive diagnosis in 20 of those with a persistently high E.S.R. and in 7 of those whose E.S.R. was only transiently raised. Although degenerative joint disease was the most frequent initial diagnosis a large number of these patients had subsequently developed rheumatoid arthritis as judged by strict criteria, while several others were probably also affected by it. In other cases, although the presenting symptoms were due to degenerative joint disease, the actual cause of the raised E.S.R. had proved to be an unrelated condition such as myelomatosis. Of those in whom no cause was found, in some the E.S.R. returned to normal as their symptoms abated, but no precise diagnosis could be established; in the others the E.S.R. remained high despite a satisfactory general condition and the disappearance of symptoms. Perhaps the high readings in these cases might be related to advancing years or to the presence of widespread degenerative changes.

The presence of a raised E.S.R. in the absence of obvious clinical cause, said Dr. Ansell and Dr. Bywaters in conclusion, called, therefore, for full investigation and follow-up before the patient could be reassured that the finding was of no significance.

Spontaneous Atlanto-Axial Dislocation

Dr. J. SHARP and Mr D. W. PURSER, F.R.C.S., of Manchester, said they had observed spontaneous atlanto-axial dislocation in 10 patients with advanced ankylosing spondylitis. The first patient had died with a tetraplegia, the cause of which had remained obscure until his post-mortem examination. The subsequent cases had presented in three ways. First, there were those with progressive deformity, a "falling forwards" of the head, difficulty in shaving under the chin, and decreased height of vision. A second group complained mainly of severe pain in the occipital and suboccipital regions, aggravated by sudden movement or riding in vehicles; several of these patients had been given x-ray therapy without relief of their pain. In a few cases the outstanding feature was the onset of severe neurological manifestations.

Damage to the cord appeared to be related not only to the degree but also to the rapidity of the displacement, and to the persistence of any abnormal atlanto-axial mobility. Although in some cases a degree of subluxation was also present at a lower level, the atlanto-axial dislocation probably accounted for the damage to the medulla or spinal cord. If severe pain or neurological changes were present, treatment consisted in correction of the deformity by skull traction, followed by occipito-cervical fusion. With this regime pain was relieved and neurological signs regressed. Atlanto-axial dislocation had also been observed in rheumatoid arthritis.

Although further experience might show that spontaneous atlanto-axial subluxation was a not uncommon sequel of ankylosing spondylitis and rheumatoid arthritis, it might well prove, suggested Dr. Sharp and Mr. Purser, not necessarily to be attended by disastrous consequences. Nevertheless, early diagnosis of the displacement was highly desirable, both to spare the patient from the possible dangers of unwarranted radiotherapy or injudicious physical treatment, and to allow him to be guarded against injury, as even trivial accidents might cause serious and perhaps fatal neurological complications.

Other Subjects

Among the other papers was a radiological study of 300 cases of ankylosing spondylitis, followed up for periods of 6 to 23 years, by Dr. J. FORESTIER, of Aix-les-Bains. He

pointed out that radiological evidence of sacro-iliac ankylosis did not imply that the disease was necessarily arrested. On average it took 14 years for the sacro-iliac joints to become ankylosed, and although the duration of clinical activity varied greatly from case to case the average time was 19 years, roughly during the period of sexual activity. As a rule, all cases that had been quiescent for several years showed complete bony ankylosis of both the spine and the sacro-iliac joints.

Papers were also read by Dr. J. S. LAWRENCE (Manchester), on physiotherapy in rheumatic diseases; Dr. V. WRIGHT (Stoke Mandeville), on diurnal variations in the grip; Dr. B. M. ANSELL, on a radio-isotope study of the sodium-retaining properties of cortisone and prednisolone, from which he concluded that in cases on cortisone where sodium retention had occurred prednisolone might exert a diuretic effect; by Dr. H. J. GIBSON and Mr. N. R. LING (Bath), on a new augmented agglutination test on the Rose-Waaler model; and by Dr. B. S. BLUMBERG and Dr. A. G. OGSTON (Oxford), on the effects of proteolytic enzymes on the hyaluronic acid complex.

MONOPOLIES COMMISSION ON OXYGEN

The "Report on the Supply of Certain Industrial and Medical Gases," of the Monopolies and Restrictive Practices Commission, published recently,* makes it clear that so far as oxygen, one of the gases considered, is concerned, it is practically the monopoly of the British Oxygen Company; for this company, in addition to supplying something like 98% of the oxygen used in Great Britain, also holds the agencies for the supply of most of the machinery used in its production.

B.O.C.'s Heavy Responsibility

In view of this position, the Commission points out, a heavy responsibility fell on the British Oxygen Company to ensure that the full requirement of industry, the hospitals, and the armed Services would continue to be met, and that in the field of research the United Kingdom would at least keep pace with other countries. In its long history the British Oxygen Company had not been responsible for the discovery of any of the successive important new processes for the production or distribution of oxygen, states the report. Indeed, almost all were discovered abroad, and the company's part had been to acquire the necessary patent rights or licences and exploit them in this country. On such evidence as was available it seemed that rapid technical progress was still being made abroad, notably in the U.S.A. and Germany.

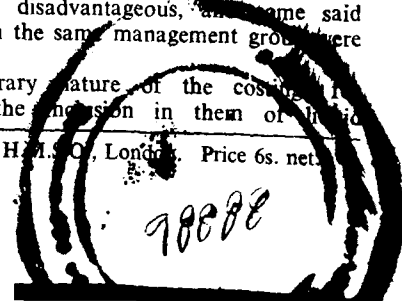
"Medical" Oxygen

In the evidence considered by the Commission figures were submitted which showed that industrial oxygen was produced at a total cost of about 25s. 11d. per 1,000 cubic ft. (28 cubic metres). But, although industrial oxygen more than met the standard of purity required by the *British Pharmacopoeia*, medical oxygen, because of the need to handle and fill small cylinders, and for greater hygienic care, a day and night service, and similar overheads, cost 72s. 5d. per 1,000 cubic ft., nearly three times as much.

Dealing with medical oxygen alone, the Commission mentions there is no national price scale for medical liquid oxygen, but there is in force a national price scheme for compressed medical oxygen. In the evidence a number of hospitals had indicated that they regarded the absence of published prices as disadvantageous, and some said different hospitals within the same management group were paying different prices.

Owing to the arbitrary nature of the cost of medical oxygen and the variation in them of

*December 20, 1956. H.M.S.O., London. Price 6s. net.



oxygen supplied to the Air Ministry for high flying, it was not possible to say with any degree of certainty what was the loss (if any) on sales of oxygen for medical purposes in the strict sense of the term. The records of the company showed an average loss of 11% on cost for medical oxygen in all forms, including liquid oxygen for high flying, and there did not seem to the Commission to be any justification for any losses sustained on the sales of medical oxygen being in effect carried by the industrial consumers. They recommended that published price scales for medical oxygen should be prepared on the same lines as for industrial oxygen.

Commission's Conclusion

"We find that the British Oxygen Company charges unjustifiably high prices for oxygen—and that this operates and may be expected to operate against the public interest," states the Commission in its conclusions as to price. And further on, when dealing with the monopoly position which the company has built up, it is stated that the British Oxygen Company had taken advantage of the position to charge prices which the Commission regarded as unjustifiably high, and had pursued a price policy which was in other respects open to objection, and that all those things operated against the public interest and might be expected to continue to operate against them unless changes were made and safeguards introduced.

Nova et Vetera

WILLIAM HILLARY, M.D. (1697-1763)

William Hillary was one of the first physicians to attempt to correlate illness with climatic conditions. He was a careful and systematic observer of the weather and its effect upon prevalent diseases. He also wrote one of the earliest books to deal specifically with tropical disease, his *Observations on the Changes of the Air, and the Concomitant Epidemical Diseases, in the Island of Barbados* . . . being published in London in 1759. This work included one of the original and most accurate descriptions of tropical sprue. Apart from these bare facts, however, little has been known of the life and work of William Hillary. His publications *On the Small-pox, Diseases in Barbados*, and *Means of Improving Medical Knowledge* may be consulted in libraries, but they contain little or no biographical detail. Who was this intriguing eighteenth-century physician? Who were his friends? Where did he come from?

Some of these questions have been answered during a recent survey of the correspondence of John Fothergill (1712-80), the famous Quaker physician. William Hillary was well known to this philanthropic doctor, for in a letter written to his brother Alexander in Wensleydale, Yorkshire, and dated July 11, 1746, Fothergill discussed Dr. Hillary and his intended voyage to the Barbados. "Whilst he was here," Fothergill wrote, "news came of the Death of the only eminent Physician at Barbados: I procured him an interview with a person who gave him an exact account of the affairs of that Island, he likewise spoke with several others who jointly recommended the place as much preferable to Jamaica . . . there are several Meetings, the Island pleasant and healthy." Other letters included Fothergill's "kind love" to the Hillary family, and in November, 1746, he told his brother that he was glad that "Dr. Hillary's relations were satisfied with the part that I acted in his affairs."

These letters do more than indicate that Fothergill knew Hillary well, that he took an active part in helping him to secure his post as physician in Barbados, and that Hillary too was a Quaker. They also suggest that the Hillary family was well known to Alexander Fothergill, living at Carr End in the wild and isolated beauty of Wensleydale,

and that the Hillary family probably lived somewhere close by. They lived, in fact, in the Wensleydale village of Burtsett, where Hillary Hall still stands to-day, two or three miles from the Fothergill home at Carr End; and a search through Quaker records reveals that William, the son of John and Mary Hillary, was born on January 17, 1697, a winter's day when the snow must have lain deep in Wensleydale.

Apart from his Yorkshire origin, William Hillary had another link with John Fothergill, for he worked in Bradford with the same apothecary, Benjamin Bartlett, to whom Dr. Fothergill later served his apprenticeship. He took his medical degree at Leyden in 1722, at that time the acknowledged centre of medical learning in Europe, graduating M.D. with a dissertation on intermittent fevers. He then became a physician in Ripon, Yorkshire, but in 1734 moved on to Bath. His situation there, however, was "not the most agreeable nor the prospect very pleasant," and for these reasons he went to Barbados in 1747, where his observations of the weather and the prevalent diseases occupied him from 1752 to 1757. He returned to London in 1758, living quietly in retirement until his death on April 25, 1763.

Hillary and Fothergill were by no means the only well-known physicians of the eighteenth century who had associations with the Yorkshire Dales. John Dawson (1734-1820) and John Haygarth (1740-1827) came from near-by Garsdale, and John Coakley Lettsom (1744-1815) was apprenticed to an apothecary, Abraham Sutcliffe, in Settle, Ribblesdale. Further afield, Anthony Askew (1722-74), one of the owners of the famous gold-headed cane, was born in Kendal, over the border in Westmorland, but, like Fothergill and Haygarth, he was educated at Sedburgh School in Yorkshire. Among this illustrious company of Dales doctors William Hillary may claim an honoured place. He was a physician whose accuracy of observation and therapeutic skill were actuated by a constant search after perfection. His philosophy and his scientific approach to the practice of medicine cannot be better described than in the words of the introduction to his *Rational and Mechanical Essay on the Smallpox*, written whilst he was in practice in Ripon. This work was published later in 1735. An extract from his introduction follows:

"It appears how necessary it is for a Physician, who would be successful in his Practice, or make any tolerable Figure in his Profession, to be well acquainted with the structure of the Human Body, the use of all its Parts, the Principles of Mechanical Powers, the Laws of Motion and Hydraulics, with a sufficient skill in Geometry and Mathematics, to apply them; as well as a knowledge of Chymistry, Pharmacy, and the Virtues and Doses of Medicines. For it is by a proper Use and Application of these, both in our Practice and Reading, that we can account for the Causes and Effects of Diseases, and the manner of the Remedies acting, so as to produce their salutiferous effects. It is by these, and accurate observations in Practice, that we must improve our Knowledge in the State of Physic and Diseases; it is this Knowledge, and these Abilities, that must be the distinguishing Characteristic of a true Physician, from an Empiric; it is by this Method of reasoning from Data, founded upon observations and real Facts, that the *Healing Art* must be improved and brought to a State of Perfection; for if we once quit our Reason for Mystery, and abandon a just Method of Mechanical and Geometrical Reasoning, for the unintelligible terms of Occult Faculties and Qualities, with all such like Metaphysical and Chymical Jargon and Nonsense, heretofore too much used in the Schools; we must wander through endless Mazes, and dark Labyrinths, playing at Hazard with Men's Lives, and suffer ourselves to ramble where ever conceited Imagination, or Whimsical Hypothesis will lead us."

We record our sincere thanks to Mrs. A. Wallis, of Darlington, for permission to quote extracts from the letters of Dr. John Fothergill in her possession; and to the librarian of the Friends' Reference Library for help in consulting Quaker records.

C. C. BOOTH.
W. N. PICKLES.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Perinatal Mortality

SIR,—As a member of a small committee engaged in a pilot survey of the problems of perinatal mortality among domiciliary as well as hospital deliveries, I was naturally interested in the exhaustive data presented by Dr. J. P. Bound and his colleagues (*Journal*, November 24, 1956, p. 1191, and December 1, 1956, p. 1260), especially as I had already experienced the usual difficulty in finding any suitable classification of the causes of stillbirth and early neonatal death. A table based upon clinical diagnosis will inevitably be inaccurate, as so many asphyxial deaths are associated with multiple causes. The child that dies during the prolonged labour of a parturient who suffers from anaemia and chronic hypertension, and who is three weeks apparently post-mature, can be placed in no one clinical group.

I had therefore hoped that I should find an answer to my problem in the pathological classification put forward by the department of paediatrics and morbid anatomy of the University College Hospital Medical School. Unfortunately, despite the most painstaking cross-reference between the pathological and clinical findings, the result remains somewhat unsatisfactory. Asphyxial deaths are divided between three groups, partly on pathological findings and partly on clinical records. Asphyxial death occurring so slowly or so long before delivery that gross evidence of the asphyxial process could not be found is placed with unexplained cases of intrauterine death, despite possible clinical evidence pointing clearly to asphyxia. The division between intra-partum asphyxia and ante-partum asphyxia is made according to records of foetal heart tones and the clinical estimate of the onset of labour. While this may seem a natural separation of two contrasting groups, it ignores the fact that most intra-partum asphyxia has been preceded by ante-partum hypoxia, and it may well be fortuitous whether death occurs just before or after the onset of labour.

Further, a pathological classification inevitably fails to meet the needs of the obstetrician desirous of information on current problems. He must hunt for stillbirths associated with inexperienced delivery of the breech presentation among intra-partum asphyxia as well as intracranial haemorrhage, and the perinatal mortality of pre-eclampsia may be in almost any one of the pathological columns. It would seem that the ideal classification has yet to be propounded, but it must surely make use of both pathological and clinical factors.—I am, etc.,

Birmingham.

W. G. MILLS.

Diesel Fumes

SIR,—Mr. B. T. Commins, Mr. R. E. Waller, and Dr. P. J. Lawther (*Journal*, November 24, 1956, p. 1235) suggest that my previous letter (*Journal*, October 20, p. 939) shows confusion of thought, in that I have appeared to confuse figures for total hydrocarbons in exhaust gas given by Elliott *et al.* with figures for polycyclic hydrocarbons given by Kotin *et al.* I regret that this distinction was not made clear, but the purpose of the quotation was to point out that output both of total hydrocarbons from Chicago diesel buses in average condition in city streets, and also of polycyclic hydrocarbons from a test-bed diesel engine (except when in perfect condition), increases greatly with increase of load, and hence that conditions in a garage where engines are very and hence that conditions in a city street, which are what matter to the general public. In fact, Commins *et al.* have not given evidence for their statement (*Journal*, September 29, p. 753) that "the highest concen-

trations of exhaust products to which men are regularly exposed probably occur in garages." It may well be that the concentrations of certain of the more dangerous products reach levels in busy city streets on windless days as high as, or higher than, in garages, and that these levels are maintained for longer periods. It would be useful to have some British measurements to compare with those of Kotin *et al.* on the Los Angeles atmosphere.

In any case, it must not be assumed that 3:4-benzpyrene or even other polycyclic hydrocarbons are the only carcinogenic substances present in internal combustion engine exhaust, nor that the petrol engine is innocent in this matter. Kotin *et al.* noted that the concentration of 3:4-benzpyrene in the Los Angeles atmosphere was relatively low in contrast with the high yield of malignant tumours produced by painting extracts of the atmosphere on to the skin of mice, and low compared with the known high quantity of 3:4-benzpyrene emitted from all sources. They give evidence to suggest that hydrocarbon oxidation products may also be important carcinogens, and that oxides of nitrogen are partly responsible for oxidation of hydrocarbons in these substances. They also point out that atmospheric carcinogenic hydrocarbons are usually adsorbed on to soot particles, in which form they are biologically ineffective, becoming effective only upon elution from the soot particles. The sebaceous secretions of the skin may act as a natural eluting agent, thus accounting for chimney-sweeps' cancer of the scrotum, but there is no such natural eluting agent in the lungs. Unburnt petrol and fuel oil vapour (present in considerable quantity in the exhaust of petrol and diesel engines) can, however, act as a solvent to extract polycyclic carcinogenic hydrocarbons from soot and render them active in the lung. Hence the normally harmless 3:4-benzpyrene adsorbed on to soot particles from coal burning (including possibly those already deposited in the lungs) can be rendered actively carcinogenic by unburnt petrol and fuel oil vapours. It may even be that such unburnt vapours activate benzpyrene from tobacco smoke. This might account for the observation by Dr. C. J. G. Franklin (*Journal*, December 15, p. 1426) that cancer of the lung seems rare among heavy smokers in the West Indies.

With regard to oxides of nitrogen, I am at a loss to understand Commins *et al.* when they state (*Journal*, November 24, p. 1235) that the "assumptions" I made in my previous letter are "in direct conflict with data given in Fitton's summary of modern work." My statements on exhaust volume of diesel engines and total output (not concentration) of oxides of nitrogen are based on Elliott *et al.* and Fitton gives no data on these points. Fitton gives no figures for proportion of petrol to diesel vehicles in city streets, and his figures for total petrol and diesel vehicles apply only up to 1954, but it is known that all buses in London and most other cities, half London's taxis, and more than half the heavy lorries are diesel powered, and Fitton does not contradict this. The reason for my fresh calculations is that it is quite wrong to assume for calculation of air pollution in city streets, as Wilkins does, that "the relative quantities of these two types of [exhaust] gas emitted are indicated by the relative amounts of exhaust gases derived from the petrol and diesel fuel used by road vehicles in 1954, viz., 5.9 and 1.4 m. tons respectively." This would be true for the country as a whole, but in city streets where public transport is provided by diesel buses the proportion of diesel vehicles is almost certainly higher than for the country as a whole, probably by a factor of 2. In any case, Wilkins appears (though his method of calculation is not displayed) to have assumed that the relative amounts of exhaust gases from the two types of engine are in the same proportion as the relative amounts of the two types of fuel used. He seems to forget (1) that a diesel engine gives at least 50% more power in proportion to fuel used than a petrol engine; (2) that a diesel engine of given power gives an exhaust volume from 2 to 7 times as great as a petrol engine of the same power. Hence the ratio for petrol to diesel exhaust volume should be 5.9 : 1.4 × 2 × 1.5 × 2 to 7—that is, 5.9 : 8.4 to 29.4—that is, 1 : 1.5 to 6 (approx.). At a ratio of 1 : 3, assuming Wilkins's and Fitton's figures for exhaust gas composition, oxides of nitrogen may reach 6.25 p.p.m.—if the ratio is 1 : 4, oxides of nitrogen may reach 8.1 p.p.m.

I am very glad to see that Commins *et al.* have realized the importance of air pollution by oxides of nitrogen and that my letter has prompted them to make some measurements. It is difficult to evaluate the significance of their results, in view of the wide variation in the figures for carbon monoxide concentration, pointed out by Dr. Handley Howell (*Journal*, December 22, p. 1487). This, the wide variation in the figure for NO₂, and the complete lack of correspondence between the two figures, suggests that the results are the purely chance figures that must be expected from individual instantaneous samples taken in the turbulent air near moving traffic. May I suggest that it would be more

reliable to take a continuous series of instantaneous samples, say, every minute for an hour, and give the maximum, minimum, and mean values? In addition to the questions which Dr. Handley Howell raises, data as to wind speed and weather conditions for each test would be helpful. It would also be useful to carry out the tests at various times of day, including times of peak travel. Nevertheless, the results at first sight seemed reassuring, but unfortunately Commins *et al.* omitted to mention that Saltzman's method (which they used for estimating oxides of nitrogen) is actually a method of estimating nitrogen dioxide only—it is not sensitive to nitric oxide. According to Faith¹ the major component by far of oxides of nitrogen from internal combustion engines is nitric oxide. This gas is important, partly because of its direct toxic effects and partly because it is steadily converted to nitrogen dioxide in the atmosphere. This conversion may well occur more readily in tissues such as the lungs in the presence of oxidizing enzymes. Perhaps Commins *et al.* could give some figures for total oxides of nitrogen.

I note that Commins *et al.* emphasize "the limited significance of the preliminary garage results." Would that much of the popular and the motor press had emphasized this instead of giving the report misleading publicity. Assuming that the London Transport Executive realizes this limited significance, surely it is its duty to admit that the diesel engine has not yet been proved harmless to health.—I am, etc.,

London, E.4.

F. G. TOMLINS.

REFERENCES

- ¹ Elliott, M. A., Nebel, G. J., and Rounds, F. G., *Journal of the Air Pollution Control Association*, 1955, 5, 103.
- ² Kotin, P., Falk, H. L., and Thomas, M., *A.M.A. Arch. Industr. Hlth.*, 1955, 11, 113.
- ³ Mader, P., and Thomas, M., *A.M.A. Arch. Industr. Hyg.*, 1954, 9, 153.
- ⁴ Fitton, A., *J. roy. Soc. Hlth.*, 1956, 76, 664.
- ⁵ Wilkins, E. T., *ibid.*, 1956, 76, 677.
- ⁶ Saltzman, B. E., *Anal. Chem.*, 1954, 26, 1949.
- ⁷ Faith, W. L., *Chem. Eng. Progress*, 1956, 52, 342.

Treatment of Acute Appendicitis

SIR,—I read with interest Mr. Eric Coldrey's article on acute appendicitis (*Journal*, December 22, 1956, p. 1458), but I would question the wisdom of his remark: "One sometimes wonders whether it would not be a sound procedure to treat all cases of acute appendicitis conservatively."

In general practice one sees from time to time cases suggestive of acute appendicitis which subside on conservative treatment in hospital and which, on returning home, repeat their symptoms and signs in maybe two or three months' time and which have to be readmitted for an emergency appendicectomy. The result is an increased call on acute surgical beds, prolonged absence of the patient from work or school, and (dare one mention it?) more work for the family doctor, who has to answer two calls for an acute abdomen instead of one, and whose advice when he suggests hospital on the second occasion is apt to be met with some remark such as, "Well, you told me last time, Doctor, my appendix would have to come out: are you quite sure this time?"

In case I appear sententious, I should add that I have probably sent in far more than my fair share of mesenteric adenitis, acute pyelonephritis, etc., wrongly labelled as acute appendicitis, and am only too aware of my own diagnostic limitations, but I do feel that from everyone's point of view an uncomplicated acute appendicitis in this country is best treated by its removal.—I am, etc.,

J. C. FOSTER

Nettlebed, Oxon.

SIR,—As G.P.s we are a little tired of reading articles on appendicitis by specialists who grumble that the case is not always admitted within 24 hours of the onset of pain. The latest "offender" is Mr. Eric Coldrey (*Journal*, December 22, 1956, p. 1458). Have these specialists all worked in general practice, and do they realize the difficulties?

The patient does not always consult the G.P. until the pain has been present some time. The diagnosis can be very difficult in the early stages, especially in children. Some children seem to start as simple gastro-enteritis, and show

signs of localization to the appendix only after a day or two. It is easy for the specialist. The period of doubt is over and the diagnosis made when the patient reaches hospital. Why do not specialists make it easier for the G.P. to get a specialist opinion instead of walling themselves in behind their appointment systems and registrars? If we want a specialist opinion we must usually wait about a week for an appointment. If we phone the registrar at hospital we are frequently told (after waiting 15 minutes while he is found), "Yes—he would see the case, but as he has no bed available anyway would we please try elsewhere?"

When we are worried by the cases we failed to diagnose within 24 hours we comfort ourselves thinking of cases we have diagnosed correctly and sent to hospital. A few of these have waited quite long periods for operation, as an alternative diagnosis, such as chest infection or adenitis, has appeared more likely to the specialist. So the differential diagnosis must be difficult.—We are, etc.,

JOAN WAGSTAFF.

HELEN WAGSTAFF.

London, E.4

Methyltestosterone Therapy

SIR,—In response to the letter by Drs. G. L. Foss and S. L. Simpson (*Journal*, December 15, 1956, p. 1426), we have recently had under our care a patient who became jaundiced while having methyltestosterone.

A woman, aged 24, and five months pregnant, was referred on August 8, 1956, to the skin department of the Gloucester Royal Hospital with severe generalized pruritus of one month's duration. In her only previous pregnancy she had had similar irritation which had cleared up on the day after childbirth. When seen on the present occasion there were no abnormal signs, and a diagnosis of pruritus of pregnancy was made. Local and sedative treatment was ineffective, and a month later the itching was so intense that she was threatening suicide. On the advice of Dr. R. E. Bowers, methyltestosterone 10 mg. twice daily by mouth was started on September 10. Relief of irritation was immediate, but on September 26 her sclerotics were noticed to be yellow and the urine contained bilirubin, urobilin, and a trace of albumin. Additional investigations were as follows: direct van den Bergh reaction, positive; serum bilirubin, 2 mg.%; alkaline phosphatase, 20.7 K.A. units; ZnSO₄ turbidity, 3 units; thymol turbidity, 1 unit; total serum proteins, 6 g.% (albumin 4 g.%, globulin 2 g.%); paper electrophoresis, within normal limits.

Because of the jaundice, methyltestosterone was discontinued. Within a few days the irritation returned and by October 8 was again intolerable. On October 12 she was admitted for the gradual reintroduction of methyltestosterone under observation, since the alternative seemed to be termination of the pregnancy. On admission the sclerotics were only faintly yellow. Investigations were as follows: urine contained a trace of bilirubin and urobilinogen; serum bilirubin, 0.9 mg.%; alkaline phosphatase, 33 K.A. units; ZnSO₄ turbidity, 3 units; thymol turbidity, 2 units; serum proteins, no change. On October 13 methyltestosterone was started in a dosage of 10 mg. daily. By the next day itching was less and the dose was reduced to 5 mg. daily. This dose failed to control itching, and on October 19 it was increased to 5 mg. three times a day. Pruritus was no longer relieved, and the patient became more jaundiced, with nausea and anorexia. The serum bilirubin rose from 0.8 mg.% on October 19 to 1.25 mg.% on October 22. The methyltestosterone was therefore again reduced to 5 mg. daily, and within a few days the nausea and anorexia disappeared and the sclerae became less yellow. The patient stated that she preferred the pruritus, now somewhat less intense than before admission, to the nausea and anorexia associated with increasing the dose of methyltestosterone, and she was discharged home on methyltestosterone 5 mg. daily and phenobarbitone $\frac{1}{4}$ gr. (16 mg.) three times a day. A week later she went into labour, and, as in her previous pregnancy, the itching completely disappeared on the day after parturition.

We concluded that initially pruritus was relieved by 20 mg. daily of methyltestosterone, and that this dose produced jaundice; that 5 mg. daily neither relieved pruritus nor increased the jaundice; and that subsequently 15 mg. daily increased the jaundice but failed to relieve pruritus. Pruritus is a well-recognized but uncommon complication of pregnancy. Standard textbooks offer no clues to its causation. We have not made a search of the literature, but a recent monograph on jaundice in pregnancy¹ suggests that pruritus

is due to hepatotoxaemia, even when jaundice is not present. In our patient jaundice was not noted when she was first seen but was discovered by the same observer (K. M. T.) after she had been given methyltestosterone. The subsequent variation of the jaundice with the dosage of methyltestosterone is, we believe, good evidence of an icterogenic effect of the drug in this patient. It seems probable, however, that pruritus of pregnancy is due to hepatic dysfunction, and that methyltestosterone aggravated in our patient a condition already present.—We are, etc.,

G. R. FEARLEY.

K. M. TOMLINSON.

G. V. BALMFORTH.

Gloucester.

REFERENCE

- ¹ Thorling, L., *Acta med. scand.*, 1955, 151, suppl. 302.

B.C.G. Vaccination after Replacement Blood Transfusion

SIR,—We were interested to read the paper by Drs. A. S. Hutcheson and P. Macpherson (*Journal*, October 13, 1956, p. 863) suggesting that babies who have had an exchange transfusion may show an abnormal reaction to B.C.G. vaccination. As we had recently vaccinated twin babies who had each received two exchange transfusions, and have since been able to trace the donors of the blood used, we feel it may be of interest to report these two cases.

The twins, female and male, were born at full term to a primigravida of blood group O rhesus-positive. They weighed 5 lb. 4 oz. (2.4 kg.) and 5 lb. 2 oz. (2.3 kg.) respectively and each received "synkavit" 5 mg. intramuscularly at delivery. Jaundice was noticed in both six hours after delivery and was progressive. There was no anaemia, and both babies were of group A rhesus-positive with negative Coombs tests. At 48 hours the boy developed athetosis and head retraction, and a diagnosis of kernicterus associated with the administration of vitamin K was made. Accordingly an exchange transfusion using group A rhesus positive blood was carried out on both twins at 57 hours. Despite this, the jaundice progressed, and a second replacement transfusion was performed 36 hours later with rhesus-positive group O blood, on a revised diagnosis of haemolytic disease due to group A incompatibility. Both babies subsequently showed clinical improvement, and the diagnosis was later confirmed by the finding of an anti-A haemolysin in the maternal blood.

On the 18th day both twins were given 0.05 ml. B.C.G. intradermally, with the production of nodules which did not discharge and without enlargement of the axillary lymph glands. At 15 weeks the Mantoux reaction using 0.1 ml. of 1:1,000 O.T. gave areas of induration of 10 mm. and 11 mm. in diameter. The five donors of the blood used, and the mother, were given the same Mantoux test, and reacted positively, having areas of induration of 13, 15, 16, 28, 32, and 18 mm. respectively.

We believe that the evidence of these two cases, together with the large series reported by Drs. W. A. B. Campbell and H. M. Purser (*Journal*, November 10, p. 1115) and Drs. M. d'Avignon and G. Berglund (*Journal*, December 8, p. 1363), supports the idea that an abnormal reaction to B.C.G. following exchange transfusion is most unusual, and is not related to the tuberculin sensitivity of the donors. It must be noted that vaccination of the patient described by Drs. Hutcheson and Macpherson was performed four days after the transfusion, whereas it is customary in the Charing Cross Hospital unit not to give B.C.G. until a sick or premature baby is almost fit to go home. Also, we used the reduced dose (0.05 ml.) of the Danish B.C.G. recommended by Gaisford,¹ and this may be a further difference between these twins and the original patient.

Our thanks are due to Dr. J. D. James, of the North London Blood Transfusion Centre, for help in tracing the donors, and to Dr. A. Doyne Bell for permission to study the babies.—We are, etc.,

J. B. BENWELL.

DAVID BURMAN.

London, W.C.2.

REFERENCE

- ¹ Gaisford, W., *British Medical Journal*, 1955, 2, 1101.

Pregnancy Sickness

SIR,—There is little doubt that Dr. Doreen S. Ball (*Journal*, December 22, 1956, p. 1487) is right in assuming the organic origin in many cases of pregnancy sickness. The hormonal causation might apply to some of them; but it occurs to me that the following considerations may not have been taken up. It has been accepted in the teaching of embryology that ontogenesis is only a shortened repetition of phylogenesis. That means that the embryo passes through the various stages of its ancestral "run," as represented by the corresponding specific anatomical and, probably, biochemical features. The sickness in question would thus be understood as allergic in type and the effectiveness of antihistamines in some of these cases explained. To prove or disprove this hypothesis must naturally be left to maternity wards equipped accordingly, unless past evidence be already available.—I am, etc.,

Cardiff.

R. BAUER.

SIR,—I am most interested in Dr. Doreen S. Ball's observations (*Journal*, December 22, 1956, p. 1487) with regard to pregnancy sickness. I have had two babies and suffered greatly with each owing to sickness. Three months after my first child was born I took stilboestrol for one day to stop lactation and had the identical sensations of nausea and vomiting as during pregnancy. The second day I decided to take one dose at bed-time, hoping that sleep would prevent me being conscious of nausea. To my amazement when I got up next morning I was very sick and still suffering from nausea identical to that of pregnancy. Dr. Ball appears to have noticed a relationship between lack of food and sickness. To prevent actual vomiting I had to eat two-hourly during the first 4–5 months of pregnancy. I studied all the available literature and sampled all the recommended drugs. They were useless.

If all obstetricians in the United Kingdom were to take stilboestrol for a couple of days, and if those who were made sick by it were willing to continue with daily doses for three months so as to experience a long-term sickness similar to that of some unfortunate woman, then they might afterwards do research into this matter with considerable determination (I should be grateful for the names of male volunteers). Those who consider neurosis as a possible cause would no longer do so. From Dr. Ball's and my own humble observations I too feel it is possible that this trouble may be due to hormonal imbalance.—I am, etc.,

Hereford.

MARGARET MACFETRIDGE.

Ocular Nerve Palsy Associated with Severe Headache

SIR.—Dr. A. P. B. Waind (*Journal*, April 21, 1956, p. 901) reviewed a syndrome of ocular nerve palsy associated with severe headache recently described in diabetic patients, adding some cases of his own. In view of the infrequency of this syndrome I would appreciate an opportunity to record a further case.

A woman, aged 71, first came under the care of the diabetic clinic of the German Hospital in December, 1954, with untreated glycosuria since 1951, complaining of numbness and pain in the left lower limb, loss of weight, and excessive thirst. She then had signs suggestive of diabetic peripheral neuropathy in her left leg. Some three months later she developed sudden diplopia due to an isolated external rectus palsy, without any other concomitant symptoms or signs, which gradually recovered over the next three months. Soon after this incident her right knee- and ankle-jerk became depressed with additional sensory impairment over the right foot, and later she developed weakness and proximal wasting of her left arm, loss of sensation, and diminished brachial and supinator reflexes. All investigations were normal except for a histamine-fast achlorhydria, C.S.F. proteins 60 mg.% with increased globulin. Electromyography suggested a neuropathy as the cause of her paresis.

About mid-October, 1956, she suddenly developed severe right-sided headache, almost continuous, for five days. As this pain abated, blurred vision in her right eye, diplopia, and ptosis developed. She then had a pure right-third-nerve palsy, a dilated

right pupil reacting very sluggishly to light, and ptosis of the upper lid, but no other additional C.N.S. signs. Repeat lumbar puncture showed 90 mg.% protein, increased globulin, but normal pressure; x-ray of her right orbit showed a normal sphenoidal fissure. Her headaches have not recurred and her diabetes has remained well controlled. After a lapse of three weeks, recovery of ptosis and pupillary reaction began, and to-day, after five weeks, most of her ptosis has recovered, her right pupil is small but still reacts only sluggishly to light, while her oculomotor palsy is still substantially unchanged.

This case appears very similar to those described by Dr. Waind. It cannot be due to any intracranial lesion, such as a tumour or aneurysm of the internal carotid artery, in view of the spatial and temporal scattering of the lesions described and the definite recovery now taking place, but must represent an unusual form of peripheral diabetic neuropathy. It is interesting to note that her diabetes was well controlled at the time of occurrence of both these ocular palsies. There is no explanation for the fact that her abducens palsy was not associated with headaches in contrast to her present attack.—I am, etc.,

London, E.8.

P. S. ELIAS.

Glycyrrhetic Acid

SIR.—The letters from Drs. Brian Russell, I. M. Patricia Smeed, and K. M. Tomlinson (*Journal*, December 22, 1956, p. 1483) are interesting and show results varying considerably from those of Dr. E. Colin Jones (*Journal*, December 1, 1956, p. 1305) and my own (*Journal*, November 24, 1956, p. 1239). All are of fairly small numbers and with apparently different brands of glycyrrhetic acid preparations. All clinicians would agree that hydrocortisone topically has an excellent but limited application in dermatology, and that now it is no longer used as indiscriminately as previously. In the same way glycyrrhetic acid has limited but apparently definite application, I agree with Dr. Colin Jones, more in the subacute and chronic dermatoses.

It would appear that the disparity in results is due very largely to selection of cases. I would point out also that glycyrrhetic acid is not a clear-cut constant chemical (Drs. E. M. Donaldson and D. A. Duthie, *Journal*, November 17, 1956, p. 1161), and the majority of my trials have been made with "biosone G.A.," a preparation which is claimed to contain the active isomers of glycyrrhetic acid. However, a few cases (reported earlier) where I tried "genodex" were more encouraging than those recorded by Dr. Smeed. Dr. Tomlinson's light-hearted comments are appreciated and taken in the spirit in which they were made.

My trials with biosone G.A. are being conducted on both out-patients and in-patients, in subacute and chronic conditions. The reactions to the drug are being recorded and mostly independently and objectively observed. I hope shortly to be able to give a comprehensive survey of the results of my trials.—I am, etc.,

Herne Bay, Kent.

QUENTIN EVANS.

Pavlov's Works

SIR.—Dr. W. Ritchie Russell's letter (*Journal*, December 22, 1956, p. 1432) embodies a very sound idea, but is rather unfortunately worded. It is to be regretted that he had found it necessary to invent a man of straw—a "psychologist." The psychologist is apparently preoccupied with the avoidance of avoiding trauma; tends to belittle traditional disciplines in a harmful way; lacks a sufficiently energetic approach to problems of national education, and so fails to provide the nucleus for a philosophy thereof; and generally manifests a negative attitude.

This sounds more like the popular stereotyped idea of the psychologist than what one would have expected from Dr. Ritchie Russell. It certainly does not sound like a colleague of the late Clark Hull, of Skinner, of Mowrer, or any of the learning theory exponents—a body of workers almost in the direct line of descent from Pavlov. It does not sound like any of the Gestalt school. It could hardly be Piaget. It does not sound like any of the educational, industrial, experi-

mental, or clinical psychologists known to me. Least of all does it sound like Hebb, whose own hypotheses have done so much to bridge the gap between the physiologist and the psychologist.

I really think that Dr. Ritchie Russell must be referring to the psychoanalysts. If so, perhaps one of that particular discipline will deal with his representation of their attitude. In the meantime, might I point out that psycho-analysis and psychology—even medical psychology—are not identical? It is a pity that such a distinguished physician as Dr. Ritchie Russell should contribute to the perpetuation of this vulgar error.—I am, etc.,

Willesden, E. Yorks.

J. AMOR ARDIS.

SIR.—For the past seven or eight years I have been under the impression that some rapprochement had been effected between the brain mechanists and the mental dynamists. Yet here is Dr. W. Ritchie Russell clapping on his brakes and incontinentally going into reverse (*Journal*, December 22, 1956, p. 1482). Had he been content with saying that he believed in brain physiology and had no faith in psychology, one could have found no quarrel with him, but he also, and unwisely, gives reasons. He talks about positive and negative attitudes as if these arbitrary arithmetical symbols could factually be applied to emotional or intellectual "attitudes." This is the sort of thing one reads about in American books on psychology of the popular sort. Secondly, it would be most enlightening to hear of methods whereby "desirable" behaviour patterns could be developed by brain physiologists, to say nothing about a "philosophy" being erected around grey matter, surely a unique spectacle. One can visualize the embalmed body of that arch brain-washer Stalin comfortably turning over on his Moscow catafalque.

Dr. Ritchie Russell would have us believe that the argument from a laboratory-conditioned mongrel to the intricacies of a civilization-conditioned human is a valid one. Here, surely, he has out-Pavloved Pavlov himself and proved himself to be more out of date than Freud or Pavlov, both of whom he so cavalierly sends to limbo. And, anyway, who says that we have to choose between physiology and psychology? Are they not both different facets of the same human unity?

Men who were fed on brain physiology all their lives and who dare not look further than the point of their dissecting scalpels should think twice before embarking upon the problem of shaping the future of the human race. Shades of Sherrington!—I am, etc.,

Kingswinford, Staffs.

W. A. O'CONNOR.

Perforation of Oesophageal Peptic Ulcer

SIR.—The report by Drs. D. D. Gellman and K. Silberstein (*Journal*, December 15, 1956, p. 1413) of a case in which there had been erosion of the pericardium by a simple peptic ulcer of the oesophagus has encouraged me to review a somewhat similar case which occurred in 1952.

A retired male farm worker, aged 75 years, died suddenly three-quarters of an hour after eating a large meal. He had vomited about half a litre of blood. Up to the time of his death he had been in good health except for occasional attacks of bronchitis. He had never complained of symptoms referable to his oesophageal ulcer. Necropsy revealed a deep elongated ulcer (3×2×2 cm. deep) in the anterior wall of the oesophagus 8 cm. above the attachment of the diaphragm. The edges of the ulcer were thickened and overhanging. Above the level of the ulcer the oesophageal mucosa was of normal appearance and was found on histological examination to be lined by normal squamous epithelium. Below the ulcer the oesophagus was dilated and lined by inflamed gastric mucosa. There was thus post-mortem evidence of the presence of a diaphragmatic hernia. The upper posterior part of the pericardial sac was obliterated by the fibrous tissue in the base of the ulcer, and the sudden fatal termination was due to direct erosion of the left auricle of the heart. The perforation measured

8×6 mm. and was situated 1½ cm. above the mitral ring. The stomach contained one litre of fresh clotted blood, but was otherwise normal. No other abnormality was revealed at necropsy. Examination of the sections from the edges of the ulcer showed simple peptic ulceration with surrounding inflamed but otherwise normal gastric mucosa.

In recording this case I wish to thank Mr. Norman Butters, H.M. coronor, for access to the statements taken on his behalf.—I am, etc.,

Ipswich.

A. B. LINTOTT.

Sudden Infant Deaths

SIR.—Dr. J. L. Emery and Miss E. M. Crowley (*Journal*, December 29, 1956, p. 1518) rightly draw attention to the importance of the clinical history in sudden infant deaths. There is no doubt that minor malaise precedes death in nearly all cases; this is well known to the average coroner's officer. I do not think their assumption that histories taken by coroners' officers are inadequate can be accepted without comment. The history taken after the coroner's inquiry is likewise open to question, in view of the time given to the parents to produce explanations and symptoms which may or may not be founded on fact.

The whole-time coroner's officer is a very experienced man who may inquire into as many as 500 deaths a year. This implies an experience of bereaved persons which one hopes is denied to paediatric workers. He usually visits the home in plain clothes for the purpose of taking the history. It is my experience that the coroner's officer shows great tact and sympathy on all occasions.

The description of the inquest is sensational and unfair to the modern coroner. It is not usual to read over a written statement to a witness, neither have I ever seen a witness's eyes wander from the coroner's face to the reporter's pencil. In such cases every effort is made to respect the feelings of a distressed young mother. It is often unnecessary to require her to give evidence, and identification can be established by the father or some other person. Most natural sudden deaths in infancy can be cleared up without inquest.

Death of a baby is a catastrophe. All concerned are anxious to find the cause by every means possible. I do not think that Dr. Emery and Miss Crowley have made their case that a subsequent history is more correct than the one taken by the coroner's officer. It is the constant care of the modern coroner to exclude fear from his investigation. There are indifferent interrogators in every organization: I do not think the coroners' services have a monopoly of these.—I am, etc.,

London, W.6.

GAVIN THURSTON.

Prevention of Tuberculosis

SIR.—Professor F. Heaf in his comprehensive survey (*Journal*, December 15, 1956, p. 1383) appears to advocate the universal use of B.C.G. vaccine in children over 12, but not in those under 12 because of three disadvantages, none of which appears to be really formidable. Are the disadvantages not greatly outweighed by the advantages observed in the countries where B.C.G. is applied in all observed in the countries where B.C.G. is applied in all tuberculin-negative reactors? Such advantages include the almost complete disappearance of progressive primary (acute miliary tuberculosis), as well as the most dangerous complication of benign primary disease (tuberculous meningitis) in B.C.G.-vaccinated children. Professor Heaf himself emphasizes the advantage of B.C.G. used in this way, when he quotes the Stockholm figures of 65.3% of non-vaccinated children developing clinical tuberculous lesions following primary infection, compared with 1.22% in the vaccinated.

Instead of B.C.G., he proposes serial tuberculin-testing of all children under 12, and the routine use of chemotherapy in the tuberculin-positive child. With regard to the first, an important principle should be adopted right away with-

out qualification—namely, that tuberculin-testing should always be combined with chest radiography in order to make a diagnosis, and that action should not be based on one of these signs alone. A good example was the demonstration of the combined method in the examination of household contacts in Glasgow by Drs. W. F. Tyrrell and J. Smith (*Journal*, December 22, 1956, p. 1451). With regard to the routine use of chemotherapy when a child is merely found to be tuberculin-positive, without reference to the possible quiescence or the activity of the disease, this would surely be a most unwise use of drugs as well as of skilled labour, very wasteful indeed, and conducive to drug resistance. Even if conversion to tuberculin-positive is known to be recent, and the benign primary complex can be diagnosed radiographically, all but the small proportion of benign primary cases that have complications are naturally healing and building up resistance in the process, and do not need chemotherapy. If a complication does occur, or if the primary complex is progressive (5% of cases), that will be shown by urgent symptoms which would clearly indicate immediate chemotherapy. Early diagnosis and treatment of this fraction should be the aim rather than an enormous and costly umbrella.

In addition, Professor Heaf makes no clear distinction between primary and secondary tuberculosis. The latter gives rise to much more disease than the former, and, apart from social measures, requires for its prevention again an early diagnosis by means of combined tuberculin-testing and radiography. The most practical means of prevention can be outlined briefly but clearly in these terms: (1) B.C.G. from infancy; (2) combined tuberculin-testing and radiography in order to make an early diagnosis, of both primary and secondary tuberculosis; (3) chemotherapy and the appropriate treatment for malignant primary, complications of benign primary, and all secondary disease; (4) maintenance of a high standard of living to strengthen resistance; (5) the chest clinics should be developed sufficiently to deal with this programme, and completed with the static mass radiography units.—I am, etc.,

London, N.W.8.

MILOSH SEKULICH.

REFERENCE

¹ Sekulich, M., *Tuberculosis Classification, Pathogenesis and Management*, 1955. Heinemann, London.

SIR.—With reference to Professor F. Heaf's article on the prevention of tuberculosis (*Journal*, December 15, 1956, p. 1383), I was very interested in his remarks concerning the giving of general practitioners reader access to chest x-ray facilities. In the area in which I practise only one local hospital has open access for chest x-rays. In the other hospitals the patient must, at least, see the casualty officer before a chest x-ray can be arranged. This adds considerably to the time which patients must spend at the hospital, and because of this they are often reluctant to attend. Could not all hospitals offer open access x-ray facilities to general practitioners?—I am, etc.,

London, E.5.

BERNARD TAYLOR.

Varicose Ulcers in Ambulant Patients

SIR.—Dr. B. FitzGerald (*Journal*, December 22, 1956, p. 1484) is to be congratulated on his efforts in the domiciliary treatment of "varicose ulcers." From personal experience of nearly seven years in general practice I know this is no easy matter and very different from the treatment of these patients in a hospital clinic run for the purpose. It is not surprising that Dr. FitzGerald's patients cannot be convinced that strict resting of the limb is necessary, for it has been demonstrated by many surgeons during the last 200 years that ambulant treatment is best.

Although chloramphenicol in propylene glycol may be beneficial for infected ulcers if used for a few days, the risk of allergic sensitization is so considerable that its use is regarded by many as unjustifiable. One cannot but wonder

how many of the patients mentioned by Dr. FitzGerald as having widespread eczema did not owe this to chloramphenicol. The most important point in the treatment of these ulcers in ambulant patients is control of the oedema. Abolish the oedema and the ulcer will heal, usually irrespective of local treatment. Ignore the oedema and healing will not take place. Although firm bandaging with crêpe may help, elastic crêpe, elastic webbing, or one of the elastic adhesive bandages is better. If the ulcer is offensive and Gram-negative organisms are present, phenoxylethanol (2%) in Lassar's paste is an effective and harmless application.—I am, etc.,

Leeds, 1

S. T. ANNING.

Supply of Bodies for Dissection

SIR,—So far in vain I have waited for a more able pen than mine to write on this subject. Your annotation (*Journal*, December 8, 1956, p. 1357) reads: "There is thus an urgent need for more people to leave their bodies." I believe it is not unwillingness on the part of the individual, but failure on the part of those responsible to furnish adequate facilities. When an individual in a household dies, there is usually sadness and a desire "to get things over" as soon and as easily as possible—"We don't want no fuss." Clearly everything should have been arranged beforehand, and in my view it is the duty of those who want the bodies to do it. I suggest that forms, particulars, and suitable notices to hang in waiting-rooms for those willing to show them, be sent to all general practitioners. This could readily be done through the agencies that send out advertisements. Is it reasonable to expect poorly paid general practitioners to bother to send up for forms? There must not be too many forms to fill up, and there must be a quick willingness to collect the bodies. Much of the above applies also to corneas. Let those who want them act.—I am, etc.,

Pettwood, Kent.

G. C. MILNER.

Increase in Scabies

SIR,—Having had a considerable experience in the diagnosis of scabies in this country during the last war, I was puzzled by the last paragraph of Dr. Margaret S. M. McGregor's letter (*Journal*, December 15, p. 1427): "I regret that I have not isolated an acarus, as I have lacked facilities for making a determined attempt to do so." Surely, if an acarus is responsible for the lesions she describes, all that is needed to detect it is a watchmaker's lens; and to extract it, a sterile needle.—I am, etc.,

Haywards Heath.

H. LYNDBURST DUKE.

Mercury Absorption and Psoriasis

SIR,—My colleagues have asked me to write and express our gratitude to Dr. R. W. Smithells (*Journal*, December 15, 1956, p. 1428) for his information regarding the origin of the term calomel disease and for his lucid comments on our original article (*Journal*, November 24, 1956, p. 1202). If we have minimized the risks of mercury poisoning from cutaneous absorption, we feel we have done so with some justification. Despite the common usage of mercurials for the even more common condition of psoriasis, nephrosis nevertheless remains a very rare disease. We do feel, however, that the danger is somewhat greater at the present time with the increased usage of the new types of occlusive dressings—i.e., tubular stockinet and tube-gauze in the treatment of psoriasis.

That syphilitic nephrosis was most probably due to the treatment rather than the disease is a conclusion which we also reached, but felt it was inappropriate to enter such a supposition into a paper in which we had brought no evidence to substantiate such a statement, and, in fact, we felt it irrelevant to the points under investigation. As Dr. Smithells states, there is obviously no toxic level of urine

mercury. High urine mercury levels simply indicate good absorption and the ability of the kidney to excrete the mercury. We believe, however, that after a time some kidneys may become "allergic" to mercury and so give rise to the nephrotic syndrome. In such event the ability to excrete mercury is greatly reduced, and this would explain why in some fatal cases of pink disease the urine mercury was found to be relatively low.—I am, etc.,

Sunderland.

B. GORDON.

No Rest for the Feverish

SIR,—Your leading article "No Rest for the Feverish" (*Journal*, December 29, 1956, p. 1531) is certainly very welcome to all those doctors who have been wondering on this part of the management of their patients. No doubt fashion and custom have played a great part in determining the length and quality of bed-rest for the sick and the feverish in general, but in this case, as in many similar matters of habit, the question arises of why this habit has been established or this custom become fashionable.

One aspect which is very often forgotten is that habits and customs depend on the state of consciousness of the individual making up the society in which he lives, just as much as it is the other way round. In especial with regard to bed-rest it is very frequently forgotten, and it appears also to have been forgotten by you, Sir, that bed-rest has a psychological effect and a psychological symbolic significance. It is the expression of withdrawal from the world and regression in general. Some people react to stress by inactivity and others by withdrawal, and when a doctor has to advise as to the management of a patient he ought to know his patient well enough also from the psychological angle to be able to advise on the just course to take with regard to rest in bed. It is also important that a patient's state and reserves in situations of stress both somatically and psychologically are accurately assessed. It may be perfectly all right to keep out of bed a person whose alarm reaction and reaction of defence are powerful enough to overcome these stressful situations, but it has to be recognized at an early moment when it is necessary to anticipate a state of exhaustion, again both somatically and psychologically, and in its prevention bed-rest is invaluable and irreplaceable.—I am, etc.,

Derby.

D. J. SALFIELD.

SIR,—Oh, Abilene! I hope your leading article (*Journal*, December 29, 1956, p. 1531) will not start another new fashion. Even if your writer sleeps well in his day clothes, and feels just as refreshed by a night on the hearth-rug as by one in bed, I pray the enthusiast, young or old, to remember the many who rest better in the more usual way. We do need rest when we are ill. Feeling the need for it is the common factor of "feeling unwell." The amount varies with the cause and the patient; the best way to obtain it changes with age and circumstances; but all need it. As all experienced G.P.s know, recovery occurs not on the day of discharge from hospital nor even of return to work, but on the day when the patient feels really well again. And ambulatory treatment does not always expedite it. So, please, not a new fashion.—I am, etc.,

Cromer.

A. HENRY GREGSON.

Alternative Approach to Prostate

SIR,—My attention has been drawn to Mr. G. T. Watts's article (*Journal*, December 1, 1956, p. 1283) on prostatotomy, in which he refers to "the Wells operation" before proceeding to describe his own vesico-capsular approach. If Mr. Watts will agree that his operation is not fundamentally different from that of Mr. Ogier Ward, I will concede that mine bears a not altogether fortuitous resemblance to that of the late Mr. Wilson Hey.—I am, etc.,

Liverpool, 7.

CHARLES WELLS.

Obituary

W. G. CLARK, C.B.E., M.B., F.R.C.P.Ed., D.P.H.

Dr. W. G. Clark, formerly medical officer of health of Edinburgh, died suddenly at his home in that city on January 4. He was 68 years of age.

A native of Glasgow, William George Clark was educated at Hill Head High School and Glasgow University, graduating M.B., Ch.B. in 1918. Not long after he had completed a number of house jobs at the Glasgow Royal Infirmary, he joined the Royal Navy to serve as a surgeon lieutenant in the first world war. Returning to civilian life, he decided to adopt a career in public health and took the D.P.H. at Cambridge in 1920. Before joining the public health department of the Corporation of Glasgow as an assistant medical officer of health he had held posts at the Brook Hospital, London, and at the Woolwich tuberculosis dispensary. In Glasgow he rose to the position of deputy medical officer of health before moving to Edinburgh in 1935 as deputy to Dr. John Guy. Three years later he became medical officer of health for Edinburgh, retiring in 1953. He was elected a member of the Royal College of Physicians of Edinburgh in 1938 and a Fellow in 1942.

Clark was a man whom everyone liked and who expressed sound and determined opinions on public health policy. An expert on housing, he did much to make more generally known the evils of overcrowding and unhealthy living. He was, in fact, a well-known advocate of health education by lectures, film shows, and demonstrations of all kinds. During the war he was tireless in organizing the civil defence services in Edinburgh. An outbreak of smallpox in the city in 1942 added greatly to his responsibilities, and about a quarter of a million people were vaccinated.

At the university Clark was a lecturer in public health. In 1941 he became Honorary Physician to King George VI, and he was appointed C.B.E. in 1953, the year after he had served as president of the Society of Medical Officers of Health, of the Scottish branch of which he had been secretary for some years. He was a member of the Scottish Health Services Council and had served on the Staff Side of Committee C of the Medical Whitley Council since 1951. In 1954 he presided at one of the plenary sessions at the Annual Meeting in Glasgow of the B.M.A. In 1921 Dr. Clark married Gladys Catherine Harrison, and she survives him with one son.

Sir ALEXANDER MACGREGOR writes: I shall be glad if you will allow me to contribute a personal appreciation of the late Dr. George Clark, as our professional lives were closely intermingled since the close of the first world war. He came to the public health department in Glasgow when the post-war developments in preventive medicine were taking place, and passed quickly from a junior to a senior deputy medical officer until his transfer in 1935 to Edinburgh as deputy and successor to Dr. John Guy—a notable career in public health, justified by his great abilities.

Dr. Clark left his imprint on Glasgow's health services. He made a name for himself in the housing and slum-clearance activities which began in earnest after the war and in which he became an expert and exponent. He organized and conducted a complete and effective venereal-disease scheme for the city. He later played a prominent part in the big developments which followed the Local Government (Scotland) Act of 1929, when the general and mental hos-

pitals of the former parish councils, as also the education health services, passed to the control of the health department. The subsequent growth of these services owed much to his skill as an organizer and to his capacity to guide and, if necessary, to compromise. Dr. Clark's easy mastery of the problems at issue and his faculty for expounding them made him a popular and respected figure among the members of the housing and health committees of the Glasgow Corporation. He had a way of making difficulties vanish, and could be depended upon to solve them by common sense, resourcefulness, and the influence of an attractive personality. His warmth of nature and his interest in people led him quite early to take a deep interest in health education; he became well known as a popular lecturer on health subjects. His activities in this direction will long be remembered, especially in Edinburgh. He made friends easily, who will be deeply affected by his sudden death in the early period of his retirement. For myself, I mourn the tragic severance of a warm friendship of close on forty years.

Dr. R. J. PETERS writes: George Clark had by training and experience as well as by ability and instinct all the equipment required for a successful health officer and administrator. In Glasgow his interests were wide and varied, as they had to be in a unit of that size, but he concerned himself especially with housing—a problem which in that city gave full scope for his talents. He became an acknowledged authority on all the complications and ramifications of that difficult subject and served on Government advisory committees.

Shortly after taking over the post of medical officer of health for Edinburgh he had before him all the problems of civil defence and the running of his department, including the hospitals, under wartime conditions. He had by then inspired major changes in the corporation's hospitals, and worked continuously towards their upgrading, co-operating happily in this with the university medical school and the consultants. He was—as indeed were many of his colleagues in public health—not favourably disposed to relinquishing the important hospital work he was doing when the National Health Service came into being, for he had many doubts about the proposed new regime and did not hesitate to express them. Nevertheless, in the end he sought how to make the new service a success, for always his main interest was the individual concerned most of all—namely, the patient. A guiding thought, always uppermost in his mind, was: What is best for the people?

After the inception of the National Health Service he turned his attention to the new functions and the further development of the old ones that were left with health departments. Health education of the public claimed a great deal of his attention, and Edinburgh displayed much activity in this field. He also geared his department to pursue special investigations and research into medico-social and public-health subjects. He served on the Scottish Health Services Council and some of its standing advisory committees, taking part in the production of many of the reports issued by these bodies. Throughout his career he had the interests of nurses at heart, and as a member of long standing of the Scottish General Nursing Council his sympathetic understanding of nursing problems was warmly appreciated especially by his nursing fellow members.

Clark was a big man physically; in his youth and middle age his favourite pastime was golf, at which he was no mean performer—a scratch man and a Glasgow University "blue." He was one of a band of enthusiasts who carved out two superb 18-hole courses in unpromising moorland and hill country north of Glasgow, and he was the first captain of that club. He had a delightful genial personality, friendly and forthright. With councillors, his medical colleagues, and other staff alike he was exceptionally popular, and had many marked characteristics of speech and manner that his associates will long remember with affection. He leaves a widow and one son, who is in the Oversea Civil Service in Nigeria. To them our sincere sympathy is extended.

W. G. BARNARD, C.B.E., F.R.C.P.

The obituary of Professor W. G. Barnard was published in last week's *Journal* (p. 50). We are indebted to Dr. R. W. JOHN for the following appreciation:

Barnard's arrival at St. Thomas's in 1939 to take up his appointment to the chair of pathology coincided with the outbreak of war. Thus it was that he was confronted immediately with the tasks of arranging for the teaching of his subject to students who were widely dispersed and to the setting up of a laboratory to deal with the histological work of Sector 8 of the Emergency Pathological Service which he undertook to do in his department. His successful accomplishment of these tasks amidst the confused conditions of those days soon revealed to his colleagues his gift for organization. In 1940, when most of the work of the hospital was transferred to Hydestile, in Surrey, and shortly afterwards it was decided to set up the medical school in the vicinity, Barnard played a major part in finding the necessary accommodation in near-by Godalming. His department, housed at first in company with the physiologists in the somewhat cramped quarters afforded by the stables of the Manor House at Godalming, clearly required more space, and when a neighbouring house called Bernina became for sale he saw in it what was needed. Bernina was bought by the school, and quickly and cleverly he designed into it laboratories for teaching and technical work and private rooms for himself and his staff. Under his vigorous direction the necessary alterations were completed in a very short time, and in all this business his ability to see clearly and swiftly the proper course became evident to all who worked with him.

Meanwhile his beautiful dissections in the post-mortem room and his stimulating teaching delighted students and clinical staff alike. The keenness of his eye and his almost uncanny visual memory made him an outstanding morbid anatomist and one, moreover, whose great store of knowledge was accumulated largely from his own experience. He was never content, however, with a merely static anatomical account of a pathological condition, but always sought to understand how the morphological changes he observed had been brought about. This attitude led him to look for the basic processes underlying pathological changes and to appreciate the great importance of a knowledge of such processes. To pursue this knowledge and encourage others to do likewise were the aims of his work and teaching.

As time went by his organizing ability and grasp of affairs were used more and more in the management of the school, so that when in 1947 Professor B. A. McSwiney died Barnard was his obvious successor as dean. Doubtless others will write of the great work he did as dean not only for the medical school but also for the hospital during the years following the war. Last October he became dean of the faculty of medicine of the University of London, and would surely have contributed much in this wider field had he been spared.

Barnard had many interests outside his work. With his technical excellence as a dissector went an appreciation of all things nicely made, and such things he gathered about him. He loved and collected furniture and books, and shared with his son a great pleasure in their collection of vintage motor-cars. He was very interested in gardening, and it is sad that he was denied the pleasures of carrying out the plans he had made with his wife for work during the years of his retirement in the extensive garden of the period house he had recently bought at Chiddingfold, in Surrey.

The intimacy of the life at the hospital and in the medical school during the war years enabled many to break through the reserve which his natural shyness produced and thus to come to know him for the very friendly and kindly man he was. His kindness and generosity were unbounded, as those who were examined by him and others who went to him with more serious troubles will remember with gratitude. He never lost patience with those whose ideas and

feelings differed from his own. Though his cheerful and optimistic nature made it impossible for him to comprehend the difficulties of those of a less happy turn of mind, he accepted the fact of such difficulties and did everything in his power to help. Only those concerned know the extent of his kindness and sympathy, for much of the good he did was covertly done. Except with those he knew well he was reserved and sometimes a little brusque, so that some felt his manner to be rather remote. This reserve was not only the result of his shyness but also was partly a cover for his irrepressible sense of fun, which was sometimes apt to bubble up even when serious matters were on hand. When this happened among people who did not know him sufficiently well their surprise was only matched by his own consternation. He was a lovable man and so vital a person that it is scarcely possible to realize that the "Prof" has gone from amongst us for ever. Our deepest sympathy is with his widow and son.

The Royal College of Physicians has arranged a memorial service to Professor Barnard on the afternoon of the Comitia on Thursday, January 31. The service will be at St. Martin-in-the-Fields at 3 p.m.

G. T. HEBERT, M.D., F.R.C.P.

Dr. G. T. Hebert, formerly physician in charge of the tuberculosis department at St. Thomas's Hospital, died at the hospital on January 4. He was 68 years of age.

Godfrey Taunton Hebert was born on January 27, 1888, the son of the Rev. S. Hebert, vicar of Seal, near Sevenoaks. From Harrow he went on to Christ Church, Oxford, where he obtained first-class honours in natural science (physiology). Continuing his medical education at St. Thomas's Hospital, he graduated B.M., B.Ch. in 1913. After holding the posts of casualty officer and house-physician at St. Thomas's, he decided to specialize in tuberculosis, becoming resident medical officer at Victoria Park Hospital. Thereafter he worked for a time as a tuberculosis officer in Hackney and Bethnal Green. Proceeding to the D.M. in 1918, he took the M.R.C.P. in 1921.

Appointed physician in charge of the tuberculosis department at St. Thomas's in 1920, Hebert made it his life work to serve the patients who attended this busy clinic from a large area of south London. Though reserved in manner, he was exceedingly conscientious and kind, and even the illest patients in his wards took courage from his calm efficiency and helpfulness. If a student wanted to learn how to examine a chest or to induce a pneumothorax Hebert was the man to go to, but he had no great interest in teaching those who were not keen to learn. He wrote a short book entitled *Pulmonary Tuberculosis* in 1927, and contributed a number of articles on tuberculosis to this and other journals. One of his last papers, on rational pneumothorax treatment, was published in the *Journal* in 1936. Elected F.R.C.P. in 1932, he was president of the Tuberculosis Association in 1940. He retired from St. Thomas's in 1948.

Dr. Hebert married Constance Tatton, and she survives him with two daughters.

T. A. B. HARRIS, M.D., F.F.A. R.C.S.

By the sudden death of Dr. T. A. B. Harris at the age of 59 Guy's Hospital has suffered the sad loss of its senior anaesthetist and director of the department of anaesthetics.

The son of a medical man who was a well-known political figure in Australia, Thomas Alexander Britten Harris graduated M.B., B.S. at Melbourne University in 1922. For several years he helped his father in

general practice in a small community: this invaluable experience helped him to become a good doctor. He started his career in Britain as an anaesthetist at the West London Hospital, and in 1935 became an anaesthetist at Guy's. He took the D.A. in 1936 and was elected F.F.A. R.C.S. in 1948. He proceeded to the M.D. of Melbourne in 1953. During the second world war Harris served for the most part in India, becoming adviser in anaesthetics to Eastern Command and attaining the rank of lieutenant-colonel. At the time of his death he was also anaesthetist at St. Peter's and St. Paul's Hospitals.

W. S. McC. writes: On a momentous day in February, 1935, Harris and the writer were among those who faced a selection committee for two appointments to the staff of Guy's Hospital. The comparatively unknown Australian was appointed in open competition with other Guy's men. It was a fortunate day for the hospital, for it secured the lifetime devotion of a loyal and dynamic worker. He so identified himself with the hospital that he resented even mild criticism of Guy's and its traditions by an outsider. His enthusiasm and search for knowledge soon made him well known to practically every member of the staff and school: when not teaching anaesthetics, he himself was picking the brains of the departments of physiology, pharmacology, or biochemistry.

Tommy, as he was known to all, felt it his calling to teach anaesthetics to students in such a way that not only should they understand the mode of action of the drugs they used but become good, practical doctors able to give a simple anaesthetic with confidence and safety. As an anaesthetist he was superb. Although not an imposing figure—he was short and had not completely conquered a slight stutter—he conveyed to me and to his other patients a remarkable degree of confidence and assurance. For the surgeons he provided operating conditions and an atmosphere of tranquillity which set a standard for his colleagues. Surgeons at Guy's and St. Peter's demanded his services for their private patients. It was while he was happily making final arrangements to meet a request for an anaesthetic in Bombay that he was taken from us.

At the time of his death he was also occupied with academic work. A second edition of his fundamental textbook, *Mode of Action of Anaesthetics*, original work on barbiturate antagonists, and an extensive survey on the relationship between the use of muscle relaxants and anaesthetic mortality absorbed all his spare time. He worked too hard for too much of the time. After a coronary thrombosis had compelled him to rest for two months, all the senior members of the staff pleaded with him to plan his life to a less strenuous programme, but to no avail. He literally worked himself to death for the sake of his patients, hospital, and medical school. In the years to come Tommy will be remembered as an individual who had a remarkable capacity for making friends. He was proud of his friends and valued their affection, but he had the courage to offer criticism and advice if he thought it would help them. Although he was forthright in his comments, his loyalty was constant.

He leaves a widow and four sons, to whom we offer all our sympathy. At a memorial service in Guy's Chapel on January 4 the congregation included not only his friends at Guy's but representatives from many London hospitals, the Association of Anaesthetists, and the Faculty of Anaesthetists of the Royal College of Surgeons.

H. K. A. writes: May I add a note on Dr. T. A. B. Harris's wartime service in the R.A.M.C., which lasted from the outbreak until he came home from India with the rank of lieutenant-colonel in September, 1945? Tommy served at Tidworth until 1942, when he went out to India and arrived in Calcutta with No. 57 British General Hospital. At that time in India the standards of anaesthetic arrangements as regards trained personnel, equipment, and technique were, to put it mildly, somewhat below those obtain-

ing at home. It was soon obvious that intensive training courses would be the only answer to the shortage of personnel, and such courses were quickly established in each of the four Commands in India, with men on the pre-war staff of teaching hospitals in England to run them. Tommy ran the Eastern Army course in Calcutta with the characteristics with which he was so richly endowed—namely, energy, conscientiousness, and scrupulous fairness to the candidates. Whenever Tommy decided that a candidate would not make the grade—and it was on his recommendation alone that an officer was or was not posted for anaesthetic duties after attending his course—he nearly always wrote me a personal letter wondering whether or not he was right. But after a month of intensive tuition from Tommy there were few who did not make the grade and fewer still who subsequently did not prove in practice the soundness of his teaching.

In the monthly intervals between courses Tommy constantly toured the forward areas on the Assam and Arakan fronts, staying with the mobile surgical units and casualty-clearing stations, watching them at work, and, after his return to Calcutta, sending clear, concise, and practical reports on what could and should be done to improve the anaesthetic service and equipment of these units.

In 1944 his sterling work was recognized by his appointment as adviser in anaesthetics to Eastern Command, and he was promoted to lieutenant-colonel.

Tommy's energy was boundless. He wrote such an excellent statement of the case for a monetary grant for technical help in his research on the mode of action of anaesthetic drugs that he miraculously extracted it from G.H.Q., India, in spite of that august body's preoccupation with the war. Much of his book was planned and written in his small, comfortable, and always hospitable flat in Calcutta, where Tommy was never happier than when entertaining his friends and colleagues. It is perhaps this aspect of Tommy Harris that those of us who were privileged to be his closest friends in India will treasure most of our many happy memories of him. In spite of his serious demeanour and his quiet and deliberate speech in the pleasant Australian accent which he never lost, Tommy was always gay and full of fun and often literally "the life and soul of the party." It is with gratitude for the happiness which he exuded that we now mourn the loss of our friend who served his country and his fellow men so enthusiastically and so faithfully, both in war and peace.

HUBERT WYERS, M.A., M.D., D.I.H.

Dr. Hubert Wyers, editor of the *Transactions of the Association of Industrial Medical Officers*, died on December 11, 1956, at the age of 56.

A native of Birmingham, where he was born on January 21, 1900, Hubert Wyers received his early education there at King Edward's School. Later, his family moved to Glasgow, where for a time he worked in a foundry before entering the university. His bent towards the classical, and his great interest in mediaeval literature, evidenced afterwards in his editorials, probably led to his first entering the faculty of arts. He took the M.A. in 1927, and two years later graduated M.B., Ch.B. Then, after some house posts, he became a successful general practitioner at Rainham, in Essex, before taking up industrial medicine. Among the posts he held were those of medical officer to the Cape Asbestos Company, to May and Baker Ltd., and to Murex Ltd. At the Cape Asbestos Company he made a very complete study of the effects of asbestos dust, and made this the subject of his thesis for the M.D., which he obtained, with commendation, in 1947. As a result of this work he became an acknowledged authority on asbestosis. In 1948 Wyers took the

Diploma in Industrial Health of the English Royal Colleges, and became in his turn an examiner for the diploma. He made some valuable contributions on the subject of industrial toxicology and was a familiar figure at conferences on industrial health. He was chairman of the London group of the Association of Industrial Medical Officers, and from 1952 was the honorary editor of the *Transactions*. Apart from these industrial interests, he acted as a clinical assistant in the skin department of the Oldchurch Hospital. He was chairman of the South Essex Division of the B.M.A. in 1955-6 and was a valuable member of a number of committees concerned with occupational health. He was a man of gentle and understanding manner, always helpful, and a good friend. He will be greatly missed by all who knew him, and particularly by the members of the Association of Industrial Medical Officers.—C. L. S.

G. F. K. writes: Hubert Wyers was a very remarkable person and was outstanding among his contemporaries in many respects. He was a classical scholar of the first order, and in addition to an intimate knowledge of Latin and Greek he was also well versed in metaphysics and ethics. His erudition was immense, and he was well acquainted with the writings on philosophy of almost every authority, ancient or modern, and he could always be relied upon for an apt quotation. It was not surprising, therefore, that he wrote admirable prose. His wide learning in classics, coupled with a deep knowledge of general medicine, made him the ideal editor of a medical journal, and during the last six years he was responsible for the production of the *Transactions of the Association of Industrial Medical Officers* in their present form. The success which this journal achieved and the respect in which it is now held are a lasting tribute to his memory. Wyers loved literature, and on more than one occasion he said that he held his post as editor of the *Transactions* in higher esteem than any other honour which the Association of Industrial Medical Officers could confer on him. He was a founder member of the small Thackrah Club, which meets twice a year to study an occupation and the philosophy of occupational medicine, and his fellow members who had the privilege of knowing him well will not soon forget his wit as well as his wisdom, and above all they will mourn the loss of a true friend. Hubert Wyers had had more than his share of anxiety and troubles one way or another, but he never gave more than a hint of his difficulties; there is no doubt that he was greatly sustained by his deep religious feeling, which led him through Anglo-Catholicism to be received quite recently into the Roman Catholic Church.

Dr. A. C. S. WATERS died suddenly at his home at Goring-by-Sea, Sussex, where he had been living in retirement since 1944, on December 11, 1956, five days before his 81st birthday. Alfred Charles Stanley Waters, who was born on December 16, 1875, was a well-known and well-liked figure in the town of March, Cambridgeshire, where he succeeded to the medical practice of his father, Dr. A. J. G. Waters, soon after the turn of the century and where he remained in practice himself for over forty years. He received his early education at March Grammar School and from there entered Cambridge University. After receiving his clinical training at St. Bartholomew's Hospital he qualified M.R.C.S., L.R.C.P. in 1901. Dr. Waters was held in high esteem by his medical colleagues, having been, at the time of his retirement, honorary secretary of the Isle of Ely Division of the British Medical Association for thirty-two years and of the Isle of Ely Panel Committee for a similar period; he was also president of the Cambridge and Huntingdon Branch of the B.M.A. in 1931-2, and long periods of office in other organizations, notably in the field of music, testified to his great popularity. He was himself an accomplished vocalist,

and his bass solos delighted audiences both local and some not so local over a period of many years. In his younger day he was a keen athlete, and won many prizes for skating and cycle racing. Dr. Waters was always impeccably dressed, and his almost old-world courtesy and charm of manner endeared him to all who knew him. The world of medicine is the poorer for his passing. He married rather late in life, in 1934, but was nevertheless able to enjoy nearly twenty-two years of happy married life before his wife predeceased him last March. There was no family.—C. T.

We much regret that there were some inaccuracies in the obituary notice (*Journal*, November 17, 1956, p. 1181) of the late Dr. C. E. BEVAN, who was murdered by terrorists in Cyprus on November 8. Dr. Bevan came from a Church of England family, and went to Ethiopia with the British Red Cross and not with the Friends' Ambulance Unit. He had not suffered from tuberculosis, as stated. At the time of his death he was medical officer to the Cyprus Asbestos Company, having resigned from the post of consulting thoracic surgeon to the Cyprus Government. These inaccuracies arose because of our having to rely upon accounts published in the national press.

Medico-Legal

SURGEON THREATENED WITH GUN

A 30-year-old Clapham labourer, alleged to have threatened with a loaded revolver a plastic surgeon who had operated on his nose, was sentenced to 10 years' imprisonment at East Sussex Quarter Sessions on January 4. The man, Alfred Allan Smith, of London, S.W., pleaded guilty to stealing a revolver and ammunition at Westminster in August or September, 1956. He pleaded not guilty to having the revolver and ammunition with intent to endanger life on October 1; to assaulting the surgeon, Mr. F. T. Moore, of East Grinstead, with intent to murder him or cause grievous bodily harm; and to carrying a revolver at the time of the alleged assault.

The prosecution alleged that because he was dissatisfied Smith paid a midnight visit to the surgeon. Mr. Moore said in evidence that on September 30 the doorbell rang. "When I opened the door the defendant was standing there with a revolver in his hand. His finger was on the trigger and he said, 'I told you I would be back.' He was pretty agitated and I thought the gun might go off. I asked him in to have a drink because I thought I would get one of his hands with something in it. He came in and I poured him a drink and poured myself one too. I asked him to have a cigarette, but he offered me one of his. He said he would give me time to smoke a last cigarette before he shot me. He said all the bullets were for me and it would probably take 20 seconds to kill me. He had several drinks, which he swallowed neat in one gulp. I was sitting while he walked up and down. All this went on for some time—30 or 40 minutes. I told him I would feel a lot happier if he would unload the gun. He bent over me and broke the gun, and I grabbed it from him."

Smith had been dissatisfied with the results of another surgeon's operation on his nose and had gone to Mr. Moore. He said that Mr. Moore operated, and that afterwards the scars went, but that was the only improvement. Mr. Moore had not promised that he could effect any improvement. He was later examined by three different surgeons and Mr. Moore told him they shared his opinion that it would be unwise to do anything more. He said he called on Mr. Moore to make him realize that he had nothing to lose by performing another nose operation. The gun was in his pocket and he pulled it out and said, "If you can't help me I shall use this on myself." Smith denied he had stuck the gun in Mr. Moore's stomach or that he had pointed it at him with his finger on the trigger.

The jury found Smith guilty on all counts.

Vital Statistics

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in November was 120, compared with 98 in the previous month and 115 in November, 1955.

The numbers of cases of industrial diseases in the United Kingdom reported during November, 1956, were as follows: Lead poisoning 4, aniline poisoning 1, compressed air illness 1, epitheliomatous ulceration 18, chrome ulceration 7; total 31. There was one death from epitheliomatous ulceration due to mineral oil.—*Ministry of Labour Gazette*, December, 1956.

London's Health in 1956

The estimated number of births in London in 1956 was 52,000, giving a birth rate of 15.8 per 1,000 population, the highest since 1950. Deaths numbered 38,700, giving a death rate of 11.7 per 1,000 population. This was 0.2 above the 1955 rate and 1.0 above the 1954 rate. The infant mortality rate was 23 per 1,000 live births, the same as in 1955. 22 deaths were attributed to maternal mortality.

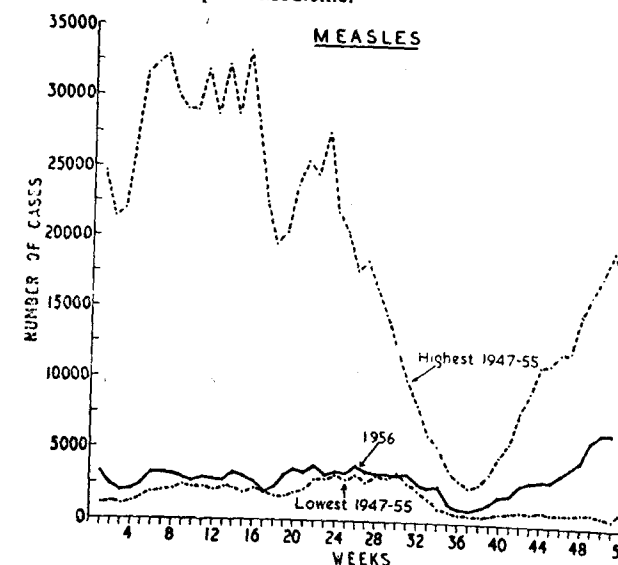
Notifications of new cases of tuberculosis again fell—from 4,122 in 1955 to just under 4,000. The death rate also declined—from 0.17 per 1,000 population in 1955 to 0.14 in 1956. The incidence of most of the other infectious diseases was light to average. 4 deaths from whooping-cough were recorded, 3 from scarlet fever, 2 from diphtheria, 1 from enteric fever, and 26 from infantile diarrhoea in children aged under 2.

Week Ending December 29

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 524, whooping-cough, 1,265, diphtheria 3, measles 6,878, acute pneumonia 400, acute poliomyelitis 49, dysentery 348, paratyphoid 2, and typhoid fever 2.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1947-55 are shown thus ———, the figures for 1956 thus ———. Except for the curves showing notifications in 1956, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending December 22 (No. 51) and corresponding week 1955.

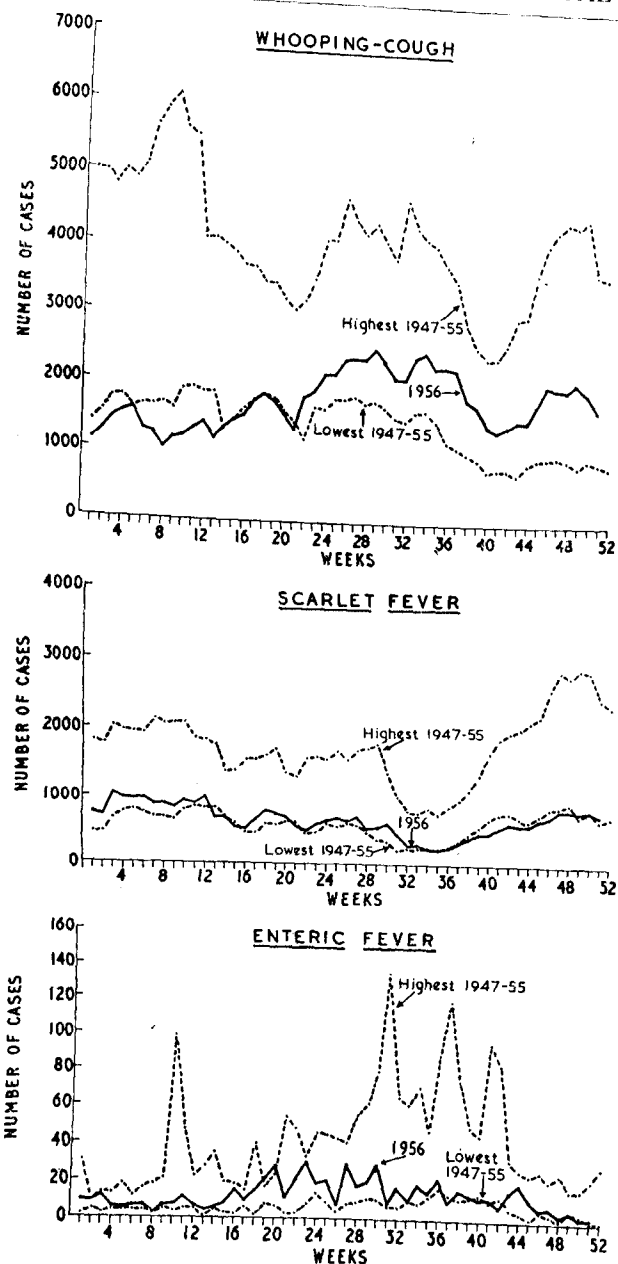
Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1956					1955				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	10	2	3	0	2	13	2	4	0	3
Dysentery ..	696	51	199	4	2	857	56	97	5	—
Encephalitis, acute	4	1	—	0	—	1	0	—	0	—
Enteric fever: Typhoid ..	1	0	0	0	—	6	0	1	0	1
Paratyphoid ..	2	0	0	0	—	2	1	3(B)	0	—
Food-poisoning ..	177	25	36	0	—	120	6	—	1	—
Infective enteritis or diarrhoea under 2 years ..	—	—	—	11	25	—	—	—	12	5
Measles *	6,575	397	455	180	58	2,480	15	61	6	34
Meningococcal in- fection ..	25	1	8	0	1	17	1	8	3	1
Ophthalmia neonat- orum ..	18	3	3	0	—	23	1	5	0	—
Pneumonia †	465	34	285	7	—	534	69	260	6	2
Poliomyelitis, acute: Paralytic ..	42	5	—	4	1	44	4	—	5	2
Non-paralytic ..	18	2	—	—	—	20	4	—	—	—
Puerperal fever ‡	198	31	3	0	—	176	26	7	0	1
Scarlet fever ..	735	53	82	17	13	951	42	107	26	21
Tuberculosis: Respiratory ..	505	73	118	17	—	454	59	122	22	—
Non-respiratory ..	70	6	14	7	—	70	8	12	5	—
Whooping-cough ..	1,732	87	366	11	20	940	38	79	43	79

DEATHS in Great Towns	1956					1955				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	0	0	0	0	—	1	0	0	0	—
Dysentery ..	0	0	—	0	—	0	0	—	0	—
Encephalitis, acute	—	—	—	—	—	—	—	—	—	—
Enteric fever ..	0	0	0	0	—	1	0	0	0	—
Infective enteritis or diarrhoea under 2 years ..	2	0	1	0	—	6	0	0	2	—
Influenza ..	14	3	2	1	—	14	5	2	0	—
Measles ..	—	0	0	1	—	—	0	0	0	—
Meningococcal in- fection ..	—	0	0	—	—	—	0	1	—	—
Pneumonia ..	285	37	26	14	—	328	68	23	7	—
Poliomyelitis, acute	1	0	—	—	—	3	0	—	—	—
Scarlet fever ..	—	0	0	0	—	—	0	0	0	—
Tuberculosis: Respiratory ..	59	6	11	3	—	58	6	13	2	—
Non-respiratory ..	—	2	3	0	—	—	0	0	0	—
Whooping-cough ..	2	0	0	0	—	0	0	0	0	—
Deaths 0-1 year ..	201	19	28	7	—	201	23	22	9	—
Deaths (excluding stillbirths) ..	5,526	755	629	106	—	6,259	942	696	96	—
LIVE BIRTHS ..	6,607	1,059	900	229	—	6,113	897	863	156	—
STILLBIRTHS ..	184	22	15	—	—	205	25	19	—	—

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
‡ Includes puerperal pyrexia.



Infectious Diseases

The largest fluctuations in the notifications of infectious diseases in England and Wales during the week ending December 22, 1956, were decreases of 247 for whooping-cough, from 1,979 to 1,732, 142 for food-poisoning, from 319 to 177, 112 for dysentery, from 808 to 696, 85 for acute pneumonia, from 550 to 465, and 31 for scarlet fever, from 766 to 735; the only large rise was 82 for measles, from 6,493 to 6,575.

The largest rises in the incidence of measles were 146 in Yorkshire East Riding, from 202 to 348, 75 in Yorkshire West Riding, from 428 to 503, and 55 in Sussex, from 82 to 137; the largest falls were 86 in Staffordshire, from 309 to 223, 75 in Westmorland, from 178 to 103, 67 in Yorkshire North Riding, from 209 to 142. The largest fluctuations in the trends of whooping-cough were a fall of 50 in Lancashire, from 245 to 195, and a rise of 32 in Essex, from 127 to 159. The largest variation in the returns of scarlet fever was a decrease of 25 in Yorkshire West Riding, from 72 to 47. 10 cases of diphtheria were notified; these were 4 more than in the preceding week; 2 cases were notified in Liverpool C.B. and Manchester C.B.

60 cases of acute poliomyelitis were notified, and these were 7 fewer for paralytic and 6 fewer for non-paralytic

cases than in the preceding week. The largest returns were London 7, Lancashire 7 (Liverpool C.B. 2), Surrey 4 (Woking U.D. 2), Sussex 4, and Glamorganshire 4 (Cardiff C.B. 2).

The largest centres of dysentery were Yorkshire West Riding 110 (Bradford C.B. 18, Sheffield C.B. 14, Leeds C.B. 13, Thorne R.D. 13), Warwickshire 106 (Coventry C.B. 84, Birmingham C.B. 11, Meriden R.D. 10), Lancashire 79 (Salford C.B. 15, Liverpool C.B. 13, Lancaster M.B. 10), Essex 62 (Thurrock U.D. 30, Chigwell U.D. 14), London 51 (Hackney 9), Bedfordshire 38 (Luton M.B. 38), Surrey 36 (Esher U.D. 11), Kent 34 (Orpington U.D. 17), Durham 30 (South Shields C.B. 14), and Yorkshire East Riding 26 (Haltemprice U.D. 9, Kingston-upon-Hull C.B. 9).

Medical News

Travelling Fellowships.—The Medical Research Council invites applications for the following travelling fellowships for the academic year 1957-8: Rockefeller travelling fellowships in medicine; Dorothy Temple Cross research fellowships in tuberculosis; and Alexander Pigott Wernher memorial travelling fellowships in ophthalmology and otology. Full particulars and application forms may be obtained from the Secretary of the Medical Research Council, 38, Old Queen Street, London, S.W.1. The closing date for applications for Rockefeller and Dorothy Temple Cross fellowships is March 15, and for the Alexander Pigott Wernher memorial fellowships March 31. All these fellowships provide for a maintenance allowance, and also for an allowance for travelling and other approved expenses. The usual maintenance allowance for a single fellow is £650 or \$2,700 a year, depending on whether the fellowship is held in a sterling area or the United States; for a married fellow £900 or \$3,900 a year. In general, these fellowships are intended to broaden the experience of those aiming at higher teaching or research appointments.

Pathological Specimens by Post.—Twice in the last 15 months—the last time this Christmas—tubes containing cultures of *Salmonella typhi* have broken in the post as a result of inadequate packing. The consequent contamination of Post Office workers and of other mail, not to mention the wastage of the specimens themselves, caused considerable nuisance as well as some danger to health. Other recent breakages due to faulty packing have included several bottles of urine being posted by patients to their doctors, and a specimen of blood being sent to a V.D. laboratory. The Post Office asks for the co-operation of doctors in ensuring that pathological specimens they themselves send through the post, and also those sent to them by their patients, should be properly packed. Appropriate containers were illustrated in one of the articles in our Refresher Course series on clinical pathology (*Journal*, 1953, 2, 876), which also forms a chapter in the book *Clinical Pathology in General Practice* (obtainable from the Publishing Manager, B.M.A. House; price 22s. 3d. inland, 21s. 9d. overseas). The regulations concerning the packing of pathological specimens are printed in the *Post Office Guide*, which may be consulted at any post office.

Tavistock Institute of Human Relations.—Grants totalling £12,525 were made by American foundations last year to aid training and research at the Tavistock Institute of Human Relations, London, for periods up to seven years. The Old Dominion Foundation has given £89,286 for the general support of the mental health training programme which the Institute has developed in association with the Tavistock Clinic; and the Grant Foundation £24,964 for the training of personnel for work with children and parents. The Grant Foundation has also provided £4,955 for a pilot study of selected London families. The two major research grants, however—£80,357 from the Ford Foundation and

£12,964 from the Josiah Macy Jr. Foundation—go to support the work of the Institute's child development research unit, directed by Dr. JOHN BOWLBY. Here studies are being made of the earliest human "behaviour patterns," such as smiling in infants.

Volunteers Wanted.—The Common Cold Research Unit at Harvard Hospital, Salisbury, now entering into its eleventh year of research, urgently needs more volunteers. People who are willing to take a fifty-fifty chance of a running nose and sore throat in return for a free 10-day "holiday" are particularly wanted for the next two sessions, starting on January 15 and 29. From now until the end of March some 100 volunteers are wanted, and there will be vacancies during the rest of the year for some 400 to 500. Comfortable living quarters are provided for volunteers. Fares to and from Salisbury are paid up to a maximum of £3, and 3s. a day pocket money is allowed. Volunteers should be between 18 and 45 years of age and in normal health. A postcard to the medical superintendent at Harvard Hospital will bring full details. The unit is a joint enterprise of the Medical Research Council and the Ministry of Health.

Odontological Centenary.—The centenary of the founding of the Odontological Society of London was celebrated by a dinner on January 4 at the Royal College of Surgeons, under the chairmanship of Mr. J. A. S. WRIGHT, president of the Section of Odontology of the Royal Society of Medicine. In October, 1856, the "Memorialists," a small group of pioneer practitioners in dental surgery, led by John Tomes, having failed to win the support of the Royal College of Surgeons for their repeated demands, met in Old Burlington Street and founded the Odontological Society of London. On January 5, 1857, was held the first formal meeting of the society, which, some fifty years later, as the Section of Odontology, became one of the founder sections of the Royal Society of Medicine. At the centenary dinner Miss PAT HORNSBY-SMITH, Parliamentary Secretary to the Ministry of Health, was principal guest. Sir ZACHARY COPE, proposing the health of the Section, referred to the close association of the founders of the Odontological Society with the Royal College of Surgeons, and to their persistent, far-sighted, and eventually successful efforts to establish dental education on a firm and independent basis and dental surgery as a specialization in its own right. But their recommendation that a fellowship of the College should be granted for work in this field was not implemented until after more than a century had passed. The centenary was marked by a historical display in the College, which included the first Minute and Obligation Books of the Odontological Society and a collection of founders' portraits.

Nuffield Dental Fellowships.—One of the objects of the Nuffield Foundation's dental fellowships is to make it possible for selected graduates in medicine (or science) to train for teaching and research on dental health and disease. So far comparatively few applications from such candidates have been forthcoming. Further details of these fellowships, whose annual value is between £500 and £800, will be found at page 59 of our advertisement columns.

"Tubercle."—This medical journal, which began its life in 1919 as a monthly journal, has since the beginning of last year been appearing two-monthly, but enlarged and in an improved format. In addition to tuberculosis, it deals with the laboratory, clinical, and epidemiological aspects of with the respiratory disease in general, and with such related infectious diseases as leprosy. Dr. J. R. BIGNALL, of the Institute of Diseases of the Chest, was appointed editor in April last, succeeding in this chair J. R. EARP (1919), S. ROODHOUSE (1920-37), N. LLOYD RUSBY (1938-44), and Stephen GLOYN (1944-56). *Tubercle*, which became the journal of the British Tuberculosis Association in 1948, is published by Staples Press Ltd. at an annual subscription of 45s.

Board for Correlation of Medical Science and Physical Education.—The final William Hyde Award of £300 has been made to Squadron Leader C. B. WYNN PARRY in recognition of his outstanding contribution in the field of physical medi-

cine in the R.A.F. The Research Board for the Correlation of Medical Science and Physical Education, which makes this award, is now being wound up, as it has completed its research investigations. Its remaining funds are being transferred to the Physical Education Association of Great Britain and Northern Ireland.

British Association of Plastic Surgeons.—At a meeting on December 14, with Mr. WILFRED HYNES in the chair, the following officers were elected: President-elect and treasurer, Mr. R. P. OSBORNE; honorary secretary, Mr. C. R. McLAUGHLIN.

Durham University.—Dr. J. A. SAUNDERS, senior lecturer in biochemistry, has been appointed to a personal readership in chemical physiology.

Aberdeen University.—Mr. J. G. MURRAY, F.R.C.S.Ed., assistant lecturer in the department of anatomy at University College, London, has been appointed lecturer in surgery. He graduated at Aberdeen in 1942.

Dr. C. L. Greening, formerly director of the Kitwe Laboratories of the Tuberculosis Research Association and of the Hull Public Health Laboratory, has been appointed production officer at the Wellcome Research Laboratories, Beckenham.

Dr. Harry Pigott, of Manchester, has been appointed a member of the National Assistance Board. His appointment is until the end of 1958.

Dr. K. G. Bergin has been appointed chief medical officer of British Overseas Airways Corporation. He was previously B.O.A.C.'s medical superintendent of air services.

COMING EVENTS

Ernest Jones Lecture.—Dr. MARGARET MEAD, the American anthropologist, will deliver the British Psycho-Analytical Society's next Ernest Jones lecture at the Royal Society of Medicine on January 30 at 8.30 p.m. Her subject will be "Changing Patterns of Parent-Child Relations in an Urban World." Admission is free.

Milroy Lectures.—Dr. D. D. REID will deliver the Milroy lectures on February 5 and 7 at 5 p.m. at the Royal College of Physicians, Pall Mall East, London, S.W.1. His subject will be "Environmental Factors in Respiratory Disease."

Institute of Dermatology.—Semi-permanent exhibitions on "The Neurohistology of the Integument and Changes in Leprosy," February 5-25.

Hunterian Festival Dinner.—Will be held at the Royal College of Surgeons on February 14. Limited number of tickets (£2 10s.) available to fellows and members of the College. Details from Mr. W. F. DAVIS, Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2.

Radio.—Two fifteen-minute programmes on "The Alcoholic." Home Service, January 16 at 10.25 p.m., and January 17 at 10.45 p.m.

NEW ISSUES

Thorax.—The new issue (Vol. 11, No. 4) is now available. The contents include:

- ADENOCARCINOMA OF THE OESOPHAGUS. D. W. SMITHERS.
- CARCINOMA OF THE OESOPHAGUS AS A COMPLICATION OF ACHALASIA OF THE CARDIA. J. L. WILLIAMS.
- RECONSTRUCTION OF THE CARDIA AND FUNDUS OF THE STOMACH. Geoffrey Wooler.
- NON-BRONCHOSPIROMETRIC MEASUREMENT OF DIFFERENTIAL LUNG FUNCTION. G. H. ARMITAGE and A. BRIAN TAYLOR.
- MASSIVE PULMONARY FIBROSIS FROM THE INHALATION OF TALC. A. C. HUNL.
- ANEURYSMS OF THE PATENT DUCTUS ARTERIOSUS. John B. DAS and Judson T. CHESTERMAN.
- RESPIRATORY FUNCTION AFTER PNEUMONECTOMY. M. B. McILROY and D. V. BATES.
- SIX CASES OF TRAUMATIC RUPTURE OF THE BRONCHUS. Michael BATES and Harvey J. BEARD.
- INVESTIGATION OF IDIOPATHIC PLEURAL EFFUSIONS BY THORACOSCOPY. S. J. FLEISCHMAN, A. I. LICHTER, G. BUCHANAN, and R. J. S. SICHEL.
- SURGERY IN THE TREATMENT OF PULMONARY TUBERCULOSIS IN PATIENTS AGED 50 AND OVER. Arnold PINES and Richard ROWLANDSON.
- INTRATHORACIC MENINGOCELE. J. C. A. RAISON.
- INDEX.

Issued quarterly: annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

British Journal of Venereal Diseases.—The new issue (Vol. 32, No. 4) is now available. The contents include:

INTRADERMAL TESTS IN THE DIAGNOSIS OF LYMPHOGRANULOMA VENEREUM. A. J. King, C. F. Barwell, and R. D. Caterall.
VENEREOLOGY IN TRANSITION. Joseph Earle Moore.
DIAGNOSIS, PROPHYLAXIS, AND TREATMENT OF CONGENITAL SYPHILIS. B. M. Pashkov.
ORGANIZATION OF SYPHILIS CONTROL IN THE SOVIET UNION. Pyotr Vasilievich Kozhewnikov.
VENEREAL DISEASES CAMPAIGN IN CHILE: ORGANIZATION AND RESULTS. Waldemar E. Coutts, Florencio Prats Roberto Vargas-Zalazar, and Luis Infante-Varas.
TRICHOMONAS VAGINALIS IN URETHRITIS OF THE MALE. Louis G. Feo, Nicholas R. Varano, and Theodore R. Fetter.
LATE HERPATIC SYPHILIS. I. A. Kellock and S. M. Laird.
ROLE OF TREPONEMA REITER IN MODERN SEROLOGY OF SYPHILIS. H. G. S. Ruge.
FURACIN URETHRAL SUPPOSITORIES IN THE TREATMENT OF CHRONIC NON-GONOCOCCAL URETHRITIS. R. R. Wilcox.
ORAL PHENOXYMETHYL PENICILLIN IN ACUTE MALE GONORRHOEA. L. P. Sheil.
SYNTHETIC L-α-DIOLEYL LECITHIN IN ANTIGENS FOR THE SERO-DIAGNOSIS OF SYPHILIS: COMPARISON WITH OTHER LECITHINS. David B. Tonks and Ravelle H. Allen.
HOG'S GASTRIC MUCIN AS AN AID IN THE ISOLATION OF N. GONORRHOEA. A. F. MacCabe.
CARDIOLIPIN KOLMER TESTS ON PLASMA. Roger D. Coleman, Harrison M. Kurtz, and Milo D. Appleman.
BOOK REVIEW.
SYMPOSIUM ON TRICHOMONAL INFECTIONS, MAY 28-30, 1957.
ABSTRACTS.
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Issued quarterly: annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, January 14

INSTITUTE OF NEUROLOGY.—5.30 p.m., Sir Rudolph Peters, F.R.S.: Biochemical Aspects of Vitamin-B Group Disorders in Relation to the Central Nervous System.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. A. C. Dornhorst: Pulmonary Physical Signs.

Tuesday, January 15

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor A. J. Lewis: Social Psychiatry.
LIFORD MEDICAL SOCIETY.—At King George Hospital, 8.45 p.m., general-practitioner clinical meeting.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. Christine Hodges: Conservative Radiotherapy.
ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Marc Daniels Lecture by Dr. W. D. W. Brooks: Prevention of Tuberculosis.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Professor L. S. Penrose, F.R.S.: Inheritance of Foetal Deformities.
SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bolingbroke Hospital, Wandsworth Common, S.W., 8.30 p.m., Dr. C. E. Newman: Changing Paediatrics.

Wednesday, January 16

EUGENICS SOCIETY.—At Royal Society, Burlington House, W., 5.30 p.m., Mrs. Barbara Simonds: Twin Research in Tuberculosis.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. A. Tickner: Minerals in Skin Metabolism.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. E. H. Hudson: Results of Prolonged Chemotherapy in Pulmonary Tuberculosis.
INSTITUTE OF UROLOGY.—4.30 p.m., Dr. S. B. Osborn: Radiotherapy in Urology.
MIDLAND MEDICAL SOCIETY.—At Selly Oak Hospital, Birmingham, 8.15 p.m., clinical meeting.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor G. Payling Wright: Cell Regeneration and Pathological Processes.
ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Weill Lecture by Professor E. Dahl-Iversen: Diagnosis and Treatment of Hyperplasias and Adenomas of the Adrenals.
WILLESDEN GENERAL HOSPITAL MEDICAL SOCIETY.—At Department of Physical Medicine, 8.45 p.m., Professor B. W. Windeyer: Use and Hazards of Ionizing Radiation.

Thursday, January 17

BRITISH INSTITUTE OF RADIOLOGY.—8 p.m., subject: Aspects of Radiation Damage Likely to be Involved in Tumour Regression. (1) Dr. John Read (Otago): Radiation Damage to Individual Cells. (2) Professor H. B. Chase (U.S.A.): Radiation Damage to Cells Dependent on their Tissue Environment.
BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor E. G. T. Liddell, F.R.S.: Calal and Sherrington.
EDINBURGH CLINICAL CLUB.—At Jordanburn Hospital, 8 p.m., Professor A. Kennedy: Hypnotism in Medicine.
GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—7.30 p.m., Honorary Presidential Address by Professor D. Fyfe Anderson.
INSTITUTE OF CHILD HEALTH.—5 p.m., Professor C. A. Janeway (Boston, U.S.A.): Resistance to Infection in the Child.
LIVERPOOL MEDICAL INSTITUTION.—8 p.m., pathological meeting. Professor C. V. Harrison: Vascular Changes in Pulmonary Hypertension.
NORTH-EAST CLINICAL SOCIETY.—At Prince of Wales's General Hospital, N., 2.30 p.m., clinical meeting.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Mr. D. W. C. Northfield: Tumours Involving the Floor of the Third Ventricle.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Goulstonian Lecture by Dr. Raymond Daley: Autonomic Nervous System in its Relation to Some Forms of Heart and Lung Disease.
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—7.30 p.m., symposium: Toxoplasmosis. To be opened by Professor P. C. C. Garnham, followed by Professor C. P. Beattie, Dr. I. A. B. Cathie, and Dr. R. Lainson.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. Desmond Curran: psychiatry demonstration.
WEST OF ENGLAND CHILD HEALTH GROUP.—At Department of Child Health Lecture Theatre, Bristol Royal Hospital for Sick Children, 5.30 p.m., Mr. D. E. Milner: Child Art.

Friday, January 18

FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, 5 p.m., Dr. R. Morrison, Mr. C. J. L. Thurgar, and Dr. J. Boland: Supravoltage Radiotherapy Technique.
● INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. H. Meara: clinical demonstration.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. K. Robson: clinical demonstration.
KING'S COLLEGE HOSPITAL MEDICAL SCHOOL.—4.45 p.m., Fifth Dorothy Platt Memorial Lecture by Dr. Cuthbert Dukes: Recent Advances in the Pathology and Treatment of Cancer of the Colon and Rectum.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Professor A. Haddow: Modern Views of Carcinogenesis.
ROYAL MEDICAL SOCIETY, EDINBURGH.—8 p.m., dissertation by Mr. W. J. Irvine: 5-Hydroxytryptamine.
ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.—At Western Infirmary, Glasgow, 8.30 p.m., clinical night.
YORKSHIRE SOCIETY OF ANAESTHETISTS.—At General Infirmary at Leeds, 8.30 p.m., Dr. W. M. Shearer: Steroid Anaesthesia.

Saturday, January 19

BIOCHEMICAL SOCIETY.—At Department of Biochemistry, London Hospital Medical College, 11 a.m., scientific papers.

APPOINTMENTS

BREWSTER, T. B., M.B., B.S., M.R.C.P., D.M.R.T., Assistant Radiotherapist to Hamilton Clinic of Ontario Cancer Foundation, Canada.
JOHNSTON, J. McLAUCHLAN, M.B., Ch.B., Physician Superintendent, State Institution for Defectives, Carstairs.
SOUTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD.—Alex Sakula, M.D., M.R.C.P., Consultant Physician in Chest Diseases, Redhill Chest Clinic, Surrey, and Horsham (Crawley) Chest Clinic, West Sussex.
SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—R. T. D. Franklin, M.B., Ch.B., D.P.M., Assistant Psychiatrist at Digby-Worford Hospital, Exeter; M. K. A. Yousef, M.B., Ch.B., Orthopaedic Registrar with duties at Winford Orthopaedic Hospital and in the United Bristol Hospitals; Margaret E. R. Stoneman, M.B., Ch.B., D.C.H., Registrar in Paediatrics at the Royal Devon and Exeter Hospital; E. C. Lewis, M.B., B.S., Registrar at Mount Gold Orthopaedic Hospital, Plymouth; T. I. Gailani, M.B., Ch.B., F.R.C.S.Ed., and M. A. Azam, M.B., B.S., F.R.C.S.Ed., Surgical Registrars, and Margaret T. Hyde, M.B., B.Ch., Anaesthetic Registrar, at South Devon and East Cornwall Hospital, Plymouth; Edith P. Pringle, M.B., B.Ch., D.P.M., Senior Psychiatric Registrar at Moorhaven Hospital, Ivybridge, South Devon.
WILLIAMS, CATRIN M., M.B., B.Ch., F.R.C.S.Ed., Consultant Ear, Nose, and Throat Surgeon, Clwyd and Deeside Hospital Management Committee.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Erooga.—On January 2, 1957, at Luton Maternity Hospital, to Shirley, wife of Mark A. Erooga, M.B., B.S., a son.
Scott.—On December 2, 1956, at Karachi, Pakistan, to Anne (formerly Calder), M.B., F.R.C.S.Ed., wife of A. W. Scott, a daughter.
Torley.—On December 29, 1956, at Wednesbury, Staffs, to Dr. and Mrs. John Torley, a daughter.

DEATHS

Crawford.—On December 19, 1956, at the Bartholomew Hospital, Goole, Yorks, John Crawford M.B., B.Ch., aged 61.
Cuthbert.—On December 15, 1956, at 7, Blenheim Place, Edinburgh, Andrew Hume Cuthbert, M.B., Ch.B.
Dewdney.—On December 27, 1956, at 24, Mount Street, Taunton, Som., Edward Lucius Day Dewdney, T.D., L.S.A., aged 86.
Evans.—On December 28, 1956, at the Kent and Canterbury Hospital, Grace Catherine Evans, M.R.C.S., L.R.C.P., J.P.
Goulden Bach.—On December 26, 1956, Lorna Muriel Adelheid Goulden Bach, M.R.C.S., L.R.C.P., D.P.H., of 14, St. Augustine's Mansions, Vincent Square, London, S.W.
Hermon.—On December 15, 1956, at his home, Ambleside, Hasle, Yorks, James Milne Hermon, M.D., formerly of Wakefield, Yorks, aged 89.
Hick.—On December 26, 1956, at The Grove, Chippenham, Wilts, Alan Provde Hick, M.R.C.S., L.R.C.P., aged 44.
Holland.—On December 24, 1956, at Overstrand, near Cromer, Norfolk, Edward Torriano Holland, M.R.C.S., L.R.C.P., formerly of Chelsea, London, S.W., aged 79.
Houlton.—On December 13, 1956, at St. Francis, Whitby, Yorks, Charlotte Leighton Houlton, C.B.E., M.D., F.R.C.O.G., formerly of India, aged 74.
King.—On December 15, 1956, at 5, St. Helens Road, Brigg, Lincs, Francis Joseph Ord King, M.B., B.Ch., aged 65.
Miller.—On November 14, 1956, at Poole General Hospital, Arthur Hallowes Miller, M.D., M.R.C.P., formerly of Branksa Towers, Parkstone, Dorset.
Poppie.—On December 14, 1956, at Bryn Mair, Penmaenmawr, Caern., Thomas Mills Poppie, M.B., Ch.B.
Sutherland.—On December 13, 1956, in hospital, Charles Russell Sutherland, L.R.C.P.&S.Ed., L.R.F.P.S., of "Windfalls," 6, The Park, Scalby, Scarborough, Yorks, aged 81.
Thomas.—On December 6, 1956, at 48, St. Marks Road, East London, South Africa, Thomas Harold Thomas, M.D., M.R.C.P., Lieutenant-Colonel, I.M.S., retired, aged 65.
Watson.—On December 17, 1956, at 3, Elm Grove, Salisbury, Wilts, Frank Herbert Cheney Watson, M.B., Ch.B.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Blood Loss in Patients with Coronary Disease

Q.—In patients with coronary disease, how important is it to deal with a chronic cause of blood loss such as bleeding piles? A patient who had a coronary thrombosis a year ago believes that the bleeding from his piles, which is sometimes rather profuse, benefits him. In such a case, provided any primary cause for the piles has been excluded, is it safe to leave the piles untreated? If not, are there any special hazards to be anticipated from their treatment by injection or operation?

A.—Many patients with angina often have some degree of dyspnoea at the time of an attack. Bleeding from any cause may give remarkable immediate relief in such patients. On the other hand, heart failure cannot be treated by repeated bleedings, as anaemia is induced, with a consequent further demand on the heart and even the precipitation of anginal pain. It seems almost certain that the patient's physical state would be improved by treating his bleeding piles. If the piles can be successfully treated by injection, this can be done without fear.

Chemotherapy in Bact. Coli Urogenital Infections

Q.—What is the best treatment for a chronic Bact. coli infection in (a) the urinary tract of a girl aged 12; (b) the prostate of a male, the prostate being otherwise normal—that is, not enlarged? Would polymyxin B or E, for example, be of value?

A.—The first necessity is to make a full diagnosis. Persistent urinary tract infection at the age of 12 strongly suggests some anatomical abnormality which may be revealed by pyelography. Non-specific prostatitis may be a sequel of gonorrhoea: the criteria on which this diagnosis is based should also be carefully reviewed. A few bacteria cultivated from prostatic secretion are of no certain significance: it must be shown that the secretion contains threads of mucus in which bacteria are numerous.

On the assumption that chemotherapy is indicated, it is better to ask the laboratory for guidance than to proceed by guesswork. *Bacterium coli* and other coliform bacilli found in the urinary tract stand next to staphylococci in the frequency with which they are resistant to some of the antibiotics. The drugs to be considered are the sulphonamides, the tetracyclines, streptomycin, and polymyxin (chloramphenicol is unpromising for this purpose because most of it is excreted in an inactive form, and it is clearly necessary to exert an action in the urinary tract itself as well as in the tissues). Of these four, only streptomycin and polymyxin are actively bactericidal, and a bactericidal drug has a better chance than one that is mainly bacteriostatic of eradicating a long-standing infection.

If the organism is sensitive to streptomycin this should be given intramuscularly in a dose of 0.5 g. at 8-hour intervals for three days, but only after the urine has been rendered constantly alkaline by full doses of sodium bicarbonate. Alternatively, the organism is almost certain to be sensitive to polymyxin. Polymyxin B or E in moderate doses for a limited period is safe, but the injections are apt to cause persistent pain. A daily total of 2 mg. per kg. body weight may be given in divided doses for three or four days. If such treatment succeeds and the organism is sensitive to sulphonamides, a very small dose of one of the more active sulphonamides—for example, sulphathiazole—may be given for several weeks or months to prevent recurrence: a total of 0.25 g. daily in divided doses is enough for this purpose.

Infective Hepatitis and Foetal Abnormality

Q.—Is there any evidence that maternal infective hepatitis in the first three months of pregnancy causes foetal abnormalities similar to those now recognized as being due to maternal rubella?

A.—There is no conclusive evidence that maternal infective hepatitis in the first trimester has caused foetal abnormalities similar to those attributed to maternal rubella. In one reported series¹ babies born to women who had suffered from infective hepatitis at any stage of pregnancy did not show a higher incidence of foetal abnormalities than that expected in the general population. Although foetal abnormalities did not occur the incidence of miscarriage was high (about 30%), abortion not so high (about 10%), and foetal mortality considerable (about 36%). It has been suggested² that the virus of serum hepatitis may pass the placenta and cause neonatal hepatitis. The mother, however, is usually a healthy carrier of the virus rather than an overt sufferer, and this theory moreover has not been proved.

REFERENCES

- ¹ Martini, G. A., Schweiz. Z. allg. Path. Bakt., 1953, 16, 475.
- ² Stokes, J., jun., Wolman, I. J., Blanchard, M. C., and Farquhar, J. D., Amer. J. Dis. Child., 1951, 82, 213.

Sensation of Chilliness

Q.—What is the physiological basis for the sensation of chilliness so often experienced in febrile illnesses and at the onset of a cold?

A.—The rise in body temperature which is the physical basis of fever is achieved by a diminution in the loss of heat by the body, and in extreme cases by an increase in heat production. In these extreme cases where the rise of body temperature is considerable and rapid a chill or rigor is the outward expression. In milder infections, such as at the onset of a cold, there may be no real shivering, and the rise of body temperature would seem to be achieved largely through vasoconstriction in the skin. These changes are believed to be due to a change in the level at which the mechanism regulating body temperature is set. It may be that this change represents an increased sensitivity of the mechanisms conserving heat, and thus an increase of sensitivity to the stimulus of cold upon the skin. At any rate, the sensation of chilliness is presumably the subjective phenomenon accompanying this disturbance in mechanism.

Trace of Reducing Material

Q.—What action should a practitioner take on discovering a trace of reducing material in the urine of a symptomless patient? What is the probable significance? If a faintly positive result is obtained with one of the new enzyme tests for glucose—for example, "clintix" or "tes-tape"—which is not confirmed on testing with Fehling's or Benedict's solution, what is the significance of this finding?

A.—The discovery of a trace of reducing substance in the urine raises two questions: Firstly, is the substance glucose, and, secondly, if so, is its presence due to a raised blood-sugar level or a lowered renal threshold? The first question can easily be decided by means of "tes-tape" or "clintix," which are specific tests for glucose and give negative results with all other reducing substances. The second question can often be answered by a single blood-sugar estimation taken about two hours after a good carbohydrate meal such as breakfast. If the figure does not exceed 120 mg. per 100 ml. it is safe to assume that the patient is not diabetic. If it exceeds 180 mg. the diagnosis is almost certainly diabetes; if the blood-sugar level is between these limits a blood-sugar curve is indicated.

It is not usually necessary to confirm the presence of a low renal threshold except for purposes of insurance and employment, etc., but it is wise to retest the urine of all patients with minimal glycosuria at intervals of three months to make sure that it is not increasing.

The discovery of constant slight reduction in all specimens, associated with a negative reaction to tes-tape or

clintix, is suggestive of "pentosuria," especially in Jews. A faintly positive test with tes-tape or clintix, even if Benedict's test is negative, must be regarded as indicating the presence of glucose in the urine. If this finding is confirmed by repeated tests it would be wise to have a blood-sugar estimation two hours after breakfast, as the new enzyme tests are more sensitive qualitatively than the older tests for sugar in the urine.

Diet and Disseminated Sclerosis

Q.—What influence has the diet in disseminated sclerosis? Relatives of a patient with the disease have asked me about a treatment consisting in the use of a low-fat diet (30 g. fat and 60 g. protein). Is there any evidence to suggest that such a diet might be helpful—or even harmful?

A.—There is no proof that diet in any way influences disseminated sclerosis. It is true, however, that the disease is almost confined to countries with a high standard of living, and in these it appears to be commoner amongst the more prosperous levels of the community. But whether dietary differences account for this distribution is not known.

In a patient who had already developed the disease it would be extremely difficult to prove that any alteration in the diet had resulted in improvement, and observations would have to be carried out for many years before any such claim could be upheld. Thirty grammes of fat is well below the usually considered minimum amount of fat for a satisfactory diet, and it seems very probable that such a drastic reduction in fat intake (which would have to be covered by a very large carbohydrate content) over a period of years might well result in further complications, such as vitamin-A deficiency. In the present state of our knowledge, therefore, drastic reduction of the fat in the diet is contra-indicated in disseminated sclerosis.

Value of Procaine in Parkinsonism

Q.—Has procaine any place in the treatment of Parkinson's disease?

A.—There is no evidence that procaine has any place in the treatment of Parkinsonism. Procaine amide has been used with remarkable success in the treatment of the involuntary movements of Huntington's chorea, but there is no evidence that it has any effect on the tremor of Parkinsonism.

Penile Smarting after Coitus

Q.—A healthy man with no history of venereal infection often experiences a burning sensation in his penis immediately after coitus. The sensation lasts for 5 or 10 minutes. What are its possible causes? If the sensation is physiological, why does it not always occur after coitus?

A.—Although there is no history of urethritis an examination should be carried out before the first morning micturition and bath, as the man may be suffering from a mild but unobserved non-gonococcal infection. In the presence of infection inflammation of the posterior urethra could account for the symptoms. If, on the other hand, no infection is detected then prostatic congestion could be responsible, the occurrence or non-occurrence of the symptoms being determined by the length of sex-play before ejaculation. In the absence of infection no treatment is recommended.

NOTES AND COMMENTS

Trichinosis.—Dr. JAN JAWORSKI (London, N.W.1) writes: May I include my method for the treatment of trichinosis ("Any Questions?" November 24, p. 1251)? I have treated 15 cases in Poland, all just before the outbreak of the second world war, as a result of which I had no opportunity of publishing a report in the Polish medical press. Early in the spring of 1939 14 students of the technical high school in Warsaw managed to kill a wild pig on their campus. They made sausages of the flesh, which was infected with trichinosis, smoked, and ate them. Of the 14, 13 ate smoked sausages and became heavily infected with trichinosis, but the fourteenth student preferred to boil his

portion and avoided infection. I still correspond with two of those who were infected, and they have both kept in good health since.

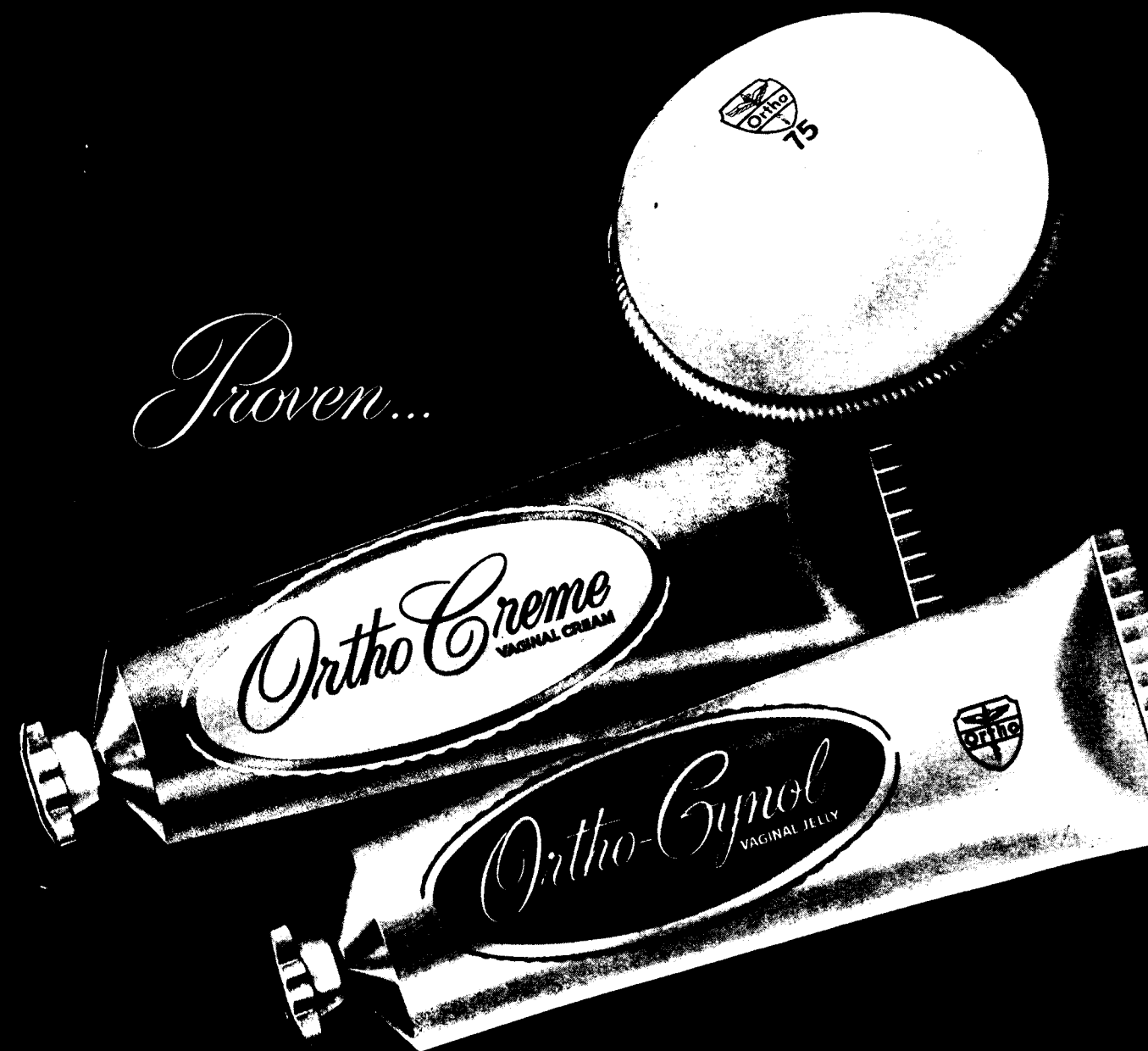
About two or three days after eating the sausages all 13 students were taken seriously ill. The illness manifested itself by the symptoms of severe gastroenteritis, a high temperature—103–104° F. (39.4–40° C.)—swelling of the eyelids, neck, and chest muscles, and partial paralysis of the diaphragm, as judged by the laboured shallow movements. The limb muscles were also painful. At the beginning the students were divided into three groups. The first group of three students were treated only by heavy purging, being given calomel and enemas of 5% borax solution. The second group were treated in the same way, but with the addition of arsphenamine intravenously. The remainder were treated with the calomel and borax enemas and with large doses of sodium iodide intravenously. This treatment brought no improvement and one student died. The rationale of the treatment was as follows: The calomel, being a heavy metal, was given to kill the trichinella embryos which develop in the intestinal mucosa and to accelerate their elimination in the faeces; the alkaline borax enemas to facilitate the detachment of the debris containing embryos from the colonic haustra; and the arsenic and sodium iodide because they are supposed to kill embryos which have already reached the intestinal lymphatics or the blood stream. When all hope failed and there was no sign of any improvement in the students' condition I started to treat them with calcium chloride injections mixed with ascorbic acid. After the first injections the improvement was striking and very obvious. All the patients fell into a deep sleep, lasting in some cases for 12 hours. Observing them in their sleep, I noticed their breathing had become easier and deeper, their pulse rate slower, and their temperature began to fall. After twelve hours I repeated the injections, and usually, after the second or third injections, the temperature returned to normal within 24 to 48 hours, the swelling diminished, and pain disappeared. In spite of this improvement the injections were given for another two or three weeks, but after the temperature had dropped they were given every other day intravenously. All the patients were cured. The eosinophilia persisted for two to three weeks. Since then I have treated only two further cases, with similar successful results. The injections of calcium and vitamin C were based on the results of the very old and numerous experiments I had made on frog's peritoneum, probably familiar to every student, which showed that calcium tightens the endothelial cells and diminishes the permeation of liquid through the capillary walls, acting as an anti-inflammatory factor. The addition of the vitamin C enhanced the tightening of the endothelial cells. I shall be very glad to hear whether others can confirm the effectiveness of this simple treatment in cases of trichinosis.

Menstrual Oedema.—Dr. RAYMOND GREENE (London, W.1) writes: I cannot agree with the last paragraph of your expert's answer on the subject of menstrual oedema ("Any Questions?" December 8, p. 1382). Restriction of salt and fluid, as mentioned in his first paragraph, is certainly important, but he makes no mention of the use of diuretics, to which many mild cases respond. He is unduly pessimistic about the use of hormone therapy. It is true that ethisterone improves only one case in three, but injections of progesterone in a dosage of 25 mg. on alternate days will produce relief or improvement in about 80% of cases.

Correction.—Drs. Mary Crosse and Jean Mackintosh are the contributors to *Recent Advances in Paediatrics* to whom Dr. J. A. Black referred in his letter on perinatal mortality (*Journal*, December 29, 56, p. 1543).

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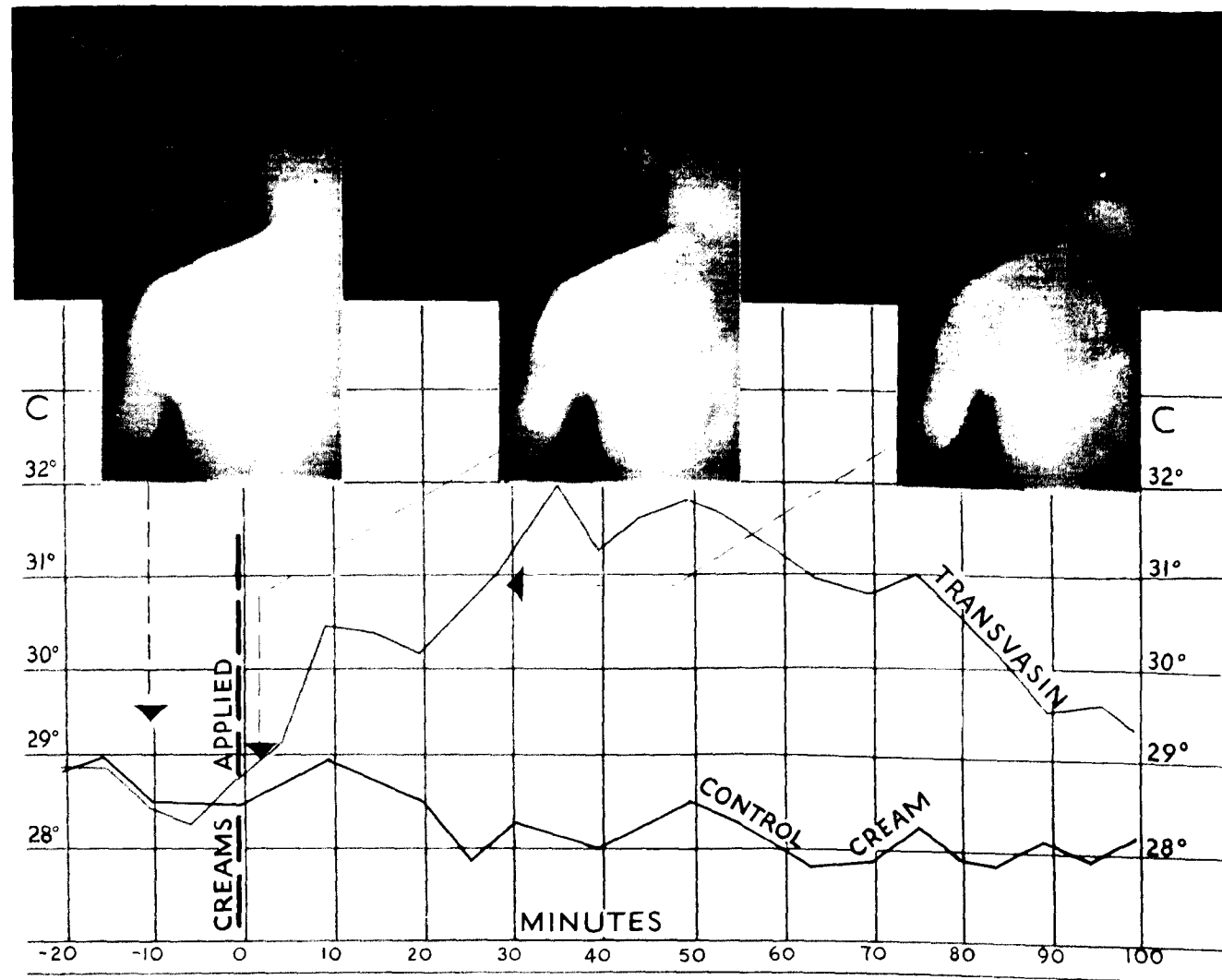


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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 19 1957

MALIGNANT MELANOMA*

BY

Sir STANFORD CADE, K.B.E., C.B., F.R.C.S., F.R.C.O.G., F.A.C.S.

Senior Surgeon, Westminster Hospital, London

Pigmented lesions of the skin are very common and the vast majority of them are harmless. Malignant melanoma is rare—only about 3% of all skin cancer—and at times very difficult to distinguish from the benign pigmented mole. Malignant melanoma has a very grave outlook and yet the prognosis of an individual patient is unpredictable, as spontaneous regression even in the late stages of dissemination is known. Five-year survival rates are of less significance in malignant melanoma than in other types of cancer, as many patients die in the sixth to tenth year, although the majority are lost in the first two years. In diagnosis the personal opinion of the clinician and that of the histologist are often at variance, and in the management of the patient there is the gulf between conservatism and radicalism. This black lesion has indeed cast over the profession and the educated patient a dark pall of uncertainty and the gloom of fear. The most important recent contributions on the histogenesis and pathology of these tumours are those of Spitz (1948, 1951), A. C. Allen (1949), and Allen and Spitz (1953) based on their unrivalled experience at the Memorial Hospital, New York. Their studies on the correlation between histological findings and clinical course resulted in a reorientation of the rationale of treatment.

The experience of 132 cases of malignant melanoma seen at Westminster Hospital has been reviewed in the light of this modern concept, and this has proved of value in achieving greater accuracy in diagnosis and as a guide in the selection of the most suitable method of treatment.

Histology of Pigmented Skin Lesions

The theories as regards the origin of pigmented skin lesions, epidermal or neurogenic—are well known, and to-day the majority of pathologists accept the epidermal theory. This, however, has no practical influence on the management of patients. It is now accepted that the histological types fall into one of four groups: (1) the junctional; (2) the intradermal; (3) the compound; and (4) the blue naevus. The recognition of these varieties is of practical importance and of prognostic significance.

The junctional naevus is so named as histologically the naevus cells are seen in the basal layer of the epidermis at its junction with the dermis; from there the tumour is seen to spread to the surface through the

stratum spinosum, granulosum, and corneum. At the periphery of the main lesion there is often to be seen a superficial spread where the cells are separated from the main lesion by areas of normal epithelium. This is of importance, as an apparently complete surgical removal showing normal epithelium beyond the naevus may still have left naevus cells at the periphery. Histologically the lesion must be distinguished from other intra-epidermal growths such as the keratoses, Bowen's disease, and Paget's disease. The degree of pigmentation varies.

The intradermal naevus, as its name implies, is situated entirely in the dermis; neither the epidermis nor the junctional areas are involved, although the epidermis may be atrophic. The naevus cells form masses without any encapsulation and often penetrate into the subcutaneous fat; pigmentation is usually less marked or absent in the deeper parts of the lesion.

The compound naevus was so named by Allen (1949) to define those naevi composed of two elements—junctional and dermal; it is much more often found in children than in adults.

The blue naevus differs from the other varieties as the main cellular element is a spindle cell; the arrangement in whorls or fascicles is common and its neurogenic origin likely. Pigmentation is marked, hence the name. The lesion is always situated in the dermis.

Clinical Features

The clinical features and the malignant potentialities of the four types are now clearly recognized. They can be briefly summarized as follows:

The junctional naevus is a pigmented lesion of every shade of brown; it varies in size, is smooth, nearly always flat, and hairless. It may occur on any part of the skin, but those on the palm of the hand, the sole of the foot, and the genitalia are always "junctional" in type. It is the "immature" naevus (Hicks, Rank, and Wakefield, 1955). It is not uncommon in children. Allen (1949) and Allen and Spitz (1953) emphasize its relationship to malignant melanoma. Quiescent junctional naevi may become active; "activity" in junctional naevi or in the junctional component of a compound naevus is recognized histologically by nuclear anaplasia, hyperchromatism, increase in nuclear size, mitotic figures, and subepithelial lymphocytic infiltration. Such changes in an adult are considered pre-cancerous, and such lesions are potentially malignant

*Dorothy Platt Memorial Lecture given at King's College Hospital on February 28, 1956.

melanomata. Although only a very small proportion of junctional naevi develop into malignant melanoma, Allen and Spitz draw attention to the fact that "with the exception of a few malignant blue naevi, every melanocarcinoma of the skin or mucous membrane arises from a junctional or compound naevus."

The *intradermal naevus* is the commonest variety and nearly all "common moles" belong to this group. Its colour, like that of the junctional naevus, varies from light to dark brown. It can be flat and smooth or papillary and warty. The hairy mole is always of the *intradermal* type. It is the most stable variety and does not undergo malignant changes. It never occurs on the palm of the hand, the sole of the foot, or the genitalia. Pigmented lesions in these sites should therefore be presumed to be other than the *intradermal* type. They are rare before puberty and become more common with increasing age. The *intradermal naevus* is the "mature" pigmented skin lesion (Hicks *et al.*, 1955).

The *compound naevus* is clinically indistinguishable from the *intradermal* one. Its incidence according to Allen (1949) is 12% of all naevi in adults and as high as 98% in children. The junctional element of the compound lesion renders it potentially dangerous. When a hairy mole spontaneously loses the hair it can be presumed that there is a compound element and that the junctional part has become active. It is estimated that less than one in ten malignant melanomata arise from a pre-existing compound naevus; whereas nine in ten arise from junctional naevi.

The *blue naevus* occurs most commonly on the face, on the dorsum of the hands and feet, and on the buttock. It is dark brown, blue, or black in colour and nearly always hairless and smooth. Its malignant variant is extremely rare and is described as a *melanosarcoma*.

Juvenile Melanoma

It is now well known that a pigmented skin lesion occurring before puberty may have histological features indistinguishable from malignant melanoma and yet pursue a benign course clinically. Such lesions have been described by Spitz (1948, 1951) under the name of juvenile melanoma and by Pack (1948) as pre-pubertal melanoma. The discrepancy between histological findings and clinical course has attracted a great deal of attention. McWhorter and Woolner (1954) reviewed all the cases of pigmented skin lesions in children at the Mayo Clinic and found 11 patients previously diagnosed as malignant melanoma who came into this group. Spitz maintains that histologists of great experience can differentiate the malignant melanoma from the juvenile melanoma in almost but not all cases. The occurrence of true malignant melanoma in the pre-puberty patient is very rare, and McWhorter and Woolner summarize 18 such patients varying in age from 3 to 12; of these, 12 had died of the disease. It is important to recognize juvenile melanoma as a clinical and pathological entity, as it influences treatment. Thus in the pre-puberty patient conservative surgery is always indicated. It should also be remembered that this variety may occasionally persist after puberty and is known to occur in adults. Allen and Spitz (1953) point out that the post-pubertal juvenile melanomata are always diagnosed as malignant melanoma and that this erroneous diagnosis leads to disproportionately radical surgery and also falsely raises the cure rate of malignant melanoma.

The juvenile melanoma may occur on the trunk or on the limbs, but the most frequent site is the face. The lesions vary in colour from yellow to brown, are hairless and warty. Histologically they show the features of malignant melanoma.

Malignant Melanoma

This is a rare condition. Willis (1948) found only 9 cases in 1,200 cancer cases submitted to necropsy. They account for 3 to 4% of all skin cancer. In a period of 27 years there have been 132 cases of malignant melanoma at Westminster Hospital. The age incidence is shown in Table I.

TABLE I.—Age Incidence of 132 Patients with Malignant Melanoma

Age:	0-20	21-30	31-40	41-50	51-60	61-70	71-90
No. of patients	9	29	25	25	25	9	10

The majority of malignant melanomata occur on the skin; those in the eye form a separate entity. Primary malignant melanoma may originate in mucous membrane; the common sites are the nasal cavity, the mouth, the ano-rectal junction, and the urethra. The intestinal lesions may be primary, but may also be metastatic (even when solitary) from a small undetected skin tumour, or from a tumour previously excised and not recognized as a melanoma. Melanomata of the larynx and bronchus have been recorded. Malignant melanoma on the head and neck seems to be of a less sinister prognosis, and in this site five-year survivals are more frequent than with lesions on the limbs. No part of the skin is immune, but there is a preponderance in certain sites. Table II shows the anatomical distribution in this series; it coincides with other published series. The lower limb, specially the sole of the foot and ankle, are common sites; this may be related to the fact that the junctional type of naevus is also common on the sole of the foot.

TABLE II.—Site Distribution in Malignant Melanoma (132 Patients)

Site	Incidence
Lower limb	62
Head and neck	24
Trunk	20
Upper limb	17
Unknown primary	4
Mouth and nose	3
Genitalia	2

Clinical Features

The lesion is generally of the low warty type with a macular edge. It often is quite insignificant, and its removal may even be entirely forgotten by the patient by the time metastases develop. The alteration of a benign birthmark into a malignant melanoma is heralded by an increase in size by peripheral spread, increased pigmentation, increase in bulk from the surface, a nodularity, oozing of serum which forms a crust, bleeding either from slight trauma or spontaneously, and by the appearance of minute satellite pigmented spots at the periphery of the lesion. In the papillary type rapid increase in size leads to the formation of cauliflower masses, some of the new tissue being quite devoid of pigment. Some masses ulcerate and the ulcer discharges serum.

Spread of Malignant Melanoma

These tumours spread by lymphatic permeation, by emboli to lymph nodes, and by blood-stream dissemination. The spread is unpredictable, and there is no other tumour as malignant as the melanoma and with such power of dissemination. Lymphatic permeation is common, and manifests itself by the formation of numerous cutaneous and subcutaneous nodules (Fig. 1) some deeply pigmented, others devoid of pigment. These nodules spread with the lymph flow; the number of nodules increases, they grow in size, some lose their pigment and become chamois-leather coloured; coalescence of nodes occurs and leads to the formation of tumour masses oozing a serous discharge. Lymph-node metastases occur sometimes without formation of satellite nodules, as if emboli were carried direct by the lymph stream to the lymph nodes (Fig. 2).

In no other malignant growth is the blood dissemination so widespread; every tissue and organ can be invaded. Nodules develop in the liver, lungs, brain, spleen, kidneys,



FIG. 1.—The primary tumour was on the front of the left leg. Metastatic spread by permeation of the subcutaneous lymphatic plexus. It illustrates the futility of removing a "strip" of skin between the primary site and the main regional lymph nodes in limb lesions.

wall and mesentery of the alimentary canal, the intestinal mucosa, and in the heart itself, in the myocardium, the chordae tendineae, and the valves. Freely circulating melanin in the blood leads to deep discoloration of the skin and mahogany-coloured urine. Mucosal metastases in the



FIG. 2.—Small primary growth on forearm with extensive axillary lymph-node involvement. No intervening lesions. Metastatic spread by lymphatic embolism.

mouth and the rectum form large fungating tumours devoid of pigment. Skeletal metastases in any bone can occur. The course of the disease is unpredictable; some tumours show a periodicity of growth with intermittent quiescence; some lesions lose their pigment and regress whilst the disease continues to spread. The survival period varies; one-third of the patients died within the first two years and one-sixth within the first year. The virulence of the disease is great and the control of it very difficult. Cures are exceptional; a five-year survival is no indication that reactivation of disease will not occur. The survival periods in this series of patients are shown in Table III.

TABLE III.—Malignant Melanoma Survival in 132 Cases

	Alive	Dead
1st year	16	21
2nd "	12	26
3rd "	11	9
4th "	2	6
5th "	6	2
6th to 10th year	9 (4 with disease)	5

Seven patients were untraced.

Only 14 patients survived five or more years; of these, five died between the fifth and tenth year with disease; four are alive more than five years with disease; and five remain free from recurrence more than five years.

Hormonal Influence

The hormonal influence on pigment formation and on the depth of pigmentation in existing pigmented skin lesions has been recognized for many years. More recently Lerner, Shizume, and Bunding (1954) have shown that the melanocyte-stimulating hormone of the pituitary (M.S.H., or intermedin) causes darkening of the human skin and of pigmented moles, and may also cause the formation of new pigmented skin lesions. Depigmentation following cortisone administration is believed to be due to the inhibition of the pituitary. In pregnancy there is increased production of M.S.H., and the areas of increased pigmentation correspond accurately to those found in untreated Addison's disease with the addition of the areola and genitalia.

The rarity of malignant melanoma in children, the benign course of juvenile melanoma before puberty, and the increase of virulence of malignant melanoma in pregnancy all suggest that there is some hormonal influence or control, yet there is no evidence that the transformation of a harmless pigmented mole into a malignant melanoma is initiated or caused by hormonal action any more

than there is proof that pregnancy can cause mammary cancer, although it is obviously patent that pregnancy will aggravate breast cancer. Hence, although it is accepted that prognosis of malignant melanoma is even worse in pregnancy than otherwise, termination of pregnancy does in no way improve the prognosis or lead to regression of malignant melanoma. Spontaneous regression of disseminated malignant melanoma after delivery has been recorded (E. P. Allen, 1955), but other instances of spontaneous regression without the added factor of pregnancy and in men are also reported (Sumner, 1953; Levison, 1955). Neither has treatment with androgens and oestrogens or the few trials of gonadectomy and adrenalectomy altered the course of established melanotic tumours. It remains to be seen if hypophysectomy will control malignant melanoma or merely result in its transformation into an amelanotic melanoma. The problem remains unsolved, but there are several practical implications as regards the management of pigmented skin lesions in children and in pregnancy. These can be summarized as follows:

1. Parents can be reassured that pigmented lesions are not dangerous before puberty. Their removal is dictated for cosmetic reasons and as a prophylactic measure, as some of these lesions may become dangerous in later life. Local excision with a small margin of normal tissue is adequate. Segmental resection of very large lesions is safe.

2. Pack (1948) suggested that the antenatal examination of pregnant women should include a survey of any pigmented lesions. Those on the genitalia and on the feet, known to be potentially dangerous, should be excised. The dark moles exhibiting activity, such as marked increase in size or pigmentation, should be excised. Patients who have had a malignant melanoma should be advised to avoid pregnancy for three to five years. Termination of pregnancy in patients with malignant melanoma is not indicated.

Management of Malignant Melanoma

It has been repeatedly stated that tragic results follow incorrect treatment. Tod (1944) rightly condemns "casual excision, ligature, or cauterization"; Ewing (1934) draws attention to the fact that "familiarity with these apparently insignificant lesions constantly invites meddling interference by patient, surgeon, dermatologist, and other specialists"; and Sylvén (1949), from the experience of 341 cases at the Radiumhemmet, concludes that "great harm was done by doctors, chiropodists, and beauticians who treated early

cases of malignant melanoma by freezing, caustics, and electric needling, whereby diagnosis and adequate therapy were delayed."

The review of the clinical histories of the 132 patients treated at Westminster Hospital shows clearly that often, even to-day, the initial management of pigmented lesions is poor and that "tinkering" is not confined to "beauticians" and chiropodists. Doctors and surgeons are far too frequently content with a local excision of the lesion, often under a local analgesic (Fig. 3). Small linear scars, the seat of sinister black satellite recurrences, bear witness to this form of practice. Yet there is no definite evidence, only a presumption, that these interferences with a pigmented lesion were actually the trigger action which transformed a benign lesion into a malignant melanoma and initiated the malignant process with an explosive violence. An alternative explanation is that the reason why advice was sought and inadequate treatment received for a pigmented lesion present for "as long as I can remember" is that the malignant metaplasia had already begun and that inadequate treatment merely failed to control it.

Treatment of the Primary Growth

All new pigmented lesions in adults showing activity, as distinguished from senile keratosis, pigmented rodent ulcers, or epithelioma, must be looked upon as potentially malignant melanoma. The period of "activity" in pre-existing so-called moles or pigmented naevi may vary from six months to five years, and two or three years of active growth has been noted in 29 patients of this series, or 22%.

The treatment in such cases should be wide excision. The larger the lesion the wider the excision; this should include a margin of 2 cm. in small lesions and 3 cm. or more in lesions exceeding 2 cm. in diameter; in depth the excision must include the deep fascia (Fig. 4).

If this principle is followed, only the very small melanomata can be excised and the wound closed without a skin graft. In most lesions a graft is essential if the excision is to be wide enough. This is brought out quite clearly from the study of 112 patients who lend themselves to a detailed analysis. These patients were subdivided into three groups: (1) Those who had had no previous treatment when first seen. (2) Those who had had "adequate" previous treatment to the primary growth and were referred for post-operative management or for the treatment of metastases, without local recurrence. (3) Those who had received "inadequate" treatment before being seen at Westminster Hospital. The definition of "adequate" treatment was: excision wide enough, and no local recurrence. "In-

adequate" treatment includes all forms of "tinkering" such as cautery, electrolysis, diathermy, "some" x-ray treatment, biopsy of part of a lesion with subsequent delay of two weeks and upwards, excision with closure without graft in lesions larger than 2 cm. in diameter. According to the previous treatment the end-results were tabulated as "good" or "bad." The results were regarded as "good" if no local recurrence occurred and "bad" when local recurrence developed. The results are shown in Table IV.

Those who had received no previous treatment of any kind had a 50% chance of control of the primary growth; those who had any form of "inadequate" treatment—in fact, the majority of patients—fared much worse, 73% developing local recurrences. Of those who received "adequate" treatment in the first instance 42% remained free from recurrence



FIG. 4.—"Adequate" and "inadequate" excision. The linear scar above the tendo Achillis indicates that excision was inadequate, as a recurrence developed in the vicinity. This was widely excised and grafted—yet not quite wide enough, as the scar of the first operation should have been included. A further local recurrence in the original linear scar developed; the area to be re-excised is indicated.

TABLE IV.—Results According to Previous Treatment (112 Patients)

Previous Treatment	Results of Definite Treatment	
	Good	Bad
None	13 (50%)	14 (50%)
Adequate	11 (42%)	15 (58%)
Inadequate	16 (27%)	43 (73%)

"Good" and "bad" apply only to primary growths, not eventual dissemination.

in the vicinity of the primary growth. It is emphasized that this subdivision into "good" and "bad" results does not refer to the ultimate five-year survival or to lymph-node or blood-borne metastases. It indicates solely the possibility of controlling the disease at the primary site according to the initial treatment. But the initial treatment profoundly influences the prognosis. Most patients in whom the initial treatment was inadequate are in fact beyond help. Preston *et al.* (1954) found in their series of 225 patients that when the initial treatment failed to control the primary lesion the five-year survival rate was 1 patient among 58, or only 2%. The experience at Westminster Hospital has fully supported the importance of the initial treatment.

Problem of the Regional Lymph Nodes

Patients with malignant melanoma can be subdivided into those with and those without clinically enlarged lymph nodes.

Nodes not Involved

The grim outlook of the disease focused attention on the question of prophylactic block dissection in the absence of clinically enlarged lymph nodes. In favour of prophylactic dissection are the following points: (1) the fallibility of clinical assessment of enlarged lymph nodes; (2) the much worse prognosis in patients with enlarged lymph nodes; and (3) the occurrence of lymph nodes in 42% of patients in whom "no glands" was followed by "no action." Against prophylactic block dissection is mainly the fact that only a few sites are suitable for prophylactic block in continuity



FIG. 5.—Primary growth was a subungual melanoma of the thumb. Local excision was followed by local recurrence. Amputation of the terminal phalanx of the thumb was followed by the removal of axillary lymph nodes. Between these two sites widespread permeation of the subcutaneous lymph plexus occurred. This was followed by widespread blood-borne metastases.

with the primary site—such as the face and neck, and the pectoral or scapular areas when the lesion is well away from the midline. However, in the common site—the limbs (and the commonest site is below the knee)—a prophylactic block is remote from the primary site and leaves a large intervening area with an extensive deep lymphatic plexus potentially invaded. The removal of a "strip" of skin from the primary growth on the foot (or the hand) up to the main regional lymph node areas is a futile gesture, if the anatomy of the lymph vessels is kept in mind (Figs. 1 and 5). The results of treatment were therefore analysed according to the presence or absence of glands, and the performance of block dissection or an expectant policy. Table V shows the

TABLE V.—Results According to Lymph-node Management

	Good	Bad	Total
No glands and no block	27 (57%)	20 (43%)	47
Glands involved. Block performed	8 (23%)	27 (77%)	35

results; "good" indicates control of the disease for at least two years and "bad" indicates recurrence of disease at the site of the "block" or proximal to it. It does not refer to blood-borne visceral or skeletal metastases.

It seems, therefore, that the best results were obtained in early cases from wide local excision without block dissection of the regional lymph nodes. An "expectant" policy in cases without lymph-node involvement showed that 43% of patients subsequently developed lymph nodes, and that a "block" performed for fully established lymph-node metastasis failed to control the disease in 77% of cases. The conclusion, therefore, is that a block dissection in continuity with a wide excision of the primary growth (feasible only in certain anatomical sites) is the method of choice.

Nodes Involved

As already stated, when the patients develop metastatic lymph nodes the prognosis is very bad; in this series a radical block dissection gave a satisfactory result in only 23%—that is, a 23% survival of at least two years (a very modest achievement). The result in 70 patients assessable for five years or more shows only a 20% survival, and, as already stated, of these 14 patients five died in the sixth to tenth year from recurrence, four are alive more than five years with the disease, and only five (7%) are alive from five to ten years free from the disease. Cunningham (1952), from a review of the literature, states that patients with palpably involved regional nodes have only a 5% five-year survival. In view of this the question of wide limb ablation advocated by Pack and Scharnagel (1951) must be given serious consideration (Fig. 5). Against such procedures are the facts that blood-borne metastases are not controlled by it, that not infrequently local recurrences develop in the amputation flaps and proximal to it, and that neither a forequarter nor a hindquarter amputation prevents further lymph-node involvement in the neck, the mediastinum, and the abdomen. It seems clear that there is not enough evidence to justify the adoption of wide limb ablation as a routine; it is justified only in exceptional cases and as a palliative measure in patients with the burden of a widely affected limb.

Other Methods of Treatment

Although it is generally recognized that malignant melanoma is a radio-resistant tumour, authentic regression of lesions has been recorded after radiotherapy (F. Ellis, 1939; Cade, 1952). It has a place in a small proportion of patients as a supplementary measure following operation, as a palliative, and when surgery is inapplicable. Chemotherapy has also been tried, and occasionally nitrogen mustard or Haddow's compound C.B.1348 has proved of temporary value. Adrenalectomy in a few cases has proved a failure and there are as yet no reports on hypophysectomy. Surgery, however poor the results (20 to 30% of five-year survival in most reported series), remains the most effective weapon.

Summary and Conclusions

In a period of 27 years, 132 patients with malignant melanoma have been treated at Westminster Hospital; of these, 122, fully documented and histologically proved, were followed up to date or to death, and seven could not be traced. I personally treated 82 of these patients; the other 50 were under the care of my colleagues, to whom I am indebted for the use of the notes and sections and the opportunity of seeing some of their patients. Treatment consisted of wide local excision and block dissection in a selected number of cases. A review of this series of patients leads to the following conclusions.

1. The initial treatment is of vital importance. A strong plea is made that no patient should be submitted to minor excisions, biopsies, or other interference, as these result in a negligible chance of survival.

2. The prognosis in children is much better than in adults, even when the histological findings are those of a highly malignant growth. The "safe" period for the local removal of pigmented lesions is before puberty.

3. Pregnancy activates pigmented lesions, and the prophylactic removal of pigmented moles in dangerous sites (feet, hands, genitalia) in the early months of pregnancy is advisable. Prognosis of malignant melanoma in pregnancy is bad. Termination of pregnancy is not indicated, although remissions and regressions after delivery are recorded.

4. Wide local excision of the primary growth is the only treatment which offers some prospect of permanent control of the disease.

5. Prophylactic block dissection in the absence of enlarged lymph nodes is always indicated when it can be done in continuity with the excision of the primary growth. It is probably indicated in other sites too, although less likely to control the disease, as the intervening untouched area may develop lesions. Removal of a "strip" of skin as a bridge between the site of the primary growth and the main lymph nodes is not considered a reasonable or sound procedure.

6. The presence of enlarged lymph nodes from distant lesions in the limbs raises the problem of amputation. There is to date not sufficient experience to recommend it as a routine measure.

7. Spontaneous regression of widely disseminated lesions has been recorded. Prognosis is therefore unpredictable in any individual patient. In the absence of visceral metastases, repeated surgical attack and major mutilating procedures are justifiable.

8. The commonest error in the management of malignant melanoma in adults is to do too little. Delay before definitive treatment is achieved is common.

9. Radiotherapy is of value as a post-operative measure and as a palliative treatment in cases which are not amenable to surgical excision.

I thank my colleagues for the opportunity of seeing some of their patients and Dr. Peter Hansell for the photographs.

REFERENCES

- Allen, A. C. (1949). *Cancer (N.Y.)*, 2, 28.
 — and Spitz, S. (1953). *Ibid.*, 6, 1.
 Allen, E. P. (1955). *British Medical Journal*, 2, 1067.
 Cade, Sir S. (1952). *Malignant Disease and its Treatment by Radium*, vol. 4. Wright, Bristol.
 Cunningham, J. A. (1952). In *Progress in Fundamental Medicine*, edited by J. F. A. McManus, p. 28. Kimpton, London.
 Ellis, F. (1939). *Brit. J. Radiol.*, 12, 327.
 Ewing, J. (1934). *Neoplastic Diseases*, 3rd ed., p. 920. Saunders, London and Philadelphia.
 Hicks, J. D., Rank, B. K., and Wakefield, A. R. (1955). *Aust. N.Z. J. Surg.*, 25, 1.
 Lerner, A. B., Shizume, K., and Bunding, I. (1954). *J. clin. Endocr.*, 14, 1463.
 Levison, V. B. (1955). *British Medical Journal*, 1, 458.
 McWhorter, H. E., and Woolner, L. B. (1954). *Cancer (N.Y.)*, 7, 564.
 Pack, G. T. (1948). *Surg. Gynec. Obstet.*, 86, 374.
 — and Scharnagel, I. M. (1951). *Cancer (N.Y.)*, 4, 324.
 Preston, F. W., Powers, R. C., Clarke, T. H., and Walsh, W. S. (1954). *A.M.A. Arch. Surg.*, 69, 385.
 Spitz, S. (1948). *Amer. J. Path.*, 24, 591.
 — (1951). *J. Amer. med. Wom. Ass.*, 6, 209.
 Sumner, W. C. (1953). *Cancer (N.Y.)*, 6, 1040.
 Sylvén, B. (1949). *Acta. radiol. (Stockh.)*, 32, 33.
 Tod, M. C. (1944). *Lancet*, 2, 532.
 Willis, R. A. (1948). *Pathology of Tumours*, p. 275. Butterworth, London.

Vladimir Bechterev, the Russian neurologist, was born on January 20, 1857. He began his studies during a vital period in the development of neurology. In 1885, while a pupil of Flechsig in Leipzig, he described the superior vestibular nucleus which bears his name. He returned to Russia, where he was appointed to a chair at Kazan. Moving to St. Petersburg (1893), he entered the most fruitful period of his career. He made valuable contributions to the knowledge of cerebral localization, experimental psychology, and clinical neurology. A colleague of Pavlov, he studied the relationship between brain and behaviour, but as an anatomist, experimental psychologist, and clinician rather than as a physiologist. After 1905 he concentrated on the problems of abnormal social behaviour. He died in 1927.

ARE ALL "T's and A's" REALLY NECESSARY?

BY

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We pride ourselves that we live in a scientific and a rational age, yet many apparently unscientific and irrational procedures based on faulty premises, uncontrolled impressions, and rash conclusions still obtain.

A good majority of these procedures are carried out on young children (who have little chance to voice their opinions) and include various orthopaedic procedures, circumcisions, treatment of naevi, and removal of tonsils and adenoids. Of these, removal of tonsils and adenoids is by far the most frequently performed operation on the human body, accounting for one-third of all surgical operations carried out in the U.S.A. since 1924 (Boies, 1948).

Are all these procedures really necessary? Do one-third of our children really require to have their tonsils and adenoids removed? Why has this century seen such a savage attack on these normally present and easily accessible structures? There has been much discussion on this topic over the years amongst paediatricians, physicians, surgeons, family doctors, and even the lay public, but in spite of this there is still no uniformity of opinion. The surgeons seem most convinced of the benefits of the operation, whilst others regard the procedure as "a prophylactic ritual carried out for no particular reason with no particular result" (Medical Research Council, 1938).

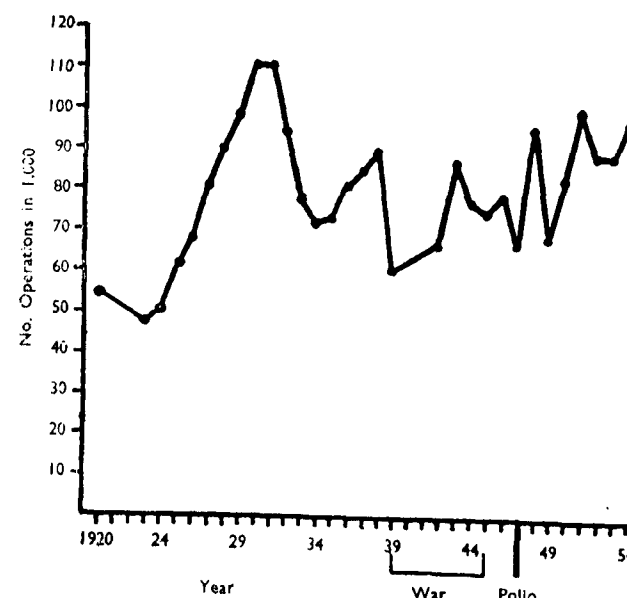


FIG. 1.—Numbers of tonsillectomies carried out in elementary and primary school children annually in England and Wales, 1920-54.

What are the Facts?

In spite of their antiquity—removal of the tonsils was described by Celsus in A.D. 50—these operations were only rarely performed until the turn of the present century. Since then there has occurred a fantastic rise in their popularity, reaching a peak in the early 'thirties, when some 50-75% of all children in this country were having their tonsils and/or adenoids removed. The highest figures were those quoted by Glover (1938), who gave a figure of 83% for an English boys' public school, and by Denzer and Felshin (1943), who in a study of 1,000 11-year-old New York children found that 94% eventually had their tonsils out.

A record of the incidence of these operations over the years is seen graphically in Fig. 1, which has been compiled from figures given by Glover (1938, 1950) for the numbers of elementary-school children having their tonsils removed every year from 1919 to 1948 and from Ministry of Education figures till 1954.

Fig. 1 shows four main points—the steep rise in the popularity of the operation from 1920 to 1930; the peak at 1930 and 1931; the drop at 1933-6, as a result of propaganda; and the fairly constant level during and since the war (the low figure in 1947 was on account of the poliomyelitis epidemic).

These figures were for elementary- and primary-school children of lower social groups. Those for the country as a whole would have been much larger, and the estimate of 200,000 operations a year by Glover (1938) must have been a fairly accurate estimate for 1936. That the operation has not lost its popularity is shown by the fact that during 1954, 226,211 such operations were carried out in this country in N.H.S. hospitals (Ministry of Health, 1955), and this does not include those done in private hospitals and nursing-homes.

It is rather difficult to account for this high incidence of an operation which has been a major medical phenomenon of this century, but two explanations are possible on medical and social grounds. Medically we can only presume that the operations must have been necessary in our children for the treatment of some very common endemic disease which has been most frequent in the upper social groups, since the incidence of the operation is greatest in public schools as opposed to elementary schools. But in actual fact, apart from this evidence of the incidence of the operation, there is little to suggest that there has been this serious endemic disease most prevalent in the "upper classes."

Situation at Present

It is a little difficult to assess the present position accurately, as there are few available figures. It is probable, however, that the situation has not altered appreciably over the past two decades, for in 1954 nearly a quarter of a million persons (226,211) (over 90% of whom were children between 5 and 10) were treated in N.H.S. hospitals in this country for removal of their tonsils or adenoids (Ministry of Health, 1954).

The frequency of the procedure is further evident from the fact that in two of the leading paediatric units in this country between one-sixth and one-quarter of all admissions are for "T's and A's" (Spence and Taylor, 1954; Burke, 1956).

A conservative estimate suggests that between 20 and 40% of our children to-day are having their tonsils and/or adenoids removed, and this is confirmed by Carne (1956), who found that 31.9% of R.A.F. entrants had had their tonsils removed.

A procedure so common must of necessity have certain economic, social, and medical drawbacks and complications. The hospital beds occupied by this large number of patients every year must cost the country almost £3 million—a fantastic and a ridiculous sum spent on a mass ritual which has never yet been scientifically proved to be necessary and which has certain possible dangers. Over the past five years

the Registrar-General's figures show that at least 190 children have died from this operation—a yearly rate of almost 40. In how many of these was the operation really necessary? Whilst it is admittedly a simple and relatively safe operation which is easily performed by all and sundry with various grades of completeness, it has its difficulties and complications. The rate of post-operative ear infections is far from negligible. Cross-infection of children in hospitals is a definite risk; the mental stress and trauma to which these young children are subjected is being more appreciated, and the anxieties of the parents should also be remembered; finally, there appears to be a definite increased risk to bulbar polio-encephalitis in the immediate post-operative period and possibly at later times as well.

These, briefly, are the risks and dangers which must be balanced against the advantages of the operation. It is on this assessment of the pros and cons that the crux of the matter rests, and in this assessment it is necessary to examine the common indications critically in order to find a proper perspective.

Assessment of the Indications for Tonsillectomy and Adenoidectomy

It is in children under 10 years of age, and largely in those between 4 and 8, that the majority of operations are performed for various reasons, and the variety of the indications for which they are carried out is almost unbelievable. The following represent the most usual reasons for operation.

1. Size and Appearance

Although not such a frequent reason as in the past, "enlargement" of the tonsils and "evidence of chronic infection" are still quoted as indications for their removal. It is doubtful, however, whether the enlargement is anything more than a physiological and natural hypertrophy which is common to all lymphatic structures in children between 3 and 8, and which undergo a spontaneous decrease in size after this period. Although I have seen children with apparently massive tonsils that meet in the midline, I have never been convinced that they cause any mechanical ill-effects. With the adenoids the matter is somewhat different, as there may be some consequent post-nasal obstruction, but even this is probably less frequent and less harmful than is generally supposed.

Clinical evidence of "chronic infection" is very indefinite and uncertain. Many of the features that are described are present in many symptomless and normal children. Epstein (1937), in an attempt to correlate clinical signs with histological appearances, found that no such correlation was possible, and he concluded that "the physician did not know an infected tonsil when he saw one."

2. A History of Recurrent Sore Throats

Recurrent sore throats are another frequent reason for tonsillectomy in children. But before we accept them as a definite indication for operation we should look more closely into their natural history.

Tonsillitis and other varieties of sore throat are extremely frequent conditions in general practice—the average family doctor in this country must see between 100 and 200 new cases each year. Most of these have to be labelled as "non-specific," for in only a little over one-third can a recognizable cause, such as the haemolytic streptococcus, Vincent's organisms, or glandular fever, be discovered. It is assumed that the remainder are due to an unidentifiable virus, but, as yet, there is no absolutely conclusive proof of the presence of such an agent.

In order to shed some light on the natural history I would like to quote from a series of 300 consecutive cases of tonsillitis (with fever and red tonsils with exudate) observed in my own practice.

Tonsillitis is rare in children under 4 years of age. It is common in those aged 4-9 years: one-third of all such cases

occur at this period. It is not infrequent between 10 and 30, but its incidence falls with age, being distinctly rare in the elderly.

Fig. 2 illustrates the incidence of acute tonsillitis in children under 10 years who have not had their tonsils removed. The low rate in infancy is apparent, a peak at 5-6 is followed by a steady decline. It is not possible to draw any definite conclusions from this small series, but it is suggestive that there is a tendency to a spontaneous diminution in incidence after the age of 6. If we accept this trend as a natural one, then it is reasonable to expect these children "to grow out of" their attacks.

3. The Catarrhal Child

Under this rather vague term I would include that very large group of children that the British family doctor sees every year for recurring symptoms of infections of the respiratory tract. It is difficult to separate off any specific syndromes, but we are all familiar with the persistent nasal catarrh, the chronic cough, the acute wheezy chest, the earache and transient deafness, which are all accompanied by variable degrees of debility.

Although these conditions are generally accepted as "infections," it is possible that other factors such as allergy, atmospheric pollution, climatic changes, psychosomatic reactions, dietetic errors, and others, may play an aetiological part. In view of this uncertainty about aetiology it is difficult to dogmatize on therapy, and the use of tonsillectomy must be critically assessed.

Of all indications for tonsillectomy it is this group of "catarrhal" conditions that figures most prominently. But are we certain that this procedure really influences their course? This can be answered only by carrying out a planned clinical trial, but some insight into the natural history may be obtained by a follow-up of a group of children.

Over the past 10 years I have followed a group of 55 unselected children (born in 1946), and have recorded the frequency of these common respiratory conditions in each year. Fig. 3 shows the proportions of children who required medical attention each year.

Three phases are apparent. From birth up to 4 years there is a fairly constant level of incidence, around 40-50% of those at risk being seen. At 5-6 there is a marked peak, presumably associated with starting school. An equally remarkable fall occurs at 7-8, and it is this natural decline which should be appreciated, for it suggests that by this time the child has acquired an immunity to the infections or other agents that are responsible for the condition. Although these are the figures from a very small series

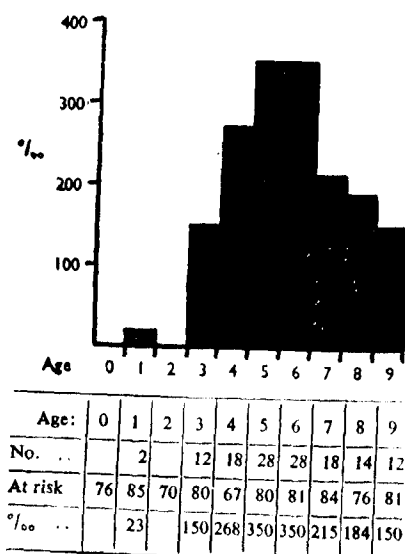


FIG. 2.—Age incidence (under 10 years) in a group of cases of acute tonsillitis.

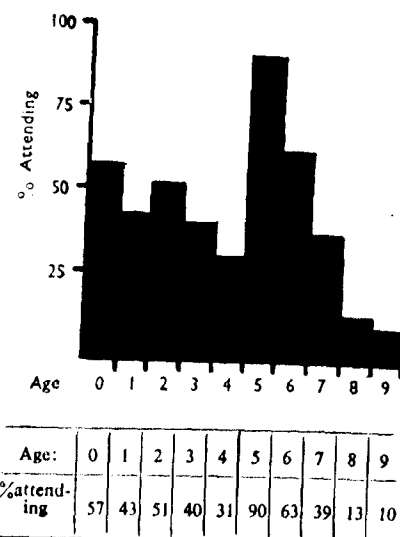


FIG. 3.—Age incidence of children under 10 years attending for upper respiratory tract infections, 1947-55.

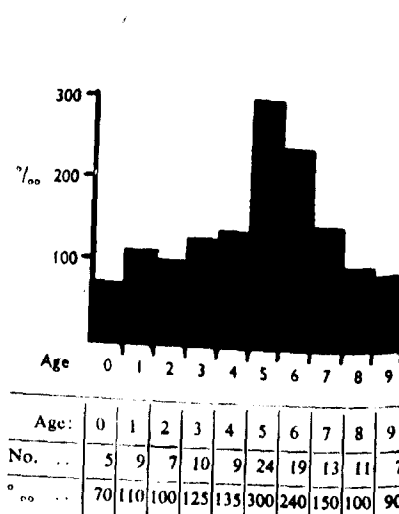


FIG. 4.—Age incidence of acute otitis media in children (under 10) in a consecutive series of 114 cases.

of cases from a single practice they are very suggestive of certain natural trends in these common conditions which account for 10% of the family doctor's work and for 25% of all attendances in a paediatric clinic (Kempton, 1954).

These patterns should be remembered whenever the question of treatment arises. When faced with parental pressure "to do something" we should seriously consider whether to advise conservatism and expectancy or to submit the child to a procedure which may not really influence the natural course. We should be grateful for the long waiting-lists and use them to reassess each child before operation to see if they have not "outgrown" their symptoms.

4. Recurrent Earache and Otitis Media

The third most frequent reason for tonsillectomy or adenoidectomy is a history of recurring bouts of earache with a red drum and with or without discharge. This condition of otitis media is a particularly common one in our children, and between the ages of 3 and 8 approximately one in four of all these children suffers from earache. Since it is one of the components of the syndrome of the catarrhal child it is not surprising that its epidemiological pattern is very similar, as can be seen from Fig. 4. Here again we see the moderate incidence under 5, a peak at 5-6, and then a progressive decline.

In addition to this natural tendency towards a spontaneous decline in incidence it is a definite fact that otitis media has itself changed in its severity over the past two decades. This change has probably come about as a result of the introduction of the antibiotics and sulphonamides, but there has also been a natural change, for in the majority of children the condition will now settle without any specific therapy and without any complications. For both of these reasons the decision to carry out removal of the tonsils and adenoids should be tempered with a considerable amount of thought. Even children with recurrent attacks accompanied by temporary deafness will eventually "grow out" of this, with no residual damage.

5. Enlarged Cervical Glands

Enlargement of the cervical lymphatic glands is quoted as an indication for tonsillectomy in most of the standard textbooks, but the fact that three out of four apparently normal children between 4 and 9 have palpable cervical glands should make us reconsider this. This latter figure was obtained by an examination of 100 consecutive children in my own practice who were not suffering from any respiratory tract infections and who were apparently quite fit and healthy. In 76 of these there were definite and palpable glands in their necks.

In my opinion such a normal finding should not serve as an indication for tonsillectomy, and it is probable that this enlargement is merely part of the physiological hypertrophy of lymphatic structures in the neck at this period.

6. Miscellaneous

"Tonsillectomy has at some time been recommended for almost every disease of children and for many conditions, such as mental retardation or enuresis, which can hardly be called diseases" (Gale, 1954).

The majority of these "diseases" are not now accepted as valid reasons for advising the operation, but there are two—focal sepsis and debility—which even now lead to the performance of a procedure for which there is little proof that it has any beneficial effects.

Comment

These, then, are the reasons for removing the tonsils and/or adenoids in some quarter of a million children in hospitals and private nursing-homes in Great Britain every year. From these figures it is estimated that one-third of children leave school minus these organs. Again we may ask whether all these operations are really necessary. In my opinion this figure is grossly excessive.

It is very difficult to lay down any definite criteria for their removal, because each medical practitioner has his own opinions to guide him, but I would like to quote my own experiences.

Over the past 10 years only 40 children in my own practice have had their tonsils or adenoids removed. This represents a rate of 5% of those at risk. Reviewing these cases, I find that there were three main reasons for the operation being carried out: recurrent otitis media in 24; recurrent attacks of tonsillitis in 10; and parental pressure that could not be resisted in 6.

What of the children who did not have the operation? A very large proportion of these passed through this catarrhal phase with its already well-known features and then emerged from it to develop along normal lines to enter healthy adolescence. None of these adolescent patients have residual deafness or aural discharge, none have recurring sore throats, none have chronic nasal catarrh, none have chest deformities or adenoid facies, none have defective speech. There have been no cases of rheumatic fever in my practice over the past 10 years and only one case of acute nephritis. In fact, I consider that I have a really healthy collection of children and young adults to care for in spite of their low rate of tonsillectomy. This is confirmed by the fact that the morbidity rates of my practice are no higher than those quoted in the reports of the General Register Office (1953, 1956).

If not by tonsillectomy, then how are these children to be managed? For there is no doubt that they need careful management. They should be treated expectantly in the knowledge that within a couple of winters or so they will be much improved whatever their treatment. If the child is in otherwise reasonable health then symptomatic treatment, with reassurance, explanation, and encouragement of the parents, is all that is necessary. Acute episodes of otitis media, tonsillitis, and chest infections should be treated as they occur, on their merits, with suitable specific antibacterial drugs when indicated, but many of these episodes will settle without these specific measures. In my experience these simple measures suffice to tide the children and their parents over this rather difficult phase, and there are no apparent risks of serious complications or permanent disabling after-effects.

Discussion

There is no doubt that tonsillectomy and adenoidectomy are useful and valuable procedures in properly selected cases, and the problem which concerns them is not whether they are of any use, but rather whether they are at present being abused.

It has already been stated that nearly a quarter of a million such operations are being performed every year in

our N.H.S. hospitals and that the tonsillectomy rate in our children is around one-third of those at risk. My own views are that these rates are excessive and could with proper selection be reduced by at least two-thirds with no serious consequences to the children in question. This would effect a national saving of £2,000,000 a year to the Health Service. If we are to carry out any reduction in this high rate we should first know the causes for it.

What are the underlying reasons for this high rate, or, in other words, what are the factors leading to the operation?

An important influencing factor is the geographical distribution. Alison Glover (1938, 1950) has shown that in England and Wales marked differences are apparent in the various areas. He compared the rates of tonsillectomy in elementary-school children in counties and boroughs in England and Wales in 1936 and 1948. It is astonishing how variable are these rates, varying by as much as twenty-fold. Thus, in 1936 a child living in Rutlandshire was nineteen times more likely to undergo tonsillectomy than one living in neighbouring Cambridgeshire. A child living in the Enfield area of London was twenty times more likely to have the operation than one in near-by Hornsey. A child living in Bexhill and enjoying the full benefits of its climatic advantages was seen to be twenty-seven times more likely to be submitted to an operation than one living in northerly Birkenhead. Similarly, in 1948 a child from Eastbourne or East Ham was more than ten times as likely to be operated on than one from Manchester or Reading.

These differences were in no way related to climatic conditions—areas with the highest and the lowest rates were often neighbours. Nor were they related to the efficiency of the school dental services, nutrition, overcrowding, unemployment, or poverty. Urbanization, which might have been considered a factor, was rather ruled out by the fact that some of the highest rates occurred in certain agricultural counties and in boroughs which are health resorts famed for their beauty, climate, and spaciousness.

There seems to be one paramount factor in all these—the local medical opinion. It seems that where and when the local medical opinions were that tonsils and adenoids were harmful in schoolchildren, and a hindrance and a nuisance, then we had approximately 65% of elementary-school children in Eastbourne and East Ham having these structures removed during their school life (from 5 to 15), according to the figures of 1948; where the reverse opinions held sway, only 5% were so treated in Manchester and Reading (Glover, 1950).

Although the social incidence of tonsillitis and "catarrhal children" seems common to all classes of society, the incidence of tonsillectomy is at least three times greater in the children of the well-to-do (Glover, 1938). Thus Glover estimated that, whereas in 1936 some 20% of elementary-school children had been tonsillectomized by the age of 14, at one of our "famous boys' public schools" between 75 and 83% had already had their tonsils removed before entry at the age of 13-14. Other figures for public schools of 50-70% (boys) and 42-63% (girls) were quoted in a report of the Medical Research Council (1938).

If we assume that the incidence of the conditions for which tonsillectomy is carried out is similar in the various social classes, then the only explanation for these differences is that, by reason of parental pressure and anxieties, and because of different medical opinions and advice, the children of the upper classes are the more unfortunate.

Of course the major factor responsible for the high rate of tonsillectomy is the very nature of the conditions for which it is undertaken. These have already been discussed in the section dealing with the indications. They are not conditions which are dangerous to life, but are irritating, trying, and demoralizing for the child, the family, the school, and the family doctor. They are both persistent and recurrent. They produce worrying signs and symptoms, and there is little apparent response to simple therapeutic measures. The parents become more anxious; grandparents, uncles, aunts, and neighbours remark that "surely

something can be done for poor little Willy"; the schoolmistress adds to parental worries by remarking on the lack of scholastic progress; and the family doctor despairs because of the lack of the response to his treatments and refers the unhappy child to an F.N.T. surgeon, possibly with a suggestion that tonsillectomy is necessary.

The surgeon-specialist is in a quandary. What has he to offer? The family doctor has already tried the usual remedies without any success and the parents are becoming desperate. He has two possible lines of action. He can decide that there are no real indications for removing the tonsils and attempt to explain and reassure the parents that all will eventually be well; or he may take the line of least resistance and agree to place the child on the waiting-list for the operation. The demand for something to be done is acceded to and the train is set in motion. Next comes the long wait. The length of the waiting-lists for tonsillectomy varies all over the country from six months to over two years. The child who is usually 5 or 6 when referred to hospital will be that much older when admitted, and quite likely free of symptoms. Should he still be routinely operated upon? I think not. All patients should be individually reassessed before being operated upon, and if found to be improving or symptom-free operation should not be proceeded with. Even if symptoms are still present subsequent improvement cannot be directly attributed to the operation, for, as Illingworth (1950) stated, "a child is older after the operation than before, and the fact that he improves is no proof that the improvement is due to the operation."

A further suggestive feature that patience might be rewarded by a spontaneous resolution is a comparison of the data given by Glover (1938) for the age incidence of the operations and the age incidence of tonsillitis in my own practice (Fig. 5). These show an amazing correspondence, and it is very suggestive to conclude that after the age of 7-8 few children will need tonsillectomy and that if we wait long enough they will get well and "grow out of it."

What of the reported results of the operation? Are they really so worth while in the treatment of the conditions for which they are advised? Obviously the fact that nearly a quarter of a million children are operated on each year suggests that the outcome is satisfactory, but is there any real scientific proof or are we jumping to conclusions without any proper controlled surveys?

There is little evidence of any properly controlled clinical trial in all the voluminous literature on this subject. There are many reports producing evidence for the pros and the cons.

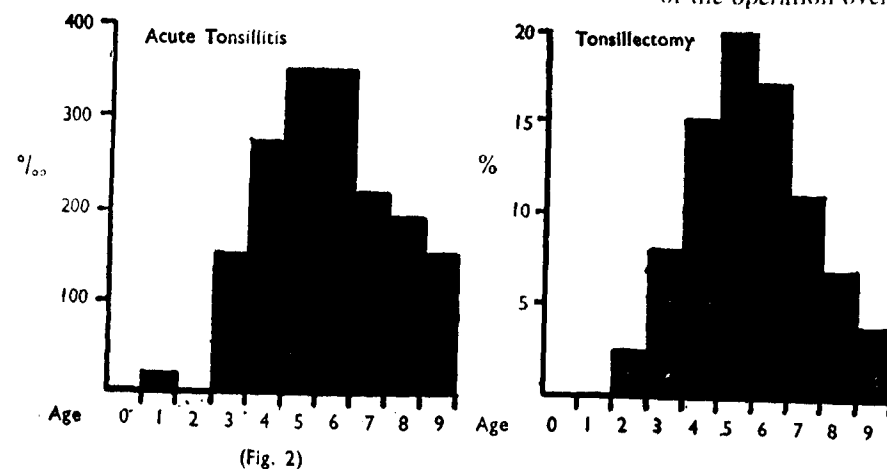


Fig. 5.—Comparison of age incidence of acute tonsillitis (Fig. 2) with age incidence of tonsillectomy (Glover, 1938).

Hadfield (1950) and Walker (1953) report benefits from the operation, but as their assessments are based on parents' opinions it is difficult to accept them. Kaiser (1930, 1940) in a 10-year follow-up of 4,000 children, half of whom had had their tonsils removed, and the other half had not, found that whilst early results seemed to indicate some benefits these were not apparent at the end of 10 years.

An appreciable number of reports find no obvious benefits from the procedure (Glover, 1938; Medical Research Council, 1938; Paton, 1943; Mertz, 1954).

Dingle and his associates, in their Cleveland families study (McCorkle *et al.*, 1955), report that in a long and continuous study of 230 children there were no differences in the attack rates and loss of school time for the common respiratory disorders in those children with their tonsils intact and those who had had their tonsils removed.

Conclusions

The aims of this intentionally provocative paper are to set the spotlight once again on this "tonsil and adenoid problem," and to try to stimulate some further thoughts on the matter in all those who are concerned with the medical care of our children—particularly family doctors, school medical officers, paediatricians, and ear, nose, and throat surgeons.

The operation is unquestionably of real value in a small proportion of children, but that it is really so necessary that almost a quarter of a million patients should have to have their tonsils removed every year—a rate of one in three of our population—seems unbelievable. Or is it merely a fashionable and misguided procedure carried out in a desperate attempt to treat a normal phase of child development which, it is suggested, will naturally and spontaneously subside and disappear in the course of two to three years? The problem might be solved by carrying out a planned clinical trial, but this presents great practical and ethical difficulties. Nevertheless it is necessary to obtain an answer. In the meantime we should give this matter serious thought, assess each child carefully, and have greater moral and clinical courage in the knowledge that the great majority of children will "grow out of" their common respiratory infections around the ages of 7-8 without any harmful effects.

Summary

An attempt is made to focus attention once again on "the problem of tonsils and adenoids," and to examine critically the reasons and indications for the high rates of the operation over the past three decades.

The popularity of the operation has been a major medical phenomenon of this century, reaching a peak in the early 'thirties, when some 50-75% of all children were being operated on, and showing no real fall at the present time, when some 33% of children are having their tonsils and adenoids removed. In 1954, 226,211 persons were admitted to N.H.S. hospitals in England and Wales for this operation. This costs the nation approximately £3 million each year. In paediatric units between one in four and one in six of all admissions are for this purpose. The operation has its risks, and some 40 deaths occur each year from its performance.

The accepted indications for the operation are critically assessed in the light of the natural course of many of the conditions for which it is carried out. My records from a South-east London suburban practice suggest that there is a tendency towards a natural and spontaneous "cure" of the common respiratory infections of children at the age of 7-8, including tonsillitis, otitis media, and bronchitis, which are the major indications for the operation. The size and appearance of the tonsils, enlargement of the cervical glands, focal sepsis, and debility should not in themselves be factors indicating removal.

During the past 10 years I have referred only 40 children for removal of tonsils and/or adenoids—a rate of 5% for the child population at risk. This figure is much lower than the national average of 33%, but in spite of this it has not resulted in any apparent harmful effects to the children in question. These "catarrhal children" and their parents require careful management during a phase of child development which is so common in this country as to be a normal feature in children between 3 and 7 years of age.

An examination of the reasons for the high rates of tonsillectomy shows marked geographical and social differences. Neighbouring areas show rates which differ twentyfold. Children attending public schools (upper social groups) show a much higher rate than those attending the old elementary schools (lower social groups). Reported results of the operation are by no means in agreement concerning its benefits.

A plea is made for a more rational approach to the problem, an approach which should take into account the fact that the "catarrhal stage" in young children is a relatively normal one which the vast majority of our children will "grow out of" at 7-8. Each child should be carefully and conservatively assessed when referred for this operation, and this reassessment should be repeated at the end of the long waiting period before admission to hospital, and if the child is improving or is free of symptoms the operation should not be proceeded with.

I wish to thank Dr. G. E. Godber, of the Ministry of Health, and Dr. P. Henderson, of the Ministry of Education, for supplying some of the data, and Mrs. K. Sabel.

REFERENCES

- Boies, L. R. (1948). *Ann. Otol. (St. Louis)*, 57, 354.
- Burke, J. B. (1956). *British Medical Journal*, 1, 538.
- Carne, S. (1956). *Ibid.*, 2, 19.
- Denzer, B. S., and Felshin, G. (1943). *J. Pediat.*, 22, 239.
- Epstein, I. M. (1937). *Amer. J. Dis. Child.*, 53, 1503.
- Gale, A. H. (1954). *Refresher Course for General Practitioners*, 2, 21. B.M.A., London.
- General Register Office (1953). *General Practitioners' Records*. H.M.S.O., London.
- (1956). *Ibid.*
- Glover, J. A. (1938). *Proc. roy. Soc. Med.*, 31, 1219.
- (1950). *Monthly Bull. Minist. Hlth (Lond.)*, 9, 62.
- (1950). *Proc. roy. Soc. Med.*, 43, 327.
- Hadfield, E. H. (1950). *Ibid.*, 43, 117.
- Illingworth, R. S. (1950). *Ibid.*, 43, 117.
- Kaiser, A. D. (1930). *J. Amer. med. Ass.*, 95, 837.
- (1940). *Ibid.*, 115, 1151.
- Kempton, J. J. (1954). *Refresher Course for General Practitioners*, 2, 344. B.M.A., London.
- McCorkle, L. P., Hodges, R. G., Badger, G. F., Dingle, J. H., and Jordan, W. S. (1955). *New Engl. J. Med.*, 252, 1066.
- Mertz, J. C. (1954). *Milbank mem. Fd Quart.*, 32, 5.
- Medical Research Council (1938). *Spec. Rep. Ser.*, No. 227. H.M.S.O., London.
- Ministry of Health (1955). *Annual Report for 1954*. H.M.S.O., London.
- Paton, J. H. P. (1943). *Quart. J. Med.*, 12, 119.
- Spence, J., and Taylor, M. D. (1954). *Lancet*, 1, 719.
- Walker, J. S. (1953). *A.M.A. Arch. Otolaryng.*, 57, 664.

ANTIBIOTICS AND HOST RESISTANCE*

BY

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During the past twenty years our approach to the treatment of infections has been radically altered by the pre-eminence of powerful antibacterial drugs, which alone enable us to control infections with but few exceptions and regardless of the part played by the patient's own defences. Although modern antibiotics might be expected to control all infections by micro-organisms shown to be susceptible in the laboratory, in practice they do not consistently do so. There are many cases, particularly in infancy and old age, where the expected response does not occur. The causes for these therapeutic failures are various, and not least amongst them is inadequacy of host defence due either to immaturity or to impairment and disturbance of the host-parasite relationship. While the inhibitory action of the antibiotic on invading bacteria can be readily measured and used as a guide to treatment, there is no such direct method of estimating the lethal action of the host defence, which can only be estimated roughly on clinical impressions.

Even with optimal antibiotic therapy the ultimate eradication of the invading micro-organism and the resolution of pathological changes depend upon effective host reaction.

The efficiency of antibiotic therapy has now reached a pitch where further improvement in results must be sought by reconsidering this important and decisive aspect of infection. Its importance is reflected in the mortality figures for pneumonia and meningococcal meningitis, to take two examples. Since 1934 a remarkable fall in the mortality from pneumonia (Fig. 1) has taken place in children and young adults

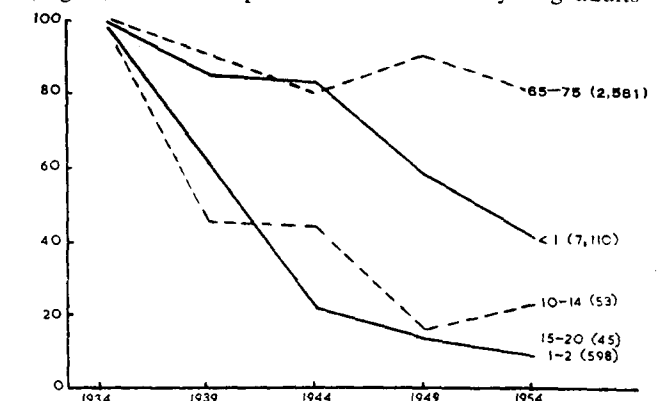


Fig. 1.—Number of deaths from pneumonia per 100 deaths in 1934 for those aged <1, 1-2, 10-14, 15-20, and 65-75 years. Number of deaths per million living is shown in parentheses.

which contrasts sharply with that in the aged and very young. The relative and absolute numbers dying at the extremes of life remain disproportionately high, although presumably treatment is similar.

Of infants under the age of 1 year the number dying in 1954 was 7,110 per million living, and thus exceeded the total deaths for all years up to the age of 75 and was about a hundred times as great as for those aged 4-5

*Read in the Section of Child Health at the Annual Meeting of the British Medical Association, Brighton, 1956.

years. The possible causes are many, but only those which are relevant can be considered here. For example, opportunities for infection and the virulence of invading micro-organisms, which vary in the different age groups, cannot alone account for this discrepancy, though they may play a secondary part. One must conclude from the figures that there is some quality of the infant inherent in its size or ability to react to infection which accounts for the poor response to antibiotic therapy.

In meningococcal meningitis there has been a relative deterioration in the results of treatment of children under the age of 3, since the broad-spectrum antibiotics have become generally available (Fig. 2). This distur-

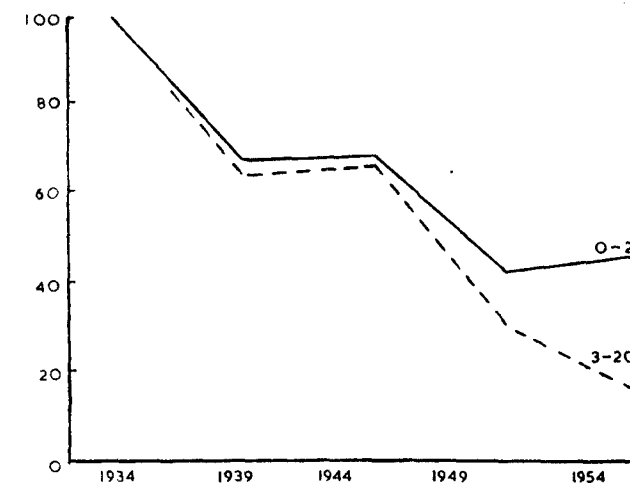


Fig. 2.—Number of deaths from meningococcal infections per 100 deaths in 1934 for those aged 0-2 and 3-20 years.

ing trend, which is doubtless due in many instances to masking of the early symptoms by suboptimal therapy (Ounsted, 1955), also serves to illustrate the special vulnerability of the very young.

The Infant's Response to Infection

Our understanding of the defence mechanisms of the infant and the ways in which they differ from those of adults is far from complete. The information available provides evidence, however, which suggests that the infant's reaction to infection is immature and relatively inefficient to an extent which may account for the poor response to treatment.

Among the studies of the cellular responses that of Matoth (1952) is relevant in that he was able to show differences in capacity for phagocytosis and amoeboid activity between the leucocytes of newborn infants and those of maternal controls. In the performance of phagocytosis infants' cells were, under experimental conditions, only 30-50% as efficient as those of the controls.

Further indirect evidence of immaturity is provided by the character of the infant's leucocytic response, which is a remarkably variable and labile phenomenon ranging from an extravagant leucocytosis with the outpouring of many immature cells to one so small that it can hardly be detected.

Whether this implies deficiency in quality or quantity of effective phagocytes is uncertain, but there may be some support for the old teaching which maintains that failure to show a leucocytosis indicates a poor prognosis.

Although the cellular response is normally of first importance in the immediate reaction to acute infection, the humoral defences act prophylactically and curatively in the later stages of infection. During the first weeks of life the humoral defences depend upon passive transfer of antibodies from the mother's serum. At birth the titre in the infant's blood is as high as, and sometimes higher than, that in the mother's blood, but falls steadily to very low levels during

the first six months (Fig. 3). Towards the end of this time active antibody is increasing and takes over the responsibility for humoral defence.

At best, transferred immunity is inferior to acquired immunity in that it does not confer the ability to react anamnistically with the enhanced speed and intensity which is found in association with active antibody. Thus an

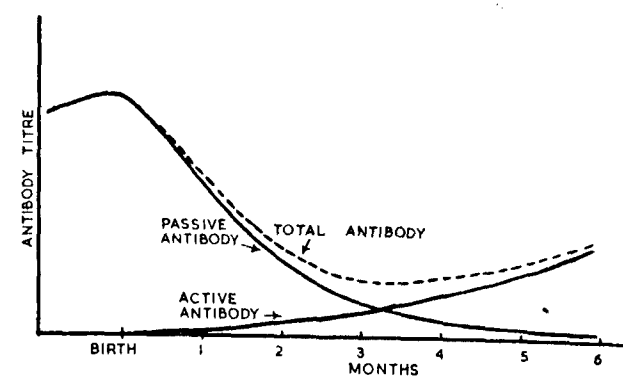


Fig. 3.—Antibody titre from birth to 6 months.

apparently sufficient concentration of antibody may not confer a commensurate ability to react with the vigour necessary to control the infection.

Circulating passive antibody may, on the other hand, actually depress the formation of active antibody produced in response to an initial stimulus—a phenomenon which is related directly to the height of the titre of passive antibody and inversely to the potency of the antigen (Osborn *et al.*, 1952b).

Passive antibody has, however, the advantage of possessing a broad antibacterial spectrum by virtue of its origin in an adult of wide experience. It can thus provide protection against micro-organisms which the infant has had no opportunity of contacting. When this antibody disappears around the sixth month of life the infant's protection depends on his own antibodies, and these are necessarily limited by the extent of his experience of bacteria. Nevertheless he will, more or less rapidly, acquire these antibodies during the next few years, and, concurrently, second and subsequent infections will boost the titres of antibodies already present, resulting in an immunity which is progressively widening in range and increasing in efficiency.

Even at the age of entering school some children, particularly those who have had little social contact, still lack resistance to the newly encountered infections; as the lack of immunity is only partial, the consequences are seldom serious, and consist usually of an inability to throw off mild respiratory infections, whereas in a small baby, in whom immunity may be virtually absent, the outcome may be a serious systemic infection.

The capacity to produce antibody appears to be fully developed by the age of 2 months, though before this age, as Osborn *et al.* (1952a) have shown, there is a significant delay before detectable antibody appears and the final concentration is low, even in the absence of any depressive action by passive antibody (Fig. 4).

In man the majority of antibodies are associated with the gamma-globulin fraction of the serum proteins, and it is therefore interesting that the amount of gamma-globulin in the serum of infants is low by adult standards. Whether it is merely an incidental finding associated with their normal hypoglobulinaemia or whether it is due to lack of antigenic stimulation and antibody formation has not been determined. Although the hypoglobulinaemia is associated with low resistance to infection, its precise significance and causal relationships are undetermined. The fact that administration of gamma-globulin, given as a prophylactic measure to the newborn and to older children suffering from the effects of agammaglobulinaemia, is protective

does not constitute proof that the normal hypoglobulinaemia is the only or indeed major factor in defence against infection.

Whatever its exact place in the complexities of defence it is nevertheless another link of doubtful strength in the infant's protective screen.

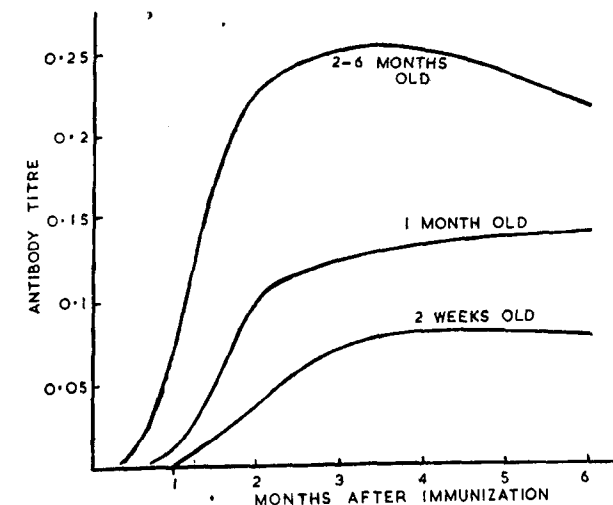


Fig. 4.—Antibody titre during six months after immunization (modified from Osborn *et al.*, 1952b).

Supportive Measures

Individually the inadequacies which have been outlined may be insignificant, but cumulatively their potential effect is great. In spite of the gaps in our knowledge it is not difficult to see the probable causes for the infant's great susceptibility to non-pathogenic micro-organisms and also his inability to localize and eradicate them. Furthermore, it is important to bear in mind the depressive influence which disturbances of internal environment exert on resistance. Among such conditions, malnutrition, dehydration, vitamin deficiencies, and imbalance of the tissue electrolytes, which may develop with great rapidity during infections, must be prevented or corrected not only because of their direct influence on prognosis. When the defects of the infant's defences are appreciated, it is possible to see more clearly what qualities in the antibiotic and what modifications in regime are required to compensate for the deficiencies. The measures which we can apply may be divided broadly into those which act by supporting and augmenting host resistance and those which act by directly inhibiting the invading micro-organism. Of the agents employed specifically to augment host resistance, antisera, fresh blood, and gamma-globulin are well established, though perhaps not employed as often as they should be.

In recent years cortisone and corticotrophin have acquired an important place in the treatment of certain severe infections—apart from their purely endocrine use in the management of the Waterhouse-Friderichsen syndrome—by virtue of their influence on the tissue's reactions to infection. They also diminish the undesirable effects of toxæmia by bringing about a fall in temperature, increase in appetite, and sense of well-being, so preventing to some extent the harmful effects of metabolic disturbance. In fulminating infections, and particularly in those associated with collapse, their timely administration may indeed be life-saving.

Their anti-inflammatory effect is utilized to prevent serious complications of inflammation such as spinal block in bacterial meningitis and adhesions following peritonitis, and to prevent raised tension within the bone in osteomyelitis. In normal dosage there is little risk of interfering with phagocytosis or antibody formation or of causing deleterious metabolic disturbance (Montgomery *et al.*, 1955).

The last but not the least important feature of infection in the very young, which must be mentioned because it is so often overlooked, is the special difficulty of securing free drainage. The small calibre of the passages, be they bronchial, nasal, or meningeal, retards the flow of viscous exudate and converts them to the state of undrained abscesses, so that the best chemotherapy is likely to end in failure if free drainage is not secured. In respiratory infections, for instance, postural drainage, tipping, aspiration, or even tracheotomy and aspiration are just as essential to recovery as surgical drainage in the case of an abscess cavity or relief of obstruction in the urinary tract.

Antibacterial Measures

The preceding observations on the host-parasite relationship in infants and its influence on the course of infections provide the rationale for certain modifications in antibiotic therapy. In infancy the lack of ability to eradicate the organism makes it necessary to employ an agent which is completely effective—that is, bactericidal—without assistance from the cellular or humoral defences. The uninhibited multiplication of organisms and their rapid spread make it particularly important to use an antibiotic which can be brought into effective action with the least delay and which is little influenced by the size of the bacterial population.

It is necessary to state here that these considerations do not override the sensitivity of the micro-organism, which remains the most important guide in choosing the correct antibiotic.

If these features are considered in more detail it becomes apparent that the antibiotics which are bactericidal in low concentration—namely, penicillin, streptomycin, polymyxin, and erythromycin—have advantages over the broad-spectrum antibiotics which are bacteriostatic in usual concentrations.

The speed with which the organism can be inhibited is subject to several variable factors. In the first place it depends upon the time taken for absorption from the gastrointestinal tract or site of injection and diffusion to the focus of infection.

For this reason, and in order to avoid delay through vomiting or refusal of the initial doses, it is often preferable in a potentially serious infection to ensure absorption by giving the first dose by injection. Injection of the first dose

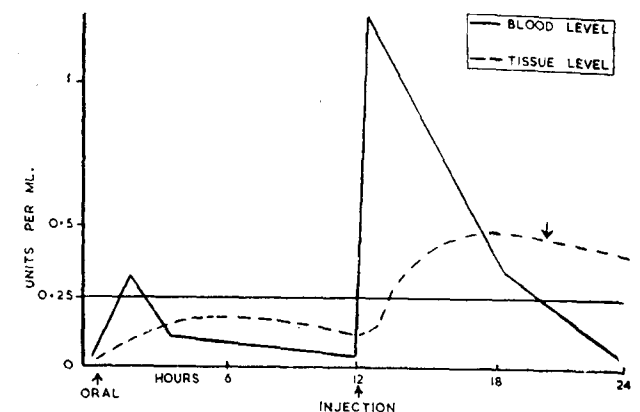


Fig. 5.—Blood and tissue concentrations of penicillin after single oral and intramuscular doses.

may save an hour or more in the time required to establish therapeutic levels in the blood, and, what is more important, many hours in producing similar concentrations in the tissues (Fig. 5). In most instances, as infection is in the tissues, it is the concentration in the tissues, not that in the blood, which determines the concentration bathing the organism. The rate of diffusion into the various organs and the ultimate concentration attained therein vary, broadly speaking, with their vascularity. Levels always fluctuate less in the tissues than in the blood stream; and in the relatively

avascular structures such as brain and bone the final concentration remains much lower than that in the blood. For the treatment of tissue infections, therefore, higher but less frequent dosage is therapeutically sound and, when involving repeated injections, more convenient. In this connexion it is interesting that a single large intramuscular dose of penicillin sodium is as effective as depot penicillin continued over five days in reducing the size of an abscess. In practice this principle has been successfully applied to the treatment of throat infections by a single injection (MacKeith, 1955).

Even when adequate concentrations have been obtained in contact with the organism there is an interval before inhibition begins. This interval may be as long as six hours, and varies to some extent with the type of antibiotic, but especially with the size of the bacterial population, as Hobby *et al.* (1950) have demonstrated in the case of oxytetracycline. This finding provides another reason for checking infection in its earliest stages while the number of organisms is still small and is consequently of greatest potential significance in infancy, when bacterial multiplication is unchecked and rapid.

Inability to complete the process of bacterial eradication may also result in undesirable consequences when antibiotic therapy is discontinued. Not infrequently there is a recrudescence of infection with either clinical and bacteriological relapse or the development of a low-grade chronic infection. In my experience this has been more common following the use of bacteriostatic agents, but it is uncertain whether it is due to their mode of action or to the convenience of administration and consequent laxity in prescribing. Whichever is the true reason, the fact that cure is not obtained emphasizes the need for a bactericidal agent, and, if bacteriostatic antibiotics are employed, to avoid sub-optimal dosage or to continue therapy, as in pertussis, typhoid, and urinary infections, for periods of 14 days or more. By this means one hopes to suppress the organism until such time as the host's defensive processes can reach an effective pitch.

Toxicity

The last aspect of antibiotic therapy which has a particular importance in infancy is the hazard of toxic and harmful side-effects. They are to be avoided not only on account of their intrinsic danger but because the additional burden may further depress the infant's resistance and swing the balance in favour of the parasite.

Chief of these, on the grounds of incidence and severity, is the risk of superinfection by insensitive micro-organisms. Virtually any disturbance of the normal bacterial equilibrium may cause serious illness in small babies, particularly when the flora of the gastro-intestinal tract is affected.

The broad-spectrum antibiotics, suppressing nearly all the natural flora, not only cause a profound disturbance but also lay the field open for invasion by organisms such as monilia, *Ps. pyocaneae*, and proteus, which are notoriously resistant to treatment. Superinfection, complicating treatment by narrow-spectrum antibiotics, is usually less troublesome, as the micro-organism will be amenable to treatment by another antibiotic.

The organisms associated with superinfection, with the notable exception of oxytetracycline-resistant staphylococci, are generally of low virulence in the presence of normal host resistance. To a small baby, on the other hand, they may be highly virulent, causing serious or even fatal illness. The rising incidence of meningitis due to two such organisms (namely, *pyocyanea* and proteus) is, as Alexander (1952) has pointed out, a consequence of the use of broad-spectrum antibiotics—which may perhaps become more common—and serves to emphasize the danger.

The second toxic action of antibiotics worthy of attention is that associated with their direct action on cell growth. Antibiotics differ from poisons such as arsenicals by exerting their lethal action against a limited range of living organisms: the wider their range the closer do they approximate

to the general protoplasmic poisons and the smaller is the margin between therapeutic and toxic concentrations.

The concentrations required to cause injury to human cells, under experimental conditions (see Table), are lower with the broad-spectrum antibiotics than with narrow-

Concentrations Required to Inhibit Growth of Human Skin Tissue Cultures

	Least Injurious Dose ($\mu\text{g./ml.}$)	Minimal Inhibitory Dose ($\mu\text{g./ml.}$)
Penicillin sodium	1,250–2,500	2,000–10,000
Streptomycin	210–415	2,220–6,665
Polymyxin B	105–210	830–1,665
Chloramphenicol	135–275	555–830
Chlortetracycline	105–210	830–1,250
Oxytetracycline	25–50	100–200

spectrum antibiotics. Similar findings are also reported by Cruickshank and Lowbury (1952). Lépine *et al.* (1950), using explants of chick-embryo lung, found that lower concentrations of chlortetracycline were inhibitory; a difference which might be attributable to the greater rate of growth, for it is known that rapidly dividing cells are more vulnerable to inhibitory influences.

While the evidence is by no means conclusive it is possible that the margin of safety with, for instance, oxytetracycline may be narrower in the case of newborn or premature babies than is generally realized. That this is not merely a point of theoretical interest is emphasized by the photograph (Fig. 6) of an indolent ulcer at the site of a subcutaneous infusion in a neonate who received chlortetracycline and chloramphenicol for 10 days. Microscopical examination of sections from the margin of the ulcer showed



FIG. 6.—Indolent ulcer at site of subcutaneous infusion in a neonate.

complete absence of any inflammatory reaction, yet within three days of withholding treatment healing became apparent. It is therefore not unreasonable to assume that minor degrees of depression can also occur and perhaps pass unnoticed.

For small infants correct dosage, neither so high as to cause toxicity nor so low as to be suboptimal, is a matter of greater importance than at other ages, when considerable latitude is normally harmless.

Discussion

From the foregoing it is apparent that the infant's imperfect reaction to infection can best be countered, so far as antibiotic therapy is concerned, by employing a bactericidal in preference to a bacteriostatic agent, and a narrow-spectrum in preference to a broad-spectrum antibiotic whenever bacteriological sensitivities permit. Of critical importance are early diagnosis and the speed with which inhibitory concentrations can be obtained in contact with micro-organisms and not merely in the blood stream.

The infant's susceptibility to certain toxic effects which are seen most commonly and in severest form with the broad-spectrum antibiotics must always be considered when deciding upon the most suitable antibiotic. In order to reduce to the minimum the number of babies receiving broad-spectrum antibiotics when narrow-spectrum antibiotics would be as effective, the administration of broad-spectrum antibiotics should be limited to cases which fall into one of the following categories: (1) when the infecting organism is insensitive to bactericidal antibiotics; (2) where temporary cover is necessary while awaiting the bacteriological diagnosis; and (3) when the bacteriological investigations have failed to demonstrate a pathogenic organism, and the nature of the causative organism remains obscure.

The modifications in antibiotic therapy which the conditions of infancy dictate may not in themselves seem great. They do, however, demand of the physician greater attention to exact bacteriological diagnosis, greater care in the choice of drug and dosage, and the avoidance of delay in bringing effective treatment to bear. They may also involve some inconvenience in that injections are more often required. Nevertheless, it is by such means that improvement in the present mortality figures must be sought.

Whatever the extent of the progress that can be brought about by these means there is little doubt that great progress could be achieved if we had the knowledge and ability to raise the efficiency of host resistance in infancy.

Summary

Successful treatment of infections with the aid of modern antibacterial drugs depends *inter alia* upon healthy host resistance. When host resistance is depressed to any great extent the therapeutic effect of antibacterial agents may be nullified and the clinical response unsatisfactory.

In contrast to the state in old age, or resulting from prolonged illness or cortisone therapy, poor resistance in infancy is primarily a manifestation of the immaturity of the various defensive mechanisms, rather than a depression of previously normal resistance. Characteristically, the phagocytic ability of the leucocytes of infants is less than that of the cells of adults. The antibody response may be slow and incomplete through lack of previous stimulation, and may also be affected by the presence of circulating maternal antibody. It is, moreover, usual to find the response delayed and incomplete, even in normal infants below the age of 2 months. After this age the level of the gamma-globulin in the serum is still abnormally low and may well exert an adverse influence on defence, though at present the exact significance of this finding is uncertain.

Taken together, these deficiencies go much of the way to explain the inability of infants to limit spread of infection and to bring about the ultimate destruction and eradication of the invading micro-organisms. The rapid dissemination of bacteria throughout the body makes prompt control a point of special and often decisive therapeutic importance, which must be taken into account when deciding upon the most advantageous method and route of administration. The infants' poor killing power that permits bacteria suppressed by bacteriostatic agents to remain viable makes it necessary to employ antibiotics which are themselves actively bactericidal.

When treating infections of infants the physician has a greater responsibility to prevent further impairment of host resistance resulting from additional stresses such as metabolic disturbance, superinfection, or direct toxicity of the antibiotic on tissue cells. In this respect narrow-spectrum antibiotics are usually less injurious

and therefore safer in practice than those whose spectrum is wide. It follows that the best antibiotics for use in infancy are those like penicillin, which combine narrow antibacterial range and bactericidal action. Not only is the need for discrimination in selecting the correct antibiotic more pressing but also the more serious consequences, particularly those due to suboptimal dosage, make care and accuracy in prescribing of greater and more decisive importance in infancy than at any other age.

REFERENCES

- Alexander, H. E. (1952). *Advanc. Pediatr.*, 5, 14.
Cruickshank, C. N. D., and Lowbury, E. J. L. (1952). *British Medical Journal*, 2, 1070.
Hobby, G. L., Lenert, T. F., Pikula, D., Kiseluk, M., and Hudders, M. E. (1950). *Ann. N.Y. Acad. Sci.*, 53, 266.
Kinsell, L. W. (1954-5). *Antibiotics Annual*, p. 51.
Lépine, P., Barski, G., and Maurin, J. (1950). *Proc. Soc. exp. Biol. (N.Y.)*, 73, 252.
MacKeith, R. (1955). *Practitioner*, 175, 692.
Matoth, Y. (1952). *Pediatrics*, 9, 748.
Montgomery, M. M., Benedek, T. G., and Poske, R. M. (1955). *Med. clin. N. Amer.*, 39, 81.
Osborn, J. J., Dancis, J., and Julia, J. F. (1952a). *Pediatrics*, 9, 736.
— (1952b). *Ibid.*, 10, 328.
Ounsted, C. (1955). *Lancet*, 2, 303.

LYMPHATIC CIRCULATION STUDIED WITH RADIOACTIVE PLASMA PROTEIN

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In this investigation plasma protein labelled with radioactive iodine (^{131}I) (R.P.P.) has been used to study the lymphatic circulation in normal subjects and in patients suffering from lymphoedema.

Three questions were considered. (1) Are extra-vascular protein molecules removed solely by the lymphatics or does absorption by the blood capillaries occur? (2) Does the absorption of protein from the subcutaneous tissues of lymphoedematous patients differ from that in normal subjects? (3) Could the removal rate of R.P.P. from the subcutaneous tissues be used as a test of lymphatic function in clinical practice?

Six normal subjects and ten patients suffering from lymphoedema were investigated. Similar determinations were made in normal rabbits and in rabbits with a limb rendered oedematous by acute lymphatic transection (Reichert, 1926). In addition, the clearance rate of crystalline solution iodide (^{131}I) from the subcutaneous tissues was determined in some patients and animals.

Experimental Method

The method of Wormall, Francis, and Mulligan (1951) was used to prepare R.P.P. solutions of high specific activity by labelling human or rabbit autogenous serum protein with radioactive iodine (^{131}I). Small volumes of solutions

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and radio-iodine of high specific activity were used so as to give a final preparation of 1 to 2 ml. of 2% protein solution containing 0.5 to 1 millicurie of ^{131}I per ml. ^{131}I in the form of iodide was removed by dialysis with normal saline, changed every half-hour, and mechanically stirred. To reduce bacterial activity during this part of the preparation the dialysis was carried out in a refrigerator. The preparation was then sterilized by filtration through an M.S.E. centrifugal Seitz filter and tested bacteriologically before use.

Injections and Observations in Human Subjects

The R.P.P. solution was injected subcutaneously into the limbs of the patients and normal subjects. It was considered important to keep the volume of R.P.P. injected as small as possible in order to minimize disturbance of tissue tension, and usually 0.1 ml., containing about 100 microcuries of ^{131}I , was used. When the specific activity of the R.P.P. was low and a larger volume had to be used, several injection sites were employed, close enough together to be regarded as a single site for counting purposes. No more than 0.1 ml. of R.P.P. solution was injected at any one site.

In the early stage of this investigation the counting rates over the areas surrounding the injection site were observed with a shielded Geiger counter of small aperture held in contact with the skin. Although this method demonstrated well the local diffusion of R.P.P. around the injection site, it was unable to separate the effect of local diffusion into the tissues from that of actual removal from the limb. For this reason it was necessary to discard the results of local counting obtained in the first seven patients. In the last three patients to be investigated and in six normal subjects this difficulty was overcome by using a counter of larger aperture, held at a distance of 22 cm. from the skin.

The arrival of R.P.P. in the blood was estimated in five patients and four normal subjects by taking 3-ml. samples of venous blood from an arm vein. Frequent specimens were obtained during the first 12 hours and sampling was continued at intervals for seven days. The radioactivity of each blood sample was measured by plating 1 ml. into 1-in. (2.5-cm.) planchettes and counting with an end-window Geiger counter in a lead castle. The diagnosis in four of the patients in this group was lymphoedema praecox of the legs. The remaining patient had an oedematous arm following invasion of the axillary nodes by carcinoma of the breast. One patient had unilateral oedema, and her normal leg was also studied and included in the normal control group.

Injections and Observations on Rabbits

Two groups of animals were used—transected and normal. In the transected animals a soft-tissue transection of the thigh, except for the main blood vessels, was carried out before the R.P.P. injections. In these animals the R.P.P. was injected under the skin of the paw of the transected leg.

Counting over the injection site was done using a small unshielded Geiger counter in a thin brass case. The counter was held in a wooden jig so that its axis lay about 2 cm. from the skin and parallel to the paw.

Blood specimens were obtained by means of a "polythene" tube inserted in the superior vena cava via the jugular vein. 1 ml. of each blood specimen was placed on a planchette, dried, and assayed in the same way as the human blood.

The completeness of the lymphatic division was tested by injection of patent blue (Kinmonth, 1952) when the transection was performed and also at the end of the investigation.

Experimental Results in Human Subjects

Results of Local Counting over the Injection Site

The observations with the small-aperture counter, after correction for natural background and the physical decay of the radioactive material, and after an approximate correction for the imperfect collimation of the counter, were used to

plot contours of equal activity. These results indicated in a general way the diffusion of the injected R.P.P. through the tissue. It was found that the size of the diffusion area after a given time was greater in the more oedematous limbs. It is also of interest to note that in all cases of lymphoedema the point of maximum activity gravitated appreciably towards the most dependent part. This movement was usually smaller in normal legs.

With this counting technique, however, it was found that the true removal of R.P.P. from limbs was masked by the effects of diffusion. A semilogarithmic plot of the maximum counting rate against time gave a curve instead of a straight line, which would correspond to a simple removal process. A detailed analysis of this curve, to separate the diffusion and disappearance effects, was thought not to be practicable. In later investigations a counter was used with a large aperture held at a sufficiently great distance to cover the whole of the diffusion area. Readings with this counter over the injection site could then be fitted to a single exponential decay, giving a straight line in a semilogarithmic plot even with observations extending over about 50 hours. The slope of this line gives the mean removal rate of the R.P.P. from the injection site, and these values are given in Table I. In this table both groups are arranged in descending order of

TABLE I.—Results of Local Counting Over Injection Site in Human Subjects

Subject	Degree of Physical Activity	Removal Rate of R.P.P. (Percentage of Dose Removed per Hour)
Control Group		
J.R.	Very active	3.9
F.S.	Active	2.2
F.B.	Slight	1.2
M.A.H.	Bed	2.5
E.W.H.	"	1.6
E.J.	"	1.7
Mean		2.2 ± 0.4
Lymphoedematous Group		
V.S.	Active	1.45
E.J.	Slight	1.06
L.A.P.	"	1.7
Mean		1.4 ± 0.2

physical activity, and in addition the lymphoedematous group is tabulated in order of decreasing severity of lymphoedema.

The results show that the clearance rate of R.P.P. in normal subjects is influenced by physical activity and that there is no significant difference in the removal rate in control subjects during bed rest and in active patients with lymphoedema. The mean values of the removal rate in the two groups show no significant difference, but the results suggest that clearance of R.P.P. is slower in patients with lymphoedema than in active normal subjects.

The following conclusions were drawn from the findings of local counting over the injection site in normal control subjects and in patients with lymphoedema. (1) A wide subcutaneous diffusion of the injected R.P.P. occurs around the injection site. This local diffusion is influenced by gravity and is greater in the lymphoedematous patients than in the normal controls. (2) The removal rate of R.P.P. in normal subjects is increased by physical activity. (3) The removal rate of R.P.P. from the limb is greater in normal active subjects than in the lymphoedematous patients.

Measurements of Blood Specimens

The rise of radioactivity in the blood following the injection of R.P.P. for a typical case in the control group is shown in Figs. 1 and 2. Correction has been made for the natural decay of the ^{131}I . Fig. 2 has an expanded scale and shows the result during the first few hours after the injection. It is seen that after an initial rise and flattening of the curve increases steeply; it then reaches a maximum and falls slowly owing to the removal of the R.P.P. from the blood.

The observed initial rise and flattening of the curve is attributed to the presence of traces of ^{131}I iodide in the injection solution. This is based on the blood activity curve of a control subject who received a subcutaneous injection of R.P.P. containing a known proportion of ^{131}I as iodide. From this observation a correction could be made for that fraction of the observed activity corresponding to iodide contamination.

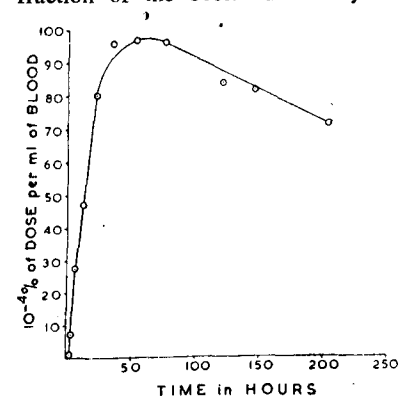


FIG. 1.—Appearance in the blood of R.P.P. injected subcutaneously into the leg of a normal subject.

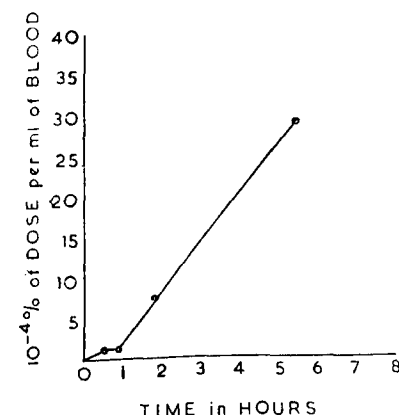


FIG. 2.—Early portion of the curve shown in Fig. 1 on an expanded time scale. After an initial rise, a plateau is formed and is followed at 50 minutes by a further steady rise in R.P.P. concentration in the blood.

activity is obtained from the initial slope of the curve and expressed as the percentage of the injected dose per ml. of blood per hour. The values found for the controls and for lymphoedematous cases are summarized in Table II.

In Table II the subjects in the control group are analysed in descending order of degree of physical activity, and it is noticeable that the initial rate of rise corresponds closely to this. The following conclusions were drawn from these estimations of the appearance in the blood stream of the injected R.P.P. in normal control subjects and in patients with lymphoedema. (1) There is a delay in time of from 0.5 to 3.25 hours following the subcutaneous injection before the R.P.P. can be detected in the blood. (2) This delay is greater in patients with severe lymphoedema than in the normal control subjects. (3) The initial rate of rise of R.P.P. content in the blood is greater in the normal control subjects than in the patients with lymphoedema. (4) In normal subjects the initial rate of rise of R.P.P. content in the blood is increased by physical activity.

Experimental Results in Rabbits

Results of Local Counting over the Injection Site

In six normal animals R.P.P. was injected subcutaneously into a hind paw and the counting rate observed over the injection site. The counting rate was found to decay

exponentially and the removal rate of R.P.P. was calculated in the same manner as in the human investigations. Similar measurements were made in five animals with transection of lymphatics in the injected limb. It was found that the removal rate of R.P.P. as determined by local counting did not differ significantly in the control and transected group of animals. Further investigation showed that a high local concentration of R.P.P. was occurring at the site of transection around the cut end of the lymphatics. Thus the R.P.P. was being removed from the paw only to be dumped at the site of the transection, and a true removal rate of R.P.P. from the limb could not therefore be determined.

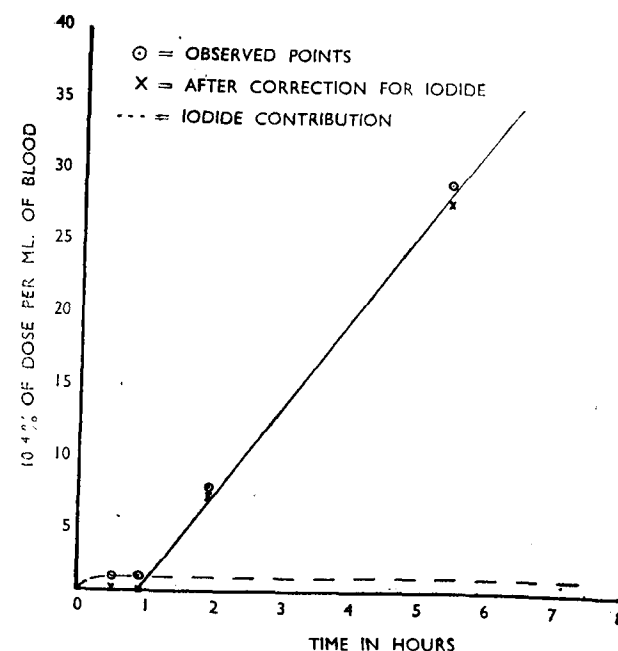


FIG. 3.—Appearance in the blood of R.P.P. after subcutaneous injection into a normal leg. The observed points have been corrected for iodide contamination of the R.P.P. and there is a delay period of approximately 50 minutes before the R.P.P. contribution becomes detectable.

TABLE II.—Estimation of Arrival in Blood of R.P.P. Injected Subcutaneously in Human Subjects

Subject	Initial Delay (in Hours)	Initial Rate of Rise of Radioactivity in Blood. (10^-4% of Dose/ml. of Blood/Hour)
Control Group		
J.R.	0.5	9.3
F.S.	0.9	6.3
F.B.	1.0	2.5
E.W.H.	0.7	1.6
E.J.	0.8	0.8
Mean	0.8 ± 0.1	4.1 ± 1.6
Lymphoedematous Group		
V.S.	2.1	0.33
E.J.	1.45	0.65
L.A.P.	3.25	0.4
E.K.	0.6	0.7
G.L.M.	0.5	1.7
Mean	1.6 ± 0.5	0.56 ± 0.08

Measurements of Blood Specimens

The ^{131}I content of the blood in the control group was found to vary with time in the same way as in the human subjects—that is, it showed a rapid initial rise to a plateau followed by a further rise. Corrections for the small fraction of ^{131}I injected as iodide were based on observations of the activity in the blood of a rabbit injected with ^{131}I in the form of sodium iodide.

In those animals, however, whose lymphatics had been transected the variation of the ^{131}I blood content with time had a different character, as is shown in Fig. 4. It is seen that the significant difference between this analysis and that of Fig. 3 is that the R.P.P. component shows no initial delay. The results obtained for these transected animals and the control group are summarized in Table III.

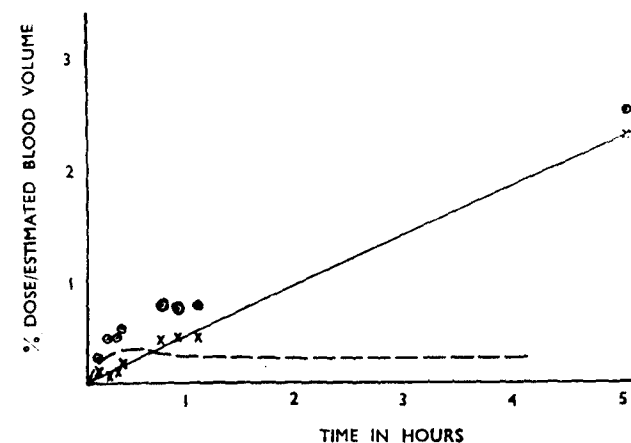


FIG. 4.—Appearance in the blood of R.P.P. injected subcutaneously into the paw of a rabbit in which acute lymphoedema had been produced by lymphatic transection. The initial part of the curve is shown with the correction for free iodide. The symbols are as for Fig. 3. There is no delay before the R.P.P. contribution becomes detectable in the blood.

TABLE III.—Estimation of Arrival in Blood of R.P.P. Injected Subcutaneously in Rabbits

Rabbits	Initial Delay (in Hours)	Initial Rate of Rise of Radioactivity in Blood (% Dose/Estimated Total Blood Volume/Hr.)
<i>Control Group</i>		
11/52	0.3	0.4
8/53	1.8	3.5
11/53	0.8	1.4
19/53	0.9	2.5
8/54	0.85	4.8
9/54	0.8	4.3
Mean	0.9 ± 0.2	2.8 ± 0.7
<i>Transected Rabbits</i>		
13/53	0	1.4
20/53	0	0.7
21/53	0	0.6
11/54	0	0.45
17/54	0	1.2
Mean	0	0.87 ± 0.19

The blood volumes of the rabbits were estimated on a weight basis from the data of Armin and Grant (1951).

and it is concluded that: (1) In normal rabbits there is a delay in time following the injection of R.P.P. before its arrival in the blood is detected. This delay is of the same order of magnitude as that observed in normal human subjects (Table II). (2) In the transected rabbits R.P.P. could be detected in the blood immediately following the injection. (3) Despite the immediate appearance in the blood of detectable amounts of R.P.P. in the transected rabbits, the initial rate of rise of R.P.P. content in the blood was greater in normal animals.

Interpretation of Experimental Findings

The present concept of tissue fluid formation and absorption is based on the original hypothesis of Starling (1896), which described a hydrodynamic process governed by the outward filtration force of capillary hydrostatic pressure and the absorbing force developed by the osmotic pressure of the plasma proteins. This hydrodynamic process is slow and is concerned largely with the net volume flow of fluid. Pappenheimer (1953) has summarized evidence to indicate

that diffusion rather than hydrodynamic flow is the mechanism of molecular exchange between the blood plasma and interstitial fluid. Molecular diffusion is rapid, is independent of filtration or absorption, and can occur against the flow of bulk transference of fluid. Thus Hyman, Rapaport and Paldino (1952) found no significant difference in the clearance rate of radioactive iodide from normal skin and from skin in which outward filtration of fluid from the capillaries had been promoted by infiltration with a 12.5% protein solution.

Pappenheimer, Renkin, and Borrero (1951) have postulated that diffusion of water- and lipid-insoluble molecules takes place through channels or pores in the capillary wall. Although the diffusion rate of small molecules through these channels is rapid, it is slower than if free diffusion was taking place. This is explained by the concept of restricted diffusion, which becomes increasingly important as molecular size approaches the diameter of the channels through the capillary wall. Thus for large protein molecules, at normal filtration rates, a high degree of molecular sieving occurs, and the resulting filtrate or tissue fluid contains small quantities of protein only. This protein leak into the tissue spaces is small, and is not sufficient to disturb the osmotic relationship on which the Starling hypothesis depends.

The fate of this extravascular protein is obscure, but it is generally held that the lymphatics offer no barrier to protein molecules and readily remove such protein as has reached the tissue space. This problem has been investigated previously by several workers. Field and Drinker (1931) injected horse serum subcutaneously into dogs and detected its presence in blood and lymph by serological methods. They found that after subcutaneous injection the protein found its way rapidly into the lymphatics and could be detected in the cervical lymph trunks after 30 minutes. When lymphatic entrance into the blood stream was prevented by ligation of the thoracic and cervical lymph ducts, the foreign protein could not be detected in the blood stream for periods of up to seven hours. Similar results were reported by Lewis (1921) and Conklin (1930).

Jepson, Simeone, and Dobyns (1953) investigated the fate of R.P.P. injected intradermally in dogs and reached the conclusion that absorption through blood capillaries was the major factor in removal of the protein. Their experiments differed from those reported here in that the R.P.P. was injected into the skin itself instead of subcutaneously, and it may be that the higher pressure required for such injections deranged the local physiological equilibrium, and permitted direct absorption into the blood capillaries.

In this investigation the disappearance of R.P.P. from the injection site in human subjects shows a tendency to be slower when the lymphatic circulation is impaired. The lack of differentiation between the R.P.P. removal rates observed in transected and control animals is probably caused, among other factors, by diffusion of the R.P.P. into the oedema of the transected limb, which makes the removal rates appear too high. A further effect which would make the observed removal rate too high in the transected animals would be produced if the lymphatics were able to carry R.P.P. away from the injection site, only to discharge it through their cut ends into the oedema fluid at the transection. This possibility is supported by the higher activity observed in the tissue specimens which were taken from just below the transection.

The time and rate of appearance of R.P.P. in the blood can be interpreted in terms of the mechanism by which the R.P.P. is removed from the injection site. The two possible removal mechanisms to be considered are: (1) passage of R.P.P. from the tissue fluids directly into the blood, through the capillary walls; and (2) absorption of R.P.P. into the lymphatic system with its subsequent discharge into the blood system. If the former mechanism only were operative the R.P.P. would appear in the blood immediately after its subcutaneous injection and the rate of increase of the R.P.P. content of the blood would be the highest at the initial stage. The magnitude of this rate of increase would be directly

related to the rate of passage of R.P.P. back through the capillary walls. The second mechanism, on the other hand, would involve some delay after the injection before the R.P.P. content of the blood began to rise, corresponding to the time it takes for the R.P.P. to pass through the lymphatic system and hence into the blood stream. Longer delays would be associated with slower functioning of the lymphatic system, and it might be expected that the subsequent rate of increase of R.P.P. in the blood would be correspondingly slower.

With the exception of the result for the transected animals the variation of R.P.P. in the blood has followed the pattern expected from the second mechanism. In human subjects the initial delay is longer and the initial rate of increase of R.P.P. in the blood is much smaller in the patients with severe lymphoedema than in the control group of normal subjects. In the latter the observed values are also related to the degree of physical activity. It appears, therefore, that in the cases examined the lymphatic system is the most important mechanism for the transport of proteins from the tissue fluids. The iodide contamination of our R.P.P. made it, unfortunately, impossible to decide whether there is a return of a small proportion of protein directly to the blood through the capillary walls.

The transected animals are the only group in which blood absorption of R.P.P. appears to be taking place. Here the lymphatic route is destroyed and the normal physiological conditions are disturbed by trauma so that appreciable passage of R.P.P. in the reverse direction through the capillary walls becomes possible. Even in these conditions the removal of protein from the tissue, as measured by the initial rate of increase of R.P.P. in the blood, is considerably (about three times) slower than in the control animals.

The results of this investigation indicate that the behaviour of R.P.P. injected subcutaneously can be used as a test of lymphatic function. The method is useful as a research tool, but it is too expensive and time-consuming for routine clinical purposes.

Summary and Conclusions

The absorption of plasma protein labelled with radioactive iodine (R.P.P.) from the subcutaneous tissues has been studied in normal subjects and in patients suffering from lymphoedema. A similar investigation was performed in normal rabbits and in rabbits with a limb in which lymphatic transection had been performed.

The behaviour of radioactive plasma protein injected subcutaneously in the limbs of human subjects and animals is consistent with its removal by the lymphatic route.

Detectable direct absorption of protein into the blood stream occurred only after acute traumatic destruction of the lymphatic pathway.

The rate of removal of R.P.P. is slower in patients with severe lymphoedema than in normal subjects.

In normal subjects the rate of removal of R.P.P. is hastened by exercise.

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REFERENCES

- Armin, J., and Grant, R. T. (1951). *Clin. Sci.*, 10, 441.
- Conklin, R. E. (1930). *Amer. J. Physiol.*, 95, 98.
- Field, M. E., and Drinker, C. K. (1931). *Ibid.*, 97, 40.
- Hyman, C., Rapaport, S. I., and Paldino, R. (1952). *Ibid.*, 163, 722.
- Jepson, R. P., Simeone, F. A., and Dobyns, B. M. (1953). *Ibid.*, 175, 443.
- Klimonch, J. B. (1952). *Clin. Sci.*, 11, 13.
- Lewis, J. H. (1921). *J. Amer. med. Ass.*, 76, 1342.
- Pappenheimer, J. R. (1953). *Physiol. Rev.*, 33, 387.
- Renkin, E. M., and Borrero, L. M. (1951). *Amer. J. Physiol.*, 167, 13.
- Reichert, F. L. (1926). *Arch. Surg. (Chicago)*, 13, 871.
- Starling, E. H. (1896). *J. Physiol. (Lond.)*, 19, 312.
- Wormall, A., Francis, G. E., and Mulligan, W. (1951). *Nature (Lond.)*, 167, 748.

CASE OF REVERSE COARCTATION SYNDROME

AN AORTIC ARCH SYNDROME

BY

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The interesting clinical syndrome characterized by absence of pulsation in the arteries arising from the arch of the aorta, though very rare, has been reported from time to time. In this condition one or more of these arteries are involved in an obliterative process. A large variety of pathological lesions may be responsible for such arterial occlusion. Of these, a primary panarteritis of unknown aetiology is in a class by itself, and has been variously described as 'Takayasu's disease,' 'pulseless disease,' and 'young female arteritis.'

The largest series of pulseless disease seems to have been reported from Japan, and a comprehensive list of 58 cases was given by Caccamise and Whitman (1952) along with the report of their own case. Skipper and Flint (1952) summarized 16 cases of 'syphilitic' and 'non-syphilitic' origin and recorded two non-syphilitic cases of their own. Ross and McKusick (1953), in an extensive review of the world literature, analysed over 100 cases, 35 being previously unreported. They discussed the whole subject of pulse anomalies in the branches of the aortic arch under the title 'aortic arch syndrome,' a term first suggested by Frovig in 1946. Other possible aetiological factors besides the panarteritis, according to their analysis, are syphilis and trauma, with or without aneurysm formation, chronic dissection of the aorta, atheromatosis, congenital anomalies, mediastinal tumours, and thrombophilia. They concluded that syphilis is the commonest and primary atheroma a very rare cause of aortic arch syndrome.

Recently two more cases of 'pulseless disease' have been reported in the Anglo-American press (Barker and Edwards, 1955; Trias de Bes *et al.*, 1955). From India the first case of aortic arch syndrome was published by Shikhare (1921), and so far as we know the case reported below is the second. Our case is of interest not only because the syndrome itself is rare but also because it belongs to a very rare aetiological variety.

Case Report

A sweeper of a veterinary hospital, aged 51, was admitted to hospital complaining of low pyrexia, breathlessness, productive cough, and generalized body ache of ten days' duration. He had been a chronic sufferer from productive cough for a long time, with occasional exacerbations, especially in the winter months, but his activities had not previously been limited by breathlessness. He had occasional attacks of vertigo, though they were never very severe. A hospital discharge ticket in his possession showed that he was sent home a fortnight previously after successful treatment of a hypopyon ulcer of his right eye.

The patient was thinly built and looked very ill, with sunken eyes and cheeks. Bilateral lenticular opacity and a scar on the lower part of the right cornea were present. The fundus oculi could not be properly visualized because of the lens opacities. The palpebral conjunctiva looked rather pale. He was slightly cyanosed; the respiratory rate was 42 a minute. Clinically the chest was grossly emphysematous. The breath sound was vesicular in character with

prolonged expiration, and plenty of rales and rhonchi were heard all over the chest. The cardiac apex was not palpable and the heart sounds were faintly audible. There was no cardiac murmur. The tender liver was palpable 1 inch (2.5 cm.) below the costal margin, and the caecum was thickened and slightly tender. There was no clinical abnormality in the nervous system.

Pulsation in the radial arteries on either side was completely absent, although the arteries were well palpable at their usual site. Further examination revealed absence of pulsation in the brachial, axillary, subclavian, carotid, and temporal arteries of both sides. The vigorously pulsatile aortic arch was, however, easily palpable at the suprasternal



notch, but its wall seemed to be unusually hard to the touch. There was good pulsation in the abdominal aorta and in all the arteries of the lower limbs. The dorsalis pedis was visibly throbbing. Several small tortuous and pulsatile arteries were also visible over the abdominal and chest walls.

It was obviously impossible to record the blood pressure in the upper limbs. Over the popliteal arteries it was 220/75 mm. Hg. The patient had a temperature of 99.8° F. (37.7° C.) and his pulse rate was 120 a minute. The extremities were warm. The patient was co-operative and was talking intelligently.

On further interrogation he denied any history of severe trauma on the chest. He had never suffered from chest pain or paralytic attacks and firmly denied a past history of syphilis.

Fluoroscopy in the out-patient department showed patchy opacities scattered in both lung fields. The heart size appeared to be within normal limits. The aorta was unfolded and extensively calcified.

Treatment with penicillin and oxygen was immediately started, but the patient died suddenly, rather unexpectedly, within a few hours before complete investigation could be made. The leucocytes numbered 10,600 per c.mm., with 82% neutrophils, and the blood Wassermann reaction was negative. A skiagram taken immediately after death confirmed the fluoroscopic findings. The patient obviously died as a result of bronchopneumonia.

Necropsy Findings

Only a limited post-mortem examination was allowed, and the arch of the aorta with about 1 inch (2.5 cm.) of each of its branches could be removed. A piece of the adjacent part of the right lung was also taken out.

The aortic arch was of cartilaginous consistency and cracked under pressure. When split open its walls were found to be plastered with innumerable calcific plaques, and a big greyish-white friable clot about 5 by 1.5 cm. was found

attached to its upper wall, completely occluding the mouths of all three branches. Less than about two-thirds of the diameter of the arch was patent (see Fig.). There was no aneurysmal dilatation of the arch.

The left common carotid artery was flattened in the antero-posterior direction and its cross-section was oval in shape. The cut ends of both the left common carotid and subclavian arteries were found occluded with a firm greyish-white mass which could not be removed from their lumina. The whole length of both these arteries felt like solid cord. The distal ends of the right common carotid and subclavian arteries were, however, patent, although the innominate artery would not admit a probe. When cut across, the latter was also found stuffed with a firm clot.

Histology.—Examination of sections of the aorta revealed gross atheromatous changes in all stages of development. There were large areas of ulceration and calcification. No cellular infiltration was found in the media or adventitia. The lumen of the left common carotid artery was filled with a mass of connective tissue which was continuous at places with the proliferating cells of the subintimal layer. In the left subclavian artery there was a loose connective-tissue mass with numerous intercommunicating capillaries and scattered areas of fibrous-tissue formation. A similar picture of recanalizing thrombus was found in the lumen of the innominate artery. No pathological change was evident in the walls of any of these arteries. The section of the lung showed areas of consolidation with surrounding emphysema suggestive of a bronchopneumonic lesion.

Discussion

The interesting presenting features in this patient were the absence of pulsation in all the arteries arising from the aortic arch and a high systolic blood pressure in the vigorously pulsatile arteries of the lower limbs, together with evidence of collateral circulation over the abdominal and chest walls. This resembles the clinical syndrome of coarctation of the aorta upside down, and we have preferred to call it a reverse coarctation syndrome. The term "reverse coarctation" has been criticized because the lesion here is not congenital (Barker and Edwards, 1955). This critical consideration does not apply when we mean a clinical complex only. We are, however, conscious that the particular syndrome under consideration has been already described under a large number of inadequate terms, and we may be responsible for suggesting another which is essentially descriptive and not nosological.

Obliteration of pulsation of all the arteries arising from the arch of the aorta is not an uncommon feature of aortic arch syndrome. It was present in 29 of the 40 best-documented cases discussed by Ross and McKusick (1953). Thrombosis occurring independently in any of these arteries, due to primary pathological conditions in their walls, can produce loss of pulsation in individual arteries. One or other of them may also, on rare occasions, be the site of embolic occlusion. In such cases the term "aortic arch syndrome" seems inappropriate. When all the branches of the aortic arch are obliterated the pathological lesion almost invariably involves the aortic arch itself, and there should not be any hesitation in calling it an aortic arch syndrome. The main symptoms

The main symptoms due to loss of cerebral blood supply such as vertigo occurred in 25, syncope in 15, hemiparesis and hemiplegia in 13, and convulsion in 8 of the 40 cases referred to. In our patient there was only a history of occasional vertigo, which was never very severe. His intelligence and memory seemed fairly good. Facial hemiatrophy and atrophy of facial bones with perforation of the nasal septum have been described as trophic changes due to diminished circulation in the face (Harbitz, 1926; Marinesco and Kreindler, 1936). In our patient, sunken eyes and cheeks may indicate atrophy of retro-orbital tissue and facial muscles. But such an appearance is not very uncommon in some otherwise normal persons. Poorly healing infections of face and scalp and premature cataract have also been reported (Ross and McKusick, 1953). The patient had a healed hypopyon ulcer in his right eye. He also had

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bilateral cataract, which is by no means uncommon at his age. It is, however, possible that reduced blood supply and age were complementary factors in the opacification of the lenses. Ophthalmoscopic assessment of the condition of retinal blood vessels was not possible in the presence of the cataracts.

A rather intriguing point is how the cerebral blood supply was maintained. Obviously the supply through the left common carotid artery was completely cut off. Although the right common carotid was patent it was not in communication with the main current of aortic blood, since the innominate artery was totally occluded. There was no expansile pulsation in it. We may be justified in assuming that the process of occlusion was slow enough to allow collateral channels to open up adequately through whatever communication was available. The only other arteries that can carry sufficient blood to the brain are the vertebrals. The left subclavian artery was completely occluded as far as it could be removed. Whether the thrombus extended and involved the left vertebral artery is unfortunately not known. The lumen of the right subclavian artery was patent. It seems reasonable to conclude, in spite of the small material evidence, that anastomotic channels were established between the intercostals, internal mammary, and lateral thoracic arteries which fed the right subclavian, common carotid, and vertebral arteries.

The presence of tortuous pulsatile arteries on the chest wall evidently lends further support to such a conclusion. From the existence of similar arteries on the abdominal wall it appears that these collaterals were also reinforced with a supply from the external iliac and femoral arteries. While this can also explain the circulation in the right upper limb, it is not easy to suggest any possible channel of supply to the left, which was also apparently well nourished and warm. It would certainly be interesting to know if the left vertebral artery, and the subclavian artery beyond it, were patent.

The popliteal blood pressure was recorded with a standard arm cuff, and due allowance for this should be made. But the high pulse pressure is striking. It is probably a common expression of the extensive collateral anastomosis and atherosclerosis.

Unfortunately a complete post-mortem examination was not possible. In compliance with the sentiments of the patient's relations we were obliged to content ourselves with removing only the aortic arch with the proximal parts of its branches and a small piece of the right lung. From the clinical and fluoroscopic findings it was thought that the mouths of the three branches were blocked with atheromatous lesions, which are known to occur predominantly around the ostia of aortic branches. The necropsy findings of the big ante-mortem thrombus were very much unexpected. Thrombus formation in an aneurysmal sac is not very uncommon. But in its absence it is surprising how such a big clot can form in the arch where the turbulence of blood is very great indeed. Ross and McKusick (1953) found only three examples in 44 patients, and in all of them the thrombus was in syphilitic aneurysmal sacs.

In our case the histological picture of an atheroma of the aorta was unmistakable. Primary atheroma of the aortic arch is rare. Ross and McKusick think that trauma may play some part in the pathogenesis of atheroma in the arch. Our patient gave no history of physical violence on the chest, at least of any severe degree which he could remember. Atheromatous changes can occur on pre-existing syphilitic aortitis. There were no pathological changes suggestive of aortitis. There were no pathological changes suggestive of such a lesion in the media and adventitia. Furthermore, there was no history of syphilis and the blood Wassermann reaction was negative. The only abnormality found in the left subclavian, left common carotid, and innominate arteries was the presence in them of organizing and recanalizing thrombi. There was absolutely no pathological lesion in their walls. It may naturally be concluded that the primary atheromatous ulcer on the wall of the aortic arch helped in the formation of the thrombus which gradually increased in size and extended into all the three branches of the arch of the aorta.

Summary

A case of aortic arch syndrome characterized by absence of pulsation in all the arteries of the upper limbs and neck, with high systolic blood pressure in the vigorously pulsatile arteries of the lower limbs and evidence of collateral circulation on the abdominal and chest walls, is described. From its resemblance to the clinical syndrome of coarctation of the aorta it has been called reverse coarctation syndrome. The patient died as a result of associated bronchopneumonia.

The patient had very few symptoms and physical signs referable to impaired blood supply to the head and neck and to the upper limbs. The possible collateral channel of supply is discussed.

Only a limited necropsy study was possible. There was extensive atheroma with calcification in the wall of the aortic arch. The upper third of its lumen was occupied by an ante-mortem thrombus which extended into and completely obliterated the lumina of the innominate artery, and the left common carotid and subclavian arteries as far as they could be removed. The right common carotid and subclavian arteries were patent. Histologically, organizing and recanalizing thrombi were found in the occluded arteries. Except atheroma in the wall of the aortic arch no other pathological lesion was found in the walls of any of the arteries.

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REFERENCES

- Barker, N. W., and Edwards, J. E. (1955). *Circulation*, 11, 486.
Caccamise, W. C., and Whitman, J. F. (1952). *Amer. Heart J.*, 44, 629.
Frovig, A. G. (1946). *Acta psychiat. Kbh.*, Supp. 39.
Harbitz, F. (1926). *Arch. Path. Lab. Med.*, 1, 499.
Marinesco, G., and Kreindler, A. (1936). *Presse méd.*, 44, 833.
Ross, R. S., and McKusick, V. A. (1953). *A.M.A. Arch. intern. Med.*, 92, 701.
Shikhare, P. V. (1921). *Indian J. Med.*, 2, 326.
Skipper, E., and Flint, F. J. (1952). *British Medical Journal*, 2, 9.
Trias de Bes, L., Sanchez Lucas, J. G., and Ballesta Barcons, F. (1955). *Brit. Heart J.*, 17, 484.

INTERMITTENT HYDRARTHROSIS

BY

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"Of periodicity in disease, no more striking example can be quoted than the recurrent effusion into joints, with little or no febrile disturbance or local signs of inflammation, which goes by the name of intermittent hydrarthrosis."

Garrod (1910).

Intermittent hydrarthrosis is a condition of unknown aetiology characterized by transient joint effusions which recur at regular intervals; one or both knee-joints are usually affected, but occasionally other joints such as the hip, ankle, or elbow are involved (Ragan, 1949). The periodicity of the effusions was first noted in 1852 by C. H. Moore (1864), a surgeon at the Middlesex Hospital.

The onset is often sudden, the effusion lasting two to six days and recurring in cycles of 7 to 11 days, though extremes of 3 and 30 days have been reported. The duration of joint swelling and the length of each cycle

are remarkably constant in any one patient, although they may vary from time to time. If more than one joint is affected the effusions do not always coincide, but the cycle for each joint remains constant (Garrod, 1910; Bierring, 1921; Baker, 1929). When one joint ceases to swell another may become involved.

Both sexes are affected equally, usually between the ages of 20 and 50, although May and Robin (1947) and Ragan (1953) believe intermittent hydrarthrosis to be most common in young women with onset at or after puberty. The age of onset and sex incidence of 101 cases reported in the literature does not support this view (Fig. 1).

Once established, intermittent hydrarthrosis may persist indefinitely, but is subject to spontaneous remissions and relapses which make assessment of treatment difficult. Although uncommon, it is probably not so rare as the literature would suggest, for fewer than 180 cases have been described. The following case reports may therefore be of interest.

Case 1

A housewife first noticed that her right knee was painful and swollen in April, 1950, at the age of 41. The swelling disappeared after a few days, only to reappear five days later, and thereafter the knee swelled at intervals of 9–13 days for a year. The swelling developed gradually, reaching its maximum in two to three days, and disappeared after five to six days. There was no history of previous injury, arthritis, or venereal disease, and the patient had never lived abroad. The effusions were not related to menstruation (Fig. 2).

In May, 1950, one month after the onset of the effusions, the patient developed an irritant rash over the lower trunk and thighs, thought to be true lichen planus; this persisted for over six months despite treatment with antihistamines, penicillin, vitamins, and local applications.

The patient remained in good health, and subsequent examinations revealed no abnormality except periodic effusions in the right knee-joint, accompanied at times by transient pitting oedema of the legs. There were no local signs of inflammation, and disability was not severe, though the patient felt unable to take up part-time domestic work.

The results of investigations, which included radiographs of the knee, haemoglobin estimation, white-cell count, erythrocyte sedimentation rate, and estimation of plasma proteins, were normal.

Treatment with pressure bandages, quadriceps exercises, antihistamines, autohaemotherapy, and penicillin was ineffective. In April, 1951, a course of gold injections was started, and in June, 1951, the patient reported that the knee had swollen only twice following chrysotherapy. Sodium aurothiomalate was given, by intramuscular injection, in weekly doses of 0.05 g. After the patient had received 0.75 g., 0.05 g. was given monthly to a total of 1.35 g. Injections were discontinued in August, 1953, as the patient went out to work and could not attend the clinic.

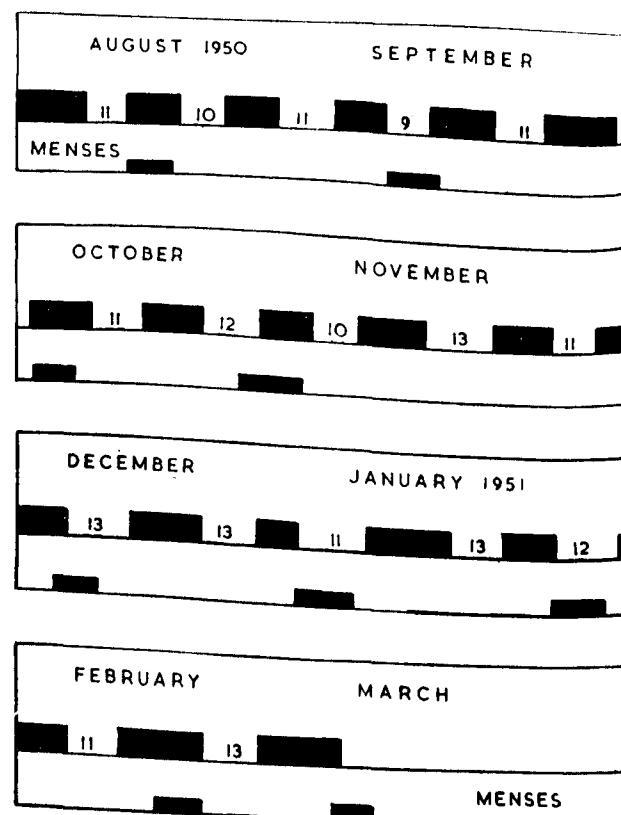
There has recently been a recurrence of her intermittent hydrarthrosis after a remission lasting five years.

Case 2

A housewife first noticed a painless swelling of the right knee in 1941, at the age of 27, when she was awakened in the early hours of the morning by an air raid and the knee "gave way." After two weeks the swelling disappeared, but six weeks later the left knee became swollen. For the next two years she was troubled by pain and swelling of alternate knees at intervals of three to four weeks. A remission lasting one year followed appendicectomy for acute appendicitis in December, 1943. Intermittent joint effusions, affecting alternate knees at intervals of two weeks, then recurred, each effusion lasting about four days. A further remission, lasting 10 months, followed venous thrombosis of the left leg with subsequent pulmonary infarction in January, 1951. The effusions recurred in November, 1951, again affecting alternate knees at two-weeks intervals, and antihistamines appeared to diminish pain and swelling without affecting the periodicity of the effusions.

The patient was admitted to hospital in May, 1952. Her general condition was good and examination of the knee-joints revealed no abnormality. Results of investigations, including haemoglobin estimation, white-cell count, erythrocyte sedimentation rate, serum uric acid estimation, and examination of catheter specimen of urine were normal; Wassermann reaction, gonococcal complement-fixation test, and brucella agglutination test were negative; radiographs of chest and hands were normal, and radiographs of the right knee showed early degenerative changes only. A small effusion, which developed in the right knee-joint, was aspirated; it was sterile and contained endothelial cells and lymphocytes only. Neither bed rest nor a four-day course of corticotrophin by injection influenced the periodicity of the effusions.

In June, 1952, the patient was treated as an out-patient with radiotherapy. Treatment was given to four areas, 10 by 8 cm., on the medial and lateral aspects of the knee-joints, the total skin dose to each area amounting to 1,200 r. The effusion recurred only once after radiotherapy.



thyroid extracts (Pellet, 1946) and testosterone (Lièvre, 1947; Hiller 1952) are unconvincing.

There is no evidence that the condition is inherited, and a familial incidence has been reported only once before.

There have been few reports on pathological changes in the synovia. Ghormley and Deacon (1936) found slight thickening of the lining cells only. Krida (1933) performed a synovectomy during an acute attack; the synovial membrane was pale, pink, and thickened, and microscopy revealed hyperaemia, round-cell infiltration, and granulation tissue in the enlarged villi and subsynovial tissues. Similar findings were reported by Weiner and Ghormley (1956). Ragan (1953) also found changes indistinguishable from rheumatoid arthritis, although his patient had a normal erythrocyte sedimentation rate and a complete remission without significant joint changes. With one exception (Baker, 1929) the joint fluid has been sterile, but it may contain several thousand cells per cubic millimetre, with over 50% polymorphs (Collins, 1936). The hyaluronic acid in the synovial fluid of the cases seen by Ragan (1953) was normal, in contradistinction to the changes which occur in rheumatoid arthritis. In "idiopathic" intermittent hydrarthrosis the sedimentation rate, haemoglobin level, and white-cell count are normal; the Wassermann reaction and gonococcal complement-fixation and brucella agglutination tests are negative, as are blood cultures. When intermittent hydrarthrosis develops in a patient with a chronic rheumatoid type of arthritis the results of investigation are those usually found in that disease.

Although the characteristic feature of the condition is the periodicity of the effusions, the cycle of joint swellings is perhaps not so constant as May, Huet, and Barraud (1937) believe when they state that "at the beginning of the year the patients can mark on their calendars in advance the dates on which they will be indisposed." Garrod (1910) pointed out that when the effusions are charted for long periods the attacks are not so regular as they appear to be if only a few effusions are observed, and this was so in Case 1 (Fig. 2). In the idiopathic cases, signs of local inflammation such as heat, tenderness, and muscle spasm are lacking and there is no constitutional disturbance. Transient oedema of the legs, as in Case 1, was also noted by May and Robin (1947).

Spontaneous remissions frequently occur and may last 5-10 years, making assessment of treatment difficult. Relapses, for no apparent reason, are equally common and the condition may persist indefinitely. The great majority of cases reported in the literature have been followed up for less than three years. While some of the patients with "idiopathic" intermittent hydrarthrosis undoubtedly develop rheumatoid arthritis, there is no evidence that this is inevitable or a frequent occurrence. Cohen (1955) has even seen a patient whose attacks recurred for over 30 years without developing rheumatoid arthritis, and Ragan (1953) states the prognosis of these cases to be good with regard to eventual crippling, although attacks may continue without remission. None of the 47 patients described by Weiner and Ghormley (1956) developed rheumatoid arthritis.

Many of the early cases of intermittent hydrarthrosis were treated with quinine, for periodicity was thought to be synonymous with malaria. It rarely proved beneficial, and other treatments equally unsuccessful included tonsillectomy, autohaemotherapy, histamine desensitization, and the administration of arsenic, mercury, ovarian extracts, stilboestrol, chorionic gonadotrophin, antihistamines, and cinchophen; injections of adrenaline, calcium gluconate, and "para-thormone" proved useless. Bed rest, ice packs, mud baths, splints, and exercises have been ineffective.

Exclusion diets, following skin tests for allergens, were credited with remissions by Berger (1939) and Miller (1949), but the latter failed to help a further case, and Epstein and Edeiken (1940) were also disappointed. Weismann-Netter (1929, 1937) claimed success with ergotamine tartrate by injection and by mouth respectively. The period of follow-up in both cases was short, and the first patient had a severe

reaction to treatment. Perhaps more convincing is the report of a case treated by Cook (1937): a man of 43, with a 15-year history of intermittent hydrarthrosis, remained in remission for three years following a prolonged course of ergotamine tartrate, 1 mg. daily by mouth. Ragan (1949) and Railliet (1938) were less successful, and most authors stress the dangers of long-term administration of this drug.

Temporary remissions have been produced by intravenous T.A.B. vaccine, but Cohen (1955) emphasizes the danger of a severe reaction; a generalized arthritis may result.

Gold injections have not previously been advocated in the treatment of intermittent hydrarthrosis, which is surprising, as they have been found to benefit patients with palindromic rheumatism (Boland and Headley, 1949) and patients with an episodic or palindromic type of rheumatoid arthritis. The remission reported in Case 1 lasted more than five years, and this result is encouraging enough to suggest a further trial of chrysotherapy.

There are few reports on the use of steroids in treatment. Steinberg (1955) found oral cortisone, 25 mg. t.i.d., was ineffective, and intra-articular hydrocortisone, whilst having a temporary effect, may aggravate the condition. A short course of corticotrophin by injection failed to prevent the onset of an attack in Case 2.

Few patients have received chemotherapy. Case 1 had two courses of intramuscular "distaquine" (300,000 units daily for five days, and 600,000 units daily for 20 days) for minor skin sepsis complicating lichen planus, without affecting the effusions. Intra-articular injection of antibiotics has not been reported and might be more effective than systemic administration.

Temporary remissions have resulted from radiotherapy (May, Huet, and Barraud, 1937; Epstein and Edeiken, 1940; Ragan, 1953), but patients were followed up for less than two years, and Ragan (1949), Lièvre (1947), and Railliet (1938) found radiotherapy ineffective. Case 2 has now had a remission lasting four years following radiotherapy, and, whilst it is too early to decide that the remission is complete, the patient remains very grateful.

Synovectomy has been recommended, but Krida (1933) followed up his two cases for only a year, and Key (1940) gives no details of cases so treated. Ragan (1949) found that, while synovectomy prevented recurrence of effusions in a knee-joint for over five years, the operation was followed within a few months by recurrent effusions in both elbow- and hip-joints. Weiner and Ghormley (1956) found synovectomy was effective in a few patients, but noted recurrence of the effusions after an interval of one to two years in several joints.

Summary and Conclusions

Intermittent hydrarthrosis is characterized by periodic joint effusions, usually affecting one or both knee-joints.

The cause is not known. Some patients develop rheumatoid arthritis.

Spontaneous remissions and relapses are common and make assessment of prognosis and treatment difficult.

Three cases are described; in two, remissions were apparently induced by chrysotherapy and radiotherapy.

Intermittent hydrarthrosis may be an unusual variant of rheumatoid arthritis, but permanent joint damage is not inevitable. It could, however, be a syndrome accompanying various joint disorders, the periodicity of the effusions being related to normal but exaggerated cyclical changes in the tissues of the patient.

Treatment is, of necessity, empirical and usually ineffective; radiotherapy, chrysotherapy, and synovectomy may induce at least a temporary remission.

I am indebted to Dr. A. C. Boyle, of the Middlesex Hospital, for his help with this paper and permission to publish details of Cases 2 and 3, and to Dr. H. A. Burt, of University College Hospital, for permission to report Case 1.

REFERENCES

- Baker, B. M. (1929). *Arch. Intern. Med.*, 44, 128.
Berger, H. (1939). *J. Amer. med. Ass.*, 112, 2402.
Bierring, W. L. (1921). *Ibid.*, 77, 785.
Boland, E. W., and Headley, N. E. (1949). *Ann. rheum. Dis.*, 8, 64.
Cohen, H. (1955). In *Copeman's Textbook of Rheumatic Diseases*, 2nd ed., p. 276. Livingstone, Edinburgh.
Collins, D. H. (1936). *J. Path. Bact.*, 42, 113.
Cook, C. K. (1937). *Med. Rec. (N.Y.)*, 145, 300.
Epstein, H. J., and Edeiken, L. (1940). *Radiology*, 35, 360.
Fridenberg, A. H. (1888). *Med. Rec. (N.Y.)*, 33, 657.
Garrod, A. E. (1910). *Quart. J. Med.*, 3, 207.
Ghormley, R. K., and Deacon, A. E. (1936). *Amer. J. Roentgenol.*, 35, 740.
Hench, P. S., and Rosenberg, E. F. (1944). *Arch. Intern. Med.*, 73, 293.
Hiller, R. I. (1952). *Amer. J. Obstet. Gynec.*, 64, 209.
Key, J. A. (1940). *J. Amer. med. Ass.*, 115, 2209.
Krida, A. (1933). *J. Bone Jt Surg.*, 15, 449.
Kuhns, J. G. (1945). *Arch. Surg. (Chicago)*, 51, 289.
Lewin, P., and Taub, S. J. (1936). *J. Amer. med. Ass.*, 106, 2144.
Lièvre, J. A. (1947). *Bull. Soc. méd. Hôp. Paris*, 63, 183.
May, E., Huet, J. A., and Barraud, M. (1937). *Ibid.*, 53, 106.
— and Robin, J. (1947). *Presse méd.*, 55, 129.
Miller, J. (1949). *Ann. Allergy*, 7, 497.
Miller, J. L., and Lewin, P. (1924). *J. Amer. med. Ass.*, 82, 1177.
Moore, C. H. (1864). *Lancet*, 1, 485.
Nielson, A. L. (1922). *J. Amer. med. Ass.*, 78, 507.
Pellet, C. (1946). *Rev. Rhum.*, 13, 338.
Porter, J. L., and Loneragan, R. C. (1932). *J. Bone Jt Surg.*, 14, 631.
Ragan, C. (1949). In *Comroe's Arthritis and Allied Conditions*, 4th ed. Kimpton, London.
— (1953). *Ibid.*, 5th ed.
Railliet, G. (1938). *Bull. Soc. méd. Hôp. Paris*, 54, 1579.
Reimann, H. A. (1948). *J. Amer. med. Ass.*, 136, 239.
Ropes, M. W. (1944). *Bull. New Engl. med. Cent.*, 6, 54.
Service, W. C. (1937). *Amer. J. Surg.*, 37, 121.
Sharpe, J. C. (1936). *Ann. Intern. Med.*, 9, 1431.
Steinberg, V. L. (1955). *Ann. phys. Med.*, 2, 255.
Wallis, H. R. E. (1955). *Lancet*, 1, 1331.
Weiner, A. D., and Ghormley, R. K. (1956). *J. Bone Jt Surg.*, 38, 1039.
Weismann-Netter, R. (1929). *Bull. Soc. méd. Hôp. Paris*, 45, 909.
— (1937). *Ibid.*, 53, 185.

ACUTE SCHÖNLEIN-HENOCH PURPURA TREATED WITH PREDNISOLONE

REPORT OF A CASE

BY

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Schönlein-Henoch purpura is a disease associated with an increased permeability of the capillary endothelium permitting the passage of blood cells and plasma (Win-trobe, 1946). The specific aetiology is not clear (Davis, 1948), although evidence points to a hypersensitivity to an antigen which may be bacterial or non-bacterial (Gairdner, 1948; Jensen, 1955). Prognosis is dependent upon whether or not severe renal damage is caused (Ackroyd, 1953). Until recently it was generally believed that no medication had a favourable effect on the natural course of the disease (Davis, 1948; Gairdner, 1948). When the adrenal and pituitary steroids were found to exert favourable responses in various allergic disorders, several investigators studied their effect on Schönlein-Henoch purpura. The results have been variable, but a symptomatic response has been observed in at least half of the reported series (Stefanini *et al.*, 1950; Levinson *et al.*, 1951; Adamson *et al.*, 1953; Leese, 1955). It was therefore of interest to observe the effect on the course of the disease of prednisolone. Stefanini and Martino (1956) stated that this drug had caused striking remissions in two cases of the acute variety of Schönlein-Henoch purpura.

The following is a report of a typical case of this disease complicated by severe and progressive renal involvement. The downhill course was apparently unaffected by cortisone, but was dramatically reversed by prednisolone.

Case Report

A 10-year-old schoolgirl was transferred to the Dundee Royal Infirmary because of purpuric eruption and rectal bleeding. She apparently had been in excellent health until three and a half weeks previously, at which time she had an abrasion of her knee requiring no specific treatment. The following day she had had an uneventful dental extraction. Four days later she complained of abdominal discomfort and vomiting. Her family doctor found she had a fever and gave her 500,000 units of penicillin. Her symptoms continued, and, as she was also suspected of having tonsillitis, she was admitted to a fever hospital one week after the onset of her illness. At that time physical examination was negative except for enlarged tonsils. Her white count, sedimentation rate, haemoglobin, urinalysis, and chest x-ray films were all within normal limits.

Within several days of admission, however, scattered haemorrhagic spots appeared over her arms. These soon spread to involve her back, buttocks (see Fig. 1), and lower extremities. Two days after the appearance of the rash, gross blood was observed in her stools. She also complained of stiffness in her right knee and both shoulders and elbows, though no redness, swelling, or tenderness was noted in these areas. The following day she had pain in the joints



FIG. 1.—Haemorrhagic eruption on buttocks of a 10-year-old girl with Schönlein-Henoch purpura; second week of illness.

of the left hand and a small effusion was found over the dorsum. New crops of haemorrhagic spots were constantly appearing. Albuminuria occurred, and one week after the appearance of the bloody stools fresh blood was found in her urine. A diagnosis of anaphylactoid, or Schönlein-Henoch, purpura was therefore made, and the patient was transferred to the Royal Infirmary approximately three and a half weeks after the initial onset of her symptoms.

At this time she was an acutely ill, pale girl complaining of colicky abdominal pain, which came in spasms that lasted from five to ten minutes. A haemorrhagic eruption was present over buttocks, abdomen, and extremities; the face was clear. The rash varied from fresh spots to faded areas. Examination of heart and lungs was negative. Blood pressure was 130/80. Abdominal examination showed no enlargement of liver or spleen, and though some tenderness was present the abdomen was soft throughout. Neurological examination was negative. Joints were normal. Laboratory studies showed: haemoglobin, 8.8 g. per 100 ml.; white blood cell count, 16,000 per c.mm.; E.S.R., 35 mm. in 1 hour; blood urea, 20 mg. per 100 ml.; cholesterol, 120 mg. per 100 ml.; serum bilirubin 4 mg. per 100 ml.; while the serum sodium, potassium, chloride, and carbon-dioxide-combining power were all within normal limits. The platelet count was 851,000 per c.mm. The antistreptolysin titre (drawn four weeks after admission) was within normal limits. X-ray films of chest and abdomen and electrocardiograms were

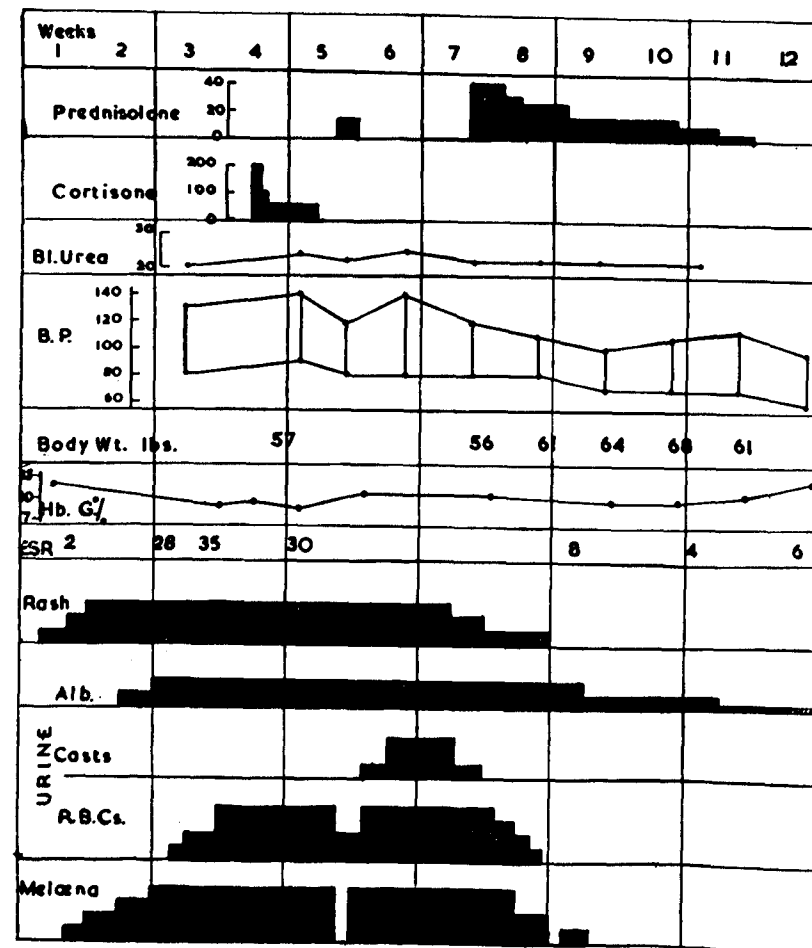


FIG. 2.—Summary of pertinent clinical and laboratory findings and of treatment.

within normal limits. No organisms were found in blood cultures or throat swab. The stools were grossly bloody. The urine had albumin and red-blood cells but no casts.

After four days' observation the patient was treated with cortisone, 200 mg. the first day, 100 mg. the second day, and 50 mg. for five subsequent days. Despite this medication, abdominal pain persisted and new crops of haemorrhagic spots appeared. There were no changes in the character of the stool or urine. There was a slight rise in the diastolic blood pressure, but serum electrolytes were unchanged. On the seventh day of treatment the patient sustained for the first time in her life two grand-mal epileptic seizures, which left her with a transient paralysis on her left side for twelve hours. Cortisone was then discontinued and phenobarbitone given (which medication was continued for the remainder of her stay in hospital).

Several days later, owing to the persistence of all symptoms, a test dose (15 mg. daily) of prednisolone was given for three days. She underwent a prompt symptomatic improvement and became alert, co-operative, and cheerful for the first time during her admission. On the third day of this treatment a decrease in the bleeding into the bowel and urinary tract was noted. At this time, however, periorbital oedema appeared, although blood pressure, serum electrolytes, and blood urea were unchanged. Treatment was again stopped.

The patient continued to deteriorate, and by the next week hyaline and red blood cell casts were found in her urine. It was decided that in view of her previous response to a small dose of prednisolone she should be given a definitive course of therapy, and this was started two months after the onset of her original illness. She received 40 mg. of prednisolone for three days, 30 mg. for the next two days, 25 mg. for four days, and then was maintained on 15 mg. until she was

asymptomatic and showed laboratory evidence of improvement (a period of eleven days). The dosage of the drug was then further decreased in 5-mg. steps and finally omitted altogether.

The subjective response to treatment was marked. The patient again became cheerful and co-operative, her appetite improved, and the abdominal discomfort disappeared. Objectively, she showed no further evidence of skin eruption, the casts and then the red cells disappeared from the urine, and the blood from the stools. The only residuum was the mild but persistent albuminuria. She was discharged home ten days after the cessation of prednisolone therapy. A follow-up one month later showed no blood in the urine or stools and no rash. Her blood pressure, blood urea nitrogen, and electrolytes were normal, but a trace of albumin was still present. She had been fully active.

A summary of the pertinent findings in the clinical course is shown in Fig. 2.

Summary

A case of Schönlein-Henoch purpura treated with apparent success with prednisolone is presented. Clearly, in a disorder so prone to spontaneous remission, caution is necessary in the interpretation of treatment. However, the patient did not respond to cortisone but did give evidence of response first to a small dose and subsequently to larger doses of prednisolone. The dramatic remission is in accord with the few other reported cases so treated (Stefanini and Martino, 1956). Only a long-term follow-up will determine whether the patient has sustained permanent renal impairment.

I thank Professor Ian G. W. Hill and Dr. Kenneth G. Lowe for their aid in the management of this case and for permission to report it; and Dr. Thomas English and Sister McLee for their help in collecting the clinical data.

REFERENCES

- Ackroyd, J. F. (1953). *Amer. J. Med.*, **14**, 605.
 Adamson, D. G., Walker, W., and McIntosh, A. E. (1953). *British Medical Journal*, **2**, 656.
 Davis, E. (1948). *Blood*, **3**, 129.
 Gairdner, D. (1948). *Quart. J. Med.*, **17**, 95.
 Jensen, B. (1955). *Acta med. scand.*, **152**, 61.
 Leese, W. L. B. (1955). *Lancet*, **2**, 851.
 Levinson, J. E., Horwitz, M., Kulka, J. P., Page, L., and Bauer, W. (1951). *Ann. Rheum. Dis.*, **10**, 255.
 Stefanini, M., and Martino, N. B. (1956). *New Engl. J. Med.*, **254**, 313.
 Roy, C. A., Zannos, L., and Dameshek, W. (1950). *J. Amer. med. Ass.*, **144**, 1372.
 Wintrobe, M. M. (1946). *Clinical Haematology*, 2nd ed. Lea and Febiger, Philadelphia.

A brief review of current research in the U.S.A. on injuries to occupants of motor-cars in road accidents has been written by H. J. H. Starkes, Ph.D., and published by the Department of Scientific and Industrial Research (*Research on Injuries Sustained in Road Accidents*, H.M.S.O., 2s.). In the U.S.A. about three-quarters of all people killed on the roads are occupants of motor-vehicles, whereas the corresponding figure in Britain is about one-sixth; consequently the American data may be of rather indirect relevance to British problems, derived as they are from motor-cars and roads that differ appreciably from those over here. For instance, the doors of American motor-cars contribute notably to the death rate by bursting open in crashes and allowing the occupants to be ejected; this doubles the risk of serious injury or death.

TREATMENT OF MONILIAL VAGINITIS

A CLINICAL TRIAL OF NYSTATIN

BY

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Since the preparation of the antifungal antibiotic nystatin from *Streptomyces noursei* by Hazen and Brown in 1950, there have been reports of its use in the prevention of experimental infections with candida (monilia) in animals (Brown, Hazen, and Mason, 1953; Drouhet, 1955a) and also in the treatment and prevention of infections in humans, especially in patients undergoing treatment with the broad-spectrum antibiotics such as the tetracyclines (Drouhet, 1955b; Sarewitz, 1955; Childs, 1956; Stewart, 1956). The successful treatment of patients with primary infections with candida have been reported by Sloane (1955), Robinson (1955), and Stewart (1956). Recently vaginal pessaries containing nystatin became available, and we report here the treatment with these pessaries of 53 patients suffering from vaginal candida infections, and in order to assess the value of this treatment the results obtained are compared with those in 36 patients treated with gentian violet.

Clinical Investigation

We included in this investigation only those women who were complaining of a vaginal discharge and/or irritation, and who were found to have candida infection bacteriologically. Two positive cultures were obtained from most patients—one on the first attendance at the clinic and one immediately before the first treatment. The women were divided into two comparable groups—one group to be treated with nystatin, and the other with a 1% aqueous solution of gentian violet. All patients were seen by one of us (J. D. L.J.) and all had the typical lesions associated with candida infection. Anyone who had an associated trichomonal vaginitis was excluded.

Initially, treatment was carried out on three alternate days, on each occasion the vagina being inspected with a speculum for lesions before its commencement. Treatment consisted in the insertion of two pessaries containing 100,000 units of nystatin or, in the control group, in painting out the vagina with a 1% aqueous solution of gentian violet.

All patients were asked to attend one week after the completion of the treatment, when the vagina was inspected for lesions and a swab taken for bacteriological examination. In the case of a negative swab being obtained, the patients were asked to attend one month later for a final examination. If candida was still present on either occasion, treatment was continued for a further week, and a swab taken a week after completion, as before. Most of the patients in the gentian-violet series who did not respond after one week were transferred to the nystatin series, together with six women in whom gentian violet caused a severe local reaction necessitating termination of treatment. There were no adverse local reactions to nystatin.

Bacteriological Examination

All the swabs were inoculated on to blood agar and Littman's medium; smears were also examined microscopically. The Littman's plate was incubated for three to five

days before a negative report was given. All the strains of *Candida* isolated were subcultured on to corn-meal agar, so that the identification of *C. albicans* by chlamydospore formation could be made. Four strains not producing chlamydospores were further examined. Their fermentation reactions resembled *C. krusei*, but their morphological appearance was not typical. Sensitivity tests were carried out on all strains by serial dilution in broth and by blotting-paper disks (Jennison and Stenton, to be published). The average minimal inhibiting concentration at 48 hours in the broth was 3.6 µg. per ml. (2,800 units=1,000 µg.). No evidence of the development of resistance appeared in this series.

Results

In Table I the bacteriological findings after treatment with nystatin are compared with those obtained in the control group treated with gentian violet. The number of patients

TABLE I.—Comparison of Bacteriological Findings One Week After Treatment with Gentian Violet and Nystatin

	Gentian Violet			Nystatin		
	No. Treated	Candida		No. Treated	Candida	
		Present	Absent		Present	Absent
Pregnant ..	13	9	4	16	5	11
			($\chi^2=2.8$, $0.1 > P > 0.05$)			
Non-pregnant	23	10	13	19	0	19
			($\chi^2=7.3$, $P < 0.01$)			
Total ..	36	19	17	35	5	30
			($\chi^2=10.0$, $P < 0.01$)			

who were bacteriologically free from infection one week after the cessation of treatment was significantly higher in the nystatin series. Some of the patients from whom candida was grown after treatment were in fact free from symptoms, and no lesions could be seen on clinical examination. Three of the failures with nystatin were in pregnant women who were delivered before a second course could be given; the other two were re-treated, one being cured. Four of the failures with gentian violet were re-treated with gentian violet with no effect.

TABLE II.—Effect of Treatment with Nystatin on Patients not Cured by Gentian Violet

	No. Treated	Candida	
		Present	Absent
Pregnant ..	6	0	6
Non-pregnant	12	4	8

TABLE III.—Total Number of Patients Treated with Nystatin, Including Five after Second Course

	No. Treated	Cured	
		No.	%
Pregnant ..	22	18	82
Non-pregnant	31	29	93
Total ..	53	47	88

Table II shows the effect of treatment with nystatin on patients who failed to respond to or who had a reaction with gentian violet. All the latter group were cured by one course of nystatin. Three of the four failures were re-treated, with a successful result in two.

The results in all 53 women treated with nystatin are shown in Table III. A notable feature of this treatment has been the large number of patients who stated that their symptoms were relieved after the first day of treatment. The number of patients cured refers only to those who were bacteriologically negative one week after the cessation of treatment and does not include some patients who, although clinically cured, still harbour candida organisms.

All the patients apparently cured after one week were asked to attend four weeks later for reassessment. Some of

the patients had been delivered, but 11 out of a possible 16 of the gentian-violet series and 34 out of 47 of the nystatin series did attend, and the relapse rates are shown in Table IV. Three of the women who had been treated with nystatin were seen by colleagues at about the appropriate time and were free from obvious infection.

TABLE IV.—Relapse Rate in Patients Seen Four Weeks After Cessation of Treatment

	Gentian Violet			Nystatin		
	No. of Patients	Candida Present	Relapse Rate	No. of Patients	Candida Present	Relapse Rate
Pregnant	2	2	100%	14	4	29%
Non-pregnant	9	3	33%	20	3	15%
Total	11	5	46%	34	7	21%

Discussion

Although the patients treated with nystatin had only a short course of treatment the results have proved to be most promising and distinctly better than those in the patients treated with gentian violet in a comparable scheme. Moreover, treatment with the nystatin pessaries is much simpler and does not have the disadvantage of staining linen, etc., as does gentian violet. The insertion of the pessaries could be easily done by the patient, thus saving much time for the patient and for the nursing and medical staffs. Also, as nystatin acts mainly on fungi and yeasts and has very little effect on bacteria, it means that there is much less interference with the normal flora than is the case with gentian-violet treatment.

Relapses, which are probably reinfections, are less frequent after nystatin than after gentian violet. It has been shown that oral nystatin greatly reduces the yeast population of the intestinal tract (Sternberg *et al.*, 1953), and it may be that combined oral and local treatment may clear the more persistent or recurrent infections. Sarewitz (1955) reported five cases of genito-urinary infection with candida which were improved or cured by oral therapy. We have treated one patient with oral tablets alone (500,000 units thrice daily for one week) with an excellent result, there being no symptoms and the culture being negative after six weeks. However, as there is no good evidence that high blood levels can be obtained by oral therapy it is unlikely that better results would accrue from this method alone. In fact, Childs (1956) has noted that systemic treatment had little or no effect on the numbers of candida organisms in the sputum and throat. Stewart (1956) and Childs (1956) reported nausea as a side-effect of oral nystatin, and our patients also complained of nausea with some abdominal pain.

Summary

Of 53 women with monilial vaginitis treated with a new vaginal pessary containing 100,000 units of nystatin, 47 (88%) were free from infection one week after treatment, whereas of 36 treated with gentian violet, only 17 (47%) were cured.

Out of a group of 18 who had not responded to gentian violet, 16 were cleared with nystatin.

In the patients seen four weeks after treatment the relapse rate was 46% in those treated with gentian violet and 21% in those treated with nystatin.

No side-effects or local discomfort has occurred with nystatin, whereas six of the women treated with gentian violet had a reaction which made it necessary to stop treatment.

One patient was treated with oral nystatin only, with an apparent cure.

We thank the obstetric and gynaecological staff of St. Mary's Hospitals for permission to treat their patients, and in particular Dr. E. A. Gerrard and Professor W. I. C. Morris for help in the planning of the investigation. Mr. Peter Stenton carried out

a large proportion of the bacteriological investigations, and Messrs. Squibb and Son supplied the nystatin preparations.

REFERENCES

- Brown, R., Hazen, E. L., and Mason, A. (1953). *Science*, **117**, 609.
Childs, A. J. (1956). *British Medical Journal*, **1**, 660.
Drouhet, E. (1955a). *Ann. Inst. Pasteur*, **88**, 298.
— (1955b). *Presse méd.*, **63**, 620.
Hazen, E. L., and Brown, R. (1950). *Science*, **112**, 423.
Robinson, R. C. V. (1955). *J. Invest. Derm.*, **24**, 375.
Sarewitz, A. B. (1955). *Ann. intern. Med.*, **42**, 1187.
Sloane, M. B. (1955). *J. Invest. Derm.*, **24**, 569.
Sternberg, T. H., Tarbet, J. E., Newcomer, V. D., Muddleson, H. G., Weir, R. H., Wright, E. T., and Egeberg, R. O. (1953). *Antibiotics Annual, 1953-54*, p. 199. Medical Encyclopaedia Inc., New York.
Stewart, G. T. (1956). *British Medical Journal*, **1**, 658.

THE BREATH IN ACUTE LEUKAEMIA

BY

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It is well known that a fetid breath may be found in patients with leukaemia in association with lesions of the upper alimentary and/or respiratory tracts. These lesions may be gum hypertrophy, petechiae and ecchymoses, or oozing of blood, gingivitis and mucosal ulceration, and necrosis. The smell is presumed to arise from the bleeding and from secondary infection.

Over the last few years some patients have been seen in whom acute leukaemia was accompanied by a peculiar sweet odour of the breath resembling that of a freshly opened corpse, but not associated with clinical involvement of the gums, mouth, or upper respiratory or alimentary tract. As the smell of the breath was of assistance to me in the clinical diagnosis of some of these patients, the results are recorded of my findings from this aspect in 73 cases of leukaemia which presented in hospital practice. In each case the presence or absence of halitosis was confirmed by at least one other medically qualified observer.

The 73 cases comprised 51 cases of acute leukaemia (34 myeloblastic, 15 monoblastic, 2 erythro-leukaemic) and 22 cases of the chronic group (11 granulocytic, 11 lymphocytic).

Results

Of 51 cases of acute leukaemia, 12 (9 myeloblastic, 3 monoblastic) had the characteristic halitosis without obvious clinical involvement of the mouth or respiratory and alimentary tracts (see Table). In six of these (Cases 5-10)

Blood Picture in the 12 Cases of Acute Leukaemia with Characteristic Halitosis

Case No.	Sex	Age in Years	Type of Leukaemia	Hb (%)	Total W.B.C./c.mm.	Blast Cells/c.mm.
1	M	17½	Myeloblastic	82	3,000	1,230
2	F	49	"	70	4,000	1,040
3	M	71	"	58	1,000	520
4	M	24	"	35	4,000	2,000
5	M	18	"	40	200,000	198,000
6	M	29	"	88	5,000	600
7	M	41	"	47	23,000	12,420
8	M	9	"	35	13,000	9,880
9	F	46	"	45	5,000	550
10	M	28	Monoblastic	48	24,000	2,880
11	M	68	"	63	45,000	14,950
12	F	44	"	47	80,000	12,000

there were other signs and symptoms such as splenomegaly, etc., which suggested the true diagnosis. Clinical examination of the remaining six patients (Cases 1-4, 11, and 12) helped very little, for they had no sternal tenderness, haemorrhagic lesions, hepato-splenomegaly, or lymphadenopathy, and it was only after examination of the blood and bone marrow that a firm diagnosis could be made. One patient (Case 1) had had an appendicectomy followed by

treatment for suspected paratyphoid fever during the six weeks before admission to the Royal Infirmary, Sheffield, while another (Case 2) had shown features of erythema multiforme. Case 3, a medical practitioner, had been admitted on the surgical side with pain in the right hypochondrium radiating to the back, upward flatulence, distaste for fatty foods, and a positive Murphy's sign. So far as the haemopoietic system was concerned, the only physical sign was mucosal pallor. Case 4 had complained of lethargy and had shown mucosal pallor only for two months. The fifth patient of this group (Case 11) had had progressive loss of energy, dyspnoea on effort, flatulent dyspepsia, and pallor of the mucous membranes only for four months, while the sixth patient (Case 12) had had a six-weeks history of malaise and pallor only, with no other suggestive physical signs.

A further 26 of the cases of acute leukaemia (15 myeloblastic, 10 monoblastic, 1 erythro-leukaemic) had the well-known fetid breath associated with a variety of intra-oral leukaemic lesions. In addition, five of these patients had epistaxis, one haemoptysis, three melaena, and two haematemesis plus melaena.

The remaining 13 cases of acute leukaemia (10 myeloblastic, 2 monoblastic, 1 erythro-leukaemic) had no halitosis at all. Five of these patients had oral petechial haemorrhages, and, in addition, one had nasal petechiae with epistaxis.

None of the 11 cases of chronic lymphatic leukaemia had halitosis, and only one had oral lesions consisting of slightly swollen gums. Ten of the 11 cases of chronic myeloid leukaemia had neither halitosis nor upper respiratory or alimentary lesions. The other case had a fetid breath. This patient had, however, bled excessively into the gut and the abdomen following partial gastrectomy for a large chronic gastric ulcer five days previously, and had received repeated blood transfusions. His tongue was tender and enlarged, the surface being dry, cracked, and yellowish red in colour.

Discussion

In 6 out of 73 cases of leukaemia, the peculiar sweet-smelling breath was of value in reaching a tentative diagnosis of acute leukaemia after clinical examination only. So far as I am aware, this physical sign has not been described previously in its present context. This may well be due to the fact that halitosis is usually associated with obvious lesions in the upper respiratory and/or alimentary tract, and/or with abnormal physical signs elsewhere suggesting the diagnosis.

The abnormal breath at present under discussion does not appear to be related to enlargement of the liver, spleen, or lymph nodes, to the haemoglobin level, to the total leucocyte count, or to the blast-cell count (see Table). A sweet, slightly faecal odour likened to the smell of mice or to a freshly opened corpse has been described in hepatic failure (Sherlock, 1955), but in none of the present cases was there clinical evidence of such a state. Recent work has shown that, in both man and animals, the lung plays an active part in the removal (from blood and organs) and release (to blood and organs) of leucocytes and platelets under various stimuli (Bierman, 1955). The mechanisms whereby these changes are induced remain to be clarified. They may possibly play a part in the halitosis, but this is only conjecture. Finally, the odour in the above six cases may have been due to lesions in the alimentary and/or respiratory tract which were not found on ordinary clinical examination.

Summary

A physical sign is described consisting of a peculiar sweet odour of the breath found in relation to 73 cases of leukaemia (51 acute, 22 chronic). It was present in 12 of the cases of acute leukaemia without obvious clinical involvement of the gums, mouth, or upper respiratory and alimentary tracts. In six of these cases there

were signs and symptoms, such as splenomegaly, to suggest the true diagnosis, while ordinary clinical examination of the other six cases, halitosis apart, was unrewarding, and it was only after examination of the blood and bone marrow that a firm diagnosis could be made. Possible sources of the halitosis are discussed.

I am indebted to my medical and surgical colleagues in the United Sheffield Hospitals and in the Sheffield Regional Hospital Board area for referring their cases, and to the medical staffs who have confirmed the observations. I also thank Dr. H. T. Swan for reading the manuscript.

REFERENCES

- Bierman, H. R. (1955). *Amer. J. Surg.*, **89**, 130.
Sherlock, S. (1955). *British Medical Journal*, **1**, 1383.

Medical Memoranda

Congenital Absence of Spleen Associated with Cardiac Abnormalities

Polhemus and Schafer (1952) described four cases of congenital absence of the spleen associated with gross cardiac abnormalities and reviewed the literature up to that time. Since then Ivemark (1955), Gasser and Willi (1952), Bush and Ainger (1955), Polhemus and Schafer (1955), and Nihoyannopoulos *et al.* (1956) have reported further cases. Bush and Ainger lay emphasis on the unusual peripheral blood picture which may be found in this condition—namely, normoblastaemia, reticulocytosis, leucocytosis, Howell-Jolly bodies, and a decreased osmotic fragility.

Details of a further case are given below. I have been unable to trace any previous report of this condition occurring in an infant born in Britain.

CASE REPORT

A male child was admitted to hospital 48 hours after birth because of an imperforate anus and possible upper intestinal obstruction. The mother's pregnancy and labour had been normal. The birth weight was 5 lb. 1 oz. (2.3 kg.). The two previous pregnancies had resulted in one miscarriage and one living healthy child.

On admission the infant's general condition was good. There was no cyanosis or dyspnoea. A precordial systolic murmur was detected at this time, but, despite repeated auscultation, was not heard again for 10 weeks. The abdomen was not distended, but there was a tight anal stenosis, probing of which produced a small amount of meconium. The anus was dilated and gave no further trouble. Straight x-ray examination of the abdomen showed gas shadows only as far as the duodenum. A laparotomy was therefore performed by Mr. A. Jolleys under general anaesthesia. An atresia of the third and fourth parts of the duodenum was found. The continuity of the lumen was restored by anastomosing the blind ends.

Progress was uneventful for the next 12 days, when the infant started passing loose green stools which became increasingly offensive. These were at first thought to be "starvation stools" because of the small feeds the child was taking, but the loose stools persisted when normal feeds were taken. The blood count at this time showed a haemoglobin of 96%. The total nucleated cell count was 19,000 per c.mm., with polymorphs 27%, lymphocytes 22%, monocytes 9%, eosinophils 2%, late normoblasts 40%. The reticulocyte count was 30%. In an attempt to account for the normoblastaemia the osmotic fragility of red cells was investigated and a slight decrease of fragility was found, 50% of cells being still present at a dilution of 0.36%, the indirect Coombs test was negative, and the urine contained no bilirubin or excess of urobilin.

When the infant was 5 weeks old, cyanosis appeared and gradually increased in intensity. In view of the absence of

a heart murmur at this stage the blood was examined for sulphhaemoglobin and methaemoglobin, with negative results. However, a systolic murmur was again heard at the age of 10 weeks, and soon after a precordial thrill also developed and the child became increasingly dyspnoeic. E.C.G. was within normal limits except for the presence of slight left axis deviation and a suggestion of left ventricular hypertrophy in the precordial leads. Radiological examination of the chest showed some widening of the upper mediastinum with a slightly globular heart shadow. The lung fields were clear. The diarrhoea, which had persisted throughout, now became profuse, and death occurred from uncontrollable dehydration at the age of 13 weeks.

At the post-mortem examination a bilocular heart was found with the aorta and pulmonary artery arising in the correct relationship from the common ventricle. The aortic arch was right-sided and the pulmonary artery was hypoplastic. On each side a superior vena cava and two pulmonary veins entered the common auricle. Each lung possessed three lobes. There was a complete absence of spleen and splenic tissue. The stomach was represented by a thick-walled widening of the gut embedded in the liver. The pancreas consisted of a small round mass of tissue.

COMMENT

In such cases as this the diagnosis of splenic agenesis might be suspected during life from the unusual blood picture and the presence of cyanotic heart disease.

I am indebted to Dr. G. M. Komrower and Mr. A. Jolleys for permission to report this case; to Dr. H. B. Marsden for the post-mortem findings; and to Dr. Komrower for his encouragement and advice.

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REFERENCES

- Bush, J. A., and Ainger, L. E. (1955). *Pediatrics*, 15, 93.
Gasser, C. Von, and Willi, H. (1952). *Helv. paediat. Acta*, 7, 369.
Ivemark, B. I. (1955). *Acta paediat. (Uppsala)*, Suppl. 104.
Nihoyannopoulos, J., Zannos, L., Oeconomou-Mavrou, C., and Statherou, E. (1956). *J. clin. Path.*, 9, 323.
Polhemus, D. W., and Schafer, W. B. (1952). *Pediatrics*, 9, 696.
— (1955). *Ibid.*, 16, 495.

Polyneuritis Caused by Antirabic Vaccination

Polyneuritis is one of the neuroparalytic complications of antirabic vaccination. The incidence of neurological complications during prophylactic treatment seems to vary widely, having been reported as 0.017% (Greenwood, 1945), 1.3% (Babés, 1912), and in India about 1 in 8,500 cases, or 0.012% (Ahuja and Brooks, 1951). The sexes are affected equally, but the extremes of age are generally immune. In my series of 2,455 patients receiving antirabic vaccination from August, 1954, to July, 1955, neurological complications occurred in five (0.2%), two of whom developed polyneuritis.

The pathogenesis of polyneuritis is controversial. Van Rooyen and Rhodes (1948) suggest that antibodies develop to the brain tissue, and that an antigen-antibody reaction occurs in the perivascular tissues, giving rise to inflammation and degeneration of the vessel wall.

With regard to its pathology, both mesodermal and parenchymatous toxo-degenerative lesions characterize the palsy. Either of these may occupy the foreground; they may also coexist, yet not develop in the same parts of the tissues.

The incubation period is between the tenth and fifteenth days from the first prophylactic dose of vaccination, with a limit of five weeks, the period being shorter than the incubation period of the disease itself, and dependent not on the interval elapsing after the bite but on the treatment.

Among the different forms of neurological complication—consisting of acute ascending paralysis of the Landry type; dorso-lumbar myelitis; cranial neuritis; polyneuritis; and meningo-encephalitis—dorso-lumbar myelitis is the commonest and polyneuritis is the rarest. The rarity of the latter condition warrants this report.

CASE 1

A Hindu peon aged 37 was admitted to the J.A. Group of Hospitals, Gwalior, complaining of weakness in all his limbs of three days' duration. The onset was gradual. As he had been bitten by a rabid dog, a course of antirabic vaccination (5 ml. for 14 days) was given. Three days after the last injection he felt weakness in all limbs, which gradually worsened. There was nothing significant in his personal and family histories. On examination there was lower motor neurone paralysis of the limbs, with severe weakness, loss of all tendon-jerks except the supinator, and tenderness of the calf muscles. There were no other subjective or objective sensory disturbances and no evidence of myelitis. Other systems were normal, and he had full sphincteric control during his illness. Laboratory investigations revealed no abnormality in any system.

He was treated in hospital for nearly four months with vitamins B₁ (100 mg.) and B₁₂ (100 µg.) parenterally on alternate days. For the first two months the condition deteriorated, and there was wasting of the distal muscles of the limbs. Subsequently he improved slowly. When he was discharged from hospital the limb weakness, loss of all tendon-jerks except the supinators, and the wasting of the distal muscles persisted, though there was slight improvement. At the time of writing he could walk about, but had very little power in his hand muscles.

CASE 2

A Hindu office superintendent aged 42 was admitted into the J.A. Group of Hospitals, Gwalior, having had pain and weakness in all limbs for 10 days. The onset was gradual, with fever. Two days after being bitten by a rabid dog he was put on a course of antirabic vaccination (5 ml. each dose). Following the seventh injection he had slight fever and felt weakness in his limbs. After an interval of four days two more injections were given. As the weakness increased the injections were stopped, and he was admitted to hospital. There was nothing significant in his family history. At the age of 15 he had received 14 injections (each 5 ml.) of antirabic vaccine after being bitten by a rabid dog. On examination there was lower motor neurone paralysis of all limbs, with marked weakness, complete loss of tendon-jerks except the supinators, and no muscle wasting. The calf muscles were tender. There were no other subjective or objective sensory disturbances and no signs of myelitis. Other systems were normal and sphincteric control was retained throughout. Laboratory investigations revealed no abnormality in any system.

He was treated with vitamins B₁ (100 mg.) and B₁₂ (100 µg.) parenterally on alternate days. About two weeks later there were signs of improvement. He gradually recovered after six weeks. After two months in hospital he was discharged with a fair degree of power in all limbs, loss of all tendon-jerks except the supinators, ability to write but inability to type, and no tenderness in the calf muscles.

COMMENT

The first case showed poor improvement even after four months, while the second case improved very well within six weeks. The difference in the degree of improvement could possibly be due to the difference in the amount of vaccine being injected. The persistence of the supinator-jerks, when all the other tendon-jerks were completely lost, was interesting. Sensory disturbances in both cases were very slight.

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REFERENCES

- Ahuja, M. L., and Brooks, A. G. (1951). *Rabies and Antirabic Treatment in India*, p. 14. Rabies Research Centre, Pasteur Association of India. Kasauli.
Babés, V. (1912). *Traité de la Rage*. Baillière, Paris. Quoted by A. Ninian Bruce in S. A. Kinnier Wilson's *Neurology*, 1954, 2nd ed., p. 766. Butterworth, London.
Greenwood, M. (1945). *Bull. Hlth Org. L.O.N.*, 12, 301.
van Rooyen, C. E., and Rhodes, A. J. (1948). *Virus Diseases of Man*, 2nd ed., pp. 870, 907. Nelson, New York.

Reviews

SUBARACHNOID HAEMORRHAGE

Subarachnoid Haemorrhage. By John N. Walton, M.D., M.R.C.P. Foreword by Sir Charles Symonds, K.B.E., C.B., D.M., F.R.C.P. (Pp. 350+xv; illustrated. 30s.) Edinburgh and London: E. and S. Livingstone Ltd. 1956.

Dr. Walton has based his monograph on the study of case reports of over 300 instances of spontaneous subarachnoid haemorrhage in Newcastle upon Tyne. He has, however, used all the more important published series of cases and isolated case reports to present as detailed and balanced a record of the disorder as is possible to-day. The work is a model of semeiological accuracy, in which the special difficulties which he has had to overcome are reflected in the fact that in over two-thirds of the Newcastle series the cause of the subarachnoid haemorrhage is unknown. That is really the justification for his researches into the literature, for this state reflects the situation as it was in the immediate past, whilst now, when every case should be fully investigated as soon as is safe and practicable, the causal lesion is more likely to be revealed in life.

The time of publication of this book is particularly opportune, for the immediate management of subarachnoid haemorrhage is a topic for formal and informal discussion in many centres, and most of the discussants need more facts upon aspects of the subject other than their own. All the facts seem to be here presented logically and without personal bias in interpretation, though with an occasional tilt at some who seem to have a little. The use of personal research and comment in this way enlivens a factual survey which might otherwise have become tedious.

It is useful to have the detailed supporting evidence for the statement: "A ruptured aneurysm is likely to be present in about 80% of cases of subarachnoid haemorrhage. In about another 10% angiomas may be demonstrated. The remaining 10% will be made up partly by cases in which it will be possible to attribute the bleeding to the many uncommon causes discussed hitherto." It is also valuable to read the evidence for the statement that "recurrent bleeding is most likely to occur in the 2nd and 3rd weeks" after the first haemorrhage, for this must be the guide to immediate management. It is equally important to see how selected have been some of the groups of patients upon which previous opinions are based.

The contemporary interest in the techniques of diagnosis of vascular disease and its medical and surgical treatment makes more than formal notice unnecessary. Great credit is due to Dr. Walton's industrious compilation, but that credit must also be extended to the multitude of workers whose observations he has documented and so faithfully integrated.

DENIS WILLIAMS.

ADVANCES IN PHARMACOLOGY

Recent Advances in Pharmacology. By J. M. Robson, M.D., D.Sc., F.R.S.E., and C. A. Keele, M.D., F.R.C.P. Second edition. (Pp. 501+xii; illustrated. 40s.) London: J. and A. Churchill Ltd. 1956.

The decision of Professor Robson and Professor Keele to combine in writing a book on *Recent Advances in Pharmacology* was fortunate for the first edition, and imperative for their second edition, which has recently appeared. The subject has grown and now covers the whole of experimental medicine in so far as that is concerned with the action of chemical substances. The reader will find in this second edition, which is to all intents a new book, discussions covering fields as varied as (1) that centring around noradrenaline; (2) the treatment of hypotension; (3) histamine and hydroxytryptamine; (4) the pituitary and adrenal cortex; (5) newer antibiotics; (6) the chemotherapy of tuberculosis; (7) nucleotoxic drugs; (8) radiation hazards; (9) haemopoietic substances; and (10) anticoagulant drugs. There

are other chapters also. Great care has been taken to deal with recent advances in all these fields, and there is no doubt that the book is of the greatest value, not only to students of pharmacology, but to all teachers of clinical medicine. Few things would do more to enrich clinical teaching in this country than a careful study of this book.

The subject-matter does not, however, become easier as years go by. Increasingly a knowledge of chemistry is required if a grasp of the advancing subject is to be maintained; increasingly, also, some idea of the action of cell membranes and of electrophysiological terminology; and now, as the analysis of cerebral processes becomes more detailed, a closer acquaintance with neuro-anatomy. We need to consider afresh the training of those who are to teach medicine in the future. That they should have spent a year in studying physiology at an honours level has till now been regarded as the essential element. Physiology is, however, now too narrow, and chemistry, biochemistry, anatomy, and pharmacology are also required. Let those who need convincing read this most valuable book.

J. H. BURN.

DISORDERS OF MENSTRUATION

The Management of Menstrual Disorders. By C. Frederic Fluhmann, B.A., M.D., C.M. (Pp. 350+xii; illustrated. 59s. 6d.) Philadelphia and London: W. B. Saunders Company. 1956.

This is a new book, and not a second edition of one on the same subject published by Dr. Fluhmann in 1936. Those to whom the title suggests another addition to the numerous accounts of sex hormone therapy by an over-optimistic enthusiast can take heart. It is nothing of the kind. The author obviously adopts the view that the proper management of menstrual disorders rests essentially on understanding them. He therefore devotes most of the work to a clear account of the function as well as the dysfunction of the ovaries and the uterus, and on allied matters such as puberty and the menopause. The hormones are there, of course, and so is endocrine therapy, but the latter is given its proper restricted and rational place. Empiricism is banned. The amount of information in this small book is quite remarkable; moreover, it is mostly factual, and any concepts not fully proved are clearly indicated with a summary of the evidence for and against. There are also many excellent photomicrographs. A critical sifting of the literature to reach a reasonable conclusion is apparent throughout, and the whole represents a masterly yet concise statement of the latest knowledge. This is introduced by an interesting and helpful review of the main historical steps which have led from the myths of the past to the reasonable certainties of the present, and by an explanation of the origin of some of the "old wives' tales" which still persist. The book is intended for undergraduates, but contains enough to satisfy the gynaecologist in practice or in training who needs an honest and logical account of these matters. It is highly commended.

T. N. A. JEFFCOATE.

Now that the laboratory has taken the place of the botanic garden as the prime source of materia medica, the study of botany has of necessity been relegated to a small and remote corner of the medical curriculum. But those medical men who in their spare time pursue this delectable science as a hobby—and doctors' names are usually prominent in the membership of natural history societies—those enthusiasts, in particular, who study the British wild flora will find Miss Stella Ross-Craig's *Drawings of British Plants* a fine aid to their pursuits. Part 9, concluding the Rosaceae and containing 39 plates, has now appeared (G. Bell and Sons, 8s. 6d.). Each plate depicts in a line drawing one species, showing the plant in natural size and some of its parts enlarged. With unique artistry Miss Ross-Craig has succeeded in portraying the plants in a manner that is at once beautiful, informative, and exact, and the superb quality of the drawings already published has everywhere evoked the highest praise. This is one of those rare works that deserve the name of masterpiece.

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ANTIBIOTICS GALORE

With the discovery of valuable new antibiotics at intervals of one or two years it has become progressively more difficult for the clinician to keep himself informed about the properties and uses of the drugs available to him. These intervals have now shortened, and the pace of increasing complexity in this subject has accelerated sharply during the past few months—indeed, in such a way as to cause positive bewilderment in many minds. Are these new antibiotics really new, and have they advantages over those available before? These questions cannot be fully answered, but the following appraisal may help to view these drugs in the right perspective.

This recently accelerated pace of discovery has produced a series of antibiotics all of which have a range of activity similar to that of penicillin: the species most sensitive to them are streptococci, pneumococci, staphylococci and other Gram-positive organisms, together with the feebler and more delicate Gram-negative genera, *Neisseria* and *Haemophilus*. Penicillin will therefore do most of what any of the new antibiotics will do unless the strain of organism is resistant to it (a problem almost confined to staphylococci) or the patient is sensitive. Only two of these antibiotics are genuinely and entirely new in the sense of being unrelated to any others. Of these vancomycin is not yet generally available in Britain, and is unlikely in its present form to be very widely used, since the only possible route of administration at present is intravenous. Its advantages are that very little bacterial resistance to it develops and that it is bactericidal. Its successful clinical use in severe staphylococcal infections is reported from the Mayo

Clinic¹: one of the patients, treated for acute endocarditis, had intravenous injections at 6-hour intervals for 3 weeks, then at 8-hour intervals for 4 days, and finally at 12-hour intervals for 3 days, totalling 102 injections in four weeks, a remarkable feat and perhaps a record. The other genuinely new antibiotic is novobiocin (known also as "albamycin" and by other names) on the value of which there are now several clinical reports.² It attains higher concentrations in the blood than any other antibiotic, perhaps in part because very little is excreted in the urine: for this reason the usefulness claimed for it in urinary infections is very doubtful. Bacterial resistance to it is acquired rather readily.

The other new drugs to be mentioned are all related in some way to erythromycin, and a question which will have to be answered is whether they possess any advantages over this well-tried and established antibiotic. At present there is very little indication that they do: indeed, in terms of such activity as can easily be measured they seem somewhat inferior. Spiramycin is the oldest of these,³ but has only recently appeared on the English market under the trade name "rovamycin." Against most bacteria it has only a fraction of the activity of erythromycin—one-sixteenth or less against staphylococci in the tests reported in this *Journal* by L. P. Garrod and P. M. Waterworth.⁴ Cross-resistance studies by these authors and others showed a close relationship with erythromycin, although there is some suggestion that this relationship may not obtain in strains found initially resistant instead of being artificially habituated in the laboratory,⁵ and one observation is claimed to have shown actual antagonism between them.⁶ This question clearly calls for further investigation, if the therapeutic properties of spiramycin are thought to make it worth while.

The other newcomer is oleandomycin, an agreeable name of obscure derivation for a substance originally described⁷ from the Pfizer Laboratories under the designation PA 105. This substance seems to have lain fallow for a time, perhaps because the preliminary view may have been that oleandomycin was too closely related to erythromycin, as well as somewhat inferior to it in antibacterial activity, to constitute a valuable discovery. That it exhibits cross-resistance with erythromycin is clear from the observations of H. E. Noyes *et al.*,⁸ who also credit it with an anti-staphylococcal activity *in vitro* which appears somewhat less than that of erythromycin. G. M. Needham and J. E. Geraci,⁹ on the other hand, found complete cross-resistance only in artificially habituated strains, a majority of initially erythromycin-resistant staphylo-

cocci being sensitive to oleandomycin. Cross-resistance with both erythromycin and carbomycin is also reported by B. Furst *et al.*,¹⁰ who nevertheless argue that oleandomycin is a distinct entity. It is said to be less toxic than erythromycin (as measured by the effects of very large doses in animals) and to display minor differences in therapeutic activity in mice: it is non-toxic to man in therapeutic doses. This paper is from the laboratories of Hoffmann-La Roche, who are now marketing oleandomycin as "romicil." There are two Swiss reports on its clinical use. A. Bernstein and M. Piller¹¹ report effects such as would be expected from any efficient drug of this class in bacterial pneumonia and acute streptococcal angina, more variable results in urinary tract infections, and failure in two cases of staphylococcal empyema (the organisms becoming resistant) and in one of osteomyelitis. A. F. Esselier and J. Keith¹² are far more sweeping in their claims: apart from acute and self-limited infections due to susceptible bacteria, they report successful treatment of staphylococcal sepsis including osteomyelitis, two cases of endocarditis lenta, influenza, ornithosis and Q fever, cholecystitis, appendicitis, diverticulitis, infectious mononucleosis, leptospirosis, and inoculation hepatitis. Further clinical study is evidently necessary before such findings can be accepted.

The other form in which oleandomycin has now appeared on our market is as a 1:2 mixture with tetracycline, under the name "sigmamycin" (Pfizer), the first product to be advertised—against a background of what seem to be perishing staphylococci—as having a two-dimensional "spectrum." The advertised claims made for this product rest on some clinical reports to the Fourth Antibiotics Symposium in Washington which are not yet in print, and on a single paper from the Pfizer laboratories by A. R. English, T. J. McBride, G. van Halsema, and M. Carlozzi.¹³ These authors' studies show that this combination of antibiotics obstructs the acquisition of resistance to either, which is to be expected, and that it is synergic, which is not so much in accordance with theoretical expectation. *In vitro* tests actually show a more than twofold difference between the activity of the mixture and that of either of its components on only 9 strains of staphylococci out of 22. Therapeutic tests in mice compared the action of a given dose of the mixture with that of the amount of each component contained in that dose: it would have been a fairer comparison to have given the same dose by weight of all three.

Before it can be accepted that this mixture has marked advantages much more work will evidently

have to be done. Further studies might include an inquiry into the combined action of tetracycline and erythromycin, a mixture which it has been open to anyone to use for some time past. The final task of assessing the relative clinical value of such closely similar products in even the commoner infections will daunt the most enterprising investigator. If antibiotics continue to be discovered which are merely first cousins or half-brothers of those already in use, to distinguish clearly between their merits will cease to be possible.

VOLUNTARY MUSCLES

That so much should have been learnt about the physiology of the voluntary muscles and so little about the disorders to which they are subject is at first sight a contrast so striking as to be almost paradoxical. Yet the explanation is probably simple. The physiologist has naturally been primarily concerned with how the muscle functions; how the impulse from the brain results in the contraction not only of the muscle fibre but of the individual protein molecules ultimately responsible for the contraction. His interest has been shaded by biochemists and biophysicists, and together they have displayed an ingenuity and achieved results unsurpassed in any other aspect of physiology. Our knowledge in this field has been admirably reviewed in a recent number of the *British Medical Bulletin*. It makes fascinating reading, but shows none the less the possibility, if not probability, that most of what has been learnt about the physiology of muscle, and much too of its biochemistry, is not directly relevant to the fundamental biochemical defect underlying human muscle dystrophy. The essential clue probably lies not so much in the mechanism of contraction as in those less well understood processes concerned with the synthesis, maintenance, and repair of the muscle protein and membrane. The nutritional approach to the study of experimental muscular dystrophy has indeed shed some light on this aspect of muscle biochemistry, and has been of undoubted value in studying the dystrophies occurring in animals. However, despite the histological similarities, the human disease is in some way fundamentally different, and at the moment it seems impossible to apply the knowledge

¹ Geraci, J. E., *et al.*, *Proc. Mayo Clin.*, 1956, **31**, 564.

² See leading article, *British Medical Journal*, 1956, **2**, 217.

³ See annotation, *British Medical Journal*, 1956, **1**, 621.

⁴ Garrod, L. P., and Waterworth, P. M., *ibid.*, 1956, **2**, 61.

⁵ Hudson, D. G., *et al.*, *Arch. intern. Med.*, 1956, **97**, 57.

⁶ Chabbert, Y., *Ann. Inst. Pasteur*, 1956, **90**, 787.

⁷ Sobin, B. A., English, A. R., and Colmer, W. D., *Antibiotics Annual*, 1954-55, 827.

⁸ Noyes, H. E., *et al.*, *Antibiot. and Chemother.*, 1956, **6**, 450.

⁹ Needham, G. M., and Geraci, J. E., *Antibiot. Med.*, 1956, **3**, 334.

¹⁰ Furst, B., *et al.*, *Schweiz. med. Wschr.*, 1956, **86**, 1245.

¹¹ Bernstein, A., and Piller, M., *ibid.*, 1956, **86**, 1247.

¹² Esselier, A. F., and Keith, J., *ibid.*, 1956, **86**, 1311.

¹³ English, A. R., *et al.*, *Antibiot. and Chemother.*, 1956, **6**, 511.

¹ Katz, B., *Brit. med. Bull.*, 1956, **12**, 210.

² Hodgkin, A. L., *Biol. Rev.*, 1951, **26**, 339.

³ Huxley, A. F., *Brit. med. Bull.*, 1956, **12**, 167.

⁴ Churchill-Davidson, H. C., and Richardson, A. T., *J. Physiol. (Lond.)*, 1953, **122**, 252.

⁵ Zaimis, E. J., *Nature (Lond.)*, 1952, **170**, 617.

⁶ Grob, D., Johns, R. J., and Harvey, A. McG., *Bull. Johns Hopk. Hosp.*, 1956, **99**, 219.

⁷ McArdle, B., *Brit. med. Bull.*, 1956, **12**, 226.

gained in animals to the cure of the human dystrophies.

But it would be absurd to suppose that the basic sciences have not helped to extend our knowledge of some, at least, of the disorders of muscle. Two obvious examples are those of myasthenia gravis and the paralysis associated with a low level of potassium in the extracellular fluid. In neither instance is the underlying cause of the paralysis fully understood, but such facts as are known can be interpreted only in the light of what is known of the physiology of neuromuscular conduction. Here there is a wealth of information.¹ The muscle membrane at rest is in a state of polarization, having a potential difference of 90 mV between the inner and outer surface. This is caused by the large individual differences in the concentration of certain ions, especially potassium, on either side of the membrane. A specialized region of the membrane, the motor end plate, lies in intimate apposition to the motor nerve endings. A nerve impulse reaching the nerve ending releases acetylcholine, which, on diffusing across to receptors on the end plate, has the property of inducing a local depolarization before being split by choline esterase. The area of depolarization results in a flow of current in the adjoining polarized membrane which, in turn, becomes depolarized. A. L. Hodgkin² has shown that this local current causes a transient increase in permeability of the membrane to sodium ions, which is limited to the region of depolarization. The sodium ions flow inwards through the membrane and thus regeneratively reinforce the initial potential change. Another local current results, and in this way a wave of depolarization travels along the muscle fibre, repolarization being effected by an initial outward flow of potassium ions, by the active extrusion of sodium from the cell, and by an inward movement of potassium. It is these propagated changes in membrane potential that constitute the muscle action potential. How it causes contraction of the muscle is not definitely known, but A. F. Huxley,³ with the ingenuity which is a feature of much of the work on muscle physiology, has shown that the initiation of contraction is in some way related to the I band. He believes that most probably "activation" of the muscle fibrils is conducted along the Z membrane, which can be convincingly shown by interference- and electron-microscopy to bisect the I band.

Recent work on myasthenia gravis has confirmed the widely held view that the essential defect is concerned with the chemical transmission of the nerve impulses at the motor end plate. H. C. Churchill-Davidson and A. T. Richardson⁴ have put forward the suggestion that the defect lies in an alteration of the

response of the motor end plate to acetylcholine, brought about by the persistence on the receptor protein of acetylcholine itself, or of a breakdown product, in an inactive form. They reached this conclusion largely by comparing the different effects of intravenous decamethonium in normal subjects and in patients with myasthenia, and considering these against the results of Zaimis⁵ in different species of animals. D. Grob, R. J. Johns, and A. McG. Harvey,⁶ as the result of detailed observations on the effects of intra-arterially injected acetylcholine, choline, D-tubocurarine, and anticholinesterases, do not regard the response of the myasthenic end plate to acetylcholine as abnormal. On the other hand they confirm the abnormal response in myasthenia to decamethonium, and find in addition that the predominant action of injected choline on myasthenic muscle, like that of decamethonium, is to produce a competitive type of block rather than the depolarizing type, which is the main action of these compounds in normal subjects. This holds true even for those muscles that clinically are unaffected. Two explanations are offered: either the end plate responds abnormally to these compounds, or else these compounds are themselves converted at the myoneural junction into competitive blocking agents. The position is further complicated by the suggestion that the block is not always of a competitive type; this type of block does not respond to neostigmine, and, if present, would explain the partial response and the danger of overdosage sometimes encountered in severe cases. These observations have also a direct bearing on the mode of action of the neuromuscular blocking agents now commonly used by anaesthetists, which have in recent weeks been the subject of a voluminous correspondence in this *Journal* (see annotation at p. 153).

The nature of the paralysis associated with the low serum potassium encountered in familial periodic paralysis and in severe potassium depletion still remains a subject for conjecture. The most plausible hypothesis is that it is analogous to the paralysis resulting from anodal stimulation of the motor end plate—that is, caused by a hyperpolarization of the end plate raising the electrical threshold to excitation. In one, the hyperpolarization is due to the anodal current, in the other to the marked increase in the ratio of potassium concentration on either side of the membrane. But whether the resting membrane potential is in fact raised has yet to be shown by applying the intracellular electrode technique to the study of human disease. This technique would also be of help in testing the theories advanced⁷ to explain the abnormal shift of potassium into the cells that initiates an attack of familial periodic paralysis.

NEOSTIGMINE-RESISTANT CURARIZATION

During the last few weeks a large number of letters in this *Journal* have focused attention on an apparently new condition—namely, neostigmine-resistant curarization. The contributors have expressed widely different views, and the subject is cloaked in some confusion. At the outset Dr. A. R. Hunter described six cases, all of them elderly and seriously ill patients, who failed to respond adequately to neostigmine after the previous administration of an anti-depolarizing myoneural blocking agent.¹ Since then many other authors have added to the total. In nearly every case cited the patient has died from circulatory failure some hours after operation, and the impression may have been created that D-tubocurarine or one of its substitutes was probably responsible. But the question must be asked: Is the evidence so far available sufficient to justify this assumption? This question is an important one, for the muscle relaxants represent the greatest advance in modern anaesthesia and it would be a pity to turn back the clock on a false assumption. On the other hand, to disregard informative clues is equally culpable.

From the data presented it appears that the risk is greatest in a particular type of case—for example, a seriously ill and elderly patient with abdominal distension after ileus or obstruction. It would be true to say that the post-operative mortality of these cases has always been high, and in the "good old days of ether" many patients were found at the end of operation to be breathing inadequately with severe tracheal tug. Recent advances in the recognition of low-blood-volume states and electrolyte imbalance in these patients have gone a long way towards reducing mortality. The distended bowel has always been a problem for both anaesthetist and surgeon, so that the temptation to try to produce just a little more relaxation is always present; yet these patients require hardly any anaesthesia, since their reflex activity is severely depressed by their toxic state.

Three theories have been propounded to account for the possible failure of neostigmine to reverse the neuromuscular block in these cases. First, that inadequate ventilation during the operation leads to an accumulation of carbon dioxide, with resultant damage to the respiratory centre. Secondly, that these patients may have a low intracellular potassium, which permits the relaxant drug to have a central depressant action on the brain. Thirdly, that the hypovolaemia and consequent low cardiac output are sufficient to prevent the neostigmine from being carried to the respiratory muscles. The last theory does not attract many supporters, and the small amount of evidence available suggests that this condition may occur irrespective of changes in the level of intracellular potassium. Whether this condition is central or peripheral is not known and it might be shown later that neostigmine had in fact reversed the neuromuscular block at the motor end-plate despite the inadequate respiratory movements. The part played by carbon dioxide at the neuromuscular junction has still to be elucidated. It is known that excessive dosage of

neostigmine in cases of myasthenia gravis can produce a neuromuscular block. It would therefore seem unwise to give large doses of this drug unless the intravenous injection of a short-acting anticholinesterase shows that some improvement in muscle power may be expected. One of the most difficult matters to explain is why these patients should die of circulatory failure if D-tubocurarine is the primary cause. Many sufferers from tetanus and poliomyelitis supply convincing proof that patients can be kept completely paralysed for many days by means of this drug without suffering any harm provided their lungs are adequately ventilated. Clearly more clinical data are needed before we can reach a conclusion. In the meantime anaesthetists who have to face this problem will be keenly aware of its dangers.

CONGENITAL ABSENCE OF SPLEEN

Congenital absence of the spleen is a rare anomaly. In a recent review of the literature W. G. J. Putschar and W. C. Manion¹ found 78 reported cases. As an isolated anomaly it is usually discovered in adults unexpectedly at operation or necropsy, but most cases are seen in young subjects, because associated developmental abnormalities are apt to shorten life. The most frequent of these are cardiac malformations and partial situs inversus of abdominal organs. These were present, separately or together, in 49 of the cases reviewed by Putschar and Manion. The cardiac anomalies are various and often complex. The commonest single defect seems to be ostium atrioventriculare commune. Especially in association with partial situs inversus, atrial septal defects and anomalies of distribution of the great veins are usual. Dissections of the vascular system in some cases have revealed abnormalities in the distribution of branches of the coeliac axis and mesenteric arteries, and anomalous connexions between the portal and pulmonary veins. Symmetrical lobation of the liver and lungs is often found. Dr. D. E. M. Plowman describes a case with some of these abnormalities at p. 148 in this issue of the *Journal*, and a further case in a 2-months-old girl has recently been reported.²

The origin of splenic agenesis and of all the commonly associated anomalies can be dated between the fifth and seventh week of foetal life. Putschar and Manion point out that the spleen is the only strictly unilateral organ in the body, and postulate that this asymmetrical development requires a special vascular or chemical stimulus. Several of the accompanying anomalies—symmetrical lobation of the liver and lungs, and situs inversus—are also regarded as disturbances in the development of "laterality," thus suggesting a reason for the frequent association. The vascular anomalies are explained as representing persistence of an embryonic vascular pattern, which may be due to absence of the splenic anlage or of the splenic vessels, or may be the cause of splenic agenesis.

¹ Putschar, W. G. J., and Manion, W. C., *Amer. J. clin. Path.*, 1956, 26, 429.
² Nihoyannopoulos, J., et al., *J. clin. Path.*, 1956, 9, 323.

³ Iverson, R. M., and Koelle, W. A., *New Engl. J. Med.*, 1956, 254, 1131.
⁴ Rowley, D. A., *J. Immunol.*, 1950, 64, 289.

⁵ Gasser, C., and Willi, H., *Helv. paediat. Acta*, 1952, 7, 369.

⁶ Hunter, A. R., *British Medical Journal*, 1956, 2, 919.

The effect of absence of the spleen in otherwise normal subjects is doubtful. R. M. Myerson and W. A. Koelle³ recently reported the case of a man of 36 who had frequent infections and recurrent episodes of Waterhouse-Friderichsen syndrome, in one of which he died with pneumonia and bilateral adrenal haemorrhage. The authors suggest that this history may indicate a lack of immune response owing to absence of the spleen. It is believed that the spleen plays a part in antibody production, and D. A. Rowley⁴ has detected a failure of antibody response to intravenously administered antigen in splenectomized human beings. The available evidence, however, is too slender to support a general conclusion that subjects with splenic agenesis are unusually susceptible to infection.

A possible means by which splenic agenesis may be diagnosed during life is provided by the discovery by C. Gasser and H. Willi⁵ that Heinz bodies may be found in 10% or more of the erythrocytes of infants with congenital absence of the spleen. Confirmation of this interesting observation, and its extension to older subjects, must await future investigation.

PAROXYSMAL IDIOPATHIC MYOGLOBINURIA

Among the various causes of myoglobinuria is the paroxysmal idiopathic disease in which muscle pigment is excreted in the urine in association with attacks of muscular pain and weakness. During severe attacks fever, vomiting, and circulatory collapse may occur, but after three to five days recovery is usually complete. Anuria may be a complication and is probably due to circulatory collapse. Various factors precipitate attacks in susceptible subjects; most common are exertion and cold, and occasionally infections. Although there is often a familial incidence, no definite genetic pattern has been found. L. R. Reiner and colleagues⁶ have recently reported two cases of this condition and reviewed the literature; only about 21 cases seem to have been documented. The condition has to be distinguished from other causes of myoglobinuria. These include crush injuries, electric shock, infarction of muscle, and rarely carbon monoxide poisoning. Myoglobinuria has also been described in association with dermatomyositis and muscular dystrophy, and it occurs in another rare disorder which has been reported in Germany and Sweden after eating fish caught in certain estuaries, Haff disease. Conditions likely to be confused in the diagnosis are those associated with haemoglobinuria and porphyria, but spectroscopy of the pigment gives certain differentiation. Idiopathic myoglobinuria may easily be confused with march haemoglobinuria, but the latter is usually painless.

It is improbable that myoglobin escapes from muscle cells in the absence of necrosis, and most reported cases in which biopsy specimens have been taken have shown

this change. Reiner and colleagues maintain that the microscopical changes differ from those of muscular dystrophy, a condition that may be simulated by the wasting that sometimes follows attacks of idiopathic myoglobinuria. M. C. Berenbaum and colleagues⁷ have suggested that the muscle pigment might be abnormal by analogy with abnormal haemoglobins, but T. A. J. Prankerd⁸ has investigated the electrophoretic properties of myoglobin and found no abnormality of the pigment in this disease. On the other hand, W. Dameshek and colleagues⁹ suggested that the abnormality might lie in the muscle membrane. There is a striking similarity between this disease and a disease of horses in which these animals are afflicted with pain and myoglobinuria when exercised after a period of rest on a high-carbohydrate diet. After a cab strike in Paris early this century large numbers of animals were affected on resuming normal work. B. Carlström¹⁰ has studied this condition and found raised levels of lactic acid in the blood during the attacks; he suggested that sudden liberation of lactic acid without normal dilatation of capillaries might lead to muscle necrosis. However, in man raised levels of lactic acid have not been detected. In spite of this it seems that the disease may be a manifestation of abnormal chemistry in the muscle cell. No specific treatment has yet been found to avert the attacks apart from the avoidance of precipitating factors.

TWO NEW HUMAN GENES

Few of the characters for which men commonly vary, such as stature, intelligence, skin colour, and eye colour, are simply inherited. This contrasts with the number of rare diseases and malformations which are largely due to affected individuals being heterozygous or homozygous for a single mutant gene. Common variations that are known to be unifactorially inherited are mostly those for qualities of the blood, and include the blood-group antigen systems such as the ABO, Rh, MNSs, and Lewis groups, the secrete character,¹ and haptoglobulins.² In certain parts of Africa and Asia variant forms of haemoglobin such as S, C, D, and E, determined by single genes, are common.³ In addition, variations in the ability to taste phenylthiocarbamide and related substances depend largely on a single pair of alternative genes. Possibly, too, the disposition of the venous drainage of the anterior chest wall is simply inherited. Claims for the unifactorial inheritance of other qualities have been made, such as eye colour, tongue-rolling, and left-handedness, but in all of these inheritance is more complex.⁴

It is therefore interesting that A. C. Allison and K. G. McWhirter,⁵ of Oxford, have been able to put forward preliminary evidence of two new common variations that are dependent on a single pair of alternative genes. These are the characters of excreting a distinctive smell-

ing substance, methane-thiol, after eating asparagus, and of excreting an unidentified red or brown pigment in the urine after eating beetroot. Excretion of methane-thiol after ingesting asparagus appears to depend on a dominant gene, for which the name "As" is suggested. In four families in which both parents were non-excretors all eleven children were found to be non-excretors. In families in which the parents were excretors or of mixed type the children were also of both types in about the proportions expected from the estimated frequency of the gene controlling excretion and of its allele (0.23 and 0.77 respectively). The excretion of red or brown pigment after eating beetroot appears to depend on a recessive gene, for which the name "bt" is suggested. For this character all six children of three pairs of parents who were both excretors were also excretors, while the children in other families were mixed in the proportions expected on the estimated frequency of the gene controlling excretion and its allele (0.31 and 0.69 respectively).

Like the genes for the blood groups, these raise interesting problems in evolutionary theory. Both conditions are controlled by a pair of genes, each member of the pair being common in the population. On general evolutionary theory it would be expected that if, for example, the dominant gene for methane-thiol excretion conferred even a small selective disadvantage it would be rare, and kept from extinction only by recurring mutations. On the other hand, if it conferred some advantage the alternative gene for non-excretion would be rare. Two possibilities are that the heterozygote with one of each gene is fitter than either homozygote, or that each gene confers an advantage under different circumstances. Both the "As" and "bt" gene and their alleles probably have more important functions than those they serve with compounds derived from asparagus and beetroot.

VAGINITIS

An outstanding phenomenon in gynaecology since the war is the remarkable increase in the incidence of non-bacterial vaginitis. This is not an artifact of more accurate diagnosis, for the symptoms are all too obvious. The increase has been variously ascribed to malnutrition, dietary imbalance, avitaminosis, alkalosis, and psychological factors; but, whatever the cause, a condition hitherto infrequent is now a major problem in both general and specialist practice. In the great majority of cases the patient is infected with either *Candida albicans* or *Trichomonas vaginalis*, but the reaction of each to treatment is so distinct that their clinical differentiation is of essential importance. Fortunately this is a fairly easy matter. Monilial infection occurs mainly during the latter half of pregnancy, though it is also closely associated with diabetes, vitamin deficiency, poor hygiene, and antibiotic therapy. It is characterized by a discharge of the consistency of a thick paste and by greyish-white spots on the vagina. Microscopically *C. albicans* is found in profusion. Trichomonad vaginitis presents as a foul, greyish-white, frothy, watery discharge; the vulvo-vaginal irritation is equally great, but

the vagina is of a much brighter red than in moniliasis. Again the offending organism is easily identified microscopically.

The diagnosis, therefore, is relatively easy. Treatment, on the other hand, presents formidable problems. The extent of them may be gauged from the multiplicity of chemicals advocated in the recent flood of publications on the subject. They include mercurials (phenylmercuric acetate), detergents (sodium lauryl sulphate), antimycotics (oxyquinoline sulphate and compounds of caprylic, propionic, and ricinolinic acids), dyes (Bonney's and methylene blue), and antibiotics (tyrothricin, nystatin). The last in the form of a pessary is the subject of a clinical trial reported by Drs. R. F. Jennison and J. D. Llywelyn-Jones at p. 145 of the *Journal* this week. The difficulty with all these preparations lies not in finding an effective fungicide—for they are all initially potent—but in overcoming the drug resistance which the organisms acquire with such rapidity and persistence. Their primary sensitivity is indeed a chief obstacle to cure, for symptoms in early cases clear so rapidly on treatment with any of the standard preparations that it is usually discontinued far too soon, and the remaining organisms, now insensitive, multiply and produce further attacks with impunity. The solution to this problem of recurrence would appear to lie, therefore, not so much in the choice of any particular chemical as in its vigorous and prolonged application. Each case should be regarded as potentially recurrent and, after differentiation into its primary type, treated thoroughly long after the cessation of the symptoms. Resistance is best avoided by large dosage, and recurrence by frequent changes of drug. In candida infections it is probably best to begin with a ten-day course of 1% methylene blue pessaries, followed by chlorphenesin ("mycil") pessaries for ten days, with nystatin pessaries for a further fourteen days. The last should be reinforced at the same time by the oral preparation, and both should also be prescribed during the subsequent three menstrual periods. For trichomoniasis two pessaries of the stovarsol-acetarsol type are inserted twice daily for ten days, reinforced by an oral trichomonicide such as aminitrazole, both being repeated during subsequent menstrual periods. The vagina is later insufflated with silver picrate thrice weekly for three weeks, with intermediate lactic acid douching. The commonly accompanying vulvitis is treated with calamine cream or lead lotion, and later with a mild fungicidal ointment. It is a mistake to risk stronger preparations in this type of dermatitis.

These measures will be found effective for most patients, but some will present with recurrences in spite of intensive and repeated courses of treatment. The explanation in these cases may lie in reinfection from the partner, for, though candida is rarely found in the husband, trichomonads are present, according to G. Peel and colleagues,¹ in the semen of 50% of contact males. These workers have also shown that the cure rate is doubled when husband and wife are treated simultaneously.

¹ Peel, G., Guttmacher, A. F., and Raggazoni, H. P., *Obstet. Gynec.*, 1956, 7, 128.

⁶ Reiner, L. R., Konikoff, N., Altschule, M. D., Dammin, G. J., and Merrill, J. P., *A.M.A. Arch. Intern. Med.*, 1956, 97, 537.

⁷ Berenbaum, M. C., Birch, C. A., and Moreland, J. D., *Lancet*, 1955, 1, 892.

⁸ Prankerd, T. A. J., *Brit. J. Haemat.*, 1956, 2, 80.

⁹ Spaet, T. H., Rosenthal, M. C., and Dameshek, W., *Blood*, 1954, 9, 881.

¹⁰ Carlström, B., *Skand. Arch. Physiol.*, 1931, 61, 161.

¹ Race, R. R., and Sanger, R., *Blood Groups in Man*, 1950, Oxford.

² Smithies, O., and Walker, N. F., *Nature (Lond.)*, 1955, 176, 1265.

³ *British Medical Journal*, 1957, 1, 34.

⁴ Tanner, J. M., in *Clinical Genetics*, Chapter 11, ed. Sorsby, A., 1953, London.

⁵ Allison, A. C., and McWhirter, K. G., *Nature (Lond.)*, 1956, 178, 748.

PSYCHOTHERAPY AND THE GENERAL PRACTITIONER—I*

BY

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I wish to start with the fact that I have to talk to general practitioners about things that each of them does every day practically with every one of his patients; I who am not a general practitioner have, in fact, done very little general practice, and for a short time only, and—I think it is better to admit in advance—not even very well. I have therefore to discuss topics about which I know very little, with people who know them intimately from first-hand experience. And on top of this I intend to tell them, not that they should do their everyday work differently—that would be really foolhardy and impertinent—but that they should do it *with a difference*.

What I mean is this: what the general practitioner does, the act itself, should remain outwardly the same: talking patiently with the patients, listening to their complaints, using his well-proved diagnostic skill to find out what they really need from their doctor, and giving them something as near as possible to what they really need. The difference I have in mind should be an internal affair; it concerns what the general practitioner thinks and feels while he is doing his work.

To begin, I wish to prove that hospital medicine and general practice are not identical—in fact, they are greatly different. Still—I repeat here only common knowledge—what the future general practitioner is taught is exclusively hospital medicine, and only after he has started his practice has he any opportunity to learn, at his own peril and at that of his patients, what general practice really is. Thus it happens that in some way he is always rather ashamed of what he is doing; he feels that his real duty is to be a minor, or even a full-grown, hospital scientist, and consequently considers his own work as a general practitioner a kind of second best, which could and even should be done better—that is, according to the standards of hospital medicine—if only there were more time and more facilities available. And lastly, because of this general atmosphere he hardly ever dares draw upon his own experiences and state confidently what he really knows, for in his mind his knowledge is neither as valuable nor as reliable as that of the hospital scientists.

Certainly you will ask now, where have I got this knowledge? The answer is that for the last six years or so we in the Tavistock Clinic have organized research seminars in which general practitioners and psychiatrists discuss as equals psychological problems arising in general practice. All the material used in this address stems from this source.

The Real Field of Study

We have only time to discuss one patient. This will be a chronic case—the real field of study for the general practitioner. It is fair to say that if the time of observation is comparatively short—from a few weeks to a few months—the findings of scientific or hospital medicine are

*Read in the Section of Psychiatry at the Annual Meeting of the British Medical Association, Brighton, July, 1956.

valid and relevant; but if the time of observation is extended to several years, new factors emerge which profoundly change the picture. Whereas hospital medicine only rarely finds opportunity and musters staff and facilities for this long period of observation, this is part and parcel of the daily work of a well-established general practitioner. Our case will clearly show this difference. I quote this case as it was presented by Dr. B. at one of our recent seminars: the shorthand record has had to be abridged for publication, but is otherwise unchanged.

An Illustrative Case

"Mrs. D., aged 42, married. One daughter of 20. She was seen in April for the first time in our practice by Partner No. 1, who made a note that she had had an operation for twisted bowel five years ago and she had had constipation and pains for 20 years; he gave her 'normacol' and liquid paraffin. Then she saw Assistant, who added that Mrs. D. was 'highly strung; severe emotional overlay,' and gave her 'drinamyl.' She saw the same doctor nine days later, and he wrote, 'Much improved. Continue treatment.' A month later she saw Partner No. 2 and told him that a fortune-teller predicted that she would have a long life but her husband a short life. She had been weeping ever since. He put down, 'Anxiety state.' She saw him again three days later. She felt faint in the morning, legs were weak; he continued drinamyl.

"About a week or 10 days ago she was brought into the surgery as she had collapsed near by. Partner No. 1 saw her, dialled 999, and sent her off to hospital with diagnosis '2 over-dose.' She was discharged from hospital about an hour later.

"I saw her first in mid-June. She is small, slight, has very grey hair, rather pale complexion, a lot of lipstick, and she smokes excessively. Was very retarded, moved slowly, took a long time to say anything, and was on the verge of tears all the time. She told me she had had a very hard life, looking after her mother, her daughter, and always going out to work. Though she didn't mind going out to work she really didn't think her husband appreciated how hard she had worked all these years.

"During the air-raids a bomb fell very near and she was badly shaken. Her husband sent her with the daughter to the country. Mother went somewhere else—to another relative probably. When evacuated she met an American soldier aged 24 (she was 26). She had intercourse with him once; she did not want to, but he persuaded her; she did not think there was anything wrong in it at the time.

"There are no hospital letters to support what follows, but she tells me that soon after she had trouble with her periods. She went to the local hospital and was told she was pregnant. A few months later she was told she was not pregnant but had an ovarian cyst, and this was removed. Meanwhile she had told her husband she was pregnant by this American soldier. Her husband was very shocked, was almost in a state of collapse at hearing the news; but they made it up, and she thinks they have been happier since.

"Between 12 and 20 she went to different fortune-tellers three times. Each one told her there would be a death in the family, and there followed a death in the family . . . the husbands of two of her sisters and her stepfather died. The fortune-teller she saw recently told her that her husband would live another two years, or would die within two years. She is quite convinced that this is going to happen.

"I saw her again this morning. She was worse, more retarded, more hopeless. One gets the feeling that she believes it is because she went to the fortune-teller that caused the chain of events. She also feels responsible for the death of the people in the family when she was young, though she does not actually put it into words.

"To-day the notes arrived from her previous doctor. There are a lot of consultants' reports. While attending an out-patient department for her bowel complaint she had a cold axillary abscess in January, 1948, which was successfully treated; chest x-ray normal. October, 1948: She was having difficulty with defaecation; nothing abnormal found and she was being treated with confection of senna. February, 1950: 'She must, I think, be suffering from spastic colon. I could find no abnormality clinically or on proctoscopy. Arranging barium enema, x-ray, and blood count. . . . March, 1950: Barium enema—no abnormality; blood count: 85% haemoglobin and 4,300,000 red cells; sigmoidoscopy—no abnormality. Symptoms must be largely

functional. . . . April, 1951: 'She was found to have second-degree piles, and these have been injected. She was given a sheet of instructions on bowel function, and some normacol. . . . July, 1951: 'Has signs suggestive of supraspinatus tendinitis. She has been put on treatment in the physiotherapy department. . . . October, 1951: 'This patient was admitted with incomplete intestinal obstruction. She had had a number of similar but less severe attacks. Laparotomy was performed and revealed the obstruction in the ileum. It was adherent to her previous scarring. The adhesions were divided and she made an uneventful recovery.' June, 1952: 'She gave a history of chronic constipation. Abdominal and rectal examination failed to reveal any abnormality. She was reassured about her condition and liquid paraffin was prescribed.' August, 1955: 'I was unable to find any haemorrhoids in this patient and although she tells me she is constipated she only has soft faeces in her rectum. Perhaps her previous history is significant in her acquisition of an exaggerated bowel awareness. She also says she feels blown up towards the end of each day, and I am wondering whether there is some stricture formation at the site where the adhesions were divided. I have arranged a barium meal and follow-through for this. She also complains of feeling depressed and requested a consultation with a psychiatrist. I am arranging this. . . . November, 1955—from the psychiatrist: 'The above-named patient of yours was referred to my out-patient department from the surgical department, where she was regarded as being over-preoccupied with her alimentary tract for no adequate physical reason. This is indeed so, but on further inquiry I find she is suffering from a moderate degree of depression, with the usual accompanying anergia, lack of concentration, excessive guilt, and irritability. She herself tends to blame her housing conditions for this, but as she has been there for 20 years this, I feel, can only be of partial aetiological significance. With your agreement I would like to see her further in out-patients in the hope of improving her general depressive condition.'

"She was seen then by the psychiatrist four or five times. There is no further letter, and I could not get much out of her about what sort of treatment she got from him."

Dr. B. then added that he thought there was no time to lose, and so he made an appointment with a psychiatrist, who was well known to him, to give the patient E.C.T. without any delay.

Points from the Case

There are a great number of important issues in this case, all well worth discussing. I shall pick out only a few. The first is diagnosis. Everybody will agree with the psychiatrist that the woman is suffering from depression. What the psychiatrist did not say in his letter is that the depression has been going on for many years. When it started it is difficult to say, but the case history suggests that its first symptoms may go back to puberty or early adolescence—when she first went and consulted fortune-tellers. Even the basis on which the depression had arisen can be approximately surmised; it must have something to do with her bad wishes towards her near male relatives, first stepfather and brothers-in-law, and recently her own husband. The fortune-teller, obviously, is only a mouthpiece of her own repressed desires. The little that we know about her does not allow us to go further and speculate why originally these desires had arisen in her and why recently they had developed to such intensity that she broke down. Remarkably, the psychiatrist's report did not even mention these problems.

Then there is another highly important aspect. When a patient presents symptoms strongly suggestive of psychological problems doctors in general feel uneasy and sooner or later—as did Dr. B.'s partners—resort to two kinds of wholesale medication. One kind is well-meant common-sense reassurance, and the other is prescribing some tonic or stimulant if the patient is depressed, or some sedative or—to use its recent fashionable name—tranquillizer if the patient is not. Drinamyl, being a combination of stimulant and sedative, is a happy solution of the doctor's dilemma.

This automatic prescribing of tonics and tranquillizers in cases suggestive of psychological problems has an unintended but highly important side-effect. When a patient comes to his doctor complaining—I leave the verb intentionally without an object—his attitude towards illness is

still "unorganized." What will happen in the future is determined partly by the nature of the illness, but partly—and especially so in chronic conditions—also by the doctor. I do not mean here faulty diagnoses or therapeutic errors, but the effects of clinically correct diagnoses and rationally correct therapy. What usually happens may be described as follows: the patient offers various symptoms to his doctor; the doctor, on the basis of his knowledge, experience, and diagnostic skill, decides which of the symptoms should be taken seriously and be treated, and which not. The "illness" to which the patient and the doctor settle down is thus a compromise, acceptable to both.

This agreement between patient and doctor about what to consider as the true "illness" can be described from another angle as the doctor helping the patient to organize an "illness" around certain symptoms. The present state of medicine, with its emphasis on organic diagnosis and the corresponding neglect of psychological factors, prompts the doctor to organize illnesses around anatomical or at least physiological—that is, around some concrete—pathology; in our case around intestinal functions, resulting in Mrs. D.'s "exaggerated bowel awareness," so poignantly described by one of the consultants. The awkward question arises, how much of this "exaggerated awareness" is due to her intrinsic illness or constitution and how much to her doctors' efforts. Our whole training is an incessant cautioning against the dangers of missing some organic sign. Although this is a well-founded attitude, I think doctors—particularly general practitioners—should be equally strongly warned against finding an irrelevant organic sign and concentrating their own and the patient's efforts towards treating it, while not paying due attention to the glaring psychological symptoms.

Although everybody hearing Mrs. D.'s whole history will agree that her psychological problems have been the most important "illness" offered by her, her doctors responded exclusively to other "illnesses" offered, and treated only those. Thus we hear of an ovarian cyst removed; from more recent years we have evidence that she was considered to be suffering from life-long constipation, a cold axillary abscess, spastic colon, piles, tendinitis, incomplete intestinal obstruction due to adhesions which were accordingly divided, a possible stricture due to further adhesions, etc.

Hospital surgeons performed four operations on Mrs. D.—all successfully—and so they closed her case, proudly improving their statistics. But what about the general practitioners? They had to go on attending Mrs. D., still suffering from exactly the same complaints as before or between the operations.

Collating the Evidence

Does this mean that the operations were not necessary? Or that treating her constipation was incorrect? Emphatically not. The four operations, as well as the treatment prescribed for her constipation, were rational therapy. It will be remembered that in the beginning of my address I said that I do not propose that doctors should do their work differently, merely that they should do what they are doing *with a difference*. Everything done in this case was correctly done; but now, looking back on the whole medical history, it appears as if the overall problem had persistently eluded the doctors. Instead of tackling the real problem, all doctors in unison joined hands with the patient to concentrate all attention on the function of her bowels.

Although the psychological problems—or, as Assistant noted on the patient's card, "the severe emotional overlay"—were glaring, no doctor, *not even the psychiatrist*, tried to piece the evidence together. For the whole duration of her "illness"—that is, at least since her ovarian cyst—Mrs. D. was described by all her many doctors as suffering from some entirely organic disease, and it was only in November, 1955, that a psychiatrist was consulted. All the records in the various hospitals or in the files of her

general practitioners list her under the various organic "illnesses" proposed by her and accepted by the doctors. Is this sensible "medicine" or only a matter of convenience, a kind of short-term, and perhaps short-sighted, thinking? And how many cases diagnosed and listed in our statistics as organic, might turn out—if properly examined—to belong to this category?

All these aspects of the case were thoroughly thrashed out in a long discussion at our seminar. The following week we learnt from Dr. B. that when he saw the patient on the day after the seminar her depression seemed more tolerable—perhaps it was better, or maybe the doctor was better. To cut a long story short, patient and doctor could talk to each other; a good deal more of her previous history was revealed which threw new light on the possible causes of the something "bad" collecting in her. In the end the emergency appointment with the psychiatrist for E.C.T. was cancelled, as neither patient nor doctor felt any urgent need of it. Let me add, drinamyl was neither prescribed nor asked for, but a psychotherapeutic relationship was started—it is true, somewhat late in the day, and so with only a very guarded though not absolutely bad prognosis.

The real change achieved at this point was that the doctor approached the patient in a different mood, in a different spirit; instead of trying to find some not quite relevant—or even irrelevant—organic change, he established a psychotherapeutic relationship with the patient, which may grow into something. Whether he himself will be able to continue the treatment or will have to refer the patient to a specialist is a matter of policy, not of principle. In other words, a tactical step, not a strategic decision. The strategic decision was taken when he sat down with his patient and listened to her. This kind of listening is an art, at least as difficult and subtle as using a stethoscope. Still, training for this kind of listening is not yet included in the medical curriculum. Maybe it will be in the future.

As you see, here is a vast field of research accessible, above all, to the general practitioner. It is he who knows intimately the patient's previous history, and it is he to whom the patient first turns with his fears, pains, or worries—with all that medicine calls complaints, symptoms, or signs. It is the general practitioner of all doctors—who can most easily get hold of and piece together the various bits of information about a patient, so that the picture should make sense. Moreover, his relationship with the patient is, as a rule, lasting, not ephemeral like that of a specialist. Thus he can conduct long-term observations extending over many years and can collect sufficient well-authenticated material on the basis of which the short-term achievements of hospital medicine can be more accurately assessed. Obviously this cannot be done so long as general practitioners are overawed by the unquestionably great successes of hospital science and cannot consider their own observations valid and reliable.

Help for the G.P.

Here we—psychologically minded psychiatrists—can be of considerable help. It will be remembered that Dr. B., after the second interview, found Mrs. D.'s depression so severe that he arranged for an immediate E.C.T. I do not wish to raise here the much-discussed problem of shock therapy; for our case this is a side issue. What is important, however, is that Dr. B. could not bear the woman's depression; it was too much for him. The more our experiences in our seminars grow, the more we become impressed by the amount of therapy prescribed—*sit venia verbo*—to help the doctor. Whether this kind of prescription helps the patient is another matter. The chief assistance that we psychiatrists can offer a general practitioner is to enable him to become aware of his own involvement in his patients and so help him to respond better, more freely, and more accurately to their needs, while being less encumbered by his own emotions.

This is by no means an easy task, and I am rather doubtful how far an individual general practitioner can achieve it on his own. One promising method for acquiring this self-awareness and with it a modicum of psychotherapeutic skill is participation in our research-cum-training seminars. I know that one case is not sufficient proof for such a peremptory announcement, but it was impossible to quote more here.

Conclusion

So may I sum up: The most important aspect of the problem "general practitioner and psychotherapy" is to understand the presenting complaints as symptoms of the patient's whole life history. In order to achieve this the general practitioner must become less dependent on—that is, more critical of—hospital medicine and with it more confident about his own observations. Further, an equally important condition, he must become aware of his own involvement in his patients' problems in order to control his responses more accurately. Whether this latter can be achieved without outside help must remain for the time being undecided.

PSYCHOTHERAPY AND THE GENERAL PRACTITIONER—II*

BY

P. R. SAVILLE, M.R.C.S., L.R.C.P.

I shall deal with only a few of the aspects of psychiatry as related to general practice, and it would perhaps be of most interest if I concentrate mainly on the influence which the research seminars at the Tavistock Clinic had on my work as a general practitioner and give some general idea of the nature of our group and its atmosphere.

Problems of the G.P.

It soon became apparent that the problems of general practitioners were different from those of the psychiatrists, in so far as we have large numbers of patients who have to be dealt with on the spot, so to speak. We cannot pick and choose; we cannot put them off; we cannot tell them to go elsewhere because we are too busy. They have to be dealt with there and then, and it becomes obvious that we must necessarily evolve different techniques to treat them. As, in the normal course of events, psychiatry in general practice does not exist at all, we had to work it out for ourselves over a period of a few years, and it is really the purpose of this contribution to demonstrate how valuable and rewarding was the time spent at the seminars, and how much it has helped me in my everyday work.

It must be remembered that we have originally been trained to think in terms of pathological processes and have in our minds a list of drugs which will alleviate these conditions. When I was a student it was a very small list, but it is much larger now; in fact, the advent of the antibiotics has enabled us to really cure people of certain inflammatory diseases. But in my early training disease of the mind (other than frank lunacy) was relegated to the diagnosis of patients after full investigation had revealed no organic cause. At that stage we produced a medical sneer, our attitude changed to one of contempt, and we labelled the patient "a neurotic"—a dreadful slur. We sometimes let the patient down more lightly by calling his condition "functional." We felt we had done a jolly good job at this stage

*Read in the Section of Psychiatry at the Annual Meeting of the British Medical Association, Brighton, 1956.

—no germs were found, no growths, and so there was nothing really wrong with him; therefore he could get on with it himself.

Unfortunately, the patient showed great reluctance to get on with it himself, and continued to plague us with his complaints. At this stage we got rid of him—to the psychiatrist, who, queer chap though he was, became rather useful after all. What he did with the patient was none of our business, but he performed his main function adequately—by keeping the patient away from us.

We learned that he was a kind sort of chap who sat down for half an hour or more and actually listened to the patient!

This was indeed a revolutionary idea, and, more surprising, it occasionally seemed to do some good. This made some of the more enlightened of us sit up and take note and attempt to follow suit, but it soon became apparent that one had to know how to listen. It was not all that simple; but how to acquire that valuable art was another matter—in fact, there was no practical way of doing it. The usual long and costly special training was out of the question for a busy general practitioner. One read a few books and attended the occasional lecture by a chap who seemed to have heard of Freud. But it did not really help.

Research Seminar at the Tavistock Clinic

At last the heaven-sent answer to our prayers arrived. The Tavistock Clinic attempted some solution to our problem, and, I think, succeeded very well.

A group of eight doctors met weekly to discuss our own cases, as a research seminar. We were a varied group, with only one thing in common—that we were all doctors in general practice. The sexes, ages, and nationalities were mixed. We had the usual tensions of any therapeutic group, for that is what we inevitably became (in a mild sort of way). We got to know each other really well and we recognized each other's patterns, idiosyncrasies, and weaknesses, and were fully conscious that everyone else was just as aware of our own deficiencies.

We gradually became more and more cognizant of the intricacies of the hackneyed doctor-patient relationship, and the traditional "bottle" was given a little extra meaning.

Listening to our colleagues relating their own cases (with some cunning and judicious guidance from the psychiatrist leader) it soon became apparent how varied and different we all were in our individual approaches to the patient, and how we all expected him to conform to certain patterns of behaviour, each of us taking it for granted that our own brand of expectation was the correct one.

Most of us learned to examine our own attitudes in the light of these discoveries, and our increasing ability to acknowledge and accept criticism was a very noticeable by-product.

Incidentally, we became highly critical of each other—not much was missed by us, and indeed we were often brutal. This was where the psychiatrist was called upon to exercise all his skill in keeping the temperature at a reasonable level. We began to understand what he meant when he spoke about the "apostolic function" of the doctor—one of his pet hobby-horses.

We were also given the opportunity of discussing difficulties concerning our own cases with one of the psychiatrists at the Tavistock Clinic (other than the seminar leader).

All this helped to increase our elasticity, so necessary in dealing with patients in general practice, reducing tension, and, most important, removing some of our own guilt feelings towards patients. We also noted that the patient responded favourably to our new type of approach and our new style of listening. We got to know something about what could be done for different patients, who could benefit by psychotherapy, and who should not be referred to a psychiatrist.

We even attempted psychotherapy ourselves. At first we looked for startling and dramatic cases, and in fact got what appeared to be amazing results—so much so that it made some of us over-ambitious. But after a bit we learned that beginners' luck did not continue to hold, and with some miserable failures we gradually dropped attempts at major psychotherapy and became more aware of our own limitations and more sensitive to what we could and should attempt, finally settling down to a type of therapy varying with our own individual skill and inclination. In my own case a combination of ventilation, reassurance, and counselling.

My personal development in the group was one of wonder at what was attempted and achieved by certain other members of the group, and then came a remarkable result in one of my early cases, a bit of magic which rather overstimulated me.

I was soon disillusioned by a dismal failure, and finally settled to my present level of treatment. I think I can best illustrate this development by relating a few details of three cases.

Case 1

The patient was a thin, pale, inoffensive man aged 26 who had been married three weeks. He complained of splitting headaches ("behind his eyes"), so severe that he could not walk and had to be taken to hospital in a taxi, where he was admitted there and then and investigated for possible cerebral cause or acute sinusitis. He reported to me immediately he left hospital, complaining that his headaches were still severe.

I knew his family set-up well—his blind father (now dead), whom he used to lead about; recent marriage; wife's healed tuberculosis; childhood in orphanage—and something clicked. I dived right in, spent an hour with him, took a full history, and with plentiful material made an immediate interpretation, tracing it back to his childhood in the orphanage, associating himself with his blind father, to whom he was greatly attached—and perhaps unconsciously resented, with headaches (always behind eyes). He was assured of the non-organic origin of the headache. There was a good deal more interpretation involving his wife, a newly acquired motor-cycle, his relationship with an elder brother, and his Cinderella-like role in life.

The patient accepted the interpretation fully. I saw him a few days later. He said he felt marvellous, "no headaches," and now understood that his symptoms were related to his abnormal childhood. He was no longer afraid of crowds, slept well, and was most grateful to me. This all happened in March, 1953. I think you will agree that he was suffering from a severe anxiety neurosis.

Over three years have elapsed. He is the proud father of a bouncing baby girl, aged 1; loses no time from work, and rarely reports to me, except for tonsillitis and such-like complaints. His wife tells me how well he is. I feel you might bear with me if I allowed myself to be carried away by this case.

Case 2

I was soon brought back to earth by my next case. A young man of 22, who could not report for his annual military training, was seized at the railway station with dizziness, apprehension, and near collapse. In a few sessions I was overwhelmed by a mass of homosexual material plus a rapidly developing positive transference. It was all there for the asking if one knew what to do with it. But I could not handle it; I was overwhelmed by the weight and content of the material presented to me, and I panicked—more or less ran away, or rather made the patient run away. He avoided me after that, with his problem unsolved. I understood from his mother, who was quite pleased about her son now, that he had a boy friend living with him and that he had settled down and was quite happy. So I nearly spoiled that romance.

This experience made me wary, and I developed more restraint and took on only the type of case I felt I could properly handle.

Case 3

My third patient was the sort of case I now feel I can do most for. She was a worried-looking married woman of 41, who had consulted me regularly for six to eight years, practically weekly, complaining of a multitude of symptoms, including sweats, headaches, "fibrositis," pain in the chest, "pins and needles," with never any abnormal physical signs. She also had waves of depression and crying bouts. It was always obvious that her symptoms were psychogenic in origin, but I had been disinclined to tackle them on that level, until the stimulating effect of the group influenced me to arrange an appointment with her, after surgery hours, so that I could really listen to her.

I spent an hour with her and listened. I heard about her drunken father, who used to beat her overworked mother, and about terrifying scenes with parents fighting and children in the street in the early hours of the morning; stitches put in mother's wounds; scenes at police courts; her mother's death followed by a stepmother in the house; and her own early marriage to get away from home.

Then came discussion of her own frigidity and memories of witnessing parental intercourse. I had to do little more than listen. The floodgates were opened, and for the first time in her life she spoke about those unmentionable things.

My interpretation was minimal, and I let her talk with only a little prompting here and there. This all happened in March, 1954, over two years ago. I see her only occasionally now, very much less than in the past. Her whole attitude is different and our relationship is especially good; we understand each other. We have friendly, encouraging chats, and we have both silently agreed not to go too deeply into it.

My heart no longer sinks as she walks into my consulting-room, and she no longer looks miserable when she walks in. In fact, the doctor has not only done the patient some good but the patient has also helped the doctor. She even brought me a new patient a few months ago.

I must emphasize that this case, so apparently simple in every way, would not have been possible for me in my pre-Tavistock Clinic days. I had learned to listen.

ORDER OF ST. JOHN OF JERUSALEM

The *London Gazette* has announced the following promotions in, and appointments to, the Venerable Order of the Hospital of St. John of Jerusalem:

As Knights: Surgeon Vice-Admiral Sir K. A. Ingleby-Mackenzie, K.B.E., C.B., M.R.C.S., L.R.C.P., Q.H.P., Brigadier Sir A. E. Porritt, K.C.M.G., C.B.E., F.R.C.S., and Colonel G. D. English, M.B. *As Commanders (Brothers):* Surgeon Vice-Admiral R. C. May, C.B., O.B.E., M.C., M.R.C.S., L.R.C.P., Q.H.S., Major-General F. K. Norris, C.B., C.B.E., D.S.O., M.D., Air Vice-Marshal P. B. L. Potter, C.B.E., M.D., Q.H.S., and E. A. Daley, C.B.E., M.B., Drs. R. Cauchi-Inglott, M.B.E., M.D., A. T. McKay, W. W. King-Brown, R. Chester, T. C. James, G. L. C. Colenso-Jones, A. J. Boase, O.B.E., and N. H. Ashton. *As Officers (Brothers):* Lieutenant-Colonels W. Windsor, M.R.C.S., L.R.C.P., and I. A. Walsh, M.B., R.A.M.C., Wing Commander W. O. Davies, M.R.C.S., L.R.C.P., Drs. W. E. Talbot, A. R. Shaw, Chang Hoey Chan, I. Mackenzie, A. K. MacRae, A. Kefaals, M. A. Watson, T. D., R. Brown, J. E. King, G. Walker, W. E. Lock, H. A. Korn, D. J. Turnbull, G. Thompson, N. J. Caldwell, A. M. Purves, V. C. Dyring, L. N. Gollan, J. A. Waycott, and E. O. Halliwell. *As Serving Brothers:* Mr. W. A. L. Tucker, F.R.C.S., Drs. Mohammed Ahmed, I. McCracken, H. H. Coulter, F. D. Morphy, M.C., J. T. Paranjothy, Kong Sau-Yui, W. Grima, J. Saliba, E. Cesario, E. H. B. Grey, A. Edwards, J. M. Sherriff, R. S. Abraham, T. F. Greenwood, T. Cullen, W. B. Ballenden, W. Kirkwood, J. F. Coates, A. St. C. R. de Costa, M.B.E., D. T. Gilbert, and F. E. Fletcher. *As Associate Serving Brothers:* Mr. I. B. Taylor, Drs. L. K. Luk, G. Frampton, and H. M. Wolfsohn. *As Serving Sisters:* Drs. Evelyn W. A. Churches, Stella C. C. Macdonald, and Catherine J. S. Sedgwick.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Smoking and Lung Cancer

SIR,—It is refreshing to read Dr. E. L. Wynder's new approach (*Journal*, January 5, p. 1) towards the solution of the tobacco-cancer problem and to see that, instead of trying to stop us smoking, he is pursuing his researches with a view to letting us continue to smoke while ridding the cigarette of its carcinogenic properties.

I think that most doctors in this country not only accept now the association between cigarette smoking and cancer but, moreover, assume that tobacco smoking is carcinogenic. One should, however, utter a word of warning to those who compute mathematically the increased risk at which smokers are in respect of cancer of the lung. There are several definite, and probably a still greater number of hypothetical, factors which may be associated with smoking. It is clear, for example, that there is some relationship between smoking and the consumption of alcohol. In the group of lifelong non-smokers are a number of persons who abstain from smoking as a matter of personal or religious principle, and most of these abstain also from alcohol. At the other end of the scale, men who drink spirits in excess nearly all smoke cigarettes too. In the small group of people who relapse after having stopped smoking drinking men bulk very large. The first cigarette is very often smoked at a party. It is therefore clear that an association does exist between alcohol and tobacco, and consequently it would be inevitable that an investigation of alcohol consumption would show a relationship between alcohol and cancer of the lung, even if there is a carcinogen in tobacco smoke. The association between alcohol and cancer of the lung would, in fact, be a false association, and false associations are the bugbears of those who conduct statistical research. Nor should we too lightly dismiss the effect that alcohol unquestionably has on respiratory function.

No one would make the absurd mistake of ascribing cancer of the lung to alcohol, but in fact that such an obvious association has not yet been reported or discussed by the authors of papers on this subject shows clearly how great a risk there may be of some factor other than tobacco smoking having a bearing on the problem of cancer of the lung. Additional associations of this kind, concealed in mortality statistics, should make us very wary of accepting calculations of the risk of cancer of the lung to which smokers are exposed. Moreover, now that cancer of the throat and gullet is being examined for a possible relationship with tobacco, extreme care will be necessary to exclude a possible causal relationship with alcohol. Such a relationship might occasion a false association between tobacco and cancer of these parts of the body, for cancer of the throat and gullet is certainly commoner in alcoholic subjects.

We have planned an investigation of the relationship between drinking and smoking, and when, in due course, your readers are invited to complete a short questionnaire, perhaps they would be good enough to co-operate with us.

I am, etc.,

London, W.12.

IAN AIRD.

Function of the Prostate

SIR,—I have been most interested in the correspondence on the function of the prostate. Dr. J. A. L. Magee (*Journal*, December 15, 1956, p. 1427) feels convinced that the prostate is the functionless remains, in the male, of the uterus and vagina. Surely this cannot be so, because it appears that the prostate depends for its development on the presence of functioning male gonads. In the immature male the prostate is small and hardly palpable,

and it grows with the development of the male gonad. If it were a vestigial remnant of the uterus and vagina, why should it do this? One would assume that the presence of male hormone in the circulation would inhibit the development of a purely "female" remnant.

Some years ago I had the opportunity of examining a number of elderly Turkish eunuchs, relics of the polygamous days of the Ottoman empire, retired seraglio guards. They were remarkably fit old people, lean and wiry, contrary to popular opinion. Their prostates were small and completely undeveloped, and could scarcely be felt per rectum. I was told that disorders of micturition were unknown among eunuchs, and that, on the whole, they lived longer than ordinary men. This proved to me that the prostate was dependent on the male gonads for its development, and must therefore be an essentially male organ with a specific function, presumably to add a fluid to the semen. One of these eunuchs, aged 76, told me that he had, in middle age, become capable of intercourse, and that he then ejaculated a small quantity of clear fluid.

I suggest that the prostate has a definite function, and that it is our civilized mode of life that leads to its giving trouble in old age. Veterinary surgeons tell me that prostatic troubles are common in pampered house dogs but unknown in foxhounds, working farm dogs, sheep dogs, etc. They treat prostatic enlargement and disorders of micturition in dogs by castration.—I am, etc.,

JOHN NESFIELD.

Whitstable, Kent.

Glycyrrhetic Acid

SIR,—I have read the letters of Drs. R. Hall and J. Jefferson (*Journal*, December 15, 1956, p. 1431), Dr. B. F. Russell, Dr. I. M. P. Smeed, and Dr. K. M. Tomlinson (*Journal*, December 22, pp. 1483 and 1484), and, although I am loath to burden any further the pages of your *Journal*, I feel it necessary to clarify certain cardinal points.

The work of Molhuysen *et al.*¹ deals with the oral administration of "succus liquoritiae" (a dried watery extract of the roots of *Glycyrrhiza glabra*), and these workers came to the conclusion that "the effect of liquorice extract by mouth is in almost all respects similar to that of injections of large doses of deoxycortone." However, I fail to see how the oral use of "succus liquoritiae" has any bearing on the topical use of glycyrrhetic acid. It is significant, as Dr. Nieman² states, that the characteristic group of deoxycortone acetate and cortisone, etc.—that is, the alpha, beta unsaturated ketone grouping—is also present in glycyrrhetic acid.

It appears to me that most of the correspondents who have written on glycyrrhetic acid have failed to examine the chemical aspects of this drug. They refer to glycyrrhetic acid as though it were a simple standard substance available from any chemist's shelf. Briefly, glycyrrhetic acid is a very complex triterpene, in the chemistry of which has still not been fully elucidated, in spite of the lengthy research work and many publications of the Ruzicka,³ Voss,⁴ Professor Spring,⁵ Kon and Ross,⁶ etc. The method of extraction from liquorice root varies considerably, as does the resultant product. Four isomers have already been described.⁷ Their melting points, optical rotations, physical and chemical properties vary. Under these circumstances it is impossible to class all the substances called glycyrrhetic acid under one heading. This is a most important point to be borne in mind when making trials with "glycyrrhetic acid."

I would also refer to the veterinary report on glycyrrhetic acid, where Mr. Brendan Halpin⁸ has demonstrated the anti-inflammatory properties of glycyrrhetic acid in veterinary practice.

The results published on my trials⁹ were obtained prior to July 5, 1956, and since that date many of my patients have been treated with "biosone G.A.," which preparation claims to contain the active isomers of glycyrrhetic acid. My results up to September of this year in selected subacute and chronic conditions of an eczematous pattern are:

Cleared	Improved	No Change	Worse
22 23%	56 58%	10 10%	9 9%

While I was fully convinced of the efficacy of this preparation, I did not find it necessary to enter into complex statistical analyses and controls. Nevertheless, after the Brighton meeting, when some colleagues suggested that this was necessary, I decided to control a few cases against the base. The figures shown only confirm my original convictions.

	Marked Improvement	No Change	Worse
"Biosone G.A."	14	1	2
Base	3	14	—

I should also like to draw the attention of your correspondents to the publications and patent specification¹⁰ of Drs. Cornforth and Long, of the National Research Development Corporation. They demonstrate, in the manner described by Long and Miles,¹¹ that products which they obtained from liquorice root had cortisone-like activity. In my opinion, it is completely unscientific to take the results of a number of independent dermatologists, add them together, and then draw conclusions for or against a particular drug. In the case of glycyrrhetic acid this is impossible, as the drug and the base used have been supplied by various manufacturers and would therefore vary. It is only after an extended clinical trial, where the dermatologist can gain experience with the drug and can select the cases, that he has any opportunity of assessing its efficacy. If this were done haphazardly it could readily alter the statistics. I cannot over-emphasize this fact.

Having used glycyrrhetic acid in several hundred cases, I feel that I can give a true opinion on this drug. Glycyrrhetic acid and hydrocortisone do not always act in the same fashion, but they can be complementary; thus I have used glycyrrhetic acid ointment with success where hydrocortisone has failed, and of course the reverse is equally true. The active isomers of glycyrrhetic acid should be the first choice in the treatment of the subacute and chronic conditions, bearing in mind its cost, and hydrocortisone can then be tried on the failures of glycyrrhetic acid.—I am, etc.,

E. COLIN-JONES.

Hove.

REFERENCES

- 1 Molhuysen, J. A., *et al.*, *Lancet*, 1950, 2, 381.
- 2 Nieman, C., *Chem. Weeksl.*, 1952, 48, 213.
- 3 Ruzicka, *et al.*, *Helv. chim. Acta*, 1937, 20, 2278.
- 4 Voss, W., *et al.*, *Chem. Ber.*, 1937, 70B, 122.
- 5 Beaton, J. M., and Spring, F. S., *J. chem. Soc.*, 1955, Sept., 3126.
- 6 Kon, G. A. R., and Ross, W. C. J., *ibid.*, 1942, 1, 741.
- 7 Beaton, J. M., and Spring, F. S., *ibid.*, 1956, July, 2417.
- 8 Colin-Jones, E., *British Medical Journal*, 1956, 2, 1305.
- 9 British Patent 713, August 18, 1954, 651.
- 10 Long, D. A., and Miles, A. A., *Lancet*, 1950, 1, 492.
- 11 Halpin, B. (1956). *Brit. vet. J.*, 112, 496.

SIR,—May I be permitted to voice the experience of a G.P. who, in common with most of his colleagues, is too busy to read the ever-increasing volume of manufacturers' literature but endeavours to keep abreast of the "newer remedies" through the columns of your *Journal*? In the last few weeks I have read with interest many letters regarding the value of glycyrrhetic acid in a variety of inflammatory skin conditions, and my own experience with what is claimed to be the active isomers of glycyrrhetic acid as contained in "biosone G.A." preparations may be worthy of record in this connexion.

Having been aware of the high therapeutic efficacy but the prohibitive costs of the hydrocortisone preparations—which were not even released for general prescribing on F.C.10 until December, 1955—I gave vent to treating some of my patients suffering from acute inflammatory skin conditions, especially "contact dermatoses," with biosone G.A. ointment, with and without neomycin dependent on the presence of superimposed bacterial infection. Later I tried biosone G.A. rectal suppositories in anal piles, prolapsed with or without bleeding, and also biosone G.A. ophthalmic ointment in inflammatory eye conditions, and soon I was in no doubt that most of my patients benefited from this medication. It was gratifying to make a mental note at the same time that a substantial saving had resulted in the national health bill without loss of efficacy.

Admittedly, I had relied entirely on my clinical acumen, as most G.P.s do, and obeyed the simple rule that, if

Ilford, Essex.

S. CHAKRAVORTI.

Sheffield, 10.

H. H. PILLING.

Cheltenham.

JOHN E. UNDERWOOD.

London, S.W.1.

ROBERT CUTLER.

BRITISH MEDICAL JOURNAL 163

Dublin.

REFERENCES

- ¹ Okell, C. C., and Elliott, S. D., *Lancet*, 1935, 2, 869.
- ² Round, H., Kirkpatrick, H. J. R., and Hails, C. G., *Proc. roy. Soc. Med.*, 1936, 29, 1552.
- ³ Fish, E. W., and Maclean, I. H., *Brit. dent. J.*, 1936, 61, 336.

SIR,—Following the interesting article by Dr. J. Basil Rennie on renal oedema (*Journal*, December 29, 1956, p. 1506) I felt the following observations on the progress of one patient with a type II nephritis of interest.

In October, 1956, because of increasing oedema (proteins 3.1 g.%, urea 60 mg.%), I decided to repeat cortisone therapy at home. Fluid input-output charts, along with weight, blood

The close association between stress (by infection) and urinary output is interesting, and perhaps a carefully watched naturally occurring infection (always more likely in a nephrotic subject) might be included as a capricious weapon in the armamentarium against nephrosis.—I am, etc.,

Eastwood, Essex.

EDWARD T. R. HOLT.

SIR.—Your leading article (*Journal*, December 29, 1956, p. 1531) on the treatment of this condition is bound to be of particular interest to general practitioners, for upon them, in most cases, responsibility falls for dealing with one of the really grave emergencies of medicine. There is, however, one strange omission in respect of the medicinal treatment of this condition. Can anyone doubt the value of combining atropine 1/75 to 1/50 gr. (0.9 to 1.3 mg.) with the morphine? Not only does it tend to lessen rapidly further bronchial secretion, but its effect in diminishing the risk of vomiting from the morphine is well known.—I am, etc.,

London. N.W.7.

A. H. MORLEY.

SIR.—The conclusions resulting from Drs. W. F. Tyrrell and J. Smith's article on tuberculosis in Glasgow (*Journal*, December 22, 1956, p. 1451) are sufficiently unusual and unexpected to warrant some comment, and I submit the following observations.

(1) The new cases of active tuberculosis discovered in the period under review were "practically all" sputum-positive. This is not the case in my own area, where only about 60% of new cases are positive. One wonders whether such matters as standard of diagnosis, laboratory facilities, or reluctance of patients to consult their doctors have anything to do with this finding: but, in view of the subsequent sections of the article, it may well be that this high proportion of positive cases is related to an undue susceptibility of the population dealt with.

(2) Approximately three-quarters of all the new patients were found to have a history of contact with tuberculosis. This is a much larger proportion than is usual in other areas, and, since "history of contact" is to a large extent synonymous with "family history," it follows that the Glasgow patients presumably have a subnormal resistance to tuberculosis on account of their family history. According to the article, this is not due to environmental conditions, such as poverty or overcrowding, and if one can exclude the possible factor of better-than-usual ascertainment of family history it would seem that we have here a further indication of undue susceptibility in the Glasgow patients.

(3) The examination of contacts appears to have been on a fairly normal scale—412 contacts of 125 new patients were examined (for comparison, in my own area, 519 contacts of 93 new patients were examined in 1955). It is remarkable, however, that 5.7% of the Glasgow contacts were found to have active tuberculosis (my own figure for 1955 is less than 1%). Again,

Like Dr. Alexander, I also have been harassed by anxious ship's captains who are always prepared to have a whole

Like Dr. Alexander, I also have been harassed by anxious ship's captains who are always prepared to have a whole

battery of engineers, electricians, carpenters, and plumbers standing by to "help," because to the lay mind an operation at sea is always more dramatic than an operation on shore. Actually, an inflamed appendix is no more dramatic than inflamed tonsils, and I find conservative treatment for the former as efficient as for the latter. I am, etc.,

London, S.W.7.

CHARLES W. LEECE.

Facial Palsy

SIR,—In reply to Dr. E. C. O. Jewesbury (*Journal*, December 22, 1956, p. 1488), who comments on the paper by Dr. Haynes and myself on facial palsy (*Journal*, November 24, p. 1197), I wish that we could produce a strictly controlled series of cases of severe and stubborn Bell's palsy in which alternate cases were submitted to decompression or left alone. We can, however, mention a group of 27 cases of Bell's palsy in which decompression was declined, though the patients remained under observation. In none of these patients was there any sign of returning function in under nine weeks, and in seven the final recovery was classified as poor because of contractures and limited movement. I agree that the classification of degree of recovery is not satisfactory, and I am now starting to control cases by cinematography.

May I once again stress the fact that in a significant proportion of the cases (in the group reported 46 out of 110) a return of facial movements was noted within a week of the decompression operation and we feel that this was more likely to be due to relieving pressure on non-degenerated axons than to coincidence.

As regards the time at which decompression should be undertaken, we quite agree with Dr. Jewesbury, and indeed with others, who say that if decompression is of value in Bell's palsy it should be undertaken as soon as possible after the onset of the paralysis. Unfortunately, we do not as yet have any means of telling within several days of the onset which nerves are going to degenerate. When we do, I have every hope that early decompression will reduce the proportion of incomplete recoveries. I am, etc.,

London, W.1.

TERENCE CAWTHORNE.

Tropical Pulmonary Eosinophilia

SIR,—Dr. Rosemary Davies (*Journal*, December 22, 1956, p. 1470) has performed a service in drawing attention to the occasional discovery of tropical pulmonary eosinophilia in this country. In a rapid survey by the records officer at the Seamen's Hospital it appears that my colleague Dr. Ronald Hartley and I have made the diagnosis in seventeen cases seen since 1951, and to these should be added another referred to me by Dr. David Erskine from his dermatological clinic.

After reviewing the case notes it seems that fourteen of these cases satisfy all diagnostic criteria. With one exception, a European who had spent most of his working life in Calcutta, the patients were Asiatic seamen. At the Seamen's Hospital the diagnosis is considered in all patients with cough, sputum, dyspnoea, and bronchospasm who are Asiatic or have lived for any length of time in that continent. Routine E.S.R., white blood counts, and W.R. and Kahn are done on all admissions, and differential white counts whenever the total leucocytes exceed 10,000 per c.mm. Fever at the time of admission usually calls for examination of blood films, and eosinophilia is sometimes discovered in this way.

We find that some of the patients have intestinal parasites which may have explained the eosinophilia, but almost all the definite cases had absolute eosinophil counts of 10,000 per c.mm. or more. The uniform feature of the series has been the satisfactory response to carbarsone 0.26 g. three times a day for four days followed by four days' rest in which exacerbation of symptoms sometimes occurred, after which 0.26 g. three times a day is again given for six days. Using this treatment all eighteen patients showed a remarkably swift and gratifying clinical response, and it seems probable that they can all be correctly classified in one

clinical group, although we have no positive proof of any single aetiological factor. In all cases eosinophil counts have fallen dramatically after treatment, but not always to normal. We have not observed relapse, but no conclusion can be drawn from this, since, with one exception, our patients were seamen and therefore nomadic.

In 1952 Dr. Ernest Soysa allowed me to examine the chest x-rays of a large number of his cases, and I then formed the opinion that there is no characteristic x-ray abnormality on which the diagnosis can be based, and that many of the patients have films which are essentially normal. Although the diagnosis is so simple and treatment so satisfactory much work still remains to be done before our knowledge of this syndrome is complete. I am, etc.,

London, W.1.

ALIC WINGFIELD.

Pregnancy Sickness

SIR, There has been correspondence recently on pregnancy sickness (*Journal*, December 22, 1956, p. 1487; January 5, p. 49), and I noted that no reference was made to the large part which might be played by the occurrence of acetonæmia. Surely in the vomiting of pregnancy, as in post-operative vomiting, one of the first investigations should be the examination of the urine for acetone, and the prompt administration by mouth, by rectal drip, or intravenously of glucose, possibly with the addition of insulin.

A vicious circle can be set up so quickly; early slight acetonæmia causes anorexia, with prompt diminution of intake of food, particularly starches and sugar. This can soon be followed by vomiting and further loss of intake, with consequent increase of the acidosis. The first thing is to break this cycle, and a day in bed with a rectal drip of 5% or even 10% glucose, or an intravenous injection of a relatively small amount of glucose, is often most efficacious. I am, etc.,

London, W.1.

J. LYLE-CAMERON.

SIR,—From time to time medically qualified women, like your recent correspondents and me, are privileged to bear children. Some of us attempt to analyse our reactions to this supreme experience, and if we differ at all from the countless generations of mothers before us it is surely only in this respect. So it happens that frequent bursts of correspondence appear in which numbers of trained personnel are constrained to confide to the press just how they, in their time, started to vomit or failed to relax. Doctor-mothers alone must surely number some hundreds at the present time. If we could collect and analyse their experiences we should gain, I believe, an interesting slant on the psychological effects of instruction on pregnancy and labour. This might influence our present trend of "education" of the pregnant lady. Meanwhile, ladies, I fear that our personal experiences, however absorbing, are simply not "statistically significant." I am, etc.,

S. Ockendon, Essex.

PRUDENCE TUNNADINE.

Allergic Response to Hyaluronidase

SIR, Dr. P. J. Joubert's report (*Journal*, January 5, p. 46) of a case of a severe allergic reaction to hyaluronidase prompts me to describe the following case.

A nurse, aged 19, had no history of asthma or eczema, but for the previous three years she had experienced watering of the eyes and nose when in proximity to horses. Hyaluronidase had never been administered to her. In the course of her duties she dissolved "hyalase," 1,000 units, in a few ml. of saline in a syringe and the solution was added to a bottle of saline for subcutaneous administration. The nurse then removed the needle from the empty syringe, and accidentally pricked her thumb with the detached needle. Within a few minutes the thumb was tensely swollen, and this was followed by intense conjunctival injection, oedema of the eyelids, and bronchospasm. Antihistamines were given and the bronchospasm was relieved in a few hours; the oedema of the eyelids persisted for three days. The amount of hyaluronidase causing this reaction must have been very small indeed.

It was shown by Holborow and Keech¹ that hypersensitivity to hyaluronidase develops rapidly on repeated administration to a given subject. The manufacturers feel that protein impurities in the preparations used at that time may have been responsible for their findings. However, it is evident that the danger of a very severe reaction still exists with modern preparations.—I am, etc.,

London, N.W.3.

KATHLEEN BARBER.

REFERENCE

¹ Holborow, E. J., and Keech, M. K., *British Medical Journal*, 1951, 2, 1173.

Health of Refugees

SIR,—I am able to tell your correspondent Dr. Bertram Mann (*Journal*, January 5, p. 44) that the Hungarian refugees who passed through the transit camp at Aldershot were not x-rayed. We had arranged mass radiography for all refugees, but this was cancelled at short notice by orders from "a higher authority." This was a pity, because there was a tuberculous history in about 10% of all refugees we saw in the medical room. These Hungarians are now spread all over the country, and a job which was once very easy is now much more difficult.—I am, etc.,

Mudford, Hants.

WILLIAM ELDON.

Mild Endogenous Depression

SIR,—I would like to compliment Dr. C. A. H. Watts on his paper entitled "Mild Endogenous Depression" (*Journal*, January 5, p. 4). Depressive illness is so common, and, in its more mild degrees, so rarely diagnosed, that it is without doubt responsible for more rectifiable ill-health and misery, not to mention work hours lost, than any other disorder in this country. Anyone who attempts to draw the attention of the medical profession as a whole to this fact is indeed rendering a public service.

On one or two points I would beg to differ from Dr. Watts, and the chief of these is in regard to prognosis. It is my experience in general practice that depressive illness does not right itself nearly so readily nor so rapidly as Dr. Watts would seem to suggest, and it is my opinion that, for a reasonably quick and full return to lasting health, convulsive therapy is usually needed in these cases. The mild depressions respond just as dramatically to this treatment as do the more severe cases in hospital.

The only members of the profession who have the opportunity to become proficient at the diagnosis of these cases of mild depression are those in general practice. I would suggest that a number of general practitioners throughout the country, especially those engaged in practice outside the N.H.S., might well become expert in this respect. Having become so, they could then receive training so that they might carry out modified convulsive therapy in their patients' homes.—I am, etc.,

Paignton.

R. J. T. WOODLAND.

Aid to Motility

SIR,—Risking accusations of the grandmother-and-egg type, I feel that a simple idea of mine may be of some assistance to exasperated colleagues whose wheels may spin in the inevitable nippy weather to come. Attendance at rugger matches during my Army service in Austria usually involved professional assistance at some stage of the game. I grew wary and carried useful odds and ends. From this evolved the fact that a standard length of Kramer wire 40 in. by 4½ in. (1 m. by 12 cm.) fits comfortably and unobtrusively on the rear window-ledge of the average small car, and two are as easily carried as one. These are useful medically, but also when stuck may be placed in front of and in line with the rear wheels to make a track on which to crawl away. I hardly dare to add that a suitable length of bandage being tied to the wire and to the rear bumper will cause your wire to bound happily along behind until a suitable stopping surface is reached.—I am, etc.,

Stourport-on-Severn.

JOHN PARKES.

Simplicity in Anaesthetics

SIR,—In his review of analgesic supplements to nitrous oxide anaesthesia (*Journal*, December 8, 1956, p. 1326) Dr. Ephraim S. Siker points out that the parabolic curve of the incidence of use of intravenously administered supplements is almost completed. He mentions ether and cyclopropane, only to dismiss them because "diathermy could not... be safely used with these otherwise valid techniques." This is analogous to insisting that fuel oils should be carried in windjammers only and that the crews of these vessels should live exclusively upon cold tinned food. In your leading article (*Journal*, November 24, 1956, p. 1225) you pointed out that 6 million inflammable anaesthetic administrations led to only three deaths in a period of six or seven years, but Dr. A. R. Hunter (*Journal*, October 20, 1956, p. 919) reports six deaths from respiratory failure in a two-year period, and subsequent correspondents—for example, Dr. G. B. Burchell (*Journal*, November 3, 1956, p. 1054) and Dr. K. A. Stewart (*Journal*, November 17, 1956, p. 1174)—more than doubled this score.

This is perhaps a suitable time to re-emphasize the virtue of simplicity. The first duty of an anaesthetist is to relieve pain in his patient. Any other contribution he may make to the conduct of a surgical operation is subsidiary to that aim and should never be made with a view to facilitating his own or the surgeon's work without a careful assessment of the added hazards to the patient. After all, it is the patient who runs all the risks. Over 100 years of time have added volumes of useless print to library shelves and have witnessed a constant procession of whimsical methods and sorry substitutes for di-ethyl ether, the most powerful and one of the safest of anaesthetic agents, but they have shed virtually no light whatever on our ignorance as to where and how ether exerts its narcotic action. If all the efforts diffused in attempts to snatch a moment of limelight with "something new" were put solidly to work in attempts to elucidate the behaviour of this versatile drug and to improve the methods of using it, we should at least have a solid baseline from which to advance into the unknown. For when we know how and where ether acts we shall be very close to the secret of life itself.—I am, etc.,

Observatory, C.P.,
S. Africa

C. S. JONES.

Domiciliary Treatment of Pneumonia

SIR,—Now that the high season for pneumonia is near its peak may I enter a plea for the more efficient domiciliary treatment of this condition? By pneumonia is meant the grave acute pulmonary infection, usually lobar in distribution, most frequently due to the pneumococcus, and met with in the average practice perhaps two or three times in a twelvemonth. Looking over recent editions of standard British textbooks on medicine one finds in many cases that sulphonamides are apparently still advised as first choice of treatment. One also gains the impression that, if it is not convenient to inject crystalline penicillin at frequent intervals, it will suffice to inject procaine penicillin once every 12 or 24 hours.

Pneumonia is a serious disease. According to the 1956 edition of Price's *Textbook of Medicine* the mortality rate in lobar pneumonia, even with sulphonamide and penicillin therapy, is still as high as 8%. Faced with a mortality figure of this magnitude it does not seem appropriate to rely on sulphonamides by mouth, since many patients tolerate them poorly in the relatively high doses necessary for success. Nor does it seem adequate, in the early acute stage, to inject a relatively insoluble penicillin compound to form a depot in muscle from which small amounts of the active substance are released into the circulation, never attaining a really high concentration. Once the diagnosis of pneumonia appears clinically certain it is essential that effective steps be taken at once to kill the offending organism with the greatest possible speed, and this can usually best be accomplished by injecting crystalline penicillin (benzylpenicillin B.P.) in large doses and at frequent intervals.

I suggest that the mortality rate could be markedly reduced by adopting the following measures. After obtaining a specimen of sputum for sensitivity tests, inject one million units of crystalline penicillin intramuscularly every four hours for the first day with one injection through the night. In many cases on this dosage schedule the temperature will have fallen sharply within 24 hours with accompanying marked subjective improvement. When this has been achieved, inject one million units crystalline penicillin every six hours during the next three or four days, omitting the night dose. With continuing improvement it is then permissible to carry on the treatment with procaine penicillin by daily injections of 900,000 units until the infection is at an end. What are the objections to these large and frequent doses of crystalline penicillin? Certainly not cost. A million units cost only 1s. 8d. Perhaps inconvenience? But pneumonia is a killing disease and the few extra visits which the use of crystalline penicillin entails should not count. Hypersensitivity reactions—about the only serious side-effects of penicillin—do not appear to be increased in frequency by adequate dosage.—I am, etc.,

Belfast.

H. J. CRONHELM.

REFERENCE

¹ Price's *Textbook of Medicine*, 1956, edited by D. Hunter. London.

Hydrocortisone for Buccal Ulcers

SIR,—I have read with great interest Dr. S. Hillman's letter (*Journal*, December 22, 1956, p. 1486) describing the use of hydrocortisone ointment for recurrent aphthous ulcers. For a year or so, on a similar hypothesis—that is, that some cases at least are due to a psychosomatic disorder—I have prescribed somewhat similar treatment with great success. I have used 1% hydrocortisone ointment, without any antibiotic addition, smeared on the ulcers after drying the mucous membrane with a clean handkerchief. This I find gives almost immediate relief of discomfort and heals the ulcers very rapidly if repeated frequently. Until I read Dr. Hillman's letter I was uncertain whether it might not have been the ointment base of the preparation ("cortril" in this instance) alone which did the trick, but his experience would seem to confirm mine. I have not had trouble with spread of infection. It is a pity that a method cannot be devised to bring local hydrocortisone into contact with peptic ulcers as Dr. S. C. Truelove (*Journal*, December 1, p. 1267) has in the case of ulcerative colitis.—I am, etc.,

North Berwick.

DERRICK MORTON.

Fluoridation of Water

SIR,—In a pamphlet from California entitled "Fluoridation Unmasked" the following statement about myself appears:

"Professor R. A. Peters, Biochemist, of Oxford, England, says: 'Fluoroacetic acid prevents the body from breaking down the citric acid created when sugar is burned into simpler compounds. Retention of waste citric acid acts as a violent poison on heart and nervous system. Fluoroacetic acid is used by African natives to murder their enemies. What will happen to the person drinking fluoridated water when he uses vinegar?' (acetic acid)."

I do not know upon what writing of mine this is supposed to be based, but I think it as well to point out that it gives entirely the wrong impression. Inorganic fluoride acts completely differently in the body from fluoroacetic acid, in which the carbon is linked firmly to the fluorine. Fluoroacetic acid is a rat poison which is much more toxic than fluoride. The suggestion in the last sentence that fluoride and acetic acid will combine easily to form fluoroacetic acid is very wide of the truth. It is, in fact, quite difficult to synthesize fluoroacetic acid, and certainly there is no evidence that it can happen in the body; furthermore, acetic acid (vinegar), if given early enough, is an *antidote* to fluoroacetic acid poisoning in some animals.—I am, etc.,

Cambridge.

RUDOLPH A. PETERS.

Obituary

Sir JOHN NEWMAN-MORRIS, C.M.G.
F.R.A.C.S., F.A.C.S.

Sir John Newman-Morris, consulting surgeon to St. Vincent's Hospital, Melbourne, and one of the most prominent medical men in the State of Victoria, died on January 3. He was 77 years of age.

John Newman-Morris was born in Melbourne on March 2, 1879, and was educated at Hawthorn College and at Melbourne University, where he graduated M.B., B.S. in 1903. Making surgery his career, he worked for many years on the staff of St. Vincent's Hospital. In later life he was a member of the advisory boards of the Royal Melbourne Hospital, Prince Henry's Hospital, and the Queen Victoria Memorial Hospital, Melbourne, and a member of the board of the Cancer Institute. In 1928 he was elected a Fellow of the Royal Australasian College of Surgeons and of the American College of Surgeons.

Newman-Morris was intensely interested in all matters affecting the health and welfare of the people and in the well-being of his own profession, and he held a remarkable number of offices in various organizations. Since 1945 he had been president of the Medical Board of Victoria, and was a member of the Federal Council and the first president (1936 to 1938) of the Australian Flying Doctor Service. At various times he was president also of many other bodies in the State of Victoria, including the Victorian Institute of Hospital Almoners (being also a member of its London council); the Voluntary Blood Donors Association; the Victorian Council of Social Training; the St. John Ambulance Association (1935-7 and 1946-7); the Old People's Welfare Council; the Medical Defence Association; and of the eighth session of the Australian Medical Congress in 1952, having been vice-president of the 1937 congress. He was also chairman of the Victorian Charities Board in 1936-7. An active and influential supporter of the Australian Red Cross, he was chairman of its national council, and visited Britain, Canada, and the U.S.A. as a member of a special wartime mission in 1942. Six years later he served as a vice-president of the seventeenth International Red Cross Conference held at Stockholm, and was vice-chairman of the general commission of the conference. During the second world war he was a member of the Central Medical Co-ordination Committee and the Commonwealth Alien Doctors' Board, under the National Security Regulations. He also served on the Standing Committee of Convocation of the University of Melbourne, and was deputy chancellor of the university from 1951 to 1953, and on the Victorian State Committee of the Royal Australasian College of Surgeons. In 1940 he delivered the Mackay Oration at Canberra and in 1945 the Stawell Oration at Melbourne.

Newman-Morris attained high office in the Venerable Order of St. John of Jerusalem, of which he was appointed a knight in 1945, being for a time treasurer of the Priory of St. John in Australia and, later, Receiver-General. A member of the British Medical Association for 50 years, he had been a member of the council of the Victorian Branch since 1918 and its chairman from 1922 to 1938, and president of the Branch in 1926-7. He was vice-chairman of the old Federal Committee of the B.M.A. in Australia from 1929 to

1932 and vice-president of the Federal Council from 1932 to 1938. Appointed C.M.G. in 1938 for public and social welfare services, he was created a knight 10 years later for outstanding services in Red Cross matters and voluntary hospital work. He married Miss Eleanor Jones in 1905 and had one son and one daughter. Lady Newman-Morris died in 1949.

H. VESEY WELLS, C.B.E., M.R.C.S., L.R.C.P.

Air Commodore H. Vesey Wells, who after some years in the Royal Navy had a distinguished career in the Royal Air Force, died on December 30, 1956. He was 79 years of age.

Hardy Vesey Wells was born at Bedford on January 30, 1877, the son of Mr. George Wells, J.P., and was educated at Bedford School and at St. Mary's Hospital, London, qualifying M.R.C.S., L.R.C.P. in 1900. Having joined the Royal Navy as a surgeon lieutenant, he was appointed to the Naval Wing of the old Royal Flying Corps in 1912 and had the unusual distinction of qualifying as a pilot in 1913. In the following year he was promoted surgeon commander, and served throughout the first world war. In 1919, having previously transferred to the newly formed Royal Air Force with the rank of lieutenant-colonel, he was granted a permanent commission in the R.A.F. as a wing commander. Promotion to group captain came in 1921 and to air commodore in 1930. During the course of his career he acted as assistant medical administrator in Ireland in 1918. Later he was principal medical officer, Inland Area (in 1920); with the British forces in Iraq (1924-6); with the Inland Area again (1927-32); and at the headquarters of the Air Defence of Great Britain (1932-4). Appointed C.B.E. in 1919, he was an Honorary Physician to the King from 1925 until he retired from the R.A.F. in 1934. Air Commodore Wells was president of the Mesopotamia Branch of the British Medical Association in 1925-6. He also served on the Central Council of the Association in 1937-8 as the representative of the Royal Air Force Medical Service, and was a member of the old Naval and Military Committee from 1935 to 1938. He contributed an article on the medical aspects of aviation to the *Journal of the Royal Naval Medical Service* in January, 1915, at which time he was serving in France as a staff surgeon in the Royal Navy, but the article was written in 1913, when he was in medical charge at Eastchurch Flying School. In 1916 he contributed an article, written jointly with Temporary Surgeon H. Graeme Anderson, to the *British Medical Journal* on injuries and destructive effects of aeroplane bombs, with suggestions on the precautions to be taken during hostile aerial raids.

Air Commodore Vesey Wells married in 1912 Miss May Justice, who survives him and by whom he had two daughters.

H. A. H. writes: "Hardy Vesey," as he was known to us in the Navy and Air Force, was a singularly attractive personality, vital and compelling. There are many who will be saddened by the news of his passing, despite his having been outdistanced the allotted span by almost 10 years. Although we had known each other it was not until the first world war had ended and Inland Area Command was formed that I had the good fortune to be appointed as his deputy. Well I had the good fortune at this move, because, having can I recollect my pleasure at this move, because, having been associated under Martin Flack, the physiologist, with the medical problems of flying, I was now to be on the staff of the man who from his personal experience as a pilot could guide those under him. For it was in May,

1913, when medical officer in charge of Eastchurch, that Hardy Vesey became the first British naval medical officer to obtain a Royal Aero Club certificate, No. 490 in fact. It is strange to look back to those times when, as he told me, he had to combine his medical duties with those of meteorological officer, "Met" forecasting being then in its infancy. The organization of Inland Area was a big task for him. There was no set pattern to follow and personnel was scarce in those days, but he surmounted all the difficulties with that wonderful resiliency, humour, and confidence to which we under him became accustomed both then and later, abroad and at home. And his human outlook and common-sense interpretation of regulations to meet their spirit rather than the written word was an example to us juniors and a happy one on many an occasion. His was truly a balanced outlook, and he believed in games as almost a necessity for the Service doctor, playing tennis and squash well above the average and getting much amusement from his determined sorties into the golfing world.

J. R. OWEN, M.R.C.P.

Dr. J. R. Owen, senior honorary physician to the skin department at the Royal Northern Hospital, London, died at a London hospital on December 23, 1956, at the age of 51.

James Roy Owen was born on March 28, 1905, and received his medical training at Birmingham, qualifying M.R.C.S., L.R.C.P. in 1929. After holding resident appointments at Queen's Hospital, Birmingham, he went into general practice at Bromsgrove in 1932. A few years later he moved to London and took the M.R.C.P. in 1937. Among the posts he held in the next few years were those of first assistant to medical out-patients at the London Hospital, honorary assistant physician at the Hospital for Diseases of the Skin, Blackfriars, and medical registrar at the Royal Cancer (now the Royal Marsden) Hospital and the National Temperance Hospital. During the second world war he served first as blood transfusion officer and acting assistant physician in the Emergency Medical Service at the National Temperance Hospital, and later in the R.A.M.C., attaining the rank of lieutenant-colonel. He was officer in charge of a medical division as a senior medical specialist, and in 1945 was mentioned in dispatches for gallant and distinguished services in Burma. On return to civilian life he decided to specialize in dermatology, in which he had always had a special interest, and he became honorary physician for diseases of the skin at the Royal Northern Hospital; the Ashford Hospital, Middlesex; Hampstead General Hospital; the Victoria Hospital for Children, Chelsea; the Queen Elizabeth Hospital for Children; and the Hospital for Diseases of the Skin, Blackfriars. At the time of his death he was senior honorary physician to the skin department of the Royal Northern Hospital. He contributed the chapter on toxic eruptions in *Modern Practice in Dermatology* (1950). Dr. Owen was a widower, his wife having died in 1953.

H. T. H. W. writes: Those who knew James Owen in former years will remember him as a man of immaculate appearance and debonair charm. He had a passion for adventure, and his past activities ranged from jumping by parachute to underwater exploration; with this passion was coupled a magnificent disregard for the trivialities of life. His essential kindness endeared him to colleagues, nurses, and patients, while his easy wit made him an excellent companion. To a man whose constitution had already been weakened by prolonged ill-health, the death of his wife a few years ago came as a profound shock from which he never recovered.

I last saw him a few days before I returned to the Middle East and perhaps two weeks before his death. He was completely composed and even cheerful as he gave me his advice and suggestions for disentangling some of the difficulties that now confront us in our Association activities in the Middle East. He must have been well aware of his approaching doom, but there was no word of complaint nor hint of any anxiety, and only a quiet determination to carry on as normally as possible to the end. We of the

Middle East Branch would like to record our gratitude to Louis Findlay both for his life of devoted service and for the calm courage of his end, and we also wish to offer our heartfelt sympathy and condolences to his wife and family.

W. G. CLARK, C.B.E., M.B., F.R.C.P.Ed., D.P.H.
The obituary of Dr. W. G. Clark was published in last week's *Journal* (p. 109).

I. A. G. M. writes: Recollection of W. G. Clark's constant kindness, and grief at the passing of that genial intellectual giant, make the penning of a tribute a difficult task. Dr. Clark—"George" to his contemporaries and "W.G." to those whom he affectionately termed his boys—was a great man, as well as a much-loved medical officer: a man big enough to acquire fame both in the old and in the modern brand of public-health work. Trained in the era of sanitation and environmental hygiene, he acquired in various posts in Glasgow a national reputation as an expert on housing, sanitary law, and hospital administration. In Edinburgh, in addition to maintaining and enhancing that reputation, he turned more and more to the newer aspects of public health. Realizing that further improvement in the health of the community would be possible only if the members of the community were prepared to co-operate actively, he developed health education on a scale previously unattempted in Scotland; he persuaded his council to appoint a medical officer and a lay assistant for health education; he gradually but steadily built up the health-visitor service, which he regarded as "the sheet anchor of the public health services"; and he organized health weeks and Sunday-evening film shows, never sparing himself in his efforts to make his city health-conscious. Appreciating that research was no less essential in preventive than in clinical medicine, he actively fostered research, and it is probably true to say that during his fifteen years as medical officer of health more papers were published from his department than from the health department of any other local authority. He devoted considerable attention to the health maintenance of the elderly and was chairman of the committee which drafted the report "The Ageing Population."

W.G.'s ability as a statesman and negotiator was almost proverbial. Sagacious, tactful, good-humoured, and persistent, he had the knack of converting opponents into allies; but when occasion warranted, or when the health of the community was endangered, he could be outspoken enough. Indeed, he often displayed not merely a powerful personality but moral courage of no mean quality. By his students at Edinburgh University (where he held the part-time post of senior lecturer in public health and social medicine) and by his staff W.G. was universally beloved. He was an inspiring chief, an excellent teacher, a brilliant administrator, and a man of boundless humanity. The whole profession is the poorer for his passing.

Dr. H. R. A. PHILP, medical missionary and minister of the Church of Scotland, died on November 14 at the age of 73. Horace Robert Andrew Philp was born at Pailton, Rugby, on February 1, 1883. From the Royal High School, Edinburgh, he went on to study medicine at Edinburgh University, graduating M.B., Ch.B. in 1909. After a period as house-surgeon in the Deaconess Hospital, Edinburgh, he became a member of the Church of Scotland's Mission to the Kikuyu people of East Africa (now the Kenya Colony Mission). Almost all his twenty years of service were at one station, Tumutumu, where he is remembered and loved to this day. Here, starting completely from scratch, he built up a simple yet efficient hospital which achieved a very considerable reputation in northern Kikuyuland. Part of the success of the hospital was due to the spectacular

treatment of yaws with arsenicals, but before Dr. Philp left much progress had been made in the treatment of leprosy and tuberculosis, as well as in general medicine and surgery. A well-developed system of training African dressers had been started, and for this Dr. Philp had prepared a simple textbook in Kikuyu, probably the first medical book in the language. Some of the men he trained are still at work in the hospital after forty years, a fact which says much for his training and inspiration. He also took a strong line against female circumcision, to this day a curse to the young womanhood of Kikuyuland. But he was above all an evangelist, his strong faith being an inspiration to many. Fine tributes to the esteem and affection in which he was held were paid at a memorial service at Tumutumu soon after his death. During the first world war he acted as medical officer for all the northern part of the Central Province. Retiring from missionary service in 1930, he became minister of the Church of Scotland in Newcastle. On the outbreak of the second world war he was appointed factory surgeon in Newcastle, and, among other things, re-organized the ambulance services in one of the largest engineering works there. Meantime he continued to act as minister. At the end of the war he gave up medical practice, but continued his work as pastor until he retired in 1955. At a memorial service held at Tumutumu soon after his death the tributes paid to his memory were evidence of the esteem and affection in which he was held.—W. M. B.

Dr. W. P. LOWE, honorary consulting radiologist to the Burton-on-Trent General Hospital, died at his home at Burton-on-Trent on December 10, 1956, at the age of 79. William Pickering Lowe, who was born on November 25, 1877, came of a well-known Burton family. Leaving Shrewsbury School in 1896, he went to Gonville and Caius College, Cambridge, where he took both parts of the Natural Sciences Tripos, and then, after a period of research in physiology, moved on to the London Hospital. After graduating B.Chir. in 1905 and M.B. in the following year, he held house appointments at the London and was for a time clinical assistant to out-patients at the Hospital for Sick Children, Great Ormond Street. Returning from voyages as a ship surgeon, he settled in Burton-on-Trent in 1909 in partnership with the late Dr. E. C. Salt. He was soon appointed to the staff of the General Hospital, and there began many happy years, with work in almost every department. He was a sought-after anaesthetist, he operated, and for some time he was in charge of the V.D. department. For many years he lectured on medicine to the student nurses, and, before joining the R.A.M.C. in 1917 for service in the first world war, even became a resident house officer once more when no junior men were available. The late Mr. C. T. Holford had introduced him to radiology, which gradually became his absorbing interest, and he worked hard to build up his department. He retired in 1948 as consulting radiologist to the hospital. In 1910 he became the first honorary medical officer to the "Babies Welcome" scheme, which was opened by voluntary effort in the town. He carried on this work for many years till the scheme grew up into the local infant-welfare service and was taken over by the local authority. At the same time he was taking his part in running a large general practice. He began this work if not in the horse-and-buggy days before the National Insurance Act of 1911, when there were large clubs as well as many private patients, and he worked on until two years after the inception of the National Health Service, when he retired, retaining only a small private practice. He was always anxious to attend clinical meetings at the hospital and meetings of the Burton-on-Trent Division of the British Medical Association, and was chairman of the Division in 1945-6. His knowledge of radiology was wide, and he kept up with the almost overwhelming advances in medicine during the fifty-two years his name was on the *Medical Register*. At Shrewsbury and Caius, William Lowe rowed with distinction, and went to Henley with his college boat. He was an

able musician, much influenced by Charles Wood in his Cambridge days, and his abiding interest was choral music and choir training. His golf was skilful, and he particularly enjoyed his many holidays at Machrihanish. He was friendly and gentle, diffident and most painstaking, always devoted to his patients and his beloved hospital, and he was a fine example of that past generation of practitioners who had the opportunity to serve in so many fields. His were the ability and the zeal to do good work everywhere.—E. G. F.

Dr. HARVEY GARDNER, of Birkdale, Southport, died in his sleep on December 23, 1956, at the age of 44. Harvey Gardner was born on August 10, 1912, and was a medical student at Liverpool University, qualifying M.R.C.S., L.R.C.P. in 1938. After holding resident hospital appointments in Liverpool he went into general practice at Brigg, Lincolnshire, for a short time before going into partnership with the late Dr. A. J. Lewis at Southport in 1942. Some five years later—after the death of Dr. Lewis—he was joined by Dr. D. MacDonald in the practice. Soon after settling at Southport Dr. Gardner became medical officer to the Post Office. Later he was appointed a Treasury medical officer and medical officer to Dr. Barnardo's Home at Birkdale. Ill-health forced him to give up general practice about eight years ago. However, he was able to serve as a member of a Ministry of Labour and National Service recruitment board for some years and as a boarding officer at Liverpool under the National Insurance (Industrial Injuries) Act. He was also medical officer to two industrial firms in the Southport district. His wife and daughter survive him.

E. G.-E. writes: The death of Harvey Gardner has robbed patients and friends of a "great and cultured gentleman" who had packed the 40-odd years of his life with selfless labour for others. His good sense, charm, wit, and painstaking interest in everything that he undertook earned affection and respect everywhere. The last eight years of his life were overcast by a serious cardiac lesion, but never once was this allowed to diminish the quality of such work as he was able to do. H. G. gave of his best or declined the attempt. His sense of humour, serious-minded conscientiousness, and utter loyalty marked him above other men. We who have been privileged to know him can never, will never, forget him.

Dr. HERBERT FOWLIE died suddenly at Aberdeen on December 25, 1956, one week after his 49th birthday. By heredity and environment Herbert Fowlie, who was born on December 18, 1907, should have been a farmer, but he turned to medicine, saying, as he often did, that he "hadna the brains for farming." He graduated M.B., Ch.B. at Aberdeen University in 1930, and, after house-appointments at the Cumberland Infirmary, Carlisle, and experience of general practice at Appleby, Westmorland, he settled in Aberdeen in 1940. He soon became one of the busiest, best-known, and best-loved family doctors in the city.

J. L. writes: "Hebbie" Fowlie was of great humanity and transparent honesty, of infinite patience when patience was needed, but of blistering impatience with incompetence or dishonesty. He made friends of all whom he met—in his practice, in his work for the British Medical Association, on the golf course, and on his beloved shooting and fishing excursions. If he had any enemies they were not of his making, and must have been folk of small account, for they were never heard of. For fifteen devoted years Hebbie Fowlie was honorary secretary of the City of Aberdeen Division of the B.M.A., but he was never proprietorial or dictatorial. To him the B.M.A. was like one of his patients, to be served and tended unsparingly and with scant regard for his own convenience. Hebbie was a wise and considerate colleague. He was also the family doctor of a number of medical households, including my own, and he paid us

a visit only a few hours before his death. He left us all laughing, for his gaiety was infectious and wherever he went he left laughter and lightened hearts behind him. We who were his patients can say with pride and gratitude, "He was our doctor, aye he left us cheered." For the last year of his life Hebbie knew that the illness which had already attacked him might strike again at any time. Mrs. Fowlie, an ideal wife for a doctor, comforted and sustained him in meeting the challenge of illness and in continuing with his work, and she was with him when his last call came. To her and to his daughter and two sons our sympathy goes out on the death of this very good man.

Major R. R. M. PORTER, I.M.S. (retired), writes: As one of Dr. Fowlie's patients, may I be permitted to put on record my great appreciation of his ability and of his unfailing kindness and understanding and my very real sense of personal loss on hearing of his death on Christmas Day? In my opinion Dr. Fowlie was one of the very best type of general practitioner, one whose unfailing care of his patients overrode any consideration of his personal convenience, and who never spared himself when they had need of his help. I feel sure I shall be expressing the feelings of his many patients, who knew they had in him not only a doctor but a friend, when I say that our sincere sympathy goes out to his widow and family.

Dr. A. P. HICK died at his home at Chippenham on December 26, 1956, at the early age of 44, after a long illness courageously borne. Alan Prowde Hick was born on May 2, 1912, the son of Dr. R. H. P. Hick, of Bracknell, Berkshire. Educated at Coatham School and at St. Thomas's Hospital, London, he qualified M.R.C.S., L.R.C.P. in 1937. He then held the post of house-surgeon at King Edward VII Hospital, Windsor, afterwards becoming medical superintendent of the hospital. After a short period at sea he volunteered for the R.A.M.C. in 1939 and went to France in that year, being evacuated from St. Nazaire in the summer of 1940. After serving in the Western Desert with the 7th Armoured Brigade he went with the same brigade to Burma and took part in the long trek back to India. In 1942 he was mentioned in dispatches for his gallant and distinguished services in Burma. After a short spell in England he landed with the 53rd Division in Normandy, and served with it, with the rank of major, until demobilization in 1945. In the following year he joined the partnership of Drs. G. W. Ayres, M. H. Evans, and R. S. Cox at Chippenham, where his cheerfulness and charm quickly won him many friends. His patients had the greatest confidence in him, for his manner was reassuring and he was an able diagnostician. He represented the Trowbridge Division at the Annual Meeting of the B.M.A. in 1955, and for some years he had been a divisional surgeon in the St. John Ambulance Brigade. He will be greatly missed both by his colleagues and patients in Chippenham and the surrounding district. He leaves a widow and two sons, to whom we extend our deepest sympathy in their tragic loss.

The obituary of Dr. C. E. BEVAN was published in the *Journal* of November 17, 1956 (p. 1181), and further tributes in the issue of December 22, 1956 (p. 1494). Dr. JOHN GUTHRIE and Dr. JOHN BREBNER write: The murder in Amiandos Hospital of Dr. Charles Bevan by a terrorist gunman was an act of such shocking and wanton brutality that one can still scarcely believe it to be true. Charles Bevan's work at Kyperounda Sanatorium was known and admired throughout Cyprus. He and his work were held in love and respect throughout the island, where he devoted the greater part of his professional life to the care of Cypriots suffering from tuberculosis. Many of his colleagues who knew him and his work more intimately than we did will be paying tribute to his skill, integrity, and devotion to his patients. Bevan's work did not end in the operating theatre or the wards. Because of widespread fear of

Vital Statistics

Infectious Diseases in 1956

The incidence of most infectious diseases in England and Wales during 1956 was relatively low. The chief features of the returns were the continued rise in the incidence of dysentery and the continued fall in the incidence of diphtheria. The incidence of dysentery was the largest on record. It was particularly high during the latter part of the first quarter, when a peak of 2,371 cases was reported in one week; this was 500 larger than the highest weekly total of previous years. The number of notifications of diphtheria during the whole of the year was less than one-half of the lowest weekly total in the pre-inoculation period. The largest numbers of notifications of diphtheria during the year were 63 in Lancashire, 54 in Warwickshire, and 38 in London. Only 8 cases were notified in Wales, and 20 English counties had no case at all.

A comparison of the returns for the past five years is given in the following Table:

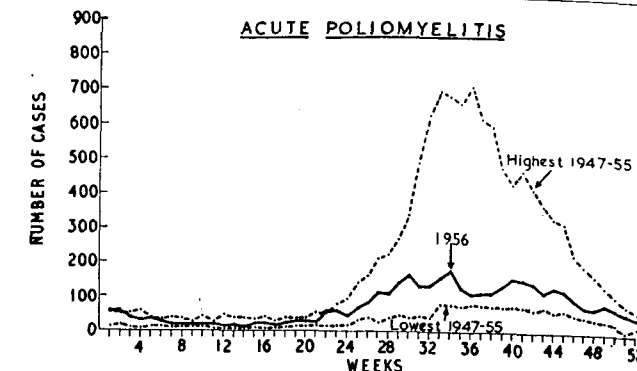
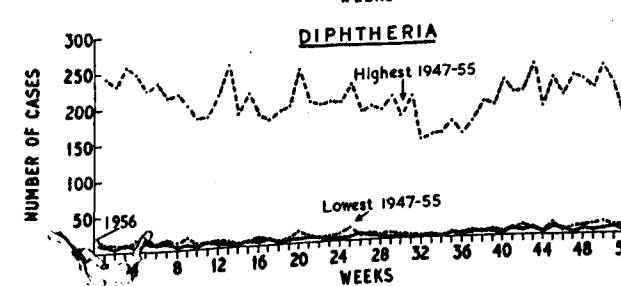
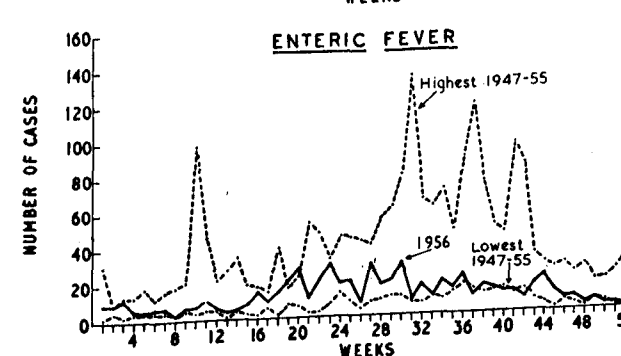
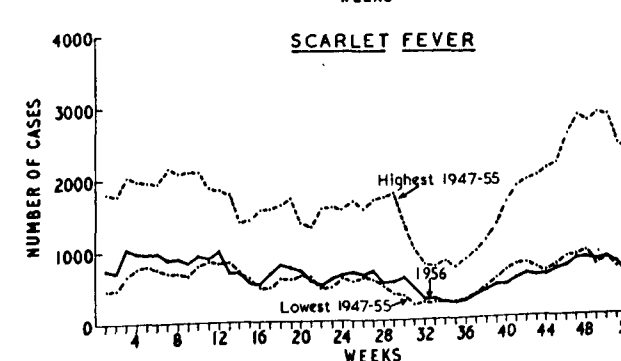
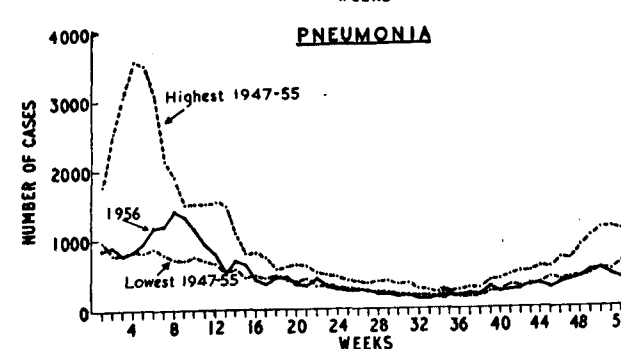
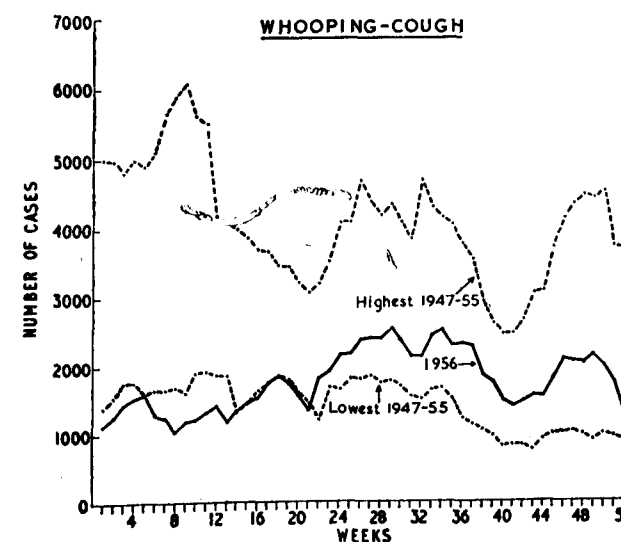
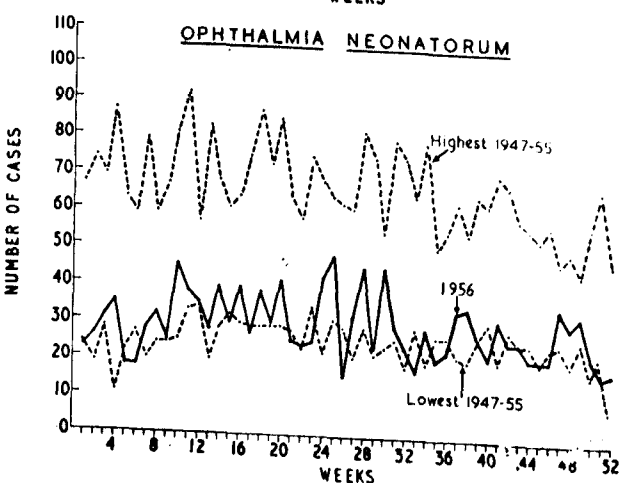
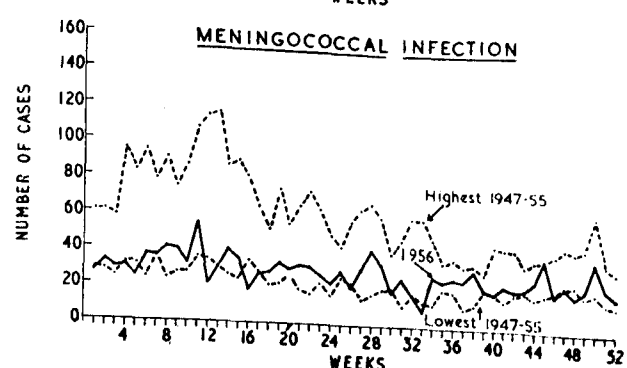
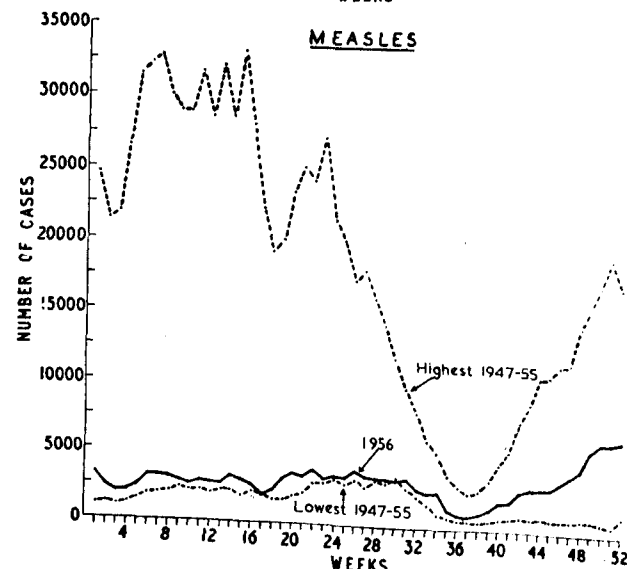
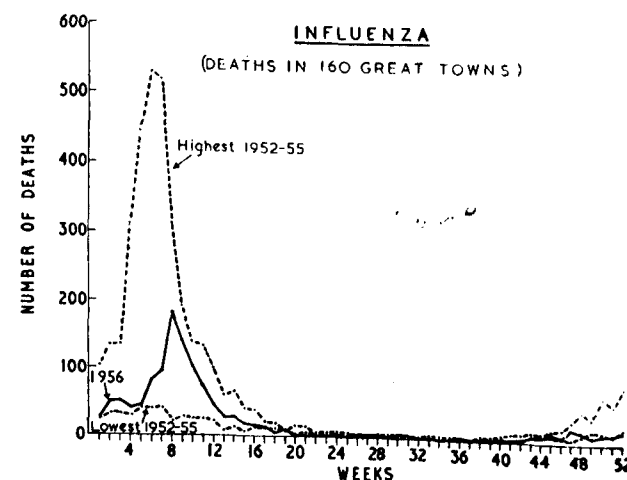
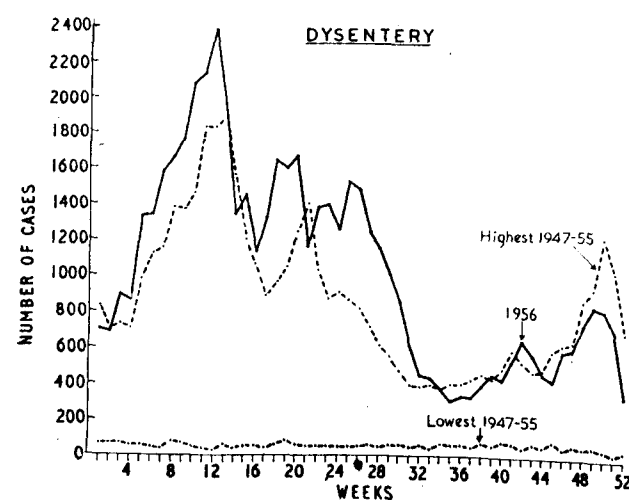
England and Wales	1952	1953	1954	1955	1956
Scarlet fever	69,091	61,578	43,388	32,922	33,285
Whooping-cough	116,311	157,772	105,628	79,191	92,046
Measles	400,838	534,020	147,076	690,918	158,131
Acute poliomyelitis	4,504	5,251	2,388	7,305	3,853
Diphtheria	1,473	1,022	778	542	302
Meningococcal infections	1,687	1,783	1,569	1,423	1,478
Dysentery	15,665	19,540	33,976	41,414	53,006
Acute pneumonia	31,403	37,058	26,750	28,087	25,675
Typhoid and paratyphoid fevers	1,190	569	751	1,117	652
Great towns: Influenza deaths	1,019	3,381	947	1,591	1,216

Week Ending January 5

Notifications of infectious diseases in England and Wales during the week included: scarlet fever 572, whooping-cough 2,109, diphtheria 2, measles 10,970, acute pneumonia 644, acute poliomyelitis 63, dysentery 535, paratyphoid fever 3, and typhoid fever 2.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the years 1947-55 (influenza, 1952-5) are shown thus ----, the figures for 1956 thus —. Except for the curves showing notifications in 1956, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The largest variations in the notifications of infectious diseases in England and Wales during the week ending December 29, 1956, were decreases of 467 for whooping-cough, from 1,732 to 1,265, 348 for dysentery, from 696 to 348, 211 for scarlet fever, from 735 to 524, and 65 for acute pneumonia, from 465 to 400, and the only large rise was 303 for measles, from 6,575 to 6,878.

The largest rises in the incidence of measles were 176 in Lancashire, from 1,701 to 1,877, and 113 in Yorkshire North Riding, from 142 to 255; the largest falls were 87 in Surrey, from 216 to 129, and 87 in Yorkshire West Riding, from 503 to 416. The largest declines in whooping-cough were 63 in Yorkshire West Riding, from 137 to 74, and 55 in Durham, from 115 to 60. The largest fall in the number of notifications of scarlet fever was 30 in Lancashire, from 91 to 61. 3 cases of diphtheria were notified, being 7 fewer than in the preceding week.

49 cases of acute poliomyelitis were notified, and these were 3 fewer for paralytic and 8 fewer for non-paralytic cases than in the preceding week. The largest returns were London 10 (Lewisham 3, Islington 2, Wandsworth 2), Sussex 6 (Crawley U.D. 2), and Lancashire 5 (Clitheroe M.B. 2).

The chief centres of infection of dysentery were Warwickshire 66 (Coventry C.B. 62), Yorkshire West Riding 47 (Bradford C.B. 17), London 42 (Woolwich 10), and Lancashire 35.

Some Census Populations

The total of 43,757,888 persons enumerated in England and Wales at the 1951 census was 3.8 million more than the population enumerated in 1931, according to the latest book of tables on the census to be issued.¹ In 1801, at the first general census, the population of England and Wales was 8,892,536. It passed 10 million in 1811, 20 million in 1861, 30 million in 1901, and 40 million in 1951. Females have always been more numerous than males, but in the nineteenth century, when maternal mortality took a high toll, they were relatively less so than in the twentieth century. The proportion of females to males was highest after the first world war, when it was 1,096 to 1,000. It was lowest in 1821, at 1,036 to 1,000. In 1951 it was 1,082 to 1,000.

The number of people aged 100 or over at the census was 271, comprising 49 men and 222 women. Of the 49 men, 14 (29%) were single and 35 married or widowed; while of the 222 women 44 (20%) were single and 176 married or widowed. None had been divorced. These percentages of single people are higher than in any other age group from the age of 30 onwards.

On census day 0.8% of the population (349,058) were in civilian hospitals and nursing-homes; 0.5% were in institutions for the mentally ill or defective; and 0.2% were in homes for the permanently disabled or aged.

Of the persons enumerated in England and Wales, 6.0% were born elsewhere, as compared with 3.9% in 1931, 4.5% in 1911, and 4.3% in 1851. The greatest number not born in England and Wales were born in Scotland (1.3%), and the next after that in the Irish Republic (1.1%).

¹ Census, 1951, England and Wales, General Tables, 1957. H.M.S.O. (52s. 6d.).

England and Wales in 1955

The crude death rate in England and Wales from coronary thrombosis again increased in 1955, according to the Registrar-General's latest Annual Review.¹ It reached 1,589 per million living population, nearly double the rate for 1946, when it was 800. On the other hand, deaths from rheumatic fever and its cardiac sequelae diminished. In 1955 the rate was 5 per million for rheumatic fever and 188 for chronic rheumatic heart disease; the corresponding figures for 1946 were 19 and 243. The suicide rate has remained fairly constant since the end of the war. In 1955 it was 113 per million living, while in 1946 it was 106. But though the total rate has not changed much the deaths by soporific substances (chiefly barbiturates) and by domestic coal gas have notably increased—the drug suicides from 4 per million in 1946 to 13 in 1955, the gas suicides from 40 in 1946 to 53 in 1955. Compensatory diminution in the suicide rate is to be found among deaths due to drowning and to poisoning other than by soporifics.

A comparison with Scotland shows that, after allowance is made for differences in age and sex in the populations, England and Wales have had a slightly lower general death rate in each of the years 1951–5. In 1955 it was 11.6 per thousand as compared with Scotland's 13.1. The rate in England and Wales was the highest since 1951, when influenza caused many deaths.

¹ The Registrar-General's Statistical Review of England and Wales for the Year 1955, Part 1, 1956. H.M.S.O., London.

Medical News

Australian Research Fellowship.—The Royal Australasian College of Physicians has established a senior research fellowship—the Adolph Basser Research Fellowship—for research likely to contribute to knowledge in clinical medicine. The fellowship, tenable for five years and possibly renewable for a further term, is at the rate of £A.3,750 a year. A candidate must be a "trained research worker in a field related to the problems of clinical medicine," and the research during the tenure of the fellowship must be done in Australia or New Zealand. The closing date for applications is March 15. Full particulars may be obtained from the Hon. Secretary, Royal Australasian College of Physicians, 145, Macquarie Street, Sydney.

Influenza Vaccines.—During the past two winters (1954–5 and 1955–6) a Medical Research Council committee has been carrying out large-scale field trials of influenza vaccines, particularly of vaccines against virus A infections. The full results of these trials are expected in about a couple of months. In the meantime the 27,000 volunteers from industry and the R.A.F. who took part in the trials have been told, through their medical officers, the broad outcome. The results were disappointing. "Although some further evidence of the value of influenza vaccines was forthcoming," states the M.R.C. committee, "there was once more no virus A epidemic either sufficiently severe or extensive to show the true comparative value of the several vaccines under trial." However, the trials—together with the concurrent serological investigations—did apparently provide useful data on the comparative reaction rates of emulsified and saline vaccines, and about the antibody production by the various vaccines tested. In one of the main trials last winter (1955–6) two virus A vaccines, tested in 7,495 industrial volunteers against a virus B vaccine as a control, are said to have reduced the influenza attack rate by 26 and 30%, as judged by the experience of those inoculated with the control (virus B) vaccine; and during the more limited period of influenza prevalence within the total period of

observation they halved the attack rate. The same vaccines were also tested in 5,278 R.A.F. volunteers, but here the incidence of influenza was too low for a satisfactory comparison.

Olympic Award to the Stoke Mandeville Games.—The International Olympic Committee has awarded the 1956 Fearnley Cup to the Stoke Mandeville Games, in recognition of the outstanding services of the International Sports Movement for the Paralysed to the Olympic Movement. The Fearnley Cup is awarded annually to a sports organization in any country, and this is not only the first time the cup has been won by Britain but also the first occasion it has been awarded to a sports organization for the disabled. Previous winners have been organizations in Portugal, Iceland, Mexico, France, and Colombia. The International Sports Movement for the Paralysed was the creation of Dr. L. GUTTMANN, director of the national spinal injuries centre at Stoke Mandeville Hospital, Aylesbury. At the first Stoke Mandeville Games in 1948 there were 16 competitors, all from Britain; by 1952 the Stoke Mandeville Games had become international; and at the 1956 Games no fewer than 300 paralysed competitors from 19 different nations participated. Sir ARTHUR PORRITT, who is a member of both the International Olympic Committee and the British Olympic Council, is to present the trophy.

Advisory Council on Employment of the Disabled.—The National Advisory Council on the Employment of the Disabled, originally established in 1944 to advise the Minister of Labour and National Service, has been reconstituted by the Minister for a further period of three years. The medical members, all of whom have served before, are Dr. J. J. R. DUTHIE, Dr. MAXWELL JONES, Sir HARRY PLATT, Dr. D. STEWART, Dr. R. R. TRAIL, and Sir REGINALD WATSON-JONES.

Fellowships in Clinical Research.—The Medical Research Council invites applications for a further series of fellowships in clinical research, tenable at centres in the United Kingdom during the academic year 1957–8. These fellowships are open to suitably qualified medical graduates who wish to prepare themselves for a career in clinical research, and the intention is to give each fellow an opportunity to study methods of research in the basic subject most relevant to his particular clinical interest. The awards will be for one year in the first instance, and renewable annually up to a maximum of three years. Stipends will be at the rate of £950 per annum, rising by annual increments of £75 to £1,100 per annum, with superannuation provision in addition. Further details and forms of application may be obtained from the Secretary, Medical Research Council, 38, Old Queen Street, London, S.W.1. The closing date for these fellowships is March 1, but applications should be lodged earlier if possible.

Kathleen Schlesinger Fellowship.—The Medical Research Council invites applications for this fellowship, for which the closing date is February 9. Preference will be given to candidates proposing to investigate degenerative diseases of the central nervous system (including biochemical abnormalities). The stipend is between £700 and £1,000 per annum, and the fellowship is usually tenable at the National Hospital, Queen Square. The appointment is renewable annually up to a maximum of three years. Further details may be obtained from the Secretary, Medical Research Council, 38, Old Queen Street, London, S.W.1.

Fulbright Travel Grants.—The United States Educational Commission in the United Kingdom announces that, under the provisions of the Fulbright Programme, travel grants are available to citizens of the United Kingdom and Colonies to go to America for an academic or educational purpose, such as study, research, or lecturing. All awards are competitive. Recommendations are made by the Commission, but the final decision rests with the Board of Foreign Scholarships in Washington. There are two classes of grants

for applications for these grants, depending on the departure date: March 15 for those travelling between June 1 and July 31; and June 1 for those travelling after August 1. Full details are obtainable from the United States Educational Commission, 71, South Audley Street, London, W.1.

Royal College of Surgeons.—At the council meeting on January 10 Sir HENRY DAWSON, F.R.S., was elected to the Court of Patrons. A Moynihan lectureship was awarded to Professor R. M. JAMES, President of the Royal College of Physicians and Surgeons of Canada. Mr. M. J. SMYTH, surgeon to the Gordon Hospital, was appointed to give the first Gordon-Watson lecture.

Medical Society of London.—Sir GORDON GORDON-TAYLOR was unanimously elected an honorary fellow of the Medical Society of London at a meeting on January 14.

Dr. Hill in the Cabinet.—Dr. CHARLES HILL has become a member of the Cabinet, as Chancellor of the Duchy of Lancaster, in Mr. Macmillan's Government. Dr. Hill was previously Postmaster-General. Last month he was put in general charge of the Government's public relations (except in the field of Foreign Affairs).

Société Française de Médecine Psychosomatique.—This society, which was formed last summer in Paris with the aim of promoting scientific research in psychosomatic medicine, seeks to establish scientific collaboration with other societies, groups, and individuals interested in exchanging information in this field. Its officers are: president, Dr. F. MOUTIER; vice-presidents, Professor G. HEUYER and Dr. M. BOLGERT; secretary-general, Professor P. ABOULKER; secretaries, Dr. L. CHERTOK and Dr. M. SAPIR; treasurer, Dr. CH. BRISSET. Correspondence should be addressed to Dr. L. CHERTOK, Centre de Médecine Psychosomatique, 54, Avenue de la République, Villejuif (Seine), France.

Postgraduate Medical Studies at Oxford.—Dr. JANET VAUGHAN, Principal of Somerville, and Dr. G. E. F. CHILVER, D.Phil., have been appointed to the directorship of Postgraduate Medical Studies at Oxford until the beginning of the Michaelmas Term, 1960.

Edinburgh Postgraduate Prize.—The Lewis Cameron prize, valued at about £45, is offered to the Edinburgh graduate of not more than five years' standing who submits the best papers (published or not) on original work relating to the diagnosis of disease. The closing date for this competition is April 5. Further details may be obtained from the Dean of the Faculty of Medicine, Edinburgh University.

Food Standards Committee.—Professor B. S. PLATT, professor of human nutrition at the London School of Hygiene and Tropical Medicine, has been appointed a member of the Food Standards Committee by the Minister of Agriculture, Fisheries, and Food (with the agreement of the Minister of Health and the Secretary of State for Scotland). He fills a vacancy caused by the retirement of Professor S. J. COWELL.

COMING EVENTS

University of Liverpool.—Six refresher courses for general practitioners, March–July. All except one consist of four half-day sessions. Enrolment before February 7. Details from the Dean of the Faculty of Medicine, the University, Liverpool.

Chronic Rheumatic Diseases.—Concentrated week-end course at St. Stephen's Hospital, Fulham Road, London, S.W.10, March 9 and 10. Details from the secretary, Fellowship of Postgraduate Medicine, 60, Portland Place, London, W.1.

Royal Society of Health.—The annual congress will be held at Folkestone, April 30 to May 3.

Symposium on Ageing and Old Age.—Arranged by department of studies in psychological medicine, Liverpool University, March 23. Speakers, Dr. A. HERON, Professor A. B. SEMPLE, and Professor M. ROTH. Details from Dr. H. JARVIE, 77, Bedford Street South, Liverpool, 7.

American Trudeau Society.—52nd annual meeting, Kansas City, Missouri, May 6–9, in conjunction with the U.S. National Tuberculosis Association. Details from the association, 1790, Broadway, New York, 19, N.Y.

Second International Congress of Social Medicine.—In Vienna, May 31–June 2. Details from Professor T. ANTOINE, 23, Spitalgasse, Vienna, 9, Austria.

Fifth International Congress of Therapeutics.—Utrecht, June 4–6. Details from the general secretary's office, 6, Vondellaan, Utrecht, Holland.

NEW ISSUES

Medical and Biological Illustration.—The new issue (Vol. 7, No. 1) is now available. The contents include:

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BOOK REVIEWS.
OBITUARY: MATHIEU-PIERRE WEIL.
AMERICAN RHEUMATISM ASSOCIATION. PROCEEDINGS OF ANNUAL MEETING, 1956.
HEBERDEN SOCIETY.
ARTHRITIS AND RHEUMATISM FOUNDATION.
ABSTRACTS.
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British Journal of Ophthalmology.—The new issue (Vol. 41, No. 1) is now available. The contents include:

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ovaries the spring of the diaphragm may cause considerable discomfort. In such cases the use of an alternative type of cap, such as a vault-fitting Dumas or cervical cap, may be more suitable. The size of the cap required must be estimated. The diaphragm fits from the posterior fornix to the sub-pubic space, and a large range of sizes from which to select is required. Although fitting-rings may be used for this purpose, they are useless for instructing the patient.

It is important that the patient should be given careful instruction in locating her cervix and in placing the cap correctly. Instruction by diagrams or models alone is inadequate. Also instruction must be given in the use of a spermicidal jelly or cream with the cap—an essential part of the method. A subsequent examination must be carried out after the patient has practised placing the cap and returned with the cap in position. It is only at this examination that a final accurate estimation of the size of the cap required can be made. Subsequently routine checking of the satisfactory fit of the cap is advisable at six-monthly to yearly intervals. Post-natal refitting should always be carried out. From this it will be seen that it is impractical for a patient to fit herself with a Dutch cap.

"Petrified Men" of Pompeii

Q.—In "The Times" of October 8, 1956, a photograph was published of what was said to be "a petrified man found preserved in lava stone" at Pompeii. I have seen a number of these so-called "petrified men" in the museum at Pompeii in various attitudes which would suggest that they were fixed suddenly and rigidly where they were without even falling flat. Can you explain the mechanism by which a body could become petrified like this, or are they, as I suspect, fakes?

A.—The photograph in *The Times* is almost certainly of a plaster cast. The victims at Pompeii were overwhelmed by volcanic ash, not lava. (At Herculaneum the bodies were buried in lava.) After being moistened by rain, the ashes formed moulds round the bodies, which in the course of time disintegrated and left the moulds hollow. When these moulds are discovered they are filled with plaster to give a cast of the victim's body. All the "bodies" in the museum at Pompeii were produced in this way.

Sudden death probably accounts for the bizarre attitudes of the victims. Rapid death might have resulted from the inhalation of the hot dust and ashes, or from the inhalation of hydrogen sulphide. The first mechanism is in some ways comparable to the killing and fixation of machine-gunners by flame-throwers in the second world war. It is well known that "sulphurous fumes" accompany the eruption of many volcanoes, and, although hydrogen sulphide is not usually considered a very rapid poison, in high concentration it is said to be as dangerous as hydrogen cyanide.

Tab. Codein. Co.

Q.—What is the maximum safe daily dose of tab. codein. co. (B.P.) in an adult for the relief of an acutely painful condition likely to persist for a week or ten days? What toxic effects should be watched for? How should the dose be modified for children? Are there any special contra-indications?

A.—Tab. codein. co. (B.P.) are compound tablets each of which contains 7.5 mg. of codeine phosphate in addition to acetylsalicylic acid and phenacetin. The analgesic effect of tab. codein. co. is chiefly due to its aspirin and phenacetin rather than to its codeine content. There is no point in giving tab. codein. co. in large doses to relieve pain, for if the pain is so severe as to require very large doses of tab. codein. co. a stronger analgesic such as morphine, pethidine, or methadone is preferable. Doses in excess of two tablets of tab. codein. co. four-hourly, though possibly not dangerous, are undesirable as likely to cause nausea and vomiting. Constipation is usually the most troublesome side-effect of the drug, and in patients with prostatic hypertrophy or urethral stricture difficulty with micturition may

be encountered. Codeine may cause vomiting, and rarely abdominal pain may develop—probably due to pylorospasm. The risks of respiratory depression are very small and do not increase as the dose of codeine is increased. Rarely allergic skin reactions may be seen. The recommended analgesic dose of codeine phosphate for children is 0.4 to 0.7 mg. per lb. (1.54 mg. per kg.), and therefore half to one compound tablet of codein. co. may be given four-hourly with safety. Codeine should be used with caution in patients with obstruction of the lower urinary tract, and should be avoided in those known to be allergic to it.

Fluorides and Domestic Water-softeners

Q.—Is the use of a domestic water-softener likely to affect the fluorine concentration in drinking-water?

A.—No. The common domestic water-softener is operated with base-exchange material which removes only the cations which cause hardness—that is, calcium and magnesium. The anions—chlorides, sulphates, fluorides, etc.—are not affected by passing through a column of base-exchange material.

NOTES AND COMMENTS

Rudolf Steiner Movement.—Dr. P. ENGEL (medical officer, Camphill Rudolf Steiner Schools, Bielside, Aberdeenshire) writes: In your reply ("Any Questions?" December 29, 1956, p. 1560) regarding schools for handicapped children established by the Rudolf Steiner movement, it is stated that the availability of this accommodation is limited by cost. At this particular residential school, which is the largest of its type in this country, the present fees are £320 a year for children sent by local authorities (plus £36 for extra expenses such as clothing); private children pay 7 guineas a week and the same extra expenses. This compares favourably with other residential schools and institutions. Ever since local authorities have sent children to us we have had a considerable waiting-list, and many requests for admission had to be declined owing to shortage of accommodation of staff and of capital rather than by cost to parents or local authorities. In 1956, 65% of children at this school were paid for by local authorities in England and Scotland.

OUR EXPERT replies: Perhaps, if isolated, the remark that the availability of the accommodation is limited by cost may appear slightly ambiguous. But its meaning would surely have been quite clear to anyone reading the rest of the sentence, which ran as follows: "so that it (the accommodation) is in practice only accessible to those children whose parents can afford to pay for them, or in whose case public authorities are willing to pay for their tuition and care in one of the special schools or colonies." The correctness of this statement is borne out by Dr. Engel's letter.

Correction.—Dr. I. B. Sneddon asks us to correct an inadvertent error he made in his letter on varicose ulceration (*Journal*, January 5, p. 43). "The cause of varicose veins is chronic venous stasis" should have read "the cause of varicose ulcers . . ."

Books of "Any Questions?" and Refresher Course Articles.—The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices include postage. *Any Questions?* Volumes 2 and 3 (8s. each); *Refresher Course for General Practitioners*, Volumes 2 and 3 (26s. 6d. each inland, 26s. overseas); *Clinical Pathology in General Practice* (22s. 3d. inland, 21s. 9d. overseas).

All communications with regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, LONDON, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: Aitology, Westcent, London. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad. ADVERTISEMENTS should be addressed to the Advertisement Director, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: Britmedad, Westcent, London. MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association, TELEPHONE: EUSTON 4499. TELEGRAMS: Meddisce, Westcent, London. B.M.A. SCOTTISH OFFICE: 7, Drumshugh Gardens, Edinburgh.

BRITISH MEDICAL JOURNAL

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THE HORMONAL PRODUCTION OF NEPHROSCLEROSIS AND PERIARTERITIS NODOSA IN THE PRIMATE

BY

HANS SELYE, M.D., D.Sc., F.R.S.C., and PIERRE BOIS, M.D.

(From the Institute of Experimental Medicine and Surgery, University of Montreal, Canada)

[WITH SPECIAL PLATE]

Most of the experimental work on the possible participation of the adrenal cortex in the production of renal and cardiovascular lesions has been performed on the rat, because this species is especially sensitive to deoxycorticosterone, the most readily available mineralocorticoid. It had been clearly shown that overdosage with deoxycorticosterone can produce nephrosclerosis in rats, but many investigators considered it unwarranted to assume that, therefore, endogenous mineralocorticoids might participate in the pathogenesis of similar diseases in man. It was pointed out that rodents may occasionally develop periarteritis nodosa spontaneously and that the corticoid metabolism of the rat is fundamentally different in many respects from that of primates. (For literature see Selye, 1950, 1951; Selye and Horava, 1952, 1953; Selye and Heuser, 1954, 1955-6.)

In answer to these objections we attempted many years ago to produce renal and cardiovascular changes with deoxycorticosterone in rhesus monkeys, but found that even the highest tolerated doses of this steroid produced no periarteritis and only moderate degrees of nephrosclerosis in occasional animals. Besides, the renal lesions which occurred were invariably accompanied by often fatal spells of hypokalaemic paralysis. This high mortality precluded long-term experimentation and, in any event, clinical nephrosclerosis is not usually accompanied by muscular paralysis, so the experimental syndrome produced with deoxycorticosterone did not truly duplicate the disease as it occurs in man (Selye and Hall, 1943). Subsequently we learned that, in primary aldosteronism, nephrosclerosis and hypokalaemic paralysis do occur conjointly in patients (Conn and Louis, 1955-6), but this merely strengthened the view that if the disease produced by deoxycorticosterone in the monkey had a clinical counterpart it would be primary aldosteronism and not ordinary nephrosclerosis or periarteritis nodosa.

The recent discovery that the introduction of a methyl group at C² greatly enhances mineralocorticoid activity in certain steroids (presumably because it interferes with their normal metabolic destruction and activity) furnishes us with new tools with which to study this problem. It was found that 2-methyl-9(α)-fluorocortisol and 2-methyl-9(α)-chlorocortisol are more effective by far than aldosterone in producing sodium retention and

potassium excretion (Byrnes *et al.*, 1956) as well as in inducing nephrosclerosis and periarteritis nodosa (Selye and Bois, 1956 a-d) in the rat. In fact these two methylated compounds are the most active mineralocorticoids discovered up to now. It seemed to be of interest, therefore, to establish their toxicity in a primate before introducing them into general practice. We also hoped that such experiments would give us further indications concerning the possibility of reproducing nephrosclerosis, and perhaps even periarteritis nodosa, with comparatively small doses of a steroid, and that in an animal more closely related to man than is the rat. Of course, the success of such an experiment would depend upon the ability of 2-methyl-9-halo-corticoids to produce morphologic changes at dose levels that do not cause fatal paralysis. We hoped that this might be possible, as both these steroids possess some degree of glucocorticoid activity, in addition to their extraordinarily pronounced mineralocorticoid effects. These two activities of steroids are antagonistic in most respects (inflammation, lympholysis, catabolism), but synergistic as regards the production of renal damage.

In the present communication we wish to present data which show that, in fact, 2-methyl-9(α)-fluorocortisol (Me-F-COL) can produce marked nephrosclerosis and periarteritis nodosa in the rhesus monkey without causing muscular paralysis.

Materials and Methods

Eight young female *Macacus rhesus* monkeys, having an initial body-weight range of 1.8-2.7 kg., were divided into three groups whose mean initial body weight varied between 2 and 2.4 kg. On the first day of the experiment the right kidney was removed under sterile conditions through a sub-costal incision in all animals to sensitize them for the possible nephrotoxic actions of Me-F-COL. For the same reason a 1% NaCl solution was supplied as the sole source of drinking fluid, but the animals did not take much of this solution and tried to get their fluid mainly from the abundant amounts of vegetables (carrots, cabbage) and fruit (oranges, lemons) which were made available to them, together with a ground wheat and soy-bean meal diet as a source of nourishment.* Group I (two animals) was other-

*The basic diet was kindly adjusted with vitamin and mineral supplements by Dr. P. Marois as based on his experience with the feeding of the large monkey colony of the Institute of Microbiology of the University of Montreal.

wise untreated. In Group III (two animals) both adrenals and the right kidney were removed simultaneously through subcostal incisions. These adrenalectomized monkeys, as well as those of Group II (four animals), received Me-F-COL in the form of microcrystals in aqueous suspension, subcutaneously. The drug was administered daily in a single injection: 1 mg. in 0.5 ml. during the first week, 2 mg. in 1 ml. during the second week, 4 mg. in 1 ml. during the third week, 8 mg. in 0.5 ml. during the subsequent four days, 16 mg. in 0.5 ml. during the next ten days, and then 8 mg. in 0.5 ml. until termination of the experiment on the 80th day.

All animals recovered from the operations without complications, but soon the adrenalectomized monkeys of Group III became obviously ill, refused to take food, and exhibited signs of great weakness, especially in the muscles of the neck. This was thought to be due to hypokalaemic paralysis such as we had previously seen in monkeys overdosed with deoxycorticosterone (Selye and Hall, 1943). The animals were consequently given repeated intravenous injections of 1%–3% KCl solutions. They seemed to rally after each injection, but relapses continued, and, despite treatment with Me-F-COL, both the adrenalectomized animals died, one on the tenth, the other on the eleventh day after the operation. The remaining six monkeys were killed, under pentobarbitone sodium anaesthesia, by exsanguination on the 80th day, and their organs were removed and fixed in Susa solution for subsequent weighing and histological study.

Results

We shall discuss our observations on the two adrenalectomized monkeys first, because, as these animals died within the first fortnight, the results obtained were not comparable to findings in the other six monkeys, with which this communication is chiefly concerned. As explained in the preceding section, recovery immediately after adrenalectomy was uneventful, but in the course of the next few days repeated attacks of great muscular weakness developed in both animals, and intravenous administration of KCl was only partially successful in relieving these spells. Curiously, histological examination of the tissues in both these animals revealed an almost leukaemia-like infiltration of the hepatic stroma with mature and immature white blood cells; in many blood vessels (especially in those of the renal medulla and liver) there was a striking predominance of polymorphonuclear leucocytes in various stages of maturation. In the blood of the vessels we also found a great deal of strongly basophilic, amorphous material somewhat reminiscent of the so-called "haematoxylin bodies" of Klempner. At the same time oedema of the adventitia developed, sometimes accompanied by hyaline necrosis of the subintimal layers, in many arteries throughout the body. There was also some oedema and thickening of the endocardium with patches of hyaline necrosis. It was tempting to attribute this whole syndrome to some accidental infection, but the operations were performed under strict aseptic conditions, and, for the sake of greater security, 50 mg. of chloramphenicol was administered intramuscularly to all eight monkeys, both on the day of the operation and 24 hours later. Besides, no sign of infection was visible in any of the non-adrenalectomized animals. It is also unlikely that the syndrome could have resulted from mere adrenal insufficiency, since KCl did not aggravate it and treatment with the highly potent Me-F-COL had been initiated several hours before surgical intervention. Although neither of these possibilities can be excluded with certainty, it seems more probable that the adrenalectomized monkeys—noticeably sensitive to corticoid overdosage—merely exhibited a particularly acute syndrome of Me-F-COL intoxication. We intend to perform systematic studies on the response of adrenalectomized monkeys to 2-methyl-halo-corticoids as soon as these compounds become more readily available, so here it will suffice merely to mention these unexpected reactions.

Organ Changes in Treated Animals

The organ changes in the four non-adrenalectomized Me-F-COL-treated animals, which form the basis of this report, were essentially the same in all individuals and may therefore be discussed conjointly.

During the period of observation the untreated controls showed a mean gain corresponding to 12% of their initial body weight, while the monkeys treated with Me-F-COL lost 5% of their initial weight. Two of the monkeys in this latter group developed a moderate puffiness around the eyes and some bluish cutaneous striae around the abdomen.

At necropsy it was noted that all but one of the Me-F-COL-treated monkeys had abundant stores of adipose tissue underneath the skin of the abdomen and in the mesentery, despite the over-all loss of weight. In three of the treated animals chalky yellow patches of steatonecrosis were seen in the fat throughout the omentum and mesentery. In these foci histological examination revealed the presence of many foreign-body giant cells with needle-shaped intracellular spaces, which apparently corresponded to dissolved fatty acid crystals.

The most striking macroscopic changes occurred in the kidneys. These were definitely enlarged in all the treated animals (9.9–11.9 g.), as compared with the controls (6.3–6.7 g.). The renal surface was pale and mottled with numerous punctate light-grey or red spots. The outstanding characteristics of the renal lesions are illustrated in the Special Plate, Figs. 1–4. The minute red spots which were macroscopically visible on the surface of the kidney corresponded to focal glomerular haemorrhages. Many of the glomeruli were partially hyalinized, and on sections stained with the PAS technique the thickening of the basement membranes around Bowman's capsules and the proliferation of the glomerular stroma with "intercapillary glomerulosclerosis" were particularly evident. Some of the glomerular capillaries showed the "wire-loop" appearance due to accumulation of PAS-positive hyaline material underneath the endothelium. Often this progressed so far that large, pearl-like accumulations of hyaline material took the place of glomerular loops, and a picture indistinguishable from the renal manifestations of the Kimmelstiel-Wilson syndrome resulted. Many of the afferent glomerular arterioles underwent hyaline necrosis and numerous tubules were obliterated with hyaline casts. In a few areas the stroma of the kidney was infiltrated with leucocytes and showed some sclerosis; the stroma of the renal pelvis and papilla was oedematous in all the treated monkeys. None of the control animals showed any abnormality in renal structure.

The heart was manifestly enlarged (11.2–16.8 g.) as compared with the controls (10.2–10.5 g.), and even mere macroscopical inspection immediately revealed the presence of pronounced periarteritis nodosa in the coronary vessels of all four Me-F-COL-treated animals. The lesions were particularly pronounced along the anterior descending branch of the left coronary artery, which assumed a rosary-like aspect due to the inflammatory nodules. Histological examination showed that most of the branches of the coronary arterial system were affected. In some instances the periarteritic changes extended to all parts of the arterial wall and led to considerable hyaline necrosis, especially in the media and the subintimal layers. Occasionally the endothelium was totally destroyed, and thrombus formation occurred on the denuded surface. However, the aspect of the arterial lesions was quite polymorph, and within the same heart it was possible to find acute necrotizing and thrombotic arterial lesions as well as largely organized obliterative endangitis in different branches (Plate, Figs. 5–7).

The peripheral vessels were not systematically examined in all organs, but definite periarteritic lesions have also been noted in the gall-bladder, pancreas, kidney, and urinary bladder. Although the intensity of the lesions differed from case to case, all four Me-F-COL-treated monkeys exhibited signs of advanced periarteritis nodosa.

The arterial blood pressure had to be taken under profound pentobarbitone sodium anaesthesia by the direct intra-arterial (femoral artery) method, and therefore gave values which were probably much below the normal resting blood pressure. Yet it is noteworthy that, under identical conditions, the mean blood pressure in the controls was 62 mm. Hg (60–65 mm. Hg), as compared with 110 mm. Hg (75–135 mm. Hg) in the Me-F-COL-treated monkeys. These observations, as well as the already mentioned great cardiac hypertrophy, imply that the steroid did produce an elevation of blood pressure.

In the pancreas the most conspicuous changes were observed in the islets of Langerhans. In three of the four Me-F-COL-treated monkeys many of the islets (and in one animal almost all of them) contained cystic cavities filled with a poorly tingible homogeneous fluid. Some of the islets were almost totally transformed into cystic spaces. There was also a conspicuous hypertrophy and hyperplasia of the centroacinar cells, and throughout the pancreas there appeared to be transitional stages between proliferating centroacinar cell clumps and Langerhans islets (Plate, Figs. 8 and 9).

The adrenals of the treated animals underwent considerable atrophy (160–255 mg.) as compared with the controls (335–380 mg.). Histologically, all layers of the cortex participated in this involution. It is especially noteworthy that the glomerulosa—which many investigators believe to be independent of hypophysial regulation—was also very definitely involved in this compensatory atrophy. As an incidental observation it may be noted that in the cortex of the monkey adrenal comparatively large, homogeneous intercellular accumulations of strong PAS-positive material are frequently found. The origin and significance of this substance are not known, but in our series it was present both in the treated and in the untreated animals (Plate, Figs. 10 and 11).

The spleen underwent considerable atrophy in all the Me-F-COL-treated monkeys; its mean weight was 1.8 g. (1.3–2.0 g.), compared with 2.7 g. (2.3–3.1 g.) in the controls. Microscopical examination showed that the involution was principally due to a disappearance of the white pulp. Another striking histological change in all the treated animals was the deposition of PAS-positive hyaline material in the arteries of the white pulp. This was particularly conspicuous at the place of ramification into the penicilli, and often led to a complete obliteration of the lumen—with total loss of the vascular structure. PAS-positive material was also seen, free and within macrophages, in the interstitial spaces of the white pulp (Plate, Figs. 12 and 13). This process is presumably closely related to the hyaline changes of periarteritis nodosa, but, curiously, within the spleen infiltration with inflammatory cells was never conspicuous.

We saw no noteworthy changes in the thyroid and parathyroids of the treated animals. The anterior-lobe cells of the pituitary were perhaps somewhat atrophic, but hyalinization of the basophils, similar to that seen in Cushing's disease, was not observed. The thymus, on the other hand, became so atrophic in all monkeys treated with Me-F-COL that it was impossible to dissect the organ for accurate weighing. This involution, as well as the atrophy of the white pulp in the spleen, was presumably a manifestation of the glucocorticoid (lympholytic) potency of our steroid.

Discussion

These observations clearly indicate that Me-F-COL, a potent mineralocorticoid compound, can produce severe renal and cardiovascular changes in a primate. It remains to be seen whether the special "conditioning" which we used (unilateral nephrectomy and a comparatively high NaCl intake) is essential in order to obtain such effects in the monkey; however, our earlier work showed that in several other species (rat, hamster, fowl) such procedures sensitize but are not indispensable. The lesions in the monkey exhibited the histological characteristics of a

malignant nephrosclerosis, with changes typical of the Kimmelstiel-Wilson syndrome. At the same time there developed cardiac hypertrophy, an increase in blood pressure, widespread periarteritis nodosa, and a peculiar cystic transformation of Langerhans' islets. Since the last change was unexpected, we neglected to determine the glucose content of the blood and urine, and hence we do not know whether the monkeys became diabetic. Several earlier investigators observed minor changes in the Langerhans' islets of animals other than the monkey (rabbit, cat, dog)—especially after sensitization with alloxan or subtotal pancreatectomy—following heavy overdosage with cortisone, cortisol, the Δ^1 -corticoids, or A.C.T.H. (For literature see Houssay *et al.*, 1954; Penhos and Cardeza, 1956; Selye, 1950, 1951; Selye and Horava, 1952, 1953; Selye and Heuser, 1954, 1955–6.) But, so far as we are aware, this cystic change has not been previously produced with steroids in any species.

The average daily dose of Me-F-COL given to our monkeys during the 80-day observation period was 7.5 mg., and necropsy revealed that most of the injected hormone crystals remained under the skin, presumably because this steroid is very slowly absorbed. Consequently it is clear that only a fraction of the injected steroid was actually responsible for the production of these severe organ changes, although we cannot tell from our experiments the minimum amount required for the production of renal, cardiovascular, and pancreatic changes of this type.

Since in this experimental series the morphological organ changes were unaccompanied by signs of muscular paralysis, it is clear that the syndrome of malignant nephrosclerosis with periarteritis nodosa can result from overdosage with a steroid compound in a primate without the complicating signs of the periodic paralysis characteristic of primary aldosteronism.

There is no reason to believe that the adrenal cortex can produce steroids similar in their chemical structure to Me-F-COL. Still, we feel that our observations raise the question whether deviations from the normal pattern of steroidogenesis in the adrenal could result in the formation of corticoids having comparable biological actions. In any event, it is clear that the syndrome of generalized "hyalinosis" can occur in the primate as a result of corticoid overdosage, and that, contrary to common belief, periarteritis nodosa is not necessarily a manifestation of allergic hypersensitivity.

Summary

Experiments on unilaterally nephrectomized rhesus monkeys indicate that overdosage with comparatively small amounts of a new highly potent synthetic mineralocorticoid, 2-methyl-9(α)fluorocortisol (Me-F-COL), can produce severe malignant hyalinizing nephrosclerosis, with renal changes reminiscent of those seen in the Kimmelstiel-Wilson syndrome, cardiac hypertrophy, a rise in blood pressure, periarteritis nodosa, and a peculiar type of cystic transformation of Langerhans' islets.

This syndrome was not accompanied by the signs of periodic paralysis seen in monkeys overdosed with deoxycorticosterone and in patients with primary aldosteronism. It is concluded that a rather typical syndrome of malignant nephrosclerosis with periarteritis nodosa can be induced hormonally in the primate under conditions which bear no apparent relationship to allergic hypersensitivity.

Attention is called to the danger of producing similar changes by overdosage with 2-methyl-halo-corticoids in man, but further work will be necessary to establish with certainty whether endogenous secretion of corticoids can participate in the pathogenesis of malignant nephrosclerosis, the Kimmelstiel-Wilson syndrome, periarteritis nodosa, or Langerhans' islet changes in the human being.

As an incidental observation, it was noted that completely adrenalectomized monkeys given 2-8 mg. of Me-F-COL per day rapidly died showing a syndrome characterized by acute cardiovascular damage and leucocytic infiltrations, especially in the liver and kidney.

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REFERENCES

- Byrnes, W. W., Barnes, L. E., Bowman, B. J., Dulin, W. E., Morley, S. H., and Stafford, R. O. (1956). *Proc. Soc. exp. Biol. (N.Y.)*, 91, 67.
 Conn, J. W., and Louis, L. H. (1955-6). In *Fifth Annual Report on Stress* (edited by H. Selye and G. Heuser), pp. 104-16. Acta, Inc., Montreal.
 Houssay, B. A., Hartmann, L. F., and Cardeza, A. F. (1954). *Rev. Soc. argent. Biol.*, 30, 33.
 Penhos, J. C., and Cardeza, A. F. (1956). *Ibid.*, 32, 1.
 Selye, H. (1950). *Physiology and Pathology of Exposure to Stress*. Acta, Inc., Montreal.
 — (1951). *First Annual Report on Stress*. Acta, Inc., Montreal.
 — and Bois, P. (1956a). *Proc. Soc. exp. Biol. (N.Y.)*, 92, 362.
 — (1956b). *Endocrinology*, 59, 646.
 — (1956c). *J. clin. Endocr.*, In press.
 — (1956d). *Canad. med. Ass. J.*, 75, 720.
 — and Hall, C. E. (1943). *Arch. Path. (Chicago)*, 36, 19.
 — and Heuser, G. (1954). *Fourth Annual Report on Stress*. Acta, Inc., Montreal.
 — (1955-6). *Fifth Annual Report on Stress*. Acta, Inc., Montreal.
 — and Horava, A. (1952). *Second Annual Report on Stress*. Acta, Inc., Montreal.
 — (1953). *Third Annual Report on Stress*. Acta, Inc., Montreal.

HYPERPLASIA OF THE ADRENAL MEDULLA

BY

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[WITH SPECIAL PLATE]

In every case in which hypercorticalism is present the question arises whether the increased function is caused by a tumour of the adrenal cortex or by hyperplasia. The occurrence of hyperfunction of the adrenal medulla, causing permanent or paroxysmal hypertension, has long been known. In most cases a pheochromocytoma was thought to be the underlying cause. The number of cases in which such a tumour has been found and removed surgically is rapidly increasing.

In general, in discussing problems of the glands of internal secretion it can be stated that conditions which can be expected to exist as theoretical possibilities have a tendency to occur in practice. Such a theoretical possibility is clearly the existence of hyperplasia of the adrenal medulla as a counterpart to pheochromocytoma and in analogy to the conditions found in the adrenal cortex. However, the existence of a clinical syndrome corresponding with this possibility has been greatly neglected, and has even been emphatically denied in many recent articles and textbooks discussing adrenal disease and especially hyperfunction of the adrenal medulla. The following is a case in point.

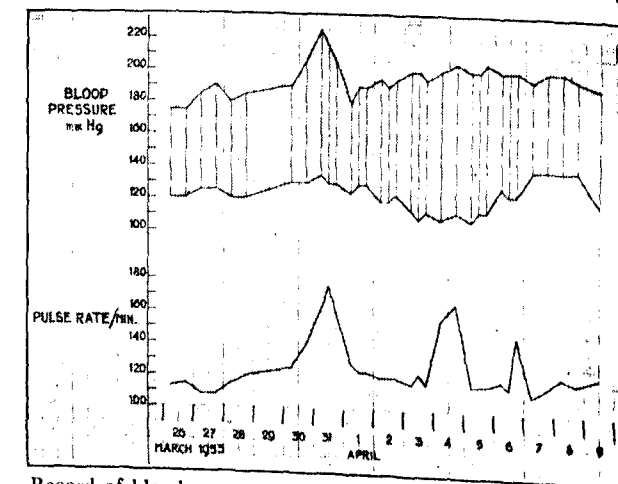
Case History

The patient, an unmarried woman, first noticed that she had become nervous, irritable, and intolerant to heat in 1936, when she was aged 17. These symptoms disappeared gradually. In 1950 she had for the first time during the night an attack of occipital headache, palpitations, and severe diffuse sweating. Since then she has had similar attacks with increasing frequency, usually lasting two or three hours. Usually the attacks started without known cause, about twice a week. Dyspnoea developed, but there was no marked loss of weight. The patient was admitted to another hospital in 1951, where she was found to have marked tachycardia (150 per minute), an increased basal metabolic rate (+52%), and hypertension (220/100 mm. Hg). The presence of a pheochromocytoma was suspected. The usual tests for this disease gave no definite results, and treatment with antithyroid drugs had no effect. Perirenal insufflation with oxygen showed moderate enlargement of the left adrenal. On surgical exploration of the adrenals both glands appeared to be normal. No pheochromocytoma was found in the adrenals or in the para-aortic tissues, and a biopsy of the left adrenal was performed. The only finding was some hyperplasia of the adrenal cortex. The possibility of a diencephalic lesion was discussed, and treatment with methylphenobarbitone and hexamethonium was instituted without benefit.

First Admission

The patient was first admitted to our department in 1953. She again had marked hypertension (200/120 mm. Hg), tachycardia (120-140 per minute), and a very high basal metabolic rate (+90%), without other clinical signs of hyperthyroidism. The blood pressure fluctuated markedly. Investigation with radioactive iodine showed normal thyroid function.

The frequency of the attacks increased, and during each attack she felt acutely ill. The attacks consisted of severe occipital headaches, palpitations, and excessive sweating,



Record of blood pressure and pulse rate during period March 26 to April 9, 1953. Shows one severe attack on March 31 with rise in blood pressure and tachycardia, and two minor attacks on April 4 and 6 with tachycardia but no rise in blood pressure.

with a pulse rate reaching 196 per minute. Often there was an increase in blood pressure, especially the systolic pressure (see Chart). Other signs were red blotching on the face, neck, and chest, mild dyspnoea (25-30 respirations per minute), and occasionally tremor affecting the whole body. During two attacks the blood sugar was determined and found to be normal (105 and 106 mg. per 100 ml.). The duration of the attacks varied from 15 minutes to half a day. During mild attacks the blood pressure was not increased. Pharmacological tests with piperoxan, phentolamine, histamine, and hexamethonium gave no indications of the presence of a pheochromocytoma. Blood sugar tolerance was normal. Excretion of 17-ketosteroids was

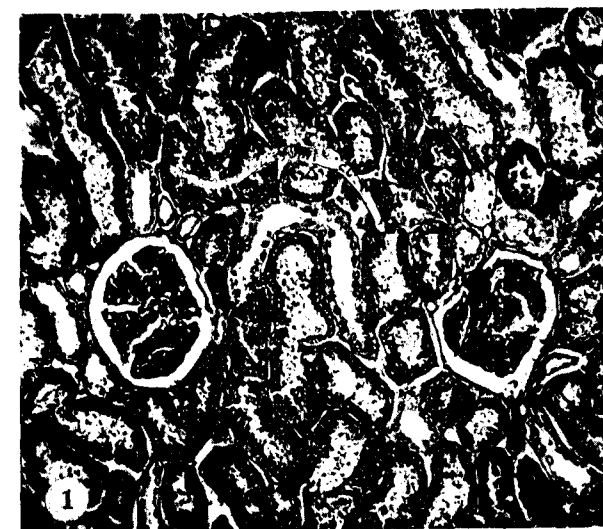


FIG. 1.—Kidney of normal control monkey from Group 1.

(Figs. 2-9 are from non-adrenalectomized monkeys of Group II which received Me-F-COL. Sections stained PAS.)

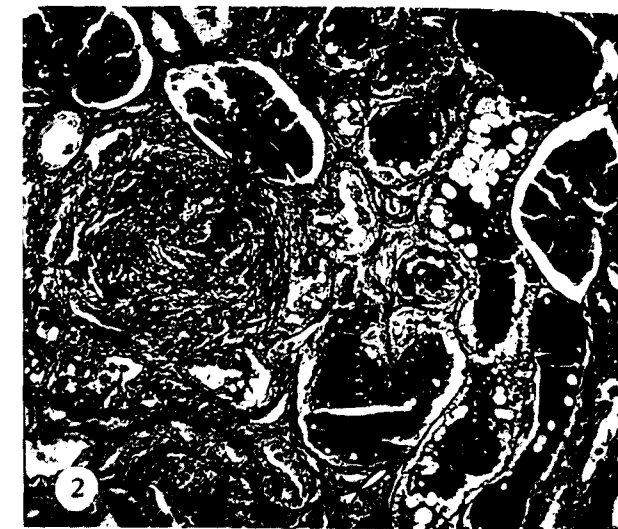


FIG. 2.—Showing pronounced hyaline necrosis with secondary inflammatory changes around hilar vessels of a glomerulus (centre of field) and presence of numerous hyaline casts which obstruct tubules. ($\times 107$.)



FIG. 3.—Interstitial glomerulosclerosis with deposition of deeply tingible PAS-positive material in glomerular stroma. Some tubules lined exclusively by "clear cells." ($\times 107$.)

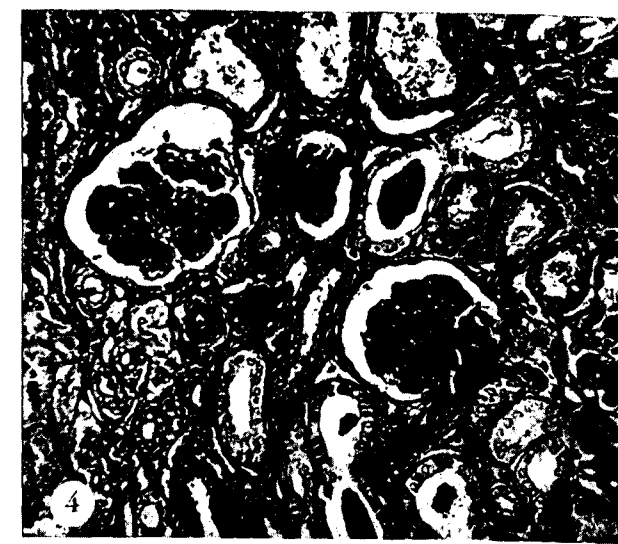


FIG. 4.—Pearl-like PAS-positive accumulations which virtually occlude certain glomerular capillaries, as in Kimmelstiel-Wilson syndrome. ($\times 107$.)

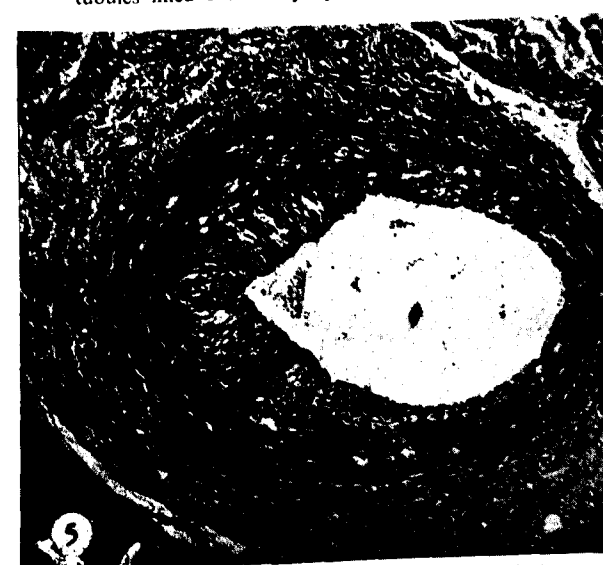


FIG. 5.—Branch of a coronary artery with marked intima proliferation (centrally from internal elastic membrane) limited to left of field. ($\times 90$.)

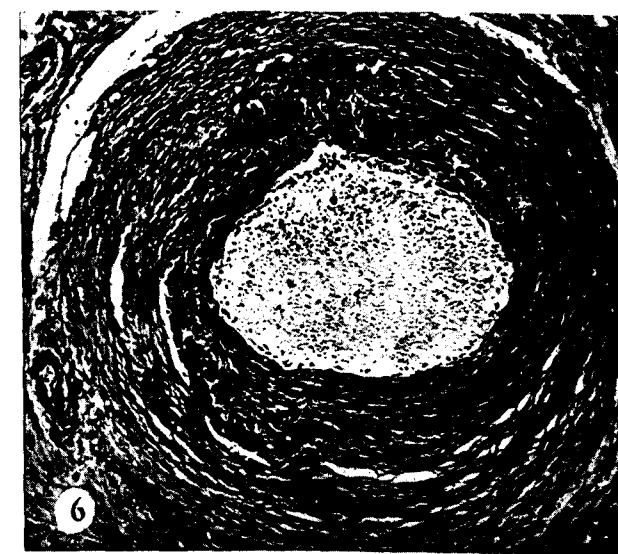
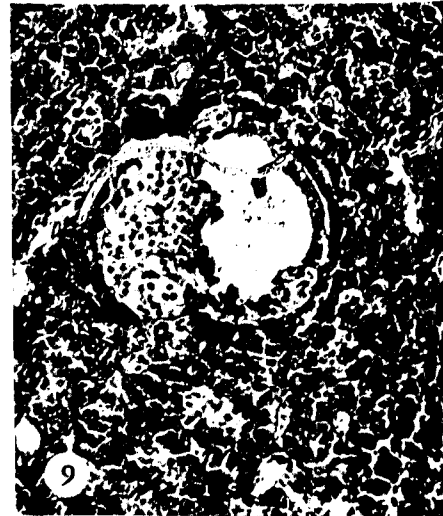


FIG. 6.—Branch of a coronary artery with intense infiltration of inner layers by PAS-positive hyaline material. ($\times 90$.)

H. SELYE AND P. BOIS: PRODUCTION OF NEPHROSCLEROSIS AND PERIARTERITIS NODOSA



FIG. 7.—Another branch of coronary arterial system in which intima proliferation has progressed to a point where lumen is considerably reduced. ($\times 40$.)



FIGS. 8 and 9.—Langerhans islets with advanced cyst formation. Note also proliferation of centroacinar (light grey) cells in exocrine tissue. ($\times 108$.)

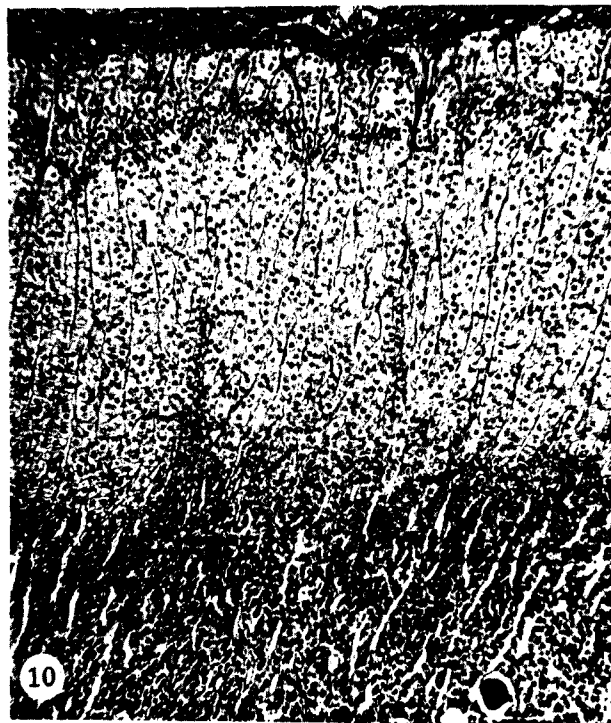


FIG. 10.—Section through entire width of adrenal cortex of an intact control monkey of Group I. Three layers clearly distinguishable; a darkly staining PAS-positive intercellular lake near right lower corner of field. ($\times 67$.)

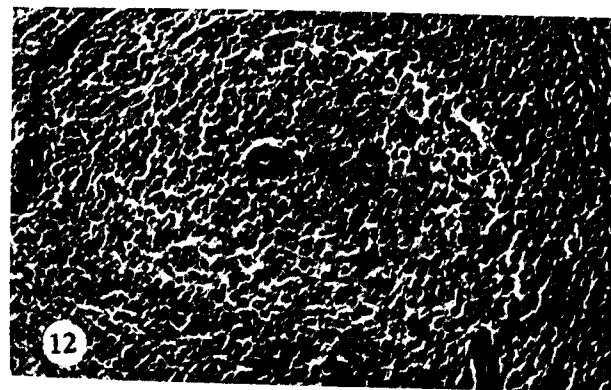


FIG. 12.—Malpighian corpuscle in spleen of an intact control animal. Lymphatic tissue around central artery well developed. ($\times 107$.)

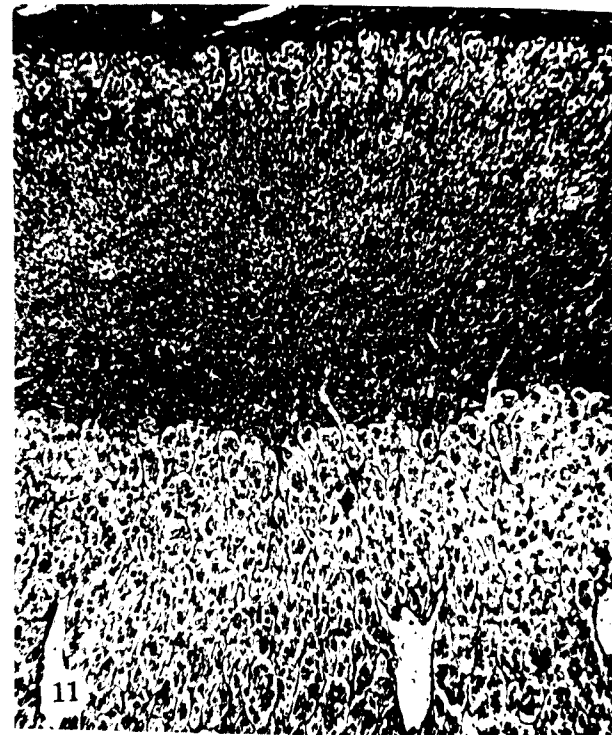


FIG. 11.—Corresponding region of Me-F-COL-treated animal from Group II. Cortex atrophic and occupies only upper half of field, outside medulla. Fasciculate and reticular no longer clearly distinguishable, because of intense cell involution; glomerulosa also participates in atrophy. ($\times 67$.)

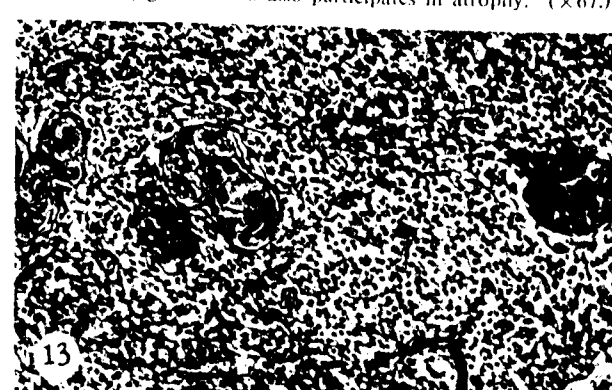


FIG. 13.—Spleen of Me-F-COL-treated monkey from Group II. Lymphatic tissue has almost completely disappeared; two dark blocks of intensely PAS-positive intercellular material. ($\times 107$.)

G. H. DU BOULAY, B. GREEN, AND A. H. HUNT: PORTAL AND SPLENIC VENOGRAPHY

FIG. 1.—Case 1 (cirrhosis). Splenic venogram. (Cf. Fig. 2.) A. Diversion of most of diiodone Na through gastric and oesophageal varices, with portal vein outlined but not filled. B. $1\frac{1}{2}$ seconds later; shows only one side of portal vein—an example of streamlining. (Gall-stones also present.)

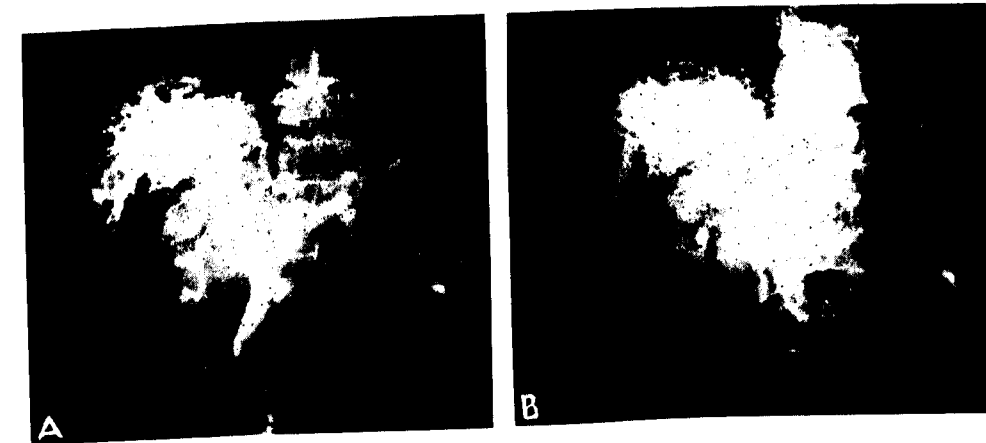
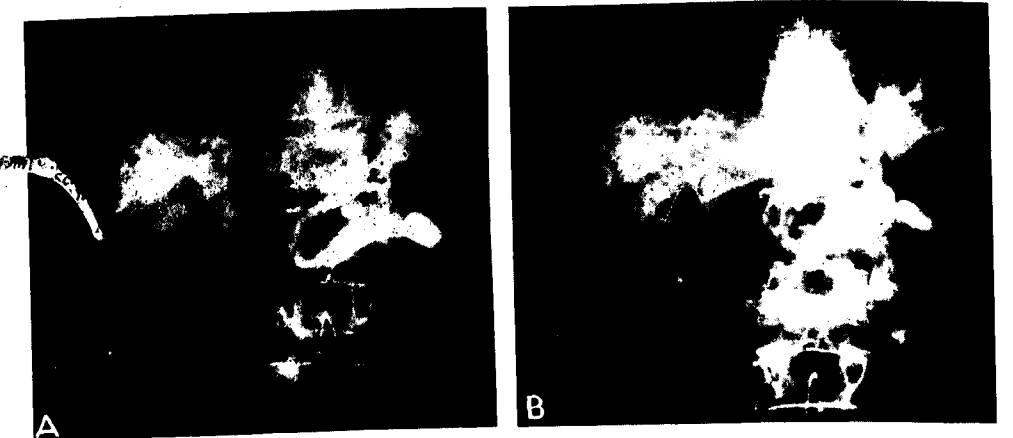


FIG. 2.—Case 1 (cirrhosis). Double portal venogram complementary to Fig. 1 (diiodone of splenic venogram showing as pyelogram). Well-filled portal vein and less diversion; splenic vein not filled.

FIG. 3.—Case 2 (cirrhosis). Splenic venography by injecting 20 ml. 70% diiodone into substance of spleen percutaneously before operation. All dye is being diverted by way of large cluster of gastric varices into retroperitoneal veins which drain into inferior vena cava.

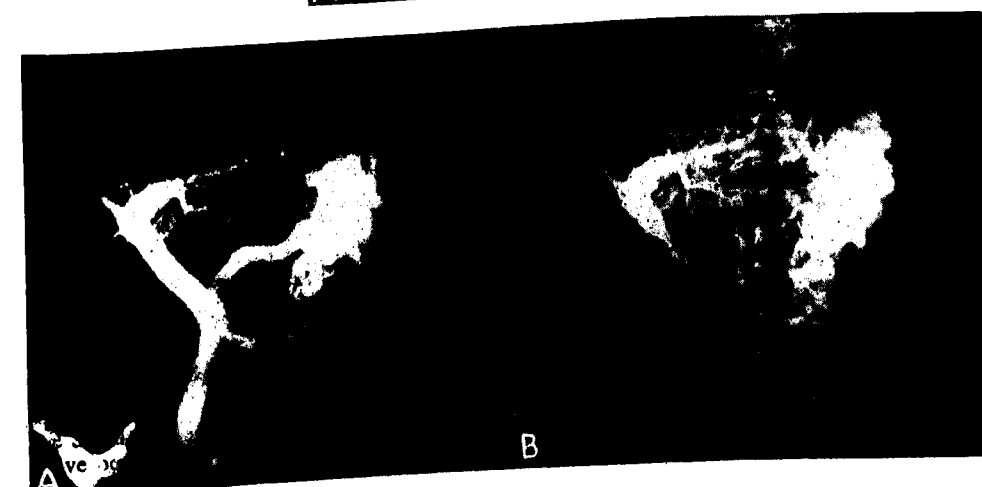
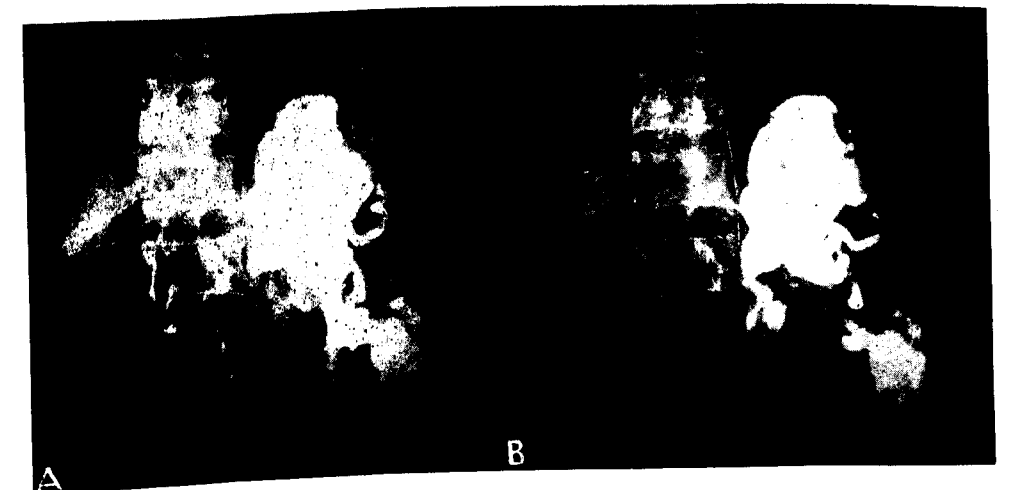


FIG. 4.—Case 2 (cirrhosis). Portal venography on same patient as Fig. 3, after abdomen opened, by injecting 25 ml. diiodone into radicle of jejunal vein. Almost all dye, admixed with blood in superior mesenteric vein, passes either to liver via a normal portal vein or to same clump of gastric varices by way of enlarged left gastric vein.

W. DRUKKER *ET AL.*: HYPERPLASIA OF ADRENAL MEDULLA

FIG. 1.—Left adrenal, removed September, 1953. Hyperplasia of medulla with elongations between cortex.

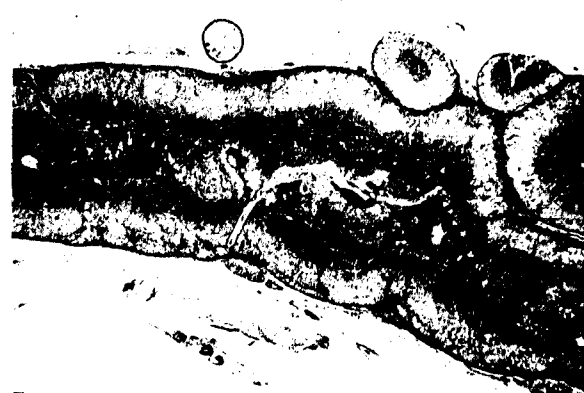


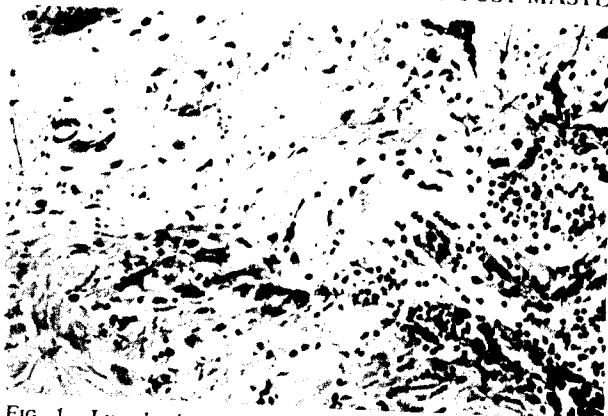
FIG. 2.—Right adrenal, removed February, 1956. Very marked hypertrophy of adrenal medulla.

D. M. DOUGLAS: MITRAL REGURGITATION



Antero-posterior and oblique views of the heart. A, Case 1; B, Case 2; C, Case 3.

J. H. KETTLE: POST-MASTECTOMY LYMPHANGIOSARCOMA

FIG. 1.—Lymph channels lined by neoplastic cells; also neoplastic cells occurring singly and in small groups. ($\times 120$.)FIG. 2.—Neoplastic cells occurring in masses. ($\times 120$.)

10 mg. in 24 hours, and of 11-oxycorticosteroids 0.1 mg. in 24 hours—values giving no indication of increased activity of the adrenal cortex. Kidney and adrenal function tests gave normal results, and serum electrolyte estimation did not show any abnormality. Perirenal insufflation again showed enlargement of the left adrenal, and it was decided to remove this gland. The operation was carried out in September, 1953, by Professor Boerema. This was followed by a decrease in frequency of the attacks and alleviation of the symptoms, especially the sweating; the blood pressure was reduced to 170/94 mm., and this level was maintained for some time. The palpitations and the tachycardia, however, persisted, while the B.M.R. remained high (+103%). It soon became evident that the operation had been unsuccessful. Treatment with hypotensive drugs, especially rauwolfia preparations, was tried without result, and the patient was discharged.

Second Admission

She was readmitted in 1954 with the same symptoms. Blood pressure, 190/130 mm. Hg; pulse 130 per minute; B.M.R., +96%. On treatment with chlorpromazine and reserpine there was a temporary lowering of the blood pressure and the B.M.R. to normal values, but a short time after her discharge from hospital both the blood pressure and the B.M.R. increased again.

Third Admission

In 1955 she was admitted for the third time. Her blood pressure was 230/130 mm., and B.M.R. +74%; the level of 17-ketosteroids in the urine was again normal; a cortisone suppression test showed a marked reduction in excretion of 17-ketosteroids. The condition of the patient became steadily worse.

The similarity of the clinical picture to that of pheochromocytoma was striking during every observation, but all special investigations to confirm the presence of such a tumour had been consistently negative. It was then thought that an explanation of this puzzling disease might be found in the existence of hyperplasia of the adrenal medulla, a condition which could be expected to give rise to a clinical picture resembling that of pheochromocytoma. The patient's condition necessitated reconsideration of the therapeutic possibilities, and finally it was decided to remove the remaining adrenal gland, which seemed to us a logical treatment if the diagnosis of hyperplasia of the adrenal medulla was correct. Although determination of the pressor amines in the urine, giving a value of 21 μ g. in 24 hours, did not support a diagnosis of hyperfunction of the adrenal medulla, this was disregarded on the assumption that this procedure could not be decisive, as even in true pheochromocytoma normal values are sometimes obtained. The possibility that the pressor amines in the urine have much lower values in medullary hyperplasia than in pheochromocytoma had also to be taken into account.

The right adrenal was removed in February, 1956, without difficulty. After the operation the blood pressure was kept at a normal level by noradrenaline intravenously, and the patient was also given cortisone orally, 75 mg. daily and later 37.5 mg. daily. The attacks, which had become very frequent before the operation, did not reappear, and the patient improved rapidly. The blood pressure was much lower, fluctuating between 145 and 160 mm. systolic and between 105 and 120 mm. diastolic. At the first and fifth months after operation the B.M.R. was +7% and +10% respectively. During these five months the patient remained well, except for slight arthralgia and a pulse rate of 130 per minute. These are possible signs of hypocorticalism in spite of a maintenance dose of 50 mg. of cortisone.

Pathological Findings

The pathological report on the left adrenal, removed in September, 1953, had been: "No pheochromocytoma is present. The adrenal medulla is clearly hypertrophic and has elongations between the cortex radiating to the sur-

face" (Special Plate, Fig. 1). At that time the significance of this report had not received enough attention. When the second operation was carried out, in February, 1956, it was decided to send the whole adrenal gland to the pathologist, as this offered the only possibility of obtaining a definite answer as to the nature of the disease. Re-entention of part of the gland for pharmacological investigation of the content of adrenaline and noradrenaline would have made it impossible for the absence of a pheochromocytoma to be proved anatomically.

The pathological report (Professor Deelman) on the right adrenal was: "Very marked local hypertrophy of the medulla. No tumour is present" (Special Plate, Fig. 2). This report confirmed the clinical diagnosis. The absence of a pheochromocytoma in the remaining adrenal gland was also proved; the presence of marked hypertrophy of the medulla made the existence of a tumour outside the gland very improbable. However, the significance of the hypertrophy of the adrenal medulla in the second gland is uncertain, in so far as some compensatory hypertrophy was to be expected following extirpation of the first adrenal gland in 1953.

Discussion

The case here described had the typical clinical picture of paroxysmal hypertension. The attacks were marked by a further rise of blood pressure, extreme sweating, and a high pulse rate. In the interval between the attacks there was persistent hypertension, with tachycardia, a very high basal metabolic rate, and normal thyroid function. The absence of other signs indicating the presence of a pheochromocytoma combined with this clinical picture suggested a diagnosis of hyperplasia of the adrenal medulla. This was confirmed by the report of the pathologist, who found marked hyperplasia of the medulla in both adrenals, especially the right, which had been removed in February, 1956.

From a study of the modern literature it seems that hyperplasia of the adrenal medulla is not regarded as a separate clinical entity, while Sprague *et al.* (1953) state that the condition is unknown. Soffer (1948) maintains that the complete classical picture of hyperadrenalism is not simulated by any other clinical condition, but he does not mention the possibility of hyperplasia of the adrenal medulla as a causal factor. Hartman and Brownell (1949) write that the proved cases of hypersecretion of the chromaffin tissue of the adrenals were due to a chromaffin tumour, and Goldenberg (1951) states that the only known instance of hyperfunction of the adrenal medulla in man was also due to chromaffin-tissue tumours. Further search in the literature has revealed, however, that the existence of hyperplasia of the adrenal medulla, either as an autonomic disease or as a consequence of renal disease, has been mooted before. Many years ago Vaquez (1904) suggested that the cause of the common type of essential hypertension may be found in the hypersecretion of adrenaline by the suprarenal gland. Vaquez and other investigators found a high incidence of diffuse cortical hyperplasia and of cortical adenomata in patients with hypertension. The fundamental difference between the cortex and the medulla was not clearly recognized at that time; moreover, critical investigations showed that there was no clear-cut correlation between the cortical changes and the presence or absence of hypertension.

Other authors have claimed the presence of medullary hyperplasia in essential hypertension, but this finding also has not been confirmed. The theory that increased secretion of adrenaline is the cause of the common type of essential hypertension has been generally abandoned. Treatment by unilateral adrenalectomy has been tried in a number of cases, sometimes with success, but on the whole the operation has been disappointing. Recently bilateral adrenalectomy has been investigated as a treatment for the more common forms of hypertension, though independent of the conception that hyperfunction of the adrenal gland may play an important part in the causation

of this disease. Other operations have been performed to eliminate the influence of the adrenal medulla. Riser *et al.* (1951) have devised a method of destroying the major portion of the medulla by sclerosing injections of salicylic acid. This treatment does not cause permanent damage to the cortex. They combined this procedure with the operation of Smithwick in cases of hypertension, sometimes of malignant type. Durante (1952) carried out curettage of the adrenal medulla, without destroying the cortex, in many cases in which he assumed there was increased activity of the adrenal medulla. His main indications were hypertension (sometimes of malignant type), Raynaud's disease, Buerger's disease, and sclerodermia.

Several authors have claimed that renal diseases can cause a secondary hyperplasia of the adrenal medulla. Sometimes the clinical picture of paroxysmal hypertension was found. An interesting case was that described by Giraud (1952). A woman of 50 had had paroxysmal hypertension for 18 months. The B.M.R. was +20%. At operation a right-sided hydronephrosis with abnormal arteries was found, and the right adrenal was also abnormal. After removal of the right kidney and adrenal the blood pressure became normal and the attacks disappeared. The adrenals contained a central cyst filled with haemorrhagic fluid, and there was hyperplasia of the medulla and cortex.

Apart from the presumed hyperfunction of the adrenal medulla in the common type of essential hypertension, cases have been presented in which hyperplasia or hyperfunction of the adrenal gland without primary renal disease was considered to be the specific cause of the hypertension. Many of these cases have been operated upon either without a clear-cut diagnosis or with a pre-operative diagnosis of phaeochromocytoma which was not confirmed at operation. Most of these cases had permanent hypertension. Unfortunately, in many of the cases the histological description of the changes in the adrenal has been incomplete.

Piotrowski and Ody (1935) observed a woman of 45 years with severe headache and hypertension, the highest systolic pressure being only 180 mm. Hg. Pain in the right lumbar region suggested the possibility of a right adrenal tumour. At operation no tumour was found, however, but the right adrenal was removed. The pathologist considered the condition to be one of hypersecretion of both cortex and medulla rather than of marked hypertrophy. After the operation the patient's condition improved. Leriche *et al.* (1935) described a similar case. A 44-year-old woman had severe headache and a hypertension of 200/100 mm. The B.M.R. was not mentioned. The right adrenal was removed and found to contain 6.3 mg. of adrenaline, which was considered to be higher than normal. Histological examination showed a central haemorrhage in the medulla. Here again improvement followed operation. Neither case is very convincing, and both could be considered as cases of common essential hypertension.

Bergstrand (1947) observed a case of severe permanent hypertension in a woman of 25 years who died from uraemia. At necropsy both adrenals were found to be greatly enlarged, weighing 90 g. together (normal 10-12 g.). Histological examination showed only small islands of medullary tissue, the glands consisting mainly of cortical tissue.

The presence of paroxysmal hypertension, presumably caused by medullary hyperplasia, has been found in only a few cases. Rowntree and Ball (1933) observed a man of 40 years (B.M.R. was +20% to +10%) in whom a diagnosis of phaeochromocytoma was not confirmed at operation. The patient died shortly afterwards, and histological examination showed hyperplasia of the adrenals. The authors do not mention whether this was a hyperplasia of the medulla or of the cortex, and in any case their opinion was that the changes were not sufficient to explain the clinical syndrome.

Schwab and Denniger (1952) describe a case in which surgical exploration for a phaeochromocytoma was made in a woman of 53. B.M.R. +9%. No tumour was found, but the left adrenal was excised. It weighed 12 g. At necropsy a central haemorrhage was found. Histological

examination showed marked hyperplasia of the adrenal medulla. Part of the adrenal investigated pharmacologically contained 49.5 µg. adrenaline and 48.5 µg. noradrenaline per gramme of tissue, which are very low values.

Lian *et al.* (1946) observed a woman of 42 years with paroxysmal hypertension in whom radiological examination showed the left adrenal to be slightly larger than the right. The left adrenal, which weighed 8.6 g., was removed. Histological examination showed a normal medullary zone and some increase of spongiocytes in the cortex. After the operation there was some improvement and the attacks disappeared. The B.M.R. is not stated. The same authors described another case, in a woman of 43 years, with a similar history. In this case the excised adrenal showed slight medullary hyperplasia, and again considerable hyperplasia of the spongiocytes. Four other cases with transient elevations of blood pressure are mentioned briefly, and are described as a minor form of paroxysmal hypertension caused by hyperplasia of the adrenal gland without tumour. In these cases also the hypertension was considered to be due to a sudden secretion of adrenaline in the blood as in phaeochromocytoma.

Our own case presents a number of features which distinguish it from other cases reported in the literature, especially: (1) the frequency and severity of the attacks, with marked tachycardia, hyperhidrosis, and general malaise; (2) the persistently high basal metabolic rate, with values of up to +100% and normal thyroid function; (3) the failure of unilateral adrenalectomy to influence the condition; these features, combined with the negative results of tests for phaeochromocytoma and the failure to find a tumour at the first exploration, led us to the diagnosis of medullary hyperplasia. Other aspects are: (4) the complete anatomical investigation of the adrenals showing the presence of medullary hyperplasia in both glands and the absence of tumour and of cortical hyperplasia; and (5) the complete disappearance of the attacks and the return of the B.M.R. to normal after removal of the second adrenal.

In conclusion some reference should be made to the differential diagnosis of paroxysmal hypertension. Although many conditions giving rise to this clinical syndrome have been mentioned in the literature, most of them appear to be rare. Mackeith (1944) mentions symptomatic paroxysmal hypertension in lead intoxication, eclampsia, tabes dorsalis, aortic insufficiency, angina pectoris, angina pectoris vasomotoria, tumours of the thalamus, and diseases of the vagal nerves. Rogen (1947) described an interesting case of paroxysmal hypertension caused by a glioblastoma in the right hemisphere in which the thalamus and hypothalamus were not affected. The blood pressure was normal (110/70 mm. Hg) between the attacks, but rose to 260/140 mm. Hg during attacks. At necropsy the absence of a phaeochromocytoma was proved. The connexion between renal disease and paroxysmal hypertension has already been referred to.

Summary

A case of hyperplasia of the adrenal medulla which gave rise to a clinical picture closely resembling that of phaeochromocytoma is described. The left adrenal was removed without effect. The diagnosis of medullary hyperplasia was made clinically before a second adrenalectomy, and this was confirmed by histological examination.

The main clinical features consisted of repeated attacks with tachycardia, excessive sweating, and an additional rise in blood pressure, the blood pressure already being permanently elevated, and the B.M.R. very high (up to +100%) without signs of hyperthyroidism.

After removal of the second adrenal all the symptoms and most of the clinical signs disappeared. The attacks did not reappear, the B.M.R. became normal, and the blood pressure fell. This improvement has now been maintained for five months.

REFERENCES

- Bergstrand, A. (1947). *Acta path. microbiol. scand.*, **24**, 412.
 Durante, L. (1952). *Presse méd.*, **60**, 102.
 Giraud, G. (1952). *Montpellier méd.*, **95**, 700.
 Goldenberg, M. (1951). *Amer. J. Med.*, **10**, 627.
 Hartman, F. A., and Brownell, J. A. (1949). *The Adrenal Gland*. Philadelphia.
 Leriche, R., Hermann, H., and Etienne-Martin, P. (1935). *Presse méd.*, **43**, 449.
 Lian, C., Welt, H., and Siger, F. (1946). *Sem. Hôp. Paris*, **22**, 15.
 Mackeith, S. A. (1944). *Brit. J. Med.*, **6**, 1.
 Piotrowski, G., and Ody, J. (1935). *Schweiz. med. Wschr.*, **65**, 704.
 Riser, Lavitry, Gleize, and Rascol (1951). *Presse méd.*, **59**, 869.
 Rogen, A. S. (1947). *Lancet*, **1**, 103.
 Rowntree, L. G., and Ball, R. G. (1933). *Endocrinology*, **17**, 263.
 Schwab, R., and Denniger, K. (1952). *Z. ges. Inn. Med.*, **7**, 592.
 Soffer, L. J. (1948). *Diseases of the Adrenals*. Philadelphia.
 Sprague, R. G., Kvale, W. F., and Priestley, J. T. (1953). *J. Amer. med. Ass.*, **151**, 629.
 Vaquez, L. H. (1904). *Congrès Française de Médecine, Paris, Comptes rendus*, p. 338.

PORTAL AND SPLENIC VENOGRAPHY

BY

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[WITH SPECIAL PLATE]

Radiological demonstration of the portal vein is a useful investigation which materially assists in the surgical treatment of portal hypertension. Its purpose is to demonstrate the presence and nature of the main channels in the portal tree, especially the portal vein itself. Accuracy is essential, otherwise it will be misleading. Two methods of obtaining portal venograms are commonly practised. In the first, which may be referred to as splenic venography, 20-30 ml. of 70% diodone is injected into the substance of the spleen itself. In the second the dye is injected into a radicle of the portal vein after the abdomen has been opened. Both methods have their advantages and disadvantages, but neither can be depended upon to demonstrate more than half the portal tree. Much has been written on the subject recently, most articles stressing the value of one or other method. It is our purpose in this brief communication to emphasize that both are sometimes necessary in order that the portal vein may be completely delineated.

Splenic Venography

Splenic venography is carried out as a diagnostic method or as a preliminary to operation (Abeatici and Campi, 1951; Dreyer and Budtz-Olsen, 1952; Walker *et al.*, 1953; Atkinson *et al.*, 1955). It is performed under local analgesia or general anaesthesia, and provides information which may be a valuable guide to the nature of the disease process and to the type of operation required in the particular case. Discomfort is minimal if the injection is well conducted in a suitable patient. Unfortunately splenic injection is by no means foolproof, for the following reasons. It is difficult to inject the diodone accurately into a spleen which is not grossly enlarged. It is unsafe to puncture a spleen when the clotting power of the blood is reduced by a deficiency either of platelets or of prothrombin. Sometimes the spleen can be damaged with consequent haemorrhage, and a few deaths have occurred as a result of this accident (see, for example,

Gvozdanovic *et al.*, 1953; Reynolds *et al.*, 1955). We have often noticed a material perisplenic haematoma at laparotomy following splenic injection (see Cooper *et al.*, 1953). For some patients the investigation, when carried out under local analgesia, is an ordeal and should therefore be avoided. Lastly, venography by the splenic route is out of the question for patients whose spleen has been removed. We have had experience of 20 such "post-splenectomy bleeders."

Portal Venography

When the above contraindications to splenic venography apply to patients who have been selected for surgical treatment, the portal vein can be demonstrated only by the direct method. Apart from this regarding it as an alternative technique, direct portal venography is applicable to all patients undergoing abdominal exploration for portal hypertension and allied diseases. It is the older and more elastic method, in that any suitable radicle of the portal vein can be used (Blakemore and Lord, 1945; de Sousa-Pereira *et al.*, 1949; Santy and Marion, 1951). It is far more certain to provide an accurate picture of the anatomy of the portal vein (Special Plate, Figs. 2 and 4), whether this vein is normal or not. A negative finding on splenic venography may mean nothing (Plate, Fig. 3), whereas such a finding on portal venography is proof that no portal vein exists. When this is the case the splenic vein is often delineated. It is not so important to show the splenic vein when a large and normal portal vein is present, because we usually prefer to use the portal vein for shunt operations. Portal venography is the safer method.

When it is our intention to demonstrate the trunk of the portal vein we use a jejunal vein for the injection. On other occasions we have used the left gastro-epiploic, left gastric, or even a branch of the splenic vein itself. The simplicity, speed, and safety of the method have recommended it to us (du Boulay and Green, 1954; Kemp Harper, 1955). However, it has two great disadvantages—it cannot be used until the abdomen has been opened and it does not usually demonstrate the splenic vein. It is less likely to show up the anastomotic vessels draining blood from the spleen. Lastly, an x-ray apparatus of high output is not usually available in the operating theatre, so that the number of serial radiographs of good quality which can be obtained from one injection is limited. When splenic venography is done in a department of diagnostic radiology, however, this limitation is less likely to apply.

In discussing the two methods, the haemodynamics of the blood flow must be considered in addition to details of technique.

"Streamlining" and Diversion of Portal Blood

Radio-opaque solutions injected into the spleen will delineate only vessels or parts of vessels which drain off splenic blood. It has been recognized for very many years that "streamlining" is a phenomenon commonly encountered in the portal vein (McIndoe and Counseller, 1927; Helps and McDonald, 1954). It has often been suggested that in some animals blood coming from the spleen and inferior mesenteric vein travels more to the left lobe of the liver than to the right, while blood from the right colon and small intestine travels to the right lobe of the liver. We have on many occasions been able to demonstrate "streamlining" in the portal vein giving preferential supply to the right lobe of the liver, but good filling of the left lobe of the liver from splenic injection has not often been an outstanding feature. Sometimes "streamlining" has prevented diodone from fully delineating the portal vein, and has thus given a false picture easy to confuse with partial thrombosis (Hunt, 1956).

When intra- or extra-hepatic obstruction is present, blood is diverted through other channels into the systemic circulation. Blood from the spleen and from the stomach seems to be the first to be side-tracked up oesophageal varices or back through the veins of Retzius into the retropancreatic, paracolic, and para-splenic veins. The diaphragmatic veins may also play a large part in this diversion of portal blood.

On three occasions recently diodone injected into the spleen has failed to reach a normally patent portal vein, having been totally diverted. (For an example see Special Plate, Fig. 3.) In such circumstances it is possible to build up a picture of the portal tree only by using both methods one after the other as required, thereby filling the complementary parts of the portal system.

Serial Radiography

In all methods of angiography in which radio-opaque material is injected into a flowing stream of blood an accurate representation is more likely to be obtained by multiplicity of pictures—the method of serial radiography. The greater the number of exposures made—that is, the more cinematographic the technique—the more complete will be the picture of the system being investigated. In the portal tree, however, multiplying photographs is not going to alter "streamlining" or diversion of portal blood along adventitious channels. Leger (1955) attempts to circumvent the misrepresentation due to these causes by the injection of a large quantity of contrast medium and the taking of many serial films, but even he illustrates a case in which this method failed to prevent a misdiagnosis of portal thrombosis.

Combined Splenic and Portal Venography

Our own experience of portal venography dates back to early 1949. In every case of portal hypertension that has been operated upon since that date the portal tree has been investigated radiologically. Other cases of splenic disease have been similarly investigated. We have used the method as a technical aid to operation rather than as a diagnostic procedure. Altogether we have more than 40 percutaneous splenic venograms and nearly 150 portal venograms available for study. On about 15 occasions both methods were carried out. We have arrived emphatically at the conclusion that in certain cases a combination of the two methods is the best way of obtaining accurate information (Rousselot, 1953).

The decision whether or not to operate is arrived at on clinical, biochemical, and radiological assessment. The patient is anaesthetized and placed on the operating table in such a position that venograms can be obtained by both methods. The patient's arms are folded across the upper chest and fixed so that they do not interfere with the operation or with serial radiography (Hunt *et al.*, 1956). The skin over the spleen is sterilized and 20–30 ml. of 70% diodone is injected directly into the spleen by the most convenient route (proportionately smaller quantities are used for children). If the spleen is very large, this is usually done through the abdominal wall; if not very large, through a convenient intercostal space. The anaesthetist maintains absolute apnoea during the course of the investigation, so that damage to the spleen is minimal and there is no risk of capsular tear. The films are developed during the next few minutes while the field of operation is being sterilized and the final arrangements for operation made. They are thus available in time to guide the surgeon in placing the incision. Sometimes the portal vein is clearly demonstrated and there is no need for further radiological investigation. If the portal vein is indistinct or appears to be absent, portal venography is performed after the abdomen has been opened. We use a standard mobile x-ray apparatus and take two pictures, one at the exact finish of the injection of diodone and another 1½ seconds later (du Boulay and Green, 1954). In addition, we usually estimate the speed of flow in the portal or the splenic vein, using the method described by Hunt (1954), and this sometimes provides information of great value.

The dual approach to the radiological demonstration of the portal tree, when it has been possible, has not so far failed us. To illustrate our thesis we have selected the radiographs obtained in two patients with cirrhosis of the liver who were operated upon for massive recurrent haematemesis from oesophageal and gastric varices. The splenic venogram in Case 1 (Special Plate, Fig. 1), shows a well-filled splenic vein and diversion of splenic blood up the left gastric vein. The portal vein and its main branches is no more than out-

lined by the diodone—a good example of laminar flow which could easily be mistaken for thrombosis. The portal venogram (Plate, Fig. 2), on the other hand, demonstrates that the portal vein is normal and suitable for porta-caval anastomosis, which was duly constructed without difficulty. In the splenic venogram from Case 2 (Plate, Fig. 3), the dye can be seen to have been injected well into the substance of the spleen. There is no real splenic vein, but there are two large channels draining the blood into an enormous mass of gastric varices. Fig. 3B shows that this blood percolates away from these varices into retropancreatic channels which communicate with the inferior vena cava, which is distinctly though faintly shown. Drainage of the portal into the systemic system can thus be seen, and yet the patient suffered from massive haemorrhages. It was evident that all splenic and much gastric blood was being diverted away from the portal vein, and that further venography would be necessary once the abdomen had been opened. In Fig. 4 of the Special Plate are reproduced the pictures obtained by portal venography. Traces of the dye from the splenic injection still remain within the spleen. The portal vein is beautifully shown together with the left gastric vein draining blood back into the same mass of varices as demonstrated by splenic venography. On studying the four radiographs it was adjudged that the oesophageal and gastric varices would be most directly decompressed if a porta-caval anastomosis could be successfully constructed. This was therefore done, and the patient has had no further haemorrhage.

For some years we have considered a natural development of the double method by connecting splenic and jejunal needles to a single syringe containing the diodone and obtaining venograms by both methods simultaneously. Unfortunately it is complicated and time-consuming, and adds to the risks of technical fault in that it is necessary to watch two needle-points instead of one. We therefore prefer the simpler methods as described above.

Summary and Conclusions

Radiological demonstration of the portal tree is a valuable method of investigation. It can be achieved by the injection of contrast medium into one or other, or both, of the two main radicles of the system: into the spleen to delineate the flow of splenic blood, which may be partially or completely diverted from the portal vein; or into a jejunal vein to delineate the flow of mesenteric blood to the portal vein itself. The former may be carried out pre-operatively, the latter must be done at operation. It is often essential to perform both before a composite and complete picture of the portal blood flow can be obtained. The laminar flow of blood in such veins may also give rise to deceptive appearances which should be guarded against by using both methods.

REFERENCES

- Abealcí, S., and Campí, L. (1951). *Acta radiol. (Stockh.)*, **36**, 383.
Atkinson M., Barnett, E., Sherlock, S., and Steiner, R. E. (1955). *Quart. J. Med.*, **24**, 77.
Blakemore, A. H., and Lord, J. W., Jun. (1945). *Ann. Surg.*, **122**, 476.
Cooper, D. R., Brown, R. C., Stone, C. H. (III), and Ferguson, L. K. (1953). *Ibid.*, **138**, 82.
De Sousa-Pereira, A., Adriaño, M. M., and Rodrigues, J. L. (1949). *Portugal méd.*, **33**, 1.
Dreyer, B., and Budtz-Olsen, O. E. (1952). *Lancet*, **1**, 530.
Du Boulay, G. H., and Green, B. (1954). *Brit. J. Radiol.*, **27**, 423.
Gvozdanovic, V., Hauptmann, E., Najman, E., and Oberholzer, B. (1953). *Acta radiol. (Stockh.)*, **40**, 17.
Helps, E. P. W., and McDonald, D. A. (1954). *J. Physiol. (Lond.)*, **124**, 631.
Hunt, A. H. (1954). In "L'Hypertension portale, Le Dumping Syndrome" (Fourth Congress of Gastro-enterology), **1**, 27. Masson, Paris.
— (1956). *Med. ill. (Lond.)*, **10**, 89.
—, Lawrence, K., and Whiteley, M. (1956). *Lancet*, **1**, 881.
Kemp Harper, R. A. (1955). *Amer. J. Roentgenol.*, **73**, 755.
Leger, L. (1955). *Splénoportographie*. Masson, Paris.
McIndoe A. H., and Counseller, V. S. (1927). *Arch. Surg. (Chicago)*, **15**, 589.
Reynolds, T. B., Mikkelsen, W., and Redeker, A. G. (1955). *J. Amer. med. Ass.*, **158**, 478.
Rousselot, L. M. (1953). *Ann. Surg.*, **138**, 591.
Santý, P., and Marion, P. (1951). *Presse méd.*, **59**, 221.
Walker, R. M., Middlemiss, J. H., and Nanson, E. M. (1953). *Brit. J. Surg.*, **40**, 392.

MITRAL REGURGITATION WITH MOBILE VALVE CUSPS

BY

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[WITH SPECIAL PLATE]

The essential pathological difference between mitral regurgitation and stenosis as gauged by the gloved finger at operation lies in the damage done to the cusps by the inflammatory process. In pure stenosis, though the free edges of the valve have fused except for an area of about 1 cm. in the middle (Brock, 1952), the cusps are soft, pliable, and mobile, so that they can come into apposition above the aperture during ventricular systole (Fig. 1). In regurgitation, on the other hand,

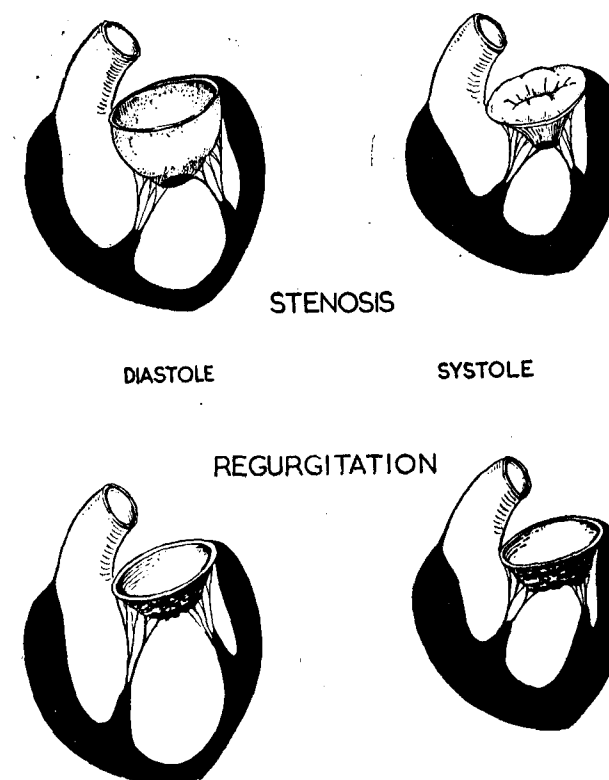


FIG. 1.—Diagrammatic representation of movements of mitral valve in mitral stenosis and regurgitation. Note that the aperture remains open in each case, closure of the valve taking place above the aperture in stenosis. Very little movement of the cusps takes place in regurgitation, the cusps being converted into a shallow rigid cone with a central aperture.

the cusps are so damaged by rheumatic endocarditis that the resultant rigidity and contracture, with or without calcification, holds the orifice in a gaping position and prevents apposition of the supravulvar area (Fig. 1).

The rigidity of the cusps, together with the gaping orifice, may reasonably be taken to account for the classical heart sounds of mitral regurgitation. The soft quality of the first sound is due to the lack of movement of the cusps in ventricular systole, and the pronounced systolic murmur to the retrograde flow through the gaping orifice, which is often irregular because of calcification. Conversely, the classical heart sounds of mitral stenosis may be attributed to cusp mobility, the loud, abrupt quality of the first sound being due to vigorous propulsion of the cusp, particularly the anterior cusp,

into the atrium by the thrust of ventricular systole (Sellors *et al.*, 1953). From the experiment of palpating the movement of the anterior cusp in cases of pure stenosis while at the same time carrying out direct auscultation with a sterile stethoscope placed over the atrio-ventricular ring I find that the loud ringing first sound coincides exactly in time with the vigorous "ballooning" of the anterior cusp. However, there must clearly be another element responsible for the loud first sound of mitral stenosis, since the most mobile cusps of all are those of the normal heart, and the apical first sound of the latter is less loud than that of mitral stenosis. Wood (1954) suggests that the additional element in stenosis is the pressure gradient across the valve in diastole. This "balloons" the cusps deeply into the ventricle right up to the moment when that chamber contracts. In the normal heart, however, the left ventricle fills quickly, so that towards the end of diastole the mitral cusps tend to float into apposition, and therefore shut more quietly when the ventricle contracts. In other words, the cusps in pure stenosis move from ventricle into atrium in a more explosive fashion than do the normal cusps.

A consideration of these facts points to the conclusion that cusp mobility rather than valve closure is the cause of the characteristic first heart sound in mitral stenosis and that aperture size is only indirectly concerned.

Three cases are now presented which are exceptions to the general rule. In each instance quite gross mitral regurgitation was detected at operation although the valve cusps were soft and mobile. In each case a confident pre-operative diagnosis of pure stenosis was made because of the loud, abrupt first heart sound and the diastolic murmur.

Case 1

A married woman aged 30 years presented with increasing dyspnoea for six or seven years. She had a child at 27 years, and during the pregnancy had been very distressed. A spontaneous delivery occurred, but she had a severe attack of pulmonary oedema on the third post-natal day. She recovered a good deal for six months, but increasing dyspnoea with attacks of nocturnal dyspnoea necessitated admission to hospital. Her exercise tolerance was as follows: walking on the level, 25 yards (22.86 m.); upstairs, 4 steps; no hills; very light housework; no shopping. Pulse, 100 per minute, regular in time and force. Blood pressure, 110/75 mm. Hg. Lungs: widespread crepitations at both bases. Heart: apex beat in 5th interspace in mid-clavicular line; impulse diffuse; no thrill. Heart sounds, mitral area: first sound clear-cut; mid-diastolic murmur with presystolic accentuation; faint systolic bruit not conducted. Radiological examination (Special Plate, A) showed the heart to be enlarged in its general size, but no definite increase in vascular markings in the lung fields. The left atrium was enlarged, the aorta of normal type. A pre-operative diagnosis of pure mitral stenosis was made.

At operation the following findings were noted. A forceful regurgitant jet was palpable coming through the mitral valve. The aperture itself was quite large, measuring 2 cm. in its transverse axis. There was very little induration of either commissure and the anterior cusp was mobile. With a sterile stethoscope placed on the atrioventricular region the same findings were noted as in the ward—namely, a loud, abrupt first sound and a low, rumbling diastolic murmur with presystolic crescendo. The soft systolic murmur noted pre-operatively was not audible at operation. A note to the cardiologist concerned contained the following comment: "The anterior cusp, though shortened, was still mobile, and this was the reason we were led astray. It could be felt to 'flap' with each ventricular systole marking the typical loud first sound."

The functional result in this case has been poor. After initial improvement dyspnoea again became severe, and the patient has recently been admitted to hospital in congestive failure during a pregnancy.

Case 2

A married woman aged 32 complained of increasing breathlessness over five years. On admission her exercise tolerance was: walking on the flat, 100 yards (91.44 m.) slowly; stairs, one flight slowly; light housework. Sleeps with three pillows. An attack of pulmonary oedema with haemoptysis precipitated her admission to hospital. Pulse, 85 per minute. Blood pressure, 130/80 mm. Hg. No cyanosis or venous distension. Lungs clear. Heart: regular rhythm; apex beat in 5th interspace inside mid-clavicular line; no heave. Mitral area: presystolic-diastolic murmur; first sound abrupt and loud; soft systolic bruit not conducted. Radiography of heart (Special Plate, B) showed mitral configuration and marked enlargement of left atrium.

At operation a considerable degree of regurgitation was found to be present. The valve was also stenosed, the aperture measuring about 1 cm. and being ovoid. The anterior cusp was quite mobile, but was apparently unable to occlude the orifice. After splitting the commissures a finger was passed into the ventricle and the area of the chordae tendineae explored. The impression was gained that the free edges of the cusps were tacked down to the ventricular wall and thus prevented from closing.

The functional result in this case has been better. The patient has returned to work in a factory and has walked four miles (6.4 km.) on the flat.

Case 3

This patient, a married woman aged 37 years, complained of fatigue and dyspnoea for a period of six years. She had had one severe attack of nocturnal paroxysmal dyspnoea for which she was admitted to hospital in 1949. On the present admission her exercise tolerance was: walking on flat, one mile (1.6 km.); walking up hills, very breathless. Sleeps with one or two pillows. Pulse, 78 per minute, fibrillating. Blood pressure, 160/90 mm. Hg. Lung fields normal. Heart: apex beat in 5th interspace 4½ in. (11.5 cm.) from midline. Mitral area: diastolic murmur of low intensity; loud ringing first sound terminating in harsh systolic murmur conducted to axilla. Radiological findings are shown at C on the Special Plate.

At operation the mitral orifice was found to be gaping wide open, measuring 2 cm. by 1 cm., and there was free reflux of blood during ventricular systole. The anterior cusp was freely mobile, and it was difficult to be sure of the cause of the regurgitation. It was considered possible that the chordae tendineae attached to the anterior cusp were so shortened that, although the cusp was not itself contracted, it was restrained from coapting with the posterior cusp.

In this case the result has been indifferent. The patient's exercise tolerance has increased somewhat, but she still has precordial compression and a good deal of bronchitis.

Discussion

These three cases demonstrate exceptions to the rule that mitral regurgitation is due to rigid and contracted valve cusps, and that mobile cusps enable the valve to close adequately. They have proved to be the only exception to this rule in a series of 183 valves palpated at operation. In each case a fairly confident diagnosis of pure stenosis was made pre-operatively, because of the loud ringing first sound at the mitral area.

The cause of regurgitation in these cases is uncertain. Belcher (1956) described four similar cases, and suggested that spontaneous rupture of a chorda tendinea was responsible for the regurgitation. However, it was my own impres-

sion on palpating the subvalvular area in the ventricle in these cases that shortening rather than elongation of the chordae had occurred and that "tacking down" of the free edges of the cusps to the papillary muscles was present. Thus the cause of regurgitation may be disproportionate damage to the chordae tendineae with lesser damage to the cusps. The excessive shortening of the chordae would lead to fixation of the free margins of the valve and prevent apposition, but it would not interfere with the sudden "ballooning" of the anterior cusps into the atrium during ventricular systole (Fig. 2).

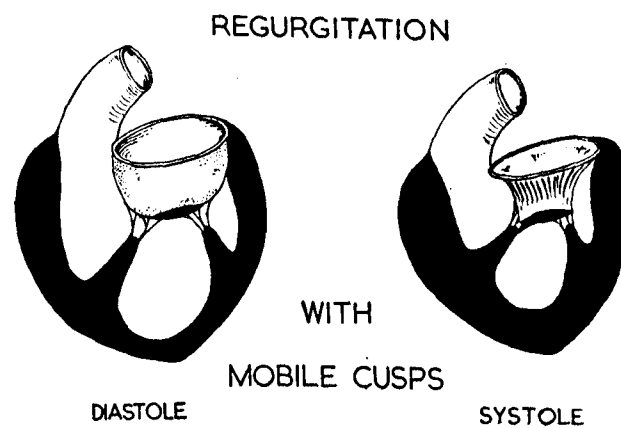


Fig. 2.—Diagrammatic representation of movements of the valve cusps in the three cases of regurgitation with mobile cusps. Note that disproportionate shortening of the chordae tendineae prevents apposition above the aperture and so allows of regurgitation.

The findings in these three cases raise the question of the cause of the typical heart sounds of mitral stenosis. There is no dispute about the apical diastolic murmurs, but the abrupt quality of the first sound has been taken to be due to violent closure of the valve at the beginning of ventricular systole. The findings here would suggest that it would be more accurate to attribute it to the cusp movement than the valve closure.

As a corollary, it may well be that the opening snap (Rouchès, 1888; Mounsey, 1953) has a similar basis and that it indicates cusp mobility rather than opening of the aperture. Of course, in the majority of cases the two are the same, and from a clinical viewpoint the distinction is academic.

Summary

Three cases are reported in which mitral regurgitation was detected at operation though both valve cusps were soft and mobile. In each case the cusps appeared to be prevented from coming into apposition by disproportionate shortening of the chordae tendineae, and in each case the loud, abrupt first mitral sound characteristic of pure stenosis was present and a pre-operative diagnosis of pure stenosis had been made.

This evidence supports the view that the loud mitral first sound in mitral stenosis is not due to valve closure, but to cusp, and particularly anterior cusp, movement. The opening snap may have the same basis.

I am grateful to Professor I. G. W. Hill, Department of Medicine, University of St. Andrews, for referring these patients for valvotomy.

REFERENCES

- Belcher, J. R. (1956). *Lancet* 2, 7.
- Brock, R. C. (1952). *Brit. Heart J.*, 14, 489.
- Mounsey, P. (1953). *Ibid.*, 15, 135.
- Rouchès, F. J. M. (1888). *Thèse de Paris*, No. 329.
- Sellors, T. H., Bedford, D. E., and Somerville, W. (1953). *British Medical Journal*, 2, 1059.
- Wood, P. (1954). *Ibid.*, 1, 1051.

LYMPHANGIOSARCOMA FOLLOWING POST-MASTECTOMY LYMPHOEDEMA

BY

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[WITH SPECIAL PLATE]

Oedema of the arm has always been regarded as one of the most troublesome complications of radical mastectomy. It is not generally realized, however, that it can, if long continued, be complicated by the development of a lymphangiosarcoma, which has proved rapidly fatal in almost every case observed.

Lymphangiosarcoma occurring in a lymphoedematous arm was first described in 1948 by Stewart and Treves. These authors reported six cases, and since then single case reports have brought the total to not more than 20. Nevertheless, it is considered that this rarity is more apparent than real, and that many of these tumours go unrecognized or are misdiagnosed as recurrences of mammary carcinoma.

Onset and Course

The tumour has a characteristic appearance and develops in the skin of an arm affected by long-standing oedema. Awareness of the condition, the patient's history, and the physical findings enable one to make a firm clinical diagnosis. In all case reports there is a history of carcinoma of the breast which has been treated by radical mastectomy. Some patients have had in addition a course of deep x-ray therapy. All have developed a persistent oedema of the arm soon after treatment. The shortest interval between the onset of oedema and the appearance of the tumour has been five years, the longest 24 years.

The first sign of the disease is the appearance of a dark reddish-purple nodule usually in the skin of the upper arm, though occasionally of the forearm. As this enlarges, other nodules arise around it with a tendency to centrifugal spread. Many of them fuse so that a patchy discoloration develops. The affected areas feel thickened, rubbery, and may be tender. Ulceration sometimes occurs, and the larger lesions may become cystic. On section of the tumour the discoloration is shown to be confined to the surface. The nodules lead to great thickening of the skin, and some of them may show areas of haemorrhage, necrosis, or cyst formation. Growth extends into the subcutaneous tissue and later involves the deep veins. Ultimately distant metastases, usually pulmonary, bring about the patient's death.

Histology

The histological appearance varies, so that many stages in the malignant process may be observed in the one section. The dominant pattern is a proliferation of lymphatic vessels, some lined with apparently normal cells, others with definitely neoplastic cells. In parts are seen circumscribed masses of undifferentiated cells. The changes are most marked in the corium and subcutaneous tissue, and the tendency is for the process to spread by involving the larger lymphatics accompanying the veins. Actual invasion of the veins is common and accounts for the frequency of embolic pulmonary metastases.

Relationship with Oedema

The nature of the relationship between the prolonged oedema and aetiology of the tumour is discussed by Stewart and Treves (1948), who postulate a circulating carcinogen

capable of acting on tissues already modified by a pathological process. It is of interest to note that one of their patients who had undergone left radical mastectomy for carcinoma of the breast subsequently had a similar operation performed on the right side for a benign lesion, with development of lymphoedema and later lymphangiosarcoma on the right side. McCarthy and Pack (1950) draw attention to the similarity in gross and histological appearance between lymphangiosarcoma and Kaposi's disease, which is a sarcoma arising from blood vessels usually in the lower limbs and having a racial predilection for Jews and Italians.

Treatment

In treatment both surgery and irradiation have been employed. Neither has met with conspicuous success. Clearly the case reports are too few to allow of any definite conclusions about the merits of a particular method of treatment. General opinion favours early radical surgery, preferably interscapulo-thoracic amputation. However, the sole reported five-year survival was treated with deep x-ray therapy only, and it would seem that this method should be given priority unless the oedema is already the cause of extreme disability (Southwick and Slaughter, 1955). The best result with surgery has been achieved by McCarthy and Pack (quoted by Marshall, 1955), with a survival of three years and five months following interscapulo-thoracic amputation. In most other cases, treated with either irradiation or surgery, or both, death has occurred within twelve months.

Case Report

In November, 1946, at the age of 63, a woman had had a radical mastectomy for carcinoma situated in the upper outer quadrant of the right breast. Microscopically the tumour had the structure of carcinoma simplex, and no metastases were found in the lymph nodes. The wound was slow to heal and required skin-grafting. On February 25, 1947, a course of deep x-ray therapy to the right supra-clavicular and axillary areas was begun, and very soon thereafter the whole of the right arm became moderately oedematous. The oedema persisted with little change until about July, 1955, when it became more marked coincident with the appearance of a reddish-purple nodule in the skin of the antero-medial aspect of the right upper arm. The nodule gradually increased in size and others developed in satellite fashion, the more centrally situated of these becoming confluent.



Clinical photograph showing the gross appearance of lymphangiosarcoma

On January 22, 1956, the patient was admitted to hospital with a provisional diagnosis of recurrent mammary carcinoma. Examination revealed oedema of the right arm extending to the hand, and marked scarring and telangiectasis of the right pectoral region and axilla, the result of deep x-ray therapy. On the antero-medial aspect of the right arm was a patchy discoloration affecting an area 7 by 5 cm. and made up of multiple dark nodules slightly elevated above skin level and varying in size (see photograph). Ulceration had not occurred and there was no tenderness. There was no clinical or x-ray evidence of metastases elsewhere. Being made aware of the possibility of lymphangiosarcoma presenting in this way by Dr. George Pack, of New York, who was visiting the hospital at the time, we were able to make a pre-operative diagnosis which was confirmed by biopsy.

From previous reports of this condition then available to us it seemed that radical surgery offered the best chance of survival. Interscapulo-thoracic amputation was therefore advised, but the patient would not agree to this. Local excision was performed on February 7, 1956, an oval of skin 15 by 9 cm. being removed together with the underlying fat and deep fascia. Closure of the wound was effected with the aid of a split skin graft, and healing proceeded satisfactorily.

Further examination of the excised tissue revealed that the skin was three to four times the normal thickness and that the discoloration was confined to the surface. Microscopical study showed that the thickening of the skin was due to an increase in the width of the corium. In this, and to a less extent in the upper subcutaneous tissue, neoplastic cells were scattered either singly or in groups of a few cells (Special Plate, Fig. 1), but sometimes as small masses (Plate, Fig. 2). Frequently these cells were lining spaces and channels. Some of the channels, especially those in close proximity to blood vessels, gave the impression that the lining of pre-existing lymphatics had become neoplastic; in other places they occurred as a seemingly purposeless network of vessels. Both the growth pattern and appearance of the cells were quite different from those of the original carcinoma of the breast, and were consistent with a diagnosis of lymphangiosarcoma occurring in post-mastectomy lymphoedema of the arm.

On April 1 the patient was readmitted with further nodules appearing at the lateral margin of the graft. Amputation was reconsidered, but again the patient was not agreeable. Accordingly a course of deep x-ray therapy was started, the final treatment being given on July 5. This led to a marked regression in the growth of the local recurrence, but, unfortunately, when the patient was last seen on July 9 nodules were detected in the area of old post-irradiation scarring in the right axilla. It was generally felt that this development must destroy any hope of controlling the tumour with irradiation. Nevertheless an attempt will be made to treat these metastases, there being at present no evidence of more distant spread.

Comment

The history and findings in this case are in accord with those previously described as occurring in lymphangiosarcoma following post-mastectomy lymphoedema. The natural history of this disease distinguishes it from other varieties of angiosarcomata. Of special interest is its association with lymphoedema in a patient who has previously been treated for carcinoma of the breast, though the nature of this relationship is obscure.

The risk of such a tumour developing is greatest in those who have survived radical mastectomy by at least five years and who may thus be regarded as having a very good chance of cure of their mammary carcinoma. The frequency of lymphangiosarcoma in this group is unknown, but its recognition as a possible fatal complication emphasizes the importance of the prevention and treatment of the swollen arm.

Summary

Lymphangiosarcoma has recently been recognized as a complication of post-mastectomy lymphoedema. Unless there is awareness of the condition it is likely to be confused with recurrent carcinoma of the breast. The characteristic features of the tumour are described and illustrated by a case report. It is hoped that appreciation of this new hazard to those who have survived a mammary carcinoma will stimulate further studies in the prevention and treatment of post-mastectomy lymphoedema.

I am indebted to Mr. Eric Langley for permission to publish this case. I wish to thank Dr. Colin Graham, who reported on the sections, and Dr. P. Corlette, of Sydney Hospital, who supervised the patient's radiotherapy.

REFERENCES

- Marshall, J. F. (1955). *Ann. Surg.*, 142, 871.
McCarthy, W. D., and Pack, G. T. (1950). *Surg. Gynec. Obstet.*, 91, 465.
Southwick, H. W., and Slaughter, D. P. (1955). *Cancer*, 8, 158.
Stewart, F. W., and Treves, N. (1948). *Ibid.*, 1, 64.

NATURAL HISTORY OF OBSESSIONAL STATES

A STUDY OF 150 CASES

BY

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The literature on obsessional states is mainly concerned with psychopathology and treatment by psychotherapy. Curran (1952) drew attention to an ignorance of the "natural history" of these illnesses. After pointing out that with increasing age a decreasing number of these patients were, in his experience, referred for a psychiatric opinion, he continues: "What happens to severe obsessional states as they get older? I have asked a number of experienced psychiatrists, and after humming and hawing they have, in the end, come clean and confessed that they did not know."

It has been possible to find only three follow-up studies based upon reasonably extensive material—namely, those carried out by Lewis (1936), Müller (1953), and Rüdin (1953). Rüdin has contributed a study of 130 cases, referring to the natural history, but places particular emphasis on the hereditary relationships of the illness. Lewis and Müller reported the progress of 50 and 57 patients respectively after discharge from hospital. These writings constitute the only follow-up studies based on reasonably large series of cases, and reports on the obsessional state from its onset have not been found.

Further, the information available in current textbooks on the course of obsessional states is often meagre and a striking pessimism may be noted. For example, Cecil and Loeb (1955) limit their observations on the outcome of the obsessional states to the sentence: "The prognosis of the obsessional state is poor." The present study is an attempt to provide fuller information on the natural history of the obsessional illness as a whole.

Lewis (1936) has emphasized that the essential element of an obsessional symptom is the sufferer's wish to resist the feeling of compulsion. In the present inquiry an obsessional symptom has been regarded as a recurrent or persistent idea, thought, image, feeling, impulse, or movement, which is accompanied by a sense of subjective compulsion and a desire to resist it; the event being recognized by the individual as foreign to the personality and into the abnormality of which he has insight. An obsessional state or illness is taken as one in which such defined symptoms are the dominant feature of the case.

In this study two main groups, often labelled "obsessional," were excluded. The first group consisted of patients with obsessional personality traits (the "anancastic personalities" as they are sometimes called) who developed a reaction other than that of obsessional illness, most commonly, perhaps, an anxiety state. The second group were cases in which obsessional symptoms occurred in the course of another mental illness, such as depression or schizophrenia. The differential diagnosis between obsessional illness proper and depression with obsessional features is often difficult. In this study doubtful cases were excluded, as were all cases in which the illness responded to E.C.T.

Material and Methods

The material for study, thus selected, numbered 150 patients. Of these, 69 (18 males and 51 females) had been in-patients at the psychiatric unit of St. George's Hospital at the Atkinson Morley Hospital, Wimbledon, the preponderance of female patients being due to the larger number of beds that were available for females during the relevant period. The remaining 81 patients (45 male, 36 female) had been seen and diagnosed by Dr. Desmond Curran in private practice as "out-patients." These "out-patients" had, on the whole, milder illnesses than the in-patients. Most of the severely sick out-patients seen were sent into hospital and were included in the hospital group.

It may be held that the inclusion of both out-patients and in-patients in this study helps to form a representative sample of these obsessional illnesses, but, since many of the hospital patients were admitted to the Atkinson Morley Hospital for leucotomy by Mr. Wylie McKissock, the bias here is probably in favour of severely ill patients. As is shown below, very few cases of obsessional state are admitted to or resident in mental hospitals.

Information was collected from case records, from reports kindly sent by other psychiatrists, and from data provided by psychiatric social workers; when possible, patients were interviewed personally. A questionnaire was designed for the follow-up. After modification in the light of a pilot run, this was sent to all patients. The obvious objection to any follow-up by means of a questionnaire is less valid when this was sent to all patients. The obvious objection to any follow-up by means of a questionnaire is less valid when considering obsessional illnesses rather than any other diagnostic category; most of the forms were filled in accurately and were found to be reliable in almost all cases in which an objective check-up was available from other sources. It seems a reasonable assumption that reliable information was provided in those cases in which an objective check-up was not available; but, in order to avoid a possibly optimistic bias, in no instance was a favourable outcome assumed solely on the basis of the patient's reply to the questionnaire.

Age of Onset of First Symptoms

Fig. 1 shows the distribution of 141 patients according to the age at which they experienced obsessional symptoms for the first time. Owing to the episodic course of the illness, the age when the first symptoms were shown must be distinguished from the age of onset of the present illness, and this age must be distinguished from the age at which the patients sought help. In 68 patients who had had no

previous attacks the first symptoms formed the present illness. The majority of patients (68%) experienced their first symptoms before the age of 25 years, and only four after the age of 45. As age increased, fewer and fewer had their first symptoms. The mean age when first symptoms developed was 21.58 years in females (standard deviation 14.46 years, standard error 1.63) and 20.16 years in males (standard deviation 11.09 years, standard error 1.41).

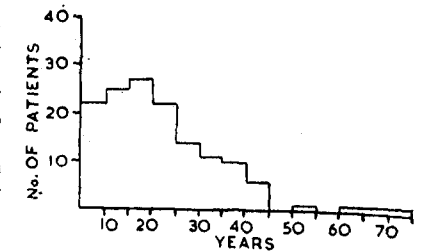


FIG. 1.—Age range in which first symptoms began.

Previous Attacks

Frequently the patient's history revealed that attacks of obsessional symptoms had occurred before the present illness, each attack ending in recovery. Of the 150 patients considered, 100 had reported previous episodes of obsessional symptoms and 82 of the latter had been sufficiently ill at the time to seek medical advice. The total number of attacks experienced by the 82 patients was 162, the approximate mean number of attacks being 2; the extremes of the range were 1 and 10 attacks (mean 1.98 attacks, standard deviation 1.56 attacks, standard error 0.17). Fig. 2 shows the numbers of patients who had one or more attacks in each age range. Ignoring the number of patients that experienced them, 28% of the previous attacks occurred between the ages of 11 and 15, 23% between 16 and 20, and 17% between 21 and 25, the peak being from 11 to 15 years of age, with its developmental associations of puberty. In general, the previous attacks were in childhood, adolescence, or early adult life rather than later.

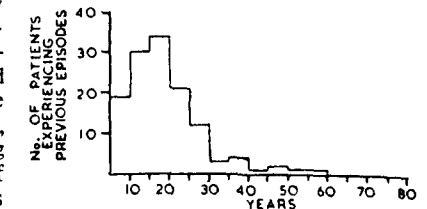


FIG. 2.—Age range in which previous episodes occurred.

Duration and Frequency of Attacks

The approximate duration of the previous episodes and the number that occurred in each patient were determined, and the results recorded to show distribution (Tables I and II).

TABLE I.—Duration of Episodes

Approximate Duration	No. of Episodes Before Present Illness Began
Months	
0-3	44
3-6	30
6-12	54
Years	
0-1	128
1-2	9
2-3	8
3-4	6
4-5	4
5-6	2
6-7	1
7-8	1
8-9	1
9-10	0
10-20	2
	162

TABLE II

No. of Episodes	No. of Patients	No. of Episodes	No. of Patients
1	44	6	2
2	18	7	1
3	12	8	0
4	3	9	0
5	1	10	1

II). It is seen from these tables that 79% of the previous episodes lasted less than a year, and that in 88% of the 82 patients one to three attacks of symptoms occurred before the present illness. Mean duration of an episode is 1.09 years, standard deviation 2.1 years, standard error 0.17.

No simple relationship was found between the total duration of previous episodes a patient had suffered and his prognosis. No correlation was found between the number of previous episodes and the type of obsessional symptoms present, such as motor, sensory, etc.

Age of Onset of Present Illness

The present illness is regarded as the unremitting train of obsessional symptoms for which the patient sought advice at St. George's or privately. Fig. 3 shows the frequency distribution of patients according to their age when the present illness began. In 68 patients who had had no previous attacks this was also the age of onset of first symptoms. Half the total number of patients began their illness in late adolescence or early adult life, between the ages of 16 and 30 years, and only 7.3% began their illness after the age of 45 years. Mean age of onset of the present illness was 28.4 years, standard deviation 13.7 years, standard error 1.1. The relative expectation of developing an obsessional illness is shown in Table III.

FIG. 3.—Age range in which present illness began.

At 20 years, 25% of the danger is past
" 30 " 65% " " " " "
" 40 " 85% " " " " "
" 50 " 91% " " " " "
" 60 " 94% " " " " "
" 70 " 97% " " " " "

TABLE III

At 20 years, 25% of the danger is past	
" 30 " 65% " " " " "	
" 40 " 85% " " " " "	
" 50 " 91% " " " " "	
" 60 " 94% " " " " "	
" 70 " 97% " " " " "	

Disablement

The age at which the patient was incapacitated by his illness is known in 121 cases. The criterion used was inability to carry out accustomed work or social duties which were a significant part of the patient's life. In the hospital series, if no other evidence was available, admission to hospital was taken as the time when the patient was incapacitated. Fig. 4 shows the distribution of patients according to the age when they were incapacitated. Three-quarters of the 121 patients were incapacitated before the age of 40. Very few were disabled after 50 years of age. (Mean age of disablement 33.2 years, standard deviation 12.6 years, standard error 1.1.)

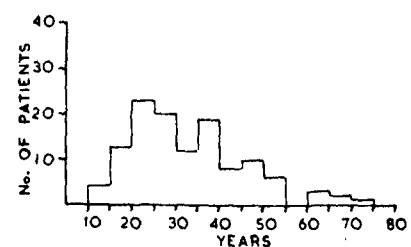


FIG. 4.—Age range in which incapacity occurred.

Table IV shows the distribution of patients according to the duration of their present illness before they were incapacitated. Approximately half the total number of patients became disabled within a year of the onset of the illness; the remainder were incapacitated only after a considerable number of years elapsed. (Mean duration of illness to incapacity 4.7 years, standard deviation 8.1 years, standard error 0.73.)

Precipitation of Obsessional Symptoms

The events leading to the onset of the present illness were known in 93 of the cases reviewed. These were the events considered significant by both patient and doctor and were

TABLE IV.—Approximate Duration of Illness Before Disablement in 121 Cases

Duration Months	No. of Patients
0-6	47
7-12	19
1-5	9
6-10	7
11-15	3
16-20	4
21-25	2
26-30	3
31-35	2
36-40	3
41-45	1
46-50	5
51-55	1
56-60	0
61-65	2
66-70	1
71-75	0
76-80	0
81-85	0
86-90	0
91-95	0
96-100	0

TABLE V.—Comparison Between Incidence of Precipitating Factors in 93 Obsessional Patients and 90 Non-obsessional Admissions

Factors	Obsessional Group	Non-obsessional Group
Sexual	28	3
Betrothal	8	13
Marital	7	13
Family difficulties	0	13
Death of near relative	14	2
Occupational	12	16
School	2	1
Physical	4	13
Childbirth	7	5
Pregnancy	3	4
Puberty	1	0
Menopause	0	0
Other causes	7	7
Total	93	90

elicited in the course of routine history-taking. Table V shows the incidence of precipitating factors in 93 obsessional patients and 90 non-obsessional admissions, the latter being selected at random from the patients admitted to the psychiatric unit at St. George's Hospital, and having an age distribution similar to that of the obsessional patients. The preponderance of sexual precipitating factors in the obsessional group is highly significant statistically.

Duration of Present Illness before Patient Attended for Advice

Table VI shows the distribution of patients according to their period of suffering in the present illness before they

TABLE VI.—Approximate Duration of Illness Until First Seen in 150 Cases

Duration Months	No. of Patients
0-6	15
7-12	32
1-5	25
6-10	12
11-15	8
16-20	2
21-25	4
26-30	1
31-35	4
36-40	6
41-45	4
46-50	10
51-55	10
56-60	13
61-65	2
66-70	2
71-75	0

were seen for the first time, privately or at St. George's. Approximately half the total number of patients were seen within two years of the onset of the illness. Almost a quarter were seen after ten years of suffering. (Mean period between onset of illness and attending for advice 7.5 years, standard deviation 9.3 years, standard error 0.77.)

Patient's Progress

It was not possible to follow up all the patients of the series owing to the fact that a number had been seen only for an initial interview and some of these failed to return the questionnaire. In the following quantitative assessment of the patient's progress, the number of cases included in each particular aspect of the study is given.

Fig. 5 shows the distribution of patients according to the period of follow-up (101 patients). The length of follow-up is variable; the range was 3 months to 15 years, and the mean follow-up period was 3.44 years; standard deviation 2.70 years, standard error of the mean 0.27.

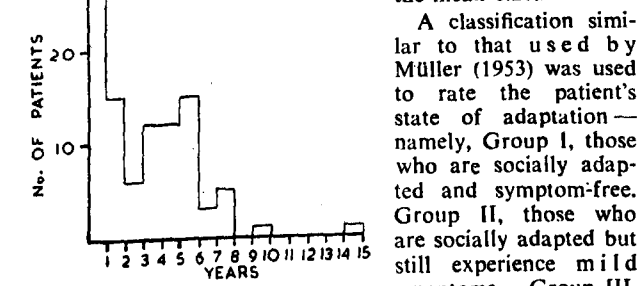


FIG. 5.—Duration of follow-up period.

whose symptoms have improved. Group II, those whose symptoms are worse or as severe and incapacitating as when they were first seen. Group III, those whose obsessional symptoms have been replaced by other phenomena.

Table VII shows the number of patients in each of the above categories at the termination of their follow-up period

TABLE VII

	I	II	III	IV	V	Dead	Suicide	Total
Non-leucotomized	16	24	8	17	1	0	0	67
Leucotomized	15	6	7	5	0	1	1	34
Total	31	30	15	22	1	1	1	101

(101 patients). Sixty-one of the patients followed up reached a state of social adaptation, 31 of them becoming free of symptoms. Fewer than a quarter showed no improvement and were worse.

To define more clearly the progress of patients after a definite period of follow-up, Table VIII shows the patients categorized according to their state after one or more years

TABLE VIII

	I	II	III	IV	V	Total
Progress after 1 Year or More						
Non-leucotomized	19	18	6	9	1	53
Leucotomized	12	6	7	4	0	29
Total	31	24	13	13	1	82
Progress after 4 Years or More						
Non-leucotomized	12	9	3	5	1	30
Leucotomized	4	4	4	3	0	15
Total	16	13	7	8	1	45

and four or more years of follow-up. Although after four years the sample of patients is much smaller, 21 of the 30 non-leucotomized patients had become socially adapted and 12 of these 21 were free of symptoms. The high proportion of patients who did well even after four years of follow-up is noticeable.

Duration of Illness and Prognosis

In order to show the influence on prognosis of the duration of the present illness at the time of seeking advice at St. George's or privately, the mean duration of the illness was estimated for the group of patients in each follow-up category (Table IX).

TABLE IX.—Mean Duration of Illness in Years

	Category at End of Follow-up Period			
	I	II	III	IV
Non-leucotomized (65 cases)	3.0	6.1	6.8	8.1
Leucotomized (33 ")	10.0	15.0	11.1	18.6
Total (98 ")	6.2	7.9	8.8	10.5

A relationship exists between the duration of the illness before seeking advice and the prognosis. It is significant statistically ($P=0.05$) that in the non-leucotomized group those who became symptom-free had shorter illnesses before they were seen than those who showed no improvement. It would therefore seem that the longer they are ill before being seen the worse the outlook. The two categories compared in the non-leucotomized group had mean follow-up periods of 3.9 and 3.3 years respectively.

Recovery in Early Years.—Further evidence to support the finding of a good prognosis in patients with relatively short illnesses is obtained from estimation of the total duration of the illness in the 61 patients who became socially adapted (Table X). The majority of those who reached this state of improvement had endured symptoms for five years

TABLE X.—Duration of Illness and Number of Patients Reaching Social Adaptation

Duration	No.
0-2 years	21
2-5 " "	16
5-10 " "	11
10-20 " "	7
20-40 " "	6
Total	61

or less. As the duration of illness increases fewer patients with a good prognosis are found. Direct inquiry into the patient's mode of improvement reveals that the intensity of symptoms gradually lessens until they become unobtrusive or are present only when the individual is fatigued or anxious.

Mental Hospital Admissions.—Inquiries at two mental hospitals, with a total of 2,545 beds, revealed that only four of the patients were diagnosed as obsessional; they were voluntary patients, and two of them had been previously leucotomized. In the series of patients studied, only four are known to have become voluntary patients. It is an interesting fact that very few obsessionals end up in mental hospitals. If they do become mental hospital patients they rarely need to stay long.

Suicide.—Only one of the 101 patients followed up committed suicide. This was a female who developed an endogenous depression four years after leucotomy for a severe obsessional illness. This patient did not entertain fears of suicide during her obsessional illness. Only two other attempts at suicide were reported in the remainder of the patients.

Schizophrenia.—The only case falling into group V after follow-up was a female patient who later developed schizophrenia.

Discussion and Summary

Incidence

Many individuals have obsessional components in their personality. It is also not uncommon for psychiatric patients to show obsessional symptoms. Obsessional illnesses as defined here, however, are rare. The 150 patients studied (69 in-patients and 81 out-patients) formed respectively under 4% of the admissions to the psychiatric unit of St. George's Hospital and fewer than 2% of the patients seen

in private practice as out-patients. This low incidence indicates to some extent the degree of selection employed. Miller (1950) comments on the rarity of extreme degrees of obsessional illness.

Age of Onset

Owing to the episodic course, the age when the first symptoms were shown must be distinguished from the age when the first symptoms of the illness for which the patient sought help began.

In 68% of 141 patients studied, the first symptoms appeared between the ages of 6 and 25 years, the mean age being 21.58 years in females and 20.0 years in males. As age increased above 20, fewer and fewer patients developed symptoms for the first time; only four did so after the age of 45 (Fig. 1). After the age of 20 there is a decreasing risk with increasing age. Either increasing age protects against the start of obsessional symptoms or the population from which patients come must diminish with age at the same rate. The age of onset of the attack which brought the patient under observation at St. George's or privately was later, the greatest frequency being between the ages of 16 and 45 (Fig. 3). Greenacre (1923) confirms these findings and states that obsessive-compulsive disorders arise usually during the active, striving periods of life and only rarely in the later years.

Episodic Course

This has been commented on by a number of authors (Greenacre, 1923; Gordon, 1926; Bumke, 1929; Lewis, 1936; Ibor, 1952), but precise figures are lacking. In no less than half the patients studied the illness ran an episodic course, with an average of two previous attacks per patient before the attack which brought the patient under observation. A history of up to three attacks was obtained in 88% of the patients who had attacks, and a history of more than three was relatively uncommon, occurring in eight patients only. The majority of these episodes occurred in childhood, adolescence, or early adult life. They were frequently short-lived, 79% lasted a year or less.

Reactivity

Reactivity to environmental factors was striking; the attacks often seemed to be precipitated by stressful situations or events. Interestingly enough, overt sexual traumata were significantly more common than in a control group of the neuroses and psychoses. The reactivity of the illness to the environment was shown by many patients throughout; thus the symptoms became more severe and prominent when anxiety and tension increased from whatever cause or when the patient's resistance was lowered by debility or fatigue. A corresponding improvement could be observed when tension was reduced by environmental or other means. In milder cases, simple reassurance alone was sometimes followed by remarkable improvement. It was also interesting to observe that patients were often less troubled by symptoms when they had to face new external difficulties in their lives. The sensitivity to external stress often seemed highly specific.

Follow-up Results

An objection may justifiably be raised when the "natural history" of an illness is said to be studied in a series of patients, many of whom have had hospital in-patient care and most of whom have had treatment of some sort or another. This objection is valid if treatment is thought to influence the long-term course of the disease. Rüdin (1953), who followed up 130 patients, thought that in only nine cases did therapy contribute towards the apparent improvement in the illness. From the present series, the impression is gained that only leucotomy, in some cases, influenced the natural course of events. It is for this reason that the leucotomized patients have been considered separately in the follow-up study.

It proved possible to follow up 101 patients for a period of from 3 months to 15 years. Of the 82 patients followed for a year or more, 55—that is, 67%—had become either

free of symptoms or able to carry on a normal life. Excluding the leucotomized patients, 37 out of a total of 53 (70%) had demonstrated a similar degree of improvement or recovery.

After four or more years of follow-up, 29 out of 45 patients (64%) became either free of symptoms or able to carry on a normal life. Of the 30 non-leucotomized patients followed for this period, 21 showed this degree of improvement or recovery.

Lewis (1936) followed up 50 cases of obsessional neurosis for five or more years after treatment in hospital and found that approximately half did well. Müller (1953) found that out of a total of 57 obsessional cases followed up for 15 to 35 years 28 became symptom-free or socially adapted. Rüdin (1953) reports that 50 out of a total of 130 patients followed up for periods up to 20 years were either notably improved or apparently cured. In the light of this evidence, the obsessional state has a much better prognosis than is usually thought, and the view that it has an inevitable, gloomy outcome can no longer be held. The fact that few are admitted to mental hospitals, and that the number of patients attending for the first time falls off gradually after the age of 25 and rapidly after 40, provides indirect evidence of a favourable outcome.

When recovery took place it occurred far more commonly in the early years of the illness and much less frequently after many years had passed since the illness began. This observation, viewed with the recovery after a year or so from the previous episodes, suggests that the prognosis of the obsessional illness is related to the duration of symptoms in the present attack, the patient with a shorter period of suffering having a better prognosis than one who has been ill for many years. There is also a relationship between the prognosis and the time a patient has symptoms before seeking advice. Those who did not improve or were worse had been ill for longer periods than those who recovered.

Mode of Recovery.—With the possible exception of leucotomy, treatment was rarely followed by immediate, sustained recovery. The mode of recovery usually consisted in a gradual lessening of symptoms. The progress to recovery was seldom smooth, but was marked by a great deal of variability of symptoms during periods of anxiety and fatigue.

Development of Psychosis.—Only one patient is known to have developed schizophrenia in the present series; possibly the failure to follow up all the cases may account for this low incidence. Müller found that 10 out of 57 patients with obsessional neurosis developed schizophrenia later. Stengel (1945) has discussed and illustrated the transition of obsessional state to schizophrenia but does not indicate the frequency of this event.

It is hoped that this attempt to learn something more of the facts regarding obsessional illnesses is of more than academic interest. It is perhaps a small step towards providing a yardstick with which one may more easily compare the profound effects of modern treatments with the comparatively small influence on the disease of the more conservative methods.

I am grateful to Dr. Desmond Curran for generously allowing me the opportunity to conduct and complete this work. I thank Dr. E. Stengel for his criticism and help in translating the relevant literature. Dr. Eliot Slater and Dr. Fraser Roberts gave me their expert advice on the presentation of the figures. I am grateful to those, too numerous to mention individually, who have helped me in collecting data.

REFERENCES

- Bumke, O. (1929). *Lehrbuch der Geisteskrankheiten*. Quoted by A. Lewis, *J. ment. Sci.*, 1934, 80, 365.
Cecil, R. L., and Loeb, R. F. (Editors) (1955). *Textbook of Medicine*, 9th ed., p. 1661. Philadelphia.
Curran, D. (1952). *J. ment. Sci.*, 98, 378.
Gordon, A. (1926). *Amer. J. Psychiat.*, 5, 658.
Greenacre, P. (1923). *Ibid.*, 2, 527.
Ibor, J. L. (1952). *Proc. roy. Soc. Med.*, 45, 511.
Lewis, A. (1936). *Ibid.*, 29, 325.
Müller, E. (1950). *Ibid.*, 43, 1001.
Müller, C. (1953). *Nervenarzt*, 24, 112.
Rüdin, E. (1953). *Arch. Psychiat. Nervenkr.*, 191, 14.
Stengel, E. (1945). *J. ment. Sci.*, 91, 166.

THROMBOCYTOPENIA AND LEUCOPENIA FOLLOWING CARBUTAMIDE

BY

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In a recent paper Duncan, Baird, and Dunlop (1956) gave an account of their use of N-butyl-N'-sulphanilyl-urea (carbutamide; BZ 55) in the control of a selected group of diabetics. Among toxic effects they reported thrombocytopenic purpura in two patients and a symptomless thrombocytopenia in several others, while throughout the group many patients showed depression of platelet or white-cell counts. They did not provide details of the blood findings or of the investigations which were being undertaken, and it is the purpose of the present paper to give them in full.

Methods

Platelet Counts.—These were made by the method of Oettle and Spriggs (1951), using a diluting fluid containing 1.2 g. of cocaine hydrochloride and 0.08 g. of sodium chloride in 40 ml. of distilled water. Normal platelet counts by this method lie between 210,000 and 400,000 per c.mm., and are commonly around 300,000 per c.mm. Counts of under 200,000 per c.mm. are regarded as abnormally low.

Tests of Capillary Fragility.—A positive-pressure test was used, and is described here as "Hess's test," though this is not strictly correct. The sphygmomanometer cuff was inflated round the upper arm to a pressure of between 90 and 100 mm. Hg, and left at this pressure for five minutes. It is notoriously difficult to classify the degree of response to such tests, and methods which pretend to numerical accuracy are misleading. Where tabulation has been required, the simple descriptive method of Ackroyd (1949) has been used, and this is explained in the legend to Table 1.

Patch Testing.—A piece of white lint approximately 1 cm. square was soaked with a suspension of pure carbutamide in a saturated solution in propylene glycol, and applied under a larger square of "cellophane" for 48 hours.

Platelet Agglutinins.—Simple examinations were made for the agglutination or lysis of platelets by the methods recapitulated by Ackroyd (1953). Platelet-rich plasma was prepared from the blood of the patient under investigation, and this was examined for agglutination or lysis of the platelets in the presence of a small amount of pure carbutamide. The effect on clot retraction of adding carbutamide to the clotting blood was investigated.

Preliminary Considerations

Carbutamide is a sulphonamide, and might be expected to have toxic effects on the blood similar to those of the chemotherapeutic sulphonamides. So far, however, there have been few published notices of such effects. Kinsell *et al.* (1956) described severe leucopenia in one patient after heavy dosage, and Ridolfo and Kirtley (1956) and Walker *et al.* (1956) each report one case of neutropenia occurring during the more usual administration of the drug. German workers (Bertram *et al.*, 1955; Franke and Fuchs, 1955; Robbers and Speck, 1956) have stated that carbutamide

has no effect on the blood picture, but do not report what examinations were made. In the present study, toxic actions of carbutamide have proved to be similar to those described for other sulphonamides.

Two aspects of the investigation of bleeding disorders in the diabetic have required special consideration. First, capillary fragility may be altered in diabetes itself, so that tests of capillary resistance may have little diagnostic value and be misleading. Secondly, there is no very satisfactory information on platelet levels in "normal" diabetics, and control studies have therefore been necessary.

Leucopenia, Thrombocytopenia, and Purpura due to Sulphonamide

Agranulocytosis is a well-recognized occasional complication of sulphonamide therapy, and leucopenia is common in patients receiving heavy or prolonged dosage (Britton and Howkins, 1938).

Thrombocytopenic purpura is rare, but has been reported following the use of all the common sulphonamides: more than 30 cases are described. Kracke and Townsend (1943) and Hurd and Jacox (1943) have reviewed the literature, and Ackroyd (1953) gives later references. A case of non-thrombocytopenic purpura due to sulphapyridine has been described by Sherlock and White (1944).

Kracke and Townsend record platelet estimations made in a group of 61 patients receiving sulphathiazole or sulphadiazine for a variety of infections. No significant alteration in the platelet counts was found during the course of treatment, but there was an abrupt rise in the count on the day after sulphonamide was stopped, with a later fall to the previous level. In some of the younger patients the "rebound" count reached 700,000 per c.mm. The authors offer this as evidence of a toxic effect on the marrow, but it is as probable that it indicates destruction of circulating platelets with a compensating overproduction by the marrow.

Capillary Fragility and Thrombocytopenia in Diabetes Mellitus

Capillary fragility may be increased in diabetes, and Hess's test may become positive. Comparatively little attention has been paid to this aspect of diabetic vascular disease, but it is of obvious importance in the investigation of thrombocytopenia and bleeding disorders in such patients. Several papers deal with the subject, notably those of Beaser *et al.* (1944), Rodriguez and Root (1948), Barnes (1950), and Hines *et al.* (1953). There is general agreement that positive tests are common and that the incidence is related to the duration of the diabetes rather than to its severity or to the age of the patient. All authors stress that with accompanying hypertension capillary fragility is increased. An association with retinitis is close but not absolute, for Barnes found 15% of his patients with frank retinitis to have negative tests. From the figures given by these authors it would be reasonable to expect that about half the patients in the present trial would have positive tests.

It may be seen from Table II that, of the 22 patients in whom initial blood examinations were made, three had platelet counts of under 200,000 per c.mm. By the method used, these are abnormally low. Carbutamide had not been given when the counts were made, and it became of importance to find out whether low platelet counts were to be expected in some diabetics. The literature makes no reference to this aspect of the subject.

A control group of 50 patients was therefore examined. Platelet counts were made and Hess's tests carried out. Forty of the patients were middle-aged or elderly diabetics having small doses of insulin, comparable to the patients who formed the trial group. Ten were of similar ages and types of diabetes, but had never received insulin. The findings are given in Table I. It will be seen that of the 50 patients 9 had platelet counts of under 200,000, one count being as low as 135,000. Low counts were found both in patients receiving insulin and in those not receiving it. There was no relationship between a low

TABLE I.—Platelet Counts and Capillary Resistance in a Control Group of Diabetics

Case No.	Sex	Age	Duration of Diabetes (Years)	Blood Pressure (mm. Hg)	Usual Insulin Requirements	Platelets per c.mm.	W.B.C. per c.mm.	Hess's Test
1	F	77	3	180/90	—	170,000	9,000	+++
2	F	50	14	132/84	—	215,000	8,000	++
3	M	51	2	130/84	—	290,000	8,200	N
4	F	62	15	204/116	—	305,000	10,200	++
5	F	77	8	220/108	—	295,000	7,800	+++
6	F	68	20	190/94	—	195,000	5,800	+++
7	F	61	2	150/90	—	190,000	7,400	sl. +
8	F	54	14	170/90	—	300,000	8,000	N
9	F	63	1	150/92	—	240,000	5,800	N
10	M	85	3/12	190/104	—	305,000	7,000	N
11	M	74	10	160/98	28 Z.P.	210,000	5,800	N
12	F	74	4	190/102	18 Z.P.	180,000	13,000	sl. +
13	F	63	3	140/84	32 Z.P.	320,000	6,000	N
14	M	80	3/12	160/78	12 Z.P.	230,000	6,400	N
15	F	61	10	134/84	20 Z.P. 10 Sol.	270,000	5,000	N
16	M	53	9	130/80	24 Z.P. 20 Sol.	250,000	4,000	+
17	M	54	21	130/90	30 Z.P.	205,000	4,400	N
18	M	51	5	110/78	24 Z.P.	230,000	8,000	+
19	M	70	15	170/94	12 I.Z.S.	185,000	8,000	N
20	M	58	8	130/88	20 Z.P.	215,000	8,200	N
21	F	56	18	140/88	36 Z.P.	245,000	7,200	++
22	F	73	8	170/92	36 I.Z.S.	285,000	7,000	++
23	F	50	16	110/74	32 Z.P. 10 Sol.	205,000	7,200	N
24	F	38	18	134/76	26 Z.P. 12 Sol.	255,000	6,000	N
25	F	44	6	118/74	20 Z.P.	260,000	6,600	+
26	M	61	24	190/96	20 Z.P.	195,000	6,200	+
27	F	70	3	140/90	16 Z.P.	200,000	5,000	N
28	F	76	6/12	170/100	12 Z.P.	215,000	8,400	N
29	F	56	14	140/90	28 I.Z.S.	135,000	6,400	++
30	F	45	9	190/100	36 I.Z.S.	315,000	6,200	N
31	F	62	4/12	180/92	20 Z.P.	310,000	10,000	sl. +
32	F	57	2	144/88	28 I.Z.S.	310,000	6,200	N
33	F	55	18	150/90	24 Z.P.	210,000	10,200	+
34	F	68	9	170/92	24 I.Z.S.	230,000	4,200	++
35	M	70	8	160/94	32 I.Z.S.	305,000	8,600	N
36	M	43	5	130/76	24 Z.P.	320,000	11,000	N
37	F	50	7	164/96	40 I.Z.S.	180,000	5,200	++
38	F	54	2	190/110	12 I.Z.S.	260,000	4,800	N
39	F	50	1	150/90	40 I.Z.S.	290,000	8,800	++
40	F	42	17	140/78	28 I.Z.S.	315,000	7,000	++
41	F	53	4	168/108	36 I.Z.S.	260,000	5,800	sl. +
42	M	52	4	160/90	28 I.Z.S.	300,000	9,600	+
43	F	56	6	170/94	28 Z.P. 16 Sol.	350,000	4,100	++
44	F	42	16	170/70	36 I.Z.S.	195,000	7,400	++
45	F	42	1	118/72	18 I.Z.S.	275,000	9,000	N
46	F	39	1	120/76	24 I.Z.S.	245,000	8,000	N
47	F	72	4/12	190/90	24 Lente	260,000	6,100	++
48	F	50	7	140/84	32 Z.P. 10 Sol.	300,000	7,000	++
49	F	67	20	210/68	14 Lente	220,000	6,600	++
50	M	72	26	150/90	28 Z.P.	320,000	9,200	N

Response to Hess's test: N, indicates 0-10 petechiae in the antecubital fossa (normal). sl. +, indicates up to 50 petechiae in the antecubital fossa. +, indicates over 100 petechiae in the antecubital fossa and just below. ++, indicates numerous petechiae extending to junction of upper and middle thirds of forearm. +++, indicates very numerous petechiae extending right down forearm (after Ackroyd, 1949).

platelet count and the age of the patient, the white-cell count, or the response to Hess's test, but low counts were more common in patients who had had diabetes for some years.

Thirty-two patients had positive Hess's tests. The positive response in diabetes was found to differ from that in thrombocytopenic purpura. In the latter the petechiae are purple and rapidly coalesce to small blotches as the pressure is maintained, while in diabetes the petechiae are red and pin-point, remaining discrete even when the test is strongly positive. The mechanisms may perhaps differ, or it may be that in the diabetic platelets limit the haemorrhage. Five patients showed very strongly positive responses, and it is of interest that three of these were not receiving insulin.

Clinical Observations

The selection of the patients and the conduct of the trial have been described elsewhere (Duncan *et al.*, 1956). It is sufficient to say that the majority of the patients were middle-aged or elderly women with mild diabetes of some years' standing. Carbutamide was given in a dose of 1.5 g. per day for the first seven days, and thereafter control was maintained on 0.5-1.5 g. daily. Average blood sulphonamide levels are given in Table III.

The trial had been in progress for five months, and only mild side-effects of the drug had been noted, when one of the patients developed thrombocytopenic purpura. This patient had only recently joined the trial and had received 24.5 g. of carbutamide over three weeks: she had shown some signs of intolerance after two weeks. Her case is considered in detail below. From the first it was probable that the thrombocytopenia was due to carbutamide, and thorough haematological examinations were at once undertaken on all the other patients.

At this time 34 patients were receiving carbutamide. Six others, who had not responded satisfactorily, had had a full fortnight's trial, with blood examinations both before the drug was given and at the end of the fortnight. The other patients of the group had either never received carbutamide or had had it for only a very short time: they have been excluded from the present study.

The 40 patients fell into two groups. In the first, full blood examinations had been made both before starting treatment and at intervals afterwards. In the second, no blood examinations had been made. Although from this time examinations were made regularly on all patients, it has remained convenient to consider the two groups separately, since the information each yields is different. No important changes in the haemoglobin levels or the red blood cell count were found in any patients, and for clarity these observations have been omitted from the Tables and are ignored. Changes in the differential white-cell counts are considered below.

Group 1

The 22 patients of this group were included in the trial at its inception or very soon after. All had had full blood examinations (haemoglobin, red-cell count, white-cell count, platelet count, and differential white-cell count) both before the administration of carbutamide was begun and two weeks later. When satisfactory control of the diabetes was achieved (in 16 patients) a further examination was made one month later while treatment was continued.

From this group, therefore, direct information may be obtained of changes in the blood picture during carbutamide therapy. The findings are given in Table II. Weekly counts made after the first check count have been omitted, as significant changes occurred only in those patients whose cases are considered separately.

Many of the patients showed a substantial fall in the white-cell count soon after carbutamide therapy was instituted, though usually the count rose again as treatment was continued. In one patient (Case 6) the count remained very low, and did not rise until some time after treatment with carbutamide was stopped: this patient also developed purpura, and her case is given in detail below.

Several patients showed depression of the platelet count. This was not marked, and took some time to appear: only in one patient (Case 8) was there any significant change in the platelet levels when the examinations were made two weeks and six weeks after the start of carbutamide therapy. By the time check counts were being made, however, an appreciable fall was shown in Cases 3, 12, and 14, while in Case 8 the platelet count had a further fall to 90,000 c.mm. Except in this last case, the changes were not alarming.

There were two other important observations. One patient (Case 3), who had latterly shown a considerable fall in the platelet count, complained of severe vaginal bleeding and said that this had been present for several weeks. Another (Case 6), the patient who had developed leucopenia but whose originally low platelet count had not altered during carbutamide therapy, was found to have spontaneous purpura. These two patients and the third (Case 8), whose platelet count had declined steadily to thrombocytopenic levels, require brief separate consideration.

Case 3

This woman showed good control of her diabetes with low blood carbutamide levels. Nothing untoward occurred until she had been receiving carbutamide for 15 weeks, when she developed vaginal bleeding, which became severe and persistent. The check count made at this time showed that her platelet count had fallen from an original 320,000 to 180,000 per c.mm. Hess's test was strongly positive and the bleeding-time prolonged to 12 minutes. Treatment with carbutamide was stopped and gynaecological examination arranged. This showed no abnormality, but after dilatation and curettage the bleeding stopped. Three weeks later her platelet count had risen to 300,000 per c.mm., and Hess's test gave a barely positive response. It is probable that carbutamide caused a haemorrhagic tendency which precipitated the uterine haemorrhage, whatever the local cause.

Case 6

This woman has presented the most difficult problem of all. It will be seen that her platelet count was low before carbutamide was given, but that there was no further fall during treatment. The white-cell count, however, fell steadily until, by the time the first check count was made,

she had a leucopenia of 2,450. At this examination she was found to have a fine purpura. The petechiae were very small and spidery rather than punctate. It is probable that in other circumstances they would not have been noticed, and the patient herself was unaware of the rash. Her platelet count was 180,000, Hess's test was only slightly positive, and there was no change in the bleeding- or clotting-time.

She was admitted to hospital for observation, and during her stay the purpura faded and disappeared. Her platelet count remained unaltered, and the white count did not rise. The differential white count showed a marked neutropenia, but mature neutrophils were present. The marrow was very fatty, though there was a fair amount of haemopoietic tissue which showed an eosinophilia. Megakaryocytes were probably diminished in numbers. Myelocytes were plentiful, but took stain badly and showed a poverty of granulation.

The mechanism of the purpura was obscure. It seemed probable that it was related to the carbutamide therapy and was allergic in type, as she had previously had a skin reaction, for which treatment had been interrupted. In view of the very low white-cell count it was thought inadvisable to give her a test dose of the drug. One month after her discharge from hospital the white-cell count had returned to normal, the platelet count remaining at its previous level. The purpura had entirely disappeared.

Her story has been given at this length for a purpose. She had found great subjective benefit from carbutamide, and was anxious to continue on oral therapy. She was given tolbutamide (D 860), to which she responded well, as she had done to carbutamide. She attended regularly as an out-patient for blood examination, and showed no significant change until, one month after starting tolbutamide, she came up with very extensive purpura, far more marked than previously and causing frank blotches on her arms and chest. On this occasion her platelet count was lower at 115,000, but again Hess's test was only slightly positive, and the bleeding-time, clotting-time, and prothrombin activity were normal. She did not have leucopenia. The time sequence of these complications is important. It was one month after she had first started to take carbutamide that the allergic rash appeared. After an interval of two months the administration of carbutamide was cautiously resumed, and it was after a further month that the first purpuric rash appeared. She had been having tolbutamide for one month when the second purpuric eruption was noted. It seems very probable that an allergic purpura, with little affection of the platelets, was caused by both carbutamide and tolbutamide. Only carbutamide caused depression of the white-cell count.

TABLE II.—Group 1. Effect of Treatment with Carbutamide on Platelet and White-cell Counts

Case No.	Sex	Age	Duration of Diabetes (Years)	Average Carbutamide Blood Levels (mg./100 ml.)	Platelets and W.B.C. per c.mm.						At Time of Check Count			
					Before Carbutamide		After 2 Weeks Carbutamide		After 6 Weeks Carbutamide		Treatment (Weeks)	Total Dose Carbutamide (g.)	W.B.C., Platelets per c.mm.	
					Platelets	W.B.C.	Platelets	W.B.C.	Platelets	W.B.C.			Platelets	W.B.C.
1	M	63	2/12	10.6	370,000	7,500	280,000	5,950	240,000	4,500	21	150	304,000	—
2	F	58	5	10.3	370,000	9,350	210,000	6,050	280,000	5,750	21	136	210,000	—
3	F	51	6	7.8	320,000	7,900	260,000	4,350	270,000	5,250	21	125	180,000	5,000
4	F	50	2	7.0	390,000	6,250	220,000	2,700	390,000	3,900	21	122	310,000	7,900
5	F	58	1	10.6	360,000	8,350	400,000	7,250	340,000	5,250	21	118	260,000	—
6	F	71	2	14.2	190,000	6,550	170,000	3,050	220,000	2,600	19	66*	240,000	2,450
7	F	62	7	15.7	340,000	4,950	280,000	5,300	290,000	7,050	19	94	240,000	7,000
8	F	64	4	12.4	190,000	6,100	150,000	3,300	130,000	—	11	80	90,000	3,800
9	F	71	2	13.4	250,000	12,500	340,000	4,900	280,000	—	13	96	260,000	7,000
10	F	61	3	16.4	250,000	6,550	320,000	6,200	250,000	—	13	66	270,000	6,000
11	F	67	3/12	10.8	300,000	11,000	—	—	325,000	—	8	60	320,000	9,200
12	F	55	1	14.2	210,000	7,150	200,000	5,400	302,000	—	6	40	185,000	6,000
13	F	66	10	13.0	270,000	7,000	240,000	5,300	240,000	—	13	73	215,000	6,400
14	F	70	21	13.2	230,000	6,050	240,000	5,400	230,000	—	13	75	175,000	5,800
15	F	55	6	13.6	280,000	5,450	—	—	330,000	—	9	40	295,000	8,400
16	F	58	4	14.0	340,000	5,900	—	—	330,000	—	9	38	320,000	8,200
17	M	55	2/12	11.5	290,000	7,700	230,000	4,800	—	—	—	—	—	—
18	F	56	1	14.9	330,000	6,100	220,000	4,800	—	—	—	—	—	—
19	F	67	1	14.5	200,000	6,350	190,000	6,200	—	—	—	—	—	—
20	F	62	3	16.1	340,000	8,850	390,000	7,700	—	—	—	—	—	—
21	F	74	1	12.0	160,000	4,800	—	—	—	—	—	—	—	—
22	F	39	2	12.3	310,000	8,400	270,000	5,950	—	—	—	—	—	—

* Therapy interrupted for two months because of skin allergy. Carbutamide was ineffective in Cases 17, 18, 19, 20, 21, and 22.

Case 8

This patient had a low platelet count before treatment with carbutamide was started, and showed a decline in the count during therapy until, when she had been receiving the drug for 12 weeks, it had fallen to 90,000 per c.mm. Hess's test was strongly positive and the bleeding-time prolonged. Marrow examination showed a great infiltration of fat, with scanty haemopoietic tissue and a diminution of the number of megakaryocytes: there was a moderate eosinophilia when the administration of carbutamide was stopped; her platelet count rose slowly without a "rebound," reaching a figure of 180,000 per c.mm. after two weeks and remaining constant. Hess's test, which had been very strongly positive indeed, became barely positive, and the bleeding-time became normal.

It is suggested that here a hypoplastic marrow was being steadily exhausted and was unable to compensate for the thrombocytopenic action of carbutamide.

Group 2

The patients of this group were included in the trial later. Their initial stay in hospital was short, and blood examinations were not made until the discovery of thrombocytopenic purpura in a member of the group made them imperative. Thereafter, examinations were made weekly. The findings are given in Table III, with a statement of the duration of therapy and the total dose of carbutamide which had been received at the time the first count was made.

When blood examinations were made, it was found that four patients (excluding the patient with thrombocytopenic purpura) had low platelet counts. It was tempting to attribute this to the carbutamide, but the several low initial platelet counts in Group 1 had to be borne in mind, and in the absence of any information on the original blood pictures attention was directed rather to the effect of stopping the administration of the drug and to *in vitro* experiment.

From Table III it may be seen that throughout the group, stopping the administration of carbutamide was followed by an abrupt rise in the platelet count, which in the course of the next few weeks returned to its previous level. Broadly, the lower the original count the higher was this "rebound." In the five patients (Cases 23, 25, 29, 30, and 40) with very low platelet counts, the "rebound" was followed by a return to the previous low level, and it must be considered probable that in these patients the count had been low before carbutamide was given. This "rebound" is discussed below. It is obviously similar to that which Kracke and Townsend (1943) found to follow sulphathiazole and sulphadiazine.

The patient who developed thrombocytopenic purpura belonged to this group, and her case is given in detail below.

Case 35

An otherwise healthy woman of 68 who had had diabetes for 14 years. For the first 11 years this was controlled by diet alone, but latterly she had been having 24 units of zinc insulin suspension daily. She was hypertensive (blood pressure 190/115 mm. Hg) and showed early hypertensive retinal changes. There was no evidence of diabetic retinopathy, albuminuria, or neuropathy. Her only serious illness had been a pneumonia two years previously. She gave no history of any blood disorder or bleeding tendency, but a son died at the age of 4 years (in 1918) of "internal bleeding" which was said to have been due to haemophilia. There was no other history of such disease in her own or her husband's family. Another son and a daughter are alive and well, and have shown no haemorrhagic tendency. A nephew suffers from diabetes.

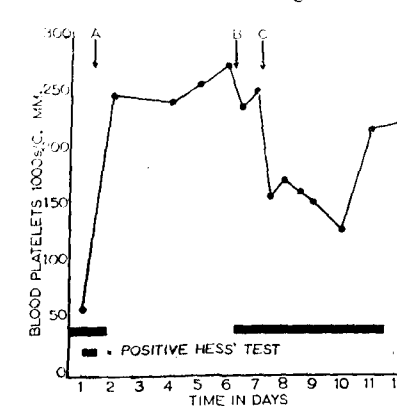
She was given carbutamide, 1.5 g. daily for the first week, with an excellent response. Thereafter, as an out-patient, she received 1 g. daily. Two weeks after starting treatment she noticed a red bumpy rash on her arms and shoulders, but thought little of it and did not mention it when she attended at the clinic. During the next week she had a further crop of spots, and then, when she had been receiving carbutamide for three weeks, she showed spontaneous purpura. Administration of the drug was stopped at once and she was admitted to hospital for investigation.

No blood examinations had been made previously. The findings on admission were: platelet count, 60,000 per c.mm.; haemoglobin, 74%; red blood cells, 4,000,000; white-cell count, 7,200. The blood film was normal except that platelets were rare. Hess's test was strongly positive. The bleeding-time (Ivy) was 12 minutes. The clotting-time (Lee and White) was 9 minutes. Thrombin generation tests and prothrombin consumption tests were normal. The marrow had an unusual appearance: each smear showed a fenestration of small fat globules, sprinkled with a great number of megakaryocytes. These were intensely basophilic and granular, and where nuclei could be distinguished they were multilobular. Other haemopoietic tissue was very scanty but normal in appearance. There was no eosinophilia.

On the day after admission her platelet count had risen to 250,000 per c.mm., Hess's test was quite negative, and the bleeding-time was three minutes.

It was decided to give her a test dose of carbutamide, and for two consecutive days she received 1.5 g. in the morning. There was a slight drop in the platelet count on the first day, but no further change. On the second day there was a further fall in the platelet count, and in the evening she

developed a hot urticarial rash on the face and arms. She described this as being exactly similar to the first rash, which had developed two weeks after the course of carbutamide was started. By the next day the platelet count had fallen a little further, but thereafter it climbed again. The Chart shows the changes in her platelet count from the



Case 35. Effect of stopping administration of carbutamide, and effect of a test dose. A, Administration of carbutamide stopped. B, 1.5 g. carbutamide given. C, 1.5 g. carbutamide given.

time of her admission, and the varying response to Hess's test. Since there could be no doubt that her thrombocytopenia had been caused by carbutamide, a unique opportunity was presented of comparing the action in this respect of tolbutamide. Therefore, two months after the purpura had cleared and the platelet count had returned to normal she was admitted to hospital and started on a course of tolbutamide, receiving 1.5 g. daily. Her platelet count on admission was 275,000 per c.mm. and Hess's test negative. Platelet counts were made hourly during the first day, and thereafter daily. Within six hours of giving tolbutamide the count had fallen to 190,000 per c.mm., Hess's test remaining negative. During the following three weeks the platelet count continued to be between 170,000 and 200,000 per c.mm. There is no doubt that tolbutamide caused a significant fall in the platelet count, but there is no evidence that sensitization to carbutamide had produced cross-sensitization to tolbutamide.

Special Investigations

Differential White-cell Counts.—These had been included at each haematological examination of all patients in Group 1, and in those of Group 2 where there was alteration in the white-cell count. In all cases of leucopenia the fall was found to be predominantly at the expense of the neutrophils, though complete agranulocytosis never occurred.

Bone-marrow Examinations.—The marrow findings in the patient with thrombocytopenic purpura have already been described in detail. Examinations were made on four other patients (Cases 6, 8, 30, and 40) with low platelet counts. Their marrows resembled one another closely in appearance and were quite different from that of Case 35. Each showed a great increase in fat, and, except in Case 6, very scanty haemopoietic tissue. Megakaryocytes were diminished in numbers but had a normal appearance, and there was an appreciable eosinophilia and an increase in the number of plasma cells. As noted previously, there was an unhealthy appearance of the white-cell precursors in the marrow in Case 6.

Hess's Test.—It is not possible to present in tabular form the changes which occurred in the response to Hess's test. Insufficient attention was at first paid to this point, for their significance in a diabetic was not appreciated. Positive Hess's tests during carbutamide therapy were seen in Cases 3, 7, 8, 25, 26, 27, 30, 34, 35, 37, and 38. When the administration of the drug was stopped recovery followed. It will be noted that six of these patients had shown no depression of the platelet count. Conversely, three patients (Cases 6, 29, and 40) with low platelet counts (and in one instance spontaneous purpura) had only slightly positive Hess's tests.

Patch Tests.—Eight patients (Cases 3, 6, 8, 25, 29, 30, 35, and 40) were patch-tested with carbutamide in propylene glycol. No reactions were seen.

Clot Retraction and Platelet Agglutinins.—Clot retraction was very poor in Cases 6 and 35, and there was no appreciable change on adding carbutamide to the blood. Cases 8, 25, and 30 probably showed some impairment of retraction, while in Cases 3, 29, and 40 it was normal. In none of these patients was there any appreciable lessening of retraction after the addition of carbutamide to the clotting blood. There was no agglutination of platelets in platelet-rich plasma after the addition of carbutamide in any of these eight patients, nor was a significant reduction found in the number of the platelets after incubation with carbutamide for two hours, four hours, or overnight. This was unexpected, for in Case 35 at least it had been anticipated that agglutinins would be found. This patient did have strong agglutinins both to pooled platelets from group O blood and to platelets from several donors of the same blood group as her own: it was not possible to demonstrate an increased titre in the presence of carbutamide. No such agglutinins were found in the blood of the other seven patients.

Discussion

These findings demonstrate the common occurrence of neutropenia during carbutamide therapy. It is of interest that the white-cell count often rises again while administration of the drug is continued, a point noticed previously by Downie *et al.* (1956). The harmful effect on the white cells is now well attested and is similar to that of other sulphonamides. In this discussion, therefore, attention is directed primarily to the toxic effects of carbutamide on the blood platelets and the capillaries.

In the immune thrombocytopenic purpuras caused by certain drugs the drug acts as a hapten, combining with platelets to give a complex which is antigenic. There is growing evidence, particularly from experiments in passive immunization, to suggest that such a loose platelet-drug combination occurs in all patients receiving the drugs, but that it is only rarely that the antigenic effect is strong enough to cause trouble. When the complex is strongly antigenic, not only will the immune reaction cause platelet destruction but the megakaryocytes may be affected, producing the changes thought previously to be those of a primary toxic effect on the marrow. Capillary endothelium being antigenically very similar to blood platelets, damage to this may occur. The present observations are considered in the light of this concept of a toxic immune reaction.

The mild depression of the platelet count which occurs in some patients during therapy, and the remarkable "rebound" in most after the administration of carbutamide is stopped, can be explained satisfactorily in this way. Supposing there was to be a slightly increased rate of destruction of platelets following the creation of a weakly antigenic carbutamide-platelet complex, most patients would be able to maintain the level of circulating platelets by an increase in production. Where the marrow reserve was small and the platelet count would fall. Where the marrow was already depressed and the platelet count low, frankly thrombocytopenic levels might be reached. The actual occurrence of each of these possibilities can be demonstrated in the present study. Conversely, once the administration of carbutamide is stopped, peripheral destruction of platelets ceases and for a short time continuing overproduction by the marrow gives a high platelet count.

There is good evidence, therefore, that some degree of sensitization is common during carbutamide therapy. Control studies suggest that hypoplasia of the bone marrow may occur in diabetes, and this may be a further reason why depression of the platelet and white-cell counts has happened so readily. Little information is, however, available on the marrow changes which may occur in diabetes. These require full investigation, for all the drugs at present under trial in the oral treatment of diabetes are potentially haemotoxic.

Of the two patients who developed purpura, one exemplified in extreme degree such an allergic thrombocytopenia

TABLE III.—Group 2. Effect of Stopping Treatment with Carbutamide on the White-cell and Platelet Counts

Case No.	Sex	Age	Duration of Diabetes (Years)	At Time of First Blood Count		Weekly Blood Counts: Platelets and W.B.C. per c.mm.													
				Total Carbutamide (g.)	Therapy (Days)	1		2		3		4		5		6		7	
						Platelets	W.B.C.	Platelets	W.B.C.	Platelets	W.B.C.	Platelets	W.B.C.	Platelets	W.B.C.	Platelets	W.B.C.	Platelets	W.B.C.
23	F	60	5	15	21	170,000	—	135,000*	7,000*	260,000	10,000	195,000	8,400	220,000	4,000	145,000	6,600	130,000	7,200
24	F	45	5	45	28	250,000	—	205,000	—	280,000	4,000	275,000*	5,200*	385,000	5,100	320,000	6,800	280,000	5,000
25	F	61	6	55	35	125,000	—	120,000*	4,800*	410,000	4,800	170,000	6,200	110,000	6,000	115,000	8,400	165,000	6,000
26	F	62	2	47	35	—	—	225,000*	—	250,000	11,000	265,000	9,000	310,000	6,400	284,000	11,000	300,000	8,000
27	F	67	2 1/2	52	35	260,000	—	210,000	—	220,000	5,800	295,000*	8,600*	265,000	7,600	305,000	11,400	405,000	7,800
28	F	53	4	45	28	230,000	—	225,000*	—	—	—	240,000	8,600	245,000	5,800	—	—	—	—
29	F	56	3	59	49	—	—	170,000*	—	340,000	6,000	275,000	9,000	240,000	7,600	245,000	9,600	405,000	8,000
30	F	68	10	50	28	90,000*	8,000*	170,000	9,250	230,000	8,000	195,000	7,200	180,000	7,400	260,000	9,600	405,000	8,000
31	F	66	7	55	35	290,000	—	255,000	—	250,000*	6,000*	280,000	8,800	255,000	7,600	205,000	6,000	190,000	7,000
32	F	73	5	30	21	220,000	—	260,000	—	—	—	—	—	—	—	290,000	7,000	290,000	7,600
33	F	67	18	40	21	235,000	—	260,000*	—	270,000	—	—	—	—	—	—	—	—	—
34	F	66	9	40	21	300,000	—	275,000	—	360,000	4,600	305,000	8,800	260,000	8,200	330,000	5,200	255,000	6,400
35	F	68	14	24 1/2	35	60,000*	7,200*	—	—	—	—	205,000*	2,800*	340,000	5,400	300,000	5,000	300,000	6,000
36	F	63	13	35	21	240,000	—	290,000	—	Hospital	—	170,000	8,000	185,000	5,600	265,000	3,800	320,000	7,000
37	F	65	3	35	21	250,000	—	220,000	—	—	—	—	—	—	—	245,000	7,000	280,000	7,000
38	F	54	6	35	21	240,000	—	300,000	—	250,000	3,900	245,000	4,400	215,000*	1,400*	445,000	—	—	—
39	F	59	7	43	35	300,000	—	300,000	—	310,000	6,000	240,000*	5,400*	240,000	8,400	265,000	5,000	305,000	8,400
40	F	58	14	30	21	125,000	—	190,000*	—	280,000	6,400	200,000	7,000	165,000	4,200	200,000	10,000	—	—

* Indicates point at which treatment with carbutamide was stopped.

as that described above, while the other had capillary damage without alteration in the platelet count. The thrombocytopenia of the first was clearly shown to have been due to carbutamide, and an unusual feature in her case was the very rapid rise in the platelet count when the administration of the drug was stopped. This is strongly suggestive of peripheral destruction of platelets rather than of a toxic effect on the marrow, though *in vitro* evidence of sensitization was lacking. It is noteworthy that both patients had shown signs of intolerance, in the form of allergic skin manifestations, some time before the purpura appeared.

These two patients were later given tolbutamide. The patient who had developed thrombocytopenic purpura while receiving carbutamide showed a slight but significant fall in the platelet count when tolbutamide was given, but there was no further fall while the administration of the drug was continued, and Hess's test remained negative. There was therefore no good evidence that sensitization to carbutamide had produced cross-sensitization to tolbutamide. On the other hand, the patient who had developed non-thrombocytopenic purpura one month after the administration of carbutamide had been resumed, following its long interruption, developed purpura again after she had been receiving tolbutamide for one month. No conclusions can safely be drawn from these isolated findings, but they at least suggest that though tolbutamide is not a sulphonamide its toxic actions may be similar to those of carbutamide.

An effect of carbutamide on the capillaries was seen. In many patients capillary resistance was found to be increased when the administration of carbutamide was stopped, even when the platelet count had been high. The point was not fully investigated, but it seems probable that carbutamide accentuates the increased capillary fragility which is due to the diabetes itself. When the antigenic similarity of platelets and capillary endothelium is borne in mind, this is an understandable effect of a drug which has been shown to cause thrombocytopenia. It is clearly an unwelcome attribute, for such diabetic complications as retinopathy and nephropathy will presumably be influenced adversely. It must, however, be emphasized again that these observations were not adequately investigated, and require confirmation.

The toxic effects of carbutamide on the blood are therefore those which might have been anticipated in the extensive use of any sulphonamide. However, when in a group of only 40 patients it has been possible to show so many instances of harmful effects on the white cells and the blood platelets, it is obvious that the drug is dangerous. Added to this, there is the possibility that it may accentuate any damage to small blood vessels. Carbutamide cannot be regarded as a safe substitute for insulin in the routine control of diabetes.

Summary

A haematological study was made of 40 patients who were receiving carbutamide for the control of diabetes mellitus. Leucopenia was common soon after this treatment was instituted, but usually the white-cell count rose again as the administration of carbutamide was continued: one patient, however, developed a severe leucopenia which persisted until treatment was discontinued.

Many patients showed a mild depression of the platelet count, and two developed spontaneous purpura. In one case the purpura was thrombocytopenic, and was shown conclusively to have been due to carbutamide. In the other the purpura was non-thrombocytopenic, and was probably due to carbutamide. Both these patients were later given tolbutamide, and the possible toxic effects are discussed.

Clinical observations suggested that carbutamide accentuates the increased capillary fragility which may occur in diabetes, but this point was not fully investigated and the findings require confirmation. It is concluded

that carbutamide is not a safe drug for use in the routine control of diabetes.

I wish to thank Professor D. M. Dunlop for his encouragement and advice, and I am indebted to him and to Drs. Joyce D. Baird and L. J. P. Duncan for giving me the opportunity of carrying out these investigations on their patients.

REFERENCES

- Ackroyd, J. F. (1949). *Quart. J. Med.*, **42**, 299.
(1953). *Amer. J. Med.*, **14**, 605.
Barnes, R. H. (1950). *Amer. J. med. Sci.*, **219**, 368.
Beaser, S. B., Rudy, A., and Seligman, A. M. (1944). *Arch. Intern. Med.*, **73**, 18.
Bertram, F., Benfeldt, E., and Otto, H. (1955). *Dtsch. med. Wschr.*, **80**, 1455.
Britton, C. J. C., and Howkins, J. (1938). *Lancet*, **2**, 718.
Downie, E., Bornstein, J., Hudson, B., and Taylor, K. (1956). *Med. J. Aust.*, **1**, 1072.
Duncan, L. J. P., Baird, J. D., and Dunlop, D. M. (1956). *British Medical Journal*, **2**, 433.
Franke, H., and Fuchs, J. (1955). *Dtsch. med. Wschr.*, **80**, 1449.
Hines, L. E., Catlin, J., and Kessler, D. L. (1953). *Amer. J. Med.*, **15**, 175.
Hurd, R. W., and Jacox, R. F. (1943). *J. Amer. med. Ass.*, **122**, 296.
Kinsell, L. W., Brown, F. R., Friskey, R. W., and Michaels, G. D. (1956). *J. clin. Endocr.*, **16**, 821.
Kracke, R. R., and Townsend, E. W. (1943). *J. Amer. med. Ass.*, **122**, 168.
Oettle, A. G., and Spriggs, A. I. (1951). In *Recent Advances in Clinical Pathology*, edited by S. C. Dyke, 2nd ed., p. 406. Churchill, London.
Ridolfo, A. S., and Kirtley, W. R. (1956). *J. Amer. med. Ass.*, **160**, 1285.
Robbers, H., and Speck, F. (1956). *Dtsch. med. Wschr.*, **81**, 1278.
Rodríguez, R., and Root, H. F. (1948). *New Engl. J. Med.*, **238**, 391.
Sherlock, S., and White, J. C. (1944). *British Medical Journal*, **2**, 401.
Walker, G., Leese, W. L. B., and Nabarro, J. D. N. (1956). *Ibid.*, **2**, 431.

EFFECTS OF "PACATAL" ON SYMPTOMS IN CHRONIC PSYCHOTIC FEMALE IN-PATIENTS

BY

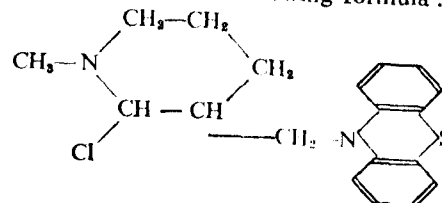
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"Pacatal," or pecazine, is one of eight different ring derivatives of phenothiazine synthesized by Schafer and Nezel in Hamburg. It is N-methylpiperidyl-(3)-methyl-phenothiazine, and has the following formula:



It was tested in animals by Nieschulz *et al.* (1954) and found to be well tolerated and to have various actions, including a tranquillizing effect on all animals, with somnolence in larger doses; an antisymphathetic-mimetic reduction of blood pressure; a potentiation of analgesics and narcotics; and an antiperistaltic action. Werenberg (1955), from whom the above information is derived, describes other effects of the drug in animals.

The therapeutic investigation described in this paper was devised in an attempt to determine whether pacatal was effective in the control of certain symptoms in chronic psychotic female patients—namely, incontinence, aggression, and noisiness—without the toxic side-effects which have sometimes caused anxiety when chlorpromazine, another phenothiazine compound, has been used.

Method

For the purpose of the investigation, 76 female patients suffering from chronic psychosis, of age range 32 to 75 years (average 59.5 years), were accommodated in one large ward. They were all long-stay patients, the duration of hospitalization ranging from 6 to 46 years (average 21 years). All were regressed in varying degrees and none had received any recent significant treatment. Most were suffering from schizophrenia (Table I).

TABLE I.—Age and Diagnosis Distribution of the Groups

	Pacatal	Control
No. of patients	37	38
Age { Minimum	32 years	35 years
Maximum	75 "	74 "
Mean	59.5 "	59 "
Diagnosis on admission { Schizophrenia	26	26
Manic-depression	9	4
Others	2	8
Duration in hospital { Minimum	6 years	10 years
Maximum	42 "	46 "
Mean	19.5 "	23.3 "

The patients were divided into two clinically random groups, which were, as Table I shows, similar in age and diagnostic distribution. The patients in one group received throughout the experiment active tablets of pacatal, for the first 12 days of the trial, in a dosage of one tablet three times daily (75 mg. daily); for the next 28 days two tablets three times daily (150 mg. daily); and for the final 12 days three tablets three times daily (225 mg. daily). Thus each patient in this group received a total of 7.8 g. of pacatal. The patients in the other group received equal numbers of inert control tablets which were identical in appearance with the active tablets. The identity of the tablets was known only to the hospital pharmacist.

For statistical purposes, with one exception (a patient in the pacatal group who had to be moved out of the ward for administrative reasons) those patients who were unable to complete the course of active tablets were regarded as having done so.

In an effort to make the investigation as objective as possible, only three symptoms were recorded throughout; the numbers of incidents of incontinence, aggression, and noisiness being recorded by the nursing staff against the patients' names on a large wall chart. Incontinence, either urinary or faecal, is self-explanatory. Aggression was defined as striking another individual or attempting to do so, and noisiness as a vocal outburst sufficient to warrant segregation of the patient because of her disturbing effect on other patients.

In addition, the blood pressure of each patient was recorded twice weekly by two of us (A. K. and P. S.), on each occasion at the same time of day, without change of instrument, posture, or investigator. At the same time any toxic effect was looked for and recorded. Apart from this, no detailed clinical appraisal of the patients was attempted, either before or during the investigation.

Results

Control of Symptoms.—Thirty-seven patients received pacatal and 38 were controls. In the pacatal-treated group there were 61 occurrences of incontinence, 31 aggressive acts, and 101 noisy outbursts, compared with 145, 96, and 206 respectively in the control group. In each case the difference is significant beyond the 1 in 20 level of probability. Thus there are significantly fewer incontinent, aggressive, or noisy incidents in the pacatal-treated group than in the control group.

Statistical Method.—In each case the incidence of acts of incontinence, aggression, or noisiness is expressed as a proportion of a hypothetical normal, this being the number of acts that would have occurred if each patient had been incontinent, aggressive, or noisy once weekly. The difference

TABLE II.—Symptomatic Incidents in Groups, With Statistical Analysis

	Pacatal-treated Group	Control Group	Difference Between Rates	Standard Error Difference
No. of patients	37	38		
Incontinent incidents	61	145		
Rate of incontinence (% if each patient incontinent once weekly)	22	51.5	29.5	10.6
Aggressive incidents	31	96		
Rate of aggression, %	11.3	34.0	22.7	10.7
Noisy incidents	101	206		
Rate of noisiness, %	36.7	73	36.3	10.6

between the proportions so determined in the two groups is then compared with its standard error (Table II). As a further control, the rates of occurrence of the three symptoms in the first 26 days of the investigation were compared with those in the second 26 days. In the group receiving pacatal the rates of incontinence and noisiness were significantly less in the second than in the first period, and that of aggression less, but not significantly so. In the control group there was no significant difference in the rates of incontinence. The rate of aggression showed an increase which just failed to be significant, while the rate of noisiness showed a significant increase in the second half of the period (Table III).

TABLE III.—Comparison of Symptomatic Incidents in First and Second 26 Days of Treatment

	Number of Incidents		Rates % of 1 Incident per Patient per Week		Difference in Rates %	Standard Error of Difference
	1st 26 Days	2nd 26 Days	1st 26 Days	2nd 26 Days		
Incontinence: Pacatal group	50	11	36.4	8.0	28.4	9.1
Control " "	75	70	53.1	49.6	3.5	11.5
Aggression: Pacatal group	23	8	16.7	5.8	10.9	7.2
Control " "	34	62	24.1	43.9	19.8*	10.6
Noisiness: Pacatal group	72	29	52.4	21.1	31.3*	10.6
Control " "	84	122	59.5	86.4	26.9*	9.9

* Increase.

Toxic Complications

Serious toxic complications of three types—jaundice, hypotonia, and neutropenia—occurred in a total of 16 (43%) of the patients receiving pacatal (Table IV).

TABLE IV.—Analysis of Toxic Effects in 37 Pacatal-treated Patients

	Jaundice	Neutropenia	Hypotonia	Total
No. of cases	2	4*	10	16
% of total	5.4	10.8	27	43.2
Age { Minimum	43 years	49 years	35 years	35 years
Maximum	56 "	63 "	74 "	74 "
Mean	48.5 "	58 "	59.4 "	57.8 "
Drug taken { Minimum	1.5 g.	6.8 g.	2.9 g.	
Maximum	3.9 "	7.8 "	7.3 "	
Mean	2.7 "	7.2 "	5.6 "	

* Includes one fatal case.

Jaundice.—Two patients developed mild jaundice; one after taking 1.5 g. and the other after 3.9 g. of pacatal. Both recovered spontaneously after withdrawal of the drug.

Hypotonia.—Ten patients developed a state of unilateral hypotonia. All showed a similar picture, differing only in degree. The syndrome consisted of a marked flaccidity of the extensors of both limbs of one side of the body and a concomitant flaccidity of the ipsilateral erector spinae muscles. The patients walked with semiflexed arm and leg, tilting to the hypotonic side. All had unsteady gait, two to such an extent that they fell, injuring themselves. Because of mental regression, detailed neurological examination was difficult, but it appeared that co-ordination was normal apart from the effects of the hypotonia. Those able to understand the

instructions could perform the finger-nose test with accuracy and without tremor. There was no nystagmus or signs of extrapyramidal or pyramidal motor lesions. Sensory examination was impossible because of the mental state, but there did not appear to be any posterior column involvement, gait being co-ordinated, allowing for the abnormal posture. One case of this condition occurred after 2.9 g. of pacatal; then towards the end of the trial nine cases occurred within a few days. The first case continued to receive pacatal to the end of the trial without any worsening. After withdrawal of the drug all cases recovered within seven days.

Neutropenia.—Four patients developed neutropenia late in the trial. In the first case, a woman of 61 presented with a small local infection of the thumb and, despite blood transfusion, penicillin, and cortisone, died of agranulocytosis 15 days later. The remaining three cases which were detected by routine white-cell counts, all occurred after the administration of between 7 and 7.8 g. of the drug. Two showed white-cell counts of 3,500 per c.mm., with 40% neutrophils. Pacatal was immediately withdrawn and the blood counts returned to normal within seven days. In the fatal case and one of the others, bone marrow biopsy confirmed an agranulocytic reaction.

Minor toxic effects in the patients receiving pacatal included dryness of the mouth and disturbances of vision, but these were not serious enough to seriously inconvenience or endanger the patients concerned and have not been tabulated.

Effect on Blood Pressure

It was found that many patients in both groups had labile blood-pressure recordings, sudden falls and equally rapid recoveries occurring at frequent intervals. Falls in the systolic pressure of 20 or more mm. Hg were recorded in 16.1% of the patients receiving pacatal and in 15% of the control group. The difference is not significant.

Discussion

The necessity of subjecting any new drug to adequate controlled clinical trials, so that its field of usefulness can be exactly determined before it is used generally, has been recently stressed (*British Medical Journal*, 1956). At the same time, psychiatric investigations present particular problems of objectivity, quantitative measurement, and adequate controls. It seems that a measure of the number of occurrences of particularly easily detected symptoms is one relatively simple way of meeting these difficulties (Mitchell, 1956). By this means, patients taking a new drug can continue to live in the same environment as previously, as they are not subjected to unusual prolonged clinical interviews by medical staff or others. Measurement of symptoms becomes a simple recording on a wall chart of each episode (in this investigation) of incontinence, noisiness, or aggression. As the individuals in a clinically similar and numerically equal control group, given an identical-appearing tablet, have similar recordings taken it is not necessary for every occurrence of a symptom to be recorded, as the final analysis is one of the relative frequency of each symptom. Thus there is a minimal change in environment, such change as there is being identical in control and the test groups, and it can be claimed that numerical differences observed in the objectively recorded symptoms are due (subject to statistical analysis) to the drug administered.

It might be argued that an initial observation period in all groups, prior to the administration of any active tablets, might have been desirable in reducing still further the effect of chance in the rather small clinically random groups chosen. It was felt, however, that the enthusiasm of the observers, on whom the success of the investigation depended, might quickly wane without positive results, so it was decided instead to compare incidences in the first half of the experimental with those in the second half as an additional statistical control, for not only were the patients on a bigger daily dosage of the drug in the latter part of the investigation, but it was presumed that pacatal, like chlorpromazine, would show some delay in developing its full effects. It

was interesting that the control groups showed an increase in aggressiveness and noisiness, due, presumably, to increasing reluctance to take tablets.

It must be noted here that no attempt has been made to restrict the investigations to patients with one type of psychosis, though, as might be expected, despite the diagnosis distribution (on admission) as shown in Table I, nearly all were suffering from chronic schizophrenia. Whatever the diagnosis, the symptoms chosen for enumeration are those which make the nursing of the chronic regressed patient a difficult and often thankless task. Any drug which will safely help to make the patients more accessible, by reduction of these symptoms, is thus of great value in these days of serious nursing shortages.

Our findings concerning the effectiveness of pacatal in the control of these symptoms—incontinence, noisiness, and aggressiveness—are similar to those reported by Werenberg (1955) in an uncontrolled experiment. It seems likely that the significant reduction in the incidence of incontinent acts may well be due, in part at least, to the inhibitory action of the drug on the smooth muscle of the intestine and bladder, rather than to increased co-operation on the part of the patient.

It has already been reported by many observers that another phenothiazine compound, chlorpromazine, is effective in the control of turbulent chronic psychotic female patients (Elkes and Elkes, 1954; Andermann and Lindsay, 1955), but, as already stated, toxic side-effects occur with this drug. These, though not usually serious, often give trouble and have been widely reported. Lomas *et al.* (1955) give a very full account of them. Jaundice, dermatitis, and Parkinsonism are the most troublesome; but Pollack (1955) describes one fatal case of agranulocytosis in 500 patients treated with chlorpromazine. At Lancaster Moor Hospital we have found that skin sensitivity to chlorpromazine amongst the female nursing staff has been our greatest cause of anxiety. No fewer than 21 female and 2 male nurses who have handled the drug have developed dermatitis, which in some cases has been of long duration. Moreover, the sensitivity appears to be long-lasting, four of the female nurses showing strong reactions to patch testing nine months after the original attack (Seville, 1956).

Unfortunately, in this investigation, pacatal has proved to be even more toxic than chlorpromazine—so much so that the investigation was terminated prematurely. The occurrence of one fatal case of agranulocytosis and three cases of neutropenia in the relatively small number under treatment, apart from the postural complications already described, made it unjustifiable to continue.

Toxic complications of the drug have previously been described. Thus Werenberg (1955) found seven cases of leucopenia in his series of 100 patients undergoing treatment with pacatal, including one fatal case of agranulocytosis in a woman of 46 who also suffered from mild diabetes mellitus. She had had a total of 7.5 g. of the drug. Of the other six cases, one had to have the drug discontinued, the remaining five exhibiting a return of the blood count to normal without stopping the drug. A case of fatal agranulocytosis, not firmly established as due to pacatal, has also been described by Wenderoth and Lennartz (1955) after a total of 13 g. of the drug. C. S. Parker (1956, unpublished communication) reports one fatal case of agranulocytosis in a patient receiving pacatal.

Kline and Jacob (1955) described five cases of postural difficulty apparently similar to those found in this investigation. Because of this and other complications, they found it impracticable to continue giving the drug. In our series it will be noted that almost 25% of the patients developed postural difficulties, two severely. Although the symptoms resolved rapidly on termination of the drug, it is clear that they could prove serious and incapacitating to an out-patient undergoing treatment.

There do not appear to be any reports in the literature of jaundice occurring in patients undergoing pacatal therapy, other than those found in this experiment.

Other serious toxic effects in patients taking the drug have been described by Kline and Jacob (1955), three of whose group developed atonic bladders and bowels when on intramuscular therapy. One of these actually showed symptoms of an autonomic bladder and required catheterization.

Finally, Werenberg (1955), in his series, reports three further deaths: one apparently from cardiovascular collapse; one from embolism of the pulmonary artery, thrombosis of the common iliac vein, and myocardial degeneration, associated with severe constipation; and the third from embolism of the pulmonary artery and thrombosis of the plexus parametralis together with a large uterine fibroma.

On the other hand, Bowes (1956) reports no serious toxic results in a series of 50 cases, some of whom received up to 600 mg. of pacatal daily.

However, the findings of Werenberg (1955), of Kline and Jacob (1955), and of the present investigation suggest that pacatal should be used only with extreme caution. Chlorpromazine is equally effective in the treatment of chronic regressed female psychotic patients and its toxic effects are much less serious. It seems to us that if either drug is to be used chlorpromazine is the drug of choice.

A reference to the pharmacology of phenothiazine itself shows that liver damage and jaundice, tachycardia, and sensitization of the skin to ultra-violet light are amongst the side-effects which brought it to be regarded as too toxic for use in humans (Martindale, 1952). It is clear that the derivatives of phenothiazine at present in use have toxic side-effects which are by no means negligible and which in some respects are similar to those of the parent substance. Further research is required in an effort to eliminate this unfortunate toxicity in drugs which otherwise seem to be valuable in mental hospital practice.

Summary and Conclusions

A controlled investigation into the effectiveness of "pacatal" in reducing the incidence of incontinence, noisiness, and aggression in chronically regressed psychotic female in-patients is described.

Pacatal was effective in reducing the number of noisy, aggressive, and incontinent acts in these patients, most of whom were suffering from schizophrenia.

Unfortunately, the high incidence of toxic side-effects in this group of patients suggests that the widespread use of pacatal is unjustifiable, at least until considerable evidence to the contrary is available. The toxicity of chlorpromazine, while not negligible, does not seem to be so serious, and it would appear to be the drug of choice. But where sensitivity to chlorpromazine has developed and where a drug of the phenothiazine type is strongly indicated, it would seem justifiable to use pacatal so long as close supervision of the white-blood-cell picture and of bowel and bladder function is maintained.

Acknowledgment is due to William R. Warner and Co. Ltd., who made supplies of pacatal freely available; to Dr. J. D. Silverston, medical superintendent of Lancaster Moor Hospital, for permission to perform the investigation; to Mr. H. Lewty, hospital pharmacist, for his assistance; and to the nursing staff, without whose help this investigation could never have been made.

REFERENCES

- Andermann, K., and Lindsay, J. S. B. (1955). *Med. J. Aust.*, 2, 80.
Bowes, H. (1956). Paper read to the American Psychiatric Association in Chicago on May 4, 1956.
British Medical Journal, 1956, 1, 969.
Elkes, J., and Elkes, Charmian (1954). *British Medical Journal*, 2, 560.
Kline, N. S., and Jacob, G. M. (1955). *Amer. J. Psychiat.*, 112, 63.
Lomas, J., Boardman, R. H., and Markowe, M. (1955). *Lancet*, 1, 1144.
Martindale (1952). *The Extra Pharmacopoeia*, 23rd ed., 1, 900. Pharmaceutical Press, London.
Mitchell, P. H. (1956). *J. ment. Sci.*, 102, 151.
Nieschulz, O., Popendiker, K., and Sack, K. (1954). *Arzneimittel-Forsch.*, 4, 232.
Pollack, B. (1955). *Psychiat. Quart.*, 29, 439.
Seville, R. H. (1956). *Brit. J. Derm.*, 68, 332.
Wenderoth, H., and Lennartz, H. (1955). *Med. Klin.*, 50, 818.
Werenberg, H. (1955). *Nord. Med.*, 54, 1787.

NICOTINYL ALCOHOL TARTRATE IN INTERMITTENT CLAUDICATION

BY

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The purpose of this investigation was to assess the value of nicotiny alcohol tartrate ("nicotol") in the treatment of patients suffering from severe intermittent claudication secondary to generalized arteriosclerosis.

Nicotiny alcohol tartrate is the alcohol corresponding to nicotinic acid, and has essentially the same vasodilator properties as the latter. However, its action is more sustained than that of nicotinic acid, probably because, in addition to the vasodilator properties of the alcohol itself, partial metabolism of it in the body results in the gradual release of nicotinic acid. The vasodilator effect of nicotiny alcohol tartrate is mainly on the small arteries and arterioles. A number of investigators in the United States and in Europe have reported encouraging results with its use in the treatment of peripheral vascular disorders.¹⁻¹⁰ However, although the drug is widely used in Great Britain, no report has yet been published describing a controlled investigation of its use in intermittent claudication.

Plan of Present Trial

The investigation was carried out on the "blind" principle; the majority of the patients had previously been admitted to hospital for full investigation and all had been treated previously with other compounds alleged to be of value in intermittent claudication. For inclusion in the trial, patients had to fulfil the following criteria: (a) There had been present for at least two months a severe gripping pain lasting for more than one minute in one or other of the calf muscles, coming on after a constant amount of exercise and relieved by a few minutes' rest. (b) Pulsation was absent in one or other of the palpable arteries in the affected limbs. (c) The skin of the extremity was blue or gangrenous and distinctly colder than that of the less affected limb.

Patients were excluded from the series if they were suffering from any other serious disease, correction of which might have influenced the assessment of the results. Congestive heart failure, when present, was always corrected by appropriate treatment in hospital before the patient was included in the series.

Once the diagnosis had been established all treatment was withheld for a period, in order to prevent any "overlap" of therapeutic effects. Patients were then treated with either nicotiny alcohol tartrate, one 25-mg. tablet four times daily, or with dummy tablets of identical appearance. Treatment was allotted by random selection by an independent person in the pharmaceutical department and I did not know the distribution of the patients until after the results of the trial had been assessed. The treated and control groups were comparable in respect of age and sex.

The series originally contained 50 patients, but by the end of the trial only 30 remained for final assessment. Of the remaining 20 patients, 15 died before the end of the trial, three moved to another area, and two refused to complete the course of treatment. It must be appreciated that, when organizing a trial using such poor clinical material over a fairly prolonged period, deaths from coronary thrombosis, cerebral haemorrhage, or renal complications, as a result of the generalized arteriosclerosis, are inevitable. All the case records of patients who died were studied, and it was decided to exclude them from the assessment of results because the duration of their treatment was too variable for useful assessment. The losses by death did not affect the comparability of the treated and control groups.

Assessment of Results

In order to achieve a high degree of standardization a form was prepared and completed for each patient. In each case the results were assessed, after at least 18 months' treatment, by analysis of the information contained in these forms. The results of treatment were classified as follows: "No benefit" means that the patient's condition had remained stationary or had become worse, as shown by a significant reduction in the walking distance before the onset of claudication, progression of the skin changes, or the presence of gangrenous ulceration. "Slight improvement" was considered to have taken place if the progress of the disease appeared to have been halted and if there was a slight but definite increase in the number of yards traversed before the onset of claudication. "Moderate improvement" means that after treatment the patient was able to walk at least half a mile further than had been possible before treatment.

The measurement of walking distance was carried out by the patients themselves, because experience has shown that this type of patient knows fairly accurately the distance that can be walked before claudication begins. It was impressed on all these patients that they must measure this distance (at their ordinary walking speed) in paces, each pace being taken as one yard.

After the trial had been in progress for about two and a half years, and all patients had received at least 18 months' treatment, it was closed and the result in each patient was assessed. Only then was I given the key to which patients had been on nicotinyl alcohol tartrate and which on placebo therapy. The results are shown in the table.

Results of Trial

Treatment	No. of Patients	Moderate Improvement	Slight Improvement	No Benefit
Nicotinyl alcohol tartrate	17	10	3	4
Dummy tablets	13	0	4	9

Side-effects.—The only side-effect observed was mild flushing of the face in two of the 20 patients excluded from the final assessment of results.

Discussion

Intermittent claudication marks the beginning of the final stages of a slowly progressive arterial disease. After a given amount of exercise the intensity of the pain is so impressive and its onset so constant that the alleviation of this symptom is an obvious way of assessing the value of any drug used in treatment.

Because of the difficulty of making an unbiased assessment of "improvement" in such a chronic condition, it was felt to be essential to carry out a "blind" control trial, comparing the effect of nicotinyl alcohol tartrate with that of a placebo. In this disease it is difficult to compare the effect of any one drug with that of another by the application of the "blind" method, because of the large number of patients who would be required, so no such attempt was made. Further, with the use of such poor clinical material a large percentage of "rejects" can be expected, and thus relatively large numbers must be included initially, even when comparing one drug with placebo therapy, in order to obtain final figures which are sufficient for analysis. In the present trial it was found possible to include 50 patients within a relatively short time, and by these means it was hoped that a sufficient number would remain at the end of the trial to give significant results.

When comparing the numbers of patients who improved on nicotinyl alcohol tartrate with those on dummy tablets there can be no doubt that the patients on the active drug improved to a greater extent than did those on the placebo. The converse was also true—that is, the number of patients failing to derive benefit from the active tablets was significantly smaller than the number of those who failed to receive benefit from the placebo.

It should be noted that statistical analysis takes no account of the fact that this is a progressive disease and is therefore no substitute for clinical experience. In the eyes of the clinician, a drug which halts the inevitable downward progress of the patient would be considered "beneficial," although, in the eyes of the statistician, a patient whose condition was unchanged at the end of 18 months would be considered to have received "no benefit."

Summary

A "blind" controlled trial is described in which 50 patients with severe intermittent claudication secondary to generalized arteriosclerosis were treated with nicotinyl alcohol tartrate or dummy tablets. Patients whose condition was complicated by the presence of other pathological processes were excluded. By the end of the trial the results of at least 18 months' treatment with nicotinyl alcohol tartrate (17 patients) and dummy tablets (13 patients) were available for comparison.

It was found that the results in those patients on the active drug were significantly better than in those who had received the placebo. It is therefore concluded that nicotinyl alcohol tartrate is a useful drug in the control of intermittent claudication.

The value of the "blind" method in a trial of this nature is discussed.

REFERENCES

- Thurnherr, A., and Heller, H. (1949). *Schweiz. med. Wschr.*, 79, 522.
- Brandman, O., and Redisch, W. (1950). *J. med. Soc. N.J.*, 47, 267.
- White, S. M. (1950). *Minn. Med.*, 33, 133.
- Klausner, F. (1950). *Wien. med. Wschr.*, 100, 756.
- Murphy, J. R. (1951). *N.Y. St. J. Med.*, 51, 2407.
- Richter, I. H., Fogel, M., and Fabricant, H. (1951). *Ibid.*, 51, 1303.
- Texter, E. C., Redisch, W., Shekman, E., Ferguson, S., and Steele, J. M. (1952). *Amer. J. med. Sci.*, 224, 408.
- Castro, C. M., and de Soleati, L. (1953). *Angiology*, 4, 165.
- Fisher, M. M., and Tebrock, H. E. (1953). *N.Y. St. J. Med.*, 53, 65.
- Epstein, K. (1955). *Dapim Refulum*, 14, v.

INTRAMEDULLARY NAILING FOR
RECENT FEMORAL SHAFT
FRACTURES

BY

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During the past 16 years the insertion of intramedullary nails into the shafts of long bones has been done with increasing frequency. The method is not a new one, and in an extensive review of the difficulties of this form of treatment Watson-Jones and others (1950) discussed medullary nailing "after 50 years." They point out that Nicolayson in 1897 writes of the method, and Hey Groves (1918-19), in this country, described a number of cases, mostly of battle casualties from the first world war, treated in this way in 1916 and 1918. More recently, Küntscher (1940) has reintroduced the method, and there is now a vast amount of literature on the subject both on the Continent and in America. Böhler (1948) published his monograph on the method, dealing with 600 cases treated in his clinic, and the American Academy of Orthopaedic Surgeons (1951) surveyed 700 cases treated by 15 surgeons.

Few reports, however, have been published in this country. Lloyd-Roberts (1951) reported 20 cases, and although many surgeons use the method the recorded cases are few.

Material

At the Redhill County Hospital in the past few years we have been making increased use of the method in recent fractures of the femoral shaft, and we here present a series of 41 cases which have been dealt with since December, 1948, although 30 have been treated since January, 1953, the most recent in February, 1956. There were 26 men and 15 women. The age distribution is shown in Table I. The site of the fracture in 8 cases was the

TABLE I.—Age Distribution

Age No. of cases	-19	20-29	30-39	40-49	50-59	60-69	70-79	80+
	3	13	1	4	2	5	5	8

upper third, in 28 cases the middle third, and in 5 cases the lower third. Six were open fractures and 35 closed. Ten were pathological fractures, of which eight were due to Paget's disease of the bone and two to secondary carcinomatous deposits. All these patients were over 60 years of age. One patient who was operated on in June, 1954, had secondary carcinomatous deposits and two other deposits lower down the femur, without fracture. She is walking and the fracture has united. She has been treated with testosterone.

Union has occurred in all cases that were treated 12 or more months ago, except in one case, and we believe that the more recent cases will also unite satisfactorily.

Knee movements in cases which have united have also been very satisfactory. Table II shows the degree of knee

TABLE II.—Knee Movements in 34 Surviving Patients

Degrees of movement No. of cases	<30	30-59	60-89	90+	Full
	5	5	4	6	14

movements obtained in the 34 cases that have been traced out of the 37 surviving patients. It is interesting to note that in the group of 10 patients who obtained indifferent knee movements—that is, less than 60°—there were five of the eight cases of Paget's disease. Two more had ipsilateral fractures of the tibia, but in three no adequate reason was found for the limitation. In only two cases were hip movements restricted at all.

The average stay in hospital for all cases has been 84 days, which compares favourably with other forms of treatment, particularly when it is remembered that 18 of our patients were over the age of 60 and eight over the age of 80. One patient who had facilities for being nursed at home was allowed out of hospital after 10 days, and started to walk six weeks after the operation.

It is interesting to note that the average stay in hospital of the last 12 patients operated upon was only 32 days and that three of them were octogenarians.

Four of our patients died in hospital. All were over the age of 70. One of these deaths was due to pulmonary embolus the day after operation; one patient with a pathological fracture due to secondary carcinoma died on the logical fracture due to secondary carcinoma and 37th day; and two patients died of bronchopneumonia and 37th day; and two patients died of bronchopneumonia and 37th day. The cause arteriosclerosis on the 37th and the 130th day. No of death in all cases was confirmed by necropsy. One patient has died since June, 1954, and all suitable cases admitted to hospital have undergone operation.

Illustrative Cases

A lorry driver aged 25 had a comminuted fracture of the mid-shaft of the left femur. Some difficulty was experienced in inserting the nail, but eventually good immobilization was obtained. He left hospital eight weeks after operation and, against advice, drove his two-ton lorry

12 weeks after the fracture. He eventually made a good recovery.

A factory hand aged 31 had a transverse fracture of the mid-shaft of the femur which was operated upon on July 30, 1953. He was in hospital for about 12 weeks and returned in May, 1954, complaining that he had slight limitation of abduction of the hip. On May 4 the nail was removed and it was found that consolidation was not complete and the leg bent in bed the next day. On May 6 another nail was inserted, using a guide, and he eventually made a good recovery, although he did not regain full knee movements.

A woman of 80 had an oblique fracture of the upper third. She was very agile for her age and started to walk six weeks after operation. She regained full knee movements, and union occurred within six months.

Operation

We have had no experience of the closed method of inserting the intramedullary nail, with x-ray control, as practised by Küntscher, but have exposed the fracture in all cases, and inserted the nail by the "retrograde" method described by Key and Connell (1951) and also used by Lloyd-Roberts. We have not used the modifications mentioned by Watson-Jones (1955).

If the fracture is a closed injury it may be convenient to immobilize the limb temporarily on a Thomas splint. Pre-operatively it is important to have a knowledge of the length of nail required. A reasonably accurate working method is to hold one end of the nail against the sound greater trochanter and note how far short the other end is from the knee-joint. The width of the medullary canal on the film should also be observed, as occasionally it is abnormally narrow, especially in the middle third, and one of the complications is that the nail impacts into the medullary canal. This can be avoided by taking an x-ray picture of the femora with the nail strapped to the outside of the thigh and measuring the respective width of the nail and medullary canal. A more accurate method is to take scanogram measurements of the medullary canal, but this requires special apparatus.

Blood should be cross-matched in all cases, as in one case hammering on the nail caused shock profound enough to interrupt the progress of the operation. Blood transfusion has not, however, been necessary in every case, but it is wise to remember, as Ogilvie (1955) has stated, that "a man can bleed to death into the thigh muscles round a fractured femur without any free haemorrhage occurring."

It is advisable to have two assistants. If the fracture is an open one, operation within a few hours of the accident is imperative, and undressing and preparation of the patient may be deferred until anaesthesia is induced.

The patient is placed supine, with the injured side as near the edge of the table as possible. A flat sandbag is put under the buttock to tilt the patient towards the uninjured side. After skin preparations, the thigh is painted with "mastisol," and a sterile piece of tubular stockinet is rolled up the limb, which is then passed through the hole of an abdominal sheet. We find that this is a satisfactory method, insuring stable sterile cover while retaining maximum mobility.

If the tibia on the same side is fractured, we plate the tibia first, and then proceed to nail the femur. This occurred in four cases.

The ideal approach to the femur is that described by Henry (1945). An incision is made along the appropriate part of the line from the anterior superior iliac spine to the outer edge of the patella. The rectus and vastus lateralis muscles are identified by the V-shaped interval between them, a handbreadth below the trochanter, and are separated. The vastus intermedius muscle is divided lengthwise, cutting down to the bone. Often the incision can be modified to allow the routine treatment of the wound, but it may be more convenient to explore and close the wound before the normal approach is made.

The upper fragment is then grasped with lion forceps by the operator and delivered from the wound in an adducted position. The first assistant controls the lower fragment while the second assistant adducts the leg strongly across the other. When full adduction has been gained the nail is inserted in the upper fragment and tapped upwards. Should it tend to become impacted it is wise to substitute a narrower nail.

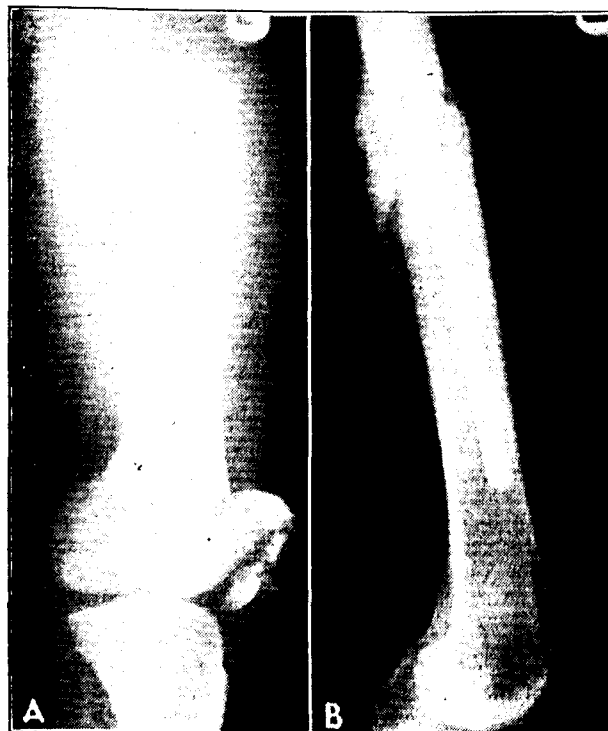


FIG. 1.—A: Showing slight comminution at fracture site and comminuted fracture of patella, which was excised. B: Same case, showing amount of callus formation eight weeks after operation. Patient had returned to work in an office.

We use a nail with an "eye" at both ends to facilitate its later removal. A sterile hacksaw is said to be a face-saving instrument if the nail becomes irretrievably impacted, but we have not had occasion to use one.

The resistance suddenly diminishes as the nail passes through the trochanter. The upper end of the nail can then be felt through the skin and glutei muscles, and a 1-in. (2.5-cm.) vertical incision is made over it. The nail is then tapped further upwards, and guided out of the upper incision with a blunt gouge, rather in the manner of a shoehorn, until the lower end is flush with the distal end of the proximal bone fragment. Full relaxation is now needed. The fracture is accurately reduced by temporarily diminishing the degree of adduction, and a large Lowman clamp, preferably with four blades, is applied. This, in the absence of much comminution, holds the fragments rigidly. The nail is then driven down into the distal fragment until no more than $\frac{1}{4}$ in. (1.3 cm.) protrudes from the trochanter. Careful watch is maintained that the fragments do not become distracted. Only the deep fascia and skin need to be closed, and the wound is covered with a non-encircling adhesive dressing.

Post-operatively the limb needs no external fixation as a rule, but if in comminuted cases it is felt that the internal fixation does not give complete immobility it is then

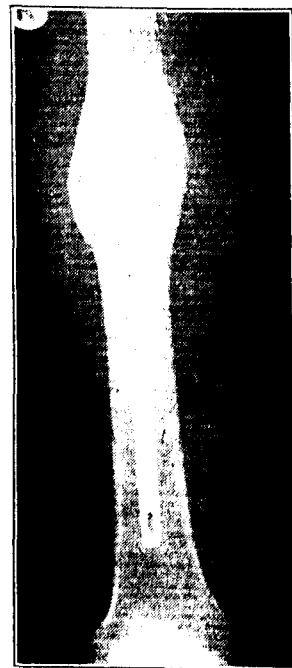


FIG. 3.—Transverse mid-shaft fracture; showing callus formation 12 months after operation.



FIG. 2.—A: Fracture of lower third of femur. B: Same case, showing amount of callus 12 weeks after operation.



FIG. 4.—A: Transverse pathological fracture due to Paget's disease. B: Same case showing union 12 months after operation.

necessary to rest the leg on a Thomas splint for some six weeks. Active exercises are enthusiastically encouraged and the patient is allowed to sit in a chair on the first post-operative day. Normally a young adult can lift his limb off the bed at the end of the first week, and can be discharged home when he is confident in the use of crutches. Weight-bearing is not generally allowed until there is good callus formation, but some of our patients with transverse fractures have borne weight after a fortnight.

Complications

Although Küntscher says "there is no complication of this method," both Böhler (1948) and Stuck and Thompson (1951), in addition to Watson-Jones, list a formidable number of complications and possible difficulties, ranging from instability of fixation to death from fat embolus. We have met with some but by no means all of these difficulties. Slow union has occasionally occurred, possibly because of slight distraction of the fragments. When one of our patients was seen nine months after the operation, he was complaining of pain on abduction of his leg, so the nail was removed. The next day the femur angulated in bed. The following day a larger nail was reinserted along a guide wire from above, and in a few days he was walking and working.

In another case of severe comminution of the femur it was found on x-ray examination after the operation that the nail had not penetrated the distal comminuted fragment, and a further exploration had to be done to correct this. The patient eventually made a satisfactory recovery.

In three other cases nails were removed because of upward displacement, but satisfactory union was obtained in all of them. One of these patients developed some sepsis in her wound, but this eventually cleared up completely. She was an obese diabetic, but did not develop any bone infection.

In the first case in our series the nail bent six weeks after insertion, and was removed at another hospital and a bone-grafting operation done. This case was poorly selected in that the fracture was too near the knee-joint.

In one patient with Paget's disease the nail bent during its insertion when its advancing end encountered sclerosed bone at the site of a previous fracture.

In one patient with Paget's disease, who was allowed to walk before the fracture was completely consolidated, the increased bowing of the femur has caused the nail to break in the centre. He is an old man of 80; he has been given a walking calliper, and manages to get about reasonably well. In other cases of Paget's disease the fracture has united satisfactorily.

In two cases calcification has occurred around the top of the nail above the great trochanter, presumably at the site of a previous haematoma. In both these cases a little pain was experienced, but after removal of the nail (in both cases about two years after the fracture) the pain has been relieved. Removing the nail was not a difficult procedure.

Although we do not advocate insertion of an intramedullary nail in children, we have used it in one case, with a satisfactory result, the nail being removed six months later. The fracture had united satisfactorily.

We have had two cases of wound sepsis; one necessitating removal of the nail, the other being a very superficial infection which did not delay progress.

Discussion

What are the indications for this method? We think that in adults all transverse fractures of the femoral shaft to within 4 in. (10 cm.) of the condyles can be treated with an intramedullary nail. Oblique fractures are not so well controlled as the transverse, but are satisfactory if the obliquity is not more than 3 to 4 in. (7.5 to 10 cm.) in length. Comminuted fractures are also suitable, although the insertion of the nail is more difficult. Eight of our cases showed comminution, two to a serious degree.

The ideal patient is the young healthy adult man with a simple transverse fracture of the midshaft of the femur. In this type recovery is rapid, discomfort and immobilization are less than with other methods of treatment, callus formation is good, and knee movements often return to normal. The method is also of value in old people: in our series eight were over the age of 80. Their nursing is facilitated by the absence of apparatus and splints.

We regard an open fracture seen six to nine hours after the causative accident as suitable for the insertion of a nail. Six of our cases were compound, and on no occasion have we regretted the treatment. In fact, in our hospital the only case of very delayed union after a fracture of the femur in the period under survey was early in this series when we were hesitant to use the technique on a compound fracture.

There is also a place for this method in the treatment of pathological fractures, and in our series there were 10 such. In cases of secondary carcinoma this method gives the patient an easier convalescence than is possible by other methods.

In difficult cases where the femur, tibia, and fibula are fractured on the same side, this is the ideal form of treatment if the tibia is plated at the same time. Four of our cases came into this category, one of them having compound comminuted fractures of the femur and of the tibia and fibula. He was able to return to work as a salesman in a multiple store 24 weeks after his accident.

Conclusion

Our experiences gained from the study of 41 cases of fracture of the shaft of the femur are presented. Watson-Jones gives a salutary warning that "this technique, if applied to improperly selected cases, or if inefficiently or unskillfully carried out, carries more possibility of trouble than any other." We would, however, like to add that we consider that in suitable cases it is at present the ideal form of treatment, and the overwhelming advantages outweigh the disadvantages, some of which we think have been exaggerated.

We are grateful to Mr. N. E. Pitt for allowing us to use the notes of one case operated on by him; to Dr. J. C. Cuthbert, medical superintendent of Dorking County Hospital, for the use of the notes of two cases which were treated at that hospital by one of us; and to Dr. E. Goldsmith for help in the translation of German papers.

REFERENCES

- American Academy of Orthopaedic Surgeons (1951). *Instructional Course Lectures*, vol. 8. Ann Arbor.
- Böhler, L. (1948). *Medullary Nailing of Küntscher*. Baillière, Tindall and Cox, London.
- Groves, E. W. H. (1918-19). *Brit. J. Surg.*, 6, 203.
- Henry, A. K. (1945). *Extensile Exposure*, p. 101. Livingstone, Edinburgh.
- Key, J. A., and Connell, H. E. (1951). *Management of Fractures, Dislocations, and Sprains*, 5th ed., p. 947. Kimpton, London.
- Küntscher, G. (1940). *Arch. klin. Chir.*, 200, 443.
- Lloyd-Roberts, G. C. (1951). *Lancet*, 1, 711.
- Ogilvie, H. (1955). *Brit. Medical Journal*, 1, 160.
- Stuck, W. G., and Thompson, M. S. (1951). *Arch. Surg. (Chicago)*, 63, 675.
- Watson-Jones, R. (1953). *Fractures and Joint Injuries*. Livingstone, Edinburgh.
- et al. (1950). *J. Bone Jt Surg.*, 32B, 694.

The Annual Report of the Institute of Almoners for 1955-6 records that during the year 9 students qualified as almoners through the course in medical social work at the University of Edinburgh, 11 through the Carnegie course in applied social studies at the London School of Economics, and 64 through the Institute's course. All 84 registered with the Institute, and 66 were already in permanent full-time employment when the report was prepared. In 1956 there was an increase of 28 in the total number of almoners employed. There has been a marked increase also in the number of hospitals employing almoners—530 compared with 496 a year ago. The number of vacant posts for almoners is still very high, and the report remarks that it is a serious matter that many senior posts remain unfilled. It is hoped that the Whitley Council will have regard to this when considering almoners' salaries.

Medical Memoranda

Two Children of Same Family Showing Features of Mongolism

Mongolism occurs in all races, though most descriptions have come from Europe or America. It is not uncommon among the Chinese population of Singapore, and we have recently seen two mongols in a single Chinese sibship.

CASE REPORTS

Case 1.—A 2-year-old Chinese girl was admitted to hospital on November 14, 1955, for bronchopneumonia. It was noticed that she had the typical mongoloid facies (Fig. 1). Her eyes were slanting, with prominent epicanthic folds, and a squint was present.



FIG. 1.—Case 1. Mother with her 2-year-old mongol baby. Note the mongolian facies, flat bridge of nose, slanting eyes with squint, and small ears.

The small ears, the flat bridge of the nose, the protruding tongue, and the foreshortened mouth were all characteristics of a mongol. There was a general hypotonia of all muscles. Moist sounds were heard over both lungs. The abdomen was soft, but an umbilical hernia was not present. The liver was enlarged two fingerbreadths. A wide gap was present between the first and second toes and she had a single crease across the palm. The milestones of the child were very delayed. She was first able to lift her head at 10 months and to sit with support at 1 year. The first tooth appeared at 1 year. She was able to stand with support at 2 years but was unable to talk.

Whilst being questioned, the mother casually remarked that her youngest child was also "very soft," and had similar features to the patient. Her three older children, aged 10, 8, and 7, were normal and attending school. The mother is now 44 years of age and the father 46.

Case 2.—The mother was asked to bring her youngest child, a boy aged 1 year. He was noted to have the features

of a mongol, but was even more hypotonic than his sister. He had a small head (circumference, 15 in., 38 cm.) with a very flattened occiput. His eyes were slanting, with marked epicanthic folds; the bridge of the nose was very flat and the tongue protruding (Fig. 2). This child had a large umbilical hernia. No murmur was heard over the heart and the lungs were clear. Although 1 year of age he was unable to lift his head.

Both the mongols were lovable pleasant children and the parents were very fond of them.

COMMENT

The aetiology of mongolism is not fully understood. The relationship of mongolism to twinning indicates that the origin is in the germ cell (Jenkins, 1933). But the association of mongolism with diminished maternal fecundity, as suggested by the age of the mother and the long interval before the birth of a mongol, supports the theory that the mongol is a product of fertilization of the ovum the viability of which is diminished.

This is a rare example of two mongols occurring in the same family.

I thank Dr. C. Elaine Field, paediatric specialist, for her assistance and Dr. R. H. Bland, the Director of Medical Services, Singapore for permission to publish.

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REFERENCE

Jenkins, R. L. (1933). *Amer. J. Dis. Child.*, 45, 506.

Acquired Diverticulum of the Mitral Valve

A woman of 63 sought advice because of severe inflammation of both eyes. She attributed this to putting her head out of the window a fortnight previously in an attempt to obtain relief during an attack of dyspnoea. She was admitted immediately to an eye and ear hospital and treated for seven days for acute iridocyclitis. She returned home and for a time was able to go out for walks, but vision was rapidly lost, and she was certified blind four months after the onset of the disease. During the next year a massive oedema of the legs and ascites developed and she became increasingly breathless. A loud blowing systolic murmur was heard in the mitral area. A diagnosis of mitral incompetence was made, palliative treatment was given, and at the end of the year she died.

Before these disturbances she had been in excellent health, and had never suffered from sore throats or any form of acute rheumatism. The appearance of a severe mitral lesion so abruptly and at such a late age was difficult to explain, and would in fact have remained unexplained had she not died when one of us (J. R.) was on holiday. No certificate could be issued and a necropsy was ordered by the coroner.

NECROPSY REPORT

A thin elderly woman with gross pitting oedema of the lower limbs and vulva and gross swelling of the abdomen. The oedema extended to the back, where extensive blebs were present. Each pleural cavity contained about 30 oz. (750 ml.) of clear fluid and there were dense adhesions at the right base in proximity to an ancient calcified focus in the lower lobe of the lung. The lungs were oedematous.

The heart muscle was pale and flabby but showed no zones of fibrosis. The left coronary artery was partially obstructed by a calcified zone 1 in. (2.5 cm.) from its origin, and the right coronary artery showed confluent fatty patches without obstruction. The heart valves, generally, showed senile opacity and fibrosis. The anterior cusp of the mitral valve was distorted by a pouch large enough to accommodate the tip of the little finger to a depth of over 1 cm. The pouch was directed backwards so that during ventricular systole it would impinge on the posterior cusp as a

rounded ball, leaving a triangular orifice on either side. The texture of the pouch was identical with that of the remainder of the valve cusp.

The liver showed advanced nutmeg change, the peritoneal sac contained 5 pints (2.8 litres) of clear fluid, and there was a cluster of tiny cysts in the head of the pancreas, forming a mass 1 in. (2.5 cm.) in diameter. No other abnormality was found in the abdomen.

COMMENT

Various diverticula have been reported in the left ventricle. Skapinker (1951) describes a congenital diverticulum arising from the apex of the heart and presenting as a pulsating swelling above the umbilicus. A successful excision was carried out. He cites 12 other cases in the literature.

The acquired diverticulum of the muscle wall, the so-called "aneurysm of the ventricle," is due to the progressive expansion of a fibrotic patch derived from obstruction of a branch of the left coronary artery. These lesions may be 4 in. (10 cm.) in diameter, and the condition is termed "bag heart." A full description is given by Friedburg (1950).

The described diverticula of the mitral valve seem to be limited to the pouches occasionally resulting from the destructive inflammation in acute bacterial endocarditis. These are usually mentioned in the formal descriptions given in textbooks of medicine and pathology.

In this case it is clear that the pouch was acquired and not congenital. It can hardly be thought that a woman could pursue an active life for 63 years and only then present symptoms. It is equally clear that she was not suffering from an ulcerative endocarditis. Her illness was protracted and afebrile, and at necropsy the valves were free from vegetations.

There may be an association between the eye condition and the diverticulum. The first symptoms of cardiac disorder appeared during the first days of the iridocyclitis, and it is possible, though it cannot be proved, that the weakening of the valve cusp and the iridocyclitis had a common origin, perhaps infective.

We are indebted to H.M. Coroner for the Craven District, Mr. Stephen E. Brown, for permission to publish this case.

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IAN STEWART, M.D.,
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Keighley.

REFERENCES

Friedburg, C. K. (1950). *Diseases of the Heart*, p. 458. Saunders, Philadelphia and London.
Skapinker, S. (1951). *A.M.A. Arch. Surg.*, 63, 629.

Unilateral Haematocolpos Haematometra

Imperfect canalization of the lower end of the Müllerian duct is the commonest cause of haematogynauios. The latter designation, derived from the Greek forms meaning blood, female, and tube, has been suggested by Alders (1953) as a collective term for the accumulation of blood in a portion or in portions of the Müllerian ducts.

The combination of failure of fusion of the Müllerian ducts resulting in a double uterus and vagina, and unilateral atresia with haematocolpos, haematotrachelos, and haematometra, must be very rare. Few such cases have been described (Purslow, 1922; Wilson, 1925; Simon, 1928; Brown and Brews, 1930; Martindale, 1935; Embrey, 1950). A further case is recorded here.

CASE REPORT

A girl of 12 was referred to the out-patient department of Swanage Hospital because of increasingly severe dysmenorrhoea. Her periods had started six months previously and for the first three months had occurred at two-weekly intervals, and the loss, which lasted five days, was described

as heavy. For the last three months they had occurred at monthly intervals and were associated with pain, chiefly referred to the back, which was increasingly severe with each period.

She was an intelligent well-developed girl. General examination revealed no abnormality of significance. Nothing abnormal was discovered on abdominal palpation, but on rectal examination a tense cystic swelling was found to fill the pelvis. No attempt was made to examine her vaginally. A tentative diagnosis of ovarian cyst was made and a laparotomy advised.

A few days before the planned date of admission she developed difficulty in starting micturition, which was relieved on lying down. She was therefore admitted as an emergency case to the Royal Victoria Hospital, Bournemouth.

Under general anaesthesia the abdomen was opened through a median subumbilical incision. A symmetrical, tense cystic swelling was seen to be rising out of the pelvis. On its top were perched two uteri of approximately normal size, though the left was somewhat larger than the right. Both Fallopian tubes and ovaries were normal. The vesico-uterine fold of peritoneum was incised and the bladder was dissected off this swelling. The latter was incised transversely; about 10 oz. (284 ml.) of viscid dark fluid was evacuated, and it was seen that there were two separate vaginae. The left vagina ended blindly below and was grossly distended. The left cervical canal was gaping, and similar tarry fluid was seen emerging from it. The slightly larger size of the left uterus was obviously due to haematometra. The right vagina was quite narrow, and ended below at a normal hymen. The right cervix was small and admitted a probe. The septum between the two vaginae was resected throughout its length, and the incision in the now single vagina was closed with catgut sutures. The incision in the vesico-vaginal fold was sutured and the wound closed in layers. Vaginal examination whilst the patient was still anaesthetized revealed the presence of a wide single vagina into which two cervixes dipped.

The patient made an uneventful recovery apart from a transient pyrexia (which was thought to be due to the presence of some of the contents of the haematocolpos in the pelvis).

In view of the frequent association of renal with genital malformations an intravenous pyelogram was taken while she was still in hospital. This showed complete absence of excretion on the left side and a slightly enlarged right kidney. The right renal pelvis, ureter, and the bladder appeared normal.

The patient was seen six weeks after the operation, when she had had a painless period of five days' duration.

COMMENT

The diagnosis of haematocolpos was missed because of the absence of the leading symptom of cryptomenorrhoea, the two uteri were not felt on rectal examination because of the presence of the large cystic tumour, and the imperforate hymen on the left side was not seen as no attempt at vaginal examination was made because of her youth.

I should like to express my thanks to Mr. N. Alders, under whose care the patient was admitted and who performed the operation, for permission to publish this report.

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REFERENCES

Alders, N. (1953). *J. Int. Coll. Surg.*, 19, 286.
Brown, R. C., and Brews, A. (1930). *J. Obstet. Gynaec. Brit. Emp.*, 37, 233.
Embrey, M. (1950). *British Medical Journal*, 1, 820.
Martindale, L. (1935). *Lancet*, 1, 1389.
Purslow, C. E. (1922). *J. Obstet. Gynaec. Brit. Emp.*, 29, 643.
Simon, H. E. (1928). *Surg. Gynec. Obstet.*, 47, 356.
Wilson, J. St. G. (1925). *J. Obstet. Gynaec. Brit. Emp.*, 32, 127.

Reviews

THE THYROID GLAND

The Thyroid. Edited by Sidney C. Werner, M.D., Sc.D.(Med.). (Pp. 789+xxii; illustrated. £7 7s.) London: Cassell and Co. Ltd. 1956.

This is unquestionably the best book on the thyroid gland which has so far been published. Despite the fact that 60 authors have contributed, excellent editing has seen to it that the discrepancies and overlapping are few and unimportant. Among the names of the contributors are found those of most of the American experts best known in England, such as Astwood, Bartels, Dobyns, Frantz, Lerman, Naffziger, Rawson, Riggs, Sloan, Smelser, Stanbury, and that of the editor himself. Dr. E. E. Pochin is the sole English contributor, and one of the few criticisms which might be levelled at the book as a whole is that there is, perhaps, a slight tendency to neglect un-American activities in this field.

Here and there the English worker will find himself at variance with his American colleagues. The value of anti-thyroid drugs in the preparation of patients for thyroidectomy is, he will think, insufficiently stressed; and he may be surprised at the high incidence quoted of post-operative vocal-cord paralysis and of permanent hypoparathyroidism—an explanation, perhaps, of the greater popularity of definitive treatment of thyrotoxicosis with antithyroid drugs in some American hospitals. The use of carbimazole is not mentioned, but when the book was written experience of the drug was almost entirely British, and short at that. The rather low quoted incidence of post-operative hypothyroidism pairs with the rather high relapse rate, and might not differ greatly from as wide a survey of British hospitals, but it is curious that there is no mention of the paramount importance of lymphadenoid changes in determining this complication. One is surprised at the high incidence of thyroid "storm" in some hospitals, perhaps resulting from a neglect of preparation with antithyroid drugs; and by the curious statement that "toxic nodular goitre is resistant to all forms of therapy including surgery." But these are niggling criticisms of an outstandingly good book which, despite its high price, is a necessity to everyone interested in thyroid disorders.

RAYMOND GREENE.

PRICE'S MEDICINE

Price's Textbook of the Practice of Medicine. By Various Authors. Edited by Donald Hunter, M.D., F.R.C.P. Ninth edition. (Pp. 1,774+xiv; 63s.) London, New York, Toronto: Oxford University Press. 1956.

Every clinician requires to own one large comprehensive textbook of the practice of medicine—not to read through, but to use as a work of reference. *Price's Medicine* has been regarded for a long time as the standard British work of this type. Many a senior physician, battling with the gathering mists of a middle-aged memory and humiliated by the superior erudition of his registrar, must have made excuses to allow him to be closeted for a time alone with his "Price," confident thereafter of being able to restore the balance of power. The ninth edition of this famous book contrasts very favourably with its immediate predecessor, which had many defects: it is handsome in its proportions; it is well bound and well printed on good paper; and the information which it contains is comprehensive, accurate, and on the whole modern. The work has always been representative of the London School of Medicine, and this tradition has been followed in the present edition. Twenty-four of the twenty-seven contributors (eleven of whom are new to the book) have charge of beds in the London teaching hospitals. The inclusion of a single contributor from St. Andrews (or should it be Dundee?) just enables the book to claim a British rather than a purely

English qualification. The clinical descriptions of the various diseases are almost invariably excellent.

The lack of illustrations is a drawback, particularly in the section on cardiology, for it is very difficult to describe electrocardiograms without giving illustrative examples; but, on the other hand, it must be remembered that there is no comparable work which is so inexpensive, and illustrations would have greatly increased its cost. It is pleasant to find that drugs are almost always referred to by their official names, the proprietary equivalent often following in brackets. The same uniform system might have been adopted with advantage in regard to dosage: a lead should have been given by using the metric system throughout, and when, as in the case of the older drug, use and wont have habituated us to the apothecaries' system, the dose in grains or drachms could have followed the metric dose in brackets. Occasional reversion to Latin—for example, *injectionis insulini protaminati cum zinco*—have a nostalgic bouquet of the '48 rather than of the '53 *Pharmacopoeia*. Here and there the recommended treatment is a little out of date: for example, the emphasis on A.T.S. and the failure to refer to curariform drugs in the treatment of tetanus; the administration of *rectal* salines six-hourly in correcting the electrolyte disturbances of pyloric stenosis; and the lack of any guidance on the indications and contraindications for thymectomy in myasthenia. In the admirable section on diabetes it is surprising to find that several litres of half-normal saline are recommended to be given by *mouth* before emergency operations on dehydrated diabetic patients, and that the foetal loss rate in diabetic pregnancies is still put as high as 40%. These minor criticisms may, however, merely reflect the reviewer's personal prejudices, and Dr. Donald Hunter—the new editor—is very much to be congratulated on producing a work of which British Medicine can once more be proud.

D. M. DUNLOP.

KRETSCHMER UP TO DATE

Medizinische Psychologie. By Ernst Kretschmer. Eleventh edition. (Pp. 382+viii; illustrated. D.M. 29.60.) Stuttgart: Georg Thieme. 1956.

This is a revised and enlarged version of the previous edition. The author has done his best to keep successive generations of readers up to date about progress made in the fields of physiology and medical psychology which he regards as relevant for them. Kretschmer's "Medical Psychology" has from the beginning been a doctor's psychology, written by a physician for physicians, and the author has remained faithful to this purpose ever since this book made its first appearance 35 years ago. He always endeavours to discern the workings of the brain behind the mental activities, and he has a strong tendency to "physiologize" in his psychological concepts. New topics included in this edition are the experimental studies by K. Lorenz and Tinbergen, recent work on constitutional physiology of development, on the biological basis of temperaments, on motor patterns and preformed automatisms, on correlations between body-build and autonomic regulations, and on analysis of psychomotor behaviour with the aid of the writing scales, to name only the most important subjects. A considerable part of the additions refer to work carried out by Kretschmer himself and his co-workers. There is a new chapter on projective tests jointly written with C. Schick; also a brief presentation of the author's views on psychosomatics.

To the medical man this book makes satisfying reading. It demonstrates how much physiology and clinical medicine have already contributed to the basis of mental science. Psychiatrists and psychologists may at times find it somewhat parochial and unduly dogmatic, but it is not primarily addressed to them. This book is unsurpassed as a courageous and consistent presentation of mental activities by a clinician of catholic orientation whose attitude to current trends in present-day medical psychology has been constructive and positive, and who has himself made outstanding contributions to medical psychology.

E. STENGEL.

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PREDNISONE AND PREDNISOLONE

The value of cortisone and hydrocortisone in the control of a wide variety of diseases is now firmly established,¹ but the search has continued for more effective substances with fewer undesirable side effects. Prednisone and prednisolone, which become available to general practitioners on February 1, are the outcome of this search and are synthetic compounds which do not occur in nature. Initially called metacortandracin and metacortandrolone, prednisone and prednisolone are analogues of cortisone and hydrocortisone respectively, from which they differ by having an unsaturated bond between carbon atoms 1 and 2 (Δ^1) in addition to the double bond between atoms 4 and 5. Hence the name delta-steroids, but this and the innumerable trade names are best avoided.

The anti-inflammatory and anti-rheumatic effect of prednisone and prednisolone is about equal to that of cortisone, but weight for weight these compounds are four or five times more active.^{2,3} They are therefore supplied in 5- and 1-mg. tablets so that the smallest effective dose can be prescribed, and this is usually one-quarter or one-fifth that of cortisone. Although more potent, prednisone and prednisolone do not influence conditions unresponsive to cortisone or hydrocortisone, and there is no convincing evidence that they are significantly more effective. Occasional patients respond to the newer steroids after showing little improvement with cortisone or hydrocortisone. This is probably related to the dosage used, though a case of Schönlein-Henoch purpura was reported by A. S. Cohen⁴ in this *Journal* last week in which striking improvement followed administration of prednisone despite the previous failure of cortisone.

- ¹ Bayliss, R. I. S., *Lancet*, 1955, 2, 1078.
- ² Bunim, J. J., Pechet, M. M., and Bollet, A. J., *J. Amer. med. Ass.*, 1955, 167, 311.
- ³ Nabarro, J. D. N., Stewart, J. S., and Walker, G., *Lancet*, 1955, 2, 993.
- ⁴ Cohen, A. S., *British Medical Journal*, 1957, 1, 143.
- ⁵ Cohen, A. S., Clark, C. J. M., and Golding, J. R., *Lancet*, 1955, 2, 998.
- ⁶ Hart, F. D., *British Medical Journal*, 1955, 2, 1263.
- ⁷ Dunlop, D. M., and Gluck, E. J., *J. Amer. med. Ass.*, 1955, 158, 166.
- ⁸ Dordick, J. R., and Barr, J. H., *Stolzer, B. L., Eisenbeis, C. H., and Martz, Margolis, H. M.*, 1955, 158, 454.
- ⁹ E. W., *ibid.*, 1955, 158, 454.
- ¹⁰ Arbesman, C. E., and Ehrenreich, R. J., *J. Allergy*, 1955, 20, 189.
- ¹¹ Barach, A. L., Bickerman, H. A., and Beck, G. J., *Dis. Chest*, 1955, 27, 515.
- ¹² Gordon, D. M., *Arch. Ophthalmol.*, 1956, 41, 593.
- ¹³ O'Rourke, J. F., Isor, G., and Ryan, R. W., *A.M.A. Arch. Ophthalmol.*, 1956, 55, 323.
- ¹⁴ Bunim, J. J., Black, R. L., Bollet, A. J., and Pechet, M. M., *Ann. N.Y. Acad. Sci.*, 1955, 61, 358.
- ¹⁵ Pechet, M. M., *J. clin. Invest.*, 1955, 34, 913.
- ¹⁶ Kupperman, H. S., Blatt, M. H. G., Vesell, M., Gagliani, J., Weisbader, H., and Vosburgh, L., *J. clin. Endocr.*, 1955, 15, 911.

In 14 patients with rheumatoid arthritis F. Dudley Hart and his colleagues⁵ found that 9 preferred prednisone or prednisolone to cortisone, 5 were indifferent, and none favoured cortisone.

The indications for using the new steroids are the same as for giving cortisone or hydrocortisone,⁶ and satisfactory results have been achieved in some cases of collagen disease (rheumatoid arthritis,^{2,5,7,8} scleroderma,⁹ rheumatic fever, disseminated lupus erythematosus), asthma,^{9,10} sarcoidosis, the nephrotic syndrome, blood diseases (leukaemia,³ thrombocytopenic purpura, haemolytic anaemia), ulcerative colitis, and acute gout. Prednisolone has been used topically in the treatment of eye and skin disease,^{11,12} but does not seem to have any clear advantages over the older compounds.

The side effects of prednisone and prednisolone are the same as cortisone and hydrocortisone with the important exception that they cause little or no retention of sodium^{3,13,14} and therefore do not give rise to oedema and hypertension. This makes them less beneficial in the treatment of adrenal insufficiency, but enhances their value in the treatment of patients with coexistent hypertension or incipient heart failure in whom cortisone or hydrocortisone would be contraindicated or would require a stringent reduction in the intake of dietary salt. This failure to induce retention of sodium may make prednisone or prednisolone particularly useful in the treatment of the nephrotic syndrome and of patients with intractable cardiac or cirrhotic oedema unresponsive to mercurial diuretics. While absence of this liability to cause oedema may encourage the prolonged administration of these steroids in high dosage, this will inevitably give rise to undesirable side effects unless care is taken to prescribe the minimum effective dose. Some investigators believe that prednisone and prednisolone are more apt to cause gastric complications (peptic ulceration, haemorrhage, or perforation) and mental disturbances, but this again may be largely a question of dosage. Except to save life, or as a calculated risk, adrenocortical hormones should not be given to patients with a history of peptic ulcer, and all patients should take their main meals at regular intervals and have milk drinks in between. Some authorities recommend the concurrent use of antacids, and a controlled trial to assess the value of this measure in preventing gastric complications is urgently needed.

Treatment with these compounds has its risks, and doctors might feel inclined in most cases to obtain specialist advice first. They are potent inhibitors of the pituitary,¹⁵⁻¹⁵ and by suppressing the release of corticotrophin induce inactivity of the patient's own

adrenals. Hence when treatment is stopped the dosage must be reduced gradually over a period of one to two weeks if dangerous adrenocortical insufficiency is to be avoided. If a patient on adrenocortical therapy needs an operation the dose of hormone must be increased, not decreased. Fear that the wound will not heal is largely unfounded.

PERINATAL MORTALITY

In 1955 stillbirths in England and Wales numbered 15,829, or 23 per thousand live and stillbirths; and there were 9,750 deaths of babies during the first week after birth, or 15 per thousand live births. These figures are a great improvement on those reported in the earlier years of the present century, but they are still a challenge, demanding further study and inviting action. The problem is many-sided; the father, the mother, the placenta, and the foetus all have to be considered, separately and in relationship to each other. And in addition to the medical aspects, whether obstetric, paediatric, or pathological, there are economic, social, nutritional, and human influences to be taken into account. In all the highly civilized countries many studies of the problem have been made, especially during the present century, and it is probable that the further development of modern laboratory techniques will add much information about placental function and the conditions of foetal life. This would indeed be an advance, for the placenta is a dead organ when it comes into the light of day, and the baby has had nine months of active life before he can be subjected to the standard methods of medical examination. It is no wonder that even the most experienced observers sometimes disagree about the significance of their findings, both clinical and pathological.

The usual pattern of recent studies on stillbirths and deaths in the first week after birth—perinatal mortality—has been to correlate the obstetrical condition of the mother during her pregnancy and labour with the clinical and pathological findings in the child, and so to reveal, whenever possible, the sequence of events leading up to the death of the child. As V. M. Crosse and J. M. Mackintosh¹ emphasized, the situation in a whole community should be studied over a period of years if we are to get a true picture of what is happening. But a detailed review of

perinatal mortality occurring in a single maternity unit can supply valuable information, and the recent survey in this *Journal* by J. P. Bound, N. R. Butler, and W. G. Spector² of 406 necropsies performed on babies stillborn or dying within a week of birth is to be welcomed. The cases were in two groups, the larger consisting of 337 babies (185 stillbirths and 152 neonatal deaths) born at University College Obstetric Hospital between January, 1948, and September, 1955; while the remaining 69 necropsies were on babies which had been admitted to the U.C.H. Premature Baby Unit from outside sources. As the total number of births during the period was 10,028 it must be assumed that the stillbirth rate at University College Hospital is unusually low or that about 50 stillbirths did not come to necropsy.

The results of the investigation emphasize certain facts which are now generally recognized. For instance, maternal toxæmia and hypertension, antepartum haemorrhage, and high maternal age are considerable threats to the child before birth; premature birth, multiple pregnancy, complicated vaginal delivery, and perhaps post-maturity carry danger during the baby's birth and in the neonatal period. In order to combat these potential threats to the child's life we need to understand the nature of the obstetrical conditions mentioned, how they arise, and the mode of their influence on the child before, during, and after birth. It is with this aspect—the effects upon the foetus and baby—that Bound and his colleagues are mainly concerned, and they introduce a classification comprising eleven groups of "causes of death," which are subsequently correlated with the mothers' clinical state and certain features of their pregnancies and labours. Anyone who has attempted a study of this kind will appreciate the problems that the authors had to face, not only in interpreting their clinical and pathological findings, but in deciding which of several potential threats was to be regarded as the most probable cause of death.³ A pertinent letter from Professor Dugald Baird appears at p. 224 this week. Any significant reduction in perinatal mortality will be achieved mainly by concentrating attention on (1) stillbirths and premature births occurring unexpectedly during a pregnancy that is apparently normal; (2) the prevention of anoxia and birth trauma; (3) the treatment of neonatal asphyxia; and (4) the prevention and treatment of antenatal and intra-natal infection, especially pneumonia.

Bound and his colleagues favour the hypothesis of placental insufficiency to account for some at least of the unexplained intrauterine deaths. P. Malpas⁴ has recently criticized this theory, and there can be no

firm conclusion until more is known of placental physiology and pathology. But this should not interfere with measures to improve and extend antenatal care, especially in regard to toxæmia and hypertension, which in Bound's series were associated with 44% of the antepartum deaths with maceration only and 42% of the antepartum deaths showing evidence of asphyxia. Perhaps more could be done, through the various social services, to ensure that medical advice given to the pregnant woman who remains at home can be put into effect. Moreover, multiparae who are aged 40 or over and women who have lost previous children have a perinatal mortality rate twice as great as that of other mothers; but they have their babies in hospital less often than the average.⁵

There is still much confusion about the interpretation of the various pathological changes found in the lungs of the premature, birth-injured, and asphyxiated babies, and their clinical differentiation is most difficult, as Bound and his colleagues point out. The treatment of neonatal asphyxia has improved in recent years, but emphasis must still be placed on its prevention, and on such steps as may be taken to lessen the danger of infection of the child during birth.^{6 7}

Even when unavoidable causes of perinatal mortality are omitted—for instance, congenital deformities and stillbirths due to haemolytic disease—we are left with a considerable problem not only of mortality but of morbidity in some of the survivors. In no field of medical work is it more necessary to secure full co-operation, as Clement Smith⁸ has indicated. There must be, he said, joint obstetrical and paediatric responsibility for the foetus and infant, not obstetrical interest and responsibility merely until the infant is born, and paediatric interest and responsibility only after birth. "One of the best ways of promoting this joint interest is by regular foetal mortality conferences employing good autopsy studies of both stillborn and neonatally dead infants, and never evading the question: How could we have done better?"

THE BLACK SHEEP

Readers who like to look at the weekly notifications and graphs of infectious diseases in the *Journal* have in recent years been greatly puzzled by the paradox of an intestinal infection with a spring prevalence and an ever-increasing incidence despite steady improvements in housing, nutrition, and hygiene. This infection, bacillary dysentery, attracted attention in our editorial column in 1937¹ when the first considerable increase in notifications occurred and the name Sonne

dysentery began to be used. The 4,119 notified cases of that year have been multiplied nearly tenfold to become over 36,000 in 1955, and the yearly notifications have looked like the successive epidemic waves of an incoming tide which gets bigger and bigger² with no indication that the peak has yet been reached. Dr. Ian Taylor, in his presidential address to the Section of Epidemiology and Preventive Medicine of the Royal Society of Medicine, had a curious story to tell of this "black sheep," as he called it, because of the embarrassment it causes to its guardians—the medical officer of health and his colleagues. The increase appears to be real and not just apparent. It has been said by a sceptic that the incidence of various infectious diseases has steadily increased with the growth of the Public Health Laboratory Service, which might mean that the bacteriologist is helping to uncover infections which before were not officially noticed. This cannot explain the epidemiological behaviour of Sonne dysentery with its peaks of prevalence and intervening troughs. The P.H.L.S., besides filling other gaps in the epidemiological picture, has shown that nowadays over 95% of the notified cases of bacillary dysentery are due to the Sonne bacillus. Moreover, it is certain that despite improvements in diagnosis only a fraction of the total cases are being officially notified. Other curious features of Sonne dysentery, discussed by Taylor, are the shift in prevalence from rural to urban areas, the disappearance of an earlier autumn hump, and the change in age incidence from the pre-school to the young school child. The shift from country to town, which has been noted in some infections with a declining incidence, was not due to the post-war return of evacuated children, but may be related to a change in the mode of spread of Sonne dysentery from a food-borne to a direct-contact infection. Although explosive food- or water-borne outbreaks of Sonne dysentery have never been common, the incrimination of food as a vehicle has been less frequent in the past ten years (six reported episodes) despite increasing prevalence than in the previous decade, when 41 food-borne outbreaks were reported. During the earlier period there was, besides the main peak in March, a secondary peak of prevalence in the autumn, which is the traditional season for the enteric food-borne infections. This secondary peak has now disappeared.

So we come to the principal paradox of an intestinal infection with a winter prevalence, resembling

¹ Crosse, V. M., and Mackintosh, J. M., in *Recent Advances in Paediatrics*, ed. Douglas Gairdner, London, 1954.

² Bound, J. P., Butler, N. R., and Spector, W. G., *British Medical Journal*, 1956, 2, 1191, 1260.

³ Mills, W. G., *Ibid.*, 1957, 1, 103.

⁴ Malpas, P., *J. Obstet. Gynaec. Brit. Emp.*, 1956, 83, 199.

⁵ Heady, J. A., and Morris, J. N., *Brit. J. prev. soc. Med.*, 1956, 10, 97.

⁶ Harnaes, K., and Torp, K. H., *Arch. Dis. Childh.*, 1955, 30, 99.

⁷ Smith, J. A. McC., Jennison, R. F., and Langley, F. A., *Lancet*, 1956, 2, 903.

⁸ Smith, C. A., *Pediatrics*, 1955, 10, 254.

¹ *British Medical Journal*, 1937, 2, 1176.

² *Ibid.*, 1955, 1, 401.

³ Glover, A., *Monthly Bull. Minist. Hlth (Lond.)*, 1947, 8, 46.

⁴ Hutchison, I., *Ibid.*, 1956, 19, 110. See *British Medical Journal*, 1956, 2, 410.

⁵ Fairbrother, R. W., *British Medical Journal*, 1944, 2, 489.

measles epidemiologically rather than enteric fever. But this paradox is not perhaps so strange and certainly not unique, for, while respiratory infections occur predominantly in the winter and intestinal infections in the summer, there are many exceptions, and we are learning that each specific infection has its own mode (or modes) of spread. Thus it seems unlikely that, despite their seasonal correlation, measles and Sonne dysentery are spread by the same routes while, on the other hand, poliomyelitis and Sonne dysentery have epidemiological features in common and may be similarly spread, though they are seasonally distinct. Taylor showed that for the country as a whole and for London in particular the distribution of Sonne dysentery is correlated to some extent with industrialization and overcrowding, which fits the view that close contact is an important factor in the spread of the disease. It should be noted, however, that the incidence in any town may vary considerably in different years, which may be related to the development of immunity, an aspect of Sonne dysentery about which little is known.

What of the changing age incidence? Sonne dysentery used to be predominantly an infection of the age group 1-5 years. As Alison Glover has said, "The scourge of armies had become the bane of nurseries."³ But to-day it causes most trouble in the primary departments of schools. In 1955 more than half the total notified cases were in the age group 5-14 years, and the rate in this age group has now risen to about half that in the pre-school child. There is no evidence that this increase is related to the increasing provision of school meals, since school outbreaks do not occur explosively. Rather it may be a reflection of the poor sanitary arrangements in many schools and the likelihood of transmission via contaminated water-closets for which there is now good laboratory evidence.⁴ That the school is a breeding-ground for this as for many other infections is supported by the sharp fall in incidence during the Easter vacation with a secondary rise in the summer term. Can it be that this rising incidence in the school years is an indicator of improving hygiene in the home while school sanitation lags sadly behind? An analogy might again be sought with poliomyelitis.

What are the medical authorities to do about this increasing nuisance? The good advice and training to wash the hands after use of the lavatory is of little value to schoolchildren when facilities for hand-washing are so woefully inadequate; and in any case the child may have become infected from handling a contaminated lavatory seat before he (or she) can perform this good social custom. Improved designs of W.C.s to prevent the upward splash and the use of plastic seats which might themselves be antiseptic need consideration. Spread of infection occurs most readily from the acute case, and both the family and the

family doctor might be taught to regard the case of diarrhoea in the young child more seriously and urgently so that early treatment with sulphonamides or streptomycin or both is given. Here the bacteriologist with his enrichment and selective-culture media has perhaps done a disservice by attracting too much attention to the convalescent and symptomless carriers. For example, a recommendation that 6-12 consecutive negative cultures should be obtained before a patient with bacillary dysentery is discharged from hospital⁵ is hardly a practical proposition; indeed it would be better not to send children with Sonne dysentery to hospital at all except where home conditions warrant it. The sulphonamides had major victories against epidemic meningitis and bacillary dysentery in the second world war. Perhaps they or some other intestinal antiseptic could stem the rising tide of Sonne dysentery in times of peace.

CANCER OF THE BLADDER AND TOBACCO

Interest in the aetiology of cancer of the bladder has recently been renewed by the observation that it is one of the few organs in which cancer appears to be becoming more frequent. The most convincing data have come from Denmark, where J. Clemmesen and A. Nielsen¹ reported that the incidence of carcinoma and papilloma of the bladder among men almost doubled between the years 1943-7 and 1948-52 in the capital, but that in provincial towns and in the rural areas the increase in incidence was slight; among women, on the other hand, no increase was observed at all. In Britain data are not available in such detail, but R. A. M. Case² has shown that the male mortality from the disease has been steadily increasing while the female mortality has been practically constant. Such trends might readily be explained if it were shown that there had been a marked increase in the industrial uses of β -naphthylamine and of the other dye-stuffs known to produce cancer of the bladder, but the trends, though less marked in degree, are so similar in type to those which have been reported for cancer of the lung that it is natural to ask whether they might not be in part explained by the existence of a common cause for the two types of cancer. This concept is supported by the experimental data of L. R. Holsti and P. Ermala,³ who found that 75% of mice which had been treated with tobacco tar intraorally developed papillomas in the urinary bladder, while no such tumours were found in an untreated control group.

Direct evidence of an association between tobacco smoking and bladder cancer in man has now been reported by A. M. Lilienfeld, M. L. Levin, and G. E. Moore⁴ from an analysis of the records of the Roswell Park Memorial Institute, Buffalo, U.S.A. At this institute smoking histories have been taken as a routine

¹ Clemmesen, J., and Nielsen, A., *Danish med. Bull.*, 1956, 3, 33.

² Case, R. A. M., *Brit. J. prev. soc. Med.*, 1956, 10, 172.

³ Holsti, L. R., and Ermala, P., *Cancer*, 1955, 8, 679.

⁴ Lilienfeld, A. M., Levin, M. L., and Moore, G. E., *Arch. intern. Med.*, 1956, 98, 129.

⁵ Hamtoft, H., and Lindhardt, M., *Danish med. Bull.*, 1956, 3, 188.

on admission from all patients since 1945, and data are therefore available for comparison between patients with many different diseases. In their study the smoking histories of 321 men with bladder cancer were compared with those obtained from 39 men proved to have benign bladder diseases, 337 men without any recognized pathological lesions, 287 men with prostatic cancer, and 306 men with lung cancer. After making allowance for differences in the age distribution of the groups it was found that more of the men with bladder cancer had been smokers than of the men with benign bladder disease, no disease, or prostatic cancer (85% against 78%, 71%, and 78% respectively); that more of the bladder cancer patients had smoked cigarettes (61% against 37%, 44%, and 42%); and that more of the cigarette smokers with bladder cancer had smoked for 30 or more years (49% against 36% each for men with no disease and men with prostatic cancer). These differences are all statistically significant, but in no case were the proportions of the various types of smokers as high as those found among men with cancer of the lung—75% of whom, for example, had smoked cigarettes for 30 or more years. Among women, on the other hand, comparisons between the smoking habits of patients with and without bladder cancer failed to show any appreciable differences at all.

The data, taken in conjunction with the results of the animal experiments and the observed trends in the incidence of the disease, are certainly suggestive of a cause-and-effect relationship between cigarette smoking and bladder cancer. Such a relationship might, moreover, explain some of the greater incidence which has been reported in Copenhagen compared with the rural districts of Denmark, since cigarette smoking in Denmark is much commoner in the capital than in the countryside.⁵ Nevertheless, it would be premature to conclude that a relationship had been established. It will be necessary to explain why no relationship is observed in women and why cigarettes should be more harmful than other forms of smoking. Explanations for both these anomalies are possible, but first it would be desirable to check the findings with other series and, in particular, to see whether a similar relationship is found in prospective studies.

HEART-LUNG MACHINES

Progress in the development and application of the mechanical pump-oxygenator or artificial heart-lung apparatus continues, and experience with its use in the human subject is being gained, principally as an aid to open cardiac surgery. Most reports have come from the United States, where many machines are in use and where an appreciable number of human operations have been reported, as well as innumerable animal experiments. In Britain the apparatus described by D. G. Melrose in this *Journal* in 1953¹ has been further developed and is now in commercial production. It is still to be considered a piece of research equipment. In several British centres many operations on animals have been performed, and a very few on human patients. Many problems remain to be solved; a considerable proportion of the animals die

from unexplained causes, for instance, but as experience increases the proportion lessens.

The pumps replace the heart and the oxygenator the lungs. In Melrose's apparatus the pumps are soft plastic tubes which are squeezed between metal plates with an undulating motion. This is imparted by cams, which are shaped so as to imitate the time intervals of the heart with a filling period longer than the ejection period. The speed and stroke volume can be varied as necessary. Valves which open for appropriate periods ensure flow in the right direction. Other machines have different pumps, but the principle of pressure on soft tubing is usually invoked because it causes less haemolysis than other forms of pump. The venous pumps withdraw blood from cannulae in the great veins and from the interior of the right atrium, and pass it to the oxygenator. In Melrose's machine this consists of a tilted cylinder which rotates; blood enters the upper end and flows by gravity, coming into contact with moistened oxygen. The surface area in contact is made large enough by numerous projecting baffles of a special shape. Other types of oxygenator are the stationary vertical screen of J. H. Gibbon,² where the blood flows smoothly down screens, and the bubble type, where oxygen is bubbled through the blood, no large surface being necessary. The oxygenated blood is then returned to the patient's circulation by an arterial pump through a cannula, usually inserted in a subclavian artery so as to supply the aorta and coronary arteries. To ensure coronary flow the aortic valve must be competent. Electronic devices control the pressure in the hydraulic circuit and keep the blood volume constant.

A valuable aid to the use of extracorporeal circulation is the ability to arrest and restart the heart at will.³ Injection of potassium citrate solution into the coronary vessels causes immediate arrest in diastole. Normal beat is restored by washing out the potassium. Full recovery can probably take place after a period of arrest of up to about twenty minutes. While the heart is arrested no coronary circulation is necessary.

One possible field of use for the pump-oxygenator⁴ is in the treatment of reversible acute heart failure, in the same way as the artificial kidney is used for acute renal failure. No doubt death could thus be averted in certain cases of coronary thrombosis. The great practical difficulties remain of recognizing the suitable case and of bringing and attaching the machine to the patient. So far extracorporeal circulation has largely been used to allow operations on the open heart under direct vision, particularly for the correction of congenital defects not amenable to closed cardiac surgery. J. W. Kirklin, D. E. Donald, and their colleagues⁵ from the Mayo Clinic, Minnesota, have briefly reported forty human operations with the aid of a Gibbon-type pump-oxygenator. In every case the perfusion was maintained satisfactorily for as long as was necessary for the intra-

¹ Melrose, D. G., and Aird, I., *British Medical Journal*, 1953, 2, 57.

² Miller, B. J., Gibbon, J. H., and Fineberg, C., *Med. Clin. N. Amer.*, 1953, 37, 1603.

³ Melrose, D. G., Dreyer, B., Bontall, H. H., and Baker, J. B. E., *Lancet*, 1955, 2, 21.

⁴ *British Medical Journal*, 1954, 1, 1310.

⁵ Kirklin, J. W., Donald, D. E., Harshbarger, H. G., Hetzel, P. S., Patrick, R. T., Swan, H. J. C., and Wood, E. H., *Ann. Surg.*, 1956, 144, 2.

⁶ Dubost, Ch., et al., *Brit. Heart J.*, 1957, 19, 67.

cardiac procedure—in one case forty-five minutes—and in every case except one the heart resumed its normal function immediately the extracorporeal circulation was discontinued. In the one, ventricular fibrillation occurred; normal rhythm was restored after further perfusion. The apparatus is apt to cause haemolysis and excessive post-operative bleeding, but this was seen in only one of these forty patients. There were no other serious sequelae. Twenty-four of the patients survived; they had a variety of cardiac lesions and some were critically ill with intractable heart failure. Twenty-one of the forty patients had ventricular septal defects; seventeen of these survived. Another recent report,⁶ from a team of French workers, describes open-heart surgery with the help of a pump-oxygenator in five cases of septal defect. Two of the children survived.

It seems likely that in the near future the artificial heart-lung machine will allow certain cardiac operations to be carried out which at present are not feasible. These include the complete correction of Fallot's tetralogy—one of the commonest congenital lesions, which present operations either add to (Blalock's operation) or partially correct (pulmonary valvotomy); the repair of other forms of ventricular septal defect and of certain atrial septal defects; and perhaps the correction of the less common abnormalities such as transposition of the great vessels. Open cardiectomy offers greater promise for the repair of incompetent rheumatic valves than present techniques.

LUMP IN THE THROAT

Most patients who complain of a lump in the throat refer to a subjective sensation somewhere in the cervical viscera or in the midline of the neck, though occasionally one who uses the expression refers to what is an obvious lump in the neck. Among those who complain of this symptom in the throat is a minority in whom it may be the only warning of serious organic disease in the upper respiratory or alimentary passages, and it is not difficult to underestimate the significance of the symptom in this group. Consequently every case requires careful interpretation, followed by a diligent examination until a precise diagnosis can be made. If this cannot be established with confidence by simple means, patients of an age when they are subject to cancer are best referred to a specialist department for further clinical, radiological, and direct endoscopic examination without delay. The sensation of a lump in the throat, often accompanied by other paraesthesiae and a variable degree of dysphagia, may indeed be the first symptom in cancer of the tongue, tonsils, pharynx, extrinsic larynx, oesophagus, or thyroid gland. Early diagnosis is thus essential. Too often these patients present themselves for treatment with what has become a lump in the neck, when both treatment and prognosis are altered.¹

While the occasional benign tumour or foreign body may also cause this type of pharyngeal discomfort, there are many more patients with the same sensations derived from lingual tonsillitis, chronic pharyngitis, and similar conditions producing an excess of mucus or mucopuru-

lent secretion in the hypopharynx. Chronic suppuration in one or more of the paranasal sinuses is well known to be often associated with any of these troubles. In a recent paper C. P. Mills has drawn attention to this,² stating that six out of ten patients who attended hospital complaining of a lump in the throat were found to have pus in their maxillary antra on proof puncture. All symptoms disappeared when the sinusitis was cured.

Finally comes a large group of patients whose complaint of a lump in the throat is an expression of some form of neurosis. It may often be aggravated by chronic ailments such as tuberculosis, anaemia, or dyspepsia.³ Hysterical symptoms of the same type may also develop in patients subjected to particular physical or emotional stress, sometimes in women at the menopause, and in many people as an expression of cancer-phobia. In a few of these patients it may even be possible to demonstrate actual spasm of the pharyngeal muscle or more rarely of the glottis. The correct treatment in some of these cases may amount to no more than sympathetic explanation and reassurance.

HUNGARIAN REFUGEES

Among the many thousands of Hungarian refugees who have reached Great Britain are 61 members of the medical profession, among them two medically qualified dental specialists. Doctors here have been generous in their response to help, and in addition the B.M.A. has acted on behalf of its members by permitting the expenditure of over £500 on the 53 of these doctors who sought its aid. The Association's International Medical Visitors Bureau, apart from helping financially, is keeping in constant touch with the doctors, either personally or by post, arranging for their accommodation and in some cases for them to attend hospital so that they can keep in touch with their professional work. A few have been able to obtain temporary hospital appointments while awaiting passage to another country. About twenty have so far expressed a wish to remain in Britain; twenty-six wish to go elsewhere, usually one of the Dominions or the U.S.A.; and the intentions of the remaining thirteen are at present unknown. Permanent registration to practise in this country nowadays presents considerable difficulties to the foreigner, especially to one who must also learn our language and support himself and perhaps a family meanwhile. Apart from passing at least one set of examinations, he is bound by law to spend a year in pre-registration house appointments. The Ministry of Health, among other bodies, is considering how best to help the refugees over these obstacles. Doctors individually can help mainly by offering accommodation, for it is naturally hard to come by. If it is in the London area, so much the better; the refugees are then enabled more easily to attend lectures and keep in touch with organizations assisting them. At present a few are fortunate enough to be living with relatives, but most are condemned to a makeshift existence. A temporary home can do much to relieve their plight, and offers will be welcomed by Brigadier H. A. Sandiford, Director of the International Medical Visitors Bureau, B.M.A. House, Tavistock Square, London.

CELLULAR BIOLOGY, NUCLEIC ACIDS, AND VIRUSES

CONFERENCE IN NEW YORK

[FROM A SPECIAL CORRESPONDENT]

In New York, from January 7 to 9, the New York Academy of Sciences held an international conference on cellular biology, nucleic acids, and viruses. The conference, made financially possible by anonymous friends, was a 65th-birthday tribute to a notable American—Mr. BASIL O'CONNOR—for his services to science, medical education, and human health and welfare. Mr. O'Connor has been president of the National Foundation for Infantile Paralysis since 1938. During this time he has accumulated princely sums for work on poliomyelitis and other viruses. Appropriately, therefore, pride of place on the first day of the conference went to poliomyelitis.

In its scope the conference programme illustrated the view, expressed by Burnet,¹ that virus investigation is now at a point where virology is ripe for integration into the structure of general biological theory. First to be discussed at the meeting was the latest triumph of applied virology in relation to poliomyelitis; then the programme committee clearly had it in mind to educate virologists and point them to the future by reviewing present biochemical knowledge of nucleic acids, the conditions of cell life in the test-tube, and the promising results of the application of tissue-culture methods to the study of human viruses. Only the future will reveal the success of bringing together workers from such different fields.

Prevention of Poliomyelitis

The conference opened, under the chairmanship of Dr. J. ØRSKOV (Copenhagen), with a review of the present position of work on immunization against poliomyelitis. After a comprehensive account of the pathogenesis of the disease by Dr. D. BODIAN (Baltimore), whose work has so fruitfully provided much of the theoretical approach to artificial immunization, Dr. J. E. SALK (Pittsburgh) spoke at length on the principal factors concerned in the preparation of his vaccine. He described the influence of changes in methods of culture, inactivation, and filtration on the final production of a safe and potent inactivated vaccine, and the effect of different doses of it in those both with and without previous experience of the virus. Dr. Salk mentioned attempts to substitute monkey-heart cells maintained by continuous artificial cultivation for the present wasteful use of monkey kidneys, with all its attendant disadvantages. Current progress in the use of inactivated vaccine in the U.S.A. was reviewed by Dr. A. D. LANGMUIR (Atlanta), who stated that their experience in 1956 indicated continued effectiveness and safety. A sharp outbreak of the disease in Chicago with 1,100 cases led to mass inoculation with over a million doses of vaccine. There was no sign that this had provoked disease, but nor had it clearly interrupted the course of the epidemic. The principles that should govern a field trial of polio vaccine were enunciated by Professor T. FRANCIS (Ann Arbor). Experience in Canada, Denmark, South Africa, and Great Britain was referred to by Dr. R. D. DEFRIES (Toronto), Dr. H. VON MAGNUS (Copenhagen), Dr. J. H. S. GEAR (Johannesburg), and Professor A. BRADFORD HILL (London). Dr. J. E. SMADEL (Washington) commented that even after two doses of present-day commercial vaccine antibodies sometimes failed to appear in children with no pre-existing antibodies to any of the three polio-viruses. This might be due to the current tendency to render vaccine safe by emphasis on repeated filtration, with consequent loss of antigenicity. Steps were now being taken to replace Mahoney with a less virulent type I virus,

¹ Burnet, F. M., *Principles of Animal Virology*, 1955. Academic Press Inc., New York

but these were not yet complete. A potency test using chicks appeared more promising than the usual monkey test.

Live Vaccines

Living attenuated polio virus was the subject of papers by Dr. A. B. SABIN (Cincinnati), Dr. H. KOPROWSKI (New York), and Professor G. W. A. DICK (Belfast). Dr. SABIN referred to the latest ways of purifying attenuated viruses by terminal dilution and by passage from single plaques on monolayer layers of tissue cultures. He considered that highly attenuated strains of all three types of virus were now available for study in man by oral feeding. The antibody formed as a result of natural infection or after such feeding appeared qualitatively different from that produced by inactivated vaccine. Professor DICK referred to the studies of Dr. Koprowski's attenuated rodent-adapted types I and II virus recently performed in Belfast and described in the *British Medical Journal* on January 12, p. 59. The viruses went in like lambs and came out via the stools like lions. They underwent an increase in capacity to produce paralysis in monkeys, and became not far removed from wild viruses. One family group had suffered contact infection from a child excreting the type I virus. There were no adverse clinical effects in these trials. Dr. KOPROWSKI, on the other hand, had obtained no evidence of altered virulence of his type I virus after three serial passages by oral feeding and recovery from the stools.

Professor J. R. PAUL (Yale) then referred to the oral use of Dr. Sabin's attenuated viruses as a method of boosting immunity in subjects previously immunized with Salk vaccine. The ease with which alimentary infection could be established in Salk-vaccinated subjects suggested that the Salk vaccine induced a different type of immunity from that following natural infection. Spread of excreted virus had occurred among children in an institution for the mentally defective. Other speakers, including Dr. R. DULBECCO (California), Dr. R. E. SHOPE (New York), Dr. P. LÉPINE (Paris), Dr. J. P. FOX (New Orleans), and Professor C. H. STUART-HARRIS (Sheffield), discussed the hazards and benefits from the oral use of living attenuated virus, and agreed that there was probably still much to be learnt on the subject.

Nature of Viruses

Nucleic acids now held the centre of the stage, and Dr. F. H. C. CRICK (Cambridge), Dr. M. H. F. WILKINS (London), and Dr. A. RICH (Washington) gave a masterly exposition of the structure of both deoxyribonucleic acid (D.N.A.) and ribonucleic acid (R.N.A.), as shown by x-ray crystallography. The double-chain helical configuration of D.N.A. was also thought to hold for R.N.A. and for synthetic ribopolynucleotides synthesized by Professor S. OCHOA (New York), using enzymes derived from bacteria. Tobacco mosaic virus (T.M.V.), being separable into nucleic acid (R.N.A.) and protein moieties, is a particularly fruitful source of material for investigating the relation between nucleic acid and virus activity. Dr. H. L. FRAENKEL-CONRAT (California) has now succeeded in showing that the nucleic acid alone, without the protein, carries not only the genetic information required for the replication of T.M.V. but also its infectivity. The smallest infective particles have a molecular weight of about 200,000–300,000. Improved methods of reconstituting T.M.V. from segregated R.N.A. and protein were now possible. In the presence of pyrophosphate or other metal chelating agents, as much as 30 to 50% of the viruses' original infectivity could be obtained in its reconstitution from R.N.A. and protein. Meanwhile the position of the R.N.A. within the rod-like protein particle was described by Dr. ROBLEY C. WILLIAMS (California) as a coaxial core. Infectivity experiments with sonically dispersed T.M.V. suggested that the R.N.A. did not extend throughout the whole length of the rod. Dr. B. COMMONER (St. Louis) suggested that the protein exerted an influence on the infectivity of R.N.A., perhaps because it created a strong configurational

¹ Martin, H., and Romieu, C., *Postgrad. Med.*, 1952, 11, 491.

² Mills, C. P., *J. Laryng.*, 1956, 70, 530.

³ Thomson, St. C., and Negus, V. E., *Diseases of the Nose and Throat*, 6th ed., 1955, London.

effect. He showed that the lesions produced by R.N.A. alone might be recognizably different from those of the complete virus. Discussion of these fascinating findings by Dr. N. W. PIRIE and Dr. F. C. BAWDEN, of Rothamsted Experimental Station, led to the conclusion that Nature was not designed for the convenience of biochemists, but they agreed that the segregated ribonucleic acid was infective.

Papers dealing with the nucleic acids of bacteriophage and of the mammalian cell by Dr. A. D. HERSHEY (New York) and Dr. A. E. MIRSKY (New York) brought D.N.A. to the fore, and led to an account by Dr. G. B. BROWN (New York) of attempts to block nucleic-acid biosynthesis by the use of purine and pyrimidine analogues. Metabolic analogues incorporated into the virus during synthesis sometimes succeeded in blocking infectivity, but unfortunately they were often toxic for the host cell.

Malignant Change in Tissue Culture

The mammalian cell as studied in cultures derived from single cells by Dr. T. T. PUCK (Colorado) now received the attention of a number of speakers who introduced the subject of malignancy. Under the able chairmanship of Dr. E. W. GOODPASTURE (Washington), speakers, including Dr. R. C. PARKER (Toronto), Dr. R. S. CHANG (Boston), Dr. J. T. SYVERTON (Minneapolis), Dr. L. L. CORIELL (New Jersey), and Dr. ALICE E. MOORE (New York), reviewed evidence for and against the suggested malignant transformation *in vitro* of epithelial cells derived from normal tissues. In addition to their resemblance to malignant cells in rate of growth, morphology, and biochemical characters, the chromosomes of the altered normal cells numbered 70-80 instead of the usual 42-46. Inoculation into rats treated by x-ray irradiation and cortisone led to the formation of tumours. Unlike the tumours induced by Hela cells originally derived from carcinoma, the normal tissue-culture lines underwent central necrosis and regression. They would not grow as did Hela cells in the peritoneal cavity of rats.

Dr. MOORE described the results of inoculating human volunteers with cells derived from Dr. Chang's normal conjunctiva and liver cells, and also with seven lines of cultures derived originally from malignant tumours. Patients with cancer supported the growth of implanted cancer cells, and subcutaneous nodules were also obtained with the cultures of normal cells. The latter nodules were morphologically similar to epithelial carcinoma, but did not form in as high a proportion of instances as with the cancer lines. On the other hand, normal human volunteers without cancer did not support the growth of Dr. Chang's cell cultures; any nodule which formed underwent subsequent regression; and only known tumour lines yielded growths. The reassuring results of these researches were somewhat dashed by Dr. H. S. GINSBERG (Cleveland), who reported on rats inoculated with cells derived from the epithelial-like outgrowths from human adenoids and tonsillar tissue. Serial passages for 14 months maintained cell-cultivation, and tumours were obtained with these cells in rats which underwent growth as rapidly as those from Hela cells. Regression did not occur, and subcutaneous tissue or glands were sometimes invaded.

Tissue Culture in Virology: E.C.H.O. Viruses and the Adenoviruses

The final session was devoted to virus studies in man which owed their inspiration to the tissue culture as the basic cultural technique. This has led to the recovery of the so-called orphan or E.C.H.O. (enteric-cytopathogenic human-orphan) viruses from human stools during studies on patients with poliomyelitis and on normal populations. Dr. J. L. MELNICK (Yale) said that similar orphan viruses existed in monkeys, cows, and swine; fourteen different antigenic types of human E.C.H.O. virus were now known. They were small agents resembling poliomyelitis virus. They passed filters with an average pore-size of 38 m μ , but were held back by 30 m μ . He had attempted to classify the

viruses with the aid of different monkey cells and plaque formation. The E.C.H.O.-9 virus recovered in England by Tyrrell and by observers elsewhere had caused outbreaks of human disease, particularly in children with an exanthem and sometimes with aseptic meningitis. Strains of this virus produced lesions in suckling mice which allowed its classification as a Coxsackie A virus. Other E.C.H.O. viruses appeared to be related to aseptic meningitis. Type 10 was pathogenic for mice. Dr. A. J. RHODES (Toronto), Dr. H. A. WENNER (Kansas), Dr. D. T. KARZON (Buffalo), and Dr. G. J. DALLDORF (New York) extended these findings with remarks on classification, on human outbreaks involving these agents, on clinical effects in monkeys, and on the confusing antigenic propensities of E.C.H.O.-6. Dr. Melnick's attempts to obtain genetic recombination between an E.C.H.O. and a polio virus emphasized the basic relationship between the new agents and older enemies. There was agreement that much hard work lay ahead.

The adenoviruses were now considered by Dr. R. J. HUEBNER (Bethesda). He reported on 14 established serotypes and several others whose antigenic relations were still doubtful. An association existed between clinical syndromes and antigenic types such that acute respiratory disease in Army recruits was more often associated with types 4 and 7, and to a lesser extent 3 and 14, than with any of the other types. Type 14 was originally derived from a chimpanzee, but was identical with strains recovered in Holland from human respiratory cases by van du Veen. Types 1 and 2 were most commonly recovered from the adenoids of children, but illnesses in children such as pharyngo-conjunctival fever or non-bacterial pharyngitis were commonly associated with types 3, 5, and other types. Kerato-conjunctivitis was linked with type 8. A high proportion of the more severe clinical forms of acute respiratory disease in children were probably associated with adenovirus infection. However, a long-term study of an orphanage had shown frequent recovery of viruses from throat swabs, and the exact relationship between virus recovery and clinical phenomena still had to be worked out. Over a period of time 11% of throat swabs taken once a week and totalling 2,066 specimens yielded adenoviruses, and 35% of stool specimens similarly studied yielded adenoviruses, E.C.H.O., or Coxsackie viruses. Such is the harvest of the tissue-culture technique.

Adenovirus Vaccine

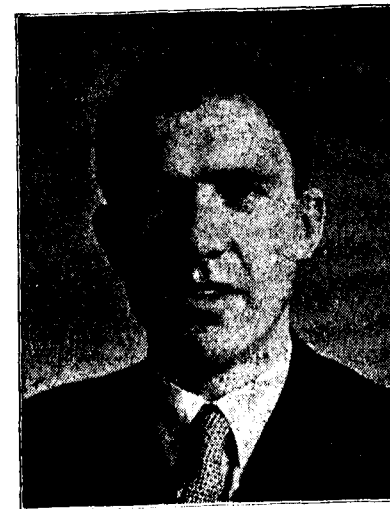
Dr. M. R. HILLEMANN (Washington) reviewed acute respiratory disease in U.S. Army recruits, in whom the adenoviruses appeared responsible for as much as 80% of the total infections. The clinical picture of the disease was that of febrile catarrh as originally described in England. It was a serious cause of wastage in time and money in the Army. Tests with a mixed type 4 and 7 inactivated vaccine had been carried out and some 600-odd persons had been vaccinated. 78% of the illnesses during the subsequent few months had been due to types 4 or 7 adenoviruses in this community. The vaccine was serologically active, and induced antibodies against type 3 as well as against the homologous types. Protection against clinical strains became apparent one week after giving the vaccine, and the attack rate was lowered dramatically. Similar tests in the U.S. Navy had shown a protective effect with a mixed type 3, 4, and 7 vaccine, but the level of protection afforded was less than that obtained in the Army. However, Dr. GINSBERG warned against the view that an adenovirus vaccine would be of importance in civilian groups, in whom infection appeared much less frequent than in the armed Forces. The major role of the adenoviruses appeared to be that of latent agents, yet, as pointed out previously by Dr. Huebner, the full extent of clinical disease produced by them in babies and infants was still unknown.

The meeting closed with a sense of achievement, voiced by Dr. J. E. SMADEL (Bethesda), who echoed the opinion of the last sessional chairman, Professor J. R. PAUL, of Yale, that had the conference been held on Broadway it would have been hailed as a smash hit.

NEW MINISTER OF HEALTH

MR. D. F. VOSPER APPOINTED

One of the consequences of the reorganization of the Government under Mr. HAROLD MACMILLAN has been the appointment of a new Minister of Health. Mr. D. F. VOSPER, formerly Parliamentary Secretary, Ministry of Education, succeeds Mr. R. H. TURTON. His appointment was announced in the list of departmental Ministers without Cabinet rank and Ministers of State published on January 17. On the same day correspondence exchanged between the



[Universal Pictorial Press and Agency]
The Rt. Hon. Mr. D. F. Vosper, T.D.,
M.P.

he took an honours degree in natural science and political economy. In 1938 he joined the firm of ships' store and export merchants, Wilson, Vosper, and Coltart, of Liverpool, to which he still belongs. In April, 1939, he enlisted in the Territorial Army, and subsequently served throughout the war with the Cheshire Regiment. He was adjutant and later second-in-command of the 5th Battalion. He was demobilized in 1946 with the rank of major. In 1950 he was awarded the Territorial Decoration.

Mr. Vosper's political career began on his return to civil life in 1946. He became agent to the Knutsford Division Conservative Association, and in 1949 he was adopted as Conservative candidate for Runcorn. In the 1950 General Election he won this seat with a majority of 8,082 in a three-cornered contest. He was appointed a Conservative Whip in November, 1950, and was a member of the British parliamentary delegation to Israel in 1951 and to Turkey in 1953. At the 1951 General Election his majority rose to 9,841 in a straight fight. He was appointed a Lord Commissioner of the Treasury after this Election, and in October, 1954, became Parliamentary Secretary, Ministry of Education. His responsibilities here were the schools for handicapped and educationally subnormal children, school medical services, and the school meals service. He also paid special attention to problems arising from village schools and the Youth Service. At the last General Election, in May, 1955, Mr. Vosper increased his majority to 10,830.

Mr. Vosper is married, and his wife is also active in political matters. There are no children. Mr. Vosper gives his recreations as tennis, travelling, and gardening.

Parliamentary Secretary

Mr. J. K. VAUGHAN-MORGAN succeeds Miss PAT HORNSBY-SMITH as Parliamentary Secretary to the Ministry of Health, while Miss Hornsby-Smith goes as a Joint Parliamentary Secretary to the Home Office. These appointments were announced on January 19. Mr. Vaughan-Morgan, who will be 52 next week, has represented the Reigate Division of Surrey since 1950. In public life he has three main interests: social services, especially the wel-

fare of the elderly in industry; local government; and Commonwealth affairs. A company director himself, he is chairman of the Conservative Party's parliamentary committee on health and social security, and he is joint author of a Conservative Political Centre pamphlet, *Care of Old People*. He was member of the L.C.C. for Chelsea from 1946 to 1952, and was for four years vice-chairman of the London Municipal Society. He visited the British West Indies in 1953 as one of two Conservative M.P.s on the Commonwealth Parliamentary Association delegation, and is chairman of the West Indies Subcommittee of the Commonwealth Affairs Committee. He is also deputy chairman of the British Commonwealth Producers Organization.

Mr. Vaughan-Morgan has been a joint honorary secretary of the "1922" Committee (1949-50), and is at present a member of the executive committee of the National Union of Conservative and Unionist Associations.

Nova et Vetera

COMMON LODGING-HOUSES IN GLASGOW

Dr. Stuart Laidlaw died in June, 1955, a few days after learning that he had been awarded the degree of Doctor of Philosophy for his thesis on "The Common Lodging-Houses of Glasgow"; now, on the instructions of the City Health and Welfare Committee, the thesis has been published,* and probably Dr. Laidlaw would not have wished for a better memorial. His account of Glasgow lodging-houses through the ages is indeed a treasure trove for the historian, not merely for its recital of what the early sanitarians thought of these places, but for its introduction to people like Molly and that other Robert Burns who brought some distinction to the lodging-house keeper's craft; or to "Hawkie," with his description of the "flea barracks," or Roger Quin, who in later days was driven to write of the lodging-houses of his time, from first-hand experience, as "plague spots. . . Here are no touches of colour . . . one drab nocturne of hopeless torpid inanity." But, faithful and accurate as is this work in detailing the lodging-houses of the city as they are and as they were, the book owes its main charm to an intimate knowledge of the people in them. Laidlaw interviewed over a thousand of these people; he learned their stories, their background, the factors that brought them to live in a "model," what they thought about it all, and how they lived in this curious world in which they found themselves.

They were in the main an elderly population, more than half of them over 55 years of age and more than half incomers to the city. Half of them had now no contact whatever with any relatives; more than half were dependent, in part at least, on National Assistance. Comparatively few were in employment—more than one-third were "unemployed," more than one-third "retired," and the "normal" occupation of most was that of unskilled labourer. About one-half of them were in good health, the others presenting a catalogue of almost every conceivable cause of chronic incapacity, physical and mental. Nearly 30% of the women and 44% of the men had been living in "models" for upwards of 10 years, one of the men for upwards of 50. Many bore evidence of neglect. It is in some ways a changed picture from that of 70 years ago—a population some 20 years older nowadays, and of much longer common lodging-house attachment. But many—perhaps the majority—of "modellers" still have prison records, and the majority, as of old, have a liking for drink, though from considerations of cost the good wholesome whisky of other days has been largely replaced by things more objectionable—methylated spirits, eau-de-cologne, and a variety of odd cocktails prepared from such things as metal polish.

THOMAS FERGUSON.

**Glasgow Common Lodging-houses and the People Living in Them*. By Stuart Laidlaw. Published by the Health and Welfare Department of the Corporation of Glasgow, 1956. Price 30s. net.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Perinatal Mortality

SIR,—Like Mr. W. G. Mills (*Journal*, January 12, p. 103), I feel that the classification of causes of perinatal mortality put forward by Dr. J. P. Bound and his colleagues (*Journal*, November 24, 1956, p. 1191, and December 1, p. 1260) will not prove very helpful to clinicians wishing to study their cases with a view to prevention. As he rightly points out, many asphyxial deaths arise from multiple causes the relative importance of which, in my experience, may be assessed more accurately by a careful study of the clinical history than of the necropsy findings.

In a reference to a paper published by myself and others in 1954,¹ Dr. Bound and his colleagues state that we challenged the value of post-mortem examination and rather gave the impression that we advised against routine necropsies. This was certainly not our intention, and, in fact, a necropsy was performed on all our cases except those in which permission was refused. We did, however, agree with Morison² that the main justification for routine necropsy is that it enables the obstetrician to recognize or to exclude such "anatomical" causes of death as birth trauma and congenital malformation.

The signs of asphyxia at necropsy show how, but not why, the baby died. The clinician is more concerned with the events which led up to asphyxia than with the terminal condition. For most of us, young and old, the ultimate cause of death will be failure to oxygenate the tissues. The classification of causes of perinatal death which we used took note of the necropsy findings, but was based chiefly on the train of clinical events which led to death, asphyxial or otherwise. We have found this approach useful, since it has enabled us to see more clearly the influence of such important factors as the mother's age, parity, and state of general health upon the incidence of complications of pregnancy and labour and upon the vitality of the foetus. The cause of a particular stillbirth may be that the foetus could not withstand some stress, physiological or mechanical, which would not have harmed a foetus of higher vitality. Depression of foetal vitality may be due to defects in the mother's development, which may have occurred many years before the pregnancy. In order to understand the prime causes of death we must therefore study the condition of the mother and the nature of the pregnancy and labour, as well as the state of the dead baby. Our data showed, for example, that asphyxial deaths occur more commonly in primiparae than in multiparae, in elderly than in young primiparae, and in post-mature pregnancies than in pregnancies at or before term, and often before the rupture of membranes has exposed the foetus to mechanical stress. Similarly, deaths due to prematurity are many times more common in ill-grown, generally unhealthy mothers than in tall, healthy mothers.

Although a post-mortem examination should be performed in all stillbirths and neonatal deaths, such examinations are unlikely to lead to great advances in our understanding of the causes of breakdown in maternal physiology which are incompatible with foetal survival.—I am, etc.,

Aberdeen.

REFERENCES

- 1 Baird, D., Walker, J., and Thomson, A. M., *J. Obstet. Gynaec. Brit. Emp.*, 1954, 61, 433.
- 2 Morison, J. E., *Foetal and Neonatal Pathology*, 1952. Butterworth, London.

SIR,—It is well that the subject of perinatal death should be brought before us both by the Registrar-General and by the recent circular to all general practitioners. The excellent article by Dr. J. P. Bound and his colleagues (*Journal*,

November 24, 1956, p. 1191) and the valuable criticism of Dr. A. L. Woolf (*Journal*, December 29, p. 1542) have sent me once again to Barcroft's invaluable *Researches on Pre-natal Life*,¹ even though, as he emphasizes (pp. 144 and 209), he deals mainly with sheep and not humans. I think some points are worth repeating. First of all (pp. 200 and 209), he shows that while the carotid blood about half-way through pregnancy is about 75% saturated with oxygen, just before term this has fallen to about 40%, while the venous return is about 25%, so that the foetal brain before birth is conditioned to anoxia, which must be even more severe than these figures suggest while the head is compressed in the pelvis. Furthermore, the graph on p. 98 shows how very small is the oxygen uptake of the brain compared with other tissues, and that even this drops decidedly just before term. This makes it unlikely that foetal death is commonly due to cerebral anoxia. The fatal anoxia is much more likely that of the heart, which not only requires oxygen to keep itself beating but has to supply the rest of the body, which takes so much more oxygen than the brain. Furthermore, the size of the body relative to the head is increasing rapidly at term, which may be one reason why post-maturity is so important in perinatal death, as the body is taking an ever-increasing proportion of the diminishing amount of oxygen available from the placenta.

This is not to say that cerebral anoxia is unimportant, for Barcroft (pp. 261-2) showed that it was all-important in determining the type of respiratory response. This is not, as is so commonly assumed, a response to lack of oxygen, for the brain is normally hypoxic anyhow. He showed how the respiratory response develops from a single gasp to a succession of gasps and so to a proper rhythm. Occlusion of the cord, by producing anoxia, would change these responses in the reverse order so that eventually stimulation would produce but a single gasp and finally none at all; but that did not mean that the foetus was dead. And the response was not elicited by lack of oxygen but by a tactile stimulus—i.e., it was nervous and not chemical. Anoxia, in fact, puts out first of all the response most recently acquired, and, as he showed on p. 266, this corresponded to the higher centres of the brain. When, therefore, Dr. Woolf writes so interestingly about cerebral irritation and "the expression of excessive activity of primitive mechanisms removed from the control of those more recently acquired" he is expressing almost exactly what Barcroft proved to be the effect of anoxia on the brain.

This may seem theoretical, but it has some very practical bearings on perinatal mortality. First of all, unless there is some fatal injury (which Dr. Bound's figures show is relatively uncommon) it should be possible to revive any baby born with a beating heart. The immediate need here is not to pump in oxygen but to apply that nervous stimulus which will elicit the fundamental respiratory response. As regards this, Barcroft says (p. 269): "Among specific sensations acting outside the body, pain (if such a word can be applied to the experiences of an organism so anoxaemic that it can have no real consciousness) can have a dramatic effect. A striking specific reaction is that of the gasp in a refractory rabbit's foetus when the ear is firmly pinched." This would seem to give some justification for the traditional slapping—though I think there are better ways. Among internal stimuli he mentions (p. 270), "A foetus with its placental circulation intact, alternately taken out of and replaced in its bath of saline, exhibits muscular tone to the point of shivering when it is taken out of the bath and relaxation when replaced." This would seem to give some support to the old-fashioned method of resuscitation by putting the baby into hot and cold water alternately. If these normal stimuli fail, the logical thing to do, as I have often stated, is to give some convulsant which will raise the threshold of the brain to such a pitch that it will respond to the stimuli which are reaching it, and 20 years' experience has taught me the safety and effectiveness of cardiazol-ephedrine for this purpose.

The other practical conclusion I draw is that, as it is the heart that finally gives out from lack of oxygen, it is important to diminish the demand for oxygen by keeping the baby cool until oxygenation is established, as I mentioned in a recent letter (*Journal*, December 8, p. 1368). Even if the heart has stopped beating it may still be possible to revive the infant. It is easy to stick an ordinary hypodermic needle into the left ventricle, prove that it is there by withdrawing a little blood, and then rapidly inject 1 ml. of cardiazol-

ephedrine. This sudden distension of the cavity may possibly restart the heart beating, but, if not, it is easy to massage the heart quite effectively through the soft foetal chest wall, and I have done this successfully on two occasions.

There is much more to be said, and unfortunately the second volume of Barcroft's researches was never published, but I trust that what I have written will send obstetricians and others to study the first volume for themselves. They will soon find that the brief précis which is given in most midwifery textbooks does not represent in any way the mind of the master. Some points are rather difficult to follow, largely because he was trying to assimilate his findings to clinical experience which he freely admitted he did not understand, but by and large it gives us physiological data on which alone a rational approach can be made to a most important aspect of the problem of reducing perinatal mortality.—I am, etc.,

Winsford, Ches.

W. N. LEAK.

REFERENCE

- 1 Barcroft, J., *Researches on Pre-natal Life*, 1946. Oxford.

Treatment of Acute Appendicitis

SIR,—Mr. Eric Coldrey's paper (*Journal*, December 22, 1956, p. 1458), advocating the conservative treatment of acute appendicitis of over 24 hours' duration and, latterly, of even less than 24 hours' duration, is certainly revolutionary, and, were it not for the astonishingly low mortality, one's natural reaction would be one of condemnation. The memories of the past are stirred and a few comments are called for.

In my younger days I had, like every resident surgical officer at the General Hospital in Birmingham, a wide experience of treating cases of acute appendicitis, and by 1928 had operated on over 2,000 cases with a mortality of just under 3%; and this, of course, long before the sulphonamides or antibiotics. Taught by such chiefs as Leonard Gamgee, Frank Barnes, and Seymour Barling, these cases were treated, except for 2-3 hours' rest and preparation, by immediate operation. At about this time the Ochsner-Sherren principles of "delayed treatment" for cases between the 2nd and 5th day had been underlined by several papers from the London Hospital analysing nearly 2,000 cases, and showing that where the case did not settle under Ochsner-Sherren treatment there was a mortality of 6.4%. Birmingham remained unmoved; and I well remember the late Professor Gemmill rebuking a visiting London physician [sic] for advocating such methods. Perhaps this was not to be wondered at in the city where the first appendicectomy was performed—that is to say, in 1880 by Lawson Tait—and Gamgee had proudly told us this in his vivid lectures.

To-day, nearly 30 years later, we all have the modern advantage of good anaesthesia, a variety of antibiotics, and some considerable understanding of fluid and electrolyte balance, and the results should indeed be better. In spite of Mr. Coldrey's very low mortality rate, one cannot help feeling that it has been obtained at the expense of a rather frequent incidence of pelvic abscess and abscess pointing in the right iliac fossa. In any case, I should regard delayed operation in a child of under 12 years as taking a serious risk. In spite of these objections, Mr. Coldrey's remarks with respect to the environment in which a surgeon works is of fundamental importance, and it is well that young surgeons-in-training should realize that their destiny may be to work (not just in the night, as Mr. Coldrey instances) where the amenities of their Alma Mater—such as good and adequate assistants, anaesthesia or laboratory services—are just not available. It is then that conservative treatment, as Dr. George L. Alexander's letter (*Journal*, January 5, p. 46) suggests, is likely to prove the safer course, and the more primitive the environment, as on board ship or in the villages of backward countries, the more important it is to avoid what might then become the dramatic or heroic. Much, of course, depends on the experience of the surgeon. Nevertheless, again must be stressed the potential dangers

of using antibiotics where intra-abdominal sepsis exists. Pus that has been sterilized by antibiotics remains a foreign body and an irritant. Two to three years ago Mr. Norman Lake¹ quoted a case treated by antibiotics where some 8 to 10 isolated sterile abscesses lay among the coils of small intestine, causing a most complicated form of subacute intestinal obstruction: and during the past six months there have occurred in the teaching hospitals in Birmingham two cases where pelvic abscesses had been converted into granulation tissue by antibiotic treatment, leading to a "frozen pelvis" with consequent stricture of the rectum.—I am, etc.,

Birmingham, 15.

F. A. R. STAMMERS.

REFERENCE

- 1 Lake, N. C., *British Medical Journal*, 1952, 2, 1307.

Translumbar Aortography

SIR,—Mr. H. Gaylis and Dr. J. W. Laws in their excellent paper (*Journal*, November 17, 1956, p. 1141) have performed a most valuable service by drawing attention to the danger of dissection of the aorta as a complication of translumbar aortography. Similar lesions with serious and even fatal results have previously been described in the carotid artery following attempts at cerebral arteriography.^{1,2} Radiologists with extensive experience of arteriography are aware of this complication and take steps to avoid both it and the more frequent, but less dangerous, mishap of perithecal injection of the contrast medium. There is no doubt that the aorta is the site where such mishaps are most likely to occur. Mr. Gaylis and Dr. Laws review several methods of avoiding the mishap, but say that these are not uniformly successful. They describe their own technique in detail. This technique seems to me to require further discussion because (1) it does not seem to include adequate precautions against the mishaps they describe, and (2) it advocates doses of the contrast medium which I would now regard as excessive (30-40 ml. of 70% diodone).

Personally, I always use the test-dose method to localize the needle point during aortography because I believe it to be essential to know where my injection is going to go, instead of injecting "blindly." In an experience of some 400 aortograms performed in the last four years this precaution has on several occasions prevented an injection of the whole quantity of contrast directly into a renal artery or other major branch of the aorta. It has also rendered perithecal injection an extremely rare phenomenon. Despite theoretical objections, therefore, the method has proved its value in practice. The needle point is adjusted or a re-puncture made if the initial injection of 5 ml. of contrast medium is seen to be in an unsatisfactory position (incidentally, only about 3 ml. enters the aorta, as some 2 ml. is held in the plastic connecting system). We have also found plastic (vinyl) connecting tubes much more satisfactory than the rigid "polythene" used by Mr. Gaylis and Dr. Laws, and we inject by hand and not by pressure apparatus.

The use of as much as 40 ml. of 70% diodone at a single injection is, in my opinion, undesirable, particularly where it is not known in advance exactly where the material is going to go. There have been over 30 cases of anuria, including six fatalities, reported in the literature.³ In nearly all these cases similar large quantities of contrast medium were used. We have personally encountered a case where two separate hand injections, one of 30 ml. and one of 25 ml., of sodium acetrizoate ("diaginal") 70% produced a temporary anuria. The second injection was made with some reluctance because the first series of films were technically unsatisfactory, and after an interval for film processing. In our case a catheter was used, and there was no question of damage to the wall of the renal artery as suggested by Mr. Gaylis and Dr. Laws. We no longer use more than 25 ml. of sodium acetrizoate 70% or diodone 70% at a single injection for lumbar aortography, and we always use hand injection rather than a pressure pump. This technique in my experience gives adequate and satisfactory results for most practical purposes. Where renal function is suspect we now restrict ourselves to a single injection of 20 ml. only.

Mr. Gaylis and Dr. Laws suggest that other previously reported complications of aortography have been due to dissection, and they bring forward evidence that the cases of paraplegia reported by Boyarsky⁴ and by Antoni and Lindgren⁵ may have been contributed to by aortic dissection. This suggestion cannot be refuted, but I think toxicity of the medium when given in excessive doses is the major factor in such accidents. Hare,⁶ of

Melbourne, has recently reported (with excellent aortogram pictures) another case of paraplegia following aortography. His case was further complicated by a temporary anuria. After a test dose of 7 ml. of "urokon" two separate injections, one of 45 ml. and one of 32 ml., of urokon were made. There was no evidence in his case of the contrast being injected outside the lumen. However, a large quantity of contrast medium injected by a pressure apparatus was used by him, and the technique was similar to that of Mr. Gaylis and Dr. Laws. Incidentally, pressure pumps have, judging from the literature, often been used to inject the medium at far too high a rate. The speed suggested by Mr. Gaylis and Dr. Laws (10 ml. a second) is of course a safe one, but such instruments which are capable of very high injection pressures can be extremely dangerous in other and unskilled hands.

Hare demonstrates that the main blood supply to the lower lumbar cord usually comes from one of the upper lumbar arteries, and attributes the accident to the direct toxic effect of the contrast medium on nervous tissues or to trauma to the lumbar artery by the needle. Recently Tarazi, Margolis, and Grimson⁷ have shown by experimental work on dogs that the contrast medium used at aortography can damage the spinal cord by a direct toxic action. Previous experimental work has also demonstrated a direct toxic action of organic iodine preparations on animal cerebral tissue.⁸ Similarly, Idbohrn⁹ attributes the reported renal accidents to a direct toxic action produced by excessive doses of the contrast medium. Toxicity of the medium was undoubtedly the mechanism in our own case. In conclusion, while offering these further points for consideration, may I again congratulate Mr. Gaylis and Dr. Laws on producing a most valuable paper, and so beautifully demonstrating and explaining one of the dangers of aortography?—I am, etc.,

London, W.2.

DAVID SUTTON.

REFERENCES

1. Liverud, K., Demonstration at 3rd International Congress of Neuro-radiology, London, 1955.
2. Crawford, T., *J. Neurol. Neurosurg. Psychiat.*, 1956, 19, 217.
3. Idbohrn, H., *Acta radiol. (Stockh.)*, 1956, 45, 141.
4. Boyarsky, S., *J. Amer. med. Ass.*, 1954, 156, 599.
5. Antoni, N., and Lindgren, E., *Acta chir. scand.*, 1949, 98, 230.
6. Hare, W. S. C., *J. Fac. Radiol. (Lond.)*, in press.
7. Tarazi, A. K., Margolis, G., and Grimson, K. S., *Arch. Surg.*, 1956, 72, 38.
8. Broman, T., and Olsson, O., *Acta radiol. (Stockh.)*, 1948, 30, 326.

Mild Endogenous Depression

SIR,—In common no doubt with very many others, I have read the very able article by Dr. C. A. H. Watts on the mild endogenous depression (*Journal*, January 5, p. 4) with great interest. I do not, however, feel satisfied that he has made good his claim that such depression is a distinct medical entity, nor in fact can I see any advantage in thus giving the condition a place to itself. Under the heading Dr. Watts himself subsumes such a variety of symptoms that it appears to me that, like Molière's M. Jourdain with regard to speaking "prose," I have been treating such depression for over 50 years of psychotherapy without knowing it.

According to Dr. Watts, the main thing which distinguishes this form of neurosis from others is its tendency to spontaneous cure, and it may be that this tendency has led me to claim successes in the past to which I was not entitled. I think, however, that a classification of nervous illness which includes under one column such widely different ages as 31 and 84 is *ipso facto* somewhat suspect. It is apparent that Dr. Watts follows his own excellent advice and establishes a good rapport with each individual patient; but even then it may be that he does not allow sufficiently for the natural ebb and flow of human spirits which made our ancestors conclude that we are all under the influence of "the inconstant moon."

External causes of present-day stress acting on the individual predisposed to neurosis by circumstances of early childhood determine whether such natural phases are unduly prolonged or pass quickly, and in elucidating and evaluating such stress the psychotherapist may need to look beyond the obvious. The typical neurotic is one who has "too much ego in his cosmos" and readily regresses to the child's attitude that "it isn't fair—this should not be happening to me." Psychotherapy finds its chief justification in

elucidating such regression and explaining the failure of childish patterns of behaviour. In my experience, analysis has rarely to be taken beyond the conscious memories, and these become more vivid and profuse once the patient starts thinking back and finds a patient listener. An analysis which dips into the unconscious is often asked for by the intelligent client who realizes that there is something lacking in his technique of living which mars his success, and who seeks help on that account.

History repeats itself. The psychotherapist must be by temperament and training a humanist. Half a century ago he had to contend with the "neurologist," who sought to interpret maladjustment to living in terms of minute anatomy. Now he finds himself superseded by the psychiatrist, whose interest is in achieving cure of symptoms by drugs and physical means rather than in finding out in each case where the shoe of life pinches. In congratulating Dr. Watts upon his research, may I express the hope that he will remain spiritually on my side of the fence?—I am, etc.,

Scarborough.

R. MACDONALD LADELL.

Benactyzine in Psychoneurosis

SIR,—We were interested in the paper by Drs. C. P. Seager and A. Leitch (*Journal*, December 15, 1956, p. 1407) recording their finding that benactyzine was no better than a placebo in the treatment of anxious neurotic in-patients. We have recently carried out a controlled trial upon 60 psychoneurotics, treating alternate cases with benactyzine and control tablets of identical appearance. The identity of these tablets was known only to the pharmaceutical departments of the hospitals concerned. Most of the subjects were out-patients; seven of the benactyzine and five of the control subjects were in hospital. All cases had some anxiety; it was the most prominent symptom in 90%. The dosage of benactyzine was 1 mg. four times a day for one to three months. An identical number of control tablets were administered. Results were as follows:

	Benactyzine	Control
Symptom-free	2	1
Improved	13	16
Unchanged	10	10
Worse	5	3

Side-effects appeared in eight of the benactyzine cases and five of the controls. They were as follows: *Benactyzine*.—Slowing of thought, weakness, and trembling; weakness and trembling; palpitations, cold feeling, erythema of scalp; generalized papular rash; headache, dizziness, nausea, and sweating; fainting, palpitations, insomnia; giddiness, dry mouth; eczematous rash. *Control*.—Thought block, giddiness, and nausea; papular rash of arms and face; frontal headache and loss of interest; trembling, sensation of unreality; headache, nausea, and confusion.

Our results would seem to indicate that benactyzine has little or no advantage over control tablets in the treatment of psychoneurosis in which anxiety is the main problem. A further point of interest is the number of what appeared to be side-effects which were attributed to the control tablets.

We would like to thank Messrs. Glaxo Laboratories Ltd. and the pharmaceutical staff of Wexford, Torbay, and Royal Devon and Exeter Hospitals.—We are, etc.,

Exeter.

H. SCOTT FORBES.
B. V. EARLE.

Care of Discharged Mental Defectives

SIR,—As you are aware, during the last six months a large number of mental defectives who have been on prolonged licence have been discharged from the order. Certain local authorities have the impression that, because these defectives have been discharged, they no longer need care, control, and supervision. This, of course, is not true, as many of the defectives concerned are of imbecile grade. I would suggest that it would be in the interest of these defectives if local authorities were informed that in the

case of the lower-grade defectives re-ascertainment should be carried out. This would then enable the local authorities legally to carry out their responsibilities concerning the supervision and training of these defectives.—I am, etc.,

Driffield, E. Yorks.

J. NEWCOMBE.

Sharpening Needles

SIR,—With reference to your annotation on sharpening needles (*Journal*, December 29, 1956, p. 1535), in 1916, knowing that sometimes Army needles had to be sent home from Salonika to be resharpened, I took out with me a No. 89 "carborundum" slip to be used for the purpose, either by a fiddle-bow or a scooping-out stroke. The needles for intravenous use then were of a larger gauge than they are to-day and clearing the burr on the outside rim helped. To-day the scooping-out method is easier and better against a support of glass or china and may be done with the small blade of a pocket-knife used longitudinally downwards. Clear the outside rim gently and test on a piece of chamois leather stretched tightly.—I am, etc.,

London, W.1.

G. H. COLT.

SIR,—I read with interest your annotation entitled "Sharpening Needles" (*Journal*, December 29, 1956, p. 1535). Personally I have found that there is less discomfort to the patients after using the same needle 20 or 30 times, as long as the arm or buttock is well relaxed and the skin well stretched. A few light strokes of the fine-grained oilstone can be used alternatively to remove the sharp point. The prick of a pin is less unpleasant than that of a fine sewing-needle. One never gets tired of being complimented on having given a painless injection.—I am, etc.,

London, S.W.1.

A. L. LANKESTER.

Vaccination Technique

SIR,—May I suggest to Dr. Neville Davis (*Journal*, December 29, 1956, p. 1545) that no covering of any sort is necessary over the vaccination area? After making two scratches through the drop of lymph I wait for about one minute and then wipe off the excess lymph. When I see the weals through the scratches I assure the mother that the vaccination has taken, and advise her that no special measures are necessary against infection and that at no time must she use a dressing over the area. Since adopting this method I have never had a failure to take, or any secondary infection, or any accidental infection of the child's mother.—I am, etc.,

Topsham, Devon.

GRACE H. WALKER.

Continuous Suxamethonium

SIR,—Dr. C. Langton Hewer (*Journal*, January 5, p. 45) disapproves of continuous suxamethonium. Perhaps we have been lucky, but, since reporting its use in 289 patients (*Journal*, August 8, 1953, p. 317), we have used this technique in some 1,500 cases of abdominal surgery. In only four instances has post-operative apnoea lasted more than a few minutes, while in the great majority the patient was breathing fully by the time the last stitch was tied. In the four exceptions mentioned, apnoea lasted 60 minutes (1), 40 minutes (2), and 30 minutes (1). No ill effects followed.

In using this technique we believe it essential, after the initial dose for intubation has been given, to keep the drip rate at "dead slow" until respiration starts again, and then rate at "dead slow" until the patient is always to so adjust it from time to time that the patient is always on the point of breathing. Constant supervision is therefore necessary, but the results seem to justify it, and, in our view, if this procedure were strictly adhered to we should hear much less of "succinylcholine apnoea," while the use of curare and neostigmine in abdominal surgery would be largely unnecessary. Moreover, if the concentration of suxamethonium is adjusted to the needs of the individual patient there should be no fear of overloading him with unwanted fluid.

Instances of slow recovery of breathing, as distinct from complete apnoea, following large doses of suxamethonium

have been reported by both British and American writers. Without discussing the theories advanced to account for these cases, we feel that this difficulty can be largely avoided by strict economy in the use of suxamethonium. Where, in exceptional cases, larger doses such as 1,500 mg. or over are given, the less well-defined type of recovery may be expected, but here no special treatment is necessary beyond careful observation and the avoidance of hypoxia in the immediate post-operative period.—We are, etc.,

Romford, Essex.

GODFREY HERINGTON.
E. JAMES.

Neodymium 3-Sulpho-isonicotinate and Blood Coagulation

SIR,—Since the publication of our paper (*Journal*, November 24, 1956, p. 1214) we have found haemoglobinaemia in all of four patients who received daily injections of neodymium 3-sulpho-isonicotinate 5 mg./kg. for more than five days. One of these patients had haemoglobinuria which lasted for three days after the drug was stopped. None of these patients showed any other signs of blood destruction, or any other bad effects whatever, but this finding obviously calls for great caution in further clinical trials, or preferably the complete suspension of clinical trials until really adequate toxicity studies have been carried out in animals.—We are, etc.,

Dundee.

R. B. HUNTER.
W. WALKER.

Corticotrophin and Cortisone Therapy in Dermatomyositis

SIR,—In Dr. Morgan McElligott's most interesting article on the treatment of dermatomyositis with corticotrophin and cortisone (*Journal*, December 29, 1956, p. 1509), he rightly points to some of the clinical differences between acute and chronic cases. I would like to draw attention to a letter I wrote on this subject¹ in which I suggested that the diagnosis of dermatomyositis at present includes three quite separate entities, and that most of the acute fulminating cases—including some which he cited from the literature² and at least case 1 of his own series—are of a polymyositic form of polyarteritis nodosa.

Typically, this hyperacute illness occurs in young adults, seemingly as a hyperimmune response to an infection which is usually of the upper respiratory tract, with or without sulphonamide treatment, and, given the same circumstances, it may recur.³ The distinctive features are: (1) hyperpyrexia; (2) pleomorphic skin lesions, which vary from erythema multiforme to peripheral gangrene; (3) exquisite tenderness of wasting muscles, to which polyneuritis contributes; (4) frequent visceral lesions from ischaemia or infarction; (5) a high polymorphonuclear leucocytosis, with or without eosinophilia; and (6) albuminuria and microscopic haematuria. A negative muscle biopsy does not exclude this diagnosis in these cases, which are an urgent indication for cortisone or corticotrophin, which can tide the patient through to virtually complete recovery. As with systemic lupus erythematosus, the initial dosage is that which controls the activity of the process and may well be up to 300 mg. of cortisone daily, with slow subsequent reduction.

In the second group of cases associated with malignant disease, which I have discussed elsewhere,⁴ it is a diagnosis of awareness when presented with a febrile patient in the relevant age group who has skin lesions like a disseminated—not systemic—lupus erythematosus, and weak oedematous muscles which proceed to waste rapidly, without great tenderness. As a palliative measure in these cases, cortisone and corticotrophin have been shown to be effective, but any success so achieved should not be allowed to hinder the exhaustive search for a neoplasm—the removal of which can, incidentally, lead to resolution of the dermatomyositic process.

In the third group of cases of true chronic progressive dermatomyositis—a variant of progressive systemic sclerosis—cortisone and corticotrophin appear to afford temporary

subjective relief only, except in the early, sometimes quite acute, oedematous phase. But, in the absence of any other certain remedy in this potentially crippling condition, one would agree with Dr. McElligott that these drugs should never be withheld.—I am, etc.,

Aberdeen.

IAN W. CALDWELL.

REFERENCES

- ¹ Caldwell, I. W., *British Medical Journal*, 1955, 1, 1477.
² Oppel, T. W., Coker, C. and Milhorat, A. T., *Ann. intern. Med.*, 1950, 32, 318.
³ Caldwell, I. W., *Brit. J. Cancer*, 1955, 9, 575.

Burns and Hydrocortisone

SIR,—My experience of hydrocortisone-antibiotic ointment in first- and second-degree burns agrees with that of Dr. E. L. Lonbay (*Journal*, December 29, 1956, p. 1547). During the course of a recent lengthy correspondence on the treatment of burns and scalds, I reported¹ that a 1% greasy hydrocortisone ointment incorporating neomycin had proved, on dermatological advice, an effective and safe application for use in a busy casualty department. Subsequent experience has confirmed this earlier impression, though no controlled trial has been carried out.—I am, etc.,

Hove.

PATRICK HALL-SMITH.

REFERENCE

- ¹ Hall-Smith, P., *Lancet*, 1956, 1, 809.

Otitis Media

SIR,—I had the unusual opportunity recently in a boarding-school of seeing a child with acute otitis media within one hour of the onset of symptoms. At that time there was acute unilateral otalgia with no temperature or other signs or symptoms. The ear-drum was absolutely normal in all respects. Four hours later the drum had begun to become injected and red, and was distinctly different from the other normal drum. My object in writing this letter is to draw attention to the danger of discounting a normal ear-drum if seen very early after the onset of symptoms, and the necessity for reviewing such a case the following day.—I am, etc.,

Hatch End, Middlesex.

MARTIN STRATFORD.

Tobacco-cancer Problem

SIR,—Dr. E. L. Wynder's masterly deployment of the evidence in support of the carcinogenicity of smoking (*Journal*, January 5, p. 1) contrasts with the timidity of his "practical aspects of solving the tobacco-cancer problem." There is, of course, but one "practical aspect," one solution, as he must know, but, like Doll and Bradford Hill, he has avoided—very wrongly, in my view—stating plainly that tobacco-smoking should be stopped and that it is our duty to stop it, quickly. Instead, we continue to fiddle while Rome burns. "All a physician can do," says Wynder, "is to present the facts to the public." He can do much more. He can state plainly what action should be taken and crusade his utmost for that action. Moreover, the mode and frequency of the presentation of the facts are important. Because of the inaccessibility of smokers to the facts against smoking, nothing less than their very frequent and blunt presentation by a non-smoker over a long period using every modern publicity device would be effective in eliminating tobacco-smoking, and in the end there would have to be compulsory prevention of smoking to cure a considerable hard core of addicts.

A filter which would remove most of the carcinogens and most of the "equally important" nicotine, if one could be made, would be unacceptable to most smokers, who smoke mainly to obtain a satisfying dose of nicotine, just as smokers of opium and hashish smoke to obtain a dose of morphine and cannabis indica respectively. For this reason it is unrealistic to speak of "tobacco taste" and "satisfactory pressure drop" (though I am not clear what this means) as though they were the main considerations in smoking.

Economic considerations should weigh little with us. The saving of £55 million in dollars annually would go a long way towards compensating us for our economic upheaval.

Taxation would have to be equitably redistributed, present-day smokers paying much less, and non-smokers much more, than in the past; and the tobacco labour force, buildings, and equipment would have to be redeployed and put to socially valuable work. Individuals can stop smoking, so also therefore can nations. Notwithstanding my criticisms, I recognize fully and gratefully Dr. Wynder's pre-eminent contributions to the cause of non-smoking.—I am, etc.,

Wallasey, Cheshire.

LENNOX JOHNSTON.

Herpes Zoster and Chicken-pox

SIR,—After nearly half a century of semi-rural practice, I find Dr. R. M. McGregor's article on herpes zoster, etc. (*Journal*, January 12, p. 84), of great interest. I have never seen two cases of zona in one house together or even in succession, but I once had seven cases in adjacent houses simultaneously; zona, very severe, accompanied by chicken-pox in the third week; and one parent developing zona about three weeks after family varicella, several times. And, of course, the reverse. I have noticed repeatedly that zona comes in crops; there may be two or three cases in our country town; and in the same week, in scattered hamlets over about sixty square miles, perhaps half a dozen cases well apart; and chicken-pox may be expected very shortly, or vice versa. All very predictably haphazard.—I am, etc.,

Kington, Herefordshire.

G. W. DRYLAND.

SIR,—Dr. R. E. Hope Simpson (*Journal*, November 10, 1956, p. 1115), in commenting on my memorandum (*Journal*, October 13, p. 864), questions my statement that adjacent roots were often affected, and draws attention to the classical paper by Head and Campbell.¹ In my series the distribution of the rash was taken to indicate the roots involved. A drawing of the distribution of the rash was made in each case and compared with the sensory charts of R. Bing.² Sir Francis Walshe,³ and Gray's *Anatomy*.⁴ For instance, rash 2 in. (5 cm.) above Poupart's ligament, and on the anterior upper third of the thigh and on the upper half of the buttock, was taken to indicate L1-2. Supra- and infra-mammary rash extending posteriorly to the inferior angle of the scapula was regarded as D3-4. Rash above the iliac crest spreading over the buttock to the mid-thigh posteriorly was taken to indicate L2-3, as was rash over the upper part of the buttock and from Poupart's ligament to the upper border of the patella. Dr. D. G. French (*Journal*, December 29, p. 1545) confirms my findings that prolonged severe post-herpetic pain is comparatively infrequent in this common disease.

Dr. Hope Simpson has shown me the age incidence of his series of 79 cases of zoster, which differs considerably from mine in that, whereas in my 72 cases 56 were over 50 years old, in his there were more under than over 50. Dr. R. M. McGregor (*Journal*, January 12, p. 84) in a series of 81 cases found 61 over 45 years old. Owing to the nature of my practice, I see more patients in the older age groups and only few children, which may account for the discrepancy.—I am, etc.,

Redhill, Surrey.

L. J. BARFORD.

REFERENCES

- ¹ Head, H., and Campbell, A. W., *Brain*, 1900, 23, 353.
² Bing, R., *Regional Diagnosis of the Brain and Spinal Cord*, 1940, St. Louis.
³ Walshe, F. M. R., *Diseases of the Nervous System*, 1955, Edinburgh.
⁴ Gray's *Anatomy*, 1954, London.

SIR,—I cannot allow the article on herpes, chicken-pox, and cancer by Dr. R. M. McGregor (*Journal*, January 12, p. 84) to go unchallenged. In our practice we have an unusually high proportion of young children, and we find that epidemics of chicken-pox are frequently accompanied by an increase in the number of cases of herpes zoster. Herpes zoster occurs frequently in youth, and I trust one must not be classified as old when attacked. I personally contracted chicken-pox as a schoolboy and herpes zoster as a fourth-year student of Edinburgh. While serving as S.M.O. at the R.A.F. station, Drigh Road, Karachi, in 1946-7, I experienced an epidemic of chicken-pox in the married quarters.

In this closed community a young child with chicken-pox spread the infection rapidly, as the mother refused to co-operate. About three cases of herpes occurred in this small group.—I am, etc.,

Watford.

A. SCOTT.

Polycythaemia Vera

SIR,—In your leading article on polycythaemia vera (*Journal*, December 8, 1956, p. 1354) it is stated that "sporadic venesection, while contributing to the blood banks, is of little benefit to the patient. . . ." From this it might be inferred that such blood could be used for routine blood transfusions. Since the cause of the malady is still uncertain, such a course would appear highly undesirable.—I am, etc.,

Scarborough.

KENNETH FROOME.

Rapid Transfusion in Children

SIR,—I was interested to read the article on rapid transfusions in children by Dr. Leslie G. Andrews and David J. Coleman (*Journal*, January 5, p. 19), but would like to add a word of warning.

Knowing my interest in transfusion therapy during the war years, a friend in 1947 reported to me two fatal cases in babies due to cardiac failure caused by rapid transfusion therapy. In neither instance was anything found amiss with their hearts; it was a case of rather too much blood given too quickly. I well appreciate that marked apprehension may develop in young children from frequent transfusions, and the need to avoid interference with schooling where this applies, but I suggest the former is not necessarily reduced by frequent general anaesthetics, and that slower transfusion techniques need not incur a week's absence from school. Back in 1939 the French gave top-up transfusions in the out-patient clinic, and I submit that 24 hours in hospital should provide ample time to do the job as safely and satisfactorily as any transfusion can be. Treatment of medical conditions by rapid infusions under general anaesthetics should, I submit, be reserved for very exceptional cases.—I am, etc.,

Oxford.

HUGH ELLIS.

Sign of Wind in Infants

SIR,—After my fourth child I have again observed a sign which might be of some help if it were more generally known. This is a pallor of the area between the nose and upper lip in infants, which is present when the baby has "wind" and disappears immediately on eructation. When my first baby was born five years ago I observed this sign. I searched paediatric textbooks but failed to find any mention of it, although since then one eminent paediatrician¹ discusses in a recent textbook pallor of the complete face in infants with wind. I have never observed this, but I should be interested to hear of a physiological reason for the sign.—I am, etc.,

Glasgow, E.3.

JEAN McEWEN.

REFERENCE

- ¹ Illingworth, R. S., *The Normal Child*, 1953, Churchill, London.

Cervical Myelopathy

SIR,—Your annotation (*Journal*, January 12, p. 96) on cervical myelopathy ends by recommending that a means to arrest the vertebral disease should be sought. I agree. Prevention of a major displacement obviously consists in reducing it when it is minor. This should be undertaken at the outset of the disorder, years before there is any question of myelopathy.

When disk-protrusion begins at a cervical joint, it is the established practice to leave the displacement where it is. If, instead, logic were followed and the displacement were reduced at once by manipulation, the best possible would have been done to ensure that myelopathy never developed. When these displacements are small and recent they can nearly always be reduced by manipulation. When they press on the spinal cord enough to cause numbness and pins-and-needles in the upper and lower limbs without

objective signs of interference with cord function, they may still prove reducible, sometimes with permanent result. By the time that a root-palsy or a spastic paresis has supervened, manipulation comes too late.

Is it not time that we took the possibility of myelopathy to heart and refused to subject patients with cervical displacements either to heat and massage at the resultant area of referred pain or to a collar applied with the displacement unreduced? These too frequent evasions must result in enhanced likelihood of crippledness later. This is best obviated by reduction carried out at the early stage. Provided anaesthesia is avoided and traction is applied during each manoeuvre, there is neither risk nor difficulty.—I am, etc.,

London, N.W.1.

JAMES CYRIAX.

Unusual Cause of Obstruction

SIR,—The following case report records an unusual cause of acute intestinal obstruction.

A man, aged 69 was admitted to hospital at 5.30 p.m. on November 29, 1956, moribund. He was vomiting faeculent material profusely, and he died very shortly after admission and before effective treatment could be instituted. At necropsy there was no relevant abnormality except in the alimentary tract. He was edentulous and had marked dilatation of the stomach and small intestine down to within 8 in. (20 cm.) of the ileo-caecal valve. At that level there was a ring of oedematous thickening encircling the gut for 1½ in. (3.7 cm.) of its length, and wedged across the proximal margin of that ring was a thin bone 1 in. (2.5 cm.) long which was beginning to soften at its ends. Firmly pressed against the bone was an unmastered and undigested whole raw fig completely occluding the lumen of the bowel.

It appeared later that the patient had eaten rabbit on November 25 or 26 and figs on November 28. He was previously of good health, but complained of acute abdominal pain during the morning of November 29. He had dentures, but never used them.—We are, etc.,

Cardiff.
 B. J. STEPHENS.
 J. N. BODGER.

Increase in Scabies

SIR,—Dr. Margaret S. M. McGregor has raised again the question of aetiology of papular urticaria (*Journal*, December 15, 1956, p. 1427). I am quite certain that there is no evidence of scabies or similar infestation in the vast majority of cases of papular urticaria. There is an urticarial response in some cases of scabies, but in these the scabies mite can be isolated. I do this in my scabies clinic by simple needling as advocated by Mellanby, and it is quite a simple procedure. A very credible explanation of the cause of papular urticaria has been put forward in an article by Drs. A. Rook and W. Frain-Bell.¹ They state that "there is strong evidence that most cases of papular urticaria are the result of an acquired sensitivity to the bites of certain insects, particularly fleas and bedbugs." This is a much more likely cause than food allergy.—I am, etc.,

Norwich.

E. LISTER.

REFERENCE

- ¹ Rook, A., and Frain-Bell, W., *Arch. Dis. Childh.*, 1953, 28, 304.

Pregnancy Sickness

SIR,—I have been greatly interested in the correspondence on pregnancy sickness and would like to add my own personal experiences. I have four children. At no time did I have any sickness, but during the first three months of each pregnancy I had a type of nausea that would be more accurately described as acute hunger. It was relieved by small frequent quantities of easily assimilated carbohydrate. I concluded the immediate cause was a low blood sugar, probably due to a metabolic failure to adjust to supporting the foetus. My further experience supported this. I fed all four babies. The last two were difficult to wean and at six months were having little else than breast milk in very large quantities. At this time I experienced nausea exactly the same as that of the first few months of pregnancy and

Obituary

E. B. BROOKE, M.B., F.R.C.P., D.P.H.

Dr. E. B. Brooke, consultant physician to the geriatric unit of the Southampton group of hospitals, and formerly physician-superintendent at St. Helier Hospital, died at his home at Southampton on January 13. He was 60 years of age.

Eric Barrington Brooke was born on May 11, 1896, and was educated at Gonville and Caius College, Cambridge, receiving his clinical training at St. Bartholomew's Hospital, and qualifying by taking the London Conjoint diploma in 1922. In the following year he obtained the degree of B.Chir. and in 1924 the M.B. He took the D.P.H. of the English Royal Colleges in 1925 and the M.R.C.P. in 1927. Four years ago he was elected F.R.C.P. After qualification he held the appointments of house-surgeon to the skin and venereal diseases department and house-physician at St. Bartholomew's Hospital and assistant medical officer at St. Giles's Hospital, Camberwell. Then followed a short period of work in South Africa before he took an appointment at the former Redhill Hospital, Edgware (now Edgware General Hospital), under the Middlesex County Council. From there he moved to the service of the Surrey County Council and became medical superintendent at its hospital of the same name at Redhill, Surrey. A few years later the Surrey County Council began to plan a new large hospital on the most modern lines to serve the rapidly increasing population in the north-east of the county. From the beginning Brooke was designated as the future medical superintendent of this hospital, which took its name from the near-by L.C.C. St. Helier housing estate. His first years in his new appointment were made difficult by the outbreak of war and the resultant shortages of men and materials. To make matters worse the building suffered a number of times from enemy action, and in 1944 the medical superintendent's house was destroyed by a flying bomb. Brooke was severely injured in this incident, losing an eye, but before long he was back to duty again. In the years after the war he became a leading authority on the medical care of the aged, and was a member of the B.M.A.'s Committee on the Care of the Elderly and Infirm. He moved to Southampton about four years ago.

Dr. C. P. PETCH writes: Eric Brooke was accustomed to observe that the heyday of medical superintendents passed with the appointment of consultants with full clinical responsibility to hospital staffs. He compensated for any loss of clinical interest by devoting his enthusiasm to the ever-increasing problem of the care of the elderly. It is for his work in this field, now known as geriatrics, that he is best known, and his reputation in it was not only national but international. He was much in demand as an adviser on the care of the elderly, and was frequently asked to lecture on this subject. He laid great insistence on the importance of keeping old people in their own homes for as long as possible, and to that end organized a variety of services to help them. In the early part of 1953 he was invited to assist in the organization of a geriatric service in the western half of the South-west Metropolitan Region, and in April of that year became consultant physician to the Southampton group of hospitals, with special duties in reference to geriatrics. Throughout his life he had battled with the handicap of severe asthma, and it was the hope of those who knew him that a move away from the London fogs

would be advantageous to his health. That hope has not been fulfilled, and it is sad that he will not see the development of his work in the Southampton area.

Mr. HENRY A. KIDD writes: The announcement of Eric Brooke's sudden death came as a shock to his many friends, and especially so to those who had been his colleagues at the Redhill, St. Helier, and Southampton Hospitals. Of the multitude of patients who have passed through the hospitals under his care, none will regret his passing more than those elderly and sick folk for whom he worked so indefatigably and successfully to make their lives a little brighter and happier and make them feel that they still had a useful part to play. He was one of the founders of modern geriatrics, and used his great skill and experience as an administrator and physician to further the interests of those who had no champion and who were only too often regarded in hospitals as unwelcome guests. His work as medical superintendent at Redhill Hospital was so well appreciated that in the early days of the war he was appointed as the first medical superintendent of the new 800-bed St. Helier Hospital. A new hospital has not only to gain a reputation for the quality of its work but to build a tradition and to find its soul. To that task Eric Brooke directed his great talents, and, in spite of the difficulties and dangers of opening a large hospital near London in the middle of a world war, he achieved for himself and his hospital a renown that spread beyond its immediate environment. He bore the loss of an eye with the courage and cheerfulness that those who knew him well would have expected. Although he was only 60 when he died, he had for many years been known affectionately at St. Helier Hospital as "Daddy" Brooke, a nickname which reflected his status as father of the hospital and the esteem in which he was held by his colleagues. Always sympathetic to other people's troubles, he had a puckish sense of humour and a sense of justice which endeared him to all who came in contact with him. In recent years his health had not been good, but at all times he strove to do his best to overcome his physical handicap, and in this he was immensely helped by the devotion and loving care of his wife. To her and to their two children we extend our heartfelt sympathy.

JOHN McGRATH, M.D., M.Sc.

Professor John McGrath, who before becoming professor of pathology and bacteriology at University College, Dublin, a few years ago was State Pathologist in Eire for about a quarter of a century, died suddenly on January 11, the day before his 56th birthday.

John McGrath was born at Cappoquin, Co. Waterford, on January 12, 1901, and from Clongowes Wood College entered University College, Dublin, graduating B.Sc. in 1921 and proceeding to the M.Sc. in the following year. Having decided upon medicine as a career, he went on to take the M.B., B.Ch. degrees in 1925, proceeding to the M.D. in 1940. After graduation he continued his medical studies at Vienna and Heidelberg, and for a time was an assistant at the Krankenanstalten, Mannheim.

Soon after his return to Dublin McGrath was appointed lecturer in medical jurisprudence at University College, and in the same year (1929) became State Pathologist. In this latter post his legal training—he was called to the Irish Bar in 1933—held him in good stead, and he proved to be a very able witness, giving his evidence in clear-cut, unambiguous terms. He examined in medical jurisprudence for the Dublin and Glasgow Universities and for the Queen's University of Belfast. When Professor Thomas T. O'Farrell retired from the chair of pathology and bacteriology at University College in 1952 McGrath was appointed to succeed him, relinquishing his appointment as State Pathologist to do so. During most of his career he was pathologist to

St. Vincent's Hospital and to the National Maternity Hospital, Dublin.

McGrath was elected a member of the Senate of the National University of Ireland in 1949, and for some years he had been a member and treasurer of the Medical Research Council of Ireland and a member of the Medical Registration Council. He was also chairman of the National Blood Transfusion Association of Ireland and a former assistant editor of the *Irish Journal of Medical Science*.

A colleague writes: The sudden passing of John McGrath—affectionately known as "Jock" to his familiars in every one of the counties of Ireland—came to us all with incredible swiftness. Less than 72 hours before, he had been of our company at the annual dinner of the hospital in which he had worked as student and as member of the staff for forty years; we knew that lately he had been gravely ill, yet that evening he bore little sign of it, and we rejoiced to hope from his obvious enjoyment of the gathering and the sustained vivacity of his conversation that he was on the road to recovery again. Next day, and the day after, he sat examining at the College; on the following afternoon, as he was setting out for his laboratory, he died, quietly, at the wheel within a few moments of entering his car. "Jock" died as he would have wished—in harness.

Through all those years we had recognized in him one of the most gifted men of his generation. The very concourse at his funeral obsequies bore witness to the gap his going has left, not merely in our Dublin medical corps but in almost every phase of Irish life—university, legal, medical, administrative, as well as in the wide and overlapping circles of Dublin's social life, in which he had an enormous acquaintance. While he was a tremendous worker, he was also a keen sportsman and a welcome lover of good company. Looking back more than a score of years, one can recall many a happy tussle at Portmarnock or Fitzwilliam, and the enthusiastic accounts with which he would entertain us envious stay-at-homes at this season of the year on his return from his annual trip to Switzerland to take part in the winter sports in which he excelled. A keen fisherman, too, he was no less expert with camera, and found deep pleasure in co-operating in his wife's accomplishment in their beautiful garden at the foot of the Dublin hills.

To the general public he was best known as the State Pathologist. As a scientific witness he had gained universal respect and repeated tribute in court for his objectivity and fairness, as well as for the accuracy and the clarity of his testimony. In the "lab" at hospital he enjoyed the same regard: ever helpful to a colleague seeking information, his exposition of a difficult slide or biochemical problem was invariably given in the simplest and clearest manner.

On his appointment to the chair of pathology at University College, he resigned his appointments as State Pathologist and as an active member of the Vincent's staff so that he might devote himself the more fully to the work of a university department. Last year he had been appointed dean of the Medical Faculty. Had providence seen fit to grant him another ten or even five years in which to expend his zeal and his wide intellectual gifts on the further development of the medical school, a coming generation would have reaped the benefit of his proved capacity for organization. His place will be difficult indeed to fill.

K. S. writes: For nearly 30 years John McGrath had, by his perception and skill in applying the fundamental principles of pathology, built up an international reputation as a medico-legal expert: he had travelled the length and breadth of his country to give his sage and practical advice on countless unexplained or more frankly suspicious deaths, and had become the unchallenged master of his field, State Pathologist to Eire, professor of forensic medicine and later of pathology also in his university school. He bore his authority with such evident humility and good sense that

no one—in court or in the field of criminal investigation—ever doubted his sound reasoning and absolute fairness. Everyone liked and admired him, quickly succumbing to his infectious warmheartedness and most generous personality. Here was the complete antithesis of Spilsbury's cold aloofness in a man of equal authority and standing among his fellows, much travelled and as much devoted to absolute justice, but warm, generous in company or opposition, capable of relaxation and pleasure in the company of his colleagues, a good club-fellow, knowledgeable in art and travel, music, wine, and book-lore, a conversationalist and raconteur—excellent company indeed. To see him relax in the garden of his country home under the Wicklow mountains, secure in the affections of his charming wife and his friends, or to sample his generous hospitality at his club in Dublin was to see an Irishman of learning and wit enjoy leisure as only the Irish can. Dublin University life has lost one of its wisest counsellors and teachers, the State its most experienced medico-legal opinion, and his many friends a most lovable companion.

DOROTHY WOODMAN, M.D., M.Sc.

Dr. Dorothy Woodman, lecturer in clinical pathology in the University of Bristol and consultant pathologist to the Frenchay Hospital, died in Bristol on December 21, 1956, aged 61.

Dorothy Woodman first trained as a physiologist, graduating B.Sc. in 1917 and proceeding to the M.Sc. in 1924. She then went on to study medicine at the London School of Medicine for Women, where she had previously been working in the department of physiology, and took the degrees of M.B., B.S. in 1931, proceeding to the M.D. three years later. After working as resident pathologist in the Royal Free Hospital and as an assistant in the pathological department of the Cancer Hospital, she won the A. M. Bird postgraduate scholarship in pathology at the London School of Medicine for Women, where she worked for a further year. She went to Bristol as lecturer in pathology in 1935, but three years later transferred to the department of preventive medicine, which, by arrangement with the city, was responsible for the laboratory services to the municipal hospitals. Although she continued to teach in the university, her main work was to organize the pathological services to Southmead, Ham Green, and, later, Frenchay Hospitals. She had continued responsibility for this throughout the war years, and only with the changes brought about by the introduction of the National Health Service did she confine her attention to Frenchay Hospital and the university.

K. E. C. writes: With the death of Dr. Woodman the University of Bristol and the regional board hospitals have lost a greatly valued pathologist, and her colleagues will deeply miss a warm friend. She enjoyed teaching, and in the years that followed her appointment as lecturer in pathology at Bristol many medical and lately veterinary students were privileged to have the benefit of her instruction. Her gift for simple exposition was valued also by the nurses and technicians to whom she gave great service as examiner, teacher, and adviser. Those who learnt from her also received understanding, encouragement, and friendship.

Her great administrative ability and capacity to organize complex pathological services became particularly evident during the war years. Before the coming of the Army Blood Transfusion Service to Bristol she organized the blood grouping. Later she carried out surveys by arrangement with the M.R.C. on haemoglobin levels, on vitamin-C levels, and on the resistance of pneumonias to sulphonamides. She arranged for the distribution of the very valuable and limited supplies of penicillin and tetanus antitoxin

then available to the local authority. Yet, when the bacteriology section of the preventive medicine laboratories was faced with epidemics of paratyphoid in 1940 and 1941, she and her staff took an important share in the work that this entailed.

With the introduction of the National Health Service, she accomplished smoothly all the necessary transfers of personnel to different hospitals, so that each person concerned felt that his or her wishes had been carefully considered, and that each was being placed where his or her gifts could be used to maximum advantage. Her great sense of duty, her patient and warm understanding, her cheerful resolution and determination, and her deep religious convictions all contributed to the love and affection in which she was held by all who really knew her.

T. A. B. HARRIS, M.D., F.F.A.R.C.S.

Mr. A. W. BADENOCH writes: May I add a few lines to what has already been written (*Journal*, January 12, p. 110) about the late Dr. T. A. B. Harris? He had been anaesthetist to St. Peter's Hospital for 25 years, and since the war was responsible for all my cases. Like all who have worked at St. Peter's, he became very attached to it and was always out to further its interests. He was delighted to welcome visitors and to make them feel at home. His knowledge of the theory of anaesthesia and the pharmacology of anaesthetics was profound, but no one could surpass him in speed of induction and delivery of patients into the theatre in quick succession. One of the best attributes a surgeon can recognize in an anaesthetist is efficient unobtrusiveness, and this could always be applied to "Tommy" in the theatre. One had never any doubt that he was complete master of the state of his patient. Outside the theatre he was full of verve, interested in all aspects of medicine, of life, and especially in his family. He used to delight in talking about his boys, and we hope they will continue to be the same unending source of comfort to his widow that they always were to him.

Dr. KATHLEEN O. VAUGHAN died in Alderney, Channel Islands, on November 26, 1956. She was well known as an advocate of pre-natal exercises for women. Kathleen Olga Vaughan received her medical education at the London School of Medicine for Women, and graduated M.B. from London University in 1900. After graduation she held the appointment of house-surgeon at the Royal Aberdeen Hospital for Sick Children and then obtained the post of medical officer in the Quarantine Office at Port Tewfik, Suez. In 1903 she moved further east to become superintendent of the Victoria Dufferin Hospital at Calcutta, and later she was appointed superintendent of the Diamond Jubilee Zenana State Hospital at Srinagar. She left India in the early nineteen-twenties and thenceforward lived in many different places in England and on the Continent. During the second world war she worked for a time in the Emergency Medical Service. She was the author of *Safe Childbirth: The Three Essentials*, published in 1937, and *Exercises Before Childbirth*, which appeared in 1951, and contributed an article entitled "The Expanding Pelvis" to this *Journal* in 1942.

Dr. DAGMAR WILSON writes: Dr. Kathleen Vaughan was associated with a time in Indian history which has already become legendary. She was a pioneer in bringing medical relief to Indian women and children, especially in the Princely States. During a long period of service in the State of Kashmir she not only built up the work of the hospital for women and children at Srinagar but found energy to undertake research on osteomalacia, a disease prevalent among poorer women living in seclusion in that city. Her convictions of the need for training Indian women as doctors caused her to take an active part in the founda-

tion of the Women's Medical Service in India. Dr. Vaughan lived to enjoy a long period of retirement in England, but during the second world war she helped organize maternity wards set up at Ruskin College, Oxford. Her chief interest remained the problems of childbirth, and she carried out extensive research on exercises during pregnancy. Dr. Kathleen Vaughan was a woman of keen wit and ready humour. Until prevented by ill-health, she was a regular attendee at the meetings of the overseas branch of the Medical Women's Federation, where she enlivened many discussions to the delight of her friends.

Dr. R. S. RENTON, who was in practice at Clevedon, Somerset, for 30 years, died on December 27, 1956, at the age of 79. Ralph Stuart Renton was born on September 7, 1877, and was a medical student in Newcastle upon Tyne, graduating M.B., B.S. from Durham University in 1902 and proceeding to the M.D. in 1914. Soon after graduation he settled in practice at Blackhill, Co. Durham, thus following in the footsteps of his father, Dr. George Renton, and his grandfather, Dr. John Renton, both of whom practised for many years in the same area. Dr. R. S. Renton became honorary surgeon to the Consett Hospital, and remained in practice at Blackhill until he entered the R.A.M.C. for service in Egypt and France in the first world war, service which was recognized by the award of the Military Cross in 1918. After the war he was in practice at Coltishall, Norfolk, for a year or two until 1921, when he finally settled at Clevedon, where he became honorary surgeon to the cottage hospital and medical officer to the Clevedon Convalescent Homes. He took a prominent part in the revival of the local branch of the St. John Ambulance Brigade, becoming divisional surgeon, and in 1946, for his long service to the movement, he was appointed a serving brother of the Venerable Order of St. John of Jerusalem. During the second world war he was a medical officer in charge of a first-aid post, and he also served on the Bristol medical board throughout the war. Failing health enforced his retirement from practice some six years ago. Dr. Renton had many outside interests, being a keen gardener, with a preference for the cultivation of roses, a breeder of deerhounds, a lover of cricket, a keen supporter of the local dramatic society, and a past president of the Clevedon Rugby football club, which he helped to form. In addition, he acquired such a deep knowledge of church architecture that his services as a lecturer on the subject were in frequent demand. He leaves a widow and one son.

Dr. TATIANA GOURLANDE died at her home in London on January 6 after an illness of some months. Born in Russia in 1887, in her youth she was a dramatic actress in Moscow. Later she studied medicine at the Women's Medical Institute in Moscow, but, owing to the revolution, had to leave Russia before her graduation. After living for a few years in London she became a medical student at St. Mary's Hospital Medical School and qualified M.R.C.S., L.R.C.P. in 1928. Dr. Gourlande specialized in gynaecology, and for a time was clinical assistant at the Hospital for Women, Soho Square, the Chelsea Hospital for Women, and the Samaritan Hospital. A kind and clever woman of the world, she was esteemed by her colleagues and patients. Her many friends will share a great sense of loss with her husband. —S.W.

Dr. D. H. BERRY died in the Peace Memorial Hospital, Watford, on December 31, 1956, at the age of 60. Douglas Haycraft Berry was born on April 25, 1896, in Watford, where his father, Dr. F. H. Berry, was a member of the oldest-established practice in that town. He was educated at Malvern College, and, soon after leaving, served as an infantry officer in the Bedfordshire and Hertfordshire Regiment during the first world war, being severely wounded during the fighting on the Somme. At the end of the war he entered Guy's Hospital, qualifying in 1922, the year that his father died, and, after holding resident appointments at Guy's, he joined the practice in 1923. Although often handicapped by ill-health, he worked very hard and conscientiously, building up an extensive practice. His quiet, unassuming manner and his kindly understanding, as well as his undoubted professional ability, resulted in his being deeply respected and loved by his many patients. For many years he was a member of the medical staff at the Peace Memorial Hospital, Watford. Owing to ill-health he retired at the end of last June, three months after a very sad bereavement, the death of his wife. For thirty-three years he never spared himself in the exacting life of a general practitioner, and he will be greatly missed by his many friends; his colleagues, and his numerous patients. The sympathy of them all is extended to his married son in Kenya and to his married daughter in Watford, with whom he lived after his wife's death.—L. K. W.

Medico-Legal

FATAL ATTEMPT TO SLIM

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On December 5 last a married woman aged 47 died in hospital in Sheffield. She had been admitted at the instance of her family doctor, whose patient she had been for three years. Until July, 1956, he had attended her for minor ailments only, including cystitis. He had always found her sensible about her health and not given to patent medicines or homely remedies. Though inclined to be influenced by what people told her, he would not have expected her to take anything without consulting him.

On July 2, 1956, she consulted him complaining of a peculiar loss of vision in the left eye which came on during the night, with lights before her eyes, and she still complained of a black spot in the eye when he saw her. He found she had a haemorrhage of the eye and high blood pressure, for which he treated her, referring her to a specialist for the eye trouble. On test her urine was normal, and phenobarbitone and theobromine brought the hypertension down to about normal.

In August the eye haemorrhage returned. On October 26 she consulted her doctor again, complaining of distension of the abdomen. He saw her again on November 23, after learning that she had been put on the list for admission to hospital. The swollen abdomen was so much worse that he phoned the hospital and got her admitted within 48 hours.

On necropsy it was found that her liver was necrotic. It was slightly smaller than normal, with the right lobe particularly small, blotchy yellow in external appearance, and on cut section very fatty and yellow with a nutmeg pattern at the periphery. Death was certified as being caused by acute liver failure due to subacute hepatitis.

At the inquest held by the Sheffield City Coroner on December 13, 1956, the deceased's brother gave evidence that she had first become ill about Whitsun, 1956, when one night she had a temporary attack of blindness. Her local chemist gave evidence that in about May or June, 1956, she had come to his shop and asked for turpentine substitute, telling him that she had been told it was good for slimming. He refused to sell her any without asking a doctor if it would do her any harm. One of his doctor customers, when asked, said that if anyone was taking that they would not need his services much longer. When he passed this on she said, "My God," and made it clear to him that she had been taking it for some time but would take it no more.

The consulting pathologist to the hospital said that turpentine substitute, which was a distillate from coal and some form of hydrocarbon, taken internally up to the time of the conversation with the chemist could have caused the necrosis of the liver which he had found. Once the damage was done there was no cure, and although she stopped taking it the necrosis would get steadily worse until it caused death. Assuming that she had taken the turpentine substitute, he had no doubt that it was this which had caused the necrosis.

A verdict of death by misadventure was recorded.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending January 5 (No. 1) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	2	1	5	0	1	9	1	3	0	7
Dysentery ..	535	43	133	3	1	696	80	131	10	
Encephalitis, acute	6	0		0		0	0		0	
Enteric fever: Typhoid ..	2	1	0	0		1	0	0	0	
Paratyphoid ..	3	2	0	0		8	2	(B)	0	
Food-poisoning ..	143	23	14	1		122	38		5	
Infective enteritis or diarrhoea under 2 years ..				11	8				13	5
Measles* ..	10,970	798	146	323	123	3,226	26	76	29	81
Meningococcal infection ..	31	3	11	1	2	27	0	15	2	
Ophthalmia neonatorum ..	32	2	4	0		23	0	4	0	
Pneumonia † ..	644	57	323	19	1	850	81	373	7	3
Poliomyelitis, acute: Paralytic ..	44	4				41	2			
Non-paralytic ..	19	2	6	0	9	18	4	7	3	1
Puerperal fever § ..	190	35	8	3		259	52	14	2	
Scarlet fever ..	572	38	81	23	18	738	44	116	26	23
Tuberculosis: Respiratory ..	537	57	69	13		516	54	68	6	
Non-respiratory ..	60	3	13	2		80	6	13	0	
Whooping-cough ..	2,109	126	279	11	59	1,130	73	51	102	226

DEATHS in Great Towns	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute		1			0		0			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	5	0	0	1	2	9	0	4	0	0
Influenza ..	15	1	4	0	2	26	2	2	1	0
Measles ..		1	1	0	1		0	1	0	0
Meningococcal infection ..		0	0				0	1		
Pneumonia ..	389	56	28	21	12	411	78	36	11	6
Poliomyelitis, acute	4	1			0	3	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	56	3	8	3	7	104	16	9	1	2
Non-respiratory ..		0	3	0	0		1	0	0	1
Whooping-cough ..	1	0	0	0	0	0	0	0	0	0
Deaths 0-1 year ..	251	36	28	15	21	247	27	33	13	3
Deaths (excluding stillbirths) ..	6,764	945	662	176	238	6,674	1082	727	121	146
LIVE BIRTHS ..	9,052	1434	1015	281	444	8,287	1201	1039	225	345
STILLBIRTHS ..	213	32	22			190	25	24		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenzal pneumonia.

§ Includes puerperal pyrexia

Vital Statistics

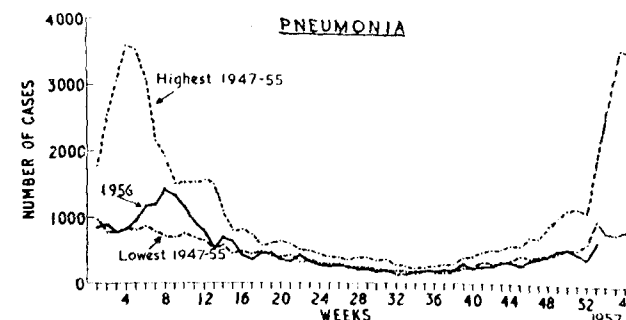
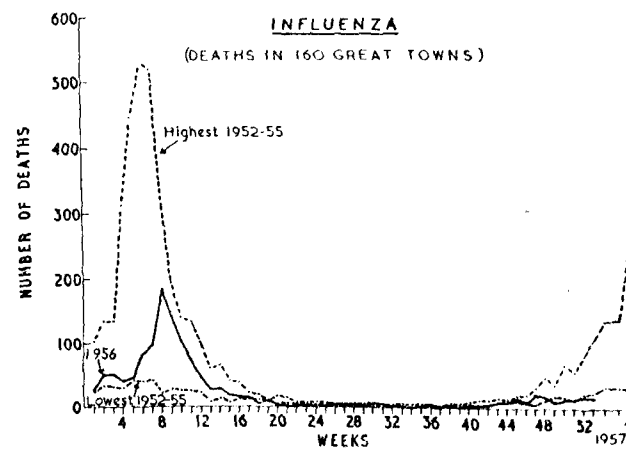
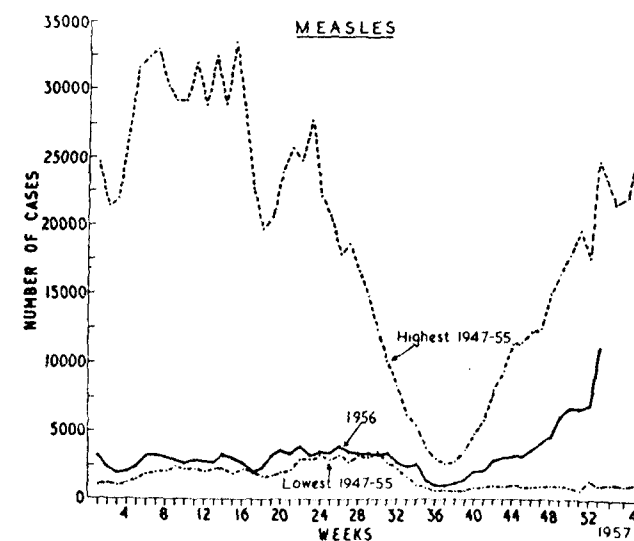
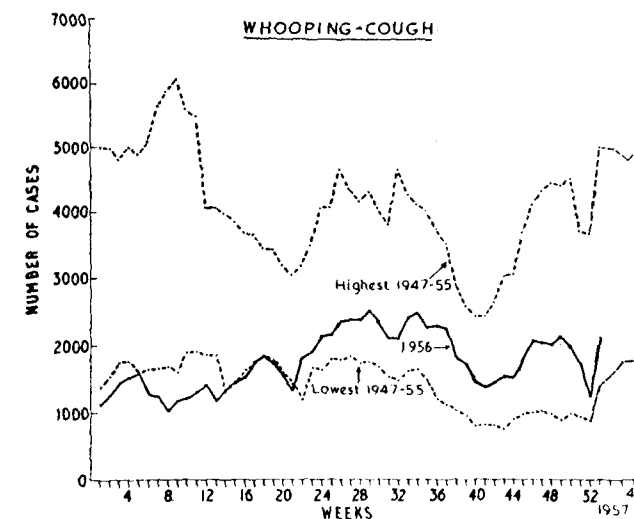
England and Wales in 1956

The infant mortality rate again reached a low record in England and Wales in 1956—namely, 23.8 per 1,000 related live births. It was 24.9 in 1955 and 52.8 in 1938. The number of infant deaths was 16,471. Live births numbered 699,059, which was the highest number since 1949. The birth rate was 15.7 per 1,000 population. The deaths registered in the year numbered 521,402, giving a rate of 11.7 per 1,000 population, the same as for 1955. The stillbirth rate was 23.0 per 1,000 live and stillbirths; this rate has not changed much in the last 5 years.

Fourth Quarter, 1956.—The live birth rate was 14.6 per 1,000 population and the infant mortality rate 23.9 per 1,000 live births—a record low figure for the fourth quarter. The general death rate was 11.3 per 1,000 population, as compared with 11.1 in 1955 and 11.4 in 1954.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the years 1947-55 (influenza, 1952-5) are shown thus ----, the figures for 1956-7 thus —. Except for the curves showing notifications in 1956-7, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

Infectious diseases were more prevalent during the week ending January 5 in England and Wales, and the rises in notifications included 4,092 for measles, from 6,878 to 10,970, 844 for whooping-cough, from 1,265 to 2,109, 244 for acute pneumonia, from 400 to 644, 187 for dysentery, from 348 to 535, and 48 for scarlet fever, from 524 to 572.

The largest increases in the incidence of measles were 715 in Lancashire, from 1,877 to 2,592, 503 in Yorkshire West Riding, from 416 to 919, 433 in Essex, from 704 to 1,137, 360 in London, from 438 to 798, 307 in Surrey, from 129 to 436, 234 in Yorkshire East Riding, from 285 to 519. The largest rises in the notifications of whooping-cough were 90 in Glamorganshire, from 24 to 114, 73 in London, from 53 to 126, 64 in Yorkshire West Riding, from 74 to 138, 63 in Kent, from 103 to 166, and 57 in Lancashire, from 158 to 215. Only small fluctuations were recorded in the local returns of scarlet fever. 2 cases of diphtheria were notified, 1 fewer than in the preceding week.

63 cases of acute poliomyelitis were notified during the week, and these were 5 more for paralytic and 9 more for non-paralytic cases than in the preceding week. The largest returns were Lancashire 11 (Clitheroe M.B. 3, Bolton C.B. 2), London 6 (Woolwich 2), Middlesex 6 (Wembley M.B. 2), and Yorkshire West Riding 5 (Saddleworth U.D. 2, Bowland R.D. 2).

The largest returns of dysentery were Warwickshire 105 (Coventry C.B. 90, Birmingham C.B. 9), Yorkshire West Riding 105 (Bradford C.B. 24, Leeds C.B. 19, Sheffield C.B. 19), Lancashire 95 (Liverpool C.B. 23, Blackburn R.D. 18, St. Helens C.B. 10), London 43 (Woolwich 11), and Surrey 26 (Mitcham M.B. 17).

Week Ending January 12

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 528, whooping-cough 2,486, diphtheria 9, measles 9,281, acute pneumonia 648, acute poliomyelitis 72, dysentery 530, paratyphoid 4, and typhoid fever 1.

Medical News

R.C.P. and Medical Education.—A steering committee is meeting shortly to consider plans for a permanent organization for the discussion of problems connected with medical education and for the promotion of research in this field. The initiative for this move comes from the Royal College of Physicians of London. On November 23 the President, Sir RUSSELL BRAIN, invited some 70 persons, broadly representative of medical teaching and the licensing bodies, with others, to a preliminary conference at the College at which the proposal was discussed and the steering committee appointed. There will be a second meeting of the conference when the steering committee's recommendations are ready.

New General Hospital for Huddersfield.—The Leeds Regional Hospital Board has released some details of a new 600-bed general hospital which is to replace the Green Lea Hospital at Huddersfield. Clearing of the site is expected to begin on March 1, and building early next year. The total cost is rather more than £2.75 million. The work will be done in two phases. The first, costing £1.5 million and included in the Ministry's schedule of capital schemes for starting in 1957-8, will provide half the beds, four operating theatres, radiological, out-patient, and pathological departments, and various other buildings. It will take about 3½ years to complete. Besides the remaining 300 beds, the second phase includes plans, among other things, for a nurses' training school. The site being restricted, the new hospital will take the form of a "vertical" building: with its eight or nine stories, it will be high in relation to the ground area covered. While it is being built the functions and staff of the Green Lea Hospital will be transferred to St. Luke's Hospital.

Three New Journals.—Three new medical journals made their appearance during the last quarter of 1956. The first is a British edition of the American monthly *Antibiotic Medicine and Clinical Therapy*; the British edition will also appear monthly. It is published by MD Publications Inc., whose London address is Effingham House, Arundel Street, London, W.C.2. The annual subscription is £2 (single issues 3s. 8d.). On the cover it is stated that the circulation is 20,000. The editors, who all are American, are Dr. HENRY WELCH (chief), Dr. FELIX MARTI-IBÁÑEZ (associate), and Dr. A. H. HOLLAND, jun. (consulting). The British members of the editorial board of 26 are Professor George Brownlee, Professor Robert Cruickshank, Sir Howard Florey, Professor F. R. G. Heaf, Professor Alan Kekwick, Sir Cecil Wakeley, Dr. R. R. Willcox, Professor John Yudkin, and Dr. K. Zinnemann. From India comes a new quarterly—the *Indian Journal of Public Health*. This is the journal of the Indian Public Health Association. It is edited by Dr. B. C. DAS GUPTA, formerly director of health services in West Bengal. This journal, which is in English, is obtainable from the offices of the Indian Public Health Association, 110, Chittaranjan Avenue, Calcutta, 12. The cost to inland subscribers is Rs. 8 for a year; Rs. 2.8 for a single copy. The first issue runs to 106 pages. Besides a message of good will from the Minister of Health of West Bengal, Dr. A. D. MUKHERJI, there are six original contributions, leading articles, abstracts from current literature on public health, notes and news, reviews, and other features. The last journal, *Living Conditions and Health*, also a quarterly, is described as an "international" medical journal. It appears in identical form in English, Chinese, French, German, Russian, and Spanish, and is published in London, Peking, Paris, Vienna, Moscow, and Santiago. It owes its origin to a conference called the "World Congress of Doctors for the Study of Present-day Living Conditions," which was held in Vienna in May, 1953. The editor-in-chief is Dr. F. SCHOLL (29/3, Wollzeile, Vienna, 1, Austria), and included on the 33-strong editorial committee are Dr. P. D'Arcy Hart, Professor L. Penrose, and Dr. Alice Stewart

from Great Britain. The annual subscription is £1 6s. (single copies 7s. 6d.). Orders for the English edition may be placed with Dr. A. RYLE, the Caversham Centre, 25, Caversham Road, London, N.W.5.

Active Membership of W.H.O.—Albania and Bulgaria, who withdrew from active membership of the World Health Organization in 1950 and 1949 respectively, have now decided to resume their participation. These are the first two countries to respond to the resolution, passed at last year's World Health Assembly, which by waiving certain dues was designed to encourage resumption of active membership. There now remain seven inactive member nations—Czechoslovakia, Hungary, Poland, Rumania, the U.S.S.R., the Ukrainian S.S.R., and the Byelorussian S.S.R.

Standing Committee on Detergents.—The Minister of Housing and Local Government, in consultation with the Secretary of State for Scotland, has now appointed the standing technical committee on synthetic detergents, whose formation he announced to Parliament on December 18. Its tasks are to keep under review possible difficulties in sewage works, rivers, and water supplies occasioned by the use of detergents, and to encourage research on this problem and assist in its co-ordination. The committee is to report progress at least once a year. The chairman is Mr. H. W. CREMER, a partner in a firm of consulting chemical engineers. The committee includes two medical men, Dr. E. WINDLE TAYLOR, director of water examination of the Metropolitan Water Board, and Dr. N. R. BEATTIE, of the Ministry of Health. Also on the committee are scientific representatives of the major firms concerned in the manufacture of detergents, Government scientists and inspectors, and others. The secretary is Mr. D. H. A. PRICE, of the Ministry of Housing and Local Government.

Royal Society Research Appointments.—Dr. J. T. EAYRS, of the department of anatomy at Birmingham University, has been appointed Head research fellow from October 1, 1957. He will study mechanism in neural integration. Dr. D. W. KENNARD, of Cambridge University, has been appointed Stohert research fellow from January 1 last. He will investigate reflex activity of the spinal cord, working in the physiology laboratory at Cambridge.

Commonwealth Bursaries.—Two awards under the Royal Society and Nuffield Foundation Bursaries Scheme particularly concern medicine. Dr. H. J. HEINZ, head of the department of parasitology of the South African Institute for Medical Research, Johannesburg, receives an award to allow him to study ankylostomiasis in Nigeria. Dr. E. A. BOULTER, of the Government's Microbiological Research Establishment at Porton, goes for four months to the Australian National University, Canberra, to study the pox viruses and the virus of myxomatosis.

Bequests to Royal Free.—Among the bequests of the late Professor WINIFRED CULLIS, who died last November, were £1,000 to the Royal Free School of Medicine, and £200 to the Royal Free Hospital for the benefit of the nurses. Professor Cullis's association with the Royal Free spanned more than half a century. It began when she was appointed demonstrator of physiology there in 1901, and ended only with her death.

French Prize for Medical Films.—The last date for the receipt of films entered for *Presse Médicale's* annual 100,000-francs prize for hitherto unpublished medical films by amateurs is February 28. Films may be in colour or not, with or without sound, but they must be 16 mm. Films made by firms or commercially subsidized will not be eligible. The teaching value as well as technical excellence will be taken into account in judging the entries. Further details may be obtained from the editorial office of *Presse Médicale*, 120, Boulevard Saint-Germain, Paris, 6.

Prize for Registrar Anaesthetists.—The Section of Anaesthetics of the Royal Society of Medicine offers a prize of £30 for the best paper on a subject connected with anaesthesia by a registrar anaesthetist. Fellowship of the society

is not a condition of entry. Further details can be obtained from the hon. secretary of the Section, 1, Wimpole Street, London, W.1.

Welsh National School of Medicine.—Dr. J. G. LAWSON, lecturer in obstetrics and gynaecology at Aberdeen, has been appointed senior lecturer at the Welsh National School of Medicine. Dr. Lawson graduated (with distinction) at St. Andrews in 1943.

Honorary Degree for Lord Malvern.—Rhodes University, Cape Province, is to confer the honorary degree of Doctor of Laws on Lord MALVERN, formerly Prime Minister of the Federation of Rhodesia and Nyasaland. It is hoped to confer the degree at the graduation ceremony on March 29.

COMING EVENTS

Liverpool University Medical Students' Society.—Annual dinner for past and present members will be held at the Adelphi Hotel, Liverpool, on February 7. Tickets (25s.) from Medical Dinner Secretary, Medical School, Liverpool 3.

Contraceptive Technique.—Lecture-demonstration by MARIE STOPES, D.Sc., at the Mothers' Clinic, 108, Whitfield Street, London, W.1, on February 7 at 2.30 p.m. No fee is charged, but tickets must be obtained in advance.

Hunterian Oration.—Sir ERNEST FINCH will deliver the Hunterian Oration at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2, on February 14 at 4 p.m. His subject will be "The Influence of the Hunters on Medical Education."

Industrial Welfare Society.—One-day conference on industrial health at the Rembrandt Hotel, Thurloe Place, London, S.W.7, on February 21. Intended for executives, industrial medical officers, and senior nurses. Details from the society, 48, Bryanston Square, London, W.1.

Laboratory Animals Bureau.—Tenth congress will be held at the Royal (Dick) School of Veterinary Studies, Edinburgh, April 4 and 5. Details from the Laboratory Animals Bureau, M.R.C. Laboratories, Holly Hill, London, N.W.3.

NEW ISSUES

British Journal of Preventive and Social Medicine.—The new issue (Vol. 10, No. 4) is now available. The contents include: OCCURRENCE AND AETIOLOGY OF LUNG CANCER IN NORWAY IN THE LIGHT OF PATHOLOGICAL ANATOMY. Leiv Kreyberg. COHORT ANALYSIS OF MORTALITY RATES AS AN HISTORICAL OR NARRATIVE TECHNIQUE. R. A. M. Carr. COHORT ANALYSIS OF CANCER MORTALITY IN ENGLAND AND WALES, 1911-1954, BY SITE AND SEX. R. A. M. Carr. GENERAL PRACTICE ON A NEW HOUSING ESTATE. J. H. F. Brotherton and S. P. W. Chave. INDEX TO VOLUME 10, 1956.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, January 28

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., films: (1) Bronchial Anatomy and Bronchoscopy; (2) Mechanical Artificial Ventilation of the Lungs.

Tuesday, January 29

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor C. A. Keele: Causes of Pain.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Mr. A. K. Munro: Gravitational Ulcers.

LIVERPOOL UNIVERSITY.—At Arts Theatre, Victoria Building, 5.15 p.m., Sherrington Lecture by Professor Wilder Penfield, O.M., F.R.S. (Montreal): Cerebral Cortex of Man: An Interpretation of Responses to Electrical Stimulation.

ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Sir Geoffrey Todd: Operative Treatment of Pulmonary Tuberculosis and its Prognosis (with lantern slides).

ROYAL STATISTICAL SOCIETY: MEDICAL SECTION.—At Keene Lecture Theatre, Westminster Medical School, 5.30 p.m., Mr. F. D. K. Liddell: Statistical Problems of the National Coal Board Medical Service.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Mr. T. L. T. Lewis: Use of Drugs in Modern Obstetrics.

Wednesday, January 30

BRITISH PSYCHO-ANALYTICAL SOCIETY.—At Royal Society of Medicine, 8.30 p.m., Ernest Jones Lecture by Dr. Margaret Mead: Changing Patterns of Parent-Child Relations in an Urban World.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Nodular Lesions of the Legs.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. J. L. Livingstone: Asthma.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. J. D. Fergusson: Prostatic Cancer.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At National Hospital, Queen Square, W.C.1, 8.30 p.m., Dr. Macdonald Critchley: Crimes of Dr. Marcel Petit.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. N. H. Ashton: Pathology and Aetiology of Retrolental Fibroplasia.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Burns Lecture by Dr. D. V. Hubble: Some Principles of Homoeostasis.

ROYAL MEDICAL SOCIETY, EDINBURGH.—2.30 p.m., Industrial Visit to Edinburgh Slaughterhouse.

Thursday, January 31

GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—7.30 p.m., Dr. Ian D. Grant: Medical Services in Other Lands.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Mr. A. K. Munro: Skin Tumours.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.30 p.m., Dr. A. H. Douthwaite: Development of Sadium.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.30 p.m., Otolaryngology Lecture by Professor E. W. Walls: A Critical Anatomical Assessment of Certain Signs and Symptoms in the Field of Otorhinolaryngology.

ROYAL NORTHERN HOSPITAL.—2.45 p.m., Dr. A. Coady: The Medical Out-patient Service and the Family Doctor's Problems (discussion invited).

ROYAL SOCIETY.—11 a.m., discussion to be opened by Dr. A. S. Parkes, Sc.D., F.R.S.: Viability of Mammalian Cells and Tissues After Freezing.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Sir Paul Mallinson: psychiatric demonstration.

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UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C.1, 5.15 p.m., Professor F. Bergel, D.Phil.Nat., Ph.D., D.Sc., F.R.I.C.: Recent Advances in Cancer Research.

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ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Sir Paul Mallinson: psychiatric demonstration.

Germicidal Sprays

Q.—What value have germicidal sprays in reducing the incidence of infections in schools, offices, cinemas, etc.? One such contains D.D.T. in addition to chloroxyleneol and formalin. Is the D.D.T. likely to constitute any hazard if inhaled?

A.—"Germicidal sprays" can be of two sorts, designed either to kill microbes floating in the air or to kill microbes in floor dust, on furniture, etc. There is no good scientific evidence that any of the chemical air-disinfectants can control the spread of infection in places such as schools, offices, or cinemas. Nor is there good evidence that any substantial effect on the spread of illness can be obtained by disinfection of dust and fomites, though it is certain that large numbers of, for example, haemolytic streptococci may be present in the floor dust if nasal carriers are about.

There is ordinarily no hazard from sprays containing D.D.T., provided they are handled in accordance with the maker's instructions.

Vomiting of Pregnancy

Q.—Have there been any recent advances in the treatment of vomiting of pregnancy? What is the most effective drug to use?

A.—The basic principles of management of vomiting in early pregnancy have changed little in recent years. They are reassurance, mild sedation, a diet rich in carbohydrates and low in fats, and the taking of frequent small dry meals with fluids taken separately. The urine is tested, firstly to exclude any urinary infection and secondly for acetone. Acetonuria signifies that the patient's nutrition is being adversely affected and she should be transferred to hospital.

With the exact pathogenesis of the condition still unknown a variety of drugs are being employed, and they fall largely into three groups: sedatives, antihistamines, and B vitamins. Several proprietary preparations contain a combination of drugs from the three groups. Different hormones have enjoyed popularity at different times, and most recently corticotrophin and cortisone have been tried, but the more innocuous drugs mentioned earlier provide quite satisfactory results. Chlorpromazine has also been employed, especially in severe cases (hyperemesis), but the possibility of consequent jaundice has militated against its general adoption.

Infantile Gratification Habits

Q.—My daughter from about 4 months of age began to suck her night-dress or sheet when falling off to sleep, and the next morning we would find the night-dress or sheet sodden with her saliva. In an attempt to prevent this, we eventually gave her a soft napkin to suck instead. She is now nearly 20 months old and still cannot go off to sleep without it. Is there any way of breaking her of this habit, and is it harmful? Incidentally, when she awakes she is extremely thirsty. I presume this is due to her having lost so much saliva on the napkin.

A.—The questioner here rightly implies, in the way the question is asked, a doubt about whether this habit really is harmful. The same doubt could be expressed about any of the gratification habits. In young children they appear to be started off by some basic physical need, and their importance naturally depends on what that was.

In the case described the child began to suck excessively at the age of 4 months. It would be interesting to know what her feeding history and what her weaning history was. I am sure some children are seen nowadays who benefit nutritionally from starting mixed feeding at 4 months but who do not seem ready at this age to relinquish the comfort of sucking from breast or from bottle. If the onset of the sucking habit began at the time of a difficult weaning, then one might have a clue to what it represents—probably a relatively unsatisfied child—although such habits are not unknown in children who appear to

enjoy their time of sucking in an unimpeded and natural way for as long as they want. The child being thirsty is explained by the questioner by reason of the loss of saliva, but again one would wonder whether she had perhaps been very rigidly trained to accept breast or bottle at fixed times, or whether she was able to ask for it a little early or in between-times and be met with some kind of solace and response. Clearly at 20 months no one would suggest putting her back on a bottle, but there might be other ways of replacing the simple body-satisfaction that accompanies successful infant feeding.

This kind of sucking can deform the teeth, but there is no mention of this. The important thing, however, is to try to understand why this little girl wants to do it. I suspect that if her difficulty is understood, and something more done to give her simple physical gratification, as well as everything possible to encourage her to enjoy growing up, the napkin could be gently moved once the child is soundly asleep. She probably will need to go on using it for a time, but with most of these habits the less of an issue that is made of them the more easily the child seems to be able to drop them when he or she feels old enough to do without these essentially infantile types of gratification.

In short, it is probably best to regard this habit as indicating a need which the child feels to experience more comfort at the level of biological gratification, and that until she is ready to grow beyond that, or until she is helped to grow beyond it, it should be understood and used in helping her rather than arbitrarily stopped.

Painful Sequelae of Epididymo-orchitis

Q.—What investigations are indicated in the case of a man with a past history of epididymo-orchitis who complains of severe pain in the perineum and scrotum after sex-play? What treatment is advised?

A.—The most likely cause for the perineal and scrotal pain after sex-play is a residual prostatitis or vesiculitis, or both, following the attack of epididymo-orchitis. Chronic inflammation of one or both of Cowper's glands could also be responsible. A rectal examination, made before micturition and bathing in the morning, together with a laboratory report on any secretion expressed from the urethra, will show whether there is involvement of the prostate, seminal vesicles, or Cowper's glands. (It should be noted that a normal Cowper's gland is not palpable on bi-digital rectal examination.) Anterior and posterior urethroscopy may reveal a stricture of the anterior urethra or involvement of the ejaculatory ducts. Sensitivity tests on any organisms isolated will indicate what drug, whether sulphonamide or antibiotic, should be used. Massage of the affected gland may also be helpful.

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CLINICAL PICTURE OF PERNICIOUS ANAEMIA PRIOR TO INTRODUCTION OF LIVER THERAPY IN 1926 AND IN EDINBURGH SUBSEQUENT TO 1944

BY

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Thirty years have elapsed since Minot and Murphy (1926) published their historic report on the value of liver in the treatment of pernicious anaemia. With each passing year fewer and fewer physicians remain on the staffs of the teaching hospitals who have had personal experience of the clinical features and course of pernicious anaemia in the era prior to the introduction of liver therapy. During the period 1920-7, first as assistant and then as a lecturer in the Department of Medicine, University of Edinburgh, I had ample opportunity of observing the tragic and inevitably fatal termination of the disease in large numbers of patients admitted to the wards of the Royal Infirmary under the charge of my chief, Professor G. L. Gulland, a famous haematologist.

I believe that the number of persons suffering from pernicious anaemia at the present time is much greater than it was when I first became interested in the disease 36 years ago. Hence the importance of early and correct diagnosis. There are two main reasons for this increased incidence. Firstly, the introduction of liver extract and later of vitamin B₁₂ has enabled patients suffering from Addisonian pernicious anaemia to have a normal expectation of life. Secondly, at the present time there are many more people in the world within the age group 60-80 than there were at the beginning of the twentieth century, and therefore the number of persons who are liable to develop Addisonian pernicious anaemia is correspondingly greater. It has also seemed to me that certain clinical features present in the late stages of pernicious anaemia in the pre-liver era occurred so frequently and were so striking in character that they have continued to be reported as being of considerable diagnostic value, when in reality they are now of very limited importance in this respect.

Before this view could be accepted it would be necessary to demonstrate that the clinical picture of pernicious anaemia at the present time is in fact different from that seen prior to the discovery of liver therapy. Accordingly, I examined the records of 250 cases of pernicious anaemia which had been under my charge in Edinburgh during the period 1944-56 and compared them with the clinical features recorded in patients investigated prior to 1926: (1) by Davidson and Gulland (1930) in Edinburgh; (2) by Richard C. Cabot (1908) (1930) in Edinburgh; Cabot stated that he had studied the case records of (a) 337 patients under his charge in

private and hospital practice, (b) 320 case records collected from his medical friends in different parts of America, and (c) 543 cases selected by him after critical study of the literature, making a total of 1,200 cases; and (3) by Panton, Maitland Jones, and Riddoch (1923), who analysed 117 cases of pernicious anaemia admitted to the London Hospital between 1911 and 1920.

Age of Onset and Duration of Symptoms

Fig. 1 clearly shows that the age of onset of the disease is much later at the present time than it was 50 years ago. Thus more than 50% of the patients in the Edinburgh

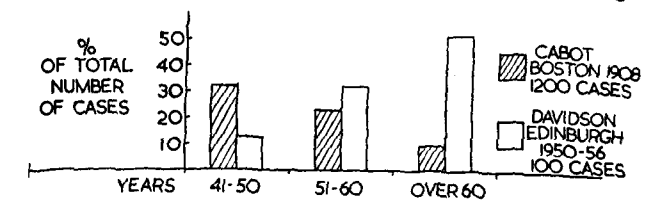


FIG. 1.—Age of onset.

series (1950-6) developed the disease when over 60 years of age, as compared with only 10% in Cabot's series (1908). There can, however, be little doubt that this figure of 10% underestimates the true incidence. Cabot states that he included in his series 35 cases of the megaloblastic anaemia associated with pregnancy, a condition which develops in young women. In addition, some cases of the megaloblastic anaemia due to malabsorption must have been mistaken for Addisonian pernicious anaemia. Lastly, since diagnosis was much less accurate 50 years ago than it is at the present time, it would seem probable that the inclusion of cases of macrocytic anaemia due to aplastic, haemolytic, or leukaemic disease was partly responsible for the high incidence of "pernicious anaemia" stated by Cabot to occur under the age of 40 years.

TABLE I.—Duration of Symptoms

	Pre-Liver Series		Edinburgh Series 1944-56 Davidson 250 Cases
	1908 Cabot, Boston 1,200 Cases	1923 Panton, London 117 Cases	
Duration of symptoms before medical advice was sought	"Disability extending back for years"	Average 17 months	26% < 3 mths. 56% < 6 mths. 75% < 12 mths.

Table I indicates that the duration of symptoms prior to diagnosis is much shorter to-day than it was in the pre-liver era. Cabot states that many of his cases had symptoms

"extending back for years," and Panton states that the "average duration of the illness was 17 months prior to admission to hospital." Symptoms had been present for less than six months in 50% of the Edinburgh series (1944-56) and under one year in 75% of the cases.

Sex Incidence

Fig. 2 shows that in Cabot's series (1908) the disease affected males twice as often as females, whereas in an Edinburgh series of 600 cases seen during the period 1938-56

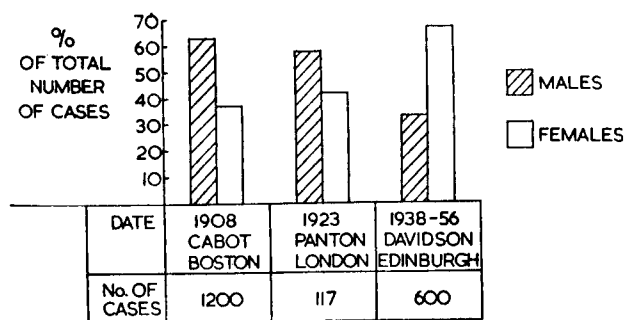


FIG. 2.—Sex incidence.

females were affected twice as often as males. A recent analysis of 223 cases examined in Glasgow showed an incidence of three females to one male (personal communication from Professor L. J. Davis). Wintrobe (1951) states that in the United States of America and in England males have been more frequently the victims of this disease than females, but in Germany and the Scandinavian countries the opposite has been recorded.

Symptoms

All authorities agree that the onset of the illness in the great majority of cases of pernicious anaemia is extremely insidious. This is as true to-day as it was 50 years ago. Patients continue to work for a surprisingly long time after the development of the disease before consulting their doctors. In addition, the anaemia is often much more severe than would be expected by the appearance of the patient or from a study of his symptoms. Table II shows

TABLE II.—Symptoms

	Pre-Liver Series		Edinburgh Series 1944-56 Davidson
	1908 Cabot, Boston	1923 Panton, London	
No. of cases	1,200	117	250
Weakness and tiredness	96%	91%	90%
Dyspnoea	88%	—	70%
Sore tongue	43%	24%	25%
	(of 372 cases)	(of 34 cases)	
Diarrhoea	51%	26%	9%
Constipation	35%	—	16%
Parosomias	100%	—	38%

that the two symptoms most commonly encountered in pernicious anaemia, both in the pre-liver era and at the present time, are *general weakness and tiredness*, and *dyspnoea on effort*. The third most frequent symptom is the feeling of numbness and tingling in the hands and feet (*paraesthesiae*). This symptom, however, occurs much less frequently now (38% of cases) than it did 50 years ago (approximately 100% of cases), as indicated in Table II. This is also true of *soreness of the mouth and tongue*, which was present in 25% of the Edinburgh series as compared with 43% of Cabot's series. Davidson and Gulland (1930) stated that this feature was present in approximately half of their cases.

While indefinite symptoms referable to the digestive tract, such as poor appetite and vague abdominal discomfort, are frequently encountered in patients with pernicious anaemia, *diarrhoea* occurred in only 9% of the Edinburgh

series. This is in marked contrast to Cabot's series, in which it was a notable feature in 51% of cases. Davidson and Gulland (1930) also state that *diarrhoea* occurred in approximately half of their cases at some stage of the illness. At the present time the complaint of constipation is twice as frequent as that of *diarrhoea*.

Signs

Apart from *pallor* of the mucous membrane and the skin, the most common finding in the Edinburgh series was a *pale smooth tongue* which was also moist and very clean. This was noted in no less than 64% of cases (see Table III).

TABLE III.—Signs

	Pre-Liver Series		Edinburgh Series 1944-56 Davidson
	1908 Cabot, Boston	1923 Panton, London	
No. of cases	1,200	117	250
Fever	79%	71%	22%
"Icterus"	Most cases	—	Uncommon
Acute glossitis (red and ulcerated)	42%	—	5%
	(of 372 cases)		
Chronic atrophic glossitis (pale and smooth)	—	—	64%
Splenomegaly	27%	18%	8%
Spinal cord damage	11%	—	7%
Ataxic type	7%	—	6%
Spastic type	4%	—	1%
Peripheral blood:			
< 2 million R.B.C./c.mm.	86%	Average	58%
< 1 million R.B.C./c.mm.	21%	1.39 million	1%

No percentage figure for this sign is available in Cabot's or Panton's series, nor in Davidson and Gulland's monograph (1930). An extraordinary cleanness of the tongue in pernicious anaemia has, however, been mentioned by many authorities as being a common feature, and this sign is undoubtedly the result of atrophy of the papillae and mucous membrane of the tongue (*chronic atrophic glossitis*). *Acute glossitis*, indicated by a beefy-red, painful, and often ulcerated tongue, was reported as being present in patients in the pre-liver era in up to 50% of cases, in contrast to only 5% of the Edinburgh series. The second most common sign in the Edinburgh series was *fever*, which was present in 22% of the cases, in contrast to 79% in Cabot's series. The frequency and degree of fever is related to the severity of the anaemia, and the pyrexia disappears when the blood supply to the heat-regulating mechanism of the brain is improved by blood transfusion or as a result of treatment.

Icterus was another sign to which much attention was paid in the pre-liver era. Cabot rightly says that it is doubtful if the waxy yellow colour of the skin, which is such a notable feature of pernicious anaemia in severe relapse, is actually due to jaundice. Be that as it may, I am certain that this appearance of the skin is much more rarely seen at the present time than it was in the era before the discovery of liver therapy.

Minor degrees of *splenomegaly* that is, the tip of the spleen being just palpable below the costal margin—were common in the pre-liver era. According to Cabot the spleen was palpable in no less than 27% of cases, but in the Edinburgh series it could be felt in only 8%. Gross enlargement of the spleen is so uncommon in pernicious anaemia that its presence should give rise to suspicion that the diagnosis is incorrect.

The *neurological features* of pernicious anaemia have always excited much interest. The name subacute combined degeneration of the cord was adopted to describe the lesions of the posterior and lateral columns of the cord which were so commonly present in patients dying of pernicious anaemia in the pre-liver era. The name is unsatisfactory in that the disease usually starts insidiously and not subacutely, combined lesions are often absent, and no cognizance is taken of the fact that lesions of the peripheral nerves occur much more frequently and much earlier than lesions of the central nervous system. If the name subacute

combined degeneration of the cord is to be retained it would appear logical to limit its use to lesions of the central nervous system. Unfortunately, even neurologists find it difficult to decide on the clinical features which clearly distinguish lesions of the posterior columns of the cord from lesions of the peripheral nerves. It is generally agreed that tendon reflexes, vibration sense, and positional sense may be reduced or absent and also that ataxia may be present in both conditions. There appear to be no infallible criteria which will distinguish the two lesions except histological examination of the affected structures.

Accordingly, the differential diagnosis during life has to be made on the basis of certain suggestive findings. Thus, hyperaesthesia of calf muscles strongly supports the diagnosis of peripheral neuritis, while loss of vibration sense extending up to the pelvis favours a lesion of the posterior columns. Lastly, a markedly disproportionate increase in the degree of impairment of muscle and joint sensibility and vibration sense on the one hand, as compared with the degree of loss of superficial sensations of touch and pinprick on the other, supports the view that the posterior columns are affected. The presence of an extensor plantar response (positive Babinski sign), clearly indicates that a lesion of the central nervous system is present, but it must be remembered that in pernicious anaemia the lateral columns of the cord are affected much more rarely and usually much later than are the posterior columns. It should also be noted that peripheral neuritis may be due to a specific deficiency of vitamin B₁₂ or it may result from anoxaemia of the peripheral nerves as a consequence of anaemia and cardiac weakness. In the former case it may be present when anaemia is minimal in degree and it will respond dramatically to vitamin B₁₂ therapy. In the latter case it may occur in association with any form of anaemia, but only if the degree of anaemia is sufficiently severe, and it will not respond to vitamin B₁₂ therapy, but will disappear when the haemoglobin level is raised by any method, including blood transfusion.

In assessing the incidence of subacute combined degeneration of the cord in the Edinburgh series of 250 patients, cases have not been included in which the only neurological features were of paraesthesiae and the subjective sensation of unsteadiness, since both these symptoms can be due to causes other than disease of the nervous system. Patients were classified as having involvement of the posterior columns if ataxia was a prominent feature, if tendon reflexes and positional sense were reduced or absent, and if vibration sense was lost as high up as the pelvis. They were classified as having lesions of the pyramidal tract if a spastic gait was present with increased tendon reflexes, extensor plantar response, and a greater or lesser degree of paralysis. These groups are therefore comparable to the two groups described by Cabot (1908) as the "ataxic type" and the "spastic type." Table III shows that involvement of the central nervous system was present in only 11% of Cabot's series and in 7% of the Edinburgh series. This is in contrast to the frequency of occurrence of paraesthesiae as indicated in Table II.

One of the most striking features of Table III is the difference in the degree of anaemia present in the three series when medical advice was first sought. Whereas 21% of Cabot's series had a blood count of less than one million red cells per c.mm., only 1% of the Edinburgh series showed a similar degree of anaemia. Panton's series also showed a very high incidence of severely anaemic cases, the average red cell count being 1.39 million per c.mm.

Summary and Conclusions

Evidence is presented to show that the clinical picture of pernicious anaemia is very different to-day from that seen prior to the introduction of liver therapy. This difference is due to the fact that as a consequence of the improved facilities for early diagnosis and treatment which are now available the degree of anaemia in

patients seeking medical advice at the present time is much less than was the case fifty years ago. Hence it is not surprising that certain clinical features which were held to be of particular diagnostic importance in the pre-liver era—namely, jaundice, splenomegaly, acute glossitis, *diarrhoea*, and subacute combined degeneration of the cord—were present in less than 10% of the patients with pernicious anaemia investigated in the Blood Clinic in Edinburgh during the past ten years. Accordingly, undue emphasis on such features in textbooks of medicine and in lectures is to be deprecated, since it will hinder rather than help early diagnosis.

It is essential to tell undergraduate and postgraduate students that there are no pathognomonic symptoms or signs which will establish the diagnosis of pernicious anaemia; that tiredness, breathlessness, paraesthesiae, and chronic atrophic glossitis are presenting features which occur frequently in other types of anaemia and in particular in cases of iron-deficiency anaemia; and that diagnosis must be based on accurate blood examination, supplemented sometimes by special methods of investigation.

I am grateful to Dr. J. Richmond, Lecturer in the University of Edinburgh, for his help in collecting and tabulating the data given in the Tables and Figures.

REFERENCES

- Cabot, R. C. (1908). In Osler and McCrae's *A System of Medicine*, 4, 612. Henry Frowde and Hodder & Stoughton, London.
Davidson, L. S. P. and Gulland, G. L. (1930). *Pernicious Anaemia*. Kimpton, London.
Minot, G. R., and Murphy, W. P. (1926). *J. Amer. med. Ass.*, 87, 470.
Panton, P. N., Jones, A. G., Maitland, and Riddoch, G. (1923). *Lancet*, 1, 274.
Wintrobe, M. M. (1951). *Clinical Haematology*, 3rd ed., p. 435. Kimpton, London.

CLINICAL SIGNIFICANCE OF WEIGHT TRENDS DURING PREGNANCY

BY

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Regular measurement of body weight during pregnancy is clinically valuable. For example, progressive loss of weight helps to confirm the seriousness of vomiting, while a sudden increase of weight may precede the appearance of oedema. It is usually easier to explain a sudden alteration in the rate at which an individual patient gains weight than to explain why overall gains in different patients vary so widely. A few patients gain very little weight, while others gain 50 lb. (22.7 kg.) or more. The impression that many patients who develop pre-eclampsia have high average rates of gain is well substantiated, but there is comparatively little exact numerical information.

The statistical evaluation of weight changes in pregnancy is difficult. A true and complete picture could be obtained only by weighing all pregnant women in a representative community at frequent intervals from conception until delivery, which is practically impossible. It is usual to circumvent the technical difficulties by reporting only on patients fulfilling certain arbitrary criteria. For example, Humphreys (1954) studied 1,000

"normal" mothers, the criteria of normality including such items as first antenatal visit before the 13th week of gestation and last antenatal visit within seven days of delivery; while Scott and Benjamin (1948) selected 360 women weighed regularly at four-weekly intervals from the 16th week. It is difficult to know whether selection on such lines introduces much distortion of results. Some of the difficulties can be avoided by restricting analyses to weight changes during a limited period of pregnancy. Hamlin (1952) has suggested that the 10-week period, 20-30 weeks,* is especially significant in relation to the prevention of eclampsia and pre-eclampsia by weight regulation. Data for this period can be obtained for the majority of cases, since most women come under antenatal care before mid-pregnancy, and few are delivered before the 30th week.

In centres where weight gain is controlled as part of antenatal care it is impossible to obtain a "natural" picture. During the years under review no attempt was made to restrict the amount of weight gained by patients.

Primigravidae are more liable to develop pre-eclampsia and many other complications than multigravidae; therefore studies in which various parities are taken together are not easily interpreted. The analysis which follows relates the "natural" rate of weight gain in primigravidae, especially during the period 20-30 weeks, to the clinical outcome. The findings are discussed in relation to proposals by Hamlin (1952), Dieckmann (1952), and others that severe restriction of the rate of gain helps to prevent eclampsia and pre-eclampsia.

Methods

Patients were weighed at the first antenatal visit and again, as a rule, four to six weeks later. Most were then weighed monthly until 28-30 weeks of pregnancy, and more often during the final weeks. Accurate lever balances were used, and patients wore underclothes only. The week of pregnancy within which each weight was taken was accurately calculated in cases where reliable menstrual data were available. Since many patients did not attend during the first trimester, data for the first 13 weeks of pregnancy are too sparse to have any representative value. Trends in late pregnancy are necessarily derived from patients whose pregnancies continued until term or near it.

Records Used and Methods of Analysis

The analysis was restricted to records of legitimate first pregnancies of women resident in the city of Aberdeen and delivered in the Aberdeen Maternity Hospital as booked patients during the six years 1949-54. Multiple pregnancies were excluded. Out of 5,297 records, 1,083 were rejected because either the period of gestation was uncertain or the number of weighings was not large enough to provide the required data with sufficient accuracy. Patients whose records were thus excluded had a slightly lower average age and belonged more often to a lower social class than the remainder. The 4,214 cases analysed have pre-eclampsia, prematurity, and perinatal death rates very similar to those of all hospital-booked primiparae, and it is therefore thought that selection does not invalidate the conclusions drawn from the analyses which follow.

Since the average rate of weight gain is well known to be related to the occurrence of pre-eclampsia, the records were first divided into three clinical groups as follows: (a) Cases of pre-eclampsia with albuminuria (6.5% of all cases). (b) Cases with other hypertensive complications,

mostly mild pre-eclampsia without albuminuria (25.4%). This group includes a few cases diagnosed as essential hypertension. (c) Cases without hypertensive complications ("normotensive") (68.1%). The first group corresponds to "severe pre-eclampsia" as defined by Nelson (1955), who has discussed the problems of definition for epidemiological purposes. For the sake of brevity these relatively severe cases will in future be referred to as "pre-eclampsia," without qualification. "Hypertension" connotes a diastolic blood pressure recorded as 90 mm. Hg or above on two or more occasions separated by at least a day, or showing a definite or progressive pattern if the rise occurs in labour.

The problem was to determine whether the weight trends in each clinical group differed according to the stage of pregnancy at which weighing began. This was done by drawing average curves for 11 groups of normotensive patients, in which antenatal care began at different stages. The scatter was so small that it was thought justifiable to pool the results.

The scatter in groups of patients with pre-eclampsia and other hypertensive complications was also small.

The Chart shows the average weight curves from the 13th to the 38th week for all cases in each of the three clinical groups. The normotensive patients had the lowest average starting weight (118 lb.; 53.5 kg.), and "other hypertensive" the highest (124 lb.; 56.2 kg.). The average rate of gain, especially in the final trimester, was greatest in pre-eclamptic and least in normotensive cases. These findings justified the separation, *ab initio*, of the three clinical groups.

For each patient, weights in the 13th, 20th, 30th, and 36th weeks were determined, by interpolation if necessary, and the average weekly rates of gain in the three intervening periods calculated. These average weekly rates of gain were the data used for most purposes. The number of cases in each period is different, because some patients had not reported early enough, or were delivered too early or were weighed too irregularly, for inclusion in all three periods.

Results

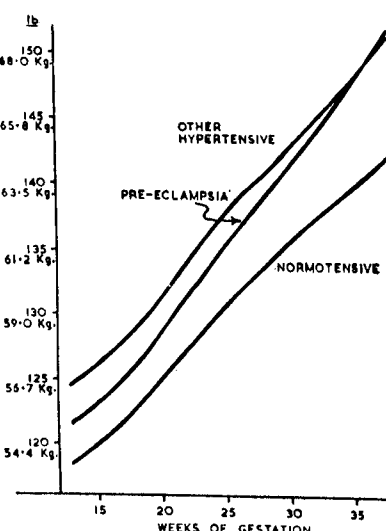
Average Weight Gains and Variations of Gain

Table I shows the average gain per week in each of the three periods and three clinical groups, together with their standard errors. In normotensive patients the average rate

TABLE I.—Average Rates of Gains in Three Periods of Pregnancy

Clinical Group		13-20 Weeks	20-30 Weeks	30-36 Weeks
Pre-eclampsia with albuminuria	No. of cases	166	274	267
	Av. gain/week (lb.) (g.)	1.00 (.036) 454 (16)	1.23 (.027) 558 (12)	1.50 (.068) 680 (31)
"Other hypertensive complications"	No. of cases	533	1,072	1,067
	Av. gain/week (lb.) (g.)	0.95 (.019) 431 (9)	1.14 (.013) 517 (6)	1.08 (.017) 490 (8)
Normotensive	No. of cases	1,362	2,868	2,833
	Av. gain/week (lb.) (g.)	0.92 (.011) 417 (5)	1.03 (.007) 467 (3)	0.87 (.009) 393 (4)

Standard errors are shown in parentheses. In each period the differences between means for clinical groups are statistically significant.



Average weight-gain curves in three clinical categories of primigravidae.

of gain was greater in the period 20-30 weeks than either before or after, whereas in pre-eclampsia the rate of gain tended to increase as pregnancy progressed and was greater at all stages than in the average normotensive case. Further analysis shows that in the period 20-30 weeks the proportion of patients gaining more than 1.6 lb. (726 g.) per week is nearly three times as high in those who eventually develop pre-eclampsia as in those who remain normotensive. This ratio becomes 6 to 1 in the period 30-36 weeks, owing no doubt to oedema adding to the rate of gain in pre-eclampsia. There is, nevertheless, so much overlap that the predictive value of rates of gain is relatively small. The rates of gain are significantly less variable in the period 20-30 weeks than either earlier or later. This is to be expected, since complicating factors such as vomiting and oedema which affect rates of gain are least common in the period 20-30 weeks.

The 20-30 weeks series includes 11 patients who had eclamptic fits. The distribution of weight gains in these is very similar to that for cases of pre-eclampsia.

The total weight gains for the period 13-36 weeks are estimated to be 21.9, 24.6, and 28.3 lb. (9.9, 11.2, and 12.8 kg.) for normotensive, "other hypertensive," and pre-eclampsia cases respectively; for all cases together 23.1 lb. (10.5 kg.). To these may be added 2.5 lb. (1.1 kg.) for the first trimester (Chesley, 1944); while the gain from the 36th to the 40th week in normotensive cases was 3.2 lb. (1.5 kg.) and in all cases 4 lb. (1.8 kg.). Thus the gain during the whole of pregnancy is estimated to be 27.6 lb. (12.5 kg.) for normotensive cases alone and 29.6 lb. (13.4 kg.) for all cases in which pregnancy continued until term. A comparable figure for pregnancies complicated by pre-eclampsia would have limited significance, since a relatively high proportion terminate before the 40th week.

Average rates of weight gain do not vary greatly according to the social class, height, or age of patients. Women in the upper social classes and tall women gain slightly more in each period than the others, but the differences are too small to have clinical importance. Older women tend to gain slightly less than those who are young.

The rates of weight gain cannot be related to the usual non-pregnant weight for height (fatness or leanness), since the weight before pregnancy is seldom known. It was therefore decided to study the weight for height at the 20th week in relation to the rate of gain during the period 21-30 weeks. An "obesity index" was calculated for each patient by relating the weight at the 20th week to the median weight at the 20th week for all patients of the same height. The average weight gains did not vary much in relation to the "obesity index." Underweight women tended to gain the "obesity index." Underweight women tended to gain at slightly lower rates than usual. Since "obesity" was assessed at the 20th week of pregnancy, a high index may, of course, mean simply that the women concerned had put on a relatively great amount of weight during the first half of pregnancy. This may be why women who were moderately overweight at the 20th week had a slightly higher than average rate of gain during the next 10 weeks. On the other hand, women who were unusually heavy at 20 weeks did not gain more than the average.

Clinical Outcome in Relation to Weight Gain

The differences of weight gain in the three main clinical groups are shown in Table I and the Chart. In the analyses which follow, the data for all cases are grouped according to weight gain and the incidence of certain complications in each weight gain category is shown. The complications in each weight gain category are shown. The data used are those for the periods 20-30 and 30-36 weeks; analyses of clinical phenomena in relation to rates of weight gain before the 20th week are of limited value, since the necessary weight data are not available for more than half the cases (Table I). The cases omitted are known to have relatively high rates of prematurity and of perinatal death; they were, for the most part, women who first attended the clinic after mid-pregnancy.

TABLE II.—Clinical Outcome in Relation to Amount of Weight Gained in the 16-Weeks Period, 20-36 Weeks

Weight Gained		Pre-eclampsia %	Pre-maturity %	Percentage of Prematures* with Pre-eclampsia	Perinatal Mortality per 1,000	No. of Cases
lb.	kg.					
< 8	< 3.6	2.6	12.1	9	36.0	273
8	3.6	3.3	8.3	9	11.9	671
12	5.4	3.1	5.5	16	27.8	1,090
16	7.3	5.7	4.4	25		1,009
20	9.1	9.2	4.9	35		651
24	10.9	13.5	5.7	47		296
28+	12.7+	26.0	8.5	66		177

* Birth weight 5½ lb. (2,500 g.) or under.

Table II shows the trends in relation to the amount of weight gained in the 16 weeks period 20-36 weeks. Amongst women who gained 8 lb. (3.6 kg.) or less—that is, at an average rate not exceeding 0.5 lb. (227 g.) a week—the incidence of pre-eclampsia was 2.6%. The incidence increased steadily with increasing rate of weight gain until, in women gaining 28 lb. (12.7 kg.) or more, equal to an average gain of at least 1.75 lb. (794 g.) a week, it was ten times as great (26%). The incidence of prematurity (birth weight 5½ lb. (2,500 g.) or less) shows an opposing trend, falling as the weight gain increases, except that it rises again when the gain becomes very large, owing to the fact that a high proportion of the prematures in the groups with the high weight gain were the result of pre-eclampsia. The high rate of prematurity (defined as low birth weight) associated with low weight gains appears, in the main, to arise from poor foetal growth resulting in the birth of relatively small babies and not from the effects of the well-recognized diseases of pregnancy. But as the rate of weight gain increases, the proportion of prematures associated with pre-eclampsia rises steeply, and in the groups with the highest weight gain the relatively high rate of prematurity is due primarily to premature termination of pregnancy either spontaneously or after induction of labour owing to pre-eclampsia.

The perinatal mortality rates shown in Table II are underestimates, since pregnancies ending much before the 36th week, which have a very high mortality rate, are not included in the data.

Table III shows the incidences of pre-eclampsia, "other hypertensive complications," prematurity, and perinatal death according to the rate of weight gain in the periods 20-30 weeks and 30-36 weeks separately. The grouping of rates of gain is arbitrary, being designed to give reasonably adequate numbers in all categories.

Pre-eclampsia and "other hypertensive complications" both show the same pattern, the highest rates being found when the rate of gain is high in the 30-36 weeks period, irrespective of the rates of gain between 20 and 30 weeks. In the period 20-30 weeks, women gaining more than 1.2 lb. (544 g.) a week had a relatively high expectation of pre-eclampsia, unless the rate of gain subsequently fell below 1 lb. (454 g.) a week in the period 30-36 weeks.

In the case of prematurity, the highest rates are found where the weight gain has been low in the period 20-30 weeks, and especially when the rate of gain has been unusually low or unusually high in the period 30-36 weeks. The rate was only 3%, less than half the average, when the gain was moderate in both periods—that is, 0.8-1.2 lb. (363-544 g.) a week from the 20th to the 30th week, and 0.6-1 lb. (272-454 g.) a week from the 30th to the 36th week.

The advantage of this moderate rate of gain is even more strikingly demonstrated in the perinatal mortality rate. The very low death rate found, 11 per 1,000 births, could be as low as it is by pure chance; however, the statistical probabilities indicate that a rate higher than 20 is unlikely. This low death rate probably reflects the fact that in this weight-gain group the foetus has the best chance of escaping the hazards of pre-eclampsia and of prematurity. In general, the trends of perinatal mortality follow those of prematurity rather than of pre-eclampsia.

TABLE III.—Incidence of Certain Complications by Rates of Weight Gain in the Periods 20–30 and 30–36 Weeks of Pregnancy

Gain per Week, 20–30 Weeks		Gains per Week, 30–36 Weeks				
lb.	g.	<0.6 lb. <272 g.	0.6 lb. – 272 g. –	1 lb. – 454 g. –	1.4 lb. + 635 g. +	All†
Pre-eclampsia (%)						
<0.8	<363	2.3	2.9	5.5	17.5	4.0
0.8–	363–	2.0	2.8	6.2	16.7	5.1
1.2+	544+	3.5	3.0	6.8	18.7	9.7
All	..	2.3	2.9	6.4	18.1	6.5
"Other Hypertensive Complications" (%)						
<0.8	<363	17.7	20.2	26.8	36.5	21.0
0.8–	363–	21.5	19.3	26.3	39.1	23.8
1.2+	544+	21.1	25.4	30.5	36.7	30.3
All	..	19.7	21.2	28.3	37.3	25.4
Prematurity (%)						
<0.8	<363	10.1	8.8	8.5	7.9	10.1
0.8–	363–	6.9	3.0	5.9	9.4	6.1
1.2+	544+	7.0	3.6	3.9	6.2	5.9
All	..	8.4	4.6	5.4	7.2	7.0
Perinatal Mortality, per 1,000*						
<0.8	<363	39.0	20.5	(–)	(31.7)	30.4
0.8–	363–	34.7	10.9	22.9	31.3	26.0
1.2+	544+	42.3	41.4	22.7	34.1	38.0
All	..	37.7	21.5	19.3	33.2	31.3
Numbers of Cases‡						
<0.8	<363	436 (10.5)	341 (8.2)	164 (3.9)	63 (1.5)	1,021† (24.1)
0.8–	363–	404 (9.7)	643 (15.4)	437 (10.5)	192 (4.6)	1,692† (40.2)
1.2+	544+	142 (3.4)	362 (8.7)	485 (11.6)	498 (11.9)	1,501† (35.6)
All	..	982 (23.6)	1,346 (32.3)	1,086 (26.1)	753 (18.1)	4,214† (100.0)

* Rates in brackets based on fewer than five deaths.
† Including cases for which adequate 30–36 weeks' weight data were not available, and cases delivered from the 31st to the 36th weeks.
‡ Numbers in brackets are percentages in each "cell."

When analyses of the type shown in Table III are repeated, grouping the weight-gain categories in different ways, the same kind of pattern emerges. The same is true when patients are first subdivided according to weight for height or by "physical grade"—that is, the judgment of the obstetrician at the patient's first antenatal attendance as to her general physique and well-being. Women who were over average weight at 20 weeks had, however, higher rates of pre-eclampsia and lower rates of prematurity than underweight women in nearly all categories.

The last part of Table III shows the numbers involved and their percentage distribution. Forty per cent. of primigravidae were in the moderate weight-gain group for the period 20–30 weeks—that is, gained between 8 and 12 lb. (3.6 and 5.4 kg.). Nearly one-quarter gained less than 8 lb. (3.6 kg.). Only 15% of all cases were in the most favourable group, that which gained 8–12 lb. (3.6–5.4 kg.) from the 20th to the 30th week, and 6–10 lb. (2.7–4.5 kg.) from the 30th to the 36th week.

Discussion

The methods of analysis described were devised primarily to elucidate the clinical significance of various weight-gain patterns, the physiological basis of which will not be discussed. We have shown elsewhere (Thomson and Billewicz, 1955) that the rate of weight gain during pregnancy is positively correlated with the calorie value of the maternal diet.

The weight gains found are consistent with those previously reported. Our estimated average total gain in normal pregnancy, 27.6 lb. (12.5 kg.), and average rate of gain in the period 30–36 weeks, 0.87 lb. (395 g.) a week, are reasonably close to estimates for the total gain and for rate of gain during the last trimester made by Chesley (1944) and by Humphreys (1954).

The relationship between weight gain and incidence of pre-eclampsia follows expectation. As Chesley and others have already noted, the incidence of pre-eclampsia rises as the rate of weight gain increases, but measurement of the

rate of gain over a period of time such as 20–30 weeks has little predictive value in the individual case. It has often been suggested that the occurrence of a sudden acceleration in the rate of gain is of more clinical significance than a high average rate of gain. Our records show that this "sign" of incipient oedema or hypertension, while not without value, is not very reliable as a means of prediction.

Primigravidae who develop mild pre-eclampsia have a higher average "starting weight" (observed at the end of the first trimester) than those who develop severe pre-eclampsia or those who remained normotensive. This cannot be wholly explained in terms of age and height differences, and its significance is not clear.

The primigravida aged 30 or over is slightly taller and heavier and has a very slightly lower average rate of weight gain than the younger primigravida. As Nelson (1955) has shown, she also has an increased tendency to develop mild pre-eclampsia, but little or no special liability to severe pre-eclampsia; though when severe pre-eclampsia does supervene the foetal mortality is relatively high. But our more extensive data do not confirm Nelson's suggestion that the tendency to high rates of weight gain with severe pre-eclampsia in primigravidae occurs only under the age of 30. We have no evidence to support the claim of Tompkins, Wiehl, and Mitchell (1955) that women with abnormally low weight gains also have a raised incidence of pre-eclampsia.

It is reasonable to expect some correlation between rates of weight gain and birth weights, since the weight of the foetus accounts for part of the increase of maternal weight. This has been observed, for example, by Kerr (1943) and Beilly and Kurland (1945), and the present data confirm it. In our data, median birth weights rise steadily from 6.7 to 7.5 lb. (3 to 3.4 kg.) as the 20–30 week rates of gain increase from under 0.6 lb. (272 g.) to over 1.8 lb. (816 g.) a week. The high incidence of prematurity (birth weight 5½ lb. (2,500 g.) or less) associated with low maternal weight gains seems to be due more to depression of the foetal growth rate than to curtailment of the length of gestation. In cases of severe pre-eclampsia, usually associated with high rates of weight gain, depression of foetal growth as well as curtailment of pregnancy is usual (Baird, Thomson and Billewicz, 1957); both facts account for the excess of very small prematures in pregnancies where the 20–30 week weight gain was very large.

Where there is no policy of weight restriction during pregnancy, moderate rates of gain are clearly associated with the most favourable clinical experience. Thus, patients who gained 8–12 lb. (3.6–5.4 kg.) from the 20th to the 30th week, and at a slightly lower rate after the 30th week, had pre-eclampsia, prematurity, and perinatal mortality rates only about half the average. Higher rates of gain were associated especially with pre-eclampsia and lower rates especially with prematurity.

It does not follow logically that, if excessively high or low gains are avoided by dietary regulation and other measures, the clinical outcome will be as favourable as in those women who gain the "correct" amounts of weight when left to their own devices. But there is some evidence that restriction of excessive gains is helpful in preventing eclampsia; the evidence that such restriction prevents pre-eclampsia is less satisfactory, perhaps because pre-eclampsia is less easy to define.

Of recent reports along these lines, those by Hamlin (1952, 1953) are the most spectacular. He claimed the abolition of eclampsia (no cases in 6,600 booked patients) and a considerable reduction of severe pre-eclampsia in a large Australian hospital, thanks to an intensive programme of antenatal care, including measures aimed at limiting the amount of weight gained and the admission to hospital of cases of mild pre-eclampsia. Hamlin says that most primiparae who are allowed to gain more than 8 lb. (3.6 kg.) in the 20–30-weeks period will progress inexorably towards pre-eclampsia and eclampsia, but gives no evidence. Hughes (1951), reporting on the same Australian campaign,

merely observes that a gain exceeding 1 lb. (454 g.) a week after the fifth month of pregnancy points to the need for close observation of the patient. Of Aberdeen primiparae who remained normotensive throughout, 73% gained more than 8 lb. (3.6 kg.) in the period 20–30 weeks, compared with 85% of those who developed fairly severe pre-eclampsia. Hamlin's statement is therefore certainly not valid in Aberdeen.

Hamlin (1953) and also Nixon (1955) have republished a "normal" curve of weight during pregnancy derived from Dieckmann, Smutter, and Rynkiewicz (1952); this shows a gain of only 7.7 lb. (3.5 kg.) during the period 20–30 weeks. It is not clear how the patients from whom the curve was derived were selected, nor whether they were required to restrict their weight gains as part of antenatal care. In his monograph on the toxæmia of pregnancy Dieckmann (1952) recommends limiting the weight gain to 200 g. a week during the last 28 weeks of pregnancy, which implies a 20–30 weeks' gain of less than 5 lb. (2.3 kg.). He acknowledges that such targets may be difficult to attain even under ideal conditions: "The fact that we were only able to restrict one-third of the patients to what we consider the maximum gain during an intense nutrition study indicates how difficult it is to restrain calorie intake in these patients."

There is no doubt that, even without a policy of weight regulation, good out-patient antenatal care, backed by adequate hospital facilities, can do much to prevent eclampsia and the more serious consequences of pre-eclampsia. Between 1938–42 and 1954–5 the incidence of eclampsia in primigravidae booked in Aberdeen Maternity Hospital fell from 8 to 2 per 1,000,* and the stillbirth rate in cases of eclampsia and pre-eclampsia from 151 to 25 per 1,000 births. Nelson (1955) has discussed the reasons. We do not know whether progress would have been accelerated if weight regulation had been practised as part of routine antenatal care. The problem now is whether results can be further improved, and especially whether the need for antenatal beds required for the treatment of pre-eclampsia can be reduced by weight regulation.† These questions can be answered only by means of an *ad hoc* trial under controlled conditions.

Preliminary trials have shown that full scientific control is practically impossible to achieve because the measures needed for regulating weight changes inevitably mean that antenatal care is intensified in other respects; again, within one centre, the ideas promulgated at an experimental antenatal clinic soon begin to "infect" staff at the routine clinics from which control cases are drawn. These facts make the value of a policy of weight regulation difficult to assess scientifically. It will be some time before the data of our current trial can be quoted. It seems more easy, by careful dietary supervision, to restrict a rate of gain which has been excessive than to augment a rate of gain which seems unduly low.

The clinical hazards associated with very low "natural" rates of weight gain do not seem to have been systematically studied in the past, though the increased risk of prematurity (especially when the mother is underweight at the beginning of pregnancy) has been noted by Tompkins *et al.* (1955). Women who fail to gain an adequate amount of weight present a problem at least as important as those who gain excessively.

The rule of moderation is probably as sound when applied to weight gains during pregnancy as to many other aspects of existence. As a realistic target, we would suggest gains within the range of ½ to 1½ lb. (340 to 567 g.) a

*The current average incidence of eclampsia in booked cases of all parities, 0.8 per 1,000, is comparable with rates reported from a number of major American hospitals in 1947–9 (Dieckmann, 1952). In the latter, presumably, weight regulation has been practised for many years.

†About 16% of all Aberdeen booked primigravidae are admitted to the antenatal wards for treatment of pre-eclampsia and related conditions, which account for over 40% of the total antenatal bed-days due to primigravid admissions of all kinds, and absorb an average of about 4 antenatal beds per 1,000 booked primigravidae per annum. The equivalent figures for booked patients of all parities are 12% admitted, 26% of all bed-days, and 3 beds per 1,000 patients per annum.

week as being consistent with excellent clinical results. Roughly half of all primigravidae will "naturally" gain weight within this range from the 20th to the 30th week of pregnancy, and it may be that the proportion could be increased by measures practicable at out-patient clinics. The mean rate of gain, 1 lb. (454 g.) a week, is easily remembered, and the patients' progress easily assessed from one clinic visit to the next. There is no real justification for the lower rates that have been widely advocated. Weight restriction is not easy, and the mother who fails to comply with a rigorous schedule may become unnecessarily burdened with guilt; while the one who succeeds, possibly with considerable stress, may be running an increased risk of prematurity.

Summary

An analysis of the weight gains of primigravidae, not subjected to weight regulation, confirmed that the average rate of gain is higher in pre-eclampsia than in normal pregnancy, and that the incidence of pre-eclampsia rises as the rate of weight gain increases. These facts are of little value for predicting pre-eclampsia in the individual case.

The incidence of prematurity (birth weight 5½ lb. (2,500 g.) or less) is highest when weight gains are consistently low, falls as the rate of gain increases, and then rises again with high rates of gain. Pre-eclampsia is an important cause of prematurity in the high but not in the low weight-gain groups.

The most favourable outcome of pregnancy—in terms of pre-eclampsia, prematurity, and perinatal death—is associated with a moderate rate of weight gain, at least throughout the second half of pregnancy. A gain of about 1 lb. (454 g.) a week is suggested as a sound and realistic average to aim at. The more rigorous restriction of weight gain which has been advocated is not justified on present evidence and may be harmful.

We are grateful to Professor Dugald Baird and many of our colleagues for encouragement and criticism, and to the ladies of the records office for hard and accurate work.

REFERENCES

- Baird, D., Thomson, A. M., and Billewicz, W. Z. (1957). *J. Obstet. Gynaec. Brit. Emp.* In press.
Beilly, J. S., and Kurland, I. I. (1945). *Amer. J. Obstet. Gynec.*, 50, 202.
Chesley, L. C. (1944). *Ibid.*, 48, 565.
Dieckmann, W. J. (1952). *The Toxæmia of Pregnancy*, 2nd ed. London.
— Smutter, R. C., and Rynkiewicz, L. (1952). *Amer. J. Obstet. Gynec.*, 64, 850.
Hamlin, R. H. J. (1952). *Lancet*, 1, 64.
— (1953). *Proc. roy. Soc. Med.*, 46, 393.
Hughes, T. D. (1951). *Med. J. Aust.*, 2, 871.
Humphreys, R. C. (1954). *J. Obstet. Gynaec. Brit. Emp.*, 61, 764.
Kerr, A. (1943). *Amer. J. Obstet. Gynec.*, 45, 950.
Nelson, T. R. (1955). *J. Obstet. Gynaec. Brit. Emp.*, 62, 48, 58.
Nixon, W. C. W. (1955). *Postgrad. med. J.*, 31, 266.
Scott, J. A., and Benjamin, B. (1948). *Lancet*, 1, 550.
Thomson, A. M., and Billewicz, W. Z. (1955). *Proc. Nutr. Soc.*, 14, v.
Tompkins, W. T., Wiehl, D. G., and Mitchell, R. M. (1955). *Amer. J. Obstet. Gynec.*, 69, 114.

"Infections in Laboratory Animals" is the subject of the fourth volume (1956) of *Collected Papers* published by the Laboratory Animals Bureau. It records the proceedings of a symposium held at the Royal Veterinary College, London, last April, and consists of seven papers on the following subjects: "Epidemiology and Laboratory Mice" (Mr. A. A. Tuffery); "Control of Ectromelia in Mouse Colonies" (Dr. M. H. Salaman); "Control of Infection in Laboratory Cats and Dogs" (Professor W. L. Weipers); "Infections in Laboratory Monkeys" (Dr. A. P. Goffe); "Control of Disease in Rabbits" (Dr. J. Stuart Paterson); "Control of Disease in Laboratory Poultry" (Dr. R. F. Gordon); and "Salmonella in Laboratory Animals" (Dr. Joan Taylor and Mr. J. D. Atkinson). In addition there are the opening remarks and summary of the meeting by the chairman, Professor J. W. Howie. The volume (pp. 68) is obtainable from the Laboratory Animals Bureau, M.R.C. Laboratories, Holly Hill, Hampstead, London, N.W.3, price 7s. 6d.

CALCIUM METABOLISM AND BONE CHANGES IN SARCOIDOSIS

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Although hypercalcaemia is uncommon in sarcoidosis it is important for two reasons. It may cause difficulties in reaching a correct diagnosis, and when persistent leads to complications such as renal failure or nephrocalcinosis. Unless this renal damage is recognized and treated it may be fatal. There is, moreover, evidence that the use of calciferol for the treatment of sarcoidosis in the last decade has increased the risk of hypercalcaemia and of its attendant dangers. The purpose of this paper is to record the frequency of disturbed calcium metabolism in a series of patients with sarcoidosis and to relate it to other features. As this involves a study of the bone lesions in the disease an account of their incidence and forms is also included, from which it is possible to estimate the value of bone radiographs as a diagnostic aid in sarcoidosis.

Clinical Material and Methods

The patients studied belonged to a group of over 160 seen personally during the last few years. The age range was 12 to 65 years, and females preponderated in a ratio of 3:2. About two-thirds of them had widespread pulmonary disease and most of the others had bilateral hilar lymph-node enlargement. Many were referred for investigation after a mass miniature radiograph had shown these abnormalities, and were free from symptoms at the time. About one-quarter of them had a uveitis, one-fifth superficial lymph-node or splenic enlargement, and one-tenth skin lesions. The diagnosis of sarcoidosis was based on a typical chest radiograph and clinical features, supported by negative cultures of sputum and urine for *Mycobacterium tuberculosis*. Confirmation by biopsy was obtained from liver, lymph nodes, skin, or conjunctiva in more than two-thirds of the series.

Radiographs of the hands and feet of 120 of these patients were examined and reported upon by a radiologist. In addition they were reviewed personally at the time of this survey and any doubtful abnormalities were scrutinized together. A control series of radiographs of 101 hands and 14 feet were taken from patients of the same age groups as those with sarcoidosis who attended the casualty department.

Estimations of serum calcium by the method of Trevan and Bainbridge (1926) were made in 86 patients with sarcoidosis (normal range 8.5–11 mg./100 ml.). The serum proteins were estimated by the micro-Kjeldahl method, albumin and globulin being separated by precipitation with sodium sulphate. All patients were examined by the slit-lamp for signs of corneal or conjunctival calcification. Radiographs of the renal tract and function tests were done when there was any reason for thinking that the kidneys were affected.

Bone Radiographs

Bone changes were seen in only 9 of the 120 patients with sarcoidosis (Table I). They were revealed by a coarse reticular pattern in two, typical cystic appearance in two, and intermediate states of medullary and cortical bone replacement in five (Figs. 1 and 2). Confirmation of the diagnosis by liver, skin, or lymph-node biopsy was possible in eight of the nine patients. Estimations of serum calcium in six gave normal results. Local bone pain occurred in

three and soft-tissue swelling in two. Five of the nine patients with bone lesions had cutaneous sarcoids, but only eight of the other 111 patients—confirming the relationship between these two forms of sarcoidosis which has long been suspected. The skin lesions did not occur over the areas of bone disease, nor were they of any particular type: all were confirmed by biopsy. Bone disease was not associated with any particular type of pulmonary disease or with other features such as uveitis.

Lesions resembling those of sarcoidosis were not seen in any of the control group of radiographs.



FIG. 1.—Radiograph of right foot of Case A, Table I. Destruction of cortical and medullary bone is seen most obviously in the middle phalanx of the second toe. (By courtesy of Drs. R. J. Cairns and J. D. Craig.)

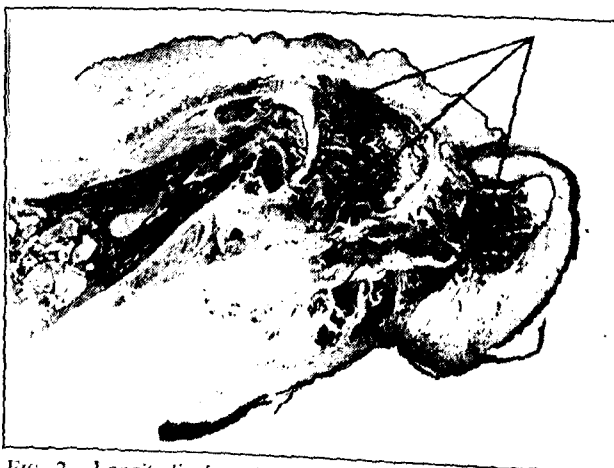


FIG. 2.—Longitudinal section of the second toe of Case A, removed because of pain. Lines point to extensive replacement of bone and surrounding structures by sarcoid tissue. (Haematoxylin and eosin stain. X2.)

Serum Calcium in Untreated Sarcoidosis

A serum calcium over 11 mg./100 ml. was found in four of 86 patients tested and below 8.5 mg./100 ml. in four others (Table II). No patient had been treated with vitamin D. None of these eight patients had digital bone lesions. There was no relationship between the serum calcium and the serum albumin, but two patients were found to have a parallel change in the level of total globulins. In Case 4 hypercalcaemia was found together with serum globulin of 3.4 g./100 ml. and in Case 5 hypocalcaemia with serum globulin of 0.29 g./100 ml.

One patient only in the series had any symptoms or signs referable to a disturbed calcium metabolism. His case history is given in detail because of the many interesting features.

Case 1

A fit Service man aged 20, with no previous serious illness, was found by a mass radiograph in August, 1952, to have bilateral hilar-node enlargement and basal infiltration. Examination revealed a transient pleural friction rub and crepitations in the base of the left lung. The Mantoux reaction was positive to 100 T.U. *M. tuberculosis* was not isolated from repeated sputum cultures. A liver biopsy confirmed the diagnosis of sarcoidosis.

Two months later he developed enlarged superficial lymph nodes, iritis, and retinal periphlebitis. This responded to a two-months course of systemic cortisone, 100 mg. daily. His general condition remained good and he gained weight while resting in hospital. In August, 1953, proteinuria was noticed and a chest radiograph showed increased pulmonary infiltration. On account of this he was admitted to King's College Hospital in November. Examination then revealed vascularization of the right cornea and circumscribed retinal scars in the left eye. There was generalized lymph-node enlargement, and fine crepitations were heard at the base of the lungs.

Investigations.—Chest x-ray examination: bilateral hilar-node enlargement with infiltration at both bases. X-ray films of hands and feet: normal. Intravenous pyelography: horseshoe kidney with two stones in right renal pelvis, also calcified mesenteric node in right iliac fossa. Blood count: normal. E.S.R., 44 mm./hour (Westergren). *M. tuberculosis* not found on repeated sputum and urine culture. Lymph-node biopsy: typical sarcoid follicles. Urine: albumin +, hyaline casts +, white cells +, red cells +, sterile on culture. Urine concentration and dilution test: range of S.G., 1014–1010. Blood urea, 37 mg./100 ml.; standard

urea clearance, 40% of normal; serum calcium, 11.6 mg./100 ml.; alkaline phosphatase, 8 K.A. units/100 ml.; plasma phosphorus, 3.3 mg./100 ml.; serum proteins, 7.2 g./100 ml. (albumin 4.2 g., globulin 3 g.).

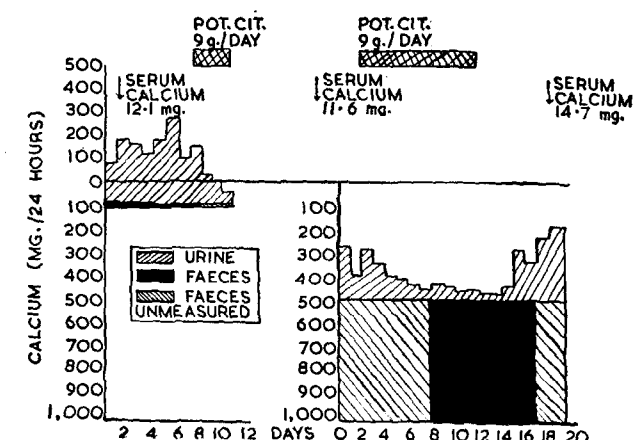


FIG. 3.—Calcium balance in Case 1 on a low and normal calcium intake from December 9–20, 1953, and January 2–21, 1954, respectively. Daily intake is measured downwards from and output upwards towards the zero line. The effect of potassium citrate is seen.

Calcium Balance (Fig. 3).—On an intake of 100 mg. of calcium and 90 I.U. of vitamin D per 24 hours there was a very low calcium excretion in the faeces, but an excretion in the urine which exceeded the intake by about 150 mg. per 24 hours; this was reduced by taking 9 g. potassium

TABLE I.—Bone Changes in Sarcoidosis (120 Patients)

Case	Age Sex	Clinical Features	Biopsy Positive	X-ray Examination		Serum Calcium (mg./100 ml.)
				Chest	Bone	
A	41 F	Skin lesions, pain in toes	Skin, toe	Normal	Erosions of medulla and cortex of right second toe, proximal and middle phalanges. Erosion of nasal bones (Figs. 1 and 2)	10.8
B	47 F	Skin lesions, aching and swelling of hands and feet, myxoedema	Skin	Hilar nodes +. Diffuse fine infiltration	Cysts of several digits of hands and feet	—
C	40 M	Skin lesions, aching in hands and feet	Skin, liver	Normal	Cortical erosion right second metatarsal head	—
D	43 M	Lupus pernio	Skin, palate	"	Coarse reticulation with early erosion of heads of several proximal phalanges	8.9
E	40 M	Lymph-node enlargement	Lymph node	Hilar nodes +	Early cystic erosion base middle phalanx right ring-finger	—
F	35 F	Tiredness, dyspnoea, painless swellings of fingers	Subcutaneous tissue	Diffuse coarse mottling	Coarse reticular pattern of several phalanges	9.3
G	47 M	Skin lesions	Skin, liver	Bilateral infiltration, mainly upper zones	Coarse trabeculation and early erosion middle phalanx right ring-finger	9.4
H	42 F	No symptoms or signs	—	Symmetrical coarse reticulation	Typical cyst base of distal phalanx right ring-finger	9.2
I	12 M	Loss of weight and energy. Inguinal nodes	Lymph node	Hilar nodes +	Coarse trabeculation and cortical erosions in proximal phalanges of both third toes	8.8 9.7

TABLE II.—Abnormal Serum Calcium in Sarcoidosis (86 Patients)

Case	Age, Sex	Clinical Features	Biopsy	X-ray Examination			Serum Calcium (mg./100 ml.)	Serum Proteins (g./100 ml.)		
				Chest		Bone		Total	Alb.	Glob.
High										
1	20 M	Generalized lymph-node enlargement, uveitis, renal stone	Lymph node, liver	Hilar nodes +.	Slight lung inflit.	Normal	11.6	7.2	4.2	3.0
2	24 M	Delayed puberty	—	"	"	"	12.3 8.7*	5.92	4.50	1.42
3	23 M	Bilateral iridocyclitis	Liver	Hilar nodes +.	Bilateral lung inflit.	"	11.4	6.54	4.41	2.13
4	22 M	Lymph-node enlargement	Lymph node, liver	"	"	"	11.5	7.7	4.3	3.4
Low										
5	18 F	Skin lesions, splenic enlargement	Skin	Hilar nodes +.	Bilateral lung inflit.	"	7.8 7.9	4.66 4.7	4.37 3.6	0.29 1.1
6	56	Bilateral iridocyclitis	Liver	Hilar nodes +.	Bilateral lung inflit.	"	8.4	6.42	4.46	1.96
7	25	Slight chest pain	—	Hilar nodes +.	Bilateral lung inflit.	"	8.1	6.84	4.45	2.39
8	36	Skin lesions, uveoparotitis	Skin	Hilar nodes +.	Coarse inflit.	"	8.0	—	—	—

* One month later.

citrate daily. The citrate was given in order to see the effect of alkalinizing the urine, as the low calcium diet has an acid ash. On an intake of 983 mg. of calcium and 1,200 I.U. of vitamin D an average of 300 mg. of calcium was retained per 24 hours, with a normal proportion of urinary and faecal excretion; the urinary component was greatly reduced when potassium citrate was given. During this period the serum calcium rose from 11.6 to 14.7 mg./100 ml. The effect of calciferol (10,000 units daily) and cortisone on the calcium balance when on a calcium intake of 718 mg. is shown in Fig. 4. The serum calcium rose from

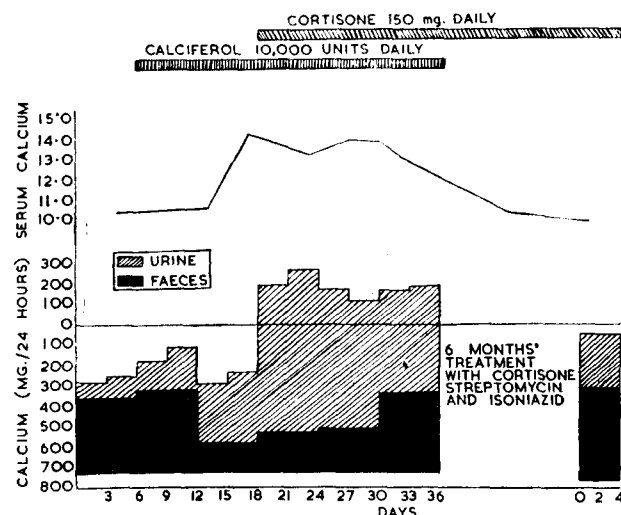


FIG. 4.—Calcium balance in Case 1 during treatment with cortisone from February 20 to March 28, 1954.

10.5 to 14.3 mg. during the 12 days with calciferol alone and there was a fall in the faecal excretion and a steady rise in the urinary excretion. The addition of cortisone, 150 mg. daily, coincided with a still greater urinary loss of calcium due to the calciferol, but this then diminished and there was a steady fall in the level of serum calcium to 10.4 mg. A short balance experiment after treatment with cortisone for six months, calciferol having been discontinued, showed a normal calcium balance and a normal level of serum calcium (10 mg.).

Progress.—During observation in hospital and investigation of the calcium metabolism the patient developed marked photophobia with aching in the eyes. On the exposed area of the bulbar conjunctiva follicles were found containing minute chalky granules, together with an early band-shaped opacity in each cornea. This appearance was thought to be associated with the hypercalcaemia, as the serum calcium at this time was 14.7 mg./100 ml. The follicles and band-shaped opacities resolved rapidly when the calcium intake was reduced, and had disappeared within six weeks, leaving only small amorphous deposits in the position of the follicles.

Treatment.—He was given a course of streptomycin sulphate, 1 g. intramuscularly daily, together with isoniazid, 100 mg. b.d., for three months. There was little response in either the clinical or the radiographic features. Cortisone, 150 mg. daily by mouth, was then added and produced a rapid reduction in the size of the superficial lymph nodes, a clearing of the pulmonary infiltration, and a shrinkage of the hilar nodes. The effect on calcium metabolism is shown in Fig. 4. This treatment was continued for three months, during which he returned to work. The dose of cortisone was then reduced to 100 mg. daily, and the streptomycin to 1 g. twice weekly. The chest radiograph and superficial lymph nodes remained normal, there were no signs of active uveitis, and the serum calcium was within normal limits. All treatment was stopped after one year. The patient remained well, and one year later there had been no relapse. The serum calcium was still normal,

and kidney function had improved; there was no albuminuria, and the standard urea clearance was 76% of normal.

Disturbed Calcium Metabolism Due to Treatment with Calciferol

No patients were treated with calciferol, but four were seen who showed signs of poisoning after having this drug elsewhere. They are not included in Table II. The case histories of three of them are given.

Case 9

A 51-year-old woman had complained of tiredness and lack of energy for three years. For two years she had noticed a skin lesion on the side of the neck and enlarged cervical lymph nodes which had increased in size six months previously. For 18 months she had had slight dyspnoea on exertion, with a cough productive of a few blobs of white sputum daily. In November, 1954, biopsy of a cervical lymph node had revealed sarcoid follicles. A chest radiograph showed extensive disease, thought to be tuberculous, although the sputum was negative for *M. tuberculosis*. She was treated by rest at home and given 2 pints (1,140 ml.) of milk a day, but there was no real change. Between February 7 and March 8, 1955, she was given 5 ampoules by mouth, each containing 600,000 units of calciferol. On March 11 headache and vomiting began, and the possibility of cerebral tumour was entertained until the serum calcium was found to be 15.4 mg./100 ml. and the blood urea 128 mg./100 ml. There was no frequency of micturition, and no pain or haematuria. The headaches and vomiting were temporarily relieved by chlorpromazine and compound codeine tablets.

When examined at King's College Hospital she displayed a slow mentality, perhaps due to the chlorpromazine. She was anaemic, but the skin was bronzed. In the eyes a few chalky fragments were visible on the exposed area of bulbar conjunctiva. The retinal vessels showed early hypertensive change. There were discretely enlarged cervical, right axillary, and epitrochlear lymph nodes and the spleen was just palpable. Bronchial breathing was heard over the right dorsal lobe, but there were no adventitious sounds. The cardiovascular system was normal apart from a blood pressure of 170/110.

Investigations.—Chest x-ray examination: bilateral coarse nodulation, becoming confluent in the upper lobes with upward retraction of the hila by fibrosis. Hands and feet: mild arthritic changes only. Kidneys: no calcification seen. Blood count: haemoglobin, 66%; white cells, 4,300, with normal differential count. E.S.R. (Westergren): 60 mm. hour. Sputum (×6) and E.M.U.: no *M. tuberculosis* on culture. Urine: sterile, albumin 1+, pus cells ++, occasional hyaline and granular casts. Blood urea 55 mg./100 ml.; standard urea clearance, 32%, normal. Range of specific gravity, 1006–1012. Serum proteins, 7.27 g./100 ml. (albumin 3.69 g., globulin 3.58 g.). Serum calcium, 12.7 mg./100 ml. Phosphorus 4 mg./100 ml. Alkaline phosphatase, 8 K.A. units/100 ml. E.C.G.: normal. Mantoux: positive to 100 T.U.

A calcium balance was undertaken three months after the last dose of calciferol. On a fixed intake of 615 mg. of calcium per 24 hours there was an excessive excretion of calcium in the urine: an average of 597 mg. in the urine and 336 mg./24 hours in the faeces during six days. The effect of 100 mg. of cortisone daily was to lower the blood calcium to normal, with little change in the proportion of calcium excreted in the urine and faeces during the 12 days in which these were measured.

Progress.—She improved steadily while taking cortisone. The nausea and headache ceased; she became more alert and energetic and resumed an active life. By November, 1955, she looked and felt very fit except for some dyspnoea on exertion due to her old pulmonary lesions, which were unaltered. Her serum calcium has remained within normal limits since June, 1955.

Case 10

A 53-year-old woman in 1940 noticed blurred vision due to uveitis. She developed parotitis and pulmonary sarcoidosis and later multiple skin lesions, and enlarged spleen and lymph nodes. During the next 10 years she became breathless from increasing pulmonary fibrosis. In 1950 she was treated with calciferol, 50,000 units, by mouth daily for nine days, without benefit, but this had to be discontinued on account of vomiting and weakness due to hypercalcaemia. The serum calcium rose to 12 mg./100 ml. In 1954 she had renal colic due to stones, which were later removed. Her blood pressure was 150/95 before treatment with calciferol, but steadily rose afterwards, and reached 235/135, with persistent albumin in the urine. It seems probable that all these complications were caused by the temporary hypercalcaemia. She took her own life in 1955; necropsy confirmed fibrosing sarcoidosis. There was extensive scarring of the kidneys from arteriolar disease, scattered calcification of the renal tubules and interstitial tissue but no sarcoid follicles, and a calculus in the right renal pelvis.

Case 11

A 45-year-old woman noticed enlarged lymph nodes in the neck and axilla in 1946 which were subsequently shown at biopsy to be due to sarcoidosis. Since 1949, during the summer months, she had developed lassitude, vomiting, and constipation of such severity as to make her cease work. In June, 1950, there was an episode of misty vision associated with a painful right eye. In November, 1955, she was given 50,000 units of calciferol daily by mouth for four weeks; but this caused severe lassitude, vomiting, and constipation. She was then referred to King's College Hospital for further investigation. Enlarged cervical, epitrochlear, axillary, and inguinal nodes were found, and an early corneal band-shaped opacity. The blood pressure was 180/90, but there were no abnormalities in the chest, heart, or abdomen.

Investigations.—Radiographs of the chest, skeleton, and kidneys were normal. A barium meal showed only delayed gastric emptying. The Mantoux test was positive to 100 T.U. E.S.R. (Westergren) 45 mm./hour. Cultures of gastric washings and urines were sterile. Serum calcium, 15.2 mg./100 ml. (repeated); phosphorus, 3.2 mg.; urea 65 mg. Total serum proteins, 8 g./100 ml. with increase of globulin on electrophoresis.

Progress.—She was treated with a low-calcium diet and cortisone, 150 mg. daily. Within a month the serum calcium had returned to normal limits (10.8 mg.) and her symptoms had disappeared. Her treatment was interrupted by an attack of acute appendicitis, which, however, gave the opportunity to confirm the diagnosis of sarcoidosis by biopsy of a mesenteric node. Treatment with cortisone has continued on a maintenance dose of 150 mg. daily; her lymph nodes have returned to normal size and gastrointestinal symptoms have disappeared.

Corneal Band-shaped Opacities

Although examination for these opacities was undertaken as a routine, they were found in only three patients. Case 1 was the most obvious. In another patient with uveitis and hilar-node enlargement, corneal calcification was seen, but unfortunately there was no histological proof of sarcoidosis and the serum calcium was not estimated. In the third patient (Case 12) there was circumstantial evidence of transient hypercalcaemia, but the serum calcium was not estimated at the time.

Case 12.—A 65-year-old diabetic woman developed uveitis in 1949 followed by parotitis and skin lesions, which on biopsy were shown to be sarcoids. One year later she developed neuritis, nausea, and vomiting; there was a trace of albumin in the urine, and the blood urea was 140 mg./100 ml. Band-shaped opacities developed, but the serum calcium was not estimated until two years later, when the nausea and vomiting had stopped and

the blood urea had returned to 65 mg./100 ml. There was persistent albuminuria. It is probable that both the kidney damage and the corneal opacities were caused by a transient hypercalcaemia.

Discussion

Bone Lesions

The earliest descriptions of the radiographic appearance of bone sarcoid were by Kienböck (1902) and Kreibich (1904), although Jüngling (1919) first described the histological changes. The frequency of bone involvement was found to be 9 in 55 cases by Holt and Owens (1949) and 19 in 100 cases by Longcope and Freiman (1952). Bone disease was found less often in the present series—only nine times in 120 patients. The true frequency of bone involvement may be much higher than any of these reports suggest, as the epithelioid cell follicles of sarcoidosis have been seen at biopsy or necropsy even when the radiograph has been normal (Schaumann, 1926). Also the earliest radiographic changes—a stippled medullary pattern from diffuse lacunar absorption—may be so indefinite that a firm diagnosis cannot be made, especially when the process affects many phalanges.

The explanation for the lower frequency in this series compared with others may be that most of the patients had predominantly intrathoracic sarcoidosis, and that there were only 13 examples of skin sarcoids, of which five showed digital bone disease. The relation between skin and bone sarcoidosis is well known (Holt and Owens, 1949), and it is because so many of the early reports of sarcoidosis were of skin lesions that bone changes were thought to be so frequent. In the last two decades pulmonary forms of the disease have been recognized to be the most common, so that bone sarcoid is seen relatively less frequently.

In the nine patients of this series the diagnosis of sarcoidosis had already been made from the clinical and radiographic features, supported by biopsy in eight. The finding of bone lesions in Cases F and H (Table I) was valuable support for the diagnosis, but their absence would not have changed this. Hence it is thought that radiographs of the hands and feet give little help in the diagnosis of sarcoidosis, and are wasteful as a routine procedure.

The most common type of radiographic change is a coarse reticulation of the shaft of the bone due to follicle formation along the cortical blood vessels, as seen in six of the nine cases. This and a stippled medullary pattern from diffuse lacunar absorption are the earliest changes. The classical punched-out areas in the medulla occurred in two cases, with less definite areas of bone replacement in four others. Thinning and expansion of the cortex, sometimes even with pathological fractures, have been reported due to the enlarging granuloma, but no examples were seen in this series. When the disease remits spontaneously there is seldom complete resolution of the bone lesions; a "cyst" of fibrous tissue may remain indefinitely. Bone sarcoid has been described in practically every bone in the body, but it has an overwhelming predilection for the middle and distal phalanges of the hands and feet. The reason is unknown.

In the differential diagnosis of bone sarcoid many diseases have to be considered. Both rheumatoid arthritis and gout have quite distinct clinical features. Here pain and swelling of the joints predominate, and the radiographic changes of osteoporosis or bony erosions are usually most pronounced at the articular ends of the bones, although in the arthropathy of psoriasis these may spread to involve the shaft as well. Enchondromata usually expand the cortex and are homogeneously translucent. Resembling these are the small degenerative cysts which occasionally occur as an incidental finding in the carpal and digits. Tuberculous dactylitis, a very rare condition in adults, causes the bone to appear distended and provokes a periosteal reaction; later destructive changes may occur accompanied by sinuses. Hyperparathyroidism should seldom be mistaken for sarcoidosis, as here there is decalcification affecting the whole skeleton,

with fibrous cysts in a few bones. Sometimes it may not be possible to separate xanthofibroma and tuberous sclerosis of the digits except by features of these diseases elsewhere. The most common error is to diagnose digital sarcoidosis too frequently through failure to appreciate the range of normal bone architecture. Areas of radiolucency in the metacarpal heads are especially apt to be interpreted falsely, as are the coarsening of the bone structure with increasing age and with osteoarthritis. Features which help in the diagnosis of sarcoidosis are the lack of joint involvement and periosteal reaction, and the usual absence of pain.

No relationship has been found between demonstrable bone disease and hypercalcaemia either in the past (Holt and Owens, 1949) or in the present series (Table I). This is not surprising, as other localized diseases of bone, such as osteomyelitis or tumours, likewise do not upset calcium metabolism. Bone sarcoid must be regarded as an oddity which seldom causes symptoms or demands treatment.

Hypercalcaemia

The first recognition of hypercalcaemia in sarcoidosis was by Harrell and Fisher (1939). Isolated reports of nephrocalcinosis and renal calculi had appeared (Salvesen, 1935), but their relationship to hypercalcaemia was not appreciated until 1941 (van Creveld). Estimates of the frequency of hypercalcaemia have varied from 11 in 44 patients (Longcope and Freiman, 1952) to 4 in 86 of the present series. Harrell and Fisher (1939) reported hypercalcaemia in 6 of their 11 patients, but in one patient the serum calcium was only 10.6 mg./100 ml., and, in another, hypercalcaemia developed only after intensive treatment with cod-liver oil. The explanation for the lower frequency in the present series compared with those of previous workers may be that many of the patients had disease affecting the hilar nodes or lungs alone and none was given vitamin D. Many of the reported cases had widespread disease, and no mention was made of whether vitamin D had been given as treatment. Hypercalcaemia in patients not receiving vitamin D occurs so infrequently in sarcoidosis that estimation of the serum calcium routinely is unnecessary. It should be done if there are symptoms of hypercalcaemia such as thirst, polyuria, tiredness, muscular weakness, and vomiting, if ectopic calcification is found, or if renal colic or albuminuria occurs, pointing to nephrolithiasis or calcinosis.

The explanation for the hypocalcaemia in four patients (Table II) is obscure, but merits further investigation. Case 5 was of particular interest in that there was an associated hypoglobulinaemia despite extensive sarcoidosis.

The cause of hypercalcaemia remains obscure. It bears no relation to a high serum protein (Harrell and Fisher, 1939; and Table II); in any case, protein disturbances affect only the serum globulin, which has little calcium-binding power (Schmidt and Greenberg, 1935; Gutman and Gutman, 1937). Also the hypercalcaemia is evidence that increased calcium in the blood is largely of the ionizable fraction. Hypercalcaemia is not due to parathyroid stimulation, as there is no hypophosphataemia or generalized osteoporosis. In several cases normal parathyroid glands have been removed (Albright and Reifenstein, 1948; Klatzkin and Gordon, 1953; Davidson *et al.*, 1954; Anderson *et al.*, 1954). One case has been recorded where hyperparathyroidism simulated sarcoidosis by showing diffuse pulmonary reticulation (Salmon and Meynell, 1951).

Hypercalcaemia is not due to widespread bone sarcoid, as there is seldom radiographic evidence of this, and in the nine cases (Table I) with known bone lesions there was no upset of calcium metabolism. Furthermore, balance studies do not support this hypothesis. It is not due to renal sarcoidosis, as there are many examples of hypercalcaemia where biopsy or necropsy has failed to show epithelioid cell follicles (Dent *et al.*, 1953; Davidson *et al.*, 1954; Correa, 1954; Case 10), and in those cases where renal sarcoidosis has occurred it is not extensive enough to cause impaired function (Longcope and Freiman, 1952). It may be due to a primary metabolic disorder, such as excessive sensitivity

to vitamin D as suggested by Anderson *et al.* (1954). Case 1 showed on the calcium balance an excessive absorption of calcium similar to that seen in their cases. This patient's metabolism also reverted to normal during cortisone treatment, a feature observed by Shulman *et al.* (1952), Lovelock and Stone (1953), Phillips (1953), Dent *et al.* (1953), Lane (1954), Citron (1954, 1955), and Anderson *et al.* (1954).

Further support for the hypothesis of vitamin-D sensitivity comes from the observations on Case 1 and of others that treatment with this drug even in small doses or with ultra-violet light may cause hypercalcaemia (Scadding, 1950; Cantwell, 1954; Letman, 1954; Anderson *et al.*, 1954). The recurrent symptoms of hypercalcaemia in Case 11 before calciferol was given all occurred during the summer months and were especially severe during the sunny summer of 1955. This suggests that the hypercalcaemia was provoked by ultra-violet light. Moreover, the clinical as well as the biochemical features of hypercalcaemia in sarcoidosis are in every way typical of hypervitaminosis D. Sensitivity to vitamin D is also thought to be the cause of infantile hypercalcaemia (Bonham Carter *et al.*, 1955; Schlesinger *et al.*, 1956), and there is some evidence that cortisone helps to reverse this abnormality (Creery and Neill, 1954).

The dangerous effects of hypercalcaemia, whether spontaneous or provoked by vitamin D, are primarily on the kidney, where irreversible damage may be done by nephrocalcinosis and renal stones (Cases 9 and 10). Impairment of function may be so severe that a fatal uraemia ensues (Cantwell, 1954; Correa, 1954; Davidson *et al.*, 1954). Hypercalcaemia may also cause band-shaped corneal opacities (Walsh and Howard, 1947; Cogan *et al.*, 1948; Cases 1, 9, and 11), and calcification in tissues, such as the blood vessels, lungs, subcutaneous tissue, and joint capsules. In addition to these potential dangers, there is considerable doubt about the efficiency of calciferol in the treatment of sarcoidosis. In the only recorded controlled trial of calciferol (Nelson, 1949) the frequency of remissions was the same in the treated and untreated groups. For these reasons the use of calciferol for the treatment of sarcoidosis should be discontinued.

When hypercalcaemia is encountered, a diet low in calcium and vitamin D may be effective. Cortisone has been shown to have some antagonistic action to vitamin D and is effective in reducing hypercalcaemia in sarcoidosis. It should be used when there is evidence of renal damage and when dietary measures prove ineffective.

Summary

Radiographs of the hands and feet have been examined from 120 patients with sarcoidosis: bone lesions were found in only nine. Such radiographs are thus of little value in diagnosis. The common association of cutaneous sarcoids with bone disease was confirmed (five out of the nine patients). No examples of disturbed calcium metabolism were seen in those with bone disease.

Estimations of serum calcium in 86 untreated patients showed hypercalcaemia in only four. Hypocalcaemia occurred in four. The effects of hypercalcaemia are described, with special reference to kidney damage. Examples of hypercalcaemia following the treatment of sarcoidosis with calciferol are given and its dangers emphasized.

Clinical and biochemical studies support the hypothesis that hypercalcaemia in sarcoidosis is due to excessive sensitivity to vitamin D. Control of this complication may be achieved by a diet low in calcium and vitamin D, although cortisone is sometimes necessary.

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REFERENCES

- Albright, F., and Reifenstein, E. C., jun. (1948). *The Parathyroid Glands and Metabolic Bone Disease*. Baltimore.
- Anderson, J., Dent, C. E., Harper, C., and Philpot, G. R. (1954). *Lancet*, 2, 720.
- Cantwell, D. F. (1954). *Irish J. med. Sci.*, p. 223.
- Carter, R. E., Bonham, Dent, C. E., Fowler, D. I., and Harper, C. M. (1955). *Arch. Dis. Childh.*, 30, 399.
- Citron, K. M. (1954). *Proc. roy. Soc. Med.*, 47, 507.
- (1955). *Postgrad. med. J.*, 31, 516.
- Cogan, D. G., Albright, F., and Bartter, F. C. (1948). *Arch. Ophthalm. (Chicago)*, 40, 624.
- Correa, P. (1954). *A.M.A. Arch. Path.*, 57, 523.
- Creery, R. D. G., and Neill, D. W. (1954). *Lancet*, 2, 110.
- Davidson, C. N., Dennis, J. M., McNinch, E. R., Willson, J. K. V., and Brown, W. H. (1954). *Radiology*, 62, 203.
- Dent, C. E., Flynn, F. V., and Nabarro, J. D. N. (1953). *British Medical Journal*, 2, 808.
- Gutman, A. B., and Gutman, E. B. (1937). *J. clin. Invest.*, 16, 903.
- Harrell, G. T., and Fisher, S. (1939). *Ibid.*, 18, 687.
- Holt, J. P., and Owens, W. I. (1949). *Radiology*, 53, 11.
- Jüngling, O. (1919). *Forstchr. Röntgenstr.*, 27, 375.
- Klenböck, R. (1932). *Z. Heilk.*, 23, 130.
- Klatzkin, G., and Gordon, M. (1953). *Amer. J. Med.*, 15, 484.
- Kreibich, K. (1934). *Arch. Derm. Syph. (Wien)*, 71, 3.
- Lane, T. J. D. (1954). *Urologia (Treviso)*, 21, 238.
- Letman, H. (1954). *Nord. Med.*, 51, 670.
- Longcope, W. T., and Freiman, D. G. (1952). *Medicine (Baltimore)*, 31, 1.
- Lovelock, F. J., and Stone, D. J. (1953). *Amer. J. Med.*, 15, 477.
- Nelson, C. T. (1949). *J. invest. Derm.*, 13, 81.
- Phillips, R. W. (1953). *New Engl. J. Med.*, 248, 934.
- Salmon, H. W., and Meynell, G. G. (1951). *British Medical Journal*, 2, 1440.
- Salvesen, H. A. (1935). *Acta med. scand.*, 86, 127.
- Scadding, J. G. (1950). *British Medical Journal*, 1, 745.
- Schaumann, J. (1926). *Acta radiol. (Stockh.)*, 7, 358.
- Schlesinger, B. E., Butler, N. R., and Black, J. A. (1956). *British Medical Journal*, 1, 127.
- Schmidt, C. L. A., and Greenberg, D. M. (1935). *Physiol. Rev.*, 15, 297.
- Shulman, L. E., Schoenrich, E. H., and Harvey, A. M. (1952). *Bull. Johns Hopk. Hosp.*, 91, 371.
- Trevan, J. W., and Bainbridge, H. W. (1926). *Biochem. J.*, 20, 423.
- van Creveld, S. (1941). *Ann. paediat. (Basel)*, 157, 1.
- Walsh, F. B., and Howard, J. E. (1947). *J. clin. Endocr.*, 7, 644.

ANAESTHESIA FOR AORTIC RECONSTRUCTION*

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Reconstruction of the thoracic and abdominal aorta calls for an anaesthetic technique appropriate to other operations in the region of these structures. There are, however, certain features peculiar to this branch of surgery which demand some special thought from the anaesthetist. Apart from the technical problems involved in maintaining (often for many hours) an even state of anaesthesia, combined with the profound degree of muscular relaxation necessitated by the surgical approach, there are other, and vital, matters concerning blood and respiratory chemistry, fluid and blood replacement, and the control of the haemodynamic disturbances of the surgical procedure. The nature of the operation may necessitate interruption of the circulation to vital organs for long periods, and in such cases the operation can be conducted safely only with the aid of induced hypothermia; this technique will itself impose some problems of anaesthetic management.

The anaesthetic techniques described below have been followed in 71 of the cases of aortic occlusion or aneurysm undergoing operation by members of the surgical unit of St. Mary's Hospital, London, under the direction of Professor Charles Rob. The anaesthetic procedure was conducted by three members of the hospital consultant staff, and their assistants. The 71 cases concerned are briefly summarized in Table I.

*Abstracted from a paper read before the Section of Anaesthetics at the Annual Meeting of the British Medical Association, Brighton, 1956.

TABLE I

	Requiring Hypothermia	Not Requiring Hypothermia
Aneurysm	5	37
Thrombosis	6	22
Coarctation	1	0
Total	12	59

TABLE II.—Fatal Cases

Requiring Hypothermia	Not Requiring Hypothermia
Aneurysm:	Aneurysm:
Haemorrhage	Haemorrhage
Thrombosis	Myocardial infarction
Suprarenal failure	Paralytic ileus and pulmonary
Myocardial infarction	sepsis
	Undecided
Thrombosis	Haemorrhage
Coarctation	Coronary thrombosis
Total	3
	9

The operative mortality (deaths occurring in the first 24 hours of the operative period) was 12 out of 71 (16.9%) (Table II).

Anaesthesia as a contributory cause of death could be implicated for certain in one case (pulmonary sepsis following aspiration of vomitus during induction of anaesthesia for reopening abdomen 12 hours after operation for aortic aneurysm. Ileus not diagnosed pre-operatively). One other case (listed as "undecided") was a possible "anaesthetic death." In the light of later experience it was thought that respiratory acidosis might have been a contributory factor (see last two cases in second column).

Type of Patient

Although, in the main, the patients likely to be encountered in surgery of the aorta may be described as being "in the prime of life," they are by no means in the prime of physical condition. With some few exceptions (such as the rare traumatic case, and some cases of aortic coarctation) they have reached middle or late middle age, and are suffering from severe arterial disease. Atherosclerosis is not likely to be confined to the portion of the aorta requiring surgery; coronary, cerebral, and renal vessels are likely to share in the general disease. Often there is hypertension, which may be of severe degree. There may have been past episodes of cardiac infarction or cerebral thrombosis. Such patients tend to be "old beyond their years," physically flabby, and often obese.

This is our somewhat unpromising material, and to subject such patients to major surgery, with the attendant hazards of blood loss and traumatic shock, under general anaesthesia (possibly maintained for as long as 12 hours), without the most careful pre-operative assessment and preparation, would be to court almost certain disaster. Only in the case of true emergency (such as leading aneurysm or haemorrhage from other causes) is it justifiable to omit the full pre-operative routine which is described below. The period of assessment and preparation may precede the operation by 7 to 10 days.

Pre-operative Investigations

Aortography.—In all cases the site of the lesion is determined by an aortogram, usually performed under local analgesia, assisted by intravenous pethidine. Only in exceptionally difficult cases, or with unusually apprehensive patients, will a general anaesthetic be necessary; since complete apnoea at the time of the exposure and the prone position are demanded, this will require tracheal intubation

and controlled respiration. The choice of the subsequent anaesthetic technique will depend on the site of the lesion as revealed by the aortogram. Should the lesion be estimated to lie 2 cm. or less below the level of the renal arteries, clamping of the aorta above this level and interruption of the renal circulation must be envisaged. In lesions of the thoracic aorta the proximal clamp will occlude some part of the blood supply to the spinal cord via the spinal branches of the posterior intercostal arteries. Such cases will call for induced hypothermia.

In addition to a complete physical examination the following routine investigations are carried out on all cases: complete blood count; estimation of haemoglobin, serum proteins, blood sugar, and blood urea; and a complete picture of the plasma electrolytes. Renal and respiratory function tests are made. Wherever electrolyte imbalance is found, every endeavour is made to restore normality, and not until stability seems assured is surgery contemplated. Certain cases require additional investigation and preparation. Of particular importance are those showing respiratory insufficiency; an important example of this group is that of chronic emphysema, which most anaesthetists will recognize as a troublesome problem in major surgery. In all such cases the blood oxygen content, pH, and plasma carbon dioxide content are determined, and operation is deferred until physiotherapy, together with antibiotic treatment of residual infection, has resulted in maximal improvement in the patient's vital capacity. The problem of respiratory acidosis is of great importance in the management of anaesthesia for aortic surgery—and, indeed, for most other types of thoracic and abdominal surgery—and is referred to below.

On the night before operation water diuresis is induced by the slow intravenous infusion of 1-2 litres of 5% glucose in water. This is believed to give some measure of protection from subsequent renal failure, particularly when surgical interruption of the renal circulation is anticipated (Wynn, unpublished observation).

It will be seen that cases for aortic reconstruction (or disobliteration) fall into two main groups: (1) those with lesions situated more than 2 cm. below the renal arteries, and (2) those with lesions at, above, or close to the renal arteries or involving the thoracic aorta—that is, cases not requiring induced hypothermia (group 1), and those in which induced hypothermia is obligatory (group 2). For convenience these two groups are considered separately with regard to management, the simpler (non-hypothermic) group being taken first.

Anaesthetic Management of Group 1 Cases

In contrast with those of the second group, group 1 cases will suffer little disturbance of normal physiology, except that at certain stages in the operation severe variations in blood pressure are to be expected and considerable loss of blood may be inevitable. As in all abdominal surgery, muscular relaxation of a high degree is demanded, and, since the operation is likely to be lengthy, the anaesthetic agents must be of minimal toxicity. Our choice at St. Mary's Hospital is nitrous oxide and oxygen, preceded by thiopentone, and supplemented by pethidine. Curare is used to provide the necessary relaxation. Endotracheal intubation is invariably employed, and respiration is controlled manually throughout the operation, with carbon-dioxide absorption on the "to-and-fro" principle. We are careful to avoid small gas-flows, with their potential danger of underventilation.

The administration of parenteral fluids, both in replacement therapy and as vehicles for drugs required in the course of operation, has received some special attention from the team in our metabolic unit. This matter is discussed below. For group 1 cases we prefer to use an isotonic dextrose-saline solution (dextrose 4.3%, saline 0.18%), which is usually administered through a "polythene" intravenous cannula. The solution can be exchanged for whole blood when necessary. An intra-arterial blood transfusion can be set up at very short notice. Since the lower limbs

are not available for this purpose (on account of surgical occlusion of the aorta), a transfusion set, kept externally sterile, is retained for the use of the surgeon as need arises. We do not favour the use of the radial or other proximal limb arteries for transfusion purposes, because of the risk of spasm and ischaemia. In most cases the aorta, proximal to the clamps, is the vessel of choice. The necessary transfusion pressure is obtained by suspending the blood-bottle from the theatre gallery at a height of about 10 ft. (3 metres), an extension of the transfusion tube allowing for this distance. Blood pressure and pulse rate are recorded at 10-minute intervals, and electrocardiographic tracings are made when required.

Recently we have come to appreciate the great importance of maintaining a normal blood pH, and, in order to detect and check developing respiratory acidosis, estimations of arterial blood pH and total carbon dioxide are made at frequent intervals, or whenever there is clinical suspicion of rising blood pCO₂ (rising systolic and diastolic blood pressure, sweating, tachycardia). Further estimations are made at the conclusion of operation, when spontaneous respiration is re-established.

Blood Replacement.—So far as is possible, blood replacement is adjusted to blood loss. The suction-bottle is calibrated in millilitres, and all swabs and packs are weighed before and after use on a sterile balance, blood loss being calculated on a weight-volume coefficient. Since no wet packs are used, an estimate accurate to $\pm 10\%$ is possible. The most critical period of the operation is when the distal aortic clamp is released. Close co-operation between surgeon and anaesthetist ensures that the latter has ample warning and can take the necessary action to avert a dangerous fall in blood pressure. Provided that the intravenous blood

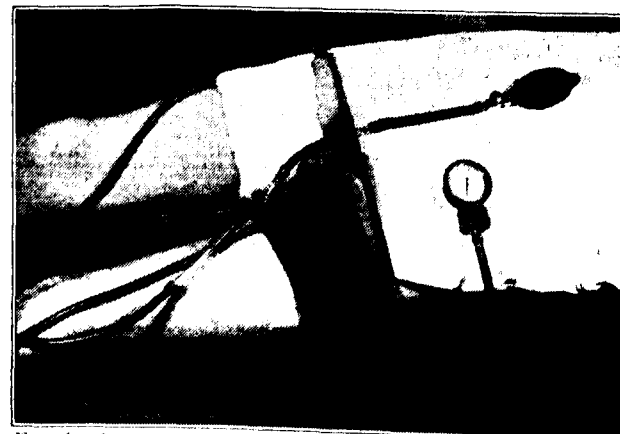


FIG. 1.—Pneumatic tourniquets control flow of blood to legs on release of clamps.

transfusion is capable of a rapid increase in rate of flow (500 ml. in five minutes) at least five minutes before release of the clamp, it is seldom necessary to transfuse intra-arterially. To prevent too rapid a loss of blood into the lower limbs we use pneumatic tourniquets, which can be gradually deflated, and, if necessary, reinflated to check dangerous falls in blood pressure (Fig. 1). Unless unusually severe leakage at the anastomosis occurs on removal of the clamps, blood pressure should be controlled and stabilized within 5-10 minutes.

Anaesthetic Management of Group 2 Cases

In the surgical unit of St. Mary's Hospital we have found the method of surface-cooling both simple and effective. We aim at reducing the body temperature to between 26 and 27° C. (78.8 and 80.6° F.), and require about one and a half hours to achieve this degree of hypothermia. The procedure is as follows.

One hour prior to cooling—that is, two and a half hours before the planned time of operation—the patient is pre-medicated with pethidine, 100 mg., scopolamine, 1/150 gr.

(0.43 mg.), and chlorpromazine, 25-50 mg. intramuscularly. My own practice is to give chlorpromazine, 25 mg., some days before operation, and to observe the effect. Should tachycardia or marked hypotension result I omit the chlorpromazine from the premedication entirely. If, on the

by removing some of the ice-bags, stopping the fans, and recovering exposed parts of the body with blankets. Operation is started as soon as the required basic temperature has been reached. At this stage it is usually necessary to give a further small dose of curare and/or pethidine.

Provided that the cooling process has proceeded smoothly, the patient, although presenting a somewhat alarmingly lifeless appearance, should by this time have suffered little or no fall in blood pressure. The pulse rate will have fallen considerably (50-60 a minute).

Cases of this group require especially careful handling at the time when the distal aortic clamp is released, for, although vasoconstriction is active as a result of the hypothermia, reflex hyperaemia will still occur in the lower limbs, in response to the restored circulation (Fig. 3). Unless this is adequately controlled by the tourniquets a hypotensive crisis will be precipitated, and this is likely to prove more difficult to treat than in the non-hypothermic cases. Infusion of noradrenaline (1/500,000) will be of great help in such cases, provided that there is not the additional complication of uncompensated blood loss.

A danger associated with massive blood transfusion is inherent in the quantity of sodium citrate which may be infused. Like glucose, the citrate ions of sodium citrate are not metabolized in the hypothermic state, and may reach a concentration high enough to be toxic to the myocardium (Bunker *et al.*, 1955). Furthermore, stored blood has a high potassium-ion concentration which can cause cardiac arrest. In all cases it is advisable that only freshly donated blood

FIG. 2.—Set-up of anaesthetic and other apparatus during induction of hypothermia. Note ice-bags. Left foreground: Control for cutting in thermocouple leads for direct temperature readings. Left background: Electrocardiogram. (The apparatus attached to right lower leg is for measuring calf blood flow.) Right foreground: Anaesthetic apparatus and sphygmomanometer.

be used and that an adequate supply be available at the time of operation. (Aneurysm cases may require as much as 3-4 litres; thrombosis cases, somewhat less.) If the quantity of citrated blood is necessarily heavy (above 4 litres) we advise the addition of calcium gluconate, 0.5 g. to each half-litre.

Post-operative Points

At the conclusion of the operation the anaesthetist must be satisfied upon the following points: (1) blood loss has been restored (verified gravimetrically and volumetrically); (2) blood pressure is stable at a safe level (not less than 100 mm. Hg systolic, with or without noradrenaline); (3) the neuromuscular block has been fully reversed by neostigmine; (4) central respiratory depression has been abolished (this may require nalorphine); (5) the blood pH and pCO₂ are normal and stable; and (6) rewarming of the hypothermic patient is proceeding at the rate of 1-1.5° C. an hour, but no faster.

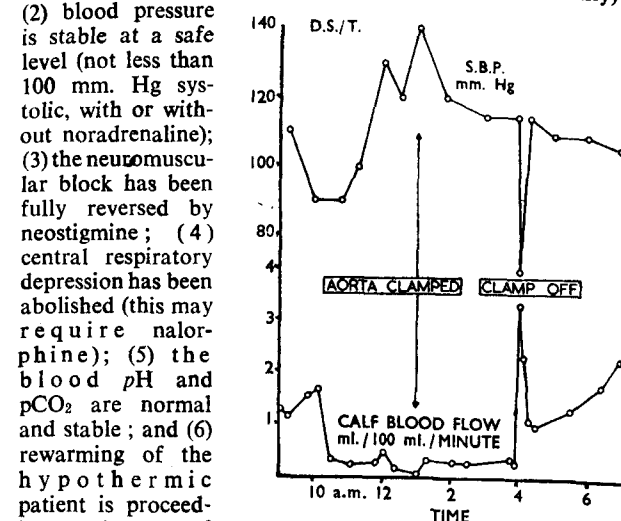


FIG. 3.—Reflex hyperaemia of lower limbs following release of aortic clamp.

Maintenance of anaesthesia is by nitrous oxide and oxygen with manually controlled respiration. Increments of pethidine are added intravenously as required. Before cooling is started, tubocurarine chloride, 20-30 mg., is administered. This not only facilitates the control of respiration in a light plane of anaesthesia, but is essential in preventing shivering, with the attendant risk of ventricular fibrillation.

Cooling (conducted on the operating table) is begun by placing ice-bags in close contact with the patient's exposed neck, thorax, abdomen, flanks, thighs, and legs, covered overall by a wet cotton sheet, from which evaporation is assisted by electric fans. The theatre temperature is kept as low as possible (40-60° F.; 3.3-15.5° C.). Body temperature is constantly recorded by thermocouples placed in the upper and lower oesophagus and rectum. Pulse, blood pressure, and electrocardiographic tracings are taken at short intervals, the latter being particularly valuable in giving warning of ventricular arrhythmias (Fig. 2).

Since Wynn (1954) has shown that glucose ceases to be metabolized at a body temperature below 31° C. (87.8° F.), the only parenteral infusion used, apart from blood, is half normal saline, to which is added such drugs as are required in the course of operation. All active cooling is stopped when the body temperature has reached about 28° C. (82.4° F.), after which, in a cool theatre, it will continue to fall until it stabilizes at between 26 and 27.5° C. (78.8 and 81.5° F.). Too rapid a fall in temperature can be checked

These last two points deserve some further amplification, and the fifth point—that is, the matter of blood pH—will be taken first, since this applies to both hypothermic and non-hypothermic cases, and is closely related to the problems

of persistent neuromuscular block and central respiratory depression. In a proportion of cases, Wynn (1956, personal communication) and the metabolic team of the surgical unit at St. Mary's Hospital have found that there is a tendency to recurrence of a neuromuscular block which has been previously reversed by neostigmine at some time during the recovery period. It is possible that in the hypothermic patient curare may persist in some depot inaccessible to the action of neostigmine; or, in those cases where the renal circulation has been interrupted, there could be delayed excretion of curare. Undoubtedly there are other factors as yet not fully understood. Scurr (1954) has already drawn attention to the apparent synergism between carbon dioxide and the neuromuscular blocking agents, and it would seem that in certain circumstances a vicious circle could become established (Fig. 4).

To break this circle the full respiratory efficiency needs to be restored, and treatment must be at the appropriate level. Thus, if reversal of central respiratory depression plus reversal of neuromuscular block (nalorphine plus neostigmine) fails to restore the *status quo*, artificial ventilation aimed at elimination of carbon dioxide must be instituted without delay, and must be continued until the pH and pCO₂ return to normal and show no tendency to further change. Reintubation of the patient and connexion to a respiratory pump for an hour or more has sometimes proved necessary. Respiratory acidosis must never be allowed to develop. The longer treatment is delayed the more difficult will it be to reverse the process.

Illustrative Case

A somewhat obese plethoric man aged 44 had a recent history of claudication of buttocks and legs. Aortogram (under general anaesthesia) showed occlusion of abdominal aorta immediately below renal arteries, with well-marked collateral circulation. Operation was begun at 9 a.m. under induced hypothermic and thiopentone-nitrous-oxide-oxygen-pethidine-curare anaesthesia with manually controlled respiration. Duration of anaesthesia was about eight hours. Surgical procedure (disobliteration and graft) required clamping of aorta above renal vessels for about two hours. Operation was completed at 6 p.m.

Post-operative Course.—Patient regained consciousness and spoke rationally about 30 minutes after return to the ward. Although respiration was spontaneous on removal of endotracheal tube, there was marked "tracheal tug," which was not abolished by neostigmine, 2.5 mg., repeated after 20 minutes. Oxygen was administered by means of a plastic facepiece at the rate of approximately 8 litres a minute, a good colour being maintained. Rewarming proceeded normally; no shivering. Three hours later (9 p.m.) respiration became shallow and soon ceased, although the colour up to this time (with oxygen) had seemed satisfactory. Patient appeared deeply unconscious. Artificial respiration with oxygen by means of a bag and facepiece (later replaced by cuffed tube) was immediately begun. Blood samples were obtained for pH, HCO₃, and pCO₂, which revealed very gross respiratory acidosis (see Fig. 5).

Four hours later (1 a.m.) the patient still appeared deeply comatose; pH was now rising, and HCO₃ and pCO₂ falling slightly. At this stage a Waters CO₂ absorber was placed in circuit. Much heat was generated, requiring change of canister after 20 minutes. Artificial respiration continued until 6 a.m. (a further five hours), when consciousness and spontaneous respiration returned. Blood samples now showed an almost complete return to normal, except the pH, which remained a little low (7.35) for about a further hour. Thereafter the patient made an uninterrupted recovery.

Comment.—An interesting feature of this case was revealed some time later. The patient, who was himself a

medical man, was able to recall in detail many of the events which took place when he appeared to be deeply comatose. This would seem to be a case of respiratory acidosis simulating complete neuromuscular block (Scurr, 1954).

Rewarming of the hypothermic patient requires the most careful vigilance on the part of medical and nursing staff. If

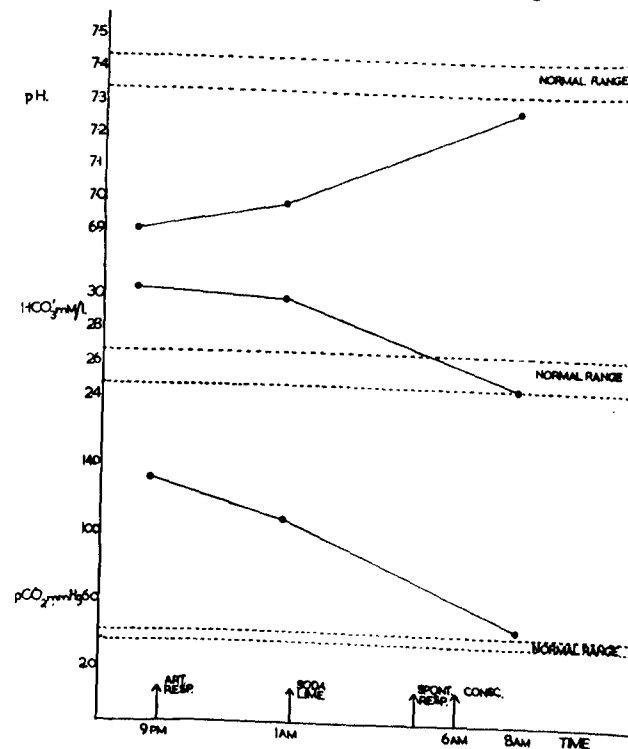


FIG. 5.—Case of severe carbon dioxide retention.

rewarming proceeds too rapidly, vasodilatation will result in a severe fall in blood pressure; if too slowly, shivering and shock may be produced. We believe that a safe average rate of rewarming lies between 1 and 1.5° C. an hour. Heat-loss is prevented by blanketing in preference to the application of outside sources of heat, such as electric cradles. Should the body temperature rise too rapidly, and result in a fall in blood pressure, it may be necessary to reapply tourniquets to the limb from time to time, whilst removing some or all of the blankets.

Conclusion

It should be observed that although the operative death rate in cases of aortic reconstruction might appear to be high in comparison with that encountered in the general run of major abdominal and thoraco-abdominal surgery, due appreciation must be given to the extreme severity of the operations performed on patients almost invariably in the "poor-risk" group. As in all comparatively new branches of surgery, improvement in this respect may be expected to follow future improvements in technique, both surgical and anaesthetic. A decrease in the incidence of operative shock and blood loss is already beginning to reflect a steady diminution in total operating-time, whilst experience has taught us to avoid many of the earlier hazards of anaesthesia.

The paramount importance of team-work in the management of these cases must be stressed. Without the close co-operation of the many special departments (electrocardiographic, metabolic, biochemical, to mention only a few of those whose services we are fortunate in having at our disposal) the anaesthetic and operative risk in major aortic surgery would be formidable indeed.

Summary

The pre-anaesthetic preparation, anaesthetic technique, and post-anaesthetic management of cases of aortic reconstruction are described.

Blood loss, blood and fluid replacement, and the control of blood pressure are discussed.

The technique of induced hypothermia by the method of surface cooling is described, and some relevant problems are considered.

The importance of maintaining a normal blood chemistry, with particular reference to the blood pH and pCO₂, is stressed.

I thank Professor Charles Rob for giving me access to case notes and statistics of the St. Mary's Hospital Surgical Unit; Dr. Victor Wynn for much valuable assistance and for supplying the graph (Fig. 5) from his personal notes; and Dr. P. N. Cardew, of the St. Mary's Hospital photographic department, for the illustrations and diagrams.

REFERENCES

- Bunker, J. P., Stetson, J. B., Coe, R. C., Grillo, H. C., and Murphy, A. J. (1955). *J. Amer. med. Ass.*, 157, 1361.
Scurr, C. F. (1954). *British Medical Journal*, 1, 565.
Wynn, V. (1954). *Lancet*, 2, 575.

CANICOLA FEVER IN MAN THROUGH CONTACT WITH INFECTED PIGS

BY

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Leptospiral infections in man resulting from contact with infected pigs have been reported from different parts of the world but have not previously been recorded in Great Britain. Thus the benign human leptospiroses known as "swineherd's disease" and "seven-day fever of Queensland" have followed contact with pigs infected with *Leptospira pomona* (syn. *L. suis*) and *L. mitis* (syn. *L. hyos*) respectively, while van Thiel (1948) quotes two published cases of Weil's disease where it seemed likely that the patient had contracted the disease through slaughtering pigs infected with *L. icterohaemorrhagiae*.

Neither *L. pomona* nor *L. mitis* has so far been isolated from man or pig in this country, but occurrences of *L. icterohaemorrhagiae* infection in swine in two rat-infested piggeries in the south-east of Scotland have been reported by Nisbet (1951).

One other type of leptospira—namely, *L. canicola*—has been isolated from swine. Williams *et al.* (1953) found during the investigation of an extensive outbreak of human canicola fever in a rural community in South Georgia that dogs, cows, and swine showed evidence of infection with *L. canicola*. All the human cases had bathed in the water of a creek to which animals had access, and, although the original source of infection remained obscure, it was the first record of *L. canicola* infection in animals other than dogs.

Previously it had been generally accepted that dogs were the only natural carriers of *L. canicola* (van Thiel, 1948) and that infection in man resulted directly or indirectly from contact with these animals. The disease in the dog varies in severity, but, whatever the degree of illness, the infection usually leads to leptospiuria, which

may persist for many months if recovery occurs, thereby providing a source of contamination for other dogs and for man. While the number of known cases of human canicola fever has been steadily increasing, its true incidence is difficult to assess, since it is a disease which must very often escape diagnosis. In some instances of human disease the history would seem to leave little doubt that infection was transmitted from a dog, but others have been recorded where no apparent connexion between patient and dog could be established (Broom, 1951) and where an alternative source of infection seemed probable. It may be that pigs are more frequently infected with *L. canicola* than is commonly supposed, and, if so, the question arises whether they may not act as reservoirs of infection to persons who feed and handle them. Investigations into a number of obscure cases of human canicola fever which occurred between 1950 and 1955 among piggery workers in and around the City of Edinburgh gave rise to a series of interesting results which point to the probable role of pigs in the transmission of canicola infection to man. These form the basis of the present communication.

Laboratory Methods

Agglutination-lysis tests were used for serological diagnoses. The methods of setting up the tests and interpreting the results were those developed by the staff of the Institute of Tropical Hygiene in Amsterdam, and are described in detail by Wolff (1954). Live cultures of leptospires were used, and the sera were diluted from 1 in 10 to 1 in 30,000. Titres of 1 in 100 and over are regarded as indicating past or present leptospiral infections. A few titres as low as 1 in 10 to 1 in 30 have been recorded, but they are to be treated with reserve since their significance is doubtful.

The isolation of leptospires from the organs of infected animals at necropsy was attempted by grinding small pieces of tissue in Korthof's medium in a Waring blender and inoculating tubes of medium with three or four drops of the emulsion so produced. Latterly, however, we were more successful in obtaining positive cultures by inoculating duplicate tubes of Korthof's or Stuart's medium with small pieces of kidney tissue punched out with a Pasteur pipette, after the surface had been seared with a red-hot scalpel blade (cf. Wolff, 1954). The tubes were incubated at 28° C. and examined at weekly intervals up to six weeks before being discarded as negative.

In addition to culture, hamsters approximately 3 weeks old were inoculated intraperitoneally with 0.5 ml. of tissue emulsions or with 0.5 ml. of centrifuged urine deposit suspended in 1 ml. of Korthof's medium.

Microscopical examinations of cultures, urine, and heart blood from experimental animals were made with dark-ground illumination using a 2-mm. objective.

Clinical Observations

The first case to be investigated occurred in November, 1954, when a man employed on a piggery (Farm A) was admitted to hospital with a feverish illness of eight days' duration characterized by severe frontal headache. Blood taken from the patient agglutinated *L. canicola* to a significantly high titre. Although, on inquiry, no history of recent illness was forthcoming, blood from four out of five other persons living and working on the farm gave positive agglutination findings. The results of these tests and other relevant features are shown in Table I.

There were three dogs on the farm, and, to determine whether they might have been responsible for the infection, specimens of blood and urine were obtained. Dark-ground examination of the urine failed to reveal leptospires. Two of the sera agglutinated *L. canicola* to titres of 1 in 30 and 1 in

TABLE I.—Details of Personnel Living and Working at Farm A

	Age	No. of Years Working with Pigs	Remarks	Serum Titre of Agglutination Against	
				<i>L. canicola</i>	<i>L. icterohaemorrhagiae</i>
Mr. A. . .	23	4 months	Case of canicola fever	(1) 1/30,000 (2) 1/30,000	1/1,000 1/3,000
Mr. W. D. .	60	45 years	Owner of piggery (no significant previous history)	1/1,000	1/300
Mrs. W. D. .	50	Intermittently over a number of years	Wife of owner (no significant previous history)	1/10,000	1/300
Mr. J. D. . .	30	15 years	Son (no significant previous history)	1/3,000	1/300
Mrs. J. D. .	30	No association with pigs 20 years	Daughter-in-law	Negative	Negative
Mr. B. . .	40		Piggery worker (no significant previous history)	1/3,000	"

100, while none of them agglutinated *L. icterohaemorrhagiae*. These low agglutination titres and the absence of leptospirae in the urine did not point to the dogs as the direct source of infection, and, as the only person in the piggery whose blood failed to agglutinate leptospirae was also the only one of the six persons concerned who had no contact with pigs, it occurred to one of us (J. N.) that the pigs might be harbouring the organisms and serving as a reservoir of infection. Consequently, blood samples were taken at random from 75 of the animals and submitted for serological examination. The results are shown in Table II.

TABLE II.—Results of Leptospira Agglutination Tests with Pig Sera from Farm A

	Total Tested	Titres of Agglutination							
		Neg.	1/10	1/30	1/100	1/300	1/1,000	1/3,000	1/10,000
<i>L. canicola</i>	75	17	1	11	24	7	8	4	3

Thus evidence of infection with *L. canicola* based on positive serological findings was present in 46 of the 75 pigs tested (61%), while in 12 others a low degree of agglutination was obtained. Although, in the cases of the positive sera, cross-reactions occurred with *L. icterohaemorrhagiae* the titres never exceeded those with *L. canicola* and were usually much less. Twelve sera were also tested against *L. pomona* and *L. mitis* with negative results.

The interesting results obtained at Farm A were a stimulus to further study and, as a first step, inquiries were directed to another piggery (Farm B), in connexion with which a confirmed case of canicola fever had occurred two months previously. Specimens of blood were obtained from this man and his nine fellow workers, and also from 98 pigs taken at random on the farm. The results of leptospira agglutination tests, with other details, are given in Tables III and IV.

Table III shows that in four out of nine persons working at the piggery there was serological evidence of previous infection with *L. canicola*. Apart from the original patient, none of these workers, in spite of careful interrogation, gave a history of an illness suggestive of canicola fever.

It will be seen from Table IV that 40% of the pigs tested had antibodies to *L. canicola* present in their sera to a significant extent.

Inquiries were now extended to 10 other piggeries, and specimens of blood were obtained from 31 workers. Serological tests in 21 were negative, but the other 10 were positive and their agglutination titres with other relevant information are set out in Table V.

It should be mentioned that at three of the piggeries all eight workers examined were free from evidence of infection. No pigs were examined on these farms. The 10 cases with positive sera were among the 23 employees at the remaining seven farms. It is also of interest that at one of the latter farms 12 pigs out of 31 tested were found to have sera positive to *L. canicola*.

Summarizing the results shown in Tables I to V, it appears that of a total of 47 blood specimens taken from persons employed or living at 12 pig farms, 19 (40%) were found to contain antibodies to *L. canicola* in amounts sufficient to signify a past infection with that organism. Five of the persons concerned had had previous illnesses diagnosed at the time on clinical and serological grounds as canicola fever, while an additional five gave histories of undiagnosed illnesses, the symptoms of which, in retrospect, suggested canicola fever. As regards the pigs, 86 out of 173 (50%) at Farms A and B showed evidence of infection with

TABLE III.—Details of Personnel Living and Working at Farm B

	Age	No. of Years Working with Pigs	Remarks	Serum Titre of Agglutination Against	
				<i>L. canicola</i>	<i>L. icterohaemorrhagiae</i>
Mr. F. . .	17	1	Case of canicola fever	(1) 1/3,000 (2) 1/10,000	1/300 1/1,000
Mr. W. N. .	50	40	No significant symptoms	1/1,000	Negative
Mr. J. N. .	17	1	"	1/30	"
Mr. M. . .	33	6	"	1/3,000	"
Mr. S. . .	26	Intermittently for several years	"	Negative	"
Mr. J. . .	50	11	"	"	"
Mr. R. . .	50	10	"	"	"
Mr. W. . .	40	20	"	"	"
Mr. McN. .	17	1	"	1/3,000	1/30
Mr. T. . .	30	1	"	Negative	Negative

TABLE IV.—Results of Leptospira Agglutination by Pig Sera from Farm B

Form B								
	Total Tested	Titres of Agglutination						
		Neg.	1/30	1/100	1/300	1/1,000	1/3,000	1/10,000
<i>L. canicola</i> ..	98	54	4	21	11	5	1	2

TABLE V.—Details of 10 Piggery Workers Whose Sera Agglutinated Leptospirae

Name	Age	No. of Years Working with Pigs	Remarks	Titres of Agglutination Against		
				<i>L. canicola</i>	<i>L. icterohaemorrhagiae</i>	<i>L. pomona</i>
Mr. D. McD.	42	Many	History suggestive of canicola fever 7 years ago	1/10,000	1/300	Negative
Mr. W. McD.	47	"	History of illness diagnosed as tuberculous meningitis 7 years ago	1/1,000	1/30	"
Mr. M. S. . .	20	3	No record of illness	1/300	Negative	"
Mr. E. N. . .	40	17	History of severe influenza 4 years ago	1/300	1/10	"
Mr. McC. . .	18	2	History of severe influenza 6 months ago	1/300	"	"
Mr. J. S. . .	32	3	Severe "influenza" 2 months previously	1/100	"	"
Mr. D. R. . .	26	10	Canicola fever diagnosed 5 years ago	1/3,000	1/30	"
Mr. R. R. . .	23	8	No record of illness	1/1,000	Negative	"
Mr. K. . .	57	5	Canicola fever diagnosed 5 years ago	1/1,000	1/30	"
Mr. C. . .	33	Intermittently	Canicola fever diagnosed December, 1955	1/3,000	1/100	"

L. canicola to a significant degree. None of these animals revealed noticeable signs or symptoms of disease.

These findings strongly suggested the probability that infection had been transmitted from pig to man, but so far it had not been possible to isolate the leptospira from either pigs or man. Only one of the five human cases of confirmed canicola fever was ill during the course of the present investigation, and in his case blood cultures, dark-ground examination of the urine, and animal inoculation gave negative results, probably because he was not brought under notice at a sufficiently early stage of the disease. Specimens of urine from the bladders of a large number of pigs on Farm A showed no leptospirae on dark-ground microscopy, and we failed to isolate the organism by inoculating hamsters with kidney tissue from "non-thriving" pigs with high antibody titres for *L. canicola*. It should be noted, however, that there was in the piggery at the time a concurrent infection of *Pasteurella septica* which killed the hamsters rapidly and contaminated the culture media inoculated at necropsy.

Because of the failure to demonstrate leptospirae by these methods, it was decided to carry out experimental work to determine whether pigs could be artificially infected with *L. canicola* and whether leptospirae could then be isolated from the urine of these pigs.

Experimental Investigations

1. Artificial Infection of Pigs with *L. canicola*

Six pigs aged 2–3 months whose sera failed to agglutinate *L. canicola* and *L. icterohaemorrhagiae* were inoculated with a culture of *L. canicola* (strain Aldgate) kindly supplied by Dr. J. C. Broom, of the Wellcome Laboratories of Tropical Medicine. This strain is highly virulent (a hamster inoculated with 0.3 ml. of the culture died on the fifth day). The pigs were inoculated by the following routes: (1) Subcutaneously through the soft skin of the groin (0.5 ml.). (2) By scarification of the skin behind the ear, one drop of culture being placed on the scarified area, covered with cotton-wool, and held firmly in place with medicated elastic adhesive bandage. (3) Intranasally by rubbing the inside of each nostril with a swab saturated in the culture. (4) Routes 1, 2, and 3 combined. (5) By mouth: 1 ml. of the culture was introduced into the back of the throat by means of a syringe. (6) Control.

Evidence of Disease Resulting from Inoculations.—Rectal temperatures of the pigs recorded before the experiment and each day afterwards showed no significant rise. No apparent symptoms of disease developed and the pigs continued to gain in weight.

Serology.—Ten days after inoculation, and periodically thereafter until the pigs were killed, blood was withdrawn from the ear veins and agglutination tests were carried out with the sera against *L. canicola*. The results are shown in Table VI. These results show that a marked serological

TABLE VI

TABLE 4					
Pig No.	Method of Inoculation	Titres of Agglutination of <i>L. canicola</i>			
		Before Inoculation	No. of Days After Inoculation		
			10	28	40
1	Subcutaneous	Negative	1/30,000	*	—
2	Scarification	"	1/10,000	1/10,000	Negative
3	Intranasal	"	Negative	*	"
4	Methods 1, 2, and 3	"	1/10,000	"	"
5	By mouth	"	Negative	1/300	1/3,000
6	Control	"	"	Negative	Negative

* Pigs 1 and 4 were killed on the 18th and the 12th day respectively.

response followed inoculation of the culture by all routes except the intranasal one. Subcutaneous inoculation and inoculation through the scarified skin resulted in strongly positive agglutinating sera within 10 days. On the other hand, antibody production in the pig inoculated by mouth was delayed and titre had reached only 1 in 100 by the 28th day, continuing to increase to 1 in 3,000 by the 40th day. It is possible in this case that the actual infection may have

been acquired through contact with the pigs already infected by the other methods, although it is noteworthy that pigs 3 and 6 failed to show any evidence of infection 47 days after the beginning of the experiment. The result in the pig infected through scarified skin (No. 2) is particularly interesting, since it not only indicates that the serological response must have resulted from invasion of the tissues by the leptospirae but also that it is possible for natural infection to follow leptospiral contamination of wounds, so often inflicted when pigs fight with one another.

Attempts to recover infecting organisms were unsuccessful. Dark-ground examination of blood from the infected pigs taken 10 days after inoculation and urine specimens taken periodically thereafter failed to show leptospirae.

Pig 4 was killed on the 12th day, pig 1 on the 18th day, and pigs 2 and 5 on the 40th day after inoculation. At necropsy no lesions were seen in any of the organs, and we were unable to recover leptospirae from the kidney and liver of these four pigs either by cultural methods or by inoculation of hamsters.

2. Introduction of Non-infected Pigs into the Infected Piggery

In order to observe the effect of introducing non-infected pigs into an infected piggery the following investigation was carried out at Farm A.

Two pens of 20 pigs were chosen for this study. The pigs in the first pen—pen 1—had been introduced into it direct from the local market three weeks previously; those in the second pen—pen 2—one week previously. Both pens had housed pigs which on serological evidence were infected with leptospirae, but after these had been removed for slaughter the pens had been given their customary cleaning by hosing and left vacant for 24 hours prior to the introduction of the fresh pigs. Three pigs from each pen were chosen, and blood specimens from the ear veins of the six were found to contain no leptospiral antibodies. Subsequent specimens of blood were taken from the six at intervals and tested against *L. canicola* and *L. icterohaemorrhagiae*. The results are shown in Table VII.

TABLE VII

Pig No.	Length of Time in Piggery							
	1 Week		3 Weeks		5 Weeks		8 Weeks	
	<i>L. can.</i>	<i>L. ictero.</i>	<i>L. can.</i>	<i>L. ictero.</i>	<i>L. can.</i>	<i>L. ictero.</i>	<i>L. can.</i>	<i>L. ictero.</i>
Pen 1	1	—	—	Neg.	Neg.	Neg.	1/1,000	1/300
	2	—	—	"	"	"	1/10,000	1/1,000
	3	—	—	"	"	"	1/10,000	1/1,000
" 2	4	Neg.	Neg.	1/300	1/100	1/300	1/300	1/100
	5	"	"	Neg.	Neg.	Neg.	Neg.	Neg.
	6	"	"	"	"	"	"	"

From the serological results shown in this Table it appears that the three pigs in pen 1 became infected within six to eight weeks of their introduction into the piggery. In pen 2 the blood of one of the pigs agglutinated leptospirae weakly to a titre of 1 in 300 after three weeks, but the titre failed to rise during the subsequent weeks and its significance is therefore doubtful. The other two pigs continued to be serologically negative.

Isolation of *L. canicola* from Urine.—A specimen of urine taken from the floor of pen 1 during the eighth week was examined by dark-ground microscopy and found to contain numerous leptospirae (approximately one per field of uncentrifuged urine). The following day a pooled specimen of urine collected in a sterile long-handled pan from 12 pigs in this pen was examined, and again numerous active leptospirae were seen (up to four per field). Separate specimens were then obtained in sterile containers from individual pigs in the pen and five out of six were found to be positive. On the other hand, eight specimens of urine taken from individual pigs in pen 2 were examined by dark-ground microscopy but no leptospirae were seen. This accords with the negative serological findings for this pen.

A pooled specimen of urine from the pigs in pen 1 was inoculated into two hamsters: one of these died on the sixth and the other on the eighth day after inoculation. At necropsy, apart from some congestion of the blood vessels of the peritoneum, there were no obvious lesions. Dark-ground examination of heart blood failed to show leptospire, but six drops inoculated into Stuart's medium produced growth after 14 days' incubation. The culture was sent to Dr. Broom at the Wellcome Research Laboratories, and was identified as a strain of *L. canicola*.

3. Experimental Infection of Pigs with Infected Urine

Two of the six pigs used in experiment 1—namely, the one inoculated intranasally and the control animal—continued to show no serological evidence of infection. No leptospiral antibodies were present in either of these animals 47 days after the beginning of experiment 1. The following day they were inoculated with infected urine collected from 10 pigs in Farm A (pen 1). (The presence of leptospire was confirmed by dark-ground microscopy.) Pig 3 was inoculated subcutaneously with 3 ml. of untreated urine, while in the case of pig 6 a piece of cotton-wool soaked in urine was placed on an artificially scarified area behind the ear and held in place with medicated elastic adhesive bandage.

Symptoms of Disease Following Inoculation with Infected Urine.—Rectal temperatures were taken before the inoculations were made and daily thereafter. In both pigs a rise of several degrees was noted, from 102.5 to 106° F. (39.2 to 41.1° C.) on the sixth day in the case of pig 3, and from 102.8 to 104.6° F. (39.3 to 40.3° C.) in pig 6 on the 10th day. No other obvious symptoms developed. Blood cultures from a subcutaneous vein on the fifth day failed to produce a growth of leptospire. Blood-agar, plates inoculated with the blood and incubated aerobically and anaerobically remained sterile, showing absence of concurrent septicaemia. Dark-ground examinations of urine taken on the 15th, 19th, and 20th days failed to reveal leptospire. Agglutination tests carried out with blood taken at intervals resulted in the titres with *L. canicola* and *L. icterohaemorrhagiae* shown in

TABLE VIII

Pig No.	Inoculated	Days After Inoculation					
		5		11		21	
		<i>L. can.</i>	<i>L. ictero.</i>	<i>L. can.</i>	<i>L. ictero.</i>	<i>L. can.</i>	<i>L. ictero.</i>
3	Subcutaneous	Neg.	Neg.	1/3,000	1/30	1/30,000	1/300
6	By scarification	"	"	1/10,000	1/1,000	1/30,000	1/1,000

Table VIII. It will be seen that inoculation of the infected urine by both routes was followed by a high antibody level by the 11th day.

Necropsy.—The two pigs were killed 22 days after inoculation. The post-mortem examination revealed no abnormalities. Bottles of Stuart's medium were inoculated with kidney and liver tissue from both pigs. Leptospire grew in one of the bottles inoculated with kidney from pig 6. The growth was slight after 12 days, but by the 18th day numerous leptospire were present. One of two hamsters inoculated with emulsified kidney from pig 6 died 14 days later, showing epistaxis and a post-mortem picture characteristic of a leptospiral infection with pronounced haemorrhages in the lungs. A blood culture from this animal gave a fair growth of leptospire by the 7th day and cultures of the kidney were positive one week later. A few drops of the heart blood introduced intraperitoneally into the second hamster resulted in its death 10 days later. A blood culture from this second animal resulted in growth of leptospire within one week. We failed to isolate leptospire from pig 3 either by culture or by animal inoculation, although two out of four hamsters inoculated with emulsified kidney died in 11 days with haemorrhagic lesions characteristic of leptospiral infection.

Discussion

The evidence submitted above has indicated that 19 out of 47 (40%) piggery workers engaged in 12 different farms in the environs of Edinburgh had been infected at some time with *L. canicola*. It seems probable that the infection resulted through contact with infected pigs, since in one farm 77% of the pigs tested, and in another 44%, had serum antibodies to *L. canicola* and the organism was shown to be excreted at times in large numbers in the urine. This high incidence of infection in humans is particularly striking, since in view of the small number of cases which result from man's contact with infected dogs (the only source of infection previously known to exist for man) it was thought that *L. canicola* had a low infectivity to man. When one takes into consideration the large number of dog-owners in the country and the fact that 25–40% of dogs show serological evidence of infection (Stuart, 1946; Broom and Macintyre, 1948) it is surprising that cases of human canicola fever do not occur more often. Broom (1951) found that persons most liable to become infected were those who had nursed a sick dog and cleaned up its dejects. On the other hand, McIntyre and Seiler (1953), investigating in Edinburgh the incidence of canicola fever among owners of dogs known to be infected with *L. canicola*, found that of 99 persons who had been in contact with sick animals and including 45 who were responsible for removal of the dejects, none were serologically positive to *L. canicola*.

It may be that in the case of piggery workers the conditions under which these men work predispose them to infection. It is known that they frequently suffer from open cuts and wounds in their hands which are apt to become contaminated when cleaning out the pens. In Farm A, where the rate of infection both in humans and in pigs was most striking, conditions in the pens may have been conducive to maintaining the infection. This piggery usually houses a herd of 400 pigs, which are all swill fed. No breeding is done and replacements are made as required from the local markets at ages of 2–3 months. Little bedding is used and the pens are hosed daily, so that the floors, other than the sleeping quarters, are rarely dry and often very wet. The pigs are crowded together from 20–30 in a pen, a practice adopted to maintain a high temperature in the piggery. It seems possible that the leptospire may remain viable for a fairly long time on the moisture-laden floors. It is not known how the pigs were originally infected, but it seems likely that the farm dogs which have access to the piggery may have introduced it and, once established in the herd, the infection has passed from pig to pig through infected urine contaminating skin abrasions or the mucous membranes of the mouth and throat.

While canicola fever in man is not as a rule a killing disease, two fatal cases have been reported (Weetch *et al.*, 1949; Wolff *et al.*, 1951). Furthermore, clinical infection with *L. canicola* gives rise to a sharp illness with meningeal symptoms alarming to the patient and his relatives and incapacitating the victim for some weeks. It is clear, therefore, that all possible steps should be taken to prevent the disease.

Up to the present the main emphasis has been placed on the possibility of spread of infection from dogs, but the results described in this paper indicate that infected pigs are a more important source. This fact should be made widely known to pig owners and their employees so that they may be aware of the danger and the necessity for employing a high standard of hygiene in the piggery. After the animal pens have been thoroughly cleaned by hosing it is recommended that they be treated with a hypochlorite solution* and allowed to dry. So far as it is possible, dogs should not be allowed to come into contact with the swine; the workers should be encouraged to wash and dry their hands and equipment after cleaning out the pens, and to cover immediately any cuts and abrasions with adequate protective dressings.

*Davidson and Smith (1936) found that "chlorox" diluted 1 in 64 was effective in killing leptospire in premises contaminated with the urine of rats.

Summary

Five cases of canicola fever, diagnosed on clinical and serological evidence, occurred during a period of five years among piggery workers engaged in farms in the environs of Edinburgh.

A survey of 47 piggery workers in 12 Edinburgh farms showed from the results of serological examinations that 19 (40%) had at some time been infected with *L. canicola*. In addition to the five known cases this figure includes five others with histories of illness suggestive of canicola fever.

Specimens of blood from pigs from the two farms in which most of the cases occurred were found to contain antibodies to *L. canicola* in titres high enough to indicate a leptospiral infection. In one farm 46 out of 75 (61%) of the pigs were positive and in the other 40 out of 98 (40%).

Four out of six pigs newly introduced into one of the infected piggeries developed antibodies to *L. canicola* within three to eight weeks. On the 47th day after admission leptospire were being excreted in large numbers in their urine.

A hamster inoculated with the infected urine died after six days and leptospire were grown in culture from the heart blood. They were identified as *L. canicola*.

Six pigs were inoculated each by a different route with a virulent culture of *L. canicola*. Those which were inoculated subcutaneously and through a scarified area of skin developed antibodies to titres of at least 1 in 10,000 within 10 days. No obvious symptoms of disease followed the administration of the culture by any of the routes employed.

Pigs which were inoculated with urine from infected pigs subcutaneously and by scarification developed antibodies to *L. canicola* within 13 days. No symptoms other than a slight febrile reaction and a tendency to be less vigorous followed the inoculations.

The above evidence indicates that pigs may harbour *L. canicola* without showing any noticeable symptoms of disease. The organisms are excreted in the urine, and infection is passed from pig to pig. Human infection may result through contact with infected pigs.

The incidence of canicola fever in piggery workers is high, and this is in contrast to the recognized low infectivity rate among dog owners.

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REFERENCES

- Broom, J. C. (1951). *British Medical Journal*, 2, 689.
— and Macintyre, A. B. (1948). *Vet. Rec.*, 60, 487.
Davidson, L. S. P., and Smith, J. (1936). *Quart. J. Med.*, 5, 263.
McIntyre, W. I. M., and Seiler, H. E. (1953). *J. Hyg. (Lond.)*, 51, 330.
Nisbet, D. I. (1951). *J. comp. Path.*, 61, 155.
Stuart, R. D. (1946). *Vet. Rec.*, 58, 131.
Thiel, P. H. van (1948). *The Leptospirae*. Universitaire Pers, Leiden.
Weetch, R. S., Colquhoun, J., and Broom, J. C. (1949). *Lancet*, 1, 906.
Williams, H. R., McCroan, J. E., Starr, L. E., and Ward, M. K. (1953). *Clin. Res. Proc.*, 1, 97.
Wolff, J. W. (1954). *The Laboratory Diagnosis of Leptospirosis*. Springfield, Illinois.
—, Dam, R. van, and Minkenhof, J. E. (1951). *Lancet*, 1, 1100.

NORADRENALINE IN SHOCK DUE TO VISCERAL PERFORATION

BY

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In states of shock survival of the patient ultimately depends on removing the cause of the shock. Some temporary measure to tide the patient over the hypotensive crisis is, however, often necessary to prevent the vicious circle of progressive irreversible shock, and may be absolutely essential if the patient is to survive a major surgical procedure.

The following three cases of shock associated with visceral perforation all responded only temporarily to the infusion of moderate amounts of blood and dextran, and the early use of a continuous noradrenaline infusion over a period of days appeared to play a necessary part in maintaining an adequate blood pressure and in ensuring the recovery of the patients from the condition of circulatory failure. The cases described are three consecutive cases of this type that were admitted to the Central Middlesex Hospital.

Case 1

A woman aged 66 collapsed at noon on December 22, 1955, with very severe pain in the left iliac fossa, the pain soon radiating across the whole abdomen. When seen she was grey and very ill. Her blood pressure was 95/70 and her pulse volume was poor.

An intravenous infusion was set up and 1 pint (570 ml.) of dextran was given. Her general condition improved, and immediately prior to operation (six hours after the onset of symptoms) her systolic blood pressure was 125.

Anaesthetic induction and maintenance was with nitrous oxide, trichlorethylene, and oxygen. Orotracheal intubation with a cuffed tube was performed under suxamethonium relaxation. Gallamine, 40 mg., was given, and later a suxamethonium drip was set up. Operation revealed faecal fluid and also solid faeces in the peritoneal cavity, due to a rupture of the sigmoid colon. Distal to the rupture there was an annular thickening of the wall of the bowel, this almost certainly being neoplastic in nature. The peritoneum was cleaned of faeces so far as possible and the perforated gut was delivered as a loop colostomy. After operation intensive antibiotic therapy with penicillin, streptomycin, and oxytetracycline was instituted.

After induction the systolic blood pressure rose to 130, but thence gradually fell during the course of the operation even though a further $\frac{1}{2}$ pint (284 ml.) of dextran was infused. The pulse volume became very poor and eventually the systolic pressure was barely 80. The patient was cold and very pale. Intravenous injection of 14 mg. of methylamphetamine hydrochloride ("methedrine") in two divided doses produced only a slight and very transient improvement in the blood pressure. A blood infusion was then started, but no immediate improvement followed.

In order to raise the blood pressure intravenous noradrenaline was given at the conclusion of the operation. A strength of 4 mg. of the bitartrate in 1,000 ml. of dextrose-saline was used, and at 60 drops a minute the systolic blood pressure rose from 80 to 125 within a matter of minutes (Fig. 1).

Back in the ward the intravenous noradrenaline was temporarily discontinued, one hour after its commencement, to see if the blood pressure would be maintained. At this time the patient had had a total of $1\frac{1}{2}$ pints (850 ml.) of

dextran and nearly 1 pint (570 ml.) of blood. There was an immediate fall in blood pressure to 90 systolic and the pulse rate rose from 140 to 160. Consequently the intravenous noradrenaline was recommenced. The blood pressure immediately rose and the pulse rate fell again.

Two hours after its commencement, the infusion was doubled in strength to 8 mg. of noradrenaline per 1,000 ml., and was utilized at this strength for the next 13 hours at a rate that varied between 32 and 80 drops a minute. Notwithstanding this, the systolic blood pressure sometimes fell to 75 and remained there at one period for four hours. The pulse volume remained very weak and the condition of the patient was poor.

Fifteen hours after operation the strength of the infusion was again doubled (now 16 mg. of noradrenaline per 1,000 ml.). At varying rates up to 60 drops a minute the systolic pressure was maintained at about 85 for the next

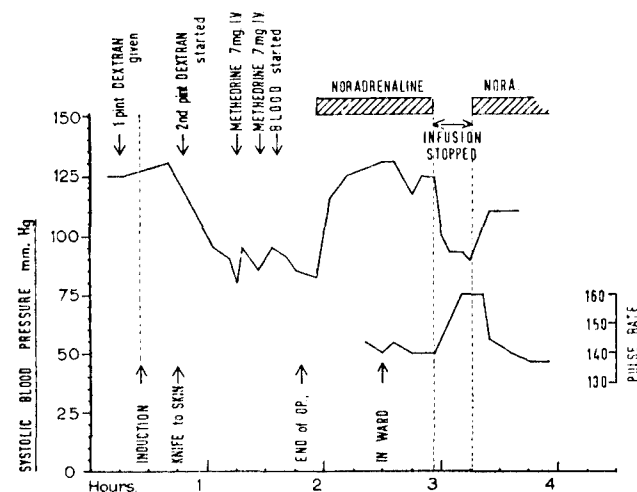


FIG. 1.—Chart showing the response of the systolic blood pressure to noradrenaline infusion (Case 1).

five hours. At 20 hours from operation the pressure rose to 100 and was maintained between 100 and 120 at 40 to 60 drops a minute. The general condition of the patient now showed some definite improvement.

Still later the strength of the infusion was increased to 32 mg. of noradrenaline per 1,000 ml. At a drip rate varying between 30 and 60, the systolic pressure was maintained fairly constantly in the region of 100. The pulse rate was 110 and the condition of the patient was now much improved.

At 40 hours from operation the drip rate was slowed to 10 and finally stopped about 47 hours after operation. Subsequently the systolic pressure was well maintained at over 110, and later became stabilized in the region of 130. The pulse rate remained about 100. The patient continued to gain strength day by day.

No further blood or dextran was given to the patient other than that received before, during, and immediately after the operation—a total of 1½ pints (850 ml.) of dextran and 1 pint (570 ml.) of blood.

The urinary output during the first post-operative 24 hours was only 8 oz. (227 ml.). During this period the systolic blood pressure was for long periods between 75 and 90. Urinary output during the second 24 hours was 33 oz. (938 ml.). During this period the systolic pressure was maintained between 100 and 130 for most of the time. Urinary output during the third 24 hours was 84 oz. (2,387 ml.).

A further operation, at a later date, revealed that the carcinoma was inoperable, and the patient went home with a permanent colostomy. Her general condition, however, was remarkably good.

Case 2

A man aged 49 on January 6, 1956, gave a history of sudden onset of acute central abdominal pain. When

admitted he was in great pain and in a shocked condition. His blood pressure was 93/55 and pulse rate 140.

He was given morphine, ½ gr. (16 mg.), and an infusion of dextran was started. Immediately prior to operation (about nine hours after the onset of symptoms) he had had 1 pint (570 ml.) of dextran and his systolic blood pressure was 100.

Anaesthetic induction and maintenance was with nitrous oxide, trichlorethylene, and oxygen. Orotracheal intubation with a cuffed tube was performed under suxamethonium relaxation. Later gallamine, 80 mg., and further suxamethonium were given. Operation revealed a large quantity of faecal fluid and lumps of solid faeces in the peritoneal cavity. There was a rupture in the wall of the sigmoid colon. The peritoneum was cleansed, the distal colon emptied of faeces, and the rupture in the sigmoid colon sutured. A transverse colostomy was performed. Following operation antibiotic therapy with penicillin and streptomycin was instituted.

Six minutes after induction the systolic blood pressure rose from 100 to 120, but thereafter there was a steady fall in pressure even though another full pint (570 ml.) of dextran was infused fairly rapidly. Towards the end of the operation the systolic pressure was 90 and infusion of blood was started. Two-thirds of a pint (380 ml.) of blood was given in 35 minutes before the patient was returned to the ward; the systolic pressure was then 100. Back in the ward the remainder of the blood was given, and the blood pressure rose to 115/70. A total of 2 pints (1,140 ml.) of dextran and 1 pint (570 ml.) of blood had then been given. The patient received no further intravenous dextran or blood.

Subsequently, however, the blood pressure progressively fell and in 75 minutes had dropped to 70/50. Intravenous noradrenaline was then begun one and a half hours after the end of the operation, and the blood pressure was raised to 100/60 in 30 minutes using a strength of 8 mg. of noradrenaline to 1,000 ml. of dextrose-saline running at 25 drops a minute. Later the drip rate had to be increased to 60 to keep the systolic pressure between 90 and 110, and at nine hours after operation the rate had to be increased to 80.

Eleven hours after operation the infusion strength was increased—to 24 mg. of noradrenaline per 1,000 ml. At 20 drops a minute the pressure fell to 70/50, but at 36 drops it was maintained fairly constantly at 100/70. The general condition of the patient was now improved.

Twenty-six hours after operation the infusion strength was again increased—to 32 mg. of noradrenaline per 1,000 ml., and a drip rate of about 40 maintained the blood pressure at approximately 115/70. Forty hours after operation the drip rate was cut down to 25 and later reduced still further. The blood pressure was maintained about 125/70 and the general condition of the patient was now fairly good.

Sixty hours after operation the noradrenaline infusion was discontinued. Although the patient had been weaned off

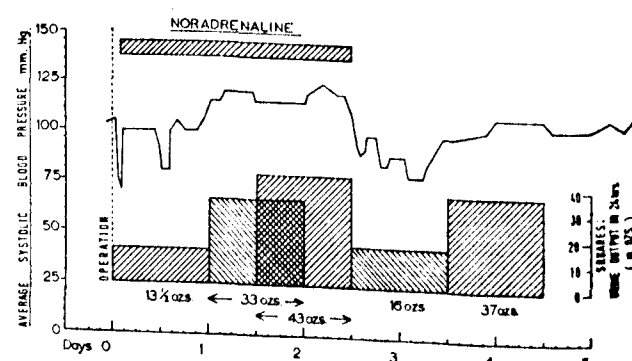


FIG. 2.—Chart showing the relationships of the blood pressure and the urinary output to the noradrenaline infusion (Case 2). Following the cessation of noradrenaline infusion there was a 24-hour period of hypertension.

this fairly gradually there was a fall in blood pressure to 90/60 and later to 80/50, the period of hypotension persisting for about 24 hours. As the condition of the patient was then good and he showed no other signs of shock it was decided not to restart the noradrenaline infusion. The blood pressure eventually rose above 100 systolic and became stabilized about 110/65.

The urinary output during the first 24 hours following operation was 13½ oz. (383 ml.) and during the second 24 hours was 33 oz. (938 ml.). Twenty-four hours before the cessation of the noradrenaline infusion the output was 43 oz. (1,221 ml.) but fell to 16 oz. (454 ml.) for the 24 hours during the period of hypotension following its cessation (Fig. 2). The input during this latter period was greater than the input of the previous 24 hours.

The colostomy was later closed and the patient eventually left hospital fit and well. A pathological state that could have accounted for the rupturing of the colon was never found.

Case 3

A man aged 75 awakened in the early hours of the morning of January 18, 1956, with severe epigastric pain which rapidly spread to the rest of the abdomen. When seen about six hours later he was in great pain and was pale and shocked. His blood pressure was 86/50 and his pulse 102.

A dextran infusion was started and morphine, ½ gr. (11 mg.), was given. Immediately before operation (about eight hours after the onset of symptoms) he had had 1 pint (570 ml.) of dextran and his systolic blood pressure was 110.

Anaesthetic induction and maintenance was with nitrous oxide, trichlorethylene, and oxygen. Orotracheal intubation with a cuffed tube was carried out under suxamethonium relaxation; later gallamine, 60 mg., was given. Further relaxation was provided by using intermittent suxamethonium. Operation revealed a large pyloric ulcer which had perforated. Several pints of free fluid and much gas were found in the peritoneal cavity. A partial gastrectomy was performed with moderate difficulty.

Fifteen minutes after induction the systolic pressure had risen from 110 to 120. As operation began a slow blood infusion was set up. However, within the next 35 minutes the systolic pressure had fallen to 80 and consequently the rate of the blood infusion was accelerated very considerably. There was an immediate response and the systolic pressure eventually rose to 140. Following cessation of the blood infusion, however (after 1 pint (570 ml.) had been given), there was a fairly abrupt fall in pressure down to 75 systolic. Intravenous methylamphetamine hydrochloride (8 mg.) raised the systolic pressure immediately to 130, but this was very transient and a further intravenous dose of 8 mg. had to be

given 20 minutes later, together with 12 mg. intramuscularly (Fig. 3). Again a good but relatively transient response was obtained.

At the conclusion of the operation voluntary respirations were relatively shallow, and while still intubated the patient suddenly collapsed, his radial pulse becoming impalpable. Whilst apparatus for a noradrenaline infusion was being assembled the patient was inflated with oxygen and recovered in under a minute, his systolic pressure returning to 110. Atropine, 1/100 gr. (0.65 mg.), and neostigmine, 2 mg., were given intravenously, and voluntary respirations definitely improved and soon appeared to be quite adequate. As the systolic pressure was being maintained over the next 15 minutes the noradrenaline infusion was withheld.

On return to the ward the patient's systolic pressure fell, and one hour after leaving the theatre was only 75—it remained about this level for two and a half hours. During this period a further ½ pint (284 ml.) of blood was infused, but no significant rise in the blood pressure occurred. A total of 1 pint (570 ml.) of dextran and 1½ pints (850 ml.) of blood had then been given. As the general condition of the patient was very poor a noradrenaline infusion was begun, a strength of 8 mg. of noradrenaline to 1,000 ml. of dextrose-saline being used. The infusion was run very slowly at first; the systolic pressure was gradually raised to 100 and was maintained fairly constantly at this level, running at 40 drops a minute.

Six and a half hours after the commencement of the infusion the strength of the noradrenaline was doubled (to 16 mg. of noradrenaline per 1,000 ml.) and the rate cut down to between 20 and 25 drops a minute. The systolic pressure was maintained fairly constantly at 100 to 110 and later between 110 and 120. The general condition of the patient showed marked improvement over the next 16 hours. Further steady improvement continued day by day.

The noradrenaline infusion was continued for a total of 40 hours; for most of the time the rate was approximately 20 to 30 drops a minute, the strength of solution being 16 mg. of noradrenaline per 1,000 ml. The infusion was discontinued fairly suddenly and the systolic pressure fell from a constant 120 down to 105. Within a further three hours, however, it was being maintained constantly between 115 and 120.

Twenty-seven hours after the commencement of the noradrenaline infusion the patient's pulse was noticed to be irregular. This was probably due to auricular fibrillation, but it might have been caused by multiple extrasystoles. No fall in the blood pressure occurred and the patient's general condition remained steady. Intravenous digoxin was given in the infusion. The irregular pulse persisted for over 24 hours after the time the noradrenaline was discontinued.

Owing to incontinence the exact urinary output during this period could not be accurately ascertained, but, apart from the first 24 hours, it appeared to be adequate.

On the twelfth day after operation the patient was very well and was beginning to eat a light diet. Unfortunately, in the evening he suddenly collapsed and died. Post-mortem examination revealed a pulmonary embolus.

Discussion

Although a systolic blood pressure below 70 or 80 mm. Hg may be tolerated for some considerable time in an otherwise fit individual, there is little doubt that in an ill and toxic patient such a hypoten-

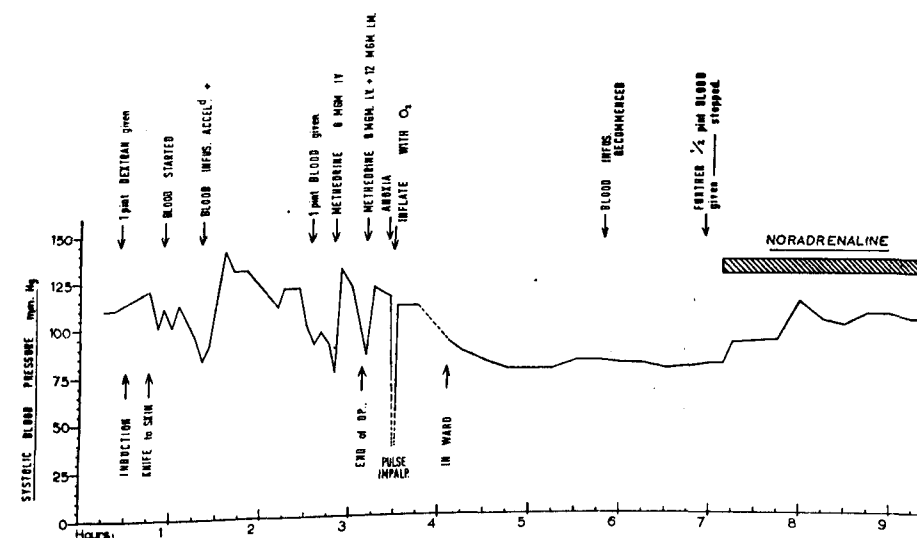


FIG. 3.—Chart showing the response of the systolic blood pressure to rapid blood infusion, intravenous methylamphetamine hydrochloride, anoxia, and noradrenaline infusion (Case 3).

sion persisting for more than an hour or so must seriously prejudice the chances of recovery. Therefore in ill toxic patients every endeavour must be made to raise the systolic pressure to about 90 mm. Hg or above.

In the treatment of shock due to visceral perforation simple infusions of blood or dextran alone are usually effective in permanently maintaining an adequate blood-pressure level provided that the factors causing the shock are effectively treated. Therefore, in the first instance, infusions of blood or dextran should be instituted. Should such simple measures fail, then the early use of continuous noradrenaline infusion probably holds out the best chance of recovery.

In the three cases of this series the responses to intravenous infusions of blood and dextran were initially good, but in none of them was the blood pressure maintained permanently at a reasonable level even after the infusion of moderate amounts—2½ to 3 pints (1,400 to 1,700 ml.)—of these fluids. However, intravenous noradrenaline quickly brought up the blood pressures, and, by a regulation of the rates of infusion, maintained them, by and large, at a constant satisfactory level. In the absence of some such measure to maintain a satisfactory blood-pressure level, it is possible that none of these patients would have survived. Perhaps further transfusions of blood and dextran might have achieved similar results, but they could, at the same time, have led to a dangerous overloading of the circulation. Certainly the use of very large amounts of blood would appear to be a more unphysiological line of therapy notwithstanding the limitations of noradrenaline as a pressor agent.

Objection to the use of noradrenaline in hypotensive states has been made because it is thought that, although the blood pressure is raised, the blood flow to vital organs is, owing to the completely unselective nature of the vasoconstriction produced by the pressor agent, actually reduced. This is undoubtedly true when considering the effect of noradrenaline on normotensive individuals, or on shocked subjects whose symptoms are due to reduced blood volume, but the haemodynamic response that occurs when noradrenaline is administered to a subject whose shocked state is not associated with any significant oligæmia may not be at all times comparable, and clinical experience tends to confirm this view. The heightened level of consciousness often seen in such shocked patients as the blood pressure rises under noradrenaline therapy is strongly indicative of an increased cerebral blood flow. The vastly increased urinary output is, similarly, a strong indication that the renal blood flow has increased, although some increase in urinary output is theoretically consistent with a reduced blood flow if the filtration fraction is sufficiently increased.

No obvious change in the level of consciousness was noted in these patients, mainly, no doubt, because the infusions were started in the immediate post-operative period. A significant effect on the urinary output was, however, apparent in Case 2, and its effect on the output in the other cases was probably no less significant. In Case 2 there was a 24-hour period of hypotension following the cessation of the noradrenaline infusion (60 hours after operation), and during this period the urinary output fell dramatically notwithstanding the fact that the input was slightly greater than the input of the previous 24 hours (Fig. 2). It is therefore reasonable to infer that noradrenaline played an important part in the maintenance of an adequate urinary output, and that its effect in maintaining such an output was so great that it is reasonable to assume that renal blood flow, during the period of noradrenaline therapy, was greater than the blood flow in the period immediately after its cessation. The effect of noradrenaline on the blood flow to other vital organs was probably comparable.

The early promotion of an increase in blood flow to vital organs, including centres in the medulla, together with the correction of any myocardial ischaemia following an increase in coronary blood flow, almost certainly helps to prevent the

development of an irreversible phase, refractory to treatment (including noradrenaline therapy), and progressing rapidly to complete circulatory standstill.

The need to increase progressively the dose of the drug as the duration of its administration increases may be evidence of deterioration in the condition of the patient, but it may, on the other hand, be due to the patient developing an acquired tolerance to the drug. It was met with in Cases 1 and 2, but not in Case 3. It was so marked in Case 1, where there had been such a dramatic initial response, that the systolic pressure was allowed to fall dangerously low: the strength of the noradrenaline solution should have been increased earlier than it actually was. Should this diminished response to the drug be due to acquired tolerance then it is possible that the administration of cortisone or corticotrophin might prevent it occurring.

Following induction of anaesthesia there was in all cases a slight rise in the systolic blood pressure and a marked diminution of the facial pallor. This may have been due to the removal of one of the possible factors causing the shock—namely, the severe pain. However, it is possible that more efficient oxygenation, following induction and intubation, was responsible for the temporary diminution of the signs of shock.

The paramount importance of adequate oxygenation in the shocked patient is clearly illustrated in Case 3. Here the patient collapsed after operation because voluntary respirations were too shallow for full oxygenation. Vigorous inflation with oxygen alone led to recovery in a very short time (Fig. 3). This episode underlines the need for ensuring that any respiratory depression due to relaxant drugs has been fully counteracted before extubation, and poses the question whether long-acting relaxants should be avoided in cases of shock or in very ill patients.

The noradrenaline infusions were maintained for 47, 60, and 40 hours respectively. Toxic effects attributable to the drug were not noticed.

Summary

Three cases are described in which noradrenaline had to be used in order to maintain an adequate blood pressure after traditional methods of resuscitation had failed. The cases are consecutive ones of their type. The two patients with perforation of the large bowel recovered completely; the patient with peptic ulcer perforation showed a good immediate recovery but died 12 days later owing to a pulmonary embolus.

It is suggested that in these cases of shock traditional methods of resuscitation should be tried first, but if these methods fail the use of a continuous noradrenaline infusion should not be delayed.

Noradrenaline therapy is very far from being the complete answer to the problem of the treatment of the shock due to visceral perforation, but its early use in the shocked state probably produces an increase in blood flow to vital organs. This and the correction of myocardial ischaemia (following the increase in coronary blood flow) may be important factors in helping to prevent the development of an irreversible phase which is refractory to treatment and where noradrenaline therapy is of no avail and may possibly do more harm than good.

The paramount importance of adequate oxygenation in the shocked patient is stressed.

My thanks are due to Mr. T. G. I. James for permission to publish Cases 1 and 3 and to Mr. J. D. Fergusson for permission to publish Case 2—under whose care these patients were respectively; to Dr. R. D. Levis for his interest and help; to others who have offered help and criticism; and to Mrs. I. M. Prentice, of the department of medical art, who produced the charts.

BIBLIOGRAPHY

- Braude, A. I., Williams, D., Siemlenski, J., and Murphy, R. (1953). *A.M.A. Arch. intern. Med.*, 92, 75.
Fremont, R. E., Luger, N. M., Surks, S. N., and Kleinman, A. (1954). *A.M.A. Arch. Surg.*, 68, 44.
Gilmour, I. E. W. (1955). *British Medical Journal*, 2, 1248.
Kurland, G. S., and Malach, M. (1952). *New Engl. J. Med.*, 247, 383.
Luger, N. M., Kleinman, A., and Fremont, R. E. (1951). *J. Amer. med. Ass.*, 146, 1592.
Miller, A. J., Shifrin, A., Kaplan, B. M., Gold, H., Billings, A., and Katz, L. N. (1953). *Ibid.*, 152, 1198.
Moyer, J. H., Skelton, J. M., and Mills, L. C. (1953). *Amer. J. Med.*, 15, 330.
Ritchie, H. D. (1956). *British Medical Journal*, 1, 371.
Shanahan, E. F. (1955). *Brit. J. Anaesth.*, 27, 31.
Skelton, J. M., Mills, L. C., and Moyer, J. H. (1952). *Fed. Proc.*, 11, 391.
Wisc, R. I., Shaffer, J. M., and Spink, W. W. (1952). *Proc. cent. Soc. clin. Res.*, 25, 961.

REPORT OF TWO SIBLINGS DIAGNOSED AS CASES OF ACUTE LYMPHATIC LEUKAEMIA

BY

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The cases described below concern a brother and sister in both of whom acute lymphatic leukaemia was diagnosed during life. In the sister the disease followed a classical course to an early death, but in the brother, although he too died after a short illness, certain unusual features were noted during life and at necropsy. This report is presented because of the rarity of familial leukaemia and because of the interest of the case of the brother.

Case 1

The patient, a housewife aged 38, was admitted to West Middlesex Hospital early in March, 1950, because of pallor, generalized pains and weakness developing during the last three months, epistaxes, and the passage of blood clots per vaginam apart from normal menstruation. There was nothing relevant in the past history. Results of blood examination on March 3 were: haemoglobin 53% (Haldane); R.B.C. 2,390,000 per c.mm. Total white cell count not available, but differential count showed polymorphs 12%, lymphocytes 71%, prolymphocytes 9%, and nucleated R.B.C. 8%.

Clinical examination revealed a pale woman with bilateral subconjunctival haemorrhages and suborbital bruising, petechiae, and bleeding gums. There was no lymphadenopathy, but spleen and liver were each enlarged to two fingerbreadths and were tender; two small haemorrhages were noted in the left optic fundus. Blood pressure was normal, the urine clear, and the temperature 99.6° F. (37.55° C.). Blood examination on March 10 showed: haemoglobin 34%; R.B.C. 1,200,000 per c.mm.; W.B.C. 50,700 per c.mm. (polymorphs 2.5%, lymphocytes 77%, lymphoblasts 20%).

The patient's condition rapidly deteriorated, with epistaxes, haematemesis, and melaena, and she died in cardiac failure on March 17, 1950.

Case 2

This patient, a brother of Case 1, aged 31, was admitted to King Edward Memorial Hospital, Ealing, on July 5, 1955. He had first complained of lumbar pain, with swollen inguinal and axillary lymph nodes, eight weeks previously, and at that time was thought to be suffering from glandular fever. There was no history of past illness. On June 8 a fever. There was no history of past illness. On June 8 a blood count revealed: haemoglobin 94%; W.B.C. 6,000 per c.mm. (polymorphs 10%, lymphocytes 89%, monocytes 1%), some large and atypical lymphocytes being similar to those seen in glandular fever.

Two weeks later severe gingivitis and some petechiae on the left arm developed. Cervical and submandibular

lymph nodes swelled and he became pyrexial. On June 24 the blood count was: haemoglobin 78%; W.B.C. 7,000 per c.mm. (polymorphs 56%, lymphocytes 36%, monocytes 4%, eosinophils 3%). No atypical "glandular fever" cells noted.

On his admission to hospital on July 5 the patient was pale and had visibly enlarged cervical and submandibular lymph nodes. There were no abnormalities in the cardiovascular or respiratory system. The tip of the spleen was just palpable, but the liver was not enlarged. There was

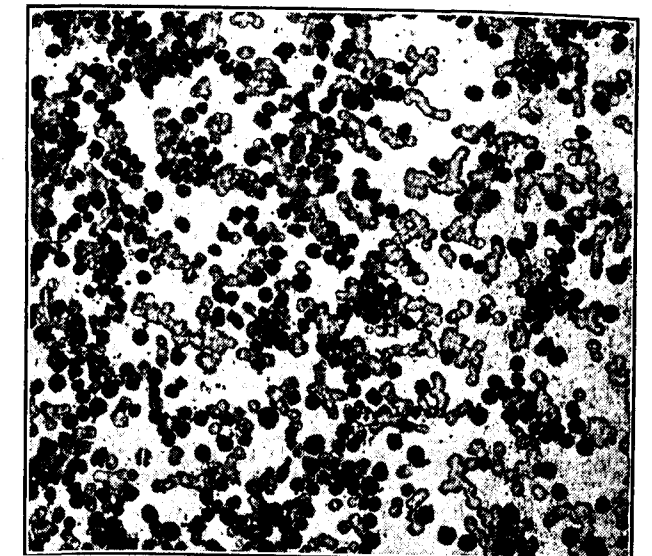


Fig. 1.—Case 2: Sternal marrow smear on admission to hospital. (×180.)

generalized lymphadenopathy, also generalized petechiae becoming confluent over chest and abdomen. Temperature was 101° F. (38.3° C.). Blood picture on admission: haemoglobin 57%; R.B.C. 4,400,000 per c.mm.; W.B.C. 3,400 per c.mm. (atypical non-granular immature cells 27%, neutrophils 6%, lymphocytes 67%); platelets 166,000 per c.mm. On sternal marrow puncture large numbers of primitive leucocytes (blast cells) and a very few normal elements were found (Fig. 1). Blood was transfused repeatedly, but no remission occurred. In view of the low total leucocyte count the patient was not given radiotherapy, or any drugs, apart from sedatives. He steadily became weaker, and on July 26 a severe throat infection with monilia occurred which did not respond to treatment.

By August 1 the lymph nodes had rapidly decreased in size and then remained so. Clinically the spleen did not appear to enlarge further. A swinging temperature—98°–101° F. (36.7°–38.3° C.)—was maintained throughout the illness. A blood count on July 27 showed: haemoglobin 70%; W.B.C. 2,400 per c.mm. (lymphoblasts 20%, polymorphs 14%, lymphocytes 64%, monocytes 2%); and on July 30: haemoglobin 57%; W.B.C. 1,400 per c.mm. (differential count as before). The blood picture continued to deteriorate, and on August 10 the figures were: haemoglobin 25%; W.B.C. 800 per c.mm. (lymphoblasts 8%, polymorphs 6%, lymphocytes 84%, monocytes 2%). The patient died two days later.

Comment

There is no other family history of leukaemia, but the father and a brother and sister, who are alive and well, state that the patients' maternal grandfather died of a "rare disease." Their mother was said to have died "at the menopause," and she lost three infants before the birth of the two patients and the surviving brother and sister, the cause of their death being unknown.

Unfortunately no post-mortem examination was held on the woman. The following is taken from the necropsy report (Dr. W. S. Killpack) on her brother: "Emaciated

young adult male, slightly jaundiced. **Cardiovascular System:** Heart as a whole, dilated; pericardium healthy, no haemorrhages; myocardium very pale but fairly firm; endocardium healthy; vessels healthy. **Respiratory System:** Lungs very bulky due to oedema; numerous emphysematous bullae in right upper lobe; extensive congestion of lower lobes, ? also interstitial haemorrhage; no pneumonia found. Air passages: Some frothy mucus present; thrush membrane on epiglottis and vocal cords. Pleurae dry; fibrin over left lower lobe. **Alimentary System:** Tongue clear; extensive thrush membrane on pharynx. Oesophagus dilated with almost cylindrical, firm thrush membrane. Stomach dilated, healthy. Small gut: a few ulcers up to 1 cm. diameter in terminal ileum. Large gut: similar ulcers with membrane in caecum and descending colon. Liver (2,200 g.): normal pattern; cut surface rather brown. Gall-bladder distended with watery bile. Pancreas healthy. **Urogenital System:** Kidneys (320 g.) generally pale, marked cloudy swelling, number of pin-point haemorrhages. Bladder healthy. Genital organs healthy. Spleen (170 g.): cut surface congested, normal pattern. Lymph nodes: all groups enlarged to about twice normal size except those on lesser curvature of stomach, which were firm and greatly enlarged. Bone marrow uniformly pink and creamy. Adrenals oedematous; complete lipid depletion. Thyroid healthy."

The histological report is as follows. Sternal marrow practically acellular; oedematous young connective tissue with small collections of lymphocytes and plasma cells and histiocytes; occasional groups of undifferentiated cells (Fig. 2). Spleen: Extramedullary haematopoiesis and siderosis without fibrosis; widespread infiltration by histiocytes (? reticulum cells), many multinucleate; undifferentiated cells here also scattered in small groups. Kidney: small focus of proliferating histiocytes or reticulum cells,

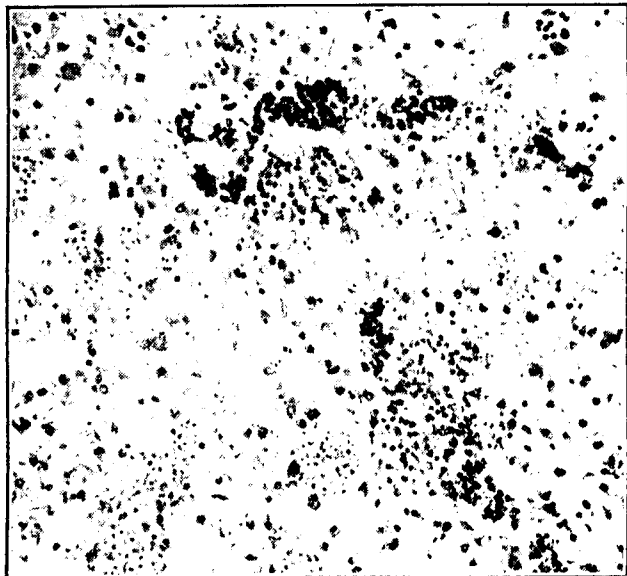


FIG. 2.—Case 2: Appearance of sternal marrow smear post mortem. ($\times 180$.)

with some new connective-tissue formation. Lung: oedema and "monocytic pneumonia." Oesophagus: monilial oesophagitis. Liver: some fatty change; no obvious infiltration.

Discussion

The interesting features of the brother's case were the rapid regression of the enlarged lymph nodes, and the change in the sternal marrow from being full of proliferating primitive cells to being virtually empty of everything but connective tissue. The enlarged submandibular and cervical nodes were very prominent at the time of his admission and subsequently. Their size diminished rapidly, literally overnight, so that by the morning of August 1,

1955, his face had resumed its normal contours. What had happened during the course of a few hours to the cellular or other tissues responsible for these swellings? And what had happened to the cells crowding the marrow cavity? Two possible diagnoses might be considered: (1) atypical reticulum-cell sarcoma with bone-marrow depression; and (2) acute lymphatic leukaemia with atypical termination. But both seem rather unlikely, for in effect there was little sign of either condition at necropsy, especially in the histological sections. No record of a similar case has been found, and it is considered that no recognized diagnosis can be applied to the present case. The case perhaps illustrates the point made by Marshall (1956), that "owing to the effects of specialisation in peripheral blood and bone marrow studies there is still a tendency to regard leukaemia as a separate disease entity instead of as a symptom in a number of neoplastic reticular tissue proliferations."

The rarity of familial leukaemia is shown by a comparison between the number of cases reported in the literature and the total number of deaths from leukaemia, which in England and Wales alone averages over 2,000 a year, the figures for 1952, 1953, and 1954, as given by the Registrar-General in his quarterly returns, being respectively 2,043, 2,121, and 2,160. By contrast there have been only about 110 cases of familial leukaemia reported in the world literature since the first descriptions of leukaemia in 1845 (Virchow; Bennett; Craigie). The first authenticated case of familial leukaemia which Videbæk (1947) allows was described by McGavran in 1922 and included in Petri's 1933 review.

Videbæk's appears to be the last review of the literature on familial leukaemia to have been published; this author found 82 leukaemic subjects in all age groups belonging to 37 different families, in none of which was there consanguinity. Since its publication, so far as I can ascertain, another 28 unquestionable cases in 12 families (excluding cases without supporting laboratory evidence) have been reported (Frech, 1948; Riel, 1948; Barbier *et al.*, 1949; Smith and Horne, 1950; Anderson, 1951; Bieber, 1951; Debré *et al.*, 1951; Portmann and Robinson, 1951; Reilly *et al.*, 1952; Stobbe and Taeschner, 1952; Ward *et al.*, 1952).

Summary

The cases of a brother and sister diagnosed in life as suffering from acute lymphatic leukaemia are reported, with a discussion of certain unusual aspects of one of the cases. Both patients died.

Brief reference is made to cases of familial leukaemia reported in the world literature.

I wish to thank Dr. J. W. Litchfield, under whose care Case 2 was admitted, for permission to publish. Case 1 was under the care of the late Dr. J. A. Torrens. I would also thank Dr. W. S. Killpack (who performed the necropsy in Case 2) and Dr. R. R. Wilson for their opinions on the bone-marrow smears and necropsy sections, and am greatly indebted to Dr. R. R. Wilson for help in preparing the article.

REFERENCES

- Anderson, R. C. (1951). *Amer. J. Dis. Child.*, **81**, 313.
Barbier, J., Guillemet, J., and Morel, P. (1949). *Lyon méd.*, **182**, 379.
Bennett, J. H. (1845). *Edinb. med. surg. J.*, **64**, 413.
Bieber, A. (1951). *Riv. Clin. pediat.*, **49**, 161.
Craigie, D. (1845). *Edinb. med. surg. J.*, **64**, 400.
Debré, R., Bernard, J., and Buhot, S. (1951). *Bull. Soc. méd. Hôp. Paris*, **67**, 183.
Frech, H. C. (1948). *J. med. Ass. Ga.*, **37**, 183.
McGavran, C. W. (1922). *Amer. J. med. Sci.*, **164**, 545.
Marshall, A. H. E. (1956). *An Outline of the Cytology and Pathology of the Reticular Tissue*. Edinburgh.
Petri, S. (1933). *Acta path. microbiol. scand.*, **10**, 330.
Portmann, U. V., and Robinson, W. H. (1951). *Cleveland Clin. Quart.*, **18**, 33.
Reilly, E. B., Rapaport, S. I., Karr, N. W., Mills, H., and Carpenter, G. E. (1952). *Arch. Intern. Med.*, **90**, 87.
Riel, L. (1948). *Kinderärztl. Prax.*, **16**, 148.
Smith, J. F., and Horne, J. N. (1950). *St. Thom. Hosp. Rep.*, **6**, 255.
Stobbe, H., and Taeschner, H. (1952). *Z. ges. Inn. Med.*, **7**, 736.
Videbæk, A. (1947). *Acta med. scand.*, **127**, 26.
Virchow, R. L. K. (1845). *N. Notiz. Geb. Natur- u. Heilk.*, **36**, 151.
Ward, J. E., Galinsky, I., and Newton, B. L. (1952). *Amer. J. hum. Genet.*, **4**, 90.

TWO CASES OF RUPTURE OF THE EXTRAHEPATIC BILE DUCTS

BY

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Closed abdominal injuries that are not rapidly fatal rarely cause damage to the extrahepatic bile ducts. The cases of two children are described in whom, as a result of a traffic accident, there was leakage of bile into the peritoneal cavity, which ceased spontaneously without any local repair at operation.

Case 1

A deaf boy of 5 years was run into by a car in March, 1952. He was struck on the left side and thrown to the side of the road. On admission to the Royal Belfast Hospital for Sick Children he was pale, with a pulse rate of 160 and a blood pressure of 60/30 mm. Hg. There was no superficial bruising. His abdomen was tender and diffusely rigid. X-ray examination of his chest and abdomen revealed nothing abnormal. After a blood transfusion his general condition greatly improved.

At laparotomy five hours after the injury about 15 oz. (430 ml.) of blood was evacuated from the abdominal cavity. The only other abnormality discovered was a large haematoma distending the right half of the lesser omentum in its free margin; neither the spleen nor the liver had been torn. As bleeding had already ceased nothing further was done and the abdomen was closed without drainage.

His condition was satisfactory until the eighth post-operative day, when a faint tinge of jaundice appeared; it progressed steadily and was accompanied by increased bile pigment in the urine and absence of stercobilin from the faeces. At the same time the abdomen became so distended with fluid that between the fourth and eighth post-operative weeks it was aspirated four times, in all about 7 pints (4 litres) of heavily bile-stained but uninfected fluid being removed. By the end of the eighth post-operative week the abdominal swelling had subsided, the jaundice had gone, the excessive bile pigment had disappeared from the urine, and normal pigmentation had returned to the faeces. Throughout these eight weeks he made no complaint of abdominal discomfort, had a moderate appetite, and never had any abdominal tenderness or rigidity other than in the operation wound. When last seen (January, 1956) he was in excellent health.

Various investigations were undertaken. The liver-function tests showed no abnormality: bromsulphthalein test, 1% retention after 45 minutes; total serum proteins, 7.2 g. per 100 ml. (albumin 5.3 g., globulin 1.9 g.); serum alkaline phosphatase, 6.9 King-Armstrong units; serum bilirubin, 0.2 mg. per 100 ml. The blood picture was normal: Hb, 11.9 g. per 100 ml.; white cells, 9,520 per c.mm.; platelets, 253,000 per c.mm. "Biligradin" visualization of the biliary tract showed no abnormality.

Comment.—The injury damaged some part of the extrahepatic biliary system which, for a while, allowed all or almost all the bile it transmitted to leak into the peritoneal cavity, from which it was aspirated or absorbed. The absence of stercobilin from the faeces suggests that for probably about six weeks the bile was all either diverted or obstructed. With no operative treatment the biliary passages re-established their continuity.

Case 2

A boy aged 6 years was admitted to hospital on December 10, 1953, after being hit by a car. On admission he was severely shocked, showing signs of internal haemorrhage from a closed abdominal injury. A radiograph of the chest

and abdomen showed no abnormality. After blood transfusion his general condition greatly improved.

At laparotomy through an upper midline incision six hours after the injury a considerable amount of blood was found in the abdominal cavity. As the spleen was found to be torn, splenectomy was performed. A tear of the liver 2 in. (5 cm.) long and $\frac{1}{4}$ in. (6 mm.) deep was found in the groove for the falciform ligament. A large haematoma, as in the previous case, distended the right half of the lesser omentum and there was a tear in the centre portion of the lesser omentum (see Fig.). A retro-peritoneal haematoma was present, extending over the pancreas and the left kidney. Haemostasis was secured and the abdomen was closed with drainage.

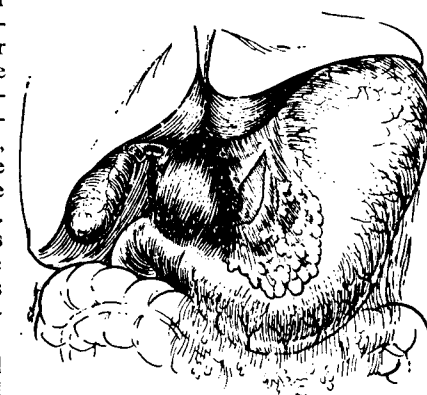


Diagram showing haematoma in the right half of the lesser omentum and a tear in its central portion (Case 2).

The general condition remained good, but within two days a biliary fistula formed at the drainage site.

After draining profusely for about three weeks it dried up spontaneously. The faeces remained normal, no excess bile pigment appeared in the urine, and there was no sign of jaundice. The abdomen did not distend.

The patient has remained a healthy schoolboy with no abnormality detectable on physical examination. Biligradin x-ray films show no abnormality of the biliary tract.

Discussion

Injury to the extrahepatic ducts is a rare surgical problem, probably because the associated injury to neighbouring structures causes early death. Fewer than 100 cases were recorded in the last century (Mason, Sidbury, and Guigan, 1954). The present two cases are the only ones in the records of the Royal Belfast Hospital for Sick Children for the last 25 years.

The extrahepatic ducts can be injured by direct violence from crushing against the vertebral column, but our first case and that described by Benson and Prust (1953) both received blows on the left side. Possibly the injury was caused by indirect violence as a result of sudden stretching of the structures in the right (free) border of the lesser omentum following flexion of the trunk to the left.

Both cases presented with signs of intraperitoneal haemorrhage, which before operation was thought to be due to rupture of the spleen or liver. In each a large haematoma completely obscured the anatomy in the region of the free border of the lesser omentum, and in neither was it thought advisable to disturb it. It may be that in each case the presence of the haematoma prevented the escape of bile at the time of laparotomy and that only as the haematoma was absorbed was bile able to leak out. Another possibility is that the wall of the duct sloughed later.

The escape of sterile hepatic-duct bile into the peritoneal cavity does little harm (Harkins, Harmon, and Hudson, 1936), causing an exudation of some fluid and a slight rise in pulse and temperature. Both of our cases had post-operative escape of bile into the peritoneal cavity without any general systemic upset. The drain in Case 2 allowed the bile to escape, preventing abdominal distension. In this case also a small tear was present in the liver which could have allowed the escape of bile; but since the discharge was so copious and prolonged, and since the haematoma in the

lesser omentum was exactly similar to that in our previous case, we feel that an extrahepatic duct must have been torn.

A partial or complete tear may occur in the extrahepatic ducts which may or may not be obvious at the time of operation. Many forms of surgical treatment have been advocated. Waugh (1916) had a case, very similar to our first, in which two laparotomies were carried out for upper abdominal distension and signs of obstructive jaundice and in which the condition suddenly cleared up spontaneously. Benson and Prust (1953) treated a case successfully by marsupialization and drainage of a false cyst of biliary ascitic fluid which had formed. Gross (1953) had two cases; one was treated successfully by simple drainage from the site of the injury, while in the other an attempt was made at primary repair. Stenosis of the common bile duct, however, developed, necessitating cholecysto-duodenostomy, which led to cholangitis, cirrhosis, bleeding oesophageal varices, and death. Mason *et al.* (1954) had a case which developed stenosis requiring cholecysto-duodenostomy even though no attempt at repair had been made at the primary operation. Hicken and Stevenson (1948) advocated a cholecystostomy to decompress the biliary system, and suggested that cholangiograms could be taken later to demonstrate healing of the tear and also to make sure that any associated traumatic pancreatitis which might obstruct the lower end of the common bile duct had settled before removing the tube.

It is quite clear that injuries to the extrahepatic ducts often heal spontaneously without the development of stenosis, and it is possible that an attempt to repair a recently traumatized duct may increase the likelihood of stenosis. Simple abdominal drainage, and possibly cholecystostomy, should be performed initially; if stenosis develops it can be treated later.

Summary

Two cases of rupture of the extrahepatic bile ducts are described in which the lesion was not recognized at operation. Biliary ascites with minimal systemic upset developed in one, necessitating frequent aspiration. In the other a drainage tube allowed the bile to escape externally. Spontaneous healing of the fistula occurred in both.

REFERENCES

- Benson, C. D., and Prust, F. W. (1953). *Surg. Clin. N. Amer.*, 33, 1187. Saunders, Philadelphia and London.
Gross, R. E. (1953). *The Surgery of Infancy and Childhood*, p. 538. Philadelphia.
Harkins, H. N., Harmon, P. H., and Hudson, J. (1936). *Arch. Surg. (Chicago)*, 33, 576.
Hicken, N. F., and Stevenson, V. L. (1948). *Ann. Surg.*, 128, 1178.
Mason, L. B., Sidbury, J. B., and Guiang, S. (1954). *Ibid.*, 140, 234.
Waugh, G. E. (1916). *Brit. J. Surg.*, 3, 685.

The General Register Office's analysis of the occupations of persons in England and Wales included in the 1951 Census has been published as *Census 1951, England and Wales, Occupational Tables* (H.M.S.O., price seven guineas). It is based on the full figures, thus replacing the results of the 1% sample published in 1952. The findings are compared with those of the 1931 Census. Owing to the difference in school-leaving age at the times of the Censuses, the 1931 occupational figures include some 285,000 children under 15, while the 1951 figures relate to those over that age. In 1951 14 million of the 16 million males were gainfully occupied, and 6½ million of the 18 million females. Of the occupied men, 29% were under 30 and only 4% over 65; of the occupied women, 44% were under 30 and 5% over 60. In 1951 there were 11 million married women, of whom 22% were gainfully occupied compared with 10% in 1931. The two commonest occupations for the married women were as charwomen and clerks—149,000 of each.

THE ANTIBACTERIAL ACTIVITY OF CHLOROPHYLL

BY

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Numerous reports have been published describing the successful treatment of chronic infected wounds with water-soluble chlorophyll preparations. In many cases healing has been induced where there had been no response to conventional treatment. Bowers (1947) treated 400 various surgical cases with water-soluble chlorophyll and noticed that infected wounds became free from suppuration and odour within two or three days. Combes, Zuckerman, and Kern (1952) produced a similar reduction in suppuration in secondarily infected ulcers, contact dermatitis, and pemphigus. Carpenter (1949) observed an early eradication of infection and early healing in 127 cases of suppurative osteomyelitis and chronic ulcers: the healthy appearance of granulation tissue under chlorophyll therapy was stressed.

Whereas chlorophyll derivatives in wound healing are generally regarded as promoters of healthy granulation, some clinical reports suggested that they have antibacterial properties. Smith (1944) observed *in vitro* bacteriostasis of staphylococci, streptococci, and the anaerobic spore-bearers, while Nevin and Bibby (1954) showed that chlorophyll inhibited the growth of staphylococci, streptococci, and lactobacilli.

The present experiments were designed to investigate further, by *in vitro* methods, the antibacterial activity of a chlorophyll preparation.

Material and Methods

The water-soluble chlorophyll preparation used throughout these experiments was sodium potassium copper chlorophyllin (which is the base of "chloresium" preparations) kindly supplied by Rystan Company, New York. A fresh 10% solution was prepared daily in sterile distilled water, and dilutions of this used in all experiments.

The sensitivity of various organisms to chlorophyll was determined, using a plate method modified from that described by May and Morley (1952). Levinthal agar was used throughout. All organisms were grown in nutrient broth for five hours and the standard inoculum was one loopful, approximately 10^8 organisms. Plates were incubated aerobically for 16 hours at 37° C. The highest concentration of chlorophyll incorporated in solid media was 1/100. This was governed by the solubility of the preparation; a 10% solution was the maximum concentration possible.

Chlorophyll sensitivity was also determined by making bacterial counts of organisms growing in fluid media. Growth curves were plotted by the method of Miles, Misra, and Irwin (1938), with organisms grown in nutrient broth containing dilutions of chlorophyll.

Results

Sensitivity of Various Organisms to Sodium Potassium Copper Chlorophyllin.—The results of the plate method are shown in Table I. Chlorophyll was found to inhibit the growth of some Gram-positive bacteria, but had no effect on the Gram-negative organisms tested. No change in antibacterial properties was produced by heating the chlorophyll at 100° C. for one hour. The presence of 10% horse serum in the medium did not affect the inhibitory level. Since *Staph. aureus* is a common wound contaminant it was chosen as the test organism for all further experiments.

TABLE I.—Sensitivity of Various Bacteria to Chlorophyll

Organism	Inhibitory Level of Chlorophyll	Organism	Inhibitory Level of Chlorophyll
<i>Staph. aureus</i> ..	1/800	<i>Cl. welchii</i> ..	1/200
<i>Staph. albus</i> ..	1/800	<i>Cl. oedematiens</i> ..	1/100
<i>Str. pyogenes</i> ..	1/1,600	<i>Cl. sporogenes</i> ..	1/100
<i>Str. viridans</i> ..	not at 1/100	<i>Cl. tetani</i> ..	1/100
<i>Str. faecalis</i> ..	not at 1/100	<i>Ps. pyocyanea</i> ..	not at 1/100
<i>Pneumococcus</i> ..	1/1,600	<i>Pr. vulgaris</i> ..	not at 1/100
<i>B. pumilis</i> ..	1/800	<i>E. coli</i> ..	not at 1/100

Sensitivity of Different Strains of *Staph. aureus*.—Thirteen strains of *Staph. aureus* were streaked over chlorophyll-Levinthal agar: five were inhibited at a chlorophyll concentration of 1/800, seven at 1/400, and one at 1/100.

Effects of Age of Culture, Time of Inoculation, and Size of Inoculum.—Cultures of one strain of *Staph. aureus* incubated for 2, 4, 6, 8, and 24 hours were plated out on chlorophyll-Levinthal agar. A dilution of 1/800 chlorophyll inhibited growth after 16 hours' incubation in every case. After 24 hours' further incubation *Staph. aureus* grew in the presence of all concentrations of chlorophyll. It appears, therefore, that either chlorophyll is inactivated at 37° C. or it does not completely inhibit growth. Chlorophyll-Levinthal agar maintained at 37° C. for 24 hours before use still inhibited growth for 16 hours at a concentration of 1/800. Hence growth of the test organism after long incubation periods is not due to inactivation of the chlorophyll. The organisms are temporarily inhibited, but after 24 hours bacterial multiplication proceeds. The size of inoculum, ranging from 10^4 to 10^8 organisms, did not affect the inhibitory level.

Growth of *Staph. aureus* in the Presence of Chlorophyll.—The growth curves shown in Fig. 1 confirmed the conclusion drawn from the results of the plate method that chlorophyll

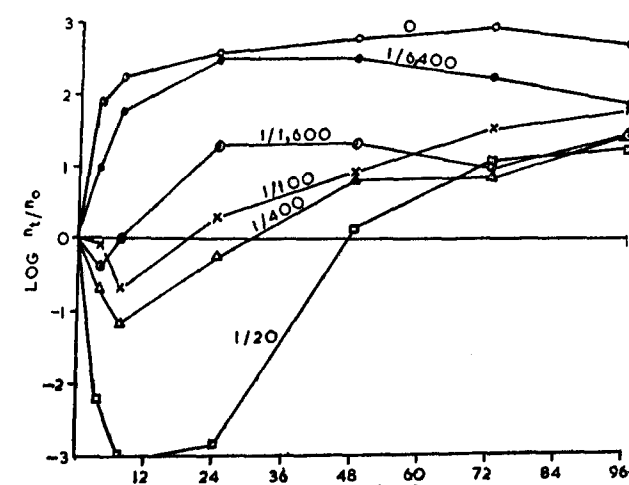


FIG. 1.—Growth curves of *Staph. aureus* in nutrient broth containing various concentrations of chlorophyll. n_t = Number of organisms per ml. at time t . n_0 = Number of organisms per ml. at start of experiment.

temporarily inhibits the growth of *Staph. aureus*. Some organisms were killed, the number increasing with chlorophyll concentration, but even when this was 1/20 bacterial multiplication began after 24 hours. Thus it seems that *Staph. aureus* became resistant to chlorophyll. The emergence of chlorophyll resistance could not be demonstrated by the usual methods because the solubility of the preparation is such that a concentration completely inhibiting the organism for indefinite periods could not be used. However, *Staph. aureus* was grown on Levinthal agar containing 1/100 chlorophyll by incubating at 37° C. for 48 hours. After eight subcultures of successively reduced incubation periods the organism grew well in the presence of 1/100 chlorophyll after 16 hours at 37° C. It therefore seems that some form of resistance to chlorophyll is acquired.

Copper Content of Sodium Potassium Copper Chlorophyllin.—The copper content of the chlorophyll preparation

used was 4.16%, and it was thought that its bacteriostatic properties might be due to the copper present. Three different organisms were cultured on two batches of Levinthal agar, one containing dilutions of chlorophyll and one containing copper sulphate in concentrations such that the two batches of medium contained identical amounts of copper. The results are shown in Table II. It may be concluded that the antibacterial properties of chlorophyll are not due to its copper content.

TABLE II.—Comparison of Sensitivity of Three Organisms to Chlorophyll and Copper Sulphate

Organism	Inhibitory Level of Chlorophyll	Inhibitory Level of CuSO_4 *
<i>Staph. aureus</i> ..	1/800	> 1/100
<i>Staph. albus</i> ..	1/800	> 1/100
<i>Str. pyogenes</i> ..	1/1,600	1/200

* Expressed as concentration of chlorophyll containing same amount of copper.

Effect of Chlorophyll on Bacteriostasis Produced by Antibiotics

The bacteriostatic effect of chlorophyll is slight, and it was thought that it might be better demonstrated by the use of synergism, as in the method described by Dye, Lynch, Cullen, and Sprague (1952). They increased the sensitivity of the agar diffusion assay of viomycin by incorporating sulphadiazine in the medium. The possible potentiating effect of antibiotics on the antibacterial activity of chlorophyll was investigated, using a routine plate assay method. Two-layer plates were poured. Both layers contained a subinhibitory level of penicillin, and the surface layer was seeded with an inoculum of an overnight *Staph. aureus* culture sufficient to produce confluent growth. Six porcelain cylinders were placed on the surface of each plate and were filled with equal volumes of different dilutions of chlorophyll. The plates were incubated for 16 hours and the diameters of the zones of inhibition around each cylinder were measured. The square of the diameter of the zone of inhibition was plotted against the log. of the concentration of chlorophyll.

Subinhibitory concentrations of penicillin incorporated in the medium were found to increase only slightly the zones of inhibition of growth of *Staph. aureus* produced around porcelain cylinders containing chlorophyll. The small size of zone of inhibition around a chlorophyll solution is probably due in part to the low diffusibility of the preparation; the green colour does not extend far beyond the porcelain cups. Hence the two substances were reversed; a subinhibitory concentration of chlorophyll was incorporated in the medium, and penicillin dilutions were put in the porcelain cylinders. A marked difference was observed in zone diameter between those produced on assay media containing chlorophyll and those on straight assay media. The same effect was demonstrated with oxytetracycline ("terramycin") and streptomycin, using *B. pumilis* as the test organism for oxytetracycline and *Staph. aureus* for streptomycin.

These findings are demonstrated graphically in Figs. 2, 3, and 4. It is obvious that subinhibitory concentrations of chlorophyll in the medium cause a vertical shift in the dose-response curves for penicillin, streptomycin, and oxytetracycline.

Growth curves were plotted of *Staph. aureus* growing in nutrient broth in the presence of penicillin alone, chlorophyll alone, and combinations of the two. No synergistic effect could be demonstrated as in the agar diffusion method. Therefore it appears that the increase in sensitivity of the agar diffusion assay of antibiotics produced by subinhibitory concentrations of chlorophyll is due to some physical property of the preparation and is not true synergism. Chlorophyllin is a surface-active agent, and may, by virtue of this property, increase the sensitivity of organisms to antibiotics under the conditions of an agar diffusion assay. Smith and Livingston (1945) found that experimental wounds

treated with chlorophyll and antibiotics healed more quickly than when treated with either agent alone. This effect may partly be due to an enhancement of the antibiotic's activity by the surface active properties of the chlorophyll.

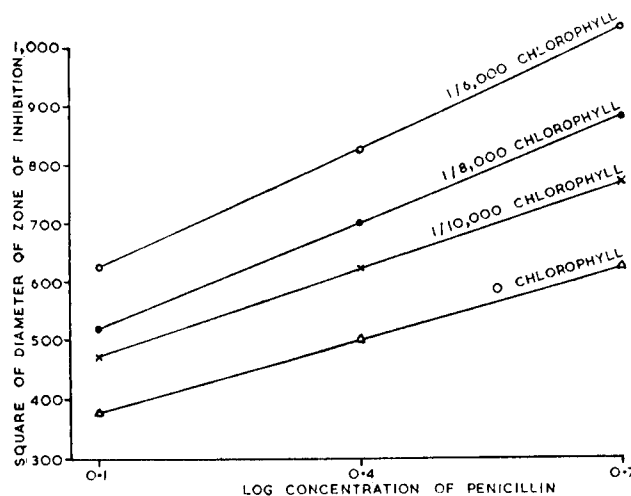


FIG. 2.—Inhibition of *Staph. aureus* by penicillin in the presence of three concentrations of chlorophyll.

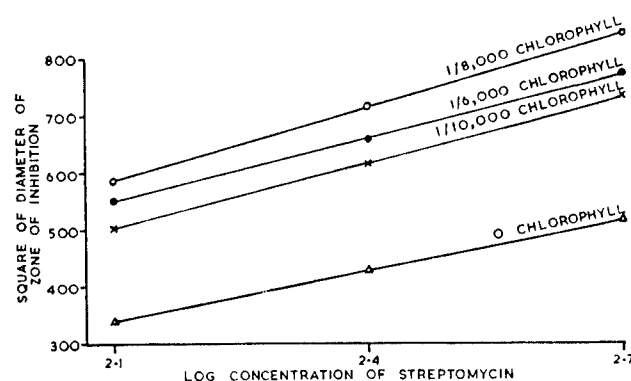


FIG. 3.—Inhibition of *Staph. aureus* by streptomycin in the presence of three concentrations of chlorophyll.

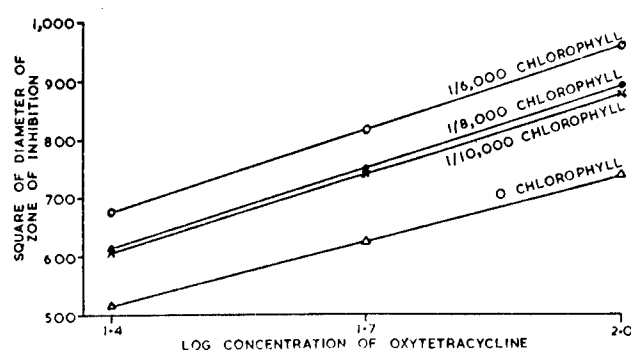


FIG. 4.—Inhibition of *B. pumilis* by oxytetracycline in the presence of three concentrations of chlorophyll.

Summary

Soluble sodium potassium copper chlorophyllin (which is the base of "chloresium" preparations) shows some bacteriostatic action against certain Gram-positive organisms, including *Staph. aureus*, *Str. pyogenes*, the pneumococcus, and the pathogenic clostridia. After a period of bacteriostasis, bacterial multiplication proceeds in the presence of all concentrations of chlorophyll tested.

After repeated culture in the presence of chlorophyll *Staph. aureus* becomes resistant to the temporary bacteriostatic effect of this substance.

The activity of some antibiotics is potentiated by the presence of subinhibitory concentrations of chlorophyll.

This work was carried out during the tenure of a research grant from Rystan Company, New York.

REFERENCES

- Bowers, W. F. (1947). *Amer. J. Surg.*, 73, 37.
Carpenter, E. B. (1949). *Ibid.*, 77, 167.
Combes, F. C., Zuckerman, R., and Kern, A. B. (1952). *N.Y. St. J. Med.*, 52, 1025.
Dye, W. E., Lynch, H. P., Cullen, T. M., and Sprague, E. M. (1952). *Antibiot. and Chemother.*, 2, 610.
May, J. R., and Morley, C. W. (1952). *Lancet*, 1, 636.
Miles, A. A., Misra, S. S., and Irwin, J. O. (1938). *J. Hyg. (Camb.)*, 38, 732.
Nevin, T. A., and Bibby, B. G. (1954). *J. dent. Res.*, 33, 571.
Smith, L. W. (1944). *Amer. J. med. Sci.*, 207, 647.
— and Livingston, A. E. (1945). *Amer. J. Surg.*, 67, 30.

Medical Memoranda

Rupture of the Uterus Involving the Bladder

Ruptured uterus involving the bladder is a very rare condition. It is more likely to be met with after a previous caesarean section in which the bladder is firmly adherent to the uterine scar. The following case is of unusual interest in that the patient had had no previous operation and gave no history to indicate that the bladder might be adherent to the lower uterine segment. Nevertheless she sustained an extensive tear of the uterus and the bladder during labour, which resulted in the baby's shoulder being lodged in the bladder cavity.

CASE REPORT

The patient, a Yoruba of Western Nigeria aged about 36, was admitted into Massey Street Maternity Hospital, Lagos, Nigeria, on November 16, 1954, with a history of nine months' amenorrhoea and labour pains which had started 18 hours previously. She was a gravida 4, para 3, one alive; the last confinement being three years before admission. Previous pregnancies and deliveries had been uneventful. Her general condition on admission was fair, although she appeared dehydrated. Her temperature was 99° F. (37.2° C.), pulse 120, respirations 24, and B.P. 130/70.

The bladder appeared to be full and was palpable up to the level of the umbilicus. The fundus uteri was level with the ensiform cartilage. The abdomen was very tense and the foetal parts were difficult to palpate. The foetal heart was not heard. Vaginal examination revealed slight bleeding, an almost fully dilated os, with a thick rim of cervix felt posteriorly, and the presentation was a face jammed in mid-cavity. The suspicion of ruptured uterus was confirmed when blood escaped during an attempt to pass a catheter by displacing the head upwards.

At operation blood-stained fluid was found in the abdominal cavity. The bladder peritoneal reflection was raised, dark purplish, and oedematous. When this was opened blood clots were exposed and a longitudinal tear in the lower uterine segment was seen. On reflecting the bladder from the uterus the baby's shoulder came into view and the glistening mucous lining of the bladder was observed. It then became apparent that the bladder was involved in the rupture.

Examination of the damage revealed a longitudinal tear in the lower uterine segment and a T-shaped tear in the bladder, the longitudinal arm of which extended downwards, splitting the trigone of the bladder symmetrically in two and involving the upper third of the urethra.

A subtotal hysterectomy was performed and the bladder repaired with a No. 0 chromic catgut suture. The patient's condition was satisfactory throughout and she appeared very little shocked in spite of the extensive damage. An indwelling catheter was inserted and the abdomen drained. The patient made an uninterrupted recovery but developed

a urethro-vaginal fistula, which was successfully repaired two months after the operation for ruptured uterus.

I am indebted to the Chief Medical Adviser to the Federal Government of Nigeria for permission to publish this case.

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Perforated Duodenal Ulcer Complicating Prednisolone Therapy

Many instances of serious gastro-intestinal complications occurring during treatment with prednisone and prednisolone have been recorded. Bollet *et al.* (1955) and Boland (1956) found a high incidence of peptic ulceration in rheumatoid arthritis patients treated with these drugs. Kofman *et al.* (1956) reported peptic ulceration as a complication of prednisolone treatment for metastatic breast cancer. Muller (1955) and Bickel (1955) described two cases of intestinal haemorrhage on prednisone. Gluck *et al.* (1955) treated a case of rheumatic carditis with a combination of cortisone, prednisone, and prednisolone; at necropsy a large gastric ulcer was found which had been symptomless. They also briefly described a case of perforated duodenal ulcer after seven days on prednisone. Fentress *et al.* (1956) reported the case of a rheumatoid patient on prednisone who had a perforated duodenal ulcer, and Pickert (1956) a fatal case during treatment for scleroderma.

Of 11 patients with rheumatoid arthritis treated by us with these steroids, four had severe gastric irritation necessitating treatment and reduction in dose, and one treated with prednisolone had a perforated duodenal ulcer. The latter is the subject of this report.

CASE REPORT

A 50-year-old married woman, first seen in January, 1950, had rheumatoid arthritis, established by clinical, laboratory, and x-ray findings. During the next three years she was twice admitted to hospital, but in spite of the usual treatments, including rest, analgesics, blood transfusions, gold, and phenylbutazone, her condition did not improve. During her second stay in hospital (June, 1951) intramuscular corticotrophin was given for 21 days with definite benefit. As the drug was scarce at that time it had to be discontinued.

Cortisone therapy, 75 mg. daily, was begun in January, 1953, and she improved greatly over the next six months. Then increasingly larger doses—up to 125 mg. daily—were needed and the drug was finally discontinued in December, 1953, because of her lack of response and a troublesome gain in weight. Her condition waxed and waned until August, 1955, when she had so deteriorated that cortisone—a replica of the first course—was recommenced. In November, 1955, she was admitted to hospital for the fourth time. Examination then showed a moon-faced, severely crippled woman, with advanced rheumatoid changes in the hands, wrists, elbows, shoulders, knees, ankles, and feet. Cardiovascular, respiratory, central nervous, and gastro-intestinal systems were normal. A blood examination showed: Hb, 70%; W.B.C., 10,000 (normal differential count); E.S.R., 83 mm. in one hour (Westergren); serum sodium, 144.7 mEq/l.; serum potassium, 4.98 mEq/l. X-ray examination: chest normal; joints showed advanced rheumatoid changes.

Prednisolone, 20 mg. daily, was begun on November 21. For the first three weeks the pain was lessened and there was a slight increase in mobility. She then received this treatment as an out-patient. On January 17, 1956, she had epigastric pain lasting only a few days. On January 31 joint pain and stiffness had increased, and, as there had been no recurrence of epigastric pain, the dose was stepped up to 25 mg. daily.

On February 3 she was admitted to hospital because of the sudden onset of severe pain in the right hip 12 hours

previously. There was no history of trauma. The right leg was held in a position of external rotation, with limitation of all movements. X-ray examination showed a fracture through the neck of the right femur, with some absorption of the neck and considerable upward displacement of the shaft. It was decided to apply skin traction as a first measure, and full sedation was given. That evening she became pyrexial (102° F.; 38.9° C.), with a pulse rate of 122 and respirations 28, and during the night she vomited 30 oz. (850 ml.) of bile-stained fluid. Nausea and vomiting continued throughout the next day.

An intravenous infusion of N/5 saline was begun, a Ryle tube passed, and systemic penicillin given. Her condition improved, and still no localizing signs could be elicited in the abdomen. Straight x-ray examination of the abdomen showed no abnormality. Investigations on this day gave Hb, 74%; W.B.C. 14,500 (82% polymorphs, 16% lymphocytes); serum sodium 135 mEq/l.; potassium 4.7 mEq/l.; chlorides, 93 mEq/l.; blood urea, 39 mg./100 ml.

On the morning of February 7 the patient's condition was regarded as satisfactory. Her temperature, pulse rate, and respirations were normal, and electrolyte balance was maintained.

At 2 p.m. she complained—for the first time since admission—of abdominal pain, which gradually became more severe and was localized to the right hypochondrium. Examination revealed a rigid abdomen, and preparations were made for immediate laparotomy. At operation an acute perforation was found in the anterior wall of the first part of the duodenum. There was no evidence of peritonitis, and the perforation was closed without difficulty.

Intramuscular cortisone and corticotrophin replaced prednisolone as soon as the abdominal symptoms began, and were continued during and after operation. The dosage was then gradually reduced and steroid therapy was stopped 21 days post-operatively, when an uneventful recovery had been completed. An ulcer regime was maintained for the next two months, and, as the patient remained symptomless, a return to full diet was then allowed. At the time of writing she was still in hospital awaiting an operation for excision of the femoral head, and unfortunately there had been a reactivation of the rheumatoid disease.

COMMENT

It is interesting to note that in this case and in the one reported by Fentress *et al.* (1956) the suppression of clinical signs and symptoms, usually anticipated with the use of steroid therapy, did not occur.

Herzog *et al.* (1955) have shown by biological experiments on animals, and Bunim *et al.* (1955) by clinical assessment, that these new steroids have three to four times the potency of the older corticosteroids. It would appear from recent reports that the incidence of digestive complications is in the same proportion. It is for this reason that many authorities—for example, Boland (1956)—now advise pre-treatment investigation of the gastro-intestinal tract and routine antacids and semi-bland diets.

We thank Dr. E. T. D. Fletcher for permission to publish, and Mrs. D. Barclay for surgical advice.

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REFERENCES

- Bickel, G. (1955). *Schweiz. med. Wschr.*, 85, 859.
Boland, E. (1956). *Bull. rheum. Dis.*, 6, 107.
Bollet, A. J., Black, R., and Bunim, J. J. (1955). *J. Amer. med. Ass.*, 158, 459.
Bunim, J. J., Pechet, M. M., and Bollet, A. J. (1955). *Ibid.*, 157, 311.
Fentress, V., Firschild, P., and Reveno, W. S. (1956). *New Engl. J. Med.*, 254, 657.
Gluck, E. J., Brandt, A. A., and Dordick, J. R. (1955). *Ibid.*, 253, 518.
Herzog, H. L., Nobile, A., Tolsdorf, S., Charney, W., Herschberg, E. B., and Perlman, P. L. (1955). *Science*, 121, 176.
Kofman, S., Nagamani, D., and Taylor, S. G. (1956). *Proc. Amer. Ass. Cancer Res.*, 2, 126.
Muller, A. F. (1955). *Schweiz. med. Wschr.*, 85, 1001.
Pickert, H. (1956). *Arzt. Wschr.*, 11, 328.

Reviews

HUGH OWEN THOMAS

The Life of Hugh Owen Thomas. By David Le Vay, M.S., F.R.C.S. (Pp. 135+vii; illustrated, 25s.) Edinburgh and London: E. and S. Livingstone Ltd. 1956.

It is interesting to find Hugh Owen Thomas among the first few biographies, which include those of Lister and Hunter, so ably published by E. and S. Livingstone, especially as it is not unlikely that only a few have knowledge of Thomas. He was born some years after Lister and before Victoria ascended the throne; he started practice before the establishment of the *Medical Register*. The author has studied the writings of Thomas and much that has been written of him, and presented a "Life" which is built up around his work. His graphic description portrays the figure of the man and a personality agreeing well with what has been told and written by Robert Jones and T. P. McMurray.

The author invites the reader to consider who influenced this able and unusual man in his work. Was it his father, who had the reputation of a successful bonesetter, or Syme or Brodie or Hilton? The reader will realize that Thomas had no hospital appointment, but it is made clear that his services to patients undoubtedly overshadow any ability he may have had of imparting knowledge to colleagues and students. However, we are told that his influence on Ridlon (and so on American orthopaedic surgery) and on Robert Jones has been of the greatest importance, so it would be interesting to read more of the association between uncle and nephew. Too little is told us in this "Life" of what has been given to us by Thomas. Tests and splints associated with his name are not all he has left to us. The author does not indicate whether he expects the reader to consider Thomas a genius and a great man, or whether circumstances or lack of these influenced his life. We are not told if there is evidence that he helped mankind by special skill and original methods. There seems little doubt that his work has been of benefit alike to surgeon and patient since his time; partly through the teaching of Robert Jones, who also was responsible for the provision of the Thomas thigh splint to the Services in the war of 1914-18, after the monstrous loss of life and limb resulting from wounds of the thigh.

The study of the life of Hugh Owen Thomas is a lesson to all surgeons, and will interest the lay reader. This book would be enjoyed by those visiting Liverpool.

ST. J. D. BUXTON.

PARASITOLOGY

Parasites and Parasitism. By Thomas W. M. Cameron. (Pp. 322+xix; illustrated, 35s.) London: Methuen and Co. Ltd. New York: John Wiley and Sons Inc. 1956.

This is one of the most original books on parasitology to appear in recent years. Unlike the majority, it is less concerned with morphology than with life-cycles, while it hardly touches treatment or prevention, but devotes nearly a third of the text to the relation of the parasite to its host, either in the present or speculatively in the remote past. The biochemistry of many organisms is discussed freely, and this indicates one of the important trends the subject is assuming to-day, not only in the metabolic processes of the parasite but in relation to the immunity reactions in the host. The book is more likely to be useful to the biologist or advanced student than to the medical man or veterinarian seeking information about the diagnosis or treatment of a parasitic infection. In fact, the author makes it clear in the preface that he has tried to avoid the anthropocentric or economic point of view. The subject is considered in three main divisions—the Protista, the lower Metazoa (chiefly the helminths), and the higher Metazoa (including vertebrates such as lampreys and vampires). This part is finely illustrated with line drawings which vividly present life-cycles or the natural history and evolution of

the organisms. The author is well known for his work on helminthology, and the sections relating to this subject are masterly. In describing the Protista there are a number of errors and omissions which rather spoil this part of the book—for instance, there is no mention of the occult trypanosomes whose life histories would provide useful confirmation of some of the author's views. Later sections in the book describe briefly the epidemiology of parasites; the index is novel in its inclusion of the definition and origin of the more important terms.

P. C. C. GARNHAM.

ANGIOCARDIOGRAPHY IN CONGENITAL HEART DISEASE

Angiocardiographic Interpretation in Congenital Heart Disease. By Herbert L. Abrams, M.D., and Henry S. Kaplan, M.D. (Pp. 233+viii; illustrated, 95s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1956.

This excellent monograph should prove of great value to radiologists, to whom it can serve as a reference book, and also to cardiologists. It is arranged in two parts. The first part describes the historical background of angiocardiography, the technique, the equipment and media employed, and also the general principles of interpretation. Aortography is also presented. The second part deals in individual sections with each of the congenital abnormalities. In addition to presenting the angiocardiographic features, each section opens with a clear, simple presentation of the chief clinical and pathological features of the relevant condition; there is intelligent and useful reference to the literature, although it is a pity that the tiresome numeral system is used and not the Harvard system. It is this inclusion of a simple clinical introduction to each condition which should prove of great help to those who are not fully experienced in congenital heart cases. The illustrations are abundant (161 figures) and well produced. The only criticism is that rather too much is read into some of the postero-anterior views. Perhaps these less satisfactory illustrations will be replaced by better ones in a later edition.

The monograph can be thoroughly recommended.

RUSSELL BROCK.

The Handbook of Medical Library Practice (2nd ed., Chicago, American Library Association, 1956) is a comprehensive guide through the intricacies of medical literature which is invaluable to medical librarians and others responsible for its collection, care, and accessibility. It provides information on library methods and services, on bibliographical tools, and on the historical aspects of medicine. It contains chapters on organization and administration, professional training and qualifications of medical librarians, classification, cataloguing, photoduplication methods, reference and bibliographical services, and rare books, and concludes with a valuable annotated bibliography of 1,965 reference works and histories in medical and related fields. The *Handbook* is the work of a team of American medical librarians under the editorship of Miss Janet Doe and Miss Mary Louise Marshall, and is obtainable in this country from the Woolston Book Co., Gamble Street, Nottingham, price 80s.

The *Medical Annual* for 1956 (John Wright and Sons Ltd., 38s. 6d.) is the 74th consecutive issue of this compact and informative yearbook. Its popularity is fully deserved, for the editors, Sir Henry Tidy and Professor R. Milnes Walker, obtain from their distinguished team of contributors a well-balanced review of progress in nearly every field of medicine, including even "Legal Decisions and Legislation." None of the important medical topics of the day are neglected, and there are authoritative contributions on such subjects as the treatment of advanced cancer, the hormone treatment of cancer, the status of cortisone, the surgery of the heart and great vessels, and the chronic rheumatic diseases. A survey of the work on otosclerosis during the last 20 years is particularly useful. When it comes to new drugs, even a yearbook cannot keep up with the output of the pharmaceutical industry, and the fact that the *Medical Annual* for 1956 does not mention the latest "tranquillizing" drugs (though there are useful paragraphs on chlorpromazine and reserpine) shows how little time there is for judicious appraisal of new remedies before they come into general use.

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PATHOGENESIS OF RHEUMATIC ENDOCARDITIS

It is gratifying to see a pathological problem simplified by the discovery of new information, and this seems to have happened with rheumatic endocarditis. Hitherto it has been assumed that two different processes play a part in this condition, one in the early acute stage and the other in the chronic. Now it seems that the same process may account for both. This is indeed a simplification, for, while it is easy to see how the vegetations of acute rheumatism are produced by the deposition of blood platelets and fibrin on the valves, it is not so easy to accept the orthodox view that chronic thickening and stenosis are produced by inflammation, especially as the signs of inflammation are so hard to find. F. R. Magarey¹ has provided, on the lines of the thrombosis hypothesis, what seems a more likely explanation by showing how valvular thickenings can be produced by the organization of fibrin deposits, and his observations have now been confirmed by P. S. Tweedy.²

The thrombosis hypothesis dates from a time when the microscope had hardly begun to influence pathology. C. von Rokitsansky, the great Viennese morbid anatomist of the last century, described atheroma of the aorta as a deposition of fibrin on the internal surface of the vessel, with subsequent change of the fibrin into fibrous tissue. The microscopists rejected this hypothesis on the grounds that the fibrous thickenings in atheroma were under the endothelium and therefore in the vessel wall rather than on the surface. Virchow described them as reactive overgrowths of the intimal fibrous tissue, and this was the accepted teaching for the next hundred years until the thrombosis hypothesis was revived by J. B. Duguid.³⁻⁵ He showed that when a mural thrombus

forms in a blood vessel it becomes covered with endothelium and is thus incorporated in the vessel wall, so that when subsequently organized it forms a fibrous thickening of the intima. The endothelium, according to him, is an adjustable membrane and cannot therefore be taken as a fixed landmark by which developmental relationships can be determined.

Duguid's findings have been confirmed by other workers,⁶⁻⁹ and now the same principle has been applied by both Magarey and Tweedy to interpreting chronic endocarditis. Magarey showed that when fibrin is deposited on the heart valves it undergoes organization and is converted into fibrous tissue, which becomes incorporated in the valve substance and so adds to its thickness. He also showed how deposits at the junctions of the cusps form adhesions between them and thus narrow the valve orifices. He has thus not only brought the theory of chronic endocarditis into line with that of acute, but has also given a convincing explanation of valvular stenosis.

It may seem hard to believe that so simple a process could have remained so long unrecognized, but histologists have had as a rule to take appearances at their face value. When fibrin is fully organized it is no longer identifiable as such but looks like any mass of fibrous tissue, and when it is incorporated in a heart valve it merges with the original fibrous structure so as to be practically indistinguishable. Thus, unless the histologist is prepared to use imagination—an exercise not always encouraged in his line of work—he must assume that it is part of the original structure; and should that structure seem to be increased in size he is forced, if he subscribes to the doctrine of cellular pathology, to conclude that there has been an overgrowth of it.

There is, moreover, a further difficulty, in that the transformation of fibrin into fibrous tissue requires intermediate changes that have not yet been assigned their final place in the scheme of histopathology. Most observers, while recognizing the presence of fresh fibrin on the surface of the valves in chronic endocarditis, have directed their attention more to the peculiar hyaline substance which so often appears under the surface, hoping perhaps to find in it the underlying cause of the disease. Sometimes this material clearly shows the staining reactions of fibrin; nevertheless, because it appears to be embedded in the valve, it has been taken to be a kind of degeneration of the collagenous connective tissue of the valve itself. Thus the idea of a "fibrinoid degeneration" of collagen has arisen, and, since the same substance is seen in atheroma and kindred lesions of the arteries, the elaborate concept of the "collagen vascular diseases" with all its manifold implications has been

¹ Magarey, F. R., *British Medical Journal*, 1951, 1, 856.

² Tweedy, P. S., *Brit. Heart J.*, 1956, 18, 173.

³ Duguid, J. B., *J. Path. Bact.*, 1946, 58, 207.

⁴ *ibid.*, 1948, 60, 57.

⁵ *Lancet*, 1952, 2, 207.

⁶ Crawford, T., and Levene, C. I., *J. Path. Bact.*, 1952, 64, 523.

⁷ Geiringer, E., *ibid.*, 1951, 63, 201.

⁸ McLetchie, N. G. B., *Amer. J. Path.*, 1952, 28, 413.

⁹ Morgan, A. D., Thesis (M.D.), 1955, University of Aberdeen.

¹⁰ Harrison, C. V., *J. Path. Bact.*, 1948, 60, 289.

¹¹ Heard, B. E., *ibid.*, 1952, 64, 13.

¹² Williams, G., *ibid.*, 1955, 69, 199.

¹³ Levene, C. I., *Lancet*, 1955, 2, 1216.

¹⁴ Still, W. J. S., and Boulton, E. H., 1956, *ibid.* 2, 117.

built up. Both Magarey and Tweedy, however, with one accord identify the substance in question as incompletely organized fibrin deposit, and now Tweedy seeks to shake the whole edifice by suggesting that the so-called fibrinoid degeneration is a superfluous concept.

These revolutionary ideas are not founded merely on the imagination of one or two histologists. The principle of the incorporation of fibrin deposits in the vascular system is well established on experimental evidence. C. V. Harrison,¹⁰ B. E. Heard,¹¹ and N. G. B. McLetchie⁸ have shown that particles of fibrin introduced into the veins of rabbits lodge in the pulmonary arteries and are converted into fibrous thickenings of the intima bearing no resemblance to fibrin. Moreover, G. Williams,¹² in a study of experimentally produced arterial thrombi, has shown that before organization occurs there is a stage in which the fibrin becomes condensed and assumes that hyaline appearance we have been taught to look on as a collagen degeneration. It is possible, therefore, that the concept of collagen diseases is based on a wrong interpretation.

How unsafe it is to take histological appearances at their face value has been brought out most strikingly by some recent electron-microscopic studies. C. I. Levene¹³ has found that fibres from the surface layers of atheromatous plaques, despite their collagenous appearance, have the electron-microscopic pattern of fibrin, and W. J. S. Still and E. H. Boulton¹⁴ have found that the same applies to the surface layers of endocardial fibro-elastosis. Thus even when organization appears to be complete the histology may still be deceptive, and substances which by staining methods are identifiable as one form of tissue may be quite another. If these findings are confirmed, we shall have to admit the existence of an additional form of connective tissue—a fibrous tissue composed not of collagen but of fibrin, and derived not from fibroblasts or any other connective tissue cells but from fibrinogen of the circulating blood.

LIVING WITH A COLOSTOMY

During the past few years a large general hospital serving a medium-sized city and its surrounding villages has been carrying out approximately 50 colostomies annually. As the population at risk is about 250,000 people it might reasonably be inferred that the number of colostomy operations carried out each year in Great Britain is of the order of 10,000. Most of them are permanent, being commonly done as part of the surgical treatment of carcinoma of the rectum and lower colon. The prognosis for most of

these patients is good, but since they are often middle-aged or elderly their natural expectation of life is not long. The figure of 10,000 colostomies carried out annually therefore agrees fairly well with the statement¹ that there are more than 100,000 patients with a permanent colostomy in Great Britain—enough to populate a good-sized town. How do these people fare for the rest of their lives?

The possession of a colostomy used to be regarded as a very serious handicap. It was usual for the surgeon to advise that the colon be regularly washed out each day with warm water, and the patient was commonly hung about with more or less complicated pieces of apparatus requiring cleaning and manipulation. In 1945 W. B. Gabriel² opposed the regime of daily wash-outs on the grounds that they were unnecessary, harmful, and dangerous: they were unnecessary because colostomies would usually function regularly once or twice a day with proper training and attention to diet; harmful because the irrigation of liquids into the colon irritated the mucosa and set up a condition like mucous colitis; and dangerous to life because of the risk of perforation of the colon. He had collected nine cases of perforated colon due to colostomy wash-outs, and of these eight had proved fatal. A little later C. E. Dukes³ gave his views on the management of a permanent colostomy after visiting 100 patients in their own homes. He found that about one-third of the patients continued to give themselves a daily wash-out because they had been told to do so, and about two-thirds had either never washed out the colostomy or had given up the practice some years before. Both groups were in good general health. He concluded that daily colostomy wash-outs were unnecessary for most patients and that less inconvenience was caused if the patient could train his colostomy to act naturally.

E. Clayton-Jones¹ likewise advocates training the bowel to act at regular times, pointing out that colonic irrigation is impracticable without adequate facilities—"What may be a simple operation in Mayfair could be impossible in the Gorbals." He gives some practical hints on the care of permanent colostomies. Different diets have to be tried until a formed stool is produced, which usually means avoiding fruit with pips and other coarse roughage and being moderate in the consumption of green vegetables and fruit generally. Another useful measure is to take by

mouth regularly an agent which retains water and thus renders the stool soft but formed. Various preparations of vegetable origin, such as karaya gum, agar, and psyllium seeds, have been used, but Clayton-Jones prefers the use of methylcellulose in the form of granules. Methylcellulose is a synthetic product, unabsorbed by the intestine, and it forms a smooth gel with water. According to Clayton-Jones it has the additional valuable property in relation to a colostomy of being a deodorant, and if the recommended routine is followed he suggests that the number of motions passed can be limited to one before breakfast and perhaps another in the evening. An alternative to methylcellulose is a mixture of kaolin and activated charcoal in the form of granules. Some patients find that taking generous quantities of this by mouth will render the stool well formed and odourless. There is clearly scope for individual trial and error in these methods of gaining control of the colostomy and eliminating faeculent gases, so that there need be no limitation of ordinary social activities.

Provided full control of the colostomy has been achieved, the dressings required are simple. It is enough to cover the colostomy with a piece of gauze or linen smeared with petroleum jelly and to place over this a good-sized square of absorbent cellulose wadding or cotton-wool, which is held in place by a colostomy belt or by a "roll-on" or ordinary corset. If necessary a disk of cardboard or of plastic may be worn under the belt to give added support. At night a wide elastic bandage to hold the dressing in place is sufficient. Whenever the dressings are changed the skin round the colostomy should be cleaned with warm soapy water and then dried thoroughly.

Diarrhoea from a colostomy is a troublesome complication. In a patient who is normally regular a bout of diarrhoea may be checked by giving such drugs as aspirin, amphetamine sulphate, or kaolin combined with an opiate. Opiates should not be given for more than a few days on end for fear of addiction. If diarrhoea persists a full investigation must be made, for, as B. N. Brooke⁴ has pointed out, there may be some underlying disease such as regional ileitis which is causing the symptom. Some patients almost inevitably suffer from "wet colostomies" if it has been necessary to make the artificial anus in the proximal part of the colon, but fortunately they are in the minority: for them the introduction of disposable plastic bags has been a great convenience.

There are still many surgeons who prefer to train their patients to wash out their colostomy daily, believing that if the colon is well emptied in the morning the passing of a motion is less likely during the rest of the day. D. Benjamin⁵ includes complete and

regular cleansing of the large bowel as one essential feature in a "triad of colostomy care," and A. Hurwitz and D. B. Alderman⁶ also assume irrigation of the colostomy to be usual; they describe a special apparatus for this purpose which is inexpensive, easy to clean, and leak-proof. How much time can be spent over the process of a daily irrigation can be gauged from their own words: "Most patients employ two 1-litre irrigations and require about 45 minutes for the entire process." While irrigation of the colon continues to be practised there will be the occasional fatality from perforation of the bowel, although this risk can be minimized by inserting into the colon only tubes made of some soft and pliable material and by not irrigating at a high pressure. P. A. Kaufman and H. Swerdlow⁷ have reported two cases of colonic rupture after an enema through a colostomy, one of which was fatal, and they review other cases previously reported. E. Hoffman and A. Macht⁸ have reported two further cases: both patients recovered with prompt surgical treatment.

It is not merely the correct mechanical functioning of the colostomy which should engage the surgeon or physician who is caring for these patients. The idea of an artificial anus provokes instinctive disgust, and frank explanation and discussion are necessary before the operation, unless this is being done as an emergency. "Even those patients for whom an artificial anus is expected to be only temporary will be shocked by its revelation on the abdominal wall post-operatively unless they have received a previous warning."⁴ Thereafter they need instruction in diet and in the care of the colostomy—instruction which is usually well given in hospitals. It is when the patients go home that they often run into difficulties. A recent article by Ruth B. Dyk and A. M. Sutherland⁹ on the adaptation of other members of the family to the patient with a colostomy makes it plain that a patient who goes home to a sympathetic and understanding atmosphere is indeed fortunate: details given in this paper provide support to the view that whenever possible daily irrigation should be avoided and "natural" regulation of the colostomy achieved, but the authors do not discuss this aspect of their data, for in common with most other American workers they appear to accept as inevitable the tyranny of the douche-can. For example, A. S. Lyons¹⁰ states: "An occasional patient can be found who has a spontaneous evacuation once or twice daily without irrigation, but I do not believe it to be wise to expect this set of circumstances except in relatively rare instances."

The ideal specification for a permanent colostomy can be summarized shortly: it acts "naturally"

¹ Clayton-Jones, E., *Med. Press*, 1956, 236, 551.
² Gabriel, W. B., *Proc. Roy. Soc. Med.*, 1945, 38, 692.
³ Dukes, C. E., *Lancet*, 1947, 2, 12.
⁴ Brooke, B. N., *Postgrad. med. J.*, 1954, 30, 237.
⁵ Benjamin, D., *Amer. J. Surg.*, 1954, 87, 127.
⁶ Hurwitz, A., and Alderman, D. B., *New Engl. J. Med.*, 1953, 249, 410.
⁷ Kaufman, P. A., and Swerdlow, H., *A.M.A. Arch. Surg.*, 1953, 87, 612.
⁸ Hoffman, E., and Macht, A., *Amer. J. Surg.*, 1954, 87, 140.
⁹ Dyk, R. B., and Sutherland, A. M., *Cancer*, 1956, 9, 123.
¹⁰ Lyons, A. S., *Amer. J. digest. Dis.*, 1956, New Series 1, 79.

morning and evening at well-regulated times; it requires the minimum of attention in the form of dressings and toilet; and the patient is able to carry out his normal job, live happily in his family, and enjoy his usual recreation. Fortunately, with the help of their medical advisers many patients are able to attain this ideal.

FATAL REACTIONS TO LOCAL ANAESTHETICS

Idiosyncrasy to local anaesthetic drugs resulting in a severe anaphylactic type of response and death is extremely rare.¹ That such a reaction is due to idiosyncrasy can be accepted only when it follows an exceedingly small amount of the drug. Sudden death within a few seconds of the topical application of a small dose of cocaine may be due to a direct action on the heart, causing ventricular fibrillation, but the unique pharmacological properties of cocaine—sympathomimetic and adrenaline-potentiating—imply that such a reaction would be peculiar to this agent. Such dramatic and unpredictable fatalities are fortunately rare, and with the justifiably diminishing use of cocaine should soon not occur at all. Most fatal reactions to local anaesthesia, as to general anaesthesia,^{2,3} are the result of faulty technique.

The usual type takes the form of convulsions followed by respiratory and finally circulatory failure. Premonitory signs include pallor, apprehension, and restlessness. Treatment to control the convulsions (for example, by a small dose of intravenous barbiturate or relaxant), artificial respiration with oxygen to prevent anoxia, and thereafter support of the circulation should prevent a fatal outcome if instituted in time. The heart may stop owing to anoxia or to the direct toxic effect of the drug. In this event cardiac massage must be undertaken without delay.

The occurrence of such reactions depends on the toxic threshold of the drug and on the factors which lead to a blood concentration above this level in the patient. The reaction threshold may vary in a given patient from time to time, according to nutritional state, the effect of premedication, and other factors. It is low in drugs with a high inherent toxicity; cocaine and many of the more potent compounds fall into this class, and it is perhaps wise to avoid using them whenever a safer drug will give an equally satisfactory clinical result. The blood concentration attained in the patient depends on the rapidity of entry into the blood stream and on the rate of concurrent elimination or destruction of the drug. Cocaine is detoxified more slowly than many synthetic local anaesthetics, another factor reducing its safety.

Inadvertent intravenous injection, overdosage, and giving unnecessarily high concentrations of local

anaesthetics all lead to high blood levels, with the danger of toxic effects. Drugs such as procaine and lignocaine are commonly dispensed in 2% concentration and often given in that strength for infiltration (more than 30 ml. of this strength would constitute an overdose in most patients); with either agent $\frac{1}{2}$ –1% concentration would be adequate for most purposes and is preferable for safety. Adrenaline is often included in solutions of local anaesthetics, since it retards absorption into the blood stream and prolongs the anaesthetic effect; but dangerous and even fatal results have followed excessive amounts of adrenaline given in this way, and the dosage needs to be carefully checked.

Many of the reported fatal reactions follow the topical application of local anaesthetic agents. In part this is because the more toxic agents are the more effectual for this purpose and because relatively high concentrations are used. For example, only 1 ml. of 10% cocaine contains 100 mg., which amount is regarded as the maximum permissible for topical application. Again, topical application of a local anaesthetic solution to the mucous membrane of the respiratory tract can result in rapid absorption of the drug, leading to a high blood level. The exceedingly rapid absorption of fluids injected into the respiratory tree was reported a century ago⁴; the rate of entry to the blood stream may approximate to that of direct intravenous injection. J. E. Steinhaus⁵ has confirmed this experimentally by spraying local anaesthetics down the tracheas of rabbits. Doses thus have to be small, and drugs with the least possible toxicity are best given. 1 ml. of 2% amethocaine contains 20 mg., and the drug is about ten times more toxic than procaine after intravenous injection. A number of fatalities, one recently reported,⁶ have followed the topical application of 2% amethocaine to the respiratory tree. D. C. Moore and J. Green¹ suggest that the dosage should be restricted to 40 mg. and that it should be used as a 0.5% aqueous solution; a total dose of 8 ml. is regarded as the maximum permissible for topical anaesthesia of the larynx and tracheobronchial tree. They state that this strength is adequate for satisfactory anaesthesia. Lignocaine in 2–4% concentration is a highly efficient surface anaesthetic, and its toxicity is only slightly greater than that of procaine (for instance, 0.5% lignocaine can be administered intravenously for various therapeutic purposes in a similar fashion to procaine solutions). If this or similarly safe agents⁷ supplanted the more toxic drugs for topical anaesthesia many fatal reactions would probably be averted.

MUMPS ORCHITIS

The importance of mumps lies mainly in its complications, of which epididymo-orchitis is the most frequent and the most severe. It affects young adult males, being very rare before the age of puberty.¹ It causes severe pain, is always accompanied by pyrexia, and often by prostration or even delirium. It may lead to partial atrophy of the testicle and sub-fertility, though the evidence for this is not very convincing, and most

clinicians will know of patients who have proved fertile after unilateral and even bilateral orchitis due to mumps. It is nevertheless a very disabling complication while it lasts and hitherto has not responded readily to treatment. Several reports now suggest that the use of corticotrophin or cortisone may be worth further study.

L. Martoni² reports excellent results in three cases. Hydrocortisone was given orally in doses of 125 mg. the first day, followed by 100 mg., 75 mg., and 50 mg. on the next three days. Pain was relieved and the temperature fell in 24 hours, and the swelling and tenderness subsided in two days. Examination 20 to 25 days later revealed no sign of atrophy. J. H. Solem³ treated two severe cases with 100 I.U. of long-acting corticotrophin. Both had had orchitis for several days before treatment and in both cases tenderness and swelling subsided within 24 hours. One of these patients had a recrudescence of the orchitis, which a second injection promptly controlled. A. G. Bower⁴ gives no figures or case histories but claims that cortisone by mouth in an initial dose of 300 mg. followed by 100-mg. doses every six to eight hours for two to four days caused diminution of pain in six to twelve hours and subsidence of swelling in two to four days. He claims that the initial dose should be at least 300 mg. by mouth. G. C. Risan⁵ is less enthusiastic. He gave cortisone to five patients in doses of 75 mg. every six hours for one day, followed by 50 mg. every six hours for three days, and then smaller doses for three to six days more. In all of five patients pain was relieved within 24 hours, but the fever and the swelling were not affected. In three patients swelling of the other testicle developed during treatment, but the swelling and duration of symptoms were milder. In one patient, who had both testes affected at the same time, one increased in size during treatment but responded rapidly to increased dosage. It is evident that the claims of different authors vary considerably, though all claim some improvement. Details of dosage and time of administration need further study, and the treatment cannot be accurately assessed until many more cases have received it.

TORULOSIS AND HODGKIN'S DISEASE

Torulosis is a systemic fungal disease caused by a yeast-like organism now known as *Cryptococcus neoformans*. The first description of the disease was that of O. Busse and A. Buschke in 1895,⁶ and cases have been reported in small numbers since then. B. R. Gendel, M. Ende, and S. L. Norman⁷ referred in 1950 to a total of 165 cases, and in 1951 V. P. Collins, A. Gellhorn, and J. R. Trimble⁸ mentioned 241 cases. The causal organism has been isolated from soil, as have the organisms of certain other systemic mycoses, and it appears to have a saprophytic role in nature. The commonest site of human lesions is the central nervous

system, which is involved in about 80% of patients with the disease. In these cases the subarachnoid space is seen at necropsy to be characteristically distended by gelatinous material, and often small cysts containing the cryptococci are present in the cerebral substance. Clinically the condition is manifested by a meningo-encephalitis, and cryptococci can often be recovered from the cerebrospinal fluid. The next most common site of disease is the lung, which is believed to be the usual portal of entry of the infection. Again, gelatinous lesions may be found there, or sometimes the lesions are granulomatous. Dissemination may take place, and then lesions will be found in many organs, including lymph nodes. The skin may ulcerate, and cryptococci can sometimes be isolated from the fluid which exudes from the lesions.

In 1923 W. Freeman and F. D. Weidman⁹ reported a case in which torulosis and Hodgkin's disease were believed to coexist in the same patient, and since then the apparent association of the two diseases has received some attention. Gendel and colleagues⁷ referred to 14 cases in which the two diseases were believed to be present in the same patient, though the number may be no more than 11 if cases are excluded in which the evidence for both torulosis and Hodgkin's disease is perhaps open to question.⁸ More recently further cases in which cryptococci were found and the histological findings supported a diagnosis of Hodgkin's disease have been described.^{10–12} The association between cryptococcal infection and a form of lymphadenopathy closely resembling, or even identical with, Hodgkin's disease seems to be proved, for it occurs too often to be a matter of chance. But that cryptococcal infection is the specific cause of Hodgkin's disease is out of the question: many cases of cryptococcal infection are known in which there is no evidence of Hodgkin's disease, and in the great majority of cases of Hodgkin's disease there is no evidence of cryptococcal infection. In animal experiments, too, no lesions resembling those of Hodgkin's disease have been produced by infection with cryptococci. Two possible explanations of this association have been considered—first, that cryptococcal infection can produce a granulomatous type of tissue reaction which is similar to that of Hodgkin's disease, and secondly that infection with cryptococci is a late event and occurs as a complication of Hodgkin's disease. It is at present not possible to decide between these two views with certainty. In support of the first is the fact that infection with cryptococci has been found in association not only with Hodgkin's disease but also with other types of

⁶ Busse, O., and Buschke, A., *Dtsch. med. Wschr.*, 1895, **21**, Vereins-Beilage, 14.

⁷ Gendel, B. R., Ende, M., and Norman, S. L., *Amer. J. Med.*, 1950, **9**, 343.

⁸ Collins, V. P., Gellhorn, A., and Trimble, J. R., *Cancer*, 1951, **4**, 883.

⁹ Freeman, W., and Weidman, F. D., *Arch. Neurol. Psychiat. (Chicago)*, 1923, **9**, 589.

¹⁰ Symmers, W. St. C., *Lancet*, 1953, **2**, 1068.

¹¹ Misch, K. A., *J. clin. Path.*, 1955, **8**, 207.

¹² Levene, M., and Michaels, L., *ibid.*, 1955, **8**, 201.

¹³ Gordon, M. H., in *Rose Research on Lymphadenoma*, 1932, Bristol.

¹⁴ Beck, A., Hutchings, M. W., Makey, A. R., and Tuck, I. M., *Lancet*, 1955, **1**, 535.

¹⁵ Dubin, I. N., *Ann. intern. Med.*, 1947, **27**, 898.

¹⁶ Benham, R. W., *J. infect. Dis.*, 1935, **57**, 255.

¹ Moore, D. C., and Green, J., *Calif. Med.*, 1956, **85**, 70.

² Edwards, G., Morton, H. J. V., Pask, E. A., and Wylie, W. D., *Anaesthesia*, 1956, **11**, 194.

³ *British Medical Journal*, 1956, **2**, 868.

⁴ Colin, G., *Traité de physiologie comparée*, Baillière, Paris, 1856, **2**, 39–41.

⁵ Steinhaus, J. E., *Anesthesiology*, 1952, **13**, 577.

⁶ Adriani, J., and Campbell, D., *J. Amer. med. Ass.*, 1956, **162**, 1527.

⁷ Harris, L. C., Parry, J. C., and Greifenstein, F. E., *Anesthesiology*, 1956, **17**, 648.

¹ See *British Medical Journal*, 1954, **2**, 1343.

² Martoni, L., *Clin. pediat. (Bologna)*, 1955, **37**, 402, abstr. in *Amer. J. Dis. Child.*, 1956, **91**, 390.

³ Solem, J. H., *Lancet*, 1953, **2**, 453.

⁴ Bower, A. G., *J. Amer. med. Ass.*, 1956, **162**, 425.

⁵ Risan, G. C., *ibid.*, 1956, **162**, 875.

lymphadenopathy.⁸ In some cases the diagnosis of a specific lymph-node lesion was considered to be established, and this group includes Hodgkin's disease, lymphosarcoma, and leukaemia. In others the histology of the lymph nodes varied. A further point in support of this view is that cryptococci have sometimes been recovered from the glands of patients with Hodgkin's disease in whom there was no clinical evidence of torulosis¹³ and from stomach washings in such a patient.⁸ One difficulty in accepting this view is that in most cases in which the diseases are believed to coexist either the cryptococci are not recovered at all from sites where the tissue changes are those of Hodgkin's disease or, if present, they are so only in small numbers.^{10 12 14} In support of the other view, that cryptococcal infection is a late event in cases of Hodgkin's disease, there is a certain amount of indirect evidence. I. N. Dubin¹⁵ has found that patients with Hodgkin's disease have a generally poor immunological response to infection, and M. Levene and L. Michaels¹² point out that many organisms such as diphtheroid bacilli, avian tubercle bacilli, and *Brucella* can be secondary invaders in Hodgkin's disease. R. W. Benham¹⁶ reported that cryptococci can be recovered from the skin of normal subjects, and these might well become established in the body if the immunological response of a patient was poor. That there is an association between torulosis and a lymphadenopathy closely resembling Hodgkin's disease, an association occurring too frequently to be explicable by chance, seems proved. But at present it does not seem possible to decide whether the cryptococci known to cause torulosis can cause this and other reactions of lymphoid tissue or whether they appear late on the scene as secondary invaders in patients whose immunological response to infection is impaired.

NOMENCLATURE OF BLOOD-CLOTTING FACTORS

The object of nomenclature is presumably to facilitate the interchange of knowledge, and yet there can be few fields of research where it is causing more confusion and misunderstanding than that of blood coagulation: clotting factors are known by different names not only from country to country but within single countries and from laboratory to laboratory. It is not surprising that many clinicians find the whole subject baffling. The classical theory of blood coagulation postulated certain factors, and there is widespread agreement on the meaning of the terms prothrombin, thrombin, fibrinogen, fibrin, and calcium, though thromboplastin is less clearly understood than the others. But there are at least four additional factors which appear to be important in the phenomenon of clotting, and each of these four has received a variety of names. To give an example of the confusion which exists, one of these substances has been described as Factor VII, proconvertin, serum-prothrombin-conversion accelerator, stable factor, auto-prothrombin I, serozyme, kappa factor, prothrombino-gen, co-thromboplastin, serum accelerator, prothrombin

conversion factor, and the prothrombin converting factor. As a result, communication between English-speaking workers has been definitely retarded, and for those who do not read English the possibility of misunderstanding is even more serious. In addition, substances of platelet origin and blood-clotting inhibitors are now being studied in detail and new names are being proposed for these.

Realizing the harmfulness of this confusion, a number of the leading workers in this field decided at the First International Congress on Thrombosis and Embolism in Basle that it was their responsibility to try to reach some agreement on nomenclature, and they therefore set up a committee to determine whether it would be possible to introduce a standardized nomenclature for those factors which are generally agreed to play a part in the physiological clotting of blood. The committee had a further meeting during the Sixth International Congress on Haematology at Boston last August, when the membership was further increased and a number of working parties were given the task of collecting the evidence in favour of the different blood-coagulation factors and of suggesting some neutral nomenclature which might be intelligible to medical practitioners whatever the country they lived in. The task confronting the committee presents very real difficulties, because with few notable exceptions the factors thought to be concerned in normal blood coagulation have not been isolated and identified. The committee wisely determined that any nomenclature selected as an international one should not be tied to any theory of coagulation, since the constant changing of theories has in the past led to repeated changes of terminology. It was also agreed that the existing terms prothrombin, thrombin, fibrinogen, fibrin, and calcium, being already used in most countries, should not be changed; that, for the reasons given above, any provisional terminology should not imply any supposed function or constitution of the factor to which it refers; and that international terms should be short, simple, and readily understood by people of different nationalities. Probably a common symbol, either a name or a number, will be selected for each factor, and each author will be encouraged to use this together with such a synonym as he may wish to use, the international symbol to be in brackets.

The work of the committee cannot reach fruition without the collaboration of different scientific societies in Europe and America, and it is hoped that the European and American societies of physiology, haematology, clinical pathology and so on will be willing to assist the committee in its endeavours, and, if they or their individual members have views they wish to put forward on the question of nomenclature of blood-clotting factors, that they will communicate with the secretary of the international committee, who is Dr. M. Verstraete, Cliniques Universitaires Maladies Internes B, Laboratoire de Physiopathologie, 57, Kapucijnenvoer, Louvain, Belgium. Thus by international collaboration it is hoped to achieve a nomenclature which will be workable and to get rid of much of the confusion which exists at the present time.

Nova et Vetera

ISAAC BUXTON (1773-1825)

"ON THE USE OF A REGULATED TEMPERATURE IN WINTER COUGH": A CONTRIBUTION TO THE HISTORY OF CHRONIC BRONCHITIS

BY

V. C. MEDVEI, M.D., M.R.C.P.

The combined meeting of the Sections of Pathology and Epidemiology of the Royal Society of Medicine on February 21, 1956, dealt in an admirable manner with problems of the epidemiology, bacteriology, and morbid anatomy of chronic bronchitis. It was pointed out that North-Western Europe seems to show a greater prevalence than the rest of the Continent, with England and Wales in the lead. A number of factors responsible for the origin were mentioned, such as respiratory infection, air pollution, type of bacteria (allergic), sensitivity of the mucous membranes, cigarette smoking, and several others.

In the discussion which followed, somebody asked if temperature studies had been made, taking into account the rapid change of climatic conditions even within a restricted area, such as a district of London, which may occur within a few hours, or even an hour: the transition from severe frost in the early morning and a snowstorm between 8 and 8.30 a.m. to sunshine and thawing conditions an hour later is a quite common experience. Such studies have apparently been carried out abroad ("microclimatology"), and seem also to have taken into account conditions of internal heating, windows, ventilation, and allied problems; from the reply given it seems that there is no similar study in existence in this country.

The problem is not new. The question of regulated temperature in relation to winter cough and consumption was described in detail by Isaac Buxton, M.D., Physician to the London Hospital and Surrey Dispensary in 1810.

Norah Schuster, in her paper on Buxton (*Proc. roy. Soc. Med.*, 1955, 48, 326), mentions this essay, but refers mainly to his enthusiasm concerning the heating and ventilation of sick-rooms.

Isaac Buxton was born on May 6, 1773, in Grange Walk, Bermondsey. At 9 years of age he went to St. Paul's School as a Foundation Scholar. About his later youth up to 1800 little is known. In that year he went to Göttingen to study medicine. In 1802 he wrote his thesis and obtained his doctorate. He then returned to London and became a pupil dresser to Astley Cooper at Guy's, and in 1805 obtained the Licence of the Royal College of Physicians. A year later we find him on the staff of the Surrey Dispensary, and after some fight he was elected to the staff of the London Hospital in 1807. During the following period of increasing practice he married Janet Travers, a cousin of the surgeon Benjamin Travers. Whether he ever used a stethoscope is not known, but he might have known it when he retired in 1822. He understood French and had read Laennec, so it was possible that the use of the stethoscope was quite familiar to him. He was elected to the Council of the Hunterian Society, but his health began to fail. In 1822 he resigned from the London Hospital on grounds of ill-health. Three years later he died in Camberwell and was buried in Bunhill Fields, and, as Norah Schuster says, "has rested in obscurity ever since."

Apart from the above-mentioned essay, he seems to have been fascinated by the possibilities of vital statistics, as he studied and wrote up the statistics of London Hospital admissions for 70 years until 1820, offering a most valuable analysis on the nature and spread of outbreaks of fever in the East End in 1817 and 1818.

He was a founder of the infirmary which later became known as the Royal Chest Hospital (in 1814), and where, for the first time, wards were kept at a constant warm

temperature, to the great benefit of the poor sufferers from chest disorders. He aimed at a temperature of 60 to 65° F. (15.5 to 18.3° C.) day and night during the winter months. Although the idea was not entirely original, Buxton was one of the first to put it into practice.

The complete title of Buxton's article is: *An Essay on the Use of a Regulated Temperature in Winter-cough and Consumption; including a Comparison of the Different Methods of Producing such a Temperature in the Chambers of Invalids*. It deserves, however, a much more detailed appreciation. The description of winter cough is perfect.

"It is absolutely necessary that I should be more minute in my description of what I mean by 'Winter cough'; because this disease, although perhaps more frequent than consumption, has not been described so often and so minutely; . . . Those who are affected with winter cough, generally feel themselves very well during the warm weather of summer. But, when the winter comes, they are afflicted with severe coughing. This cough is often so extremely troublesome during the night, as almost entirely to deprive them of rest. It is generally brought on with a considerable degree of violence whenever they go out into the cold air; and is easiest during the time of their continuance in a warm room. . . . Their breath is generally extremely short, so short that they frequently walk about with a considerable degree of difficulty; and an exertion rather greater than usual is very severely felt. If they draw in the breath deeply, pain is often occasioned in the chest, together with sudden catching and cough. Tightness across the same part is another symptom which they experience. Patients with this complaint in general expectorate considerably. The expectoration varies much; but, for the most part, it is thick, and large in quantity. . . . Sometimes they spit blood; but the quantity is usually not very large. Their complaints vary in the winter season, according to the state of the weather; so that when the wind is southerly they feel relieved, and when it changes to the north or north-east, every symptom is materially aggravated. . . . towards the latter end of winter or beginning of spring they are extremely thin and debilitated. Patients of this description are very liable to take cold; . . . and, when they have caught cold, the cough, the pain, the expectoration, the shortness of breath, and other symptoms, are considerably aggravated."

"As the spring advances, and mild weather comes on, the cough and other affections of the chest gradually abate; till, on the arrival of warm, settled summer weather, it . . . entirely quits them; and probably they enjoy, for a time, the pleasing hope that they are now thoroughly recovered. . . . But the succeeding winter destroys the pleasing delusion. They are again affected with the winter cough; and, if the weather is at all severe, most probably in a greater degree than during the preceding winter. In general the cough and other symptoms of the complaint become worse and worse every succeeding winter; and the remission between the attacks, during the summer, shorter, till at last patients frequently have the cough both winter and summer, although most severely during the winter. . . . The same train of symptoms has had various denominations applied to it. . . . I do not adopt the term chronic catarrh (perhaps the most proper denomination) because, although understood by medical men, it would not be so readily apprehended by others; nor do I employ the word asthma, because I think it better to follow Cullen's* example, and to confine the use of that expression to one particular kind of complaint. Winter cough is not the term I would fix on, were I writing a system of nosology, as I am well aware that it is liable to some objections. But since it is generally adopted in common life, not liable to ambiguity, being intelligible to persons medical and non-medical, and sufficiently designating the disease in question, I thought proper to employ it."

In the next paragraph he discusses the "frequency of winter cough and consumption," based on returns from "authentic documents," such as Dr. Willan's "Reports on the Diseases of London," rather than on "random modes of judging" from his own private practice: another feature which sounds more like present-day methods of studying the problem. In paragraph 4 he talks "of the Fatality of these disorders," and the introductory sentences are again worthy of detailed quotation:

"What renders consumption and winter cough still more worthy of our attention is, the amazing number of persons who fall victims to these complaints. No one will be surprised that

*Dr. Wm. Cullen (1710-90), also quoted by Badham (pp. 20-21 in the 2nd ed.), was Professor of Medicine in Glasgow and Edinburgh.

this is said, relative to consumption. But that an assertion of this kind should be made relative to winter cough, may, at first sight, appear extraordinary. Yet it is a certain fact, that a very considerable proportion of those who are affected with winter cough, ultimately die either of that complaint or of its consequences. . . . Consumption is a disease that kills of itself, i.e., without inducing another disease, which, although a consequence of the first complaint, puts on a particular character. Winter cough superinduces other complaints, which kill the patient; the death is then set down to the latter disorder and not to the winter cough."

In the following paragraph the usual terminations of winter cough are discussed—namely (1) consumption; (2) pneumonia (inflammation of the lungs); (3) dropsy, obviously as an expression of the failing heart; and (4) water in the chest (pleurisy), often in connexion with acute pneumonia.

In paragraph 6 important observations are made on the causation of these complaints:

"It is always of great importance to discover the causes of a complaint, as such discovery may probably lead either to its prevention or cure. . . . We have not to go far to discover the principal causes of consumption and winter cough. I am persuaded they will on examination be found to lie chiefly in the variableness and frequent severity of the climate. . . . When do these diseases make their commencement? Certainly in the severest and most variable weather of winter and spring. . . . If we go into the warm, settled climates, such as Spain, Italy, and the South of France . . . we shall scarcely ever meet with tedious cough and shortness of breath, such as we have described by the name of winter cough. Yet the inhabitants of some of these climates, when removed to England, are still more liable to these diseases than even the natives themselves. . . .

"Exposure to alternations of heat and cold is the common origin of protracted cough and shortness of breath, as well as of consumption. . . . We have before observed, that this winter cough vanishes on the approach of summer, and, could summer be always continued, would never again appear. All this, I think, is abundantly sufficient to prove, that variable and severe weather is materially concerned in producing and supporting by far the greater number of consumptions and protracted coughs."

In this country, Charles Badham (1780-1845) is regarded as the father of bronchitis, because he used the term first. Badham was a scholar and poet, as well as a doctor. He was an M.D. Edinburgh, which degree he obtained in the same year as Buxton did his in Göttingen. He added to it the M.D. Oxford fifteen years later, and was elected F.R.S. and F.R.C.P. in 1818; eventually he became a Censor of the College of Physicians (1821), and professor of physic in Glasgow in 1827. At the time of the first publication of his description of bronchitis, he was physician to the Westminster General Dispensary. He also was a Royal Physician to the Household of the Duke of Sussex. His treatise—which was, incidentally, dedicated to the Duke—was first published in 1808, two years before Buxton's essay. He set to work more methodically than Buxton, in so far as he gave a good historical introduction, and a systematic classification of various types of bronchitis based on punctilious clinical and morbid anatomical observations. He also gave a detailed account of the treatment, and devoted a full chapter to the "History and Treatment of Chronic Coughs, etc." which covers more or less the subject of Buxton's essay. In two respects, however, it seems inferior to Buxton's study. There is no mention of vital statistics to prove the prevalence and mortality of the disease. On the other point, Buxton, who was familiar with Badham's tract, wrote: "Dr. Badham gives his sentiments relative to this treatment of chronic bronchitis—that is, winter cough—in the following terms (Observations on the Inflammatory Affections of the Mucus Membrane of the Bronchiae, p. 122†). 'An uniform moderate temperature, to be secured only by confinement to the house during the unfriendly winters of this climate, is a measure about the propriety of which (where it can be adopted) no person can doubt.' Thus, therefore, both these writers perfectly agree with

me as to the propriety of the measure. But neither of them has brought forward any instance where it was used" (pp. 99-100).

Buxton's essay can be regarded as a minor classic. His description of the clinical picture can hardly be bettered; the choice of the name of the disease appears sound; the follow-up, the modes of termination, and the fatality of the illness are better assessed than by Badham. The attempted use of vital statistics shows Buxton at least half a century ahead of his contemporaries.

His real point is that the temperature changes are so rapid and by no means merely seasonal: cold summers, two or three very warm winter months followed by two or three weeks of sharp frost and icy snow blizzards are by no means uncommon; but the main problems are the great daily variations of temperature in any given spot—for example, in the heart of London.

The task, therefore, to cope with only one single aspect although it is an important factor—of the problem of prevention and mitigation of winter cough is a very great one: no wonder it has taken 140 years to appreciate and heed Isaac Buxton's opinion and suggestions. It may take another 50 years before they are fully carried into practice. Isaac Buxton deserves to be remembered when the history of bronchitis is written.

Reports of Societies

TOXOPLASMOSIS: A WIDESPREAD INFECTION

RECOGNITION AND TRANSMISSION

The Royal Society of Tropical Medicine and Hygiene discussed toxoplasmosis at a meeting on January 17 at Manson House, London. Owing to the increasing number of recorded human infections, especially severe and fatal forms of the congenital disease, much attention has been devoted to *Toxoplasma* in recent years. Infection in man (and animals) has been found in many parts of the world.

Professor P. C. C. GARNHAM (London School of Hygiene and Tropical Medicine) introduced the speakers with the observation that it might be asked why a tropical society should discuss a subject with no special tropical significance. He regretted so little work on the disease had been done in the tropics, and suggested that workers there should look out for more cases, ascertain the incidence in the general population, and define the local animal reservoirs.

Clinical Picture and Incidence

The variety of presentation in human infections was outlined by Professor C. P. BEATTIE (Sheffield). The syndrome in infants might be characterized by internal hydrocephalus or microcephaly, choroidoretinitis, signs of central nervous system involvement, or cerebral calcification. The mortality rate in severe congenital cases was high, and children surviving were usually mentally retarded. At necropsy, distension of the ventricles with yellowish fluid, miliary granulomata, necrosis, and caseation were frequent features, while *Toxoplasma* might be found in the tissues. The disease might be noticed at birth, but could become obvious only days, weeks, or even months later by many signs indicating damage to the nervous and ocular systems. There could be jaundice with a purpuric or maculo-papular rash, enlargement of the liver and spleen, and lymphadenopathy. The frequency of congenital infection was incompletely known. In Britain Professor Beattie put the figure at about 1 in 35,000 live births: from 1950 to the end of 1956 110 cases were diagnosed in children under 5 years in England.

Even with congenital infections, however, severe disease was the exception, said Professor Beattie; and, although in adults acquired disease could be severe, afebrile lymphadenopathy seemed the common mode of presentation.

Surveys indicated that from one- to three-quarters of the populations in different countries possessed antibodies against *Toxoplasma*. Turning to transmission, Professor Beattie suggested that attention should be paid to direct transfer from man to man and to the possible importance of entry via the respiratory tract. He presented figures indicating infection to be commoner in rural areas than in urban localities, and that animal-handlers have a higher infection rate than other occupational groups, as suggested by serological tests. Variation in the virulence of the organism was difficult to explain, but concomitant illness might be important in deciding the severity of the attack.

Serological Tests in Diagnosis

Dr. I. A. B. CATHIE (Hospital for Sick Children, Great Ormond Street) gave the results of investigations on the specificity of the various serological tests for *Toxoplasma*. Several authors had found an unexpectedly high proportion of sera to be positive for the dye test among animals infected with such organisms as *Sarcocystis*, *Trichomonas*, and *Trypanosoma cruzi*. He had been able to substantiate these findings for *Sarcocystis*, but had found that the "toxoplasm-hostile factor" involved could be inactivated by heating at 56° C. He had also shown that properdin did not interfere with the dye test; similarly the results of testing sera from patients with *T. cruzi*, *T. gambiense*, and *Trichomonas* gave no evidence that antibodies affecting the dye test were produced by these organisms. Nor did infection with *Salmonella typhi* or malaria give rise to a positive complement-fixation reaction for toxoplasmosis as reported by some other authors. Dr. Cathie concluded therefore that, so far as the human subject was concerned, the reliability of both the dye test and the complement-fixation test for *Toxoplasma* was upheld. In diagnosis, however, both tests should be used: for example, a dye test of 1:64 with a negative C.F.T. would be of little significance, but an additional C.F.T. titre of 1:16 would be corroborative. From his evidence, Dr. Cathie considered that much experimental work on animals was not applicable to man, at least so far as trichomonad and trypanosome infections and the dye test are concerned.

Animal Reservoirs of Infection

Toxoplasma infection in animals was discussed by Dr. R. LAINSON (London School of Hygiene and Tropical Medicine). Such infections appeared to be world-wide, he said. Whereas no warm-blooded animal species seemed to possess complete natural immunity, it had yet to be proved that cold-blooded animals were infected in nature. It was generally agreed that only a single species of *Toxoplasma* existed.

The study of host reservoirs for human infection was complicated by the extremely wide range of host species and our ignorance of modes of transmission. Among dogs, and only about a hundred cases had been reported where the parasite had been demonstrated, although serological evidence suggested that they might often suffer from chronic infections. Cats, too, often showed antibodies against *Toxoplasma*, but there had been few instances of actual isolation. The organism had also been isolated from cattle, pigs, sheep, rabbits, pigeons, and poultry. Infections had been found in wild rats, but the incidence was apparently not high; occasionally house-mice were infected.

Dr. Lainson stressed that the only absolute proof of infection was the isolation of the parasite, and he discussed how this might best be achieved. After intraperitoneal inoculation of brain tissue into mice he had succeeded in isolating *Toxoplasma* from 6 of 113 domestic rabbits, all of 5 members of the Mustelidae (stoat family), and 1 of 99 *Rattus norvegicus*. No infections were found in 122 wild rabbits, 399 house-mice, and 85 birds. He mentioned also the difficulties in detecting avirulent strains of the parasite. Interpreting these findings, Dr. Lainson concluded that *Toxoplasma* was not uncommon in wild and domestic animals, but normally there was a very well-balanced host-

parasite relationship. The highly virulent forms of *Toxoplasma* were probably aberrant or altered strains. He thought it possible that humans might become infected through handling raw, infected meat—either through cuts and abrasions on the hands or by direct conveyance of parasites to the mouth. Carnivorous animals seemed to be more commonly infected than omnivores or herbivores, and this suggested oral transmission. Cats and dogs were often fed on raw meat, and might, if they became infected, act as sources of the human disease. In an investigation of London dogs he had found that 42% had antibodies against *Toxoplasma*.

Discussion

Opening the discussion, Dr. J. K. A. BEVERLEY (Sheffield) gave case reports in support of Professor Beattie's suggestion that the visceral stage of congenital infection could be eliminated by passively acquired antibodies. He agreed with Dr. Cathie's views on the specificity of the serological tests for toxoplasmosis, and gave illustrations to support this. As to the significance of antibody titres, he considered a dye-test titre of 1:800 and a C.F.T. titre of 1:16 indicated active or very recent infection, but more significant was a rise in titre between the early stages of infection and convalescence. Low dye-test titres might indicate very recent infections or past subclinical ones; the parasites had been isolated in cases showing such low titres.

With regard to the treatment of toxoplasmosis, Dr. Beverley discussed the action of the following drugs: in mice, sulphonamides, diamino-diphenyl sulphones, and diaminopyridines (all effective); in rabbits, pyrimidine-substituted sulphonamides and diamino-pyrimidines (ineffective) and thiazole-substituted sulphonamides and diphenyl sulphones (both good). In acute human infections there was evidence that sulphadimidine and pyrimethamine were effective. In chronic cases chemotherapy might help by preventing future relapses due to rupture of cysts, but could not help in cases with tissue breakdown due to hypersensitivity. Cortisone was often useful in acute exacerbations.

Professor R. J. V. PULVERTAFT (Westminster Hospital) showed an interesting film of the motility and mode of entry of *Toxoplasma* into the host cells, while Dr. J. D. FULTON (National Institute for Medical Research) described useful methods whereby the parasite might be obtained in pure suspension for biochemical assay. Several other speakers described their experience of cases of congenital toxoplasmosis.

Recently a W.H.O. team visited Austria to advise on the health problems raised by the influx of Hungarian refugees. The team was particularly concerned with the risk of epidemics and the mental health of the refugees. Apart from the immediate effects of their journey—cold and hunger—the team reports that the refugees were, generally speaking, in good physical health. Vaccination programmes in Hungary appeared to have been thorough, particularly against smallpox and diphtheria, and precautions were being taken against outbreaks of typhus. The team emphasizes the importance of understanding the psychological difficulties of the refugee in planning help. In spite of individual differences and variations in the causes of flight, refugees the world over had a number of features in common: they were afraid of what they were fleeing from; their attitude towards rules and regulations had changed because they had had to break rules in order to save their lives; they suffered from some form of home-sickness; and they expected a great deal from the country and the people that received them. Unless the many willing helpers appreciated these things, states the team, disappointment on both sides was inevitable, and disturbances would occur. A typical refugee reaction after the triumph of at last reaching safety was to become completely exhausted, to make no effort at all after the tremendous effort of flight. This should be regarded as a normal reaction. What was needed was human contact: anything that bound the refugee to a society should be encouraged.

†At page 132 in the second edition, which was entitled *An Essay on Bronchitis*. London, 1814.

‡Dr. Thomas Beddoes (1760-1808), cited by Buxton on page 98.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Two New Human Genes

SIR.—Your annotation (*Journal*, January 19, p. 154), "Two New Human Genes," on the interesting findings of Allison and McWhirter,¹ conveys the inaccurate impression that the two hypothetical inherited factors "As" and "bt" are well established, like blood antigens or haemoglobin variants. No report about these new factors, based on a large series of families, seems to be available. Moreover, it is not yet known how far the phenomena of beetroot pigment and methane-thiol (methyl mercaptan) excretion are independent of incidental influences, such as rate of absorption from the gut or peculiarities of intestinal flora. Until these matters have been settled it seems premature to discuss the evolutionary significance of the observations.—I am, etc.,

L. S. PENROSE.

London, W.C.1.

REFERENCE

¹ Allison, A. C., and McWhirter, K. G., *Nature (Lond.)*, 1956, 178, 748.

Translumbar Aortography

SIR.—Mr. H. Gaylis and Dr. J. W. Laws, in their account of dissection of the aorta as a complication of translumbar aortography (*Journal*, November 17, 1956, p. 1141), have shown how easily the middle coat of the aorta can be split when the injecting medium goes astray. This easy splitting is, of course, the explanation of the dissection of the aorta in dissecting aneurysm. In 1951 I called attention to the ease with which this can be done by plucking at the inner wall of the aorta with catch forceps.¹ The cleavage is a natural one, as the separation can be readily produced in the aorta of the newly born. What still requires explanation in dissecting aneurysm is the rupture, usually transverse, into the lumen of the vessel which enables the blood to enter and cause the dissection. From the usual situation and size of these tears it seems probable that the rupture is due to physical stress. My colleague, Mr. R. Culver, a senior lecturer in civil engineering now in England on study leave, is interesting himself in the solution of this problem and I am sure would welcome any help or suggestions from our profession.—I am, etc.,

Adelaide, Australia.

J. B. CLELAND.

REFERENCE

¹ Cleland, J. B., *Med. J. Aust.*, 1951, 2, 399.

Toxic Psychosis Caused by "Preludin"

SIR.—Dr. M. F. Bethell (*Journal*, January 5, p. 30) describes a patient who became irritable and suspicious and developed paranoid delusions after taking large amounts of "preludin" for some weeks prior to admission to hospital. The following notes relate to a patient who also showed marked addiction to this substance.

A married woman, aged 31 years, was brought to St. Francis Hospital mental observation ward on October 31, 1956, on an order of a duly authorized officer from a hostel where she had been staying. She had become increasingly restless, agitated, and depressed, and kept craving preludin tablets, to which she had become addicted. She stated that she had started taking them in January, 1956, for slimming, but found that besides decreasing her appetite they gave her increased self-confidence. She had increased the dosage steadily, and for the month prior to admission had been taking 60 tablets a day. However, for about six weeks prior to admission her confidence had waned; she had been sleeping poorly and become increasingly agitated and restless.

Physical examination revealed a generalized erythematous rash (which the patient stated had been present for about three months) and cutaneous hyperaesthesia of the skin of her lower limbs. Mentally she was agitated and restless, apprehensive and

depressed, but had no defects in memory and no evidence of delusions or hallucinations. She became rather aggressive in manner when told that she could not have any more preludin, but after 24 hours in hospital she ceased her demands for it. Her personal history revealed abundant evidence of a "psychopathic personality." She had come from a very disturbed home background, and she had formed no close relationships with either her parents or siblings. She had never worked but drifted around forming transient relationships, and her marriage had broken up and her children been taken from her care. She had been treated at several hospitals for alcoholism and generally had proved a failure in everything she attempted (she described rather interesting parties in Soho and Chelsea, where the guests regaled themselves from bowls of "benzedrine" and "dexedrine" tablets). During the week she was in hospital she gradually settled down and became calmer, possibly aided by chlorpromazine 100 mg. three times a day. She refused to accept a mental hospital vacancy we had arranged for her as a voluntary patient and left hospital on November 8. However, after leaving hospital she recommenced preludin and was admitted to another hospital. Haematological examination revealed no abnormalities (this was done for fear of a blood dyscrasia resulting from prolonged abuse of a new drug).

There seems little doubt that in patients with a "psychopathic personality" any drug, no matter how innocuous its makers claim it to be in the normal dosage, is likely to be taken in dosages never imagined by its sponsors. Whether this justifies the placing of all such preparations in Schedule I is a matter for discussion. For example, aspirin with its known toxic and lethal effects is still freely available, despite the numerous suicides from over-dosage with it.—I am, etc.,

London, S.E.5.

LEWIS CLEIN.

Glycyrrhetic Acid

SIR.—Forgive my intrusion into a correspondence in which originally I had no intention of taking part. Since the "halloo" was sounded by Drs. R. P. Warin and C. D. Evans (*Journal*, August 25, 1956, p. 480), Dr. F. R. Bettley (*Journal*, October 13, p. 882), and Dr. B. Russell (*Journal*, November 10, p. 1113) there has been an almost unseemly rush to be in at the death of a new drug. There must be some explanation why such widely varying results with glycyrrhetic acid have been reported.

At this stage I think it is wise to consider a few general observations which may occasionally be overlooked in the evaluation of any particular form of local treatment. Take, for example, the use of ichthyol calamine liniment in the treatment of dermatitis: (1) It may give continued relief. (2) It may relieve to begin with, but later irritate. (3) It may fail at first, but help later. (4) It may be helpful in some areas—e.g., face, neck, and arms—but only partially help or fail to help on the legs. Variations in response, provided the same batch of liniment has been used, must be due to fluctuation in the primary cause, the degree of reaction at times being greater than the degree of response. This explains the necessity at times for internal measures as well as local treatment.

Some adverse comment has been made with regard to the so-called hydrocortisone-like action of glycyrrhetic acid. I am sure that it will be agreed that among the important effects of hydrocortisone are to be found the following: (1) an anti-pruritic effect—seen in its most dramatic form in some cases of ano-genital pruritus; (2) inflammation-masking effect—best illustrated in some cases of dermatitis of various types; (3) immunity-lowering action—seen in onset of acute impetigo after infantile eczema and a folliculitis after an irritant dermatitis. Each of these happenings has been noted, not possibly so dramatic, with the use of glycyrrhetic acid in the following series of cases.

Treatment was carried out by members of my staff at the Western Infirmary, the Royal Hospital for Sick Children, and the Southern General Hospital in Glasgow, and to these are added a few cases seen in private practice. In some, no control was exercised other than various, and at times numerous, preceding older forms of local therapy. Others were more fully controlled. In suitable cases glycyrrhetic acid ointment, its base, hydrocortisone ointment, and some other older applications were

applied by the ward sister, the clinical observers being unaware of the disposition of the remedies. Response noted did not necessarily mean cure.

In all, 33 patients have been treated: 8 of these were scarcely expected to improve—5 being chronic psoriasis rubra, 1 reticulosis, and 1 tinea pedis, in both of which the ointment was used to see if itch might be relieved, and finally a case of folliculitis—to see frankly whether the condition might be aggravated, as indeed happened. The remaining 25 cases were made up of dermatitis in all its forms: infantile eczema, flexural eczema, seborrhoeic, infective, sensitization, contact, exfoliative and herpetiformis (in the last-named, itch was relieved when other local measures failed), and finally 2 cases of drug eruption. Of the 25, 16 showed improvement, a specific response, 2 a non-specific response (did as well with base), 4 showed no response, and 3 were actually irritated. Of the 18 improved, 7 later relapsed, including the 2 which had shown non-specific improvement.

These results do not suggest that glycyrrhetic acid is a panacea for all ills or even God's gift to dermatology, but they do suggest that any inference or statement that glycyrrhetic acid is an inactive substance is both misleading and wrong. More research is necessary. It may be that a new "isomer" or a salt may be found to be more stable or active and that additional bases or an increase in percentage strength may be required.—I am, etc.,

Glasgow, C.2.

JAMES SOMMERVILLE.

Herpes Zoster and Chicken-pox

SIR.—The article by Dr. R. M. McGregor on herpes zoster, chicken-pox, and cancer in general practice (*Journal*, January 12, p. 84) prompts me to record two case histories of "chicken-pox" developing after exposure to herpes zoster infection.

In the first, I myself developed, some three weeks after examining a typical case of herpes zoster, a generalized eruption resembling chicken-pox. Two weeks later my daughter, then aged 2, produced a similar eruption. Neither of us had had any relevant exposure to chicken-pox, and I had contracted it as a child. In the second, a child of 3 developed "chicken-pox" three weeks after exposure to herpes zoster. In this instance the mother, assisting a neighbour with herpes, was accustomed to take her two children with her and they would play on his bed. I have to-day examined the second child, aged 16 months, with an exactly similar rash appearing 15 days after the first. Once again there are no local chicken-pox contacts.

In my experience the rash in these cases is much less dense than in chicken-pox and the constitutional disturbance negligible. I therefore prefer to believe that it is an instance of the leopard changing his spots and that what we are observing is a form of generalized herpes zoster, analogous to generalized vaccinia, and should be properly so termed.—I am, etc.,

Hanworth, Middx.

G. MELOTTE.

Drug Sensitivity Presenting as Penile Herpes

SIR.—I was interested to read Dr. John E. Underwood's letter (*Journal*, January 19, p. 162) regarding drug sensitivity presenting as a penile herpes. Phenolphthalein and sulphonamides are known to be common aetiological factors in the production of fixed drug eruptions, and the following history illustrates such a case caused by sulphadimidine.

In December, 1952, a miner, aged 26 years, developed circular erythematous patches on the dorsum of the tongue, the left side of the glans penis, the under surface of the penis, and the dorsum of the left hand, the latter showing a vesiculo-bullous eruption. The lesions were accompanied by a burning sensation and were very irritable. At first it was thought that this was a herpes, until he developed identical eruptions following the ingestion of sulphadimidine tablets in October, 1953. It transpired that the patient had a supply of the tablets which remained from the treatment of a relative's illness and which he was in the habit of taking each time he developed an upper respiratory infection. In December, 1953, when free from the latter, he was given a

tablet of sulphadimidine with the subsequent production of lesions in the previously mentioned sites. Within five minutes of taking a tablet the irritation started as a burning and throbbing sensation. On the first day of the attack the lesions were red and erythematous, followed, on the second day, by multiple small vesicles which rapidly became confluent to form a bullous type of lesion. The lesions lasted for five days in all and caused the patient considerable discomfort. After the first attack there was no residual staining of the skin. The second attack, however, was followed by a very faint brownish discoloration of the skin which has remained since.

I am indebted to Dr. Peter Inman, dermatologist at the Royal Infirmary, Sunderland, for his advice on this case of fixed drug eruption.—I am, etc.,

Peterlee, Co. Durham.

W. A. BROWN.

SIR.—The condition mentioned by Dr. John E. Underwood (*Journal*, January 19, p. 162) is well known to venereologists and dermatologists. It is sometimes associated with a urethritis. The syndrome has been fully described in a monograph by my friend and former colleague, Mr. A. H. Harkness.¹—I am, etc.,

London, N.W.8.

REFERENCE

¹ Harkness, A. H., *Non-gonococcal Urethritis*, 1950, p. 301. E. S. Livingstone, Edinburgh.

Neostigmine-resistant Curarization

SIR.—So-called "neostigmine-resistant curarization" cases described by Dr. A. R. Hunter (*Journal*, October 20, 1956, p. 919) have provoked many letters, but no one has been humble enough to suggest that even in these days of modern anaesthesia patients must die. As patients gradually become moribund and die all the signs seen in the neostigmine-resistant cases occur. Surely, when these elderly cases receive such an insult as an intestinal obstruction or perforation some must reach a point of no return, when they must die. I venture to suggest that this "moribund syndrome" would explain why succinylcholine, gallamine, curare, serum potassium, and other biochemical estimations are collectively or severally castigated. If Dr. Albert Christie (*Journal*, December 1, p. 1303) happened to tackle a "moribund syndrome" case with his "less spectacular method" he would view the post-operative peripheral failure, gradual intercostal and diaphragmatic paralysis, and death in proper perspective.—I am, etc.,

Adelaide, Aust. alla.

J. A. SCANLON.

Psychiatry in Africa

SIR.—In his article on neuropsychiatric problems in Nigeria (*Journal*, December 15, 1956, p. 1388) Dr. Adeoye Lambo, within a few paragraphs, makes the following statements: "Some of the native treatment centres which I have seen may well play a useful part in solving our immediate problems. Their psychotherapeutic measures are as effective and as scientifically sound as any I have seen practised in Europe." "It is known that institutionalized confessions, trances, dances, and primitive religious rites and ceremonies, all of which are found to form the basis of the treatment armamentarium of these centres, are powerful psychotherapeutic measures."

Dr. Lambo goes on to quote approvingly another authority who has emphasized "the tremendous psychotherapeutic power which magic has, not only for those for whom it is performed, but above all for the performer himself." He further states that "these native treatment centres claim greater success in the sphere of neuroses [greater than what we are not told]. Some of the medicine-men think that incipient or latent psychosis responds in the same way." I have no wish to minimize the enormous difficulties under which Dr. Lambo and his colleagues have to work in a grossly under-doctored area, but it would be derogatory to his dignity as an African trained in our medical schools to pass some of these remarkable statements without criticism.

(1) Is the claim that psychology and psychiatry are scientific disciplines valid in Western Europe, when their results are reproducible and even bettered by primitive magic in Africa? (2) Dr. Lambo endorses Tooth's statement: "So that, until African psychiatrists can be trained, it would seem better to allow the care of the majority of the insane to remain in lay hands." What conceivable reason is there for training Africans in the principles of Western psychiatry if their own psychotherapeutic measures practised at the natives centres "are as effective and as scientifically sound" as any seen in Europe?

The *B.M.J.* is the official organ of the B.M.A., one of whose primary objects is the promotion of the medical and allied sciences (*B.M.A. Year Book*, 1956-7). You, Sir, have an annotation (p. 1420) on Dr. Lambo's article without once commenting on the use of magic in medical treatment, so patently commended by the author. I should be glad to know how you reconcile this omission with the declared objects of the Association.—I am, etc.,

Glasgow, W.2.

A. STEWART HENDERSON.

REFERENCE

¹ Tooth, G., *Studies in Mental Illness in the Gold Coast*, 1950. Colonial Res. Publ. No. 6. H.M.S.O., London.

Common Infectious Diseases in General Practice

SIR,—Dr. G. I. Watson's excellent article on common infectious diseases in general practice (*Journal*, January 5, p. 39) is indeed thought-provoking. I would take issue with him on one point particularly, and that is his "German measles tea parties" for schoolgirls. It is believed that permanent immunity almost always results from a single attack of rubella. But how effective is this "tea-party" immunity and what degree of protection will still exist after perhaps 10 or 20 years? Secondly, there is an obvious risk that some of the "tea-party" girls might have mothers in the early stages of pregnancy. Also, what about the girls that would contract a mild infection or show no symptoms or signs at all? Could it be assumed that this was due to inherent immunity, or should they be exposed to a further attack and, if so, when? Lastly, German measles is usually a minor ailment, but the possibility of severe infection and even neurological complications cannot be ruled out. Much more experience is required before such an unusual procedure can be recommended.—I am, etc.,

Taunton.

J. G. P. POWER.

REFERENCE

¹ *Memorandum on the Closure of Schools and Exclusion from School on Account of Infectious Illness*, 1956. Jointly issued by Ministry of Education and Ministry of Health. H.M. Stationery Office, London.

Tonsils and Adenoids

SIR,—I read with interest Dr. John Fry's article, "Are All 'T's and A's' Really Necessary?" (*Journal*, January 19, p. 124). That he is not the first to ask this question enhances rather than reduces the value of his observations. While I am in substantial agreement with these, may I be allowed to make a few comments?

(1) He does not distinguish clearly between the indications for tonsillectomy and adenoidectomy. Although, for practical reasons, the two operations are often performed at the same time, it is important to realize that the indications are distinct and that it may be correct to perform one only. I have in mind particularly adenoidectomy without tonsillectomy. (2) In adults tonsillectomy is rarely criticized because, when done for good reasons, the result is only beneficial. It is probable that the pathology of "chronic tonsillitis" in adults and children is not quite the same, but perhaps sauce for the goose is sometimes sauce for the gosling. (3) There seems little doubt that the tonsils have a definite function in early childhood, as the late A. J. Wright suggested in his Semon Lecture in 1949.¹ The removal of tonsils which are still functioning may result in compensatory hyperplasia of the other lymphoid structures of the pharynx. As this may cause a chronic sore throat which is almost untreatable, we must certainly be

chary of operating on young children unless the reasons are very good. In my experience this does not apply to adenoidectomy.

We should ask ourselves, "Is it really necessary?" before advising any operation, and this is particularly so with tonsillectomy.—I am, etc.,

Taunton

PETER HUGGILL.

REFERENCE

¹ Wright, A. J., *J. Laryng.*, 1950, 64, 1.

SIR, Unfortunately, provocative articles in medical journals are eagerly seized on by the popular press, as in the case of Dr. John Fry's paper (*Journal*, January 19, p. 124). As a result, an operation which Dr. Fry admits to be useful and valuable in its place tends to be discredited in the public mind. Surely the fact that the number of tonsillectomies per 100 children has fallen by half in the past twenty years is evidence that the more critical approach sought by Dr. Fry already exists.

A list has been given of "the most usual reasons" for operation, which ought not to be confused with the indications, although Dr. Fry has combined them. Among the proper indications are several not mentioned—after peritonitis, which does occur in childhood (tonsillectomy), chronic otitis media maintained by nasopharyngeal infection, persisting conductive deafness, and chronic suppurative sinusitis (adenoidectomy). Borderline cases are decided between the G.P. and the E.N.T. surgeon: the latter is no more "in a quandary" than is any surgeon when asked to see any patient referred from a practitioner for consideration of an operation. Lastly, many adult tonsillectomies are still required in spite of the high rate of incidence of operation in children in the past.—I am, etc.,

Maidstone.

J. D. TRETOWAN.

SIR,—Dr. John Fry's interesting and stimulating paper on tonsillectomy (*Journal*, January 19, p. 124) would have been of greater scientific value if it had been possible to include two control series from other practices. Dr. Fry's statistics suggest that the harmful effect sometimes produced by enlarged tonsils and adenoids often disappears, but takes some years to do so. It would be of interest to know whether this period is significantly cut short (1) where tonsillectomy is done as a routine, and (2) where cases are selected but the net is spread much wider than in Dr. Fry's practice. Three points would be worth considering in particular: the amount of medical attention required for, say, three years after operation; the rate of growth; and absenteeism from school. If these are significantly affected, surely most doctors and parents would agree that operation was worth while at a time of life when satisfactory development is so important.

My first eight years in practice were in an industrial area, where definite indications for removal of tonsils and adenoids seemed very frequent. It was usual for the children to grow more rapidly, and not to need attention for ailments of any kind, for two or three years after operation. With rare exceptions the operation was done at home, in any kind of home. Possibly that is why psychological trauma did not occur. One boy, seeing the benefit to his elder brother, asked to have his own tonsils removed. Complications were very rare. There were no sulphonamides then, but also no cross-infections in the patient's own home.—I am, etc.,

Bracknell, Berks

L. G. JACOB.

SIR,—Dr. John Fry's stimulating and provoking article (*Journal*, January 19, p. 124) shows a capacity for statistical research. He neglects, however, the most important factors. "A prophylactic ritual carried out for no particular reason with no particular result." This misstatement by the M.R.C.¹ offers the answer. There is a reason. There is a result. The sacrifice of lymphoid tissue pacifies the parents and relieves the general practitioner of anxiety and frustration.

What is the family doctor expected to treat? A natural hypertrophy? A sore throat without pathogens? A running nose in a child that neither sniffs nor blows? Mechanical

irritative and obstructive features of the upper respiratory tract? Not surprisingly, the results are bad. Why does the family doctor treat the child? Mother's complaint that the child is always ill is belied by its appearance. Her continuous anxiety, despair, guilt, and agitation are transferred to the practitioner, and "Something must be done" leads to the mutilation. It must not be assumed that all cases of recurrent catarrh and sore throats are brought to the doctor. Witness the children running to school coughing, spluttering, and noses dripping, but still laughing and happy. Surprisingly, no comment has been offered on the child's own reaction to his illness: the warmth and comfort of bed, the attempt at spoiling, the singling out from the siblings for extra favours, and the holding up to ransom of the parents. Even where the inner need for retributive punishment is causative, where the child hates the enforced rest, these factors may easily be elucidated.

The mother's overt anxiety is accepted as a direct result of the child's condition. Her related deeper anxieties, unconscious like her guilt, remain unrecognized and indeed neglected. Irrespective of her aggression to the child or her over-indulgence of it, these are the factors at play. The mother desires cure of her own illness and offers a sacrifice. The result of operation relieves mother's anxiety temporarily, and the assessment of improvement is of her own condition. The child's growing-up problems, his jealousies, fears, and difficulties of adjustment—in these spheres lies the answer to the catarrhal child. The problem is one of utilization of illness by the parents and, less commonly, the child, sickness that is rarely infective or allergic but is almost always psychogenic.

Dr. Fry describes anxiety in the child's parents, relatives, and teacher, but offers them a policy of *laissez faire* and sympathy. He prefers to wait for the child to grow out of his catarrhal stage to save enormous operation costs, but this will not affect the mental health of the mother, nor make her a less frequent visitor to his surgery. A direct psychotherapeutic approach and the elucidation of the meaning of the illness to the mother is required. He finds anxiety and agitation in everyone but the child, and offers sympathy instead of psychotherapy. Over the past two years I have seen no child deserving tonsillectomy but many mothers requiring psychotherapy. Correlation of the pre-Oedipal and Oedipus phases with the normally accepted illnesses of childhood has yet to be finally assessed. In the hands of the general practitioner lies the opportunity for increasing efficient psychotherapy and less referral to otorhinology.—I am, etc.,

Sidcup.

L. A. NICHOLS.

REFERENCE

¹ Medical Research Council, *Spec. Rep. Ser.*, 1938, No. 227.

Sudden Infant Deaths

SIR,—The paper on sudden unexpected death in infants by Dr. J. L. Emery and Miss E. M. Crowley (*Journal*, December 29, 1956, p. 1518) does not in our view help to elucidate this difficult problem, and may in fact give false impressions. While we agree that the case history taken by the coroner's officer may be at variance with that taken by the parents in a different manner, it is subsequently by one trained in a different manner, it is doubtful if either version can contribute materially to producing a more accurate diagnosis in obscure cases. Many of some interest had the authors interviewed 50 control mothers whose babies did not die. Following the tragedy of an unexplained death it is the natural tendency of both parents to remember and magnify a minor ailment, which may or may not be of importance. The group showing no significant symptoms remains.

Do the authors really believe that, had some attention been paid to the symptoms, many of the cases could have been diagnosed and treated? We have carried out been diagnosed and treated? We have carried out been necropsies when the symptoms prior to death were absent or minimal, and no satisfactory cause could be discovered

either histologically or bacteriologically. They represent about a third of the cases of sudden death in infants, and we think that such a view would be unfair to both the parents and the family doctor. The authors' statement that their policy is "to give some definite cause of death at inquests" puzzles us. What causes do they give in such cases? Do the authors feel that it is safe to put a baby in a cot with a pillow, especially when it is ailing? We fear that it will be necessary to suspend judgment in this important matter until new methods of examination for virus infections become available to the routine pathologist.—We are, etc.,

E. S. DUTHIE.

R. A. GOODBODY.

Southampton.

Bolus Obstruction

SIR,—I feel that brief mention of the following two cases may be of interest, particularly at this time of year. During the course of one afternoon two men were admitted to the Merthyr General Hospital from widely separated areas. Both gave a history of severe upper abdominal pain and vomiting for six hours. The possibility of an acute pancreatitis or perforated peptic ulcer was considered and a laparotomy was performed in each case. Both were found to have a brussels sprout impacted in the ileum, in one case 1 ft. (30 cm.) and in the other case 2 ft. (61 cm.) from the ileocaecal valve. The obstruction was relieved by removing the bolus, and recovery ensued. I do not recollect seeing mention of brussels sprouts among the numerous food materials cited as causes of bolus obstruction, and these cases illustrate their potential danger if not properly masticated. Once again, it may be said that food which enters as a friend may become an enemy in our midst.—I am, etc.,

Merthyr Tydfil.

R. J. WILLIAMS.

Advertisements for Cigarettes

SIR,—The leading article on mortality and smoking (*Journal*, November 10, 1956, p. 1104) ended with these impressive words: "The new evidence now published makes it more than ever imperative for all concerned to see that the public is repeatedly informed of the possible dangers to health and life from smoking cigarettes." But the same issue of the *Journal* carried a full-page advertisement for one brand of cigarettes. My inquiry about this striking inconsistency was referred to the Journal Committee, which has since resolved that no action should be taken. Its policy remains "to take advertisements for cigarettes, provided the 'copy' is acceptable."

To continue advertising cigarettes in the face of the overwhelming medical evidence of the dangers of tobacco addiction can only be considered extremely reprehensible, more especially when we recall that the most damning indictment is based upon the high death rates among heavy-smoking doctors (Dr. R. Doll and Professor A. Bradford Hill, p. 1071). The *Journal of the American Medical Association* refuses to carry tobacco advertisements. This enlightened attitude was urgently adopted in 1954—when the mortality rate from bronchogenic carcinoma in the United States was only half that in England. What possible excuse can the *British Medical Journal* offer for not following this example? In protest against the *Journal's* refusal to practise what it preaches, I am tendering my resignation from the B.M.A.—I am, etc.,

Leicester.

J. P. ANDERSON.

Carcinoma of Cervix and Corpus Uteri

SIR,—It is commonly held that carcinoma of the cervix uteri is much more common than carcinoma of the corpus—e.g., Anderson,¹ "Carcinoma of the cervix composes about 90% of all uterine cancer"; Novak,² "In round figures it may be said that about 1 out of every 8 uterine cancers will be found to be of the body type"; and Willis,³ "Broadly it may be said that cervical carcinoma is three or four times

as common as endometrial." Probably the proportion given by Willis is that found in the large industrial centres of Great Britain, but this may be untrue in rural areas. In this rural area carcinoma of the cervix has formed only about one-third of the total cases of uterine carcinoma during the past few years, and Dr. E. M. Martland tells me that for many years before this it has formed only a small proportion. This low proportion is not due to patients with cervical carcinoma by-passing the hospital here by being sent direct to a radiotherapy centre, and biopsies are taken here irrespective of whether further treatment is to be surgical or by irradiation.

The table shows the figures from (1) a large industrial centre, (2) two mainly rural areas, and (3) from three rural areas.

Centre	Period (Months)	Carc. Cervix	Carc. Body	C/B
Jessop Hosp., Sheffield	24	127	44	2.91
Carlisle	39	102	78	1.31
Winchester	60	65	50	1.30
Portsmouth	36	111	89	1.20
Bournemouth	24	31	34	0.94
Salisbury	24	16	30	0.53

It would be unwise at the moment to speculate on possible reasons for a difference in incidence between industrial and rural populations. Far more figures than those given above are necessary to establish that there is in fact such a difference. I should be grateful to receive figures from pathologists throughout the country, and meanwhile I thank Drs. C. G. Paine, J. S. Faulds, H. G. H. Richards, J. D. Clay, and T. K. Owen for the figures quoted above.—I am, etc.,

General Infirmary,
Salisbury, Wilts.

REFERENCES

- Anderson, W. A. D., *Pathology*, 1948, St. Louis.
- Novak, E., *Gynecologic and Obstetric Pathology*, 1952, 3rd ed. Philadelphia.
- Willis, R. A., *Pathology of Tumours*, 1948, London.

Congenital Absence of Spleen

SIR,—Your annotation (*Journal*, January 19, p. 153) states that congenital absence of the spleen is a rare anomaly. In a series of 126 cases of congenital abnormalities of the heart and great vessels coming to necropsy, mostly in the first year of life, I have encountered three cases in which the spleen was absent; two showed dextrocardia associated with Fallot's tetralogy and ostium atrioventriculare commune respectively, while the third showed transposition of the great vessels; in none was situs inversus of any abdominal viscera present.

The assessment of the rarity of a condition rests largely upon the frequency with which it appears in the literature. Congenital anomalies of the heart of sufficient severity to cause death within the first few weeks of life are generally not considered of sufficient interest to warrant publication, but it is in this group that absence of the spleen is most common. Since the anomaly probably arises in the fifth to seventh week of intrauterine life it would be surprising if it were not a relatively frequent incidental finding in any series of infantile deaths due to severe cardiac anomalies.—I am, etc.,

London, E.2.

N. E. FRANCE.

Pregnancy Sickness

SIR,—Recent letters from Dr. Doreen S. Ball (*Journal*, December 22, 1956, p. 1487) and Dr. R. Bauer and Dr. Margaret MacFetridge (*Journal*, January 12, p. 105) provide further evidence of the complete failure of research into the aetiology of pregnancy sickness. Further evidence, if any is needed, is provided by the multiplicity of drugs, diets, and routines recommended by the different adherents, and, incidentally, all of them equally useless. Dr. Bauer suggests an allergic basis for some of the cases, and on that ground

explains the effectiveness of antihistamines in some. On the other hand, is it not possible that the success of antihistamines might be due to (1) suggestion, (2) sedative action, and/or (3) an action similar to that in travel sickness? Dr. MacFetridge feels that it is possible that the trouble may be due to hormonal imbalance, and describes the sickness and nausea caused by stilboestrol (taken to stop lactation) as identical to the nausea and vomiting of pregnancy. Here again there seems to be an anomaly, because large doses of stilboestrol seem to be very well tolerated when given to terminate lactation. Similarly, large doses are well tolerated indefinitely when given to men with carcinoma of the prostate.

Finally, there are a number of cases of pregnancy sickness which never reach either the antenatal clinics or the obstetricians. I refer to sickness in "expectant fathers." Reference to the literature reveals little mention of this type of sickness. F. J. Browne¹ mentions one case reported by Atlee in support of his psychological theory. I am sure, however, that this type of sickness is much more common than is generally appreciated. Over the past year I can call to mind four cases of men who suffered from typical pregnancy sickness. In each case the sickness of the wife was much less than with previous pregnancies. In one case pregnancy was not even suspected (so I am assured) and sickness was absent in the wife but typical in the husband. In another case sickness was controlled in both husband and wife by a widely advertised pregnancy sickness tablet. It would seem that here is a condition which could be the subject of large-scale research by general practitioners under the supervision of the College of General Practitioners. I am, etc.,

Nuneaton, Warwicks.

REFERENCE

- Browne, F. J., *Antenatal and Postnatal Care*, 1955, London.

Incidence of Diphtheria

SIR,—The fall in the incidence of diphtheria in the past few years is much more striking than is shown in your table (*Journal*, January 19, p. 176), which is evidently based on uncorrected notifications. The figures for corrected notifications, as published by the Registrar-General, are approximately one-quarter of those in your table. During 1954 and 1955 the total corrected numbers of cases for the whole year were approximately one-fifth of the average weekly numbers in the pre-immunization period.—I am, etc.,

London, W.C.2.

H. I. WINNER.

Rupture of Hind-waters and Haemorrhage

SIR,—I have read the report by Dr. J. K. Russell, Mr. D. F. Smith, and Mr. R. Yule (*Journal*, December 15, 1956, p. 1414) with interest. In their discussion they mention their practice of sweeping the membranes off the lower uterine segment as far as it can be reached with the examining finger before puncturing the hind-waters with the Drew Smythe catheter, but point out that the placenta may not be reached.

With this instrument the amniotomy is performed through an area which cannot be assessed by palpation; bleeding is a frequent occurrence as a result of passing the catheter between the placenta and the uterine wall, and should be an indication for its withdrawal and passage in a direction at least 90° from the original. With low puncture of the membranes and drainage of the fore-waters the amniotomy is performed through a part of the membranes which has been palpated and may even have been visualized, hence disruption of the placenta from its site is obviated. Only once out of many hundreds of cases have I seen foetal bleeding occur, from an unsuspected vasa praevia, in a case of induction by low puncture of the membranes.

In the two cases reported the causes of death are given as being due to or contributed to by the exsanguination, yet the haemoglobin in the child delivered alive was estimated

at 10.3 g. per 100 ml. and the amount of blood lost 90 ml. In the other infant the loss was heavier. However, both these were the offspring of mothers suffering from toxæmia of pregnancy, and in one case (the stillbirth) labour occurred nine days after her expected date of delivery. The post-mortem findings in case 1 are consistent with the baby having died from toxæmia, possibly aggravated by the blood transfusion, but the abrupt cessation of the carefully recorded foetal heart in the early stages of labour at or about 10 days over term is common. It would thus seem that, though blood loss from the foetal circulation is to be avoided, neither of these deaths can truly be laid to this cause.

In these two case reports, and according to their "invariable" practice of sweeping the membranes off the lower uterine segment, it would appear that the os admitted the examining finger with ease, and I suggest that, given such conditions, low puncture of the membranes is a safer procedure for the foetus and a more certain method of inducing labour without the time-lag of 24-36 hours usual with draining the hind-waters. The examining finger in such cases is also able to exclude the presence of a cord presenting with danger of prolapse at the time of "bursting of the waters," whether spontaneous or artificial.

As a method of induction of labour the Drew Smythe catheter has another disadvantage, shown by Dr. Russell and his colleagues, to add to the uncertainty of the method, the slow response where successful, the danger of placental separation (especially in toxæmia where repeated small infarcts may have brought the placental sufficiency to a borderline level), and the danger of intra-amniotic infection by contamination.—I am, etc.,

Nova Scotia.

HENRY FITZGIBBON.

Vaginitis

SIR,—We were very interested in your annotation entitled "Vaginitis" (*Journal*, January 19, p. 155), for in this clinic we treat a considerable number of cases of vaginitis due to *Trichomonas vaginalis* and to *Candida albicans*. We are surprised, however, that you recommend the use of "an oral trichomonicide such as aminitrazole." Our own experience with trichomonicides, including aminitrazole, has been most discouraging. Administration of aminitrazole alone, unsupported by local treatment, has, as far as we have been able to observe, no therapeutic effect whatsoever. It therefore seems to us unlikely that this drug contributes in any way to the efficacy of the scheme of treatment described. We should be interested to know details of the experience of others with oral trichomonicides.—We are, etc.,

London, E.1.

R. D. CATTERALL.
E. M. C. DUNLOP.
EVA GALLAGHER.

Varicose Ulcers

SIR,—The logical and successful treatment of any disease depends upon the knowledge and application of certain fundamental principles. This applies no less to the healing and prevention of varicose ulcers. The number of diverse treatments for varicose ulcer is mainly due to lack of understanding or failure to apply these principles.

First, it is necessary to understand the process of repair. A surgical wound, even though strictly aseptic, is not bacteriologically sterile. Carrel¹ demonstrated that an aseptic wound will not heal if all debris and blood clots are removed and the wound is protected from outside irritation. An open wound heals from below by granulation, and the youngest tissue is at the surface; it is highly vascular and bleeds readily. Healing is delayed if these granulations are torn off or caused to bleed. The use of antibiotics in treating a varicose ulcer is unnecessary and may retard healing. It does not matter what sort of dressing is used on the ulcer, provided the patient is not sensitive to it and provided it does not stick to or in any way damage the granulations.

Secondly, it is necessary to understand and apply the teaching of Hilton.² A varicose ulcer can be completely at rest when the patient is walking about and is not necessarily at rest when the patient is in bed. To immobilize a varicose ulcer the leg should be bandaged from the toes to the tibial tubercle, and the heel must be included. It does not matter what sort of bandage or support is used, so long as there is a firm, even pressure to the skin. If the bandaging is efficient it will control the high-pressure venous leaks in the deep fascia in the same way that a truss controls a hernia. The so-called calf pump is repaired, and when the patient walks the blood supply to the ulcer is improved, and also the oedema rapidly disappears. Activity is therefore an essential part of the treatment.

By applying these principles I have been able to heal every varicose ulcer I have treated, except one which was owned by a lady who persistently removed her bandages. I include patients whose work involves standing all day and who continue to work during treatment, and one patient with an artificial limb. Zinc oxide spread on gauze is a convenient and cheap dressing which does not stick. Two 4-in. (10-cm.) crepe bandages are far more comfortable for the patient than "elastoplast" or elastic webbing and are much easier to apply. Patients with ulcers less than 2 in. (5 cm.) in diameter I treat in the normal course of the surgery and can dress and bandage them in less than five minutes. In conclusion, there is no more grateful patient than one whose varicose ulcer has been healed without time off from work, particularly if he has previously had operative treatment. In order that he shall remain grateful it is necessary to explain that his ulcer will recur unless he continues to wear support for most of the time and to advise him to raise the foot of his bed about 3 in. (7.5 cm.).—I am, etc.,

Staines, Middx.

REFERENCES

- Carrel, A., *J. exp. Med.*, 1921, 34, 425.
- Hilton, J., *Rest and Pain*, 1863, London.

PETER DARBY.

Antibiotic Cover for Dental Extractions

SIR,—We have read the letters from Dr. R. Cutler and Mr. Adrian Cowan (*Journal*, January 19, p. 162). It was our sincere hope that our communication (*Journal*, December 29, 1956, p. 1501) would revive interest in the fundamental observations of Okell and Elliott¹ and later of Elliott,² that a *Str. viridans* bacteraemia follows not only the major trauma of dental extractions but also the rocking of teeth in infected gum sockets in the course of mastication and teeth grinding.

The mouth, gums, and dental sockets are the normal habitat of *Str. viridans*, and it is improbable that by any local or systemic medication the organism will be eliminated even for short periods of time. It is our belief that so long as teeth or dental remnants are present in the jaws the ideal mechanism is present to produce a *Str. viridans* bacteraemia. For any patient who has developed subacute bacterial endocarditis due to *Str. viridans* we believe that this dangerous mechanism should be completely eliminated. In the cases referred to in our communication the opinions upon the teeth of our patients were those expressed by the clinical dental staff of the hospital and the radiologists whose opinion was sought in specific relation to the possibility of any evident and treatable source of infection in the teeth or gums. "Good" indicated that no defect was detected by either dentist or radiologist; "bad" indicated that defects were present. Whatever steps are taken to promote the more rapid healing of a dental socket after the extraction of a tooth, these are unlikely to control the bacteraemia incidental to the extraction.—We are, etc.,

Oxford.

REFERENCES

- Okell, C. C., and Elliott, S. D., *Lancet*, 1935, 2, 869.
- Elliott, S. D., *Proc. roy. Soc. Med.*, 1939, 32, 747.

F. G. HOBSON.
B. JUEL-JENSEN.

Obituary

C. L. GIMBLETT, M.D., F.R.C.S., M.R.C.P.

Mr. C. L. Gimblett, formerly senior surgeon at the Westminster Branch of Moorfields Eye Hospital, died in the Westminster Hospital on January 21, aged 66.

Charles Leonard Gimblett was born on June 19, 1890, the only son of Robert Wheddon Gimblett, of Somerset. From Clifton College he went on to Gonville and Caius College, Cambridge, where he took the Natural Sciences Tripos, continuing his clinical studies at St. Thomas's Hospital. Qualifying in 1914, he graduated M.B., B.Ch. the following year, proceeded to the M.D. in 1918, and took the M.R.C.P. in 1919 and the F.R.C.S. in 1922. At St. Thomas's he was casualty officer, house-surgeon, house-physician, resident anaesthetist, and senior ophthalmic house-surgeon, but before completing this impressive series of house appointments he served from 1915 to 1919 in the Royal Navy, like so many of his name. Early in his career he decided to devote himself to ophthalmology, and during part of his wartime service he was in charge of the eye departments at the Royal Naval hospitals at Portland and Chatham. In 1923 he was appointed assistant surgeon to the Royal Westminster Ophthalmic Hospital and ophthalmic surgeon to the Royal Northern Hospital, and he was also ophthalmic surgeon to the East Ham Education Committee, for which he prepared a report on the incidence of myopia in the schoolchildren in the borough during the years 1920 to 1926. In 1927 he became full surgeon at the Royal Westminster Ophthalmic Hospital, and twenty years later senior surgeon there, retiring from the active staff last August. During the second world war he worked at the Haymeads Hospital, Bishop's Stortford, and was appointed to the staff of the General Hospital in that town. For nearly twenty years he was a member of the staff of the Lord Mayor Treloar Orthopaedic Hospital at Alton, a hospital for which he always had a very great love. Last July he was appointed emeritus consultant there, and he remained chairman of the medical advisory committee up till the time of his death.

Orthoptics was Mr. Gimblett's special interest, but he wrote on a variety of subjects and contributed the chapter on eye diseases in Romanis and Mitchiner's *Science and Practice of Surgery*. In 1949 he was elected vice-president of the Ophthalmic Section at the Royal Society of Medicine.

Mr. Gimblett married Audreen Isobel McKenzie McNicol in 1935, and she survives him with two sons.

G. G. P. writes: Mr. Gimblett was keenly interested in orthoptics, carrying on the work of Claud Worth, whose practice he took over, and on the inception of the orthoptic department at the Royal Westminster Ophthalmic Hospital he was appointed medical officer in charge. He was also the first chairman of the Orthoptic Board. A clinical ophthalmologist of the best kind, he never spared himself and was always painstakingly thorough in his work. It was with the utmost difficulty that he could be persuaded to take a holiday. In spite of two severe illnesses he continued his hospital work, even going on after the normal retiring age when asked to do so. He continued with his private practice right to the end. He was beloved by his patients, with whom he was patient and tactful to a degree, and by his colleagues, to whom he was a loyal and faithful friend and who always enjoyed his charming sense of humour. His services were invaluable as chairman of the

medical committee and on other committees at the Westminster Branch of Moorfields. He had a fine collection of books on mediaeval art. His delight when he did take a holiday was to go to the Mull of Kintyre with his family and have a sailing holiday. All his many friends will extend their deepest sympathy to Mrs. Gimblett and her sons in their grievous loss.

J. D. BENJAFIELD, M.D., D.P.H.

Dr. J. D. Benjafield, formerly bacteriologist at St. George's Hospital, died in his sleep at his home in London on January 21. He was 69 years of age.

Joseph Dudley Benjafield was born in London on August 6, 1887, the son of Dr. W. B. Benjafield, and was educated at Marlborough College and at University College Hospital, London. He qualified by taking the London Conjoint diploma in 1909, and in the following year he obtained the London University degrees of M.B., B.S., with honours in medicine. He proceeded to the M.D. in 1912, and in 1924 took the D.P.H. of the English Royal Colleges. After qualification he held the appointments of house-surgeon at the Evelina Hospital for Sick Children and house-physician at University College Hospital. From 1913 to 1920 he was bacteriologist to the Western Skin Hospital, in the Hampstead Road, and the Kensington, Fulham, and Chelsea General Hospital, and, later, to the All Saints' Hospital for Genito-urinary Diseases. He served in the R.A.M.C. from 1915 to 1919 during the first world war and from 1940 to 1942 in the second world war. After demobilization in 1919 he was appointed assistant bacteriologist at St. George's Hospital and lecturer in bacteriology in the medical school, where subsequently he became lecturer in clinical pathology.

In his younger days Benjafield was a well-known racing driver of Bentleys at Brooklands and Le Mans, where, with Mr. S. C. H. Davis, he won the Grand Prix d'Endurance in 1927. Two years later he came in fourth. A founder member of the British Racing Drivers' Club, he was a vice-president and former treasurer. His enthusiasm was infectious and did much to encourage British drivers to enter for the Le Mans events and similar meetings on the Continent. He leaves a widow and a son.

J. A. B. writes: Benjafield was not a learned bacteriologist. He was, in fact, a clinical pathologist whose theory and practice were derived from the time early in this century when it was hoped that the lessons of bacteriology might be applied usefully not only to the diagnosis but to the treatment of the individual patient. The fashion waned (until revived by antibiotic treatment), but Dudley remained faithful to the meticulous examination of cultures from every orifice of the body and to treatment with vaccines from these sources. The theory may have been unsound and its application outmoded, but he remained a successful and much-loved consultant because each one of his patients, in hospital and in Harley Street, was to him an individual with whose troubles he sympathized and for whom he did his very best. When he went on holiday he used to leave me a catalogue of notes on expected patients, which were masterly summaries not only of their ailments but of their virtues and failings.

Although he put on weight quite early in life his energy was amazing. He performed his teaching and other duties at St. George's scrupulously. He held appointments at other hospitals, and his private practice was very large. He always arrived in a hurry (and in later years rather out of breath), but time was never too short for his cheerful courtesy to great and small. He played as hard as he worked. Others can tell of his motor racing; I found a journey in his car

unrestful. When he abandoned this sport for fishing he became a skilful if rather petulant angler, but there were no bounds to his enthusiasm. A few hours after salmon in the Teifi were to him well worth a drive to West Wales and back crammed into a short week-end. He appreciated personal and material elegance, and he liked the pleasures of the table. Above all, he liked the life he led, and retirement had no attraction for him. He had few illusions about his fellow men and none about himself. Many of us must be grateful for having enjoyed his friendship.

Dr. REX BINNING writes: I first met Dudley Benjafield when I was a student at St. George's Hospital. He was a popular figure among the students, for his prowess as a racing motorist was well known. He was a most patient lecturer and demonstrator of bacteriology and an excellent teacher of laboratory technique. In addition to being a first-class bacteriologist he was also a very wise and shrewd clinician. As students, we learned to respect his ready wit and biting tongue, but it never left a mark except upon the pompous or petty-minded. Dudley Benjafield was always young in mind, and had many friends among his juniors. His counsel was often sought, but never in vain. In 1941 I shared a cabin with Benjafield in a crowded troopship I then making the long and tedious voyage round the Cape. I then came to know him better and to admire his active mind and capacity for work. He decided to write his reminiscences of his motor-racing days, and on hot sweltering afternoons in the tropics, when most of us were lying in our bunks, he would be writing the 3,000 words that were his target for the day. At night, after perhaps an evening playing poker, he would read over to me what he had written. When I myself was confined to my bunk with a carbuncle he was kindness itself, directing the treatment, doing the dressings himself, and bringing me my meals. Dudley Benjafield will be mourned by a host of friends, who will remember him for his zest for life, for his wit, his charm, and for many acts of kindness that were known only to a few.

CHARLES NOON, O.B.E., F.R.C.S.

Mr. Charles Noon, formerly senior surgeon to the Norfolk and Norwich Hospital, died at his home at Norwich on January 19 at the age of 71.

Born in Leicester on November 22, 1885, Charles Noon was educated at Blairlodge School, Stirling, and at St. Bartholomew's Hospital Medical School. Qualifying in 1910, he held the appointments of house-surgeon and resident anaesthetist at St. Bartholomew's Hospital, and house-physician at the Royal Northern Hospital, and resident chief assistant to the department of gynaecology at St. Bartholomew's Hospital. Having taken the F.R.C.S. in 1914, he went to Norwich in the following year as a major in the R.A.M.C., taking charge of the surgical section of the Thorpe War Hospital, a post which he held until the end of the war. For his services there he was appointed O.B.E. in 1919. In that year also he was elected assistant surgeon to the Norfolk and Norwich Hospital, becoming full surgeon in 1932 and senior surgeon in 1946. He retired from the active staff in 1955. He was also consultant surgeon to many local hospitals, including St. Andrew's Hospital, Thorpe, the West Norwich Hospital, and the Jenny Lind Hospital for Children. Always keenly interested in the welfare of war pensioners, Mr. Noon was at one time surgeon-in-charge of the Ministry of Pensions out-patient clinics and limb-fitting centre at Norwich. Treatment of malignant disease by radium therapy was a method which he had studied closely, and over thirty years ago he had purchased his own supply of radium, which he used freely in the hospitals to which he was attached. During

the second world war he was once again in charge of the Thorpe Hospital, this time under the Emergency Medical Service. Since the inception of the National Health Service he had been a member of the surgical advisory committee of the East Anglian Regional Hospital Board.

He married Cicely, daughter of Mr. F. South, and she survives him, together with one son.

J. M. R. T. writes: Charles Noon was a shrewd and far-seeing man whose advice and guidance, willingly given, were always of the utmost value. To those who met him for the first time he could give the impression of being remote and even cynical, but to the few who were privileged to know him well real kindness was the mainspring of his personality. Surgery was the absorbing interest of his life. Gifted with a profound clinical instinct, he taught generations of registrars and housemen to use their five senses rather than to rely on the "investigations" judged indispensable in the surgery to-day. His out-patient clinics, ward rounds, and operating sessions were enlivened by his forthright personality, his great store of surgical aphorisms, and his wide knowledge of medical history. He was a man who never suffered fools gladly, and he always expected everyone to give of his best.

Charles Noon was an enthusiastic bibliophile and collector, but among his many treasures his books and papers relating to every facet of the medical work and history of Bart's took pride of place. His enthusiasm and admiration for his own teaching school never waned. It was an education in itself to hear him talk when surrounded by the *lares et penates* which he had acquired with the discerning patience of a connoisseur.

P. S. FLEISCHMAN, M.D.

Dr. Paul S. Fleischman, who might be regarded as the doyen of the group of German doctors who came to Britain in the days of the Third Reich, died in the Regent's Park Nursing Home on January 16 after a short but not unexpected illness at the age of 77.

He was born on July 23, 1879, of a well-known banking family at Fürth, in Bavaria, and on his mother's side he was related to the famous Romberg. His school days were spent in Berlin, but he returned to Bavaria for his medical studies at Munich, where one of his teachers was Röntgen, and he graduated in medicine in 1902. After qualification he travelled and studied in many centres, in Paris with Metchnikoff, in London with Sir Almroth Wright, in Berne with Sahli and Kronecker, and then he went to the famous Charité in Berlin, working under von Leyden and His, father and son. Rising through the various stages of this German medical faculty, he was eventually appointed after fifteen years of junior posts as "ausserordentlicher" professor at the Charité Hospital. The two "ordinarius" professors at this time were the famous and witty Friedrich Kraus and Wilhelm His of "bundle" fame. Wilhelm His was particularly fond of Fleischman, who was his chosen doctor in his last illness, being not only his medical adviser but his intimate friend.

Other appointments followed, numerous papers from his pen appeared in the German literature in these years, and he became one of the most sought-after physicians in Berlin. Then at the height of his career came tragedy, and humiliation after humiliation was heaped upon him until finally his *venia legendi* was taken from him and he could no longer talk to his students.

Beneath these bludgeonings of fate his head was "bloody but unbowed," and he came to London, 57 years old, with his wife and three young children. The one-

never lost heart for long, and her natural zest for living, her kindness and quick brain, made her a delightful friend and interesting companion. She had outbursts of indignation over various subjects, to which her friends would listen amazed at the wide range of knowledge of history and facts she displayed, though usually unable to accept the sweeping condemnations made. She had great clinical acumen and skill, and deservedly won the love and confidence of many patients. The constant inflow of lovely flowers during months of illness gave ample testimony of this love. Dr. Hanby was retiring and shy of meeting strangers, and was little known outside the small circle of her local practice near Bolton. Hers was a quiet, unobtrusive, and courageous life, like that of many who give themselves devotedly to the service of their patients and have themselves to struggle against great odds. She made no contributions to medical literature and did nothing spectacular, but will long live in the memory and affection of those who, by intimate contact with her, could recognize the flashes of that fine and undefeated spirit that was herself.

Medical Notes in Parliament

Treatment of the Elderly Sick

When Parliament reassembled on January 22 after the Christmas recess Lord AMULREE, with the support of Lord COTESLOE and Lord HADEN-GUEST, called attention in the House of Lords to the case of old people and administrative difficulties arising between the working of the National Health Service Act and the National Assistance Act.

He was concerned with the substantial minority of old people, mostly pensioners—and particularly those living alone—who were on the border between health and sickness, neither fit enough to look after themselves nor yet sick enough to need hospital treatment. The B.M.A. in 1947 set up a committee (of which he was a member) whose report advocated that old people who were not really ill, but frail and infirm, should come under the umbrella of the Health Service rather than being separated under the Assistance Act. Unfortunately that was not done, and the difficulties still remained. The Guillebaud Committee in 1956 reported that they were very worried about it. One suggestion, that there should be amending legislation to put the matter back under one authority, he dismissed as impracticable. Another that might be encouraged was that regional boards and local authorities should make a joint appointment when they appointed doctors to take care of the old people in their hospitals, so that they would have charge of the people under Part III of the Assistance Act. That had been done in one or two cases, and was working well. A third suggestion, which was included in the Guillebaud report, was that the welfare services might be transferred to the health committee of the local authority, which would mean that the medical officer of health would be in the chair and they would have a medical side to them. It was a medical matter, and the more that kind of balance could be kept the better.

Lord COTESLOE, who is chairman of the North-west Metropolitan Regional Hospital Board, said that administrative difficulties arose mainly from the dichotomy under the two Acts, by which regional hospital boards were responsible for the aged sick and the county councils for the welfare of the senile and infirm. It was not a practical possibility to make a single authority, either local or hospital, responsible for the care of all the old people in an area. What was needed was not such a tidy, theoretical solution but a real understanding and knowledge of the problems and needs of the individual old people on the part of hospital officers on the one hand and the welfare officers and wardens of old people's homes on the other, and the closest co-operation between them locally. That was the course that should be pursued in the search for a solution.

Lord HADEN-GUEST advocated a national survey by a committee and the formulation of a plan for the country as a whole.

The EARL OF HOME, speaking for the Government, said that progress must rest on greater efficiency in organization, greater co-ordination of the efforts of hospitals, doctors, and welfare authorities, and greater appreciation by local authorities of the needs of the old. In spite of all that had been done, there was room for much better co-ordination between hospital and welfare authorities. He was inclined to think that the root of the trouble was the lack of accommodation for those who need no longer be kept in hospital, and that part of the trouble was lack of personnel to look after those old people in their homes. But some things could be done with advantage. One of them was Lord Amulree's suggestion about the joint appointment of geriatric physicians. Further attention ought to be given to the powers of local authorities to a direct meals service, in addition to assisting voluntary associations. There had been a survey between 1954 and 1956 by Ministry of Health officers and the services affecting the elderly sick. The results had been assessed on a national basis, and the Minister proposed to issue memoranda, with suggestions arising from the survey, to all hospitals and local authorities. No Government or Act of Parliament could compel co-operation, but if common sense was applied great improvements could be made.

Mental Hospital Patients

Mr. NORMAN DODDS (Erith and Crayford, Lab.) asked the Minister of Health on January 23 if he was aware of the concern that had arisen from the knowledge that a person could be certified as insane under the Lunacy Act, 1890, by one doctor at one interview lasting no more than five minutes, with the reasons for certification denied to the person concerned or to relatives; and what action was proposed to minimize the risk of mistakes, which could have a grave effect on the liberty of the individual, and to bring this aspect of national life more into keeping with modern practice. Mr. DENNIS VOSPER stated that he did not accept the implication. A summary reception order might be made by a justice of the peace on a certificate by one medical practitioner. It was for the justice himself to examine the person, to make inquiries, and to satisfy himself that the person was of unsound mind and a proper person to be detained. The law on this subject was being reviewed by a royal commission at the present time.

He informed Mr. Dodds that the numbers of persons detained under the Lunacy Acts were, in 1945, 130,462; in 1950, 120,698; in 1952, 117,948; and in 1955, 110,788. The numbers detained under the Mental Deficiency Acts were, in 1945, 55,336; in 1950, 59,417; in 1952, 61,211; and in 1955, 63,255.

Mr. DODDS asked how many persons in mental institutions, up to the latest convenient date, were detained under the Mental Deficiency Acts for other reasons than being mentally defective. Mr. VOSPER: I am not aware of any such persons. Mr. DODDS asked the Minister, in view of the large number of young people who had in the past been certified under the Mental Deficiency Acts because of being in need of care and attention rather than being mentally defective, and because of the difficulties that such patients had in invoking the law to have the certification set aside, what action he was taking to have a thorough investigation made of each case with a view to enabling as many as possible to lead normal and useful lives. Mr. VOSPER: I am not aware of any such persons.

Immigrants' Health Certificates

Captain H. KERBY (Arundel and Shoreham, Con.) asked the Minister of Health on January 25 if he was aware that Great Britain was the only Commonwealth country that any immigrant could enter without producing a certificate of good health; and what steps he proposed to safeguard

Great Britain from imported communicable diseases. Mr. VOSPER informed him that the existing Public Health (Ships) and (Aircraft) Regulations, 1952, gave wide powers to port medical officers to deal with any case or suspected case of communicable disease arriving in this country. In addition, alien immigrants might be medically examined under the Aliens Order, 1953.

February Meeting with Minister

The new Minister of Health, with the Secretary of State for Scotland, has agreed to meet representatives of the medical profession towards the middle of February. Mr. DENNIS VOSPER stated this in answer to three questions on January 28 asking for a statement on the salary negotiations. He added, "For the present, I have no statement to make."

Mr. ARTHUR LEWIS (West Ham, North, Lab.) asked for an assurance that the Minister would deal with the matter on its merits, and not treat the doctors in the same shabby and dirty way that the Government had treated M.P.s' salaries. Mr. M. LIPTON (Brixton, Lab.) suggested that, as the Government's honour was at stake, they should agree to arbitration to settle a firm basis for any future adjustment of doctors' salaries. Viscount HINCHINGBROOKE (South Dorset, Con.) spoke about the enormous importance of the State honouring its obligations to important sections of the community, and of seeing that justice, as pledged in the past, was fully discharged. He suggested that the Minister could argue with the Chancellor of the Exchequer that the possible inflationary consequences in the present instance could be taken care of by other means.

Mr. J. RANKIN (Glasgow, Govan, Lab.) asked the Minister if he was prepared to accept the contractual obligation implied in the Spens report on the basis of all future salary negotiations with the medical profession. Mr. VOSPER: I am advised that no legal contractual obligation exists. Mr. RANKIN said this was one of the points that had caused every scalpel in Scotland to be drawn over the week-end. There would be no satisfactory issue unless this matter was dealt with. Doctors did not accept the explanation which had been given. Mr. VOSPER: I am going to meet the doctors, and I shall not meet them on the basis that a legal contractual basis exists.

Cigarette Smoking

Mr. LIPTON asked the Minister of Health whether he would move to appoint a select committee to consider what immediate and practical steps could be taken to reduce cigarette smoking. Mr. VOSPER replied "No." He did not consider that a select committee would be an appropriate body for this purpose. Mr. LIPTON questioned whether, as a definite connexion had been established between cigarette smoking and lung cancer, the hundreds of millions of pounds made by the Government out of cigarette smoking could be regarded as moral earnings. Were not the Government under a solemn obligation to warn the public of the risks? Should they not take more positive action, even if it meant upsetting the Chancellor and the tobacco magnates? Mr. VOSPER retorted that if Mr. Lipton had raised the matter in an adjournment debate, as he had said he would do, it would have been possible to deal with some of the rather unfair allegations he had made. Mr. SOMERVILLE HASTINGS (Barking, Lab.) asked whether the evidence was not sufficiently strong for something definite to be done by the Ministry. Ought not young people and children in schools to be warned of the dangers of cigarette smoking? Mr. VOSPER said that he intended to look further into this, and take the advice of those concerned.

Pharmaceutical Products.—Discussions with the pharmaceutical industry on prices of proprietary preparations have recently been concluded, and in the light of these the industry has revised its proposals, which the Minister of Health is considering.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending January 12 (No. 2) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1957					1956				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	9	2	6	0	2	4	1	1	0	9
Dysentery ..	530	49	183	2		687	59	116	3	5
Encephalitis, acute	3	0		1		1	0			
Enteric fever:										
Typhoid ..	1	1	0	0	1	0	0	0	0	
Paratyphoid ..	4	1	1	0		9	2	5	0	
Food-poisoning ..	162	29	22	0		123	7			
Infective enteritis or diarrhoea under 2 years ..				12	13				12	6
Measles * ..	9,281	674	617	321	119	2,368	26	91	25	41
Meningococcal infection ..	35	3	7	0	3	33	3	17	1	1
Ophthalmia neonatorum ..	25	3	9	0		26	3	12	0	
Pneumonia † ..	648	39	417	11		897	83	387	12	1
Poliomyelitis, acute:										
Paralytic ..	47	7	2	0	17	35	4		6	4
Non-paralytic ..	25	3				24	3			
Puerperal fever § ..	224	32	5	1		208	33	13	1	2
Scarlet fever ..	528	33	84	13	19	714	31	93	38	13
Tuberculosis:										
Respiratory ..	543	57	124	16		574	61	91	13	
Non-respiratory ..	84	6	7	1		76	8	11	5	
Whooping-cough ..	2,486	122	507	15	24	1,267	67	89	117	211

DEATHS in Great Towns	1957					1956				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute		0			0		0			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	6	0	3	0	1	8	0	1	0	1
Influenza ..	21	0	0	0	0	48	6	5	2	1
Measles ..		0	0	0	0		0	0	0	0
Meningococcal infection ..		1	1				0	1		
Pneumonia ..	348	39	28	17	12	488	96	30	10	12
Poliomyelitis, acute	5	1			0	3	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory ..	76	11	9	2	2	92	11	12	3	5
Non-respiratory ..		0	0	0	0		2	3	0	0
Whooping-cough ..	1	0	1	0	0	2	0	0	0	1
Deaths 0-1 year ..	217	29	35	12	17	253	36	29	1	27
Deaths (excluding stillbirths) ..	6,023	831	617	142	177	7,383	1186	756	142	191
LIVE BIRTHS ..	8,525	1269	1118	252	410	7,903	1196	971	219	324
STILLBIRTHS ..	205	31	18			226	33	22		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenzal pneumonia.

§ Includes puerperal pyrexia.

Vital Statistics

London in 1955

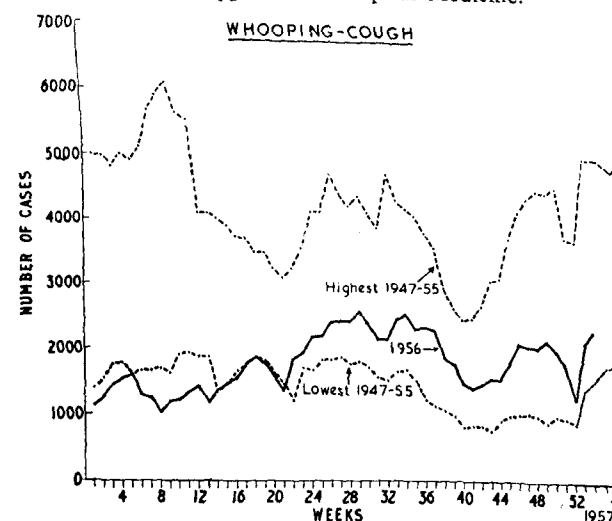
The population of the County of London in 1955¹ was 3,295,000, which was 27,000 fewer than in 1954. In comparison with England and Wales as a whole, there were relatively fewer people aged under 25 and over 44, with relatively more aged 25-44. Females exceed males by 6.5%, as compared with 3.7% in England and Wales. The live birth rate, at 15.1 per thousand population, was the lowest since the 1946 peak of nearly 21, but was well above the figures of the 1930's—about 13.5. It is much the same as the rate for England and Wales, though the proportion of women of child-bearing age is greater in London.

The general death rate was 11.5 per thousand population. It has not changed much since the end of the war, having fluctuated about one point above or below that figure. It is near the rate for England and Wales. The infant mortality rate, at 23.2 per thousand live births, showed a slight rise from the rate for 1954—namely, 20.6. The rate for London is normally lower than the rate for England and Wales, which in 1955 was 25.

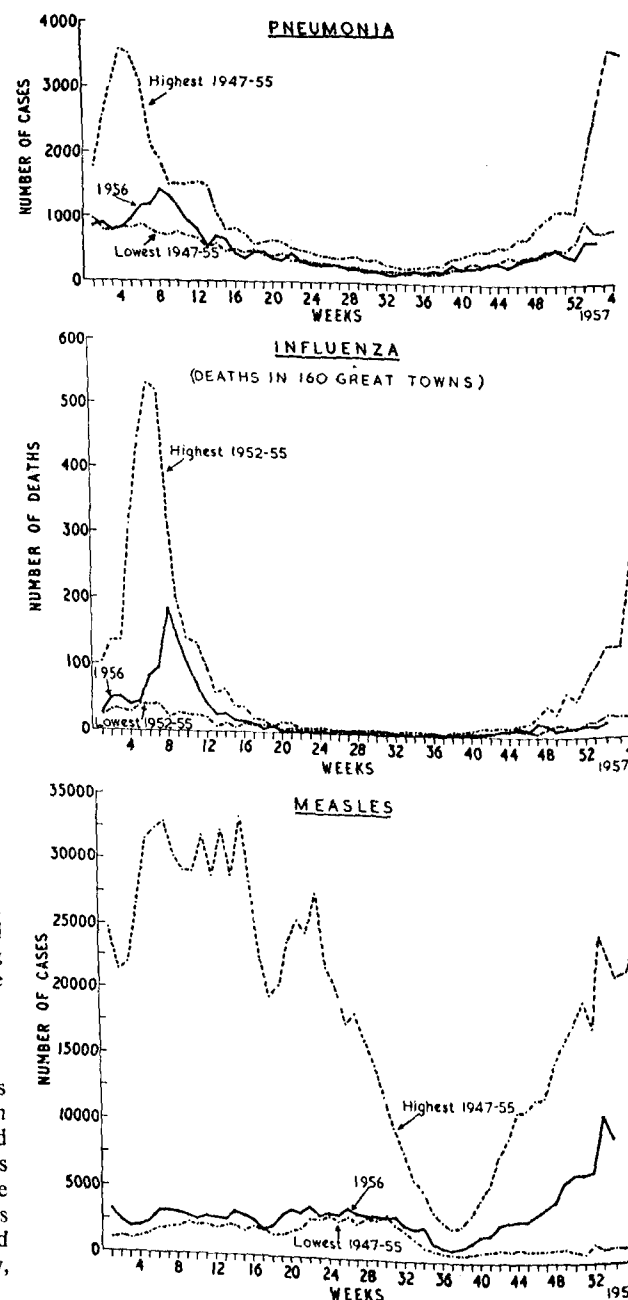
Cases of diphtheria were more numerous in 1955, being 16 as compared with 4 in 1954, and 2 deaths were reported. The County Medical Officer has recently started a campaign to increase the numbers of immunized children in London; only about 54% of children aged under 5 were immunized at the end of 1955. Other deaths caused by infectious diseases were 7 from whooping-cough, 15 from measles, 27 from diarrhoea in children aged under 2, 164 from influenza, 22 from meningococcal infections, 1 from erysipelas, 26 from acute poliomyelitis, and 561 from tuberculosis (517 respiratory). The commonest source of tuberculous infection nowadays is a human case; such was the source even in a recent outbreak among monkeys at the Zoo. B.C.G. vaccination is offered to all tuberculin-negative 13-year-old children attending London schools whose parents give written consent. By the autumn of 1955, 19,301 children had been vaccinated.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the years 1947-55 (influenza, 1952-5) are shown thus ———, the figures for 1956-7 thus ———. Except for the curves showing notifications in 1956-7, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



¹ Report of the County Medical Officer of Health for the Year 1955 (L.C.C., 2s. 6d.).



Infectious Diseases

The only large variations in the returns of infectious diseases during the week ending January 12 in England and Wales were falls of 1,689 in the number of notifications of measles, from 10,970 to 9,281, and 44 for scarlet fever, from 572 to 528, and a rise of 377 for whooping-cough, from 2,109 to 2,486.

The largest falls in the incidence of measles were 453 in Lancashire, from 2,592 to 2,139, 346 in Yorkshire West Riding, from 919 to 573, and 324 in Essex, from 1,137 to 813; the only large rise was 151 in Northumberland, from 318 to 469. Only small fluctuations were reported in the trends of scarlet fever. The largest increases in the number of notifications of whooping-cough were 83 in Lancashire, from 215 to 298, 48 in Durham, from 109 to 157, 46 in Staffordshire, from 98 to 144, and 46 in Warwickshire, from 71 to 117. 9 cases of diphtheria were notified, being 7 more than in the preceding week.

72 cases of acute poliomyelitis were notified, and these were 3 more for paralytic and 6 more for non-paralytic cases than in the preceding week. The largest returns were London 10 (Battersea 2, Islington 2, Stepney 2), Surrey 10 (Reigate M.B.

7, Kingston-upon-Thames U.D. 2), Essex 7 (Dagenham M.B. 2), Kent 6 (Crayford U.D. 2), Sussex 6 (Hove M.B. 3), and Lancashire 5 (Bootle C.B. 2).

The notifications of dysentery numbered 530, being 5 fewer than in the preceding week. The largest centres of infection were Lancashire 110 (Accrington M.B. 27, Liverpool C.B. 14, Manchester C.B. 11, Bolton C.B. 10), Yorkshire West Riding 91 (Leeds C.B. 21, Sheffield C.B. 16, York C.B. 12), Warwickshire 74 (Coventry C.B. 66), London 49 (Woolwich 10), Staffordshire 22 (Kidsgrove U.D. 16), and Yorkshire East Riding 22 (Kingston-upon-Hull C.B. 20).

Channel Islands Census

At the 1951 census the population of the Channel Islands was 102,806 persons, an increase since 1931 of about 9,600. 2,066 visitors were enumerated in Jersey in 1951 and 1,131 in Guernsey and adjacent islands.

Householders were asked to state whether they had exclusive use of, or shared with another household, or were without a piped water supply within the house, a cooking stove or range, a kitchen sink, a water-closet, and a fixed bath. In Jersey 40% of all private households and in Guernsey and adjacent islands 36% had exclusive use of all five of these household arrangements. A further 8% in Jersey and 9% in Guernsey and adjacent islands had all except a fixed bath. These figures compare with 52% for England and 19% for Wales.

The populations of the islands were on the average slightly older than that of England and Wales. 12.6% of the population of Jersey were aged 65 and over, and 12% in Guernsey and the adjacent islands. The figure for England and Wales was 11.0%. Since 1931 the proportion of married people has increased particularly among young people. At age 20-24, in Jersey, there were 245 married males per thousand as compared with 168 in 1931, and 461 married females per thousand compared with 291. In Guernsey and the adjacent islands the changes were similar. Fertility in Guernsey was higher than in Jersey. In Guernsey and the adjacent islands there were 186 live-born children per 100 married women under age 50, while in Jersey the figure was 167. In England and Wales it was 169.

Week Ending January 19

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 693, whooping-cough 2,664, diphtheria 4, measles 8,175, acute pneumonia 516, acute poliomyelitis 41, dysentery 477, paratyphoid fever 2, and typhoid fever 5.

Medical News

Benefactions by the Wellcome Trust.—This week the Wellcome Trustees announce grants totalling £173,500 to scientific institutions in Britain. In addition, the Trustees have agreed in principle to present a motor cruiser to the Medical Research Council to assist communication between the Council's laboratories at Fajara on the Gambia River and the branch laboratory near the village of Keneba, some 70 miles further up the river. This vessel would be adaptable as a mobile research laboratory for use in field studies in the interior of the Gambia territory. Appropriately enough, the Trustees point out, probably the first floating laboratory to be made was the one built in 1907 to the order of the late Sir Henry Wellcome. It was used on the Nile by the staff of the Gordon Memorial Hospital, Khartum. Details of the grants to scientific institutions are as follows:

Leeds University.—Up to £60,000, towards building research laboratories for medical physics and urology on the site of the General Infirmary.

Edinburgh University.—Up to £35,000, for rebuilding animal houses at the Institute of Animal Genetics.

Royal College of Surgeons of England.—Up to £35,000, for the completion of the Wellcome Museums at the College.

Manchester University.—Up to £13,000, for a mobile radiographic and laboratory unit for use primarily in field work on the rheumatic diseases.

St. Andrews University.—Up to £15,000, for adding Wellcome Laboratories of Pharmacology to the Gatty Marine Laboratory.

Rowett Research Institute, Aberdeen.—Up to £5,000, for a building to house special equipment for research in animal nutrition.

University College of South Wales and Monmouthshire, Cardiff.—Up to £3,000, for an ultracentrifuge for indefinite loan to the department of biochemistry.

Liverpool Medical Institution.—£5,000 spread over five years, for cataloguing the library and rebinding books published before 1850.

Royal Faculty of Physicians and Surgeons of Glasgow.—£2,500 spread over five years, for rebinding historical volumes in the library.

Caesium Unit at Royal Marsden Hospital.—The radiotherapy department of the Royal Marsden Hospital is carrying out a clinical trial of radioactive caesium as a source for beam therapy at its branch hospital, the Downs Hospital, Sutton. The unit, which was designed by Professor W. V. MAYNEORD, is the second of its kind in the world, the first being at Oak Ridge, Tennessee; another unit, at Southampton, with a rotating apparatus containing two caesium sources, is expected to start work in a few months' time. The caesium comes as a waste product from the Atomic Energy Authority's reactor at Windscale, where it is extracted by a complicated chemical process and sealed in platinum capsules. The active material is the 137-isotope which emits gamma rays. The caesium source has a number of advantages over the usual 250-kilovolt x-ray therapy machine: the quality of its beam, with the energy concentrated over a very narrow waveband of short wavelength, is about equivalent to that produced by the much more costly 660-kilovolt machine; as a consequence, absorption is much more even in the various tissues and there is little trouble from differential absorption in bone; the risk of damage to the skin is also less. On the other hand, the amount of protection needed is far less than with a cobalt-60 source, a factor of importance in the design of both the treatment room and the container for the caesium; the apparatus is thus more manoeuvrable and better adapted for treatment at short distances, such as for tumours in the head and neck. In spite of these advantages, the caesium unit is also attractive economically. Its capital cost is about the same as for a conventional x-ray therapy plant—there is even a considerably cheaper "utility" model available—and, apart from the hire of the caesium, running costs are negligible. The trial is under the direction of Professor D. W. SMITHERS.

Teaching Hospital in the West Indies.—In September, 1952, the Teaching Hospital of the University College of the West Indies was opened with 240 beds. The hospital is in Jamaica. The intention of the Jamaican Government, as stated in a law establishing it in 1948, was a 500-bed teaching hospital for the instruction each year "of not less than thirty medical students in such subjects as are usually provided in medical schools forming part of the University of London." January, 1955, was given as the deadline. Since the hospital was opened a further 81 beds have been added, "provisional recognition" has been accorded by London University, and plans have been prepared for further expansion. A report has been published (Colonial No. 327, H.M.S.O., price 2s. net) giving the views of a four-man committee, appointed by the Colonial Secretary, on the hospital's future development. The committee consisted of Dr. R. S. AITKEN, vice-chancellor of Birmingham University (chairman); Dr. E. R. BOLAND, dean of Guy's Hospital Medical School; Dr. J. W. P. HARKNESS, medical adviser to the Comptroller for Development and Welfare in the British West Indies; and Mr. G. A. PHALE, secretary to the United Birmingham Hospitals. Their principal recommendations are that the teaching hospital should be enlarged to provide for fifty students in each of three clinical years, a recommendation which would involve bringing the number of beds up to 454 at a capital cost of £1m.; and that the hospital's board of management should be increased so as to include members

from British Caribbean territories other than Jamaica and one member of the hospital medical staff besides the dean. Recommendations are also made about recurrent costs.

Report of an Accident.—The United States Atomic Energy Commission has published a report on the medical findings among the Marshall Islanders and members of the American task force who were accidentally contaminated by the hydrogen bomb exploded at Eniwetok in March, 1954. The report, edited by Dr. E. P. CRONKITE, Dr. V. P. BOND, and Dr. C. L. DUNHAM, is titled, *Some Effects of Ionizing Radiation on Human Beings*, and may be obtained from the U.S. Government Printing Office, Washington, 25, D.C., for \$1.25. The report runs to 106 pages, and includes as its final chapter a general discussion on radiation injury from atomic weapons. The accident was due to an unexpected change in the wind.

Scholarships Abroad.—The British Council announces about a hundred scholarships for British students (mostly university graduates or undergraduates) for study abroad. They provide for free tuition and maintenance, usually for a full academic year. The British Council helps with the recruitment of candidates, and further details may be obtained from the controller of the council's education division, 65, Davies Street, London, W.1.

Active Membership of W.H.O.—The Government of Poland has now informed the World Health Organization of its desire to resume active membership. Similar requests by Albania and Bulgaria were noted in this column last week (p. 237). Poland's active participation lapsed in August, 1950.

W.H.O. Regional Director for Europe.—Dr. P. J. VAN DE CALSEYDE, director-general of public health at the Belgian Ministry of Health, has been appointed director of the World Health Organization's regional office for Europe from February 1. He succeeds the late Dr. NORMAN BEGG.

Otser Club.—At a meeting on January 24 at the Royal College of Physicians, Sir RUSSELL BRAIN, P.R.C.P., gave an address on Dr. Thomas Lawrence (1711-83), a former president of the College and a friend of Dr. Samuel Johnson. Dr. W. S. C. COPEMAN, the Club's president, was in the chair. An exhibition of historical books, papers, and portraits was held subsequently in the library.

North of England Obstetrical and Gynaecological Society.—At the annual meeting on January 18 the following were elected officers for 1957: president, Mr. F. STABLER; vice-presidents, Dr. E. A. GERRARD (Manchester), Mr. P. MALPAS (Liverpool), Mr. H. AGAR (Leeds), Mr. G. R. MACDONALD (Sheffield), and Dr. W. HUNTER (Newcastle); hon. treasurer, Mr. C. H. WALSH; hon. general secretary, Mr. F. J. BURKE; and hon. reporting secretary, Miss U. M. LISTER.

Postgraduate Medical Studies at Oxford.—Surgeon Rear-Admiral J. HAMILTON is the director of Postgraduate Medical Studies at Oxford, not Dr. JANET VAUGHAN and Dr. G. E. F. CHILVER as we stated on January 19 (p. 179). They have been appointed to the board of electors for the directorship.

Professor W. C. W. Nixon, professor of obstetrics and gynaecology at University College Hospital, London, has been appointed to the World Health Organization's expert advisory panel on maternal and child health.

COMING EVENTS

Lecture in Belfast.—Sir CECIL WAKELEY will deliver the Sir Thomas and Lady Edith Dixon Lecture at the Royal Victoria Hospital, Belfast, on Friday, February 8, at 4.30 p.m. His subject will be "External Herniae."

Corneo-plastic Unit, East Grinstead.—Lecture-demonstrations to illustrate the relationship of ophthalmic and plastic surgery will be held on February 2, March 2, March 9, and April 6 at 2 p.m. Details from the secretary, Corneo-plastic Unit, Queen Victoria Hospital, East Grinstead.

Tenth International Hospital Congress.—Lisbon, June 3-7. Registration before March 15. Details from Captain J. E. STONE, 10, Old Jewry, London, E.C.2.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, February 4

MARLBOROUGH DAY HOSPITAL.—8.15 p.m., Dr. T. F. Main: The Past and the Present in Neurosis.
● UNITED HOSPITALS CATHOLIC SOCIETY.—At 13, Devonshire Place, W., 6.15 p.m., Mr. A. J. King: Marriage—Moral and Medical Concepts.

Tuesday, February 5

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. N. B. Myant: Biliary Excretion of Thyroid Hormone.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. T. Brain: Electrotherapeutic Techniques.

ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Dr. J. T. Scales: Metals and Plastics in the Treatment of Disease.
ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Milroy Lecture by Dr. D. D. Reid: Environmental Factors in Respiratory Disease.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., E. Rawns Wilson: Demonstration by Dr. G. T. Allen: Histological Variations in Basal Cell Tumours.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Mr. D. W. S. Gordon: Some Unusual Lesions of the Vulva.

Wednesday, February 6

ASSURANCE MEDICAL SOCIETY.—At Medical Society of London, 5 p.m., Presidential Address by Dr. K. Shirley Smith: Revision of Underwriting Standards in Life Assurance.

EDINBURGH ROYAL CLUB.—4 p.m., visit to Department of Cardiology, Edinburgh Royal Infirmary.

GLASGOW UNIVERSITY MEDICO-SURGICAL SOCIETY.—7.30 p.m., meeting with Queen Margaret Medical Society. Professor Ian Donald: The Dominant Sex.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Laboratory Procedures for Mycotic Infections.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Mr. T. Holmes Sellers: Surgical Treatment of Pulmonary Stenosis.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. H. G. Hanley: Disorders of Micturition in Females.

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Professor J. H. Dible: Pathology of Peripheral Ischaemia.

MIDLAND MEDICAL SOCIETY.—At 154, Great Charles Street, Birmingham, 8.15 p.m., Dr. H. W. Donovan, Dr. C. F. Hawkins, Professor E. Brodie Hughes, and Dr. L. Nagley: Symposium on the Relief of Pain.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. Alick Isaacs: Influenza and Adenoviruses.

ROYAL MEDICAL SOCIETY EDINBURGH.—8 p.m., clinical meeting.

Thursday, February 7

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. H. M. Sinclair: Vitamins in Nutrition.

FACULTY OF HOMOEOPATHY.—5 p.m., Dr. L. R. Twentymen: Approach to the Pre-cancerous State; Dr. A. E. Stricker: Review of Treatment of Pneumonia and Acute Bronchitis in Children Admitted to the Royal London Homoeopathic Hospital Since 1948.

NORTHAMPTON MEDICAL SOCIETY.—At Northampton General Hospital, 3 p.m., clinical meeting.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Milroy Lecture by Dr. D. D. Reid: Environmental Factors in Respiratory Disease.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. J. H. Paterson: Neurology demonstration.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—4.30 p.m., demonstration and discussion of clinical cases.

UNIVERSITY COLLEGE LONDON.—At Eugenics Theatre, 5 p.m., Mr. D. J. Payne: Compensation for Industrial Injuries.

UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C., 5.15 p.m., Professor F. Berger: Pharmacology.

D.Phil.Nat., Ph.D., D.Sc., F.R.I.C.: Chemical Aspects of Psychopharmacology.

Friday, February 8

● INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. D. I. Williams: clinical demonstration.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. K. Robson: clinical demonstration.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., Mr. C. Gill-Carey: Tinnitus.

MIDLAND CENTRE FOR NEUROSURGERY.—At Holly Lane, Smethwick, near Birmingham, 8 p.m., Sir Francis Walshe, F.R.S.: Aetiology and Nature of the So-called Traumatic Neuroses.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—10 a.m., Professor F. R. Winton: Renal Circulation.

ROYAL MEDICAL SOCIETY, EDINBURGH.—8 p.m., talk by Dr. R. M. Marquis: Impact of Surgery on Cardiology.

● UNITED KINGDOM COMMITTEE FOR THE WORLD FEDERATION FOR MENTAL HEALTH.—At County Hall S.E., 5.45 p.m., Dr. Margaret Mead: Mental Health in a Changing World.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Griffiths.—On January 14, 1957, at the Imperial Nursing Home, Cheltenham, Glos., to Elizabeth (formerly Poulton), wife of Dr. Eric Griffiths, a brother for Lynn-Anthony Eric.

Spalding.—On January 1, 1957, at Oxford, to Dr. Elizabeth (formerly Falle) and Dr. John Spalding, a daughter.

Way.—On January 19, 1957, at the C.S.T. Hospital, Karim-Nagar, India, to Dr. Hedi Way (formerly Papigay), wife of Dr. Gilbert Way, a sister for David—Erica Ruth.

DEATHS

Pittman.—On January 19, 1957, John Cecil Pittman, M.B., B.S. Thomas.—On January 11, 1957, at 80, Chatsworth Road, Croydon, Surrey.

Rufus Clifford Thomas F.R.C.S.Ed., F.R.C.O.G.
Wilson.—On January 5, 1957, William Mitchell Turner Wilson, M.B., Ch.B., of 951, Harrow Road, Wembley, Middlesex, aged 73.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

"Spanish 'Flu'"

Q.—What is the "Spanish 'flu'" mentioned recently in the newspapers, and why is it so named? Is it true that it carries a particularly high mortality, and, if so, what is the reason for this?

A.—The term "Spanish 'flu'" was at one time applied to the virulent form of influenza which afflicted the whole world in 1918-19. The term was a misnomer, as there is no reason to believe that the disease came from Spain. It did cause a high mortality, particularly in young adults. This was due to pneumonia in which various secondary infecting organisms were involved. There is no reason to believe that such a virulent strain of influenza has been current in recent years.

Cancer Hazard from Tar Lotions

Q.—There is no doubt that coal tar contains carcinogens, yet why is it that many dermatologists still persist in using tar preparations for chronic dermatitis and eczemas? These conditions themselves predispose to carcinomatous changes.

A.—Although it is true that coal tar contains carcinogens, in the concentrations usually used its carcinogenic effects are negligible. There are probably very few dermatologists who avoid the use of tar as an antipruritic because they fear the development of malignancy. We see very many patients who have used tar lotions and ointments over many years, yet the development of tar dermatoses and malignant changes is of the greatest rarity. A few cases have been recorded of carcinoma developing in the skin after long-continued application of tar, but this happens so seldom that one may indeed doubt whether the tar has had much to do with it.

Coal-tar applications are extremely valuable for the relief of irritation, and it seems entirely reasonable to suppose that their value more than offsets this very small risk. Incidentally, it is very doubtful whether chronic dermatitis or eczemas have the slightest tendency towards malignant change.

Two Attacks of Tetanus

Q.—A boy of 10 with chronic otorrhoea, living in India, has had two very severe attacks of typical tetanus separated by a year's interval. Both attacks were treated by large doses of antitoxin. (1) How long is the usual immunity after an attack of tetanus, and are second attacks common? (2) Could the aural infection have had any bearing on the attacks, and, if so, what treatment is advised for it? (3) Should active immunization with tetanus toxoid be undertaken after an attack of tetanus; if so, how soon, and what dosage scheme is recommended? At what intervals should boosting doses of toxoid be given?

A.—(1) The evidence suggests that the immunizing effect of a clinical attack of tetanus is very slight.^{1,2} Repeated attacks have been known to occur in the same person, but they are very uncommon.

(2) An infection of the middle ear is a well-known source of tetanus infection. Basic treatment should consist in eradication or drainage of the infected focus after active or passive immunization, but the actual procedure should be varied to suit the individual patient. A chronic middle-ear infection, secondarily infected with tetanus bacilli, might well give rise to two attacks of tetanus separated by a long interval. Such a case was described in a letter by Dr. Trevor Phillips recently.³ The mechanism is probably as

follows: A large dose of antitoxin would neutralize circulating toxin and allow natural recovery from tetanus to take place and symptoms to subside. However, spores remaining in the wound might germinate later and produce a further clinical attack of tetanus which would again subside with antitoxin treatment.

(3) Although second attacks of tetanus are rare, active immunization is the only certain way of preventing them. Payling Wright and his colleagues⁴ have pointed out that the previous injection of a soluble antigen leads to its much faster removal from the circulation on subsequent injection, an action that reduces the therapeutic effect of second doses of antitoxin. They therefore recommend that once a person has received an injection of a horse-serum antitoxin, irrespective of the disease for which it may have been given, that person should be promptly immunized against diphtheria and tetanus with the appropriate toxoid. However, it is wise to delay active immunization until after the injected antitoxin has had a chance to be eliminated—a process which should not take longer than six months. The method of initial active immunization recommended by the Army Pathology Advisory Committee¹ consists of two injections of tetanus toxoid, spaced by not less than 6 weeks but not more than 12 weeks, followed by a third injection 6 to 12 months later. A reinforcing dose is usually given every five years.

REFERENCES

1. Barr, M., and Sachs, A., *The Investigation into the Prevention of Tetanus in the British Army*. Army Pathology Advisory Committee Report, 1956, War Office, London.
2. Parish, J. H., *Antisera, Toxoids, Vaccines, and Tuberculins*, 1954, 3rd ed. London.
3. *British Medical Journal*, 1956, 2, 714.
4. Littlewood, A. H. M., Mant, A. K., and Wright, G. Payling, *ibid.*, 1954, 2, 444.

Granuloma Annulare

Q.—What is known of the aetiology of granuloma annulare, and how should the condition be treated?

A.—The cause of granuloma annulare is completely unknown, and recent views about its aetiology involve abandonment of former ideas rather than the acceptance of new ones. For example, the tuberculous aetiology has been entirely given up, and although the histopathology shows some resemblances to that of the rheumatic diseases there is no clear relationship between the two conditions.

For most dermatologists views on treatment have tended to undergo a somewhat similar change. The tendency now is to leave the lesions untreated; it is known that they clear up eventually without scarring and that there are no systemic complications of any sort. Most methods of treatment involve physical destruction, which leads to scarring and is hard to justify. Carbon dioxide snow is favoured by some.

Prognosis in Treated Pernicious Anaemia

Q.—What is the prognosis for patients with pernicious anaemia treated with adequate amounts of vitamin B₁₂? Are they ever cured in the sense that treatment is no longer necessary?

A.—The introduction of vitamin B₁₂ (cyanocobalamin) is too recent for there to be reliable statistics on survival and morbidity among patients with pernicious anaemia treated with the pure vitamin. Clinical observation, however, suggests that such patients have an expectation of life and a morbidity no worse than that of the general population: in fact, it has been suggested that they may be better off, because they come under review every month or two when they receive their injections.

In his presidential address to the Manchester Medical Society last October Dr. J. F. Wilkinson reviewed a personal series of 2,211 cases of pernicious anaemia seen over the past 28 years. Of course, only in the last few years would pure vitamin B₁₂ have been available for the treatment of these patients, but the mortality in this series was only 0.83% per year. Almost all died from conditions other than pernicious anaemia; but, of those who died of cancer, in about half the primary was in the stomach. In Dr.

Wilkinson's experience the expectation of life for the patients in this regularly supervised group of patients was rather better than for people without pernicious anaemia. Of the 1,550 patients still attending his clinic, no fewer than 758 were over 70 years of age, 283 over 80 years, 39 over 90, and one over 100.

Patients with pernicious anaemia are never cured in the strict sense of the word, though if adequately treated their lives are in every respect as if they had been. The chief pathological change is the atrophy of the gastro-intestinal mucosa, which so far has proved irreversible. Very occasionally a patient who discontinues treatment remains well for months or even years before relapsing, but these are exceptional cases and afford no general grounds for the discontinuance of treatment. Treatment must be for life.

Nasal Sprays for the Common Cold

Q.—Manufacturers continue to advertise nasal sprays of one sort or another, some of them containing sulphonamides, antibiotics, hydrocortisone, or vasoconstrictors, for the treatment of the common cold. Is it advisable to use any or all of these medicaments in this way?

A.—The use of nasal sprays containing sulphonamides or antibiotics is to be deplored, on account of the grave danger of sensitization which it incurs. A patient who has used a nasal spray of this sort for a relatively trivial condition may find that subsequent use of the antibiotic or sulphonamide for the treatment of a serious disease is made difficult or impossible by a sensitivity reaction. With regard to hydrocortisone, there may be a place for the use of this in the management of severe vasomotor rhinitis, seasonal or otherwise, but its use in infections of the common-cold type may, in theory, increase the risk of secondary bacterial infection. Vasoconstrictors may give temporary relief to nasal congestion and obstruction, but in the early acute stage of a cold this relief is transient and may be followed by aggravation of the symptoms. Later, when secondary bacterial infection has given rise to a purulent phase with involvement of the nasal sinuses, vasoconstrictors may be useful in permitting intermittent drainage of secretions from the affected sinuses.

Injury and Central Retinal Vein Thrombosis

Q.—Can an injury produce thrombosis of the central retinal vein or one of its branches?

A.—Central retinal vein thrombosis has been reported after a contusion as a rarity (von Wiser, 1901; Hillemans and Pfalz, 1905; Pincus, 1907; Cozzoli, 1916).¹

REFERENCE

¹ Quoted by Duke-Elder, S., *Textbook of Ophthalmology*, vol. 6, p. 5854, 1954. London.

Sensitivity to Arsenic and Penicillin in Tertiary Syphilitic

Q.—A patient with tertiary syphilis is sensitive to arsenic and penicillin. How should he now be treated?

A.—Most of the antibiotics derived from lower-grade fungi are effective in the treatment of primary, secondary, and tertiary syphilis, and attempts to desensitize patients who have become intolerant of arsenic and penicillin, besides being often unsuccessful, are unnecessary.

A ten-day course of oxytetracycline or chlortetracycline (0.5 g. six-hourly) is recommended. The dosage suggested by some workers, including Taggart and his collaborators,¹ is 60 mg. per kg. of body weight daily for six to eight days. Antibiotic therapy should be followed by a ten-week course of intramuscular injections of bismuth (injectio bismuthi, B.P., 1.5 ml. once weekly), and, as iodides assist materially in the resolution of tertiary lesions, a mixture containing potassium iodide, 15 gr. (1 g.), should be taken three times a day at the same time.

REFERENCE

¹ Taggart, J. R., Romansky, M. J., and Landman, G. C., *Amer. J. Syph.*, 1952, 36, 174.

NOTES AND COMMENTS

Retraction of the Prepuce.—Dr. A. E. SELIGMANN (Barking) writes: I was glad to read your expert's opinion ("Any Questions?" December 8, 1956, p. 1382) that it was doubtful if the practice of gentle retraction of the prepuce from 6 months onwards would affect the incidence of necessary circumcisions. Even during the first six months it is unusual for the prepuce to be left alone, and among hundreds of male babies seen at infant welfare clinics I have not yet met one whose mother has been taught to respect the waiting period of six months. On the other hand I was surprised to learn that "most prepuces will retract spontaneously by the age of 2 or 3 years." As a school medical officer I have seen an appreciable number of school-entrants with fully or half-adherent prepuces. In some cases mothers have even told me that the boy "had been done" as a baby, that she had been unable to persevere with it, and that the foreskin had become "stuck again" (if it was ever mobilized in the first place). I suspect that these late adherent cases do right themselves spontaneously after a few more years. Or do medical officers in the Forces still see many adherent cases?

OUR EXPERT replies: Dr. Seligmann is clearly correct in his observations about adherent prepuces in boys at school-entrance age. In my answer to the original question I said "most prepuces" will retract spontaneously by 2 or 3 years of age. This was certainly not meant to exclude the "appreciable number" encountered by Dr. Seligmann. There are inevitably a number which take longer—and a few which will require active intervention. The answer to the question whether medical officers in the Forces will see many cases depends on the definition of "many." They certainly see "a few."

Lignocaine in Pudendal Block for Low Forceps.—Dr. NORMAN MORRIS (London, W.12) writes: An answer discusses the use of 0.5% lignocaine for pudendal block anaesthesia ("Any Questions?" December 29, 1956, p. 1559). Whilst advising that "the maximum amount of this concentration that may be safely given is 200 ml." Dutton,¹ however, in another report recommends 50 ml. of 0.5% lignocaine as "effective and safe." The majority of obstetricians would, I think, agree with this statement. Hunter² has made a careful study of the toxicity of lignocaine, and he considers that 500 mg. is the maximum safe dose, even when adrenaline is added—that is, 100 ml. of an 0.5% solution. It would be a great pity if this extremely useful anaesthetic and method fell into disrepute because of complications resultant upon unnecessary overdosage.

REFERENCES

- ¹ Dutton, W. A. W., *Lancet*, 1955, 2, 1368.
- ² Hunter, A. R., *Brit. J. Anaesth.*, 1951, 23, 153.
- ³ — *Lancet*, 1956, 1, 158.

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Correction.—In Dr. M. M. Glatt's letter on methypylone (*Journal*, January 19, p. 164) the sentence beginning "Glutethimide ('doriden'), methypylone and α -phenyl- α -ethyl glutarimide) . . ." should read: "Methypylone and glutethimide (α -phenyl- α -ethyl glutarimide, 'doriden'), another recently introduced non-barbiturate hypnotic, are both used in many wards at the Warlingham Park Hospital as satisfactory alternatives to the barbiturates."

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BRITISH MEDICAL JOURNAL

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SOME QUESTIONS ON CANCER OF THE LUNG, LARYNX, AND URINARY TRACT*

BY

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From the Department of Pathology, St. Bartholomew's Hospital, London

The study of cancer as it occurs in man must be carried on empirically while others attack the fundamental question, "How, and why, does a cell divide?" The distribution of cancer in man, and all factors which might affect this distribution, must be examined systematically.

Some Characters of Cancer in Man

These characters are: (1) *sex incidence*; (2) *prevalence*—increasing, decreasing, or stationary; (3) *social gradient*—rise or fall, or neither, in relation to the Registrar-General's Social Classes I to V; (4) *urban-rural rates*—urban +, rural +, or neither.

Sexes must always be considered separately. They may or may not be found to behave in the same way. Figures for the total incidence of any one form of cancer are of little if any value.

The reason for any difference in these characters can be the subject of inquiry. It may not be possible to

prove what the reason is, because: (1) one cannot experiment on man; (2) the time lag of such effects is very largely unknown; and (3) social conditions and atmospheric pollution are continually changing.

Thus about 150 years ago the Industrial Revolution began to change England from an agricultural to an industrial country, and about 1850, in the districts most affected by this change and in others to the east of them, about 50 species of *Lepidoptera* began to change their protective colour from lighter to darker shades as the lichens on the blackened bark of trees were killed by the sulphur dioxide and other constituents of town

*These notes are based upon data used in May, 1956, for the Richardson Lecture at the Massachusetts General Hospital and for talks given at the Sloan-Kettering Institute for Cancer Research, and in Professor W. U. Gardner's Department of Anatomy at Yale, with the addition of material obtained from Dr. E. Cuyler Hammond and Dr. Oscar Auerbach. It is a great pleasure to acknowledge my debt to all who did so much to make this visit enjoyable and valuable in every way.

smoke (Fig. A). Now atmospheric pollution is decreasing with more efficient combustion of coal and the increased use of gas and electricity for heating. (Kettlewell, 1955a, Fig. 1.)

Sexual Incidence of Cancer of Lung

Doll (1953) concluded that the incidence of cancer of the lung was about the same in non-smokers of either sex. But no inferences can be drawn from the incidence of cancer of the lung upon smokers of one

sex with regard to the other sex, as is very often done, because we simply do not know whether any intrinsic sexual factor is concerned. The kind of wholly impossible experiment which is required is to set up populations of, say, 10,000 persons of each sex, of the same age distribution, who will smoke 30 cigarettes daily for 30 years. Our present knowledge does not allow any forecast of the resulting sexual incidence of cancer of the lung.

The Registrar-General's figures (Table I) show that the immense increase in deaths from cancer of the lung in the 12 years 1943 to 1954 has not been accompanied by any change in the ratio of the death rates of the two sexes (1:5.8 in the first half and 1:5.9 in the second half of the period). This fact suggests that the agent causing this rise has changed uniformly. The data from Japan (Stocks, 1956) provide an interesting comparison (see Table VII).

Incidence of Cancer in Town and Country* and in Smokers and Non-Smokers

A comparative study of the incidence of all forms of cancer in town- and in country-dwellers, and in smokers and in non-smokers, in both sexes is needed urgently. The two problems are very much of the same nature and require

*Since this paper was written the Registrar-General's *Statistical Review of England and Wales* (1953, Text) has been issued, which contains a very large amount of data on this subject.

TABLE I.—Cancer of the Trachea, Bronchus, and Lung, England and Wales, 1943-54 (Registrar-General, Statistical Review, 1953-54, Tables, Part I, Medical)

	Males			Females		
	Deaths	Rate per Million Living	Increase in Mean Rate	Deaths	Rate per Million Living	Increase in Mean Rate
1943	4,943	303		1,166	54	
1944	5,331	329		1,237	57	
1945	5,805	354		1,356	62	
1946	6,607	355		1,437	65	
1947	7,581	387		1,623	73	
1948	8,403	413		1,759	79	
Mean of first 6 years	6,445	375.0		1,430	65.0	
1949	9,130	444		1,845	82	
1950	10,254	485		1,987	87	
1951	11,166	530		2,081	91	
1952	11,981	568		2,237	98	
1953	12,881	607		2,251	98	
1954	13,995	658		2,336	101	
Mean of second 6 years	11,568	548.7	46.3%	2,123	92.8	42.8%

Ratio of mean rates, female to male: first 6 years, 1: 5.8; second 6 years, 1: 5.9.

the same kind of investigation. Tobacco and coal are both plant products, one of which is about 300 million years older than the other.

Thus when one is exposed to the irritating atmosphere of a fog a good deal of mucus upon which particles have been arrested passes back from the nose into the pharynx, and comes up from the bronchial passages into the mouth, and this material, if not expectorated, is swallowed. Is it quite harmless to the alimentary canal? Similarly, the subject of "smoker's throat" may swallow a good deal of mucus when smoking.

Urban Factors

A number of investigations have shown, with varying degrees of distinctness, a higher incidence of various forms of cancer among town-dwellers. In seeking for a reason, the fact that better methods of diagnosis are more accessible in towns is always easy to invoke and difficult to assess. Any numerical estimate of the effect of improved diagnosis can only be arbitrary. Thus Kreyberg (1954) considers that in Norway a four-and-a-half-fold increase in lung cancer in females is due to better diagnosis, while a sevenfold increase in men is a real one.

Where the respiratory tract is concerned one must of course consider atmospheric pollution and exposure to soot containing at least two carcinogens—namely, 3:4-benzpyrene and arsenic—and doubtless others not yet identified. But do these factors penetrate to and affect any other parts of the body? Some data showing the very large range of atmospheric pollution in various towns and countries are given in Table II.

Thirty years ago my wife and I showed that cancer of the scrotum is rare in agricultural workers and is almost

TABLE II.—Some Examples of Atmospheric Pollution. (Published and Other Data from H.M. Fuel Research Station: J. M. Campbell, R. L. Cooper, F. Goulden, E. L. Kennaway, M. E. Urquhart, and R. E. Waller)

	Smoke (mg./100 m. ³)	3:4-Benzpyrene (μg./100 m. ³)	Arsenic (As ₂ O ₃) (μg./100 m. ³)
Sheffield, February, 1948	44-173	6 to 33	
Salford, November to March		15 to 30	
London (County Hall) January		14.7	7.7-9.6
London (County Hall) June		2.6	2.0
Sheffield 1950, January		7.8	7.0-9.4
Sheffield 1949, June		2.0	
Mean of London (Beckton) year		7.1	13.2
7 English towns, Winter mean	36.5	1.3	3.7
Oslo, Whole year	18.4		
Copenhagen. Mean of 4 stations, Winter	1.3-5.7	2.5	1.9-3.1
Reykjavik, Whole year	4.9	1.45	1.8
Iceland { Akureyri { Winter	0.9-1.5	0.23	0 to 0.7
Iceland { Akureyri { Summer	0.5	0.049-0.057	0 to 1.7

unknown in those social classes who wash most (Kennaway, 1925; Kennaway and Kennaway, 1946), and the suggestion was made that "it would seem possible that cancer of the scrotum is influenced by exposure to coal-smoke—in other words, possibly all town-dwellers are in some very slight degree liable to 'chimneysweep's cancer.'" Probably various carcinogens, with the exception of sunlight, are more abundant in towns, and their actions may summate, a process about which we know very little; one of the latest contributions on this question is that of Cloudman *et al.* (1955).

When comparing various batches of data about atmospheric pollution one must bear in mind that the materials concerned may not be the same in different countries or even in different towns in the same country. Thus the suspended matter of Liverpool might have a carcinogenic effect which summates with that of tobacco (Stocks and Campbell, 1955), while the corresponding material of Oslo might not do so (Kreyberg, 1954).

A very valuable source of data on this question is available in the official figures for mortality and morbidity from Norway, Denmark, and Finland, which are classified under urban and rural districts, and in the two last-named the figures for the capital† also are given separately. The populations of these three countries are of the order of one-eleventh of that of England and Wales, and present a more manageable problem.

The first evidence brought forward suggesting that urban conditions induced cancer of the lung and larynx was perhaps that showing the low incidence upon male outdoor workers. Calculations based on the Registrar-General's figures showed (Table III) that a group of open-air occu-

TABLE III.—Cancer of Lung and Larynx in Out-of-Door Occupations, England and Wales (Kennaway and Kennaway, 1936, 1947)

Occupation	Ratio of Registered to 100 Calculated Deaths			
	Cancer of Lung		Cancer of Larynx	
	1921-32	1933-8	1921-32	1933-8
Gardeners	58	61	75	79
Farm bailiffs and foremen	26	22	44	30
Agricultural labourers, including shepherds	34	26	41	60
Farmers	53	32	40	41

TABLE IV.—Open-air Occupations, England and Wales, 1951 (Registrar-General)

Cancer	Standard Mortality Ratio. Males aged 20-64	
	Social Class IV Partly Skilled	
	Agricultural Workers	Others
Larynx	13*	115*
Lung, bronchus, trachea	62	97

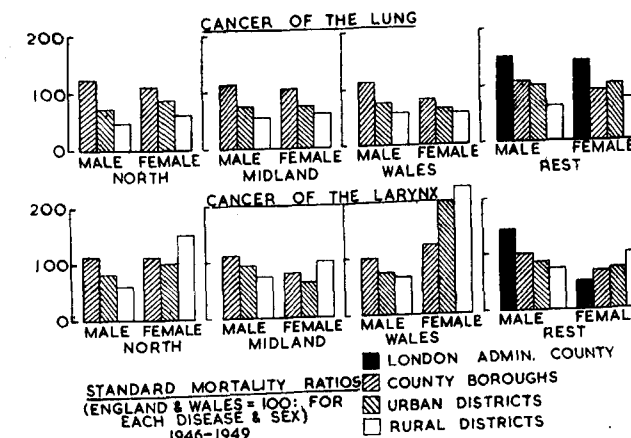
* Based upon fewer than 10 deaths.

pations (gardeners, farmers, agricultural labourers, including shepherds, and farm bailiffs and foremen), which included about 954,000 men, had low ratios for cancer of the lung (22 to 61) and of the larynx (29 to 79). The highest figures in each case are given by gardeners, of whom many live in or near large towns.

[Some evidence that the same character of open-air occupations persists in recent years is given by the smaller numbers derived from the 1951 Census 1% Sample Tables (Table IV).]

These results led to further investigation comparing the whole population of England and Wales of both sexes (Curwen, Kennaway, and Kennaway, 1954). This showed that the standard mortality ratio for cancer of the lung in both sexes, and of the larynx in males, falls with decreasing urbanization, as is shown in Fig. 1 by the series—county boroughs (mostly towns with a population of 100,000 or more), urban districts (other towns), and rural districts (the

†An important instance of the value of such data is given below, in the section on Cancer of the Urinary Tract.

FIG. 1.—Urban and rural incidence of cancer of the lung and larynx, England and Wales (Curwen *et al.*, 1954). Reproduced, by permission, from the *British Journal of Cancer*.

rest of the country). The gradient is less steep for cancer of the lung in women, and cancer of the larynx in women shows exactly the reverse relationship. This peculiar behaviour of cancer of the female larynx has at present no explanation, although one might suspect a diet consisting too largely of white bread and tea.

When considering urban factors in relation to cancer one must of course seek for other conditions besides atmospheric pollution by smoke from various sources. There may be differences in the diet, both solid and liquid, of town and country dwellers, and radioactivity increases in any enclosed place owing to emanation from walls. Thus Dawson (1952) observed that: "In the laboratory there was usually twice the activity found at the open-air site on the roof. At Chiswick, ventilating the room lowered the activity by as much as one-half, whilst in the coal-cellar the activity was 14 times greater than at the site in the garden. In the Post Office air-raid shelter the ventilation was as restricted as any found in habitable buildings; the activity was 120 times as high as at the open-air site."

Smokers and Non-Smokers

The classification of persons affected by cancer of the lung into smokers and non-smokers is easy, but the matter is not so simple. A person who is going to develop cancer of the lung whether he smokes or not, may be a smoker, and a heavy smoker. Possibly with further knowledge we may be able to identify such cases by the histological type of the tumour. Some possible categories of persons affected by cancer of the lung are shown in Table V.

TABLE V.—Classification of Some Persons Developing Cancer of Lung

Carcinogen:		
Intrinsic	Tobacco	1. Non-smoker.
		2. Smoker who would have developed cancer of lung if non-smoker.
Extrinsic	Atmospheric pollution	3. Smoker not exposed to atmospheric pollution.
		4. Smoker exposed to atmospheric pollution.
		5. Non-smoker exposed to atmospheric pollution.

The relation of atmospheric pollution and tobacco, together, to the causation of cancer of the lung is the subject of considerable difference of opinion. The summation of carcinogenic action is a subject about which we have much to learn, even under the comparatively simple conditions of experiments upon animals. Data on a very wide range of atmospheric pollution are now available (Table II) thanks to the co-operation of Professor Niels Dungal, of Reykjavik, Professor Leiv Kreyberg, of Oslo, and Dr. Johannes Clemmesen, of Copenhagen. When such data can be correlated with those for smoking habits and for cancer of the lung it may be possible to decide this question. If such summation occurs, a smoker in, for instance, Reykjavik should be able to smoke more cigarettes with

impunity than if he were in Sheffield or Salford. Stocks and Campbell (1955) show the interesting inferences which can be drawn if this process of summation is accepted.

The simple adding together of amounts of materials—for example, arsenic or 3:4-benzpyrene inspired with town air, and with tobacco smoke, is misleading, because the greater part of the former is taken in through the nose, which arrests 80% of particles larger than 2.5 μ (Davies, 1949), while tobacco smoke evades this filter altogether.*

Scar-Cancers of the Lung: Possible Importance of Cholesterol

The cancers of the lung associated with scars (*Narbenkrebs*) and with deposits of cholesterol described by the German pathologists Rösle (1953) and Lüders and Themel (1954) have been investigated in this country by Raeburn (1956), who states: "Further cases of lung cancer associated with scarring have been studied in detail. The scars are of various aetiology—collapse pneumonia, tuberculosis, and even foreign body. The common factor is proliferation of bronchial epithelium within the fibrous framework of the scarred area. Twelve cases of cancer in association with tuberculosis are receiving separate attention. These scars are rich in cholesterol."

This proximity of cholesterol to malignant growth is of great interest in view of the discovery by Hiebert (1949) of the carcinogenic power of cholesterol, which is not diminished by drastic purification (Schwenk process). Of course, the juxtaposition of these crystals and a carcinoma is very far from proving that one is the cause of the other, but what more evidence can one expect from histological appearances?

The Process of Smoking a Cigarette

The physical and chemical changes which take place when a cigarette is smoked are complex, and the conditions under which they occur are unlike those present

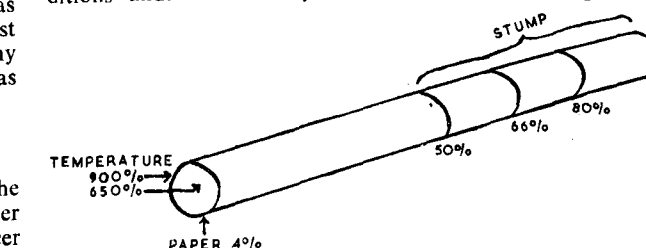


FIG. 2.—Diagram of a cigarette.

in most other combustions. The changes include: (1) oxidation, (2) pyrolytic condensations producing polycyclic compounds, (3) volatilization repeatedly, and (4) condensation repeatedly.

Commins, Cooper, and Lindsey (1954) threaded a thermocouple through a cigarette and observed the readings as the burning zone approached. They found that the maximum temperature ranges from 650° to 700° in the centre, to 900° at the surface, where the oxidation is most rapid. The temperature drops very rapidly behind the burning area—for example, from 770° to 100° in 3.5 mm. (Harlow, 1956). Hence a continuous process of volatilization and condensation takes place in a "leap-frog" manner as the cigarette is smoked.

For the present purpose, nothing matters but what emerges at the stump, and in this respect there may well be a considerable difference between smoking, say, 66% and 80% of the cigarette (Fig. 2).

*The first smokers of tobacco seen by Europeans (two companions of Columbus in Cuba in 1492) inspired the smoke of cigars through the nostrils; but their example was not followed (Koskowsky, 1955).

†The work of Dr. Hiebert and Professor L. F. Fieser on the carcinogenic action of cholesterol was the subject of a talk which I gave at the Sloan-Kettering Institute for Cancer Research, and in Professor W. U. Gardner's Department of Anatomy at Yale in May, 1956, and is dealt with at length in Chapter 3, entitled "The Carcinogenic Effect of Cholesterol," of a book *Cancer* (in the press).

The investigation shown in Fig. 3 is very elementary, but we seem to have few data of this kind. Cigarettes of two well-known British brands were weighed, and smoked in the ordinary way by one or other of two habitual smokers who dropped the ash, and stump, into weighing-bottles. The mean figures show that the ash and stump together make up

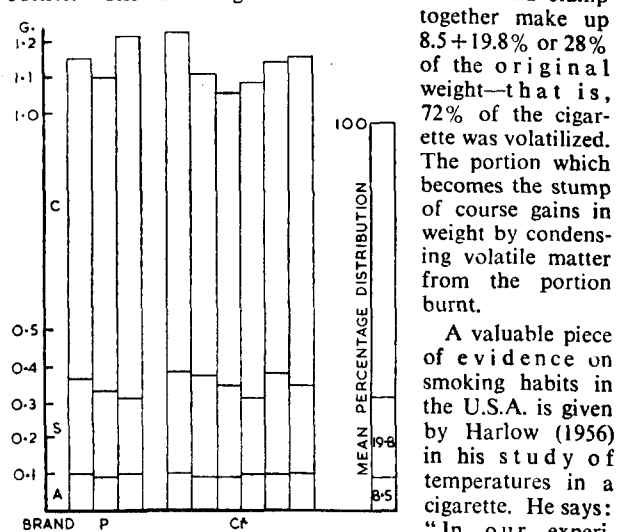


FIG. 3.—Ash and Stump of cigarettes.
C=Cigarette. S=Stump. A=Ash.

A valuable piece of evidence on smoking habits in the U.S.A. is given by Harlow (1956) in his study of temperatures in a cigarette. He says: "In our experience, not one cigarette smoker in 1,000 smokes to a butt length less than 23 mm." A length of 23 mm. is 29% of 70 mm., which is the length of an English cigarette of a very popular brand; hence almost always less than 71% of the length of the cigarette is smoked, as compared with 80% which is commonly smoked in this country (Fig. 3), and was adopted by Commins *et al.* (1954) in their method of artificial smoking. Anyone from this country who observes ash-trays in the United States will note the difference in the length of the cigarette ends.

Work of Dr. E. L. Wynder on the Carcinogenic Action of Cigarette Smoke

The emphasis laid upon the collected negative results of painting experiments from various laboratories, and the more or less explicit suggestion that these discredit Wynder's results (see, for instance, *Nature*, 1956), suggest that, in this instance, where smoking is concerned, the comparison of evidence from man and from animals may not always be conducted with complete impartiality. We do not smoke chromium compounds and no one doubts that these are carcinogenic to the human lung on the ground that we have no confirmatory evidence from animals. Positive results, if obtained by legitimate methods, must take precedence of negative results.

Recently I had the opportunity of seeing, and handling, Dr. Wynder's mice, which showed no sign of undue injury to the skin; and, in any case, no process of simple ulceration of the skin of the mouse, or of any other tissue, will give carcinoma in 44% of cases (Wynder *et al.*, 1953). To anyone who has any experience of such work with mice it is clear that the material used is carcinogenic under these conditions. The suggestion has been made that Wynder's mice are "hypersensitive"; one might just as well assert that other mice are "hyposensitive."

Negative results of smoke-inhalation experiments on rodents seem to me to be of no significance, because the animals, presumably, unlike smokers, keep their mouths shut and pass the smoke over their turbinates, which, in the rabbit at any rate, are more complex than our own.

Comparison of Cigars and Cigarettes

A cigar consists of intact portions of tobacco leaf arranged more or less concentrically, while a cigarette is made up of more finely divided material packed together; the conditions for combustion, and therefore its products, are different, quite apart from any difference due to the quality of the tobacco. The smoke from a cigar gives an

alkaline condensate, and that from a cigarette an acid one. The very large difference between cigar smokers and cigarette smokers in regard to cancer of the lung which is shown by Dr. Hammond's figures (see below) suggests that if one could ascertain the cause of it one might attempt to construct something which would embody this quality of a cigar in something sufficiently like a cigarette to be adapted for smoking during short periods, which character is the chief advantage of the cigarette over the cigar. One could then offer smokers a precaution which would not involve "giving up smoking." A cigar is comparatively large and expensive, and hence the economical smoker wishes to smoke one as completely as possible.

Dr. Lindsey, at the Sir John Cass College, and Mr. J. M. Campbell, in Professor Blacklock's department at St. Bartholomew's Hospital, are examining cigar smoke, and will compare their results with the considerable experience which they have gained in the study of cigarette smoke.

I asked Dr. Hammond what kind of cigar would be smoked by persons who furnish the bulk of his statistical material. He writes: "I went to a cigar store located on a street which is near the dividing line between a rich residential district and a poor residential district. The customers appear to be largely middle class or lower middle class, but many are labourers and some are rich men. They sell a very large number of different brands, with prices ranging from \$0.04 to \$1.25 per cigar. I asked the owner to sell me one each of his best-selling cigars." Dr. Hammond has very kindly sent to us samples of 18 of these brands.

In this country at the present time a person who smokes a cigarette uses 1 g. of tobacco, costing perhaps about 2d., in 10 to 15 minutes. One of the smallest cigars on sale here, weighing 2 g., costs 8d.—that is, nearly twice as much per gramme; we have not as yet any figure for an average time taken to smoke such cigars. The cigarillos commonly smoked by women in Denmark weigh about 1.8 g.; some of the smallest cigars smoked in the U.S.A. weigh 3 to 3.4 g. and cost 4 to 5 cents.

Dr. Hammond has kindly obtained for me the figures of the U.S. Internal Revenue Service for the retail price range of cigars sold in the U.S. in 1955:

Retail Price Range	%
Not over 2½ cents	0.48
Over 2½ to 4 "	3.68
" 4 to 6 "	39.04
" 6 to 8 "	9.64
Subtotal: Up to 8 cents	52.84
Over 8 to 15 cents	40.79
" 15 to 20 "	3.28
Over 20 cents	3.09
Subtotal: Over 8 cents	47.16
Total—all classes	100.00

Thus 89% of the cigars sold cost from 4 to 15 cents (3½d. to 1s. 1d.).

Cigarette Smoking and Cancer of Lung

Statistical Inquiries.—No attempt is made here to summarize the very numerous papers of recent years on the relation of cigarette smoking and cancer of the lung. Such investigations may be either retrospective, dealing wholly with data from the past; or, prospective, in which current events are followed. Hammond, in a personal communication in 1956, referred to 17 studies of the first class from five among medical practitioners in Great Britain by Doll and Bradford Hill (1954, 1956), and by the geographical survey of Stocks and Campbell (1955), which is also retrospective. The prospective scheme of the American Cancer Society, designed by the statistician Dr. E. Cuyler Hammond, is chosen for brief mention here because it is an extremely interesting example of organization on a very large scale.

Inquiry by American Cancer Society planned by Dr. E. Cuyler Hammond

This investigation by means of a questionnaire is in progress in nine States of the Union in 394 counties, urban

and rural, selected chiefly because they have well-organized units of the American Cancer Society. Female volunteers, 22,000 in number, were asked (1) to give a copy of the questionnaire "to white men aged 50 to 69 years whom they knew well enough to be able to trace for the next several years"; and (2) to secure the filling up of a follow-up form yearly on November 1. The progress of the inquiry may be summarized as follows:

Questionnaires suitable for study collected between January and May 31, 1952	190,134
Of these persons, on October 31, 1954	
Alive	179,973
Dead	8,105
Not traced	2,056
Death certificates	8,019
Deaths attributed to cancer of the lung	288
Regular cigarette smokers at some time	107,978
Currently smoking a pack or more of cigarettes a day	25,561

Some early results are as follows:

Ratio of Mortality from Lung Cancer

Regular Cigarette Smokers	1/11/52 to 31/10/53	1/11/53 to 31/10/54
No*	1.0	1.0
Yes	7.3	7.3
Pack-a-day or more	14.1	15.6

* Includes pipe and cigar smokers and occasional cigarette smokers.

Number of Deaths and Annual Death Rate from Lung Cancer per 100,000

Smokers	All 245 Cases Reported		Well-established Diagnosis, Excluding Adenocarcinoma (161 Cases)	
	Deaths	Death Rate	Deaths	Death Rate
Never	9	14.0	2	3.1
Occasional	2	8.4	2	8.4
Cigar only	5	16.5	4	13.3
Pipe only	9	35.2	6	24.1
Cigarette only	151	141.6	97	87.2
Cigarette and other	69	81.9	50	57.7

Cigarette Smoking Habits in 1952	Annual Death Rate from Lung Cancer per 100,000	
	All Cases	Well-established Cases Excluding Adenocarcinoma
Never smoked regularly	12.6	4.5
Ex-regular smokers {None	39.1	31.6
Occasional	71.0	71.0
Packs {1	101.3	67.3
2	101.7	61.1
3	208.4	119.0
4+	340.7	278.7

In the well-established series the incidence of lung cancer upon heavy cigarette smokers is 62 times greater than that upon those who had never smoked regularly.

	Cities 50,000+	10,000-50,000	Suburb or Town	Rural
Cigarette smokers per 100 of male population	62.6	60.1	56.9	50.3
Lung cancer death rate {Standardized for age	82.5	67.8	74.6	50.5
and smoking habits	78.7	70.3	78.7	60.0

The urban-rural difference is distinct when all diagnosed cases of lung cancer are taken together, but is much less so among well-established cases in cigarette smokers after exclusion of adenocarcinoma.

The death rates in these tables of the American Cancer Society are standardized for the white male population of the U.S.A. in 1953.

Work of Dr. Oscar Auerbach

At the Veterans' Hospital, East Orange, New Jersey, Dr. Oscar Auerbach and seven other workers (1955, 1957) are investigating "the anatomical approach to the study of smoking and bronchiogenic carcinoma."

As soon as possible after death the trachea and lungs, fixed in formalin, are divided in the coronal plane so as to separate the cartilaginous from the muscular part of the trachea, and the posterior portion is rejected; the bronchial tree is separated by blunt dissection, carried sometimes to within 1 cm. of the pleura, and divided transversely into blocks, usually 208 in number (Fig. 4), and from one to five sections from each block are examined for (1) basal-cell hyperplasia, (2) stratification, (3) squamous metaplasia, and (4) carcinoma-in-situ.*

The results obtained in 28,638 slides from 117 out of the first 150 cases (all white males, of whom more than two-thirds were aged from 50 to 70 years) show (1) a remarkable parallelism between the smoking habits of the deceased and the four changes named above; and (2) carcinoma-in-situ in unexpected numbers, and over a wide area, including the trachea, a discovery which is of obvious surgical importance and complicates the already difficult problem of localization. Cases of "recurrence" after operation may actually be due to growth developing from another centre of carcinoma-in-situ. One now has to explain not only the development of cancer-in-situ at many different points but also the prevention of further growth at the great majority of these.

The histological examination of each slide was carried out by from two to five persons who were "ignorant of the smoking histories and the clinico-pathological data." Unfortunately the cases of carcinoma of the lung did not include a single non-smoker; all were "moderate to heavy smokers." Cigar smokers and pipe smokers and ex-cigarette smokers were excluded from the three classes of smokers.

The results of this investigation are presented in an unusual manner (Table VI). The percentage of slides from

TABLE VI.—Histological Changes in the Respiratory Tract in Relation to Cigarette Smoking (Auerbach *et al.*, 1955)

Histological Changes	Deaths from Causes other than Cancer of Lung		Deaths from Cancer of Lung	
	Per Cent. of Slides			
	Never Smoked Regularly	Less than 1 Pack Daily	1 Pack or More Daily	
Basal-cell hyperplasia { Three or more cell rows { Five or more cell rows	18.6	22.0	36.1	43.5
Stratification	2.9	5.6	10.8	15.0
Squamous metaplasia	4.2	7.1	10.4	13.4
Carcinoma-in-situ	1.9	6.3	9.5	11.7
	1.0	4.1	6.0	6.3
No. of cases	16	20	47	34
				Total 117

the respiratory tract which show each one of the four changes named above is recorded separately for each of three classes of smokers, and for cases of cancer of the lung. "In subjects who died of bronchiogenic carcinoma, basal-cell hyperplasia, stratification, squamous metaplasia, and carcinoma-in-situ were diffusely distributed throughout the epithelium of the bronchial tree in both lungs as well as the trachea." Details of the extent to which these changes occur in the trachea would be of great interest, as carcinoma of the trachea is very rare.

Future Course of Research on Cancer of Lung

The study of the aetiology of cancer of the lung is complicated by several factors; (1) Cancer of the lung has several different histological forms which may differ in aetiology, and these distinctions are lost in figures for total incidence. (2) We do not know which, if any, forms of atmospheric pollution can summate with tobacco smoke as carcinogens. A carcinoma of the lung in a smoker might perhaps be due to the combined action of radio-

*Could not some more appropriate name be found for "carcinoma-in-situ," which tissue lacks the essential invasive property of carcinoma? "In situ" contributes nothing of value to the term; everything at rest is *in situ*. One might suggest "pre-carcinoma."

activity and of several constituents of both atmospheric pollution and tobacco smoke. (3) The recent work of, for example, Salaman and Roe (1956) and Gellhorn *et al.* (1956) shows the complex state of our knowledge of initiators and promoters of malignant growth. (4) The significance of carcinoma-in-situ, which, according to Auerbach, occurs on a very large scale, is most difficult to assess, as it is in other forms of cancer (cervix, prostate). (5) Lungs of persons of known smoking history, for chemical and histological research, are difficult to obtain here either from operation or from necropsy.

Cancer of Larynx

The statistical study of cancer of the larynx is made difficult by several factors. (1) Cancer of the larynx in men and that in women are to a large extent different diseases, as the so-called "extrinsic cancer of the larynx" is much more common in women; it is not a cancer of the larynx at all, and would be much better described by some other name (see discussion by Lederman, 1954). (2) The evidence of death certificates does not allow a reliable separation of cases of intrinsic and extrinsic cancer of the larynx. (3) The improvements in surgical and radiological treatment of cancer of the larynx may have reached a stage when the number of deaths is not a reliable measure of the incidence of the disease. Hence cancer registration is required. This system is in operation in Denmark, Finland,

and Norway, and in such countries, with populations of not much more than four million, the establishment of registration is easier than it is in England and Wales, with a population of 44 millions. However, our General Register Office already registers about 70% of the cases of cancer in England and Wales, and the Anna Fuller Fund has given us a grant for a Fellowship to be devoted to the study of the new material obtained by registration.

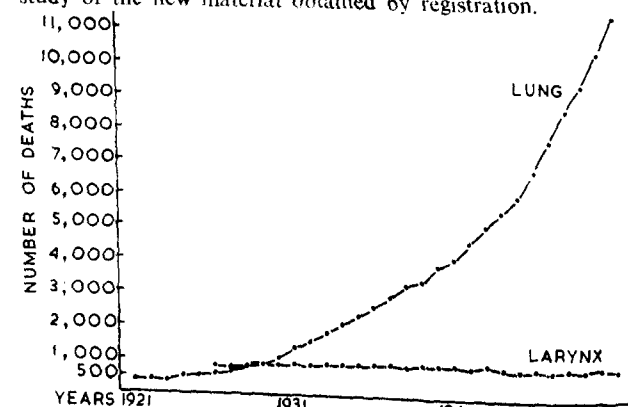


FIG. 5.—Deaths from cancer of the lung and larynx. Males. England and Wales, 1921-51 (Curwen *et al.*, 1954). (Reproduced, by permission, from the *British Journal of Cancer*.)

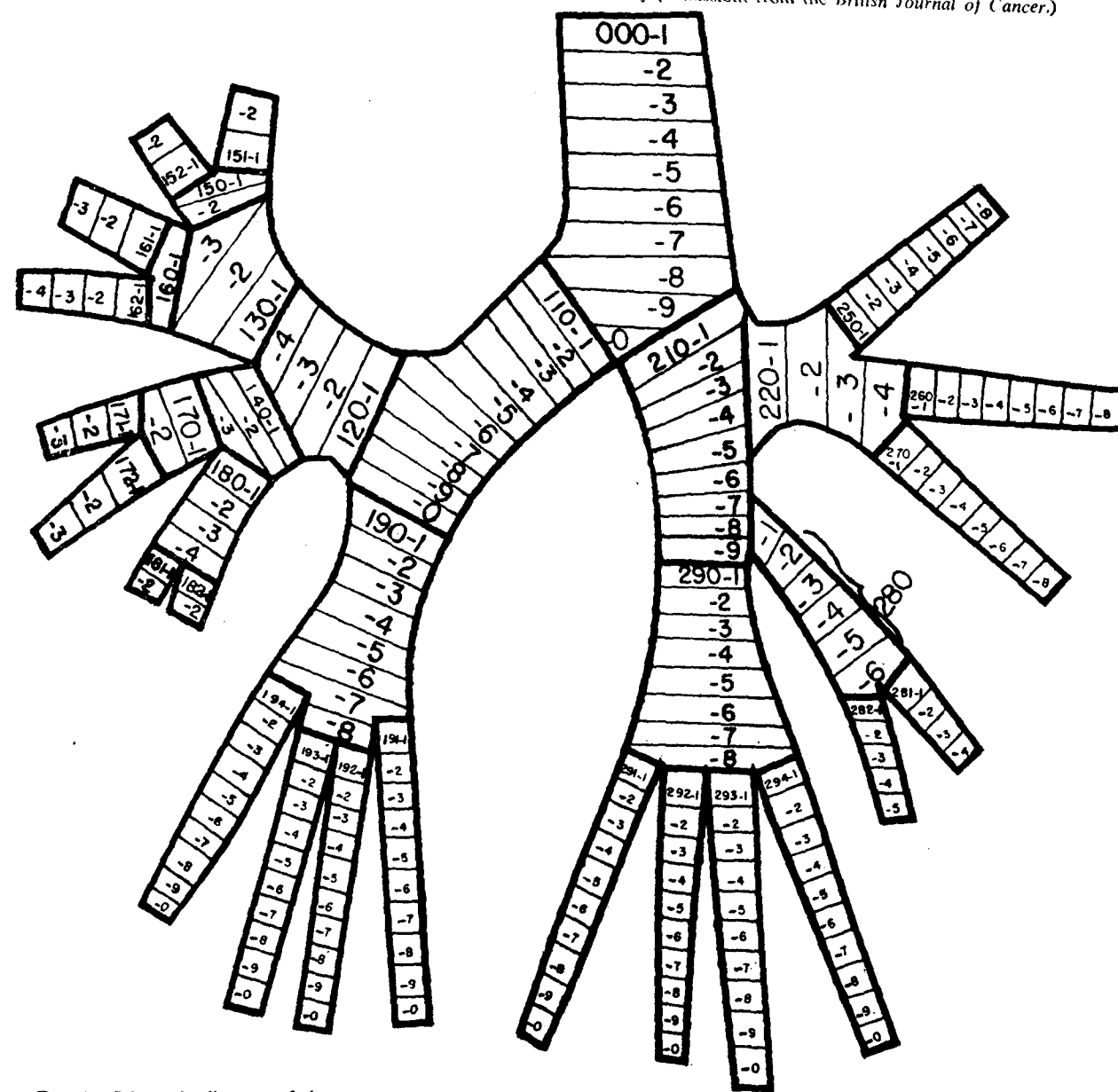


FIG. 4.—Schematic diagram of the tracheobronchial tree showing the distribution of the 208 blocks. (Auerbach *et al.*, 1956.)

Cancer of the Larynx and Tobacco

We do not know if there is any association in this country between cancer of the larynx and smoking. Whatever factor is affecting the incidence of cancer of the lung in men does not appear to be affecting cancer of the larynx (Fig. 5), but, as we are not certain about the total of the latter, the question is not settled. Wynder (1955) finds that in the U.S.A. "pipe and cigar smoking are more closely associated with cancer of the larynx than with cancer of the lung" (Wynder, 1955, p. 111; Wynder *et al.*, 1956).

A dissociation of the incidence of cancer of the lung and of the larynx, similar to that shown in Fig. 5, appears in the very valuable study of cancer in Japan by Stocks (1956). In comparing Japan with England and Wales he says: "For the larynx the figures are similar in the two countries up to age 70, but for lung cancer registered mortality of men in Japan is less than one-tenth of the English rates at most ages, and amongst women the ratio is between one-half and one-third" (Table VII). Data about the smoking habits of the Japanese would be of great value.

TABLE VII.—Age-Specific Death Rates from Cancer Per Million in Japan (1952) and in England and Wales (1952-4) (Stocks, 1956)

Age Group	Males				Females			
	Larynx		Lung		Larynx		Lung	
	Japan	E. & W.	Japan	E. & W.	Japan	E. & W.	Japan	E. & W.
0-24	0.1	0.1	0.7	2.1	0.1	0.1	0.7	0.6
25-34	0.5	0.2	5	26	1.1	0.8	2.4	10
35-44	1.2	1.8	6	97	0.8	2.2	3.5	26
45-54	6	5	21	249	0.8	3.3	11	52
55-64	18	13	43	577	7	18	89	89
65-74	32	33	114	2,002	15	17	40	201
75-84	57	75	181	2,543	28	19	65	287
85-94	85	101	236	2,922	32	24	80	384
95-104	151	156	219	2,592	34	32	93	379
105-114	146	225	190	2,072	42	33	70	445
115-124	125	294	110	1,267	33	39	18	362

Prevalence.—The Registrar-General (*Statistical Review*, 1952, Text, p. 158) states that: "Above 75 there has been no change in the male rate, but both the equivalent average death rate (0-64), and the rates between ages 45 and 75 have fallen by about 40% since 1936, while the female rates have remained constant." (Fig. 6. These figures of course refer to death rates.)

Alcohol and Cancer of Larynx

Men concerned in the sale of alcoholic drinks are especially liable to cancer of the larynx (Kennaway and Kennaway, 1936, 1947), while cancer of the lung appears to be unaffected.

TABLE VIII.—Ratio of Registered to 100 Calculated Deaths From Cancer of Lung and Larynx in Occupations Concerned With the Sale of Alcoholic Drinks. England and Wales

	Lung		Larynx	
	1921-32	1933-8	1921-32	1933-8
Barmen	104	122	469	275
Cellarmen	92	87	319	502
Licensed victualliers	128	124	185	199

Social Incidence of Cancer of Larynx

In 1921-3 and 1930-2 cancer of the larynx in males showed a very distinct social gradient, the incidence being highest in the poorer classes (Table IX). In 1950 this gradient had disappeared, and in this respect cancer of the larynx provides a very distinct contrast to cancer of the stomach, in which the gradient has remained the same throughout the whole period. The decreased strength and increased cost of alcoholic drinks during the 16 years

TABLE IX.—Standard Mortality Ratio. Males Aged 20-64 According to Social Class. England and Wales (Registrar-General, 1951 Census. One Per Cent. Sample Tables, Occupational Mortality, Part I)

Cancer	Social Class				
	I	II	III	IV	V
	Profes- sional	Inter- mediate	Skilled	Partly Skilled	Un- skilled
Larynx:					
1921-3	72	96	93	96	135
1930-2 (aged 35-65)	60	81	98	90	143
1950	113†	70	110	93	115*
Lung, bronchus, trachea:					
1921-3	100	109	97	79	124
1930-2	107	95	100	92	114
1950	80	79	108	89	116
Oesophagus:					
1921-3	76	91	104	88	130
1950	150*	85	97	94	120
Stomach:					
1921-3	60	82	100	106	130
1930-2 (aged 35-65)	55	83	98	112	122
1950	57	67	100	114	132

* Based upon fewer than 50 deaths. † Based upon fewer than 10 deaths.

TABLE X.—Cancer of the Bladder and Kidney, England and Wales, 1944-54 (Registrar-General's Statistical Review, 1953-4. Table. Part I. Medical)

	Bladder						Kidney					
	Male			Female			Male			Female		
	Deaths	Rates per Million	Increase %	Deaths	Rates per Million	Increase %	Deaths	Rates per Million	Increase %	Deaths	Rates per Million	Increase %
1944	1,234	76		573	27		395	24		347	16	
1945	1,339	82		611	28		419	26		303	14	
1946	1,375	74		670	30		434	23		343	16	
1947	1,417	72		651	29		492	25		350	16	
1948	1,540	76		712	32		529	26		381	17	
Mean		76.0			29.2			24.8			15.8	
1949	1,617	79		701	31		562	27		384	17	
1950	1,676	79		773	34		597	28		366	16	
1951	1,787	85		738	32		597	28		430	19	
1952	1,890	90		742	32		638	30		471	21	
1953	1,824	86		801	35		655	31		443	19	
1954	1,861	87		847	37		676	32		455	20	
Mean		84.3	11.0		33.5	14.7		29.3	18.1		18.7	18.1

since 1939 must be considered in relation to the change in the mortality from, and social distribution of, cancer of the larynx. Television might in time have a similar effect, owing to lessened consumption of alcohol, but the results could hardly be apparent as yet.* Cancer of the oesophagus, of which the incidence is certainly high upon occupations concerned with the consumption of alcohol, shows a similar diminution in social gradient.

Cancer of Bladder and Kidney

An increase in cancer of the bladder in recent years has occurred both in Denmark (Clemmesen and Nielsen, 1956) and in England and Wales (Registrar-General, 1954, 1955) (see annotation, this *Journal*, January 26, 1957, p. 218).

Clemmesen and Nielsen say: "... there has been a steady increase in the number of cases notified for papillomata and carcinomata of the urinary bladder among men in the capital. In provincial towns and rural areas a less pronounced increase occurred during the years 1951 to 1953, the significance of which is doubtful, so far. No increase in incidence was observed for tumours of the bladder among women nor for malignant neoplasms of the kidney."

The Registrar-General's figures, on the other hand, show an increase in both sexes in cancer of the bladder and of the kidney in the eleven years 1944-54 (Table X). The percentage increase in the death rates for cancer of the bladder is somewhat greater in women than in men, and for cancer of the kidney it is equal in the two sexes.

Possible Effects of Tobacco upon the Urinary Tract

The importance of a search for carcinogenic effects of tobacco other than those upon the mouth and respiratory tract has been emphasized in a recent paper (Kennaway, 1955) in which attention is drawn to the antidiuretic action (Walker, 1949) which must facilitate any such carcinogenic effect. The quantity of compounds absorbed from tobacco smoke is made plain by the very numerous investigations of their effects upon the circulatory system (see, for instance, Wynder, 1955, Chapters 2 and 3).

Steele, Koch, and Steiner (1951) obtained fibrosarcoma in about 19% of mice after subcutaneous injection of an extract (butyl alcohol, after extraction with benzene) of human urine, presumably from unselected persons. Dr. A. J. Lindsey allows me to say that he is examining, at the Sir John Cass College, the urine of smokers and of non-smokers for compounds which he and his fellow-workers (Commins *et al.*, 1954; Cooper and Lindsey, 1955) and J. A. Campbell in this laboratory have identified in cigarette smoke.

REFERENCES

- Auerbach, O., Petrick, T. G., Stout, A. P., Statsinger, A. L., Muehsam, G. E., Forman, J. B., and Gere, J. B. (1955). *Cancer*, 9, 76.
 — *et al.* (1957). *New Engl. J. Med.* In press.
 Clemmesen, J., and Nielsen, A. (1956). *Dan. med. Bull.*, 3, 36.
 Cloudman, A. M., Hamilton, K. A., Clayton, R. S., and Brues, A. M. (1955). *J. nat. Cancer Inst.*, 15, 1077.
 Commins, B. I., Cooper, R. L., and Lindsey, A. J. (1954). *Brit. J. Cancer*, 8, 296.
 Cooper, R. L., and Lindsey, A. J. (1955). *Ibid.*, 9, 304.
 Curwen, M. P., Kennaway, E. L., and Kennaway, N. M. (1954). *Acta Un. int. Cancr.*, 10, 104; and *Brit. J. Cancer*, 8, 181.
 Davies, C. N. (1949). *Brit. J. Industr. Med.*, 6, 245.
 Dawson, K. B. (1952). *Brit. J. Cancer*, 6, 22.
 Doll, R. (1953). *Ibid.*, 7, 303.
 — and Hill, A. B. (1954). *British Medical Journal*, 1, 1451.
 — (1956). *Ibid.*, 2, 1071.
 Gellhorn, A., Klausner, C., and Hibbert, J. (1956). *Proc. Amer. Ass. Cancer Res.*, 2, 109.
 Harlow, E. S. (1956). *Science*, 123, 236.
 Hieser, I. (1949). *Brit. J. Cancer*, 3, 123.
 Kennaway, E. L. (1955). *J. Industr. Hyg.*, 7, 69.
 — (1955). *British Medical Journal*, 1, 1107.
 — and Kennaway, N. M. (1956). *J. Hyg. (Camb.)*, 36, 236.
 — (1946). *Cancer Res.*, 6, 49.
 — (1947). *Brit. J. Cancer*, 1, 260.
 Kettlewell, H. B. D. (1955a). *Nature (Lond.)*, 175, 943; and *Heredity*, 9, 323.
 — (1955b). *Discovery*, 16, 507.
 Koskowsky, W. (1955). *The Habit of Tobacco Smoking*. Staples Press, London.
 Kreyberg, L. (1954). *Brit. J. Cancer*, 8, 214.
 Lederman, M. (1954). *J. Larynx*, 68, 333.
 Lüders, C. J., and Thelme, K. G. (1954). *Vitcheows Arch. path. Anat.*, 325, 499.

*The number of television licences in England and Wales rose from 18,730 in May, 1947, to 2,957,000 at the end of 1954.

- Nature*, 1956, 178, 667.
 Raeburn, C. (1956). *A.R. Brit. Emp. Cancer Campgn.*, p. 402.
 Registrar-General (1952). *Census 1951. One Per Cent. Sample Tables. Occupational Mortality. Part I. H.M.S.O., London.*
 — (1954). *Statistical Review of England and Wales, 1953. Tables. Part I. Medical. H.M.S.O., London.*
 — (1955). *Statistical Review of England and Wales, 1954. Tables. Part I. Medical. H.M.S.O., London.*
 Rössle, R. (1943). *Schweiz. med. Wschr.*, 73, 1200.
 Salaman, M. H., and Roe, F. J. C. (1956). *Brit. J. Cancer*, 10, 70, 79.
 Steele, R., Koch, F. C., and Steiner, P. E. (1951). *Cancer Res.*, 1, 614.
 Stocks, P. (1956). *Brit. J. Cancer*, 10, 257.
 — and Campbell, J. M. (1955). *British Medical Journal*, 2, 923.
 Wynder, E. L. (1949). *Quart. J. Med.*, 18, 51.
 — (1955). Edited by, *The Biologic Effects of Tobacco*. Churchill, London.
 — Bross, I. I., and Day, E. (1956). *Cancer*, 9, 86.
 — Graham, E. A., and Croninger, A. B. (1953). *Cancer Res.*, 13, 855.

BENACTYZINE AS AN AID IN TREATMENT OF ANXIETY STATES

PRELIMINARY REPORT

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Benactyzine hydrochloride has been found to reduce or modify stress-induced behaviour in animals (Jacobsen and Sonne, 1955; Jacobsen and Skaarup, 1955a, 1955b). It has also been found to diminish the autonomic responses of human beings to emotionally disturbing experiences (Jacobsen *et al.*, 1955). Favourable results have been reported in Denmark with clinical use of the drug for the treatment of psychiatric cases (Jensen, 1955; Ostenfeld, 1955), and it has recently been introduced into the United Kingdom. Beresford Davies (1956) reports its use in a group of 110 patients suffering from psychiatric conditions, with favourable results in 67 patients. Further trials have been reported by Raymond and Lucas (1956) and Seager and Leitch (1956).

In recent years a variety of new drugs—the so-called "tranquillizers"—have been introduced in psychiatric practice, some of which are now being prescribed very extensively—so extensively, in fact, that the American Psychiatric Association has issued a warning against their indiscriminate use, and hospital management committees in this country have expressed concern at the high cost incurred by their use in mental hospitals. For some of these drugs the value in specific conditions has been thoroughly assessed—for instance, in the case of reserpine or chlorpromazine employed for the treatment of chronic disturbed hospitalized schizophrenics. But the widespread use of drugs of this type for the treatment of psychoneuroses in general practice rests on no such secure evidence.

If the preliminary findings of the clinical use of benactyzine prove valid it appears likely that its application may lie mainly in the treatment of certain types of psychoneurotic patients, in which case its chief use would be found in general practice and in psychiatric out-patient clinics. It seems therefore to be of particular

importance that its value in such a type of practice should be rigorously assessed as soon as possible.

None of the clinical papers previously quoted can be regarded as entirely conclusive as an assessment of the value of the drug from the point of view we have in mind. Jensen's series of 110 cases consisted predominantly of in-patients in the Danish Red Cross Sanatorium, since it included only 14 out-patients. From a diagnostic point of view the series is heterogeneous, as it contains many different types of psychoneurotic and some psychotic reactions. Beresford Davies's series also contains patients suffering from many different types of psychoneurotic and psychotic reactions. Of his 110 cases 74 were out-patients, the remainder being in-patients in a mental hospital, some of whom were receiving modified electroplexy at the same time and others drugs of the antihistamine group. (It is not clear whether chlorpromazine was included in this category.) The 13 in-patients studied by Seager and Leitch are diagnostically an extremely heterogeneous group, since they include no fewer than four different types of psychoneurotic syndrome, and the only results presented are those for the group as a whole. Raymond and Lucas, on the other hand, although their series of 43 out-patients contains five different diagnostic groups, present the results for each group separately, from which they conclude that benactyzine had a favourable effect on 12 out of 18 cases of "anxiety neurosis."

Jensen's series includes a "control" group which is said to have been "picked out at random but so that approximately the same types of patients are represented in both groups." It seems to us that there may be a certain incompatibility between the first and second statements in this sentence. It is open to the further objection that the patients in the control group were apparently receiving three different treatments—thiopentone or phenobarbitone, "the latter often combined with bromides"—and that the psychiatrists undertaking the assessments were aware of the treatments which the patients were receiving, except that, at a later stage of the trial, in the case of 40 patients who had responded well to benactyzine, placebo tablets were substituted unknown to the patients' nurses and the colleagues of the author but apparently with the knowledge of the author himself. In Beresford Davies's series no control group was employed, and Ostenfeld's material consists of nine diagnostically heterogeneous case reports without controls. The trials reported by Raymond and Lucas and by Seager and Leitch were both blind and also controlled in the sense that the patients were used as their own controls by the blind alternation of placebo and drug. Unless combined with independent controls this method has, however, the disadvantage of providing no information on the course of the malady in comparable patients who do not receive the drug being investigated.

The method of assessment of the patient's condition is not fully described in any of the papers, except that of Raymond and Lucas (1956). In Jensen's series three general categories—"good effect," "moderate effect," and "no effect"—are employed; Beresford Davies similarly uses two sets of three categories—"worse," "unchanged," and "improved," and elsewhere in his paper "fair," "good," and "marked" improvement. In both these series it appears that different psychiatrists made assessments on different cases. No attempt is made to categorize the degree of improvement shown by Ostenfeld's cases.

In planning our own trial it appeared to us important to eliminate as many as possible of the uncontrolled variables which we have outlined above, or, where they could not be eliminated, to measure the significance of their effect.

Design of Trial

We decided to accept for the trial out-patients between the ages of 20 and 65 suffering from an anxiety state of less than four years' duration. We excluded any patient whose condition merited immediate treatment as an in-patient by reason of the severity of the anxiety, or patients in whom marked depressive symptoms appeared at the outset to be the principal feature. Three psychiatrists participated in the trial. Each patient was seen weekly for at least eight weeks by the psychiatrist who conducted the initial consultation. At the end of the second and fifth weeks—that is, at the third and sixth interviews—a second psychiatrist also saw the patient. Four treatments—A, B, C, and D—were available for prescription. Each psychiatrist was provided with a different list of these treatments arranged in random order, and the treatment prescribed for each new patient taken into the series by a psychiatrist was dictated by the next treatment on his random list.

The three possible combinations of psychiatrists to undertake the double interviews at the end of the second and fifth weeks were allotted in the same way. For any individual patient the third and sixth interviews were conducted by the same pair of psychiatrists. The chief pharmacist at the hospital, without our knowledge, allotted two of the treatments A, B, C, and D to benactyzine tablets, 1 mg., and the other two to placebo tablets of identical appearance.

At the first interview the psychiatrist prescribed for the patient the next treatment code letter on his random list at a dosage of one tablet three times a day. During the first fortnight—the preliminary period—all patients received inert tablets. In this period the fact that the tablets were inert was known to the psychiatrist but not the patient. At the third interview the dosage of the prescription was changed so that during the succeeding week it rose by one tablet a day to a maximum dose of two tablets four times a day. From this interview onwards the pharmacist dispensed tablets according to his code, and it was not known to the psychiatrist or to the patient whether the latter was receiving inert or active tablets. Unless side-effects led the psychiatrist to decrease the dose, the patient continued to receive the tablets at the rate of two tablets four times a day until the sixth interview. At this time all tablets were discontinued for one week. At the end of this week the patient was then placed on "known" benactyzine prescribed by name and continued as an ordinary out-patient at the clinic.

In summary, therefore, the trial provides a preliminary period of two weeks in which the patient is known to be on inert tablets, a test period of three weeks during which it is known only to the pharmacist whether the patient is receiving benactyzine at a dose starting with 1 mg. three times a day rising within five days to 2 mg. four times a day, and remaining at that level until the end of the test period, or, alternatively, is receiving the same dosage of inert tablets. This is followed by a withdrawal period of one week, after which the patient is given "known" benactyzine for at least two more weeks.

The first interview, which lasted about one hour, was devoted to a full psychiatric examination. At the end of this interview an assessment of the patient's symptoms was made in a manner described below. Succeeding interviews varied in length up to three-quarters of an hour. These interviews were devoted to minor psychotherapy and to an assessment of the extent of the patient's symptoms during the preceding week. At the third and sixth interviews a second psychiatrist was present—the external examiner—who made an independent assessment of the patient's symptoms.

The psychiatrist in charge of the case was at liberty to prescribe a nocturnal sedative during the trial if the severity of the patient's sleep disturbance made it imperative. In only one case was this found to be necessary. No drugs other than those under trial were prescribed by day. The psychiatrist was at liberty to reduce the dosage of the drug under trial if side-effects appeared.

Assessment of Symptoms

The method of assessment of the severity of the patient's condition was given considerable attention. The usual method whereby the psychiatrist makes an intuitive global assessment of the patient's improvement under such headings as "fair," "good," or "marked" seemed open to the objection that it is difficult with such assessments to compare with any degree of accuracy the improvement of the same or different patients—in addition, such judgments provide no qualitative information on the nature of the changes in symptoms which might throw light on such matters as general prognostic differences between anxiety states of varying symptomatology or on the type of symptom particularly likely to be relieved by the drug under study. We therefore classified all the symptoms likely to be found in our patients under the following headings: (1) anxious mood; (2) tension; (3) specific fears and phobias; (4) sleep disturbance; (5) intellectual disturbance; (6) depressive features; (7) somatic disturbances (muscular and sensory); (8) cardiovascular disturbance; (9) respiratory disturbances; (10) gastro-intestinal disturbances; (11) genito-urinary disturbances; (12) autonomic disturbances; and (13) manifestations of anxiety in the behaviour at the interview.

A gloss was prepared listing the features to be taken into account in making an assessment under any of these headings. At the interview we rated each of these thirteen items on a five-point scale as follows: 0, none; 1, mild; 2, moderate; 3, severe; 4, grossly disabling.

This rating scale yields a variety of different types of information for each patient, including a "profile" of his symptomatology and, by summing the ratings for all headings, a gross symptom score.

Such in outline is the design of the trial, which provides the means for an intensive study of a small diagnostically homogeneous group of cases to elicit data relevant to many questions. This paper deals with one of those questions—namely, the comparison over a test period of three weeks of two groups of patients suffering from anxiety states, both of which received minor psychotherapy and pills: only in the case of one group, however, were the pills active.

Other matters, such as the extent of agreement between the ratings of different psychiatrists (which proved to be great, $r=0.89$), the prognostic significance of different symptom-patterns, the response of different symptoms to the drug, and the effect of changes in his life situation on the patient's illness, will be dealt with elsewhere.

Nevertheless a word must be said regarding the effect of change in the patient's life situation. While we were still unaware of the coding employed for the tablets, we identified six cases in which it appeared to us that such a factor had been operative and rejected them from the series. In five cases there was considerable improvement (an average of 13 points improvement on the patient's symptom-score during the trial period), which appeared to us to result from very favourable changes in the patient's life situation. In a sixth case a worsening of the patient's life situation appeared to us to be associated with a slight worsening of his condition (two points on his total symptom-score). When the code was broken it was found that the five patients who had improved in this way had all been receiving inert tablets, while the patient whose condition had deteriorated had been receiving benactyzine. It is evident from this that if such factors are not taken into account they may considerably bias the results of drug trials with psychoneurotic patients. In the remainder of our cases, 26 in all, there were, so far as we could tell, no changes

in circumstances during treatment to which any change in condition could be attributed.

To emphasize what we have said regarding the restricted value of global assessments of the patient's condition, such as the term "improved," we show in columns 2 and 3 of Table I our results using the categories "improved" (mean-

TABLE I

	Our Series		Davies (1956)
	Inert	Benactyzine	Benactyzine
Improved	9	14	15
Not improved ..	1	0	7
Worse	2	0	9
	12	14	22

ing a reduction in total symptom score between the first and second double interviews), "not improved," and "worse." In column 4 we show the results of the 22 cases of "anxious neurosis" treated with benactyzine in the uncontrolled trial reported by Beresford Davies (1956). These data show that, even after the rejection from our series of patients in whom improvement appeared to result from a favourable change in their life situation, three-quarters of the patients receiving inert tablets "improved"—as high a proportion as is attributed to benactyzine in column 4. Although the class frequencies in this table are too small to permit the use of statistical tests, the figures nevertheless make it appear unlikely that valid conclusions can be drawn regarding "improvement" in the treated groups unless the degree of improvement can be assessed in some way.

The improvement of our patients who received inert tablets may be attributed to the benefits of minor psychotherapy or the natural history of the malady, according to the taste of the reader; but, whatever its cause, such an outcome makes it evident that a drug trial in this condition is valueless unless it is controlled, unless the effect of change in the patient's life situation is excluded, and unless it attempts by some means to measure the degree, scope, and nature of the symptomatic improvement. The total symptom-score improvement, as assessed by two psychiatrists on the thirteen-items rating scale, provided us with such a means, although the raw symptom-score might be open to the objection that it does not differentiate between an improvement in a patient displaying one symptom and a more widespread but more modest improvement affecting different symptoms. We have therefore used, in addition, an index of improvement based on the percentage improvement on the patient's original symptom-score as assessed by the two psychiatrists.

Table II shows the data obtained in this way. Columns 1 and 2 show the initial and final symptom-scores during the test period of the patients who received inert tablets, and columns 5 and 6 give similar information for the "benactyzine

TABLE II

Control				Benactyzine			
(1) Initial Score	(2) Final Score	(3) Improvement Score	(4) %	(5) Initial Score	(6) Final Score	(7) Improvement Score	(8) %
22	8	14	64	28	7	21	75
27	15	12	44	14	4	10	71
37	22	15	41	8	3	5	63
39	25	14	36	23	12	11	48
28	21	7	25	44	25	19	43
34	26	8	24	32	20	12	38
13	11	2	15	31	20	11	36
46	41	5	11	23	15	8	35
22	20	2	9	42	28	14	33
32	32	0	0	61	27	7	21
31	34	-3	-10	20	16	4	20
48	56	-8	-17	41	34	7	17
				38	36	2	5
Mean 31.6	25.9	5.6	20.2	31.4	21.1	10.2	37.5

For difference in means of improvement score, $t=1.77$ ($N=24$), $P=0.08$.
 " " " " " % improvement, $t=1.98$ ($N=24$), $P=0.06$.

cases." Columns 3 and 7 give the net improvement for "control" and "benactyzine" patients as shown by the difference between the initial and final scores. Columns 4 and 8 show the improvement as a percentage of the symptom-score at the beginning of the test period. From this table it will be seen that the average degree of improvement of the patients who received benactyzine was greater than in the case of those who received inert tablets and that this difference can reasonably be attributed to the effect of the drug.

Effect of the Drug

The effect of benactyzine in those cases in which it is evident is to produce a feeling of calmness, and sometimes a sense of detachment from such symptoms as remain, in that it diminishes rumination and preoccupation. It is our impression that it makes some patients more accessible to psychotherapy. In some cases it also appeared to have a favourable effect on sleep disturbance without the administration of any nocturnal sedatives. Patients responding to benactyzine show an improvement within a few days of its administration and, in most cases, a deterioration within a few days of its withdrawal after the comparatively short period of three weeks' medication on which the trial was based.

We found no toxic effects during the period under review, but 8 out of 14 patients receiving the drug, and 1 out of 12 of those on the placebo, showed side-effects of the type reported previously (Jensen, 1955; Beresford Davies, 1956). They complained of dizziness and "muddled thinking" amounting in a few cases to thought-blocking. In most cases these symptoms were very mild; they appeared within 24 hours of the dosage reaching 8 mg. daily and disappeared equally rapidly when the dosage was reduced. Reduction of the dosage to 6 mg. daily was sufficient to abolish the side-effects in all cases except two, in which it was reduced to 4 mg. daily.

During the progress of the trial we were inclined to suspect that an increase in depression might also be a side-effect of the drug. This suspicion was aroused by the fact that, although we had excluded at the outset patients in whom marked depressive symptoms were the predominant feature, we noticed a tendency for our ratings of depression in certain patients to increase during our observation of them.

The data derived from the trial enable the validity of this clinical impression to be examined. The mean depression-scores of the "inert" and "benactyzine" groups at the initial interview were 2.7 and 2.6 respectively. At the end of the preliminary period, during which both groups received inert tablets, the respective mean scores were 2.2 and 2.4. At the end of the trial period both groups had the same mean score of 1.8.

It is evident, therefore, that there was a general tendency for the depression score to fall to the same degree regardless of whether inert or benactyzine tablets were received. There were five patients whose course ran counter to this general tendency in that at some period of the trial their depression-score increased. Three showed such an increase only during the preliminary period while receiving inert tablets. A fourth patient showed an increase only during the trial period while receiving inert tablets, and a fifth showed an increase during the preliminary period on inert tablets and a further increase in the trial period on benactyzine.

Our suspicion that an increase in depression might be a side-effect of benactyzine therefore proves to be without support. The average fall in the depression-scores of those who received this drug is as great as in those who did not. In only one patient receiving benactyzine did an increase in depression-scores occur, and this tendency had already become manifest, before he received the active drug, by a rise in depression-score during the preliminary period.

The increase in the depression-scores may indicate a real and spontaneous increase in the severity of depressive

symptoms, or, alternatively, it may indicate the inaccuracy of assessments of depression made at a single initial interview—an inaccuracy which may diminish with assessments repeated at weekly intervals. It may well be that in some cases the depressive symptoms became more severe, but that in others depressive features became more evident to the observer as anxiety symptoms diminished. We hope to deal with this matter more fully in another communication.

Conclusions

The majority of our "placebo" patients have improved; some, we suspect, by reason of a favourable change in their circumstances, and others, we hope, by reason of the assistance which minor psychotherapy could give to their natural capacity for recovery. Several of our patients showed an increase in depression which proved to be unrelated to benactyzine.

Had our trial not been "blind" and "controlled" we should inevitably have attributed to benactyzine both favourable and unfavourable effects which, it is evident from our data, are not attributable to it; and had we not attempted to assess improvement in both a quantitative and a qualitative manner we should have failed to discern the favourable effects which are attributable to it. This trial has convinced us, firstly, of the misleading findings that may result from uncontrolled drug trials on psychoneurotic patients; we shall in future view with increased scepticism conclusions drawn from such trials. Secondly, we have learnt that, although blind controlled trials are essential, they are exceedingly time-consuming, not only because of the amount of time that must be devoted weekly to the assessment of each patient's condition, but also because a considerable proportion of the patients seen for an initial consultation with a view to inclusion in the trial failed on examination to meet the criteria we had laid down for acceptance. Even when they did meet the criteria there was another source of wastage—namely, their inability (by reason of geography or their employment situation) to attend the clinic weekly for at least eight weeks during working hours. Thirdly, we have learnt that impressionistic global judgments of a patient's condition alone are of little value in assessing the effect upon him of a particular regime, and in attempting to devise a method of symptom appraisal in anxiety states we have been disappointed to obtain little help from past literature with the notable exception of a paper by Cameron (1944). Fourthly, we have been reassured to discover that, with respect to assessment of anxiety states made in the manner we have described, doctors do not differ significantly, at least so far as we three are concerned. And, finally, we have found that, on the average, patients who received benactyzine in this trial showed a greater degree of improvement than those who did not.

Summary

Thirty-two out-patients suffering from anxiety states have received either benactyzine or an inert substance in a double blind controlled trial.

The majority showed "improvement." Six cases in which a change in symptoms appeared to us to result from a change in the patient's circumstances were discarded from the series.

Among the remaining 26 patients the extent of the average degree of improvement as assessed by two independent psychiatrists using a rating scale was greater in the case of the group of patients that received benactyzine than in the control group ($P=0.08-0.06$).

More than half the patients receiving benactyzine, 8 mg. a day, complained of side-effects, usually of mild degree, which disappeared when the dose was reduced.

An increase in depression occurring in five patients was not due to benactyzine.

Double blind controlled trials and improved methods of assessment of the patient's condition are very time-consuming; they are nevertheless essential in studying the effects of drugs on psychiatric patients in order to circumvent the capacity for unwitting self-deception which both psychiatrists and their patients display.

We thank Mr. N. W. Blacow, chief pharmacist of the General Infirmary at Leeds, for supervising the coding and dispensing of the substances under trial; and Glaxo Laboratories Ltd. for the gift of "suavitil" brand benactyzine and the matched inert tablets used in the trial.

REFERENCES

- Cameron, D. E. (1944). *Amer. J. Psychiat.*, 101, 36.
 Davies, E. B. (1956). *British Medical Journal*, 1, 480.
 Jacobsen, E., Kjetil, H., Larsen, V., Munkvad, I., and Skinhoj, K. (1955). *Acta psychiat. neurol. scand.*, 30, 627.
 — and Skaarup, Y. (1955a). *Acta pharmacol. (Kbh.)*, 11, 117.
 — (1955b). *Ibid.*, 11, 125.
 — and Sonne, E. (1955). *Ibid.*, 11, 135.
 Jensen, O. Ø. (1955). *Dan. med. Bull.*, 2, 140.
 Ostfeld, I. (1955). *Nord. Med.*, 54, 1523.
 Raymond, M. J., and Lucas, C. I. (1956). *British Medical Journal*, 1, 952.
 Sager, C. P., and Leitch, A. (1956). *Ibid.*, 2, 1407.

ANTILIPAEMIC AGENT WITHOUT ANTICOAGULANT ACTION

BY

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There is now ample evidence that heparin influences the transport or metabolism of fats in man. When injected after a fatty meal it accelerates the disappearance of visible lipaemia (Anderson and Fawcett, 1950; Oliver and Boyd, 1953). Following heparin administration, analysis of serum lipoproteins by the ultracentrifuge shows a redistribution of the low-density fractions with reduction of the Sf 12-20 and increase of the Sf 6-12 group (Graham *et al.*, 1951). In 1953 Nikkilä reported comparable changes in the electrophoretic pattern of serum lipids after heparin, with diminution of the beta- and increase of the alpha-lipoproteins. However, this quantitative change in the electrophoretic pattern has not been found by all observers. The most constant change is an increase in mobility of both beta- and alpha-lipoproteins with an absolute decrease of the neutral fats and apparent diminution of the beta-lipoprotein (Herbst *et al.*, 1955; Kuo *et al.*, 1955; Besterman, 1957).

Thus heparin tends to rectify the abnormal lipaemia and Sf distribution associated with atheroma. There is as yet no convincing proof that human atherosclerosis will regress with heparin therapy, and to obtain such evidence a prolonged course of treatment would be required. Daily intravenous injection is impracticable, and the anticoagulant action of heparin makes repeated subcutaneous or intramuscular therapy hazardous.

To overcome this difficulty a substance is required which retains the antilipaemic properties of heparin but has no anticoagulant action. Constantinides *et al.* (1954) reported that certain sulphated polysaccharides with negligible anticoagulant action would clear turbid serum in rats, thereby establishing that the antilipaemic and anticoagulant effects were independent properties. Subsequently at the Institute of Seaweed Research Black and

Dewar (1954) showed that laminarin, a relatively homogeneous polysaccharide from the seaweed *Laminaria cloustoni*, could be sulphated to varying degrees. The highly sulphated compounds have an anticoagulant action, whereas the laminarins with few sulphate groups have little or no effect on blood-clotting. The object of the present study was to determine whether either of two lower-sulphated polysaccharides exhibited antilipaemic properties similar to those of heparin as judged by their effect on the electrophoretic pattern of the serum lipoproteins.

Method

The preparations used in this study were two samples of laminarin sulphate, M and N, with a low sulphate content—namely, 0.62 and 0.37 sulphate groups per glucose unit respectively. The anticoagulant activities of these preparations as tested *in vitro* were 1.4 and less than 1.3 international units per mg. respectively. Previous work had shown that laminarin sulphate M and N had very low acute toxicities in mice and guinea-pigs, in contrast to laminarin sulphate K, a preparation with high sulphate content which has been shown to be very toxic to guinea-pigs (Adams and Thorpe, 1957). Toxicity data are shown in the Table.

Acute Intravenous Toxicities of Laminarin Sulphates to Mice and Guinea-pigs

Animal	Substance	I.V. Dose (mg./kg.)	Deaths
Mice	Laminarin sulphate K	1,000	6/10
	" "	1,500	9/10
	" "	4,000	2/12
	" "	2,800	1/9
	" "	3,600	1/5
	Heparin (100 I.U./mg.)	4,000	5/8
Guinea-pigs	" "	1,500	2/10
	" "	2,500	5/5
	Laminarin sulphate K	20	8/11
	" "	40	3/5
	" "	200	0/5
	Heparin (100 I.U./mg.)	200	0/5
	" "	250	0/5

These compounds, comparable to heparin in their low acute toxicity, were considered to be suitable for short-term clinical investigations.

Twelve patients with ischaemic heart disease were given an intravenous injection of 10,000 units of heparin and in 11 the electrophoretic pattern of the serum lipids was significantly altered. Only these 11 patients were subjected to further study. Nine of these patients subsequently received a single intravenous injection of 100 mg. of laminarin sulphate; six were given laminarin sulphate M and three laminarin sulphate N. The remaining two patients were given 100 mg. of laminarin sulphate M by intramuscular injection.

Samples of venous blood were taken from each patient before and at varying times from 10 minutes to 24 hours after injection. Paper electrophoresis of the serum was carried out as described by Dangerfield and Smith (1955). Each strip of filter-paper was divided longitudinally, half being stained for proteins with "light green" and half for lipids with "Sudan black B."

Two of the patients who received laminarin sulphate M had been given a fatty meal four hours before the intravenous injection. The visible turbidity of the serum and the electrophoretic pattern of the lipids were observed. To determine whether laminarin sulphate M or N altered the turbidity or electrophoretic pattern of the serum *in vitro*, 1 ml. of lipaemic serum was incubated at 37° C for one hour with 1 mg. of each of the polysaccharides.

The clotting-time of whole blood was estimated by the method of Lee and White before and after injection in five patients who received laminarin sulphate M and in two who received laminarin sulphate N.

Observations

Heparin. The alterations in the electrophoretic pattern of the serum lipids after heparin consisted of increased mobility of the beta-lipoproteins and less consistency of the alpha-lipoproteins, reduced intensity of staining of the beta-lipoproteins, and clearing of the neutral fat zone (Fig. 1). Changes of variable degree were noted in 11 of the 12 patients. They were fully developed within 10 minutes of the injection and persisted for 6 to 24 hours. The serum proteins were unchanged after heparin save for the appearance of a band ahead of the albumin corresponding in position to the alpha-lipoproteins.

Laminarin Sulphate M. After an intravenous injection of laminarin sulphate M in six patients, the electrophoretic pattern in all cases showed similar changes to those observed following intravenous heparin (Figs. 2 and 4). Increased mobility of the beta-lipoproteins and, to a lesser extent, of the

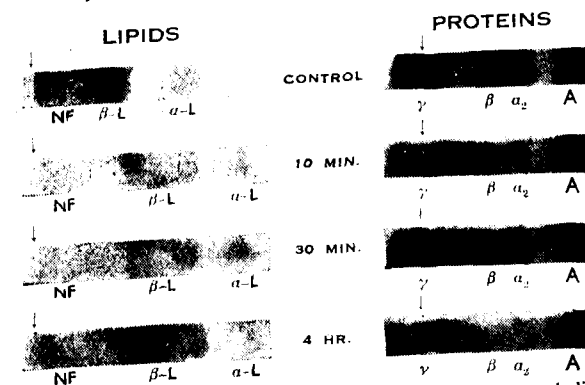


FIG. 1.—Electrophoretic pattern of serum proteins and lipids before and at varying times after an intravenous injection of 10,000 units heparin. NF=neutral fat; α-L=α-lipoprotein; β-L=β-lipoprotein; A=albumin; α₂=α₂-globulin; β=β-globulin. γ=γ-globulin. Arrow marks, point of application of serum.

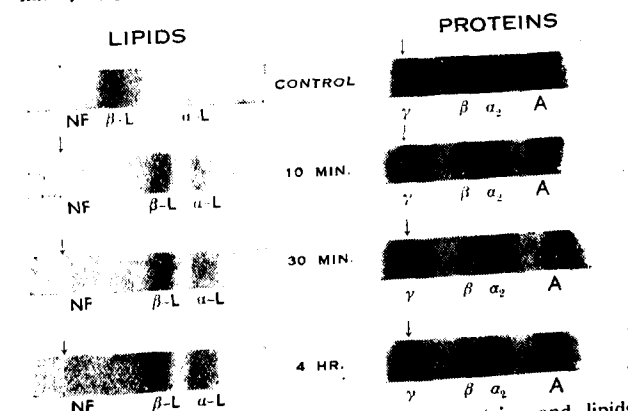


FIG. 2.—Electrophoretic pattern of serum proteins and lipids before and at varying times after an intravenous injection of 100 mg. of laminarin sulphate M. (For symbols see Fig. 1.)

alpha-lipoproteins, was noted in each case. The beta-lipoprotein band was decreased and the neutral fat zone, when present, was cleared. As with heparin, the magnitude of the changes varied from patient to patient. These effects were most marked in the serum taken 10 minutes after injection and tended to disappear within four to six hours. The serum and proteins appeared unchanged. Once again a band beyond the albumin fraction was seen in cases with greatly increased mobility of the lipoproteins (Fig. 4). The distribution and mobility of the lipoproteins was not significantly altered in either of these patients, who received 100 mg. of laminarin sulphate M by intramuscular injection. No discomfort was noted locally at the site of injection. The clotting-time of whole blood was slightly prolonged after intravenous laminarin sulphate M in each of the five patients in whom it was measured. The maximum increase was from 9 minutes before injection to 13 minutes after injection. The visible turbidity of the serum was reduced in both patients

given laminarin sulphate M after a fatty meal (Fig. 3). These observations were confirmed on electrophoresis (Fig. 4). The sample taken 10 minutes after injection showed clearing of the heavy zone of neutral fat in addition to marked changes in the lipoproteins. Within four hours neutral fat had reaccumulated and the lipoproteins had reverted to the control pattern.

Laminarin Sulphate N. No changes were observed in the electrophoretic pattern of the serum lipoproteins in any of the three patients given an intravenous injection of laminarin sulphate N (Fig. 5). The clotting-time of whole blood was not prolonged in either of the patients in whom it was measured.

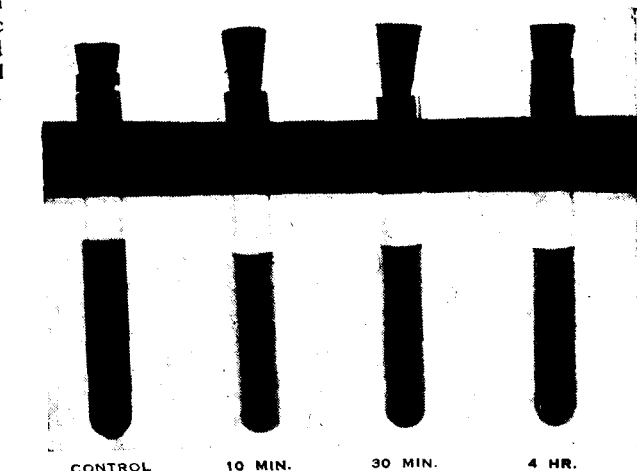


FIG. 3.—Visible turbidity of serum following a fatty meal, before and at varying times after an intravenous injection of 100 mg. of laminarin sulphate M.

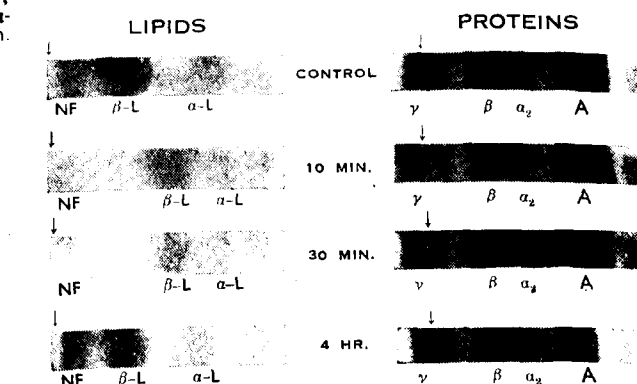


FIG. 4.—Electrophoretic pattern of serum proteins and lipids before and at varying times after an intravenous injection of 100 mg. of laminarin sulphate M in a patient who had been given a fatty meal. (For symbols see Fig. 1.)

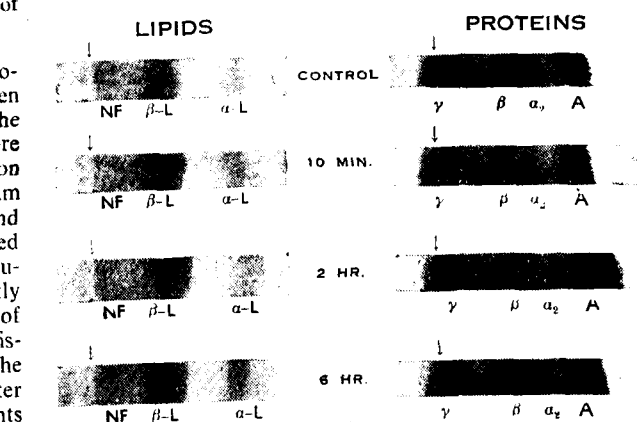


FIG. 5.—Electrophoretic pattern of serum proteins and lipids before and at varying times after an intravenous injection of 100 mg. laminarin sulphate N. (For symbols see Fig. 1.)

In-Vitro Studies.—The addition of either laminarin sulphate M or N *in vitro* to lipaemic serum caused neither visible clearing of the serum nor any significant alteration in the electrophoretic distribution of neutral fats and lipoproteins.

Discussion

As only small amounts of the two laminarins were available for clinical trial, it was particularly useful that laminarin sulphate N proved to be inert and thus acted as a control for the positive findings following injection of laminarin sulphate M.

A single intravenous injection of the lower-sulphated polysaccharide laminarin sulphate M cleared lipaemic serum, increased the electrophoretic mobility of lipoproteins, and altered the distribution of lipoproteins in the same way as heparin. The changes could be demonstrated almost immediately after injection, and persisted for four to six hours. They were not reproduced by the addition of laminarin sulphate M to serum *in vitro*. It is evident, therefore, that the antilipaemic properties of laminarin sulphate M closely parallel those of heparin, except for the shorter duration of action of the dose used in this study. On the other hand, laminarin sulphate N, a closely related polysaccharide, showed no demonstrable effect on the electrophoretic mobility or distribution of lipoproteins.

No effect was noted when 100 mg. of laminarin sulphate M was injected intramuscularly. It is possible, however, that with larger doses changes may be seen following both intramuscular and subcutaneous injections, and that the duration of the changes will be prolonged by slow release from the tissues at the site of injection. No local reaction resulted from intramuscular injection of the polysaccharide, and no reactions were observed in any patient following intravenous laminarin.

Since laminarin sulphate M possesses the antilipaemic properties of heparin without the hazards of its anticoagulant action, it would appear to be a suitable substance with which to study the effect of prolonged administration of "lipaemia-clearing" substances on the course of atherosclerosis in man. Following the completion of chronic toxicity trials in animals and further information on the optimal dose and most convenient method of administration, a long-term investigation of patients with ischaemic heart disease will be undertaken.

Conclusion

A lower-sulphated polysaccharide of laminarin is described that has antilipaemic properties similar to those of heparin without significant anticoagulant activity. It would appear to be a suitable agent to assess the effect of "lipaemia-clearing" substances on the course of atherosclerosis in man.

We are indebted to Dr. Woodward and his staff at the Institute of Seaweed Research for advice and supplies of laminarin sulphate, and to the Research Department of Boots Pure Drug Company Ltd. for carrying out toxicity trials and the preparation of the material for clinical use. We would in particular like to acknowledge the co-operation and assistance of Drs. E. V. B. Morton, Cobb, and Adams, of Boots. Dr. Paul Wood, Director of the Institute of Cardiology, has throughout provided us with invaluable advice and encouragement, and we are grateful to him and to the other physicians of the National Heart Hospital for their kind co-operation. For untiring technical assistance we are indebted to Miss B. Hall.

REFERENCES

- Adams, S. S., and Thorpe, H. M. (1957). To be published.
Anderson, N. G., and Fawcett, B. (1950). *Proc. Soc. exp. Biol. (N.Y.)*, 74, 768.
Besterman, E. M. M. (1957). To be published.
Black, W. A. P., and Dewar, E. T. (1954). *J. Sci. Food Agric.*, 5, 176.
Constantinides, P., Cairns, A., and Werner, A. (1954). *Arch. int. Pharmacodyn.*, 99, 334.
Dangerfield, W. G., and Smith, E. B. (1955). *J. clin. Path.*, 8, 132.
Graham, D. M., Lyon, T. P., Gofman, J. W., Jones, H. B., Yankley, A., Simonton, J., and White, S. (1951). *Circulation*, 4, 666.
Herbst, F. S. M., Lever, W. F., Lyons, M. E., and Hurley, N. A. (1955). *J. clin. Invest.*, 34, 581.
Kuo, P. T., Joyner, C. R., and Reinhold, J. G. (1955). *Circulation*, 12, 492.
Nikkilä, E. (1953). *Scand. J. clin. Lab. Invest.*, Suppl. 8.
Oliver, M. F., and Boyd, G. S. (1953). *Clin. Sci.*, 12, 293.

DIFFUSION OF RADIOACTIVE SODIUM IN NORMOTENSIVE AND PRE-ECLAMPTIC PREGNANCIES

BY

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The diminished placental transfer of radioactive sodium which is known to occur in pre-eclampsia (Browne and Veall, 1953; Cox and Chalmers, 1953; Johnson and Clayton, 1955; Clayton *et al.*, 1956) may be due either to a change within the placenta itself or to a reduction in its blood supply from the uterine decidua. This latter possibility has been investigated by Morris *et al.* (1955), who developed a simple method for measuring the effective blood flow in the pregnant uterus. It is based on a determination of the clearance rate of radioactive sodium ions following their injection into the anterior wall of the uterus in the final stages of pregnancy.

It is claimed that the physiological half-life of the injected radiosodium is almost constant in normotensive subjects, whereas in patients suffering from pre-eclampsia there is a very significant reduction in the clearance rate of the isotope. The actual values recorded are dependent upon the clinical severity of the condition as judged by the magnitude of the maternal diastolic blood pressure.

The significance of these results in relation to the possible use of the method in the identification of pre-eclampsia, and to a better understanding of this syndrome, is clear.

We have made similar investigations and have measured the radiosodium clearance rates in normotensive patients, pre-eclamptics, and a group under treatment with a hypotensive drug.

Method

(a) Uterine Muscle

Twenty microcuries of $^{24}\text{NaCl}$ contained in exactly 0.4 ml. of isotonic saline is injected into the antero-lateral aspect of the pregnant uterus between the 34th and 43rd weeks of pregnancy, in the manner described by Morris *et al.* (1955).

The abdominal skin in the region of McBurney's point is infiltrated with a small quantity of 1% procaine, and a hypodermic needle 2 in. (5 cm.) long is introduced into the subjacent myometrium. Localization within the uterine wall is confirmed by asking the patient to inspire, when the needle mount is depressed downwards as the abdominal wall slides over the uterus. Subsequent aspiration with a sterile syringe confirms that the needle point has not punctured the amniotic sac or a large vessel. Experience shows that very careful attention to these details of technique is essential.

After injecting the radiosodium, a gamma-ray G.-M. counter, with the end window screened, held in a delicately balanced support, is located over the injection site. It is kept in position with a thin strip of adhesive plaster. Pressure of only a few grammes is exerted on the skin, and the balancing mechanism enables the counter to ride any abdominal movement which may take place, so that a constant relationship with the injected site is maintained.

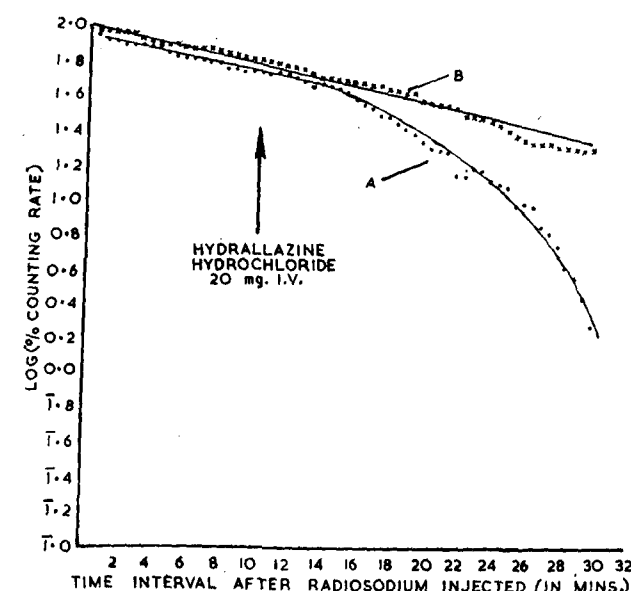
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DIFFUSION OF RADIOSODIUM IN PRE-ECLAMPSIA

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The observed counting rates were recorded at half-minute intervals, using a counting rate meter. The radioactivity is expressed in counts per second, and where necessary the final value is corrected for a simultaneous increase in background radiation due to systemic absorption of radiosodium from the injected site.

The reaction time of hydrallazine hydrochloride ("apresoline") in relation to radiosodium clearance in the uterine muscle was also investigated in three cases. Each patient had severe pre-eclampsia. A radiosodium-clearance curve was started, and as soon as the slope of the curve had been established the first treatment with hydrallazine hydrochloride was begun: 20 mg. of the drug was injected intravenously. Observations were continuous and the usual corrections were made. In order to extend the record for as long a period as possible a larger dose of radiosodium (35 $\mu\text{c.}$) was given in these cases. A result typical of the three cases is seen in the Chart.



The action of hydrallazine hydrochloride in increasing radiosodium clearance from an injected site in uterine muscle is seen in Curve A to be significant at approximately 15 minutes after its first injection. Curve B is typical of the 11 cases of untreated severe pre-eclampsia and shows a physiological half-life similar to that of Curve A before the injection of hydrallazine hydrochloride.

(b) Gastrocnemius Muscle

Similar observations have been made over the fleshy portion of the medial head of the gastrocnemius muscle, after intramuscular injection of the same volume and activity of saline as in the uterine muscle experiments. The results obtained in the two series of patients are recorded below.

Material

The above-mentioned studies were carried out on 55 patients between the 34th and 41st weeks of pregnancy. Thirty-eight separate observations were made in the plain muscle of the uterus and 17 in the striped gastrocnemius muscle of the calf.

The patients in these two groups were further subdivided into normotensives, mild pre-eclamptics, and severe pre-

TABLE I.—Numbers of Cases Studied

	Uterine Muscle Clearance	Gastrocnemius Muscle Clearance
Normotensive	14	6
Mild pre-eclampsia (diastolic B.P. 85-95 mm. Hg)	8	5
Severe pre-eclampsia (diastolic B.P. exceeding 95 mm. Hg)	11	6
Severe pre-eclampsia under treatment with hydrallazine hydrochloride	5	

eclamptics, depending on the magnitude of the maternal diastolic blood pressure at the time of experiment (Table I). We have accepted the same standards as Morris *et al.* (1955), and patients with pre-existing essential hypertension were carefully excluded from the study.

An additional group of patients who were receiving intermittent doses of hydrallazine hydrochloride to control the severe hypertension of pre-eclampsia were also included in this study.

Results

The clearance rates observed in uterine and gastrocnemius muscle are set out in Tables II and III. Values are expressed in terms of the physiological "half-life" of the sodium—that is, the time required for half the injected radiosodium to diffuse from the injection site.

TABLE II.—Clearance Rate of Radiosodium from Uterine Muscle

Type of Pregnancy	No. of Experiments	Mean Physiological Half-life (mins.)	Standard Deviation (mins.)	Standard Error of Mean
Normotensive	14 (20)	4.7 (4.1)	± 1.18	± 0.328
Mild pre-eclampsia	8 (10)	8.14 (7.7)	± 3.83	± 1.45
Severe pre-eclampsia	11 (8)	11.6 (15.3)	± 3.60	± 1.1
Severe pre-eclampsia treated with hydrallazine hydrochloride	5	4.5	± 2.72	± 1.21

Values reported by Morris *et al.* (1953) are given in parentheses.

TABLE III.—Clearance Rates of Radiosodium from Gastrocnemius Muscle

Type of Pregnancy	No. of Experiments	Mean Physiological Half-life (mins.)	Standard Deviation (mins.)	Standard Error of Mean
Normotensive	6	24.5	± 4.75	1.9
Mild pre-eclampsia	5	18.7	± 4.41	0.9
Severe	6	24.9	± 7.25	1.2

Discussion

The close correlation which has been found to exist between the magnitude of the diastolic blood pressure in pre-eclampsia and the clearance rate of radiosodium in uterine muscle is in sharp contrast to the results obtained with gastrocnemius muscle, where no significant correlation was observed. The reason for this is not clear, and we have not yet made any investigation beyond that reported, but it is possible that the very different histological texture of the muscle is an important factor. At the moment, however, the lack of any observed correlation in the gastrocnemius muscle seems to be of doubtful importance in diagnosing or understanding the pre-eclamptic condition.

The very significant decrease in radiosodium clearance rate which is seen to occur in uterine muscle in pre-eclampsia can be compared with the similar decrease in radiosodium clearance from an injected site in the placenta and also with the reduction in placental transfer rate of the same isotope in the same condition (Cox and Chalmers, 1953; Johnson and Clayton, 1955; Clayton *et al.*, 1956).

If it is generally accepted that the rate of radiosodium clearance from tissues is a measure of the efficacy of the blood supply (Kety, 1949; Braithwaite *et al.*, 1954), then it may well be that all these observations are an indication of a reduced maternal blood supply to the uterine decidua. If this is so then it is interesting to speculate on the precise environment which prevails in the uterine muscle to cause this reduction, and with the evidence available it is possible to suggest some theory for this mechanism.

Since the radiosodium is injected between the cells and in between the capillaries, the reduced clearance rate must be due to a reduction in the diameter of the open capillaries, a reduction in the number of open capillaries, or a change in the nature of the capillary endothelium itself. The first two alternatives would have the effect of reducing

the total quantity of blood passing through unit cross-sectional area of muscle in unit time. The third possibility—that is, that a reduction in radiosodium clearance rate can also be brought about by a change in the diffusing properties of the capillary endothelium—would result from direct biochemical or toxic activity on the capillary endothelium and would have no effect on blood flow. This latter corresponds to a change in the value of "K," the diffusion constant, in the equation $\frac{ds}{dt} = K.A.(S-S_1)$ (Fulton, 1949).

The first two postulates correspond to a change in "A," the total surface area of capillary available to transfer the sodium ion. S and S_1 are the radiosodium concentrations inside and outside the capillaries.

This postulate of the change in the nature of the capillary bed of the uterus in pre-eclampsia is consistent with the observed change in placental transfer in this condition, for the interchange of electrolytes between mother and foetus depends upon the vascularity of the uterine muscle which supplies the decidua. Furthermore, this capillary injury is not inconsistent with maternal hypertension. In this case the hypertension might be thought of as a consequence of changes in the resistance offered by the capillary bed to the blood flow, and hence of a subsidiary development in the main syndrome. In this event, however, it is not clear why this change in resistance should be confined to the uterus, for the results obtained with the gastrocnemius muscle do not reflect this same change in capillary condition, and blood-flow measurements in several other structures seem to be unaltered in mild pre-eclampsia (Kellar, 1955).

It is possible, however, that similar changes in the capillary bed are taking place in the gastrocnemius and other structures, but an increased clearance rate of radio-sodium in mild pre-eclampsia is not reflected by this method because of the different texture of the muscle.

It is reasonable to expect, however, that in advanced eclampsia with widespread oedema a generalized change in the capillary bed might have been observed, but we have had no opportunity of studying this condition.

It may be, of course, that the whole of the decrease in radiosodium clearance is due to biochemical changes within the myometrium. These may either act directly upon the capillary endothelium or they may be a result of the indirect effect of adrenocortical activity (Venning *et al.*, 1954) which is known to occur in pre-eclampsia and which increases the quantity of extracellular sodium ions causing oedema. The increased intercapillary distances in this latter condition have the effect of reducing the number of capillaries passing through the volume occupied by the injected sodium, and hence are likely to be a contributory factor in determining the clearance rate. Neither the direct nor the indirect of these two hypotheses, however, seems to explain the correlation between uterine muscle clearance and placental transfer rate, or suggest a cause for hypertension. It may be that these intrinsic alterations in the capillary bed are also present in the chemoreceptor organs in the carotid body, which are intimately concerned in the vasomotor control of blood pressure. These structures are well known to be sensitive to local alteration in electrolyte balance and lowered oxygen tension, and capillary injury of the type envisaged may have an adverse effect on this mechanism, with resultant hypertension.

It is felt, therefore, that although the biochemical changes may be contributory to a reduced radiosodium clearance rate they do not fully explain them in the way described above. It is realized, however, that they could be the controlling influence on the change in the nature of the capillary bed in pre-eclampsia.

The effect of hydralazine hydrochloride can be seen from the studies of radiosodium clearance (Table III and the Chart). It is clear that in the patients who were under treatment with this drug and who were suffering from severe pre-eclampsia there was a very significant increase in the radiosodium-clearance rate, which may be interpreted as an improvement in myometrial blood flow.

When hydralazine hydrochloride was first started whilst observation of radiosodium clearance was being made, a gradual increase in the clearance rate was noted. This became significant after about 15 minutes, and is in accordance with the findings of other workers who have measured similar effects upon the cerebral and renal circulations (McCall, 1953; Kaplan and Assali, 1953).

These latter observations add further evidence to the theory that a change in the nature of the capillary bed is one of the observable features of pre-eclampsia. The action of hydralazine hydrochloride in improving the blood flow gives a rationale to its observed therapeutic value in the management of this disease, although it should be understood that if permanent placental injury from pre-existing pre-eclampsia has occurred the use of vasodilator drugs is unlikely to be of value in restoring placental function.

It should be emphasized that the only direct measure of the consequences to the foetus of pre-eclampsia must be by observations on the foetus itself (Clayton *et al.*, 1956), or by measurement of the utero-placental exchange of nutrients and metabolites: a study of decidual blood flow is not necessarily a direct indication of placental function.

Summary

A study of the effective blood flow in the capillary bed of the full-term pregnant uterus in normotensive and pre-eclamptic patients has been made by investigating the clearance rates of isotonic saline containing sodium-24 after injection into the myometrium.

A constant clearance rate of radiosodium in normotensive patients was found to be significantly reduced in patients suffering from pre-eclampsia in proportion to the severity of the disease. We failed to demonstrate a similar correlation in the capillary bed of striped muscle.

The changes in the nature of the capillary bed which condition these observations and their relation to some features of hypertension are considered. It is postulated that a similar alteration in the capillary endothelium of the carotid bodies might be an aetiological factor in the onset of material hypertension in pre-eclampsia.

Hydralazine hydrochloride ("apresoline") administered to pre-eclamptic mothers by the intravenous route was found to restore the reduced myometrial capillary blood flow of this condition, the drug being therapeutically active in approximately 15 minutes from the time of its administration. These findings are in accordance with those previously observed in the cerebrum and kidney.

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REFERENCES

- Braithwaite, F., Farmer, F. T., Bell, R. C., and Edwards, J. R. G. (1954). *Brit. J. plast. Surg.*, 7, 13.
 Browne, J. C. M., and Veall, N. (1953). *J. Obstet. Gynaec. Brit. Emp.*, 60, 142.
 Clayton, C. G., Farmer, F. T., and Johnson, G. T. (1956). *Lancet*, 2, 539.
 Cox, L. W., and Chalmers, T. A. (1953). *J. Obstet. Gynaec. Brit. Emp.*, 60, 214.
 Fulton, J. F. (1949). *A Textbook of Physiology*, p. 563. Saunders, Philadelphia.
 Johnson, G. T., and Clayton, C. G. (1955). *J. Obstet. Gynaec. Brit. Emp.*, 62, 513.
 Kaplan, S. A., and Assali, N. S. (1953). *Surg. Gynec. Obstet.*, 97, 501.
 Kellar, R. (1955). In *British Obstetric and Gynaecological Practice*, edited by E. Holland, p. 230. Heinemann, London.
 Kety, S. S. (1949). *Amer. Heart J.*, 38, 321.
 McCall, M. L. (1953). *Amer. J. Obstet. Gynec.*, 66, 1015.
 Morris, N., Osborn, S. B., and Payling Wright, H. (1955). *Lancet*, 1, 323.
 Venning, E. H., Singer, B., and Simpson, G. A. (1954). *Amer. J. Obstet. Gynec.*, 67, 542.

HEINZ-BODY ANAEMIA IN THE NEWBORN

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Haemolytic anaemia in the newborn is usually due to the transfer of antibodies from the maternal to the foetal circulation (haemolytic disease of the newborn), but such an anaemia may also be the result of an inherent defect, such as congenital spherocytosis. A further haemolytic anaemia occurring in premature infants was reported by Gasser and Karrer (1948) and Gasser (1951, 1953). They described the clinical appearances and haematological findings in 14 infants with this condition, which they called the "spontaneous" Heinz-body anaemia.

The children developed jaundice in the first few days of life, usually between the first and fifth days. Anaemia appeared as the jaundice faded, commonly during the third week. The general condition of the infants deteriorated; they became pale, refused feeds, and were drowsy. At no time could the spleen be felt. Examination of the blood before the development of the anaemia showed the presence of Heinz bodies in 9-45% of the red cells. There were many distorted, disintegrating red cells when the anaemia was severest.

Heinz bodies are intracellular inclusions in the red cells which stain by various supravital dyes, but not by Romanowsky stains. They are thought to be particles of denatured haemoglobin. They occur in man as a result of poisoning with a variety of chemicals, but no such cause could be found in the mothers before or after birth or in the infants.

In the present paper, two unusual cases of Heinz-body anaemia are reported; one patient was a normal full-term infant and the other was not jaundiced at any time during the illness.

Methods.—Haemoglobin estimations were carried out by the oxyhaemoglobin method, using a photoelectric absorptiometer. Red- and white-cell counts were done in a Burk counting chamber. Reticulocytes and Heinz bodies were counted in brilliant cresyl-blue and Nile-blue dry preparations, and the effect of counterstaining with Romanowsky dyes was observed after previous fixation with ethanol. Differential counts were carried out on blood smears stained with May-Grünwald-Giemsa and on bone-marrow smears stained with N.R.G. (Gurr). The osmotic fragility of the red cells was determined both before and after incubation (Varadi, 1951), using the method of Parpart *et al.* (1947).

Case 1

The patient was a full-term male infant, one of non-identical twins, normal delivery, whose birth weight was 3,370 g. (7 lb. 7 oz.). During pregnancy the mother was found to be hypertensive; she had ankle-swelling and was anaemic but not jaundiced, and she had had no known contact with any case of hepatitis. The infant fed poorly from birth and the mother noticed that the baby was jaundiced when he was two weeks old. The twin sister was perfectly

well. The child's motions were loose but not pale. As the jaundice persisted, he was admitted to hospital on October 25, 1954; he was then 3 weeks old.

On examination he was seen to be very jaundiced, quite active, and crying normally. The liver could be felt one fingerbreadth below the right costal margin; the spleen could not be felt; the stools were not pale. No abnormality was found in the cardiovascular, respiratory, and central

TABLE I.—Results of Peripheral Blood Examinations in Case 1

Date	Hb g./100 ml.	R.B.C. $\times 10^6$	Reti. %	Nucl. R.B.C.	W.B.C.	Platelets	Notes
Oct. 26	6.8	1.82	8.6			Normal	Numerous distorted red cells and a few microspherocytes. Heinz bodies +++ Morphology as on Oct. 26. Heinz bodies in 31% of R.B.C.s
" 27	6.2		19.4	2 per 100 W.B.C.			Heinz bodies fewer. Polychromasia more marked Morphology reverting to normal. Heinz bodies very sparse
" 28	4.4	1.48	23.4	1-100/c.mm	16,200		
" 29	14.5	4.5	12.2				
Nov. 2	14.5		5.2				
" 5	14.5		1.8				
" 9	13.3						
" 12	12.6						
" 16	13.6	4.3	<1				

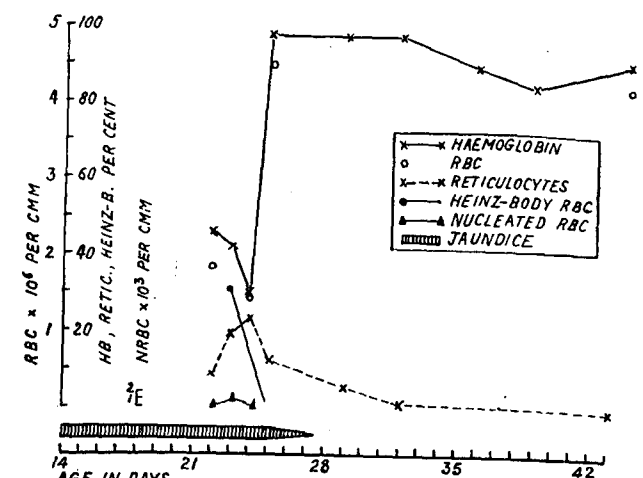
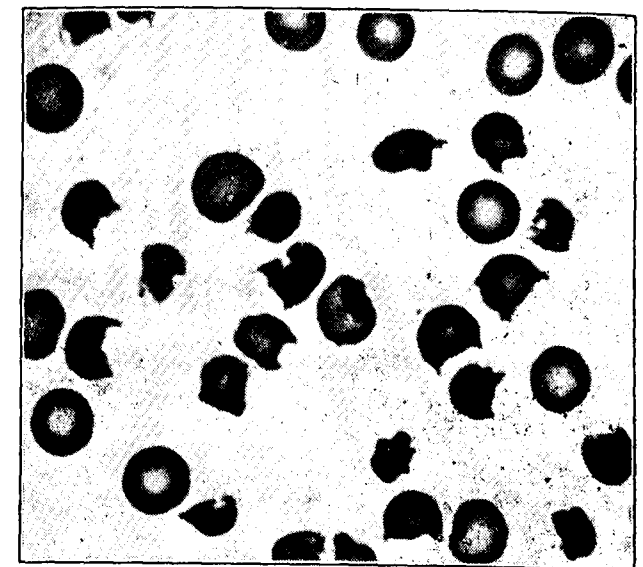


FIG. 1.—Case 1. Results of peripheral blood examination.

FIG. 2.—Case 1. Showing numerous distorted red cells and a few spherocytes. ($\times 1,200$.)

nervous systems. The following diagnoses were considered possible: (1) acholuric jaundice, (2) infection, and (3) haemolytic disease. The following haematological examinations were carried out.

Peripheral Blood (Table I, Fig. 1).—This showed the presence of a severe haemolytic anaemia; many distorted red cells and a few spherocytes were present (Fig. 2); nearly one-third of the red cells contained Heinz bodies

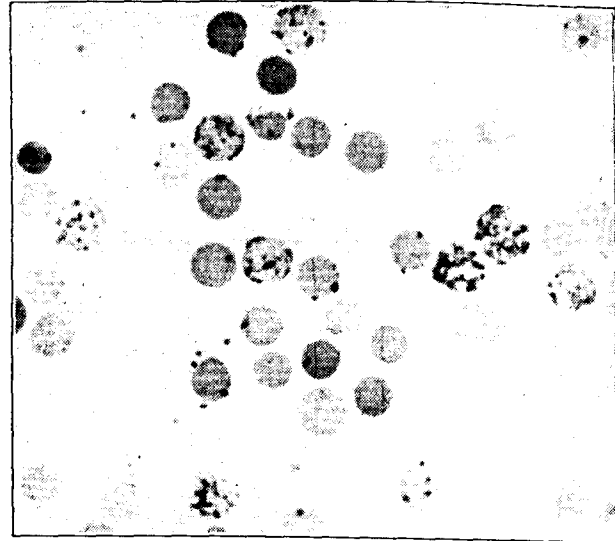


FIG. 3.—Case 1. Heinz bodies in nearly one-third of red cells. (x900.)

TABLE II.—Results of Tibial Puncture in Case 1

Neutrophils:		Normoblasts:	
Segmented	1.25%	Orthochromatic	0.50%
Band	2.75%	Late polychromatic	7.50%
Metamyelocyte	5.50%	Polychromatic	34.25%
Myelocyte	1.50%	in mitosis	1.00%
Promyelocyte	2.75%	Basophilic	15.25%
Eosinophils:		Proerythroblasts	3.75%
Segmented	0.75%	Haemocyto blasts	4.25%
Metamyelocyte	2.00%	Megakaryocytes	0.25%
Myelocyte	1.00%	Reticulum cells	4.00%
Myeloblasts	5.75%	L: E ratio, 0.22:1	
Lymphocytes	4.75%	Marrow cellular	
Monocytes	0.25%		
Promonocytes	1.00%		

(Fig. 3). In the next two days the haemoglobin fell rapidly, numerous nucleated red cells appeared, and reticulocytes increased.

Tibial Puncture on October 29 (Table II) showed an extremely active erythropoiesis with an increased proportion of early cells, findings consistent with haemolytic anaemia.

Osmotic Fragility Test.—This gave a curve with a somewhat wide span. This was due mainly to a "mode" in the

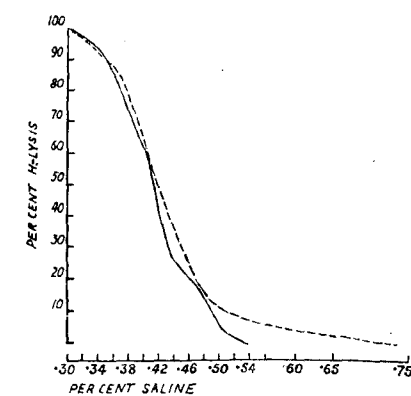


FIG. 4.—Case 1. Osmotic fragility curve in buffered solutions before (continuous line) and after 24 hours' incubation (broken line) at 20° C.

range of the higher saline concentrations (Fig. 4). The mean corpuscular fragility was normal and did not show a pathological increase after 24 hours' incubation at 20° C. The tail of the curve, however, showed a marked shift to the right, caused, no doubt, by the further deterioration of the inferior distorted red-cell population on standing.

Autohaemolysis.—There was a marked haemolysis in the defibrinated blood sample after 24 hours' incubation at 37° C., weaker at 4° C.

Urobilin was strongly positive in the urine (October 27); bilirubin was negative. Serum bilirubin (October 28) was 13 mg. per 100 ml.; direct van den Bergh reaction negative. Direct Coombs test on the child's red cells was negative. Both child and mother were group O, Rh negative, and no incompatibility could be demonstrated between the mother's serum and the infant's red cells by the saline, albumin, or anti-human-globulin methods. The infant's serum did not contain abnormal cold or warm agglutinins or haemolysins. Wassermann reaction and Kahn test were negative. No pathogens were isolated from the faeces.

The child was transfused with 120 ml. of packed cells on October 29: the jaundice rapidly disappeared and was hardly noticeable after two days. The patient's condition remained good, he was gaining weight, and the motions were only slightly more watery than expected at his age. He was discharged on November 18.

Case 2

This patient was a 30-weeks, premature female infant; birth weight 970 g. (2 lb. 2 oz.). The mother's health during pregnancy was good and the delivery was normal. The

TABLE III.—Results of Haematological Examination in Case 2

Date	Hb g./100 ml.	R.B.C. $\times 10^6$	Retic. %	Nucl. R.B.C.	Heinz Bodies %	W.B.C.	Notes
Mar. 8	6.1		2.8	900	67.6	22,700	Numerous distorted red cells. Immature neutrophils ++ Distorted red cells almost absent Very few immature neutrophils only
" 10	4.0	1.2	4.0	6,200	65.6	15,800	
" 14	4.0	1.2	18.6	6,200	55.2	15,800	
" 15	9.7	3.12	15.6	900	16.8	21,500	
" 17	12.3	4.11	18.4	800	11.6	20,800	
" 22	9.7	3.22	5.6		4.4	11,100	
" 29	8.7	2.86	6.4			8,200	
Apr. 5	7.7	2.5	6.0			10,800	
" 10	7.4		12.0		Few	8,900	
" 13	6.4	2.2	10.0			5,000	
" 20	7.4		9.4			5,000	

general condition at birth was good, and the child appeared to thrive until on the 13th day a soft swelling developed in the left buttock. This swelling increased gradually in size. On the 17th day it discharged spontaneously a few drops of pus and the abscess was incised three days later. About this time the child was noticed to look pale. Haematological examination (19th day) disclosed a severe anaemia (Table III, Fig. 5), with Heinz bodies (Fig. 6) and numerous distorted red cells.

The infant's general condition continued to deteriorate and she became drowsy and very pale. The haemoglobin fell to 4 g./100 ml. on the 25th day. The following day the patient was given a transfusion of 45 ml. of packed cells with very good effect clinically and haematologically. Although the haemoglobin decreased gradually during the next fortnight, Heinz-body formation ceased and haemolytic forms of red cells rapidly disappeared. The abscess healed. The child kept her feeds satisfactorily. She was never icteric and the spleen was not felt. She received no drugs.

Haematological investigations on the peripheral blood showed the

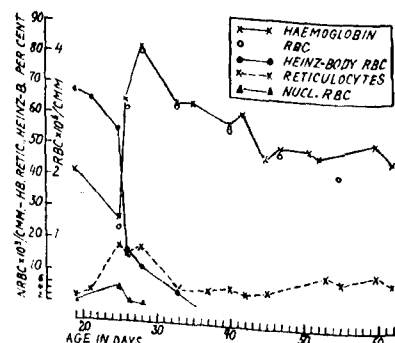


FIG. 5.—Case 2. Results of haematological examination.

typical order in which the red-cell changes develop: peak of Heinz-body formation—morphological alterations—anaemia—outpouring of nucleated red cells—peak of reticulocytes (Table III, Fig. 5).

The mother's blood was group B, Rh positive, the infant's group O, Rh negative. There were no antibodies in the mother's serum. Her Wassermann reaction was negative.

Faecal stercobilinogen (five days' average) was 4.1 g. a day. There was no increase in the urinary urobilin.

The bacteriological examination of the abscess (culture) showed a growth of *Bact. coli*.

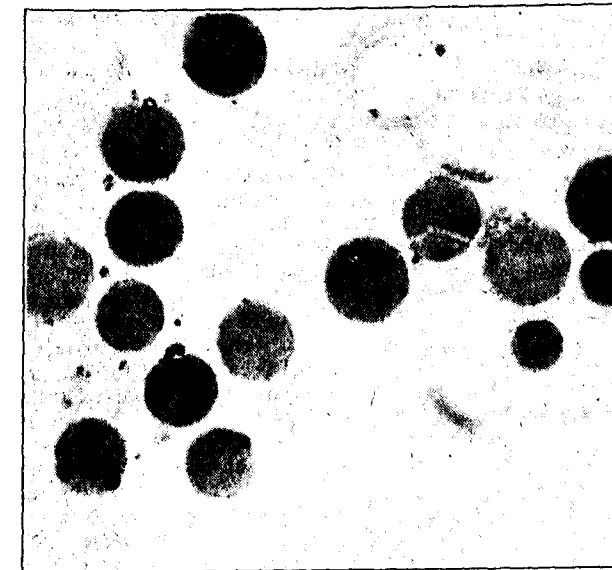


FIG. 6.—Case 2. Showing presence of Heinz bodies. (x1,100.)

Discussion

For several reasons we felt justified in recording our two cases. Firstly, as a contribution to the differential diagnosis of haemolytic anaemias in the newborn; secondly, and more important, to point out the excellent effect of transfusion in this type of haemolytic anaemia, because if left untreated the patient may die; and thirdly, to our knowledge the condition has not previously been reported in a normal full-term infant.

The diagnosis of Heinz-body anaemia should not cause any difficulties from the haematological standpoint: the essential thing is that one should think of this diagnosis when faced with a non-obstructive type of jaundice in the first days of life. The patients are not anaemic at birth (Gasser, 1953). After the appearance of the jaundice the first haematological abnormality to be detected will be a rapidly increasing number of Heinz bodies in the red cells during the first and second weeks. As the Heinz bodies become more numerous, red cells that are shrunken, abnormally crenated, and the shape of broken eggshells make their appearance and anaemia develops.

There is a vast literature on Heinz-bodies, to which we refer the reader (see Dacie, 1954; Selwyn, 1955). A variety of aromatic nitro- and amino-compounds and inorganic oxidizing agents known to produce Heinz bodies are listed in reviews of the subject by Webster (1949) and Buckell and Richardson (1950). If the dose of the toxic substance ingested is sufficient to cause a haemolytic anaemia, both Heinz bodies and the above described morphological alterations of the red cells will be present. In the absence of any exogenous toxic cause, the occurrence of Heinz bodies was observed in cases of hypoplasia (Schilling, 1928; Zadek and Burg, 1930; Moeschlin, 1941, 1942) or aplasia of the spleen (Gasser and Willi, 1952), and also in splenectomized individuals (Selwyn, 1955). In such cases the Heinz-body formation is a permanent feature. There are reasons for believing that the spleen either filters off red cells contain-

ing Heinz bodies from the circulation or is in some way responsible for the extrusion from the cells of the bodies which are subsequently phagocytosed by the spleen.

The spontaneous occurrence of Heinz bodies was observed in the newborn in the absence of any exogenous toxic influence and without a demonstrable splenic pathology (Willi, 1947). Out of 1,251 newborn infants, 225 (18%) were found to contain Heinz bodies in over 2.1% of the red cells, and 84% of these 225 infants were premature (Willi and Hartmeier, 1950). Unlike the haemolytic anaemia with spontaneous Heinz-body formation (Gasser and Karrer, 1948; Gasser, 1951, 1953), there were neither disintegrating red cells present in these cases nor signs of an increased haemolysis or of any degree of anaemia.

As Heinz bodies are insoluble in water and red cells "tagged" with them show an increased resistance to lysis by hypotonic saline, the above clinical observations and *in vitro* tests on our Case 1 (saline fragility curve, autohaemolysis test) suggest that the increased haemolysis is due to the presence of the irreversibly contracted distorted red cells.

No satisfactory explanation for the production of Heinz bodies has been found hitherto in the spontaneous Heinz-body syndrome of the newborn. Gasser (1953) suggested that it might be due to a "disturbance of adaptation" ("Anpassungsstörung") of the erythropoiesis in premature infants, and left the question open of whether a fault in haemoglobin synthesis or in the mechanisms normally protecting the erythrocytes from damage or a dysfunction of the spleen is to be blamed. There is a high proportion of twin pregnancies among these cases of anaemia. Five out of Gasser's (1953) 14 premature infants and our first patient were twins.

It would appear that the unknown endogenous factor causes not only Heinz-body formation and disintegration of red cells but also a depression of the erythropoiesis at the time when the changes in the mature red cells in the periphery are the severest (Gasser, 1953). According to Gasser the jaundice is haemolytic and sometimes in part also hepatic in origin. The absence of jaundice in our Case 2 is not surprising in spite of the presence of a severe anaemia associated with morphological alterations of the red cells. Jaundice need not necessarily develop if the function of the liver is unimpaired and the erythropoiesis is depressed to a sufficient degree. Such is the case in the aplastic crisis of acholuric jaundice. It is doubtful whether in Case 2 the abscess of the buttock played any part in the causation of the Heinz-body anaemia; this possibility cannot be ruled out entirely, but is unlikely.

Summary and Conclusions

Two cases of spontaneous Heinz-body anaemia are described. One, a full-term twin of normal birth weight, had both haemolytic anaemia and jaundice. The other, a premature infant, had typical haematological findings, but no jaundice. Both responded well to a single transfusion.

The haematological findings are discussed.

In the differential diagnosis of jaundice in the newborn, Heinz-body anaemia should always be considered, especially if jaundice—not obstructive in character—develops after the first day of life, the Coombs test is negative, and no immune antibodies are present in the maternal serum. It would also appear that Heinz-body anaemia (Case 2) can be present without clinical jaundice: if marked anaemia develops in the premature infant during the second or third week and contracted irregularly crenated erythrocytes are found in the smears, Heinz bodies should be looked for. It is likely that, if these haematological criteria are systematically sought, more cases of this type of haemolytic anaemia will be recognized in the future.

Heinz-body anaemia of the newborn is not only of theoretical but also of considerable practical importance, as transfusions performed in time might save life.

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REFERENCES

- Buckell, M., and Richardson, J. D. (1950). *Brit. J. Industr. Med.*, 7, 131.
 Dacie, J. V. (1954). *The Haemolytic Anaemias*, p. 15. Churchill, London.
 Gasser, C. (1951). *Die hämolytischen Syndrome im Kindesalter*, pp. 65, 177. Thieme, Stuttgart.
 — (1953). *Helv. paediat. Acta*, 8, 491.
 — and Karrer, J. (1948). *Ibid.*, 3, 387.
 — and Willi, H. (1952). *Ibid.*, 7, 369.
 Moeschlin, S. (1941). *Folia haemat. (Lpz.)*, 65, 346.
 — (1942). *Ibid.*, 66, 308.
 Parpart, A. K., Lorenz, P. B., Parpart, E. R., Gregg, J. R., and Chase, A. M. (1947). *J. clin. Invest.*, 26, 636.
 Schilling, V. (1928). *Z. klin. Med.*, 108, 709.
 Selwyn, J. G. (1955). *Brit. J. Haemat.*, 1, 173.
 Varadi, S. (1951). *J. clin. Path.*, 4, 221.
 Webster, S. H. (1949). *Blood*, 4, 479.
 Willi, H. (1947). *Schweiz. med. Wschr.*, 77, 243.
 — and Hartmeier, F. (1950). *Ibid.*, 80, 1091.
 Zadek, I., and Burg, K. (1930). *Folia haemat. (Lpz.)*, 41, 333.

SOME OBSERVATIONS ON OUT-PATIENT PSYCHOTHERAPY WITH A FOLLOW-UP OF 235 CASES

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In the minds of most doctors the results of psychotherapy are still clothed in a certain amount of mystery. Yet with the development of the Health Service and the consequent increase in out-patient work it is important to try to estimate the value of this type of treatment. Several questions immediately spring to mind. "Is psychotherapy any good at all?" And if the answer is "Yes," then "How good?" And again, "What sort of cases should it be reserved for?"

Few papers seem to have been written on this subject, and only two will be quoted, both of which are pre-war. In 1935 Luff and Garrod reviewed 500 consecutive patients treated with psychotherapy at the Tavistock Clinic, all of whom had finished treatment at least three years previously. This is a creditable follow-up period, and the patients had had thorough treatment; indeed, half of them had between 20 and 60 interviews. The follow-up was based on information obtained from replies to letters sent out to the patient or the patient's practitioner, though occasionally other methods were used, such as a visit from a psychiatric social worker. Yet it was possible to contact only 70.4%, and there must be serious limitations to the value of a follow-up where only two-thirds of the series were contacted by letter and no patient was personally interviewed by a psychiatrist.

The second paper we quote is by Curran (1937), who records a follow-up of 83 patients. The psychotherapy was carried out under poor conditions (in a dental room of all places) at St. George's Hospital. The only

criterion for selection in Curran's series was that the patients were thought to present psychiatric problems by one of the out-patient physicians or surgeons who referred them to the psychiatric department. These cases were all seen by Dr. Curran at their first interview, though subsequently some were treated by Dr. Eliot Slater. Only 25 of the 83 attended for more than four sessions. It is important to note that these 83 patients represented only 40% of the total circularized. Another 40% did not reply to follow-up inquiry, and the remaining 20% of inquiries were returned "addressee untraced." 40% is a very small percentage of any group to be followed up, and, as Curran says, few deductions are possible. As in Luff and Garrod's series, no patients were interviewed by a doctor.

Present Investigation

Our investigation differed from the two investigations quoted above in that we endeavoured to interview the patients personally. Early in 1954 we studied the case papers and psychotherapy notes of 235 out-patients who had been selected by us as suitable for a course of out-patient psychotherapy from a total of 3,226 out-patients referred to us in Plymouth during the five-year period 1948-52. It should be noted that these 235 patients represented the total number who had been selected for psychotherapy. Thus a few patients had been discharged for nearly six years, while all had been discharged at least 15 months. In about 35% the follow-up period was two and a half years or more. It may be observed at this point that the recovery rates of those patients treated in the earlier years did not vary significantly from the recovery rates of the more recently treated, and also that the percentage of untraced cases did not increase with the passage of time. For the collection of documents we relied on the records department, and there is no reason to suppose that many cases were omitted or that the odd ones left out represented special types.

Before seeking to interview the patients we tried to reduce the mass of documentary information to some sort of order. This included placing each case in one of five diagnostic categories (as explained under "Diagnosis"), a procedure which we termed "diagnosis in retrospect." We also formed an opinion from the documents whether we considered the prognosis with treatment to be "good" or "moderately good," a procedure we termed "prognosis in retrospect." Briefly, the factors which weighed with us mostly in making this prognosis were: (1) intelligence (low, average, high); (2) attitude to life and previous adjustment (poor, average, good); (3) duration of symptoms (over 10 years, 1-10 years, under 1 year); and (4) effect of symptoms on function (very serious, serious, slight). We also had to define the terms we were using—for example, distributive analysis—and, lastly, we drew up a form for use at the time of the forthcoming interviews. Our results and conclusions were eventually arrived at through analysing the completed forms.

Types of Psychotherapy

The various types of psychotherapy used by us were divided into two main groups: (1) Superficial—by which we mean advice, explanation, suggestion, persuasion, reassurance, and encouragement. (2) Distributive analysis—by which we mean that more use was made of analytical principles and that certain experiences in the patient's life were dealt with on analytical lines.

Abreactions with the use of injections or carbon dioxide were occasionally employed, chiefly in conjunction with the main methods just defined. What is described as superficial therapy was given in 45% of the cases, and distributive analysis in 49%, while 6% were treated mainly by abreactive methods.

We based our therapy on the assumption that if a person is tackling his life problems badly and producing neurotic

symptoms as a result, then a change of attitude is necessary, and this change is best brought about by increased insight derived from some form of psychotherapy.

A few further notes are necessary in order to give some idea of our broad views on psychotherapy and our procedure in selection and technique. As part of every psychiatric consultation we try to assess how much we can help the patient by out-patient psychotherapy. This includes an opinion on the extent to which the patient can accept insight and, having accepted it, on whether he or she will be able to act on it.

The aim of our treatment has been the attainment of a suitable degree of insight and the positive encouragement of self-discipline. At some stage in treatment practical advice is often given in a friendly way.

For various reasons, including the length of the waiting-list and the time at our disposal, we aim at a course of about six to eight sessions, and in this series of cases it was unusual for any patient to have had more than 12 interviews. (Recently our practice has changed a little in this respect so that very occasionally we may treat a patient for a year or more.) The interviews are weekly and last about 45 minutes, but may vary from 15 minutes to an hour or more. The average number of interviews in this series worked out at 6.8 per patient, only two patients being given as many as 20 sessions. We decided to consider the discharge date as being the last occasion on which the patient had a regular interview at not longer than monthly intervals.

In choosing a patient for psychotherapy we kept four different considerations in mind, any one of which justified placing the patient's name on the waiting-list: (1) A severe illness, where there was no other form of therapy available; (2) the possibility of removal of symptoms; (3) the possibility of helping the patient to adjust to his symptoms; (4) the possibility of assisting the patient to adjust to future stresses of a similar nature to those causing the present breakdown. Finally, as we have already stated, we attach particular importance to assessment of the degree to which the patient can accept insight and act on it.

A patient who is severely ill and likely to be helped, even if only to a limited extent, is worth accepting, if no better form of treatment is available. One would not insist on the likelihood of cure to justify selection in this type of case.

It goes without saying that the removal of symptoms is a desirable change, but one is not always sure that there may not be a recurrence later in the face of repeated stress of a similar type. If the patient deals with later stress and cures himself or herself of a relapse, this would be regarded as a good result. (In several cases where there had been a relapse a further interview proved well worth while.)

It is not always possible to remove the symptoms while treatment is being given, but if the patient can be helped to live with his symptoms it is likely that the reduced anxiety will allow a gradual improvement. When we saw some patients after a length of time we were surprised how much they had improved in the interval as the result of discussions or advice given during the psychotherapy.

It is generally agreed that the shorter types of psychotherapy tend to be somewhat authoritarian in character. When using suggestion and persuasion one tries to get a patient to abandon his own method of dealing with his problems—namely, with neurotic symptoms or reactions—and accept instead a solution which appears preferable. If the solution one offers the patient does not seem preferable to him he will refuse it, and part at least of the skill in this type of psychotherapy lies in the manner in which the therapist tackles this difficulty. Some of the issues presented are quite straightforward, and most people would agree on the lines upon which advice shall be given; but many are highly controversial, and in these there is a danger of moralizing with the patient. It appears to us that there is no objection to giving the patient specific advice if one is asked for it, but it must always be borne

in mind that far more good advice is given in the world than is ever acted upon. Needless to say, when one is actively trying to influence a patient one's own personal integrity is especially important. We would like to observe at this point that psychiatrists give fewer dramatic instructions to their patients than any other breed of doctor. It is rare for us to advise a patient to get married or have a baby, and if occasionally we do give advice of this nature we do not do it lightly.

In our follow-up interviews one of the most striking revelations was the realization of the profound influence a psychotherapist has on his patient's attitude to life even after only a few hours of treatment. This teaches us afresh the need for the most careful consideration of all the many facets of every case; and once again we realized the problems presented in the selection of doctors interested in a training in psychotherapy.

While treatment progresses it is often borne in upon us that, though the ability to accept insight depends upon emotional and intellectual factors, the will to change a pattern of reaction depends greatly on the patient's philosophy of life. In many instances the patients fail to make satisfactory improvement because we ourselves fail to assess this philosophical "disease" (or "atrophy") adequately. We are not at all sure whether our credentials as psychotherapists entitle us to tackle problems of this nature as part of treatment, but we have come to realize that the experience of psychotherapy is often a most valuable education to the patient and inevitably affects his or her philosophy in an indirect way. Unfortunately, if we fight shy of tackling the philosophical issue it happens all too often that nobody else will do it.

These few paragraphs will, we hope, give some idea of our problems in selection and treatment. We may not have always selected the most suitable patients, but we have had definite ideas and are prepared to modify them as time goes on.

Diagnosis

We grouped the 235 cases into five main categories:

Mainly Anxiety States.—This label was also used for certain psychosomatic cases and tension states; 39.6% of our patients were so classed.

Mainly Hysterical States and Anxiety Hysteria.—This term was used for the majority of phobic and anxiety states with hysterical symptoms, as well as for the more classical types of hysteria; 42.6% came under this heading.

Obsessional States.—This was used for the patients with classical obsessional states, which therapeutically we considered a very different problem from the obsessional personalities with anxiety symptoms; 6.4% of our patients were true obsessives.

Psychopathic Personalities, which accounted for 2.5% of the series.

Other Diagnoses.—This group totalled 8.9% and included psychoses, mild depressive states, etc., as well as the diagnostically difficult group of schizoid personalities.

This procedure of "diagnosis in retrospect" may be open to criticism, but it gives a more accurate diagnosis than that made at the first consultation, and it enabled us to separate off the few misdiagnosed patients who turned out to be paranoid schizophrenics. Furthermore, it made for simplicity when considering results of treatment.

Immediate Results of the Psychotherapy

From the case notes we also assessed the immediate results of treatment (that is, the state of the patient at the time of actual termination of treatment) on a four-point scale—namely, much improved, improved, not improved, and treatment broken off. The results are shown in the Table.

Like Curran we omitted, as being too difficult to define, the category "slightly improved" which is used by some authors.

Details of Results on Discharge and at Time of Follow-up

Diagnosis	Total	Condition on Discharge				Condition at Time of Follow-up			
		Much Improved	Improved	Not Improved	Psychotherapy Broken Off	Much Improved	Improved	Not Improved	Not Traced or Died
Anxiety states	93	41 (44.1%)	39 (41.9%)	5 (5.4%)	8 (8.6%)	48 (51.6%)	26 (28%)	7 (7.5%)	12 (12.9%)
Hysterical	100	31 (31%)	36 (36%)	16 (16%)	17 (17%)	31 (31%)	35 (35%)	21 (21%)	13 (13%)
Obsessional	15	7 (46.7%)	7 (46.7%)	1 (6.7%)	—	7 (46.7%)	6 (40.0%)	1 (6.7%)	1 (6.7%)
Psychopathic states	6	—	2 (33.3%)	2 (33.3%)	2 (33.3%)	1 (16.7%)	3 (50%)	1 (16.7%)	1 (16.7%)
Other diagnoses	21	7 (33.3%)	6 (28.6%)	4 (19%)	4 (19%)	7 (33.3%)	6 (28.6%)	6 (28.6%)	2 (9.5%)
	235	86 (36.6%)	90 (38.3%)	28 (11.9%)	31 (13.2%)	94 (40%)	76 (32.3%)	36 (15.3%)	29 (12.3%)

Other Treatment

It was also known to us, before we interviewed the patients, which of them had had any out-patient electroplexy during or since psychotherapy, or had been admitted to hospital for conditions of psychiatric importance. The frequency and effect of this additional treatment had to be taken into account as there were as many as 25 cases, which represented 10.5% of the whole series. When examined in detail, of the nine who had out-patient electroplexy, eight were improved, and the final results of our psychotherapy were influenced to this extent. In-patient treatment rarely helped anyone who had not already improved with psychotherapy, and, in fact, the 16 who were later admitted to hospital included a quarter of our "not improved" category.

Information Available at Follow-up

It should now be clear that at the time of interviewing the patient we had, in addition to the individual psychotherapy notes, the following information on each case: the date of last regular interview, number of regular interviews, type of psychotherapy, diagnostic category, condition on discharge (that is, immediate result of treatment), information regarding physical treatments such as out-patient electroplexy or in-patient treatment of psychiatric importance, and prognostic category.

Questionnaire Used at Interview

We were now ready to interview the patients, and we decided to adopt to some extent Curran's excellent questionnaire. In the course of the interview each patient was asked:

1. Have you regained your former health? (an answer "yes" or "almost" was required for a "much improved" classification).
2. Do you still suffer from symptoms which trouble you? If so, what symptoms?
3. Have you been able to go back to work or carry on with your work in a satisfactory manner?
4. Are you happier than before treatment?
5. Did the treatment help you? If so, in what way?

The essence of the patient's remarks was recorded verbatim. To those unable to attend, a standard letter with stamped addressed envelope was sent with these questions included in the letter. If the follow-up was carried out by a social worker she asked the same questions.

At the interview the difficulties in assessing the results were less than we anticipated, and any doubt was usually between the categories "improved" and "much improved" rather than between "improved" and "not improved." When the follow-up was carried out by means other than personal interview the information was carefully considered, and if it was regarded as inadequate for an assessment to be made the patient was classed as "not traced."

Of the total group, 59% were interviewed by their original therapist, 14% were followed up by letter, 15% by a social worker, and 12% (including two deaths, both from non-psychiatric causes) were untraced. In all, 88% were contacted. In Luff and Garrod's series none was seen by a doctor, follow-up was largely by letter from the patient or the patient's general practitioner, and 30% were untraced. In Curran's series none was seen by a doctor, and

only 40% were followed up at all. The percentage of patients traced in our series is much higher than in either of the above-quoted investigations, but we have the advantage that we work in a much more static community. Most of our untraced patients belonged to Service families, who are, of course, subject to frequent changes of station.

It may be noted that Luff and Garrod argue that their group of untraced patients have probably done as well as the traced group. Our untraced patients were regarded as a representative sample of the group as a whole.

Results and Comments

It remains now to consider our results of treatment at the time of the follow-up study, together with one or two other statistical details. Of our series, 44% were male and 56% female. Only 6% were over 50 years of age. Of Luff and Garrod's cases 9.6% were over 50. We may have been rather diffident at taking on the older patients. As already mentioned, the grouping into diagnostic categories shows that 39.6% fell into the mainly anxiety group; 42.6% into the mainly hysterical group; 6.4% had obsessional states; 2.5% were psychopathic personalities; and 8.9% belonged to "other diagnoses." One-third of our patients had been given a good prognosis and two-thirds a moderately good prognosis. Our follow-up revealed that 50% improved to the extent anticipated, 26% did less well, and 24% better than was expected.

We gave the anxiety states a better prognosis than the hysterics, and this was confirmed by our results. It is interesting that Luff and Garrod, who were apparently much more strict in the diagnosis of hysteria, came to the same conclusion. Of their anxiety states 80% were "relieved" as compared with 86% of ours. On review, their percentage dropped to 64%, while ours over a somewhat shorter period rose to 91%. It is noteworthy that their number of "much improved" anxiety states also increased. Their "relieved" rate for hysterical states was 50%, which remained at 50% after three years. Our figure was 67% on discharge and increased later to 76%. These rates we realize are embarrassingly high; but our opinion, based on so many personal interviews, is that these patients did in fact continue to improve after the termination of psychotherapy. It may be that the untraced patients, who reduced the size of the series slightly during the final review, were the less improved patients, but there is no indication that this is so. Of the obsessionals, 13 out of 14 followed up had improved, and this was consistent with our prognosis.

As a bald statement of results conveys little meaning unless prefaced by some explanatory remarks, we have left our results for the total series to the end. Of our 235 patients we know that 40% of the total are now "much improved," a further 32% are "improved," 15% are "not improved," 12% are untraced, and two patients have died. If, as in the other series, our untraced patients are excluded, our results are 45.5% much improved, 37% improved (making a total of 82.5% "relieved"), and 17.5% "not improved."

Summary

The purpose of this investigation was twofold: firstly, to examine the psychotherapeutic methods used by three consultants working independently in the same National Health Service out-patient department of psychological

medicine and to report on the aims of treatment; secondly, to follow up a series of out-patients so treated.

Out of a total of 3,226 consecutive referrals during the five-year period 1948-52 235 patients received a course of psychotherapy.

The types of psychotherapy used were: (1) superficial for 45% of the cases, and (2) distributive analysis for 49%; the remaining 6% were treated mainly by abreactive methods. The average number of sessions given to each patient was seven.

We followed up these patients early in 1954. No patient was followed up who had not been discharged for at least 15 months, and in about 35% the follow-up period was at least two and a half years. 59% were interviewed by the original therapist, 15% by a social worker, and only 10% were untraced. The method of follow-up is described in detail.

It was found that of our 235 patients 40% were "much improved," 32% were "improved," and 15% were "not improved"; the remainder were either untraced or had died.

It is our opinion that results of this order can be expected from short courses of psychotherapy in a provincial out-patient department provided that a careful selection of cases is first made.

REFERENCES

- Curran, D. (1937). *Lancet*, 2, 1005.
Luff, M. C., and Garrod, M. (1935). *British Medical Journal*, 2, 54.

VAGAL RESECTION IN TREATMENT OF DUODENAL ULCER

BY

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Vagal resection for the treatment of duodenal ulcer has not been generally accepted in this country. It is not the purpose of this paper to discuss the theoretical grounds for its use, nor to review the voluminous literature on the subject, but to present the results obtained since late 1947 in one surgical unit. Pollock (1952) collected a large series, including 1,314 cases of duodenal ulcer, from various centres.

Present Investigation

As no large series from one source has been reported on in Britain, it seems worth while analysing the results of a series of 473 consecutive cases (401 male, 72 female) up to the end of 1955. These were entirely unselected. Every duodenal ulcer case referred to us for surgical treatment was treated as detailed below. The only exceptions were (1) those who refused surgical treatment; (2) those seen first with severe haemorrhage which it was impossible to control by any means other than a direct attack on the site of haemorrhage in the ulcer; and (3) those first seen with acute perforation requiring immediate operation—simple closure of the perforation was done. If persistence of ulceration or recurrence of ulceration or symptoms occurred the cases were dealt with in the routine manner and then included in the series. These exceptions comprised less than 2% of the total.

Table I shows the age incidence and the duration of symptoms. Perforation had occurred in 17% and notable haemorrhage in 17%. Medical treatment before

TABLE I.—Age Incidence and Duration of Symptoms in 473 Cases

Age:	10-19	20-29	30-39	40-49	50-59	60-69	70-79
	1%	16.5%	30%	30%	17%	5%	0.5%

Pre-operative Duration of Symptoms in Years								
0-	1-	2-	3-	4-	5-9	10-14	15-19	20+
9%	10%	10%	9%	7%	27%	15%	5%	8%

operation had been given at home in 76% and in hospital in 19%. Over 50% had had symptoms for more than five years, and over a third had had either a perforation or noteworthy haemorrhage before operation.

The normal routine before operation was: history; physical examination; barium-meal x-ray examination; gruel fractional test meal; and a Hollander (1946) insulin test meal. After operation the gruel fractional test meal and the insulin test meal were repeated. Routine post-operative x-ray examination was not possible in all cases; it was made in many, including every case with any post-operative symptoms. Pre- and post-operative weights were recorded.

For various reasons the full investigation outlined was impossible to carry out in every case, but in over 92% of cases the data were adequate for assessing the completeness or otherwise of the nerve section.

Operation

The patient is brought to the theatre with a naso-gastric Ryle tube in position. The surgical approach is through an upper left paramedian incision, the rectus muscle being retracted laterally. After inspection, including confirmation of the presence of the duodenal ulcer, a Balfour self-retaining retractor is inserted. The left lobe of the liver is then detached from the diaphragm by cutting the suspensory ligament, close to the liver, care being taken not to damage the left inferior phrenic vein. The left lobe of the liver can then be folded and held gently to the right with a Deaver retractor. The stomach is packed down as far as possible with two packs, the upper one being placed between stomach and spleen and retracted downwards and to the left with a Deaver retractor. This exposes adequately the lower inch (2.5 cm.) of the oesophagus. The peritoneum over the oesophagus is cut transversely, the left forefinger inserted, and the opening in the peritoneum enlarged up and down. With the left fore- and mid-fingers behind and the thumb in front it is easy to identify the oesophagus with its Ryle tube.

By "burrowing" behind and around the oesophagus from right to left the two fingers emerge at the left of the oesophagus, where they pick up a gauze tractor, one end of which is pulled back around the oesophagus. During the "burrowing" process if slight traction is kept on the oesophagus it is easy to feel the right vagus behind and include it in the tissues picked up. The two ends of the gauze tractor are caught together in an artery forceps on which an assistant makes firm traction. The vagus nerves are readily palpated as taut cords. Each in turn is isolated from the oesophagus; two fingers are inserted between the nerve and the oesophagus and spread widely to free at least 2 in. (5 cm.) of nerve from the oesophagus. The nerve trunk is then caught with long Kocher artery forceps and the nerve stripped cranially as far as possible. A section of the nerve is then resected, at least 2 in. (5 cm.) being removed.

When each nerve has been thus dealt with it is found that the lower 2-3 in. (5-7.5 cm.) of the oesophagus is more mobile and can be pulled up with the gauze tractor to allow careful inspection. Any structures resembling nerve twigs are seized with diathermy forceps and sectioned after coagulation; usually these "nerve fibres" are small blood vessels emptied by the traction, and coagulation before section expedites operation. By pulling first on one side, then on the

other, of the gauze tractor the oesophagus can be rotated easily and sufficiently to allow complete inspection of the entire circumference of its lower reaches. It is essential to be painstakingly careful in the search for any branches of the nerves and to be certain that two nerves have been found and dealt with, the right nerve in particular being occasionally missed in picking up the tissues in the original "burrowing" procedure. When the nerve section has been completed, bleeding points are coagulated by diathermy and the left lobe of the liver is unfolded and replaced *in situ*, where it will adhere to its original support. The use of lighted retractors has not been found an advantage. Adequate field lighting can be obtained by tilting the normal theatre operating lamp.

The gastro-enterostomy has always been of the retrocolic no-loop isoperistaltic type and performed with clamps in the standard manner. The opening is always made at the lowest part of the stomach, and the size of the opening made is small, the aim being to achieve an anastomotic opening equal in calibre to the normal pylorus. A large gastro-enterostomy stoma is likely to lead to dumping syndrome sequelae.

If pyloroplasty is carried out the essentials are to remove a diamond-shaped area at the pylorus, including compulsorily a segment of pyloric sphincter, and where possible the ulcer itself. The resultant gap is sutured transversely in two layers. While the production of an adequate channel is necessary, the resection of part of the pyloric sphincter is regarded as the essential step in this operation.

Difficulties during operation have been rare. In two cases the oesophagus was holed during isolation. The gap was repaired without untoward sequelae. In two cases the pleura was opened without any serious complication. Before the necessity to take great care not to inflict venous damage was appreciated one patient died of severe uncontrollable haemorrhage from tearing of the left inferior phrenic vein from the inferior vena cava in freeing the liver. We now prefer to omit this step if any difficulty appears probable in freeing the liver safely.

Immediate Post-operative Results

The total mortality from operation was 2.1%. The 10 fatalities were: one anaesthetic death; one immediate death from haemorrhage as described; one death three days after operation from acute cardiac failure; one death five days after operation from perforation of the duodenal ulcer (at operation the ulcer was noted to be near perforation; it would have been wise to make a direct attack on the ulcer or at least to sew omentum over the danger area); two deaths six days after operation from paralytic ileus; three deaths from pulmonary embolus, on the fourth, seventh, and seventh days after operation; and one death six days after operation from "pseudomembranous enterocolitis." There has been no death in the last 200 consecutive cases up to the writing of this report.

Post-operative complications have been few. In the early part of the series post-operative chest complications—almost invariably a right lower segmental collapse—occurred, but pre- and post-operative breathing exercises supervised by physiotherapists have practically eliminated these. Surprisingly, ileus has been uncommon.

Dysphagia has occurred in less than 2% of cases and has been without exception of short duration.

Results at Follow-up

Cases have been followed up by return visits to out-patient clinics at intervals after operation of one month, three months, six months, and annually thereafter, unless symptoms necessitated more frequent visits. Early in the series patients were admitted for insulin test meals annually, but this practice was discontinued as a routine. A questionnaire was sent out to all cases in late 1955. If the form was not returned and the patient could not be traced information

was sought from the family doctor. By these means enough information has been obtained to allow of a final assessment of results.

From the results in the several groups certain general points emerge. (1) Complete vagal resection as shown by insulin test meals remains complete permanently. Insulin test meals negative immediately after operation have remained negative to our knowledge for as long as eight years after operation. (2) Complete vagal resection was achieved in only 86% of cases, complete section was doubtful in 7%, and failure to achieve complete section occurred in 7%. With increasing experience we think complete section is now made in over 90% of cases. We believe that incomplete section of the two vagi explains some—perhaps all—of the unsatisfactory results which have been published. To make a complete section requires experience and great care. (3) In 365 cases note was taken of whether the vagus nerves showed any branching. It was found that the left nerve alone was branched in 21% of cases, the right alone in 6%; both nerves were branched in 43%, and in only 30% of cases were both nerves single cords. This emphasizes the need for careful technique to achieve complete section.

At first vagal resection alone was practised. It became evident early in the series that this operation was not wholly satisfactory, and since 1950 the operation of choice has been vagal resection and posterior gastro-enterostomy. In a small number of cases pyloroplasty has been combined with vagal resection, sometimes by choice to compare a number of these cases with those having gastro-enterostomy, sometimes because some local condition precluded gastro-enterostomy. Table II shows the operations performed and the year of operation.

TABLE II.—Operations Performed in 473 Cases

Year	1947	'48	'49	'50	'51	'52	'53	'54	'55	Total
Vagal resection only ..		37	34	35	7	3	1	1		118
" " and gastro-enterostomy ..	2	12	40	26	41	63	55	46	47	332
Vagal resection and pyloroplasty ..				12				1	6	19
Vagal crush ..		1	2	1						4

Vagal Resection Alone

Vagal resection alone was the operation in 118 cases. There was one death from anaesthetic causes in the series. Of the 117 survivors one died of intercurrent disease six years after his original operation but had had no dyspepsia or other digestive troubles until his death from secondary renal carcinoma; one died of aneurysm four years after operation, having had no digestive complaints in the interim; and 10 cases were either insufficiently followed up or could not be traced. This leaves for consideration of results 105 of the original 118.

Of these, 23 required gastro-enterostomy for symptoms secondary to the vagal resection, such as gross gastric retention, with foul flatulence and diarrhoea. Six further cases await gastro-enterostomy. In all these cases the vagal section appeared complete. Thus in 28% of cases vagal resection alone has been a failure, and the necessity to relieve gastric retention by a second operation in so many cases condemns it.

In the 23 cases in which secondary gastro-enterostomy was required the duodenal ulcer was healed at the time of the second operation. All have remained well and symptom-free since their second operation. They are not included in the 332 cases whose primary operation was vagal resection and gastro-enterostomy.

In four of the remaining 76 patients who had vagal resection alone recurrence of the duodenal ulcer occurred; in all four the vagal section was not complete. One case developed a gastric ulcer within three years of operation. While some of the results have been unexceptionally good a considerable percentage of patients have troublesome flatulence and diarrhoea, and uncomfortable fullness after meals.

These indifferent results and the high rate of secondary gastro-enterostomy required forced us to the alternative of adding gastro-enterostomy to the original nerve resection.

Vagal Resection with Gastro-enterostomy

Vagal resection combined with retrocolic gastro-enterostomy was performed in 332 cases. In assessing results the classification suggested by Visick (1948) has been adopted: grade 1, cases having no gastric symptoms; grade 2, cases with preventable minor symptoms; grade 3, cases whose symptoms are not preventable but cause no interference with their activities; grade 4, symptoms preventing full enjoyment of life; and grade 5, failures.

In assessing the results grade 1 cases have been restricted entirely to those without any symptoms; in grade 2 are placed those with minor symptoms such as occasional flatulence, fullness after large meals, slight occasional indigestion after dietary indiscretion, and, on rare occasions, a loose bowel movement not amounting to diarrhoea. In grade 3 are included those with some occasional bilious vomiting, or occasional diarrhoea or intermittent discomfort relieved by alkalis. In grade 4 are those with dumping or hypoglycaemic syndromes, those with troublesome diarrhoea, and those with troublesome bilious vomiting. In grade 5 are stomal ulcers, recurrent duodenal ulcers, and those who fail to derive any benefit from operation.

The results of a total of 332 cases show that nine died from operation, an operative mortality of 2.7%. Of 324 survivors, seven died of intercurrent disease unrelated to the operation or ulcer and were free of dyspepsia, etc., to the date of death. Of the remainder, 10 have not been included in the assessment of final results as they have been followed up for less than a year; all were symptom-free at the time of writing. Nine cases could not be traced. This leaves 298 cases followed up adequately for assessment. Of these, 238 are grade 1, 31 grade 2, 8 grade 3, 13 grade 4, and 8 grade 5.

All the 31 in grade 2 have very minor symptoms, are satisfied with the result, and consider the operation has been of decided benefit and well worth while. The eight in grade 3 are also pleased with their present position as compared with their pre-operative state. Their symptoms are not of serious consequence and do not incommode them to any noticeable degree. Therefore one can say that the results in 93% of cases are satisfactory.

Of the 13 in grade 4, five have considerable trouble from dumping; three have a marked hypoglycaemic syndrome (one persisting seven years after operation); two suffer from bilious vomiting to a troublesome degree, probably due to fault in the gastro-enterostomy; two have persisting diarrhoea; and one has had partial gastrectomy elsewhere. This last patient was very neurotic and when first seen was referred to the psychiatric department, whose report was unfavourable. His duodenal ulcer persisted and operation was eventually undertaken. For a time after operation he remained well. He then again complained of symptoms similar to those before operation. Repeated investigation revealed no organic basis for his complaints. He then went elsewhere, where again after a period, and after an unfavourable psychiatric report, laparotomy was undertaken. His duodenal ulcer was healed and his gastro-enterostomy stoma healthy. Partial gastrectomy was done. He is not yet symptom-free. It was an error to operate on his duodenal ulcer in the first instance.

Among the eight in grade 5 the duodenal ulcer has recurred in five, of whom four obviously failed to have complete nerve sections, as shown by positive insulin responses after operation; the one case with a negative insulin response had one post-operative test meal only, and section may be incomplete. One case has had no relief of symptoms: ulceration has persisted, and a positive insulin response indicates failed section. Two cases have developed stomal ulcers. In both, vagal section was incomplete. In one the left nerve was known to have been missed during operation, but anaesthetic

difficulties prevented prolongation of search for the nerve. When his stomal ulcer developed, the vagal section was completed at a second operation two years after his primary surgery. Prompt healing of the stomal ulcer occurred, and the patient has been in excellent health and symptom-free for the past five years. In the second case a large stomal ulcer was found at the second operation four months after the first; vagal resection was repeated, but the post-operative insulin meal was still positive after the second operation. Apparent healing of the stomal ulcer occurred, with disappearance of symptoms, disappearance of the ulcer on x-ray examination, a negative faecal occult blood test, and a gain in weight. In just over a year the symptoms recurred and partial gastrectomy was undertaken elsewhere.

There has been a gain in weight in 70% of cases, the average being 8.3 lb. (3,765 g.); 5% have shown no change in weight; 25% have lost an average of 6.4 lb. (2,900 g.).

We have not found any case in which pulmonary tuberculosis developed after operation: no such case is known to the local tuberculosis service. Also no case has shown evidence of anaemia.

The 277 patients in the first three grades are well satisfied. They are no longer on diet and do not require to restrict themselves in any way so far as food is concerned. From this they derive much psychological benefit. The great majority have returned to their pre-operative occupations; those who have taken lighter jobs have been more than balanced by those who have found themselves capable of heavier work after operation. There has been almost no loss of working-time from digestive causes since their return to work after operation, a feature which is noted with gratitude by numbers in replying to the questionnaire.

Other Operations

Vagal crush was done in four cases. In all four a negative post-operative insulin test meal became positive within 12 months, with a return of pain and dyspepsia. The operation appears to have no useful place.

Vagal resection was combined with pyloroplasty in 19 cases. In all of them the results have been excellent. 80% have gained an average of 10.5 lb. (4,760 g.), 10% have lost 4 lb. (1,815 g.), and 10% have not changed their weight.

Conclusions

In the treatment of duodenal ulceration, operations on the vagal nerves alone, either by resection or by crushing, do not give good results. When vagal resection is combined with posterior gastro-enterostomy excellent results are obtained in over 90% of cases, with a mortality rate around 2%. It seems likely that equally good results may be obtained by vagal resection combined with pyloroplasty. The results are at least as good as those after partial gastrectomy, and the operative mortality is probably appreciably lower. These good results, added to the fact that partial gastrectomy is not excluded as a further possible operative treatment for failure in resistant cases, indicate that the combined operation should be the method of first choice in the treatment of duodenal ulceration.

REFERENCES

- Hollander F. (1946). *Gastroenterology*, 7, 607.
Pollock, A. V. (1952). *Lancet*, 2, 795.
Visick, A. H. (1948). *Ann. roy. Coll. Surg.*, 3, 266.

A fourth, expanded edition of the catalogue of isotopes on sale from the isotope division of the Atomic Energy Authority has now been published. Copies of the catalogue may be obtained from the isotope division, A.E.R.E., Harwell, Didcot, Berkshire. A separate catalogue covering naturally radioactive materials, long-lived fission products, labelled compounds, and other materials requiring processing or synthesis is obtainable from the Radiochemical Centre, Amersham, Buckinghamshire.

SEGMENTAL LESIONS IN DRUG-TREATED PRIMARY TUBERCULOSIS IN YOUNG CHILDREN

BY

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A considerable volume of experience concerning the effects of specific drug treatment on the course of primary tuberculosis in the child has now accumulated.

While it is generally recognized that the mortality rate has been favourably influenced, particularly since the introduction of isoniazid (Lincoln, 1954), and largely as a result of a decrease in the frequency and severity of the haematogenous complications, it appears to be the general consensus of opinion that in tuberculosis of the mediastinal lymph nodes neither the symptoms nor the associated bronchoscopic appearances show a specific response to drug treatment (Lincoln *et al.*, 1955). In a small series (Todd, 1955) it has also been shown that there is no statistically significant improvement in the speed of radiological resolution. Lincoln *et al.* (1955) state: "No known drug or combination of drugs has demonstrated an obvious effect on the resolution of primary pulmonary tuberculosis."

A carefully controlled series of children is at present being studied at Bellevue Hospital (Lincoln *et al.*, 1955) in order to assess the results of antimicrobial treatment, and should provide more conclusive evidence when the results are available, as previous studies, apart from that of Todd (1955), have not employed controls.

It has been suggested (Bentley, 1955) that drug treatment may even be detrimental to complete recovery in uncomplicated hilar adenitis in young children by leading to an increased frequency of segmental lesions with their associated risk of bronchiectasis in later life. His impression was mainly based on a small group of eleven children under 2 years of age. Nine of these were treated with isoniazid and P.A.S., and five of them developed segmental lesions. Two similar conservatively treated cases recovered uneventfully. On the basis of these findings he expressed the opinion that "great care should be exercised before starting a small child with obviously enlarged tuberculous mediastinal glands on a course of antibiotics, and particularly on isoniazid."

It has consequently been thought desirable to review the cases of uncomplicated tuberculous mediastinal lymphadenitis in children treated with drugs in this institution since 1951, with special emphasis on those aged 2 years and under, from the standpoint of the frequency of development of segmental lesions.

Plan of Investigation

Cases of primary pulmonary tuberculosis in children admitted to this institution since 1951 were studied, in addition to cases at present in the institution who had had a minimum of three months' drug treatment. From these, cases of uncomplicated mediastinal glandular enlargement treated with drugs from the outset were selected for study. Variations in posture and respiratory phase, with their resultant distortion of the normal mediastinal outline, often create difficulties in the diagnosis of enlarged mediastinal glands in the young child. Because of this, cases were selected on two main criteria: (1) the demonstration of an obviously enlarged mediastinal gland on two or more films,

and in many cases their reduction in size during treatment; and (2) the development of foci of calcification in mediastinal shadows whose enlargement had been doubtful. In the absence of areas of calcification to date it has been necessary to exclude a number of cases of doubtful hilar enlargement at present progressing favourably on drugs.

It was possible to collect a total of 50 cases. Of these, 20 were aged 2 years or under. The mean age of the older group was 6.3 years, the oldest child being aged 10. The racial breakdown was as shown in Table I.

TABLE I

	0-2 Years	3-10 Years	Total
Eskimo	9	12	21
Indian	2	6	8
White	9	12	21

Treatment consisted of streptomycin, P.A.S., and isoniazid in varying combinations. Streptomycin was given in a dose of 0.25-0.5 g., bi-weekly, depending on age. The dosage of P.A.S. varied from 2-8 g. daily, depending on age. Isoniazid was employed in a daily dosage of 5 mg. per kg. The combinations used are shown in Table II.

TABLE II

Drug Combinations	S.M., P.A.S.	S.M., P.A.S., I.N.H.	P.A.S., I.N.H.
No. of cases	12	14	24

S.M. = streptomycin. I.N.H. = isoniazid.

Treatment has been completed in 16 patients who have been discharged. Nineteen are continuing treatment, having had more than six months to date. The remaining 15 have been under treatment for periods varying from three to six months. The frequency with which segmental lesions appeared is shown in Table III. All these lesions occurred

TABLE III

Age	No. of Cases	Uneventful Recovery	Segmental Lesions
2 years and under	20	18	2
Over 2 years	30	28	2
Total	50	46	4

within three months of admission, except one which first became evident at six months. One occurred in a patient treated with streptomycin and P.A.S. One occurred in a patient on streptomycin, P.A.S., and isoniazid, and two occurred in patients on P.A.S. and isoniazid.

Discussion

The natural frequency with which segmental lesions occur in primary tuberculosis in childhood is not clearly established. They usually become evident at tuberculin conversion or in the early subsequent months. Because of this any series of cases of tuberculous mediastinal lymphadenitis diagnosed early will show a higher incidence of subsequent segmental lesions than a similar series diagnosed at a later stage in their natural history, when many of the cases predisposed to segmental lesions will have already developed them.

The increased efficiency of diagnostic services may therefore lead to an apparent increase in the frequency of segmental lesions mainly because of earlier diagnosis. It has been stated (Bentley *et al.*, 1954) that approximately 5-10% of children will develop a segmental lesion following primary infection.

The risk of developing a segmental lesion is believed to be appreciably greater in young children with primary infection, although again no precise figures exist. Grzybowski (personal communication) has quoted a figure of 15-18% as an approximate estimate of the total frequency of segmental

lesions in infants under the age of 2 years, based chiefly on a review of the High Wood figures (Bentley *et al.*, 1954).

Misgivings about the possible hazards of drug treatment in tuberculous mediastinal lymphadenitis have been expressed (Bentley, 1955), as mentioned previously. He also records the development of segmental lesions in 10% of a group of 80 children of all ages suffering from tuberculous mediastinal lymphadenitis treated with drugs, and he points out that this compares unfavourably with an incidence of 4% in 202 children of all ages with uncomplicated tuberculous mediastinal lymphadenitis studied at High Wood between 1942 and 1946, although he admits that much of the apparent increase in the drug-treated series may result from earlier diagnosis and admission. Cases were classified, mainly on the radiological condition found on admission, as showing uncomplicated mediastinal lymphadenitis or segmental lesions in the earlier series, and there was an average waiting period of three months before admission, during which interval the majority of the segmental lesions might be expected to appear. As a result, cases of uncomplicated mediastinal lymphadenitis classified as such at the time of admission would represent a selected group much less prone to the development of segmental lesions after admission.

In a recent article dealing with the treatment of tuberculosis in children with isoniazid (Plettenburg, 1955) the development of lobar atelectasis in 29 children, mostly of "crawler" age, is recorded. The total number of children in the group with hilar lymph node tuberculosis in whom this complication appeared is not recorded. Treatment consisted of isoniazid in a dose of 10 mg. per kg. and streptomycin in an unstated dosage. Four of these children died after bronchoscopy carried out in order to remove caseous material and granulation tissues from the bronchi.

The results obtained in the present relatively small series of cases, although they cannot take the place of an adequately controlled large-scale trial, do not suggest that specific chemotherapy in young children is likely to increase greatly the natural hazard of the development of segmental lesions. The latter occurred in only two cases in the group 2 years and under, and the overall incidence of 8% does not appear excessive in view of the low mean age of the group treated. In all four cases the lesions involved segmental areas in upper lobes, and no case of massive lobar consolidation or collapse was noticed. Three cases have run their course to a residual area of fibrosis and final stability has not yet been reached in one. No haematogenous complications occurred and no deaths were encountered.

The hazards of primary infection in the young child are well recognized. Haematogenous complications occurred in 10% of children under 2 years of age (Bentley *et al.*, 1954). The risk of meningitis or miliary tuberculosis among children under 5 years has been estimated at 4% (Cammock and Miller, 1953). The known risks in the group 2 years and under lend support to the current practice of advocating antimicrobial therapy for them, and the results in the present series do not suggest that there is at present strong enough reason to withhold the benefits of drug treatment, even in the child with obvious enlargement of the mediastinal glands.

Summary and Conclusions

A series of 50 cases of tuberculous mediastinal lymphadenitis in children were studied.

The influence of antimicrobial treatment on the development of segmental lesions was investigated.

There is no obvious increase in the natural frequency of segmental lesions as a result of antimicrobial treatment.

There appears to be no definite reason to abandon the current practice of administering specific drug treatment to children aged 2 years and under suffering from primary tuberculous infection even in the presence of obvious mediastinal glandular enlargement.

ADDENDUM.—Since this article was submitted for publication, eight further cases have completed a minimum of three months' treatment. Three were aged 2 years or under, and five were over 2 years. Segmental lesions appeared in two of these cases within three months, one occurring in each age group.

It does not appear that these additional cases increase the frequency of segmental lesions in drug-treated cases beyond the range of their natural incidence in the respective age groups.

REFERENCES

- Bentley, F. J. (1955). *British Medical Journal*, 2, 1084.
— Grzybowski, S., and Benjamin, S. (1954). *Tuberculosis in Childhood and Adolescence*. London.
Cammock, R. M., and Miller, F. J. W. (1953). *Lancet*, 1, 158.
Lincoln, E. M. (1954). *Amer. Rev. Tuberc.*, 69, 682.
— Sewell, E. M., and Anastasiades, A. A. (1955). *Postgrad. Med.*, 16, 422.
Plettenburg, W. (1955). *Dtsch. med. Wschr.*, 80, 376.
Todd, R. McL. (1955). *Lancet*, 1, 794.

PENETRATING ULCER OF THE TONGUE

BY

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Penetrating ulcer of the tongue is of fundamental importance, in that it resembles carcinoma very closely. It has been appearing infrequently in the surgical clinics of this hospital recently, thus stimulating a search for information about the subject. No record of this disease has been found in any standard British textbook on surgery, medicine, pathology, oral medicine, or pathology. No reference has been found in the last ten years of the *Index Medicus*. Thoma (1949) mentions briefly what he calls decubitus (traumatic) ulcer of the tongue. Butlin and Spencer (1900) described traumatic ulcers of the tongue due to rough teeth, commented upon the difficulty in diagnosis, and indicated that complete excision may produce a dramatic cure.

Details

The lesion is a deep ulcer (Fig. 1), oval or circular, with sloping or slightly rolled edge and yellow slough base. It feels hard, but induration does not spread into the muscle. It is painful when eating and has usually been present for two to four months before advice is sought. The picture is typical of carcinoma, except that deep induration is absent and the cervical glands, if enlarged, are tender.

The ulcer seems to occur after middle age, affecting the same age groups as carcinoma. The frequency is impossible to assess at present, because most out-patient notes are not indexed with diagnosis. In this hospital in the last five years penetrating ulcer and carcinoma have occurred with equal frequency. The posterior aspect of the lateral border of the tongue seems to be the most commonly affected site, but it may develop in the central area.

Chronic irritation by adjacent teeth is the most obvious cause, but this cannot explain Case 3, in which the central



FIG. 1.—Penetrating ulcer of the tongue (Case 2).

area was affected and the dentures had been worn for 20 years. This area is not in contact with the upper incisors during speech or mastication. There would appear to be a special response by the tongue to irritation in advanced age groups.

The diagnosis must be made by biopsy, as the ulcer may usually be confidently diagnosed as carcinoma on first examination. The Wassermann and Kahn tests are necessary to exclude syphilis, and tuberculosis will be eliminated by histological section. There is no difficulty in differentiating penetrating ulcer from acute ulcers such as peptic, aphthous, and herpetiform. Microscopy shows an abrupt termination of normal epithelium at the edge of the ulcer and diffuse infiltration of the subepithelium and muscle by inflammatory cells (Fig. 2). There may be acanthosis of the epithelium at the edge, especially when healing is occurring.

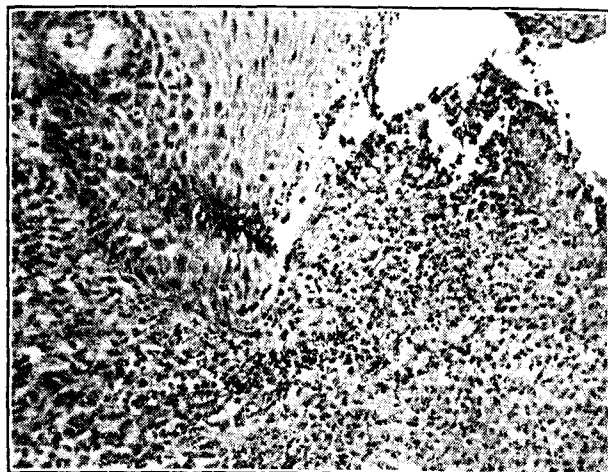


FIG. 2.—Low-power view of biopsy in Case 2. This shows abrupt termination of epithelium and heavy infiltration with inflammatory cells.

The course is difficult to estimate in view of the small number of cases observed, but at present it can be said that healing will occur in one to three months if treatment is begun at once. The condition does not seem to be premalignant, but prolonged follow-up is obviously essential.

Treatment.—Any likely mechanical irritating factor such as a rough tooth or filling must be abolished. A course of parenteral penicillin should be given. The ulcer may be completely excised by diathermy, but healing will take much longer and the area may produce a patch of acanthosis resembling leucoplakia.

Case Histories

Case 1.—A woman aged 70 attended surgical clinic on November 13, 1951, complaining of painful ulcer on left side of tongue for two months. Tonsillar gland on that side enlarged and tender. Good general health. Several teeth in poor state, one almost opposite the ulcer. W.R. and Kahn, negative. November 28: Excision of ulcer by diathermy. Histology: Hyperplasia of epithelium at edge of lesion and heavy infiltration by inflammatory cells. No evidence of malignancy. January 21, 1952: Ulcer healed. Follow-up until July 10, 1955, shows persistence of soft whitish area which does not appear to be true leucoplakia.

Case 2.—A woman aged 75 attended surgical clinic on January 26, 1955, having had a painful ulcer on the right side of tongue for two months (Fig. 1). Raised edge and yellow slough. No enlarged glands. Good general health. Several teeth present in poor state, one being opposite the ulcer. W.R. and Kahn, negative. Biopsy performed on February 1. Histology: Floor of ulcer composed of granulation tissue heavily infiltrated by polymorphs; no evidence of malignancy (Fig. 2). A course of parenteral penicillin was given and dental clearance performed. March 9, 1955: Ulcer completely healed.

Case 3.—A man aged 63 attended surgical clinic on May 3, 1955, complaining of painful ulcer, $1\frac{1}{2}$ by $\frac{1}{4}$ in. (3.8 by 1.9 cm.), in centre of tongue for four months. Slightly raised edge and yellow slough. No enlarged glands. Good general health. Edentulous; no irritating factor present on upper denture, which had been worn for 20 years. W.R. and Kahn, negative. Biopsy performed on May 6. Histology: The loose fibrous tissue underlying the acanthotic stratified squamous epithelium is heavily infiltrated by chronic inflammatory cells. No evidence of malignancy or gumma. May 30: Ulcer healed.

Discussion

Penetrating ulcer of the tongue deserves widespread recognition and inclusion in standard textbooks of medicine and surgery, because it resembles carcinoma exactly and the two conditions seem to occur with equal frequency. Irritation by a mechanical factor is likely to be the cause of the ulcer, but this response of the tongue epithelium occurs only in later age groups. It is significant that at this hospital the lesion has not been seen in younger age groups, for a much higher percentage of them are dentulous. Biopsy of all such ulcers is imperative. The only salient clinical differences between penetrating ulcer and carcinoma are that pain is a constant complaint in the former and that deep induration is usual in the latter.

So far as can be determined at present, successful treatment involves a course of parenteral penicillin and removal of any irritating factor. In the present state of our experience the lesion is not pre-cancerous, but more widespread appraisal of the disease and prolonged follow-up should provide a final decision in some years.

Summary

A penetrating ulcer of the tongue with an incidence similar to carcinoma is described and illustrated. A plea is made for more widespread recognition of this lesion, which is quite distinct from the small acute "dental" ulcers often seen at the edge of the tongue.

I am grateful to Mr. N. M. Matheson for his advice and to Mr. O. D. Morris for access to records of patients under his care. I am indebted to Miss M. Nicholson for Fig. 1 and to Mr. A. Vinten for Fig. 2.

REFERENCES

- Butlin, H. T., and Spencer, W. G. (1900). *Diseases of the Tongue*, 2nd ed., p. 164. Cassell, London.
Thoma, K. H. (1949). *Oral and Dental Diagnosis*, 3rd ed., p. 354. Saunders, Philadelphia.

The Australian Government has appointed a committee of inquiry into the future of the Australian universities. The inquiry arises out of a request by the Vice-Chancellors who approached the Government. This, according to an official source, is the first comprehensive inquiry to be made into the needs of Australian universities. The committee has been asked to indicate ways in which the universities might be organized so as to ensure that their long-term pattern of development is in the best interests of the nation, and in particular to inquire into such matters as the role of the university in the Australian community; the extension and co-ordination of university facilities; technological education at university level; and the financial needs of universities and appropriate means for their provision. It is hoped that the committee will pay attention to what Australian universities could reasonably be expected to do, how they might be organized to do this, and how their activities should be financed; and that it will examine the adequacy of the Commonwealth scholarship scheme. The committee's chairman is Sir KEITH MURRAY, chairman of the British University Grants Committee, and among its members is Sir CHARLES MORRIS, Vice-Chancellor of Leeds University. The committee will carry out its inquiry in July, August, and September.

Medical Memorandum

Allergic Basis for Migraine: A Lesson from Loa loa

It is not uncommon to suspect that attacks of migraine in a particular patient may have an allergic basis, usually on the somewhat insecure grounds of a history of other known allergic phenomena in that patient or the near relatives. Proof is rarely obtained; a particular allergen is rarely incriminated; and though when antihistamines were first discovered there were hopeful reports of their efficacy in the treatment of migraine, yet they have, in general, proved most disappointing.

That a direct relationship between allergy and migraine may, however, exist is illustrated in an unusually convincing manner by the following case.

CASE REPORT

A 44-year-old woman was first seen on October 2, 1954, complaining of an intense recent aggravation of a long-standing tendency to migraine. She was admitted to hospital on October 12. From the age of 14 she had suffered from very infrequent attacks of severe headache, preceded either by loss of the right half of her field of vision or by an altitudinous hemianopia. The headaches were accompanied by vivid teichopsia in either field. Occasionally the teichopsia was the only ocular phenomenon, and at times it occurred without accompanying headache. On two occasions the left arm had become numb prior to the onset of the headache. She had had many years of complete freedom, and the attacks were so rare as never to interfere with her activities.

Ten months before admission she went to Nigeria and remained there for eight months. One week after arriving there she developed an intensely irritating rash which spread over the body from above downwards and lasted one week. Seven weeks before admission she felt a pricking sensation at the left ankle, which rapidly became greatly swollen, hot and tense, and over the next few days the swelling extended to involve the whole left leg, lasted ten days, and then subsided without any residual disability. Since this episode she had had repeated localized swellings, affecting either arm or leg, measuring several inches in diameter, appearing and subsiding spontaneously and painlessly over a three-day period. In addition she noticed areas of an urticarial nature about 1 in. (2.5 cm.) in diameter, appearing several times a day and lasting about 24 hours. The day before admission she developed one of the typical large swellings on the right arm.

In the weeks since these swellings appeared her migrainous episodes had become both severe and very frequent, so that she had attacks every day and sometimes several short attacks during one day, in between which she would have transient hemianopia without subsequent headache. It was on account of the severity of these symptoms that she sought medical advice.

On examination no abnormality was found in the central nervous, respiratory, cardiovascular, or gastro-intestinal systems. On the right upper arm there was an area of greyish-white brawny oedema, measuring 6 by 4 in. (15 by 10 cm.), and clearly outlined by an erythematous margin. The swelling was hot but not tender; it did not pit on pressure; there was no lymphangitis or enlargement of regional lymph nodes. The appearances were those of a Calabar swelling. On the left arm, leg, and buttock were small urticarial areas about the size of a florin.

Investigations.—X-ray films of chest and skull were normal. The cerebrospinal fluid was purposely not examined. Red blood count was normal. White blood counts, carried out daily, showed from 6,400 to 16,300 leucocytes per c.mm., of which the eosinophil count ranged from

1,400 to 7,800 per c.mm. (direct count). Blood smears were examined at various times of the day and night, and, by the courtesy of Professor Macgrath, midday thick films were examined at the Liverpool School of Tropical Medicine. No *Acanthocheilonema perstans* or *Loa loa* microfilariae were seen.

While awaiting admission to hospital the patient was given promethazine hydrochloride, 25 mg., three times a day, and this was continued while awaiting supplies of diethylcarbamazine dihydrogen citrate ("hetrazan"). From the first dose of promethazine there was a dramatic cessation of the migrainous symptoms and the urticarial areas on the skin ceased to appear. The antihistamine was continued throughout her subsequent full course of diethylcarbamazine and she had no further headache and no reaction to that drug until the last day of a three-weeks course, when on 300 mg. three times a day. On this day she felt giddy and was abnormally drowsy for six hours. The diethylcarbamazine was discontinued and she returned to normal rapidly. During the period of the treatment she had one typical Calabar swelling on the left thigh, lasting two days.

The patient remained perfectly well. Within three months her white blood count was normal, with no eosinophils, and 18 months after discharge she had been entirely free from headache, hemianopia, or any form of swelling.

COMMENT

Microfilariae were not seen in this patient's blood. Nevertheless, the history of having lived in Nigeria, the typical Calabar swellings, the smaller more transient urticarial areas, and the very high eosinophilia make the diagnosis of loasis almost beyond doubt.

It was, however, a striking fact that the patient came complaining, not of the swellings, but of the intensity and frequency of her attacks of migraine.

Neurological complications in the course of loasis are not unknown, and van Bogaert and his collaborators (1955) give an extensive review of the literature on this aspect and describe in detail a fatal case of encephalitis. They consider that many of the reported neurological manifestations are allergic in origin and that the pathological findings in their case are consistent with a state of hypersensitivity.

In the case reported here it seems reasonable to conclude that there was a direct causal relationship between the allergic state and the migraine. There was a known allergen; there was clinical evidence of skin allergy; and there was an abrupt cessation of severe migrainous attacks on giving antihistamines before any specific therapy directed towards eradication of the filariae had been started.

The syndrome we know as migraine is probably the common end of a variety of precipitating factors, and it may be that in only a small proportion of cases is there an allergic basis. If in each instance careful search and inquiry were made, from time to time commonly occurring allergens might be found to be the factors responsible, and, by removal, relief be obtained comparable to that reported in this patient, whose allergen was more clearly defined by virtue of its rarity.

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REFERENCE

- van Bogaert, L., Dubois, A., Jaanssens, P. G., Radermecker, J., Tverdy, G., and Wanson, M. (1955). *J. Neurol. Neurosurg. Psychiat.*, 18, 103.

The Cultural Relations Division of the French Ministry of Foreign Affairs has begun publication of *Informations Scientifiques*, a bulletin which will contain information on recent developments in the fields of science, medicine, and agriculture. The bulletin, which will appear periodically, will be sent free to scientific organizations requesting it. It may be obtained through the Scientific Office of the French Embassy, 22, Wilton Crescent, London, S.W.1.

Reviews

SIR GORDON HOLMES

Selected Papers of Sir Gordon Holmes. Compiled and edited by F. M. R. Walshe. (Pp. 262+xii; illustrated. 20s.) London: Macmillan and Co. Ltd. 1956.

The unusual prestige of British neurology has been largely determined by the achievements of the great exponents of the last two generations. In this twentieth century no one has done more to establish British neurology than Sir Gordon Holmes. It is no exaggeration to assert that the accepted present-day techniques of clinical examination of the nervous system, which in skilful hands reveal so much, directly stem from Holmes's exemplar. Whether we realize it or not, in Medicine . . . "as in Life, the law of heredity holds good; on est toujours le fils de quelqu'un," as Oscar Wilde has truly said.

The *Guarantors of Brain*, that journal of neurology which Holmes edited so long and with such authority, wisely decided to mark the occasion of his eightieth birthday by re-issuing a number of his earlier papers. The task of selection was no easy matter, but Sir Francis Walshe did well in his eventual choice. Thus we find in the first place a series of articles dealing with the cerebellum, and therein we discern Holmes's original methods of detailed clinical analysis of the physiology of that organ in man. Holmes's researches into the visual pathways are equally well known, and the original communications fittingly find a place in this volume. His views upon the cortical representation of vision, and especially of the macula, are well worth re-reading, and they contrast with the rival opinions of Henschen and of Bouwer. Lastly, the very topical theme of visuo-psychic disturbances from gross cerebral lesions becomes illuminated in an interesting fashion when one refers to the pioneer papers written by Holmes (alone or in collaboration with Gilbert Horrax) on such notions as visual attention and spatial and visual orientation.

The reader will note the detached and careful way in which Holmes observes, records, and evaluates his facts, using the scientific and austere prose-style of a modern Tacitus. Each word is packed with meaning and stands out sincere and unembellished.

Walshe as editor has provided a valuable preface with an eloquent appraisal of Holmes and his work. All this steady accumulation of scientific research, be it noted, has been effected by dint of "private enterprise" in the medical sphere. Walshe makes the telling point that it was the voluntary achievement of a physician, without university post or title, engaged in both hospital and private practice. It might be pointed out, too, that these researches were unsupported by expense grants or financial aid of any kind, being the outcome of sheer hard work, tireless devotion to an ideal, and innate intellectual brilliance. Holmes and his accomplishments are an inspiration and at the same time almost a reproach to those of us physicians who follow him and owe him so much.

MACDONALD CRITCHLEY.

INFANT METABOLISM

Infant Metabolism. Edited by I. Herbert Scheinberg. Proceedings of the W.H.O. Seminars held at Leyden and Stockholm in October-November, 1950. Conducted by Evert Gorter, S. Z. Levine, and Arvid Wallgren. (Pp. 435+xxii; illustrated. 56s.) London and New York: The Macmillan Company. 1956.

In 1950 two seminars were organized by the World Health Organization in Leyden and in Stockholm; the proceedings of the latter have now been published under the title *Infant Metabolism*. Apparently the reporting arrangements at Leyden went wrong, but, since the Stockholm meeting to some extent repeated what had been discussed at Leyden, these verbatim proceedings probably give a good account of the total presentations. Although about 80 participants are listed for Leyden and over 60 for Stockholm, the form

of the meetings appears to have been in smaller panel discussions. The whole has been ably edited by Professor I. Herbert Scheinberg, of New York, whose name does not appear among "those present." The object of these two gatherings was to discuss advances in knowledge of metabolism in the younger age group, no doubt hoping to fill up gaps in European work created by the war. In fact the contributions from war-occupied countries were remarkably valuable. The Danes in particular seem to have carried on good scientific work despite disturbances. There are reports of ten panel discussions. Three of these are more general, concerning metabolism in premature infants and in newborn infants, and on estimating nutritive status. The remainder deal with more special topics, such as water and electrolyte metabolism, vitamins, and protein metabolism. One of the most fascinating discussions arose in the panel on calcium, phosphorus, and vitamin D. On the inevitable problem of what exactly constitutes rickets no final conclusion was arrived at, and, since this was six years ago, there is little mention of hypercalcaemia, though in some of the remarks made quite enormous doses of vitamin D are mentioned.

The book is beautifully printed and produced, but regretfully has no index. It could be a valuable reference book but for this omission. It has also to be wistfully regretted that, although nine countries were represented, the United Kingdom was left out of participation, though Dr. F. W. Clements batted well for the Commonwealth.

ALAN MONCRIEFF.

POTT'S DISEASE

Pott's Paraplegia. By D. Ll. Griffiths, H. J. Seddon, and R. Roaf. (Pp. 129+xiv; illustrated. 50s.) London, New York, Toronto: Oxford University Press. 1956.

There is much important scientific information in this small book, which is the outcome of careful observations extending over many years. The authors decided to pool their experiences of 175 patients, as they had certain views in common about the management of Pott's paraplegia and evidence of the failure of conservative treatment. Although some of this work has been published recently this book will attract attention, as the subject is difficult and the condition not very common but may be lethal. Although tuberculosis of the spine is becoming less common in the United Kingdom, it is likely to continue in some parts of the world, where this book should be particularly useful. It is acknowledged that most of this report is on patients seen before the introduction of streptomycin.

The purpose of the book is to review the clinical features and pathology of Pott's disease, the need for operative intervention, and the results of such treatment. The indications for operation are stated in categories of "absolute" and "relative." The authors find that a decompression is the most effective method of treatment for paraplegia, and in this respect their experience differs from that of Alexander. The evolution of operative treatment from laminectomy to antero-lateral decompression is described. The technique, difficulties, and dangers of antero-lateral decompression and of costo-transversectomy are stated in an authoritative manner with well-chosen and clear illustrations. There are many tables and analyses of cases, showing careful records. The illustrations are excellent, and it should be appreciated that many are from photographs and radiographs of the spine which are difficult to reproduce. The authors are to be congratulated on this record of work, to which much thought has been given.

ST. J. D. BUXTON.

Methods of Chemical Analysis as Applied to Sewage and Sewage Effluents is a small technical manual which first appeared in 1929. A second edition, revised by a committee appointed by the Ministry of Health, has now been published by H.M. Stationery Office (10s.). It describes in detail tests for measuring most of the constituents of sewage that are of significance in its disposal.

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PITUITARY TISSUES

The growth and function of anterior pituitary tissue outside the domain of the sella turcica and hypothalamus have been much debated. The results of experimental work show that, though the anterior hypophysis may retain some cellular differentiation and a good blood supply after separation from the influence of the hypothalamus (by hypothalamic lesions, section of the pituitary stalk, or pituitary transplantation), gonadotrophic activity is completely lost, and adrenocorticotrophic and thyrotrophic functions are at least greatly reduced. Data are scanty on lactogenic and somatotrophic secretion. The findings of the more reliable studies show that the influence of the hypothalamus in maintaining and regulating the activity of the adeno-hypophysis is mediated through the hypophysial portal vessels of the pituitary stalk.

Metastases from primary carcinomata of the anterior pituitary are very rarely seen, if ever, though they arise only too commonly from carcinomata of other endocrine glands such as the ovary, testis, thyroid, and adrenal cortex. Sir Geoffrey Jefferson¹ has recently, in his Sherrington Lectures at the University of Liverpool, discussed the problem of the invasive adenomata of the anterior pituitary. He described fourteen cases in which an adenoma of the adeno-hypophysis showed local spread and infiltration. In many of these cases the cells were malignant in type—anaplastic and undifferentiated—though none of them showed any sign of metastases. The fact that locally malignant tumours of the anterior pituitary do not metastasize is a general finding. A. B. King,²

¹ Jefferson, Sir G., *Sherrington Lectures 3, The Invasive Adenomas of the Anterior Pituitary*, 1955, Liverpool.

² King, A. B., *Bull. Johns Hopk. Hosp.*, 1951, 89, 339.

³ Willis, R. A., *The Spread of Tumours in the Human Body*, 1952, pp. 102-3, London.

⁴ Winkelman, N. W., Cassel, C., and Schlesinger, B., *J. Neuropath.*, 1952, 11, 149.

⁵ Cairns, Sir H., and Russell, D. S., *Brain*, 1931, 54, 377.

⁶ Boyd, J. D., *J. Endocr.*, 1956, 14, 66.

⁷ Kingsbury, B. F., *Anat. Rec.*, 1942, 82, 39.

⁸ Tolins, S., and Moore, R. A., *Endocrinology*, 1941, 29, 228.

⁹ Muller, W., *Acta neurochir. (Wien)*, 1954, suppl. 3, 128.

¹⁰ Luft, R., and Olivecrona, H., *J. Neurosurg.*, 1953, 10, 301.

¹¹ ———, *Cancer*, 1955, 8, 261.

¹² Li, M. C., Rall, J. E., MacLean, J. P., Lipsett, M. B., Ray, B. S., and

Pearson, O. H., *J. clin. Endocr.*, 1955, 15, 1228.

¹³ Pearson, O. H., Ray, B. S., Harrold, C. C., West, C. D., Li, M. C., MacLean,

J. P., and Lipsett, M. B., *J. Amer. med. Ass.*, 1956, 161, 17.

R. A. Willis,³ and N. W. Winkelman, C. Cassel, and B. Schlesinger,⁴ and others all agree on the rarity of the occurrence if it ever occurs. Although the usual criteria of malignancy (mitoses, anaplasia, loss of functional arrangement, and marked invasion of the surrounding tissues) are all applicable to invasive pituitary "adenomata," secondary growths do not seem to appear. Thus the question arises, Why are secondary metastases so rare from pituitary tumours when they are so common from carcinomata of other endocrine glands? Several answers suggest themselves. First, pituitary carcinomata are in themselves rare. However, Jefferson says, "Really massive extensions occur in at least 10% of pituitary adenomas." Secondly, patients with untreatable pituitary tumours may die before the tumour grows large enough to metastasize. But in Jefferson's series of invasive adenomata the majority lived four, five, or seven years. Thirdly, the pituitary gland lacks a lymphatic drainage necessary for the spread of such a tumour. It may be recalled here that gliomata of the brain very rarely spread to distant organs.⁵ However, a primary glioma of the brain is not infrequently associated with subarachnoid spinal metastases.⁶ An invasive pituitary tumour does not metastasize even in this way. Cairns and Dorothy Russell described the case of a female, aged 25 years, who died in a coma with hyperglycaemia, apparently in consequence of a large, very soft pituitary adenoma. During life this patient had cells of a peculiar type in the cerebrospinal fluid, and after death multinucleated cells identical with those forming the primary tumour were found in the subarachnoid space, though "they did not appear in any way to be grafted on to the structures in their environment." Therefore pituitary tumours and gliomata seem to differ in regard to their spread in the cerebrospinal fluid. While cells of pituitary tumours may disseminate in the cerebrospinal fluid, there is no evidence that they become implanted in distant meninges and grow as separate tumour masses.

But to account for the lack of metastases from pituitary tumours another possibility should be considered. In recent years evidence has accumulated that carcinomata in organs related to the endocrine system grow at a rate which, at least in the early stages, may be dependent on the presence of the normal stimulus to activity of the tissue from which they arise. Thus a carcinoma arising from a lactating breast has a high growth rate; the growth of a mammary carcinoma and its metastases may be arrested by hypophysectomy; and the growth of carcinoma of the prostate may be brought to a standstill

by castration or administration of stilboestrol. If, then, the growth of such primary and secondary tumours is dependent on the presence of the normal physiological stimulus to the tissue from which they arise, it might be reasoned that secondaries from tumours of the ovaries, testis, adrenal cortex, or thyroid which receive a supply of the appropriate pituitary eutrophic hormone, wherever situated in the body, may occur and grow readily, but that secondaries from pituitary carcinomata would not receive the normal stimulus to anterior pituitary activity if situated outside the vascular territory of the hypophyseal portal system of vessels and for that reason are not seen.

In a recent article J. D. Boyd⁶ emphasizes the existence of the pharyngeal hypophysis in the human foetus. He describes the presence of this structure in all but one of fifty prenatal specimens and three full-term stillborn infants, and remarks that this derivative of Rathke's pouch has structural features closely resembling those of the normal adenohypophysis. It was found to be richly supplied with blood vessels, and nerve fibres derived from the sphenopalatine ganglion were observed to penetrate it. In surveying the literature, Boyd comments that the pharyngeal hypophysis is constantly present only in man and the dog, and that its cells can differentiate to at least a slight degree, as do those of the adenohypophysis. These findings may have an important bearing on the performance of hypophysectomy for mammary carcinoma and other conditions, and it becomes of interest to know whether the pharyngeal hypophysis is a functional entity or not. Boyd suggests that the structure is active because it shows some (if slight) cellular differentiation and possesses a rich blood supply and a nerve supply. However, anterior pituitary tissue which is inactive may show some cellular differentiation and retain a good blood supply. The significance of a nerve supply is doubtful, since recent electron-microscopic studies have shown the normal pars distalis to be devoid of a nerve supply. The reasons put forward by Boyd cannot then be taken as evidence for functional activity by the pharyngeal hypophysis, and as he himself points out: "It must be stressed, however, that the association of any normal function with the pharyngeal hypophysis remains to be sought." Experimental data on the function of anterior pituitary tissue separated from the hypothalamus indicate that normal function in the pharyngeal hypophysis is hardly to be expected. What direct evidence there is argues against any activity in this embryological remnant. B. F. Kingsbury⁷ records the observations made on six adult dogs

hypophysectomized some six weeks earlier. In none of the animals was there evidence indicative of a residual hypophyseal function. Further, S. Tolins and R. A. Moore⁸ were unable to detect any endocrine activity in extracts of the pharyngeal hypophysis of the dog. However, though the dog always has a pharyngeal hypophysis, it tends to become cystic after birth. The evidence so far obtained from studies of hypophysectomy in man indicates, in spite of the claims of W. Muller,⁹ that complete removal of the pituitary gland results in a state comparable to that seen in the lower mammals. Many workers¹⁰⁻¹³ have found that typical loss of gonadotrophic, thyrotrophic, and adrenocorticotrophic function follows hypophysectomy in man. There is little reason to suspect that the pharyngeal hypophysis can compensate in any way for the loss of the pituitary gland.

CORTISONE AND ASTHMA

Despite many recent advances in treatment, bronchial asthma still remains a challenge to modern therapy. Not only do asthmatic patients continue to suffer for many years from chronic disability, but they are liable to severe and distressing exacerbations needing urgent treatment if life itself is not to be endangered.^{1,2} It is a sad reflection that most family doctors have under their care many patients who have undergone all forms of orthodox, and many forms of unorthodox, treatment and yet remain victims of constant dyspnoea and wheezing. Their suffering is only partially mitigated by continued and often surreptitious recourse to their favourite brand of antispasmodic. Since asthma is to some extent an allergic disorder it was hoped with the advent of corticosteroid therapy that cortisone and corticotrophin might bring relief and possibly offer a chance of cure to the asthmatic. Early reports soon confirmed that these drugs were efficacious, but, as so often happens, the initial enthusiasm later gave way to some scepticism and caution.^{3,4} It is not surprising that in a disorder as capricious as asthma there is some difficulty in assessing the value of treatment; indeed, it is an adage known to all clinicians that "any new treatment seems to work for a time."

In an attempt to assess more accurately the efficacy of cortisone in chronic asthma and in severe asthmatic

¹ Robertson, C. K., and Sinclair, K., *British Medical Journal*, 1954, 1, 187.

² *Ibid.*, 1954, 1, 203.

³ Gottlieb, P. M., *Ann. Allergy*, 1954, 12, 456.

⁴ *British Medical Journal*, 1955, 1, 216.

⁵ Report to the Medical Research Council by the Subcommittee on Clinical Trials in Asthma, *Lancet*, 1956, 2, 798.

⁶ *Ibid.*, 1956, 2, 803.

⁷ Savidge, R. S., and Brockbank, W., *Lancet*, 1954, 2, 889.

⁸ *Ibid.*, 1954, 2, 893.

attacks, a subcommittee of the Medical Research Council has analysed the results of two therapeutic trials.^{5,6} In the first, the effect of cortisone was compared with that of a placebo in patients with chronic asthma—patients with respiratory infection and those given to spontaneous remissions being excluded. Neither the patients nor the physicians knew whether cortisone or the placebo tablets were being given until the results were assessed. It was concluded that the patients receiving cortisone were definitely, though not very markedly, improved during the early weeks of treatment. This early improvement, however, was not maintained beyond a period of about two months, after which there was no real difference between the treated patients and the controls. The second trial was planned to determine the value of cortisone in status asthmaticus. Cortisone was given to certain patients in addition to standard treatment, and the results of treatment compared with those achieved by using standard methods and a placebo tablet indistinguishable from cortisone. The dose of cortisone was 350 mg. on the first day, 200 mg. on the second day, and was then slowly reduced until the ninth day, after which the drug was discontinued. This trial showed beyond doubt that patients receiving cortisone responded more rapidly and more completely than the controls. Nevertheless, it is encouraging to note that routine methods for treating status asthmaticus—with antispasmodics and oxygen—were so successful that many patients recovered before cortisone treatment could be started.

Statistical evidence from blind trials of this sort does not necessarily indicate the correct treatment for individual patients, and certainly reports have shown that some asthmatics apparently do well on prolonged treatment with cortisone.⁷ But it is disturbing that a number of unexplained deaths have occurred in asthmatic patients given cortisone over a long period.⁸ The reports to the Medical Research Council confirm the impressions of most physicians that cortisone is best used in the acute and severe phases of asthma when more conventional ways of treatment have failed. Though a minority of patients might need prolonged treatment, the slight advantages of this should be carefully weighed against the serious risk of complications from continued administration and the tragic possibility, however remote, of sudden death. In the Medical Research Council's trials cortisone was used because it was more readily available and easier to administer than corticotrophin. Corticotrophin, however, has probably become the more popular drug in the treatment of status asthmaticus in hospital practice. Although corticotrophin is not yet available to general practitioners no doubt it will

become more abundant, and it would be instructive to compare results from the two drugs in controlled trials.

Nowadays when new drugs are introduced in the treatment of a disease they are usually rightly submitted to critical trial before their efficacy is accepted, whereas traditional treatment often goes unchallenged. Thus, although we are now able to appraise the role of cortisone in asthma, widely divergent opinions are held about the merits of most other forms of treatment. It would be salutary, and possibly quite surprising, to see the results of controlled trials rigidly applied to such treatment as protein desensitization, inhalation of various gases, breathing exercises, and other forms of treatment which are often used for the relief of asthma.

SOIL AND CANCER

Observations on the occurrence of multiple cases of cancer in certain houses led at one time to a "cancer house" hypothesis, and statistical studies were then made to find whether this happened more often than might be expected by chance. Such a study at Lyons in 1933¹ failed to show any difference in this respect between deaths from cancer and deaths from all causes; and in 1935 P. Stocks² found from the distribution of 3,500 fatal cases of cancer in houses in Worcester and Bristol that, though multiple deaths tended to occur in the same or adjacent houses more often than would be expected if the people were distributed uniformly, the census showed that people over 55 years of age were in fact clustered together in the same way as the cancer cases. Any effects of soil on cancer incidence would hardly be manifest in large towns, however, and should be looked for in rural areas.

Some 90 years ago W. Farr and A. Haviland³ deduced from a geological map of England and Wales that registration districts with high crude death rates for cancer in women tended to coincide with low-lying clay areas liable to seasonal flooding by rivers, whereas chalk and limestone areas tended to have low rates, and the thesis was elaborated later.^{4,5} Certification at death of many forms of cancer at that time was far from complete in rural areas, and the rates could not be standardized for age, so it was hardly surprising that the cancer maps by counties prepared by Stocks⁶⁻⁸ differed a good deal from Haviland's. In Wales crude

¹ Lumière, A., and Vigne, P., *Bull. Acad. Med.*, 1932, 109, 280.

² Stocks, P., *J. Hyg. (Lond.)*, 1935, 35, 46.

³ Farr, W., and Haviland, A., *Medical Society of London*, Nov. 30, 1868.

⁴ Haviland, A., *Lancet*, 1888, 1, 314, 365, 412, 467.

⁵ *The Geographical Distribution of Disease in Great Britain*, 1892, London.

⁶ Stocks, P., *A.R. Brit. Emp. Canc. Camp.*, 1936, p. 239.

⁷ *Ibid.*, 1937, p. 198.

⁸ *Ibid.*, 1939, p. 308.

⁹ Diehl, J. C., and Tromp, S. W., *Brit. J. Cancer*, 1955, 9, 349.

¹⁰ Tromp, S. W., *ibid.*, 1956, 10, 265.

¹¹ Davies, R. I., and Wynne Griffith, G., *ibid.*, 1954, 8, 56, 594.

¹² Stocks, P., *A.R. Brit. Emp. Canc. Camp.*, 1955, p. 467.

death rates for cancer in the early days of death registration were low, but the standardized rates in the last 30 years have been uncommonly high. Indeed, when the 60 county aggregates of rural districts in England and Wales are ranked according to their comparative mortality figures for gastric cancer, the 7 counties with highest mortality are all in Wales, and the first 17 consist of Wales and the English Lake District, where igneous rock is close to the surface, and the Fen district, with peaty soil. Of the 8 lowest-ranking counties, on the other hand, 7 have underlying chalk in their geological formation. In Holland also, J. C. Diehl and S. W. Tromp⁹ have shown by study of death rates for gastric cancer in 1946-52 in about 1,100 municipalities that peat and sea-clay soils tend to have higher rates than river-clay soils. For example, the equivalent average death rates per 10,000 males at ages between 50 and 80 were 247 on peat soils, 203 on sea clay, 194 on sandy soils, and 170 on river clay. In a more recent paper Tromp¹⁰ has produced maps of death rates for stomach cancer at different ages by provinces in 1946-52, and at ages over 50 by separate municipalities, and he concludes that mortality was in general greater in agricultural than industrial municipalities. R. I. Davies and G. Wynne Griffith¹¹ investigated the soil groups in Anglesey characterizing localities where people had died of cancer during 1943-52, the residences being pinpointed on the map of the soil survey. They classified soils into three main groups, (α) subject to late spring and summer drought owing to shallowness or excessive drainage, (β) with equable distribution of moisture owing to a fluctuating water table at all seasons, and (γ) with a prolonged wet season owing to poor drainage. There were 1,148 deaths, and the ratios of stomach to other cancer showed a statistically significant excess of stomach cancer on β soils. Later 238 of the deaths from stomach cancer were matched against non-cancer deaths, and this confirmed the tendency for stomach cancer to occur on soils of the β group, while other cancers did not show this relationship.

In his most recent progress report on the environmental survey of cancer in North Wales and the Liverpool Hospital Region P. Stocks¹² gave some first results of analysing soils from gardens of houses where a resident had died of cancer. In respect of organic carbon content and total carbonaceous matter as measured by loss of weight on igniting the dried soil, gastric cancer seems to have occurred after long residence (but not after short residence) more often where the soil contained certain proportions of these constituents than was to be expected from controls. No such peculiar relation with length of residence was found for the other forms of cancer under investigation. Moreover, the soil characteristics manifesting this statistical correlation with stomach cancer correspond in general with those of the β group defined in the independent Anglesey study. If these tentative findings are confirmed in the complete report, it will be necessary to consider in what way soil could affect the incidence of gastric cancer, whether through organic carcinogens trace elements, radiation, or other means.

FEVER AFTER MITRAL VALVOTOMY

After mitral valve operations some patients whose early course has been uneventful later develop a fever and chest pain, the cause of which is not apparent. These symptoms are usually seen about one or two months after operation, occasionally within two weeks but sometimes after longer delay, even over a year. Most reports have come from the U.S.A.,^{1,2} where the symptoms are known as the post-commissurotomy syndrome, post-valvotomy syndrome, or post-cardiotomy syndrome. The incidence of the syndrome varies from about 6% to 40% or over of the patients receiving operation. It is also seen in Britain, but not very often. Paul Wood reported a rate of 10%.³

The onset of the syndrome is usually abrupt. The most common symptom is pain, felt in the left anterior chest, usually deep-seated and constricting, sometimes sharp, and occasionally severe. It may radiate to the left shoulder or neck or sometimes to the right side. There is typically a coincident fever, with the temperature up to 102° F. (38.9° C.), rarely higher; it usually subsides after a few days but may recur after a few weeks, sometimes on several occasions. Other less common symptoms include dyspnoea, cough and haemoptysis, joint and muscle pains, pleurisy, and abdominal pain.

The fever apart, these patients seldom appear seriously ill. Rales may be heard in the lungs, especially on the left side, and pleural effusion is common. Pericardial friction or effusion is sometimes found; cardiac signs are meagre, though tachycardia is common, whether the patient has regular rhythm or atrial fibrillation. Fibrillation may begin, but its onset after operation is frequently not associated with the other features of the syndrome. Spontaneous reversion to normal rhythm may occur or be induced with quinidine. Episodes of congestive heart failure may be seen, but are usually readily controlled. Laboratory findings are not specific. A mild leucocytosis and a raised sedimentation rate are found, but no anaemia; effusions are sterile. There is no correlation between the finding of Aschoff bodies in the wall of the auricular appendage removed at operation and the occurrence of the syndrome. The chest radiograph may show pleural or pericardial effusion, and the electrocardiograph abnormal rhythm or evidence of pericarditis. The course is benign. Symptoms gradually subside during several days, and serious sequelae do not occur, though recurrence of symptoms is common.

The syndrome was first observed after mitral valvotomy, but has also occurred in cases when only exploration has been performed and no incision made in the heart. It has occasionally been seen after operations for congenital heart disease. As a rule no evidence can be found of rheumatic activity or of bacterial infection. The symptoms resemble those seen in cases of pericarditis, particularly traumatic pericarditis, and it is generally believed that this is the cause. Most surgeons

¹ Elster, S. K., Wood, H. F., and Seely, R. D., *Amer. J. Med.*, 1954, 17, 826.
² Dresdale, D. T., Ripstein, C. B., Guzman, S. V., and Greene, M. A., *ibid.*, 1956, 21, 57.
³ Wood, P., *British Medical Journal*, 1954, 1, 1113.

after heart operations suture the pericardium very loosely, so as to allow the fluid which forms to drain into the pleura and to avoid tamponade. If the precaution is also taken of washing out or sucking away all blood clot from the pericardial cavity, the likelihood of the syndrome is reduced. As a rule no treatment is required, but aspirin relieves the symptoms and cortisone is rapidly effective. Chemotherapy has no effect and no prophylactic value. D. T. Dresdale and his colleagues² have given cortisone to all patients having operations on the mitral valve, and report a much lowered incidence of the syndrome. It is doubtful whether this practice will find universal favour.

STEREOTAXIS AS AN AID TO NEUROSURGERY

The use of a stereotaxic technique for locating structures in the brain of the living animal was first described by Victor Horsley and R. H. Clarke in 1908.¹ Clarke had designed an apparatus which allowed the physiologist accurately to place a needle electrode into most areas of the brain. During his lifetime he did not receive the recognition that was due to him for a remarkable and fruitful invention, the principle of which is simple. The head of an anaesthetized animal is firmly secured, and a movable arm holding the electrode travels along a bar parallel to the skull, so that the electrode can be inserted vertically through a burr hole to any desired depth in the brain. The instrument is calibrated in millimetres, and areas of the brain are located by the use of co-ordinates based on skull sutures and a line joining the auditory meati as reference points. Excellent atlases are available for many of the common laboratory animals, including the rhesus monkey, cat, rabbit, and rat. The instrument is particularly valuable for studying the function of subcortical areas and was first used for producing destructive lesions by electro-coagulation. Stimulation of the brain of the anaesthetized animal, analogous to the experiments carried out on peripheral nerves, soon followed. A notable advance was made by the Swiss physiologist W. R. Hess,² who, although working without the apparatus of Horsley and Clarke, showed that it was possible to implant electrodes permanently in the hypothalamus of the cat without disturbing the well-being of the animal. This has considerably extended the possibilities of the technique. Electroencephalographic recordings can now be obtained in the unanaesthetized animal, drugs can be injected through permanently implanted needle guides, and electrical stimulation can be carried out for prolonged periods. Ultrasonic waves and ionizing radiations have been used to produce necrosis of sharply defined areas of the brain.

Clarke³ hoped that his apparatus might eventually be adapted for use in human patients, and the first instrument for this purpose was described by E. A. Spiegel,

¹ Horsley, V., and Clarke, R. H., *Brain*, 1908, 31, 45.
² Hess, W. R., *Helv. physiol. pharmacol. Acta*, Suppl. 4, 1947.
³ Clarke, R. H., *Johns Hopk. Hosp. Rep.*, "Investigation of the Central Nervous System," Spec. Vol., 1920.
⁴ Spiegel, E. A., Wycis, H. T., Marks, M., and Lee, A. J., *Science*, 1947, 108, 349.
⁵ Lister, W. C., and Sherwood, S. L., *Electroenceph. clin. Neurophysiol.*, 1955, 7, 311.
⁶ Talairach, J., et al., *Rev. Neurol.*, 1949, 81, 4.
⁷ Spiegel, E. A., and Wycis, H. T., *Stereotaxic Neurosurgery*, 1952, New York.

H. T. Wycis, and their colleagues⁴ in 1947. At the present time at least a dozen instruments are available, including one designed in Britain by W. C. Lister and S. L. Sherwood.⁵ They have been used for implanting radio-isotopes into brain tumours, for injecting alcohol into the thalamus of patients with intractable pain, and for destroying subcortical tissues in patients with mental disease. Electroencephalographic recordings have also been obtained from the deeper parts of the brain. There are of course many difficulties in the design and handling of such instruments which do not arise in animal experiments. They must be light in weight, durable, able to stand up to sterilization, and easy to handle during operation. For the accurate location of different parts of the brain some form of radiographic control is necessary. Ventriculography⁶ and the position of the pineal gland, as well as bony structures of the skull, are used for reference. If the technique proves useful clinically—and the surgery of psychiatric disorders seems to be a promising field—perhaps the neuroanatomist will be able to prepare an atlas of the human brain similar to that of Spiegel and Wycis⁷ but based on the type of co-ordinates used in the experimental animal. This would greatly simplify the surgeon's task.

EMOTIONS AND EPILEPSY

Research into epilepsy has recently been extended to the study of the auras that patients experience. As is usual with studies on this disease, it is often hard to improve upon Hughlings Jackson's original, accurate, and detailed descriptions, and harder still to enlarge upon his simple but profound analysis of their pathology. Among interesting recent contributions is Denis Williams's study¹ of the structure of emotion as reflected in epileptic experiences. A hundred experiences were studied in about 2,000 epileptics. The most interesting point that emerges is that the range of emotions experienced was narrow, and confined to the "primary" emotions of fear (61), depression (21), pleasure (9), and unpleasure (9). Anger and rage were observed in some other cases, which will be the subject of a later paper. In all except one case the emotion was associated with other ictal sensations (hallucinations, déjà-vu, and somatic or visceral feelings). Cognitive activity was rarely part of the aura, and, though elaborate experiences might be described, they had the diffuse quality of dreamy states, as Hughlings Jackson so aptly called them long ago.

Williams relied mainly on electroencephalographic studies for locating the probable site of origin of the discharging lesions, though some were verified by operation. In 30 of the 61 cases showing fear he found anterior temporal foci, in 17 cases middle temporal foci, and in the other 9 none could be located. It is probable that almost all the foci were below the Sylvian fissure, mostly deep in the temporal lobe, but some were inferior frontal. This

¹ Williams, D., *Brain*, 1956, 79, 29.
² Meyer, A., and Beck, E., *Proc. roy. Soc. Med.*, 1955, 48, 457.
³ Epstein, A. W., and Ervin, F., *Psychosom. Med.*, 1956, 18, 43.
⁴ Hill, D., and Mitchell, W., *Folia psychiat. (Amst.)*, 1953, 56, 718.
⁵ Fenichel, O., *The Psychoanalytic Theory of Neurosis*, 1945, New York.

predominance of lesions in the region of the deep temporal lobe accords well with experimental data obtained in research on animals. Complex epileptic seizures of "psychomotor" type were found to be accompanied by movements and visceral activities that would be appropriate to the animal experiencing emotion, especially fear. Furthermore, lesions in the deeper regions of the temporal lobe (uncus, amygdaloid, hippocampus) are the commonest findings in the operative specimens obtained by temporal lobectomy.² Most of these patients had had complex auras with affective experiences.

There seems to be a neurophysiological mechanism for the expression of, and the experience of, emotional states; it comprises visceromotor and sensory, and somato-motor and sensory, and special-sense activities. An epileptic discharge activates in a typical, brief, telescoped, stereotyped fashion some or all of these various components, in the same way as an epileptic discharge in the lower level of the motor cortex produces a distortion of the smooth motor activity mediated by this region. We have not yet gained any idea why one particular epileptic attack should pick out only certain elements of what is usually a smoothly co-ordinated response. Neither the form of the spike in the temporal-lobe electroencephalogram nor the pattern of the actual seizure, if it is recorded, gives any information about the probable type of emotion experienced or what sort of visceral somatic activity might be associated with it. However, from psychological and psychiatric studies some interesting observations have been made by A. W. Epstein and F. Ervin,³ and D. Hill and W. Mitchell.⁴ Both groups of authors have pointed out that the resemblance of the dreamy state to a dream can be extended to finding in both of them similar mechanisms of distortion, condensation, secondary elaboration, and so on, such as were first described by Freud in his classical study *The Interpretation of Dreams*. Individual case histories of epileptics partially psycho-analysed have been published for many years,⁵ but most of these reports pay scant attention to the actual epileptic aura, and the type and frequency of fits are hard to discern. Epstein and Ervin have also noted that the reported content of an aura changes during psychotherapy in a psychodynamically meaningful way, as dreams do, and the number of fits increases during times of increased emotional tension. The question arises, therefore, of what elements of an aura, if any, can be ascribed directly to the epileptic discharge.

The emotions that Williams's subjects reported correspond closely to the primitive emotions described by psychologists as the only ones occurring in babies. Depression is a more elaborate state somewhat different from the rest, and it is interesting to note that the form in which this emotion appears in Williams's patients also differs from the other ictal experiences. It tends to last longer and be less clearly an aura phenomenon only, so its neurophysiological substrate is not as definite as with fear, pleasure, and displeasure. Williams speaks of a hallucinated emotion comparable to an ordinary sensory hallucination, which is a precept without apparent stimulus. He assumes a distinction between such

organic hallucinations and psychotic hallucinations, but at present this does not seem quite as clear-cut. His idea would be more useful if the mechanisms of ordinary hallucinations were understood. It seems possible that the effects of Jacksonian epileptic discharge are brief and distorted primitive emotional states, with their appropriate visceromotor and viscerosensory components. What aspects of this state may be reported by the subject and what cognitive components grafted on to it are dependent on secondary psychopathological processes comparable to the "dream work" of Freud, and related to personality structure and previous experience. The study of epileptic patients thus continues to be an important and useful method of investigating the interaction of mental and physiological events, with implications that go far beyond the phenomenology of the seizures themselves.

S.H.M.O.s IN CONSULTANT POSTS

After continued representation by the Staff Side of Whitley Committee B, the Management Side of that body has agreed to a review of the remuneration of certain senior hospital medical officers in consultant posts. According to the agreement, which is reported at p. 60 of this week's *Supplement*, three categories of S.H.M.O.s may apply for a review of their remuneration. They are those who hold posts which are established as consultant posts; those who hold posts which for the purpose of replacement would be graded as consultant posts (many in these two categories will be those who held appointments on the staffs of hospitals before July 5, 1948, but were not given consultant grading in the National Health Service, and have continued in the same appointments); and others who carry out consultant work with full and independent responsibility. The Management Side would not agree that all S.H.M.O.s in posts of a consultant nature should automatically be paid on the consultant scale. Each individual case is to be examined on its merits. It should not be difficult to define those who come into the first category. There may well be, however, a conflict of opinion on those—and the number must be considerable—whose work is of a kind that qualifies them for consideration under the second and third categories. The Management Side will no doubt look very closely at each application, but the Staff Side, by its persistence, has managed to get a foot in the door, however grudgingly it has been opened. The history of the S.H.M.O. grade makes one of the unhappiest chapters in the Health Service story. It is a record of a group—who in numbers form one-third of all specialist hospital staff and upon whom therefore the hospital service must largely depend—who have become increasingly incensed at the injustice of their lot. As Dr. C. B. V. Walker puts it in a letter at p. 61 of this week's *Supplement*, the S.H.M.O. grade has created "a class working at substandard rates . . . a sort of 'minus merit award.'" It is yet to be seen how many will benefit from this review, but if the rate for the job has any meaning in common justice a large number of S.H.M.O.s would appear to have an unanswerable case for an increase in remuneration.

THE CHILD HANDICAPPED BY CARDIAC CONDITIONS*

BY

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The cardiac causes of crippling in childhood fall into two main categories—congenital cardiovascular lesions and rheumatic carditis. There are, of course, other examples—often of great medical interest—but they are comparatively rare, and I need not mention them.

There is a general impression that over the past fifteen years or so congenital deformities of the heart and large vessels have become more common, while rheumatic carditis has diminished in frequency. It is difficult to obtain reliable evidence. In regard to congenital malformations, the great advances made during recent years in the surgical treatment of these deformities, and in anaesthesia for these patients, have focused the attention both of doctors and of parents upon this type of disability, and the hospital services for the detailed diagnosis and treatment of these cases are under increasing pressure. Certainly it would be interesting and helpful to know (1) whether the incidence of congenital cardiac deformity is increasing, because this might have a bearing upon possible means of prevention; and (2) the percentage of children suffering with congenital cardiac deformity that might be amenable to surgical treatment. Clearly this proportion is likely to increase, year by year, as surgical and anaesthetic techniques expand and improve.

Congenital Cardiovascular Lesions

Some light can be thrown upon the incidence of congenital cardiac deformity by studying the paediatric reports of maternity hospitals; but even the most detailed of these cannot give a certain answer, because the clinical signs of handicap may not appear until the child has left hospital; and it must be remembered that a systolic murmur can be heard in 1% to 2% of all newborn babies, and may disappear again within a few weeks. In a series of 6,053 newborn infants (live births and stillbirths) reported by Richards *et al.* (1955) it was found that 7.6 per 1,000 of the live-born had (1955) congenital cardiac deformities, and 10 of these babies (26%) died in the neonatal period. At the Liverpool Maternity Hospital the incidence of congenital abnormality of all types (not cardiovascular only) is about 20 per 1,000 live births; and an analysis of the 20,339 live births in the hospital during the eight-year period 1946–53, inclusive, shows that 56 (or 2.7 per 1,000) almost certainly had a congenital cardiovascular lesion, while an additional 43 were "possible" cases. I estimate from these figures that the incidence of congenital heart deformity in the Liverpool Maternity Hospital is probably about 3 to 4 per 1,000 live births.

It is worth noting that of the 56 definite cases 13 (23%) died during the first two months of life, and that this figure compares closely with the 26% noted in the American study as dying in the neonatal period. It would appear, therefore, that about one-quarter of all congenital cardiacs born alive have very serious, and often multiple, anomalies in the heart and large vessels, and sometimes abnormalities elsewhere; and that these cases are seldom suitable for surgical treatment, especially when there are complications such as pneumonia or atelectasis.

*Read at a Plenary Session at the Annual Meeting of the British Medical Association, Brighton, 1956.

The deaths of congenital cardiacs during the first five years of life reduce the incidence of congenital cardiac deformity to a figure that has been thought to be about 2 per 1,000 during school age, which would represent about 13,000 affected children in England and Wales. But it may be that this estimate is too small, and I am indebted to Dr. J. A. Scott, Medical Officer of Health to the London County Council, for the following information. In 1954 some 5,000 children out of a new intake of about 41,000 to the primary schools were examined to determine whether special educational treatment was necessary, and 23 cases of congenital cardiac malformations were found—an incidence of 4.6 per 1,000.

Here is a considerable problem for the medical and educational services, as well as for the affected children and their relatives. Two practical questions at once suggest themselves: (1) Is it possible to take any steps to prevent congenital cardiac deformities?; and (2) How many of the affected children can be helped, or perhaps cured, by surgical treatment? The answer to the first question, unfortunately, is no. It seems probable that many of the cases are due to genetic imperfections, though they are seldom familial. Rubella affecting the mother early in her pregnancy is a rare cause. Probably there are other maternal infections, as well as metabolic disorders and faulty implantation, that disturb the normal nutrition of the early embryo, but we do not know what they are.

Surgical Treatment

In regard to the operative treatment of congenital cardiovascular disorder, an uncomplicated persistent ductus arteriosus presents little difficulty to the experienced surgeon except in the early months of life and when the ductus is unusually wide; pulmonary stenosis (whether valvular or infundibular) is being tackled with increasing success; and operative treatment will often relieve the handicap suffered by a child with Fallot's tetralogy. Techniques are being devised and are now in use to close interatrial septal defects. Coarctation of the aorta lends itself fairly well to operative treatment, and the constricting effect of an aortic ring can often be removed.

So far we have no reliable figures giving the percentage occurrences of these various types of lesion in clinical practice, but interatrial and interventricular defects are the most frequent, followed by persistent ductus arteriosus, pulmonary stenosis, Fallot's tetralogy, and aortic coarctation in that order. Gasul and Fell (1956) have reported their findings in a series of 1,395 congenital cardiacs, 90% of whom were under 16 years of age; the patients were examined with much care, and the diagnoses were confirmed, when necessary, by angiocardiograms (850) and cardiac catheterization (450). There were also 300 necropsies. The frequency of the commoner malformations were: ventricular septal defects, 20.5%; tetralogy of Fallot, 11.1%; persistent ductus arteriosus, 10.7%; atrial septal defects, 9.6%; undiagnosed (mostly either atrial or ventricular septal defects) 8.1%; coarctation of the aorta, 5.5%; complete transposition of the great vessels, 4.3%.

Dr. J. D. Hay, who has charge of the cardiac clinic at the Royal Liverpool Children's Hospital, has kindly furnished me with the following information based upon his detailed examination of 1,324 children referred to him for his advice (in some cases his diagnosis is "provisional," but I have grouped these cases with the "definite" diagnoses):

"Functional" systolic murmur	249
Rheumatic heart	102
Persistent ductus arteriosus	222
Ventricular septal defect	207
Pulmonary stenosis	99
Tetralogy of Fallot	93
Atrial septal defect and common atria	88
Aortic and subaortic stenosis	67
Transposition of great vessels	36
Aortic coarctation	32
Miscellaneous	129
	1,324

These figures would appear to suggest—though only in very general terms—that at the present time about one-third of all children referred to a cardiac clinic may be cured or at least helped by surgical treatment.

Rheumatic Carditis

The incidence of acute rheumatism in children, as recorded in successive reports of the Ministry of Health, has been decreasing fairly steadily, though there are indications that in some areas an increase has occurred during the past year or so. The number of patients admitted to hospital annually for a particular illness cannot be taken as an accurate estimate of the prevalence of that illness in the area, but it may be a pointer. In 1943 185 children were admitted to Alder Hey Children's Hospital, Liverpool, for rheumatic infection (with and without carditis), and subsequently there was a fairly steady decline to 44 in 1950. Since then there has been a gradual increase to 63 in 1955.

Dr. J. A. Scott has informed me that in 1954 146 children were admitted to Queen Mary's Hospital, Carshalton, under the London County Council's rheumatism scheme, representing an incidence of 0.33 per 1,000 of the total school population. But it should be noted that only 30 (20%) of these 146 patients were diagnosed as suffering from rheumatic carditis. Dr. Peter Henderson, Principal Medical Officer to the Ministry of Education, has kindly given me the results of an analysis, made during 1955, of the school medical records of the 14,000 children in Oxford City schools. Only 37 (or 2.6 per 1,000) were found to have organic heart disease (including deformities) or a history of acute rheumatism. Twenty of the 37 had congenital heart lesions, and the remaining 17 had had one or more attacks of acute rheumatism; but only 6 of the 17 had permanently damaged hearts. There is little doubt, however, that in the northern industrial districts the incidence of rheumatic infection is higher than this; and it must be remembered that the report of the Registrar-General for 1954 shows that the total deaths in England and Wales, at all ages, certified as due to acute rheumatism and rheumatic heart disease, numbered 8,895.

Sir John Parkinson (1945) estimated that there were at that time at least 200,000 persons between the ages of 18 and 41 years in Great Britain suffering from acquired heart disease—mostly rheumatic, and usually contracted during childhood. This estimate is supported by Kerley's (1949) observation that in the mass radiography of 3,000,000 adults during the period 1945 to 1948, 4 per 1,000 were found to have undoubted radiological evidence of rheumatic carditis, and he thought that the correct figure would probably be nearer to 6 or 7 per 1,000. At the same time, Kerley noted that 20% of the cases detected were unaware of any disability and gave no history of rheumatic infection. Even if the incidence of acute rheumatism in childhood is only 0.3 per 1,000 children of school age (as indicated by the statistics from areas where acute rheumatism is notifiable and shown in the Ministry of Health Report, Part II, for 1954), the total number of new cases in each year must be about 2,000. We do not know what proportion of these patients will develop permanent carditis, but we can be sure that even the present incidence of rheumatic infection provides a terrible load of mischief for a nation to carry.

Prevention and Treatment

Is it possible to prevent not only the first attack of rheumatic infection, but also the recurrences which are so liable to occur when the individual's defences have been breached, especially during the early years following the initial infection? On this subject a committee of the American Heart Association (1955) has prepared a statement stressing the paramount importance of controlling group A haemolytic streptococcal infections and claiming that adequate and early penicillin treatment over a period of 10 days will eliminate streptococci from the throat and will usually prevent an attack of rheumatic fever. The dose recommended is one

intramuscular injection (600,000 units) of benzathine penicillin G; or one intramuscular injection of procaine penicillin (300,000 to 600,000 units) in oil with 2% aluminium monostearate, given every second or third day for three doses. Oral penicillin is also recommended in a dose of 250,000 units three times daily for 10 days. For the prevention of rheumatic recurrences in subjects who have had the initial attack (whether rheumatic fever or chorea or heart damage) it is suggested that a daily dose of 0.5 to 1 g. of sulphadiazine be taken each morning, throughout the year, and continued for years. Alternatively penicillin may be used, either by mouth in a dose of 200,000 to 250,000 units once daily, before breakfast; or as a monthly injection of 1,200,000 units of benzathine penicillin G.

Markowitz and Hemphill (1955) found that a daily dose (oral) of benzathine penicillin G, 200,000 units, was more effective than a sulphonamide in preventing rheumatic recurrences and caused fewer toxic reactions. When rheumatic patients are in hospital wards, and therefore in possible contact with streptococcal carriers or patients with active streptococcal infection, particular attention must be paid to the accepted techniques for avoiding cross-infections.

Those who may feel opposed to ordering a prolonged course of either sulphonamide or antibiotic treatment—and I confess that I am somewhere on the fringe of this group—should remember the sinister character of rheumatic recurrences, which are often initiated by quite mild recurrences of streptococcal infection; yet they invade the heart with ever-increasing damage, as a river in mounting flood erodes its banks. In practice one frequently finds that a prolonged course of prophylaxis breaks down because the parents forget to give the drug regularly. A less common difficulty is that the patient shows toxic reactions. Fortunately, there is at present little evidence that beta-haemolytic streptococci become resistant to penicillin.

Another important aspect of the prevention of rheumatic infection must be mentioned under the comprehensive heading of "home circumstances"; for there is little doubt that social status, poverty, housing conditions, overcrowding, and the prevalence of respiratory infections play a part in determining the incidence of rheumatic infection.

Care of Cardiac Cripples

To make adequate provision for the care of cardiac cripples—whether due to congenital cardiovascular deformity or to rheumatic infection—we must consider the needs of each individual patient from a number of angles. This is, of course, true for all types of handicap. A civilized community takes care of its weaker members; it considers their happiness, their medical attention, their education, their training for a suitable occupation, their future economic position, and their spiritual needs. It gives thought to the human and financial strains that may develop in a household that includes a handicapped child, and to the wider social and economic implications of crippling. It makes plans to prevent, in every way possible, the cause or causes of the disability. It should, moreover, keep very much in mind the duty of each individual, whether healthy or handicapped, to make some contribution to the welfare of society. Perhaps the most important, and certainly the most difficult, task of a community in accepting these obligations is to administer its benefits and services in such a way that they do not undermine the sense of responsibility of each family group to face its particular problems bravely and intelligently.

It needs little imagination to realize that a child crippled by cardiac disease or deformity is an individual to whom the handicap is little short of a tragedy, for it interferes with the activity of a full normal life. Depressing psychological reactions are almost inevitable, but they may be modified by understanding and appropriate management. This point was well brought out by Dr. Morris Fishbein (1955) in the following words:

"The poet John Donne wrote that no man is an island. Never was this more apt than when applied to the person who is suffering with a crippling disease. For him isolation is disastrous. If intelligent and left too much alone, he becomes embittered, sullen and perhaps an enemy of society. If unintelligent, he deteriorates slowly and steadily into a parasitic, vegetable-like existence, which may eventually sap the lives of all about him. The modern approach to the problem emphasizes adjustment of the handicapped person to the family, the community, and even the nation. All these forces are brought to bear from the social, economic and psychological points of view, so that such a person is able to live an existence as nearly normal as possible. He contributes to rather than lives upon the society that encompasses him."

The adjustment to which Dr. Fishbein refers should be, in fact, mutual, at all events in respect of the handicapped child and his family, and the doctor should seek every opportunity of explaining to the child's parents the nature and extent of the patient's crippling, so that they may be the better able to accommodate themselves to the situation. This medical opinion should be based mainly upon the child's functional incapacity; we have all known patients who have been condemned to live a life of invalidism when, in fact, they were well capable of enjoying a more active life. Complete rest is essential during recurrences of rheumatic carditis; but subsequently it should be remembered that in childhood the heart, like most other organs, possesses a remarkable capacity for recovery, and that with graduated exercises and physiotherapy there are many cardiac patients who can be gradually promoted towards a more normal life. In short, the doctor should maintain an optimistic outlook, using as yardsticks of the patient's condition such tests as heart rate, liability to dyspnoea and fatigue, diminution of oedema and venous congestion, and the child's appetite and feeling of well-being.

Institutional or Home Care

The pros and cons of institutional as against home care need careful thought in each case separately. Institutions for cardiac cripples have proved their usefulness, particularly for children whose home conditions are unfavourable. In addition to the medical and nursing care that the children receive in them, education can be provided without difficulty, physiotherapy and occupational therapy can be made available to them, and group interests, like games, concerts, television, etc., can be satisfied more easily than when the patient is in bed at home. A library service is another much-appreciated recreation.

On the other hand, institutional life has its disadvantages, especially for those children who seem predisposed to develop the invalid outlook; and is it not true that for most children "there's no place like home"? The family doctor who is well acquainted with the home situation is in the best possible position for giving advice to the parents, and he is able to call upon the ancillary services provided by the local authority, such as home nursing, home helps, health visitors, and so forth. In particular, he knows the child and the parents as individuals, and he can ensure that the various services available to the child are suitably balanced. The need for overall and continuing supervision of the handicapped child by one doctor—the captain of the team—is properly receiving emphasis in these days when so many different services, often specialized, are available. It is a need which certainly holds good for the cardiac cripple.

REFERENCES

- American Heart Association (1955). *Pediatrics*, 15, 642.
- Fishbein, M. (1955). *Ibid.*, 15, 610.
- Gaull, B. M., and Fell, E. H. (1956). *J. Amer. med. Ass.*, 161, 39.
- Kerley, P. (1949). *Proc. roy. Soc. Med.*, 42, 1041.
- Markowitz, M., and Hemphill, W. (1955). *Pediatrics*, 15, 509.
- Parkinson, J. (1945). *Lancet*, 2, 657.
- Richards, Mary R., Merritt, Katharine K., Samuels, Mary H., and Langmann, A. G. (1955). *Pediatrics*, 15, 12.

SADISM AND POWER

A PHYSICIAN ON DE SADE

"Unlimited power is apt to corrupt the minds of those who possess it," the first Earl of Chatham told the House of Lords in 1770. The same moral was drawn by Dr. A. H. Douthwaite, senior physician to Guy's Hospital, when he spoke on sadism at a meeting of the London Jewish Hospital Medical Society on January 31. Dr. Douthwaite used to illustrate his theme the lives of the Marquis de Sade, the eponym of our words sadism and sadistic, and of Gilles de Rais, de Sade's evil inspiration. Both men, he said, had possessed great power, largely by virtue of their wealth.

Basis of de Sade's Reputation

Sadism and sadistic were words used freely by both the profession and laity, said Dr. Douthwaite, yet many of those who did so knew little of the man from whom they were derived. The Marquis de Sade (1740–1814), the son of aristocratic parents, had shown himself a brave soldier as a young man, attaining the rank of lieutenant-general at the close of the Seven Years War; and his sexual appetites at first had been normal. But at the age of 23, threatened with imprisonment if he disobeyed, he was forced by his father into a distasteful marriage with the elder daughter of the de Montreuil family. The tragedy was sharpened by the fact that the woman de Sade wanted to marry was his wife's beautiful sister, Louise, whom later he was to seduce, carry off to Italy, and debauch there. It was his wife's large dowry that made possible the excesses of his subsequent life. These landed him often in prison, and although on occasions de Sade indulged in abnormal sexual practices the latter were not so gross or frequent as to justify the universal execration in which his name was now held. It was his books.

Living in the Bastille in great comfort, thanks to the lavish table provided for him by his mother-in-law, de Sade in 1784 wrote his most notorious work, *Cent-vingt Journées de Sodom*, whose three volumes he completed in 37 days. It was kept in the hands of his family until its publication in 1904. The book told of a group of aristocrats who used their extreme power and wealth to abduct men, women, girls, and boys to a castle where was practised every conceivable sexual abnormality amid bouts of extreme cruelty. It was a most boring and repetitious exercise in pornography. Other books followed, of which *Justine* was the best known. It was on his pen, much more than on his deeds, that de Sade's posthumous reputation rested. Of his 74 years of life, the first 28 had been unexceptionable for a rich young man of his times. The last 36 years were spent largely in prison, and of the ten years when he was free to practise the cruelties attributed to him—many of them exaggerated—de Sade was in exile for at least four.

Influence of Gilles de Rais

What influence, then, had led de Sade to imagine atrocities he could never have practised? The answer, said Dr. Douthwaite, lay in his reading. De Sade had enjoyed Suetonius's lives of the Roman emperors and revelled in the cruelties of those days. But above all he had been fascinated by the shocking cruelty and unbridled sexual abnormalities of Gilles de Rais.

Gilles de Rais, Marshal of France, born more than three centuries earlier than de Sade in 1404, was like him in his wealth, his aristocratic origin, and his personal bravery. Like de Sade also he had studied the lives of the Roman emperors. But de Rais was a sadist in the fullest sense of that term.

As a young man Gilles de Rais had earned a good name for his behaviour at court, and when in 1429 Joan of Arc had appeared there he supported her cause. He went further still. He was her squire at Orleans, where, although wounded,

he saved Joan from capture. For this, at 25, he was accorded the unparalleled military honour for his age of being made Marshal of France. When later, in consequence of the king's half-hearted support, Joan of Arc was finally taken, Gilles de Rais set forth again and laid siege to Rouen. Indeed, Joan's martyrdom was probably the turning-point of his life. Leaving the army and court in disgust, Gilles de Rais and a boon companion embarked on a career of seduction and cruel murder of boys. The children were taken to his castle in Normandy, where they were killed slowly by slitting their abdomens or by strangulation during sexual orgies; others were sacrificed for the purposes of black magic. More than 200 such murders were committed before Gilles de Rais was arrested and hanged in 1440. Gilles de Rais, it was said, was the original of the Normandy legend of Bluebeard.

Sadism To-day

If it were thought, said Dr. Douthwaite in conclusion, that such horrors could not occur in our time, it might be well to ponder what had already taken place in this century. States or dictators had emulated and surpassed Gilles de Rais—and certainly de Sade—in mass murders and torture. One could only pray that our country would never fall into the control of the human fiends who clearly lurked in all societies in every century.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

The Black Sheep

SIR,—Your leading article on this subject (*Journal*, January 26, p. 217) is timely, on the eve of the month when we expect the peak incidence of Sonne dysentery. During the past three weeks 60 specimens of faeces have been delivered by my patients to our public health laboratory: 11 specimens have been reported positive for *Shigella sonnei*, 37 specimens were negative from convalescents or contacts of Sonne dysentery, and another 12 negative specimens were from single cases of diarrhoea of a more dramatic type than that associated with Sonne infection. In no case was a patient seriously ill or even confined to bed. Out of seven families (one or more of whose members submitted infected faeces for examination during the past three weeks), four families have good standards of hygiene. One family has no conception of the need for hygiene, and lives in filth. One family is numerous, poorly disciplined, but usually washed. The other family has been dealing with relapses since November (in my opinion through special difficulties beyond their control), but is now finally clear. It is noticeable that quite moderate standards of hygiene suffice to prevent cross-infection, under mother's supervision, but school teachers cannot be expected to enforce successfully proper standards in a crowd if children with diarrhoea are allowed to mix with healthy children in school premises.

Comment on three weeks' results from a single practice can be at best one scene from a moving battle, but it raises the question of whether Sonne dysentery deserves to be dignified by the ritual of notification. It is usually one of the mildest of diarrhoeas, and its very mildness produces the frequent comment from my patients that they know scores of people who continue to send their children to school with diarrhoea. Diarrhoea of any sort should (in a civilized community) be regarded as the result of a breakdown of hygiene and the evacuation of the poison which has been ingested. The sufferer should be isolated, and hand-washing ritual (including soap) be rigorously enforced. I maintain that persistent repetition of this simple theme, through every possible

medium of publicity, will do far more to eliminate Sonne dysentery in 1957 than all the painstaking (and heart-breaking) work of laboratories and inspectors in 1956. May I suggest that Sonne has its peak incidence in February just because hand-washing is least welcome in cold weather?—I am, etc.,

Nottingham.

MAURICE HARGREAVES.

Mitral Valve Mobility

SIR,—I was delighted to see that the view expressed by Professor D. M. Douglas (*Journal*, January 26, p. 191) on the signs of mobility of the mitral valve coincided so closely with mine.¹ The "closing" and "opening" snaps are signs of mobility of a diaphragmatic valve, not of stenosis; it so happens that the pathological processes which cause loss of mobility—i.e., heavy scarring or calcification—also lead to regurgitation, as there is no redundant tissue to overlap the rigid valvular orifice during ventricular systole. It is for this reason only that the loud first sound and the "opening snap" have been regarded as signs of pure stenosis. Valve mobility and dominant incompetence may in fact occur together.

I agree with his statement that mitral incompetence may be due to disproportionate shortening of the chordae tendineae in some cases, such as his first and third patients. These clearly had an element of stenosis and were examples of dominant mitral incompetence with diaphragmatic valves: the valve orifice in both was 2 cm. across only. The second case he described was a straightforward example of dominant stenosis with unimportant incompetence also in a diaphragmatic valve. None of the three cases correspond to the group of "hypermobile" valves described. These patients have no stenosis whatsoever; the orifice is at least 4 cm. long. They constitute a different pathological entity, due, I still think, to a rupture of a chorda. I referred to nine cases similar to Professor Douglas's cases 1 and 3. In these I advocated completion of the separation of the cusps despite the presence of dominant mitral incompetence. It is not clear whether or not this was done in his patients. I also referred to 17 valves similar to the one he met in case 2. As in his case, the results proved fairly good because the stenosis was the main cause of the disability.—I am, etc.,

London, E.2.

REFERENCE

¹ Belcher, J. R., *Lancet*, 1956, 2, 7.

J. R. BELCHER.

Carbon Monoxide Poisoning

SIR,—The Registrar-General's *Statistical Review of England and Wales for the Year 1955*, just published, shows that in the three years 1953–5 9,143 persons died of carbon monoxide poisoning—2,168 accidents and 6,975 suicides. This total is 2,000 more than might have been expected from the figures prevailing in the previous five years. A year ago (*Journal*, February 11, 1956, p. 347) I suggested that increased deaths might possibly have been due to withdrawal from ambulance and other first-aid services of 7% CO₂ and 93% oxygen on the advice of a committee of the Medical Research Council. The chance of survival of badly poisoned patients depends mainly on the effectiveness of first-aid treatment.

The Medical Research Council asked its statistical research director, Professor A. Bradford Hill, to make an inquiry. His report (*Journal*, November 24, 1956 p. 1220) concludes that change in resuscitation procedures was not the cause of the large rise in deaths and that this was associated with a concurrent rise in the number of cases occurring as measured by ambulance emergency calls. This conclusion is of great importance because on it may depend official policy in regard to the emergency treatment of a condition which causes nine deaths a day. If it happens to be mistaken then needless loss of life may continue. I submit, with respect, that the evidence upon which it is based is inadequate, and therefore the conclusion may be incorrect.

The evidence for increase in total cases is presented in three tables. Table II shows London ambulance calls for coal-gas suicidal cases, and the main inference from it reads that "the number of cases carried has, in fact, increased very substantially—from, roughly, a little over 100 in 1951 to 202 in 1952, to well over 200 in 1953 to 1955." This inference means that from 1953 onwards coal-gas suicidal attempts in London suddenly doubled. Can this really have happened? The answer lies in a fallacy, mentioned in the report, concerning change of labelling of cases as "accident" or "suicide." Up till 1952 in London a call was entered as "accident" unless definitely known to be suicide; after 1952 this charitable convention was discontinued and a case was entered as "suicide" unless it was definitely known to be an accident. Because of this source of error a special search of ambulance records was made for the years 1951 and 1953 and all coal-gas cases extracted irrespective of labels. This showed a rise in total coal-gas emergency calls of 36% as between these two years. This figure is more credible, but it is a statistical comparison limited only to two selected years. In spite of the admitted labelling flaw, with its probable very large error, table II was still put forward as evidence and the above-quoted inference made that cases increased by 100%.

Tables III and IV show figures from eight provincial towns in which cases increased by 30%. The combined total populations of the eight towns is slightly less than total populations of the eight towns in England and Wales. What 4% of the population of England and Wales. What guarantee is there that other towns, from the remaining 96%, might not show different figures? Yet these scanty data, plus fallacious table II, are made the basis for a dogmatic conclusion that cases throughout the country suddenly greatly increased from 1953 onwards.

Whatever else emerges, it is clear that change of first-aid treatment was not followed by any fall in deaths as might have been expected if the theoretical argument in the committee's report had been correct. If there has been no decrease in mortality and, instead, a very big rise in deaths, then why persist with reversion to treatment discarded over a quarter of a century ago? Why not at least try CO₂/O₂ once more (for carbon monoxide poisoning only) and see if deaths fall? Over a year ago (*Journal*, October 15, 1955, p. 966) the chairman of the committee said experimental work was planned. It would seem time that the mental work should be apparent. If it is not unequivocally in favour of pure oxygen then it is surely indefensible to continue to deny CO₂/O₂ to first-aid services.

It now becomes evident that the advice of the committee was circulated to local authorities about four years before publication in the medical press. This may have been done in response to requests for guidance, but such practice may be dangerous—particularly when unproved advice, contrary to accepted opinion, is put out under the prestige label of the Medical Research Council. Administrative officials, medical or lay, can hardly fail to act on it. Publication in medical journals is less mandatory because officials do not receive it in the guise of circulated instruction from higher authority. And publication has the vital safeguard of public criticism which can be made in time if there is chance of error. It is disquieting that a small committee can scrap a standard method of treatment, for a common and urgent condition, without the medical profession as a whole being informed till years afterwards.

The most serious consequence of private direction, long prior to publication, is that the Medical Research Council may be put in an awkward position if there is subsequent question that the advice given may have been wrong, and caused loss of life. The council is then on the defensive, and in consequence its ability to weigh the matter dispassionately becomes open to doubt. Because that is the present situation, I submit, Sir, that there are grounds for Ministerial or Parliamentary inquiry concerning the desirability of transfer of official advisory responsibility regarding carbon monoxide poisoning to some other body.—I am, etc.,

H. L. MARRIOTT.

London, W.1.

Vaccination Against Whooping-cough

SIR,—In a reprint of the report to the Medical Research Council on vaccination against whooping-cough (*Journal*, August 25, 1956, p. 454) I read the following opinion: "Thus the use of chloramphenicol for the siblings of vaccinated children did not reduce the risks of the vaccinated children developing the disease." At the Clinic for Infectious Diseases in Childhood, Warsaw, we think this conclusion is in some respects not quite correct, as it does not take into consideration the time at which chloramphenicol is given. It is possible that if given too late it will not be effective in preventing the disease.

I would like to report our results with chloramphenicol administered for a longer period to protect children exposed to the risk of developing whooping-cough. We started our trials on the supposition that, although vaccination is the main prophylactic measure against pertussis, it has its deficiencies. First, the degree of immunity acquired from vaccination is uncertain, and, secondly, vaccination of newborn infants, so far as I can gather from the literature accessible to me, has not as yet given any clear results. Yet up to the age of 6 months the mortality from pertussis is high.

With this in mind we carried out trials in the home, where there were infants in contact with older children who had contracted the disease, and in nursery schools for babies up to 3 years. There were 271 children in four schools. At the time of the trial there were 37 cases of pertussis (tested bacteriologically, clinically, and by blood examination). As soon as they were diagnosed the sick children were sent home or to hospital, but in spite of this further cases developed. We therefore started the administration of chloramphenicol prophylactically. Some of the children had been vaccinated, and we had also had cases of pertussis among vaccinated children earlier on.

Chloramphenicol was given in doses of 50 mg./kg. body weight every 24 hours for 7 to 10 days under blood examination control and urinalyses. Chloramphenicol was given four times a day—three times in the nursery school and once at home. Bacteriological examinations were carried out after the treatment was finished. The pertussis bacillus was not once found in those children. After this prophylactic treatment was started not one child developed whooping-cough, and after three weeks new children were admitted to the schools without any further cases developing. In 20 home exposure cases chloramphenicol failed to prevent the onset of the disease only in one case. Therefore it seems that the administration of chloramphenicol for 7 to 10 days has a strong sterilizing action on the whooping-cough bacilli, and that it is worth while trying this method against the infection, especially in infancy. We have no experience in prophylaxis with hyperimmune serum or gamma-globulin. This method is very troublesome, and there are difficulties in obtaining these substances in quantities sufficient for large-scale trials.—I am, etc.,

Warsaw.

J. BOGDANOWICZ.

Rh-Hr Nomenclature

SIR,—The purpose of this letter is to call the attention of your readers to the tentative supplementary report of the committee on Medico-Legal Problems of the American Medical Association on the Medico-Legal Application of Blood Grouping Tests.¹ The most important item in this report is the recommendation of a single uniform system of Rh-Hr nomenclature for medico-legal reports. "It is recommended that unless and until some other convention can be agreed upon the original Rh-Hr notations must be retained as the standard and sole nomenclature for the preparation of approved medico-legal reports on Rh types." In response to an editorial request for criticisms and suggestions, close on 50 letters were received from workers in the field. Approximately half the correspondents heartily approved the recommendation, whereas the remainder vigorously attacked it. The adverse criticisms have been

abstracted and will be published in the form of a supplement to the report, together with footnotes explaining to the readers the fallacies and paradoxes of the arguments of the C-D-E protagonists. The body of the report has also been revised, but no valid argument has been received why the recommendation regarding nomenclature should be changed. Therefore it is anticipated that the revised report will be approved for publication at the committee meeting to be held at the end of February, so that the final report should appear in April or May. Study of the correspondence received has merely served to fortify the committee in its conclusion that the C-D-E notations must be discarded.

The dilemma of workers who still use the C-D-E notations could have been avoided through familiarity with the history of the blood groups, since the same problems arose in connexion with the A-B-O groups. As can be seen in my book on *Blood Groups and Transfusion*,² in addition to the theory of multiple alleles the possibility of heredity by independent pairs of genes or by linked genes was considered. In the absence of crossing over, the hypothesis of completely linked genes was also considered, although 30 years ago the impressive term pseudoallelism had not yet been introduced. Now the theories concerning Rh-Hr heredity have gone through the same process of evolution—namely, multiple alleles, linkage with crossing over, and then completely linked genes. Since a set of completely linked genes is really a unit, this represents a complete circle with a return back to the theory of multiple alleles. Also, the controversy regarding nomenclature is reminiscent of the Moss-Jansky terminologies for the A-B-O groups, except that the latter preferred numbers instead of letters for their notations. The use of the so-called shorthand notations again represents a complete circle, since these notations are nothing but a slightly altered version of the original Rh-Hr nomenclature.

In conclusion, one cannot help but note the parallelism between the following two quotations: "What genotypes correspond to the phenotype large C plus, large D minus, large E plus, small c minus, and small e plus?" asked the professor. (This professor must have just run out of little d antiserum.) "I don't know," said the student; "I lost track. Could you give me the phenotype name in shorthand symbols?" "You fail. You don't know your rhesus blood types," said the professor.—*Somewhere in England*. "What is one and one and one and one and one and one and one and one and one and one?" "I don't know," said Alice, "I lost count." "She can't do addition," said the Red Queen.—*Lewis Carroll*.—I am, etc.,

New York.

A. S. WIENER.

REFERENCES

- 1 J. Amer. med. Ass., 1956, 161, 233.
- 2 Wiener, A. S., *Blood Groups and Transfusion*, 1943, 3rd ed. C. C. Thomas Springfield, Ill.

Reactions to Acetarsol Vaginal Pessaries

SIR.—Considering the vast number of patients who have been treated with acetarsol vaginal pessaries during the last twenty years, reported systemic reactions have been few, and Dr. A. White's memorandum (*Journal*, December 29, 1956, p. 1528) prompts this further report of a case.

A healthy primipara, aged 27, developed a trichomonas vaginitis at the 12th week of her second pregnancy. One acetarsol 4 gr. (220 mg.) vaginal pessary was inserted nightly for twelve nights with improvement at first, followed by an increase in the discharge, swelling of the labia, and erythema and folliculitis in the skin of the medial surface of the upper thighs. Misdiagnosis at this stage resulted in the application of ten acetarsol 4 gr. (220 mg.) pessaries in the vaginal fornices.

The patient spent a restless night and was ill the next day, with malaise, photophobia, and generalized pruritus; her temperature was 103° F. (39.4° C.), pulse rate 120 beats to the minute, and there was a generalized maculo-papular rash, confluent in places, with bullae on the skin of the upper medial aspects of the thighs, and vesicles on the swollen, cyanosed lips and buccal skin. The vagina was emptied and cleaned, pulmonary tuberculosis was excluded, and the

fasting blood sugar found to be 116 mg. per 100 ml. One 5 mg. prednisolone tablet was given 4-hourly for five days, 6-hourly for three days, 12-hourly for three days, and she made an uneventful recovery. There was no history of previous treatment with arsenical compounds and no history of allergy either in the patient or her family.—I am, etc.,

Great Baddow, Essex.

ANTHONY PEARSON.

Lesions of the Feet in Diabetes

SIR.—May I refer those who are interested in the aetiology of lesions of the feet in diabetes to the recent work of Dr. A. L. Woolf? In a paper read to the Pathological Society of Great Britain in January, 1956, Dr. Woolf has described changes in the intramuscular nerve endings in diabetic neuropathy, and his technique based on a biopsy study should enable a definite decision to be made on the presence of diabetic neuropathy. Dr. Wilfrid Oakley and his colleagues (*Journal*, October 27, 1956, p. 953) might be able to settle the point in question by making use of Dr. Woolf's method.—I am, etc.,

Southampton.

R. A. GOODBODY.

Glycyrrhetic Acid

SIR.—Dr. E. Colin-Jones mentions our work¹ in his letter (*Journal*, January 19, p. 161) in support of his contention that glycyrrhetic acid has therapeutic value in skin diseases. The National Research Development Corporation, acting on behalf of our employers—the Medical Research Council—took out a patent on a preparation of ours which contained a highly active substance which depressed sensitivity to tuberculin in B.C.G.-infected guinea-pigs. This substance was not glycyrrhetic acid, which we found to have no measurable desensitizing effect.—I am, etc.,

London, N.W.7.

J. W. CORNFORTH.
D. A. LONG.

REFERENCE

- 1 British Patent 713, August 18, 1954, 651.

SIR.—I have hesitated for some months from adding to the dreary correspondence on the efficacy of glycyrrhetic acid. Some say it cures eczema, some say it does not. Drug firms send sheets of "literature" and stacks of samples. To me it has always had a pseudo-scientific ring about it. To be sure, it is fairly cheap in comparison with hydrocortisone, but, as ointments containing it do not, in my experience, do the least good, it really seems a waste of money. I am sure Dr. E. Colin-Jones (*Journal*, January 19, p. 161) is absolutely right about glycyrrhetic acid being frightfully complex chemically, but that doesn't make it any more useful clinically—and how does one tell an "active" isomer from an inactive one, anyway? I presume because of the "biosone G.A." side chain.

It is a great misfortune that dermatologists to-day have to rely more and more on ready-made proprietary preparations when taking advantage of the tremendous advances in therapeutics which have occurred during the last few years. Under such conditions it behoves us to be particularly cautious in extolling the virtues, or even mentioning the trade name, of any particular product, let alone repeating its commercial claims, while many of one's experienced colleagues are patently unconvinced.—I am, etc.,

Plymouth.

R. D. SWEET.

Translumbar Aortography

SIR.—Dr. David Sutton (*Journal*, January 26, p. 225) has expressed his opinion that Mr. H. Gaylis and Dr. J. W. Laws (*Journal*, November 17, 1956, p. 1141) advocate the use of a quantity of contrast medium (30–40 ml. of 70% diodone) for translumbar aortography which he would now regard as excessive. Dr. Sutton states that he never uses more than 25 ml. of 70% sodium acetizolate or 70% diodone. He then states: "Mr. Gaylis and Dr. Laws suggest that other previously reported complications of aortography have been

due to dissection. . . This suggestion cannot be refuted, but I think toxicity of the medium when given in excessive doses is the major factor in such accidents." With this we are in agreement. For that very reason, in the Bristol Royal Infirmary we have reduced the concentration of diodone from 70% to 50% (25–30 ml.) for the last 18 months. Though we do not get radiographs of such high contrast as we did with 70% diodone, they are of quite adequate contrast for diagnostic purposes. Assuming the same rate of injection, we are personally of the opinion that a contrast medium of high concentration should never be injected into the vascular system anywhere, if one of lower concentration will give diagnostic radiographs. This is quite definitely the case with translumbar aortography, especially in patients with obliterative arterial disease. When one or both femoral pulses are absent, it is imperative that diodone of not more than 50% concentration be used, because thrombosis of a narrowed iliac artery may take place when the opposite artery is already blocked. In addition, when the iliac arteries cannot drain off the contrast medium a massive dose may perfuse the kidneys or large intestine. In short, we would enter a plea that 50% diodone in similar quantities is quite adequate for translumbar aortography and that it is unnecessary to use 70% diodone to obtain radiographs of diagnostic quality in most cases. We are sure that the use of the lesser concentration would materially reduce the risk of complications.

Having regard to the potential dangers, it is doubtful if aortography should be employed except in disease of the aorta or great intra-abdominal arteries of such a nature that direct surgery is contemplated and will be made easier by the addition of radiographic delineation of the disease.—We are, etc.,

R. E. HORTON.
F. G. M. ROSS.

Bristol.

Tonsils and Adenoids

SIR.—Dr. John Fry's excellent article (*Journal*, January 19, p. 124) led me to look into my bottom drawer and to extract the following notes.

In 1949 I joined a conference on tonsils and adenoids as the sole paediatrician. My otorhinolaryngological colleagues were all top-level consultants surveying the problem from within their own beautifully run departments. The great mass of these operations is in fact performed away from university centres. I collected information about the reasons for which 1,034 sets of tonsils and adenoids had been removed in a small London children's hospital and a paediatric unit in the Home Counties between September, 1946, and September, 1949. The peak ages for operation were 4, 5, and 6 years (664 cases). The indications taken from the case records were grouped under six headings. There were none on account of size and appearance only.

	Cases	Per cent.
(1) (Fry 2 and 5) Recurrent tonsillitis and for cervical adenitis, sore throats, and colds	592	57.3
(2) (Fry 3) Nasal symptoms including sinus disease	123	11.8
(3) (Fry 4) Aural disease	79	7.6
(4) (Fry 6) General medical diseases—e.g., rheumatic fever, asthma, acute nephritis	45	4.3
(5) (Fry 3) Ill-defined reasons—e.g., underweight, general ill-health	52	5.0
(6) No reason ascertainable from the records	143	13.8
	99.8	

Group (1) accounts for the largest number, but the size of the unknowns in group (6) is disconcerting. The aural cases (3) provide a surprisingly small number. In the smaller hospital only 9% of cases had been followed up, and of these there was definite improvement in only 68%. Whatever may have happened, the only information available to the surgeon was that six out of every hundred had improved and three had not. About the remaining 91 there was no comment. This group included two sisters, one was operated upon for no clear reason, and her sister "be-

cause it would be nice to get them done together." In the children's hospital all cases were seen one month after operation, but very few subsequently.

In the hope of comparing the list of reasons for operation with that in the hospital group, we scrutinized a school waiting-list in a borough near London. Such lists contain many cases which never get treated, and therefore we expected, and found, a larger proportion of indefinite cases. The proportion was so high as to make worthless any comparison with the hospital operation series.

The records of 15,000 school and infant welfare clinic children out of a total of 16,000 covered by the service were examined. No account was taken of cases referred directly from the family doctor to a hospital outside the area. The waiting-list contained 795 names, including 84 cases for adenoidectomy only. There were still (1949) 110 cases put on the list in 1947, 327 put on in 1948, and 328 in 1949. The largest number was put on at 5 years, probably as the result of the first school examination (259 or 33.8%). In over 14% the reason stated was large tonsils, deep-set tonsils, unhealthy-looking tonsils, or blocked crypts, and these appearances were not correlated with a clinical history. Little care was taken to get such a history. The cases were all referred by the school doctor to an otorhinolaryngologist; he seldom turned down a case. For what they are worth the reasons for placing on the "T and A" list are set out:

	Cases	Per cent.
(1) Recurrent tonsillitis and/or cervical adenitis, sore throats, and colds	105	13.7
(2) Nasal disease including sinus disease	67	8.7
(3) Aural disease	17	2.2
(4) General medical disease	2	0.2
(5) Ill-defined reasons	23	3.0
(6) No reason given or no indication on case sheet	442	57.8
(7) Enlarged tonsils without symptoms	109	14.2

There seemed to be a real indication properly recorded in only 25% of cases.

There was a further "observation list" for children who were re-examined every six months and then transferred to the operation list or to "normal." This list numbered 446. Half of these were put on the list at the age of 5 years, and 206 for "enlarged tonsils without symptoms."

Dr. Fry comments, as we did in 1949, that too much regard is still paid to the appearance of the tonsil and too little to the history. The throat specialist did not always take a critical enough view of the case presented, possibly because in clinics he saw too many cases at a sitting. The parents were not always consulted about the history. There was scanty follow-up information to record the effect of the operation, a gap that Dr. Fry still finds. No treatment was carried out while the child's name remained on the waiting-list to try to improve conditions or prevent operation. We noted, like Dr. Fry, that no reassessment of the waiting-list case was attempted even after two or three years. We felt that too many parents and doctors look on tonsillectomy as an inevitable step in the child's life and take too light a view of the whole business. Dr. Fry points to extraordinary differences in the frequency of operation in different areas. It still seems necessary to stress that each child and not only the "T's and A's" should be most fully and carefully studied before operation is advised (or, indeed, refused) and reassessed during the waiting period. This is another way of saying that knowledge of the best laryngological practice still needs to be disseminated through the whole profession. I am greatly indebted to my friend and colleague Dr. Jill White (formerly Clarke), who carried out the real work of the inquiry.—I am, etc.,

London, W.1.

ALFRED WHITE FRANKLIN.

SIR.—Dr. John Fry, in his courageous and unsparing article on the removal of tonsils and adenoids (*Journal*, January 19, p. 124), makes no mention of the microscopic investigation of these structures. My experience in the last five years, which perhaps is shared by other pathologists, is

that, unless some condition such as tubercle or neoplasm is suspected, no histological report is demanded. During a spell of twelve years abroad, in Army practice and with a large commercial concern operating in the Middle East, it seemed to be the rule to send tonsils and adenoids to the laboratory. Records of these are no longer accessible, but my recollection is that one or two cases of caseous tubercle and one of a malignant neoplasm occurred in several hundred examinations. The rest showed either no sepsis or a thin film of pus in the tonsillar clefts. Certainly in the great bulk of cases little could be found to justify operation. It may be that there are hospitals here with a large "T and A" trade where histological investigations are routine practice. If so, perhaps the pathologists will come forward boldly to Dr. Fry's support, though their relations with their surgical colleagues may suffer as a result.—I am, etc.,

Keighley.

IAN STEWART.

Drug Sensitivity Presenting as Penile Herpes

SIR,—The case of drug sensitivity presenting as penile herpes reported by Dr. John E. Underwood (*Journal*, January 19, p. 162) is most interesting. However, I should doubt if the case is really one of true herpes simplex virus infection induced by the drug. It is most likely to be a "fixed" drug erythema due to phenolphthalein sensitivity. A case of this type on the penis (with mucosal involvement suggesting urethritis) was reported by Haber.¹ Since that time Dr. Haber's experience has enabled me to diagnose fixed drug eruptions on the penis on several occasions. While phenolphthalein is the commonest drug which induces it, the reaction may also result from sensitivity to suphonamides, barbiturates, and other drugs, and can be proved by a test dose.—I am, etc.,

London, W.C.2.

REFERENCE

¹ Haber, H., *Brit. J. Derm.*, 1950, 62, 22.

SIR,—With reference to the letter by Dr. J. E. Underwood (*Journal*, January 19, p. 162), entitled "Drug Sensitivity Presenting as Penile Herpes," may I suggest that this is an extremely mild case of erythema multiforme exudativum (Stevens-Johnson syndrome)? I am at present preparing a case record of this condition for publication, and would point out that penile vesicles are common and that phenolphthalein has been incriminated as one of many possible causative allergens.—I am, etc.,

Paisley.

J. H. MITCHELL.

Preservation of Parasite Ova

SIR,—In response to Dr. Shafi Muhammad Shaikh's letter (*Journal*, December 29, 1956, p. 1545), we keep ova at the Royal Army Medical College in 10% formol saline for teaching purposes. Some have been here up to thirty years and still show structures clearly enough to demonstrate.—I am, etc.,

London, S.W.1.

LENOX MACFARLANE.

Treatment of Acute Appendicitis

SIR,—Interesting though Mr. E. Coldrey's article may be (*Journal*, December 22, 1956 p. 1458), I think it contains some dangerous advice, and I am surprised that no one has raised yet any of the following points. In the first place, in view of the possibility of blood dyscrasia resulting from the administration of chloramphenicol, the use of this drug for the treatment of acute appendicitis when so many others are available would seem to be quite inexcusable. Secondly, the prescribing of a broad-spectrum bacteriostatic agent with a bactericidal antibiotic is surely a policy that few pharmacologists would recommend.

Although conservative treatment in early cases may be preferable in special circumstances, I can see no advantage in carrying this out in surgical units when early operation means a quick discharge from hospital, benefiting both the

patient and the National Health Service, and a relief from tension and anxiety for the patient, surgeon, and nursing staff. Conservatism usually means hospitalization twice or three times that of the operated case, with still the prospect of a future admission. Few surgeons would disagree with the expectant treatment of the late case, but even here the position may be fraught with danger, as the correct diagnosis can elude the most perceptive and intuitive person. I have seen several cases of carcinoma of the caecum presenting as typical late cases of acute appendicitis with mass formation. On conservative treatment the pyrexia, tachycardia, and leucocytosis returned to normal, with corresponding clinical improvement apart from the fact that the mass, although decreasing in size, did not completely subside. Laparotomy revealed the true nature of the disease. Earlier surgery might have been more beneficial to the patient. Also, recently, at an interval appendicectomy I found a chronic pelvic abscess. This had been symptomless and was not palpable abdominally or per rectum (admittedly the patient was obese), although originally a mass had been clearly felt and appeared to resolve completely under the influence of antibiotics. Finally, it is a brave man who will treat all cases of peritonitis, especially in children, without operation. I know that if I were suffering from such a condition I would demand immediate laparotomy.—I am, etc.,

London, S.E.10.

R. F. BOLAM.

Congenital Absence of Spleen

SIR,—The case reported by Dr. D. E. M. Plowman (*Journal*, January 19, p. 147) prompts me to record a further case upon which I performed the necropsy examination.

A full-term male was born to the British wife of a serving soldier in Germany. The pregnancy and delivery were normal apart from a rapid second stage of labour. The birth weight was 6 lb. 14 oz. (3 kg.). The child was soon found to be cyanosed and respiring poorly. A clinical diagnosis of intracranial haemorrhage was made, and, following a steady downhill course, the child died on the ninth day. Unfortunately no examination of the blood was performed. At necropsy, apart from being deeply cyanosed, the child appeared externally normal. Internally both the chest and abdomen showed gross congenital abnormalities. Both lungs were divided into three lobes. The heart consisted of two atria joined by a patent foramen ovale. These chambers drained into a single ventricle from which only one efferent trunk arose. This vessel ascended to arch over the right main bronchus and then descended as the thoracic aorta. From the ascending portion of the aorta two large trunks arose which supplied the lungs. The inferior vena cava and the right innominate vein entered the right atrium. The left innominate vein fused with the venous drainage of the lungs to enter the left atrium as a single vessel. In the abdomen no trace of the spleen could be found. The gut showed partial failure of rotation. The duodenum extended only as far as the right kidney. The rest of the mesentery then ran upwards to the upper pole of the left kidney where the caecum was found. From here large gut descended in the usual way. No other abnormality was found.

This was the second child, the first being healthy. Subsequently the mother has miscarried at three months.—I am, etc.,

Hano-ver.

N. A. G. LEADBEATER.

SIR,—In the valuable annotation (*Journal*, January 19, p. 153) on congenital absence of the spleen the following statement appears: "The origin of splenic agenesis and of all the commonly associated anomalies can be dated between the fifth and seventh week of foetal life." This indeed has been the commonly accepted view, repeatedly expressed in the rather large number of papers published in recent years on this condition.

Some months before his untimely death in July, 1956, the late Dr. Hugh Middleton and I wrote a paper entitled "Congenital Absence of the Spleen Associated with Malforma-

tions of the Heart and Transposition of the Viscera," which was subsequently published.¹ From study of the heart malformations in two cases we were able to date the onset of faulty morphogenesis at not later than the 24th–27th day of embryonic life (ovulation-age), an age corresponding to the 11th or 12th "developmental horizon of the embryo."² Such precise dating was possible from recognition of the fact that there had been failure of development of the septum which normally grows at this time between the left horn of the sinus venosus and the primitive atrium, and which leads eventually to the formation of the coronary sinus of the heart. Published accounts of the anatomy of the heart from similar cases mostly fail to comment on the presence or absence of a coronary sinus, but it seems not unlikely that many specimens of cor biloculare and cor triloculare would show absence of this structure.³

In the future study of the condition of spleen agenesis and associated anomalies, whether or not the aetiology will prove to be endogenous (genetic) or exogenous (resulting from a temporary disturbance in the environmental conditions in which the embryo is developing), we have suggested that particular attention be paid to the time of, or shortly after, the mother's "first missed menstrual period."—I am, etc.,

BERNARD TOWERS.

Cambridge.

REFERENCES

- ¹ Towers, B., and Middleton, H., *J. Path. Bact.*, 1956, 72, 553.
- ² Streeter, G. L., *Contr. Embryol.-Carneg. Instn.*, 1942, 30, 211.
- ³ Reagan, F. P., *J. Anat. (Lond.)*, 1954, 88, 560.

Supply of Bodies for Dissection

SIR,—Dr. G. C. Milner writes (*Journal*, January 12, p. 108) that you stated (*Journal*, December 8, 1956, p. 1357): "There is thus an urgent need for more people to leave their bodies." I understand that nobody can legally dispose of his body, and that only the executor can do this, or the next-of-kin. A will is usually opened after the burial of the testator, and it would seem that all one can do is to make known before death one's wishes to the next-of-kin. Dr. Milner also suggests that all general practitioners should hang in their waiting-rooms "forms, particulars, and suitable notices" (requesting his patients to leave their corpses to be dissected). Has any more fantastic suggestion ever been made? Imagine the reaction of any patient, presumably anxious about his health, who on entering his doctor's waiting-room finds that his doctor is already regarding him as a corpse. I feel sure that any doctor foolish enough to carry out this suggestion would very quickly find that he had no longer any patients.—I am, etc.,

Hampstead.

E. N. RUSSELL.

Natural Childbirth

SIR,—As a humble follower and practitioner of Dr. Grantly Dick Read's teaching on natural childbirth, I feel that Dr. Sita Sen's letter (*Journal*, December 29, 1956, p. 1545) cannot be left unchallenged. A little study of Dr. Read's writing would have avoided some misconception. First, Dr. Dick Read neither demands nor promises a labour completely devoid of pain; he does say that "over 90% of women can have their baby safely and without unbearable discomfort" (my italics) by the practice of natural childbirth.¹ Secondly, it is incorrect to call his of natural childbirth.¹ Secondly, it is incorrect to call his training programme elaborate. Certain routines, mis-called "natural childbirth," are indeed elaborate, but these often result from over-enthusiastic physiotherapy which is quite unnecessary and indeed may be harmful. Dr. Read's unnecessary and indeed may be harmful. Dr. Read's training programme consists of (1) education, (2) correct breathing, (3) relaxation, and finally (4) a few simple exercises—in this order of importance. Some six to ten 1–1½ hourly sessions during pregnancy cover the whole routine. Thirdly, the "unsophisticated girl" is frequently highly educated in the process of childbirth (by native midwives, etc.), whereas her sophisticated sister is quite uneducated and needs all the training that can be offered to her. Fourthly, to say that confidence in the

accoucheur is neglected is quite untrue. In general practice at least, the patient is under the care of the same personnel right through her pregnancy, labour, and puerperium. If such trained patients do have long arguments with the medical attendant, all I can say is that I have not found it so. At the classes they are encouraged to ask all the questions they wish, and incidentally none has yet asked which suture material is used for an episiotomy. Episiotomy is not part of natural childbirth and routine instruction about it is not given. Finally, it is certainly not possible at routine antenatal clinics to give satisfactory explanations. In my experience classes in natural childbirth are of incalculable value for expectant mothers, and I suggest that Dr. Sen both studies Dr. Read's writings and watches his programme put into practice before launching out into print against it.—I am, etc.,

Southampton.

JAMES G. SCOTT.

REFERENCE

¹ Read, G. D., *Antenatal Illustrated*, 1955, p. 1. London.

Domiciliary Treatment of Pneumonia

SIR,—I was interested to read Dr. H. J. Cronhelm's letter (*Journal*, January 19, p. 157), and would agree that massive injections of crystalline penicillin would rapidly cure most cases. This therapy, however, is difficult to carry out in a large practice, and moreover certain organisms—that is, many staphylococci, *H. influenzae*, and viruses, the two former of which are likely to be found in cases of pneumonia complicating chronic pulmonary disease—are insensitive to penicillin, and valuable time may be wasted in employing this drug, possibly with fatal results. I should like to put in a plea for immediate and adequate tetracycline therapy for severe pneumonia, particularly if complicating chest disease—that is, chronic bronchitis—or evidence of myocardial failure is present. I prefer oxytetracycline fortified by vitamin B complex, and give 500 mg. every six hours until the temperature has been normal for 24 hours, when I give half the dosage for a further three to four days. If the case is uncomplicated or less severe I employ daily injections of benzylpenicillin diethylaminoethyl ester hydroiodide (0.5 to 1 mega unit) with oral sulphadimidine. In many cases, however, I have found oral penicillin plus oral sulphonamide very satisfactory.—I am, etc.,

Birmingham.

H. JOSEPHS.

Smoking and Lung Cancer

SIR,—The carcinogenic bodies present in tobacco smoke are, it is understood, liquids of high boiling point present in the droplets of the tar-fog. Tar-fogs consist of a suspension of droplets of widely differing size from extremely small, which will pass through most filters, to comparatively large droplets which tend to deposit on any solid surface with which they come into actual contact. To render the smoke relatively harmless it would appear to be necessary to remove only that portion of the tar-fog which will deposit tar on the lungs or throat.

It is likely that the passage of the smoke through a filter-tip consisting, for example, of a plug of tightly packed cotton-wool would remove the heavier droplets, and I suggest that the tar-fog which passes through such a filter would be unlikely to deposit much of its tar on the throat or lungs, which would probably present fewer contacts for the tar droplets than the cotton-wool filter. It is therefore probable that the passage of the smoke through a good filter-tip will remove the harmful constituents to a very much greater degree than is represented by the actual percentage of the tar-fog removed.

I should state that my qualifications for writing this letter are based on research experience in the removal of tar-fog from coal gas—a somewhat similar problem—and not on medical research work.—I am, etc.,

Stockport.

H. FRANKLAND TAYLOR.

Delayed Reaction to Primidone in Pregnancy

SIR.—Primidone ("mysoline") is an anti-convulsant drug which has been gaining wide popularity during recent years. Many workers have rightly emphasized its low toxicity compared with other available substances. The following case is described in order to indicate the possibility of delayed or chronic toxicity in certain circumstances.

A 29-year-old married woman was put on primidone in March, 1956, having previously had many years of phenobarbitone medication. The commencing dosage was 0.75 g. daily, gradually increasing over the next few months to a maximum of 1.25 g. daily. The patient had become pregnant at about the time treatment began. During the first six months there were no side-effects whatever. However, in the last three months of pregnancy the patient complained of increasing drowsiness, depression, slight oedema of hands, arms, and face, and pitting oedema of the legs. She appeared to be quite toxic, although there was never the slightest evidence of cardiac or renal insufficiency. There was occasional bleeding from the nose and marked hypertrophy of the gums during the last weeks of pregnancy. Following the birth of the child the symptoms described above did not abate. The patient felt increasingly lacking in any desire to undertake both mental and physical tasks. A generalized itchiness of the skin began three weeks after delivery, followed two days later by an intensely pruritic morbilliform rash. There were night sweats and transient sore throats. Antihistamine drugs had no effect. Within a few days persistent vomiting began, accompanied mentally by a frank toxic confusional state. At this time the blood picture was normal with the exception of a 10% eosinophilia. The white cell count was 5,700/c.mm. Primidone was totally withdrawn and phenobarbitone was substituted. Recovery was almost immediate, the pruritus, oedema, and rash disappearing within 48 hours. At the same time the mental state returned to normal, the patient regaining her usual energy and cheerfulness.

The above symptoms have all been described by Handley and Stewart,¹ Whitty,² Greenstein and Sapirstein,³ Goodman,⁴ and many others; but it seems that such symptoms have always been reported as appearing during the early weeks of treatment. This case suggests that a chronic reaction can also occur; and it may be of value to speculate whether pregnancy was either a direct cause, or by influencing excretion may have given rise to retention of primidone in sufficient quantity to produce a delayed type of toxicity. It is perhaps worth noting that Timberlake⁵ indicated the possibility of a cumulative reaction to primidone similar in nature to an initial side-effect reaction and "not a different type of reaction as implied by the term idiosyncrasy." He does not describe any cases, and seems to have reached this conclusion from theoretical considerations.

I would like to thank Dr. Alastair Cruickshank for his permission to publish this case, and to acknowledge the helpful information supplied by Imperial Chemicals (Pharmaceutical Division), Grangemouth.—I am, etc.,

Edinburgh.

RONALD M. GABRIEL.

REFERENCES

1. Handley, R., and Stewart, A. S. R., *Lancet*, 1952, 1, 742.
2. Whitty, C. W. M., *British Medical Journal*, 1953, 2, 540.
3. Greenstein, L., and Sapirstein, M. R., *Arch. Neurol. Psychiat.* (Chicago), 1953, 70, 469.
4. Goodman, L. S., Swinward, E. A., Brown, W. C., Schiffman, D. O., Grewal, M. S., and Bliss, E. L., *J. Pharmacol.*, 1953, 108, 428.
5. Timberlake, W. H., Abbott, J. A., and Schwab, R. S., *New Engl. J. Med.*, 1955, 252, 304.

Treatment of Barbiturate Poisoning

SIR.—Dr. H. G. Penman raises an interesting point in his letter (*Journal*, December 8, 1956, p. 1365). Can the treatment of acute barbiturate poisoning with bemegride and amiphenazole ("daptazole") be simplified by the omission of amiphenazole? The answer is, in most cases, yes. I pointed this out in an early article.¹ Amiphenazole was included in the early treatments because it was believed, on the evidence of certain animal experiments, that this drug lowered the toxicity of bemegride. More recent experiments throw doubt on the general applicability of this find-

ing. Further, we know from the work of Delay,² which we have confirmed, that bemegride is not a very toxic drug in man.

Amiphenazole is a mild respiratory stimulant in man. From reports received, one would expect benefit in about 50% of cases of non-specific respiratory depression. If, in the treatment of a case of barbiturate poisoning with respiratory depression, one did not obtain an improvement in respiratory function with bemegride alone, then one might employ amiphenazole. However, I have not had a report of such a case which did not respond to bemegride alone.—I am, etc.,

Melbourne, Australia

F. H. SHAW.

REFERENCES

1. Shaw, F. H., *Med. J. Aust.*, 1955, 2, 889.
2. Delay, J., *Presse méd.*, 1956, 64, 1525.

Tibial Traction

SIR.—I should like to put in a plea against the use of tibial traction in the treatment of fractures of the femur. I see quite a lot of these cases after their hospital treatment is finished, and am impressed by (1) the excellence of the result so far as the femur is concerned: the alignment is good and shortening is rare; (2) the deplorable result as regards the knee-joint, which, too often is left permanently stiff and painful. When traction is applied to the femur by way of the tibia the considerable force used is exerted through the knee-joint, pulling the articular surfaces apart and straining the ligaments. It is not surprising that the joint responds to these insults by synovial effusion, instability, and traumatic arthritis.

Surely there must be a better method. I wonder why orthopaedic surgeons (if they must use skeletal traction) do not put their Steinmann pins through the lower end of the femur and so spare the knee-joint this appalling trauma and its consequences.—I am, etc.,

Derby.

W. L. TURNER.

Suicide in Obsessional States

SIR.—On reading Dr. John Pollitt's article, "Natural History of Obsessional States" (*Journal*, January 26, p. 194), one may get the impression that suicide is unlikely in obsessional illnesses. Such an assumption could be dangerous. I have known several patients with obsessional illnesses who have committed suicide. The last was a man of 35 years, severely incapacitated by ruminations, rituals, and indecision, who said he was "so undecided he didn't know what to be undecided about." He had been a voluntary patient in a well-known hospital and diagnosed as having a hysterical illness.

Obsessional disorders are notorious for being missed, and tend to masquerade in old case histories (including some of my own) as depressions or anxiety states with hysterical features. Often such patients are too carefully dressed or groomed to "ring true" and pass muster as a depressive illness. There is, indeed, a strong case for calling obsessional features signs as opposed to symptoms, since they are more often elicited by the physician than volunteered by the patient. I think it is likely that some suicides occur in patients with obsessional disorders who are diagnosed as something else. *En passant*, violence seems a characteristic quality in patients with obsessional disorders. I can recall three suicides of a violent type, two who jumped under tube trains and one who cut his throat with a razor blade.

Out of Dr. Pollitt's series of 150 cases, 101 were followed up, and it was found that one committed suicide and two attempted it. I would predict that several of the remaining 49 who did not reply to the questionnaire have committed suicide. Obsessionals are secretive about their symptoms when alive, and dead men tell no tales. Quite often, I have found, nor will their relations.—I am, etc.,

St. Albans.

RUSSELL BARTON.

Obituary

Sir JAMSHEDJI DUGGAN, K.B.E., C.I.E.
F.C.P.S., D.O.

Sir Jamshedji Duggan, formerly professor of ophthalmic medicine and surgery in the Grant Medical College, Bombay, died on January 15 at the age of 72.

Jamshedji Nusserwanji Duggan was born in Bombay on April 8, 1884, and received his professional training at the Grant Medical College, Bombay, where he obtained the diploma of L.M.S. in 1905. He took the Oxford D.O. in 1912, and was elected a Fellow of the College of Physicians and Surgeons of Bombay in 1918. Sir Jamshedji Duggan concentrated on ophthalmic work throughout most of his career, but for some time he was superintendent of the Tata Memorial Hospital for Cancer. From 1922 to 1939 he was professor of ophthalmic medicine and surgery in the Grant Medical College, and superintendent of the Sir Cowasji Jehangir Ophthalmic Hospital. In 1934 he was president of the All-India Ophthalmological Congress. A frequent contributor to ophthalmological journals, he was the author of the chapter on presbyopia in the 1938 edition of the *British Encyclopaedia of Medical Practice*, and was the Bombay representative on the editorial committee of the *British Journal of Ophthalmology*.

Throughout the first world war Sir Jamshedji Duggan served as a major in the Indian Medical Service, and in the second world war he was chairman of the Bombay Provincial Joint War Committee of the Indian Red Cross Society and St. John Ambulance Association. A justice of the peace for Bombay since 1918 and sheriff of Bombay since 1942, he was appointed O.B.E. in 1929 and C.I.E. in 1933. He was created a knight in 1935 and promoted to K.B.E. in 1945. He married in 1914 and for over forty years had devoted support from his wife in all his activities. He is survived by Lady Duggan, by whom he had two sons, and the sympathy of all his friends, both in India and London, is extended to her and to the other members of his family in their great loss.

J. M. STALKER, M.D.

Dr. J. M. Stalker, regional medical officer at Dundee under the Department of Health for Scotland, died on January 21 in Dundee Royal Infirmary, where for a number of years he had been on the staff as a physician. His illness had lasted about three months.

James Miller Stalker was born at Dundee in 1892, the son of the late Professor A. M. Stalker, physician at Dundee Royal Infirmary and professor of medicine in St. Andrews University. He was educated at Dundee High School and at the universities of Edinburgh and St. Andrews, graduating M.B., Ch.B., St. Andrews, in 1916, and proceeding to the M.D. in 1936. In the first world war he served in France as a student dresser with the British Red Cross, returning to qualify in 1916. Thereafter he served with the R.A.M.C. and was wounded in 1917. After the war he took up general practice in Dundee. Later, in 1923, he was appointed an assistant physician to Dundee Royal Infirmary. In 1936 he was promoted consulting physician to the infirmary and lecturer in clinical medicine in St. Andrews University. He was a medical referee under the Workmen's Compensation Act for some twenty years. After

the outbreak of the second world war he was appointed consulting physician to the Emergency Medical Service hospital at Bridge of Earn, in Perthshire. He returned to Dundee on the cessation of hostilities and resumed practice until appointed regional medical officer for the area, under the Department of Health for Scotland, in 1952. He was a past president of the Forfarshire Medical Association and of the Dundee Medical Club, to which he contributed papers on several occasions. He had been local chairman of the College of General Practitioners since its inception, and three years ago he contributed an article to this *Journal* on "General Practice: Need for Hospital Technique in the Home." Of a philosophical mind and considerable literary talent, he will be remembered for his cultured and often witty speeches. He was an elder of the St. George's Parish Church, and at his funeral a large attendance of colleagues and friends paid tribute to the esteem in which he was held. He is survived by his widow, Dr. Jeannette Stalker, and his son, Dr. Alexander M. Stalker, both of whom practise in Dundee, and by a younger son, who is a chartered accountant in Malaya.

C.-E. A. WINSLOW, M.S., Dr.P.H.

Professor C.-E. A. Winslow, professor emeritus of public health at Yale University, died at New Haven on January 8, aged 79. He had edited the *Journal of Bacteriology* and the *American Journal of Public Health* for many years.

Charles-Edward Amory Winslow was born at Boston on February 4, 1877, and graduated in science at the Massachusetts Institute of Technology, where he worked first as an assistant in the department of biology and later as assistant professor of sanitary biology. For some years also he held the post of assistant health officer at Montclair, New Jersey. In 1910 he moved to New York as associate professor of biology at the New York City College, holding at the same time the curatorship of public health at the American Museum of Natural History. In 1915 he went to Yale as Lauder professor of public health in the school of medicine, and for the next thirty years he was one of the most active and influential of public-health workers in the United States. His range of interests was enormous, and, besides being a bacteriologist and teacher of renown, he was an expert on health education, on sanitary engineering, and on international aspects of public-health work. Meanwhile he accepted added responsibilities as editor of the *Journal of Bacteriology* and the *American Journal of Public Health*, and he wrote several books.

Among the first of those who helped to organize the health work of the League of Nations, Professor Winslow was one of the "expert assessors" of its health committee from 1927 to 1932, and he was also for a short time scientific director of the International Health Division of the Rockefeller Foundation. His work for the World Health Organization culminated in the publication of his monograph *The Cost of Sickness and the Price of Health* in 1951. He was made president of the Society of Bacteriologists in 1913, of the American Public Health Association in 1926, and of the American Society of Heating and Ventilating Engineers. He gave the *Cutter Lecture at Harvard* in 1928, and among the awards he received for his services to the cause of preventive medicine were the Sedgwick Medal of the American Public Health Association, the Shattuck award, the Léon Bernard Medal (W.H.O.), and the Lasker Award.

Sir CHAD WOODWARD, M.B., F.R.C.S.

Sir Chad Woodward, who practised in London as a surgeon for a few years before the first world war and was at one time chairman of the Worcestershire County Council, died on February 2 at Queen Elizabeth Hospital, Birmingham, aged 76.

Alfred Chad Turner Woodward was born on March 2, 1880, the son of Robert Woodward, D.C., J.P. From Radley School he went on to study medicine at Edinburgh, graduating M.B., Ch.B. in 1904 and taking the F.R.C.S. of Edinburgh in 1908 and of England in 1911. After graduation he held the posts of house-surgeon at the Edinburgh Royal Infirmary and of resident surgical officer at the Birmingham General Hospital. When he returned from a period of postgraduate study on the Continent he was elected to the staff of the Royal Orthopaedic Hospital, Birmingham. Later, he moved to London, and was surgeon to out-patients at the Hampstead General Hospital and at the Temperance Hospital and assistant surgeon at the Belgrave Hospital for Children. At this time he wrote a number of papers, mainly on orthopaedic subjects, and he was the author of the chapter on burns and scalds in *Choyce's System of Surgery* (1912). During the first world war, in which he served as a major in the R.A.M.C., his elder brother was killed and he became heir to the family estate at Arley, near Kidderminster. Thereafter he took a prominent part in public life in Worcestershire, as his father had before him. He became not only chairman of the Worcestershire County Council but of the Severn Catchment Board and of the Board of Conservators of the Severn Fishing District. He put his medical training to good use as a member of the Radium Commission and as a governor of the London School of Hygiene and Tropical Medicine. He was also a governor of Birmingham University. For his many public services he was knighted in 1944.

He married in 1934, and is survived by his wife and three daughters.

The sudden death of Dr. P. T. HULL on December 22, 1956, at the early age of 37 came as a great shock to his very many friends. Patrick Terence Hull was born on June 10, 1919, and began his medical education at King's College, London, in 1938, but joined the Army not long afterwards. In 1947 he became a medical student again at King's College, going on to the Westminster Hospital, and qualifying M.R.C.S., L.R.C.P. in 1951.

Dr. G. D. REES writes: I first met "Pete" Hull in October, 1938, when we started the first M.B. course at King's College, London. He quickly became a popular member of the medical faculty, and this popularity increased when the faculty moved to Glasgow and subsequently to Birmingham after the outbreak of war. While at Birmingham he gave up his studies and joined the Army. After training in this country he served in India and subsequently in Japan with the British Commonwealth Occupation Forces. He returned to this country and resumed his studies in January, 1947. After leaving King's College he went on to Westminster Hospital, where he soon became well known and well liked. He was keenly interested in all forms of sport, particularly Rugby football, and in spite of a somewhat rotund build was a proficient centre three-quarter. Immediately after qualification he joined his father and brother in practice at Rogerstone, Newport, Monmouthshire, and became a popular and respected member of the community. He married in the spring of 1956. The medical profession has lost a most colourful personality and many of us have lost an invaluable friend. To his wife and family we extend our sincere sympathy.

Dr. CATHERINE EVANS, a general practitioner in Herne Bay and specialist anaesthetist to the Canterbury and Isle of Thanet Groups of Hospitals, died on December 28, 1956. She was 56 years of age. Grace Catherine Evans was born on April 29, 1900, within a stone's throw of the Royal Free Hospital, where her father was on the teaching staff, and equally near to the London School of Medicine for Women, of which her maternal great-grandfather, John Turle, was a founder and at which she later studied medicine. The family moved to Herne Bay in 1908, when her father set up in general practice, and it was there that she received her early schooling before following the family tradition, the fifth generation to do so, by qualifying to practise medicine. When her studies were interrupted by a year in hospital as a patient she was told from all sides that she could never complete the course. But Catherine Evans was never one to give up, and her courageous determination carried her through in the shortest possible time. She qualified by taking the London Conjoint diploma in 1927. This early demonstration of a refusal to allow difficulties or illness to quell her spirit was echoed in a lifelong disregard of a constitution that was not at all robust. Her devotion to her vocation was shown in her conscientiousness in working for her patients' best interests, both within and outside the medical sphere. After a few years as assistant to her father she set up in general practice by herself. For twenty years she covered the duties at the infant-welfare and antenatal clinics in the locality, and was beloved by mothers and children. She showed a marked dexterity and speed in all her skills, and made herself an excellent anaesthetist, joining the hospitals staff in an honorary capacity as an anaesthetist before the inception of the National Health Service in 1948 and subsequently as an established part-time specialist. At the early age of 36 she was appointed to the bench of magistrates and took a lively interest in local public affairs. She served for many years on the executive committee of the East Kent Division of the British Medical Association, and was representative at the Annual Representative Meeting from 1946 to 1953. Representatives will remember her forthright and fearless expression of opinions, voiced because they were her sincere belief and never withheld if they were unpopular. It was always a joy to be pinned to the wall by her criticism or energetic disagreement, for she was the soul of candour and courage. How she continued to do her work crippled with illnesses any one of which would have reduced an ordinary mortal to helplessness will ever remain a marvel and an inspiration to those who knew her. A great fighter for life, she was overwhelmed by illness, but she never surrendered. There hung in her surgery the framed text, "The Peace of God Passeth Understanding," and underneath was added, "Peace of Conscience, Peace of Character, Peace of Conviction, Peace of Confidence." The strength that Catherine Evans drew from that inner peace throughout her years of conflict swelled out as a triumph in the organ notes of Mendelssohn's "Be Not Afraid" at the crowded funeral service to mourn the passing of this courageous lady. She leaves a sister and three brothers, of whom two are in medicine, while the son of the third is the sixth generation of doctors.—M. S. H.

Dr. R. S. RYCE, who was in practice at Pentrebach, Merthyr Tydfil, Glamorganshire, for forty-five years, died at his home there on January 8 at the age of 86. Richard Samuel Ryce was born at Cork on December 6, 1870, and was educated at the former Queen's College, Cork, graduating M.B., B.Ch. at the old Royal University of Ireland in 1897. He proceeded to the M.D. in 1901 and to the M.Ch. in 1902, when he was also elected a Fellow of the Royal College of Surgeons in Ireland. Soon after graduation he became an assistant in a general practice at Aberdare, but in 1906 he set up on his own account at Pentrebach and Abercanaid, then two very small villages near Merthyr Tydfil, where he was surgeon and radiologist at the local hospital. His practice was mainly among miners and their families, and by the time he retired the population of Pentrebach and Abercanaid had risen to over 5,000. A

member of the British Medical Association for forty years, he was chairman of the North Glamorgan and Brecknock Division in 1929-30, and for many years he was a representative at the Annual Panel Conference. He took a prominent part in the life of the district, and was a past president of both the Merthyr Rotary Club and the Abercanaid Recreation Association. Archaeology was a subject in which he was always specially interested. A widower, Mrs. Ryce having died in 1914, he is survived by his son, Dr. J. L. Ryce, who succeeded him in the practice.

Dr. JOHN LOW died at the Princess Elizabeth Hospital, Guernsey, Channel Islands, on January 1 at the age of 80. For many years he was a well-known general practitioner at Oldham, Lancashire. John Low was born at Aberdeen, and received his medical education at the university there, graduating M.B., Ch.B. in 1899. After holding house appointments at hospitals in Sheffield, Wigan, Derby, and Rochdale he went into general practice at Oldham in 1904, where he remained for thirty-five years. He was also factory surgeon for the Oldham East district. For many years a member of the Oldham Borough Council, he served as chairman of the watch committee and the police committee at various times. He was awarded the Military Cross in 1917 for conspicuous gallantry and devotion to duty in Mesopotamia while serving in the R.A.M.C. in the first world war. In 1950 Dr. Low moved to Guernsey, where he lived in retirement until his death.—F. R. L.

The death occurred at St. Andrews, Fifeshire, on January 9 of Dr. ELIZABETH M. RAMSAY, at the age of 91. She was the widow of Dr. Andrew Maitland Ramsay, the eminent Scottish ophthalmic surgeon, who died in 1946. Elizabeth Margaret Pace, one of the pioneers among medical women—she was a member of the B.M.A. for 64 years—graduated M.B. at London University in 1891 and proceeded to the M.D. four years later. She settled in practice in Glasgow, and became gynaecologist to the Victoria Infirmary Dispensary. Later she went into partnership with the late Dr. Alice McLaren, who died in 1945. A notable achievement of the partnership was its founding in 1903 of the Glasgow Women's Private Hospital, now known as the Redlands Hospital for Women, which was staffed by women doctors for the treatment of women and which became eventually a complete general and maternity hospital staffed by women specialists in all departments. Dr. McLaren was the first woman gynaecologist in Glasgow and the first medical superintendent of the hospital. Dr. Pace married Dr. A. Maitland Ramsay in 1907, and both continued to practise in Glasgow until about 1924, when they retired to live at St. Andrews.

A friend writes: The Ramsays had an ideally happy marriage, as the large number of those in St. Andrews who enjoyed their hospitality were aware. The Castle House, which was their home, became a place of pilgrimage for many of their old patients, and there they so warmly received a multitude of new friends. Their concern for education prompted them to take that vigorous interest in the university and in St. Leonard's School which animated them until the end of their lives. On the council of the latter, Mrs. Ramsay was a deeply respected member for many years. Eventually, after her husband's death, she found herself compelled to leave her house, and in recent years had lived in the Graigmount Nursing Home, where, with all her old alertness of mind and with the large-heartedness which was hers to the end, she received her friends. Generous, keen-witted, kind, and affectionate, she found her happiness latterly in identifying herself with the concerns of others. All her friends will sadly miss her; they will ever remember her with affection and gratitude.

Dr. C. E. E. HERINGTON, who was medical officer of health for Dagenham for twenty years, died on January 15 at his home in Selsey, Sussex, where he had been living in retirement. He was 63 years of age. Cecil Edward Eede Hering-

ton was born in Sussex on May 10, 1893, and received his medical education at St. Bartholomew's Hospital, qualifying by taking the London Conjoint diploma in 1918. During the first world war he served first in the Army and then in the Royal Navy. After demobilization he took the London degrees of M.B., B.S. in 1920—proceeding to the M.D. in 1943—and was in general practice at Longton, Staffordshire, and Twickenham and Teddington, in Middlesex. Having decided upon a career in public health, he took the D.P.H. of the English Royal Colleges in 1923, and was appointed deputy medical officer of health for Doncaster in 1925, after having gained experience as assistant medical officer of health under the Surrey County Council. He left Doncaster in 1926 to become medical officer of health for Ilkeston, where he stayed until 1928, when he was appointed medical officer of health for the Erith Urban District. In 1934 he obtained the appointment of medical officer of health for Dagenham, where he remained until he retired in 1954. While at Erith he was president of the local Rotary Club, of which he was a founder member, and president of the Erith branch of the National Association of Local Government Officers. He was also honorary secretary of the Kent branch of the Society of Medical Officers of Health, and in 1953 he became honorary treasurer of the society itself, an office he held until his death. A member of the British Medical Association for some thirty years, he was chairman of the South Essex Division in 1950-1. He also served on a number of committees at B.M.A. Headquarters, including the Central Medical Recruitment Committee, the Services Subcommittee, and the County District Medical Officers of Health Subcommittee. During the second world war he was in charge of the Dagenham casualty services, and his work at that trying time will always be remembered there. He is survived by his widow and two sons, one of whom is a doctor.

A friend writes: It is not so much as a medical officer of health that Dr. C. E. E. Herington will be remembered but as a man. He was a really delightful person, and those of us who were privileged to be his personal friends will never forget his quiet, kindly manner. He was one to whom one could go easily for advice and help. He was a keen follower of county cricket, and took every opportunity to watch his adopted county, Essex. An enthusiastic gardener, he was an authority on chrysanthemum growing, and to spend a summer afternoon with him was something to be remembered.

Dr. O. L. SCARBOROUGH died in the Selby War Memorial Hospital on January 16 at the age of 80, after being in practice almost forty years. Born in Halifax on June 28, 1876, Oswald Lowndes Scarborough was educated at Bradford Grammar School and St. John's College, Cambridge, going on to the Leeds General Infirmary for his clinical training. He qualified M.R.C.S., L.R.C.P. in 1905, and many years later, in 1941, he graduated M.B., B.Ch. at Cambridge. After qualification he held a number of resident appointments and then went into general practice in Chapel-town, Leeds. He volunteered for the R.A.M.C. at the outbreak of the first world war, and served until 1919, when he finally became a general practitioner in Selby. For many years he was a member of the medical staff of the Selby Hospital and also divisional surgeon to the St. John Ambulance Brigade. In 1935 he had two attacks of coronary thrombosis, which kept him away from his work for almost a year. Ten years later the youngest of his three sons died while still a medical student, and in 1946 his wife died.

C. R. H. writes: Dr. Scarborough symbolized the old family doctor at his best. With his old-world courtesy and charm of manner, his rare physique, and conscientiousness in his work, he built up a very extensive practice. A founder-member of the Selby Rotary Club, he always gave of its first principle, "Service before self." His serious demeanour, his keen, penetrating expression, his monocle and cravat were always apt at first to make his patients a little apprehensive, but his rare gift for hard work coupled

with his obvious medical skill inspired infinite trust, which was always acknowledged by colleagues and patients alike. The high esteem in which he was held was fittingly demonstrated at his funeral service. Many people, some from miles away in the country, came to pay their last tribute and revere his memory in the quiet beauty and dignity of the lovely Abbey Church at Selby, for which he had been a devoted worker. Our sympathy is extended to his sister, who looked after him so well in his later years, and to his two sons, both members of the medical profession.

Dr. J. H. SIMMONS, consulting physician to the Lewisham group of hospitals, died in Lewisham Hospital on January 17, aged 54, after a brief illness. John Howard Simmons received his medical education at King's College Hospital, qualifying with the London Conjoint diploma in 1925, and later graduating M.B., B.S. in 1926. He took the M.R.C.P. in 1930 and proceeded M.D. in the following year. After house appointments at King's College Hospital he spent some time in general practice, but early in the 1930's he joined the hospital service of the London County Council. His outstanding medical ability led to steady promotion, and he served in no fewer than six of these hospitals, his final appointment being that of physician specialist to Lewisham Hospital in 1944. With the advent of the National Health Service he became consultant physician, and he served the hospital as senior physician up to the time of his death. He also served on the staff of St. John's Hospital in a similar capacity. His opinion was respected and widely sought, and his kindly nature and good advice brought him many friends. He was always interested in hospital administration and had served as deputy medical superintendent at Mile End and St. Charles's Hospitals. He was chairman of the Lewisham hospital staff committee for a period, and later for three years he served as chairman of the group medical advisory committee. In this capacity his tactful handling of many difficult problems proved a very valuable asset in the early stages in the development of the Lewisham hospitals as a group. After the retirement of the late medical superintendent in 1951 Dr. Simmons undertook the medical administrative duties of the hospital—under the title of executive medical officer—but he still gave the greater part of his time to his clinical work and to the welfare and medical care of the nurses, who held him in great affection. Many of his leisure hours he devoted to his garden, of which he was very fond. He had a happy family life, which he shared freely with a large circle of friends, and at Christmas he and his wife used regularly to entertain students from the Commonwealth. A large congregation of colleagues and friends paid their last respects at a memorial service at St. Mary's Parish Church, Lewisham, on January 26. His sudden and tragic death—in the prime of his life—has been a very severe loss to his colleagues and friends, who will wish to extend their sympathy to his widow and daughter.—J. J.

By the death of Mr. ARTHUR H. CROOK on January 19 Eastbourne has lost a revered and well-known member of the medical profession. He was 72 years of age. Arthur Henry Crook was born at Southampton on August 19, 1884. From Christ's College, Cambridge, he went on to Guy's Hospital with a scholarship in 1906. Qualifying by taking the London Conjoint diploma in 1908, he took the F.R.C.S. in 1911, the Cambridge M.B. in 1912, and the M.Chir. in 1913. After qualification he held the appointments of out-patients officer, house-surgeon to Sir Charters Symonds, and resident obstetrician at Guy's Hospital, and then settled in practice with Dr. Astley Roberts at Eastbourne, where he was appointed assistant medical officer to the Princess Alice Memorial Hospital. A member of the R.N.V.R., he was called up immediately the first world war broke out and served at Antwerp and Gallipoli, being mentioned in dispatches. On return to civilian life he again took up his work at the Princess Alice Memorial Hospital. In 1936 he was due to retire from the honorary staff of the hospital after fifteen years as a senior, but his services were con-

sidered of such value that the post of fracture surgeon was created and he was appointed to fill it. To fit himself for this work he undertook postgraduate study abroad and in England. He served on the staff of the hospital for 38 years, from 1914 to 1951, but up to as late as last year he returned to duty as locum during holiday periods. When the British Medical Association held its Annual Meeting at Eastbourne in 1931 he served as vice-president of the Section of Obstetrics and Gynaecology. Arthur Crook was a keen sportsman. While at Cambridge he was captain of an Association football team, and from 1906 to 1910 he played for the Guy's Hospital Rugby fifteen. In 1933 he helped Dr. M. Ross Taylor to found the Eastbourne Sailing Club, of which he was at first vice-commodore, then commodore, and ultimately vice-president for life. He was an enthusiastic Sussex Townsman and District Officer for a number of years. He had travelled widely on the Continent, and was interested in people and their welfare more than in the arts or in antiquities. His family life was one of great happiness, and our sincere sympathy goes out to his widow, formerly Miss Margaret Witherbee, whom he married in 1913, and his three sons and daughter. He saw his last patient on January 16 and died three days later, truly in harness to the end, as he would have wished.—E. W. H.

Dr. JANET MCGILL died in the South London Hospital for Women on January 25 after a short illness. Janet McAllister McGill was born at Falmouth on April 26, 1894. She received her medical training at the London School of Medicine for Women and St. Mary's Hospital, graduating M.B., B.S. from London University in 1918, proceeding to the M.D., gaining the University gold medal, in 1921. After graduation she held resident posts at St. Mary's Hospital, the Elizabeth Garrett Anderson Hospital, and Paddington Green Children's Hospital. In 1922 she settled in general practice in Streatham, and became known to a large circle of patients, who valued her thoroughness and judgment and her quick insight and sympathy, and who came to know her as their friend. She loved children, and with her understanding and sense of fun she readily won their confidence. She held a variety of appointments and gave herself to each with the zest and interest which were characteristic of her. For many years she was medical officer to the Balham Infant Welfare Centre and was medical officer to the Streatham Babies' Hospital until its closure in 1939 at the outbreak of war, during which she took an active part in the training of A.R.P. personnel and was medical officer to a first-aid post. She became medical officer to the Magdalen Hospital School in 1928, and was also for some years medical officer to a home of the Fellowship of St. Michael and All Angels, caring for unmarried mothers and their children, and in both she was a friend both wise and gay to the girls and to the staff. Her cheerful energy and capacity for hard work enabled her to overcome serious handicaps of ill-health. Towards the end of 1952, however, her health became worse, and she was obliged to retire from much of her work, keeping only some private practice, and her post at the Magdalen Hospital School. She was happy to have more time for reading and her garden and for her friends. She had a wonderful memory and wide interests, and her sense of enjoyment was infectious. In difficulty or trouble she seemed to have, for her friends as for her patients, a boundless store of encouragement and good counsel, and this sprang essentially from the faith which was the mainspring of her life. All who knew her are indeed grateful for her example and companionship.—E. M. S.

Dr. A. I. ROSS, who died suddenly at his home at Sutton, Surrey, aged 45, on January 25, was a well-known figure in the Croydon area, where he held the office of group pathologist at Croydon General Hospital. The son of a general practitioner in Stockton-on-Tees, Alastair Ian Ross was educated at Fettes and Aberdeen University, where he followed the family calling of medicine. After graduating M.B. in 1935 he worked as house-physician and house-

surgeon at Sheffield Royal Hospital, and then spent a period studying abroad at the institute of pathology, Freiburg University. He returned to Britain to take the D.P.H. in London in 1938. He then held, in succession, the appointments of assistant in the Nuffield Department of Pathology and Bacteriology at the Radcliffe Infirmary, Oxford, and assistant lecturer at the Postgraduate Medical School, Hammersmith. In 1942 he joined the R.A.M.C. and served as a graded specialist in pathology, with the rank of major, in North Africa and Italy. On demobilization in 1946 Ross returned to Hammersmith. Then he went to the Kent County Hospital, Farnborough, and in 1948 to his final appointment in Croydon as a consultant. In Croydon Ross found himself faced with the need for unification and modernization of the laboratory services in a diverse group of hospitals. In spite of many difficulties, and with very little assistance, he achieved in a short time a remarkable measure of reorganization. As a man Ross combined a large, strong frame with a reserved, even shy, demeanour. He was essentially sincere and straightforward, though in personal dealings these qualities could make him seem, on occasions, somewhat brusque. To those who knew him he had an innate and sometimes disarming candour and modesty. He was methodical, instinctively cautious, and always knowledgeable in his work. His opinion in matters of surgical pathology was very sound indeed. In the last year or two his career and activities generally were clouded by a tragic illness, which he bore courageously. His organizing ability in Croydon, his respect for the needs of general practitioners, and his touches of kindness will be remembered. Dr. Ross leaves a widow—herself a doctor—and three children.—G. T. S.

Medico-Legal

INSULIN AND DRIVING

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

By Section 15 (1) of the Road Traffic Act, 1930, anyone who, when driving or attempting to drive or when in charge of a motor vehicle on a road or other public place, is under the influence of drink or drugs to such an extent as to be incapable of having proper control of the vehicle is liable to serious penalties. He is liable to disqualification from driving for at least a year. On indictment he is liable to six months' imprisonment or an unlimited fine or both. On summary conviction before justices he is liable for a first offence to a fine of £50 or four months' imprisonment, and for a subsequent offence to a fine of £100 or four months' or both. Section 9 (1) of the Road Traffic Act, 1956, provides that, if he is not driving, a person shall be deemed not to have been in charge of the motor vehicle if he proves that there was no likelihood of his driving the vehicle so long as he remained unfit to drive and that after becoming unfit to drive he had not in fact driven the vehicle on a road or other public place. The penalties, then, are heavy, though not in comparison with the disastrous consequences to others which can and often do follow the offence.

On January 30, 1957, an appeal¹ was heard before the Queen's Bench Divisional Court against the dismissal by the Prestbury (Cheshire) Justices of an information charging Mr. J. W. Clark with unlawfully driving a motor-car on the road when under the influence of a drug to such an extent as to be incapable of having proper control of the vehicle. The facts were that Mr. Clark, a chemist, had suffered from diabetes for 12 years. On August 13, 1956, after taking by injection his usual and prescribed dose of insulin, followed by a regulated meal, he had driven himself two miles to the cinema. Some hours later he was found sitting semi-comatose at the wheel of his car in a hypoglycaemic coma. The justices dismissed the information on the basis that insulin was not a "drug."

¹ *Armstrong v. Clark*, *The Times*, January 31, 1957.

The Lord Chief Justice, in the course of his judgment allowing the appeal against the justices' decision and remitting the case to the justices with a direction to convict, said that of course insulin was a "drug" for the purpose of the Road Traffic Act. The justices must remember that the section of the Act was designed for the protection of the public, and if people were in a condition of health which rendered them subject to comas, or the remedies for which might send them into comas, they ought not to drive because of the danger which resulted. Mr. Justice Cassels, in a concurring judgment, said that it would be small consolation for anyone injured by a motorist to be told that the motorist was under the influence of a drug and it was not his fault.

Proper Control

This decision is reported to have caused concern to the British Diabetic Association, with its 20,000 members. This concern should be dispelled so long as the precise constituents of the offence are remembered. It is not an offence to drive a motor vehicle while under the influence of a drug. It is an offence, and for the protection of the public it obviously must be an offence, to drive when under the influence of a drug to such an extent as to be incapable of having proper control of the vehicle.

If the accurate regulation of insulin intake and diet makes the risk of hypoglycaemia negligible, and a doctor is satisfied that his patient understands the situation and can be trusted to regulate his intake accurately, there is no reason why he should advise him not to drive. But if the patient for any reason does develop hypoglycaemia he will be as grave a danger to people on the road as if his control of his car was impaired by drink, and he will be liable to the same penalties. The fact that he deserves more sympathy than the alcoholic will be no consolation to his victim if he hits someone. Once his condition is such that he is incapable of having proper control, it is chance which decides whether he will hit anybody or not.

THEFT OF HOUSE-PHYSICIAN'S CLOTHES

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

One of the terms on which Dr. V. A. Edwards was engaged as resident house-physician at the Watford and District Peace Memorial Hospital was that he should live in a hostel near the hospital and provided by the West Hertfordshire Group Hospital Management Committee. A deduction of £125 was to be made from his salary of £425 per year in respect of the board, lodging, and other services which the committee provided there. The terms of his engagement were as negotiated between the Whitley Council for the Health Services and the B.M.A.

On December 17, 1955, Dr. Edwards got home to his room in the hostel at 2 a.m. to find that £70 worth of his clothes and personal belongings had been stolen. He brought an action against the management committee on the ground that they owed him a duty to take reasonable care of his bedroom and his personal clothes and effects, and of the keys to the door, and that it was an implied term of his contract of employment that they would perform that duty. The Watford County Court Judge decided in favour of the committee, and on January 31, 1957, Dr. Edwards's appeal against this decision was dismissed by the Court of Appeal.¹

In his judgment Lord Justice Hodson said that, on the authorities, a boarding-house keeper was under a duty to take some care of the goods of his guests, but that the duties which arose in the case of a boarding-house could not arise in the present case. The committee was not conducting the hostel as a boarding-house any more than if the staff was resident in the hospital building itself and getting food and lodging free. This was simply a case of master and servant when the master was paying his servant partly in cash and partly by giving him food and lodging, and

¹ *The Times*, February 1, 1957.

² *Deyong v. Shenburn*, [1946] K.B. 227.

it made no difference that the food and lodging were valued at £125. It had been said by Lord Justice du Parc² that there had never been a decision that, merely by reason of the relation of master and servant, the master must take reasonable care of his servant's belongings in the sense that he must take steps to ensure, so far as he could, that no wicked person should have the opportunity of stealing his servant's goods. This was not confined to domestic servants, and there was no implied term in the contract which laid such a duty on the committee.

Lord Justice Morris and Lord Justice Sellers agreed, and the court refused leave to Dr. Edwards to appeal to the House of Lords.

The Medical Defence Union instructed Messrs. Hempsons, solicitors, to act for Dr. Edwards.

Medical Notes in Parliament

Industrial Health Service

The MINISTER OF LABOUR said in reply to Mr. F. WILLEY (Sunderland, North, Lab.) on January 29 that he could not tell when he would be able to make a statement on industrial health services and organization as envisaged in paragraph 143 of the Report on the Staffing and Organization of the Factory Inspectorate. Mr. WILLEY observed that it was heartening to read in the report that much thinking was taking place; but was it unrealistic to expect effective action as a result in the near future? Mr. IAIN MACLEOD said the main thinking referred to in paragraph 143 was being done by the Industrial Health Advisory Committee. He would not like to hurry that. It was more important to get the right answer than to come to a conclusion quickly. In particular, they would want the report of the survey going on in Stoke-on-Trent into the pottery industry, which would not be available till the end of the year.

Mr. A. SKEFFINGTON (Hayes and Harlington, Lab.) asked when it was proposed to announce a successor to the senior medical inspector of factories. Mr. MACLEOD said he hoped to do so well before August, when the senior medical inspector would retire. Mr. SKEFFINGTON urged that in building up an effective department the name of the person to be in charge should be known soon. Mr. MACLEOD said he recognized that, and attached the greatest importance to the medical inspectorate.

Sir LESLIE PLUMMER (Deptford, Lab.) asked the Minister of Labour on January 31 if he would improve the grading of the post of senior medical inspector. Mr. MACLEOD replied "No." The present grading of the post was based on the recommendations of the Howitt Committee, which reported in 1951. The salary had been adjusted in accordance with the recommendations of the Royal Commission on the Civil Service.

Mental Hospital Patients

Mr. C. DOUGHTY (Surrey, East, Con.) asked the Minister of Health on January 29 which officials of mental hospitals were responsible for the discharge of patients; on what basis they were remunerated; and whether their remuneration was related in any way to the number of patients in the hospital. Mr. D. VOSPER replied that no official was authorized to discharge a patient in a mental hospital, but any two members of the hospital management committee when ordering the discharge of a temporary or certified patient must do so with the advice in writing of the medical superintendent. The salary of medical superintendents was generally based on length of service in their clinical grade and not on the number of patients.

Moulded Rubber Footwear

Mr. N. DODDS (Erith and Crayford, Lab.) asked the Minister of Health on January 31 from what sources he inquired about the effect of moulded rubber footwear in respect of foot ailments; and what advice he received in

connexion with the use of synthetic materials. Mr. VOSPER told him that advice was sought from consultants in dermatology and orthopaedic surgery. No distinction was made in this advice between synthetic materials and natural rubber, or a mixture of the two.

Industrial and Medical Gases

The PRESIDENT OF THE BOARD OF TRADE, who was asked on January 31 what action he proposed to give effect to the recommendations of the Monopolies Commission on the supply of certain industrial and medical gases (*Journal*, January 12, p. 101), said he must consider the report further before deciding what action to take. Mr. D. WADE (Huddersfield, West, Con.) said the Commission's comment that existing legislation did not seem to provide any effective means of dealing with the situation appeared to endorse the view that there were loopholes not covered by the Restrictive Trade Practices Act. Sir DAVID ECCLES replied that that was one of the parts of the report he had in mind.

Cancer and Diesel Fumes

Mr. READER HARRIS (Heston and Isleworth, Con.) asked the Minister of Health on February 4 what information his department now had on the connexion between diesel engine fumes and the increase in cancer. Mr. VOSPER stated that the investigations being made under the auspices of the Medical Research Council into the nature and effects of the exhaust products of diesel engines had provided no evidence to support the suggestion that these fumes were a cause of cancer. Mr. HARRIS said there was still some concern about a possible connexion, and asked if further investigations were being made. Mr. VOSPER replied that investigations would continue, but he could assure Mr. Harris that there was no connexion whatever. In a similar inquiry among London Transport employees it was found that the cancer incidence among those working with diesel engines was no greater than among those working with other vehicles.

Research Expenditure

Mr. M. LIPTON (Brixton, Lab.) asked how much was being spent from public funds on research into the connexion between smoking and lung cancer. Mr. VOSPER informed him that in the current financial year the Medical Research Council were spending about £29,000 on research on this subject. Most of this sum came from the lung cancer research fund put at the disposal of the Council by a group of British tobacco manufacturers. Mr. LIPTON said it was deplorable that the Government were making no contribution. Was this explained by the Treasury's policy that they did not want too many people to stop smoking? Mr. VOSPER retorted that the Government were making a contribution to this research. The Medical Research Council were spending £327,000 from public funds this year on cancer research, but the mere expenditure of money would not necessarily find the answer.

Proprietary Drug

Mr. M. EDELMAN (Coventry, North, Lab.) asked the Minister whether he had studied the claims contained in the advertisement of a proprietary drug; what was its composition; whether it was to be included in *Prescribers' Notes*; what equivalent preparation of a non-proprietary nature was already included in *Prescribers' Notes*; and at what cost. Mr. VOSPER stated that he had studied the claims. Its composition was 50 mg. of caffeine per tablet. The preparation had been noted for inclusion in the list of preparations advertised to the public which doctors had been asked not to prescribe. A standard drug of similar therapeutic effect was included in the *British Pharmaceutical Codex*, retail price 11½d. for 25 tablets, and he was advised that its clinical use was small and diminishing. He added that the drug was not harmful; the effect of one tablet was about the equivalent of a cup of tea or coffee. On social grounds it was undesirable.

Prescription Charge

Mr. ARTHUR LEWIS (West Ham, North, Lab.) asked the Minister in what numbers he had received letters of support and opposition, respectively, to the Government's increased 1s. per item prescription charge. Mr. VOSPER told him that approximately 600 letters had been received criticizing the revised charge. Some letters had been received expressing approval of it. Dr. EDITH SUMMERSKILL (Warrington, Lab.) asked how many executive councils had written. Mr. VOSPER replied, "A very large number," and added that their replies all expressed the view that the scheme was working well except in three or four instances.

Group Practices

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked the Minister how many group practices existed; whether he was satisfied that sufficient loan capital was still available for them; and what amount of increase over the annual sum of £100,000 was contemplated. Mr. VOSPER stated that the total number was not known, but loans to about 100 such practices had been approved in England and Wales and the money involved was about £450,000. The fund was now increasing by over £100,000 a year, and he thought this should be sufficient.

Food-poisoning

Mr. SOMERVILLE HASTINGS (Barking, Lab.) called attention to the increase by 49% of food-poisoning incidents in 1955; and asked whether the Minister would arrange for an inquiry into the causation and prevention of such incidents. Mr. J. K. VAUGHAN-MORGAN, the Parliamentary Secretary, said the cause and means of prevention were being continuously investigated by medical officers of health, supported by the Public Health Laboratory Service and the Ministry's medical staff, and he did not think that a special inquiry was required.

Universities and Colleges

UNIVERSITY OF DURHAM

In Congregation on December 15, 1956, the following degrees were conferred:

M.B., B.S.—Elizabeth Arnott (*in absentia*), J. B. G. Arthur, S. A. Banful, B. A. Black, B. Ehrlich (*in absentia*), Alwynne Gray, N. Manson, Emily S. S. Mochrie, N. L. K. Robson, J. A. Smith, J. K. Todd, H. N. Williams.

UNIVERSITY OF MANCHESTER

The following candidates have been approved at the examinations indicated:

FINAL M.B., Ch.B.—K. S. Ansell, P. J. Barber, K. Bass, A. Booth, A. T. Cartmell, B. W. Chant, J. D. Corcoran, Joan M. Curtis, E. W. Dade, Moira P. Dillon, Cynthia M. Dixon, A. M. Easty, W. O. Goldthorp, B. Graham, E. A. G. Hamilton, G. A. Harris, D. D. Hilton, Irene Holbrook, K. Horsfield, H. C. Jennings, T. A. Lambros, Elizabeth J. Larrad, J. R. Ledwich, Brenda J. Lovejoy, K. A. Mackenzie, P. McKelvie, Elizabeth M. B. McKenzie, Edith M. Meyer, P. Morris, H. Nickson, J. P. O'Loughlin, M. A. Pacovsky, H. W. Proctor, A. R. Robertson, D. T. Robinson, J. H. Scotson, Barbara S. Seymour, D. B. Shaw, N. M. Shaw, S. A. Silver, J. J. Slater, Eleanor M. Stocks (awarded distinction in medicine), A. G. Tetlow, M. H. Vause, D. Walker, W. B. Waring, R. D. Wood, A. B. Wooltiff.

DIPLOMA IN PUBLIC HEALTH.—Cecilia F. G. Wild.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS

At a meeting of the Faculty held on December 3, 1956, with the President, Professor Stanley Alstead, in the chair, the following were admitted Fellows of Faculty: J. S. Beck, A. Smith, J. M. J. Supramaniam.

CONJOINT BOARD IN IRELAND

The following successful candidates in the recent final examinations under the Conjoint Board were admitted by the President of the Royal College of Physicians of Ireland to the Licence in Medicine and Midwifery on December 7, 1956:

Alice N. Abdelnour, N. A. Barry, D. P. Beirne, R. G. E. Benson, Erda P. Bodden, J. C. Briggs, W. O. Brinckenhoff, H. I. C. P. Browne, B. G. Curtin, J. E. L. Daly, Mary Duffy, J. R. Duksta, W. A. K. Dwyer, S. O. Ejlwunni, D. G. Elletberry, J. I. Horowitz, M. Kelly, A. Kenny, A. Kleskiewicz, Wanda Lawendel, M. N. Lynch, M. P. Moran, B. N. Murray, F. U. K. Ozeah, B. Redfern, N. S. Ryan, R. I. R. Shannon, J. H. Smyth, Zofia W. Swistak, P. D. Tanham, W. R. Watkins, Virginia M. L. Wong, J. Wyganowski.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending January 19 (No. 3) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1957					1956				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria ..	4	0	3	0		10	1	1	1	17
Dysentery ..	477	49	226	2	1	890	65	125	6	1
Encephalitis, acute	3	0		0		3	1		0	
Enteric fever: Typhoid ..	5	2	1	0	1	2	2	1	0	1
Paratyphoid ..	2	0	1 (B)	0		10	0	3 (B)	0	
Food-poisoning ..	148	25	9	2		293	24		0	
Infective enteritis or diarrhoea under 2 years ..				9	27				16	16
Measles * ..	8,175	680	852	369	215	1,957	20	65	26	35
Meningococcal infection ..	30	4	12	0	1	29	3	9	1	
Ophthalmia neonatorum ..	25	3	5	0		31	3	3	0	
Pneumonia † ..	516	31	320	14	1	796	77	332	8	
Poliomyelitis, acute: Paralytic ..	30	3	2	0	9	23	1	2	3	
Non-paralytic ..	11	4				16	2			
Puerperal fever § ..	210	35	9	1	1	245	41	9	1	2
Scarlet fever ..	693	35	83	30	18	1,035	37	109	33	32
Tuberculosis: Respiratory ..	612	79	118	27		668	77	118	23	
Non-respiratory ..	73	10	15	9		76	4	15	2	
Whooping-cough ..	2,664	121	479	13	74	1,422	54	107	69	269

DEATHS in Great Towns	1957					1956				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	1
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute		0			0		0			0
Enteric fever ..	0	0	0	0		0	0	1	0	
Infective enteritis or diarrhoea under 2 years ..	3	0	1	0	0	6	0	2	0	1
Influenza ..	19	0	1	2	0	49	9	2	2	1
Measles ..		0	0	0	0		0	0	0	0
Meningococcal infection ..		0	0				1	0		
Pneumonia ..	294	44	21	18	11	415	88	37	18	7
Poliomyelitis, acute	1	0			0	0	0			1
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	55	5	11	2	0	86	11	10	1	6
Non-respiratory ..		1	0	0	1		0	0	0	0
Whooping-cough ..	0	0	0	0	0	1	0	1	0	0
Deaths 0-1 year ..	222	32	32	13	5	231	32	37	13	13
Deaths (excluding stillbirths) ..	5,913	847	674	151	174	6,917	1,102	786	157	198
LIVE BIRTHS ..	7,746	1,135	978	230	396	8,023	1,199	1,034	230	390
STILLBIRTHS ..	209	22	29			193	28	28		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Vital Statistics

Poliomyelitis Vaccine

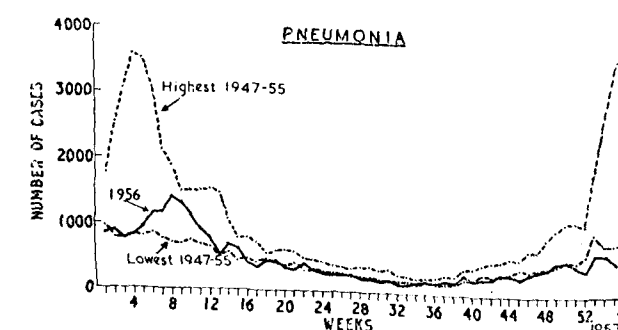
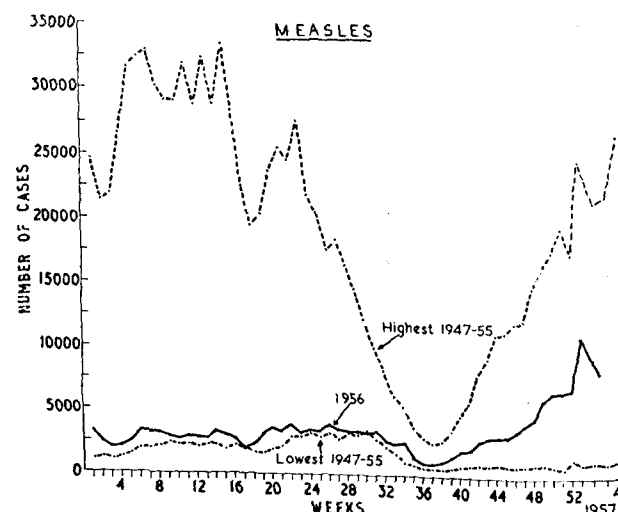
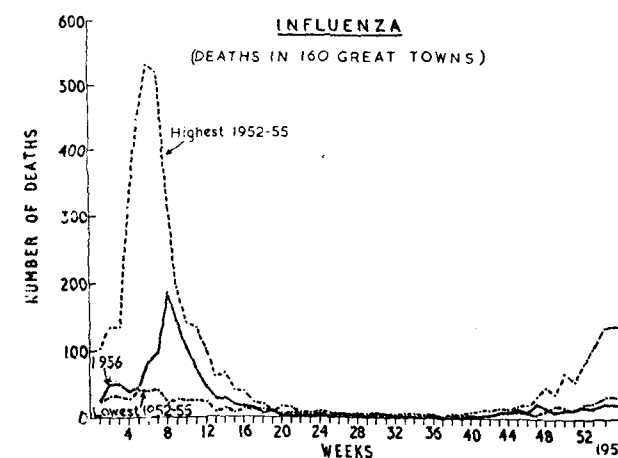
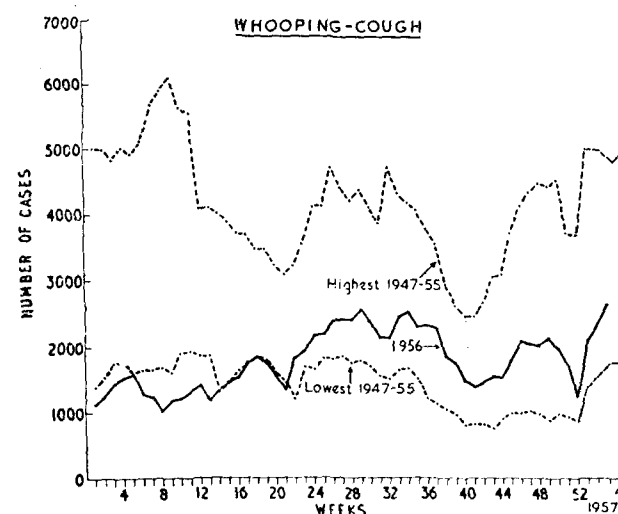
The Ministry of Health has informed medical officers of health that it is hoped distribution of poliomyelitis vaccine will begin again about the middle of this month. One large batch due last month was rejected because it was found to be contaminated, though it contained no live virus. Another batch was expected to be ready within a matter of days, but under the Therapeutic Substances Act one test has to be done again, and it will take about fourteen days to complete. Each of the next few issues of vaccine should be approximately equal to the total amount available last May—enough to give two injections to about 200,000 registered children aged 2 to 9.

Week Ending January 26

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 829, whooping-cough 3,233, diphtheria 1, measles 9,527, acute pneumonia 572, acute poliomyelitis 27, dysentery 635, paratyphoid fever 2, and typhoid fever 1.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the years 1947-55 (influenza, 1952-5) are shown thus ----, the figures for 1956-7 thus ———. Except for the curves showing notifications in 1956-7, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The largest fluctuations in the numbers of infectious diseases in England and Wales during the week ending January 19 were decreases of 1,106 for measles, from 9,281 to 8,175, 132 for acute pneumonia, from 648 to 516, and 53 for dysentery, from 530 to 477, and increases of 178 for whooping-cough, from 2,486 to 2,664, and 165 for scarlet fever, from 528 to 693.

The largest declines in the incidence of measles were 208 in Lancashire, from 2,139 to 1,931, 170 in Surrey, from 498 to 328, 147 in Yorkshire North Riding, from 443 to 296, 146 in Warwickshire, from 271 to 125, and 140 in Essex, from 813 to 673; the only large exception to a decreasing incidence was a rise of 105 in Durham, from 561 to 666. A small rise in the incidence of scarlet fever was recorded in most regions, but there were no large fluctuations in the local trends. The largest increase in the number of notifications of whooping-cough was 44 in Lincolnshire, from 31 to 75. 4 cases of diphtheria were notified, being 5 fewer than in the preceding week; 2 of the cases were notified in Birmingham C.B.

41 cases of acute poliomyelitis were notified, and these were 17 fewer for paralytic and 14 fewer for non-paralytic cases than in the preceding week. The largest returns were London 7 (Camberwell 2), Essex 6, and Lancashire 4.

The largest centres of dysentery were Yorkshire West Riding 80 (Leeds C.B. 24, Sheffield C.B. 19, Bradford C.B. 10, Keighley M.B. 10), Lancashire 73 (Stretford M.B. 24), Warwickshire 63 (Coventry C.B. 46, Birmingham C.B. 13), London 49 (Lambeth 16), Nottinghamshire 27 (Arnold U.D. 16, Nottingham C.B. 11), and Staffordshire 25 (Kingsgrove U.D. 21).

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in December was 116, compared with 120 in the previous month and 121 in December, 1955.

The numbers of cases of industrial diseases in the United Kingdom reported during December, 1956, were as follows: lead poisoning 3, phosphorus poisoning 2, aniline poisoning

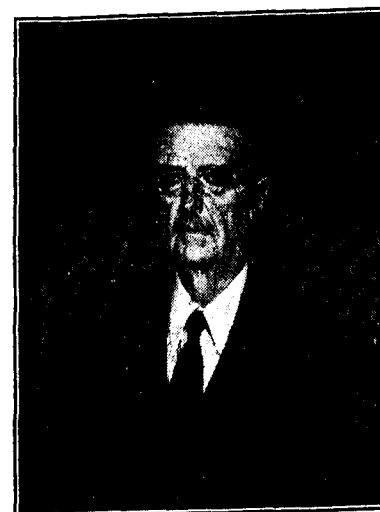
8, chronic benzene poisoning 1, anthrax 2, epitheliomatous ulceration 34, chrome ulceration 27; total 77. There was one death due to anthrax.—*Ministry of Labour Gazette*, January, 1957.

Venereal Diseases

In England and Wales during the quarter ending September 30, 1956, 1,199 new cases of syphilis were reported as attending the clinics. Of these, 208 were classified as primary, secondary, or latent in the first year of infection. 9 cases of congenital syphilis in children aged under 1 year were reported, and 127 in persons over that age. New cases of gonorrhoea numbered 5,790, of chancroid 65, and of non-gonococcal urethritis (males only) 4,066.—*Monthly Bulletin of the Ministry of Health*, January, 1957.

Medical News

Tribute to Sir Gordon Holmes.—On the twenty-second of this month Sir GORDON HOLMES, F.R.S., consulting physician



to the National Hospital for Nervous Diseases, Queen Square, will be 80. This event was celebrated at "The National" on Thursday when Sir FRANCIS WALSHE, F.R.S., unveiled the portrait of Sir Gordon Holmes which is reproduced opposite and formally presented it to the Institute of Neurology, where it will hang in the lecture theatre. The portrait is the work of Mr. HAROLD KNIGHT, R.A.

Already British neurologists have shown their eagerness to honour Sir Gordon Holmes: the guarantors of *Brain* recently sponsored a monograph comprising a selection of his published papers, which is reviewed elsewhere in this issue (p. 328). For the benefit of future neurologists it was decided to commission the portrait of Sir Gordon Holmes to serve as a permanent reminder of his genius and achievements, and the co-operation of a very large number of Sir Gordon's former residents, clerks, and students at the National Hospital was enlisted. Many of them, especially those now living elsewhere in the Commonwealth or in the United States, sent personal messages of gratitude to Sir Gordon. Sir FRANCIS WALSHE, in unveiling the portrait, paid tribute to Sir Gordon Holmes's inspiration to his pupils. "I should not be doing justice to the occasion," he said, "if I did not stress the greatness of the debt we all owe to you and now gladly acknowledge. The lessons you so incomparably taught us are as essential to the neurologist to-day as ever before: the lesson of exhaustive and accurate observation, of faithful and methodical recording, and of a mind ever alert to seek the significance of the patterns and sequences of what we observed. These are the very foundations of training in clinical medicine." The portrait was then accepted on behalf of the Institute by Sir ERNEST GOWERS, chairman of the School's committee of management.

Atlantic Crossing in Canoe.—A Hamburg doctor, Dr HANNES LINDEMANN, who arrived in New York on January 29, has sailed from Las Palmas in the Canary Islands to St. Martin in the Dutch West Indies—a direct distance of about 3,000 miles—in a 17-ft. rubber kayak, according

to a report in the *New York Times* (January 30). He started this remarkable passage on October 20 and reached the West Indies on December 30, after twice having capsized in storms. He had originally sailed from Spain. According to the *New York Times* Dr. Lindemann took no water, but his 175 lb. of concentrated food included about 130 lb. of evaporated milk and canned beer. Before the trip he deliberately fattened up to 14 st. 13 lb., and during the voyage he lost 3 st. 1 lb. He is now back to his ordinary weight of 12 st. 7 lb. The canoe was rigged with two small square-sails, fore and aft, in addition to a main-sail. Dr. Lindemann, whose age is stated to be 34, said on his arrival in New York that he wanted to carry out further research on survival at sea while in the United States.

W.H.O. Executive Board.—On January 30 the Executive Board of the World Health Organization concluded its 16-day meeting in preparation for the Tenth World Health Assembly, which opens in Geneva on May 7. The Board met under the chairmanship of Professor G. A. CANAPERIA, of Italy. The Board's most important task was the scrutiny of the director-general's proposals for W.H.O.'s programme and budget for 1958. The Board recommended a basic budget of \$11.76m., \$1m. less than the director-general asked for, but made provision for a supplementary budget up to \$1.87m., depending on the extent to which inactive member States might resume participation. Besides Albania, Bulgaria, and Poland, who recently notified their intention of resuming active membership, it was known that Czechoslovakia, Russia, and Hungary were also considering this step. The Suez crisis had led to the evacuation of the staff of the Eastern Mediterranean Regional Office to Geneva, but their return was planned for the near future. Dr. ABDOL H. TABA would succeed Dr. A. T. SHOUSA as director of this office on September 1. The International Diabetes Federation, the International Confederation of Midwives, and the World Federation of Societies of Anaesthesiologists were added to the 40 non-governmental organizations with which W.H.O. has official relations. The United Kingdom delegate on the Board was Sir JOHN CHARLES, Chief Medical Officer of the Ministry of Health.

Clinical Teachers at Oxford.—On January 29 Congregation approved new titles for clinical teachers in the medical school at Oxford. Since the school was opened many members of the staff of the United Oxford Hospitals have taken a full share in the teaching of the students, and in 1949 the University recognized their services by conferring the title of clinical lecturer on a number of them. In the past eight years, however, the number of hospital staff engaged in teaching has increased considerably, so that the Board of Faculty of Medicine put forward proposals for a revision and extension of the list of recognized clinical teachers. It is these new proposals which are now approved. Those who previously had the title "clinical lecturer" are now to be known as university lecturers; in addition, one other teacher not previously a "clinical lecturer," Dr. E. M. BUZZARD, is also made a university lecturer (in medicine). This is regarded as the senior grade. Others who take a substantial part in the teaching of the students, but hitherto have had no official recognition, are to receive the title "clinical lecturer." Eighteen names are included under the latter title. As in the case of the original clinical lectureships, no stipend from the University will be paid to the holders of these titles.

Drugs Exported.—British exports of drugs and medicines reached a new record in 1956 of nearly £36m., states the Association of British Pharmaceutical Industry. Of this total, antibiotics accounted for nearly £7m. and vitamins for nearly £3m. Sulphonamide preparations (£11m.), aspirin and synthetic antimalarial drugs (£1m. each), and barbiturates, insulin, and antihistamine drugs (around £11m. each) also contributed significantly to the total. Proprietary medicines not covered by specific headings in the Board of Trade returns amounted to over £10m. Australia and India were the leading export markets for British drugs, with purchases around £3m. Next came Nigeria, Pakistan, South Africa,

New Zealand, the Republic of Ireland, and Burma, in that order, all taking between £1m. and £2m. Sales to Egypt at £742,000 were nearly £400,000 down on the previous year, but there was a great improvement in sales to the United States of America, which at nearly £1m. easily surpassed last year's record of £660,000.

R.C.O.G.—The Royal College of Gynaecologists and Obstetricians announces the election of Sir RUSSELL BRAIN, P.R.C.P., and Dr. I. C. RUBIN, of New York, to honorary fellowships of the College in recognition of their outstanding services to medicine. Dr. Rubin became clinical professor of obstetrics and gynaecology at New York University medical college in 1948.

Statistical Prize.—A competition for the 1957 Frances Ward memorial prize of 50 guineas is announced by the council of the Royal Statistical Society. The prize is open to investigators under the age of 35 on October 1, 1957, whether fellows of the Society or not. The prize is for the best investigation, on statistical lines, of any problem bearing directly or indirectly upon economic or social conditions. Members of the Society's medical section are mentioned among those who may wish to enter for the prize. Essays should be limited to between 5,000 and 10,000 words, and the closing date is September 30. Further details may be obtained from the Royal Statistical Society, 21, Bentinck Street, London, W.1.

D.G.M.S., Air Ministry.—Air Marshal P. B. LEE POTTER, Q.H.S., has been appointed Director-General of Medical Services, Air Ministry, from February 1. He succeeds Sir JAMES KILPATRICK, who is retiring from the Royal Air Force.

Diagnostic Radiology and Radiotherapy.—The Faculty of Radiologists is now arranging courses, starting in October, for candidates for the D.M.R.D. and D.M.R.T. Further information will be found at p. 54 of our advertisement pages.

Cambridge University.—Dr. J. D. LEVER, university lecturer in anatomy, has been elected to a staff fellowship at Trinity College on his appointment as college lecturer.

Professor W. M. Mitchell is to retire from the chair of veterinary surgery at the Royal (Dick) Veterinary College, Edinburgh University. He became principal of the College in 1946, and five years later was made director of veterinary education in the University of Edinburgh. He joined the staff of the College in 1910. Professor Mitchell graduated in medicine after his veterinary training.

COMING EVENTS

Royal Eye Hospital Centenary Year.—Medical staff dinner at the Royal College of Surgeons, February 21, 7.30 for 8 p.m. Tickets (30s.) from the medical secretary, Royal Eye Hospital, St. George's Circus, London, S.E.1.

Institute of Dermatology.—Semi-permanent exhibition on "Cosmetic Dermatitis," March 4-25.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Saturday, February 9

ASSOCIATION OF CLINICAL BIOCHEMISTS: SOUTHERN REGION.—At West Middlesex Hospital, Twickenham Road, Isleworth, 2 p.m., scientific papers.

Monday, February 11

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—3 p.m., Dr. J. McClintock (New York): Thyroid Cancer (Lecture and coloured talking film); 4 p.m., Dr. Sheila Sherlock: Portal Hypertension.

Tuesday, February 12

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Mr. H. J. Seddon: Recent Work on Paralytic Poliomyelitis.

CHELSEA CLINICAL SOCIETY.—At Rembrandt Hotel, S.W., 8.30 p.m., discussion to be opened by Dr. J. A. Dudgeon and Dr. F. O. MacCallum: Prevention and Laboratory Diagnosis of Virus Diseases.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. O. L. S. Scott: Genodermatoses.

ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Lord Cohen of Birkenhead: Concept of Collagen Disease.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Mr. W. G. Mills: Dysmenorrhoea and Pelvic Pain.

Wednesday, February 13

EUGENICS SOCIETY.—At 26, Portland Place, W., 5 p.m., Galton Lecture by Professor Tage Kemp: Genetic-Hygienic Experiences in Denmark in Recent Years.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Clefts, Vesicles, and Bullae.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Mr. D. M. E. Thomas: Surgery of Primary Tuberculosis.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. H. K. Vernon: Indications for Treatment in Enlarged Prostate.

LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., special university lecture in pathology by Professor J. B. Duguid: Mechanical Factors in Atherosclerosis.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor C. L. Oakley: Food Poisoning Due to *Clostridium welchii*.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.—3.30 p.m., Sir Harold Stiles: Lecture by Mr. G. E. Mavor: Administration of Potassium to the Hypothermic Heart.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Walker Lecture by Dr. E. N. Chamberlain: British Contributions to Cardiology.

THURSDAY, FEBRUARY 14

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. W. J. Whelan, Ph.D.: D.Sc.: Synthesis and Degradation of Polysaccharides.

GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—7.30 p.m., Mr. S. A. Barnett: Freud and Instinct.

HUNTERIAN SOCIETY.—At Savoy Hotel, 7 for 7.30 p.m., annual dinner.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. S. C. Gold: Bullous Eruptions.

LIVERPOOL MEDICAL INSTITUTION.—At Liverpool Royal Southern Hospital, 2.30 p.m., afternoon clinical demonstration.

LIVERPOOL UNIVERSITY MEDICAL SOCIETY.—5.15 p.m., B.M.A. Lecture by Sir Daniel T. Davies: To-morrow's Doctor.

LONDON UNIVERSITY.—At Meyerstein Lecture Theatre, Westminster Medical School, 5.30 p.m., special university lecture in pharmacy by Dr. E. Weston Hurst: Approaches to the Chemotherapy of Virus Diseases.

NUFFIELD ORTHOPAEDIC CENTRE.—At Wingfield-Morris Orthopaedic Hospital, 8.30 p.m., Mr. J. M. Zarek: Biochemical Problems in the Reconstruction of the Femur.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—4 p.m., Hunterian Oration by Sir Ernest Finch: Influence of the Hunters on Medical Education.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION: CHILD PSYCHIATRY SECTION.—At 11, Chandos Street, W., 5.30 p.m., discussion: Psychological Factors in the Production of Epilepsy.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION: PSYCHOTHERAPY AND SOCIAL PSYCHIATRY SECTION.—At Royal Society of Medicine, 8.15 p.m., Dr. G. M. Carstairs: Preventive Psychiatry: Is there such a Thing? (Open to members and guests.)

ROYAL SOCIETY.—4.30 p.m., Dr. Honor B. Fell, D.Sc., F.R.S.: Effect of Excess Vitamin A on Cultures of Embryonic Chicken Skin Explanted at Different Stages of Differentiation.

ROYAL SOCIETY.—4.30 p.m., Dr. Margaret L. R. Harkness, Dr. R. D. Harkness, and Dr. D. A. McDonald: Collagen and Elastin Content of the Arterial Wall in the Dog.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. M. A. Partridge: psychiatry demonstration.

FRIDAY, FEBRUARY 15

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. P. F. Borrie: clinical demonstration.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. A. P. Norman: Cystic Fibrosis of the Pancreas.

INSTITUTE OF LARYNGOLOGY AND OTOLARYNGOLOGY.—3.30 p.m., Mr. K. G. Rotter: Common Diseases of the External Ear.

KENT AND CANTERBURY HOSPITAL.—8 p.m., clinical meeting.

LONDON UNIVERSITY.—At Meyerstein Lecture Theatre, Westminster Medical School, 5.30 p.m., special university lecture in pharmacy by Dr. E. Weston Hurst: Approaches to the Chemotherapy of Virus Diseases.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—10 a.m., Professor J. B. Kinmonth: Lymphoedema; 4 p.m., Dr. E. N. Rowlands: Symptomatic Injury of Peptic Ulcer.

ROYAL MEDICAL SOCIETY, EDINBURGH.—8 p.m., dissertation by Mr. I. B. MacLeod: Intestinal Obstruction.

ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.—At Royal Faculty of Physicians and Surgeons of Glasgow, 8.30 p.m., Dr. J. H. Cyriak: Backache.

SOCIETY OF MEDICAL OFFICERS OF HEALTH: WELSH BRANCH.—At B.M.A. House, 195, Newport Road, Cardiff, 6.30 p.m., Dr. Alice M. Stewart: Survey of Malignant Disease in Childhood.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Love.—On January 18, 1957, to Joan (formerly D'Arcy), M.D., D.C.H., and Lester Love, of Banstead, Surrey, a second daughter—Jane Anne.

DEATHS

Benson.—On January 12, 1957, in hospital, London, John James Benson, L.R.C.P.&S.I. and L.M., Surgeon Commander, R.N., aged 50.

Bowen.—On January 14, 1957, Owen Henry Bowen, M.R.C.S., L.R.C.P., of 146, Stag Lane, Kingsbury, London, N.W.

Crook.—On January 19, 1957, at his home, 2, Chiswick Place, Eastbourne, Sussex, Arthur Henry Crook, M.Ch., F.R.C.S.

Dal.—On January 16, 1957, at Lochhead, Dalhousie Place, Arbroath, Arthur David Ducat, D.S.O., T.D., M.B., late of Chiswick, London, W., aged 86.

Forrest.—On January 13, 1957, Alfred Wightman Forrest, M.B.E., M.B., C.M., of Myrtle Cottage, Mare Hill, Pulborough, Sussex.

Haslam.—On January 11, 1957, in London, Ivy Evelyn Haslam, M.D., M.R.C.P., aged 79.

Herrington.—On January 15, 1957, at Selsey, Sussex, Cecil Edward Eede Herrington, M.D., D.P.H., of 27, Bonnar Road, Selsey.

Honourfield.—On January 15, 1957, Sydney Comland Honourfield, M.R.C.S., L.R.C.P., of Fairway, Felixstowe Ferry, Suffolk, aged 84.

Lynch.—On December 31, 1956, at Vancouver, British Columbia, Canada, Arthur Lynch, M.D., F.R.C.S. Ed., aged 75.

Taffs.—On January 6, 1957, at Salisbury, Southern Rhodesia, Cullis Charles Taffs, M.R.C.S., L.R.C.P., D.T.M.&H., formerly of Watton-at-Stone, Herts. and Desford, Leics.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Aetiology of Microcephaly

Q.—Have there been any recent advances in our knowledge of the aetiology of microcephaly?

A.—There has been little advance in our knowledge of the aetiology of microcephaly recently. A number of authorities consider that there is a distinct type of microcephaly known as the "true" variety. Brushfield and Wyatt¹ found that approximately half of 147 cases were "true" microcephalics. Penrose² considers that the true variety, which he distinguishes as having a relatively long and narrow head, is due to a recessive gene, and Hanhart³ found 10 microcephalics who were related to each other. However, the clinical distinction into "true" and "other" cases is very difficult in practice. It is now well established that some cases are due to irradiation during pregnancy,⁴ and it has also been shown⁵ that a number of cases followed the atomic bomb explosions in Japan. It seems very likely that many other cases of microcephaly are due to environmental factors operating early in pregnancy.

REFERENCES

- 1 Brushfield, T., and Wyatt, W., *Brit. J. Child. Dis.*, 1926, 23, 265.
- 2 Penrose, L. S., *The Biology of Mental Defect*, 1954, London.
- 3 Hanhart, E., *Arch. Julius-Klaus-Stift.*, 1943, 18, 632.
- 4 Murphy, D. P., *Amer. J. Obstet. Gynec.*, 1929, 18, 179.
- 5 Goldstein, I., and Wexler, D., *Arch. Ophthalmol. (Chicago)*, 1931, 5, 591.
- 6 Plummer, G. W., *Pediatrics*, 1952, 10, 687.
- 7 Yamazaki, J. N., Wright, S. W., and Wright, P. M., *J. cell. comp. Physiol.*, 1954, 43, Suppl. 1, 319.

Precooked Meat

Q.—It is usual in some hospitals and institutions to pre-cook meat, particularly roasts, on the day before it is required and then to reheat before serving. This is done for administrative convenience. I understand that certain education authorities have forbidden this practice in the case of meals for schoolchildren. Are there any dangers in it?

A.—If cooling is slow and there is a period of warm storage, precooking meat or poultry carries a risk of *Clostridium welchii* food-poisoning. This is true not only when the precooking is done on the previous day but even when it is done only a few hours before the meat is eaten.

The spores of certain food-poisoning types of *Cl. welchii* can withstand boiling or steaming for 4 or 5 hours, and furthermore these organisms multiply rapidly at fairly high temperatures—e.g., 40–50° C. Food-poisoning strains of *Cl. welchii* may be found in a proportion of animal carriers and also on and within meatstuffs and poultry as they reach the canteen.

To overcome this danger meats should be either cooked so that contaminating spores are killed (e.g., by steam under pressure, possibly by radiation, or by the efficient roasting of small joints); or cooked in the ordinary way and eaten the same day with as short a gap as possible between cooking and eating; or cooked, cooled rapidly (within 1½ hours), and refrigerated until required. If there is no possible alternative but the last procedure, then the size of joints should be limited to not more than 6 lb. (2.7 kg.) in joints should be limited to the penetration and loss of heat; order to facilitate both the penetration and loss of heat; while bulks of steaks or soups should be distributed into shallow containers to accelerate the speed of cooling before refrigeration. The criticism that meats can be carved economically only if cold is now invalid, as new makes of machine are able to slice as thinly from hot joints as from cold.

The reheating of meat at temperatures sublethal to bacteria may serve to increase the numbers of organisms

present. It may even convert a non-infective or non-toxic dose of bacteria or toxin to one which will cause symptoms. These principles apply also to gravies and stocks.

As well as the particular hazard of *Cl. welchii* food-poisoning, there is a danger that other types of food-poisoning organisms such as staphylococci or salmonellae may develop on precooked meats if they are carelessly handled after cooking and stored at temperatures conducive to bacterial multiplication.

Standards of Growth in Adolescence

Q.—How can one decide whether an adolescent's shortness in stature represents simply a normal variation from the mean for his age, weight, and build, or a condition demanding further study? If the latter, what investigations are indicated?

A.—Unfortunately, there are at present no adequate standards for heights and weights applicable to adolescents in Britain. In any case the assessment of normality of size in adolescence must be made in relation to whether or not the adolescent spurt in growth has occurred, and not in relation to chronological age, which at adolescence means very little.¹ The best way to go about this problem would seem to be as follows: Take a radiograph of the left hand and wrist of the adolescent in question and determine his skeletal age.² Then, from the Bayley and Pinneau tables,³ see what adult height is predicted from the present height and skeletal age. The decision whether or not the predicted adult height is normal can then be made in the light of general experience.

If the predicted adult height is grossly below normal the only investigations that are likely to help would be measurements of the father and the mother to assess the factor of heredity, and a general medical investigation to make sure that the child was not suffering from any chronic disorder. Investigations in such cases, however, usually yield negative results, and at present treatment is quite unsatisfactory. It may well be that such patients have suffered from a lack of growth hormone during the growing period, but we have at present no means of determining whether or not this is the case; and growth hormone preparations are not as yet effective therapeutically.

REFERENCES

- 1 Tanner, J. M., *Growth at Adolescence*, 1955. Blackwell Scientific Publications, Oxford.
- 2 Greulich, W. W., and Pyle, S. I., *Radiographic Atlas of Skeletal Development of the Hand and Wrist*, 1950. Oxford University Press, London.
- 3 Bayley, N., and Pinneau, S. R., *J. Pediat.*, 1952, 40, 423; 1952, 41, 371.

Underclothes for All Seasons

Q.—What is the best all-the-year underclothing for a person who works in the hot atmosphere of operating theatres during the week and at week-ends attends to his smallholding in all weathers? Is the string vest the answer?

A.—Underclothing is a matter of personal preference and prejudice. Any advice given is inevitably coloured by personal experience, and any advice received contrary to "experience" is likely to be ignored; but I would say that, unless the questioner is prepared to vary his outer garments according to weather, activity, and environment, he will never be comfortable wearing the same weight and type of underclothes all the year round. This assumes that underclothes are being worn for warmth and not simply for hygienic reasons.

The thermal insulation provided by any garment is a function not of the fabric *per se* but of the air trapped in and under it; the string vest by itself traps very little air, but it allows more air than otherwise to be trapped by garments worn over it, thus improving their insulation. The "warmth" of the string vest therefore depends upon its being covered up; worn under the surgeon's apron and gown it would be almost totally enclosed (unless the surgeon leaves the back of his gown undone) and would be somewhat hot to wear in the operating theatre. But for hard work in the open, especially in a cool climate, a string

vest is the ideal garment. The outer garment must be so designed that it can be opened up widely, exposing the vest and allowing the trapped air to escape, so that when the wearer has warmed up insulation can be reduced; when he stops working and begins to cool off the outer garment can again be closed over the vest to conserve body heat. Properly used in this way, the string vest is effective and comfortable.

Hiccups in Elderly Hypertensive

Q.—What treatment is advised for repeated attacks of severe hiccups in an elderly hypertensive who has had a coronary thrombosis and a hemiplegia in the past and who now from time to time suffers from attacks of congestive failure? The hiccups come on every two or three weeks, and last a few days without intermission. Chlorpromazine and barbiturates have proved ineffective.

A.—The problem is to break the rhythmic reflex. Simple measures like sucking ice may occasionally do the trick. Sedation in this case has apparently failed. Local analgesics such as very dilute procaine solution, if swallowed, may break a reflex from the pharynx or oesophagus. Re-breathing (from a paper bag) to get a strong carbon-dioxide stimulus to respiration may help. Operations on the phrenic nerve have actually been done for this condition, but are not recommended.

Carpal Tunnel Cuff Test

Q.—What is the "carpal tunnel cuff test"? How useful is it in the diagnosis of the carpal tunnel syndrome?

A.—The "carpal tunnel cuff test," correctly styled the pneumatic tourniquet test for the carpal tunnel syndrome, was described by R. W. Gilliatt and T. G. Wilson.¹ It depends upon the theory that paraesthesiae, the outstanding complaint of patients with the carpal tunnel syndrome, are caused by ischaemia of nerve trunks. In normal persons the inflation of a sphygmomanometer cuff around the upper arm produces "pins and needles" felt mainly in the palm and in the ulnar half of the hand, never predominantly in the thumb, index, and middle fingers. In patients whose median nerves have already been rendered somewhat ischaemic by compression in the carpal tunnel the inflation of such a cuff produces "pins and needles" predominantly in the median area of the hand. In some such cases actual sensory loss develops in the median area a minute or so after the cuff is inflated.

The test is simple and useful. But, like so many other clinical tests, its usefulness is rather limited by the fact that, though it is positive in the obvious case of median compression, it is often equivocal and unhelpful in the doubtful case. A negative tourniquet test does not mean that the patient will not be cured by decompression of the median nerve.

REFERENCE

- ¹ Gilliatt, R. W., and Wilson, T. G., *Lancet*, 1953, 2, 595.

Causes of Leucopenia in Some Infections

Q.—Some infections promote a leucocytosis whereas others are associated with a leucopenia. Why should this be so, and in particular why should typhoid fever be associated with a leucopenia?

A.—On the whole, infections that cause the formation of pus stimulate a polymorphonuclear leucocytosis, while those not producing pus do not. In these cases the leucopenia—really a neutropenia, as the lymphocytes are hardly affected—may be due to three causes: diminished production of polymorphs in the bone marrow, the result of toxins or nutritional factors; increased destruction, as in some cases of agranulocytosis; or alteration in distribution. This last appears to be the most important cause, and has been shown by Menkin¹ to be due to a leucopenia-producing material which can be isolated from inflammatory exudates. Injections of this substance lead to trapping of polymorphs in the lungs,

liver, spleen, and bone marrow with a resultant neutropenia. Robertson and Yu² found that injections of filtrates of *Salmonella typhi* caused accumulation of leucocytes in the liver and spleen, and concluded that the leucopenia in this disease was due to redistribution.

REFERENCES

- ¹ Menkin, V., *Int. Arch. Allergy*, 1953, 4, 131.
² Robertson, R. C., and Yu, P. H., *Caduceus*, 1940, 19, 73.

NOTES AND COMMENTS

Congenital Cataract and Mental Defect.—Dr. GORDON DUTTON (Ottershaw, Surrey) writes: The answer to the question on congenital cataract and mental deficiency ("Any Questions?" January 19, p. 181) seems to leave out one very important point—the question of galactosaemia. As this may well be a preventable disease in that removal of lactose from the diet may lead to considerable amelioration of the signs of oligophrenia as well as regression of cataracts, and as the condition also appears to be a genetically determined syndrome, it is important to exclude it by testing for reducing substances in the urine.

OUR EXPERT replies: It is a wise precaution, as Dr. Dutton suggests, to consider the diagnosis of galactosaemia in any child with cataract and mental defect. There are a number of reasons why this diagnosis is improbable in the children in question. The cataracts are specified as congenital; in galactosaemia they develop in the first few months of life. No history is given of such prominent features of galactosaemia as failure to thrive, albuminuria, and hepatic enlargement. The medical practitioner who sent in the question had presumably performed routine tests for reducing substances in the urine on several occasions and found none. But, since the presence of galactose may be missed in routine testing for sugar in urine, Dr. Dutton's suggestion is a practical one.

Doctors with Cancer.—Dr. M. DONALDSON (Oxford) writes: The last part of the answer to the first question refers to a comparison between doctors and lay people in the delay in seeking advice when suffering from cancer ("Any Questions?" January 5, p. 57) and quotes a paper by Robbins and others.¹ Surely it is statistically unsound to accept a comparison between such different figures as 229 cases among doctors and 2,000 lay patients. Moreover, there is insufficient detail about the types of cancer grouped under "Superficial," "Thorough," and "Special" to justify any such comparison. The figures in the first half of the answer seem to contradict the conclusions. The death rate for cancer among the profession at each of the important sites is lower than among white males in general. It is improbable that this could be true without earlier diagnosis.

REFERENCE

- ¹ Robbins, G. F., Macdonald, M. C., and Pack, G. T., *Cancer*, 1953, 4, 624.

OUR EXPERT replies: The comparison between 229 patients on the one hand and 2,000 on the other is admittedly open to criticism. Unfortunately I do not know of any other or better investigation which can be quoted. Dr. Donaldson's contention that a lower death rate among doctors than among laymen could hardly be true "without earlier diagnosis" is equally open to criticism. It could easily be true if, for instance, they had better treatment, as well they might have done.

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MEDICAL ASPECTS OF BOXING, PARTICULARLY FROM A NEUROLOGICAL STANDPOINT*

BY

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Traumata arising in the course of boxing contests or during a pugilistic career are diverse in character. Whether they are to be regarded as commendably rare or as alarmingly common is a matter of opinion. It is sometimes claimed that boxing *per se* causes no more injuries or fatalities than some other sporting events. Thus Johansen (1955), of Oslo, has analysed a series of 6,057 sport injuries occurring during the period 1946-8: of these, boxing, which came tenth out of a list of 14 athletic pursuits, was held responsible for only 100 accidents (1.65%). This contrasts with the numbers attributed to skiing (1,784, or 29.4%) and to football (1,320, or 21.8%).

One important distinction, however, distinguishes boxing from most other forms of athleticism. Injuries are coincidental in other sports, but in boxing the aim and object—explicit or implied—is to render the opponent *hors de combat*. Traumata are therefore not so much regretted as regrettable.

This paper makes no plea either for or against pugilism. Amateur boxing can certainly fulfil many useful purposes, sociological as well as personal. Whether the benefits of amateur boxing outweigh the drawbacks is a question for others to decide; while some may well consider that professional pugilism forms a problem all of its own. The purpose of this communication is merely to enumerate some of the principal ill effects which have been ascribed to boxing, with particular reference to the neuro-psychiatric deterioration which may develop late in the career of a prize-fighter.

The "Knock-out"

The "knock-out"—so dramatic a spectacle in professional contests—entails the deliberate and violent production of a state of motor hypotonus and helplessness coupled with a severe—if short-lived—disturbance of consciousness. As a rule this knock-out phenomenon is the result of a violent blow to the point or side of the chin. The victim collapses heavily and remains immobile or inert for a matter of seconds or minutes. The unconsciousness produced by the knock-out blow is clinically rather unusual, being as a rule very abrupt in onset, quite short in duration, and comparatively complete in recovery. In falling, the head may forcibly strike the ground, thereby producing a second and direct injury to the head which of itself may complicate the clinical picture. If the boxer is rendered so helpless as to be unable to regain the erect stance within 10 seconds, he is "counted out." After a knock-out blow most boxers

*Being the opening paper at a discussion upon this topic held at the Chelsea Clinical Society on November 13, 1956.

are able to leave the ring within a minute or two, though ordinarily with the help of their seconds. Longer periods of powerlessness, or of unconsciousness, are by no means unknown, however.

According to the sporting fraternity there are causes of a knock-out other than a blow to the chin. Thus there is the "solar plexus knock-out," which is not ordinarily attended by unconsciousness. Jokl (1941) believed that this type of injury is identical with the experimental *Klopfversuch* studied so thoroughly by Goltz (1863). There is also a "heart knock-out" (or *commotio cordis*), which on occasion has proved fatal. Blows to the side of the neck may provoke what physicians may regard as a "carotid sinus knock-out." The physiological mechanism of this lesion has been particularly associated with the work of Hering (1927). According to Boigey (1938), the right side of the neck is more sensitive to blows than the left, so far as the carotid sinus is concerned. There are, in addition, certain types of foul punch which are apt to produce a knock-out. These include a downward chop to the nape of the neck (rabbit punch); blows "below the belt" (a euphemistic term for direct injury to the testicles, which is apt to produce much pain, shock, and occasionally unconsciousness); and "kidney punches," which have been known to provoke haematuria and even renal lacerations.

The ordinary classical knock-out blow is, however, an indirect head injury, where the point of impact of the fist is to the "button"—that is, the point of the chin. The violence is transmitted up and back to the base of the skull. The exact mechanism of the loss of consciousness and tonus has been a source of controversy. Sherrington's (1906) description deserves quotation: "The 'knock-out blow,' where the lower jaw conveys concussion to the otocyst, reduces in a moment a vigorous athlete to an unstrung bulk of flesh whose weight alone determines its attitude, if indeed a reactionless mass can be described as possessing attitude at all." It is interesting to note that Sherrington did not mention disordered consciousness. In other words, concussion of the otocyst is—in his opinion—the essential factor of the knock-out, leading to an abrupt hypotonus of vestibular origin. Somen (1913-14) also implicated the inner ear; and, according to Somen, Babinski concurred. La Cava (1952) believed that a violent blow to the mandible involves nerve structures immediately behind the angle of the jaw, and leads to an abrupt drop in blood pressure. Denny-Brown and Russell (1941) visualized a sudden stimulation of vasomotor centres leading to a temporary depression in cardiac, vasomotor, and

respiratory function. Jokl (1941), like Winterstein (1938), also imagined a condition of mechanical medullary dysfunction which may be complicated by concussion due to the direct effect of the fall.

More precisely Jokl and Winterstein (and also Gonzales, Vance, and Helpen, 1937) believed that a blow to the chin produces a two-phasic jerk which involves the medullary centres. In the first place, the clivus and the anterior edge of the foramen magnum impinge violently against the pons and upper medulla; while during the second phase, by virtue of a *contre-coup*, the medulla bounces back against the occipital bone and the posterior edge of the foramen magnum. Gonzales *et al.* described this double impact as "oscillation" of the brain.

The investigations made by Larsson *et al.* (1954), though not conclusive, are rather against any theory that a drop in blood pressure is the *modus operandi* of the knock-out, suggesting that the factors responsible are essentially concussive in type.

Other hypotheses about the cause of the knock-out include that of Flint (1920), who imagined that a distortion of the jaw mechanically impinges upon the carotid artery and so produces a temporary cerebral anaemia. Pfeiffer (1922) implicated a mechanical and short-lived obstruction of the jugular vein.

Amnesias due to Boxing

Just as different types of knock-out can be isolated, so too one can identify a number of different types of amnesia or loss of memory in association with boxing. Thus there may be a period of retrograde amnesia immediately preceding the spell of unconsciousness due to a knock-out. Sometimes there is a more lengthy period of retrograde amnesia, so that the boxer afterwards has no recollection whatsoever of any events of that particular contest. Indeed, he may not be able to remember that the fight even began. This amnesia is of course permanent. Then there are the anterograde amnesias where the pugilist goes on fighting after a knock-out, but without subsequent recollection thereof. This is the groggy-state automatism. Quite independent, of course, is the gross day-to-day memory-defect of the dementing punch-drunk victim. These phenomena are described below.

Other Injuries from Boxing

It does not come within my province to describe in detail the various surgical injuries which have been reported as consequent upon amateur or professional boxing. Some of them are admittedly quite rare, such as ruptured muscles, fractured arm, arteriovenous aneurysm, direct damage to a single nerve—for example, the facial nerve or the long thoracic nerve of Bell (the "commotio nervi" of Jokl). Quite unspecific is the occurrence of bouts of vomiting ("athlete's sickness") which may follow any violent physical exertion. Other injuries are so commonplace as to constitute the ordinary occupational marks of an experienced pugilist. Here belong such physical signs as the cauliflower ear, the flattened nose, hypertrophied superciliary ridges, and arthritis of the first metacarpo-phalangeal joint.

Injuries to the eyes are much more serious and more variegated in character. They have been well described by Doggart (1951, 1955) in this country and by Favory and Sédan (1951) in France. Just how common they are in the course of a boxing career has not been made clear. Among the injuries listed by Doggart are, first, damage to the outer eye. Here belong trauma to the conjunctiva and to the cornea, folding or rupture of Descemet's membrane, and scleral rupture. Secondly, a great diversity of lesions of the inner eye may occur. These include tears of the iris, perhaps involving the sphincter muscle of the pupil. Persistent hypotony may result from lesions of the ciliary body. Chronic iridocyclitis may develop, and go on to a phthisis bulbi. Accommodation may be paralysed. The lens of the eye

may be subluxated or dislocated. Cataract is not uncommon. Haemorrhage into the vitreous may take place, and, though it often resolves satisfactorily, it may lead to a retinitis proliferans. Retinal detachment, which may be bilateral, is a disastrous complication, for it is only rarely amenable to surgery. Cystic and pigmentary changes at the macula and retinal or choroidal haemorrhages may also occur.

Doggart draws special attention to irregular patchy choroidal degeneration in boxers, a feature which he speaks of as "cauliflower choroids." Optic atrophy, avulsion of the optic nerve, haemorrhage into the nerve sheath, and recurrent congestive glaucoma are among some of the other disastrous sequelae that have been described as due to boxing injuries. Doggart finally enumerates injury to the neighbouring structures: fractures of the orbit, periosteal thickening, orbital emphysema, damage to the lacrimal gland or duct. Implication of any of the ocular muscles may occur, especially the superior and inferior obliques.

Boxing Fatalities

Injuries sustained in the ring have ended fatally. Just how the recorded figures strike one depends mainly upon the prejudices and emotions of the reader. Thus, Blonstein and Clarke (1954) have spoken of six deaths over the course of seven years' experience—all in the course of amateur boxing. Kaplan and Browder (1954) have had 26 years' medical experience of the professional ring and have assisted at the necropsy study of five cases. Jokl (1941) went into the published statistics in some detail. He said that Flint (1920) had stated that 124 fatal cases had been recorded up to that time. Since then Jokl had been able to collect another 41 cases between 1920 and 1938. According to Steinhaus (1950b), in the four years prior to 1950 42 professional boxers and 22 amateurs had died from occupational injuries. While the total to the end of 1956 is uncertain, we can say that, up to 1950, at least 207 fatalities had been recorded.

Most of the deaths were due to subdural haemorrhage; some to intracerebral bleeding. At times a heavy fall on the back of the head in the ring was held responsible, rather than blows to the face by a gloved fist. In some cases necropsy demonstrated an innate and unsuspected thinness of the cranial bones. The youthful age of some of the victims is striking—for example, 16 years (case of John Shoddy, 1951); 15 years (Weimann, 1931; Berg, 1933; Kappi, 1938), and 13 years (case of David Zimmerman, 1951). Quite a number of these fatalities had occurred in amateurs and not professionals. In some of them, death had occurred from a blow struck in the first round of a contest.

Besides these deaths from haemorrhage, there are the rarer cases of "reflex death" and "fatal commotio" which may or may not be associated with status thymolymphaticus.

The Punch-drunk State

To a neurologist the chief interest centres in those experienced boxers, whether amateurs or professionals, who have undergone gradual physical and mental deterioration as a direct accumulated result of their careers. This is the condition popularly termed punch-drunkness. We do not know who it was first coined the term "punch-drunk." Probably it was a layman. Its introduction into the medical literature dates from the paper by Martland in 1928. Since that time it has established itself in medical terminology, and a not inconsiderable literature has developed. The term has also become well known to the laity, and in sporting circles certain pejorative—almost derisory—connotations have become attached both to this particular word and to its synonyms "punchie," "goofy," "slug-nutty," "paper dolls," "stumble-bum," and "slap-happy." For such reasons attempts have been made to introduce a more esoteric and less offensive expression. Thus we have "traumatic encephalopathy" (Parker); "traumatic encephalitis" (Ravina); "dementia pugilistica" (Millsbaugh); "chronic brain injury after boxing" (Bøje). If we really require a suitable scientific alternative to "punch-drunkness" we may perhaps adopt the

term "chronic progressive traumatic encephalopathy of boxers."

Up to date, my own neurological experience has comprised a series of 69 cases of chronic neurological disease in boxers. Many of these—perhaps the great majority—should be looked upon as examples of punch-drunkness, either early or well established. In only a comparatively few cases does legitimate doubt occur about the possibility of there being some coincidental and non-related nervous or mental disease—for example, epilepsy; psychopathy; presenile dementia; cerebral arteriopathy.

The details of the boxing careers in punch-drunk patients are significant. Punch-drunkness is much commoner among professionals than among amateurs. It is commoner in second-rate or third-rate performers than in the intelligent scientific exponent with a championship title. It is very rare in coloured boxers. As fighters, the punch-drunk ex-pugilists have been slow on their feet rather than nimble, and notorious as being able to "take it." They can perhaps be looked upon as "sluggers" rather than scientific boxers. Punch-drunk states have been found in fighters of all weights, but most characteristically in small men who had not been particular about the size of their opponents, having often taken on contestants heavier than themselves. There is a correlation between the degree of cranio-facial marking and the intensity of the punch-drunk syndrome. The sum total of contests is important, as well as the number of occasions upon which the boxers have been rendered unconscious. Being "knocked out on the feet" is perhaps just as significant as being floored.

Of special aetiological importance is that humbler side of boxing where the contestant travels in fairs in the boxing-booth (or "blood-tub"), taking on all-comers at any weight. Almost as characteristic is the story of the boxer who eventually gives up the ring, having failed to make the grade, later to become what they call a "punch-bag"—that is, one of a team of sparring partners to a first-class heavyweight. A typical story is that the boxer, after a promising early career in the ring, begins to slow up; to be knocked out more often; to win fewer contests; and to be seedy for increasingly longer periods after each affray. Most characteristic of all is the admission on the part of the boxer that he finally abandoned the ring because of his wife's increasing disapproval of his career.

The symptoms and signs of a punch-drunk state are variegated, but there are certain clinical features which underlie all the diverse patterns of the disease. As a rule, gradual evolution of mental and physical anomalies marks the insidious onset of the encephalopathy. Among mental symptoms there is the slow appearance of a fatuous or euphoric dementia with emotional lability. The victim displays but little insight into his deterioration. Speech and thought become progressively slower. Memory deteriorates considerably. In Service experience there is a falling-off both in efficiency and in conduct. There may be mood-swings, intense irritability, and sometimes truculence leading to uninhibited violent behaviour. Simple fatuous cheerfulness is, however, the commonest prevailing mood, though sometimes there is depression with a paranoid colouring.

From the clinical standpoint, the neurologist may encounter almost any combination of pyramidal, extra-pyramidal, and cerebellar signs. Tremor and dysarthria are two of the commonest findings. In an earlier paper upon this topic (Critchmore, 1949) three or four commonly recurring syndromes lay within the punch-drunk state were enumerated. Thus one could isolate a syndrome reminiscent of general paralysis; and another which closely resembled disseminated sclerosis; and a third where differentiation was necessary from a frontal lobe tumour. This paper was mainly based upon wartime experience. Since the war one has been impressed with the frequency, in civilian practice, of types of punch-drunkness in which pallid and striatal defects are conspicuous. Here the clinical combination of a mask-like face, slurred monotonous speech, extrapyramidal rigidity, and tremors of the

arms and head constitutes a syndrome which superficially resembles a post-encephalitic Parkinsonian state.

The foregoing constitute the clinical findings in cases of punch-drunkness. The victim, as a matter of fact, may spontaneously admit to but few disabilities, if any at all. Here, then, is evidence both of the insidious development of the encephalopathy and of the lack of awareness so characteristic of the dementing patient. He may, however, complain of such symptoms as persistent dull headache, postural dizziness, deafness, poor vision, intolerance towards alcohol, unsteady gait, and shakiness. Very occasionally periodic convulsive seizures bring the victim to the doctor. In Service medicine the punch-drunk victim is often identified quite early for other reasons—namely, in his role as a persistent offender. Delinquency therefore may be the evidence of a rapidly changing personality, associated with progressive brain damage.

Illustrative Cases of the Punch-drunk State

The following clinical notes illustrate some of the characteristics of traumatic progressive encephalopathy in boxers.

Case 1: A Punch-drunk Syndrome reminiscent of a Frontal-lobe Tumour.—A professional heavyweight who had been sparring partner to Walter Neusel, Tommy Farr, Eddie Phillips, Max Baer, Jack Hyams, and others gave his story with extreme slowness, and some dysarthria. His actual words were, "I can't think properly and I can't remember things; my speech has been getting bad for 18 months, and for the past two weeks it has been playing hell with me. I can't talk any quicker than I am now. My head goes blank at times. I get pain over my left eye nearly every morning when I wake, but if I rest it goes away, but I feel thick-headed all day long. I get dizzy but I've never lost my senses. The left ear is a bit deaf, and the sight isn't good in the left eye. I can't give my mind to reading; it makes my head worse, I just look at the illustrations."

Case 2: Incipient Punch-drunk Disability in a First-class Heavyweight.—This boxer, who was always liable to headaches after each contest, had found them more persistent in the last few months. It was noticed by others that he was becoming a little slower, and the speech somewhat thick. On the occasion of his last contest he was knocked out, and headaches thereafter became troublesome. Although the patient maintained that he felt well, he was noticeably dysarthric and slow in cerebration. There was a strong suspicion here of an early punch-drunkness and he was advised to rest. In this view the British Boxing Board of Control concurred, but the U.S. authorities dissented. They insisted on his fulfilling his American contracts, but thereafter he rapidly deteriorated both medically and professionally, and the diagnosis of punch-drunkness was ultimately agreed upon.

Case 3: Mild Case of Punch-drunkness with Dementia, Euphoria, and Dysarthria.—This man, aged 61, had fought as a professional lightweight between 1910 and 1926. He became flyweight champion of Essex. Later he went to seed and took on various female boxers, including Madame Carpentier, the world's champion lady boxer. When examined he was complaining of poor powers of concentration and forgetfulness. He would lose the thread in his conversation and had to rely on written memoranda. His mood was extremely euphoric and his speech grossly dysarthric. There was a traumatic arthritis of his thumb-joint with evidence of an old fracture. The E.E.G. was flat. The patient asserted that he would never allow his children to box, and said that "it ought to be stopped."

Case 4: Isolated Convulsive Seizure in a Professional Boxer.—? Epilepsy. ? Early Punch-drunkness.—A man aged 23, who had been a professional lightweight for about four years, had been knocked out only once. Recently, while flying from South Africa, he began to vomit in the aircraft and then lost consciousness and became convulsed. Clinical examination was negative, but the E.E.G. was abnormal, with bilateral synchronous rhythmic slow-wave

discharges suggestive of idiopathic epilepsy. He was advised not to fulfil his engagement to fight the following week; but this warning was not heeded.

Case 5: Delinquency associated with Early Punch-drunkness.—A naval rating aged 29 was sent to the medical officer with the following report from the regulating petty officer: "He has been adrift for two and a half hours . . . he has lost his respirator in a pub. When spoken to, he belched offensively and without regard. He is a general nuisance, not intelligent, a bad influence. In short, he is evil." When asked what symptoms he complained of, he hooted with laughter and said in a grossly dysarthric fashion, "I've been adrift." Inquiry revealed that he had taken up boxing at 13 and that he had turned professional. He believed he had won about three-quarters of his 300-odd fights. Latterly, after some of his longer fights, he would be groggy and complain of misty vision.

Case 6: Gross Delinquency in a possible mild case of Punch-drunkness.—A featherweight professional boxer aged 27, at one time sparring partner to Seaman Watson, was seen in 1942. In 1937 he had been charged with inflicting grievous bodily harm, but was acquitted. He entered the Service in 1940, and promptly went adrift for 24 hours and then deserted for 14 days. After serving 90 days' detention he almost at once deserted for 21 days. Later he deserted a third time, and was convicted of theft, going to gaol for three months. Thereafter he deserted for seven weeks and married a woman he had met the day previously. He left her immediately after the ceremony and never saw her again. Since then he was charged with a fourth term of desertion. His medical state comprised: headache, poor memory, a tendency towards losing himself in familiar environments, depression, and intolerance towards alcohol.

Case 7: Recurrent Attacks of Hysterical Blindness associated with a Punch-drunk State.—A former bantam-weight champion of Wales and of the West of England aged 27 had been knocked out some 60 times in all. He gave up the ring in 1938 after a fight on account of failing eyesight and hearing. The first attacks of blindness followed a vitriol-throwing incident when he tried to rescue a prostitute from some low joint. He had met her a few days before and had, he thought, persuaded her to go straight, and had given her her fare home. Another attack of blindness took place when he narrowly escaped being run down by a lorry. He suddenly lost his eyesight once again in the naval barracks, and he was examined two weeks later in the R.N. Hospital, Chatham, showing all the dramatic characteristics of a case of hysterical blindness. His vision suddenly returned, but it disappeared once again when he received an anonymous letter impugning the fidelity of his wife.

Case 8: Striatal Type of Punch-drunk Syndrome.—This man, aged 27, began to box at the age of 16 and turned professional. He fought about 200 contests as a bantam-weight, sometimes two or three times a week. Later he appeared in boxing booths, for it was becoming increasingly obvious to him that he was deteriorating. About this time—that is, when aged 27 years—he was rejected at the recruiting office, and he realized then that his sight was poor and that his gait was unsteady. Three months later his hands became tremulous. His symptoms increased up to a point and then remained stationary. On examination he was found to be slightly forgetful. He had a nasal type of dysarthria, his face was expressionless, and he tended to dribble. He had a tremor of the outstretched hands, some increase in muscle tonus, and slight but definite ataxia. Tendon-jerks were increased and there was a right extensor response. The gait was titubant, short-stepped, and stiff.

Case 9: Cerebellar Type of Punch-drunkness, reminiscent of Disseminated Sclerosis.—This man, aged 37, was a professional boxer between the ages of 21 and 31. Successful at first as a lightweight, he deteriorated and took on opponents out of his weight class. He did not think he came to much harm until a particular fight in the Albert Hall when—being distracted by a spectator calling out his name—he was knocked down. He got up after a short count and was floored a second time. This state of affairs

went on again and again, and though he finished the fight he subsequently remembered very little of what happened. His symptoms consisted of progressively increasing tremor and clumsiness of the right upper limb. Examination revealed a slight dysarthria, bilateral intention tremor, increased tendon-jerks, but flexor plantar responses. Appropriate tests brought to light a mild degree of intellectual deterioration.

Case 10: Striato-cerebellar Type of Punch-drunkness.—A professional welterweight, aged 27, whose record had gradually deteriorated, had been knocked out three times. In 1948 (aged 24) after losing his temper with his fiancée, he started to tremble all over. This subsided except in the left hand, where the tremor persisted with increasing amplitude. After six months it involved the head, and his leg began to drag. His articulation altered. Examination revealed a fine tremor of the head, which was held in a curious retracted posture. The speech was dysarthric and staccato. On the left side there was an unusual type of intention tremor, associated with dysidiadochokinesis. The gait showed a steppage abnormality of the left leg. Both plantar responses were extensor in type.

Case 11: Cerebellar Type of Punch-drunkness in an Amateur Boxer.—A man aged 39, who had been four times schoolboy champion of Great Britain, began to develop tremor of the arm during the war, on which account he was invalided from the Army. His symptoms increased slightly and he showed an impassive, rather mask-like face; marked dysarthria; titubation of the head, with some hypertrophy of the muscles of the neck; incoordination of the arms and legs, more so on the left; with intention tremor and dysidiadochokinesis. Originally of superior intelligence, he later showed both an intellectual falling-off and a curious alteration in personality.

Traumatic Encephalopathy

The interval between the onset of a boxing career and the onset of punch-drunk manifestation is often difficult to gauge precisely, but it is usually a matter of years. In an earlier paper (Critchley, 1949) it was stated that in the case of 21 punch-drunk naval patients the interval between the taking-up of a boxing career and the development of neurological symptoms or signs averaged 16 years, with extremes of 6 and 40 years. Of great interest, pathological as well as practical, is the fact that this traumatic encephalopathy is a progressive condition. Once established it not only does not permit of reversibility, but it ordinarily advances steadily. This is the case even though the boxer has retired from the ring and repeated cranial traumata are at an end.

Neurologists have visualized this state of chronic traumatic encephalopathy as being based upon multiple minor cerebral contusions, possibly with initial pinpoint haemorrhages later replaced by a gliosis, cortical atrophy, and internal hydrocephalus. It is a matter of surprise that actual pathological verification should have been so dilatory in its appearance. At the time of the publication of my earlier paper on the punch-drunk syndromes—namely, in 1949—no necropsy material was available. Since that date there has been a report of a single case of punch-drunkness with thorough pathological study (Brandenburg and Hallervorden, 1954). The outstanding findings consisted in a rich profusion of "senile" plaques scattered throughout the shrunken cortex, especially in the frontal lobes. Although the patient was only 51 years of age at the time of death, the histological picture was that of senile dementia, or, alternatively, of an Alzheimer psychosis.

Special *in vivo* investigations of cases of punch-drunkness may indicate the existence of a cerebral atrophy. Air-studies are of particular merit here in that they may demonstrate an atrophic process, especially of the frontal lobes, with corresponding shrinkage of the white matter. Electroencephalography has been widely practised of late in cases of punch-drunkness. The findings have mainly revealed a non-specific type of disordered cortical rhythm, indicative merely of an atrophic process.

This particular method of investigation is of importance in that it might conceivably prove to be a more delicate index of cerebral dysfunction than clinical study. It might lend itself to a screening procedure. By submitting boxers to this test, before a contest and after a contest with or without a knock-out episode, information of value might perhaps be forthcoming. The test could furthermore be applied to experienced pugilists of all types—that is to say, those who proclaim themselves entirely fit and who display no mental or physical deterioration, as well as those who show symptoms or signs of incipient or advanced encephalopathy. A certain amount of electroencephalographic evidence is already to hand.

Although E.E.G.s were carried out on a number of my Royal Naval cases of punch-drunkness during the war, the literature on this particular topic starts with the paper by Guillain, Sévileano, and Fandré (1948), who observed pathological E.E.G. records in two cases. Thereafter the literature contains many references to electroencephalographic data in boxers. Though of interest, and not without promise of ultimately affording diagnostic assistance, much of the available material is contradictory (Titeca, 1952; Busse and Silverman, 1952; Temmes and Huhmar, 1952; Taylor, 1953; Marquardsen, 1954; Larsson *et al.*, 1954; Kaplan and Browder, 1954; Blonstein and Clarke, 1954; Kampus and Grote, 1956).

From one's personal experience, taken in conjunction with the published evidence, the electroencephalographic aspects of the boxing problem can perhaps be summed up by saying that: (1) minor non-specific anomalies are common in the records of experienced boxers; (2) such findings are commoner and often more intense in cases of punch-drunkness; but, (3) the E.E.G. record is at the present time a less sensitive index of punch-drunkness than is the clinical evidence, for symptoms and signs may be present at a time when the E.E.G. records are within the limits of normality; and (4) a return to a normal state in a series of E.E.G. records taken in a particular patient cannot be regarded as a *restitutio ad integrum*, whether physiological, anatomical, or clinical.

"Groggy States"

Intermediate between the knock-out (the most acute manifestation of cerebral dysfunction among boxing injuries) and the punch-drunk state (the most chronic among the disorders) is a condition which is referred to in lay terms as the "groggy state." Here, as the result of severe battering sustained during a particular contest, the victim develops a mental confusion with subsequent amnesia, together with an impairment in the speed and accuracy of the motor skill represented by the act of boxing. The affected pugilist may continue to fight, but in an "automatic fashion," to use a lay expression again. The constellation of movements needed for defence and attack takes place at a more inferior level of consciousness, without there being a vigilant awareness of each muscular movement. Unlike many motor skills—for example, driving a car, typing, playing a musical instrument—the motor pattern of a pugilist in the ring depends upon imponderable circumstances—that is, the actions of the opponent. Consequently the movements cannot be carried out with full efficiency unless awareness is intact. Each movement is much more a willed deliberate volitional act than, say, in the case of a skilled typist or pianist, who can go through a set repertoire of actions while thinking and talking of something quite different.

In the groggy state this process of active attention is at fault, with resulting falling-off in the quality of performance, more especially in attack.

Even to an unpractised eye it may be obvious that the patient in a groggy state is making feeble and uncoordinated movements, that his limbs are ataxic, and that he is inefficient and vulnerable. He is, as they say, "out on his feet." At this point the referee may stop the fight. The victim may remain indisposed for the next few days, with headaches, postural dizziness, and imbalance. During this time

he may be morose and taciturn, muddled regarding recent events, and perhaps tremulous and dysarthric. This condition passes, and the boxer ordinarily returns to his *status quo ante*. It is arguable, however, that he has suffered a certain cerebral affront, for one groggy state is apt to follow another with succeeding contests. The suggestion, indeed, that an accumulation of groggy states leads to a permanent punch-drunk clinical picture is not to be considered far-fetched. Perhaps, then, we could translate the layman's term "groggy state" into "remitting commotio cerebri."

Illustrative Cases of the Groggy State

The following case notes illustrate the increasing grogginess which may follow a particular contest or series of contests.

Case 12.—This man would feel groggy for days after each contest, with his eyesight getting worse temporarily each time. He had particular difficulty in judging distances. This is why he eventually packed up boxing.

Case 13.—"I seemed to go dead, and not to feel the punches. It would now take me two or three days to get over each fight." (Ex-welterweight champion of the West of England.)

Case 14. Latterly he took longer and longer to recover from each fight, because of headaches, defective memory, and impaired speech. His wife did not approve of his boxing and persuaded him to give it up. (Ex-lightweight professional boxer with punch-drunkness in which headaches and irritability were conspicuous.)

Case 15.—A former welterweight champion of Lincolnshire, aged 30, used to recover from his contests promptly and has even boxed on two consecutive days. Latterly he would remain stiff for some days after each contest. After two years his record deteriorated, especially when he got to London, where he found the style of boxing was different, with more "in-fighting." He stopped boxing for four years, but took it up again when he joined the Navy. In his last contest he went down several times in the fourth round, but he finished the fight "not feeling right" . . . his "limbs felt like rubber" and he complained of a thick head and a sore neck, and he could not sleep. Early morning headaches followed, with severe postural giddiness, irritability, tearfulness, poor memory, fatigue, and lack of interest. Examination brought out that his emotivity and a gross dysarthria were evident.

Case 16.—A man aged 29, never quick on his feet, he could always "take it," and ordinarily "did twelves" (as he put it when questioned on the length of the contests he fought). He packed it up because of his headaches. After one fight he became so unsteady on his legs that he was accused of being drunk. Towards the end of his boxing career he would feel queer for about a week after each fight.

Case 17.—A man aged 28; two weeks before entering hospital he staggered so much in the ring that the audience howled him down and the promoter declared him drunk. In hospital he presented a picture somewhat resembling disseminated sclerosis. Three weeks after his discharge from hospital he fought Paolino in Paris for the heavyweight championship of Europe (this was in 1932), but he was knocked out at the first blow and the crowd stormed the ring.

Case 18.—This man, aged 25, had been four times middleweight champion of Wales and sparring partner to Jack Petersen and to Len Harvey. About six months before coming into hospital he received some blows from Jack Petersen. He had to fight again two days later, but gave up after three rounds because of weakness in his arms. His next fight was a fortnight later; he gave up after the second round because of weakness and tremulousness of his limbs. His manager thought he was drunk. A doctor told him never to box again. He seemed to improve after a month's convalescence in Swansea, but, still being unsteady, he went into the National Hospital, where he was found to be punch-drunk.

Case 19.—A heavyweight aged 31 was knocked out "through the ropes" in 1945 and was dazed for the next 24 hours. The right leg was found to be weak immediately after his fight and continued so. Within the day or two following this same fight his right hand began to shake: the left hand started to tremble some six months later. He was hospitalized seven years later, a typical severe punch-drunk.

Case 20.—A delinquent mild punch-drunk, interviewed in prison, gave up boxing at the age of 20 because he was not feeling himself. He felt drunk although he had taken nothing in the way of alcohol: his head would be in a swim after each fight.

Case 21.—A Royal Navy welterweight, aged 22, matched against a tougher opponent, was struck heavily over the heart in the second round, causing him to feel dizzy or groggy. Shortly after he got a severe blow to the side of the head, flooring him for a count of nine, when he rose and resumed the fight. He could remember vividly every incident up till then; but after that his memory was a blank. Apparently he finished the second round, and in the third round he received heavy punishment, being knocked down 10 times, striking his head on the floor more than once. His next recollection is being on the deck of his ship about an hour later, feeling dizzy and sore about the stomach. Two weeks later he became ill with headaches, vertigo, and vomiting, and was hospitalized. Investigation showed old blood-staining of the C.S.F.

Conclusions

There is much in boxing to interest a practising neurologist, and special attention should be focused upon (1) the phenomenon of groggy states as occurring during or after a contest, and (2) the condition known as traumatic progressive encephalopathy (or punch-drunkness).

Owing to the extreme paucity of pathological data, it is highly desirable that opportunity should be afforded neuropathologists of studying the appearances in the brain of punch-drunk patients.

There is a scope for further study of boxers by electroencephalographic as well as clinical techniques, at all stages: that is, early as well as late in their careers; and before and immediately after a contest, especially if a knock-out has occurred.

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REFERENCES

- Blonstein, J. L., and Clarke, E. (1954). *British Medical Journal*, 2, 1523.
 Boigey M. (1938). *Léçons et traumatismes sportifs*. Paris.
 Brandenburg, W., and Hallervorden, J. (1954). *Virchows Arch. path. Anat.*, 325, 680.
 Busse, E. W., and Silverman, A. J. (1952). *J. Amer. med. Ass.*, 149, 1522.
 Critchley, M. (1949). "Punch-drunk syndromes: the chronic traumatic encephalopathy of boxers." from *Hommage à Clovis Vincent*. Maloine, Paris.
 Denny-Brown, D., and Russell, W. R. (1941). *Brain*, 64, 93.
 Duggart, J. H. (1951). *Trans. Ophthal. Soc. U.K.*, 71, 53.
 — (1955). *A.M.A. Arch. Ophthal.*, 54, 161.
 Favory, A., and Sedan, I. (1951). *Arch. Ophthal.*, 11, 429.
 Flint, O. (1920). *Boxer*. Leipzig and Zürich.
 Guillaumin, G., Sévillano, E., and Fandré, M. (1948). *Bull. Acad. nat. Méd. (Paris)*, 132, 394.
 Goltz, F. (1863). *Virchows Arch. path. Anat.*, 24, 1.
 Gonzales, T. A., Varce, M., and Helpen, N. M. (1937). *Legal Medicine and Toxicology*. Appleton-Century Co., New York.
 Hering, H. E. (1927). *Die Karotissinusreflexe auf Herz und Gefässe*. Dresden and Leipzig.
 Johansen, O. (1955). *Idrett og skader*. Oslo.
 Joki, E. (1941). *The Medical Aspects of Boxing*. Van Schaik, Pretoria.
 Kaplan, H. A., and Browder, J. (1954). *J. Amer. med. Ass.*, 156, 1138.
 La Cava, G. (1949). *Brux. méd.*, 29, 3233, 3304.
 — (1952). *Ibid* 32, 61, 120.
 Larsson, L. E., Melin, K. A., Nordström-Öhrberg, G., Silfverskiöld, B. P., and Öhrberg, K. (1954). *Acta psychiat. neurol. scand.*, Suppl. 95.
 Marquardsen, J. (1944). *Ibid.*, 29, 30.
 Martland, H. S. (1928). *J. Amer. med. Ass.*, 91, 1103.
 Pampus, F., and Orvic, W. (1956). *Arch. Psychiat. Nervenkr.*, 194, 152.
 Pfeiffer, K. (1922). *Der Faustkampf*. Leipzig.
 Sherrington, C. (1906). *Integrative Action of the Nervous System*. London.
 Somen, H. (1913-14). *Paris méd.*, 13, 54.
 Steinhaus, A. H. (1950a). *Look*, 14, 35.
 — (1950b). *Amer. Forum of the Air*, 13, 3.
 — (1951). *J. Amer. Ass. Hlth.*, 22, No. 8, 12.
 Taylor, R. B. (1953). *British Medical Journal*, 1, 200.
 Temmes, Y., and Huhmar, E. (1952). *Acta psychiat. neurol. scand.*, 27, 175.
 Titeca, J. (1952). *Bull. Acad. Méd. Belg.*, 17, 507.
 Winterstein, C. E. (1938). *Med. Wld (Lond.)*, 49, 427.

FURTHER OBSERVATIONS ON THE MEDICAL ASPECTS OF AMATEUR BOXING

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The medical aspects of boxing continue to attract attention in both the medical and the lay press. Recent attacks on the sport (Duggart, 1955; Summerskill, 1956) have aroused further controversy, and the reports of death (Rottgen, 1955; Pampus and Müller, 1956; Müller, 1956) and of possible brain damage (Taylor, 1953; Geller, 1953; La Cava, 1954; Brandenburg and Hallervorden, 1954; Soeder and Arndt, 1954; Pampus and Grote, 1956) repeatedly raise the question of the advisability of allowing youths to indulge in what would appear to be a dangerous and unjustifiable recreation. We therefore thought it worth while to review the boxing injuries, especially those to the head, encountered in the London Amateur Boxing Association contests during the past season, as an extension of a previous report (Blonstein and Clarke, 1954).

Material

During the period of seven months (October, 1955, to April, 1956, inclusive) there were approximately 300 tournaments representing about 3,000 boxing contests under the control of the London Amateur Boxing Association, and these involved almost 5,000 boxers. According to the medical welfare scheme instituted two years ago (Blonstein and Clarke, 1954), all contestants who have been concussed or have suffered lengthy amnesia are rested for at least one month, the exact period depending upon the estimated severity of the injury. It was therefore possible to trace with ease all the boxers who had been knocked out during the season. Those who had been more severely concussed or who had been knocked out more than once were selected for special study. There were 29, and their ages ranged from 17 to 26 years; 23 had been knocked out twice and 6 had been severely concussed on one occasion.

Method

First an attempt was made to classify the boxers according to the severity of their injury, as judged by events in the ring. The following groups could be identified.

Group I: "Out on the Feet."—Following a head blow the boxer was unable to defend himself, was obviously dazed, and staggered about the ring or rested on the ropes.

Group II: Mild Knock-out.—Those who were knocked down and could not rise before the count of 10, but who, although dazed, were not unconscious for more than a few seconds.

Group III: Moderately Severe Knock-out.—Those rendered unconscious, and carried to their corner, where they quickly recovered.

Group IV: Severe Knock-out.—Those remaining unconscious for periods greater than Group III.

This classification accounted for only 26 of the 29 cases, for at times there was a disparity between the observed actions of boxers and the amnesia estimated subsequently.

As the behaviour of the boxer in the ring is obviously of considerable importance, a grouping based on this rather than total traumatic amnesia alone was selected. Both, however, were recorded in every instance.

Each of the 29 boxers was given a careful neurological examination after the responsible contests, and an electroencephalogram (E.E.G.) was carried out. Seven had the E.E.G. within two weeks of the knock-out and 22 had it three to four weeks afterwards. The difficulties in arranging this examination for amateur boxers have been discussed previously (Blonstein and Clarke, 1954); a recording immediately after a bout was never practicable.

Results

The 29 boxers represented 0.58% of all boxers active during the 1955-6 season, so that, roughly speaking, in each 100 contests there was one such person involved. Their distribution according to weight was: heavyweight, 4; light heavyweight, 7; middleweight, 5; light middleweight, 4; welterweight, 2; light welterweight, 3; lightweight, 1; featherweight, 1; bantamweight, 1; flyweight, 1.

As would be expected, the boxer's weight varied directly with the frequency and severity of knock-outs. The grouping relative to the severity of the knock-out in 26 cases was: group I, 6 cases; group II, 7 cases; group III, 7 cases; and group IV, 6 cases.

In these youths the central nervous system was normal when examined soon after the head injury and no E.E.G. abnormalities were detected in any of them.

The three cases that could not be included in the suggested classification are described individually because they illustrate some of the varieties of memory loss encountered.

Amnesia may occur without an obvious knock-out. One boxer completed his bout and was given the decision on points, but in the dressing-room he complained of headache and had amnesia for the whole contest and its sequelae. On examination the left pupil was larger than the right, but the nervous system was otherwise normal. He had received several blows to the jaw, but had not fallen, and his condition during the contest had given rise to no comments or anxiety, despite the fact that he had no memory of events in the ring. His E.E.G. was normal, but he was not allowed to box for one month. This case points out the disparity that may exist between the boxer's behaviour and his subsequent amnesia.

Sometimes the head blows may be trivial but the combined amnesia (retrograde and post-traumatic) may be disproportionately large. In the second case, a youth who was unconscious for only a few seconds during his contest was confused and forgetful the next day. Instead of going to his usual place of work he travelled to a different town. The nervous system and E.E.G. were normal. There is reason to believe that his lengthy amnesia was in part "functional" in origin.

A delayed loss of consciousness has been observed, and in the following case it closely resembles that described by Denny-Brown (1941). A boy was "out on his feet" at the end of the first round and the contest was stopped. He complained of double vision on looking to the left, but had a shower and his refreshments. About half an hour later he became unconscious and was removed to hospital, where he regained consciousness 12 hours later. There were no abnormal neurological signs and the E.E.G. was normal. This boy made a complete recovery, but has been advised to give up boxing permanently.

The E.E.G. was therefore normal in each of the 29 boxers and the neurological abnormalities were extremely few. If loss of memory alone in the 26 cases is considered without reference to the suggested grouping, three youths had retrograde amnesia of up to one hour and in seven the post-traumatic amnesia lasted from half an hour to three hours. The maximum period of unconsciousness, however, was half an hour.

During the 1955-6 season there were no skull fractures, and injuries elsewhere in the body were few. One boxer suffered a spontaneous pneumothorax, another fractured a fibula, and there were 11 cases of fractured metacarpals. Cuts of the supraorbital ridges and cheeks occurred approximately twice in every tournament; not a single case of fractured nose or serious eye injury has been reported.

Discussion

Medical control of boxing, both amateur and professional, is of vital importance if the sport is to continue, and recent reports indicate the prophylactic measures used or suggested in various countries (Labignette, 1954, in France; Egan, 1954, in the U.S.A. (see also Ferlino, 1952); Schwarz, 1955, in East Germany; Henner, 1955, in Czechoslovakia; Graham, 1955, in Great Britain; Medved, 1955, in Yugoslavia). We are concerned here with the amateur boxer only, and it is obvious that youths at school, at work, or in the armed Forces who are indulging in the sport as a pastime rather than as a profession must be given the maximum of protection; an impeccable medical service is therefore mandatory.

We have described elsewhere the scheme adopted by the London Amateur Boxing Association (Blonstein and Clarke, 1954), and it would appear from a survey of a season's boxing that damage to the brain, claimed to be severe by most opponents of the sport, may not be a serious objection when medical supervision is adequate. By clinical and electroencephalographic means we have detected no acute or subacute disabilities resulting from boxing blows to the head, and injuries elsewhere in the body on the whole have been few. A survey of casualties in other sport over a similar period of time would be of interest; it seems that in New York, for example, it is more dangerous to play baseball or football than to box (Gonzales, 1951).

That deleterious cerebral changes may occur in amateurs after an interval is a possibility that has by no means been excluded by this study. There have been allegations that it is inevitable; but there is in fact very little, if any, evidence to support them. There is probably more to indicate the reverse. Thus in our experience the "punch-drunk" syndrome has never been observed in amateur boxers (Blonstein and Clarke, 1954), and, furthermore, there are many men in the various professions who, although keen amateur boxers in their youth, have demonstrated by their careers that a cerebral deficit has not ensued. However, a follow-up over a long period of time has not yet been carried out in either professional or amateur boxers, so that the precise frequency of the "punch-drunk" state is unknown. On the whole it seems that the much-publicized pugilist's dementia is in amateur boxers as unlikely as the deleterious effects of "athlete's heart" in non-professional athletes.

The popular concept that each major head blow produces a petechial haemorrhage in the boxer's brain has been fostered by Martland (1928), who was one of the first medical observers to describe the "punch-drunk" syndrome. But, as Kaplan and Browder (1954) have pointed out, there is no pathological verification of this. Evidence from animal investigations (Windle, Groat, and Fox, 1944), however, suggests that a blow sufficient to induce unconsciousness, as well as heavy blows that do not, will produce histological changes in the form of cell death. It follows that if these changes take place in the human brain, repeated stimuli of the same nature will eventually bring about clinically detectable brain degeneration such as that seen in the professional pugilist after a long and misguided career (Brandenburg and Hallervorden, 1954); that a very severe closed head injury in man will produce white-matter degeneration has recently been shown by Strich (1956).

So far as the present considerations are concerned there are two objections to this assumption. In the first place, the juvenile brain, like any other young organ, can presumably adapt itself to the small amount of cell loss, if this in fact takes place. The second point is the more

important, because if there is a strict medical control of amateur boxers the possibility of extensive and repeated neuronal destruction will not exist and the argument indicting boxing on account of the cerebral end-results will therefore be groundless and unnecessary. Thus according to the London Amateur Boxing Association laws, boxers who are repeatedly knocked out, who suffer lengthy amnesias on several occasions, or who are severely concussed are excluded from further contests.

There is another aspect of the medical service, and this is to explore all possible measures that will help to safeguard the non-professional boxer. As well as our report on the use of the E.E.G. as a prophylactic aid, other authors have published their results (Ardito, 1954; Soeder and Arndt, 1954; Larsson *et al.*, 1954; Medved, 1955; Pampus and Grote, 1956). Kaplan and Browder (1954) made an extensive study of professional boxers, and they, like most other authors and ourselves, found little or no evidence of permanent brain changes. Records taken soon after a bout in which the boxer received a lot of head blows were usually normal, and a few men who were followed for up to three years whilst boxing regularly developed no E.E.G. abnormality. Permanent cerebral deficits, although they no doubt occur, seem to be very difficult to detect by the methods of investigation at present available, and are in any case probably rare. Kaplan and Browder (1954), when evaluating the relative merits of the information obtained from these investigations, arrange them in the following order of usefulness: past medical history, physical fitness, past boxing performances, and finally the E.E.G. With this we would agree, and it is obvious that a decision concerning a boy's boxing future can be reached only by considering all the available evidence.

At the moment, all the possible information concerning boxing head blows must be amassed, and observations on the amnesia of the concussed boxer is of considerable importance. The retrograde and post-traumatic memory losses are both indications of the severity of the blow (Russell and Nathan, 1946), but they must be assessed with reference to events observed by onlookers. Thus, a lengthy amnesia without the external appearances of loss of consciousness should be considered equivalent to a state where the boxer is obviously unconscious.

The grading of head blows received in the ring is not easy, and we have attempted to provide a classification that seems to include most cases of concussion. It is possible that as we acquire more knowledge some modification may be necessary, but at the moment the recording of both objective and subjective information is justified.

Much more information on boxing amnesia, however, is required, and, as well as the immediate retrograde type, the behaviour of more distant pre-traumatic memories may be important (Williams and Zangwill, 1952). It seems possible that assessment of the total traumatic amnesia will be more important than the neurological examination, the E.E.G., or other tests in detecting the first signs of the deleterious effects of boxing upon the brain—if such will ever result from amateur boxing.

The increase of medical interest in amateur boxing that is evident all over the world is of considerable importance. It is helping to eradicate the prejudices and misconceptions that dominate most discussions on the subject. At the same time, it will improve and popularize the medical welfare of youths who indulge in boxing as a recreation and in particular will protect them from chronic cerebral damage, if this can be proved to be a consequence of amateur boxing. The medical problems of the amateurs are under constant review and new knowledge acquired from the sport or from elsewhere will be made use of where appropriate.

With regard to the more fundamental objections to boxing as a sport, we have nothing to add to previous statements (Blonstein and Clarke, 1954), except to comment upon the interesting fact that the emotions said to be displayed in the ring and condemned by the opponents of boxing are often evident in their belligerent verbosity.

Summary

Boxing injuries encountered in 3,000 London Amateur Boxing Association contests during 1955-6 are assessed.

Only 29 boxers (0.58%) were severely concussed or knocked out more than once. The results of neurological and electroencephalographic examinations were normal in all. Other injuries were very few.

A classification of boxing head injuries is suggested and the importance of traumatic amnesia stressed.

Doubt is cast upon the possibility of chronic cerebral changes in amateur boxers who are protected by an adequate medical service.

In view of the limitations of clinical, electroencephalographic, and other investigations the evaluation of memory loss may be of great importance as a prophylactic aid.

REFERENCES

- Ardito, R. (1954). *Riv. Neurol.*, 24, 731.
Blonstein, J. L., and Clarke, E. (1954). *British Medical Journal*, 2, 1523.
Brandenburg, W., and Hallervorden, J. (1954). *Virchows Arch. path. Anat.*, 325, 680.
Denny-Brown, D. (1941). *Lancet*, 1, 371.
Doggart, J. H. (1955). *A.M.A. Arch. Ophthalmol.*, 54, 161.
Egan, D. J. (1954). *Med. Techn. Bull.*, 5, 102.
Ferland, F. R. (1952). *J. Amer. med. Ass.*, 150, 651.
Geller, W. (1953). *Nervenarzt*, 24, 69.
Gonzales, T. A. (1951). *J. Amer. med. Ass.*, 146, 1506.
Graham, J. W. (1955). *British Medical Journal*, 1, 219.
Henner, K. (1955). *Cas. Lek. Ces.*, 94, 859.
Kaplan, H. A., and Browder, J. (1954). *J. Amer. med. Ass.*, 156, 1138.
Labignette, P. (1954). *Concours méd.*, 76, 4204.
La Cava, G. (1954). *Dtsch. med. Wschr.*, 79, 817.
Larsson, L. E., Melin, K. A., Nordström-Ohrberg, G., Silfverkiöld, B. P., and Ohrberg, K. (1954). *Acta psychiat. neurol. scand.*, Suppl. 95.
Martland, H. S. (1928). *J. Amer. med. Ass.*, 91, 1103.
Medved, R. (1955). *Dtsch. med. Wschr.*, 80, 191.
Müller, N. (1956). *Dtsch. Z. ges. gericht. Med.*, 44, 763.
Pampus, F., and Grote, W. (1956). *Arch. Psychiat. Nervenkr.*, 194, 152.
Rottgen, P. (1955). *Med. esp.*, 34, 35.
Russell, W. R., and Nathan, P. W. (1946). *Brain*, 69, 280.
Schwarz, B. (1955). *Dtsch. GesundhWes.*, 10, 1319.
Soeder, M., and Arndt, T. (1954). *Dtsch. med. Wschr.*, 79, 1792.
Strich, S. J. (1956). *J. Neurol. Neurosurg. Psychiat.*, 19, 163.
Summerskill, E. (1956). *The Ignoble Art*. Heinemann, London.
Taylor, R. B. (1953). *British Medical Journal*, 1, 200.
Williams, M., and Zangwill, O. L. (1952). *J. Neurol. Neurosurg. Psychiat.*, 15, 54.
Windle, W. F., Grost, R. A., and Fox, C. A. (1944). *Surg. Gynec. Obstet.*, 79, 561.

A FATAL INJURY AT BOXING (TRAUMATIC DECEREBRATE RIGIDITY)

BY

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A fatal outcome from a punch on the head at boxing is fortunately a rare event, and when it does occur a sportsman who was fighting fit has been lost. The clinical and post-mortem findings in these fatal cases provide a continuous set of observations of the victim from before the beginning of the contest to the post-mortem examination. As the objective of a combatant at boxing is to punch the opponent on the head with sufficient force to drop him to the mat and cause him to remain there till he is counted out by the referee, it is evident that the victim of a "knock-out" drops because he has suffered a concussion of the brain. It is expected that the concussion will last just long enough for the count, and that recovery will be full and complete after this.

In the occasional fatal case the questions arise: has the victim died of concussion? and has he sustained additional injuries to the brain which caused his death? These are questions which could be decided by a post-mortem examination. The fatal accident also provides

the opportunity for investigating the mechanics of a punch delivered by a gloved hand on the head of an opponent who was prepared for the attack, in which the direction and the force of the punch are observed, and the condition of the victim is observed before, at the time of, and after the blow. If concussion be the cause of death, here is a complete picture of the condition. If intracranial haemorrhages have resulted from the blow, the part that these play in determining the fatal outcome can be decided. These features were well presented in the case under review.

Case History

On June 21, 1956, at an amateur boxing meeting open to boxers who had not won a trophy at an intermediate or open meeting, two entrants met for a bantam-weight—118 lb. (53.5 kg.) and under—contest. The victim of the "knock-out," Raymond Perera, was 114 lb. (51.7 kg.) and his opponent 116 lb. (52.6 kg.). Both contestants were 20 years old. The judge, Mr. A. B. Henricus, gave me his observations. The knock-out was delivered shortly after the first minute of the first round. Up to this stage the deceased, Perera, had been leading "lefts" at his opponent and the blow which knocked him out was the first struck by his opponent. It was a right cross which caught Perera on the left side of his chin. Perera appeared to be stunned by the impact, and gradually went dizzier, and slowly slumped down till his bottom reached the canvas. Then he rolled over to one side. He did not appear to be unconscious, and he was raised by his two seconds and helped to walk to his corner.

Mr. A. I. Obeysekera, who was the time-keeper at this meeting, was watching this match between rounds. He observed that when Perera reached his chair he was lying with his limbs fully extended and his jaws clenched, and that he was breathing deeply and audibly like a man sound asleep. To Mr. Obeysekera these appearances were unreal and so unlike those of the victim of a knock-out that he wondered whether the victim was shamming. He had noticed that the victim had never spoken from the time of the knock-out and that he still remained rigidly extended when being lifted into the stretcher for transport to hospital. The knock-out had occurred at 6.30 p.m. I was on duty at 7 p.m. in the casualty ward of the General Hospital, Colombo, when Perera was brought in. He lay on his stretcher breathing deeply as if in deep sleep, his lower limbs were rigidly extended at the hips and knees, and his upper limbs lay by the side of the body rigidly extended at the elbows, with the forearms fully pronated and the fists clenched. Passive movements were resisted by the rigidity, and if the resistance was overcome by force there was movement of the limb, restoring it to its original position. Perera was unconscious, and made no response to a pin tickling the inside of the nostril or pricking the skin of an eyelid.

The left pupil was widely dilated, the right pupil was small. There were no external injuries, no bruises, and no haemorrhage from the nostrils, mouth, or chin. The temperature was 97.4° F. (36.3° C.), pulse full and regular 104, and respirations 20.

At 8 p.m. Mr. C. P. De Fonseka made a trephine hole in the left temporal fossa, and found the dura mater bulged with subdural blood. Incision of the dura mater evacuated 2 oz. (57 ml.) of fluid blood. A second trephine hole in the right temporal fossa showed no extradural or subdural blood. At 11 p.m. the pulse was 88, respirations 38, and temperature 102° F. (38.9° C.). Perera's condition continued to deteriorate and he died at 1.30 a.m. on June 22.

I obtained permission of the coroner to make a post-mortem examination on June 22 at 11 a.m. On turning down the scalp there were diffuse films of coagulated blood on the subepicranial surface of the scalp and on the pericranial surface of the skull extending upwards from the temporal fossae from the surgical incisions in the scalp.

When the vault of the skull was removed, the dura mater covering the whole of the convex surface of the left cerebral

hemisphere was blue from subdural blood, and when the dura mater was incised a thin film of fluid subdural blood covering the convex surface of the left cerebral hemisphere flowed away. The blood was pooled posteriorly, where it bathed the left occipital lobe. The brain was not compressed by the blood. There was no subdural blood over the right cerebral hemisphere. There was a film of subarachnoid blood coating the pre- and post-central convolutions of both cerebral hemispheres extending a little in front of and behind these convolutions as well.

On the left side this film of subarachnoid blood continued into the Sylvian fissure over the island of Reil, and over the outer surface of the left temporal lobe. The medial and inferior surfaces of the cerebral hemispheres had no films of subarachnoid blood. There were no cerebral lacerations. There was about 3 oz. (85 ml.) of dark blood in the posterior fossa, but the cerebellum and the brain stem showed no subarachnoid films of blood and no lacerations, and it is likely that this blood had flowed into the posterior fossa from above.

Sections of the cerebral hemispheres showed no intracerebral haemorrhages or lacerations, but the white matter of both hemispheres was studded with the pinhead orifices of dilated vessels. There were no haemorrhages at these orifices. Sections of the brain stem and the cerebellum showed no haemorrhage or laceration at these sites.

Discussion

The decerebrate rigidity of the victim of this bout presented some striking features. That it came on with the receipt of the blow was evident from the observation that the victim appeared to be stunned and to get dizzier, and that he then slowly slumped down till his bottom touched the canvas, an unusual fall for a knock-out blow which would be explicable on the basis that the decerebrate rigidity had broken the fall. Then, too, the "automatic walk" back to the corner, when he had been picked up and supported by his two seconds, is another phenomenon referable to the state of decerebrate rigidity. The poker-back posture when he was laid down was clear evidence of the state of decerebrate rigidity, as was the maintenance of this posture till the time of death. Experimental transections of the mid-brain have established that decerebrate rigidity is the result of a lesion between the vestibular and the red nuclei. The post-mortem examination showed that there was no visible lesion in the mid-brain, but it did establish that there had been an appreciable displacement of the cerebral hemispheres within the brain case. The subarachnoid haemorrhages on the convex surfaces of both cerebral hemispheres across their waists between their frontal and occipital poles is clearly the result of an upward drive of both cerebral hemispheres against the cranial vault from the blow on the chin being transmitted upwards through the condyles of the mandible. The diffuse subdural blood covering the convex and inferior surfaces of the left cerebral hemispheres must have been from a traction rupture of veins in the subdural space passing from the dura mater to the inferior surface and the lower convex surface of the left cerebral hemisphere. As the punch was delivered on the left of the chin this would account for the greater upward shift of the left cerebral hemisphere rupturing the veins in the subdural space on this side.

The post-mortem findings afford clear evidence of an upward shift of both cerebral hemispheres, and it would be logical to deduce that this had determined the strain in the mid-brain between the vestibular and the red nuclei which had caused the condition of decerebrate rigidity.

In this case the site of the strain in the mid-brain is postulated with precision because of its causing the condition of decerebrate rigidity. The theory that concussion is the result of a strain in the mid-brain just above the red nuclei cannot be postulated with the same certainty, but the evidence of this case in which the strain occurred at a slightly lower level is good evidence for the mid-brain lesion of concussion.

Brain Injuries at Boxing

Boxing is a well-established sport, and the rarity of fatal accidents at boxing and the absence of apparent ill effects in combatants encourage its continuance. Although the head may well receive many punches during a bout, the brain escapes damage. What is the reason for this? It must be that the positioning and tensing of the head and neck, when it is about to receive a punch, prevents the brain from being displaced. In the occasional instance where this protective position is ineffective, the brain does shift within the brain case, and the effects of this are to be assessed by examining the fatal case. The present case details such an examination. The evidence in this case permitted a reconstruction of the mechanics of the injury, and this reconstruction throws light on the mechanics of concussion.

Summary

The case is described of a boxer aged 20 who was knocked out by a blow on the chin and died in consequence. Between the knock-out and the intracranial operation the patient was in decerebrate rigidity.

BIBLIOGRAPHY

- Blonstein, J. L., and Clark, E. (1954). *British Medical Journal*, 2, 1523.
Laune, J. C. (1955). *Ibid.*, 1, 227.
Winterstein, C. E. (1937). *Lancet*, 2, 719.

ANTIGENIC ACTIVITY OF BRITISH
POLIOMYELITIS VACCINE

A REPORT TO THE COMMITTEE ON LABORATORY INVESTIGATIONS OF POLIOMYELITIS OF THE MEDICAL RESEARCH COUNCIL*

During May and June, 1956, three batches of poliomyelitis vaccine were used for the inoculation of 200,000 children in Britain under the scheme organized by the Ministry of Health. The antigenic activity of these three batches was studied in a group of children who were shown to have no detectable antibodies to any of the three types of poliomyelitis virus before their course of inoculations. The group consisted of 196 children between the ages of 1 and 11 years, in five different areas—London, Manchester, Central Scotland, Sheffield, and Southend-on-Sea.

Each batch of vaccine was also tested for antigenic activity in monkeys.

Vaccine

The three batches—designated 4, 5, and 6—were prepared by the Glaxo Laboratories under the direction of Dr. W. Wood from virus strains Brunenders (type 1), MEF-1 (type 2), and Saukett (type 3) by the formalin-inactivation method introduced by Salk. The vaccine differed in its type 1 component from that produced in America, the Mahoney strain having been replaced by a partially attenuated variant of the Brunhilde strain (Enders *et al.*, 1952; Sabin, 1955). Gear (1956) has called this the Brunenders strain.

*Children were immunized and sera collected by Dr. A. Dudgeon, Dr. J. C. W. MacFarlane, Dr. D. O'Brien, and Dr. A. M. Peach (London); Dr. P. B. Stones and the medical staff of the Health Department (Manchester); Dr. N. R. Grist, Dr. W. M. Janieson, Dr. R. C. McLeod, Dr. B. R. Nisbet, and Dr. E. Neil Reid (Scotland); Dr. J. Rendle-Short, Professor C. H. Stuart-Harris, and Dr. D. Tyrell (Sheffield); Dr. J. Greenhalgh, Dr. J. Stevenson Logan, Dr. A. D. Macrae, Dr. Gladys Neill, Dr. R. Pkeworth, and Dr. J. C. Preston (Southend-on-Sea).

Laboratory investigations were made by Miss A. J. Ferguson, Dr. F. T. Perkins, Mrs. K. Russell, and Dr. J. O'H. Tobin, of the Biological Standards Control Laboratory, Hampstead.

The results were analysed and the report prepared by Dr. F. T. Perkins and Dr. J. O'H. Tobin

Titration of Sera

Serial dilutions of serum in Hanks basic salt solution were mixed with an equal volume (0.25 ml.) of virus suspension in Parker 199 solution containing approximately 50 TCID₅₀ of the required type of virus. The mixtures were held at 37° C. for three hours, and then added to tubes containing 6- to 8-day-old monkey kidney cell cultures; two tubes were used for each serum dilution. The inoculated tubes were incubated at 37° C. in roller drums for six days, when the final readings of the cytopathic effect of virus were made and the titre (PD₅₀) of the serum determined. Titres are given as the dilution of serum in the serum-virus mixtures, as recommended by the Committee on Laboratory Investigations of Poliomyelitis.

All sera were titrated, using Brunenders, MEF-1, and Saukett as the test viruses. Twenty post-immunization sera were also titrated for type 1 antibody, using Mahoney as the test virus. They gave similar results to those obtained with Brunenders, the geometric mean titres being 1/90 with Brunenders and 1/70 with Mahoney.

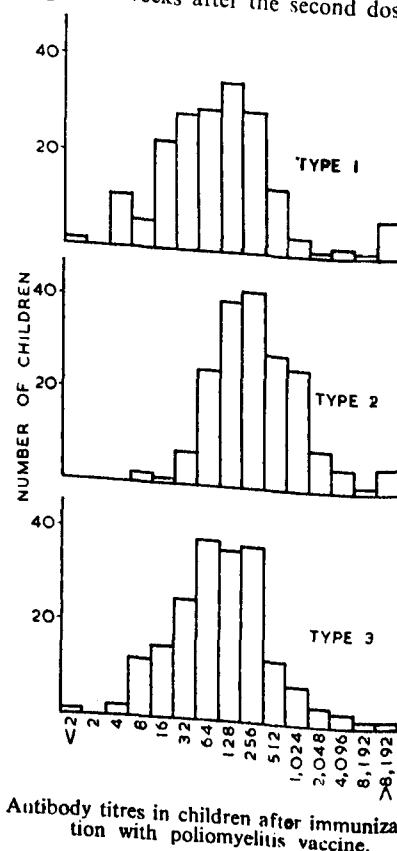
As controls the three British Standard poliomyelitis antisera (to be published) were always titrated in parallel in each set of tests and gave consistent results throughout. Each standard serum has been assigned a potency of 10 units per ml. and, by the method of titration employed in this study, gave on the average a titre of 1/480, 1/806, and 1/960 for types 1, 2, and 3 respectively.

Antigenic Activity in Children

Of the 196 children selected for the study, the majority had their pre-immunization sera taken on the day the first dose of vaccine was given and the remainder within a month before the first dose. The sera were shown to be negative at a titre of 1/8 to all three types of poliomyelitis virus. Seventy-two of the children were injected with batch 4, 66 with batch 5, 53 with batch 6, and 5 with a mixture of batches. Each child received two injections, each of 1 ml., at an interval of three to four weeks. The injections were given intramuscularly into the left deltoid; no untoward reactions were observed in any of the children. Serum was taken on the average two weeks after the second dose

and titrated for antibody to each of the three types. Those sera showing no antibody at 1/8 were retested at 1/2 and 1/4.

Table I gives the results of the three batches of vaccine together in each area and in all areas combined; the combined results are also given in the figure. The results clearly show that almost all children responded; of the 190 whose sera were fully examined, all except two responded to all three types. It is noted that the distribution of type 1 antibody titres in Manchester differed from that in the other areas; of the 33 sera from Manchester, 9



Antibody titres in children after immunization with poliomyelitis vaccine.

TABLE I.—Antibody Titres in Children after Immunization with Poliomyelitis Vaccine

Area	No. of Sera	Virus Type	Number of Sera with Antibody Titre of:														Geometric Mean Titre	
			<2	2	4	8	16	32	64	128	256	512	1,024	2,048	4,096	8,192		>8,192
London	31	1	1	0	3	0	5	6	3	5	5	0	1	1	1	0	0	60
	30	2	0	0	0	0	0	2	4	10	6	3	2	0	1	0	2	250
	31	3	0	0	0	0	2	6	9	3	3	2	2	0	2	1	1	157
Central Scotland	53	1	0	0	4	4	9	5	10	7	9	4	0	0	1	0	0	58
	48	2	0	0	0	1	1	2	10	11	13	4	5	1	0	0	0	168
	53	3	1	0	0	2	8	4	13	9	10	2	2	2	0	0	0	86
Manchester	33	1	0	0	2	0	2	1	5	4	5	3	2	0	0	1	8	144*
	33	2	0	0	0	1	0	1	5	9	5	7	2	0	2	0	1	246
	33	3	0	0	1	4	2	1	6	8	6	1	2	1	1	0	0	100
Sheffield	25	1	0	0	2	0	1	6	4	4	5	2	1	0	0	0	0	80
	25	2	0	0	0	0	0	0	2	4	8	3	3	4	0	1	0	420
	25	3	0	0	0	1	2	1	2	6	9	3	0	1	0	0	0	146
Southend- on-Sea	54	1	0	0	0	2	6	11	8	16	6	5	0	0	0	0	0	77
	54	2	0	0	0	0	0	2	4	6	10	12	14	4	2	0	0	428
	54	3	0	0	1	5	1	13	4	10	9	5	2	0	0	0	0	80
All areas	196	1	1	0	11	6	23	29	30	36	30	14	4	1	2	1	8	72*
	190†	2	0	0	0	2	1	7	25	40	42	29	26	9	5	1	3	282
	196	3	1	0	2	12	15	25	38	36	37	13	8	4	3	1	1	101

TABLE II.—Antibody Titres in Children after Immunization with Three Different Batches of Poliomyelitis Vaccine

Vaccine Batch	No. of Sera	Virus Type	Number of Sera with Antibody Titre of:															Geometric Mean Titre
			<2	2	4	8	16	32	64	128	256	512	1,024	2,048	4,096	8,192	>8,192	
4	72	1	0	0	8	4	9	7	14	12	12	2	1	0	1	0	2	54*
	71†	2	0	0	2	0	2	8	15	13	12	11	4	2	1	1	223	
	72	3	0	0	1	6	8	10	18	10	10	3	2	1	1	1	81	
5	66	1	1	0	2	1	9	15	7	10	8	5	0	1	0	1	6	61*
	61†	2	0	0	0	0	1	3	7	15	16	7	6	4	0	0	2	259
	66	3	1	0	0	2	5	11	11	15	12	4	1	3	1	0	0	101
6	53	1	0	0	0	1	5	7	8	13	9	7	2	0	1	0	0	117
	53	2	0	0	0	0	0	2	9	9	12	10	8	1	2	0	0	270
	53	3	0	0	1	2	2	4	9	10	14	5	5	0	1	0	0	142

In Tables I-III titres of >8,192 were taken as 16,384 in calculating the geometric mean.
* Nine Manchester sera with high type 1 titres were excluded in calculating the geometric mean.
† In the case of six subjects there was insufficient serum to titrate type 2 antibody.

had type 1 titres equal to or greater than 1/8,192 and lay well outside the general distribution curve. These high titres were probably due to infection rather than to vaccination, as an epidemic was occurring there at the time, and have been omitted in calculating the geometric mean response. Considering all areas and all batches of vaccine together, the geometric mean response was 1/72, 1/282, and 1/101 for types 1, 2, and 3 respectively.

The results with each of the three batches of vaccine are given in Table II, and it is evident that the antibody responses to all of them were similar.

TABLE III.—Antibody Titres in Children Under 5 Years of Age and 5 Years and Over After Immunization with Poliomyelitis Vaccine

Age Group	Vaccine Batch	No. of Children	Geometric Mean Antibody Titre to		
			Type 1	Type 2	Type 3
Under 5 years	4	38	73*	291	91
	5	36			
	6	18			
5 years and over	4	35	71*	274	110
	5	34			
	6	35			

From Table III it can be seen that children under 5 years of age responded as well as those aged 5 and over.

Antigenic Activity in Monkeys

The three batches of vaccine were tested for antigenic activity in monkeys by the method in current use in the United States of America (U.S. National Institutes of Health, 1955). A commercial batch of American vaccine, E/2769, kindly supplied by Eli Lilly and Company, was tested at the same time for comparison; this batch was prepared early in 1955, and since then had been stored in the cold without any apparent loss of antigenicity.

For each batch a group of 10 to 12 Rhesus monkeys, weighing between 4 and 8 lb. (1.8 and 3.6 kg.) and with no detectable poliomyelitis antibodies, were given three 1-ml. intramuscular injections of vaccine at intervals of seven days. Sera were obtained seven days after the third injection and titrated for antibody to each of the three types.

TABLE IV.—Antibody Titres in Rhesus Monkeys After Immunization with Poliomyelitis Vaccine

Vaccine Batch	No. of Monkeys Injected	Geometric Mean Antibody Titre to:		
		Type 1	Type 2	Type 3
4	12	52	108	32
5	10	67	54	39
6	11	45	47	30
E/2769	10	47	46	24

The results, given in Table IV, show that the antigenic activity of the four batches was very similar in these animals.

Conclusions

It is evident from the results of the study in children that the poliomyelitis vaccine used in this country in 1956 was able to produce an antibody response to all three types of poliomyelitis virus in a high proportion of children. The results compare favourably with those reported from other countries; they are similar to those obtained in America by Salk (1956) after immunization with two doses of vaccine and decidedly better than those reported from Denmark (von Magnus *et al.*, 1955) after intradermal vaccination.

Although both field and laboratory tests indicate that the three different batches of vaccine were similar in antigenic activity, there is so far insufficient information to decide definitely on what response is required in the monkey test in order to ensure that a vaccine will give a substantial response in children. It will be necessary to test, both in the field and in the laboratory, further batches of vaccine

with differing degrees of antigenic activity before a decision on this question is reached. Antigenicity tests in guinea-pigs (Gard *et al.*, 1956) and cotton-rats (Tobin, 1956) are also being investigated in parallel with the field studies.

Investigations are also to be made of the decline of antibody levels in some of the children who took part in the present study to obtain information concerning when a third booster dose should be given.

Summary

A study of the antibody response produced by the three batches of poliomyelitis vaccine used in Britain in the 1956 immunization programme was made in a group of 196 children who had no detectable poliomyelitis antibodies before their course of inoculations.

The children received two doses of vaccine at an interval of three to four weeks, and antibody response to the three types of poliomyelitis virus was determined two weeks after the second dose. No untoward reactions were observed in any of the children as a result of the inoculations.

All except two of the children produced antibodies to all three types, and the average response to each of the three batches of vaccine was similar.

The antigenic activities of the three batches were also shown to be similar when tested in monkeys and of the same order as that of an American vaccine.

The committee is grateful to the parents who consented to have their children vaccinated, and also thanks the Ministry of Health for the supply of poliomyelitis vaccine.

REFERENCES

- Enders, J. F., Weller, T. H., and Robbins, F. C. (1952). *Fed. Proc.*, 11, 467.
Gard, S., Wesslén, T., Fagracus, A., Svedmyr, A., and Olin, G. (1956). *Arch. ges. Virusforsch.*, 6, 401.
Gear, J. (1956). *S. Afr. med. J.*, 50, 587.
Sabin, A. B. (1955). *Ann. N.Y. Acad. Sci.*, 61, 1050.
Salk, J. E. (1956). *Amer. J. publ. Hlth.*, 46, 1.
Tobin, J. O'H. (1956). *Brit. J. exp. Path.*, 37, 161.
United States National Institutes of Health (1955). "Minimum Requirements for Poliomyelitis Vaccine."
von Magnus, H., von Magnus, P., Petersen, I., Godtfredsen, A., and Rønkaer, M. (1955). *Dan. med. Bull.*, 2, 226.

POLIOMYELITIS STUDIES IN AN ISOLATED SCOTTISH COMMUNITY

BY

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During recent years it has been established that poliomyelitis, spread through human association, is widely disseminated throughout the world. Overcrowding and a low standard of living are associated with the early development of immunity which, once established, appears to persist throughout life. Reinfection may occur to bolster up immunity, but Paul *et al.* (1951), from investigation of an isolated Arctic community lacking opportunities for frequent reinfection, have shown that poliomyelitis antibodies may persist in the blood for many years. The development of these antibodies could be temporally aligned with well-separated outbreaks of the disease in the area.

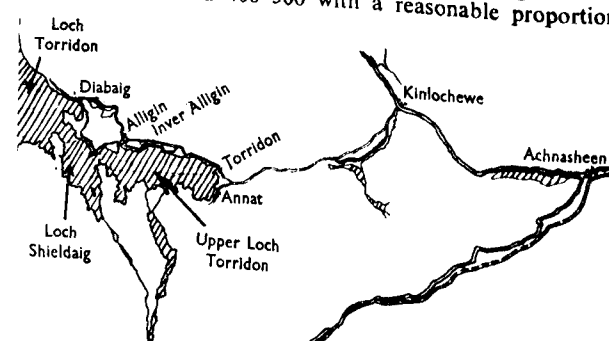
The natural development of immunity to poliomyelitis is less evident in countries and communities with a higher living standard, and many persons of all ages remain fully or partly susceptible to the disease. The introduction of such persons into an area in which the local population has to a large extent been naturally immu-

nized may result in outbreaks of poliomyelitis involving the new arrivals only. Hammon (1949) has reported this occurrence among recently arrived American children and adults in the Pacific island of Guam. From laboratory studies he found that most native children became infected and developed an immunity below the age of 1, confirming that poliomyelitis was widespread, though mainly inapparent, throughout the island. The circulating viruses showed an apparently increased degree of virulence in the presence of a more susceptible population. He commented on the opportunities for studying the behaviour of poliomyelitis presented by such isolated populations.

Poliomyelitis has been a notifiable disease in this country since 1912, but before 1947 no countrywide epidemics had occurred. In a number of areas there have been no reported cases over prolonged periods, owing either to the existence of a widespread immunity or to lack of exposure to virus. Studies of such a community in the Western Highlands of Scotland in which there had been no evidence of poliomyelitis for many years were planned in 1950. It was hoped by the collection of samples of blood and faeces from members of a representative number of households to determine whether poliomyelitis viruses were currently circulating or had been present in the past.*

Selection of Area

Among the points considered in the selection of a community were the following: (1) the relative remoteness from neighbouring villages and restricted means of approach; (2) the relative compactness of the community itself; too much scatter would add to the problems of collection of specimens; (3) the size and age range of the population; around 400-500 with a reasonable proportion



Map of Torridon area

of young people was thought most suitable; (4) the co-operation of the people in supplying information and suitable specimens, and the co-operation of the local medical services; (5) the past incidence of poliomyelitis in the area; (6) any local industries; and (7) the means of transporting specimens to the investigating laboratory.

The area finally selected lay on the north shore of Upper Loch Torridon on the west coast of Ross-shire (see Map). It included the population of Annat, Torridon, Fassag, Corrie, Alligin, and Diabaig. Poliomyelitis had not been diagnosed there within living memory. Approach was by a single road from Kinlochewe, a distance of about 12 miles (19 km.), with the nearest railway station a further 10 miles (16 km.) away at Achnasheen on the route from Dingwall to Kyle of Lochalsh. The local occupations consisted of estate work, crofting, forestry, and fishing. There were few facilities for visitors. Children attended schools in the area up to the age of 11.

*The investigation was planned and the collection of material was organized by Drs. F. O. MacCallum, I. N. Sutherland, and W. C. Cockburn.

The houses in the area were identified on ordnance survey maps and numbered. Lists of the occupants of each house, with details of occupation, age, and school attended if a child, were prepared. In all there were 104 houses with a total population of 294, who had an age range as shown in Table I. Families with one or more children lived in 28 of the houses.

TABLE I.—Age Range of Torridon Population

Years:	0-5	6-10	11-15	16-30	31-50	51-91	Total
Males	13	8	12	21	40	52	146
Females	11	6	6	18	40	67	148
Total	24	14	18	39	80	119	294

Selection of Donors

It was hoped to obtain specimens of blood and faeces from one child in each of the 28 houses, from the youngest child where there were more than one, or failing that from the next youngest, and so on. In addition blood was to be obtained from 30 persons, aged 15 and over, and selected by random sampling from the houses with no children. Specimens of faeces were to be obtained from 12 of these persons. All specimens were to be sent, as quickly as possible after they were obtained by the doctor and nurse, to the nearest bacteriological laboratory. This was 70 miles (112 km.) away, at Inverness. There the serum was to be separated from blood clot and the faeces were to be frozen. The specimens, packed in dry ice, were then to be sent by passenger train to the Virus Reference Laboratory, Colindale.

Collection of Material

An approach, through the doctor and the district nurse, to the persons from whom material for investigation was desired, met with a good response. Specimens of faeces and serum were collected in the spring of 1951, between mid-March and mid-May, and again from the same persons, except for a small number who could not be contacted or who were unwilling, between mid-October and mid-December of the same year. The specimens came from 64 adults and children living in 53 of the 104 houses. There were children under 16 years of age in 25 of the houses. The distribution of the material is shown in Table II. That

TABLE II.—Distribution of the Material

Types of Specimen	Age Range in Years						Total
	0-5	6-10	11-15	16-30	31-50	51-91	
Paired sera and stools	4	5	5	2	2	7	25
.. stools only ..	7	—	—	1	10	9	27
.. sera only ..	2	1	—	—	—	3	6
Other combinations	4	1	1	—	—	—	6
Total	17 (12)	7 (7)	6 (6)	3 (3)	12 (9)	19 (16)	64 (53)

Figures in parentheses indicate the number of houses from which the specimens came.

samples of serum were not obtained from all children providing faeces was due to difficulty in obtaining blood from some of those under 5 years old. This difficulty had been foreseen, and when it occurred an attempt was made, where possible, to obtain samples of blood from the sibling nearest in age.

Further samples of blood were obtained in the late autumn of 1954 from 19 of the original donors. Of these, four were children up to 5 years old, six were children aged 6 to 10, and three were aged 11 to 15 years; two were adults 16 to 30, and four were aged 31 to 50 years. The aged 16 to 30, and four were aged 31 to 50 years. The intention then had been to bleed (1) those less than 20 years old in 1951, and (2) those over 20 years old with either no old in 1951, and (3) those with either no old in 1951, or with antibody to one type only. Early in 1956, virus or with antibody to one type only. Early in 1956, samples of blood were obtained from the boy (Table III, No. 6) whose faeces yielded the two strains of poliomyelitis virus in 1951, and from his sister. This family had left Torridon for another locality.

Virus Investigations

The investigations consisted (1) in attempted virus isolation from the samples of faeces and (2) in determining whether poliomyelitis antibodies were present in the serum. The material, collected in 1951, was transported to the laboratory and stored there, frozen at -10°C , until 1954, when it was examined.

Faeces.—A 20% suspension of each sample of faeces in buffered saline solution was centrifuged at 5,000 r.p.m. for at least one hour at 4°C . The supernatant fluid was harvested and tested for the presence of bacteria, being ready for virus investigation when bacteriologically sterile. Twenty-four pools, each composed of equal volumes of three suspensions, were prepared; those, and the remaining single suspension, were investigated in tissue culture and in newborn mice. When a virus was detected in a pool the suspensions composing it were individually studied.

Tissue Culture.—Epithelial cells of rhesus monkey kidney grown from minced tissue fragments or from trypsinized cell suspensions were used in the virus isolation and neutralization tests. Lactalbumin hydrolysate medium (Melnick and Riordan, 1952) or synthetic medium 199 (Morgan *et al.*, 1950) supplemented during the initial period of cell growth with 5% normal horse serum was employed. Tubes were incubated in stationary racks at 37°C . For isolation 0.1-ml. amounts of each pool were inoculated into five tubes, which were then observed microscopically at intervals for cell degeneration. The fluids were harvested when this became apparent or after 10-12 days in its absence. Three tissue culture passages were done before a pool of suspension was regarded as negative. Neutralization tests were based on the method of Ledinko *et al.* (1952), using 100 tissue-culture doses (TCD₅₀) of each virus type against increasing dilutions of serum and leaving each serum-virus mixture at room temperature (about 22°C) for at least one hour before inoculation into tissue cultures. The virus strains used were Mahoney (type 1), Y-SK (type 2), and Saukett (type 3). The second samples of serum were tested at a single initial dilution of 1 in 2.5 against the three types of poliomyelitis virus and against the newly isolated Coxsackie B3 strain of virus. Where antibody was present against a type of poliomyelitis virus both samples of serum were titrated in increasing half-log dilutions against that virus. In the antibody titrations of the samples of serum obtained in 1954 and 1956 increasing twofold dilutions were used. The serum dilutions given in the tables are the final dilutions after the addition of virus suspension.

Animal Inoculation.—Litters of mice less than 24 hours old were inoculated subcutaneously with 0.02-ml. amounts of each pool suspension or with individual positive suspensions and tissue-culture fluids. Second mouse passages were done when there was evidence of weakness, tremors, or paralysis in the initial passage. Two rhesus monkeys were inoculated intracerebrally (0.5 ml.) and intramuscularly (2 ml. combined with an equal volume of adjuvant—"arlacel A," "bayol F") with tissue-culture fluids of No. 4 or No. 6 strains (Table III). Three rhesus monkeys, each inoculated intracerebrally (0.3 ml.) with faecal suspension from No. 6, were used in the identification of the newly isolated strains of virus from this child.

Results of Virus Isolation

Seven cytopathogenic agents were isolated on first passage in tissue culture from six samples of faeces from young children (Table III). In each instance the faeces was an autumn sample, the earlier specimens from the same children obtained in the spring being negative, as were the other 67 specimens. Five agents were identified as being strains of Coxsackie virus group B, type 3, by neutralization tests using specific antiserum obtained from Dr. Dalldorf. The cell degeneration produced by these strains occurred in a varying proportion of the culture tubes inoculated with each faecal suspension and characteristically

TABLE III.—Virus Isolations

No.	Age in Years	House No.	No. in Household	Faeces Sample	Cell Degeneration in 1st T.C. Passage*	Day of Appearance of Degeneration	Virus Identity
1	9/12	54	8†	Autumn, 1951	1/5	5th	Coxsackie B3
2	2 8/12	53	4	"	1/5	4th	"
3	8/12	55	3†	"	4/5	3rd	"
4‡	5	75	4	"	1/5	5th	"
5	8/12	31	6	"	2/5	10th	"
6	1 1/12	48	3	"	5/5	3rd	Poliomyelitis type 2 and type 3

* Number of tubes showing degeneration over number of tubes inoculated.
† All the other persons in these households had Bornholm disease.
‡ Paired sera were available from this child; no serum was obtained in 1951 from the others.

developed slowly in the first passage. In the later passages the degeneration appeared more rapidly and was more complete.

In mice inoculated with pooled faecal suspensions, only one pool which contained the strains of virus No. 1 and No. 2 gave rise to signs of infection. In this instance, weakness, tremors, and varying degrees of paralysis developed after seven days in a litter of six, three of which ultimately recovered, surviving beyond a three-weeks period. In a second passage, using a 20% mouse carcass suspension, the effect was similar, with six mice dying and four recovering. When the five individual faecal suspensions containing Coxsackie virus were inoculated into litters of mice the same slowly developing signs of infection were noted in four instances, but inoculation of further litters with positive tissue-culture fluids yielded more rapid and clear-cut results.

The remaining two agents, isolated from the sixth sample of faeces, were identified as being strains of poliomyelitis virus, type 2 and type 3 respectively. The possibility of this occurrence arose when it was found that serum from the monkey inoculated with tissue-culture fluid of No. 6 strain neutralized types 2 and 3 poliomyelitis virus. The separation of the two strains in monkeys and in tissue culture had already been reported (Macrae and Shepherd, 1955).

Results of Serum Neutralization Tests

The distribution of antibody against the poliomyelitis viruses in the various age groups, based on the serum samples collected in the autumn of 1951, is shown in Table IV. Up to the age of 10, four out of 15 children possessed

TABLE IV.—Distribution of Neutralizing Antibody to Poliomyelitis Viruses in Serum* of Persons in Different Age Groups in 1951

Age Range in Years	No. of Persons	Antibody Against Poliomyelitis Virus					No. of Types		
		Type 1	Type 2	Type 3	No. Antibody		1	2	3
0-5	8 (24)	0	1	0	7		1	0	0
6-10	7 (14)	1	2	0	4		3	1	0
11-15	6 (18)	4	3	1	2		1	2	0
16-30	3 (39)	1	1	1	2		0	0	1
31-50	12 (80)	3	8	4	2		5	5	0
51-91	19 (119)	16	14	16	0		0	11	8
Total	55 (294)	25	29	22	17		10	18	10

* Tested at a final dilution of 1/5.
Figures in parentheses are the total population in each age group.

antibody, in each instance against one virus type. From the age of 11 onwards, a gradual development of antibody, particularly against virus types 1 and 2, was apparent, although the small number of serum samples from the 16-30 year group does not allow a clear picture of events in this age range to be drawn. After the age of 30 exposure to the three types of virus appeared to have been about equal.

Titration of the paired samples of serum obtained in 1951 were done (1) to determine the individual levels of antibody and (2) to see whether any development of im-

munity against poliomyelitis virus had occurred during the summer. The results of titration, representing the second samples of serum, are shown in Table V; with one excep-

TABLE V.—Neutralizing Antibody Levels in the Torridon Sera in 1951

Poliomyelitis Virus	Range of Serum Dilutions						Total
	<5	-32	-100	-320	-1,000	>1,000	
Type 1	30	10	9	2	3	1	55
" 2	26	7	8	9	4	1	55
" 3	33	14	5	2	0	1	55

tion (Table VI, No. 2) the titres of the earlier samples of serum showed only minor differences within the limits of experimental error. Of the 19 samples of serum obtained in 1954, 10 were without antibody against any type of poliomyelitis virus; 7 of these were from children who had been less than 10, and one came from a child who had been 15 years old in 1951. The other two sera were from adults who had been 24 and 28 years old.

The remaining nine samples of serum and the two obtained early in 1956 were titrated, together with their preceding 1951 samples, and the results are given in Table VI. These show: (1) that the boy from whom the strains

TABLE VI.—Persistence of Neutralizing Antibody to Poliomyelitis Viruses After an Interval of Three or More Years

No.	Age (in 1951)	Sex	House No.	Serum and Year	Antibody Titres to Virus		
					Type 1	Type 2	Type 3
1*	1 1/12	M	48	1956	<4	648	32
2†	5	F	48	1951 A	<4	<4	<4
				1951 B	<4	64	<4
				1956	<4	32	16
3	8	F	77	1951 A	—	1,024	—
				1951 B	<5	1,024	<5
				1954	<2	256	<2
4	9	F	73	1951 A	—	180	—
				1951 B	<5	150	<5
				1954	<2	512	<2
5	10	M	41	1951 A‡	32	<5	<5
				1954	32	<2	<2
6	11	M	47	1951 A	—	<5	—
				1951 B	<5	<5	<5
				1954	<2	256	<2
7	12	F	33	1951 A	256	—	—
				1951 B	512	<5	<5
				1954	256	<2	<2
8	33	M	18	1951 A	—	54	—
				1951 B	<5	46	<5
				1954	<2	54	<2
9	36	F	57	1951 A	—	128	—
				1951 B	<5	90	<5
				1954	<2	56	<2
10	38	M	57	1951 A	—	430	—
				1951 B	<5	256	<5
				1954	<2	256	<2
11	46	F	2	1951 A	2	—	4
				1951 B	2	<5	4
				1954	2	<2	4

* Types 2 and 3 poliomyelitis virus were isolated from this boy in 1951. No sample of serum was obtained then.

† Sister of No. 1.

‡ No sample of serum obtained in autumn, 1951.

§ Reciprocal of serum dilution: calculated by Kaerber's method.

of poliomyelitis virus types 2 and 3 were isolated in 1951 had antibody to these types in 1956; (2) that the sister of this boy had developed antibody to type 2 virus before the collection of her second 1951 sample of serum and had also developed antibody to type 3 virus at a later time; (3) that a boy (No. 5) living in a house close to the home of these children developed antibody to type 2 virus between 1951 and 1954; (4) that a girl (No. 3) with a high antibody level against type 2 virus in 1951 showed a four-fold drop in titre by 1954; and (5) that the other antibody levels showed little variation during the three-year period.

The tests with the samples of serum obtained in the autumn of 1951 showed that 12 contained antibody against the Coxsackie group B type 3 virus. These came from six children less than 10 years old and from six adults ranging in age from 26 to 62. These children, including one (Table III, No. 4) from whom a strain of virus was isolated, and one adult had developed the antibody in the interval between the taking of the first and second specimens, the earlier sera being negative. In three adults the antibody was already present in the spring samples of serum, and in the remaining two adults only the autumn samples of serum were available for testing. The children came from scattered houses throughout the community, but, except for one of pre-school age, attended the same school. A strain of Coxsackie B3 virus had also been isolated from the brother (Table III, No. 1) of one of the children.

In tests with the samples of serum obtained in 1954, 10 persons were found with antibody against the Coxsackie B3 virus. Of these, one was a child (Table III, No. 3) from whom a strain of virus had been isolated in 1951, but from whom no serum had previously been obtained; three were children already positive in 1951; and six were from persons, previously negative, with ages ranging from 9 to 38 years and living in houses scattered throughout the community.

Discussion

Torridon, in which no recorded cases of poliomyelitis have occurred, is a sparsely populated and relatively isolated area. It may, however, be reached from London within 24 hours, without difficulty at most times. As in other Highland communities the population is decreasing, owing to the drift away to the towns in search of work and greater amenities. After the age of 11 the children go elsewhere to complete their education; the young adults stay away because of the lack of work, but some return to settle down in late adult life.

The distribution of antibody to the poliomyelitis viruses appears to bear some relation to this. Up to the age of 11 years, 15 of the 38 children available were investigated serologically; 11 of these had no antibody to any type of virus, and four had antibody against a single type. The three children with type 2 antibody were aged 5, 8, and 9 years, the youngest having developed this during the summer of 1951. One child aged 10 had antibody to type 1 virus. In the 11-15 year group, six of the 18 children available were investigated serologically; four had antibody to type 1 virus, one of these having antibody to all three types, one to type 2 virus, and one to type 3 virus also. As the purpose of the investigation was to sample separate households, the extent of infection in siblings was not estimated. It would appear, however, that infection with type 2 virus had occurred in a number of households during the previous ten years and infection with type 1 virus before that, but there had been no widespread distribution of these viruses.

In the 16-30 year group samples of serum from only three persons were obtained. As one person had antibody to all three types of virus and two were completely negative it is not possible to reach any conclusions. After the age of 30 an increasing proportion of persons had antibody to one or more types of virus, probably acquired elsewhere in a number of instances. The antibody distribution in children differs from that found in Bettws-y-Coed, North Wales (Fallon, 1956), an area from which no cases of poliomyelitis had been notified since 1912. There, antibody against the poliomyelitis viruses, particularly types 1 and 2, was found in the sera of children from the age of 1 onwards, and only 6 out of 57 sera from children under 10 were devoid of antibody.

Although the isolation of two strains of poliomyelitis virus from a boy in the autumn of 1951 showed that these viruses were present in the area, there were no notified cases of poliomyelitis in Torridon during 1951 or subsequently. One adult at Kinlochewe, 12 miles (19 km.) away, was transferred to hospital as a suspected case of non-

paralytic poliomyelitis, but no virus was isolated from a sample of faeces obtained while she was in hospital. Serological evidence of recent infection in Torridon was limited to the boy, his sister, and one child from a near-by house who was infected with type 2 virus only. This boy, his sister, and mother had returned to this country from the tropics before the start of the Torridon investigation. No evidence of poliomyelitis infection was found in the material collected in the spring. Whether they had all gone away from Torridon during the summer or whether there had been close contact with relatives or visitors from elsewhere during this time is not known. The age of the children makes it improbable that they had many contacts in the community, hence the limited spread of infection. In addition, there is the possibility, suggested by Dalldorf (1952), of interference with the spread of poliomyelitis virus by Coxsackie B viruses.

Outbreaks of Bornholm disease in 1951, in some instances associated with Coxsackie B3 virus, were reported from Scotland and England (Swain and Mitchell, 1953; Disney *et al.*, 1953). The disease was prevalent in Ross-shire during the summer and autumn, starting on the east coast and spreading westwards. From the Torridon area 13 cases were reported to the medical officer of health (personal communication), including four who were donors of specimens in this investigation. Except for one donor whose serum contained no demonstrable antibody against the Coxsackie B3 virus in either 1951 or 1954, the cases occurred in houses in which evidence of infection with this virus was obtained either by isolation or by antibody development. The laboratory findings support the probability that the clinical illness in Torridon was associated with this type of virus.

The five strains of Coxsackie virus isolated came from young children, three being from near-by houses and two from well-separated houses. One of these was also a combined post-office and shop, the child's father being postmaster, shopkeeper, and, in addition, ferryman and warden of the local youth hostel. The serological findings confirm that infection was widespread, and the combined results are a contrast to the picture with the poliomyelitis viruses. They also serve as a model of what might happen with poliomyelitis, given suitable conditions.

Summary

An investigation of the semi-isolated community of Torridon, in the Highlands of Scotland, for evidence of infection with poliomyelitis is reported. No clinical cases of poliomyelitis have ever been reported from there.

Out of a population of 294 living in 104 houses, samples of faeces, serum, or both were obtained in the spring and again in the autumn of 1951 from 64 persons living in 53 of the houses. Emphasis was placed on obtaining specimens from the youngest child in each family selected. Further samples of serum were obtained in 1954 from 19 of the original donors.

Strains of Coxsackie B3 virus were obtained from five young children living in separate houses, and strains of poliomyelitis virus types 2 and 3 were isolated from one young boy in another house.

The development of antibody against types 2 and 3 poliomyelitis virus during these studies occurred only in the sister of the boy from whom the viruses were isolated, although serum from the boy himself, obtained five years after the virus isolations, did also contain these antibodies. One other child from a near-by house to these children developed antibody against type 2 virus only.

The distribution of antibody in the serum of donors indicated that immunity to poliomyelitis developed

relatively late in life, but that antibody levels, where present, showed little variation over a three-year period.

Serological evidence of widespread recent infections in children and adults with Coxsackie B3 virus corroborated reports of Bornholm disease in the area.

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REFERENCES

- Dalldorf, G. (1952). *J. Mt Sinai Hosp.*, 19, 396.
 Disney, M. E., Howard, E. M., Wood, B. S. B., and Findlay, G. M. (1953). *British Medical Journal*, 1, 1351.
 Fallon, R. J. (1956). *Lancet*, 1, 65.
 Hammon, W. M. (1949). *Bact. Rev.*, 13, 135.
 Ledinko, N., Riordan, J. T., and Melnick, J. L. (1952). *Amer. J. Hyg.*, 55, 323.
 Macrae, A. D. and Shepherd, P. A. (1955). *Monthly Bull. Minist. Hlth (Lond.)*, 14, 55.
 Melnick, J. L., and Riordan, J. T. (1952). *Proc. Soc. exp. Biol. (N.Y.)*, 81, 208.
 Morgan, J. F., Morton, H. J., and Parker, R. C. (1950). *Ibid.*, 73, 1.
 Paul, J. R., Riordan, J. T., and Melnick, J. L. (1951). *Amer. J. Hyg.*, 54, 275.
 Swain, R. H. A., and Mitchell, R. G. (1953). *British Medical Journal*, 1, 1354.

DEATHS FROM POLIOMYELITIS AMONG BRITISH DOCTORS

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In our study of lung cancer and other causes of death in British doctors in relation to their smoking habits we have observed 34,494 medically qualified men over nearly five years—that is, from November, 1951, to September, 1956, a total of a little more than 165,000 years of exposure.* Over this time and in these 34,494 medical men there have been recorded eight deaths from poliomyelitis (including one certified as acute poliomyelitis). In relation to the size of the population at risk eight is a very small number. Yet it is greatly in excess of the number that would be expected to occur if doctors were dying of poliomyelitis at the same rate as adult males in the general population of Great Britain. Applying to our population of medical men these general population rates in the ten quinquennial groups from age 20 to age 70 (no deaths occurred in the general population over the age of 70) gives an expectation of only 0.83 deaths. It may be that persons in the higher social classes are rather more at risk of contracting poliomyelitis than those in the lower social classes. That would be in accordance with some modern beliefs—though we know of no statistical evidence in this country in its support. But even making them three times as vulnerable we would not expect more than two or three deaths to put against the eight observed. It therefore seems that doctors are specially at risk either of contracting poliomyelitis or, having contracted it, of dying from it.

*In our previous report (Doll and Hill, 1956), the total number of years of exposure observed was referred to as 148,686, but at that time data were available for deaths occurring only until March, 1956.

All those who died were relatively young men. At time of death their ages (last birthday) were 28, 30, 30, 32, 36, 37, 39, and 41. In their work there was no evidence of special risk—for example, in a laboratory. Their last known appointments were hospital casualty officer, hospital medical officer, chest physician, orthopaedic hospital officer, and general practitioner (4). These appointments were widely scattered—London (2), Middlesex, Berkshire, Kent, Staffordshire, Yorkshire, and Lincolnshire. In time, on the other hand, the deaths were curiously concentrated, since five of them occurred in August and September, 1952. The poliomyelitis season in this country is such that one would expect deaths to be specially concentrated in those months, but in each of the 1953 and 1956 seasons there was but one death of a doctor from poliomyelitis and in 1954 and 1955 there was none. The eighth death occurred at the end of the 1951 season (January, 1952). On the other hand, the total number of adult male deaths from poliomyelitis in Great Britain in 1952 (98) was the same as in 1953, not very different from the number in 1955 (105), and only about double that in 1954 (46 deaths) and, it seems likely, 1956.

Summary

The evidence given here suggests that men between the ages of 25 and 45 who are practising medicine in Great Britain are at special risk of dying of poliomyelitis. The actual number of deaths recorded (8) is small in relation to the number of men at risk (nearly 35,000), but at the rates of the general population not more than one death would have been expected to occur.

REFERENCE

- Doll, R., and Hill, A. B. (1956). *British Medical Journal*, 2, 1071.

INVESTIGATION OF NON-ULCER DYSPEPSIA BY GASTRIC BIOPSY

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Large numbers of patients with dyspepsia come to hospital, and often, in spite of appropriate investigations, no cause for it can be found. Although symptoms may abate when a patient learns of negative findings they often persist, and treatment may be difficult and unsatisfactory. A nervous cause of the indigestion may be suspected, but it is difficult to prove. In fact, dyspepsia of unknown aetiology constitutes a notable clinical problem.

Gastritis has long been suggested as a cause of non-ulcer dyspepsia, but in common with others we have found its diagnosis by gastroscopy far from certain (Wirts *et al.*, 1951; Shallenberger *et al.*, 1951; Palmer, 1952; Debray *et al.*, 1953; Selesnick and Kinsella, 1953). The suction biopsy tube introduced by Wood *et al.* (1949) offered a new means of obtaining information

about the gastric mucosa in dyspepsia, and we have used it for this purpose. Details of the modified instrument and method, together with illustrated descriptions of the commoner mucosal lesions, have already been given (Coghill and Wynn Williams, 1955a, 1955b).

By dyspepsia we mean a condition in which abdominal or thoracic symptoms other than dysphagia occur in relation to eating. In this paper non-ulcer dyspepsia (N.U.D.) implies the occurrence of such symptoms when (N.U.D.) implies the occurrence of such symptoms when no ulcer can be found in an oesophagus, stomach, or duodenum not previously subjected to surgical intervention. Patients with anaemia, hiatus hernia, oesophageal reflux, carcinoma of the stomach, or hepatic, biliary, pancreatic, intestinal, renal, or cardiac disease were excluded.

Classification of Histopathological Changes in Gastric Mucosa

In our examination of 1,043 biopsy specimens from 467 patients with different disorders we observed changes in which were mainly, although not entirely, inflammatory in character. Different classifications of gastritis have been suggested (Schindler, 1947; Magnus, 1952; Palmer, 1954), and these vary in complexity. The following simple classification, which is based partly on that of Motteram (1951), was found to be most useful. It is to be especially noted that in our classification the changes refer to body ("fundic") mucosa.

Chronic Superficial Gastritis.—There is atrophy of the glands in their superficial part and infiltration of the stroma in this region with numerous inflammatory cells, mainly plasma cells and lymphocytes.

Chronic Atrophic Gastritis.—Glandular atrophy is complete or almost so, and there is a variable amount of infiltration of the stroma with inflammatory cells similar in type to those seen in chronic superficial gastritis. Intestinal heterotopia ("metaplasia") commonly occurs, and pyloric gland heterotopia is also of frequent occurrence.

Gastric Atrophy.—The mucosal changes are the same as in chronic atrophic gastritis, but inflammatory cells are inconspicuous.

"Hypertrophic Gastritis."—This unsatisfactory title refers to a group of rare and ill-understood disorders characterized by a marked proliferation of epithelial or stromal cells, or both (Schindler, 1947; Palmer, 1954; Fieber, 1955). In a single example, proved by partial gastrectomy, we were unable to diagnose the condition from biopsy specimens obtained subsequent to operation.

In many patients there were abnormalities in the gastric mucosa which were so slight that classification into any of the groups we have mentioned was not possible. Consequently it was necessary to introduce a fifth group.

Miscellaneous Minor Mucosal Changes.—The glandular pattern is normal, but the surface epithelium or the stroma, or both, are abnormal. The alterations include irregularities in the size, shape, staining properties, and numbers of surface epithelial cells, and oedema and a mild excess of inflammatory cells, usually plasma cells and lymphocytes, in the stroma. The excess of inflammatory cells, in particular, was a common finding.

Material

After excluding patients in whom a cause for the symptoms was found outside the oesophagus, stomach, and duodenum, 775 new subjects with dyspepsia were seen as out-patients in a medical unit over the three years from July 1, 1952, to June 30, 1955—an average annual rate of 258. This figure comprised 25.7% of all new out-patients attending the unit. The corresponding figure for all new general medical out-patients attending the hospital was about 20%.

To assist diagnosis every patient had a barium-meal examination with appropriate investigation of oesophagus and cardia. When there was doubt about the result the examination was repeated and gastroscopy was performed when indicated.

Of the 775 patients with dyspepsia, 459 (59.2%) were men and 316 (40.8%) women. Investigation revealed a likely organic cause for the dyspepsia in 307 (39.6%)—duodenal ulcer, 195 (25%); gastric ulcer, 79 (10%); gastric and duodenal ulcers, 7 (1%); hiatus hernia, 16 (2%); oesophageal reflux, 3; gastric carcinoma, 3; cardiospasm, 2; oesophageal ulcer, 1; volvulus of stomach with eventration of the left diaphragm, 1.

Thus there were 468 patients, forming 60.4% of the whole group, in whom no peptic ulcer could be found, and in whom other causes of dyspepsia were not suggested by the clinical findings or were excluded by appropriate investigations. Of the patients with N.U.D. 251 (53.6%) were men and 217 (46.4%) women.

Gastric biopsy specimens were obtained from 200 of 564 consecutive new out-patients with N.U.D. seen after July 1, 1952. Fourteen had had a peptic ulcer in the past, but none was present at the time of biopsy, although symptoms persisted. Mild overt haemorrhage of the upper alimentary tract had occurred recently in three patients, but in none was notable anaemia present. Attempts at gastric biopsy were made on less than half the patients with N.U.D. There were several reasons for this. Some patients failed to return after their x-ray examination, some were too old (Coghill and Wynn Williams, 1955b), and some declined the investigation because they felt better, or for other reasons such as a dislike of swallowing tubes. Some patients with N.U.D. in whom gastric biopsy was performed were grouped under different categories—for example, because of anaemia, as the subject of further studies—and have not been included in this series.

Results

Of the 200 patients with N.U.D. from whom biopsy specimens of the gastric mucosa were obtained, 134 (67%) were men and 66 (33%) women. The mucosa was classified as normal in 90 (45%); 72 (36%) were placed in the miscellaneous group, 9 (4.5%) were classed as chronic superficial gastritis, and 29 (14.5%) were classed as chronic atrophic gastritis. There were no examples of gastric atrophy in the series. In 14 (48%) of the cases of atrophic gastritis the mucosa showed signs of intestinal metaplasia. In 13 patients (6.5% of all cases) multiple specimens demonstrated notably different histology in the same patient, and each case has been classified as showing the more severe of the changes found.

Thus in 110 (55%), rather more than half the patients examined, there was evidence of gastritis. Of these, 72 had only minor changes (miscellaneous group). Major abnormalities (superficial and atrophic gastritis) were found in only 38 patients (19% of the whole N.U.D. group).

Sex.—The distribution between the sexes of patients with normal and different types of abnormal mucosae is shown in Table I and Fig. 1. Fewer women than men were examined, chiefly because fewer presented suffering from N.U.D. and more declined the examination or were unsuitable for

TABLE I.—Mucosal Findings in 200 Patients with N.U.D. According to Age and Sex

Age in Years	Males				Females			
	N	M	SG	AG	N	M	SG	AG
18-19	1	2	0	0	0	2	0	0
20-29	10	8	0	1	5	4	0	0
30-39	20	12	1	0	33	7	1	0
40-49	14	10	0	8	32	9	10	1
50-59	11	6	4	12	33	6	5	1
60-69	4	5	1	2	12	1	6	0
70-73	2	0	0	0	2	0	0	0
Total	62	43	6	23	134	28	29	6

N=Normal. M=Miscellaneous minor mucosal changes. SG=Chronic superficial gastritis. AG=Chronic atrophic gastritis.

It is generally acknowledged that dyspepsia is a common complaint, and that in a large proportion of cases no cause can be found. Edwards and Copeman (1943) failed to demonstrate a peptic ulcer in 50% of 436 dyspeptic patients in the Army, while Avery Jones and Pollak (1945) classified 41% of a group of 1,522 patients with gastric symptoms into the category of "non-ulcer dyspepsia." Friedman (1948), reviewing "functional dyspepsia" in the American forces, reported a 10 to 60% incidence in various series of patients, the average incidence for a total of 13,000 patients being 52%. Doll *et al.* (1951), in a survey of 5,951 men and women at work, found 25.4% with N.U.D. compared with 5.6% with peptic ulcer. In our series no cause for the dyspepsia was discovered in 60% of 775 out-patients presenting with this symptom. We have found miscellaneous minor histological changes in the gastric mucosa in 36% of 200 patients with N.U.D. and superficial or atrophic gastritis in 19%. The significance of these findings depends on several factors.

RESPIRATORY VIRUS INFECTIONS IN HOSPITAL AND IN GENERAL PRACTICE, 1954-6

BY

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In continuation of previous laboratory studies of respiratory illness, tests for a wider range of virus infections were made in a series of patients admitted to hospital and also in cases of milder illness seen in general practice during the winter seasons of 1954-5 and 1955-6. This paper presents evidence of infections with influenza viruses of types A, B, and C, an agent related to the Sendai strain of newborn pneumonitis virus ("influenza D," Jensen *et al.*, 1955), and the adenovirus group (Rowe *et al.*, 1953).

Methods

The population investigated included 167 patients admitted to pneumonia wards of Ruchill Hospital from July, 1954, to April, 1955, 70 admitted to baby pneumonia wards from November, 1954, to May, 1955, and 98 adults and 44 children under 2 years old admitted to these wards from November, 1955, to April, 1956, inclusive. Tests were also conducted in 105 cases of suspected influenza seen in general practice from December, 1954, to April, 1955, and in 92 similar cases seen in the corresponding five months a year later in the course of schemes for the detection of influenza in the community during vaccine trials of the Medical Research Council (M.R.C. Committee, 1955). A number of additional cases were examined in the course of investigations of outbreaks of respiratory illness. Serum samples were taken during the early and late stages of illness. Garglings for attempted virus isolation were collected with autoclaved skimmed milk or saline with added broth. During the 1955-6 season, respiratory secretions of infants were collected from the nose or throat by sterile cotton-tipped swabs which were subsequently extracted each in a few millilitres of broth for one hour at 37° C.

In general, the cultural and serological techniques were those described in previous papers (Grist, 1955; Grist and Landsman, 1955). For attempted virus isolation, embryonated eggs were inoculated by the amniotic route; at least two passages were made before specimens were regarded as negative.

Sera were examined by small-volume complement-fixation (C.F.) tests and by haemagglutination-inhibition (H.I.) tests. Soluble antigens were used in C.F. tests for influenza A and B; in some experiments soluble antigens prepared from locally isolated strains of virus were used. A fixation period of 90 minutes at 37° C. was employed with adult sera, but with sera from infants the cold overnight method was used. Antigens from several of the following strains of virus were used for H.I. tests: PR8 (type A), A/Scotland/1/53, A/Scotland/26/54, A/Scotland/31/56, Lee (type B), B/England/52, B/Scotland/28/55, and the 1233 strain of type C virus (Taylor, 1949). The Sendai strain of newborn pneumonitis virus was received from the World Influenza Centre of the World Health Organization. Allantoic-fluid antigens of this virus were used in C.F. and H.I. tests; positive and negative control sera for C.F. tests were received from the Virus

Laboratory of the School of Public Health, University of Michigan. Type 4 adenovirus (Hilleman and Werner, 1954), together with positive control serum, was received from the Virus Reference Laboratory, Colindale. Adenovirus group antigen was prepared from HeLa cell cultures showing complete degeneration after infection with this virus; the cultures were frozen, thawed, centrifuged at low speed to remove debris, and the supernatant fluid was heated to 56° C. for 30 minutes and stored at 4° C. for use as antigen in the small-volume cold overnight C.F. test. Sera were tested for agglutination of streptococcus M.G. by a standard method similar to that employed at the Virus Reference Laboratory, Colindale. Titres are cited as reciprocals of initial serum dilutions in C.F. and H.I. tests and as reciprocals of final dilutions in streptococcus M.G. agglutination tests.

Results

Influenza

Evidence of influenza infection indicated by fourfold or greater rising titres in serological tests was found during the periods shown in Table I. In common with the rest of

TABLE I.—Serological Evidence of Influenza

Period	Category of Case	No. of Cases Tested	No. with Rising Titres to Indicated Type of Influenza
Dec., 1954-Mar., 1955	Adult pneumonia	85	12
	Baby " "	98	2
	" Influenza " "	49	27
April, 1955	Adult pneumonia	28	1
	Baby " "	5	2
	" Influenza " "	7	2
Dec., 1955-Apr., 1956	Adult pneumonia	92	11
	Baby " "	24	2
	" Influenza " "	92	32
Jan., 1956-Apr., 1956	Adult pneumonia	89	5
	Baby " "	19	0
	" Influenza " "	74	1

Britain, Glasgow experienced an outbreak of influenza B during the winter of 1954-5. A few type A infections detected during April, 1955, heralded the following winter's outbreak of influenza A, which was associated with virus C infections as in the outbreak two years before (Grist, 1955). No influenza infections were found at times other than those shown in Table I. As might be expected, a higher proportion of serologically positive cases was found in the general-practice group than among the miscellany of cases admitted to the pneumonia wards, but very few of the infants showed rising titres of antibody. Thus, during the months when type A or B infections were detected, a specific serological diagnosis of influenza A or B was made in 42% of the general-practice cases, and in 12% of adults, but in only 3% of young children in the hospital series. Two type B strains of influenza virus were isolated during the first winter from garglings collected from children involved in an outbreak of illness in a Glasgow school for the deaf in January, 1955. Dr. A. Harboe, of the World Influenza Centre, reported that these strains closely resembled those sent to the Centre from other countries during the previous two years. During the same period outbreaks of influenza were reported from Ayrshire, and serological evidence of type B infection was found in four out of five cases from which paired sera were sent by Dr. C. D. Rigg, general practitioner.

During the second winter outbreak eight strains of virus A were isolated: these viruses were identified by Dr. A. Isaacs, of the World Influenza Centre, as Scandinavian subtype A strains similar to those isolated in Glasgow in 1953 and 1954. Two of these viruses were isolated from garglings from adults suffering from clinical influenza and six from throat swabs of infants or young children admitted to the baby pneumonia ward, of whom two aged 1 year showed fourfold or greater increases in antibody to type A virus. Of the other four children, two aged 3 years gave positive

serological reactions in the earliest serum samples and in the second serum of one; no second serum was available from the other child. The remaining two infants were 3 months old: very weak positive reactions were given by the sera of one and no reaction was found with the sera of the other at a dilution of 1/2 in the cold overnight C.F. test with soluble antigens prepared from PR8 or from current (A/Scotland/26/54) strains of virus.

Table II, constructed from the records of adults in both hospital and general practice series from whom paired sera were examined by both C.F. and H.I. tests, shows that these

TABLE II.—Results of Influenza C.F. and H.I. Tests of Adult Sera

Season and Type of Influenza	Results of C.F. Tests	Results of H.I. Tests	
		Fourfold or Greater Rising Titre	No Rise of Titre
1954-5 B	Fourfold or greater rising titre ..	28	3
	No rise of titre ..	8	176
1955-6 A	Fourfold or greater rising titre ..	24	15
	No rise of titre ..	8	142

tests were of similar efficiency. Five more cases of influenza B were diagnosed by H.I. than by C.F.; of 31 cases tested by H.I. with two type B antigens, all showed significant increases of antibody titre with current virus antigen (B/Scotland/28/55) and 30 did so with antigen of the Lee strain. Only 62% of type A infections gave diagnostic reactions with both tests, and seven more were detected by C.F. than by H.I.; only antigens from recently isolated strains of virus were used in H.I. tests for influenza A.

A specific serological diagnosis of influenza A or B based on rising titres of antibody was made in 34% of the general-practice cases. When sending blood for examination the practitioners were asked to classify the patients as either "typical" or merely "probable" cases of influenza, basing the distinction on their own clinical judgment. Virus A or B infection was confirmed serologically in 41 (31%) of "probable" and 26 (39%) of "typical" cases.

Newborn Pneumonitis Virus

The detailed results of experience with this agent will be reported separately (Sommerville, to be published). Fourfold or greater rising titres were found by one or both of the C.F. and H.I. tests in three adults admitted to pneumonia wards and also in six of the general-practice cases of suspected influenza (Table III). Of these nine cases of antigenic experience, four were found in the 1954-5 season; the other five occurred during the following winter.

TABLE III.—Serological Evidence of Infection with Other Respiratory Viruses

Category	Newborn Pneumonitis Virus		Adenovirus		Streptococcus M.G.	
	No. Cases Tested	No. with Rising Titres	No. Cases Tested	No. with Rising Titres	No. Cases Tested	No. with Rising Titres
Adult pneumonia	175	3	103	0	199	1
Baby " "	97	0	32	0	53	0
" Influenza " "	172	6	70	1	120	0

Adenovirus Infections

C.F. tests with the group antigen were performed with negative results in 103 cases admitted to adult and 32 admitted to baby-pneumonia wards; a rise in titre from <8 to 64 was found in 1 of 70 general-practice cases tested (Table III). One infant pneumonia case admitted in November, 1955, had a C.F. titre of 32 in both serum specimens, suggestive of recent infection. Further evidence of infection with a virus of this group was found during investigation of an outbreak of respiratory illness in a children's residential nursery in Paisley in mid-January, 1956. Eight children aged from 9 months to 4 years became ill on January 14 with

fever followed by the development of pneumonia with marked illness and copious nasal and post-nasal discharge. Serological investigations gave no evidence of infection with the viruses of influenza A, B, C, newborn pneumonitis, psittacosis, or Q fever. No influenza virus was isolated from throat swabs by egg inoculation, but in one instance an agent which produced the cytopathogenic effects and gave the C.F. reaction of a member of the adenovirus group was isolated in tissue culture.

The results of C.F. tests on serum from the children (Table IV) show that antibody was detected in the first two sera of the child from whom virus was isolated and that at least

TABLE IV.—Evidence of Adenovirus Infection in Residential Nursery

Age of Child (Years)	Virus Isolation from Throat (17/1/56)	C.F. Titres of Sera Tested with Adenovirus Group Antigen		
		17/1/56	31/1/56	7/3/56
9/12	—	<5	<5	<8
1	+	40	40	<10
1	—	220 (a.c.)	<10	<10
2	—	N.T.	N.T.	<8
2	—	220 (a.c.)	N.T.	10
2	—	N.T.	N.T.	<8
4	—	<5	<10	<8

a.c. = Anticomplementary. N.T. = Not tested.

one other child had some antigenic experience. These findings do not prove that an adenovirus was responsible for the wave of illness in the nursery, although negative C.F. reactions do not exclude the possibility, since Balducci *et al.* (1956) have reported instances of infected children whose sera contained no demonstrable complement-fixing antibodies but nevertheless neutralized the homologous strain of adenovirus isolated. Serological evidence of infection with an adenovirus was also found during investigation of an epidemic of keratoconjunctivitis on Clydeside in the early months of 1956.

Streptococcus M.G. Agglutination Tests

Of 372 cases tested (Table III), none had antibody titres of 40 or greater or showed significantly rising titres except one man aged 24 years who was admitted to the pneumonia ward in March, 1955. Titres of 10, 160, and 320 were found with sera taken on the 4th, 7th, and 15th days of illness respectively; the serum of the 7th day gave a cold agglutination titre of 256. Clinically, the illness was an atypical pneumonia of gradual onset, with right lower lobar consolidation and without leucocytosis.

Discussion

These investigations showed the continuing seasonal activity of influenza viruses in and around Glasgow and again illustrated the tendency of type A and B viruses to become active in alternate years. Virus C infections were again found only during the epidemic of influenza A. Serological evidence of infection with an agent related to the newborn pneumonitis virus, for which the name "influenza D" has been proposed by Jensen *et al.* (1955), was found mainly during the height of the outbreak of influenza A. Significantly high but unchanging titres in the tests for infections with these four viruses were found mainly during and after the periods when cases with fourfold or greater rising titres were detected.

Little evidence of specific viral aetiology for respiratory infections of infants admitted to hospital was found in the present study, but our experience again indicated the greater difficulty in demonstrating serum antibodies in this age group. Not only is the antibody response of infants highly specific for the infecting virus, as compared with the broader response of the antigenically more-experienced adult, but also their antibodies react more weakly than those of older subjects in the C.F. test with influenza antigens (Anderson *et al.*, 1953). In Glasgow, Russell (1956) has found that the period of maximum notifications of pneumonia in children under 1 year old often precedes by some weeks the

seasonal outbreak of influenza which coincides with peak notifications of pneumonia in adults. Similar observations that maximal respiratory illness in young children may not coincide with outbreaks of influenza were reported by Stuart-Harris *et al.* (1949) and by Garrow and Fawcett (1953). The epidemics of acute bronchiolitis in infants in 1951, 1953, and 1955, observed by Heycock and Noble (1956), were all in the pre-Christmas season (Heycock, personal communication), whereas influenza epidemics usually occur later in the winter. It seems likely that influenza viruses are not the main agents responsible for the winter seasonal increase in serious respiratory illness of infants. Nevertheless, influenza infection was detected in several infants in the present study; the clinical aspects of their illnesses will be described in a separate report (Thomas, to be published).

McDonald and Andrews (1955) investigated diagnostic methods in an influenza vaccine trial and concluded that assessments based on purely clinical grounds were apt to underrate while those based on purely serological data were apt to exaggerate the protective power of the vaccine. They recommended that the assessment should be based on the numbers of cases diagnosed as influenza on clinical grounds during the limited period when laboratory tests showed that influenza was present in the community. The general-practice study described above was organized primarily in connexion with vaccine trials. Both hospital and general-practice investigations indicated the activity of influenza viruses in Glasgow during similar periods. A higher proportion of serologically positive cases was found among those seen by the practitioners, and during the second winter influenza A was detected earlier and for a longer period in this group than in hospital. On the other hand, laboratory investigation of patients admitted to hospital with acute respiratory illness is more easily organized, and earlier studies at this laboratory have confirmed that the results of such tests reflect the influenza experience of the community as judged by other criteria (Grist and Landsman, 1955).

The standard C.F. test with soluble antigen was again found to be a convenient and satisfactory method of diagnosis in adults, though an additional 23% of infections were detected when this test was supplemented by H.I. tests. The difficulty of clinical diagnosis of influenza is illustrated by the similarity in the proportions of confirmed cases in the groups considered "typical" and "probable" influenza by the general practitioners. It should be understood that each practitioner was encouraged to submit specimens from two patients a week whose illnesses might conceivably be influenza in origin. This was done in order to secure a representative sample of minor febrile and respiratory disease throughout the study, and doubtless resulted in some dilution of influenza with other cases. Nevertheless, the "typical" group did not contain a significantly higher proportion of cases in which laboratory tests indicated specific infection with influenza virus A or B.

Evidence of infection with members of the adenovirus group has been reported in Britain by Zaiman *et al.* (1955), Andrews *et al.* (1956), and Balducci *et al.* (1956). In the present study these infections were infrequently found except during investigation of an epidemic of keratoconjunctivitis. Rising titres of C.F. antibody were found by Balducci *et al.* (1956) in 3 out of 67 adults with pneumonia or bronchitis in a Sheffield hospital, whereas none of 103 similar cases in the Glasgow hospital study showed a rising titre. The pathogenicity of these viruses for man is incompletely defined, but in this country they have now been associated with the syndromes of febrile catarrh, pharyngo-conjunctival fever (Bell *et al.*, 1955), and epidemic keratoconjunctivitis.

Atypical pneumonia accompanied by the development of cold agglutinins and agglutinins for streptococcus M.G. has continued to be uncommon in Glasgow since these investigations of pneumonia cases began in 1950. Glasgow did not appear to share the epidemic experience of this disease in 1954 reported from East Anglia and London by Wormald *et al.* (1956), Wood (1956), and Garrow (1956).

Summary

Examinations for virus infection were made in 197 cases of suspected influenza seen in general practice and in 265 adults and 114 children admitted to pneumonia wards during the winters of 1954-5 and 1955-6.

Cases of influenza B were detected in all groups during the first winter.

In the second season an outbreak of influenza A occurred; during this period were found several influenza C infections and also instances of antigenic experience with an agent related to the Sendai strain of newborn pneumonitis virus.

Few adenovirus infections were detected except in cases of epidemic keratoconjunctivitis, but a virus of this group was isolated during investigation of an outbreak of respiratory illness in a children's nursery.

One case of atypical pneumonia with agglutinins to streptococcus M.G. was found.

The investigation showed the practicability of detecting the time and type of influenza outbreak by serological tests of cases selected in general practice or admitted to hospital with the diagnosis of pneumonia.

Combined complement-fixation and haemagglutination-inhibition testing revealed more influenza cases than either test alone. The weak immune response of infants made serological diagnosis difficult.

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REFERENCES

- Anderson, S. G., Donnelly, M., French, E. L., Kalra, S. L., and White, J. (1953). *Med. J. Aust.*, 2, 44.
Andrews, B. E., McDonald, J. C., Thorburn, W. B., and Wilson, J. S. (1956). *British Medical Journal*, 1, 1203.
Balducci, D., Zaiman, E., and Tyrrell, D. A. J. (1956). *Brit. J. exp. Path.* (1955). *J. Amer. med. Ass.*, 157, 1083.
Garrow, D. H. (1956). *British Medical Journal*, 1, 1105.
Grist, N. R. (1955). *British Medical Journal*, 2, 795.
Grist, N. R., and Landsman, J. B. (1955). *Glasg. med. J.*, 36, 69.
Heycock, J. B., and Noble, T. C. (1955). *British Medical Journal*, 1, 438.
Hilleman, M. R., and Werner, J. H. (1954). *Proc. Soc. exp. Biol. (N.Y.)*, 75, 71.
Jensen, K. E., Minuse, E., and Ackermann, W. W. (1955). *J. Immunol.*, 123, 1232.
McDonald, J. C., and Andrews, B. E. (1955). *British Medical Journal*, 2, 1139.
M.R.C. Committee (1955). *Ibid.*, 2, 1139.
Rowe, W. P., Huebner, R. J., Gilmore, L. K., Parrott, R. H., and Ward, T. C. (1953). *Proc. Soc. exp. Biol. (N.Y.)*, 84, 570.
Russell, S. J. (1957). *Scot. med. J.*, In press.
Stuart-Harris, C. H., Laird, J., Tyrrell, D. A. J., Kelsall, M. H., Franks, Z. C., and Pownall, M. (1949). *J. Hyg. (Camb.)*, 47, 434.
Taylor, R. M. (1949). *Amer. J. Publ. Hlth.*, 39, 171.
Wood, P. (1956). *British Medical Journal*, 1, 711.
Wormald, P. J., Dowsett, L. M., and Walker, J. H. C. (1956). *Ibid.*, 1, 709.
Zaiman, E., Balducci, D., and Tyrrell, D. A. J. (1955). *Lancet*, 2, 595.

A film entitled "Hearing Tests in Cerebral Palsied Children" has been made at the Centre for Spastic Children, Chelsea, in co-operation with the audiology unit of the Royal National Throat, Nose, and Ear Hospital. It shows some of the methods and difficulties in testing these children. The film is silent, 16 mm., and 650 ft. (198 m.) in length. A script to accompany the film is available or a lecturer can be supplied. The film is available from the Centre for Spastic Children, 61, Cheyne Walk, Chelsea, London, S.W.3.

INFECTION WITH SENDAI VIRUS IN AN OUTBREAK OF RESPIRATORY ILLNESS

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In February, 1956, an outbreak of respiratory infection, suspected to be due to an influenza virus, occurred in a hospital for the chronic sick and infirm of both sexes (many of limited intelligence). A small section of the establishment also contained rooms for the destitute. In the next month, among 180 patients, 67 cases (25 male, 42 female) were recognized, of which 21 proved fatal. The staff consisted of two part-time doctors, a matron, and 65 full-time and part-time nursing staff, none of whom had an attack of respiratory infection other than minor colds during this period. Specimens of serum were sent to the laboratory for confirmation of influenza virus infection, but no material was collected for virus isolation.

At the same time there were cases of clinical influenza among residents of the town and among nurses at the local cottage hospital. In several of these the diagnosis was confirmed as influenza virus A infection by complement-fixation (C.F.) tests with their sera. When the sera from 41 patients at the "chronic sick" hospital were examined (38 pairs, 3 single convalescent) by C.F. tests and haemagglutination-inhibition (H.A.I.) tests, only 13 of 38 (34%) had rising titres (9 of them fourfold or greater) suggestive of recent infection with influenza virus A. All gave negative results in the streptococcus M.G. agglutination test and in routine C.F. tests with influenza B and C, psittacosis, adenovirus, and *Rickettsia burnetii* antigens.

At this time a strain of Sendai virus became available at the Virus Reference Laboratory. This virus, said to be a cause of pneumonitis in infants, was isolated originally in Japan. Complement-fixing and haemagglutinating antigens had been prepared to test sera from infants suffering from acute bronchiolitis with spasm in 1955-6. None of these tests had provided evidence of Sendai virus infection, but interesting results were obtained when the same antigens were used to investigate the outbreak in the hospital for chronic sick.

Materials and Methods

The strain of Sendai virus, W.I.C. 12827, was kindly supplied by Dr. Isaacs, of the National Institute for Medical Research, Mill Hill; it had come originally from Dr. Ackermann, School of Public Health, Ann Arbor, Michigan. The strain had had 12 mouse, one rat, two mouse, and 14 egg passages; it had undergone two further egg passages at the Virus Reference Laboratory. The complement-fixing and haemagglutinating antigens consisted of undiluted allantoic fluid derived from 10-day-old fertile hens' eggs inoculated allantoically with 0.1 ml. of a 10^{-4} dilution of stock seed virus. After incubation for three days at 95° F. (35° C.) the

eggs were chilled overnight. Fluids containing haemagglutinating virus were pooled, and clarified by centrifugation at low speed.

The strain of mumps virus used in the course of the investigation was that of Enders, E63/2, which had had many egg passages. Haemagglutinating and "virus particle" complement-fixing antigens were prepared by the allantoic inoculation of 8-day-old fertile hens' eggs with 0.1 ml. of a 10^{-2} dilution of stock seed virus. The eggs were incubated at 95° F. (35° C.) for five to six days. They were then chilled and the allantoic fluids were harvested from those eggs containing haemagglutinating virus in high titre. The pooled fluids were spun at 20,000 r.p.m. for one hour after low-speed clarification, and the deposit was resuspended in normal saline in one-tenth the volume of the harvested fluids.

Sodium azide was added as a preservative (in a final concentration of 0.08%) to both mumps and Sendai complement-fixing and haemagglutinating antigens. The optimal dilutions of the antigens for use in the C.F. tests were determined by means of chequerboard titrations with known positive sera.

C.F. tests were carried out in "perspex" plates with cups, using 0.1-ml. quantities of inactivated test serum, complement, and antigen; 2½ M.H.D. of complement were used and fixation of reagents took place for 1½ hours at 37° C. Then 0.2 ml. of 1% sensitized sheep red cells was added and lysis was allowed to occur for a further half-hour at 37° C. Suitable controls were put up with the test, and all results were read next morning after standing at 4° C. overnight.

Sera tested for haemagglutination-inhibiting antibody were first treated for 18 hours at 37° C. with receptor-destroying enzyme (R.D.E.), and after inactivation at 56°-58° C. for one hour were adsorbed in the cold with a suspension of fowl red blood cells which were subsequently removed by low-speed centrifugation.

Haemagglutination-inhibition titrations were carried out in W.H.O. plastic haemagglutination plates (World Health Organization, 1953) employing 0.2-ml. doubling dilutions of the prepared sera in normal saline. Then 0.02 ml. of virus suspension (containing four agglutinating doses of virus) and 0.02 ml. of 7% fowl red blood cells were added to each serum dilution, and the results were read after mixing and standing for 30 minutes at room temperature. Suitable controls were set up with each series of tests.

Results

In consequence of the small number of patients at the hospital providing results suggestive of recent infection with influenza virus A it was decided to retest their sera with a number of other virus antigens. On testing the sera of those

TABLE 1.—Results of Complement-fixation and Haemagglutination-inhibition Tests on Patients with Rising Titres to Sendai Virus

Patient	Complement-fixation Test									Haemagglutination-inhibition Test		
	Influenza A Sol. Antigen			Sendai Antigen			Mumps V Antigen			Sendai Virus		
	1	2	3	1	2	3	1	2	3	1	2	3
Ba	4*	4	<8	8	64	<8	8	8	<8	36	288	216
Be	<8	<8	<8	32	32	—	<8	<8	27	576	216	—
Sa	8	4	<8	16	<8	<8	<8	<8	9	144	144	—
Hi	<8	<8	<1	8	<8	—	<1	<8	27	432	—	—
Ma	8	4	8	64	16	<8	<8	<8	144	—	>576	—
Tec.K.	<8	<8	<1	16	16	4	4	<8	36	—	432	—

* Reciprocal of the dilution of sera at which test was positive. In some instances the small quantities of sera available prevented testing at lower dilution than that stated.
— Indicates not tested.

elderly patients serologically negative for influenza virus A for their ability to fix complement with Sendai virus preparations, recent infections with this agent were suggested when five patients were found to have rising antibody titres (Table 1); two other patients gave positive results at a dilution of 1:16 in both specimens (patients H and F,

Table II). In addition, the laboratory technician (patient Tec. K) who had collected blood from patient Ba suffered later from a mild respiratory illness and his sera showed rising antibody titres with Sendai virus only. Further examination by C.F. and H.A.I. tests of all remaining sera available from the hospital inmates, and other patients from the town, showed that in all probability a number had been infected recently with Sendai virus, including some who had suffered in addition from an influenza virus A infection. Table II shows those patients with elevated but unchanging antibody titres to Sendai virus, including some with rising antibody titres to influenza virus A.

Examination of further samples of sera (third specimens) collected about three months later confirmed this opinion. The Sendai virus complement-fixing antigen, which had the same constitution as the haemagglutinating antigen—that is, both were undiluted allantoic fluid—gave reproducible results from day to day with sera collected for the investi-

TABLE II.—Results of Complement-fixation and Haemagglutination-inhibition Tests in Patients Showing Non-rising Titres to Sendai from Hospital and Town

Patient	Complement-fixation Test									Haemagglutination-inhibition Test		
	Influenza A Sol. Antigen			Sendai Antigen			Mumps V Antigen			Sendai Virus		
	1	2	3	1	2	3	1	2	3	1	2	3
G (H)	<4	16	8	16	16	16	—	<8	<8	108	54	216
K (H)	8	32	16	16	8	8	—	<8	<8	13.5	13.5	27
H (H)	—	<8	<8	16	16	<16	—	<8	<8	432	>576	—
F (H)	<8	<8	<8	16	16	<8	<8	<8	<8	27	108	—
R (H)	<4	<4	16	—	<8	8	—	<8	<8	27	27	54
Ha (T)	<4	<4	—	8	8	8	—	<8	<8	144	108	—
L (T)	<2	<4	<8	8	8	16	8	8	8	54	108	54
B (T)	<4	8	—	8	8	—	<8	—	—	432	432	—

(H) = hospital; (T) = town.
Sera 1 and 2 were examined in parallel in the C.F. test, but 3 was examined separately owing to shortage of sera. All three were examined in parallel in the H.A.I. test.

gation. In addition, rising titres of haemagglutination-inhibiting antibody always appeared as such on repetition of the tests, but the actual titres obtained tended to vary somewhat when the titrations were repeated on different occasions. This rendered impossible the determination of an H.A.I. baseline value for the detection of patients who had suffered from a previous infection, and from whom only one serum was available or whose paired sera showed unchanging antibody titres. It was not possible to determine exactly the times at which Sendai virus infection started and stopped in the hospital, but the first specimen from Ba, apparently the first case, taken supposedly on the third day of illness, January 20, was already positive at a dilution of 1:8; the sera collected in June (third specimens) from 29 patients providing negative results in February showed no evidence of further rises in antibody titre, with the exception of patient R, whose titre in the third specimen may not be significant because it could not be tested at the same time as the previous specimen. R was also the only patient in whom there was evidence of influenza A virus infection between the first week in March and the third bleeding in June (Table II).

The serum of one of the medical officers, collected in June, did not contain any complement-fixing antibodies at a dilution of 1:8 for influenza virus A antigen, but gave positive results at this dilution with both Sendai virus and mumps "virus particle" antigens. The significance of these findings cannot be interpreted at the moment (see below). Too few sera were obtained from the nursing staff to be able to determine the presence of infection among them.

The sera of 8 of 49 (16%) blood-transfusion donors from the town, collected in June, had Sendai virus complement-fixing titres of 1:8 or higher (five at 1:8 and three at 1:16), suggesting the possibility of infections with this virus in the local population.

While this work was in progress Dr. G. K. Hirst, of New York, visited the laboratory and reminded us that Sendai virus was similar in some respects to Newcastle disease virus. Although Jensen *et al.* (1955) found no serological cross-reactions between Sendai virus and the virus of mumps, the patients' sera were tested for antibody with mumps complement-fixing "virus particle" (V) antigen, which has an antigenic relationship to Newcastle disease virus (Jungherr *et al.*, 1949). It was found that of the six patients in whom rising Sendai virus complement-fixing titres could be demonstrated the sera of five had no complement-fixing antibody at a dilution of 1:8 when tested with mumps V antigen. The sixth patient had an unchanging titre of mumps V antibody of 1:8 in the first two specimens (Table I). The sera of five elderly patients (G, K, H, F, and R, Table II) showing unchanging Sendai virus complement-fixing antibody titres of 1:8 or higher were tested with mumps V antigen, and complement-fixing antibody was found to be absent at a dilution of 1:8.

None of the sera which gave negative results at a dilution of 1:8 in the Sendai virus complement-fixing test (including those with high haemagglutination-inhibiting antibody titres) had mumps V complement-fixing antibody at this dilution. The sera of four patients from the hospital for whom rising Sendai virus haemagglutination-inhibiting and complement-fixing antibody titres could be demonstrated gave negative results when retested with mumps V antigen for haemagglutination-inhibiting antibody.

Among 800 patients with illnesses of all descriptions from whom pairs of sera were received in 1956, five patients were found whose sera showed fourfold or greater increases in complement-fixing titre with Sendai virus and negative (titres <1:8) or non-rising complement-fixing titres with mumps "virus particle" antigen. The sera of these five patients gave negative results when examined routinely for antibodies to influenza viruses A, B, and C, psittacosis, adenovirus, *R. burnetii*, lymphocytic choriomeningitis virus, and streptococcus M.G. One of the patients was an adult with an influenza-like illness, and four were children with respiratory infections.

Discussion

In 1953 Kuroya and Ishida described the isolation of a virus from the lungs of a fatal case of pneumonitis in an infant by intranasal inoculation of mice. This virus was isolated subsequently by other Japanese workers from different laboratory stocks of mice, hamsters, and swine. Subsequent investigations (on volunteers) by Japanese workers confirmed that the virus could cause severe pneumonitis in children.

Jensen and his colleagues (1955) found serological evidence of the presence of the virus in the U.S.A. Five cases were identified, but no isolations of virus were made. The results of our preliminary serological surveys of single sera suggest that infection with the virus may not be uncommon in England, but more work is needed to ascertain the significance of these tests. The precise relationship between mumps V and Sendai antigens is being investigated at the moment. It is for this reason that all our suspected cases have been tested with mumps V antigen.

It is of interest that the recent addition to the myxo group of viruses, the "croup agent," isolated by Chanock (1956) in Cincinnati, U.S.A., and by Beale *et al.* (1956) in Toronto, also gives some serological cross-reactions with the mumps virus, but not with Sendai virus.

Summary

In an outbreak of respiratory illness in a hospital for the chronic sick, six patients (five old people and one technician) who developed rising titres of complement-fixing antibody to Sendai virus were observed.

Preliminary surveys show that antibody to Sendai virus is not uncommon in Southern England.

We wish to thank Dr. F. O. MacCallum for his active help and advice in investigating the outbreak and in preparing this paper. We are also indebted to Dr. Preston, Deputy Director, and the staff of the Regional Transfusion Centre, Oxford, for supplying specimens of blood from local donors; and to the laboratory staff at the Memorial Hospital, Cirencester, for the collection and dispatch of specimens.

REFERENCES

- Beale, A. J., McLeod, D. L., Stackiw, W., and Rhodes, A. J. (1956). Paper presented at annual meeting, Society of Pediatric Research, Buck Hill Falls, Pa.
Chanock, R. M. (1956). *J. exp. Med.*, 104, 555.
Jensen, K. E., Minuse, E., and Ackermann, W. W. (1955). *J. Immunol.*, 75, 71.
Jungherr, E., Luginbuhl, R. E., and Kilham, L. (1949). *Science*, 110, 333.
Kuroya, M., and Ishida, N. (1953). *Yokohama med. Bull.*, 4, 217.
World Health Organization (1953). *Tech. Rep. Ser.*, No. 64. Geneva.

SUXAMETHONIUM CHLORIDE ADMINISTRATION AND POST- OPERATIVE MUSCLE PAIN

BY

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A great deal has been written in praise of suxamethonium chloride ("scoline") as a muscle relaxant in clinical anaesthesia, stressing its freedom from side-effects such as bronchospasm, tachycardia, and fall in blood pressure. In many ways suxamethonium is the ideal relaxant: the rapid onset of complete relaxation followed by the quick return of full muscle power has made it very popular for endotracheal intubation, orthopaedic manipulation, and short abdominal operations. The ideal conditions produced for intubation have undoubtedly reduced the incidence of minor trauma to lips, tongue, and teeth, and of sore throat. One of its principal disadvantages, that of prolonged apnoea, has received so much attention as to obscure other side-effects which produce considerable anaesthetic morbidity.

It is the purpose of this paper to call attention to muscle pain and stiffness, in some cases of great severity, following the use of suxamethonium in patients who are discharged from hospital within 48 hours of operation.

Churchill-Davidson (1954) first drew attention to muscle pains after suxamethonium administration, but this received little attention in the literature; some writers denied that it even occurred. It has been noted that patients kept in bed for two to four days after operation rarely complain of post-operative muscle pains. In the present investigations dental patients discharged the day after operation were chosen. The investigations were designed to show the incidence of post-operative muscle pain, to make an estimate of its severity, and to try to find some simple means of preventing it.

Technique

The patients were premedicated with "omnupon" and scopolamine, or morphine and atropine, in doses appro-

priate to their age, weight, and physical condition. Induction was with 0.5–0.75 g. of thiopentone 5%, immediately followed by suxamethonium, 50–75 mg., and naso-tracheal intubation. Maintenance was with nitrous oxide, oxygen, and trichlorethylene. On the Nosworthy card was recorded the occupation of the patient, the dose of suxamethonium, and its speed of administration, divided into fast, medium, and slow. The resulting fasciculations were recorded as strong, moderate, and weak, and any particular muscle group strongly affected was noted. The patient's shoulders, chest, abdomen, and legs were bared in order to observe this accurately. The patients were seen the day after operation, when they were discharged, and five days later in the out-patient department, when they attended for routine dental follow-up. The site of any muscle pain or stiffness, its severity, and any spontaneous observations of the patient were recorded.

Control Series

In all, 73 patients were anaesthetized in the way described and followed up. The results were: 25 (35%) complained of pain and/or stiffness on day of discharge; 52 (72%) complained of pain and/or stiffness when seen in out-patient department; and 16 (22%) complained of severe pain and/or stiffness.

The relationship of pain and stiffness to the degree of fasciculations was studied. There seems to be no clear-cut correlation between strong fasciculation and the development of severe pain and stiffness afterwards. Some cases in which the fasciculations were weak developed severe pain and stiffness. One case is of particular interest in this connexion. The only visible fasciculation was an isolated jerk of the rectus muscle, and the patient complained post-operatively that she felt as if she had been "kicked in the belly by a horse." However, when seen in the out-patient department five days later she had experienced generalized aching for three days after discharge. Likewise, there seemed to be no definite relationship between the occupation and the state of physical fitness of the patient. Many athletic patients developed pain, and a blacksmith's striker complained of severe shoulder pain.

Our results are thus in close agreement with Churchill-Davidson's figures—that is, 72% of cases developed pain and stiffness. Our incidence of severe pain was, however, much lower: 22% as compared with 42% approximately. This difference can be explained on the basis that Churchill-Davidson's cases were out-patients, immediately ambulant after operation, whereas ours were in bed for 24 hours after operation. The longer the patient remains in bed after operation the less likely he is to develop suxamethonium pain. One patient, an architect, who had undergone five dental operations before this investigation and developed suxamethonium pain after each one, gave a very interesting account of this phenomenon. He had observed that if he kept still and made no sudden movements he was free of pain; but any activity, such as getting up out of a chair, was painful. Patients quiescent in bed after operation may not notice any discomfort. The figures from the control series show this clearly. Many patients who have no pain on the day of discharge develop it later when they return home. The incidence of pain in patients seen in the out-patient department is twice that on the day of discharge.

Experiments with Modified Technique

The following modifications of anaesthetic technique were made in an attempt to abolish muscle pains:

1. *Chlorpromazine Hydrochloride Experiment.*—Chlorpromazine hydrochloride has a direct paralytic action on skeletal muscle (Burn, 1954). It was hoped that it might modify the painful after-effects of suxamethonium. Chlorpromazine hydrochloride, 50 mg., was given intramuscularly with the premedication. A further 25 mg. was given intravenously on arrival in the theatre, followed by 0.25 g. of thiopentone, 50–75 mg. of suxamethonium, nitrous oxide, oxygen, and trichlorethylene. Fourteen cases were anaesthetized. The results were: 7 (50%) complained of

pain and/or stiffness on the day of discharge; 8 (56%) complained of pain and/or stiffness when seen in the out-patient department; and none complained of severe pain and/or stiffness. Although this series of cases was very small, administration of chlorpromazine hydrochloride did not seem to influence the incidence of post-operative pain, and the experiment was abandoned on account of the drowsy condition of the patients post-operatively, which in some cases persisted on the morning of discharge.

2. *D-Tubocurarine Chloride Experiment.*—In 65 cases Gray's test dose of D-tubocurarine (5 mg.) was given intravenously before the thiopentone and suxamethonium induction. It is important to observe the effects of these test doses, as a sensitive patient might develop a mixed block on subsequent suxamethonium administration. All of our cases developed ptosis, but none showed hypersensitivity. Visible fasciculations were not abolished in every case; in the few in which they did occur they were weak and transient. The results were: 2 (3%) complained of pain and/or stiffness on the day of discharge; 15 (22%) complained of pain and/or stiffness when seen in out-patient department; and 3 (5%) complained of severe pain and/or stiffness. Churchill-Davidson, in a much smaller series of cases, using 40 mg. of gallamine triethiodide in place of 5 mg. of D-tubocurarine, found that 40% complained of muscle pains, as compared with 22% in this series. There is no doubt that the administration of 5 mg. of D-tubocurarine effectively reduces the incidence and severity of post-operative suxamethonium pain, and is a simple practical measure. The case referred to above in which the patient had experienced suxamethonium pain from five previous anaesthetics underwent a further five dental operations during the investigations. In each of these inductions 5 mg. of D-tubocurarine was given before the thiopentone and suxamethonium induction as described, with complete relief of post-operative muscle pain.

3. *D-Tubocurarine Post-suxamethonium Experiment.*—In order to prove that 5 mg. of D-tubocurarine before suxamethonium is the effective measure in reducing muscle pains, 5 mg. of D-tubocurarine was given after the suxamethonium in 25 cases. No modifications of fasciculations were seen; this was expected, as suxamethonium acts more rapidly than D-tubocurarine. The results, as expected, correlate closely with the control series: 7 (28%) complained of pain and/or stiffness on the day of discharge; 19 (76%) complained of pain and/or stiffness when seen in the out-patient department; and 4 (16%) complained of severe pain and/or stiffness.

4. *Slow Administration Experiment.*—In 27 cases suxamethonium was given at the rate of 10 mg. per 30 seconds until apnoea occurred. When administered in this way fasciculations are greatly reduced in strength. The results were: 12 (44%) complained of pain and/or stiffness on the day of discharge; 20 (74%) complained of pain and/or stiffness when seen in the out-patient department; and 8 (30%) complained of severe pain and/or stiffness. Some of the most severe cases occurred in this group. One female patient was confined to bed on her return home and was so stiff and aching that her relatives had to lift and turn her over in bed. Bourne *et al.* (1952) state that where fasciculations are vigorous post-operative stiffness is more likely. This series shows conclusively that the degree of pain bears no relationship to the strength of visible fasciculations. Six patients who complained of severe pain had no fasciculations at all.

5. *Procaine Experiment.*—Procaine produces neuromuscular block by inhibiting production of acetylcholine at the end-plate. In 25 cases 10–20 ml. of 1% procaine was given intravenously before the thiopentone and suxamethonium induction. The results were: 2 (8%) complained of pain and/or stiffness on the day of discharge; 11 (44%) complained of pain and/or stiffness when seen in the out-patient department; and 3 (12%) complained of severe pain and/or stiffness. Procaine administration does seem to have some influence on suxamethonium

muscle pain, but is a clumsy method and not so effective as D-tubocurarine. Procaine administration is time-consuming and suffers from the danger that it may prolong the action of suxamethonium, since they are both destroyed by the same enzyme.

Discussion

It is evident from the results of the investigations that suxamethonium is responsible for considerable post-operative discomfort when a patient is discharged home within 48 hours of its administration. After the patient has been up and walking around for about eight hours, aches and pains start, lasting two or three days; in some cases they are severe and may last for as long as six days. A common description by patients is to say, "I feel as if I had been kicked in the belly by a horse," or "trampled on by a herd of elephants": a tough young man will say, "I feel as if I have been in a brawl." Many patients have called in their own doctors for advice and treatment. The condition usually goes unrecognized, and various diagnostic labels are attached, such as "Fibrositis" or "You must have been in an awkward position on the table."

From the statistical results and from interviews with these patients in the out-patient department it is our firm opinion that suxamethonium should be given up as a relaxant in those cases where the patient is discharged within 48 hours of operation, unless previously modified with D-tubocurarine. Suxamethonium is often the relaxant of choice for a difficult intubation or a manipulation in a very muscular individual, and in these cases the likelihood of suxamethonium pain can be greatly reduced by the use of 5 mg. of D-tubocurarine before the suxamethonium.

Summary

229 cases undergoing dental operation were given suxamethonium chloride ("scoline") for endotracheal intubation, and the incidence of post-operative pain attributable to the drug was investigated.

Slow administration of suxamethonium does not reduce the incidence and severity of post-operative muscle pain.

The only practical and convenient measure to reduce this muscle pain is the administration of 5 mg. of D-tubocurarine or 40 mg. of gallamine triethiodide before the suxamethonium.

We are indebted to Mr. H. Mandiwall, consultant dental surgeon, and Mr. D. A. Brown, senior hospital dental officer, for their co-operation in conducting these investigations.

REFERENCES

- Bourne, J. G., Collier, H. O. J., and Somers, G. F. (1952). *Lancet*, 1, 1225.
Burn, J. H. (1954). *Proc. roy. Soc. Med.*, 47, 617.
Churchill-Davidson, H. C. (1954). *British Medical Journal*, 1, 74.

For the first time a section devoted to hospitals will be included in the annual Congress of the Royal Society of Health, which is being held at Folkestone from April 30 to May 3. This section will be presided over by LORD INMAN, Chairman of Charing Cross Hospital. Another innovation will be a forum consisting of a general practitioner, two medical officers, the medical director of a London hospital, and a health visitor, which will discuss questions concerning the health and welfare of the family. During the Congress papers will be read on such subjects as world nutrition, new methods in food preservation, absenteeism in industry, marriage and mental health, slum clearance, food hygiene, fluoridation of public water supplies, and atmospheric pollution. To commemorate the tercentenary of the death of William Harvey, Sir ARTHUR MACNALLY will deliver a special lecture entitled "William Harvey—His Influence on Public Health." Provision has also been made for an overseas forum at which late papers from foreign delegates will be given.

GENERALIZED ARTERIAL CALCIFICATION OF INFANCY

BY

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In some 40 reported cases of arterial calcification of infancy the proved occurrence in siblings has been described once (Menten and Fetterman, 1948). We report a further example of siblings affected by this disease. It has been described in children of either sex from the age of 1 day to 27 months, usually in the first six months of life. The clinical history and post-mortem appearances in most of the reported examples in early infancy are very similar. The children are born to apparently healthy young parents. The pregnancy and birth are normal, and there is no evidence of abnormal consumption by mother or child of poisons or poisonous dosages of calcifying substances. The infant thrives at first, then, after a few hours, or at the most a few days, of acute symptoms, succumbs from cardiac ischaemia. The symptoms are refusal of feeds, painful rapid respiration, abdominal distension, and heart failure. Occasionally, as in the first of our cases, an electrocardiogram may show the picture typical of coronary occlusion.

Although the clinical manifestations are usually attributable to blockage of the coronary arteries, the calcification affects large and medium-sized arteries throughout the body, and hence we have used the term "generalized arterial calcification."

This is not the only cause of cardiac infarction in infancy, but the syndrome forms a well-defined clinical entity.

Case 1

A male child was born on July 11, 1949. The mother was aged 19 and the father 20; both were in good health with no significant medical history. Both were English and not consanguineous. The child was delivered normally in hospital after an uneventful pregnancy and weighed 7 lb. 13 oz. (3.5 kg.) at birth. He cried vigorously. There was difficulty in establishment at the breast owing to retracted nipples, and the infant was therefore bottle-fed (dried milk). The mother noted no disturbance of any kind until four days before readmission to hospital on August 9, 1949, the infant then being 4 weeks old. The first symptom was refusal of food, and this was followed by vomiting and rapid breathing. The family doctor did not think the child was seriously ill until the day of admission, when respiration became much more difficult.

On arrival at hospital the infant was extremely ill, cyanosed, and pale, with a respiration rate approaching 100, temperature 100° F. (37.8° C.), and heart rate 180–200. The liver was enlarged, but there was no oedema. The clinical diagnosis was of acute infection, possibly accompanied by paroxysmal tachycardia. The cardiogram showed inversion of the T waves and elevation of the ST segment, typical of coronary occlusion. The leucocyte count was 7,000, of which 50% were polymorphonuclears. X-ray examination of the chest showed some mottling at the bases. Antibiotics and digoxin were prescribed, but the infant died a few hours later.

Case 2

A third child (a girl) was born at home on October 28, 1955, after a normal pregnancy—a second child (a boy) having been born in 1954. Delivery was spontaneous, and the infant appeared healthy. She was breast-fed and showed no signs of illness until 24 hours before admission to hospital on November 26, then being 4 weeks old. The first symptom was refusal of food, and this was followed by vomiting, the passing of two or three loose stools, and rapid grunting respiration. On admission the infant was cyanosed, pale, and collapsed, with a heart rate of 180, enlargement of liver and spleen, and oedema. There were crepitations over both lungs. The infant died within a few hours.

Post-mortem Examination

Both children were well nourished and externally normal. The most outstanding lesion internally was the calcification of the coronary arteries. The first 2–3 cm. stood out hard, white, and tortuous from a faintly mottled pale-red epicardium. The external iliac, femoral, popliteal, axillary, and brachial arteries were rigidly calcified in almost their whole length, but no other calcification was seen with the naked eye. In Case 2 all of the viscera were radiographed after removal, and, besides the sites already mentioned, calcification was obvious in the mesenteric arteries and in the lingual arteries. The heart of the first child was enlarged (40 g.), predominantly by left ventricular thickening, and the myocardium was firm and light red. In Case 2 the heart was of normal size (23 g.) and the anterior wall of the left ventricle was pale and slightly mottled, the pallor being most pronounced in the inner third. The anterior columnae carinae were flattened. In Case 1 the valves were normal, but in Case 2 there were five minute dark flecks on the contact margin of the posterior mitral cusps. Macroscopically the aorta was normal.

The kidneys were normal to the naked eye. The bones and their epiphyseal lines in Case 2 showed no abnormality macroscopically or microscopically. Only the upper pair of parathyroid glands were found in Case 2 despite a prolonged naked-eye and microscopical search. The two found were of normal size and microscopically appeared normal by the criteria of Gilmour (1947). The parathyroid glands were not examined in Case 1.

Microscopical Appearances

Arteries.—The vascular changes in both children were in all major respects similar, although there were minor variations in the degree of involvement at different sites. In addition to the arteries in which calcification was visible, either by naked eye or radiologically, smaller arteries, such as the pericapsular vessels of the thyroid and suprarenals, and arteries in the pancreas and thymus, often showed slight degrees of calcification. The relationship of the calcification to elastic tissue emphasized particularly by Stryker (1946) was very obvious. There was a remarkable predilection for the internal elastic lamina. The minimal lesion was a fine incrustation on each side of the elastic strand, and there were all degrees between this and large irregular masses of calcification distorting the media, with great fibrous intimal proliferation even to the extent of completely obliterating the lumen. In most of the large masses fragments and lengths of elastic tissue could be demonstrated with suitable staining. A common finding was straight bars of calcification along the course of the elastic lamina with loss of the characteristic wavy appearance, and a slight degree of intimal thickening. The pulmonary arteries showed calcification in the elastic strands throughout the media, but no large masses and no intimal changes. A few elastic fibres in the media of the aorta were focally encrusted with calcified material. The affected elastic was at varying levels in the thickness of the aortic media, and sections of all parts of the aorta showed the change. There were no changes in the cerebral vessels. Minimal lesions were present

in the common carotid arteries in Case 1. The elastic laminae remote from the areas of calcification appeared normal.

Heart.—The myocardium of the enlarged heart in Case 1 showed slight patchy interstitial fibrosis, most marked in the subendocardial third and in the papillary muscles, and a few small areas of recent muscle necrosis. In Case 2 there was less fibrosis and more extensive recent infarction, mainly in the anterior wall of the left ventricle. The flecks on the mitral valve consisted of fibrin and red cells, and the valve itself was normal.

Kidneys.—There were amorphous masses of calcification in a few scattered glomeruli in both cases. These masses projected inward from Bowman's capsule and distorted the glomerular tuft. In sections stained with periodic-acid-Schiff the calcification was clearly related to the basement membrane of the capsule, which split to enclose it.

No calcification was found histologically in any other sites, including the gastric mucosa, the pulmonary alveolar walls, and the endocardium.

Examination of the Mother and Surviving Sibling.—This was made clinically, radiologically, and electrocardiographically, and no abnormality was detected. Their serum calcium, blood inorganic phosphorus, and plasma cholesterol were normal.

Discussion

The differential diagnosis clinically between the effects of generalized arterial calcification on the heart and the manifestations of such conditions as glycogen-storage disease, interstitial myocarditis, endocardial fibroelastosis, and aberrant coronary arteries may be difficult. It has been suggested by Cochrane and Bowden (1954) that radiography of the neck may show the arterial calcification.

The aetiology of generalized arterial calcification of infancy is unknown. There is a possibly distinct small group of cases in which primary renal disease may have produced metastatic calcification. Hydronephrosis was found in two children (Bryant and White, 1891; Andersen and Schlesinger, 1942) and congenital renal hypoplasia in one (Cochrane and Bowden, 1954).

A congenital abnormality of the arterial wall and an abnormality of calcium metabolism are the most likely alternatives to account for the remaining cases, and in our opinion the latter is the more probable. The possibility of vitamin D overdosage has been excluded in the majority, although the possibility of hypersensitivity to the vitamin cannot be disproved. The parathyroids have been normal in the few cases in which they have been examined, and no lesions have been found in the bones.

The serum calcium level has been estimated in life in only one example of primary arterial calcification without primary renal disease, and was normal—10.8 mg. per 100 ml. (Traisman *et al.*, 1956). This isolated estimation in a single case cannot be regarded as of great significance.

The predilection of the calcification for elastic tissue has been thought to indicate a primary abnormality of this structure (Stryker, 1946); it has been suggested that the calcification of the arteries in the children with primary renal disease was coincidental. However, calcification round elastic laminae has been described in renal rickets (Shelling and Remsen, 1935), and we have observed a similar picture in material from seven young adults with chronic renal disease and metastatic calcification in the collection of the Bernhard Baron Institute of the London Hospital. In four of these a prominent feature was arterial calcification, most commonly in the form of diffuse calcification of the media, but frequently with a narrow darker staining deposition of calcium against the internal elastic lamina. In all seven cases there were fine incrustations and bars of calcification related to the internal elastic laminae in medium and small arteries closely resembling the lesions of generalized arterial calcification of infancy. It appears that in any state of metastatic calcification the arterial

elastic laminae are particularly liable to have calcium deposited round them.

The presence of calcification in the kidneys in many examples of arterial calcification of infancy, either in the glomeruli or in the tubules, suggests that the condition may be part of a generalized metastatic calcification rather than a dystrophic one.

Lightwood (1932) reported widespread arterial calcification in a mentally retarded dwarfed child of 26 months with calcification at sites other than the arteries and kidneys, and with increased density of the bones. The serum calcium was 11 mg. and the blood inorganic phosphorus raised to 6.68 mg. per 100 ml. This case may indicate an aetiological connexion of at least some of the cases of generalized arterial calcification with the severe form of infantile hypercalcaemia described by Fanconi and Girardet (1952), Schlesinger *et al.* (1952), and others.

Furthermore, deposition of calcium in relation to "degenerated" elastica in lingual, meningeal, and renal arteries has been described in a child of 26 months with the severe type of infantile hypercalcaemia (Schlesinger *et al.*, 1956, Case 9).

Until some information becomes available on the biochemical changes in life in generalized arterial calcification of infancy, it is unlikely that any more will be known of its aetiology. It appears from Menten and Fetterman's (1946) cases and ours that the condition may have a familial incidence.

Summary

Two cases are reported of sudden death in infancy from general arterial calcification occurring in a family. Little is known of the aetiology of the condition.

We thank Dr. F. E. Camps for allowing us to use his post-mortem records and material from Case 1.

REFERENCES

- Andersen, D. H., and Schlesinger, E. R. (1942). *Amer. J. Dis. Child.*, 63, 102.
Bryant, J. H., and White, W. H. (1891). *Guy's Hosp. Rep.*, 55, 17.
Cochrane, W. A., and Bowden, D. H. (1954). *Pediatrics*, 14, 222.
Fanconi, G., and Girardet, P. (1952). *Helv. paediat. Acta*, 7, 314.
Gilmour, J. R. (1947). *Parathyroid Glands and Skeleton in Renal Disease*. London.
Lightwood, R. (1932). *Arch. Dis. Child.*, 7, 195.
Menten, M. L., and Fetterman, G. H. (1948). *Amer. J. clin. Path.*, 18, 805.
Schlesinger, B. E., Butler, N. R., and Black, J. A. (1952). *Helv. paediat. Acta*, 7, 335.
— (1956). *British Medical Journal*, 1, 127.
Shelling, D. H., and Remsen, D. (1935). *Johns Hopk. Hosp. Bull.*, 57, 158.
Stryker, W. A. (1946). *Amer. J. Path.*, 22, 1007.
Traisman, H. S., Limperis, N. M., and Traisman, A. S. (1956). *Amer. J. Dis. Child.*, 91, 34.

"The Flour (Composition) Regulations, 1956, require that all flour, other than wholemeal, shall contain minimum quantities of certain nutrients, including vitamins B₁ and B₂, and iron and chalk. Some of these nutrients are partly removed during milling operations, and the lower extraction flours now being sold require, in many cases, the artificial addition of such substances in order to bring the total amounts in the flour up to the minimal quantities laid down by the Regulations. The nutrients are added by millers in the form of a so-called 'master mix' containing all of them in such amounts as to ensure that if the level of one of them in the flour is of the correct order the remaining ones will also normally be present in the required quantity. From the analytical point of view it will be therefore usually necessary to determine only the amounts of one or two of the nutrients present, and to assume, fairly justifiably, that if these are found to be in the correct proportions the others will be likewise. Four samples of flour were examined during the quarter as a preliminary trial. Three of them were of incorrect composition."—Report of the Birmingham City Analyst.

Medical Memoranda

Primary Dislocation of the Left Shoulder-joint in the Boxing-ring

In the course of a light-heavyweight bout between R.A.F. College, Cranwell, and Cambridge University a cadet was seen suddenly to hold his left elbow with his right glove and to be completely disabled. The round ended almost immediately, and he subsided into the chair in his corner in great pain.

It is often difficult to see some decisive incident in the ring (hence multiple judges as well as a referee), and in this instance I was "stymied" by the referee and saw nothing. As I climbed up to investigate, a colleague in the front row helpfully hazarded the opinion that the man had dislocated his shoulder. On examination this "spot" diagnosis was seen to be perfectly correct, with the classical flattening of the deltoid region and the bulge of the head of the humerus anteromedially and subcoracoid. It was not the moment or the place for bothering the patient about the detailed mechanism whereby this extraordinary happening had come about. I was puzzled because, in boxing, the left upper limb is mainly concerned with the safe piston-like movements of leading and guarding, in which no considerable abduction is involved. It would have been much more explicable in the case of the right shoulder-joint, where wide abduction occurs in swinging a right hook to the jaw. Moreover, this was not a recurrence. The man had never dislocated his shoulder before, and so lacked the notorious tendency to recurrence. I wrote to the patient and to the S.M.O. at Cranwell R.A.F. College, asking if they could throw any further light on the dislocation, and I also questioned his opponent, our own light-heavyweight.

The cadet replied: "It was very difficult, as I didn't actually feel it happen at all. The only sensation was of not being able to raise my left arm, and then I thought it must be cramp. I didn't realize the shoulder was dislocated until I returned to my corner at the end of the round." He continued: "I have asked independently all the members of the team who were watching, and . . . it appears that . . . I attempted a left hook, and while my arm was fully extended (my punch having missed) he hit my arm with a right-hand punch."

The opponent confirmed this missed hook, and stated that he himself had a very sore right ulna from the violent impact of his own upthrusting forearm blow in warding off the said hook.

COMMENT

It would appear that the patient's left shoulder-joint was relaxed, with flaccid muscular control, at the moment when his arm was widely abducted and the blow missed. Simultaneously the Cambridge man violently forced the arm much further upwards, bruising his own forearm, and levering the head of the humerus downwards out of its shallow socket and through the capsule of the joint.

It is hardly necessary to recall that the stability of the shoulder-joint (with its shallow glenoid cavity providing little or nothing to hold the head of the humerus) depends on the tension of the tendons passing under, over, or through the joint and the elastic compressing pull of the muscles acting upon it. The dislocation happened at the moment of misfire, when all these structures were relaxed.

I have never seen this accident in the boxing-ring before, during thirty years at the Cambridge ringside, nor have I heard of it elsewhere. It would seem that primary dislocation of the shoulder-joint in the boxing-ring is an extremely rare accident, comparable in rarity with dislocation of the hip-joint at "rugger" (Woods, 1949).

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REFERENCE

- Woods, R. S. (1949). *British Medical Journal*, 1, 272.

Agranulocytosis During Treatment with an Amoebicide

A case of agranulocytosis developing in the course of treatment of amoebiasis with "camoform" is described. It appears to be the first time in which such a haematological change has been noted during camoform medication.

CASE REPORT

In November, 1955, in Calcutta, an Englishwoman aged 27 complained of abdominal discomfort and dyspepsia. She had never been ill before. She had one child aged 15 months. On clinical examination no abnormality except moderate obesity was found. A stool examination revealed mucus and a few precystic and cystic forms of *Entamoeba histolytica*, no cellular exudate, and no ova. A blood count showed: erythrocytes, 4,510,000; Hb, 12.6 g./100 ml.; leucocytes, 5,200 (polymorphs 70%, lymphocytes 27%, monocytes 0%, eosinophils 3%). Her urine contained no abnormality. Camoform, one tablet (250 mg.) four times a day, was prescribed. On the fifth day of treatment her temperature was 101° F. (38.3° C.), and she had mild photophobia and mild pains in the limbs and neck. On the following day the fever had abated to 100° F. (37.3° C.), and she had very little photophobia or pain. She did not complain of sore throat and no pharyngeal abnormality was found on examination. On that day her leucocytes numbered 2,300 (polymorphs 71%, lymphocytes 24%, monocytes 3%, eosinophils 2%).

Camoform treatment was stopped after a total of 16 tablets (4 g.) had been taken. On the sixth day the leucocytes had further decreased to 2,000 (polymorphs 56%, lymphocytes 40%, monocytes 2%, eosinophils 2%). On the seventh day the lowest readings were obtained: leucocytes, 1,200 (polymorphs 56%, lymphocytes 40%, monocytes 1%, eosinophils 3%).

The patient was admitted to hospital on the sixth day and treatment instituted. Penicillin was given eight-hourly in doses of 400,000 units intramuscularly (crystalline penicillin G procaine 300,000 units, with buffered crystalline penicillin G potassium 100,000 units) for five days. "Pent-nucleotide," 10 ml. daily, was given intramuscularly for the first three days. Cortisone acetate, 150 mg. daily in divided doses, was also given for four days. Afterwards the dose of cortisone acetate was gradually reduced. On the third day of this treatment the leucocytes rose to 1,800 (polymorphs 68%, lymphocytes 30%, monocytes 1%, eosinophils 1%), and there was a consistent improvement onwards. Five days later a blood count showed: erythrocytes, 4,250,000; Hb, 12 g./100 ml.; leucocytes, 5,100 (polymorphs 54%, lymphocytes 34%, monocytes 2%, eosinophils 10%). Four months later the patient was still well.

COMMENT

In a series of 20 cases Barrios (1954) reported no haematological toxic signs, though three of his patients developed anorexia, transient albuminuria, or headache. Abdominal pain, headache, nausea, dizziness or vertigo, sweating, or palpitation were observed in East Africa by De Mello and De Mello (1955), but they, too, do not report any blood dyscrasia. In Honduras, Hoekenga and Batterton (1954) gave camoform, 1.5 g. daily for seven days, to a series of 18 patients with amoebiasis, with no ill effect.

We have used camoform in a large number of cases of amoebiasis, but this case of agranulocytosis is the only one in which a serious toxic reaction followed the use of the drug.

Acknowledgment is made to Professor B. P. Tribedi for his help in performing laboratory investigations; to Messrs. Parke, Davis and Co. Ltd.; and to the Librarian of the Royal Society of Medicine for aid in surveying relevant literature.

H. F. HAHNDEL, M.D.,
L. PREGER, M.B., D.Obst.R.C.O.G.

REFERENCES

- Barrios, H. (1954). *Gastroenterology*, 27, 81.
De Mello, J. P., and De Mello, Ruby, N. (1955). *E. Afr. med. J.*, 32, 47.
Hoekenga, M. T. and Batterton, D. L. (1954). *Amer. J. trop. Med. Hyg.*, 3, 849.

Reviews

ANATOMY AND PHYSIOLOGY OF
GALEN

Galen on Anatomical Procedures. Translation of the surviving books with introduction and notes by Charles Singer. (Pp. 289+xxxvi; illustrated. 37s. 6d.) London, New York, Toronto: Oxford University Press for Wellcome Historical Medical Museum. 1956.

This translation by Dr. Charles Singer of Galen's *De Anatomica Administrationibus* is a very useful addition to the publications sponsored by the Wellcome Historical Medical Museum. In it we have what is essentially Galen's "Little Cunningham," for the book is a translation of a series of lecture-demonstrations on anatomy and physiology given at Rome in the year A.D. 177. The greater part of it comprises a dissecting manual, not of the human but of the monkey or ape, as Galen himself freely acknowledges. This is not to say that Galen did not have access to human material in his studies, for he indicates quite clearly that he had worked on the human skeleton—and there are other hints that he knew something of the soft parts. Such knowledge must have been obtained as occasion offered, and so he officially advises his students to dissect either the Barbary ape or the rhesus monkey, which seemed to him most like the human in structure. Professor Singer has very carefully assessed the problem to which of these two creatures the majority of Galen's dissecting instructions refer—and he believes that the animals used were rhesus monkeys. Accordingly the text has been illustrated by relevant figures from the excellent monograph by Hartman and Straus (*The Anatomy of the Rhesus Monkey*, 1953), which do much to assist the reader.

One of Galen's difficulties was that of nomenclature, especially with regard to the muscles. There were few "official" names for many structures when he wrote, so his descriptions may seem rather verbose and the structures difficult for us to identify, the more so since his observations do not refer to the human; but Singer has interpolated the modern names in the text, and in a series of notes has shown the essential differences between monkey and man for those who know little of comparative anatomy. Much of the value of the translation stems from this scholarly work. Galen, however, was not only an investigator of the dead body; he constantly refers to observations on the living human where wounds or disease are present; and, again, he practised operations on animals in attempts to understand the mode of the circulation and respiration. In this he showed the essential linkage between anatomy and physiology as two subdivisions of one science.

This book should be in all medical libraries; it would be worth while for postgraduate and undergraduate students to study it at their leisure, and to learn from it that the sciences of anatomy and physiology are not of such recent development as they may think, and reflect on the heritage to which they are successors.

J. S. BAXTER.

THE HEART AND ITS DISORDERS

Cardiology. By William Evans, M.D., D.Sc., F.R.C.P. Second edition. (Pp. 574+x; illustrated. 92s. 6d.) London: Butterworth and Co. Ltd. 1956.

Diseases of the Heart and Circulation. By Paul Wood, O.B.E., M.D., F.R.C.P. Second edition. (Pp. 1,005+xxxviii; illustrated. £5 5s.) London: Eyre and Spottiswoode Ltd. 1956.

That new editions of two books emanating from the National Heart Hospital should appear in the same month is a testimony to the authority, ability, and industry of their distinguished authors. Both dedicated to Sir John Parkinson, the doyen of British cardiologists, both nurtured and maturing in the same stable, yet were there ever such dissimilar but attractive twins?

William Evans claims to write for the student requiring a concise statement of modern views. Dogmatic, personal, steeped in the clinical outlook, more than a trifle prejudiced at times, but always vastly stimulating, his book sets out his views with a deep conviction and a burning fervour. This is the gospel according to Evans. Not the least praiseworthy of his many attributes is the author's nonconformist attitude, which should serve to arouse the critical powers of the more experienced postgraduate. A most commendable, original, but unorthodox book by a great clinical teacher.

Paul Wood writes primarily for the graduate, and modestly claims that his volume is not intended for the consultant cardiologist. In point of fact few physicians—cardiologists or not—can afford to dispense with this book, which provides a comprehensive survey, unique in its scope and outlook. Similarly, surgeons, now entering this field in increasing numbers and not averse to advice, will find the help and guidance they require. The author brings to the bedside a vital dynamic approach, based primarily on the application to man of the physiological techniques which have revolutionized our concepts of circulatory mechanisms over the past 20 or 30 years. Facts and figures, opinions and hypotheses, are criticized and analysed with a masterly assurance. This is the naked truth according to Wood. In breadth of outlook, in the blending of clinical experience with the results of technical procedures, and in their welding together, a sound critical and constructive judgment is revealed. There is no better presentation of the advance in our understanding of circulatory disease than this masterly survey from the pen of Paul Wood—an outstanding achievement which brings great credit to British cardiology.

A. RAE GILCHRIST.

NON-VENEREAL GENITAL DISEASES

The Nonvenereal Diseases of the Genitals: Etiology, Differential Diagnosis and Therapy. By Fritz T. Callomon, M.D., and John F. Wilson, B.S., M.D., M.S. (Pp. 382+xiii; illustrated. 95s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1956.

This is a book by two dermatologists who have undertaken to give a detailed comprehensive description of all the non-venereal affections of the genitalia, whether localized to that area or forming part of more generalized conditions. They have covered a wide field, and some of their descriptions, especially of dermatological conditions, are excellent. Disproportionate attention is, however, paid to the rare and unusual, of which the description is in some cases unduly discursive, with the result that the book is far longer than the subject-matter really requires. Its chief value will be as a book of reference, and as such it is particularly commended to venerologists, for all kinds of lesions which have nothing to do with venereal infection are apt to present in the clinic for venereal diseases. There is also much of interest to the dermatologist, the gynaecologist, and the urologist.

The sections on treatment are valuable and in most instances well up to date. In general the English is lucid enough, but it is sometimes quaintly phrased, almost as though it had been translated too literally from a foreign language. There are a number of typographical errors which careful proof-reading might have corrected, and the references, though large in number, are not always accurate and seem to show a bias, perhaps determined by a nostalgic devotion to out-of-date German literature. Many of the illustrations are excellent, but others are not so. Those readers who feel able to afford the considerable cost of a personal copy will be rewarded with a book that is well printed and produced on excellent paper, and subject-matter which contains much of interest. It could, however, have been much better done, for when the authors deal with some subjects outside the immediate scope of dermatology, such as non-gonococcal urethritis, the standards of achievement are very indifferent.

AMBROSE J. KING.

CLINICAL ORTHOPAEDICS

Clinical Orthopaedics—No. 7. Edited by Anthony F. DePalma, with the assistance of the associate editors, the board of advisory editors, and the board of corresponding editors. (Pp. 354+x; illustrated. 60s., or 48s. to subscribers.) Philadelphia and Montreal: J. B. Lippincott Company. London: Pitman Medical Publishing Company, Ltd. 1956.

The subject-matter in No. 7 of this series is bone tumours and injuries resulting from motor accidents. There are, in addition, an appreciation of Bloodgood's work and a few chapters on general orthopaedic subjects, including central fracture of the acetabulum. There is not a textbook description of all bone tumours, but those of interest are chosen, either because there has been particular study of such growths as chordoma and osteoid osteoma, or because the advance of knowledge is slow, as in the case of the sarcomata. Copeland writes on tumours of cartilaginous origin, and Jaffe and others on osteogenic sarcoma. It is reported that solitary and multiple osteochondromata and chondromatosis of joints may acquire malignant changes. The history of several types of sarcomata is well described. Biopsy is advocated to provide accurate diagnosis rather than the assumption that the manipulation during examination is a more potent factor in dissemination than the operation. The round-cell sarcomata are separated into types, and it is stated that correct diagnosis is essential, as the cell type of the neoplasm determines the nature of the appropriate treatment. There are reports on 107 fibrosarcomata and 32 aneurysmal bone cysts from the Mayo Clinic and of a chondroblastoma of the talus from Texas.

Ample material was available for the study of several aspects of motor injury, such as the time intervals between injury and death, the crush syndrome, and the injuries of young and old. Readers will be interested in chapters on head, chest, and abdominal injuries. The information on residual disabilities will be accepted, but the opinion expressed on the withholding of a driving licence on medical grounds is unlikely to meet with approval in this country.

These volumes continue to contain high-grade information, and the illustrations, especially the reproductions of radiographs, are excellent.

ST. J. D. BUXTON.

DISEASES OF THE SKIN

An Introduction to Dermatology. By G. H. Percival, M.D., Ph.D., F.R.C.P., D.P.H. Twelfth edition. (Pp. 374+vii; illustrated. 45s.) Edinburgh and London: E. and S. Livingstone Ltd. 1956.

The Edinburgh school of dermatology is well established, having been founded by William Allan Jamieson and carried on by his successor, the late Sir Norman Walker. Both wrote textbooks on diseases of the skin and made the Edinburgh teaching more generally available. It is now over half a century since Sir Norman Walker's first edition of *An Introduction to Dermatology* was published. Professor Percival, who holds the only chair of dermatology in the British Isles, collaborated with him in the production of the tenth edition, and nine years ago was solely responsible for the eleventh. Since then additional antibiotics, the discovery of A.C.T.H. and cortisone, and the appearance of other new therapeutic agents have made a new edition essential and welcome.

In the twelfth edition the arrangement of the contents is unchanged, the chapter headings being precisely the same as before. There are 25 more pages and six more figures. In a book of this kind the illustrations are of great importance. Almost without exception these are excellent, and it is remarkable that 188 of them are in full colour. The book is well balanced in its consideration of both common and rare conditions. It is, moreover, essentially practical in its approach, and once more can be warmly recommended to medical students and general practitioners, for whom it is written.

S. T. ANNING.

PHYSICAL AIDS IN PLASTIC SURGERY

Physical Methods in Plastic Surgery. By Joseph P. Reidy, M.A., M.B., B.Ch.(Cantab.), F.R.C.S. General editor of physical medicine series: William Beaumont, M.R.C.S., L.R.C.P. (Pp. 69+xiii; illustrated. 12s. 6d.) London: The Actinic Press. 1956.

Although the physiotherapist, the occupational therapist, the remedial gymnast, and the rehabilitation expert may all have their parts to play in the team which is concerned with the treatment of patients requiring reconstructive or plastic procedures, it is often extremely difficult to define their existing activities. These, in any case, will vary from patient to patient and from condition to condition. Instead of producing a dry catalogue of the possible remedial procedures, the author has written an informative little book containing a series of simple descriptions of the commoner surgical methods which the plastic surgeon may employ, together with an indication of some of the conditions for which they are likely to be used. The whole is well illustrated by line drawings and photographs, and throughout an indication of the particular activities of the physiotherapist is given. On the other hand, the book will have an equally wide appeal to both nurses and medical students, and it is for this reason that one can almost wish that its title were more indicative of its contents.

R. MOWLEM.

PARASITOLOGY

Introduction to Parasitology. With Special Reference to the Parasites of Man. By Asa C. Chandler, M.S., Ph.D. Ninth edition. (Pp. 799+xiv; illustrated. 68s.) New York: John Wiley and Sons, Inc. London: Chapman and Hall, Ltd. 1955.

Some 35 years ago the first edition of this book was published with the title *Animal Parasites and Human Disease* to present human parasitology in a readable popular form for general readers. It was immediately accepted as an introduction to parasitology for academic purposes; in successive editions, of which this last is the ninth, the scope was widened to include the lower animals as well as man, in order to emphasize the general principles of parasitology that may not be obvious when the parasites of only one host are considered. The approach is primarily biological, stressing the importance of the parasites, their life-cycle, epidemiology, pathogenicity, immunology, and the applied aspects of prevention and control. Taxonomy is considered only so far as is necessary to give an understanding of the general relationships of the parasites. The book is more concerned with fundamental principles than with the details that would interest a specialist.

A comprehensive and integrated account is given of the relevant fields of protozoology, helminthology, and medical entomology, and this approach is most desirable in giving a general introduction to subjects which are so intimately related. The spirochaetes are included with the protozoa, since some are transmitted by arthropod vectors, and arthropod-borne bacteria, rickettsias, and filterable viruses are considered together. Parasitic diseases that are of increasing current interest in the world, such as leptospirosis, amoebiasis, schistosomiasis, onchocerciasis, and leishmaniasis, are dealt with more fully, and the general sections on immunity, insecticides, etc., have been largely rewritten. The guidance given to the literature on parasitology is particularly valuable.

There are occasional statements with which those intimately concerned with particular subjects may not agree, and since this edition was compiled there have been important advances in onchocerciasis and in infections with *Loa loa*, *Wuchereria malayi*, and *W. pacifica*; but this is inevitable in a subject which is developing so rapidly. This new edition succeeds even better than the last in presenting parasitology to the novice as a fascinating integrated study of living organisms, and is a book which may be read with new pleasure by the parasitologist.

W. E. KERSHAW.

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VIRUSES MADE TO ORDER

The relative simplicity with which the plant viruses can be handled has recently led to outstanding advances in the understanding of their structure, and it is no exaggeration to say that it is now possible to take a virus particle to pieces and put it together again without at the same time ending its existence as an infective entity. Tobacco mosaic virus is an exceptionally favourable object for study, since it can be prepared from infected tobacco plants in large quantities and obtained in crystalline form, a circumstance which enables its structure to be investigated by the powerful method of x-ray diffraction. G. Schramm, G. Schumacher, and W. Zillig¹ showed that the rod-like particles of virus could be broken down into sub-units by treatment with alkali, and that the sub-units could then be recombined into particles of protein which were of the same size and shape as the original virus, although they were no longer infectious. The sub-units could be further separated from each other by electrophoresis to yield a number of distinct fractions, and when these fractions were examined under the electron microscope an odd assortment of objects came to light. There were virus rods with one or more sections missing out of their middles, and held together by a central filament which evidently ran throughout the whole length of the rod. The missing bits were also in evidence as disks with holes in the middle. From studies of the chemical composition of the virus it seemed probable that the disks were made of protein and were strung upon a central filament of ribonucleic acid. Now protein and nucleic acid are chemical substances of distinctive properties which can be separated and treated by standard chemical procedures, and H. Fraenkel-Conrat and R. C. Williams² have been able to prepare each com-

ponent in a fairly pure state. The protein was precipitated with ammonium sulphate and the ribonucleic acid was obtained by treating the virus with detergent; after purification the protein and the ribonucleic acid were obtained as separate solutions. No trace now remained of the structure of the original virus rods, and the two solutions were not infectious when rubbed on to the leaves of tobacco plants. But when the solutions were mixed an opalescence gradually developed on standing; examination in the electron microscope revealed that rods had reappeared, and that they resembled the rods of tobacco mosaic virus in all respects except that they showed greater variation in length. Moreover, when this material was inoculated on to tobacco plants it was found that 3% of the rods were infectious, and produced the distinctive lesions of tobacco mosaic virus.

In further experiments³ protein of standard tobacco mosaic virus was combined with ribonucleic acid prepared from certain strains of virus which produced distinctive symptoms, and the reconstituted virus was then inoculated on to tobacco plants. In all cases the lesions which resulted were those characteristic of the strain of virus which supplied the ribonucleic acid. In one instance investigated in further detail the progeny virus which developed in the plant was identical with the parent which donated the ribonucleic acid. It is therefore evident that hybrids can be produced *in vitro*, and the experiments further afford an elegant demonstration that the genetic characters of the virus reside in the ribonucleic acid and not in the protein. The practical aspects of the reconstitution process have been studied by B. Commoner and his colleagues,⁴ and by paying careful attention to details it was possible to raise the yield of infectious rods to nearly 10%. They also made an observation of far-reaching implications. Ribonucleic acid extracted from normal tobacco mosaic virus could be separated into three fractions by chromatography, and when these fractions were recombined with virus protein and inoculated on to tobacco plants the three types of reconstituted virus particle produced symptoms which differed widely from those characteristic of the normal virus. The genetic behaviour of the virus had evidently been modified by the procedure, and three new viruses had in effect been created in the test-tube.

The experiments reported so far have all been carried out with ribonucleic acid obtained from tobacco mosaic virus itself, but it now appears that the virus protein will also combine with ribonucleic acid from other sources. The biosynthesis of ribonucleic acid has been studied by S. Ochoa and his colleagues,⁵ and they have found that the nitrogen-

fixing bacterium *Azotobacter vinelandii* contains an enzyme, named by them polynucleotide phosphorylase, which will cause adenosine diphosphate and other nucleotide diphosphates to polymerize into a long chain of nucleotide units. The product may be regarded as a highly artificial form of ribonucleic acid, artificial in that it does not consist of all four types of nucleotide arranged in a sequence of genetic significance. In spite of this it has now been found⁶ that the protein of tobacco mosaic virus will combine with this material as well, forming rods which are indistinguishable from those of the virus itself. These rods were not infectious for tobacco plants, but it can be fairly claimed that they represent a close approach to a synthetic virus, which lacks infectivity only because it has been supplied with the wrong key for unlocking the metabolism of the host cell.

What applications could this work have in the field of human and animal virology? The material is far less favourable to work with, but it has recently been reported that poliomyelitis⁷ and Coxsackie⁸ viruses can be crystallized, and crystalline arrays of particles have been seen in sections of cells infected with adenoviruses.⁹ It is possible that these viruses have a structure as simple as that of tobacco mosaic virus, and the examination of their crystals by x-ray diffraction will soon enable this point to be settled. If they in their turn can be separated into components and recombined, the manufacture of synthetic animal viruses *in vitro* may become possible. Many years may pass before this is achieved in practice, but it offers the possibility of obtaining non-pathogenic variants by a controllable procedure, without having to wait for spontaneous mutants to arise. The use of synthetic viruses prepared in this way might greatly advance the prevention of such a disease as poliomyelitis.

NON-ULCER DYSPEPSIA

Biopsy has often helped clinical progress during the past twenty years. The development of needle biopsy of the liver, originally described by P. Iversen and K. Roholm,¹ has led to notable improvements in the diagnosis of hepatic disease and in the interpretation of the pathological changes occurring. Recently renal biopsy, which was introduced by P. Iversen and C. Brun,² has been developed in Chicago by R. M. Kark and R. C. Muehrcke³ into a reliable technique and has already cast light on the diagnosis, pathogenesis, and treatment of renal disorders. Most biopsy studies of the stomach have sprung from the work of I. J. Wood and his colleagues in Melbourne.⁴ In 1949 they described a method of obtaining biopsy speci-

mens of gastric mucosa by passing a flexible tube into the stomach, sucking a knuckle of gastric mucosa into a lateral hole in a small metal cylinder at the distal end of the tube, and then cutting it off by means of a cylindrical knife running within the first cylinder. Their studies confirmed the critical importance of chronic atrophic gastritis and mucosal atrophy in pernicious anaemia and its neurological complication, subacute combined degeneration of the cord. Many centres with much experience of the megaloblastic anaemias now include gastric biopsy as part of their routine investigations.

At page 372 of the *Journal* this week Dr. A. Wynn Williams and his colleagues at the West Middlesex Hospital describe the results they obtained from studying gastric biopsy specimens from a large number of patients suffering from so-called non-ulcer dyspepsia. They use this term to describe dyspeptic symptoms related to the intake of food and occurring in the absence of any focal lesion of the stomach or duodenum (such as ulcer or cancer) and of disease elsewhere, such as in the gall-bladder, appendix, and colon. Such patients represent a formidable challenge to physicians. They are very numerous, as may be seen from the fact that F. Avery Jones and H. Pollak⁵ found that two out of every five patients with gastric symptoms do not suffer from peptic ulcer, and in the majority of these patients it is impossible to make any firm diagnosis. More recently, S. Lipetz and colleagues⁶ have found that patients with non-ulcerative dyspepsia are even more common in an urban general practice than are patients with peptic ulcer.

Wynn Williams and his colleagues divide the histological changes seen in gastric-biopsy specimens into several categories—normal, chronic superficial gastritis, chronic atrophic gastritis, mucosal atrophy, and minor mucosal changes. In company with other workers they find that atrophic gastritis becomes steadily more common with advancing years. By contrast, the proportion of patients showing superficial gastritis and minor mucosal changes stays relatively constant in all age groups; this finding agrees with that of Wood's group of workers in their latest report.⁷ There are two possible explanations for this difference between relatively mild mucosal changes on the one hand and the severe disturbances of chronic atrophic gastritis and mucosal atrophy on the other.

¹ Schramm, G., Schumacher, G., and Zillig, W., *Nature (Lond.)*, 1955, **175**, 549.
² Fraenkel-Conrat, H., and Williams, R. C., *Proc. nat. Acad. Sci. (Wash.)*, 1955, **41**, 690.

³ ———, *J. Amer. chem. Soc.*, 1956, **78**, 882.

⁴ Commoner, B., Lippincott, J. A., Shearer, G. B., Richman, E. E., and Jia-Hsi, W., *Nature (Lond.)*, 1956, **178**, 767.

⁵ Grunberg-Manago, M., Ortiz, P. J., and Ochoa, S., *Biochim. biophys. Acta*, 1956, **20**, 269.

⁶ Hart, R. G., and Smith, J. D., *Nature (Lond.)*, 1956, **178**, 739.

⁷ Schwerdt, C. E., and Schaffter, F. L., *Science*, 1955, **122**, 879.

⁸ Matten, C. F., and Dubuy, H. G., *ibid.*, 1956, **123**, 1037.

⁹ Kjellen, L., Lagermalm, G., Svedmyr, A., and Thorsson, K. G., *Nature (Lond.)*, 1955, **175**, 505.

¹ Iversen, P., and Roholm, K., *Acta med. scand.*, 1939, **102**, 1.

² ——— and Brun, C., *Amer. J. Med.*, 1951, **11**, 324.

³ Kark, R. M., and Muehrcke, R. C., *Lancet*, 1954, **1**, 1047.

⁴ Wood, I. J., Doig, R. K., Motteram, R., and Hughes, A., *ibid.*, 1949, **1**, 18.

⁵ Jones, F. A., and Pollak, H., *British Medical Journal*, 1945, **1**, 797.

⁶ Lipetz, S., Sklaroff, S. A., and Stein, L., *ibid.*, 1955, **2**, 172.

⁷ Joske, R. A., Finckh, E. S., and Wood, I. J., *Quart. J. Med.*, 1955, **24**, 269.

⁸ Shallenberger, P. L., De Wan, C. H., Weed, C. B., and Regan, J. C., *Gastroenterology*, 1950, **16**, 327.

⁹ Palmer, E. D., *Medicine (Baltimore)*, 1954, **33**, 199.

¹⁰ Atkins, L., and Benedict, E. B., *New Engl. J. Med.*, 1956, **254**, 641.

One is that the lesser changes are precursors of the more severe, so that the proportion of patients showing the lesser changes stays constant with advancing years because entrants to the group are roughly balanced by subjects who develop the more severe changes. Alternatively, the lesser mucosal changes can be regarded as not being a significant departure from normality. This does not seem likely in view of the finding that the lesser mucosal abnormalities are associated with an appreciable diminution in the secretory power of the stomach, this group of cases lying intermediate between the "normal" group and those with atrophic gastritis which show severe loss of secretory power.

Wynn Williams and his colleagues have not been able to attach any specific significance to the various mucosal changes met with on gastric biopsy. At the moment, therefore, this procedure does not seem likely to enter into routine medical practice for the investigation of dyspepsia. It has become plain that patients with a normal specimen obtained at gastric biopsy can suffer from non-ulcer dyspepsia, and it is equally plain that a patient's stomach may be the seat of chronic atrophic gastritis without his having a single gastric symptom. Moreover, combined gastroscopic and biopsy studies have shown some startling discrepancies.⁸⁻¹⁰ The condition of chronic hypertrophic gastritis, once confidently diagnosed at a glance by gastroscopists, is found to yield a specimen of normal mucosa more often than not. In other words, the type of gastritis most prone to be associated with dyspeptic symptoms turns out not to be "gastritis" after all. The fact that precise clinical significance cannot yet be assigned to the varieties of gastritis in the causation of dyspepsia does not vitiate the value of making careful observations on the state of the gastric mucosa in disease. It is to be hoped that the West Middlesex Hospital group will be able to observe the future progress of many of their patients with superficial gastritis and minor mucosal changes to see if these changes evolve in time into the more profound disturbance of atrophic gastritis and mucosal atrophy, which, if generalized throughout the stomach, is the primary lesion in pernicious anaemia.

BOXING INJURIES

That boxing is by no means the innocuous sport that some suppose it to be is apparent from the attention paid in recent years to the injuries sustained in the ring by both amateurs and professionals. The subject has previously received attention in these columns,¹ and four papers in the present issue refer to various aspects of the problem. Dr. Macdonald

Critchley gives a comprehensive review of the subject, illustrating his account with numerous case histories; Drs. J. L. Blonstein and E. Clarke discuss the ill-effects observed in 29 amateur boxers who were severely concussed or knocked out more than once in a seven-month period; Professor M. Paul describes a fatal injury in a young amateur boxer; and Mr. R. Salisbury Woods reports a curious case of dislocation of the shoulder-joint. Boxing enthusiasts have made much of statistics which suggest that the incidence of serious injury is less than in many other sports such as football and skiing; on the other hand, boxing is unique in that the intention of the boxer is to damage his opponent and, if possible, to render him unconscious. Such superficial signs of injury as the flattened nose, the cauliflower ear, and the scarred, hypertrophied eyebrows are insignia of the boxer's trade. Serious damage to muscles and peripheral nerves is a rare occurrence, and so also is fatal cardiac contusion. The local effects of foul blows (the "rabbit" punch to the nape of the neck, testicular bruising from a punch "below the belt," and renal haemorrhage from the kidney punch) have occasionally to be treated, but it is the injuries which may result in damage to intracranial structures and to the eye which constitute a serious threat to life and livelihood.

Fatalities resulting from injuries in the ring, though uncommon, are being reported more frequently, and Critchley remarks that over 200 had been described up to 1950. Most of these have been attributed to intracranial haemorrhage, usually in the subdural space, but it is remarkable how often surgical evacuation of a subdural haematoma has failed to save the patient's life. In Paul's case, such a collection was found and evacuated, but the patient showed severe decerebrate rigidity from the moment of injury and it seemed probable that mid-brain damage had occurred, even though no definite histological changes were found in this region. As E. Jokl² has pointed out, the ordinary knock-out may be due to a transient effect of the blow upon the brain stem, and irreversible damage to this area, without striking histological change, is possibly responsible for some fatalities. It should also be remembered that death may result from the secondary head injury which results when the boxer's head strikes the floor.³

The punch-drunk state, so graphically described by Critchley in his paper, has long been recognized as a serious cause of progressive physical and mental

deterioration in professional boxers whose standard of performance has fallen off, resulting in increasingly frequent knock-outs. This condition of traumatic encephalopathy is often unhappily progressive even after the subject has abandoned the sport; it has previously been attributed to multiple petechial haemorrhages in the brain, but recent histological studies⁴ have revealed a diffuse cerebral atrophy with changes like those of presenile dementia. Euphoric dementia with dysarthria and ataxia is seen in the fully developed case of punch-drunkness, or there may be extrapyramidal manifestations of Parkinsonian type. As Critchley points out, the "groggy state," in which the boxer, "out on his feet" during the contest, is subsequently confused and amnesic, may become increasingly severe after successive bouts and may be a prelude to punch-drunkness. Blonstein and Clarke assert that in their experience the punch-drunk syndrome has never been observed in amateur boxers, but Critchley reports an amateur champion who developed its characteristic signs. While it is clearly true that the risks of amateur boxing are slight compared with those of the professional sport, the prolonged amnesia which Blonstein and Clark describe in some of their cases clearly differs only in degree from the "groggy state."

The many and varied eye injuries which may occur in the boxer have been comprehensively reviewed by J. H. Doggart.⁵ Among the most important are corneal trauma, scleral rupture, tears of the iris, iridocyclitis, cataract, subluxation of the lens, vitreous haemorrhage leading to retinitis proliferans, and retinal detachment which is rarely amenable to surgery. Doggart also describes a patchy choroidal degeneration ("cauliflower choroids"), as well as orbital fractures, glaucoma, and direct damage to the optic nerve. Many of these lesions represent a serious threat to vision. In fact, the list of possible injuries in boxing is a formidable one, but the medical authorities supervising both professional and amateur boxing are advising many sensible precautions in an attempt to limit their occurrence. Serial E.E.G. recordings can be of value in detecting early evidence of cerebral damage, but frequent clinical review by experienced observers, with particular attention to the occurrence and duration of amnesia, may be equally satisfactory. Although much evidence exists to justify the opinion expressed by Blonstein and Clark that amateur boxing in particular is remarkably safe, occasional catastrophes will certainly continue to occur, and it is important that all concerned with the sport, and particularly the boxers themselves, should be aware of the risks involved. Many will feel that the benefits derived from boxing outweigh its dangers, but this

opinion will be hard to sustain unless every reasonable step is taken to minimize the risks of permanent disability, particularly that resulting from injury to the brain or eye.

BILIRUBIN

Forty years ago van den Bergh¹ showed that gall-bladder bile and serum from patients with obstructive jaundice reacted directly with freshly prepared, diazotized sulphanic acid to give an intense purple colour, whereas serum from normal subjects and from patients with haemolytic jaundice reacted only after the addition of alcohol—that is, indirectly. It appeared that the bilirubin formed by the breakdown of haemoglobin was altered in some way by its passage through the liver, but until recently no satisfactory explanation has been forthcoming to explain the van den Bergh reaction. Perhaps the most popular theory was that the indirect-reacting pigment was bound to protein, from which it was released by the addition of alcohol, while the direct-reacting pigment was free bilirubin. Electrophoretic studies, however, showed that both pigments migrate with the serum proteins, and are probably lightly attached to the albumin fraction. A recent detailed analysis² has finally disposed of the view that different bilirubin-protein complexes are responsible for the two reactions. An alternative theory, that a chemical change takes place in bilirubin during its passage through the liver, remained unproved, and it was suggested that the liver produces a catalyst which is responsible for the rapidity of the direct reaction.

The pioneer work of P. G. Cole and G. H. Lathe,³ using the technique of reverse-phase chromatography, has finally settled the question whether there are one or two bilirubins. They found it possible to separate two distinct pigments—a fast moving, water-soluble substance which gives the direct reaction, and a more slowly moving, indirect-reacting pigment, which is identical with crystalline bilirubin. Later work has shown that the direct reacting pigment is made up of two distinct components.⁴ Unfortunately these are extremely unstable, a fact which has hindered their identification. Now two papers have appeared almost simultaneously, one from England and the other from the U.S.A., which provide an important clue to their probable nature.^{5,6} Chromatographic analysis of the more stable azo-pigments reveals that the direct-reacting bilirubins are glucuronides, which can be converted to bilirubin (indirect-reacting pigment) by treatment with alkalis or with β -glucuronidase. This is a discovery of great general interest. It is well known that many substances are conjugated on their passage through the liver. This has been termed "detoxication" because it applies

¹ van den Bergh, A. A. H., and Müller, P., *Biochem. Z.*, 1916, **77**, 90.

² Klatskin, G., and Bungards, L., *J. clin. Invest.*, 1956, **35**, 537.

³ Cole, P. G., and Lathe, G. H., *J. clin. Path.*, 1953, **6**, 99.

⁴ ——— and Billing, B. H., *Biochem. J.*, 1954, **57**, 514.

⁵ Billing, B. H., and Lathe, G. H., *ibid.*, 1956, **63**, 6P.

⁶ Schmid, R., *Science*, 1956, **124**, 76.

⁷ White, A., Handler, P., Smith, E. L., and Stetten, D., *Principles of Biochemistry*, 1954, p. 64, New York.

⁸ Jirsa, M., Večerek, B., and Ledvina, M., *Nature (Lond.)*, 1956, **177**, 895.

⁹ Watson, C. J., *Ann. intern. Med.*, 1956, **45**, 351.

¹ *British Medical Journal*, 1954, **2**, 1535.

² Jokl, E., *The Medical Aspects of Boxing*, 1941, Pretoria.

³ Kaplan, H. A., and Browder, J., *J. Amer. med. Ass.*, 1954, **156**, 1138.

⁴ Brandenburg, W., and Hallervorden, J., *Arch. path. Anat.*, 1954, **325**, 680.

⁵ Doggart, J. H., *Arch. Ophthalm. N.Y.*, 1955, **54**, 161.

particularly to toxic materials, but there is good evidence that naturally occurring substances—for example, certain steroids—are treated in the same way. Bilirubin appears to be a further example. A. White and colleagues⁷ state that “the enhanced solubility in water incident to glucuronide formation . . . may well render them [conjugated substances] more readily dispensable by the body.” This would explain the classical clinical observation that bilirubin appears in the urine in obstructive but not in haemolytic jaundice. Glucuronides are not the only compounds available for conjugation, and there may well be other types of bilirubin complex. For example, bile acids are readily demonstrable in the direct-reacting material, and the capacity of bilirubin to form complexes with taurine has recently been reported.⁸

It looks as though a satisfactory explanation of the van den Bergh reaction is available at last. While of great theoretical interest, the clinician may well ask if these findings have any practical value in the elucidation of jaundice. It is probably fair to say that at present the test is rarely helpful, because there are simpler ways of differentiating obstructive from haemolytic jaundice. In parenchymatous jaundice, for which a reliable test is badly needed, the reaction is complex and often equivocal, though if the speed with which the colour develops is taken into account it may be useful in some cases.⁹ It seems possible, however, that a study of the bilirubin complexes in disorders in which the liver cell is damaged may yield data which could be applied to the diagnostic problems of the clinician.

DOCTORS' DISEASES

Some data showing that British medical practitioners may be at special risk of dying from acute poliomyelitis are reported by Dr. R. Doll and Professor A. Bradford Hill at page 372 of the *Journal* this week. The authors have derived them from the death certificates of certain doctors who died in the five years 1951–6. Among 34,494 doctors who had provided particulars for these authors' prospective investigations into the relation between smoking and lung cancer were eight men who, in this five-year period, died from poliomyelitis. While the number is small, it seems to be about ten times as large as it would be if medical men experienced the same death rate from this disease as men in the whole population. The difference is striking, and it does suggest that poliomyelitis can with some certainty be added to the list of diseases to which medical practitioners are unusually susceptible. One of these is coronary heart disease. J. N. Morris and his colleagues¹ showed that middle-aged general practitioners are about twice as likely to die from this cause as are men of comparable age in the population as a whole. In the U.S.A. leukaemia has been shown to be more prevalent among radiologists than other physicians,² but evidence in

Britain is lacking. Deaths registered in England and Wales in 1950 analysed by social class showed a steep decline in mortality from leukaemia from class 1 (in which doctors are grouped) to class 5 for men as well as women.³ But unfortunately, though we are more than half-way to the next census, no full occupational mortality tables based on the 1951 census have yet appeared. Some recent figures from the U.S.A. show a relatively high death rate for diabetes mellitus among doctors,⁴ though their significance to the British scene is debatable.

In seeking an explanation for the unusually high number of deaths from poliomyelitis in their sample of medical practitioners Doll and Bradford Hill mention the belief that people in the higher social classes may be more likely than people in the lower to contract the disease. As they say, no statistical evidence in this country supports it. Nor does living in a healthy environment seem to raise the risk of contracting the disease, as has been suggested, for Bradford Hill and W. J. Martin⁵ found no correlation between infant mortality rates and incidence of poliomyelitis in England and Wales. Possibly the clue lies in the inescapable obligations that so often fall to the medical man to fulfil. Doctors may contract the disease no more often than laymen, but, because they keep working too long, pay the penalty of succumbing to a more severe attack.

HEALTH SERVICE SUPPLEMENTARIES

There is nothing new in a supplementary estimate for the cost of the Health Service being presented to Parliament; in fact, it has been the exception rather than the rule for Ministers to keep within their original estimates. There are two main reasons for this. One is that in a period of rising prices the spending authorities are faced throughout the year both with a bigger outlay on goods and with claims for higher pay from those providing services. The second reason is that no other department of state, in estimating its expenditure, has to cope with such an unpredictable and uncontrollable demand for its service as has the Ministry of Health. In the early years of the Health Service it was the unexpected demand that made nonsense of the original estimates of the Service's cost. In recent years it has mainly been the need to pay higher wages and salaries that has raised the estimates. Both factors have led to the supplementary estimate for 1956–7, which was presented last week, though increased remuneration is dominant.

The net total of the supplementary estimate (that is, after allowing for an increase in superannuation contributions and savings in certain items such as the poliomyelitis vaccination scheme) is nearly £27m. for Great Britain. All the main branches of the Service share in this increase:

<i>Extra Amount Needed</i>			
	£		£
Hospitals ..	15,008,000	Pharmaceutical service ..	8,089,000
Local health authorities ..	1,227,000	Dental service ..	1,635,000
General medical services ..	2,946,000	Supplementary ophthalmic service ..	801,000

The hospitals, as is only to be expected, account for over half the net total of the supplementary, and in fact a supplementary estimate was heralded at the very beginning of the financial year with the announcement last April of new scales of pay for nurses, including mental nurses, and midwives. Since then there have been Whitley awards to ancillary workers and to administrative and clerical staff. For England and Wales these awards, costing an extra £4½m. a year for nurses and about the same amount for the ancillary staffs, account for about £10m. of the extra £13½m. needed to maintain the hospitals in this financial year. The balance is made up by higher prices for goods consumed, such as food and fuel, which account for £2½m., and by an extra £1m. which the hospitals have to pay in rates as a result of the revaluation of their premises.

The supplementary estimate of nearly £3m. in the cost of general medical services mainly represents the extra amount due to general practitioners as a result of the increase in their expenses. The remainder is accounted for by more payments into the central pool for maternity services, the treatment of temporary residents, and so on. Higher remuneration, especially of nurses, is responsible for almost all the increased cost of the local health services. In the remaining branches of the Service it is a bigger demand from the public that is the chief reason for their cost being higher than was originally estimated. This increased demand is reflected most clearly in the extra sums needed for drugs. Under a new agreement chemists are made a slightly bigger allowance for the cost of containers, but the bulk of the additional £8m. needed is to meet an increase in the number and average cost of prescriptions. An even larger supplementary bill for drugs would have been presented had it not been for the change in the prescriptions charge from a shilling a form to a shilling an item, which is estimated to save £1½m. this year. For some reason the cost of prescribing per head of the population seems to have been more stable in the past year north of the Border than in England and Wales.

COMPOUND ASPIRIN AND STEROID TABLETS

Since the Ministry of Health announced the availability to general practitioners of the newer cortisone analogues prednisone and prednisolone some pharmaceutical manufacturers have been drawing the attention of doctors to the supposed advantages of tablets containing a combination of one or other of these substances with aspirin in a fixed dosage. Advertisements have stated that the combination has a greater anti-inflammatory action than the steroid alone. There is no proof whatsoever of this. In the early days of cortisone investigation claims were put forward that such substances as insulin and *p*-aminobenzoic acid were “cortisone spacers,” but these claims were not upheld, and so far

no substance has been found to enhance the action of the older or newer steroids.

In one advertising leaflet the indications for the combined tablet are given as rheumatoid arthritis, osteoarthritis, gouty arthritis, bursitis, tenosynovitis, myositis, fibrositis, and neuritis. There is little convincing evidence that oral steroid therapy is of any value in osteoarthritis or in the non-articular varieties of rheumatic disease which involve bursae, tendons, muscles, or nerves. As steroid therapy causes adrenal involution it should be used only where there is a clear indication of its value. A few reports have shown that cortisone or the newer analogues may be helpful in attacks of gout where colchicine is contraindicated, but their main value in the field of rheumatic diseases is in severe active rheumatoid arthritis. Controlled trials by the Joint Committee of the Medical Research Council and Nuffield Foundation¹ and by the Empire Rheumatism Council² have shown that in the average case of rheumatoid arthritis steroid therapy is unnecessary, since progress is as good with aspirin. In severe cases, when other methods of treatment have failed to halt the progress of the disease, W. S. C. Copeman and his colleagues³ have shown the value of long-term treatment with cortisone under careful medical supervision. W. S. C. Copeman and O. Savage⁴ have estimated that only 10% to 20% of cases of rheumatoid arthritis should be considered for steroid therapy.

There would seem to be no advantages and some disadvantages, as Dr. F. Dudley Hart has pointed out in a letter at p. 398 in this issue, in combining 0.5 mg. of prednisolone with 5 grains (0.32 g.) of aspirin. For mild cases of rheumatoid arthritis 60 grains (4 g.) of aspirin is an average dose, and this would provide only 6 mg. of steroid—an amount unlikely to have any suppressive effect on the arthritis. In a severe case requiring steroids the average maintenance dose of prednisone or prednisolone is 15 mg. per day, and if that were given by the combined tablet the patient would have to take 30 tablets and 150 grains (10 g.) of aspirin a day. In other words, such tablets, in spite of being the most expensive form of aspirin yet devised, contain steroids in amounts which are quite inadequate for effective treatment.

HUNGARIAN MEDICAL REFUGEES

A special fund is being opened to help those medical men and women who have recently had to flee from Hungary. This week in a letter at p. 398 the Chairman of Council of the B.M.A. earnestly solicits the help of all doctors on behalf of these unfortunate colleagues, of whom about sixty have reached Great Britain, while many more are in Austria. He suggests that doctors may if they wish earmark their contribution to be used in Austria; for the medical profession there, through the Austrian Medical Association, has already made great sacrifices to help the refugees. A certain amount of assistance has already been provided from B.M.A. funds,⁵ but all that doctors individually can give will be most gratefully received.

¹ *British Medical Journal*, 1955, 2, 695.

² *Ann. rheum. Dis.*, 1955, 14, 353.

³ Copeman, W. S. C., Savage, O., Dodds, E. C., Glynn, J. H. H., and Fearnley, M. E., *British Medical Journal*, 1954, 1, 1109.

⁴ — and Savage, O., *Fourth Annual Report on Stress*, 1954, Acta Inc., Montreal, p. 153.

⁵ *British Medical Journal*, 1957, 1, 220.

¹ Morris, J. N., Heady, J. A., and Barley, R. G., *British Medical Journal*, 1952, 1, 503.

² See *ibid.*, 1953, 1, 444.

³ Registrar-General's Decennial Supplement, England and Wales, 1951, Occupational Mortality, Part 1, 1954, H.M.S.O.

⁴ Dickinson, F. G., and Martin, L. W., *J. Amer. med. Ass.*, 1956, 162, 1462.

⁵ Hill, A. B., and Martin, W. J., *British Medical Journal*, 1949, 2, 357.

FATAL HOSPITAL FALLS

BY

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The incidence of fatal hospital falls is not high, but the matter deserves notice from the standpoint both of prevention and of the risk of litigation. These aspects are, of course, interdependent. The kind of accident caused by falls on polished floors is well recognized and is not dealt with here. This article is concerned with falls, often suicidal, from windows and roofs.

In six months in the West London Coroner's district six such falls have occurred. The area includes 40 hospitals with roughly 13,800 beds. Postulating an 80% bed occupancy and an average length of stay of 20 days per patient, this gives an annual population at risk of about 100,000. The risk of a fatal fall from a window is therefore about 1 in 8,000. Not all the cases are overtly suicidal, but it is of interest to compare this figure with the current suicide rate of 1 in 10,000 in the general population. The six falls occurring during the six months under review seem to represent an unusually high incidence. Against the factor of closer supervision must be set the nature of the hospital population, consisting as it does of sick people who may be temporarily upset by pain, toxæmia, or biochemical disturbances, to say nothing of psychological troubles. During this time no fatal fall occurred among those occupying the 4,000 beds for mental patients.

Case Reports

Case 1.—Two days after an abdomino-perineal resection of the rectum for carcinoma a man aged 66 climbed out of bed at 6.30 a.m., scaled a radiator, and got out of a narrow opening in a window. He fell to the ground and died of multiple injuries. He had been somewhat mentally confused during the preceding night, but not unduly so for an elderly man recovering from a severe operation. The nurses on duty, quite reasonably, did not consider the possibility of such an athletic action, which was carried out under their eyes with such speed that they could not stop him. He was in an open ward. In view of his disordered mental state it was doubtful whether the conscious intention of self-destruction existed, and an open verdict was returned.

Case 2.—A male hospital employee aged 63, while convalescent from cholecystectomy for gall-stones, developed functional retention of urine, for which he had an indwelling catheter. He was distressed by this. At 12.30 a.m. he was missed from his bed and was found to have made his way to a staircase and thrown himself from a window on the floor above the private room which he had occupied. It was clear that he had deliberately killed himself, and the verdict was in accordance with this.

Case 3.—A woman aged 54, who had had bilateral adrenalectomy for carcinomatosis from carcinoma of the breast, was in hospital, in a private room, to have her cortisone dosage balanced. She had had much distressing treatment and knew she had carcinoma. Superficially she did not seem to have been unbalanced mentally. She had had several attacks in which she had become giddy and had staggered while walking. At 3.30 p.m. she fell from a high-silled window just outside her room door. In view of a history of breathlessness and the giddy attacks it was not possible to exclude accident, and an open verdict was returned.

Case 4.—A woman aged 41 was suffering from alcoholism and had had several epileptiform fits, for which she was being investigated in hospital. She was in a general ward and was described as being rather euphoric and facetious and confused at night. Treatment consisted of large doses of vitamin B, paraldehyde, 5 ml. six-hourly, and phenobarbitone, 3 gr. (0.2 g.) intramuscularly if required. During her third night in hospital she seemed more confused than usual and announced her intention of going home. An extra nurse was detailed to look after her. Early in the morning she got out of bed, gathered her belongings, and said she was going to call a taxi. Despite remonstrance she went down the stairs, accompanied by the nurses, who were still remonstrating with her; suddenly she stopped, threatened the nurses with a piece of iron which she had picked up, and slipped through a staircase window on to a flat roof. Still followed by the nurses, she made her way along the roof and climbed a wall at the end. This was thought to be at ground level, but was in fact some distance above a yard. She fell and was killed. The verdict was accidental death.

Case 5.—A man aged 22 with Crohn's disease had been in various hospitals for several months and had had extensive resection of the ileum. During the course of the illness he developed symptoms of anxiety and depression and was admitted to a mental observation hospital. After a time he was thought fit to return to the general ward for further treatment of his somatic disease. He did not then show signs of mental confusion. At 6.30 a.m. he was seen to go to the lavatory, and bid good morning to one of the nurses quite cheerfully. He was soon missed, and was found lying dead on the pavement several stories below the lavatory window. This window was of the casement variety and so situated that accidental falling was impossible. At the inquest the finding was that he had killed himself.

Case 6.—A man aged 68 had had an operation for implantation of radium seeds for inoperable carcinoma of the pancreas. He had had a previous operation and much medical attention. He was aware of the diagnosis. He had been in hospital 12 days, made no complaint, and suffered no pain. At 6 p.m. he went to the lavatory and threw himself from the window. A note written on the edge of a newspaper was found, making clear his intention. The verdict was that he had killed himself.

Discussion

These six cases show the kind of risk involved. It may be recorded here that the three suicides as found at inquest were the only suicides in hospital during the six-months period. Other methods of committing suicide, such as coal-gas poisoning, drugs, and hanging, are clearly less likely in hospital in view of the practical difficulties, so the window-jump must be regarded as the chief danger. Only a small number of cases are recorded, but they are cited to indicate the risk. Any person with hospital experience could add to them, and no particular hospital seems unduly vulnerable. It is easy to be wise after an event, but reasonable precautions should be taken to avoid this kind of death. The problem should be taken into account in planning the design and layout of new hospitals. No claims were made against the hospitals in which these deaths took place, but it is known that liability has been alleged in similar cases. If a claim is made it would be necessary for the hospital authority to show that a reasonable standard of care had been taken to avoid such incidents. What is reasonable would be assessed by referring to current hospital practice; but this is not inflexible, and would cease to be a guide in the presence of some proved danger. Attention to the following points is suggested.

Perhaps the outstanding feature of these cases is that in no instance was the window-fall expected; and the paucity of such events from mental hospitals, where organization is geared to the ever-present possibility of suicide, indicates the importance of the staff being aware of the risk.

It has been noticed that suicide, including cases of self-destruction that lie on its borderland, is often associated with convalescence from major operations, especially where there has been deprivation of an important viscus. The psychopathology of this is outside the scope of this article. It is suggested that patients who show signs of unusual behaviour in these circumstances, even if it is only slight, should be regarded as possible suicidal risks and be placed in a ward on the ground floor. They certainly should not be left in side wards or private rooms without a special nurse. If a psychiatric opinion has been sought and removal to a mental hospital advised, the usual delay associated with administrative obstacles must be eliminated. It has been noted that the nursing staff can more easily supervise a patient in an open ward; but even this, as shown in Case 1, is no guarantee of security, although the risk is clearly diminished. It is not thought that increase of staffing by night or day would make much difference to fatal falls from windows: the patients in these six cases all fell at a time when ward activity was slight.

Precautions of a structural kind seem more practical, though there would be difficulties where buildings are old and financial resources are slender. It should be impossible to open windows more than 9 in. (23 cm.) at the bottom in upstairs wards, staircases, and corridors. Casement windows could likewise be limited. Where this is not feasible, bars should be fitted to afford at least a temporary obstacle to egress from windows. In the case of lavatories, it should not be possible to bolt the door from the inside. Instead, a large indicator showing "engaged" or "vacant" would be suitable.

In the present state of hospital design and routine it does not seem that any further precautions would be expected by a reasonable person.

Summary

The risk of fatal falls from hospital windows is described and illustrated.

Awareness of the risk is important and should be inculcated in nursing staff.

Simple structural precautions are suggested.

MEDICAL ETHICS IN WARTIME

CODE AND EMBLEM ADOPTED BY W.M.A.

The World Medical Association, at its tenth general assembly last autumn, adopted a "Code of Medical Ethics in Wartime" drafted by a joint committee of the International Red Cross, the International Committee on Military Medicine and Pharmacy, and W.M.A. itself. The World Health Organization was represented on the committee as an observer. W.M.A. also adopted an emblem, recommended by the same committee, for civilian doctors (and others) to wear in wartime. National medical associations are now being asked by W.M.A. to approve and support the code and the emblem. The matter is due to be considered shortly by the B.M.A.

Code of Medical Ethics in Wartime

The provisions of the "Code of Medical Ethics in Wartime" are as follows:

1. Medical ethics in time of war is identical with medical ethics in time of peace, as established in the International Code of Medical Ethics of the World Medical Association. The primary obligation of the doctor is his professional duty; in performing his professional duty the doctor's supreme guide is his conscience.
2. The primary task of the medical profession is to preserve health and save life. Hence it is deemed unethical for doctors to: (a) give advice or perform prophylactic, diagnostic, or therapeutic procedures that are not justifiable in the patient's interest;

(b) weaken the physical or mental strength of a human being without therapeutic justification; (c) employ scientific knowledge to imperil health or destroy life.

3. Human experimentation in time of war is governed by the same code as in times of peace; it is strictly forbidden on all persons deprived of their liberty, especially civilian and military prisoners and the population of occupied countries.

4. The forbidding of the medical procedures in points 2 and 3 is mandatory under all circumstances regardless of decisions to the contrary issued by either a *de jure* or a *de facto* authority.

5. In emergencies the doctor must always give the required care impartially and without consideration of sex, race, nationality, religion, political affiliation, or any other criterion. Such medical assistance must be continued as long as necessary.

6. Medical secrecy must be preserved by the doctor in the practice of his profession.

7. Privileges and facilities afforded the doctor must never be used for other than professional purposes.

Rules Governing the Care of Sick and Wounded, Particularly in Time of Conflict

1. Under all circumstances every person, military or civilian, must receive promptly the care he needs without consideration of sex, race, nationality, religion, political affiliation, or any other criterion. Any procedure detrimental to the health, physical or mental integrity of a human being is forbidden unless therapeutically justifiable.

2. In emergencies doctors and associated medical personnel are required to render immediate service to the best of their ability. No distinction shall be made between patients except those justified by medical urgency. Services may be refused if other doctors are rendering their services.

3. The members of medical and auxiliary professions must be granted the protection needed to carry out their professional activities freely. The assistance necessary will be given to them in fulfilling their responsibilities. Free passage will be granted whenever their assistance is required. They will be afforded complete professional independence.

4. The fulfilment of professional duties and responsibilities shall in no circumstance be considered an offence.

5. In fulfilling their professional duties the medical and auxiliary professions will be identified by the distinctive emblem of a red serpent and staff on a white field. The use of this emblem is governed by special regulation.

Medical Emblem

It is clear from the fourth Geneva Conventions and Conferences, states W.M.A., that the protection of the Red Cross emblem applies only to doctors, ancillaries, and medical installations in military organizations. Hence, in time of war, the civilian doctor, his assistants, and civil defence units not under military control are without such protection. The new emblem, suggested by the joint committee and approved by W.M.A., is for them to wear. It consists of a red staff and serpent on a white field. The staff is represented by a vertical line, the serpent by a sinuous line, overlying the vertical line, with two undulations on the left side and one on the right (see diagram).

The ultimate success of this emblem and the Code of Ethics as a guarantee of protection for civilian doctors will largely depend, states W.M.A., on the support they receive from national medical associations.

Dr. W. A. HORNE, medical officer of health of Glasgow, has some remarks to make in his Annual Report for the year 1955 about infestation with bed bugs. In that year 15,000 houses in rehousing schemes were inspected and evidence of infestation was found in 66 (0.44%). Twenty years before the percentage of infested houses was 9.2. The use by the disinfection unit of D.D.T. and "gammexane" is said to give every satisfaction in the eradication of this pest. The total number of "apartments" treated for infestation by bugs in 1955 was nearly 3,000.



Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Hungarian Medical Refugees

SIR,—The many problems presented by the Hungarian refugee doctors have been considered by the Council of the Association, and it is with the full approval of the Council that I now appeal to the profession for subscriptions to a fund to provide assistance for them.

A particularly heavy burden has fallen upon Austria, as will be seen from the following letter, recently received from the Austrian Medical Association.

"Dear colleagues,

"You have certainly heard about the events which happened in Hungary, our neighbour-country, and that the people of Austria helped the refugees with all efforts, achieving great sacrifices. You will realize, however, that so small a country as Austria is not able to help alone for long and therefore asked the freedom-loving world for assistance. Also the doctors of Austria, who certainly are not too well off, helped the Hungarian refugees by giving them free medical treatment and by raising large sums for the general relief funds. However, another problem arose affecting the doctors of Austria, and for the solution of which the co-operation of the medical profession is needed. Among the Hungarian refugees there are many doctors, and the Medical Board of Vienna sponsored a collection to provide a gift of 500 Austrian schillings (20 dollars) for every one of our colleagues. However, the number of the Hungarian doctors increased and is still increasing. Up to date (December 28, 1956) 560 Hungarian doctors called at our office and the Medical Board of Vienna had to raise a loan to continue the financial support given to them. However, we are now at the end of our financial means and therefore ask you to help the Hungarian doctors. We are convinced that, once you have heard about the misery of the Hungarian doctors, the willingness to help your colleagues will be in your country as great as in Austria.

"However, *Bis dat qui cito dat*!

"Will you please transmit financial support for the Hungarian doctors to the Österreichische Ärztekammer, Erste Österreichische Sparcasse, Wien 1, Graben 21, Konto No. 889,685.

"Thank you very much for your co-operation in the name of our Hungarian colleagues."

The Council would particularly like to be able to give prompt assistance to the profession in Austria, which has already shown great generosity to the many refugee colleagues now in that country. It is proposed that a part of the money subscribed should be used to relieve distress among the relatively small number of refugee doctors from Hungary who have come to this country—most of them on their way to other parts of the Commonwealth or to America—but subscribers may earmark their contributions for transmission to Austria if they so wish.

I have no doubt that very many doctors have already subscribed to one or another of the general relief funds, but I hope that some may be able and willing to subscribe again to a special fund for medical refugees, and I appeal especially to any who may not yet have contributed to any fund for refugees from Hungary.

Subscriptions should be sent to me at B.M.A. House, Tavistock Square, London, W.C.1, and cheques should be made payable to the "B.M.A. Hungarian Relief Fund."—I am, etc.,

London, W.C.1.

S. WAND,
Chairman of Council.

Prednisone and Prednisolone

SIR,—In view of the fact that prednisone and prednisolone are now generally released to the profession, your excellent leader (January 26, p. 215) on the subject was most timely and instructive. Judging by the many brochures on the subject issued by various drug houses since then it

seems necessary to underline certain of the points made in your leader, for, acting on the different instructions given in the brochures, the practitioner may run into real trouble, particularly as regards gastric intolerance. Dyspepsia is common in steroid therapy, and these new delta compounds are no exception; a patient should always be asked regarding previous dyspepsia and gastric investigations before starting therapy. Most clinics using these substances since they became available to hospitals eighteen months ago have seen haemorrhage or perforation at least once.

The dosage level should be considered one-fifth that of cortisone; the number of tablets required daily remains, therefore, the same if one changes a patient from tablets containing 25 mg. of cortisone acetate to tablets containing 5 mg. of prednisone or prednisolone. Much of the improvement seen in the clinical condition on changing a patient from one drug to the other may lie in actual increase of dosage, some workers assuming the substances are effective in a dose ratio of 1:3 or 1:4. We have learnt with cortisone to restrict the dosage to the lowest effective level, and in treating rheumatoid arthritis, for instance, daily dosage of cortisone nowadays practically never exceeds 100 mg. and is usually 75 mg. or lower. The equivalent dosages of prednisone and prednisolone are 20 and 15 mg., and though this dosage can be, and should be, increased in the short-term treatment of emergencies, such as severe status asthmaticus, the daily dose in continued suppressive therapy should be under 20 mg., except in conditions dangerous to life.

It offends the lovers of champagne that the bubbles in that delightful wine should be removed by special whisks before making champagne cocktails; it offends my common sense that prednisone and prednisolone, whose main virtue lies in causing less sodium retention than cortisone, should be recommended in some brochures for the treatment of adrenal deficiency, but only in conjunction with deoxycortone. As stated in your leader, the delta substances, because of their very slight salt-retaining properties, are not suitable for the treatment of cases of Addison's disease or the adrenalectomized subject; cortisone or hydrocortisone are to be preferred here, with, in salt-losing cases, fluorohydrocortisone. There is no particular virtue in medicine in removing one property in manufacture so that a second drug must be administered in practice.

Finally, a word against compound analgesic cum steroid tablets. If a given dose of prednisone or prednisolone is mixed with an analgesic substance in a compound tablet it may easily lead to over- or under-dosage of one or other substance. Aspirin is so readily available and widely used that it seems unnecessary to invent yet another compound tablet.—I am, etc.,

London, S.W.1.

F. DUDLEY HART.

Prednisone and Nasal Allergic Disease

SIR,—During the last few years I have been lucky to have the opportunity of helping to assess the value of corticosteroids in the treatment of allergic disease of the nasal cavities and para-nasal sinuses. In particular, corticotrophin, cortisone, and hydrocortisone both as solids, suspensions, and in free alcohol solution have been used. They were given either systemically, by local spray, or by local injection under reasonable conditions of controlled trial. No real evidence of lasting or even temporary benefit in a majority of the cases has resulted from this work, so that enthusiasm had flagged somewhat by the time prednisone became available for clinical trial in hospital.

It is therefore most encouraging to find preliminary studies showing that prednisone in small systemic doses can be of real benefit. So far, selection of patients has been strictly limited to the very worst and most intractable cases, usually with polypi and unresponsive to all other forms of treatment. Out of 14 patients treated after removal of gross polypi, 12 have been completely relieved of symptoms, many of them during the first two or three days, and in four cases the sense of smell has returned after many years' absence.

Dosage begins with one 5-mg. tablet three times a day and is proportionately reduced over the next month until a minimal effective dose is found. In several, this appears to be only 5 mg. every other day. Relapses occur when the treatment is discontinued, and so far the longest consecutive period of treatment of any patient is four and a half months.

Such treatment is likely to be purely palliative and has been used in only a small number of the most severe cases. But these early clinical results have been so heartening, and the gratitude of the patients so impressive, that I feel they should be recorded.—I am, etc.,

London, W.C.1.

HENRY J. SHAW.

Safety Factor in Car Design

SIR,—As we see the results in hospitals, road traffic accidents as a class cause the most serious injuries, have the highest mortality rate, and are associated with more permanent disabilities than any other type of accident. In 1954 such accidents accounted for 5,010 deaths in Great Britain.

The mortality rate from similar accidents in 1954 in the German Federal Republic, France, and Italy (each with populations comparable but lower than our own) were respectively 11,565, 7,539, and 5,281. Undoubtedly there are many factors contributing to these considerably higher figures than our unenviable record. One may well be the popularity in those countries of small low cars of extremely light construction. Since petrol rationing and the resulting increase of such cars in this country, both of foreign and home make, we have already treated many serious and two fatal injuries in users of such vehicles.

Many years of hospital experience have shown² that, from the car-users' (safety) angle, car design and solid construction are important factors. Four good wheels, a few feet of steel between the driver and what he hits in head-on collisions, stoutly constructed body work as a protection against side-swipe accidents and overturning, a safe design of steering-wheel and dashboard, splinter-proof glass, and a car at least high enough to give its driver a good view of the road ahead and its crossroads, are all important factors in safety car design.

From the safety angle, the increasing popularity of small, low, and very lightly constructed cars is to be deplored. A saving in petrol may be bought at too high a price.—I am, etc.,

Birmingham.

WILLIAM GISSANE.

REFERENCES

1. G. O. Jeffcoate, *International Comparisons of Road Accident Statistics in 1954*, Road Research Laboratory (unpublished).
2. Gissane, William, *Practitioner*, 1954, 172, 620.

Tuberculosis in Glasgow

SIR,—Drs. W. F. Tyrrell and J. Smith have written an interesting and valuable epidemiological study in their paper on pulmonary tuberculosis in north Glasgow (*Journal*, December 22, 1956, p. 1451). It should be of interest to all part-time tuberculosis consultants. Among their most striking results was a definite contact history in 77.6% of the male cases and 75.4% of the female cases, and of a familial nature in the high figure of 88.5% of cases. To obtain such figures the intensity of the contact investigations must have been great but worth while. The following paragraph among their conclusions deserves special mention: "This work has given us some general impressions which we feel may be of value to other workers in the field. For example, we find that visits by the chest physician to the homes of new patients give the health visitor a feeling of greater interest and encouragement, with the added advantage that such visits serve to reinforce, and occasionally redirect, her activities to the best advantage. We also found that home visits made in the evening were most productive in eliciting information and in establishing rapport with the members of the household. Moreover, at such times recalcitrant contacts were found to be in a more

amenable state of mind and willing to discuss the reason for their reluctance to be examined. As our figures show, this reluctance could usually be overcome as a result of our methods, which, however, sometimes involved a considerable number of visits."

The authors state, "Overcrowding, poverty, and Irish nationality were found not to be significant factors," and correlate this with Bradbury's¹ well-known, quite different findings in his Tyneside study. Here, surely, like is not being compared with like. In 1932 the country had some three million unemployed, and Jarrow on Tyneside was a real black spot. Visiting that area then was to see real abject poverty, with housing mostly of the "box house" type, with eight rooms and eight families, the staircase turning right and left into complete darkness; the smell of vermin; rat-gnawed wainscoting; male patients in bed spitting on to newspaper; and children swarming about in squalor and dirt. Glasgow in 1956 was not a distressed area, and is not comparable with Jarrow in 1932, either in its economic conditions or the housing.—I am, etc.,

Church Stretton, Salop.

G. LISSANT COX.

REFERENCE

1. Bradbury, F. C. S., *Causal Factors in Tuberculosis*, 1933. N.A.P.T.

Incidence of Venereal Disease

SIR,—It is obviously most desirable to know the true incidence of venereal disease in this country, and from this viewpoint the inquiry instituted by the B.M.A. Venereologists Group Committee (*Supplement*, January 12, p. 19) is to be welcomed. However, attention must be called to the statement that there has been a big fall in the number of new cases attending the V.D. clinics. As far as we can ascertain there has been no significant decrease in these numbers, as the average number of new patients attending the clinics in England and Wales in the years 1921–5 was approximately 76,000; in 1934–8, 100,000; and in 1952–5, 97,000. In 1956 the number of cases attending during the first three-quarters of the year totalled 74,000, so that the probable average for the five-year period 1952–6 will be in the region of 98,000.

It is true that early syphilis is rare and late syphilis is also decreasing in most areas, as would be expected. The incidence of gonorrhoea remains disturbingly high, and in some areas, including Birmingham and district, is tending to reach epidemic proportions. This is partly due to immigration, but also, we feel, due to the failure of the medical profession to tackle the problem of gonorrhoea from the aspect of the community as a whole. We feel that many cases of gonorrhoea, and probably a few cases of syphilis, are treated by general practitioners. This they have every right to do, but we wonder if in all cases they follow up the contacts or retrieve defaulters. It is also not generally appreciated that gonorrhoea in the female is frequently symptomless, and that in very many cases there are no significant signs. As a result of this attenuated reaction to infection in females cultural investigation is always necessary in possible contacts.

The above points, we feel, are important factors in the continuing high incidence of gonorrhoea, and practitioners who treat cases of this infection should realize that they have a greater responsibility than that of curing the individual patient.—We are, etc.,

Birmingham, 4.

GERALD H. KNIGHT.
W. FOWLER.

The Hurt Brain

SIR,—In company with millions of viewers, I have watched with interest the series of programmes on the television concerning mental health under the title "The Hurt Mind." I was greatly astonished and considerably disturbed to hear the doctor who presented the series state that syphilis affecting the brain could now be cured with ten injections

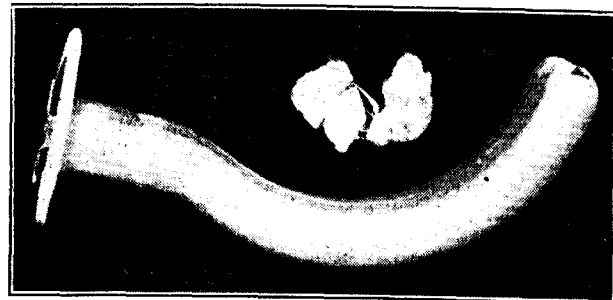
of penicillin. Unfortunately, this view seems to be widely accepted in mental hospitals, and yet I feel quite sure that few venereologists would support this statement. It is true that in many patients the symptoms are relieved and greatly improved by such a course of treatment, but that is far from establishing a cure. I fear that these same magic powers are attributed to a short course of penicillin not only by psychiatrists but by many others in the various ancillary branches of medicine, and one cannot too loudly decry this view.—I am, etc.,

Liverpool.

E. E. PREBBLE.

Asphyxia due to Faulty Apparatus

SIR,—Having read with interest the letters by Dr. W. N. Rollaston (*Journal*, September 15, 1956, p. 658) and Dr. C. Langton Hewer (*Journal*, September 29, 1956, p. 766) titled "Asphyxia Due to Faulty Apparatus" prompts me to publish the enclosed photograph, which is self-explanatory. Luckily the patient suffered from no ill effects except for some temporary cyanosis.



It looks as if anaesthetists must not only examine the patency of endotracheal tubes and T-pieces but airways as well before they embark on an anaesthetic.

Surely the lesson to be learnt from this photograph is that airways should not be cleaned with pledgets of cotton-wool but by a proper brush on a wire holder.—I am, etc.,

Farnham Royal, Bucks.

F. J. RUSSELL STONEHAM.

Treatment of Acute Appendicitis

SIR,—The recent discussion on the conservative treatment of acute appendicitis has occurred at an opportune moment so far as emergency treatment on the high seas is concerned. This week the national dailies have graphically told of the predicament of Captain R. S. Paton, of the *Tahsinia*, who was confronted with a serious case of acute appendicitis in one of his crew. According to the news accounts, he was 700 miles from land and with no hope of skilled help being immediately available. In answer to his messages for advice he was told to operate. Bear in mind this was a ship of 5,680 tons, pitching and rolling in the teeth of an Atlantic gale. There was no anaesthetist and the captain had no medical qualification, but it is alleged he was advised to plunge into the patient's abdomen to look for he knew not what. Wisely he decided to disregard advice, wear ship, and make full speed for land, believing that the circumstances for his first exploratory laparotomy were not propitious.

Following Mr. Eric Coldrey's account (*Journal*, December 22, 1956, p. 1458) of his method of conservative treatment of acute appendicitis, it would seem proper to revise the *Ship Captain's Medical Guide* and to give a detailed method of conservative treatment to be applied in all cases of acute appendicitis when no surgeon is carried aboard. This should enable the patient to be carried in safety to skilled medical help and save the predicament which beset Captain Paton. It is, of course, by no means unknown for captains to embark on surgical treatment of sick or injured members of the crew when no skilled help is at hand. In the days of

sail many captains became of necessity physicians, surgeons, and accoucheurs according to the demands of the occasion.

Twenty years ago I sailed in a windjammer whose Finnish mate, Lars Persh, told me of a surgical occasion in his previous ship. He was sailing in the Erikson-owned windjammer, the *Olivebank*, and when about a month from Australia and two months from England a member of the crew had symptoms of acute appendicitis. The captain decided to operate and Persh assisted him. Another member of the crew gave the chloroform. Although he made a good opening in the S.W. corner of the belly (as it is described in the *Ship Captain's Medical Guide*) they failed after prolonged search to find the appendix. The captain sewed everything up in one layer, using fine twine, and the patient recovered sufficiently to walk off the ship some weeks later. My friend, the mate, was well used to doing minor surgery and had plenty of confidence. He would have been quite happy to operate on me had the occasion arisen. On my voyage I had to operate on a septic hand which had gone beyond further conservative treatment, and I sampled some of the minor problems of working in such surroundings. The weather was bad and the ship was in stone ballast, which caused everyone and everything to be thrown from side to side. Nothing would stop still. The patient was held in a bunk while I gave him hexobarbitone and a member of the crew endeavoured to hold me against the bunk for steadiness. Bowls, syringes, etc., rolled in all directions. The lighting was bad. Add to this the need for a laparotomy, a volunteer anaesthetist giving his first chloroform administration, and a lay operator making his first acquaintance with the inside of the peritoneal cavity, and there seems a sound argument for adopting conservative treatment of the acute appendix on the high seas.—I am, etc.,

Sheffield, 8.

E. C. ATKINSON.

SIR,—It was with great interest that I read Mr. Eric Coldrey's paper (*Journal*, December 22, 1956, p. 1458) advocating a conservative approach to the treatment of acute appendicitis. I have been engaged in emergency surgery for over twenty years and have performed the operation of appendicectomy, very rarely with drainage, on some thousands of cases at all ages and all stages of the disease. Surely the introduction of antibiotics has not abolished the old surgical dictum, "Where there is pus, let it out." The observation of Professor F. A. R. Stammers (*Journal*, January 26, p. 225) on frozen pelvis as a result of antibiotic therapy with consequent stricture of the rectum should be enough to condemn this method of treatment. I personally consider it dangerous teaching for house-surgeons and registrars to enter the practice of surgery with the idea that in the presence of infection with pus formation antibiotic therapy is the be-all and end-all of treatment.—I am, etc.,

Swansea.

J. RUSSELL HUGHES.

SIR,—Your correspondent, Dr. G. I. Alexander, states as follows in his letter (*Journal*, January 5, p. 46): "I seem to remember that during the war a directive was issued by the Admiralty that under no circumstances was appendicectomy to be attempted at sea—the results of keen young chaps operating in destroyers had been so bad." No instruction of this nature was issued by the Medical Director-General and I have no knowledge of any directive of this nature having been issued. I cannot conceive any circumstances in which such an instruction would be sent. As the conditions under which such emergency action would arise cannot be foreseen, a directive on such a matter might have fatal consequences. This is not intended to be an entry into the lists of *pro* and *contra* appendicectomy. Professional freedom as regards treatment in the Royal Naval Medical Service is a much-prized duty and privilege. It would be a great pity if it were to be thought that arbitrary directives are issued governing the conduct of that professional duty.—I am, etc.,

London, S.W.1.

R. C. MAY,
Medical Director-General
of the Navy.

Abnormal Haemoglobin

SIR,—I was interested in your review of the abnormal haemoglobin situation (*Journal*, January 5, p. 34). May I be permitted to comment? During a three-month period last year I examined the blood of a number of West Indians and Africans who have recently become resident in S.W. London. The majority were out-patients and not, to my knowledge, first-degree relatives. By electrophoresis and sickling tests the haemoglobin composition of 204 subjects was determined as follows: A, 167 (82%); S, 1 (0.5%); C, 1 (0.5%); A+S, 29 (14%); A+C, 5 (2.5%); S+C, 1 (0.5%); total abnormal haemoglobins, 37 (18%).

These findings confirm that a considerable incidence of abnormal haemoglobins may be found in such a population. It seems important to recognize this fact because the presence of haemoglobin S may be responsible for a wide variety of non-haematological syndromes. For example, in this series (none of whom presented with any haematological symptoms) the patient in whom S only was found by electrophoresis, a 29-year-old housewife and mother of two children, presented with Perthes's disease of the hip. Unfortunately, no family study could be made and we cannot state whether the condition was homozygous or heterozygous, in the latter case coupled with thalassaemia. In sickle-cell thalassaemia the haemoglobin A production of the heterozygote can be suppressed. The combination of sickle-cell trait with thalassaemia is likely in this instance because, in addition to S, there was 36% foetal haemoglobin. Similarly, the combination of S+C haemoglobin was found in a young man who underwent splenectomy for enlarged painful spleen. Both these conditions are presumed to be the result of intravascular sickling, a condition which may give rise to vascular occlusion in almost any organ of the body. Patients may, on account of this, present with such conditions as haematuria, pyrexia, jaundice, abdominal pain, and various neurological lesions. I suggest, therefore, that elucidation of haemoglobin type is required in any anaemia or inexplicable syndrome occurring in patients of West African ancestry.—I am, etc.,

London, S.E.1.

J. A. M. AGER.

The Black Sheep

SIR,—Your leading article on Sonne dysentery (*Journal*, January 26, p. 217) draws attention to the likelihood of transmission of infection through the handling by children of infected lavatory seats.

The reputation of the lavatory seat for transmitting disease, like its owner, has had its ups and downs for years, and up to recent times it has been thought that such blame as it has received has resulted largely from its limited scope for hitting back. However, there is now good reason to believe that Sonne dysentery, trichomoniasis, and syphilis through the secondary rash can be transmitted by this means.

The answer to the problem lies in the provision of the squatting type of water closets. These have the following advantages: (1) the feet are the only part of the anatomy to have contact with the lavatory; (2) the lavatory can be cleansed with a water jet from a hose-pipe; (3) absence of upward splash; (4) the squatting position maintains better tone of the abdominal and perineal muscles; (5) more effective evacuation. It may be thought that prejudice against such water closets would make them unacceptable in this country, but nevertheless the two local authorities I serve have provided them in certain of their public conveniences, and a large factory here has adopted this style for its labourers.—I am, etc.,

Dartford, Kent.

J. H. HUDSON.

SIR,—May I send you two clues which may help to solve the mystery of the black sheep (*Journal*, January 26, p. 217)? (1) The cheaper lavatory paper now consists largely of what Dr. Samuel Johnson called "interstitial vacuities," through which the faeces can hardly fail to contaminate the right hand. (2) In the days of the high cistern the handle on the dangling chain lay more conveniently

accessible to the uncontaminated left hand. The modern cistern, built low and flushed by a button or small lever, is more easily manipulated by the contaminated right hand. Even among the very U. flushing precedes washing.—I am, etc.,

London, W.1.

RAYMOND GREENE.

Fatal Reactions to Local Anaesthetics

SIR,—Your annotation on fatal reactions to local anaesthetics (*Journal*, February 2, p. 276) rightly points out the danger of these drugs, especially when applied topically in the dosage normally used. However, as I pointed out in a previous letter (*Journal*, May 28, 1949, p. 957), there appears to be evidence that, in the case of amethocaine as well as cocaine, the real danger is idiosyncrasy rather than overdosage. My experience of toxic reactions has been increased by only one case since the four I mentioned in 1949, but in every one of these convulsions have developed at an early stage in the preparation of the patient for bronchoscopy or laryngoscopy. Case 4, as previously reported, had less than 10 mg. of amethocaine following 1 mg. of cinchocaine, and the highest dosage in the five probably did not exceed 50 mg. when allowance is made for the solution left on swabs or expectorated. No case has occurred late in a difficult bronchoscopy or bronchography in which use of the bronchial spray may almost double the normal dosage of anaesthetics.

Experience here appears to confirm the belief that premedication with a barbiturate reduces the incidence of these reactions. We had nine years' immunity after adopting such a scheme. However, as case 5 proved fatal in spite of thiopentone and artificial respiration with oxygen, we will use lignocaine in future, but will not relax our normal precautions—barbiturate premedication, thiopentone, and a Boyle's machine at hand.—I am, etc.,

Market Drayton, Salop.

A. CLARK PENMAN.

Mild Endogenous Depression

SIR,—I was most interested in Dr. C. A. H. Watts's account of the mild endogenous depression (*Journal*, January 5, p. 4). As a retired consultant psychiatrist, I am filled with admiration at Dr. Watts's "clinical insight" into these conditions, and I would like any remarks I may make to be regarded as complementary to his paper rather than critical. I could not agree more with Dr. Watts's contention that these patients must be treated with patience, sympathy, and understanding. But, having said that, instead of "waiting for three months," I would suggest the enormous benefit most of these patients would get from the immediate giving of 4 or 5 E.C.T.s. In the majority of cases there would be no need for the patient to enter a mental hospital. Most mental hospitals now give such treatment freely to out-patients, and in some instances the treatment may be had in the psychiatric out-patient department of a general hospital.

In dealing with any form of depression the adjective mild, in my opinion, is a risky one to use. The most careful examination may miss the depth of the depression, and what may be a mild depression to-day may be a very severe one to-morrow. Therefore, I do not think the practitioner (or psychiatrist) should subject himself to all the worries of the possible outcome of such cases, but should seek the immediate help of E.C.T. (E.C.T. by no means removes the necessity for sympathetic understanding and support—in fact, if given without the latter, it will usually be found to be very unsatisfactory.)

It is difficult to understand what Dr. Watts means by his "anxious patient" who is "rational and he can follow with interest a logical argument" (so, too, can most depressives). If he means uncomplicated anxiety hysteria, then of course we are dealing with an entirely different condition where E.C.T. would be quite valueless, and where, in my opinion, the treatment of choice is suggestion, which, correctly given, should be almost instantaneously effective. But exceeding care is required here in diagnosis, and it should be remembered that the anxiety hysteric, while perhaps full of

fears and anxieties of, as a rule, all sorts of bodily ailments, does not exhibit any of the classical triad (depression, sleeplessness, and tearfulness), either alone or in combination, of depressive states. It cannot, I think, be too strongly borne in mind that the latter symptoms, in any combination, connote a breakdown, and not a "psychological aberration" which will immediately respond to any form of psychotherapy.—I am, etc.,

Northampton.

ROBERT THOMPSON.

Neostigmine-resistant Curarization

SIR,—The recent spate of correspondence in your *Journal* on the subject of neostigmine-resistant curarization leaves me bewildered and not a little anxious. As a surgeon, I am wondering whether one can any longer, with a clear conscience, leave the choice of anaesthetic to an anaesthetist. It may be that the time has come to reconsider the advantages and disadvantages of regional analgesia, and to avoid tampering with the patient's vital functions. Each of your correspondents voices a different opinion as to the root cause of his troubles, but the fact remains that several fatalities are admitted, and, unless a solution is forthcoming, many more may be expected. What distresses me most is the lamentable lack of precise description in most of these reports. Your *Journal* reaches every corner of the globe, but of what possible use can such letters be if the cardinal facts are omitted? You, Sir, and your advisers are not blameless in this matter. It is your editorial duty to ensure that the relevant facts are supplied, so that their publication may stimulate healthy and helpful criticism and the high scientific level of your *Journal* may be maintained.

One correspondent reports five cases with extreme vagueness. The notable omissions are: (1) the amount and nature of the relaxant given; (2) the method by which the dose was assessed; (3) whether the drug was given in a single dose or repeated at intervals; (4) whether a CO₂ absorber was used; (5) the proportions of gas and oxygen; (6) blood-pressure readings; and (7) the age, weight, and muscular development of the patient. Given these very pertinent findings, it is at least possible that somewhere in the world a fellow anaesthetist might be able to offer more than a feeble conjecture as to the cause of the condition.

Two other correspondents advance a possible explanation, and submit four case reports, again very incomplete. In the first, the statement is made that the dose of relaxant was not excessive. To my mind, Sir, that bald statement requires supporting evidence. How was the dose assessed? And what was the dose? Further, what proportions of anaesthetic gases were used? Was attention paid to the tidal and minute volumes respired? Was an efficient CO₂-absorber used? What were the findings as to colour, pulse, and blood pressure? Their second case recovered after two hours of artificial respiration, and is summarily dismissed without a single detail, incredible as it may seem, as to the anaesthetic. Such a case might be highly illuminating if fully reported. Their third case report omits to state the proportions of gases used, the amount of relaxant, whether a CO₂-absorber was used, details as to tidal and minute volumes, and the facts as to colour, pulse, and blood pressure. The fourth case report has similar omissions.

It seems to me that such anaesthetists are forgetting their elementary physiology in their search for a scapegoat. I believe that the relaxants are safe if used in the correct dosage; that this dosage should be assessed in the light of many factors, such as age, sex, muscular development, weight, and state of health; that the estimated dose can be easily checked by feeling the resistance offered by the re-breathing bag to manual compression; and, finally, that the reported complications can be avoided by correct dosage, by attention to the fundamental factors of tidal volume, minute volume, and adequate intake and output of oxygen and CO₂ respectively, and not by sanguine reliance on antidotes.—I am, etc.,

Johannesburg, S. Africa.

M. ARNOLD.

SIR,—While not wishing to drag out this correspondence, I would like to congratulate your last contributor, Dr. J. A. Scanlon (*Journal*, February 2, p. 283). His point of view savours of common sense and clinical acumen, qualities which are apt to be sadly lacking nowadays. As anaesthetists, we are constantly asked to deal with hopeless cases. The surgical mind appears to be incapable of accepting defeat: modern anaesthesia is apparently innocuous to the patient, and cases are operated on which have already reached a "point of no return." But before that point is reached there is a stage where operation will save life, and it is then that my less spectacular method (*Journal*, December 1, 1956, p. 1303) will prove effective.—I am, etc.,

Glasgow, S.4.

ALBERT CHRISTIE.

Translumbar Aortography

SIR,—May I comment on the interesting paper by Mr. H. Gaylis and Dr. J. W. Laws (*Journal*, November 17, 1956, p. 1141) and the subsequent correspondence? As a result of their experimental work Gaylis and Laws advance the theory that aortic dissection from intramural extravasation following translumbar aortography was largely responsible for some of the serious complications previously attributed to toxicity of the various injection media. It is true, as they point out, that there are many instances in which all the contrast medium has been injected into one branch without ill effect and that some of the reported complications have been associated with extravasation. On the other hand, there are just as many instances in which no ill effect has ensued following the extra-aortic or intramural injection of dye, and there are good grounds for accepting the toxic effect of these media on various tissues. Their theory, however, cannot be refuted, and goes far to explain dissection as a factor in some of the complications, but I incline to agree with Dr. David Sutton (*Journal*, January 26, p. 225) that "toxicity of the medium when given in excessive doses is the major factor in such accidents."

At least four factors must be taken into account in the explanation of complications following aortography—namely, technique of puncture, type of medium, quantity of medium, and injection pressure. Dr. Sutton, in his criticism of the technique used by Mr. Gaylis and Dr. Laws, advocates the use of a test dose to ascertain the position of the needle point. While this will reduce the risk of injection into one main branch, I agree with Gaylis and Laws, supported by Lindgren,¹ that it does not completely obviate the possibility of intramural extravasation occurring during the main injection. In an experience of 500 translumbar aortograms performed mainly (95%) for renal diagnosis I have found that when extravasation occurs it is usually as a result of imperfect positioning of the needle before injection. This is largely a matter of technique and should be, to a great extent, avoidable. In practice, the surest method to avoid this mishap is to effect puncture by a needle alone and not by one connected to a closed saline system. In this way the needle may be rotated through a full circle of 360 degrees and adjustment made so that a free pulsatile stream of blood is obtained throughout the whole manoeuvre. It is imperative that such a free flow of blood is obtained before injection is made.

As regards the various opaque media, the modern organic iodide compounds, while a great advance on sodium iodide, are not completely free from toxic effect. I insist on a routine intravenous test dose for toxicity and sensitivity, and do not place complete reliance on a previous uneventful excretion urogram in which a different strength if not a different drug may have been used. Sodium acetrizate 70% ("urokon") has proved, in my hands, the most satisfactory medium so far. I consider large quantities of dye, such as 70–100 ml., to be excessive. The use of more than 20 ml. is no more necessary or desirable in renal angiography than in intravenous urography. In practice I never use more than 18 ml. for renal angiography or aortography, this amount being quite adequate provided reasonably rapid injection is carried out. Further, in the event of extravasa-

tion, it is not unreasonable to assume that the effects will be proportional to the quantity injected.

The most important single factor in the production of good aortograms consists of the rapid introduction of the dye, and there is little doubt that the pictures produced using moderate mechanical pressure are superior to those obtained by hand pressure alone. Dr. Sutton, however, appears to condemn the use of pressure injection and states that such instruments "can be extremely dangerous in other and unskilled hands." This is certainly true, but such a criticism applies to the use of almost every piece of apparatus in the medical armamentarium, and I think the position is fairly summed up in respect of aortography in general by the editorial comment on arteriography² that translumbar aortography should be employed "as a diagnostic adjunct by carefully trained personnel" (my italics). The use of excessive pressure such as 3,000–4,000 mm. Hg attained by some gas-air machines is to be condemned, but few articles on this subject state the actual pressures used for injection. The lever apparatus and technique which I use have been described elsewhere³ in which 15–18 ml. of dye is injected in one second. This requires a pressure of 800 mm. Hg through a No. 16 S.W.G. needle, which I do not consider excessive compared with a pressure of 500–600 mm. Hg over a period of three seconds required by hand pressure to introduce the same amount. Experiments with this injection pressure showed that the rise in intra-aortic pressure was less than 10 mm. Hg and had no detectable effect on the cardiac cycle. While I may have been fortunate in the absence of any significant complications in this series, I attribute this largely to the small quantity of dye used for injection.—I am, etc.,

Glasgow.

W. BARR STIRLING.

REFERENCES

- 1 Lindgren, E., *Acta Radiol. (Stockh.)*, 1953, 39, 205.
- 2 J. Amer. med. Ass., 1952, 148, 652.
- 3 Stirling, W. B., *Lancet*, 1955, 2, 123.
- 4 — *Proc. roy. Soc. Med.*, 1955, 48, 823.

Breasts from Bird-seed

SIR,—The interest which has been shown in the device which I described in my previous letter, "Breasts from Bird-seed" (*Journal*, March 17, 1956, p. 628), indicates the real need which exists for a better form of mammary prosthesis. The purpose of this further communication is to describe an improved pattern, which is now on the market, possessing the mechanical advantages of the bird-seed model but free from its obvious drawbacks.

It may be remembered that the original model consisted of a cloth bag loosely filled with bird-seed, which was inserted into an ordinary brassière. The design of the new one is identical except that "polystyrene" granules are used as a filling instead of bird-seed. The patient who first used the bird-seed model has tried this one out and has found it to be equally satisfactory. It is now going into production, and I understand that a patent has been applied for. It has been given the name of "malpro," and may be obtained, in limited quantities at present, from Eunice A. Morris, 62, Church Street, Blackpool.

The polystyrene granules which are used are similar in size and weight to bird-seed, and so they provide the shifting quality and the exact counterpoise which are needed (see my previous letter). They are non-absorbent and resist boiling, so that washing the prosthesis presents no problem. Although they burn in the open fire, they are not highly inflammable. In conclusion, may I reply to two points which were raised by "Interested Victim" in her letter (*Journal*, April 14, p. 862)? First, although cotton-wool is a satisfactory substitute in ladies of modest proportions, it is quite inadequate in the majority of cases, because it is much too light to retain its place and to counterbalance the other side. Secondly, the discomfort in the immediate post-operative period which she has experienced from the standard models is largely due to their fixed shape and lack of resistance—i.e., a lack of the very shiftiness which has caused such fun.—I am, etc.,

Blackpool.

D. K. LENNOX.

Non-united Fracture of Scaphoid

SIR,—In two successive orthopaedic clinics at the R.A.F. Hospital, Nocton, recently, six new cases of established non-union of a fractured carpal scaphoid were referred for diagnosis and treatment. While the number was unusually high it did serve to emphasize the steady stream of such cases encountered. Disability from this lesion is variable, but more often than not manual workers are handicapped by pain, a weakened grip, and restricted mobility, while a skilled craftsman can become seriously disabled. In almost every case the fault lies in premature reassurance of the patient in the surgery or the casualty department as his "sprained wrist" is strapped. This reassurance may have been encouraged by an x-ray report of "No bone injury" within a few days of injury. A confirmatory radiograph twelve or fourteen days later (when clinical suspicion should have remained) was not taken.

A non-united fracture of the scaphoid offers considerable difficulties in management. Degenerative osteoarthritic changes are often well established by the time the patient presents for treatment, and there is, unfortunately, no single procedure available that will guarantee union and/or abolish disability in all cases. It is for these reasons, Sir, but above all for the distressingly high incidence of this largely avoidable lesion, that I beg leave to raise this subject in your columns. I realize only too well that this problem has long been widely appreciated. Our experience, however, does seem to underline the value of occasional emphasis on this diagnostic problem.—I am, etc.,

Lincoln.

K. R. J. DE BELDER.

Herpes Zoster and Chicken-pox

SIR,—I recently had a case of herpes zoster in one of my patients followed later by chicken-pox in her daughter, aged 21 years. I reviewed the recent comprehensive article on this subject by Dr. R. M. McGregor (*Journal*, January 12, p. 84), and felt that my observations on these cases might strengthen the view that there is some connexion between the two conditions.

The patients in question went away on holiday over Christmas and returned to Liverpool on New Year's Day. Two days later (January 3) the mother developed severe pain in the right hypochondrium radiating through to the back, associated with a feeling of nausea, and this was considered most likely to be an attack of biliary colic. A curious feature is that for three nights the pain recurred at approximately the same time—2 a.m.—although during the day she could bear the pain. I called out a consultant physician on January 4, who agreed that biliary colic was the cause, due to over-indulgence in rich food while on holiday. He suggested I call in a surgeon if there was no improvement in her condition. This I did on January 5, and, although he considered the diagnosis of biliary colic most likely, for the first time it was noticed that she had some vesicles in the region of the umbilicus, in the line of the tenth right intercostal nerve. It was felt advisable to admit her to hospital for Graham's test, which proved negative, and the herpes zoster lesions appeared in typical fashion. After a week she returned home. On January 23 her daughter developed a severe attack of chicken-pox, from which she is convalescing at present.

I feel that in these cases exposure to infection took place during the holiday, and there is presumptive evidence that there is approximately twenty days' difference between the incubation period of chicken-pox and herpes zoster, as both the mother and the daughter must have been exposed to the same source of infection. An interesting feature of the case is that some years ago the mother's father had severe herpes zoster at the same time as his son had chicken-pox. I have seen several cases of herpes zoster in the last few years, but regret that my note-taking has not been as thorough as that of Dr. McGregor, who must be congratulated on his most excellent article. As a point of interest, a recent case of herpes zoster was in a patient suffering from

Hodgkin's disease, and I would welcome any suggestions as to the possible associations between the two conditions.—I am, etc.,

Liverpool, 7.

R. H. BRACEY.

SIR,—I was interested in Dr. R. M. McGregor's article on herpes, chicken-pox, and cancer (*Journal*, January 12, p. 84), and since reading it have come across a small outbreak I feel worthy of mention.

The father of a family of grown-up children was diagnosed as having herpes ophthalmicus on January 5. Sixteen days later his married daughter, who lives in the same house, had chicken-pox. Only four days after this her young brother of 17 was similarly diagnosed. A young married woman and frequent visitor of the family, who lived two houses away, contracted chicken-pox on the same day as the daughter. So far as we are aware there have not been any other cases of herpes or chicken-pox in this fairly isolated village for many months. And the patients concerned have had no known contact with these diseases outside their village.—I am, etc.,

Charing, Kent.

RAYMOND CASTLE.

Hereditary Factor

SIR,—The report by Dr. Mary E. Carter on two siblings diagnosed as acute lymphatic leukaemia (*Journal*, February 2, p. 265) is particularly interesting to me, because in 1953 I saw a woman of 45 with typical chronic myeloid leukaemia, who had lost identical twins with acute lymphatic leukaemia 20 years earlier. The literature on the possible hereditary factor in leukaemia by Guasch¹ does not contain any similar information, but it may well be that my three cases were coincidental.—I am, etc.,

London, W.1.

A. PINEY.

REFERENCE

- ¹ Guasch, J., *Le Sang*, 1954, 25, 384.

Pregnancy Sickness

SIR,—I am encouraged to add my mite of personal observation to that of Dr. Doreen S. Ball (*Journal*, December 22, 1956, p. 1487) and Dr. P. G. Cronk and Dr. Muriel Dalby (*Journal*, January 5, p. 49). My medical school is known for its antenatal training, and I anticipated a pregnancy without emesis or toxæmia, with well-being, a "natural" birth, and full breast-feeding, as being the right of a wanted pregnancy and a calm, sensible approach. So eager was I to conceive that I thought myself pregnant before I was, though of course the symptoms did not include sickness. Does pseudocyesis ever include emesis? The first sign of pregnancy was slight giddiness and that a casual throat clearing or cough made me retch at about six weeks. All day nausea and retching attacks developed; flavours went wrong; my mouth seeming to be coated with stale fat, which drove me to eat citrus fruits. Nausea, occasional vomiting, and wrong flavours persisted till delivery. I never felt well and had mild pre-eclamptic toxæmia at 30 weeks.

In labour I had no fear, was completely confident in my doctor and nurses, and had my husband with me. The familiar uterine contractions were painless, but accompanied by a sharp pain in the sacrum, this becoming unbearably severe even with pethidine. The pain had no component of pressure, distension, ache, or drag, and was not like intestinal colic. Relaxation did not ease it. The second stage was comparatively easy. The baby was by my side during the lying-in period, and breast-feeding seemed the easiest and happiest thing, but after two months the supply declined and was not revived by 14 days' religious expressing.

Such experiences open one's mind to try to observe instead of merely applying teaching. Any patient's account published by Dr. Grantly Dick Read and followers describes feeling some very strong sensation during labour, which is not pain. What is it? I am sure that only a few "trained"

mothers achieve painless labour (I have not personally known of one), while a few "untrained" mothers have painless labours anyway. Are there any comparative figures? I do not decry antenatal training in the least, but so much depends on the personalities of those who attend women in labour. I have heard a nurse answer an appeal from a distressed woman with, "You've been taught to relax—get on with it," then leaving her alone. It is the absence of fear that is all-important.—I am, etc.,

Emsworth, Hants.

ANN PARKER.

Methyltestosterone Therapy

SIR,—In response to the request of Drs. G. L. Foss and S. L. Simpson (*Journal*, December 15, 1956, p. 1426) we wish to report an additional case of jaundice due to methyltestosterone. A female patient, aged 50, diagnosed as a case of hypopituitarism, was admitted to Sheffield Royal Infirmary and treated with methyltestosterone linguets (20 mg. daily) from March, 1953. In July, 1953, she became deeply jaundiced, and three months elapsed before the patient returned to her normal colour. The results of liver-function tests between the onset of jaundice and December, 1953, are tabulated below.

The main abnormalities are a raised serum bilirubin and alkaline phosphatase with a normal thymol turbidity. Two weeks after the jaundice became evident the patient's haemoglobin fell to 7.4 g./100 ml., and, though no frank melaena was observed, the stools contained occult blood at this time.

Date	Thymol Turbidity	Serum Bilirubin (mg./100 ml.)	Serum Alkaline Phosphatase King-Armstrong Units	Serum Albumin (g./100 ml.)	Serum Globulin (g./100 ml.)
1953					
July 16	1		42		2.2
" 30	<1	37	37	4.1	
Aug. 10	<1	22	23		
" 20	<1	13.8	20	4.3	2.3
" 28	<1	10.4	18		
Sept. 2	<1	6.9	17		
" 9	<1	5.0	16	4.9	3.0
" 15	1	3.6	15	4.7	2.3
" 24	1	1.8	11		
Oct. 14	2	2.5	7		
" 21	2	1.6	12		
Dec. 2	1	0.8	8	5.0	3.1

After transfusion and oral iron the anaemia was corrected, and repeated examination of the stools showed that they contained no occult blood. The interval between starting the drug and the onset of jaundice is in keeping with most of the cases reported by Werner and others,¹ who also found the serum alkaline phosphatase to be raised. The case reported by Wood² had a normal serum alkaline phosphatase.

Since recovering from jaundice the patient has been well and treatment with methyltestosterone has not been resumed. The number of reported cases is small, and the complication is so rare that it should not be regarded as a contraindication to using this drug.—We are, etc.,

Manchester
Sheffield.

S. OLEESKY.
D. S. MUNRO.

REFERENCES

- ¹ Werner, S. C., Hanger, F. M., and Kritzler, R. A., *Amer. J. Med.*, 1950, 8, 325.
² Wood, J. C., *J. Amer. med. Ass.*, 1952, 150, 1484.

Tobacco-cancer Problem

SIR,—If Dr. Lennox Johnston (*Journal*, January 26, p. 228) is correct, as I believe he is, in asserting that tobacco smoking is essentially a manifestation of nicotine addiction, there seems to be a simple solution to the cancer-smoking problem: nicotine could be presented in some bland vehicle providing characteristic and pleasant sensations of taste, flavour, touch, etc. For the edentulous, a flavoured sucrose pastille might be suitable, but for others some non-fermentable (non-cariogenic) substance would be preferable—e.g., sorbitol, as in diabetic sweets, or chiclé gum sweetened if necessary

Obituary

D. R. MacCALMAN, M.D., F.R.C.P.Ed.

Professor Douglas MacCalman, formerly Nuffield professor of psychiatry at the University of Leeds, died after a prolonged illness on January 31 at the age of 53.

Douglas Robert MacCalman was born on December 4, 1903, in Strachur, Argyllshire, the son of the Rev. D. M. MacCalman. Brought up in the north-west Highlands, he never lost his deep affection for that remote and lovely part of the country, and the influence of those years was always apparent in his own quiet and courteous manner. He was educated at Glasgow Academy and then at the

University of Glasgow, where he graduated M.B., Ch.B. in 1929, winning the Hunter medal in pathology. As with many other sons of the manse who have studied medicine, he was at an early stage in his career attracted to psychological medicine. Soon after qualification he took up appointments in psychiatry in the United States, first at Phipps Clinic, Johns Hopkins Medical School, Baltimore, under the late Professor Adolf Meyer, and then at the Boston Psychopathic Hospital, under the direction of another illustrious Scot, Dr. McFee Campbell, professor of psychiatry at Harvard. Having come under the tutelage of two of the most eminent psychiatric teachers of our time, MacCalman was well fitted to return to this country and assume a position of leadership at an early age. In 1932 he was appointed medical director of the Notre Dame Child Guidance Clinic in Glasgow and assistant physician at the Victoria Infirmary, having in the previous year proceeded to the M.D., with high commendation in psychiatry. In 1935 he was invited to become general secretary of the Child Guidance Council in London, where he enhanced his reputation not only as an able clinician but as a man of outstanding academic and administrative ability.

The institution, in 1938, of the Crombie-Ross lectureship in psychopathology at Aberdeen University was an important new development, for it was the intention of the founder and of the university to extend teaching and research in psychological medicine into the general teaching hospital and to enlarge the mental health service by setting up out-patient clinics for adults and children. Dr. MacCalman was the first and only holder of this appointment, which carried with it the honorary status of assistant physician at the Aberdeen Royal Infirmary and the Aberdeen Hospital for Sick Children. Throughout the war years the new department was gradually built up in face of wartime restrictions, shortage of staff, and the like. Additional duties in connexion with the emergency medical services were placed on his shoulders. Despite these great handicaps and the mounting burden of private practice, he succeeded in establishing himself and his subject in the north-east



[Kemsley Picture Service]

with saccharin. I suggest a sweet or sweetened solid vehicle because those who are giving up smoking often find the use of ordinary or diabetic sweets helpful, but I imagine that some other consistency and taste, or combination of tastes, would be found equally pleasant if it were especially associated with the pleasure derived from nicotine, in the same way that a degree of bitterness that would otherwise be objectionable is pleasant in some drinks containing caffeine or alcohol.

Such a solution to the cancer-smoking problem might possibly lead to an increase in nicotine poisoning, but it surely deserves consideration. The ideal solution, of course, would be the discovery of some perfectly harmless but identically satisfactory substitute for nicotine itself. I doubt if education, propaganda, and legislation will themselves do much to prevent tobacco-smoking. Even middle-aged doctors obviously prefer to run the risk of cancer rather than forgo the pleasure of absorbing nicotine from tobacco smoke. Prohibition could only be accepted, if at all, when every possible effort to find a constructive solution had failed, and this is very far from the case at present.—I am, etc.,

London, S.W.10.

R. B. D. STOCKER.

Check the Dose

SIR,—The anticoagulant drug phenindione is familiar under the trade name "dindevan" as scored tablets in one strength only—50 mg.—from which dosage schedules in multiples of 25 mg. may be arranged. There is now a need for a weaker strength if advantage is to be taken of the more accurate stabilization of patients by means of Owren's¹ modified method of estimating the "one-stage prothrombin time." The advantages claimed for this method of controlling anticoagulant therapy are that it is sensitive to dosage increments of 10 mg. and thus it is possible to stabilize patients whose dosage requirements do not coincide with multiples of 25 mg.; trends towards overdosage are obvious and the correct dose can often be decided two or three days earlier than with the older method.

The makers are ready to supply a 10-mg. tablet of dindevan to meet this need. With this new strength, however, difficulties for the prescriber and pharmacist may arise. The *British Pharmacopoeia*, 1953—Addendum, 1955, directs that, "if the quantity [of phenindione] contained in a tablet is not stated, tablets containing, in each, 50 mg. shall be supplied or dispensed." If this directive were followed, the pharmacist would supply tablets which might be five times the strength of those intended.

So that there may be no doubt as to what should be supplied, prescriptions or orders for this drug should state the precise dose in milligrams or the strength of the tablet required.—We are, etc.,

ROSEMARY P. BIGGS.
W. TRILLWOOD.

Oxford.

REFERENCE

- ¹ Owren, P. A., *Schweiz. med. Wschr.*, 1954, 84, 822.

Wellcome Floating Laboratory

SIR,—Under the heading "Benefactions by the Wellcome Trust" (*Journal*, February 2, p. 295) there occurs the following statement: "... probably the first floating laboratory to be made was the one built in 1907 to the order of the late Sir Henry Wellcome. It was used on the Nile by members of the staff of the Gordon Memorial Hospital, Khartum."

There has, in fact, never been a hospital in Khartum called the Gordon Memorial Hospital. The floating laboratory was given by Sir Henry Wellcome to the Wellcome Tropical Research Laboratories, which he had himself founded in 1902–3. It was first used by the director, the late Sir Andrew Balfour. The floating laboratory was loaned to me for several months in 1915 when I was dealing with a devastating epidemic of cerebrospinal meningitis in the then White Nile Province of the Sudan.—I am, etc.,

London, W.1.

H. C. SQUIRES.

region with such success that the fruits of his work are still being gathered to-day. It was singularly appropriate that when it was decided to create a professorial department in Aberdeen Dr. MacCalman should become the first incumbent of the chair. In the next three years the unit was extended and the teaching programme completely reorganized, so that now a comprehensive course of over 100 hours is given to the undergraduates during their third to fifth years of study. His opinions were much sought after in the early days of the National Health Service, and his vision contributed greatly to the close integration of the mental health service in the north-east region.

In 1948 he decided to apply his great gifts to a new and larger sphere when appointed the Nuffield professor of psychiatry at the University of Leeds. Here again he built up a university department, both in its teaching and in its research functions. He organized the training scheme for the University of Leeds diploma in psychiatry and advised the regional hospital board on the organization of its mental health service. He was the chairman of the North and Midland Division of the Royal Medico-Psychological Association and a member of many other learned societies and official committees. He was one of the founder members of the Mental Health Research Fund and a Trustee of the World Federation for Mental Health, and he was in constant demand as a lecturer to medical societies, conferences, and lay audiences. One of his outstanding achievements in this connexion was his address to the first World Congress of Mental Health in London in 1948. He was invited to lecture in Finland, the United States, and more recently in Australia, and wherever he went his sterling gifts were apparent. In his early years as a psychiatrist he took part in a large-scale scheme of research into the causation of schizophrenia, and he also made a study of the Rorschach test. He contributed chapters to a number of books and published articles on child psychiatry, education, and neuroses. At the Annual Meeting of the B.M.A. in 1953 he served as vice-president of the Section of Psychiatry. He was elected to the Membership of the Royal College of Physicians of Edinburgh in 1948 and to the Fellowship in 1952.

In recent years ill-health began to impair his prodigious energy, but characteristically he carried on doggedly and without complaint. Though often in considerable pain, he never made reference to it. After a mild thrombotic episode, he eventually decided that he must retire from his chair, but continued in active work, both clinical and academic, almost to the end.

In his younger days MacCalman was an all-round sportsman. He was a fast and elusive wing three-quarter for Glasgow Academicals, and played low-handicap golf until arthritis made this impossible. He had a lifelong interest in gardening, ornithology, and painting, liking nothing better than a painting holiday in Ullapool. An ardent exhibitor of fruit and vegetables at local flower shows, he was always greatly delighted when he won a prize for his products. He was extremely well read, not only in his own subject but in English literature and history.

Professor MacCalman married Helen, only daughter of Dr. J. M. Dawson, in 1935, and she survives him, with one daughter.—W. M. M.

G. R. H. writes: As the first holder of the Crombie-Ross chair of mental health at Aberdeen Douglas MacCalman combined his earlier experience in the mental hygiene

of childhood with his developing interest in the teaching of medical students. This combination of interests he continued to pursue when at Leeds. The attention which the Leeds medical school pays to psychiatry in both its undergraduate curriculum and its final examination bears witness to MacCalman's personal conviction of the importance of this subject in the family doctor's daily work. The existing postgraduate training of psychiatrists at Leeds was continued and developed by MacCalman, and the introduction into the curriculum of the course for the Diploma in Psychological Medicine (Leeds) of teaching on certain aspects of the social sciences and on psychotherapy is evidence of his own broad orientation in psychiatry. Since he had taken up his chair at Leeds in the early days of the National Health Service it was always one of his main aims to strengthen the links between his department in the university medical school, the clinical work of the teaching hospitals, and the psychiatric services of the regional hospital board. Both as a consultant to St. James's Hospital, Leeds, and to the City Council of Leeds, and as chairman of the Mental Health Technical Advisory Committee of the Leeds regional hospital board, he did much to build a closer relationship between the various aspects of the cure and prevention of mental illness in the region.

To those who did not know him well Douglas MacCalman must sometimes have seemed a shy man until his interest in a topic broke through his natural reserve, as it would in discussion, teaching, or public speaking, for which he had a great natural gift. Those who worked with him developed strong bonds of affection with him, and all who saw the way he faced his long and crippling illness admired his great courage. His colleagues and his friends in many countries will feel deep sympathy for his widow and his daughter.

M. B. H. W. writes: I should like to try to express something of my personal concept of and indebtedness to the late Professor Douglas R. MacCalman. In so doing, I am doubtless giving utterance to the thoughts and feelings of the many other psychiatric social workers who have known his encouraging and enabling way with us. Under his aegis as secretary of the Child Guidance Council, a few of us in the 1930's were lent to authorities who wished to start child guidance clinics. We would wish to thank him for his quietly effective support in these ventures and for his sure and careful guidance of our committees. Thanks to his unswerving convictions, out of these small beginnings the present child guidance services have been enabled to grow. In the 1940's, a period of challenge—from without from the rapidly developing mental health services and from within by reason of our growing consciousness of our roles in this field—Professor MacCalman helped many of us individually with our conflicts and problems, never withholding himself when his help was sought. A wider circle will recall his several addresses to the Association of Psychiatric Social Workers: in these he gave full measure of his rich, literary, artistic, humanist self—brilliant and bright—renewing us. It is this quality of renewing, this therapeutic personality, which, as his psychiatric social worker over a period of sixteen years, I feel was his peculiar gift as a psychiatrist; and as I write I recall the many patients, simple and sophisticated alike, who have spoken of this. As a professor, he has been cut off before he could reach his full stature, but for the advancement of psychiatry he imaged the whole; now others must execute the parts. As a colleague he was benign and as a friend he was lovable.

W. H. WILSON, D.M.

Professor W. H. Wilson, emeritus professor of physiology in the University of Cairo, died at the Victoria Hospital, Cairo, on November 14, 1956. He was in his 91st year.

William Hawkins Wilson was born on February 16, 1866, the second son of the late J. C. Wilson, D.C.L., a law tutor at Oxford, and was educated at Radley College

and at Keble College, Oxford, where he was a scholar. In 1888 he obtained a first-class in the Honours School of Physiology and his B.A. degree. From 1888 to 1890 he was science tutor at Keble College and university demonstrator in histology. Deciding to obtain a medical degree, he went on to St. George's Hospital with a scholarship and graduated B.M., B.Ch. in 1893. Before this he had been awarded a Radcliffe travelling fellowship and spent two years studying in Paris, Vienna, Dresden, Munich, and Freiburg in Baden. After qualification he worked as a house-surgeon and house-physician at St. George's. He proceeded to the D.M. in 1903.

In 1895 Wilson was appointed by the Egyptian Government to the post of assistant professor of physiology at the School of Medicine at Kasr-el-Aini, Cairo (afterwards known as the Faculty of Medicine of Cairo University), and he became professor a year or two later, occupying the chair until 1928, when he retired. Later, he was elected emeritus professor of physiology and carried on research work in the physiology department of the faculty and acted as examiner in his subject. He contributed papers on a variety of subjects to the *Journal of Physiology* and other journals, and had made a special study of scorpion venom. During the first world war he remained in Egypt and continued his official duties, also acting as adviser in physiology to the British Army and Air Force. He founded a charitable dispensary at Mataria, Cairo, in 1921, which served a large number of villagers in that area, having a yearly visiting attendance of many thousands. He was a member of the General Board of Health, on which he represented British interests. A member of the British Medical Association for over 50 years, he was president of the Egyptian Branch in 1929–30. He married Kate Hamilton Naylor in 1897; she died in 1935.

C. B. S. E. writes: The late Professor W. H. Wilson, who was appointed to the inspectorate of the Department of Public Health in Egypt in 1895, became much interested in the country, more especially as the increasing national budget permitted of extensive developments in the health service, including the foundation of hospitals and dispensaries in every province, and of the enlargement of the teaching hospital of Kasr-el-Aini, in Cairo. He had a natural sympathy and understanding of the most varied classes of the inhabitants, from his nearest neighbour, Prince Youssef Kamel, to the fellahen workers and small proprietors by whom he was surrounded in Mataria, an outlying suburb of Cairo. There, shortly before the outbreak of the first world war, Professor Wilson and his wife had settled, building a house in a country property; in this he resided until his final illness. His life there was marred only by a disastrous fall during the building of his home, a fall which resulted in serious spinal and internal injuries, crippling him for life so far as locomotion was concerned, but in no way affecting his mental energy or his determination to improve the life of all around him.

At this period he was appointed professor of physiology at the Kasr-el-Aini Medical School, a post in which he remained until superannuated. He continued, however, to take part in the annual examinations until quite recently, when well over his 80th year. The ailments of advanced age further limited his physical capacities, but did not prevent him from flying to England and back in 1955. During his professorship his personal interest in the students provided him with devoted friends among the Egyptian medical leaders in his later years. He conducted much physiological research at the school laboratories. Until three years ago he was also a member of a dietetic research committee of the Public Health Ministry (formerly Department), which laid down rules for the diet in schools, prisons, hospitals,

and for manual workers based on the habits and possible food resources of the country. His close personal touch with working classes living around him, and their women-kind, gave him unusual opportunity to study these matters. In the course of the second world war, when research laboratories were no longer open to him, he invented an instrument to facilitate the sight in night flying, an instrument which was put to use by the R.A.F. He completed the whole work himself in a small wooden hut in his grove of apricot, orange, and almond trees.

His kindness of heart was shown by the fact that on Fridays, his only day free from official work, he opened his doors to the poor and needy in the villages near him, giving them advice, drugs, and money for years. About 36 years ago, with the financial backing of his friend and neighbour, Prince Youssef Kamel, he founded a clinic in Mataria village near his home. In doing this he was supported by some of the best-known medical men in Cairo. He supervised the clinic personally for many years. Fairly recently some official support for it was arranged. Advancing years seriously affected his sight, yet he patiently kept abreast of physiological progress and was ever ready to talk over some new development. During his last days in the Victoria Hospital he had the consolation of visits from several leaders of the medical profession in Cairo, old pupils of his. In spite of the expulsion orders served on the leading members of the English world in Cairo a few days before his death, an English lady was enabled to attend his funeral in company with one or two friends of other communities, including Danish and Egyptian.

H. M. SHELLEY, F.R.F.P.S., M.R.C.P. D.T.M.&H.

Dr. H. M. Shelley, formerly director of medical and health services in Cyprus, died suddenly at sea on January 26 while travelling from Cyprus to Greece. He was 56 years of age and had been ill for some time. He was buried in Athens.

Horace Minton Shelley was born at Bradford on January 11, 1901. From the Intermediate School, Nottingham, he went on to study medicine at Sheffield University. Qualifying in 1923, he joined the Colonial Medical Service in the following year and his first post was in Nyasaland, where he remained until 1939. He took the D.T.M.&H. in 1927 and the M.R.C.P. in 1938, and in 1934 he was elected F.R.F.P.S. of Glasgow. After working for a few years as a pathologist in Nyasaland he transferred to Tanganyika as a senior medical officer in 1939. In 1947 he was appointed director of medical services in Cyprus, where he successfully carried out many reforms and was in charge of the campaign which freed the island from malaria. One of the reasons for the success of this campaign was the friendly relationship which Dr. Shelley established with all his colleagues, medical and administrative. He retired from the Colonial Medical Service in 1952, but continued to live in Cyprus.

An active member of the British Medical Association, Dr. Shelley was honorary secretary of the Nyasaland Branch for six years and president of the Branch from 1934 to 1935. He wrote a small textbook entitled *Epitome of Laboratory Diagnosis and Treatment of Tropical Diseases*, and, having founded the *Cyprus Medical Journal*, he continued to edit it until the time of his death. He married Claire, daughter of Madame Boulenger. She survives him with three children of the marriage.

J. E. G. writes: Dr. Shelley had been ill for several years, and was on his way to seek quieter retirement in South Africa. He had an interesting career, for he was a personality and took a deep interest in many things beside his

work. He boxed as a flyweight for the British against the American universities, and his life was indeed a continual and often successful fight against great odds. He never accepted defeat, and even in a long struggle against a failing heart he seemed to be the attacker. He had more bravery than most men, and rose above his physical incapacity and pain until it mercifully overwhelmed him completely and suddenly. He had dramatic talent and acted on the stage for a time, but mostly this ability was well used in informal medical teaching. Even without his extensive knowledge he would have been impressive. In territories he served in he worked hard and devotedly with the help, and sometimes the handicap, of an imagination not often found in administrators. During his tenure in Cyprus the eradication of the malaria-carrying mosquitoes was completed, and most of this was due to his efforts. He was fond of writing and lecturing, and in addition to his medical writing he wrote fiction and poetry. There are many who will mourn his passing and many whose lives will miss the stimulation of his ideas.

R. W. D. LESLIE, C.B., C.B.E., L.R.C.P.I.

Major-General R. W. D. Leslie, who after a distinguished career in the Army Medical Services, gave valuable help with the organization of the Emergency Medical Service, died at his home at East Leake, near Loughborough, Leicestershire, on January 31, his 74th birthday.

Robert Walter Dickson Leslie was born on January 31, 1883, and was educated at Michaelhouse, Natal, South Africa, receiving his medical training in Dublin. He qualified by taking the Irish Conjoint diploma in 1904. Two years later he entered the R.A.M.C., and when the first world war began in 1914 held the rank of captain. In the twenty years from 1917 to 1937 he rose from the rank of brevet major to that of major-general, holding many important posts in that period. For his services in the first world war, towards the end of which he was an A.D.M.S. in France, he was mentioned in dispatches and appointed O.B.E. in the 1919 Birthday Honours.

Promoted to lieutenant-colonel in 1930, Leslie was deputy assistant director of medical services in India from that year until 1932, and in 1936—having been promoted colonel two years before—he was deputy director of medical services in Palestine and Transjordan. Returning to the United Kingdom, he was in command of the Queen Alexandra Military Hospital, Millbank, until 1937. In that year he became major-general and was appointed deputy director of medical services in Northern Command. He occupied that post until 1941, when he was appointed C.B. and retired from the Army, and from 1939 to 1941 he was an Honorary Physician to the King. During the course of his career in the A.M.S. Leslie contributed a number of articles to the *Journal of the Royal Army Medical Corps*. These included papers on improvements in motor ambulance construction (with Captain G. A. Child); improvised ambulance trains; the medical services in Palestine; and the casualty card scheme in R.A.M.C. field training.

The end of Leslie's military career was by no means the end of his working life. In 1941 he obtained an appointment as a hospital officer in the Emergency Medical Service, and from 1948 to 1954 he was employed as a regional medical officer (No. 3 Region) under the Ministry of Health. For his services in the E.M.S. he was appointed C.B.E. (Civil Division) in the 1946 New Year Honours. Leslie was a member of the Council of the British Medical Association from 1942 to 1948.

He also served on the old Naval and Military Committee of the Association from 1944 to 1948 and on the General Medical Council Committee (1946–8) and the Central Medical War Committee (1947–8). He married Miss Eleanor V. Jackson in 1911, and she survives him.

Dr. RUFUS C. THOMAS, consulting obstetrician and gynaecologist to the Kent County Council, died at his home at Croydon on January 11 at the age of 67. Rufus Clifford Thomas was born at Llantwit Vardre, near Pontypridd, in June, 1889, and was educated at Christ College, Brecon, University College, Cardiff, and at the Westminster Hospital. After qualifying M.R.C.S., L.R.C.P. in 1915 he held the appointments of resident obstetric assistant and senior house-surgeon at Westminster Hospital, and then served for a time in the R.A.M.C. From 1919 to 1927 he was in practice at Newport, Monmouthshire, and while there was elected F.R.C.S.Ed. in 1924. At Newport he was also honorary anaesthetist to the Royal Gwent Hospital, consulting surgeon to the maternity and child welfare clinic, and consulting gynaecologist to the borough council. In 1927 he went to India as chief medical officer to the Maharajah Jamsaheb of Nawangar—"Ranji," the famous cricketer. In India his work was partly administrative, but largely surgical. He left India in 1933 because of illness, and joined the staff of the West Middlesex County Hospital as resident surgeon. Two years later he became obstetrician and gynaecologist at the Mayday Hospital, Croydon, and consultant to the county borough council, and in this post his clinical and administrative skill was used to the full. Some two years after the end of the second world war he accepted a similar appointment under the Kent County Council, with headquarters at Farnborough County Hospital. He was a lecturer and examiner for the Central Midwives Board. Elected a Member of Royal College of Obstetricians and Gynaecologists in 1934, he became a Fellow in 1947, and from that year until 1952 served on the council of the College. He was also a member for some years of its Hospital Recognition Committee. He was president of the Association of Whole-time Salaried Specialists. He leaves a widow and a daughter.

K. G. S. writes: Having worked with Rufus Thomas for nearly twenty years, I feel his loss very keenly. In the early days of our association his acumen in diagnosis and strict attention to detail were at once an example and an inspiration, and there are many who, like myself, owe much to his wise counsel. As a colleague he was always ready with advice, and his wide experience in all branches of medicine made this exceptionally valuable. In addition he had a highly critical appreciation of the legal aspects of his work and was much sought after as a member of various committees. Thomas had a keen sense of humour and an endless supply of anecdotes, but although his hobbies were golf and fishing these subjects were seldom mentioned. He will be greatly missed at Farnborough, especially by those of us who were privileged to enjoy his friendship.

Dr. W. N. GRAY, of Helmsdale, Sutherlandshire, died on January 27, aged 62. William Nicol Gray was born at High Blantyre, Lanarkshire, on August 15, 1894, and was educated at Hamilton Academy. He matriculated at Glasgow University in 1912, his original intention being to become a teacher. His plans were interrupted by the first world war, during which he served first in a munitions factory and then in motor torpedo-boats with the Royal Navy. After the war he turned to medicine and graduated M.B., Ch.B. from Glasgow University in 1922. After holding hospital appointments in Glasgow and Middlesbrough he spent a year as assistant to Dr. W. H. M. Barclay, at Grantown-on-Spey. Though attracted by a country life, he chose to settle in a busy industrial practice in Clydebank in partnership with the late Dr. Thomas M. Strang, a man of outstanding clinical acumen, integrity, and great humanity—traditions which Dr. Gray amply maintained. When the

practice was scattered almost overnight by the fury of the Clydebank "blitz" during the second world war there was widespread dislocation of medical services, and he took up practice again at Helmsdale, where he remained until his death. He leaves a widow and three children, two of whom are graduates in medicine.

R. D. M. writes: In the Highlands outsiders do not always find ready acceptance, but Bill Gray's patent worth, sincerity, depth of understanding, and sense of humour soon made him the friend of all in this scattered area, with its difficult and sometimes snowbound roads. With his passing the Highlands have lost a fine doctor. He identified himself completely with his new parish, even learning Gaelic and later becoming president of the local branch of An Commun Gaidhealach. It would be impossible here to detail the many ways in which Bill Gray served the Highlands during his years in the north. On his shoulders seemed to fall the mantle of that grand old man the late Dr. J. B. Simpson, of Golspie, whom he succeeded as chairman of the Sutherland Insurance Committee. He was also chairman of the Sutherland Division of the British Medical Association and for a year was president of the Northern Counties of Scotland Branch. As a member of the Scottish Committee and the Highlands and Islands Subcommittee of the B.M.A., chairman of the Sutherland Executive Council, of the local medical committee, and of the Highlands and Islands Subcommittee of the Scottish Health Services Council, he undertook a vast amount of extra work and responsibility, as well as many wearisome hours of travel by car and train. Apart from these journeys, he rarely left his practice area. He was a keen fisherman, photographer, and gardener who could coax life out of stones. To his patients, however, he will perhaps always be associated with the struggle to establish the "Hospice" as a small maternity hospital, serving not only his own practice but the rest of the county, particularly the more remote and inaccessible parts. An outstanding all-round clinician with a natural bent for midwifery, he was, moreover, a born teacher; no less than four of his trainees took the D.Obst.R.C.O.G. from this remote country practice. It was a measure of his qualities as a doctor, teacher, and friend that three of his former trainees made the long journey north to join with the sorrowing throng which seemed to include every man in the neighbourhood, who packed the church and streets of Helmsdale to overflowing to bid him sad farewell. In the age of specialization Bill Gray was that fine thing a first-class general practitioner.

Dr. G. W. LLOYD, formerly medical superintendent of the Mayday Hospital, Croydon, and subsequently a general practitioner at Thornton Heath, Surrey, died at the Mayday Hospital on January 28. He was 74 years of age. George William Lloyd was born at Brough, East Yorkshire, on August 1, 1882, and was educated at Hull Grammar School and at St. Bartholomew's Hospital, qualifying M.R.C.S., L.R.C.P. in 1905. After holding a resident appointment at the East Suffolk and Ipswich Hospital he went into a country practice at Alsager, in Cheshire, and while there obtained the London degrees of M.B., B.S. in 1911. He proceeded to the M.D. in 1917. During the first world war he served in the R.A.M.C. from 1914 until he was invalided out of the Army in 1917, and for the next few years was assistant medical superintendent of St. Giles Hospital, Camberwell. From 1922 to 1929 he was medical superintendent of the Mayday Hospital, Croydon. He returned to general practice in 1929, this time at Thornton Heath, and continued in this work until he retired in 1954. A year or two after he had had a stroke. As a young man Dr. Lloyd was a good athlete. He played Rugby for the first fifteen at Bart's and represented the hospital at boxing. In later life his interests were shooting, fishing, ornithology, and the rearing of gun-dogs. He married Miss Elsie Rigby-Jones, of Liverpool, in 1909, and had five sons and one daughter. His eldest son and his son-in-law are both doctors.

Dr. T. M. BODY, who was in practice at Middlesbrough for nearly fifty years, died at Marton-in-Cleveland, Yorkshire, on January 28 at the age of 80. Thomas Munn Body was born at Wittersham, Kent, on December 13, 1876, the son of John Body, J.P., and was educated at Tonbridge School and at St. Bartholomew's Hospital. After qualifying M.R.C.S., L.R.C.P. in 1902 he held the appointments of house-surgeon at the Norfolk and Norwich Hospital and the Royal Portsmouth Hospital and accompanied the Anglo-Liberian Boundary Commission as medical officer. He settled in general practice at Middlesbrough about 1908, and shortly afterwards went into partnership with Dr. John Hedley, succeeding to the practice on Dr. Hedley's death. During the first world war he served as a captain in the R.A.M.C. in France, Mesopotamia, and India. Returning to his practice after the war, he became a prominent figure in the public life of Middlesbrough. He became deputy lieutenant of the North Riding of Yorkshire in 1947, an appointment he regarded not only as an honour to himself but also as one for the medical profession in general. Since 1918 he had been a Justice of the Peace for Middlesbrough, and throughout the second world war he was chairman of the North Riding Territorial Association. He had been chairman also of the committee for the care of mental defectives and of a medical recruitment board at Middlesbrough and president of the Betterment Association. A member of the British Medical Association for forty-five years, he was chairman of the Cleveland Division in 1925–6.

Dr. G. O. MONTGOMERY, who was in general practice at Croydon, Surrey, for some 30 years, died at his home there on January 31 at the age of 63. Geoffrey Owen Montgomery was born in Tasmania on August 31, 1893. He enrolled as a student at University College, London, in 1914, but joined the Army on the outbreak of the first world war. Commissioned in the Green Howards in 1915, he served in France for four years. On return to civilian life he resumed his medical training, and qualified by taking the London Conjoint diploma in 1923. Two years later he obtained the London degrees of M.B., B.S. After holding the resident posts of house-surgeon, house-physician, and obstetric assistant at University College Hospital he became resident medical officer there. In 1927 he joined a firm of doctors at Croydon, and worked in that practice until the time of his death. Among the appointments he held were those of physician to the Croydon General Hospital and medical officer to the Post Office. A keen Territorial officer, he was in France with the British Expeditionary Force in 1940 as commanding officer of the 133rd Field Ambulance, with the rank of lieutenant-colonel. In 1941 he was promoted colonel, and, after serving as assistant director of medical services in the Anti-Aircraft Command, was given the command of a general hospital, first in West Africa and afterwards in India. For his services to the Territorial movement he was awarded the Territorial Decoration in 1955. His cheerful, kindly, and unselfish nature will always be remembered by all who came into contact with him, and a large circle of colleagues, friends, and patients mourn his passing. He leaves a widow and one son and one daughter, to whom our sincere sympathy goes out in their great loss.—E. M. C.

The obituary of Mr. C. L. GIMBLETT was printed in the *Journal of February 2* (p. 288).

Dr. A. G. SALAMAN writes from Saffron Walden, Essex: When Charles Gimblett came here during the war under the E.M.S. scheme we in these parts met a man of great charm. A complete disregard for pomp was one of his outstanding characteristics. He had an untiring enthusiasm from which he seemed to derive enormous fun even when doing the simplest eye test, and his eagerness to guide us G.P.s through the more treacherous mazes of ophthalmology was a delight to experience. I well remember an occasion when my wife took our son, aged 5, to see him. Gimblett sat solemnly at his desk and asked for symptoms. My son said, "I can't

hardly see nothing at all." With great seriousness Gimblett wrote on the case card: "Patient says, 'I can't hardly see nothing at all.'" He then summoned the patient over in order to sign the statement, which he did in large spidery letters. His vision proved to be normal. Those of us who knew Gimblett remember him as a very human person who, when practising his specialty, never forgot that the owner of the eyes he was examining was a human being too.

Medical Notes in Parliament

DIMINISHED RESPONSIBILITY IN MURDER CASES

The Homicide Bill, emerging without alteration from the committee stage, was given a third reading in the House of Commons on February 6—the voting was 217 to 131—and sent up to the House of Lords.

Mr. R. A. BUTLER moved the third reading in his first speech as Home Secretary, and in so doing sought to put the Government's proposals in a new setting. The Bill represented some progress, he said, since it swept away the doctrine of constructive malice and enlarged the defence of provocation; but, more particularly, in its adaptation to English law on the doctrine of diminished responsibility it would enable the courts to take account of the great strides that had been made in the understanding of the human mind, and to avoid treating as murder killings for which the accused ought not to be held wholly responsible. This, he went on, was all part of the new approach to the problems of the mind which would exercise both the Home Office and Parliament in the future. This unexplored territory of the mind would be perhaps one of the most exciting of the adventures before the human intellect; it was as important in the human sphere as nuclear development was in the scientific. He invited in anticipation the support of the House in any further moves in the direction of the humanizing and understanding of relationships.

This part of his speech at any rate was welcomed by the Opposition, though their general opinion of the Bill was that for the sake of party unity the Government had missed the opportunity of what could have been a great measure of penal reform. Mr. SYDNEY SILVERMAN (Nelson and Colne, Lab.) moved the official amendment against the third reading which, while welcoming the removal of some anomalies in the law of murder and the abolition of the death penalty from some offences, refused assent to a Bill which "fails to satisfy the public sense of justice, and is in defiance of the principle which the House has already approved—namely, that the death penalty for murder no longer accords with the needs or the true interests of a civilized society."

Indefinite Sentences

Dr. REGINALD BENNETT (Gosport and Fareham, Con.) said he felt considerable unease of mind about Clause 2. A verdict reduced to manslaughter automatically on proof of diminished responsibility meant the introduction of a new code on which the courts would have to decide these matters which would exist simultaneously—and in conflict—with the McNaughton Rules. Which of these two mechanisms was to be invoked? If there was *prima facie* abnormality of mind, did a charge of murder still stand? If it was evident from unopposed medical evidence before a trial that the prisoner's mental state was in other ways deranged, did the indictment drop to manslaughter? The greater difficulty was of deciding on what basis and to what degree there was irresponsibility. The provision in Clause 2 was whether the accused "was suffering from such abnormality of mind (whether arising from a condition of arrested or retarded development of mind or any inherent causes or induced by disease or injury) as substantially impaired his mental responsibility for his acts or omissions." The McNaughton Rules test was whether the accused was suffering at the time

from such a defect of mind as to be unable to appreciate the nature of his act or the fact that it was wrong. Which standard came first? Which was to be a criterion? If a person was found guilty of manslaughter there could be little purpose in sending him to a psychopathic institution, with a finite sentence.

The East-Herbert institution being built was not likely to be effective or to give anything like the results that the Herstedvester Institution in Denmark was giving, unless they were prepared to agree that for curative purposes the mentally afflicted offender must be sent to such an institution for an indefinite sentence, with the varying degrees of probation that would follow it as his rehabilitation became more complete. If the McNaughton Rules applied, a man found to be suffering from a defect of reason would go to Broadmoor, which was automatically an indefinite sentence. If, however, his defect of mind—maybe even the same defect—was found to justify a sentence for manslaughter, he would go down for seven years, and there would be no consideration of any treatment for his mental state except such as was incidental to an ordinary term of imprisonment.

Mr. J. E. S. SIMON, Under-Secretary, Home Office, saw the introduction of the defence of diminished responsibility as possibly the greatest change that was being made in the law of England. Among other factors, it provided a criterion which took cognizance of the fact that there were many degrees of mental responsibility for crime. The relation between the two defences, of insanity and diminished responsibility, he suggested was this. The accused man might, on the face of it, be unfit to plead. That was generally determined initially by the prosecution, although it might be raised by the defence, and a jury was empanelled to decide whether the man was fit or unfit to plead. Only if the man was fit to plead did any question of these defences arise, and then it was a matter for the man: it was for him to say whether he would raise a defence which would lead to a verdict of "Guilty but insane," or a defence which would lead to a verdict of manslaughter by raising a question of diminished responsibility. The one was under the McNaughton Rules; it was a complete defence, and the verdict was "Guilty but insane," equivalent to "Not guilty." The diminished responsibility defence would lead to a verdict of "Guilty," but "Guilty of manslaughter." It did not necessarily follow that the man would be sentenced to a fixed term. It was entirely a matter for the judge's discretion, on the evidence given to him after the verdict, whether he passed a sentence for life if he could not determine the time necessary to treat the prisoner successfully. He could sentence the convicted man to a term of years. Equally he could, if he wished, put him on probation for the crime of manslaughter, and make it a condition in a proper case that the man should submit himself to psychiatric treatment, or any other medical treatment, for a suitable time.

Poliomyelitis Vaccination

Mr. M. TURNER-SAMUELS (Gloucester, Lab.) asked the Minister of Health on February 8 whether, in view of the fact that the remuneration to general practitioners for carrying out the responsible duties and complicated arrangements required to collect, store, and administer the vaccine and keep the necessary records in connexion with inoculation against poliomyelitis was unreasonably low, he would increase the present inclusive fee of 5s. for the two inoculations required in each case to a more reasonable figure. Mr. D. VOSPER stated that the vaccination would be performed as part of the general practitioner's comprehensive medical care of his patients for which he received remuneration from his local executive council. The additional 5s. fee was to be paid by the local health authority for the record of vaccination. This was the present fee for records of other forms of immunization, and was agreed between representatives of local authorities and of the medical profession.

Analgesia

Mr. R. W. SORESENSEN (Leyton, Lab.) asked what further advance had been made in the use of analgesia and the supply of apparatus for this purpose in hospitals and in domiciliary practice; and, in the light of experience during the past year, what was the merit and cost of triline, as compared with analgesia, in respect of confinements. Mr. VOSPER replied that no information was available about the use of analgesics in hospitals or by general practitioners. In 1955 inhalational analgesics were administered by domiciliary midwives in 75% of the confinements attended by them, compared with 72% in 1954, and the number of sets of apparatus in use rose from 6,489 to 6,764. He was advised that triline served broadly the same clinical purposes as gas and air, but the apparatus was more easily transportable. The costs of the types of apparatus in general use were broadly comparable. The use of triline, he stated, was on the increase. At the end of 1955 about 256 triline sets were in use, and this had risen at the end of 1956 to about 900.

Health Centres

Mr. J. K. VAUGHAN-MORGAN, Parliamentary Secretary, Ministry of Health, informed Mr. W. T. PROCTOR (Eccles, Lab.) on February 4 that eight new health centres had been provided under the Health Service since July, 1948. In addition, premises were taken over in July, 1948, by six local authorities so that general medical or dental services could be continued there. Current restrictions on capital expenditure rule out further provision for the time being. The new centres were: Faringdon, Berks; William Budd, Knowle West, Bristol; Woodberry Down, Stoke Newington, London; John Ryle Health Centre, Clifton Estate, Nottingham; Harold Hill, Romford Aveley, Thurrock, Essex; Hesters Way Estate, Cheltenham; and Alderman Jack Cohen Health Centre, Sunderland.

Pay Variations

Dr. DONALD JOHNSON (Carlisle, Con.) asked the Minister whether he was aware that the average earnings of general practitioners supplied by his department was comprised of wide variations; and whether he would give a breakdown of such an average. Mr. VOSPER, in reply, said that the breakdown of earnings for which he asked was not available.

Mr. J. A. LANGFORD-HOLT (Shrewsbury, Con.) asked what was the average salary received by doctors working whole-time for the Health Service after deduction of income tax. Mr. VOSPER told him also that this information was not available.

Dental Council's Rebuff

Mr. BARNETT JANNER (Leicester, North-west, Lab.) asked for a statement on the availability of dental hygienists for the general public in accordance with the provisions of the Dentists Act, 1956.

Mr. VOSPER replied that some dental hygienists were already employed in the local authority and hospital dental services, but they could not work with dentists in dental practice until permitted by regulations made under the Dentists Act, 1956, by the General Dental Council. The General Dental Council had asked the Privy Council to approve draft regulations which provided that dental hygienists should not be allowed to work in private practice until such time as the requirements of the local authority and hospital dental services were in the opinion of the General Dental Council satisfied. This limitation would not appear to accord with the intentions of Parliament, as expressed during the passage of the Bill, and the proposals had therefore been referred back to the General Dental Council for further consideration.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending January 26 (No. 4) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1957					1956				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria ..	1	0	5	0	1	4	1	7	0	5
Dysentery ..	635	43	255	0	1	867	94	175	11	2
Encephalitis, acute ..	5	0		0		5	0		1	
Enteric fever: Typhoid ..	1	0	0	0		2	0	0	0	
Paratyphoid ..	2	0	1 (B)	0		4	0	1 (B)	1	
Food-poisoning ..	165	20	46	5		92	17		0	
Infective enteritis or diarrhoea under 2 years ..				14	16				10	15
Measles * ..	9,527	682	431	428	201	2,130	22	85	21	108
Meningococcal infection ..	23	2	17	0	1	31	1	13	2	1
Ophthalmia neonatorum ..	27	0	4	0		35	2	6	0	
Pneumonia † ..	572	35	338	21		836	60	406	17	2
Poliomyelitis, acute: Paralytic ..	21	2	0	0	11	21	1	2	3	3
Non-paralytic ..	6	0				10				
Puerperal fever § ..	241	28	9	1	1	263	38	4	0	
Scarlet fever ..	829	47	98	36	20	964	52	110	41	27
Tuberculosis: Respiratory ..	636	70	116	26		700	94	123	21	
Non-respiratory ..	30	4	9	2		102	5	8	8	
Whooping-cough ..	3,233	154	506	14	65	1,537	90	88	108	224

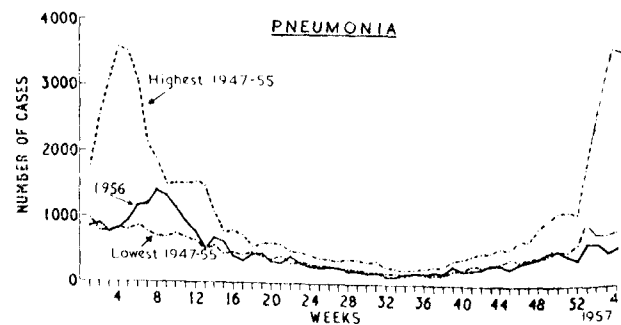
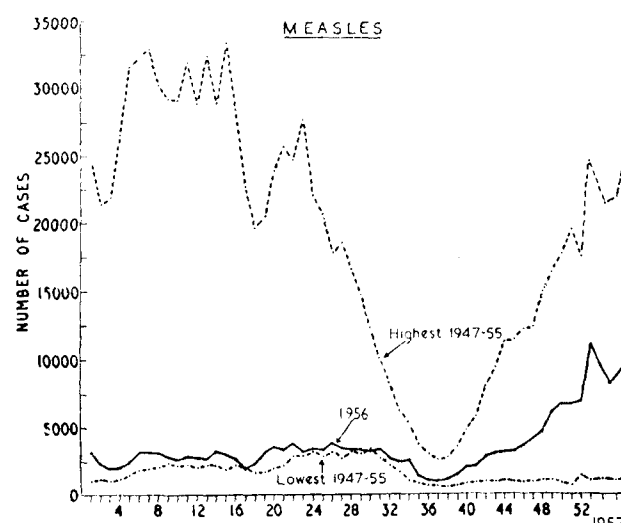
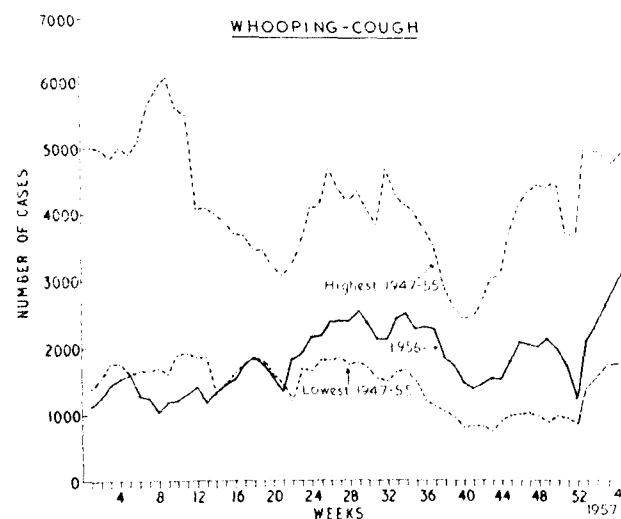
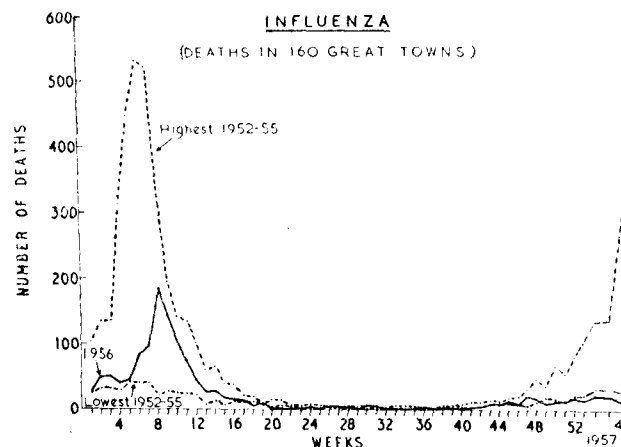
DEATHS In Great Towns	1957					1956				
	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire	Eng. & Wales	Lond.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	1	0	0	0	0	0
Dysentery ..	1	0		0		0	0		0	
Encephalitis, acute ..		0			0		0			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	8	0	0	1	2	7	0	1	0	0
Influenza ..	12	0	3	1	1	39	7	6	0	1
Measles ..		0	0	0	0		0	0	0	0
Meningococcal infection ..		1	0				0	0		
Pneumonia ..	282	46	32	17	13	373	72	46	19	7
Poliomyelitis, acute ..	2	2			0	2	1			1
Scarlet fever ..		0	0	0	0		1	0	0	0
Tuberculosis: Respiratory ..	52	3	6	2	1	72	13	19	2	3
Non-respiratory ..	0	0	0	0	1	0	0	0	0	0
Whooping-cough ..	0	0	1	0	0	0	0	0	1	1
Deaths 0-1 year ..	220	21	32	7	26	249	33	30	11	9
Deaths (excluding stillbirths) ..	5,944	784	712	156	190	6,735	1030	795	134	181
LIVE BIRTHS ..	7,982	1125	1000	222	331	7,719	1155	884	223	369
STILLBIRTHS ..	199	18	21			219	36	19		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenza pneumonia.
§ Includes puerperal pyrexia.

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the years 1947-55 (influenza, 1952-5) are shown thus ----, the figures for 1956-7 thus ———. Except for the curves showing notifications in 1956-7, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

Infectious diseases were more prevalent in England and Wales during the week ending January 26. Rises in the numbers of notifications included 1,352 for measles, from 8,175 to 9,527, 569 for whooping-cough, from 2,664 to 3,233, 158 for dysentery, from 477 to 635, 136 for scarlet fever, from 693 to 829, and 56 for acute pneumonia, from 516 to 572.

The largest rises in the incidence of measles were 373 in Lancashire, from 1,931 to 2,304, 202 in Lincolnshire, from 62 to 264, 174 in Northumberland, from 472 to 646, 166 in Surrey, from 238 to 404, 144 in Durham, from 666 to 810, 130 in Essex, from 673 to 803, and 107 in Cumberland, from 142 to 249; the chief exceptions to the general trend were falls of 126 in Yorkshire West Riding, from 610 to 484, and 72 in Oxfordshire, from 159 to 87. The largest rises in the number of notifications of whooping-cough were 63 in Suffolk, from 36 to 99, 47 in Lancashire, from 297 to 344, and 40 in Kent, from 168 to 208. The largest increases in scarlet fever were 45 in Shropshire, from 2 to 47, due to an outbreak involving 44 persons in Bridgnorth R.D., and 35 in Essex, from 30 to 65. Only one case of diphtheria was reported, 3 fewer than in the preceding week.

27 cases of acute poliomyelitis were notified, and these were 9 fewer for paralytic and 5 fewer for non-paralytic cases than in the preceding week. The largest returns were 3 cases in the counties of Lancashire, Essex, and Hertfordshire (Stevenage U.D. 2).

The rise in the incidence of dysentery was due to an increase in established outbreaks rather than to new centres of infection. The largest returns were Lancashire 121 (Stretford M.B. 49, Liverpool C.B. 13), Warwickshire 89 (Coventry C.B. 47, Birmingham C.B. 20), Yorkshire West Riding 80 (Bradford C.B. 14, Sheffield C.B. 14, Leeds C.B. 12, Keighley M.B. 11); Yorkshire East Riding 45 (Kingston-upon-Hull C.B. 42), London 40 (these cases were scattered through 15 boroughs), Nottinghamshire 35 (Arnold U.D. 18, Nottingham C.B. 15), Northumberland 29 (Alnwick U.D. 13), Staffordshire 22 (West Bromwich C.B. 13), Surrey 21.

Week Ending February 2

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 865, whooping-cough 3,302, diphtheria 5, measles 13,008, acute pneumonia 661, acute poliomyelitis 37, dysentery 1,097, paratyphoid fever 10, and typhoid fever 3.

Isle of Man Census

The total population enumerated in the Isle of Man at the 1951 census was 55,253, representing a net gain since 1931 of about 6,000 persons. 1,229 visitors were enumerated in the Isle of Man, and 1,306 persons enumerated in the United Kingdom stated that their usual place of residence was in the Isle of Man. It is estimated that 55,437 persons were usually resident in the Isle of Man at the census date.

Householders were asked to state whether they had exclusive use of, shared with another household, or were without piped water supply within the house, cooking stove or range, kitchen sink, water-closet, or fixed bath. 55% of

household arrangements, and a further 14% had all except a fixed bath; these figures compare with 52 and 19% for England and Wales.

The population of the island was on the whole a little older than that of England and Wales. 13.9% were aged 65 and over, compared with 10.9% in 1931. The figures for England and Wales were 11.0 in 1951 and 7.4 in 1931. The ratio of females to males in the Isle of Man was higher than in England and Wales, the numbers of females per 1,000 males being respectively 1,144 and 1,082. A striking feature of the returns was the increase since 1931 in the proportions married, particularly among younger people. At age 20-24 there were 169 males married per thousand as compared with only 96 in 1931, and 401 females per thousand compared with 169.

Total fertility in the Isle of Man was somewhat higher than in England and Wales. There were 173 live-born children per 100 married women under age 50, compared with 169 in England and Wales. Current fertility rates (percentages of married women under age 50 bearing a live-born child in the year ending April 8, 1951) were slightly higher in the Isle of Man (10%) than in England and Wales (9%).

The number of people returned in 1951 as able to speak Manx (all of whom could speak English also) was 355 for the whole island, compared with 4,657 in 1901, 915 in 1921, and 529 in 1931.

Medical News

Radiological Practice.—The Minister of Health and the Secretary of State for Scotland have now appointed the promised committee under Lord ADRIAN's chairmanship to review current practice in diagnostic radiology and the radiotherapy of non-malignant conditions, and it has started its work. The committee's appointment was recommended by the Medical Research Council subcommittee responsible for the preparation of the Council's report on *The Hazards to Man of Nuclear and Allied Radiations* (Cmd. 9780, H.M.S.O., 1956). Besides reviewing current practice in the two fields of radiology mentioned, the committee is asked to submit recommendations to the Ministers. The members of the committee in addition to Lord Adrian are: Professor J. C. McC. Browne (professor of obstetrics and gynaecology, London), Sir Horace Evans (director, medical unit, London Hospital), Mr. R. J. G. Grewcock (dental surgeon, London), Professor R. J. Kellar (professor of obstetrics and gynaecology, Edinburgh), Dr. Peter Kerley (director, x-ray unit, Westminster Hospital), Dr. D. R. Maitland (radiologist, Royal Infirmary, Edinburgh), Professor W. V. Mayneord (professor of medical physics, London), Professor J. S. Mitchell (professor of radiotherapeutics, Cambridge), Mr. C. Naunton Morgan (surgeon, St. Bartholomew's Hospital), Dr. Kenneth Robson (chest physician, St. George's Hospital), Mr. T. Holmes Sellors (thoracic surgeon, Middlesex Hospital), Mr. G. R. Seward (dental surgeon, Ilford), Professor F. W. Spiers (professor of physics, Leeds), Professor E. J. Wayne (regius professor of the practice of medicine, Glasgow), Professor Charles A. Wells (professor of surgery, Liverpool), and Professor B. W. Windeyer (professor of radiotherapy, London).

Research on Smoking and Lung Cancer.—Following a question in Parliament this month about public expenditure on research on smoking and lung cancer (*Journal*, February 9, p. 350), the Tobacco Manufacturers' Standing Committee has released, by agreement with the Medical Research Council, some details from the latter's report on the projects supported from the Tobacco Manufacturers' research fund. The report covers the year which ended on October 31 last. During that period the total expenditure from the fund was £51,679, of which £28,679 was non-recurrent and £23,000 recurrent. This brings the total so far spent

from the £250,000 fund to £68,679. (The fund was accepted by the M.R.C. three years ago.) The major grants made from the fund during 1956 were for the expansion of the work at St. Bartholomew's Hospital on atmospheric pollution, and for the establishment of a group at Exeter to study the chemistry of tobacco smoke. In addition, states the report, "there are other important projects which have only just got under way." In America the Tobacco Industry Research Committee there announces that it made grants to the value of \$566,000 during 1956, bringing the total sum allocated since the latter part of 1954 to \$1,380,000.

World Federation for Mental Health.—The executive board of the World Federation for Mental Health has been meeting in London, and on February 7 the Federation's United Kingdom committee held a press reception in honour of Dr. MARGARET MEAD, this year's president of the Federation. She was introduced by Dr. J. R. REES, director of the Federation. Earlier, on January 30, Dr. Mead had delivered the British Psycho-Analytical Society's eighth Ernest Jones lecture at the Royal Society of Medicine, and on February 8 she gave a public lecture on "Mental Health in a Changing World" at County Hall. Dr. Mead, whose work on primitive cultures is well known from her books, is now particularly concerned with the impact of social forms and cultural changes on the development of character. She is associate curator of ethnology at the American Museum of Natural History in New York. Among those who attended the reception were Dr. BROCK CHISHOLM, of Canada, W.H.O.'s first director-general, Dr. F. FREMONT-SMITH, medical director of the Josiah Macy, Jr., Foundation, New York, and Dr. EDUARDO KRAFF, of Buenos Aires, chief of W.H.O.'s mental health section.

Polish Surgeons Visit Britain.—Two Polish surgeons, Dr. WITOLD RUDOWSKI, chief surgeon at the Radium Institute, Warsaw, and Dr. BRONISLAW PRASZALOWICZ, senior surgeon at the Institute of Haematology, Warsaw, and deputy editor-in-chief of the Polish State Medical Publishing House, have been visiting Britain under British Council auspices. They arrived on February 2 and have been seeing hospitals and university departments in London, Manchester, Edinburgh, Oxford, and Birmingham. With them has been Mr. TADEUSZ KLONOWICZ, director of the Polish State Medical Publishing House. Their visit, which is a return of that paid to Warsaw last autumn by Sir ROBERT MACINTOSH, Professor IAN AIRD, and Dr. R. H. DOBBS (see *Journal*, November 24, p. 1230), ends to-day.

Tata Awards for Leukaemia Research.—The trustees of the Lady Tata Memorial Fund invite applications for grants, scholarships, or fellowships for research on diseases of the blood, with special reference to leukaemia, in the academic year beginning on October 1, 1957. Candidates with programmes of research on any aspect of malignant disease which may throw incidental light on leukaemia will be eligible for consideration. The awards are open to suitably qualified investigators of any nationality, working in any country in which it will be possible to make payments.

Grants of variable amount are made for research expenses or to provide scientific or technical assistants for senior workers. Scholarships are awarded for the personal remuneration of workers carrying out approved research under suitable direction; their normal value will be £600 sterling per annum for whole-time research, with proportional adjustment for work on a part-time basis. In addition, the trustees may award one or more Lady Tata Memorial Research Fellowships to workers with considerable research experience; the stipends of these fellowships will be at the rate of £1,200 sterling per annum.

Further particulars and forms of application may be obtained from the Secretary of the (European) Scientific Advisory Committee, Lady Tata Memorial Trust, Chester Beatty Research Institute, Fulham Road, London, S.W.3. Applications must be submitted before March 31, and the awards will be announced in June.

French Government Exchange Scholarships.—Under the terms of a reciprocal arrangement with the Centre National

de la Recherche Scientifique, the Medical Research Council invites applications from British workers in medical science for two scholarships tenable at research institutions in France during the academic year 1957-8. The scheme is intended for young graduates in medicine or science who have already had some experience in a branch of medical science. Candidates must be of British nationality and have at least a working knowledge of French.

The scholarships will normally carry a maintenance allowance within the range of 50,000-70,000 francs a month, according to qualifications and experience, and married men will receive a supplementary allowance (payable in sterling by the M.R.C.). Provision will also be made for travelling expenses to and from the place of work.

Application forms may be obtained from the Secretary, Medical Research Council, 38, Old Queen Street, London, S.W.1, with whom applications must be lodged by March 31.

Polio Vaccination at Wakefield and Burton-on-Trent.—Neither Wakefield nor Burton-on-Trent participated in the Ministry of Health's poliomyelitis vaccination programme last year, as a result of advice given by their health committees. This year they are participating. On December 4 the Wakefield City Council resolved to give children in their area, born between 1947 and 1954, an opportunity to be vaccinated against poliomyelitis. The Burton Borough Council took its decision last April, but it was then too late to register the children for the 1956 vaccination programme.

International Society of Internal Medicine.—Sir RUSSELL BRAIN, P.R.C.P., has been elected president of the International Society of Internal Medicine. He took office on February 1. The Society's next meeting will be held in Philadelphia from April 24 to 26, 1958.

Eli Lilly Fellowship (South Africa).—Dr. H. A. SHAPIRO, as honorary chairman of the selection committee, writes to draw the attention of medical practitioners registered in South Africa but resident at present abroad to the 1957 Eli Lilly medical research fellowship. This fellowship is for research in the United States and provides a net sum of 250 dollars a month together with travelling expenses to and from the place of study. The closing date for applications is April 30. Further details may be obtained from Dr. Shapiro, P.O. Box 1010, Johannesburg.

COMING EVENTS

William Sheen Memorial Lecture.—Sir HARRY PLATT, P.R.C.S., will deliver the Welsh National School of Medicine's sixth William Sheen Memorial lecture on March 6 at 8 p.m. in the Reardon-Smith lecture theatre, Park Place, Cardiff. His subject will be "The Backache-Sciatica Problem."

Royal Society of Health.—Exhibition on "Atoms and Health" at 90, Buckingham Palace Road, London, S.W.1, March 18 to May 31, Mondays to Fridays, 10 a.m. to 5 p.m.

Physical Society.—Exhibition of scientific instruments and apparatus at the Royal Horticultural Society's Old and New Halls, Westminster, London, S.W.1, March 25-28. Tickets from the secretary-editor, 1, Lowther Gardens, London, S.W.7.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Saturday, February 16

KENT PAEDIATRIC AND CHILD HEALTH SOCIETY.—At Children's Department, Farnborough Hospital, 3 p.m., Dr. J. D. Kershaw: Child Health in the U.S.S.R. (illustrated by slides).

Monday, February 18

HUNTERIAN SOCIETY.—At the Mansion House, 8.30 p.m., Hunterian Oration by Mr. A. W. Badenoch: The Surgery that Hunter Changed.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. W. Ritchie Russell: Pn.

UNITED HOSPITALS CATHOLIC SOCIETY.—At 13, Devonshire Place, W., 6.15 p.m., Mr. John Ryan: Family Limitation.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C., 5.30 p.m., Dr. T. S. Work: Biochemical Approach to the Problems of Protein Synthesis.

Tuesday, February 19

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. A. L. Greenbaum, Ph.D.: Control of Fat Metabolism.
ILFORD MEDICAL SOCIETY.—At King George Hospital, 8.45 p.m., Dr. James Graham: Planning of Hospital Services on a Regional Basis. Members of Stratford Division, B.M.A., are invited.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. G. B. Dowling: Scleroderma and Dermatomyositis.
ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Professor G. W. A. Dick: Attenuated Virus Vaccines.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnott Demonstration by Dr. Frank Stansfield: Anatomy of the Visual Pathway.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Dr. N. F. Morris: Uterine Blood Flow During Late Pregnancy and Labour.
SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bellinghroke Hospital, Wandsworth Common, S.W., 8.30 p.m., Mr. R. W. Nevins: Ulcerative Colitis.

Wednesday, February 20

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Localized Disease of the Co.aren.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. H. Nicholson: Corticosteroids in Chest Disease.
INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. A. Clifford Morson: Non-tuberculous Infections of the Urinary Tract.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. J. H. Humphrey: Biochemical Mechanisms Underlying Hypersensitivity Reactions (I).
ROYAL MEDICAL SOCIETY, EDINBURGH.—2.30 p.m., Industrial Visit to Caledonian Distillery, Edinburgh.

Thursday, February 21

AUSTRIAN INSTITUTE, 28, Rutland Gate, S.W.—8.30 p.m., Professor V. Frankl (Vienna): Collective Neuroses of the Present Day.
BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. Honor B. Fell, Ph.D., D.Sc., F.R.S.: Physiology of Skeletal Tissue in Culture.
EDINBURGH CLINICAL CLUB.—At Royal College of Physicians of Edinburgh, 8 p.m., Dr. G. Swapp: Organization in General Practice.
GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—7.30 p.m., Mr. J. Dunbar: Personalities in Medicine.
HILL END HOSPITAL MEDICAL SOCIETY, St. Albans.—8.45 p.m., Dr. W. Edwards: Changing Picture of Tuberculosis.
HYPNOTHERAPY GROUP.—At Royal Society of Medicine, 8 p.m., Dr. D. M. L. Doran and Dr. I. Hadfield: Hypnototherapy from the Trainee Point of View. A discussion will follow.
LIVERPOOL MEDICAL INSTITUTION.—8 p.m., pathological meeting. Mrs. Edith K. Dawson, M.D.: Mammary Cancer in Young Subjects, with Special Reference to Pregnancy.
LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.30 p.m., Professor C. G. Rob: Surgery of Arterial Disease.
NORTH-EAST CLINICAL SOCIETY.—At Prince of Wales's General Hospital, N., 2.30 p.m., clinical meeting.
NORTH-WESTERN TUBERCULOSIS SOCIETY.—At Clinical Theatre, Manchester Royal Infirmary, 5 p.m., Dr. W. Brockbank: Some Aspects of Asthma.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnott Demonstration by Mr. B. E. Greenfield: Functions of the Masseter Muscle. Studies on Normal and Abnormal Subjects.
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—At 26, Portland Place, W., 7.30 p.m., Dr. W. S. S. Ladell: Some Physiological Aspects of the Heart Disorders. A discussion will follow.
ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5 p.m., Dr. D. J. Williams: neurology demonstration.
WEST OF ENGLAND CHILD HEALTH GROUP.—At Department of Child Health Lecture Theatre, Bristol Royal Hospital for Sick Children, 5.30 p.m., Dr. J. C. Spencer Ph.D.: Neighbourhood and Family.

Friday, February 22

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. A. D. Porter: clinical demonstration.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. K. Robson: clinical demonstration.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—10 a.m., Mr. G. Flavell: Usual Manifestations of Cancer of the Lung.
ROYAL MEDICAL SOCIETY, EDINBURGH.—8 p.m., address by Professor A. Kennedy: Intercorrelation and Brainwashing.
ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.—At Royal Faculty of Physicians and Surgeons of Glasgow, 8.30 p.m., reception and dance.

Saturday, February 23

BIOCHEMICAL SOCIETY.—At Beveridge Hall, Senate House, London University, 11 a.m., Symposium: Structure and Function of Subcellular Components.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Evans.—On December 23, 1956, at Morfa, New Park Road, Holyhead, Anglesey, to Dr. Joan Evans (formerly Wilson) and Dr. Emrys Evans, a brother for David.

DEATHS

Crymble.—On January 26, 1957, Edward Marshall Tate Crymble, L.R.C.P. & S.I. and L.M., of 27, Derby Road, Fallowfield, Manchester.
Kay.—On January 15, 1957, at Boscombe Hospital, Charles Wallace Kay, L.R.C.P. & S.I., L.R.F.P.S.

Macdowell.—On January 16, 1957, Francis Lewis Hartwell Macdowell, L.R.C.P. & S.I. and L.M., Surgeon Captain, R.N. (retired), of The Skips, Sheepscote, near Stroud, Glos.

Newton.—On January 17, 1957, Herbert William Newton, M.R.C.S., L.R.C.P., late of Chester Cottage, Kingsdown, Deal, Kent, formerly of Feltham, Middx, aged 90.

Orchard.—On January 15, 1957, at 458, New Bedford Road, Luton, Beds, Harry Percival Orchard, M.R.C.S., L.R.C.P., late of Brixton, London, S.W., aged 76.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Third Shot of Polio Vaccine

Q.—(1) Does the present evidence suggest that a third inoculation with a Salk-type vaccine is desirable? (2) If so, when is the optimum time to give it, and how long after the second injection does it still remain worth doing? (3) Does it matter if the vaccine used for the third injection, although of Salk-type, is not identical with that used for the first two inoculations?

A.—(1) With the Salk-type vaccines at present available there is little doubt that a third inoculation is needed before a person can be considered adequately immunized. This should be given from six to twelve months after the initial course of two injections spaced four to six weeks apart. By this time the antibody level obtained after the first two injections will be reaching a low level in many of the vaccinated, and the third injection will "boost" it, often to that obtained after natural infection. The fall after this "booster" is very much slower than after the initial course, and antibody will probably remain at detectable levels for at least three to four years.

(2) The ability to respond to a "booster" almost certainly persists longer than detectable antibody, and the third dose can act in this way two to three years after the initial course. As it is not known if the secondary reaction to natural infection is quick enough in these circumstances to prevent any virus reaching the central nervous system, it is preferable not to delay the third injection for more than a year, so that some antibody may be maintained in the circulation continuously. In diphtheria it has been shown that, when the level of antitoxin in the serum is very low, clinical disease may occur before the secondary antibody rise has had time to be effective. Of the inoculated subjects 20% will not respond to the first injection, but do so to the second; a third injection is essential in these people, and this is another reason why it should not be delayed for more than a year.

(3) The type of Salk vaccine used is not important, provided it has been produced under regulations ensuring adequate potency and safety, as the polio viruses fall into three distinct antigenic types with little antigenic variation within each.

Hay Fever Season

Q.—When is the usual hay fever season in Britain, and for how long does it last? To what extent do variations in locality, flora, weather, or other factors influence the time of its onset or its duration? For example, what difference would be expected in the hay fever seasons in Devon and the West Highlands of Scotland?

A.—Grass pollen, the most important cause of hay fever, is most prevalent in the air in England and Wales during the period June 1 to July 15.¹ The hay fever season opens during the last week of May, is at its height in early and mid-June and continues for a variable period (depending on the individual patient's degree of sensitivity), and ends during the latter part of July. The severity of the grass-pollen season is related to the luxuriance of the season's grass crop, which in its turn depends mainly on the rainfall in April and May²; but, since the release of pollen into the air is dependent on bright sunshine, sunny periods are much more conducive to dense grass-pollen clouds—and to hay fever—than are dull ones. During an abnormally sunless, cool, and wet summer only about half as much pollen is released into the air as in a sunny, hot, and dry one. The densest clouds of grass pollen are experienced in the

neighbourhood of meadows of standing mowing-grass during the hours of pollen liberation. This period varies from species to species: in most, though not all, species it occurs in the early morning or the late afternoon. In general, the more remote a particular place is from large areas of cultivated grassland, the lower is the grass-pollen incidence.

No figures are available for either Devon or the West Highlands of Scotland, but to judge from the evidence from lowland and mountain areas, respectively, one would expect Devon to be much more subject to grass pollen than the West Highlands. What evidence there is suggests also that the grass-pollen season opens perhaps 10 days later in Scotland than in southern Britain.

It has been found that very significant quantities of pollen of all kinds are carried from productive areas into non-productive land areas and to a distance of at least 30 miles out to sea.

REFERENCES

- Hyde, H. A., *British Medical Journal*, 1949, 1, 897.
- *Acta allerg (Kbh.)*, 1952, 5, 98.

Varicose Eczema

Q.—Are local applications of cortisone ointment of value in the conservative treatment of varicose eczema? My patient refuses operation. What alternative treatment is advised?

A.—True varicose eczema occurs only in the presence of chronic venous insufficiency with oedema. No local measures will improve the eczema unless the oedema is abolished. Rest in bed will accomplish this, but, although occasionally necessary, it is undesirable for social and economic reasons and because of the risk of thrombophlebitis. Elastic compression is best, though elastic stockings are unsuitable.

Once the affected area is dry, elastic crêpe bandages may be used, but if there is much weeping ichthyol paste bandages covered by elastic adhesive bandages are very efficacious. They should be changed weekly during the weeping stage, which is usually soon passed, and less frequently once a dry glazed surface appears. The Unna's paste type of bandage is not well tolerated in the presence of varicose eczema. During the period of absorption of oedema fluid from an eczematous leg, patches of eczema may appear on other parts of the body, but they usually soon clear up with bland applications.

If the leg is very moist it may be painted with a mixture of talc, zinc oxide, glycerin, and lime water in equal parts, or with silver nitrate solution (1%). Often there is a superimposed infection of the area and it is useful to apply gentian violet solution (1%) as a paint. With dry eczema Lassar's paste spread on thinly with the finger-tip is best. Hydrocortisone ointment or lotion may be helpful but is unnecessary.

Two main reasons for difficulty in the cure of varicose eczema are failure to get rid of the oedema and over-treatment (especially with irritant preparations or such as may provoke allergic sensitization). It must never be forgotten that constitutional causes are likely to be playing a part.

Fusus Oil

Q.—In shops where diesel fuel injector pumps are tested a special oil called "fusos" oil is often used. When the injectors are being tested the atmosphere in the shop may be quite thick with atomized oil for half an hour, say, at one or two periods during the day. Is this harmful to the workers?

A.—Shell fusos oil is a highly refined petroleum oil of low aromatic content. The main reason for using it for the type of work in question is that when gas oil (for diesel engines) is used for fuel pump calibration it tends to give rise to deposits if the pump is then placed in storage for a long period.

There have been some instances of dermatitis where gas oil may have been a contributory factor. It is possible that

fusus oil might similarly affect some susceptible individuals. There is little information on occupational exposures to mists of gas oil or fusus oil, but one case of chronic lipid pneumonia arising from the inhalation of mineral oil has been reported.¹ It is considered sound practice not to expose workers to a mist of Shell fusus A, and tests on injectors are best carried out under a hood with forced draught. Barrier creams are generally available for the use of employees exposed to the oil.

REFERENCE

- ¹ Proudfit, J. P., Van Ordstrand, H. S., and Miller, C. W., *Arch. industr. Hyg.*, 1950, 1, 105.

High-fat Slimming Diets

Q.—Is it true that the high-fat low-calorie diets recently advocated for slimming have advantages over the more usual reducing diets?

A.—In the present state of our knowledge it is undesirable to use high-fat low-calorie diets for the purpose of reducing weight. The main features of a reducing diet should be to restrict the carbohydrates, protein and fat being allowed in normal amounts. Certain patients who do not lose weight on these diets can be treated with the high-fat regime.¹

REFERENCES

- ¹ Kekwick, A., and Pawan, G. L. S., *Arch. Med. Hosp.*, 1953, 3, 139.
² ———, *Lancet*, 1956, 1, 155.

Gustatory Sweating after Sympathectomy

Q.—Shortly after bilateral cervical and lumbar sympathectomies eight years ago a woman began to experience sweating while eating. Though slight at first, the sweating has become severe enough to cause much discomfort and social embarrassment. Sweating is most marked after savoury and meat dishes, but occurs to some extent at all meals. It affects the face, scalp, neck, and upper chest, and is at times very profuse. Is this a recognized complication of sympathectomy, and what treatment is advised?

A.—Gustatory sweating is a well-recognized phenomenon. Like other rarer clinical curiosities such as "crocodile tears" and "gustatory gooseflesh," it has aroused controversy about its physiological basis but no agreement. Three types are known. The first occurs in some normal individuals when they eat certain types of food. The sweating is often accompanied by vasodilatation or lacrimation and is believed by some to be a parasympathetic function like blushing. The second type follows wounds in the neck or face, often in the region of salivary glands, and the third may follow operations on the sympathetic nervous system. An example of the second type was described recently by Young.¹

In the last type—i.e., following sympathectomy—thermoregulatory sweating is absent. Warming the patient causes no sweating in the denervated area. This means that the sweat glands in the area have lost their sympathetic nerve supply, and they might therefore be expected to become supersensitive to acetylcholine, their usual chemical excitant. If then acetylcholine, liberated by the parasympathetic nerves such as those concerned with blushing, etc., on the face, reached these supersensitive sweat glands, it might activate them. Another possibility is that collateral budding might take place from the parasympathetic nerves to the degenerative sympathetic nerve fibres in the area and thus innervate supersensitive sweat-gland nerve-endings. Treatment must therefore be directed to diminishing parasympathetic activity, and anticholinergic drugs should be tried. Tincture of belladonna has been tried in the past, but the side-effects are often unpleasant if the dose is large enough to control the sweating. There are many new anti-parasympathetic drugs now available, and a trial of these in varying dosage offers an opportunity for alleviation. Should this fail the patient should be referred to a centre where the investigation and surgery of the sympathetic nervous system are being studied.

REFERENCE

- ¹ Young, A. G., *British Medical Journal*, 1956, 2, 976.

NOTES AND COMMENTS

Penile Smarting After Coitus.—Dr. D. M. O'CONNOR (Loughlinstown) writes: As no more eminent person has apparently done so, may I venture to add a suggestion to your expert's reply on penile smarting after coitus ("Any Questions?" January 12, p. 118)? A search for a renal calculus might reveal a cause for the symptom.

OUR EXPERT replies: I have never seen a patient with smarting after coitus where it was due to a renal calculus. I have been in touch with several urological surgeons and they are of the same opinion. In my reply I stated that an examination should be carried out before the first morning micturition and bath, which would detect any urinary infection. If Dr. O'Connor has seen a case of renal calculus where there was smarting after coitus, the symptom was in all probability due to urinary infection with a concomitant prostatitis and not to the calculus.

Sulkowitch and Fantus Tests.—Dr. B. J. BOUCHÉ (London, S.W.19) writes: In the answer by your expert on the Sulkowitch and Fantus tests ("Any Questions?" December 29, 1956, p. 1559), there are two points calling for correction in regard to Fantus's test, viz.: (1) The pipette, after measuring 10 drops of urine, is washed twice, once with distilled water and again with some of the pot. chromate solution as used in the test; this is obviously for further safety. (2) The number of drops of silver nitrate solution required to give a brick-red precipitate, less one, is the correct number of grammes of sodium chloride per litre of urine. In other words, the number of drops used before the change of colour (not necessarily the formation of a precipitate) indicates the number of grammes per litre. These two are quite minor points.

Treatment of Acne.—Dr. G. ENGLER (Panama) writes: Referring to the inquiry about recent advances in the treatment of acne ("Any Questions?" December 1, 1956, p. 1317), I would like to mention the remarkable results after the administration of rauwolfia preparations. We have been using "rautensin CUP," a Columbian product, a whole root preparation of *Rauwolfia hirsuta* containing 100 mg. per tablet. However, other rauwolfia products may well be equally effective. The average doses of 600 mg. per day resulted in startling improvement in our cases within a period of two weeks. Besides the reduction of blood pressure by about 20 to 30 mm., several patients have observed a decrease in libido.

Infantile Gratification Habits.—Professor R. S. ILLINGWORTH (Sheffield) writes: May I suggest another answer to your correspondent's query concerning the 20-months-old child who is sucking a napkin ("Any Questions?" January 26, p. 240)? My answer would be (1) it is normal, (2) it will stop as she matures, provided only that you do nothing about it. It will not cause permanent deformity of the teeth, provided that it stops by the age of 5 or 6, as it will if no effort is made to stop it.

Correction.—The sentence in Dr. A. S. Playfair's letter (*Supplement*, February 2, p. 50): "Twice in his letter Dr. Glaisher assumes . . . that his relationship has been destroyed through the machinery of the N.H.S." should have read: "Twice in his letter Dr. Glaisher assumes . . . that this relationship has been destroyed . . ."

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TREATMENT OF ADRENOCORTICAL DEFICIENCY STATES

BY

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The treatment of adrenocortical deficiency states has been completely revolutionized since the advent of the new adrenocortical steroids. The discovery by Hench, Kendall, and others in 1949 of cortisone as a therapeutic agent marked an advance into a new therapeutic era. Now that adrenal substitution therapy is a practical measure, adrenalectomy for a variety of disorders has become increasingly popular. Total or subtotal adrenalectomy is now orthodox therapy for Cushing's syndrome, and total adrenalectomy has also been extensively used in the treatment of metastatic malignant disease and of malignant hypertension; it has also been empirically performed in the treatment of a number of disorders: diabetes mellitus, schizophrenia, and rheumatoid arthritis, to mention three. Substitution therapy has therefore become a day-to-day problem in the wards of many hospitals, and, as a natural sequence, the treatment of adrenocortical crisis has become more common than it used to be.

The tempo of practical therapeutics is now so rapid that by the time a new effective form of treatment is evolved and applied in medicine its probable successors are already on the scene, as yet incompletely studied and unproved clinically. This is particularly so in the adrenal-deficiency states, where steroid chases steroid across a constantly changing scene. We have passed from the time of high-salt treatment, through the cortical extract era, from the deoxycortone to the cortisone age, and are now in the happy position of having many practical tools, all of proved efficiency. In spite of this, many patients with adrenal deficiency still lag behind somewhere on this therapeutic pathway; to-day brown lethargic Addisonian patients, on deoxycortone alone, resemble the partially treated patients of the pre-1949 era. Such patients are by no means rare even at the time of writing.

The clinical material which forms the basis of this study consists of 150 patients, 5 adrenalectomized for malignant hypertension, 2 for Cushing's syndrome, and 143 for metastatic malignant disease. Details of these 143 cases have been published by Sir Stanford Cade (1954, 1955). Of the metastatic cases, 65 have survived and have been followed-up for more than six months to September, 1956. The number of "survival years" of these 65 cases now totals 85.3. The two patients with Cushing's syndrome are in good health, four and one year after operation. Of the patients with malignant hypertension only one survives after two years; the others lived 10, 12, 19, and 12 months after operation.

The details of these five patients, all under the care of Dr. Swithin Meadows, have been reported by Van T'Hoff (1956).

Sodium Loss, Cortisone Deficiency, and Water Intoxication

The classical symptoms of adrenal deficiency are increasing weakness, lassitude, and inability to respond to any form of stress, followed by vomiting, diarrhoea, prostration, and finally coma. The blood urea rises as the serum sodium falls; the serum potassium rises steadily as the patient becomes depleted of salt and water. These symptoms are, however, found only typically in a minority of patients; in most cases the early signs and symptoms are more subtle and less easy to define.

In the adrenal-deficient subject, particularly in the adrenalectomized subject suffering from metastatic malignant disease, the variables with which the clinician has to contend daily are: (1) the salt-and-water balance; (2) the cortisone requirements; and (3) the activity of the underlying (malignant) disease process.

The clinical and biochemical picture may change rapidly overnight in these severely ill patients. Inter-current infection, extreme pain from involvement of a fresh structure by the neoplastic process, vagaries of appetite and thirst, and, particularly, gastro-intestinal upsets may all rapidly and thoroughly upset the delicate balance of the adrenalectomized subject. The symptoms and signs of imbalance in each of the above—water, sodium, and cortisone—may be very similar; symptoms due to neoplastic extension may also cause a similar clinical picture. To illustrate this point, apathy, anorexia, nausea, and vomiting may be due to water intoxication, sodium loss, cortisone deficiency (absolute from the usual dosage being omitted, or relative in the face of cross-infection or some other stress), or extension of the malignant process. If these symptoms are initiated by extension of the neoplastic process they may in turn cause sodium deficiency and/or water loss and/or hypocorticism (relative cortisone deficiency).

The commonest early symptoms of cortisone deficiency are, in our experience, apathy, lassitude, nausea, anorexia, and a general lack of well-being, followed later by vomiting. The blood urea usually rises, but not invariably at this early stage, and the blood pressure usually, but not always, drops. The pulse usually increases, and the pulse pressure lessens. Exactly the same symptoms and signs may herald sodium deficiency;

Used in adrenalectomized subjects in conjunction with cortisone, glycyrrhetic acid has proved in our hands a weak mineralocorticoid, causing some retention of sodium and chloride, but a stronger water-retaining substance. If dosage of glycyrrhetic acid be raised to 500 mg. daily the cortisone-treated patients will rapidly gain weight and become oedematous; we have twice seen, in our patients, water-loading occurring in the face of persistence of signs of salt deficiency. Galal suggests that this water-loading effect is not mediated through the posterior pituitary, but is

The diagnosis, as mentioned below, must not be confused with that of water intoxication, where the patient has been overhydrated. In the acute form of this (water intoxication) syndrome marked mental disturbances occur, with disorientation, weakness, fits, and even coma; such cases can prove fatal and must be clearly differentiated from the true adrenal crisis before therapy is initiated. In the treatment of adrenal crisis hydrocortisone (free alcohol or hemisuccinate) may be given intravenously; Lundy (1955) has

cortisone was donated by the Medical Research Council. Since this article was written we have learnt that Messrs. Squibb have made 9 α -fluorohydrocortisone available to hospitals in tablets of 1-mg. and 0.1-mg. strength.

REFERENCES

- Bartter, F. C. (1956). *Metabolism*, 5, 369.
 Borst, J. G. G., Ten Holt, S. R., de Vries, L. A., and Molhuysen, J. A. (1953). *Lancet*, 1, 657.
 Byrnes, W. W., Barnes, L. E., Bowman, B. J., Dulin, W. E., Morley, E. H., and Stafford, R. O. (1956). *Proc. Soc. exp. Biol. (N.Y.)*, 91, 67.
 Cade, Sir S. (1954). *Ann. roy. Col. Surg. Engl.*, 15, 71.
 — (1955). *British Surgical Progress*, edited by E. R. Carling and J. P. Ross, p. 54. Butterworth.
 Calvert, R. J. (1954). *Lancet*, 1, 805.
 Card, W. L., Mitchell, W., Strong, J. A., Taylor, N. R. W., Tompsett, S. L., and Wilson, J. M. G. (1953). *Ibid.*, 1, 663.
 Fried, J., and Sabo, E. F. (1954). *J. Amer. chem. Soc.*, 76, 1455.
 Galal, E. E. (1955). *Brit. J. Pharmacol.*, 10, 305.
 Garrod, O., Nabarro, J. D. N., Pawan, G. L. S., and Walker, G. (1955). *Lancet*, 2, 367.
 Groen, J., Pelzer, H., Frenkel, M., Kamminga, C. E., and Willebrands, A. F. (1952). *J. clin. Invest.*, 31, 87.
 —, Willebrands, A. F., and Kamminga, C. E. (1951). *New Engl. J. Med.*, 244, 471.
 Hart, F. D. (1956). *Ann. roy. Coll. Surg. Engl.*, 18, 314.
 Hollander, V. P., West, C. D., Whitmore, W. F., jun., Randall, H. T., and Pearson, O. H. (1952). *Cancer*, 5, 1019.
 Hudson, P. B., Mittelman, A., and Podberezec, M. (1954). *New Engl. J. Med.*, 251, 641.
 Liddle, G. W., Richard, J. E., and Tomkins, G. M. (1956). *Metabolism*, 5, 384.
 Louis, L. H., and Conn, J. W. (1956). *J. Lab. clin. Med.*, 47, 20.
 Luetscher, J. A., jun., and Curtis, R. H. (1955). *Fed. Proc.*, 14, 746.
 Lundy, J. S. (1955). *Proc. Mayo Clin.*, 30, 446.
 Maclean, J. P., Li, M. C., Lipsett, M. B., Ray, B., and Pearson, O. H. (1955). *J. clin. Invest.*, 34, 951.
 Mitchell, W. (1956). *Mig. Chem.*, 27, 168.
 Molhuysen, J. A., Gerbrandy, J., de Vries, L. A., de Jong, J. C., Lenstra, J. B., Turner, K. P., and Borst, J. G. G. (1950). *Lancet*, 2, 381.
 Pearson, O. H., Mendelsohn, M. L., and West, C. D. (1953). *J. clin. Endocr.*, 13, 841.
 Sahagian-Edwards, A., and Holland, J. F. (1954). *Cancer*, 7, 1242.
 Simpson, S. A., and Tait, J. F. (1952). *Endocrinology*, 50, 150.
 Thorn, G. W., Renold, A. E., Morse, W. L., Goldfien, A., and Reddy, W. J. (1955). *Ann. intern. Med.*, 43, 979.
 Van T' Hoff, W. (1956). *Quart. J. Med.*, 25, 571.
 Wynn, V. (1956). *Metabolism*, 5, 490.

USE OF MECAMYLAMINE IN THE MANAGEMENT OF HYPERTENSION

BY

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The discovery by Stone *et al.* (1956) that mecamlamine ("inversine"), a secondary amine, has pharmacological properties in many ways similar to those of the quaternary ammonium compounds, which are tertiary amines, is of interest not only in relationship to the properties of the substance itself but also because other secondary amines as yet untested may prove to be more satisfactory as ganglion-blocking drugs than any of those now available.

On the basis of both animal (Ford *et al.*, 1955; Stone *et al.*, 1956) and clinical studies (Ford *et al.*, 1955; Freis, 1955; Freis and Wilson, 1955, 1956; Moyer *et al.*, 1955) it is evident that mecamlamine causes blockade of both sympathetic and parasympathetic ganglia. It differs from the methonium compounds, however, in being readily and completely, or almost completely, absorbed from the alimentary canal. It has also been reported (Freis and Wilson, 1955, 1956) that, contrary to the invariable course of events with the methonium compounds, the continued administration of mecaml-

amine leads to little or no drug toleration, a point of great practical and theoretical interest. The structural formula of mecamlamine (3-methylamineisocamphane hydrochloride) is here shown.

The present study describes our experiences with the use of mecamlamine in the management of 40 cases of hypertension treated for from four to eight months.

Method

Mecamlamine was administered by subcutaneous or intravenous injection and by mouth. The blood pressure was measured by the method recommended by the Committee for the Standardization of Blood Pressure Readings (1939) in order to maintain uniformity with observations published previously on hexamethonium, pentolinium ("ansolysen"), and chlorisondamine ("ecolid") (Restall and Smirk, 1950; Smirk and Alstad, 1951; Smirk, 1953; Smirk and Hamilton, 1956).

Over a period of from four to eight months (average 4.6) 40 patients (20 males, 20 females) have received a trial of mecamlamine. Fundal gradings were or had been grade IV (Keith, Wagener, and Barker, 1939) in five cases, grade III in nine, and grades II or I in the remainder, most of whom had other severe manifestations such as congestive cardiac failure. Twenty-five patients had had treatment with other ganglion-blocking agents previously. In the remainder treatment was instituted with mecamlamine.

Drug Toleration

Before comparing the potencies of mecamlamine and other ganglion-blocking drugs it is necessary to consider whether mecamlamine causes drug toleration. At an early stage it became evident that toleration either did not occur or was present to a comparatively minor degree following the repeated administration of mecamlamine. Indeed, if drug toleration does develop it must do so early in the course of administration of gradually increasing doses; for once a fully effective dose has been discovered there is no consistent change in the dose needed to reproduce the same fall of blood pressure. In some instances the requisite dose has increased somewhat after several weeks or months of treatment; in other instances, somewhat less frequently, the requisite dose has decreased. In Fig. 1 is shown the

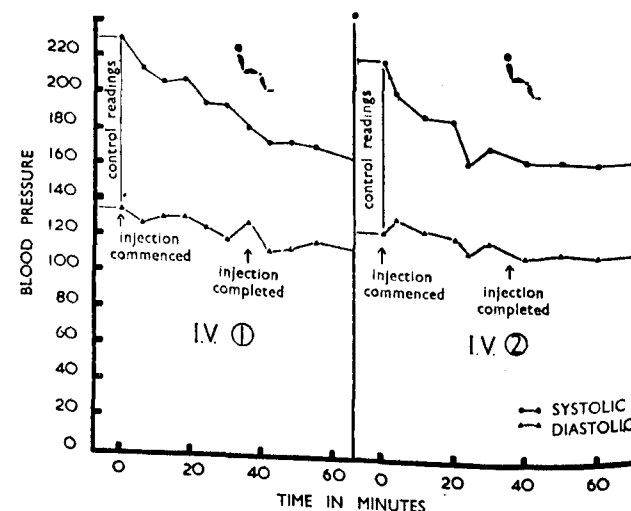


FIG. 1.—Effect on blood pressure of identical doses of mecamlamine given intravenously. I.V. (1) shows effect of an initial dose of 14 mg. of mecamlamine given slowly over the period shown, in the posture indicated. I.V. (2) shows effect of the same dose given in the same manner after two weeks of oral therapy, during which time the patient received 14 mg. of mecamlamine twice daily.

result of a test in which the initial effective dose was determined by intravenous titration. This was repeated after two weeks of oral therapy, with the production of an identical response.

Comparison of the Effective Doses of Mecamlamine, Pentolinium, Chlorisondamine, and Hexamethonium

The effective dose of mecamlamine may be compared either with the initial doses of quaternary ammonium compounds or with the doses of such compounds which may be required after repeated administration. In a series of 40 patients treated with mecamlamine the least dose to produce any significant effect was 3 mg., and 5 mg. is a suitable initial oral dose. The effective single oral dose reducing the blood pressure in the standing posture to about 120 or 130 mm. systolic, with corresponding reduction in the diastolic pressure, was 10 mg. or more in 80% of cases.

The duration of action of mecamlamine is in excess of 12 hours. Consequently, when two or more daily doses are given the effect obtained from one dose is influenced by the residue of the effect from the preceding dose. Hence increase of the night dose will have some effect on the level of the blood pressure next morning, and will influence the size of the dose which should be administered then. A fairly good control over blood-pressure levels can be obtained usually by two doses a day, the night dose being, for preference, approximately 30% higher than the morning dose. We have found it an advantage to give a small supplementary dose about 2 p.m., as otherwise there is often a rise of pressure in the late afternoon or early evening. Doses are adjusted in terms of the hypotensive action. The average daily dose in those of our patients who continued on mecamlamine was 33 mg. This average is probably higher than the average daily dose in unselected cases, as about half of our patients on mecamlamine had been selected because of the large dose of pentolinium or chlorisondamine which had been needed to reduce the blood pressure adequately. Among all cases maintained on treatment the highest dose was 70 mg.

By comparison, the effective oral dose of pentolinium per 24 hours at the time of initiation of treatment may vary from 40 to 160 mg., whereas when full drug toleration has been acquired, 60 to 1,800 mg. a day may be necessary, although most patients are controlled with doses of between 160 and 360 mg. a day. Correspondingly effective doses of chlorisondamine are of the order of 25 to 75 mg. at initiation of therapy and 50 to 750 mg. in the fully tolerant patient, and of hexamethonium salts 100 to 300 mg. initially and 300 to well in excess of 3,000 mg. when full tolerance has been acquired.

Direct comparison of mecamlamine with pentolinium was possible in 21 patients. In all of these pentolinium had been administered long enough for full tolerance to develop. Most of these cases had required unusually high doses of pentolinium. In 10 of these pentolinium had been given parenterally, in 11 orally. The results are shown in Table I.

The group originally receiving parenteral pentolinium was made up of patients having in general a particularly high requirement of quaternary ammonium compound. This is reflected in the larger requirement of mecamlamine in this group than of the group previously on oral pentolinium, and of the whole series (33 mg.).

It is of interest to note that oral mecamlamine and parenteral pentolinium, when full tolerance had developed to the latter, were equally potent.

TABLE I

No. of Patients	Average Effective Daily Dose Pentolinium (mg.)	Average Effective Daily Dose Mecamlamine (mg.)
11 10	460 (oral) 39 (parenteral)	32 (oral) 39 "

When hypertensive patients receive two or three doses daily there is usually less variation of the blood pressure throughout the day after mecamlamine than after chlorisondamine or pentolinium. Indeed, in some patients the degree of control which can be obtained by mecamlamine alone is approximately equal to that which can be obtained by chlorisondamine or pentolinium in combination with reserpine. Unfortunately, in some patients the development of side-effects makes it impracticable to administer a sufficient dose of mecamlamine. Our impression of the relationship between control over the blood-pressure level by mecamlamine as contrasted with pentolinium and chlorisondamine is that the best control over blood-pressure levels can be obtained with mecamlamine in those patients who are fortunate enough to be able to tolerate it. Unfortunately, mecamlamine in fully adequate doses is more often associated with prohibitive parasympathetic side-effects than either pentolinium or chlorisondamine. The responses to these drugs are highly individual, some patients for an equivalent degree of control over the blood pressure being more comfortable on mecamlamine, and some on pentolinium, and some on chlorisondamine.

Other Findings

Relationship Between the Effective Subcutaneous and Oral Doses of Mecamlamine.—It has been reported by Freis (1955), Freis and Wilson (1955, 1956), Moyer *et al.* (1955), and Ford *et al.* (1955), that mecamlamine has approximately the same hypotensive action whether administered subcutaneously or orally. Certainly the difference between the subcutaneous and oral doses is very much less than with the various quaternary ammonium compounds. We have found that on the average the oral dose must be a little greater than the parenteral dose in order to produce an equal fall of blood pressure, although in a number of patients the same dose was equally hypotensive when given orally as when given parenterally (Table II, Fig. 2).

Postural Hypotension After Administration of Mecamlamine.—The occurrence of postural hypotension following the administration of ganglion-blocking drugs has been referred to on many occasions. The action of mecamlamine appears to be indistinguishable in this respect from that of quaternary ammonium compounds. The relationship between the extent of the fall in blood pressure in the horizontal posture and the additional fall in the blood pressure which occurs on standing varies from patient to patient.

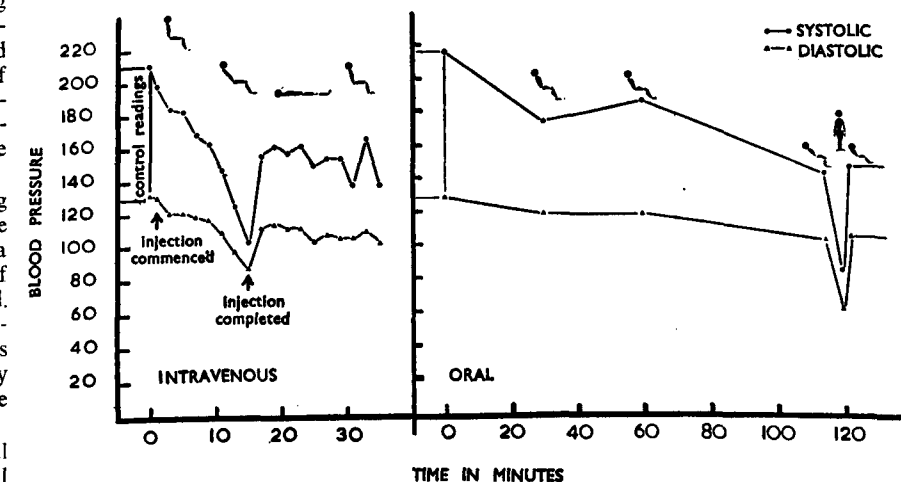


FIG. 2.—Effect of 8 mg. of mecamlamine intravenously over period shown compared with that of a single oral dose of 8 mg. given to same patient on a subsequent occasion. Effect of posture as shown.

TABLE II

Case No.	Parental Dose (mg.)	Route	B.P. Before	Lowest B.P. After	Oral Dose (mg.)	B.P. Before	B.P. After
7	9	H.I.	216/122	120/62	12	198/116	118/64
8	12	H.I.	242/126	176/90	20	214/104	162/78
26	10	H.I.	198/120	124/68	16	190/112	166/100
29	20	I.V.	230/136	154/94	20	200/122	166/100
30	6	H.I.	176/100*	118/76	6	186/100	128/80
35	10	H.I.	150/100*	140/96	12	170/100	142/96
38	15.5	I.V.	216/108	138/84	15	182/100	138/78
R.M.†	14	I.V.	212/108	124/92	14	208/104	166/104
E.D.†	8	I.V.	204/132	102/86	8	216/128	114/82
H.F.†	7	H.I.	238/124	180/108	7	258/130	156/94

* These cases had received doses of mecamlamine on the previous day and some residual drug action is present.
† Additional to series.

Some patients have a substantial fall of blood pressure in all postures with comparatively little postural hypotension. Others have a very little fall of pressure when lying flat but a considerable decrease in the blood pressure on assumption of the erect posture (Table III).

TABLE III.—Relationship Between Lying and Standing Blood Pressures and Pulse Rate Before and at the Trough of Blood-pressure Fall After Mecamlamine

Case No.	Before Mecamlamine*			After Mecamlamine		
	B.P. Lying	B.P. Standing	Pulse	B.P. Lying	B.P. Standing	Pulse
2	238/122	210/118	82	194/108	186/88	80
3	204/106	162/118	76	146/96	142/90	76
4	208/120	194/110	84	154/102	126/90	80
6	254/142	240/160	100	182/134	144/96	98
8	246/112	208/100	84	142/68	140/72	84
9	196/116	214/136	60†	154/116	118/90	64†
10	240/112	208/114	96	170/98	118/70	92
11	222/112	210/114	96	172/98	140/88	92
14	238/116	222/120	102	178/92	168/96	92
20	174/120	178/100	80	142/90	116/80	84
21	216/130	150/108	80	168/114	124/102	84
23	238/140	194/108	56	116/70	92/40	60
24	272/110	232/118	100	210/118	118/72	88
25	190/100	196/104	76	170/98	140/82	72
26	202/124	198/120	72	132/72	124/68	72
27	176/120	168/116	90	162/104	132/98	90
28	220/120	200/118	62	170/110	148/104	76
31	232/108	208/106	70	166/92	156/80	72
32	180/112	168/114	80	174/110	142/96	80
33	188/126	174/120	72	134/80	130/80	72
34	204/100	186/102	62	150/70	130/70	68
35	188/134	198/142	80	180/94	162/74	88
36	208/122	174/100	72	162/82	120/48	68

* All cases had received doses of mecamlamine on the previous day and in some cases residual drug action is present.
† Patients with auricular fibrillation having digitalis.

Effect of Mecamlamine on Pulse Rate.—There is no consistent change in the pulse rate following the administration of mecamlamine, except where congestive heart failure or impaired circulatory activity has been improved by its administration. The pulse rate may rise or fall slightly.

Effect of Meals on Hypotensive Action of Mecamlamine.—Just as with hexamethonium, pentamethonium, "M. & B 1863," "Ciba 9295," pentolinium, and chlorisondamine, so also mecamlamine administration is associated with an additional fall in the blood pressure after a meal. Probably this is due to inability of vascular reflexes to compensate for splanchnic dilatation.

Side-effects After Administration of Mecamlamine.—Most of the side-effects which may follow the administration of mecamlamine are of the same kind as those already encountered following the administration of chlorisondamine, pentolinium, and hexamethonium. In addition to the side-effects exhibited by hexamethonium and pentolinium, the administration of chlorisondamine and mecamlamine may lead to vague and indefinable feelings of malaise which make the patients unwilling to continue with the drug, often without their being able to explain exactly the nature of their symptomatology. Such complaints have been rather more prominent with mecamlamine than with chlorisondamine. In an individual patient parasympathetic side-effects such as blurring of the vision, dry mouth, and constipation may be either greater or less with mecamlamine than with

chlorisondamine or pentolinium. We have found that urinary retention has occurred more often after mecamlamine and that nausea and vomiting have been more frequent after mecamlamine and chlorisondamine than after pentolinium. On the other hand, patients who have had attacks of ileus or abdominal distension or other intolerable alimentary side-effects on large doses of pentolinium, necessitating in some cases their transfer to subcutaneous injections, have usually been more comfortable on mecamlamine. In this series of 40 patients, half of whom had been selected for trial because of difficulty with side-effects or with control of blood pressure, the side-effects encountered were of such severity as to cause substantial discomfort in 25 (Table IV).

TABLE IV.—Side-effects of Mecamlamine

Alimentary	Dryness of mouth	11
	Nausea and vomiting	9
	Constipation and abdominal distension	14 (partial ileus in one)
Urinary	Diarrhoea	2
	Dysuria	5 (retention of urine in one)
Visual	Blurring of vision	5

Clinical Appraisal

It must be borne in mind that our experience with mecamlamine has been derived from a group of patients more than half of whom had previously proved difficult to manage with other ganglion-blocking agents and who probably constitute a particularly severe test for any therapeutic regime.

Of the total of 40 patients in whom the trial was undertaken, mecamlamine continues to be used as the ganglion-blocking agent of choice, with or without a rauwolfia alkaloid, in 22. Of the remainder, two died, and in three further cases supply difficulties curtailed the trial. It is of some interest to consider the 13 in whom mecamlamine was abandoned. In one case control of hypertensive cardiac failure was less satisfactory than with the original regime using parenteral pentolinium. In the remaining 12, severity of parasympathetic side-effects was the determining factor. Eight patients reverted to other ganglion-blocking agents (three parenteral pentolinium, three oral pentolinium, one oral chlorisondamine, one oral "139.C.55"), one was satisfactorily managed on reserpine alone, and three defected from treatment, an unusual event for this clinic.

Since tolerance occurs to a limited extent only, if at all, and since the parenteral and oral doses so nearly correspond, the method of intravenous titration can be used very profitably to initiate treatment. Our experience has been that intravenous administration at the rate of 0.5 mg. a minute with continuous blood-pressure recording is safe and not too time-consuming.

Use of Mecamlamine in Conjunction with Rauwolfia Alkaloids

We have used mecamlamine in conjunction with reserpine (0.5 mg. or less in 24 hours), rescinnamine (0.75 mg. or less in 24 hours), or canescine (1 mg. or less in 24 hours). We have encountered no difficulties in using these combinations of drugs. Smaller doses of mecamlamine suffice when rauwolfia alkaloids are administered concurrently. The extent of the potentiation of ganglion-blocking activity requires further study, but the initial impression is that it is of the same order as that observed after pentolinium.

Summary

Mecamlamine, a secondary amine, exhibits in man the pharmacological properties characteristic of a ganglion-blocking drug. In contrast with quaternary ammonium compounds, mecamlamine is well absorbed

*N'-(5-cyano-5'-diphenylpentyl)-N':N'-N'-trimethylethylene-l-ammonium-2-morpholinium sulphate (Burroughs Wellcome and Co.).

from the alimentary canal, so that the oral dose is little more than the parenteral dose. The degree of drug toleration is slight, and is not sufficient to cause difficulty in determining the requisite dose of the drug. The action is more prolonged than that of pentolinium or of chlorisondamine, so that the degree of control over the blood-pressure level is better, provided that a sufficient dose can be administered. Adequate control over the blood-pressure level is hindered in some instances by the occurrence of parasympathetic side-effects, which appear to be rather more prominent in most cases than those we have encountered with pentolinium. There are, however, individual differences in patients such that, with equal falls of blood pressure, side-effects may be less in some patients when they are treated with mecamlamine and less in others when they are treated with pentolinium.

Mecamlamine may be used satisfactorily in combination with rauwolfia alkaloids. Delayed toxicity has not been encountered with mecamlamine during our experience of eight months.

This work was supported in part by the Life Insurance Medical Research Fund of Australia and New Zealand. We wish to acknowledge the generosity of Messrs. Merck, Sharp, and Dohme in the supply of mecamlamine, and to thank Miss Noeleen Richardson for her assistance with the secretarial work.

REFERENCES

- Ford, R., Dennis, E., and Moyer, J. H. (1955). *J. Lab. clin. Med.*, **46**, 815.
Freis, E. D. (1955). *Lancet*, **2**, 977.
— and Wilson, I. M. (1955). *Circulation*, **12**, 707.
— (1956). *A.M.A. Arch. Intern. Med.*, **97**, 551.
Keith, N. M., Wakener, H. P., and Barker, N. W. (1939). *Amer. J. med. Sci.*, **197**, 332.
Moyer, J. H., Kinard, S. A., Conner, P. K., Caplovitz, C., Ford, R., Herschberger, R. L., and Dennis, E. W. (1955). *Med. Rec. (Houston)*, **49**, 390.
Restall, P. A., and Smirk, F. H. (1950). *N.Z. med. J.*, **49**, 206.
Smirk, F. H. (1953). *Lancet*, **1**, 457.
— and Alstad, K. S. (1951). *British Medical Journal*, **1**, 1217.
— and Hamilton, M. (1956). *Ibid.*, **1**, 319.
Stone, C. A., Torchiana, M. L., O'Neill, G. Q., and Beycr, K. H. (1956). *J. Pharmacol.*, **116**, 54.

Q FEVER DOWN THE DRAIN

BY

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There is nothing very original about Q fever contracted in the laboratory. Since the early days of research on this disease in Australia and the United States infections have regularly occurred in institutes where live organisms (*Rickettsia burneti*) have been handled, although the incidence has probably diminished since vaccination was introduced in 1948 (Smadel *et al.*, 1948). In most published accounts the mode of infection is apparently airborne, sometimes after transport on clothing (Oliphant *et al.*, 1949; Beeman, 1950), and often after very short exposure.

The main purpose of this paper is to describe two infections in the Department of Pathology, Cambridge, by a route which this highly versatile organism has not previously succeeded in exploiting. Since the investigation of Q fever has now ceased in the department, the opportunity is also taken to review briefly other infections which occurred among members of the staff while the work was in progress.

General Arrangements and Vaccination Procedure

Research on Q fever was carried out in a set of three rooms on the top (third) floor of the department, in an animal-room and post-mortem room on the same floor, and in five small huts on the roof.

Serological investigation of Q fever began in 1947, but living strains of *R. burneti* were not handled until October, 1949. From this date until March, 1955, the rickettsia was grown in large numbers for production of antigen and other purposes. All those who worked in the Q fever laboratory itself were given a course of two or three injections with vaccine kindly supplied by Dr. H. R. Cox, of the Lederle Laboratories. From December, 1953, vaccination was extended more widely to those who were known to visit the laboratory, and, in all, 31 of a total of 83 members of the staff of the department were vaccinated.

Vaccination was not more extensive, because of limitation of supply and also because a chronic sterile abscess sometimes formed at the site of inoculation. In two individuals this progressed to form a discharging sinus which took many months to heal. This complication is thought to occur more frequently after booster injections (Meiklejohn and Lennette, 1950), so these were not generally given.

No cases of Q fever were identified between 1949 and 1953. Between October, 1953, and July, 1954, however, five members of the staff developed typical attacks of Q fever, which were confirmed serologically. Investigation failed to reveal outside sources, and it was assumed that infection took place within the department.

Several outbreaks of Q fever in other laboratories have followed the first growth of *R. burneti* in the yolk sacs of chick embryos, which yield very highly infective material. The number of eggs harvested and the method of processing in Cambridge had not varied much since 1949, however, and the onset of laboratory infections in late 1953 seemed to coincide more with an increase in the number of workers who were handling the organisms, even though, with one exception, they did not themselves succumb.

Of the five individuals who developed Q fever, four (patients B, C, D, and E) worked elsewhere in the building and were unvaccinated. They had all been in their occupations for a number of years. The remaining patient (A) had recently arrived to work on Q fever and was consequently vaccinated. Two patients (D and E) were infected together from a blocked drain. The remainder were unconnected sporadic infections.

Sporadic Laboratory Infections (Not Associated with the Blocked Drain)

Patient A received 1-ml. injections of vaccine on January 4 and 11, 1954. On January 21 he harvested yolk sacs heavily infected with *R. burneti*. On February 11, 21 days after this exposure, he developed Q fever. Complement-fixing antibody was absent on the third day, but appeared on the fourth day—very much earlier in the course of the disease than is usual—and was presumably due to the previous vaccination. The attack was nevertheless moderately severe, until after chlortetracycline was given on February 15.

It is clear that insufficient time had elapsed between completion of the course of vaccination and exposure to large numbers of rickettsiae.

Patient B worked in the histology department on the first floor. Eighteen days before the onset of his illness, on February 21, 1954, he briefly entered the Q fever laboratory to deliver a message. He had no other contact that could be discovered, and it seems highly probable that he was infected during the few seconds that he was in the laboratory.

Patient C, who became ill on October 4, 1953, also worked in the histology department on the first floor. Although he lived in the country no obvious source of *R. burneti* to which he was exposed could be discovered outside the department. He paid occasional visits to the Q fever laboratory, but could remember none during the probable period of exposure. He had contact, however, with one of the assistants in the Q fever laboratory who often took tissues (not infected with *R. burneti*) for sectioning, and it is possible that the rickettsia may have been carried in the clothes or hair (see Beeman, 1950).

Laboratory Infections from the Blocked Drain

Patients D and E both developed Q fever on July 2, 1954. Since they did not meet outside working hours and had no obvious contact with external sources of *R. burnetii*, it seemed likely that they were both infected in the department and at the same time. D had been in charge of the media and autoclave rooms for many years. E worked in the histology room, but he occasionally helped D with autoclaving when there was a lot to be done.

Material from the Q fever laboratory was sometimes taken to D's autoclaves, but until autoclaving was complete it was handled by Q fever laboratory staff and not by D himself. Moreover, E had not been assisting with the autoclaves during the period when infection probably occurred. D did go upstairs to the door of the Q fever laboratory, but not inside, on June 8 or 9 (23 or 24 days before the onset of his illness), but E claimed that he had not been near the Q fever laboratory at this time.

On June 11 at the probable date of infection, 21 days before the onset, a drain had been opened in the media room, flooding the floor. Both D and E were present, and subsequent inquiries strongly suggested that they were both infected at this time.

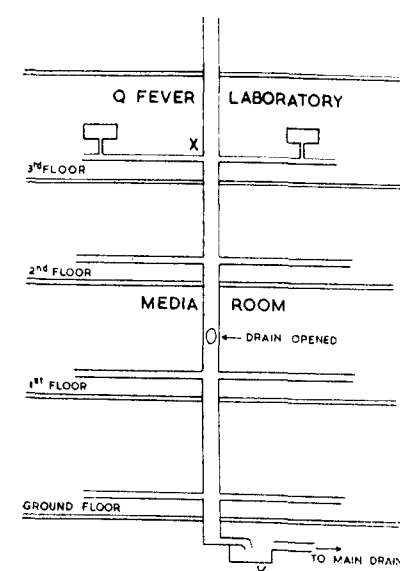


Diagram of relevant part of waste-water-drain system in the Department of Pathology. X=Junction which often became blocked. Y=Trap to main drainage.

including the media room on the first floor, collecting the waste water from lateral drains.

The lateral drain in the Q fever laboratory on the third floor was almost horizontal and the flow was very slow, so that it often became blocked at the junction (X) with the vertical drain and had to be opened at this point to be cleared.

The drain was blocked and cleared in this way on June 10, but on June 11 the obstruction recurred. This time it was lower in the vertical pipe and could not be cleared from the junction (X) in the Q fever laboratory. No clearing-points were present lower in the vertical drain for removing this obstruction, and the pipe was therefore cut open as it descended through the media room. This procedure, which had never been necessary before, released a flood of black sludge on to the floor of the room.

Twelve individuals were present or entered the media room shortly afterwards to see what was going on. Of these twelve, one had had Q fever previously (patient B) and three had received Q fever vaccine. Of the remaining eight susceptible individuals who were exposed, two developed Q fever (patients D and E). Serum was obtained later from four of the six susceptibles who remained well, but there was no antibody rise to suggest asymptomatic infection.

It seemed probable that patients D and E were infected by inhalation of droplets containing *R. burnetii* from the deluge of sludge. Specimens of sludge were therefore collected from the junction of the horizontal and the vertical drain in the Q fever laboratory (X) and from the trap at the bottom of the pipe (Y). These specimens, which were taken in November, 1954, were centrifuged at 2,000 r.p.m. for 10 minutes, and the supernatants were mixed with penicillin and injected into guinea-pigs. *R. burnetii* was isolated in this way from the sludge at the top of the drain, but not from the trap at the bottom.

Viable rickettsiae had not been deliberately poured down the sink in the Q fever laboratory. Infected glassware and other equipment, as well as discarded egg and animal tissues and infected fluids, were normally autoclaved, and some pieces of special apparatus were boiled. An exception was made for Tenbroeck tissue grinders and Waring blenders, however. The heavy coating of yolk which usually remained after processing of eggs made it extremely difficult to clean these pieces of apparatus after sterilization by heat. They were therefore soaked in lysol (approximately 5%) overnight, then were washed in the sink. In earlier investigations of the inactivation of *R. burnetii* by disinfectants (Malloch and Stoker, 1952) lysol was easily the most effective of those tested at room temperature. 1% lysol reduced the infectivity of yolk-sac suspensions by a factor of more than a million in three hours, at room temperature.

Nevertheless the most likely source of the living rickettsiae in the drain was the lysol-treated material. This may have occurred through a mistake in the time of inactivation or the concentration of lysol, which was not accurately measured, or through failure of the disinfectant to penetrate large lumps of yolk tissue. Once in the drain the lysol would rapidly be diluted out, and surviving organisms might remain embedded in the sludge for many months.

Undiagnosed and Asymptomatic Infection of Department Staff

In view of these attacks of Q fever an attempt was made to find out if asymptomatic or undiagnosed infection had occurred more widely than was suspected while work on *R. burnetii* was being carried out.

Of 83 members of the staff in October, 1954, 31 had been vaccinated. Excluding the 5 patients and 10 others who were not available, specimens of serum were obtained from 68 individuals and tested for Q fever antibody by the complement-fixation test.

Of 42 unvaccinated members of the staff, four had antibody (two at 1/5, one at 1/10, one at 1/20). This could have been due to unrecognized infection in the department, but the numbers were too small to show a significant increase over the proportion of the general adult population (blood donors) with antibody. There is no suggestion that unrecognized infection was at all common in the department.

Twelve out of 26 of the vaccinated group had antibody at 1/5 or greater. Antibody was present in all the six vaccinated individuals who were heavily exposed to the rickettsia in the Q fever laboratory, but in only 6 out of 20 of those who were rarely exposed.

Summary and Conclusions

Two Q fever infections in the Department of Pathology, Cambridge, are described: these occurred by an unusual route. A review is also given of other infections which occurred among the staff.

Except for Patient A, the laboratory infections occurred amongst unvaccinated individuals who had a rare and unlucky experience of the rickettsia. It is curious, however, that no infections were ever detected among those of the staff who had close contact with the Q fever laboratory but were nevertheless unvaccinated.

In 1953, before vaccination was offered more widely, nine unvaccinated workers from an adjoining laboratory were sharing a refrigerator in the Q fever laboratory, which they repeatedly entered. None developed either clinical or serological evidence of infection. On the other hand, Patient B entered the laboratory for a few seconds and later succumbed to the disease.

This effect might be due to chance or individual variation in susceptibility. It is possible, however, that small repeated infections produce an immunity which is not detectable by conventional tests for antibody.

The resistance of *R. burnetii* to adverse environmental conditions has allowed its transfer to new hosts by varied and often devious routes. The two infections, which resulted from contamination of the drain-pipe, suggest that the possibilities are not exhausted, but it is fortunate that the circumstances of this particular incident are unlikely to recur frequently.

I am grateful to Professor H. R. Dean for permission to publish this paper.

REFERENCES

- Beeman, E. A. (1950). *Publ. Hlth Rep. (Wash.)*, 65, 88.
Malloch, R. A., and Stoker, M. G. P. (1952). *J. Hyg. (Camb.)*, 50, 502.
Meiklejohn, G., and Lennette, E. H. (1950). *Amer. J. Hyg.*, 52, 54.
Oliphant, J. W., Gordon, D. A., Meis, A., and Parker, R. R. (1949). *Ibid.*, 49, 76.
Smadel, J. E., Snyder, M. J., and Robbins, F. C. (1948). *Ibid.*, 47, 71.

A SURVEY OF DIABETES IN WEST CORNWALL

BY

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The objects of this survey were (1) to determine the incidence of diabetes in the West Cornwall clinical area, which is an isolated geographical entity with a population of a quarter of a million, largely shut off from the rest of England by Bodmin Moor; and (2) to find out to what extent the diabetic patient constitutes a load on the community. In assessing the second object four main agencies were considered: the home, the district nurse, the general practitioner, and the hospital service.

Incidence

Approximately one-third of the population has been surveyed through general practitioners, the doctors taking part being chosen so as to obtain an even geographical distribution and a balance between town and country practices.

In the spring of 1953 preliminary invitations were sent to 55 general practitioners, and a subsequent letter invited each one who agreed to co-operate to survey his list and complete a short questionnaire (see Appendix). In this way figures were obtained covering the practices of 48 doctors distributed from near Land's End to Camelford and Bodmin. These varied in size from just over 500 to one partnership of nearly 13,000. The results are given in Table I. The rate per 1,000 is seen to be 5.6. The incidence varied within the practices surveyed from 3.2 to 8.4 per 1,000.

Of the 593 patients accepted as diabetics, the diagnosis had been confirmed in 579 by attendance at a diabetic or general medical clinic, by blood-sugar investigation, or by previous investigation as a hospital in-patient. The

remainder were accepted after careful scrutiny, and, in some cases, after personal discussion with the doctor making the return. No significant difference was found in the predominantly rural and predominantly urban practices. A cross-check on these findings was made by counting the number attending general medical and

TABLE I.—Incidence of Diabetes in West Cornwall

Total population of West Cornwall	266,389
No. of list patients surveyed	104,827
Percentage of total population surveyed	39.2
Total number of diabetics found	593
Number of diabetics per 100,000 population	565.7
Estimated number of diabetics in West Cornwall	1,507
Percentage attending diabetic or general medical clinics	77.4
Estimated total number attending diabetic or general medical clinics	1,167
Actual number found attending	1,141

diabetic clinics, and the number (1,141) was found to accord closely with the estimated figure obtained from the general-practitioner returns (1,167).

Very little information is available on the incidence of diabetes in this country. During the second world war the necessity to obtain a medical certificate for special rations afforded an opportunity of arriving at an approximate figure. In 1947 it was thought that nearly all diabetics were availing themselves of the extra allowances. The incidence calculated from medical certificates in this year was 231 per 100,000 for England and Wales. It is possible, however, that many of the milder diabetics in rural areas did not avail themselves of the special rations.

The advent of the National Health Service has made it possible to enlist the help of the general practitioner in investigations of this type. In a recently published survey of the work of eleven practices covering the years April, 1952, to March, 1954, it was found that the annual rate of patients having consultations for diabetes varied from 2 to 7 per 1,000 population within the practices investigated. The average annual rate for all the practices was 3.6.

A partial explanation of the high incidence of the disease in Cornwall is provided by a study of the population structure. In this area approximately 19% of the population is aged 60 or over, as compared with 15% for the rest of the country. As diabetes predominates in the older age groups a higher incidence would be expected. A more powerful reason is probably provided by the isolation of the area, with consequent inbreeding in the past. Isolation in West Cornwall has meant a great deal more than lack of intercourse with the rest of England. The small fishing village and rural township have kept themselves apart to a degree rarely seen in the rest of England. Local geography has fostered this isolationism, for many of the coastal villages even to-day have no more than one bus a day or even one a week.

Sex Distribution

The distribution between the sexes is given in Table II, and is compared with that derived from a count of special ration certificates for the whole of the country in 1947. It will be seen that the sex distribution in Cornwall closely follows that of England and Wales as a whole. The

TABLE II.—Sex Distribution

	Males		Females	
	No.	%	No.	%
General-practitioner survey	234	39.5	359	60.5
Old clinic cases	173	39.3	267	60.7
Present Truro Clinic	178	36.9	304	63.1
England, 1947 (special ration certificates)		38.0		62.0

slightly greater predominance of female patients at the clinics as compared with the general-practitioner survey may be explained by the fact that the principal clinic in the area is held at 10 a.m., so that men in jobs may have some difficulty in attending.

Age at Onset

In relation to the load on the community it is necessary to consider the age at which the disease first produces symptoms and the manner of its presentation.

The average age of onset as determined from the case records of 901 clinic patients was 52 years. The age of onset in relation to sex shows a striking difference between male and female diabetics (see Chart). The female curve rises

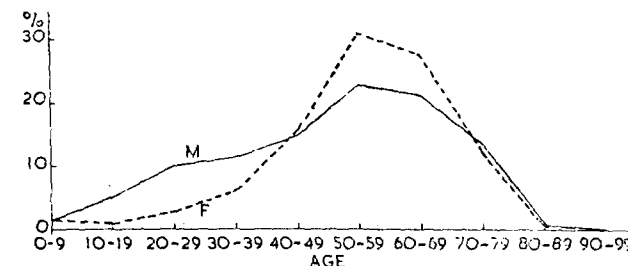


Chart showing age at onset of diabetes in males and females.

sharply to a peak in the sixth and seventh decades while the male curve is flatter. Of greater interest perhaps is the relative preponderance of males in the first four decades and the tendency for this preponderance to reappear in extreme old age. The effect of this on the incidence of the disease in the over-70 age groups is accentuated by the tendency in West Cornwall for the female diabetic to die at an earlier age than the male (see below). The striking excess of females in the sixth and seventh decades is well known and accounts for their overall preponderance in the survey (60.5% in a total of 693 cases).

Mode of Onset

The material used for this part of the investigation was the case records of 573 clinic patients, in nearly all of which the history had been taken with this investigation in mind. It will be seen from Table III that the classical symptoms of thirst, polyuria, and weight loss constituted the reason for seeking advice in only 41.4% of the cases. Incidental illness and routine examination together account for the first attendance of 13.5% of all the cases attending. Some of these were picked up by shrewd general practitioners looking after minor illness such as influenza at home. Most, however, were diagnosed on admission to hospital for illness in no way associated with diabetes. Routine medical examination for life assurance, for the Services, or for employment led to the diagnosis of 3.7%.

TABLE III.—Mode of Onset in 573 Cases

Classical (thirst, polyuria, weight loss)	237 (41.4%)
Incidental illness	56 (9.8%)
Eye complications	38 (6.6%)
Pruritus and eczema	53 (9.2%)
Skin sepsis (including foot sepsis)	46 (8.0%)
Weight loss alone	30 (5.2%)
Routine examination	21 (3.7%)
Lassitude alone	12 (2.0%)
Neuritis	9 (1.6%)
Coma or pre-coma	20 (3.5%)
Gangrene	20 (3.5%)
Other	31 (5.4%)

A consideration of these groups raises the question of whether there are not in the community to-day many diabetic patients more or less symptom-free and therefore undiagnosed. While it is true that many of this group on direct questioning admitted having symptoms of diabetes such as polyuria, they were not such as to bring them to medical attention. It seems likely, indeed, that routine urine testing of the whole community would lead to a further substantial addition to the figure of incidence in this area at least.

The figure for skin sepsis includes also cases presenting with foot sepsis. All but one of the cases of gangrene were of the lower limb. Several of the 20 cases presenting in coma or pre-coma appear to have had no symptoms suggestive of the disease till a few days before the onset of coma.

Use of Clinics

Information was obtained on this subject from the answers to the questionnaire. They show that 77.4% of all patients attend either a diabetic or a general medical clinic (Table IV). Some were attending more than one clinic at

TABLE IV.—Attendance at Clinics

Total number of diabetics found (G.P. survey)	593
Information re clinic attendance not given	26
Remainder	567
Attending clinics	445 (78.5%)
" diabetic clinic	418 (73.7%)
" general medical clinic	21 (3.7%)
" other clinics	11 (2.0%)
Hospital in-patients	26 (4.6%)

the same time—for example, diabetic and chest. Some were regarded as still attending the clinics though in-patients at the time of the survey.

The extent to which the clinics were used varied widely, and this variation appeared to bear no relation to geographical accessibility. For example, in one large practice returning 63 patients all but three of these attended the diabetic clinic four miles away. In the same town the attendance rate from another doctor's practice was 18%. It was clear that a small proportion of the general practitioners regarded themselves as competent to look after their own diabetics and referred to the clinics only those presenting special problems.

It might be thought, particularly in a sparsely populated rural area, that age would exert a considerable influence on attendance, but this is apparently not so. The average age of those attending the clinics is 64, of those not attending 65. Of the 120 patients shown as not attending the clinics in the general-practitioner returns, 50 (41.7%) were males and 70 (58.3%) females. These figures show a slightly greater attendance rate for females than for males in proportion to their total numbers.

Problems of the Home

These are mainly those constituted by special diet, insulin administration, and intercurrent illness. Of these, the dietetic problem gives rise to least anxiety in the minds of diabetic patients. Of 501 patients investigated at the Truro Clinic, 100 (20%) were adhering to a strict dietetic regime (Lawrence line ration scheme); 363 (72.4%) were observing some dietetic restriction short of this; and 38 (7.6%) might be regarded as observing no dietetic restrictions.

It is probably true to say that the problem of diet constitutes a handicap to no more than 20% who adhere to a strict regime. The problem of insulin administration, however, is of a different order. Of the clinic patients, 18% are found to require no insulin, 37% use one type, and 45% two types (generally soluble and protamine zinc) daily, while 5% of all patients attending require more than one injection of insulin daily. Thus insulin administration constitutes a problem in 82% of all cases, and amongst this number the problem is of several grades from the point of view of domestic responsibility. The patient who requires one injection daily of one type of insulin is much less of a problem than the patient who has to manipulate two separate phials, while the patient who requires two daily injections may be much restricted in activity if she is not able to cope with the problem herself.

Table V shows the home arrangement for insulin administration in 383 patients attending the Truro Clinic. It shows that the problem confronting the female patient is solved through a wider variety of agencies than that of the male. The number of patients regularly giving their own injections is 80.4% of the males and 62.5% of the females. For those, however, who are unable to give their own injections the wife proves more valuable to the helpless

TABLE V.—Insulin Administration in 383 Cases

	Males		Females	
	No.	%	No.	%
Self	111	80.4	153	62.5
Wife	18	13.0	—	—
Husband	—	—	26	10.6
Father	1	0.8	1	0.4
Mother	—	—	1	0.4
Daughter	3	2.2	27	11.0
Son	2	1.4	8	3.2
Neighbour	1	0.8	9	3.7
Nurse	2	1.4	20	8.2
Total	138		245	

Nurse gives 5.7% of all insulin injections. 69% of all patients give their own insulin.

husband (13%) than the husband to a dependent wife (10.6%). The helpless female patient in fact chooses from a wide range of assistance of which daughter, husband, and district nurse are the most important. The helpless husband tends to rely exclusively on his wife, and usually only when a widower does he resort to help from other agencies.

The figure of 5.7% of all injections given by the district nurse is probably too low. In country districts she plays an important part in the training of the patient or a relative in insulin administration. This applies particularly to the milder diabetic who is stabilized as an out-patient. This phase ended, she generally ceases to attend except for the small percentage who are dependent on her for daily insulin. There are some, however, who require a supervisory visit once a week or oftener, and on these occasions the nurse usually gives the insulin. In some cases where measurement of the correct dose constitutes the main problem she may fill the syringe and leave it for the patient herself to administer the next day. In some cases of defective eyesight a member of the household measures the dose and the patient gives the injection.

The commonest reasons given for inability to administer their own insulin were defective eyesight, nervousness, and general frailty of old age. Though defective eyesight was the commonest reason given it often seemed to be mainly an excuse to cover lack of courage. The relationship to age was very definite, as shown by Table VI. From this

TABLE VI.—Age and Inability to Give Own Insulin

Age Group	0-9	10-	20-	30-	40-	50-	60-	70+	Total
Total on insulin	4	6	8	25	42	90	115	93	383
Dependent on others	3	1	0	2	4	18	33	52	113
%	75	16.6	0	8	9.5	20	29	56	29.5

it is seen that dependence on others for insulin administration increases numerically in each decade from the third and that more than half of those over 70 are dependent on others for this service.

Intercurrent Illness

How much illness does the diabetic patient have? In an attempt to answer this question 483 patients passing through the clinic at Truro were questioned at each quarterly attendance during 1954 regarding illness in the previous three months. The investigation has now been continued, and has been completed for the year 1955, during which 663

TABLE VII.—Days in Bed 1954 and 1955

	Males		Females	
	1954	1955	1954	1955
None	139 (77.7%)	216 (82.4%)	214 (70.4%)	317 (79%)
1-7 days	14 (7.8%)	15 (5.7%)	27 (8.9%)	24 (6%)
8-15	19 (10.6%)	25 (9.5%)	55 (18.1%)	50 (12.5%)
Over 15 days	7 (3.9%)	6 (2.3%)	8 (2.6%)	10 (2.5%)
Total	179	262	304	401

patients were questioned. The results are set out in Table VII. At the onset it became clear that in dealing with the older age groups it was extremely difficult or impossible to obtain a true measure of morbidity. Many of the patients are frail or infirm. Standards based on fitness for work or confinement to the house have little meaning in a group in which many are over working age or are housewives doing a limited job of work in their own homes. In the end it was decided to inquire about days spent in bed through illness. Two main reasons for this inquiry were (1) such illness constitutes a load on the home to a much greater extent than that which does not require rest in bed, and (2) it is a measurable entity which the patient can easily remember.

From this investigation the fact emerges that 73% of all patients had no illness requiring rest in bed in the year 1954 and that the proportion was rather higher for 1955, a year in which less respiratory illness and fewer fractures of the lower limb occurred. These figures might not be so good if they included diabetics not attending the clinics. This point is discussed below.

The figures also include time spent by clinic patients in hospital. Owing to the large number of hospitals involved it has not been possible to determine this figure accurately for clinic patients, but the hospital requirements of the total diabetic population of the area are discussed in a later section.

It will be seen that illnesses of one to five weeks predominated in the females in both years reviewed. This was due almost entirely to the greater tendency to fracture of the lower limb and abdominal operations in this group.

TABLE VIII.—Principal Causes of Incapacity During 1954 and 1955

	1954	1955
No. of patients questioned	483	663
Total No. of bed days, all patients	2,385	2,727
Average for all patients attending the clinic	4.9	4.1
" laid up	18.2	21
Total No. of patients confined to bed	131	130
Respiratory infections: colds, influenza, bronchitis, sinusitis, pneumonia	666 days	632 days
Percentage of all bed days	27.9	23.2
No. of patients affected	42	43
Recognized diabetic complications: coma, pre-coma, hypoglycaemia, cataract extraction, skin sepsis, gangrene	370 days	377 days
Percentage of all bed days	15.5	13.8
No. of patients affected	26	28
Abdominal operations	307 days	276 days
Percentage of all bed days	12.9	10.1
No. of patients affected	12	10
Fractures and other injuries	249 days	82 days
Percentage of all bed days	10.4	3.0
No. of patients affected	7	4
Cardiovascular disease	171 days	262 days
Percentage of all bed days	7.2	9.6
No. of patients affected	5	9
Rheumatism, fibrositis, backache	55 days	58 days
Percentage of all bed days	2.3	2.1
No. of patients affected	6	5
Infectious fevers	149 days	118 days
Percentage of all bed days	6.3	4.3
No. of patients affected	7	6
Pulmonary tuberculosis	0	310 days
Percentage of all bed days	0	11.3
No. of patients affected	0	2

Table VIII gives the time spent in bed with the principal groups of illness. It amplifies Table VII and shows that the average number of days during which a clinic patient was laid up was 4.9 and 4.1 respectively for the years 1954 and 1955. There was a slight predominance of illness in the females: this was more definite in the year 1955, in which the average duration of bed illness was 3.6 days for males and 4.5 for females. In this respect the findings agree with those of the general-practitioner survey recently published by the General Register Office (1956).

An analysis of the illnesses shows that those which predominate in the lives of diabetics are not the recognized complications of diabetes but the sort of illnesses prevalent in the general community of corresponding age, with some diabetic complications added. These latter account for only about one-seventh of all bed days.

The predominance of respiratory ailments in a group which includes a large percentage over 60 is not surprising.

The small figure for pulmonary tuberculosis emphasizes the comparative infrequency of this disease in the controlled diabetic to-day. The incidence of gall-bladder disease is certainly much higher than the figure given under this heading suggests. It could be assessed accurately only by radiological examination of a large number of diabetic patients. No figure is given for the incidence of hypoglycaemic reactions. These are very common, and it is probable that in the course of seven years nearly every patient has experienced hypoglycaemic symptoms. In an educated diabetic community, however, these seldom amount to much except in the brittle unstable diabetic, who constitutes a problem in every diabetic clinic.

The main figures showing the work of the district nurse for diabetics are set out in Table X. The principal information that emerges from this investigation is that the district

Total No. of district nurses involved	98
No. of diabetic patients in the area (estimated)	1,507
" " visited in 1954	228
Percentage of all diabetics visited	15.1
Total No. of general nursing visits to all sick patients in the area in 1954	135,468
Total No. of visits paid to diabetics	25,068
Percentage of total visits paid to diabetics	18.5
No. of visits per diabetic patient visited	110
Average No. of visits per diabetic patient in the area	16.6
No. of diabetics requiring regular visits	125
Percentage of all diabetics in the area	8.3
No. dependent on district nurse for daily insulin	96
Percentage of all diabetics in the area	6.4

As already suggested, some of those whom the district nurse regards as dependent are not in fact given the daily injections by her. She may visit the patient on one day, give the injection, and leave a further dose ready for administration the next day by a member of the family or by the patient. The number of patients in whom insulin administration is a combined operation between nurse, patient, and family would appear to be considerable.

The amount of work done for diabetics in the area by general practitioners is set out in Table XI. A large number of general practitioners failed to answer this section of the

Home Visits	
Total No. of diabetics	593
No information	131
Remainder	462
No. visits	236 (51.1%)
1-5 visits	124 (26.8%)
6-10	40 (8.7%)
Over 10 visits	62 (13.4%)
Total No. of visits paid to	1,721
Average per diabetic patient	3.7
" " " " visited	7.6
Surgery Attendances	
No. of attendances by	2,815
Average per diabetic patient	6.1

	No.	Visits	Average	Surgery Attendances	Average
Males	187	454	2.4	1,459	7.8
Females	275	1,267	4.6	1,356	4.9

There was wide variation in the amount of visiting and surgery attendance from patient to patient and from practice to practice. For example, one patient was returned as

In association with the figure of 49% of patients requiring some domiciliary visiting during the year by the general practitioner should be considered the figure from Table VII of 70 to 82% of patients having no days in bed. From this it seems clear that a large number of the doctors' visits are made to patients who are not confined to bed. The patient, for example, with an attack of bronchitis or a sore foot will stay indoors and send for the doctor, but he will often weather the illness in his armchair by the fire. Further

The last section of Table XI compares the attention given to male and female patients at home and at the doctor's surgery. It will be seen that while the male diabetic gets most of his attention at the doctor's surgery the female patient gets it mainly at home. This is no doubt related to the fact that men can more readily arrange to fit in surgery attendances on the way to and from work. It is, however, in contrast to experience at the clinics, where the tendency is for a better attendance of women than men in proportion to their overall numerical distribution.

What are the hospital requirements of diabetic patients? Why do they go there and how long do they stay? The answers to these questions were sought by inviting each of the 22 hospitals in the area to supply information regarding diabetic admissions during the year 1954-5 and by taking a census of diabetics in hospitals in the area on a day in November, 1955. Table XII shows the result of the first of these investigations. About 42% of those seeking admission to hospital did so for reasons not directly associated with the diabetes. This is not surprising in view of the findings for illness in the home. The diabetic picture is, however, more prominent in Table XII than in that of home illness (Table VIII). This is largely accounted for by the large number who have to come in for initial stabilization. The comparatively low incidence of respiratory ailments contrasts sharply with the high figure for illness in the home. This is in keeping with the general trend of medical care to-day, for the general practitioner can usually cope with such ailments even in the diabetic patient unless severe complications arise.

Diabetic Causes		Non-Diabetic Causes	
Stabilization	51	Congestive failure	6
Restabilization	10	Other heart disease	3
Cataract and other eye complications	17	Cerebrovascular disease	8
Skin sepsis	12	Gall-bladder	6
Hypoglycaemia	12	Thyroidectomy	2
Diabetic coma	9	Cancer	6
Pre-coma	4	Fracture (5) other injuries (2)	7
	115	Respiratory infection	5
		Pulmonary tuberculosis	8
		Other infections	4
		Intestinal haemorrhage	4
		Prostatic enlargement	3
		Acute abdomen	2
		Social reasons	6
		Pregnancy	3
		Other	10
			85

From a study of all the hospital figures it is possible to hazard a guess at the bed requirements for diabetics which may serve as a guide to those planning diabetic units. On

the basis of an average stay of 14 days a 15-bed unit in this area should be able to cope with approximately 300 admissions per annum, which is 73 in excess of the total admission figure for the area for the year 1954. Approximately three-fourths of the admissions were to medical wards, so that, given an even admission rate, 12 beds could deal with all medical admissions. There are, however, seasonal fluctuations, so that the actual range of bed occupancy for medical diabetics is from 5 to 18. There are also generally some patients waiting for admission. Taking all these factors into consideration, it seems reasonable to suggest a figure of one medical bed for every 100 of the diabetic population. The provision of a similar number of long-stay beds to cope with social and special clinical problems seems necessary.

Table XIII shows the cause of death, so far as can be ascertained, of 76 diabetics who have died in this area in the past three years. The figures were obtained partly from a follow-up of all diabetics who cease to attend the

TABLE XIII.—Recorded Causes of Death in 76 Diabetic Cases

	No. of Cases	%	Registrar-General (Total Pop.)
Cerebrovascular accidents	17	51.3	59
Coronary thrombosis	11		
Congestive failure	9		
Kidney disease	2		
Diabetic coma	7	9.2	
Respiratory infection	6	7.9	7
Cancer	6	7.9	17
Post-operative deaths	4	5.3	
Senility	4	5.3	
Bleeding peptic ulcer	2	2.6	
Pulmonary tuberculosis, suicide, appendix abscess, subcutaneous abscess, pulmonary embolism, acute pancreatitis, urinary infection, gangrene	8	10.5	

clinics at Truro and Redruth and partly from a search of hospital records. It is believed that these are more accurate than those obtained from registration returns. Joslin *et al.* (1952) estimate that in the United States only about two-thirds of diabetics who die have their diabetes mentioned on the death certificate. It seems probable that the practice here is similar.

The figures in the third column provide a comparison with those derived from the Registrar-General's (1955) returns for Cornwall for the year 1954. It seems surprising that there is not a greater incidence of death from cardiovascular and renal disease in diabetics than in the general population. The series, however, is a small one, and it is possible that the figures might look substantially different if the investigation were extended for 10 years. The number of deaths from diabetic coma (seven in three years) is small, but could probably be further reduced with better liaison between hospital and general practitioner. In a concentrated urban area, with good hospital facilities for dealing with this emergency, deaths from diabetic coma might well be eliminated.

Table XIV shows the age at death of 129 cases (50 men and 79 women) for which this information was available. It is worth noting that the peak decade for deaths is the

TABLE XIV.—Age at Death of 129 Patients

Age:	0-39	40-49	50-59	60-69	70-79	Over 80
Men	2	2	8	11	18	9
Women	2	1	16	32	26	2
Total	4	3	24	43	44	11

Average age at death: men, 68.9 years; women, 66.1 years.

eighth for men and seventh for women. The average age at death of the 50 men was 68.9 years and of the 79 women 66.1 years; for both sexes it was 67.1 years. The figure compares with that of 61.9 years given by Joslin *et al.* (1952) for 656 of their own patients. We are, however, dealing with an older population in West Cornwall, which may partly explain the high average age at death. It should be remembered also that the figures given are derived from a follow-up of clinic patients personally supervised: the

figures for the whole diabetic population would almost certainly be less favourable.

A study of registration figures for the administrative County of Cornwall for the year 1954 discloses the fact that 54% of male deaths and 67% of female deaths occurred at 70 or over. The corresponding figures in this diabetic series are 54% (male) and 35% (female). It appears, therefore, that diabetes as seen in Cornwall has a definite effect on the expectation of life in the female patient, but little or no effect on that of the male.

Summary

In a survey of diabetes in West Cornwall the incidence of the disease has been found to be 5.6 per 1,000 of the population. This figure is high in comparison with previously published figures for the country as a whole.

The sex distribution (3 female : 2 male) follows that of the country as a whole.

An attempt has been made to measure the load on the community by assessing the work done by general practitioners, district nurses, hospitals, and the patients' relatives and families.

A study of the age of onset shows a tendency for males to predominate up to age 40, with a striking excess of females in the sixth and seventh decades. There is a tendency for male predominance to reappear in old age.

Less than 50% of the patients present with the classical symptoms of thirst, polyuria, and weight loss.

Seventy-seven per cent. of the patients attend a general medical or diabetic clinic.

The problems of the home are mainly those of insulin administration and intercurrent illness: 80% of male and 62% of female diabetics requiring insulin administer it themselves.

For those unable to give their own insulin the wife usually provides the necessary assistance for the helpless husband; to the dependent female patient help is most often given by the daughter, district nurse, or husband.

More than three-fourths of the patients attending the clinics had no illness requiring rest in bed during the course of a year. The average number of days spent in bed with sickness was 4.9 in the year 1954 and 4.1 in 1955. The female patient tended to have rather more illness than the male. Respiratory illnesses predominated in the home. Diabetes and its complications were responsible for only 15.5% and 13.8% of all days in bed in the two years investigated.

The district nurse visits 15.1% of all diabetic patients in a year and is responsible for daily insulin administration in about 6.4% of all patients.

The general practitioner sees the average diabetic patient 10 times in the year. He is consulted by 91% at some time during the year. Home consultations predominate for women and surgery consultations for men.

The commonest reason for admission to hospital was initial stabilization: 42.5% of all admissions were for reasons not connected with the diabetes.

It is suggested that one medical bed for every 100 of the diabetic population is required in this area.

Cardiovascular disease was responsible for death in more than half of 79 patients followed up. The disease in Cornwall appears to affect the expectation of life in the female but not in the male. The age at death for both sexes was 67.1 years.

I am indebted to the 48 general practitioners who co-operated in this survey; to Miss A. White, who provided the information on the work of the district nurses; and to the hospital secretaries and matrons for figures of diabetic admissions.

APPENDIX : QUESTIONARY SENT TO G.P.s

Patient's initials.....
 Present age if known.....
 Sex.....
 Whether attending a clinic:
 (a) Diabetic clinic.....
 (b) General medical.....
 (c) Other.....
 Whether at present a hospital in-patient:
 (a) General medical ward.....
 (b) Chest hospital.....
 (c) Geriatric service.....
 (d) Mental hospital.....
 (e) Other.....
 If no hospital contacts, diagnosis based on:
 (a) Previous hospital investigations.....
 (b) Symptoms and urinary findings.....
 (c) Blood-sugar examination.....
 During 1954 how many visits did this patient require:
 (a) Home visits.....
 (b) Surgery attendances.....
 Is this patient at present having insulin?.....
 Number of list patients surveyed.....
 Number of diabetics found.....
 Private diabetic patients under your care.....

Remarks:
 If information not available enter O. Signature:

REFERENCES

- General Register Office (1956). *Studies on Medical and Population Subjects*, No. 9. H.M.S.O., London.
 Joslin, E. P., Root, H. F., White, P., and Marble, A. (1952). *The Treatment of Diabetes Mellitus*, 9th ed. London.
 Registrar-General (1954). *Quarterly Returns for England and Wales*. H.M.S.O., London.
 — (1955). *Statistical Review of England and Wales for 1954*. H.M.S.O., London.

OUTBREAK OF STAPHYLOCOCCAL INFECTION IN A SURGICAL WARD

BY

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Outbreaks of staphylococcal infection in surgical wards are not very uncommon, but they are rarely recorded in print. This is partly because opportunities are not often available for extensive investigation, and in consequence the source of infection can rarely be traced. Nevertheless, the paucity of published records makes more difficult the study of new outbreaks as they occur.

It so happened that the outbreak described in this paper could be investigated in some detail, and, perhaps for this reason, we have been able to indicate a possible way in which infection may have been spread.

Clinical Features

The surgical unit concerned consisted of an operating theatre and a male and a female ward, each containing

25 beds. The wards were large and airy and the beds were spaced approximately 6 feet (1.8 m.) apart. Before May, 1956, sporadic cases of staphylococcal infection had occurred in both wards. On May 2 a wound-book was begun in order that a more reliable measure of the incidence of sepsis could be obtained. Against each patient's name was entered the name of the surgeon, details of the operation, and the condition of the patient's wound during convalescence. Wounds in which pus could be seen were regarded as septic; patients whose operations were through infected areas were excluded in assessing the sepsis rate.

Between May 2 and June 25, 86 clean operations were performed: three of the patients died post-operatively from causes unrelated to sepsis; of the remaining 83 patients, 24 developed sepsis in their wounds (Table I). Most of this

TABLE I.—Sepsis Developing in Clean Wounds, May 2 to June 25, 1956

	No. of Operations	No. Infected	Other Staphylococcal Infections
May 2-6	7	4	1 chest infection
" 7-11	7	4	
" 12-16	8	2	
" 17-21	3	0	
" 22-26	10	0	1 urinary "
" 27-31	12	3	
June 1-5	7	2	
" 6-10	4	3	
" 11-15	9	3	1 chest, 1 urinary infection, 2 enteritis
" 16-20	9	2	1 chest, 1 urinary infection, 1 enteritis
" 21-25	7	1	

sepsis was in the male ward, where 18 out of 43 patients became infected as compared with 6 out of 34 women. Six children brought from the children's unit in another part of the hospital to the operating theatre and returned after operation had no septic complications. *Staphylococcus pyogenes* was recovered in culture from 17 of the infected wounds. From two coliform bacilli were grown, and from five no swabs were taken.

Seven of the male patients developed staphylococcal infection of sites other than the operation wound, including five chest infections and three urinary infections. Finally, by June 25 three patients were found to have staphylococcal enteritis, and, because of this and the number of other infections, it was decided to stop operating, and the male ward was closed.

In addition, the male ward contained six patients operated on before May who, before or during May, became infected with staphylococci. Of these six, one had a pelvic abscess, two had infected wounds, two had urinary infections, and three had chest infections. One of these last patients developed an abscess involving most of the upper lobe of the left lung.

Staphylococci Responsible for Infection

The staphylococci isolated from infected wounds were all of a strain of *Staph. pyogenes* resistant to penicillin, streptomycin, and tetracycline, but at first sensitive to chloramphenicol and erythromycin. Later, as a result of treatment, variants resistant to chloramphenicol or erythromycin appeared. Twelve of the 17 staphylococci isolated from lesions were typed by the bacteriophage method and all were found to belong to one type, with the phage-sensitivity pattern 47/53/75/77. Some strains were lysed only by phages 53, 75, and 77, and some by 75 and 77 alone, but all were considered to belong to the same type. There was no correlation between these minor variations in phage-sensitivity pattern and the change in antibiotic sensitivity. Staphylococci that were not tested, but had the same sensitivity to antibiotics, were considered to belong to the same type in view of our failure at that time to find any strain with the same characteristics but belonging to a different phage type. With one exception, all the staphylococci isolated from patients with infective complications belonged to the epidemic type.

In the case of enteritis, chest infection, and urinary infection the staphylococci were plainly acquired in the ward. The source of the staphylococci infecting the wounds was not so clear. The majority of infections were thought on clinical grounds to be theatre infections, an early rise in temperature and pus developing deep in the wound being the main criteria.

Staphylococci in the Operating Theatre

In a report of post-operative wound infection occurring in another unit in this hospital (Shooter, Taylor, Ellis, and Ross, 1956) the opinion was expressed that infection originated from air-borne organisms sucked into the theatre from adjacent wards. There seemed less reason to incriminate air in this case.

There was some suction of air into the theatre from the corridor outside, but this was less than in the unit described before, and the total bacterial air counts in the theatre were substantially lower. Search for staphylococci in the theatre air showed a variety of types to be present. On May 30 50 cu. ft. (1.416 cubic metres) was sampled, and six staphylococcal colonies were recovered, five of which belonged to the epidemic type. Examination of 50 cu. ft. (1.416 cubic metres) of air on June 6 yielded three staphylococcal colonies, none of the epidemic type, and a further examination of 540 cu. ft. (15.29 cubic metres) of air on June 20 yielded 26 staphylococcal colonies, only 2 of the 25 typed being of the epidemic type.

Altogether the 35 staphylococci isolated included 15 different phage types. If the wound infections had been chiefly due to air-borne bacteria the staphylococci cultivated might have been expected to reflect the diversity of types present in the theatre air. The fact that they did not suggested some other source of infection.

A clue to this source was given by the examination of nasal swabs from the theatre team. Swabs were taken from 17 members of the team, including surgeons, nurses, students, and the orderly, and from seven of these swabs *Staph. pyogenes* was recovered. From only one person, however, were staphylococci of the epidemic type isolated. Examination of this individual's movements strongly suggested that he was concerned with infection of the wounds. Of the 45 operations in which he took part 21 resulted in infection. On the other hand, of the 38 patients operated on in his absence, only three became infected, and of these one was infected with coliform bacilli, and the other two may have been ward infections. Furthermore, he had been on leave from May 14 to 27, and during this time, with the exception of the wound infection due to *Bacterium coli*, no patients operated on developed septic wounds.

The surgical members of the unit worked as two teams, and it was possible that infection was the result of some difference in technique or came from some other person. This appeared improbable in view of the failure to detect any other carrier of the appropriate staphylococcus, and was not supported by a more detailed analysis of the wound-book. The team to which the carrier did not belong carried out 29 operations, three of which were followed by sepsis. The other team, with the carrier, performed 54 operations, and 21 of these patients developed infected wounds. However, of these 54 operations, 40 were done in the carrier's presence, and 20 of the 21 infections came in this group. Of the 14 patients operated on in his absence, only one became infected, and that infection was due to *Bact. coli*.

On three occasions the carrier was examined after he had been wearing rubber gloves; his hands were moist, and staphylococci of the epidemic type could be recovered from the fingers and the insides of the gloves. The same finding was recorded after preliminary washing of the hands with soap and water and a scrubbing-brush. In two of these experiments he was dressed in clean surgical uniform and incarcerated in a sterile room for 10 minutes. On neither occasion were staphylococci of the epidemic type

recovered from the air. Such staphylococci were, however, isolated from the air when he was shut in the room in his ordinary clothes. The carrier yielded a heavy growth of staphylococci from his nose on all the occasions on which he was examined; his faeces also yielded numerous staphylococci of the same type.

Staphylococci in the Wards

During this investigation there was less wound sepsis in the female ward than in the male ward, only 6 women out of 34 developing septic wounds, as compared with 18 out of 43 men. There was still, however, a suggestion that the carrier in the theatre was concerned, since of the 15 operations on female patients which he attended four were followed by sepsis, whereas of the 18 when he was absent only two wounds were infected, and in one of these the cause was *Bact. coli* and the other was almost certainly a ward infection. The patients in the female ward were also free from staphylococcal complications.

In the male ward *Staph. pyogenes* was carried in the nose by 7 out of 10 nurses, but only one of the strains was found to be of the epidemic type. This nurse, and the carrier from the surgical team, constituted a source of infection in the ward, but a very much more prolific source was provided by the patients themselves. This applied particularly to the patient with an extensive lung abscess who was present in April and throughout May. During most of the period this elderly man was producing copious sputum which despite treatment contained very large numbers of staphylococci.

Air samples were taken in the ward on May 10, 11, 18, and 22, and June 13 (Table II). In the first samples, other strains besides the epidemic strain were present, but by May 18 the epidemic type was predominant, and it remained so.

TABLE II.—*Staph. pyogenes* in Air Samples Taken in the Male Ward, May 10 to June 13, 1956

Date	Volume of Air Sampled		<i>Staph. pyogenes</i> Colonies	
	cu. ft.	m. ³	No.	Proportion Epidemic Type
May 10	60	1.70	22	4/11
" 11	60	1.70	8	2/5
" 18	125	3.54	29	11/12
" 22	120	3.40	14	7/8
June 13	450	13.00	623*	22/22

* Estimated number on phenylphthalein phosphate plates: coagulase tests done on 158.

In all the samples counts of general bacteria ranged between 19 and 51 colonies per cubic foot (0.028 cubic metre) of air.

Air collected on June 17 in the corridor joining the male and female wards to the operating theatre showed *Staph. pyogenes* to be present. Of 26 strains tested, 10 belonged to the epidemic type.

Further evidence of the large number of staphylococci present in the male ward was given by examination on June 27 of blankets from three patients with staphylococcal enteritis and of eight of the bed curtains. Both blankets and curtains were tested by the sweep-plate technique (see Blowers, Potter, and Wallace, 1955), and all were found to be heavily infected. Of the many staphylococci recovered, 28 were typed, and all but one were of the epidemic strain.

Closure and Cleaning

In view of the sepsis rate and the simultaneous onset of staphylococcal enteritis in three patients, it was decided on June 28 to cease operating, and to clean and, if possible, disinfect the male ward. All the patients were therefore removed, either by discharge or by transfer to isolation in other parts of the hospital. Movable articles in the ward were disinfected by boiling, treating with formalin vapour, or spraying with sodium hypochlorite solution as seemed

most appropriate. The ward itself was most vigorously cleaned by spraying from ceiling to floor with a power-driven spray of sodium hypochlorite solution (0.17%).

No such steps were taken in the female ward. This was partly because of the better record of the ward, and partly because the result of examination of the air on June 27 was reassuring. Altogether 375 cu. ft. (10.62 cubic metres) of air was examined, and, although 16 colonies of *Staph. pyogenes* were isolated, none belonged to the epidemic type. General bacterial counts were also low, averaging 6.6 per cu. ft. (0.028 cubic metre). The decision not to close this ward was justified by the fact that none of the 39 patients operated on before the unit finally closed on August 22 for redecoration developed sepsis due to *Staph. pyogenes*.

Opening of the Male Ward

During the cleaning of the ward the carrier in the surgical team and the nurse who carried the epidemic staphylococcus left the unit. The ward was opened on July 3 and stayed open until August 22. At first, examination showed a great reduction of the staphylococcal and general bacterial population. For example, the count for the latter ranged between 5 and 10 colonies per cu. ft. (0.028 cubic metre) of air on July 3 and 4. Sweep-plates taken from 10 blankets on July 3 and 4 failed to grow any staphylococci. As the ward was reoccupied bacterial counts rose, and the results of sampling for general bacteria in the air showed a steady climb to a maintained level—approximately 16 colonies per cu. ft. (0.028 cubic metre). This climb was accompanied by an increase in the staphylococci in the ward air (Table III), and a return of the epidemic type.

TABLE III.—Colonies of *Staph. pyogenes* Recovered from the Air of the Male Ward After Cleaning

Date	Volume of Air Sampled		<i>Staph. pyogenes</i> Colonies	
	cu. ft.	cu. m.	No.	Epidemic Type
July 3	100	2.83	1	0
" 4	195	5.52	3	0
" 10	195	5.52	5	0
" 31	200	5.66	12	3
Aug. 13	110	3.11	12	26
" 14	75	2.12	29*	

* Includes 18 colonies from 5 cu. ft. (0.14 cu. m.) when a bed was being made.

There was again little to suggest that the staff were chiefly responsible. Nasal swabs taken from 34 members of the unit on August 9, 10, and 11 failed to yield any staphylococci of the epidemic type.

At first the return of staphylococci to the surgical ward was not accompanied by infection. This freedom was, however, only temporary, and infections occurred on July 27 and August 2, 4, and 7. Two of these—an infection around an indwelling catheter and a septic wound—were caused by the type of staphylococcus previously present in the ward. The other two, an enteritis and a wound infection, were due to a staphylococcus of different type. During this time 47 men underwent clean operations.

On August 22 the ward was closed for painting, which had been previously arranged.

Discussion

Outbreaks of staphylococcal infection have been attributed to a variety of sources. Wells and Wells (1936, 1938) and Hart (1937) suggested the possibility of air-borne infection during operations, and, more recently, Blowers, Mason, Wallace and Walton (1955) and Shooter *et al.* (1956) described wound infections which they thought were due to staphylococci from the air of the operating theatre.

In other cases infection was apparently transmitted to the patients by a single carrier, as in the outbreak described by Devenish and Miles (1939). They drew attention to the frequency with which surgical gloves are punctured at operation, and suggested that infection might be caused by staphylococci squeezed through perforations in the gloves.

A third mode of transmission, recorded more for streptococcal than for staphylococcal infection, is from case to case at the time of wound dressing by way of contaminated fingers and instruments (for example, Miles *et al.*, 1940).

In the present outbreak there seemed little doubt that a proportion of the wounds were infected at the time of operation, and glove punctures may well have been the way in which the carrier in the surgical team infected patients, as normally about a third of the gloves worn by members of the surgical staff of the hospital are found to have perforations after use. In retrospect, direct proof is unobtainable, and the possibility that staphylococci from the carrier found their way into the wound by some other route cannot be excluded.

Though in our opinion there seemed to be good grounds for suspecting that the theatre infections originated from a single person, the position in the ward was considerably more complex. The key to the situation seemed to be the great ability of the epidemic staphylococcus to colonize wounds and lungs and other sites. No reliable method exists for testing in the laboratory the disease-producing potentialities of strains of *Staph. pyogenes*, but there is no doubt that some strains are in fact able to spread more readily than others and are more able to cause infection. Our strain showed considerable versatility in the way in which it caused a variety of infections and while the patients were under treatment became resistant to chloramphenicol or erythromycin. It seemed also to be able to establish itself to the exclusion of other strains of staphylococci which had been present earlier. In consequence, not only was it the only strain to be recovered from wounds by mid-May, but it became increasingly preponderant in the ward air (Table II) and was practically the only strain to be recovered from the ward curtains on June 27.

Some of the ward infections may have originated from the male carrier or the nurse, but these two individuals are less likely to have been the cause of some of the other complications; for instance, chest infections or enteritis. Compared with the patients, the carriers must have contributed only a small proportion of the staphylococci present in the ward, and it is tempting to suggest that the start of the epidemic was the elderly patient with the lung abscess. Once established, new victims maintained the staphylococcal strain. To what extent the extensive spread of the staphylococcus should be attributed to inherent properties and to what extent to the efficiency with which two or more particular carriers were able to spread it must remain unknown.

During this epidemic we were able to examine the air for general bacteria and for staphylococci. General air counts appear to reflect largely the activities of the ward and are not necessarily linked with infection. It is misleading to use them alone as a gauge of the effectiveness of measures designed to prevent the spread of infection. Staphylococcal air counts, on the other hand, particularly when phage-typing is available, may be of more help. We used low counts and the absence of the epidemic type in deciding to keep the female ward open, and when more is known it may be possible to estimate the risk of infection in a ward from the number of pathogenic staphylococci present in the environment, and the extent to which they belong to one phage type known to be responsible for infection. Whether this is so or not must depend, of course, largely on whether the staphylococci are actually transmitted to the patients through the air. Further surveys similar to ours are needed to discover whether high air counts precede the transfer of infection or whether they merely reflect transfer that has already happened by other routes.

Another unanswered question in our survey is why the female ward enjoyed its relative freedom from infection. Women are known to be less liable to post-operative chest infection than men, and during this period there was no patient in the female ward disseminating large numbers of staphylococci. Even so, the absence of the epidemic type

in the air collected on June 27 was surprising, and, taken in conjunction with the low general bacterial count, may represent some other factor such as the effect of differences in light or ventilation which we have not recognized.

Finally, the measures taken to disinfect the male ward appear to have been successful in that for a time they eliminated staphylococci and reduced the incidence of infection. From the information available, it is not possible to tell if the epidemic strain of *Staph. pyogenes* was brought back to the ward by a member of the staff from some other part of the hospital, or was brought in by a patient, or came from some unsuspected hiding-place which had escaped disinfection. This staphylococcus had been isolated from time to time in other parts of the hospital.

Summary

During a period of nine weeks, 24 of 83 patients undergoing clean operations in one surgical unit developed wound sepsis and seven developed other staphylococcal infections. All but one of the staphylococci tested from the wounds and other lesions belonged to one phage type.

In many cases wound sepsis seemed to follow infection acquired in the operating theatre, and there was strong evidence implicating one of the members of the surgical team in these infections.

Some cases of wound infection and most of the other infections seemed to have been acquired in the ward. It is suggested that one patient, who had a staphylococcal lung abscess, may have been responsible for widespread dissemination. The epidemic type was found in large numbers in the air and on bedclothes, curtains, etc.; it was carried by only one member of the nursing staff.

We are greatly indebted to Dr. Radmila Skalova, of the Medical Faculty of the University of Zagreb, Yugoslavia, who, while working with a British Council bursary at the Central Public Health Laboratory, gave much assistance with the bacteriological air sampling.

REFERENCES

- Blowers, R., Mason, G. A., Wallace, K. R., and Walton, M. (1955). *Lancet*, 2, 786.
 ———, Potter, J., and Wallace, K. R. (1955). *Ibid.*, 2, 1087.
 Devenish, E. A., and Miles, A. A. (1939). *Ibid.*, 1, 1088.
 Hart, D. (1937). *Arch. Surg. (Chicago)*, 34, 874.
 Miles, A. A., Schwabacher, Herta, Cunliffe, A. C., Ross, J., Paterson, Spooner, E. T. C., Pilcher, R. S., and Wright, Joyce (1940). *British Medical Journal* 2, 855, 895.
 Shooter, R. A., Taylor, G. W., Ellis, G., and Ross, Sir James Paterson (1956). *Surg. Gynec. Obstet.*, 103, 257.
 Wells, W. F., and Wells, Mildred W. (1936). *J. Amer. med. Ass.*, 107, 1698.
 ——— (1938). *Amer. J. publ. Hlth*, 28, 343.

The latest *Life Tables* volume of the Registrar-General's *Decennial Supplement for England and Wales, 1951* (H.M.S.O., 3s.), is based on the 1951 census populations and on the mortality experience in England and Wales as a whole during the three years 1950-2. It shows that the expectation of life of a boy at birth has increased by nearly 15 years in the past 40 years; for a girl the increase is more than 16 years. These increases are largely the result of the immense improvement in infant mortality. In 1910-12 120 of every 1,000 boys born and 98 of every 1,000 girls born died before reaching their first birthday; the corresponding figures for 1950-2 were 33 boys and 25 girls. Women have fared better than men in the improvement of longevity. While for women there has been a continued substantial lightening of mortality even beyond the age of 80, for men the improvement has been much less. For men aged 60 the expectation on 1950-2 mortality is about 14½ years, an increase of only three-eighths of a year on the figure 20 years earlier, whereas for women of that age it is 18 years, an increase of 1½ years. Persons living in England have a higher expectation of life than those living in Scotland or Wales. The rural districts show mortality lighter than the national average. Alone of all the major conurbations Greater London experienced lighter mortality than England and Wales as a whole.

CLINICAL AND LABORATORY ASSESSMENTS OF SENNA PREPARATIONS

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The use of standard British pharmacopoeial preparations of senna implicitly assumes that all such preparations will have, for the same dosage, similar laxative effects, and that, subject to individual variation, like effects will be consistently produced by the same dose of the same preparation at different times.

Work directed by one of us (J.W.F.) led to the development of a reliable bioassay procedure, using mice as the test animal (Lou, 1949); and the indications of laxative potency given by this method agree closely with those derived from a physico-chemical method of assay which determines the amount of the glycosides, sennosides A and B, present in different senna preparations (Fairbairn and Michaels, 1950). When applied to standard preparations of senna both these laboratory assay methods strongly suggest that senna pods and different samples of the B.P. liquid extract vary widely in potency: indeed, some of the extracts appear to be virtually inert. Further, B.P. liquid extract of senna appears to lose potency when kept over a period of time (Fairbairn and Saleh, 1953).

These indications, however, are based on laboratory techniques and need not necessarily apply in clinical practice. Although American workers (Miller and Alexander, 1949) have shown that bioassay results agree with laxative effects in humans, their subjects were normal (unconstipated) individuals. We here describe controlled clinical trials designed to measure the relative laxative potency of various B.P. senna preparations in constipated patients in hospital practice and to compare clinical results with the findings of chemical and biological assay. At the same time we have included in the trial a new granular type of senna preparation ("senokot"), for which total retention of the activity of the crude drug, consistency, and stability of potency are claimed (Ryan, 1951). Its laxative efficiency has been favourably assessed by several workers (*Brit. Ency. med. Pract.*, 1956), but no rigorously controlled observations have been reported.

Trial Design

Stage I

In the first stage of the trial, doses of the various senna preparations within the usually prescribed range were given to two groups of patients complaining of constipation; one group comprised expectant mothers in the obstetric wards of a general hospital—that is, "short-stay" patients—the other consisted of patients of both sexes in wards containing some elderly chronic sick—that is, "long-stay" patients. Four preparations were used at two dosage levels. The first levels, representing the average of the B.P. dosage range for the syrups and its approximate equivalent for senokot, were:

- *1. Syrup of senna B.P. (A) 5 ml. (made from 1.25 g. senna pod)
- *2. Syrup of senna B.P. (B) 5 ml. { " " 0.9† g. " " }
3. Senokot granules " 6 g. { " " 0.9† g. " " }
4. Blank syrup (taste and appearance similar to the B.P. syrup of senna).

One dose of each preparation was measured into glass containers. These were numbered in random order and used as required, in that order, in the wards. Any one patient received only one dose. The patient, the physician, and the sister-in-charge did not know the chemical or biochemical activity of the preparations which had been administered. A time limit of 24 hours was given for a bowel action to result. If none was produced, another type of laxative was given. The results of the administration of the senna preparations under trial were recorded on standard forms according to the time, type (full, scanty, or fluid), and frequency of motions.

The second dosage levels for the two syrups were increased by 40% above the first to 7 ml.—that is, approximately the maximum B.P. doses. To avoid drastic purging the dose of senokot was increased by only 25% to 7.5 g.

In the trials at these higher levels the trial procedure was repeated, but the inactive control preparation used was a chocolate granule containing no senna but otherwise indistinguishable from senokot.

Stage II

In the second stage of these trials the design was rather different. To minimize the effect of individual differences in response to laxatives, and to balance the effects of order of administration, each of the four preparations was administered in turn to elderly patients suffering from severe chronic constipation. A latin square type of design ensured that, within each set of four patients, each type of preparation was given once to each patient and once in each order from first to fourth (Table I).

TABLE I.—Order of Administration of Preparations

Patient	1st	2nd	3rd	4th
1	Syrup A	Syrup B	Senokot	Inert granules
2	" B	Inert granules	Syrup A	Senokot
3	Senokot	Syrup A	Inert granules	" A
4	Inert granules	Senokot	Syrup B	" B

Half the patients were given doses at the average levels already indicated, half were given the higher dosages. Inert granules were used as controls throughout this stage. Otherwise the procedure was as before. If, however, no bowel action resulted after at least 24 hours, another type of aperient (not one of those under trial) was given and the trial resumed when the patient next complained of constipation.

To ensure that the dosage of the preparations being clinically assessed had a consistent sennoside content throughout the trials, the same samples of the three preparations were reassayed chemically before the second stage

*The strongest and the weakest (on the basis of chemical and animal assay) of a number of different commercial samples of B.P. syrup of senna examined for this investigation.

†Reduced from 1.25 g. for the syrups owing to the anticipated higher laxative potency of senokot.

TABLE II.—Chemical Reassays of Senna Preparations

Preparation	Mg. Sennoside Content/Aliquot		
	1953	1955	Loss %
Syrup of senna B	0.3	Traces	100
" " A	2.8	1.9	33
Senokot	4.7	5.0	0

began. The results seen in Table II show the changes in sennoside content which had taken place. The apparent loss in potency by one-third noted in one of the B.P. syrups was then compensated for by increasing the average dose from 5 ml. to 7 ml., and the maximum dose from 7 ml. to 9.5 ml. The small sennoside content of the other B.P. syrups had virtually disappeared and no such compensation was practicable. Since the chemical content of senokot showed no loss, the dosage was left unchanged.

Summary of Results

In a preliminary analysis of the results two criteria of clinical potency were used: (1) The percentage of "satisfactory" results—that is, one or more full motions produced within the time limit. Motions described as scanty or otherwise unsatisfactory by the patient were ignored. (2) The total number of motions produced within the time limit without regard to the patient's subjective report.

TABLE III.—Response to Control Preparations

Type of Control	Type of Patient							
	Short-stay				Long-stay			
	No. of Cases	Criteria			No. of Cases	Criteria		
		1	2			1	2	
Syrup	19	42%	1.3	13	23%	0.8	32	33%
Granules	16	63%	0.9	15	53%	0.6	31	58%
Mean	35	53%	1.1	28	38%	0.7	63	46%

Criterion 1: Satisfactory. Criterion 2: Number of motions per patient in 24 hours.

In Table III are compared the results, using each criterion, of the effects of the control substances during stage I in the two groups of patients. The difference in response rates between the two types of clinical case is in line with expectation. The large subjective element in the first criterion is evident in the increase in response achieved simply by substituting the more elegant and novel but inert granular preparation for the syrup type of control. On the other hand, the second criterion shows a satisfactory consistency between the two inert preparations. Partly for this reason and partly because the bioassay method on mice depends on counting the number of extra or fluid motions produced, this second criterion has been used throughout. To match the bioassay technique more closely and to minimize any differences between wards, the final result is expressed as a percentage increase in the number of motions produced by a particular senna preparation over the number produced in the same trial group by the inert control.

Table IV shows the results obtained in the first stage of the trial. As already seen, the response rate is greater among the short-stay patients, but the general trend of the results is similar in the two groups: in total, only the higher doses of one of the B.P. syrups and both doses of senokot produce a laxative effect which is appreciably better than the corresponding inert controls.

In the alternative trial design the individual variation is minimal, but the chronically constipated patient gives a less marked response to laxatives. Table V shows that in these circumstances again only the high doses of one syrup (syrup A) and both dosages of senokot effect any marked rise above the control level. An analysis of variance showed that these results were unlikely to be fortuitous ($P < 0.01$).

It is clear that there are appreciable differences in laxative potency between the various preparations used; it

remains to decide whether these clinical indices agree with the results of chemical and biological assay. Table VI sets out the laboratory and clinical assay results for each preparation arranged in order of the potency as estimated by bioassay. The close correlation between chemical and biological assay methods is obvious. More striking, however, is the relationship seen in Figs. 1 and 2 between chemical

TABLE IV.—Clinical Response to Different Senna Preparations in Different Patients (Mean Number of Motions in 24 Hours)

Preparation	Short Stay			Long Stay			Total Unweighted Mean Control
	No.*	Mean†	Control	No.*	Mean†	Control	
Average Dosage							
Syr. control	19	1.3	100%	13	0.8	100%	100%
" senna B	14	0.7	54%	16	0.7	88%	71%
" " A	17	0.6	46%	16	1.2	150%	98%
Senokot	14	1.8	138%	16	1.6	200%	169%
Maximum Dosage							
Granule control	16	0.9	100%	15	0.6	100%	100%
Syr. senna B	17	0.5	56%	15	0.7	117%	87%
" " A	17	1.6	178%	14	0.9	150%	164%
Senokot	13	2.2	244%	14	1.1	183%	214%

* Number of patients. † Mean number of motions per patient.

TABLE V.—Clinical Response to Different Preparations in Same Patients (Mean Number of Motions in 24 Hours)*

Preparation	Average Dosage		Maximum Dosage	
	Mean No.	Control	Mean No.	Control
Granule control	0.7	100%	0.4	100%
Syr. senna B	0.7	100%	0.6	150%
" " A	0.6	86%	0.8	200%
Senokot	1.4	200%	1.2	300%

* 16 patients in each dosage group.

TABLE VI.—Correlation of Chemical, Biological, and Clinical Assay Results

Preparations	Mg. Sennosides Dose		Control Response	
	Chemical Assay	Bio-assay*	Different Patients	Same Patients
Syr. senna B (av. dose)	1.3	2.0	71%	100%
" " B (max. ")	1.8	2.8	87%	150%
" " A (av. ")	13.8	22.1	98%	86%
" " A (max. ")	17.5	30.9	164%	200%
Senokot (av. dose)	29.0	51.0	169%	200%
" (max. ")	36.0	65.0	214%	300%

* The bioassay figure is always higher than the chemical assay figure, since the sennoside A and B content represents only about two-thirds of the total biological activity (Fairbairn and Saleh, 1951).

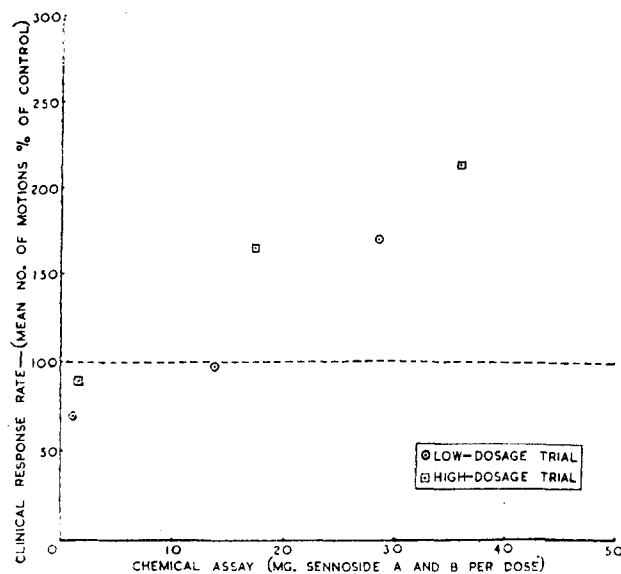


FIG. 1.—Stage I. Clinical and chemical assay results (in different patients).

assay results and clinical response rates where preparations are tested both separately on different patients and serially on the same patient. In the type of patient included in this trial no perceptible rise in clinical response above the control level of 100% occurs consistently with sennoside contents below about 15 mg. per dose.

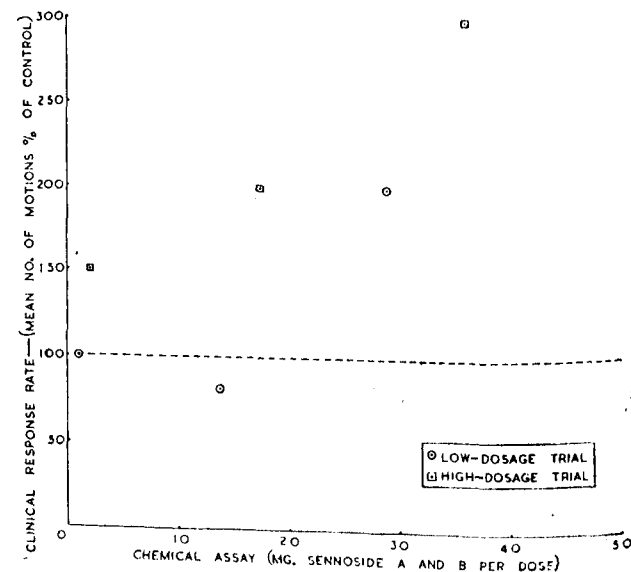


FIG. 2.—Stage II. Clinical and chemical assay results (in same patient).

Discussion

These clinical trials show how, by careful design and conduct, results of practical value can be simply attained with the use of crude criteria in a relatively minor but important ailment. The nature of the control preparation may be crucial when more subjective patient responses are involved. Changing the inert preparations from syrup to granules can produce a rise in the proportion of "satisfactory" responses from 33 to 58%. It seems better to minimize these psychological influences by using simple objective criteria such as the number of stools produced within 24 hours. For the group of short-stay hospital patients comparisons of preparations allocated separately and at random to different patients will give essentially the same indications as trials where individual variation in response is minimized by serial administration of drugs, in a balanced and randomized design, to the chronically ill.

The analysis of variance set out in Table VII suggests that while order of presentation is unimportant compared with the random variability in response of the same patient

TABLE VII.—Analysis of Variance of Response Rates in Trials on Same Patients (Maximum Dose)

Sources of Variation	Sum of Squares	Degrees of Freedom	Mean Square	Variance Ratio
Difference due to treatments	4.92	3	1.64	4.56*
Personal differences	18.23	15	1.22	3.39*
Order of presentation	1.17	3	0.39	1.08
Random within-person variability	15.16	42	0.36	
Total	39.48	63		

* P. 0.01.

at different times, personal differences in responsiveness are of some account in trial design. This implies that the serial type of trial which minimizes these personal differences is, for this type of patient at least, the more effective test procedure. On the other hand, the greater responsiveness of the younger "short-stay" patient makes such cases more sensitive indicators of differing laxative potencies. Choice of method in clinical trials of laxatives can thus be decided simply on the basis of the number and type of clinical cases

available. Either method will indicate the clinically effective dosage range for the particular type of patient included in the trial.

Of particular importance is the introduction of chemical and biological methods of potency assay where results can be used to grade senna preparations in terms of their likely effect on the constipated bowel in humans.

We would emphasize the agreement between the various forms of assessment, laboratory and clinical, in indicating gross disparities between similar doses of apparently identical standard B.P. syrups. The laboratory tests confirm earlier suggestions of the serious deterioration which may take place in such aqueous preparations. Again, average doses of the two B.P. syrups tested clinically gave no better results than inert syrups. On the other hand, the dry granular preparation tested (senokot) proved to be chemically stable and to have the potent clinical effect which had been predicted from the results of both chemical and biological assay.

Summary and Conclusions

The design and conduct of controlled clinical trials of the therapeutic effect of different senna preparations are described. The results obtained in constipated patients of different clinical types have been compared with the potencies estimated from chemical assay of sennoside content and biological assay based on the laxative action in mice. It was concluded that: (1) Laxatives could be effectively graded by simple clinical trials in both short-stay hospital patients and the more chronically constipated elderly sick. (2) Clinical response rates are in general agreement with the results of both types of laboratory assay methods. Not only do apparently identical B.P. preparations of syrup of senna differ widely in their therapeutic effect, but, at average doses, the B.P. syrups tested were no better than inert controls. Chemical assay confirmed previous indications of deterioration in aqueous B.P. preparations. (3) A dry granular preparation of senna pod (senokot), used in dosages usually prescribed, proved to be chemically stable and to have a potent laxative effect.

We should like to thank the sisters in charge of the wards concerned, Sisters Anderson, Ronaldson, Cawthorn, and East, for their conduct of this trial, and we are indebted to Westminster Laboratories Ltd. for supplies of senokot and the specially prepared inert granules.

REFERENCES

- Brit. Ency. med. Pract. (1956). Cum. Suppl., p. 87. London.
Fairbairn, J. W., and Michaels, I. (1950). *J. Pharm. Pharmacol.*, 2, 807.
— and Saleh, M. R. I. (1951). *Ibid.*, 3, 918.
— (1953). *Ibid.*, 5, 317.
Lou, T. C. (1949). *Ibid.*, 1, 673.
Miller, L. C., and Alexander, E. B. (1949). *J. Amer. pharm. Ass., Sci. Ed.*, 38, 417.
Ryan, H. A. (1951). *Pharm. J.*, 167, 115.

Speaking at the Royal Institution in London on February 15, Dr. MARGARET MEAD discussed factors in social evolution. Borrowing, either of isolated traits or of whole patterns of behaviour, was one of the essential mechanisms of human evolution, she said. In 1928-9 she had carried out an anthropological study of a Melanesian village in the Admiralty Islands, and had repeated the study 25 years later. In this time the villagers had established a small "distinctive" with imitation of Western democratic Christian society, with ideas drawn from Christianity, British administration, and the American expeditionary forces. Contact in childhood with adults who were perceived as being of the same order as the children—in this case, their own parents—and dissatisfaction among the adults with the state of their culture, seemed to have been two preconditions of this change. This state of affairs could be contrasted with treating children as lower or imperfect human beings, rearing them with the help of another class such as nurses or teachers, or letting older children or grandparents bring them up.

STANDARDIZED SENNA AS A LAXATIVE IN THE PUERPERIUM A CLINICAL ASSESSMENT

BY

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For many years senna has been regarded as a safe laxative for pregnant and puerperal women. Variability in efficacy from case to case led to diminished use of the drug until in recent years a standardized preparation became available. For this preparation, marketed under the name "senokot," stability and consistency of potency are claimed (Ryan, 1951). A number of favourable reports have now been published (*British Encyclopaedia of Medical Practice*, 1956) and a preliminary trial suggested that senokot might be suitable for use as a routine laxative for puerperal women (Duncan, 1953). In this further clinical trial the laxative effect of cascara and senokot are compared.

Spontaneous Bowel Movement.—As a preliminary step 100 consecutive puerperal women (32 primiparae and 68 multiparae) were observed with regard to spontaneous bowel movement. No laxative was given. The findings are shown in Table I.

TABLE I.—Bowel Movement After Delivery in 100 Cases

	No. of Patients
First spontaneous action on 2nd day	4
" " " 3rd "	22
" " " 4th "	30
" " " 5th "	15
" " " 6th "	4
" " " 7th "	1
" " " 8th "	1
Enema required	23

Design of the Trial

All patients in puerperal ward A were given, as a routine laxative, tab. extract cascara B.P., 6 gr. (0.4 g.), on the morning of the third puerperal day. No further laxative or enema was given for 48 hours.

In puerperal ward B exactly the same routine was followed except that the laxative used was "senokot" granules, 2 teaspoonfuls (equivalent to 11 gr. (0.7 g.) of senna pod). Patients who had been delivered by the abdominal route and 12 patients whose bowels moved spontaneously before the third morning were excluded from the trial. No other exceptions were made.

The interval between administration and bowel movement, and the nature of the first motion, were recorded. The patients whose bowels moved within 24 hours of the dose were regarded as having shown a positive response, and in these the number of bowel movements within the period was noted. These objective observations were made by senior members of the nursing staff. Subjective impressions, such as the severity of colic, were more difficult to assess.

Comparison of the Two Groups

The fact that the two groups are comparable in respect of parity, nature of delivery, and previous history in relation to aperients is shown by Table II.

TABLE II

	Cascara Series		Senokot Series	
	Multip.	Primip.	Multip.	Primip.
Spontaneous delivery without tear	78	14	74	21
Episiotomy, forceps, or tear	21	29	22	31
Total	99	43	96	52

Of the cascara series 37 patients had been in the habit of taking aperients before pregnancy, and a total of 58 had taken aperients during the pregnancy. Of the senokot series 29 patients had been in the habit of taking aperients before pregnancy and a total of 56 had taken aperients during the pregnancy.

Results

The results of the trial are summarized in Tables III-V.

TABLE III.—Response to the Laxative

	No. of Patients	
	Cascara Series	Senokot Series
Bowels open within 4 hours	6	20
" first open between 4 and 12 hours	39	87
" " " " 12 " 24 "	35	21
Total positive response within 24 hours	80 (56.3%)*	128 (86.5%)*
No response within 24 hours	61	19
Time of response not recorded	1	1
Total No. in trial	142	148

* $P < 0.01$.

TABLE IV.—Nature of Motions in Patients Showing a Positive Response Within 24 Hours

Nature of First Motion	No. of Patients	
	Cascara Series	Senokot Series
Normal	29 (36.25%)	60 (46.9%)
Loose	23 (28.75%)	39 (30.5%)
Watery	3 (3.75%)	16 (12.5%)
Constipated	23 (28.75%)	10 (7.8%)
Not recorded	2	3
Total (positive response)	80	128

TABLE V.—Number of Motions Within 24 Hours of Taking the Laxative

	Cascara Series	Senokot Series
Patients having 1 motion	67	86
" " 2 motions	9	23
" " 3 " "	2	9
" " 4 or more motions	2	10
Total (positive response)	80	128

Resumption of Normal Bowel Habit.—After initial bowel movement 52 of the cascara series and 32 of the senokot series required further aperients or an enema during the puerperium. This is not regarded as significant, because 37 of the cascara series and 29 of the senokot series had been in the habit of taking laxatives regularly even before pregnancy.

Incidence of Gripes.—Of patients who had a positive response within 24 hours, 10 (12.5%) in the cascara series and 22 (17.2%) in the senokot series experienced gripes.

Lactation.—No difference in lactation performance was observed between the two groups. There was no evidence that either laxative had an adverse effect on lactation. Illingworth (1953) suggested that babies may develop diarrhoea when receiving milk from mothers taking senna or cascara. Experimental evidence (Tyson *et al.*, 1937; Friebe and Walkowiak, 1951) shows that senna glycosides do not appear in maternal milk. Certainly in this small series there was no instance of diarrhoea amongst the babies.

Previous History in Relation to Laxatives

For the purpose of comparison of the two groups in the trial a detailed history of the previous use of laxatives was taken. The results of this inquiry are presented as they give an indication of the habits in relation to laxatives in a small sample of married women.

Of the 95 primigravidae, 23 took laxatives regularly before they became pregnant. The drugs used were liquid paraffin in 5 cases, cascara in 5, salts in 4, doctor's prescription in 2, and various (1 each) in 7. During pregnancy a total of 39 primigravidae took laxatives regularly.

Of the 195 multiparae, 43 took laxatives regularly before the present pregnancy. The drugs used were liquid paraffin in 12, cascara in 9, "agarol" in 7, various in 15. During pregnancy 75 of the multiparae took laxatives regularly.

In view of the evidence that liquid paraffin prevents absorption of fat-soluble vitamins it is interesting to note that 43 of the 290 women studied took liquid paraffin regularly during the pregnancies.

Discussion

In the preliminary study it was found that 56 out of 100 patients had spontaneous bowel movements by the end of the fourth puerperal day. The positive-response rate in the cascara series (56.3%) shows no improvement on this. In the senokot series the positive-response rate was 86.5%, and this difference is statistically significant. In these positive-response groups a higher proportion of the senokot series had normal motions (46.9% compared with 36.25%), but also a higher proportion had loose or watery motions (43% compared with 32.5%). On these findings it is clear that with the dosage used senokot was a more effective laxative than cascara. The question arises whether this greater effect was merely a matter of size of dose. The pharmacopoeial dose of tab. extract cascara B.P. is 2-8 gr. (0.13-0.5 g.) (the dose used was 6 gr. (0.4 g.), which is three-quarters of the maximum B.P. dose) and of senna pod B.P. is 10-30 gr. (0.65-2 g.) (the dose used was equivalent to 11 gr. (0.7 g.), which is one-third of the maximum B.P. dose). The laxative effect should therefore have been greater rather than less in the cascara series. The reason for this discrepancy appears to lie in the fact that tab. extract cascara B.P. is unstandardized and contains only part of the original activity of the bark (Fairbairn and Mahran, 1953), whereas senokot is standardized and contains 100% activity of senna pod (Fairbairn and Michaels, 1950). A further point of practical importance is that for a fully active preparation such as senokot the upper limit of dosage for senna pod B.P. (30 gr.—2 g.) may be too high.

No untoward side-effects of the laxatives were noticed apart from gripes. The fact that a higher proportion of the senokot series had gripes is thought to be due to over-dosage, because for the purpose of the trial it was necessary to give the same dose to all patients. Further experience with senokot has shown that an occasional patient experiences severe gripes in spite of smaller dosage, but this has been so infrequent that it has not detracted from the advantages of the drug. The majority of patients expressed the opinion that they preferred senokot to other laxatives which they had used in the past. This might be attributed to the novel form of the preparation in chocolate-flavoured granules. Senokot is also available, however, in tablet form, and a further series of 138 patients was studied under the same trial conditions with the exception that granules were replaced by tablets. The results of this further trial are so similar to those reported above that they are not given in detail. More than half of these patients said that they preferred senna to other laxatives they had used.

The continued use of senokot since the trial was completed has confirmed that it is a very satisfactory laxative for puerperal women. Its value during pregnancy is much more difficult to subject to a clinical trial, but it seems very satisfactory for this purpose. A few patients complaining of severe morning sickness have improved dramatically following regular administration of senokot. The question whether senna is more effective in this respect than other laxatives will require further study.

Summary

In a series of 100 puerperal women who were given no laxative in the puerperium only 26 had spontaneous bowel movements by the end of the third day, but 71 had had spontaneous motions by the end of the fifth puerperal day.

In a clinical trial, extract of cascara in a dose of 6 gr. (0.4 g.) (three-quarters of the pharmacopoeial maximum) was compared with a standardized preparation of senna in a dose of 11 gr. (0.7 g.) (one-third of the pharmacopoeial maximum). With the dosages used the senna ("senokot") was shown to be a more effective laxative.

In the course of the trial it was noted that, of 290 women, 66 had been taking laxatives regularly before they became pregnant and that 43 had taken liquid paraffin regularly during their pregnancy.

I thank Miss G. C. Cruickshank, of the Maternity Department, Western General Hospital, Edinburgh, for her careful supervision of this trial, and Dr. D. H. McVie for his help with the earlier stages. I am indebted to Westminster Laboratories Ltd. for supplies of senokot.

REFERENCES

- British Encyclopaedia of Medical Practice (1956). Cumulative Supplement, p. 87. London.
Duncan, A. S. (1953). *Lancet*, 1, 602.
Fairbairn, J. W., and Mahran, G. E. D. H. (1953). *J. Pharm. Pharmacol.*, 5, 827.
— and Michaels, I. (1950). *Ibid.*, 2, 813.
Friebe, H., and Walkowiak, L. (1951). *Med. Klin.*, 46, 208.
Illingworth, R. S. (1953). *Practitioner*, 171, 533.
Ryan, H. A. (1951). *Pharm. J.*, 167, 115.
Tyson, R. M., Shrader, E. A., and Periman, H. H. (1937). *J. Pediatr.*, 11, 824.

TREATMENT OF HYPOPITUITARISM

BY

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Before cortisone became available patients with pituitary insufficiency presented a difficult therapeutic problem, and many died as a result of adrenal crises or hypopituitary coma. All this has now been altered, and the major complications endangering life can readily be prevented by the addition of cortisone to existing methods of therapy. We have shown that patients with Addison's disease can be maintained in good health on cortisone as the sole method of treatment (Beck and Montgomery, 1956), and it is now generally recognized that, provided adrenal gland replacement is carried out, the therapeutic control of patients with pituitary insufficiency is usually satisfactory.

There is still diversity of opinion over what additional treatment, if any, is necessary in the latter. Sheehan and Summers (1954) report on the excellent response obtained in four cases treated with cortisone alone. On the other hand, Perkins and Rynearson (1952), Hart (1953), Querido *et al.* (1954), Whittaker and Whitehead (1954), and others advocate a wider range of substitution therapy and include deoxycortone acetate (D.C.A.), testosterone, and thyroid in addition to cortisone.

With the object of determining the simplest and most effective method of treatment for hypopituitarism, four patients suffering from post-partum pituitary insufficiency were studied as out-patients, and their response to traditional methods of therapy, supplemented with cortisone, was compared with their behaviour when treatment was continued on cortisone alone.

Method

The four patients were treated for periods ranging from 8 to 20 months on combined therapy consisting of D.C.A., sodium chloride, methyltestosterone, stilboestrol, thyroid, and cortisone (combined therapy), and subsequently for periods of 7 to 11 months on cortisone alone. Each patient was carefully assessed at three stages: before treatment started; when D.C.A., salt, testosterone, stilboestrol, and thyroid were withdrawn; and, finally, at the end of the trial period on cortisone. As a safeguard, each patient was interviewed monthly or more often as necessary, and the blood pressure and weight were recorded. At the three major examinations special attention was paid to the following points: energy and capacity for work and recreation; emotional tone, sense of well-being, and mental state; libido; menstruation; incidence and severity of infections; and crises; tolerance of cold; weight and blood pressure; condition of hair and skin; and certain laboratory investigations. The decision to start the trial with combined therapy first, followed by cortisone alone, was made partly because we felt that the withdrawal of a drug providing a measure of relief of symptoms would be more readily noticed by the patients. An additional reason was that several patients were already on a modified form of combined treatment, so it was decided to extend and proceed with this aspect first.

Clinical details of the four patients together with details of treatment given are recorded in Table I.

Results of Treatment

Energy and Capacity for Work.—Profound weakness and lack of energy were characteristic of each case before the clinical trial started. A remarkable recovery was evident with combined treatment, and this improvement was maintained without any deterioration in three cases on cortisone alone. One patient felt well enough to resume her work as a weaver in addition to household duties. Another housewife was able to nurse an invalid relative living at some distance from her home. In the fourth case there was reappearance of asthenia and intolerance to cold, and thyroid had to be restarted seven weeks after its withdrawal.

Emotional Tone, Sense of Well-being, and Mental State.—The patients were depressed and low in spirits before treatment began, and mentally dull or sluggish. All returned apparently to normal on combined therapy, and no change was noticed by the patients, relatives, or physicians when therapy was continued on cortisone alone, except in Case 2, where mental sluggishness, depression, and misery were quickly apparent despite additional cortisone dosage. These symptoms were attributed to lack of thyroid, and they quickly regressed when this was restarted.

Libido.—This was lost in all subjects, and in two there was no improvement throughout the trial with either therapy, but libido had always been weak in these two women. However, one patient noticed some improvement in libido and sexual response with combined treatment, an improvement little altered with cortisone alone. Another patient reported almost immediate improvement in libido and return of orgasm on combined therapy. This was fully maintained with cortisone.

Menstruation.—All had complete amenorrhoea from the onset of their illness until three reported a three to four-day menstrual staining or bleeding during the periods of cyclical stilboestrol withdrawal. One patient (Case 4) did not take stilboestrol very regularly and did not menstruate. There was complete amenorrhoea again when stilboestrol was withheld.

Incidence and Severity of Infections and Crises.—One patient was initially admitted to hospital in coma. The other three had no history of frequent infections or crises before treatment. Since the start of treatment all have remained well and no difference has been apparent between the two forms of therapy.

TABLE I.—Details of Cases

	Case 1, Aged 38	Case 2, Aged 40	Case 3, Aged 48	Case 4, Aged 33
Clinical features before treatment	Severe post-partum haemorrhage 15 years before, with subsequent amenorrhoea. Tired, lifeless, unable to work. Intolerant of cold. Waxy pallor, pubic and axillary hair absent. 17-Ketosteroids 0 mg./24 hrs. B.M.R. -44%. †Radioactive iodine test in myxoedema range (T index 2.1)	Post-partum haemorrhage 17 years before, with amenorrhoea since. Depressed, intolerant of cold. Treated as case of myxoedema with thyroid. Admitted to hospital in semi-coma following respiratory tract infection. Hypoglycaemic. Immediate treatment with D.C.A., cortisone; glucose given. Pre-treatment investigations not done. Subsequent radioactive iodine test in myxoedema range (T 1.55)	15 years' amenorrhoea following post-partum haemorrhage. Unable to work, intolerant of cold. Depressed, no interests. 17-Ketosteroids 0 mg./24 hrs. *Urinary 17-hydroxycorticosterone 0.5 mg./24 hrs. —following corticotrophin stimulation 7.5 mg./24 hrs. B.M.R. -65%. †Radioactive iodine test in myxoedema range (T 0.89)	3 years' amenorrhoea following post-partum haemorrhage. Tired, unable to do housework. Intolerant of cold. 17-Ketosteroid output 2.1 mg./24 hrs. Urinary 17-hydroxycorticosterone and B.M.R. levels unfortunately unavailable, but both were low and the B.M.R. result was below -25%. †Radioactive iodine uptake just above myxoedema range (T 2.9)
Combined therapy—details and duration of treatment	Cortisone 12.5 mg. daily, thyroid 3 gr. (0.2 g.) daily, D.C.A. trimethylacetate and testosterone isobutyrate, 50 mg. each every 4 weeks, stilboestrol 1 mg. daily for 3 weeks out of every four, and NaCl 3 g. daily, for 9 months	Cortisone 12.5 mg. daily, thyroid 2 gr. (0.13 g.) daily, D.C.A. trimethylacetate and testosterone isobutyrate 50 mg. every 4 weeks, NaCl 4 g. daily, for 20 months Stilboestrol, 1 mg. daily for 3 weeks out of every four, for 6 months	Cortisone 12.5 mg. daily for 2 months. Cortisone 25 mg. daily for 7 months For 9 months: thyroid 2 gr. (0.13 g.) daily. D.C.A. trimethylacetate and testosterone isobutyrate 50 mg. each every 4 weeks; stilboestrol 1 mg. daily for 3 weeks out of every four; NaCl 4 g. daily	For 10 months: cortisone 12.5 mg. daily; thyroid 3 gr. (0.2 g.) daily; D.C.A. trimethylacetate and testosterone isobutyrate 50 mg. each every 4 weeks; NaCl 6 g. daily
Cortisone alone and duration	Cortisone 12.5 mg. daily, 7 months	Cortisone 12.5 mg. daily, 7 weeks, then cortisone 25 mg. daily and thyroid 2 gr. (0.13 g.) daily thereafter	Cortisone 25 mg. daily for 11 months	Cortisone 12.5 mg. daily for 7 months

* Measurement of urinary 17-hydroxycorticosteroid output was carried out before and after the intravenous injection of 25 mg. of corticotrophin on two successive days.

† Radioactive iodine uptake test was carried out by measuring the radio-iodine output in urine over successive periods of 8, 16, and 24 hours after an initial oral dose of 10 μ c. of 131 I in accordance with the method described by Fraser *et al.* (1953). They give the T index range in myxoedema as lying between 1.3 and 2.8.

Cold-tolerance.—Intolerance of cold was a major complaint of the untreated patients. All had the well-known characteristics of this symptom—namely, unwillingness to leave the fire, excessive underclothing, and cold extremities. On combined therapy they became normal—undergarments were shed and their extremities felt warm to touch. When treatment was modified and thyroid stopped, three continued to feel normal and did not seem to miss it, but Case 2 relapsed almost immediately and thyroid had to be restarted. Of particular interest is the fact that thyroid was withheld during the month of January, 1955. This and the following two months were colder than usual, so that the apparent normal response to cold in three patients on cortisone alone was surprisingly good.

Electrolytes and Blood Pressure.—It has been previously shown (Beck and Montgomery, 1956) that cortisone will maintain satisfactory electrolyte and blood-pressure control in patients with Addison's disease. It was similarly found that electrolytes and blood-pressure levels of the four patients with hypopituitarism were satisfactorily maintained on cortisone alone (Table II), although it will be seen that there was no significant disturbance in blood chemistry in any case before treatment began. The initial blood pressure was low in three subjects with systolic levels of 100 mm. of mercury or below (Table III). A good response was ob-

TABLE II.—Electrolyte Levels in mEq/litre

	Case 1			Case 2			Case 3			Case 4		
	BT	CT	CA	BT	CT	CA	BT	CT	CA	BT	CT	CA
Na	136	145	146	137	148	141	138	154	136	—	160	146
K	4.5	4.2	4.4	5.2	5.9	4.7	4.4	4.1	4.1	—	4.4	4.1
Cl	103	105	103	—	108	99	104	107	108	—	106	103
CO ₂ CP	30	30	28	23	22	26	—	29	29	—	30	30

CO₂CP = Carbon-dioxide combining power.

BT = Before treatment.

CT = Combined therapy consisting of D.C.A., sodium chloride, methyltestosterone, stilboestrol, thyroid, and cortisone.

CA = Cortisone alone—for dosage, see Table I.

TABLE III.—Blood Pressure in mm. Hg

	Case 1	Case 2	Case 3	Case 4
Before treatment	100/60	85/70	110/70	90/65
Combined therapy	120/70	120/75	150/85	110/80
Cortisone alone	130/80	120/75	140/80	105/80

Blood pressures recorded are the averages of numerous recordings made at the three stages of clinical assessment.

tained in all on combined therapy, and the improvement was well maintained when treatment was continued with cortisone alone.

Weight.—Three patients gained 3, 17, and 19 lb. (1.4, 7.7, and 8.6 kg.) on combined therapy. On cortisone alone there was a further gain of 2, 4, and 1 lb. (0.9, 1.8, and 0.45 kg.) respectively. The fourth patient lost 10 lb. (4.5 kg.) on combined therapy, but regained 4 lb. (1.8 kg.) on cortisone alone.

Effects on Skin.—All four patients had dry atrophic skin with some fine scaling, and did not sweat. The characteristic waxy pallor and puffiness of the face associated with loss of pituitary function was well marked. With combined treatment there was considerable improvement. The skin became more supple and its dry scaling quality was replaced by a smooth texture. Three patients noticed recurrence of sweating. The unusual pallor was lost as colour came back to their cheeks and their facial contours resumed a more normal appearance. When treatment was continued with cortisone alone the improvement was maintained in two. One regressed slightly, but the skin of the other (Case 2) returned rapidly to the state existing before any treatment was given.

Effects on Hair.—Very similar findings were experienced regarding hair. Dry, lustreless scalp hair which was rapidly thinning was the finding in each patient. On combined treatment, hair growth improved to a certain extent and eyebrow regrowth was noted in two. All felt, however, that their hair had not returned in quality to that existing before their illness began. Three patients thought that there was no appreciable regression in hair growth or texture when combined treatment was stopped. A definite assessment could not be made for the fourth patient, as thyroid was withheld for only a brief period, and this was clearly too short an interval in which to notice definite worsening in the quality of hair and its growth. There was no change in axillary hair in any patient. Its complete loss in each, prior to treatment, was a feature. Pubic hair was absent or very scanty. Little if any change was noted with either form of therapy.

Electrocardiographic Changes.—All patients had the characteristic electrocardiographic changes associated with myxoedema—namely, low voltage, sinus bradycardia, and flat or inverted T waves. With combined treatment there was distinct improvement in three cases, with increased

voltage and upright or less negative T waves. This improvement was fully maintained in only one patient on cortisone alone; in two others there was definite regression in voltage and T wave formation (see accompanying electrocardiogram); in the fourth case an electrocardiogram was unfortunately not obtained while the patient was on com-

bined therapy, but the graph recorded when she was on cortisone alone showed little change from the pre-treatment appearances. It was clear, therefore, that cortisone had not significantly altered the electrocardiographic pattern in her case.

Discussion

From a study of the patients and their response to treatment it seems clear that the only drugs which played a significant part in their recovery were thyroid and cortisone. In only the following aspects, however, did treatment with cortisone alone seem to be inferior to that provided by combined therapy. Firstly, intolerance of cold and mental depression recurred quickly in one patient when thyroid was withdrawn, but were corrected when thyroid was restarted. Secondly, two patients found that the satisfactory response to treatment made by their skin regressed on cortisone alone. Finally, the improvement noted in the electrocardiogram on combined treatment deteriorated in two when therapy was continued with cortisone, and in one case cortisone failed to improve the electrocardiographic pattern. In each of these aspects the deterioration appeared to be related to withdrawal of thyroid, and where this was recommenced the situation improved.

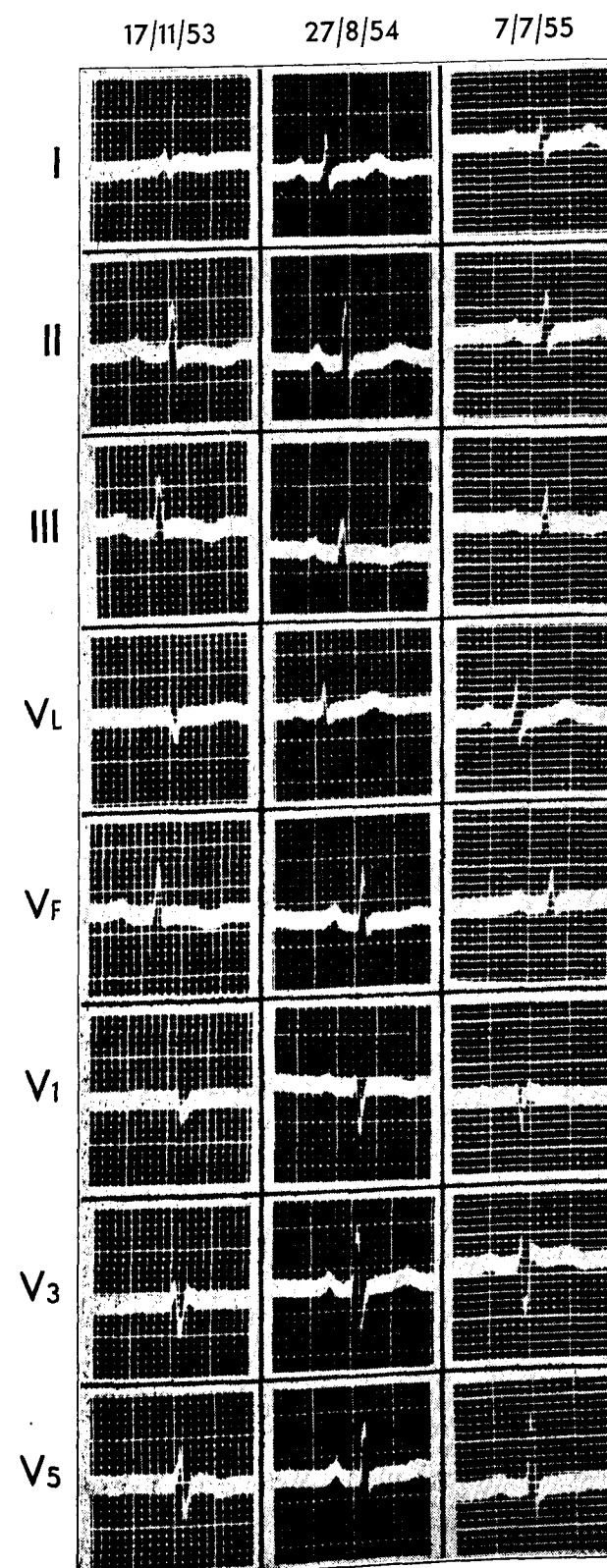
It is noteworthy that in only one of the cases was it essential to restart thyroid after it was stopped. The other cases continued to do well on cortisone alone, and it was only by careful observation and questioning that any change was apparent in their clinical status. This has also been our experience with three other cases treated on identical lines with those in the trial. In only one of these were the effects of thyroid withdrawal noticeable, in circumstances resembling those in Case 2. Mental apathy set in, she felt cold, and energy declined. All these symptoms were reversed when thyroid was restarted.

It is difficult to understand why in only two cases out of a total of seven, such profound reactions should be experienced following the cessation of thyroid medication. All the patients had clinical evidence of thyroid dysfunction, and, where carried out, basal metabolic rates and radio-iodine tests were in the myxoedema range. In the cases that continued to do well on cortisone alone there was unequivocal evidence of thyroid dysfunction. The only feature common to the two cases under discussion was that both had been treated previously with thyroid, having been incorrectly diagnosed as suffering from myxoedema, while the remaining cases had been untreated when first seen. It may be that the earlier treatment with thyroid had in some way made them dependent or sensitive to the drug so that its withdrawal was quickly followed by symptoms of deprivation. Suppression of the thyroid gland due to long-term replacement therapy would not be a factor in this secondary type of hypothyroidism where deficiency of thyrotrophic hormone is the primary defect.

The well-known improvement that occurs in the electrocardiogram when patients with myxoedema are treated with thyroid, coupled with the improvement noted in the three cases on combined therapy and subsequent regression when thyroid was withdrawn, suggests that thyroid was mainly responsible for the improvement. This action of supplementary thyroid therapy is considered to be important, and to be a further indication for routine treatment with this drug when there is clinical evidence of thyroid gland deficiency.

The stopping of D.C.A. and salt did not apparently give rise to any symptoms, nor could we detect any significant change in the patient's clinical condition. One abnormally high serum sodium level was reduced to the normal range when these were withdrawn. However, as has been previously shown, cortisone is adequate to keep patients with Addison's disease healthy, so that nothing is gained by the use of additional drugs in secondary adrenal failure.

Testosterone is frequently given to patients with hypopituitarism in order to improve strength and energy, and to restore normal sexual libido (Hart, 1953; McCullagh, Skillern, and Schaffenburg, 1954; Williams, 1955). Sheehan and Summers (1954) found, however, that cortisone was



Case 3. Electrocardiogram 17/11/53: before treatment; 27/8/54: after combined therapy for nine months; note improved voltage, T waves now upright in I, II, VF, V3, V5. 7/7/55: off all treatment except cortisone for 11 months; some regression in voltage and lowering of T wave in I, II, VF, and inversion in V5.

more effective than testosterone in the treatment of hypopituitarism, and that the only additional effect obtained when the two drugs were given together was an increase in growth of body hair. Whittaker and Whitehead (1954) gave additional testosterone to the maintenance treatment with cortisone in two male patients, and found increase in libido was produced. No change, however, was noticed in two female patients on the addition of testosterone to their treatment. In this series there was no conclusive proof that testosterone had any effect except to produce unwanted facial hair in one patient, and any general improvement in strength and energy or in libido with combined therapy appeared to be adequately maintained on cortisone alone. From these findings we suggest giving testosterone only to those female patients complaining of loss of libido who fail to improve with a combination of cortisone and thyroid. In male patients, routine testosterone is probably advisable, especially those in the younger age groups.

No definite conclusions regarding the value of stilboestrol can be drawn from this investigation because no detailed gynaecological studies were carried out. It was our impression, however, that stilboestrol made little, if any, difference, and its withdrawal caused no noticeable effect. As a method of treatment, therefore, we would not advise its routine use unless genital atrophy is so severe as to cause symptoms or unless oestrogen-withdrawal bleeding is desired for psychological reasons.

Summary and Conclusions

A clinical trial in which four patients with post-partum pituitary insufficiency were treated for varying periods on combined treatment consisting of D.C.A., sodium chloride, testosterone, stilboestrol, thyroid, and cortisone, and on cortisone alone, is described.

Three patients continued in good health on cortisone alone, while one patient relapsed and had to continue with thyroid.

Cortisone alone was thought to be inferior to combined therapy in respect of minor changes in skin in two patients, regression of the electrocardiogram in two, and return of cold-intolerance in one. It appeared that these changes were related to the withdrawal of thyroid, as they quickly improved when this drug was restarted.

From the study of these four patients and others treated since the trial ended, we regard cortisone and thyroid as the essential drugs to maintain good health in hypopituitarism. While cortisone alone seems to be little inferior to combined therapy, the effect of thyroid on the skin, electrocardiograms, and in some cases (which are apparently often unpredictable) intolerance to cold makes its routine use desirable. D.C.A. and salt therapy are unnecessary and complicate treatment, while testosterone is not advocated as routine therapy in female patients unless libido remains deficient without it.

We thank Professor G. M. Bull for allowing us to treat one of his patients and for his advice; Dr. R. S. Allison, who allowed us to study Case 4; Dr. J. A. Smyth and Mr. D. W. Neill for carrying out the biochemical estimations referred to in this study; and Mr. R. G. Wood for the illustration.

REFERENCES

- Beck, R. N., and Montgomery, D. A. D. (1956). *British Medical Journal*, 2, 921.
Fraser, R., Hobson, O. J. G., Arnott, D. G., and Emery, E. W. (1953). *Quart. J. Med.*, 22, 99.
Hart, F. D. (1953). In *Cortisone and ACTH in Clinical Practice*, edited by W. S. C. Copeman, London.
McCullagh, E. P., Skillern, P. G., and Schaffenburg, C. A. (1954). *Cleveland Clin. Quart.*, 21, 31.
Perkins, R. F., and Rynearson, E. H. (1952). *J. clin. Endocr.*, 12, 574.
Querido, A., van der Werff ten Bosch, J. J., Blom, P. S., and van Gilse, H. A. (1954). *Acta med. scand.*, 149, 291.
Sheehan, H. L., and Summers, V. K. (1954). *British Medical Journal*, 1, 723.
Whittaker, S. R. F., and Whitehead, T. B. (1954). *Ibid.*, 2, 265.
Williams, R. H. (1955). In *Textbook of Endocrinology*, 2nd ed., edited by R. H. Williams, Philadelphia.

ASPIRIN INTOLERANCE A COMPARATIVE TRIAL OF TWO MODIFIED ASPIRIN PRODUCTS

BY

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The use of aspirin preparations in rheumatic conditions is often attended by side-effects which preclude full relief of pain. These are gastric symptoms (nausea, heartburn, epigastric pain); salicylism (deafness, vertigo, tinnitus); and allergy (rash, bronchospasm).

Numerous aspirin preparations have been devised to reduce gastric intolerance, which is not without danger (Douthwaite and Lintott, 1938; Hurst and Lintott, 1939; Kelly, 1956) and which is reported to be commoner in rheumatic patients than in others. Femont-Smith (1955) compares the incidence of 26% of 200 rheumatoid cases being intolerant with two other series (Paul, 1943; Tebrock, 1951) where the incidence in non-rheumatic cases varied from 3 to 10%. It is, however, unsatisfactory to compare series of cases from different centres and with different assessors.

In this series an aspirin and glycine preparation ("paynocil") was compared with a citrated preparation ("disprin") in rheumatic patients intolerant of plain aspirin; intolerance in this context being defined as inability because of gastric symptoms to take doses of aspirin sufficient to relieve the rheumatic pain.

Design

The following categories were excluded from the trial: patients receiving cortisone, corticotrophin, phenylbutazone, or colchicine; those allergic to aspirin; and those whose response to treatment was so modified by psychological factors that a reliable assessment was impossible.

The conditions treated included all types of rheumatic disease, with rheumatoid arthritis predominating in both sexes; but most cases of gout and the severest cases of rheumatoid and collagen disease fell into the excluded category requiring more specific treatment.

With these exceptions all patients admitted to research unit beds were given aspirin, 50 gr. (3.2 g.) daily in divided doses, and this dosage was adjusted as necessary until pain relief was adequate, the final dose ranging from 20 to 100 gr. (1.3 to 6.5 g.) daily. Appropriate physical treatment was also prescribed.

Patients showing intolerance were changed to disprin or paynocil, in doses equivalent to the last dose of aspirin, the drugs being chosen alternately on each ward. After further dose adjustment, if necessary, the other product was then substituted for a week (the dose again being altered if necessary), after which the original choice was resumed. Patients were asked for their preference, with reasons. Salicylism was rarely encountered and did not in itself cause us to change the drug; any changes made (for other indications) did not appear to influence this group of side-effects.

Results

Results in men and women are shown separately, but no attempt is made to isolate the conditions treated.

Table I shows that 25% of patients in the series were intolerant to plain aspirin; this agrees with previous reports. The incidence in men and women was similar.

TABLE I

	Men	Women	Total
No. of patients	71	107	178
"intolerant to aspirin"	19	26	45

Table II shows results obtained in the aspirin-intolerant cases. Of 23 given disprin first, 5 preferred it, 10 preferred paynocil, and 8 were indifferent; all the men who made a choice preferred paynocil. Among 22 given paynocil first, opinion was more evenly divided—8 for paynocil, 9 for disprin, and 6 abstaining.

TABLE II

	Disprin Tried First			Paynocil Tried First			All Cases		
	M	F	Total	M	F	Total	M	F	Total
No. of patients	9	14	23	10	12	22	19	26	45
Disprin preferred	0	5	5	5	4	9	5	9	14
Paynocil	5	5	10	3	4	7	8	9	17
Equally satisfactory	1	3	4	1	1	2	2	4	6
"unsatisfactory"	3	1	4	1	3	4	4	4	8

The relative efficacy of the three drugs sometimes differed; four patients found the buffered preparations less effective than plain aspirin, and two found the opposite. Disprin was judged more effective than paynocil in three cases and less effective in one. In this connexion (remembering that the efficacy of salicylates is diminished by alkalis such as sodium bicarbonate, which accelerates excretion) it is noteworthy that two patients in the "unsatisfactory" group experienced improved tolerance without apparent loss of analgesia when every dose (of paynocil in one case and of aspirin in the other) was accompanied by magnesium trisilicate.

One patient who reported that she never took aspirin because of her duodenal ulcer was given paynocil from admission; unfortunately her ulcer symptoms reappeared in a few days, and analgesics had to be withdrawn.

Conclusions and Comment

In this series 45 out of 178 rheumatic patients (25%) could not take adequate doses of aspirin. Of these 45 patients, 37 (82%) responded well to paynocil, disprin, or both. There was a slight majority (17 to 14) in favour of paynocil, but the numbers are too small for this to be significant. Most of those who expressed a preference for one product did so because of marked inability to stomach the other, demonstrating that "one man's meat is another man's poison," and that there is a place for both preparations in the treatment of rheumatism, since one may succeed where the other fails.

Summary

The freedom from gastric side-effects and the analgesic efficacy of two modified aspirin preparations—paynocil and disprin—have been compared in rheumatic patients intolerant of aspirin. Four-fifths of these patients benefited, and two-thirds expressed a definite preference for one or other of these drugs, the preferences being fairly evenly divided between the two. Differences in the analgesic effect were encountered, but no definite pattern emerged. The high incidence of aspirin intolerance in rheumatic patients was confirmed.

Acknowledgment is made to Messrs. Bencard Ltd. for the supply of the aspirin-glycine compound.

REFERENCES

- Douthwaite, A. H., and Lintott, G. A. M. (1938). *Lancet*, 2, 1222.
Femont-Smith, P. (1955). *J. Amer. med. Ass.*, 158, 386.
Hurst, A., and Lintott, G. A. M. (1939). *Guy's Hosp. Rep.*, 89, 173.
Kelly, J. J. (1956). *Amer. J. med. Sci.*, 232, 119.
Paul, W. D. (1943). *J. Iowa med. Soc.*, 33, 155.
Tebrock, H. E. (1951). *Industr. Med. Surg.*, 20, 480.

Medical Memoranda

Abdominal Periarthritis Nodosa

It is extremely rare for periarthritis nodosa to present as an acute abdominal emergency. However, several cases have been reported which conform to the pattern of gradually increasing abdominal symptoms culminating in an attack of peritonitis, at which stage laparotomy has been performed. The ultimate diagnosis has usually come from the histologist, but three cases are recorded (Manges and Baehr, 1921; Logue and Mullins, 1946) in which the nodules of periarthritis were visible to the naked eye within the peritoneal cavity. We wish to describe a fourth case in which these nodules were visible at laparotomy. Obviously the visibility of the periarthritic nodules depends on their size, and this in turn on the degree of necrosis in the arterial wall, which is one of the variable factors in this disease.

CASE REPORT

A young man of 20 was admitted to St. Mary's Hospital, Portsmouth, on May 13, 1955, with severe epigastric pain. At the age of 9 he had an attack of anterior poliomyelitis which left some residual wasting of the right thigh and leg; in the past year he had had attacks of asthma. For the preceding three weeks he had suffered from intermittent epigastric pain, diarrhoea, and aching pains in the right leg. During this period he had been on a "gastric diet," which had given him some relief. For the 18 hours before admission his epigastric pain had been severe, and he had acute nausea but had not vomited; his bowels had been open normally during that time.

He was thin, pale, and over-anxious. His temperature was 100° F. (37.8° C.), pulse 120, respirations 20. His tongue was clean and moist. The abdomen was tender in the epigastrium and the right hypochondrium; there was widespread moderate abdominal rigidity, with very marked rebound tenderness in the lower abdomen and faint bowel sounds on auscultation. Rectal examination did not reveal any peritoneal tenderness. The respiratory and cardiovascular systems were normal apart from a blood pressure of 148/110 mm. Hg. The urine contained no albumin. An abdominal radiograph showed there was no gas under the diaphragm. His leucocyte count was 17,000 per c.mm., of which 90% were neutrophils and 3% eosinophils.

It was thought that the patient had peritonitis, probably due to a perforated peptic ulcer, and laparotomy was therefore performed, the abdomen being opened through a right paramedian incision (Mr. J. D. Younghusband). There was no free fluid. The first striking finding was that the greater part of the small intestine, and especially the ileum, showed a blotchy, purplish discoloration which was maximal about 2 in. (5 cm.) from the ileo-caecal valve and extended throughout the small intestine with the exception of the upper 2 in. (5 cm.) of the jejunum. Two small round yellow sloughs about half an inch (12.5 mm.) in diameter were present in the bowel wall, indicating imminent perforation. There was little or no fibrinous reaction. The colon was mildly thickened, with generalized faint inflammatory changes. The mesentery, surface of the bowel, and parietal peritoneum were extensively studded with whitish pinpoint nodules; these were best seen in the mesentery of the small intestine and along the peripheral vascular arcades of the mesenteric vessels. Most of the abdominal contents felt gritty because of these nodules. The spleen was not enlarged or affected by the nodules; the liver also was normal. The appendix was not inflamed. The nature of the nodules and the condition affecting the bowel was obscure. The two areas of threatened perforation were carefully oversewn and specimens of the nodules removed for biopsy; the abdomen was then closed. The histological report (Dr. R. D. Clay) stated: "Serial sections of a nodule reveal it to contain a small artery with focal necrosis of the whole thickness of its wall

resulting in a minute aneurysm; this is surrounded by granulation tissue, and the whole is infiltrated by polymorphonuclear and eosinophil cells. The basis of the lesion therefore appears to be a necrotizing arteritis, and a diagnosis of polyarteritis nodosa must be considered."

Post-operative progress was satisfactory, although on May 28 the patient had another severe attack of abdominal pain associated with lower abdominal tenderness, guarding, and a positive release sign. This second attack was treated by a short course of erythromycin, and he made an excellent recovery except for a continued diarrhoea. Sigmoidoscopy revealed "slight patchy reddening of the mucosa and one definite ulcer, with an irregular edge, r-d base, but without a slough." By this time his leucocyte count was 14,800 per c.mm. (12% eosinophils). A left pectoral muscle biopsy was performed (Dr. R. D. Clay) to confirm the diagnosis, and this showed "extensive fibrinoid necrosis of the arteriolar walls, which were densely infiltrated with cells mainly of the polymorphonuclear type. Surrounding the necrotic walls were zones of epithelioid cells, plasma cells, lymphocytes, eosinophil cells, and more polymorphs. This surrounding cellular infiltration was very marked, extending in some areas for a short distance between the muscle bundles. The biopsy thus showed periarteritis nodosa in the acute stage."

The diarrhoea slowly ceased together with some vague abdominal pain of which he had complained. On June 21 treatment with cortisone, 25 mg. twice daily, was begun, and within a week he was stronger; the cortisone was then reduced to 25 mg. daily owing to oedema formation. After three weeks' treatment he was discharged home on the above dosage and continued to remain well apart from two attacks of asthma.

On July 29 he became unconscious after vomiting and was readmitted. The unconsciousness lasted only a few minutes and was followed by irrational and violent behaviour requiring heavy sedation. Later neck rigidity, a positive Kernig's sign, and bilateral early papilloedema developed; a diagnosis of subarachnoid haemorrhage was made and confirmed by lumbar puncture. The blood pressure was 190/145 mm. Hg. The dosage of cortisone was increased to 100 mg. daily for eight days and gradually reduced to 25 mg. twice a day. He recovered satisfactorily from this incident, his blood pressure returning to 140/95 mm. Hg. One further attack of abdominal pain occurred. This was suggestive of peritonitis, but was relieved by sedation. Apart from this incident and slight frontal headaches he recovered well from the subarachnoid haemorrhage. He was eventually discharged on September 20 to continue with cortisone, 25 mg. twice daily. Since then he has remained well, though at no time has his blood pressure been below 140/95 mm. Hg.

COMMENT

Diseases of the abdominal viscera occupy first place in the minds of most surgeons, and it is only natural that they tend to be most commonly diagnosed in cases of peritonitis. Allen (1940) describes a case of abdominal periarteritis nodosa in which perinephric abscess, appendix abscess, and cholecystitis were considered before laparotomy was performed on a presumed diagnosis of penetrating peptic ulcer. Manges and Baehr (1921) thought that their case was one of suppurative retroperitoneal lymph nodes or perhaps a localized peritonitis in the lesser sac. It would appear that patients with abdominal periarteritis nodosa present with a short history of vague abdominal pain—in our case thought to be due to a peptic ulcer; they may also have pains in the muscles and joints and a history of sore throat. Eventually the abdominal symptoms become more marked and signs of peritoneal irritation develop, leading to surgical intervention. The patient usually has a high temperature—100° F. (37.8° C.) in our case—and a marked leucocytosis. Logue and Mullins (1946), in reporting 177 cases of periarteritis, list the most prominent symptoms as fever (81%), leucocytosis (73%), albuminuria (65%), abdominal pain (56%), and hypertension (53%). The presence of albuminuria and hypertension depends on involvement of the renal arteries;

in our case there was a raised blood pressure which has remained constant, but no albumin or red blood cells have been found after repeated urinary examination.

Our thanks are due to Mr. J. D. Younghusband and Dr. R. G. Moore for permission to publish this case.

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REFERENCES

- Allen, P. D. (1940). *Arch. Surg. (Chicago)*, 40, 271.
Logue, R. B., and Mullins, F. (1946). *Ann. Intern. Med.*, 24, 11.
Manges, M., and Baehr, G. (1921). *Amer. J. med. Sci.*, 162, 162.

Operation for Midline Epigastric Incisional Hernia

Although the majority of incisional hernias following midline epigastric incision cause little discomfort and can be supported by a suitable abdominal belt, there are a number with wide divarication of the recti and ballooning of the hernia itself which, because they cause both mental and physical discomfort and in some cases exaggeration of pre-existing chest symptoms, need surgical repair.

Such hernias can, in the main, be prevented by the careful use of unabsorbable suture, but the price is an incidence of stitch sinus which, although varying in the practice of individual surgeons, occurs in a few cases.

For the type of hernia described above I have used the following procedure with unfailing success in some 12 cases.

The scar is excised by an elliptical incision from xiphisternum to umbilicus and the skin on both sides undermined laterally to expose the peritoneum of the sac and the whole of both anterior rectus sheaths to their lateral edges.

The peritoneum is now repaired where it is deficient or weak and the exposed anterior rectus sheaths are dissected off the underlying rectus muscles to form two rectangular flaps, consisting of external and internal oblique aponeurosis, hinged on their medial margins—that is, along the whole lateral margin of each side of the hernial gap. It is important that these flaps should be raised without damage either to the underlying muscle or to the flaps themselves, and that they should include almost the whole width of the sheath. Bleeding, which is usually troublesome, should be dealt with carefully by ligation and suture.

The flaps are now turned over medially on their hinges and sutured with closely placed interrupted sutures of No. 3 plaited silk to the medial edge of the opposite rectus sheath, this being the original but split linea alba forming the hinge of the opposite flap. The security of these sutures is enhanced by folding under the lateral edge of each flap to obtain a double bite. The gap can always be filled in this way with two double-layered aponeurotic flaps—the suture line of each being protected by the intact hinge of its fellow.

The recti, relieved of the lateral pull of the obliques, tend to approximate slightly during the suturing, and this relief of lateral pull can be appreciated later when the repair is healed, when it can be seen that, on straining, the gap tends to close and the remaining deficiency is well controlled by the aponeurotic graft.

The suturing having been completed and haemostasis checked, the skin incision is closed without drainage.

Any subcutaneous serum is aspirated as soon as it forms during the post-operative period; drainage is avoided, to ensure healing by primary union.

ADDENDUM.—Since submitting this article for publication a description of this operation by Professor Charles Wells has been published (*Ann. roy. Coll. Surg. Engl.*, 1956, 19, 316).

I thank Sir Heneage Ogilvie for his advice concerning the preparation of this article.

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Reviews

THE LONDON SCHOOL OF TROPICAL MEDICINE

History of the School of Tropical Medicine in London (1899-1949). By Sir Philip Manson-Bahr, C.M.G., D.S.O., M.D., F.R.C.P. (Pp. 328+xiii; illustrated, 50s.) London: School of Hygiene and Tropical Medicine (Memoir No. 11). London: H. K. Lewis and Co. Ltd. 1956.

Within the short period of 50 years the tropics have been converted from a white man's grave almost to a health resort. We are told that it used to be said:

"Beware and betide of the Bight of Benin,
For few come out, though many go in."

Under the changed conditions, however, a doctor who married a nurse and had three children in Nigeria wrote:

"The Bight of Benin is no longer in doubt;
Where two have gone in, now five have come out."

A perusal of this excellent history makes it plain that the London School of Tropical Medicine played a very important part in bringing about this great change. The idea of the school was conceived in the imaginative yet practical mind of Sir Patrick Manson. With the powerful aid of Joseph Chamberlain and Mr. (afterwards Sir) Herbert Read, and the co-operation of the Seamen's Hospital Society, the school was born in a building near the Albert Dock Hospital. Further development took place in the building in Endsleigh Gardens, and it finally entered (in conjunction with the School of Hygiene) into the beautiful building within the curtilage of London University. It triumphed over many difficulties.

The well-produced book in which the story is told comprises four parts. The first tells the plain story in a readable manner; the second gives fascinating short biographies of all those (whether professors, lecturers, technicians, or secretaries) who have played essential parts in the development of the school; the third and final sections give a chronological list of events and an account of the research work and publications of the members of the staff and former students of the school. The whole work is tinged with wit and lit up by flashes of humour. Some of the quotations at the head of sections and chapters are very appropriate. What could be better than these two lines (from Samuel Johnson) to portray Sir Leonard Rogers?

"A frame of adamant, a soul of fire;
No dangers fright him and no labours tire."

I thoroughly enjoyed this book, both for the story it contains and for the many autobiographical interpolations of the author. I take the liberty of quoting one good story. In the old building in Endsleigh Gardens the lecture-room was dark and stuffy. "There was one memorable occasion on one July day when the lecturer was demonstrating a series of statistical tables by means of slides ornamented with yellow, red and blue dots, when he exclaimed to the attendant, 'Turn up the lights and I will talk to them for a bit.' When the light did come on it revealed the whole class of over seventy men, without exception, fast asleep."

One small criticism—there is no index. I should like to add a modern proverb which may be quoted without acknowledgment: "A book without an index is like a country without a map."

ZACHARY COPE.

DISEASES OF THE BREAST

Diseases of the Breast. By C. D. Haagensen, M.D. (Pp. 751+xviii; illustrated £5 12s.) Philadelphia and London: W. B. Saunders Company. 1956.

This is the second important work on breast diseases from an American centre in the last year, but it differs from the former in being an account of the experience of a lifetime in dealing with these conditions. The consequences of this

personal approach are, on the one hand, that the opinions expressed are backed by a vast experience and acquire great value on that account; on the other hand, there is the disadvantage that alternative views are not given so much prominence nor considered with such objectivity as if the author had not had this almost unique experience. The effect is to make the book an object of study for the experienced surgeon and the expert. It is not, however, to be recommended for general reading, nor was it presumably intended for the undergraduate student.

In the section on anatomy the views of Batson on the significance of the vertebral system of veins in the dissemination of breast cancer are given justifiable prominence, and there is a very full discussion of the important subject of lymphatic drainage. On the other hand, the physiology is not very fully discussed. This attitude is reflected in the somewhat inadequate account of the hormone aspects of the treatment of breast cancer, and shows that the author is primarily concerned with the surgical treatment of this condition. An instance of this is the incorrect statement that the presence of hepatic metastases renders a case unsuitable for treatment by adrenalectomy. The author advocates the American practice of self-examination, and he rightly condemns aspiration biopsy, trephine biopsy, and intra-duct biopsy. He will command almost universal agreement when he says that frozen-section biopsy is not adequate to distinguish between the different types of papillary lesion. Dr. Haagensen is an advocate of scrupulous radical mastectomy with skin-grafting in almost every case. The fact that this operation takes between five and six hours might not recommend it to the British school of surgery, which teaches that, with equal care, as satisfactory an end-result can be achieved in half that time and with a lower morbidity. The author's operation for intra-duct papilloma is not perhaps the most elegant which is now available, but it is a great improvement on the hit-and-miss technique of resection of the block of breast tissue in the region from which the blood is thought to be emanating. In the section on tuberculosis of the breast no mention is made of antibiotic therapy, which has completely altered the prognosis of this condition. The advocacy of radical mastectomy for Paget's disease and for the intra-duct cancers in general must command wide support. Finally, the considerable space devoted to the description of biopsy from the bodies of the vertebrae is once more illustrative of the colour which this book derives from the author's personal interests.

The above comments are criticisms of points of detail, which are inevitable when a book is written by an expert who has explored personally so many controversial issues. Taken as a whole, this book is a monument to the life work of a fine surgeon. Although there may be disagreement on certain particular conclusions, this work is informed by scrupulous care and that thoughtful consideration for the interests of the patient which is the mark of a great doctor all the world over.

HEDLEY ATKINS.

PORPHYRIN BIOSYNTHESIS AND METABOLISM

Ciba Foundation Symposium on Porphyrin Biosynthesis and Metabolism. Editors for the Ciba Foundation: G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., and Elaine C. P. Millar, A.H.W.C., A.R.I.C. (Pp. 308+xii; illustrated, 30s.) London: J. and A. Churchill Ltd. 1956.

This volume records the proceedings of a symposium on the biosynthesis of porphyrins and porphyrin metabolism held at the Ciba Foundation, London, in February, 1955, under the chairmanship of Professor C. Rimington. The subject was last considered in a Ciba Foundation symposium in 1951, when the volume subsequently published bore the title *Isotopes in Biochemistry*. At that time the incorporation of labelled glycine into the haem of circulating blood and the existence of the amino-laevulinic acid cycle were both appreciated, but many gaps existed in knowledge of the

biosynthesis of porphyrins. Because research since that time has been so fruitful, the scope of the new three-day conference had to be limited to the biosynthesis of porphyrins and of haem, and, apart from experimental porphyria, porphyria diseases had to be excluded.

The conference and the book both fell naturally into four main sections: (1) the early stages in biosynthesis, those involving steps before the pyrrole stage; (2) studies involving porphobilinogen; (3) the general role of porphyrins and the binding of iron; and (4) the use of sedormid and allylisopropylacetamide in inducing derangements of porphyrin metabolism. Although firm evidence is available to link glycine and succinic acid as precursors of β -amino-laevulinic acid, and the latter is clearly an intermediary in the formation of porphobilinogen, the steps between porphobilinogen and protoporphyrin are uncertain, though uroporphyrin and coproporphyrin may both be implicated. The stage at which iron enters in the synthesis of haem, and the mechanism of its incorporation, are still uncertain.

The book is well edited, and makes most interesting reading for those anxious to have in an easily accessible form an account of researches spread widely over the original literature.

F. G. YOUNG.

EYE DISEASES ILLUSTRATED

An Atlas of Diseases of the Eye. Compiled by E. S. Perkins, M.B., F.R.C.S., and Peter Hansell, M.R.C.S., F.R.P.S. Foreword by Sir Stewart Duke-Elder, K.C.V.O., M.A., D.Sc., Ph.D., M.D., F.R.C.S. (Pp. 91+ix; plates in colour and black-and-white. 42s.) London: J. and A. Churchill Ltd. 1957.

An Atlas of Diseases of the Eye, by E. S. Perkins and Peter Hansell, attempts to cover the whole range of diagnosis in ophthalmology. Thirty-two pictures are devoted to the lids and orbit, both in their normal and in their pathological aspects; such common conditions as styes and chalazia and such rare affections as naevus flammeus of the face are shown. Affections of the conjunctiva, cornea, and sclera are represented in 36 further illustrations, and a similar number deal with the uveal tract, the lens, and retrolental fibroplasia. The scope of these is shown by the fact that two plates are devoted to gonioscopy and neoplasms of the anterior uveal tract. The two concluding sections depict appearances of the fundus—32 figures show changes occurring in systemic disease, and 64 changes in more localized disease of the eye: in all 96 illustrations forming a useful atlas of the fundus and its diseases. Throughout the work there is evidence of much thought and care, both in the choice of material and in the drawings prepared; no praise can be too high for the reproduction and printing. The explanatory matter is usefully placed opposite the pictures.

ARNOLD SORSBY.

PHYSIOTHERAPY IN PARAPLEGIA

Physiotherapy in Paraplegia. By Elvira P. G. Hobson, F.C.S.P. Foreword by L. Guttmann, O.B.E., M.D., M.R.C.P. (Pp. 110+ix; illustrated. 12s. 6d.) London: J. and A. Churchill Ltd. 1956.

This book is based on a thesis written for the Fellowship of the Chartered Society of Physiotherapy, and as a thesis is commendable. The modern treatment of the paraplegic is considered in all its aspects, and it is here that the book may disappoint the medical reader. Thus it seems inappropriate for a physiotherapist to attempt to report on the strictly medical and surgical problems, for which she can only repeat uncritically what others have said to her. However, for physiotherapists themselves this book gives a useful account of the methods developed by Dr. Guttmann at Stoke Mandeville Spinal Injuries Centre.

W. RITCHIE RUSSELL.

Bibliography on Hearing (London: Geoffrey Cumberlege, 55s.), prepared by the Psycho-Acoustic Laboratory at Harvard under the direction of S. S. Stevens, is a second and enlarged edition of *A Bibliography on Audition* published in 1950. It lists over 10,000 titles of books and papers, arranged alphabetically by author. Following the main list is a subject classification in two parts: the first is an outline scheme under 315 heads, numbered serially; the second, arranged under the numbers of the scheme, lists the authors who have written on each subject. Such an arrangement is open to criticism. The method of using the classification lists to find entries on a particular subject is tiresome. In the second half of the scheme only the surnames of authors are given, and in the case of such common names as Smith this may entail looking through a great many entries to find a particular paper. There is no indication if an author has written more than one paper on a particular subject or if two authors of the same surname have both written papers on it. Considerations of space and printing costs have no doubt dictated the present arrangement; a subject bibliography with an author index would have been more usable. Even so *Bibliography on Hearing* is a valuable work of reference covering all aspects of otology.

The *Annual Review of Medicine* (Vol. 7, 1956) continues to give expert evaluations of progress in a variety of medical and surgical specialties. Although designed primarily for clinical investigators and teachers, it also provides a valuable refresher course for the general and specialist practitioner. It concludes as usual with an exhaustive bibliography of reviews in medicine which have appeared during the past year. It is published by Annual Reviews, Inc., Stanford, California, price \$7.50.

The 58th edition of *Scientific and Learned Societies of Great Britain* (George Allen and Unwin Ltd., 1956, pp. 212, 35s.) brings this valuable reference book up to date once again; the last edition appeared in 1951. Its aim is to include, in classified order, details of all those societies which give educational facilities and/or publish papers or other original material. In the new edition a larger number of societies has been compressed into less space by abolishing the geographical subdivisions and sometimes by omitting names of officers. The price seems high for so small a volume.

Looking back over a varied life of doctoring at home and abroad, Dr. C. V. Nicoll has a number of good stories to tell about medical men, politicians, and others in his book *From a Doctor's Diary* (Wilding, 15s.). Samuel Gee, who was teaching at Bart's when the author was a student there, thought that tobacco smoking was unhealthy and that business men ate and drank too much—traditions alive and kicking to-day. A fellow-student of the author's will arouse the admiration of many for having taken exception to a hectoring examiner and told him he was unfit for the job. However, he apparently had to go elsewhere for his qualifications.

Lecture Notes on the Use of the Microscope, by Dr. R. Barer, is an excellent little book for anyone to study when he first begins to use a microscope. It will also be instructive to the slightly more advanced worker who wants to learn the advantages of Köhler illumination for critical work and how to set up his apparatus to obtain it. The author's elementary account of the optics of microscopes is so designed as to be of use in practice at the bench. The book is published by Blackwell Scientific Publications at 7s. 6d.

The well-known textbook, *Law Relating to Hospitals and Kindred Institutions*, by S. R. Speller, LL.B., has now reached its third edition (1956). Since the Health Service began a number of cases contested in the courts have resulted in alterations to the law. Consequently the author has made a considerable number of changes in his book to keep it up to date. So that it shall not become too unwieldy, he has reduced the text on the Public Health Acts. The book is published by H. K. Lewis Ltd. for 70s.

A group of distinguished contributors have combined in *Progress in Clinical Medicine* (3rd edition) to set out in a practical, didactic style modern views on diagnosis and treatment in many fields of medicine. The subjects covered include infections, diabetes, rheumatism, and diseases of the alimentary, cardiovascular, renal, haemopoietic, respiratory, neurological, and endocrine systems; old people, metabolic disorders, and radio-isotopes come in for special chapters. Edited by Drs. Raymond Daley and Henry Miller, the book is published by J. and A. Churchill Ltd. for 40s.

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THE CONSTITUTION OF THE B.M.A.

The Representative Body set up in 1953 a Constitution Committee "to examine and report on the present structure of the Association, with special reference to the reorganization of the Representative Body." The report of the Committee is published in this week's *Supplement* and will be the subject of a whole day's debate when the Representative Body meets at Newcastle in July. Mr. H. H. Langston, the Chairman, and his Committee have put the Association in their debt by their painstaking and thorough analysis of the present situation, by the fairness with which they have put the arguments for and against proposals for reform, and by the cogency with which they propose changes in the constitution which will go some way towards meeting the criticisms which have been voiced since the end of the war, and especially since 1948. Many felt that a constitution adapted to the conditions of 1902 would be unlikely to meet the greatly changed conditions of to-day. In particular the Representative Body has grown to such a size as to lead Mr. Langston's Division in Winchester to describe, a few years ago, its meetings "as a shambles—too many members discussing too many resolutions." There have been occasions when on the last day of the meeting important matters had to be hustled through with a haste that allowed hardly any time for discussion. The numbers of the Representative Body rose with the increase in membership of the B.M.A., which grew with but faster than the increase in the numbers of doctors practising in Britain. In 1938 the Representative Body numbered 366 and in 1956 it numbered 500. Can a body this size—the annual Parliament of the B.M.A.—effectively deal with the business of the Association during the four days it meets every year? And the business is no less than that of determining the policy of the B.M.A. The Constitution Committee recommends that the Representative Body should be reduced in number from 500 to 350. The question to be answered is, Will 350 men and women be wiser than 500?, or, at least, be better able to

concentrate on the matters at issue? There would certainly be 150 fewer with a potential right to speak. A more practical question is the difficulty of finding a large enough meeting-place in the different cities of Britain. A more contentious question is that the Representative Body is composed so predominantly of general practitioners that the policy of the Association is determined largely by their interests. The consultants and specialists in particular are uneasy about this. They feel themselves to be, and are, in a minority at a Representative Meeting, and are therefore dependent upon a vote of general practitioners to secure the policies they wish the Association to adopt. The B.M.A.'s constitution is based on a "federation of geographical units rather than an alliance of craft groups," as the Committee puts it, and the Committee sees no reason to change this, but stresses that a Division "should be large enough to include in its membership all the main fields of medical practice." It has taken an important step by recommending that the Central Consultants and Specialists Committee should elect four members of the Representative Body, important because the Committee thus outwardly does something towards meeting a grievance which undoubtedly exists. It notes in its report that at the Glasgow meeting, for example, there were 75 consultant members of the Representative Body as compared with 281 general practitioners.

If consultants and specialists still feel anxious about their position in the constitution of the B.M.A. they should feel encouraged by the Committee's proposals for the reconstruction of the Branches of the Association. It recommends that "the Branches shall be reorganized on a basis corresponding in the main with the areas of the Regional Hospital Boards." In this way hospital staffs will find a B.M.A. focus for their interests and a unit large enough to embrace them effectively. The Branch Council will be able to co-ordinate the opinions of all sections of the profession in its area, and the Divisions and the Regional Consultants Committees will have a common meeting-place for discussion and a common instrument for formulating policy. The Branch Council, the Committee states, "should contain in its membership representatives of all the organized bodies in its area, and so be able to speak with authority on behalf of the profession as a whole." What stands out in this proposal is that it would lead to the establishment of a much closer relationship between hospital staffs and the Association and thus go a long way towards removing the criticism, untenable though it is, that the Association is principally concerned with the welfare and interests of general practitioners. The Committee

does not recommend any change in the present constitution of the Central Council of the B.M.A., consisting of 77 members, of whom 40 members are elected by Branches in Great Britain and Northern Ireland grouped for the purpose. But the proposed reorganization of the Branches, if carried through, might have as one result an increased representation of consultants in the Council.

There is space here to touch upon only a few outstanding matters in a report of remarkable interest. Among others there is the recommendation that a second scientific meeting should be held in the winter, a reminder of the fact that one of the principal aims of the B.M.A. is to promote the medical and allied sciences. It is much to be hoped that members will read and re-read the Constitution Committee's report in this week's *Supplement*. It is the thoughtful product of much hard work. It shows that the B.M.A. is a live organization, alert to its responsibilities in a rapidly changing world. Its publication now, well in advance of the Annual Meeting, gives Divisions ample time to study it and their Representatives the opportunity to join in the debate at Newcastle with prepared minds. Much will depend upon the decisions the Representative Body takes, because it will be laying down the pattern for the future.

MEETING THE NEW MINISTER

A delegation from the Negotiating Committee met the Minister of Health, Mr. D. F. Vosper, on Wednesday this week, and at the time of writing we are ignorant of the results of the meeting. The new Minister has taken office at a time when the profession is deeply disturbed about its relations with the Government and about the conditions in which it works in Britain's National Health Service. With little time in which to grasp the intricacies of the situation facing him Mr. Vosper will have had to lean heavily on the advice of his civil servants; and almost immediately on his appointment he was invited to attend a meeting of the Cabinet. In these circumstances he will inevitably be the spokesman of others, and what he says on the immediate issue of remuneration will be said on the authority of the Cabinet. Whatever the reactions of the profession to this, it will no doubt be fair-minded in its attitude to Mr. Vosper himself at the beginning of his tenure of an office to which many have been called but in which few have chosen to remain.

This week will show whether Mr. Vosper is to adopt the same negative attitude as his predecessors

to the medical profession's claim that its remuneration must continue to be based on the recommendations of the two Spens Committees. It is now being said that the Spens formula is unrealistic and that something new and more flexible must be sought. What at present seems to be inflexible is the Government's attitude to its moral obligation to act on a promise. We do not recall that when the Conservative Party was in opposition in 1948 it raised even one voice against the "unrealistic" nature of the Spens reports. And if the Government to-day tries to evade the issue by calling for a new formula—a more flexible formula—what confidence will the profession have in it in view of the way the Government has treated it since July, 1948? During the past several months our negotiators have patiently asked for a reasonable examination of their case, and have for their pains been fobbed off with a cursory dismissal of it. One result of this has been to bring to the surface a volume of frustration and discontent with many other things than the amount of pay for work done. If—as some people are suggesting—the Spens formula is not flexible enough, neither is the Health Service itself. Doctors feel themselves cased in a rigid structure which inhibits initiative and creative activity.

Basing their claim on the Spens formula, our negotiators have asked for an increase of 24% in the remuneration of those working in the Health Service. If this is rejected the various elements in the Negotiating Committee—we understand—will report back to their constituents. If this is to be done it is hoped that it will be done quickly, so that concerted and united decisions and action may be taken without too much delay. The crisis now facing the profession is for the whole of the profession and not just any one section of it. It must remain united in its collective responsibility not only for its several parts to-day but for the profession of to-morrow.

Many correspondents to this *Journal* rightly insist that the first question to be settled is the present claim for increase of pay in accordance with the Spens recommendations. If the Government refuses to admit their validity, then the relations between it and the profession will be at breaking point. It will have precipitated a crisis that will be of its own making, a crisis of confidence, as it has been aptly called. The present mood of the profession is shown unmistakably by the many resolutions from different parts of the country calling for withdrawal from the N.H.S. if no satisfaction is given. Short of this, a demand might be made for arbitration, a time-honoured method of settling disputes between two groups of people each of which believes it has reason on its side.

GESTATION AND SEX

The idea that the time in the menstrual cycle when intercourse takes place might have some influence on the sex of the child is not a new one.¹ There has been no direct support for this hypothesis, however, and attempts to examine it on experimental animals have given conflicting results.²⁻⁵ Indirect evidence which may have a bearing on the matter has recently been obtained by T. McKeown and B. MacMahon⁶ in an investigation of sex differences in length of gestation of mammals. Their starting-point was the well-established fact that the period of gestation is slightly longer for girls than for boys, and their own observation that the proportion of male children decreases as the period of gestation increases. The relationship was not the same in all the mammals examined. Pregnancy was longer for males than for females in the cow, horse, and possibly the sheep, and appeared to be longer for females than for males in the guinea-pig as well as in man. In commenting on these observations McKeown and MacMahon focused attention on the data for man and the cow, species in which the interpretation is somewhat simplified by the fact that only one foetus is usually present. They suggest that in the cow the most likely explanation of the longer gestation of males is that the proportion of males conceived is higher if mating takes place early in heat; this is to say that in relation to time of ovulation—which occurs after the end of heat in the cow—it is the date of mating which is early and not the date of birth which is late. At first sight this possibility would appear to be ruled out in the case of man, since the sex difference in duration of pregnancy is probably attributable to a difference in foetal weight; second-born females and first-born males are of approximately the same birth weight, and are delivered after about the same period of gestation. But in cattle gestation is dated from mating, whereas in man it is dated from onset of menstruation, and hence provides no information about the time of mating in the cycle. In short, the observations on the cow suggest that sex of offspring may be related to time of mating, whereas the human data are wholly, and inevitably, inconclusive.

This conclusion is necessarily cautious. McKeown⁷ has noted that, if the sex of the child is related to the

time in the menstrual cycle when intercourse occurs, it might explain some of the anomalies of the human sex ratio at birth. There has never been a satisfactory explanation of the fact that the proportion of male births decreases slightly as parental age increases, and that the proportion appears to increase during war. Both observations might be accounted for if the proportion of males conceived is higher in pre-ovulatory than in post-ovulatory matings, since an increase in the frequency of matings would probably tend to increase the proportion of early fertilizations and to raise the sex ratio. In this context the decline in the proportion of male births with increasing parental age is of particular interest. It has never been clear whether the change is associated primarily with age of mother or with age of father, and it is so small that large numbers of observations are required to separate the two influences. A recent report by E. Novitski and L. Sandler,⁸ based on all births of white children in the United States in the years 1947-52, suggests that the age of the father is more important than the age of the mother. If this is true the age trend cannot be attributed mainly to a maternal influence—such as a sex difference in the incidence of abortion—but must also be due to something associated with the father's age. Variation in the relative frequencies of production of X- and Y-bearing sperm is well established in some animals, and is the explanation suggested by Novitski and Sandler. But if time of intercourse in the cycle has an effect upon sex of offspring the slight decline in the proportion of male children with increasing paternal age might result from a decline in the frequency of intercourse rather than from a change in the relative viability or frequency of the two types of sperm.

OXYGENATION IN RADIOTHERAPY

Cellular damage from exposure to x rays is believed to be caused by two different processes—first, by direct "hits" by the ionizing particles on the chromosomes, and, secondly, by ionization of the water contained in the cell with the production of very short-lived oxidizing radicals which inactivate the cellular enzymes and may lead to cell death.¹ The formation of these oxidizing radicals is appreciably increased in the presence of oxygen. The proportion of the cellular damage which can be ascribed to each of these processes is not known, but recent radiobiological research culminating in the work of L. H. Gray and his colleagues² has suggested that the latter is at least as important as the former, if not more so. They showed that the sensitivity of many different types of plant and animal cells to damage by x rays may be reduced, both *in vivo* and *in vitro*, by as much as two-thirds if they are deprived of their normal oxygen supply, but will not be greatly increased in the

¹ Thury, M., *Mémoire sur la loi de production des sexes chez les plantes, les animaux et l'homme*, 1863, Geneva.

² Pearl, R., and Parshley, H. M., *Biol. Bull.*, 1913, 24, 205.

³ ———, *Maine agric. exp. St. Bull.*, 1917, 261, 130.

⁴ Cooley, C. L., and Slonaker, J. R., *Amer. J. Physiol.*, 1925, 72, 595.

⁵ Hart, D., and Moody, J. D., *Ann. Surg.*, 1949, 129, 550.

⁶ McKeown, T., and MacMahon, B., *J. Endocr.*, 1956, 13, 309.

⁷ ———, *First International Conference of Human Genetics*, 1956.

⁸ Novitski, E., and Sandler, L., *Ann. hum. Genet.*, 1956, 21, 123.

presence of excess oxygen. In man the normal environment of most cells contains oxygen at a tension of about 35 mm. Hg, and a rise in the tension will not greatly affect the radiosensitivity; similarly, normally oxygenated tumour cells will not be made much more radiosensitive by increasing the oxygen tension. Many tumours, however, contain large numbers of cells which, because of poor blood supply, exist under almost anoxic conditions.³ It is believed that these poorly oxygenated cells may survive such doses of irradiation as may safely be given to patients, but that if the oxygen tension to which they are subjected were raised to somewhere in the normal range they might become much more sensitive.

In 1954 K. A. Hultborn and A. Forssberg⁴ described four cases of skin tumours in which the concomitant inhalation of oxygen at atmospheric pressure appeared macroscopically to have amplified the effect of irradiation. In the following year I. Churchill-Davidson, C. Sanger, and R. H. Thomlinson^{5,6} reported the results of a preliminary investigation into the effects of irradiating carcinomas in patients breathing oxygen at a pressure of three atmospheres absolute (30 lb. per square inch (2.1 kg. per square cm.) gauge pressure). To obtain results quickly they tried to determine whether the expected increase in radiosensitivity was demonstrable histologically. To do this they treated patients with carcinomas large enough to be divided into two fields for irradiation. One field was irradiated with the patient breathing air at atmospheric pressure and the other with the patient breathing oxygen at three atmospheres in a pressure chamber. Each field was irradiated once only with the same dose of x rays. To compare the effect on the two fields a dose was given which was considered insufficient to kill all the cells. After an interval a biopsy specimen was taken from each field, or the growth was excised, and the pathologist was told where the dividing line between the fields lay but not which field was irradiated in oxygen. Eight patients were treated—four had carcinomas of the lung and four carcinomas of the breast (two were local recurrences after mastectomy). The results were encouraging in that the tissue which the pathologist reported as more damaged was in six cases out of the eight that irradiated in oxygen. This was also probably true in the seventh case, but the conditions of the experiment were not fulfilled, the pathologist having been told, because of some misunderstanding about the dividing line, which tissue was which. In the eighth case no distinction could be made because none of the tumour cells in either field had survived.

At the annual congress of the British Institute of Radiology last December, Churchill-Davidson and his colleagues presented the results of treatment of a further thirty-five patients, who had been given potentially cura-

tive doses of x rays to the whole tumour while breathing oxygen at three atmospheres—the criterion for their selection being that they should, either owing to the tumour's extent or histology, be considered to have little chance of cure by conventional radiotherapy. The apparatus and technique, though experimental, had proved satisfactory and no mishap or immediate complication attributable to the treatments had occurred. The authors stated that, although the results could be regarded only as a preliminary assessment because of the short time which had elapsed since many of the patients had been treated, the initial response of the tumours had in most cases been very much better than would otherwise have been expected in their experience. Nevertheless, they believed that several years' work would be necessary before a final appraisal could be made. The work of P. Howard-Flanders and E. A. Wright⁷ suggests that the addition of oxygen might increase the incidence of radionecrosis of bone and cartilage because of the normally poor oxygenation of these tissues. It is hoped that this difficulty will be overcome by the use of higher energy irradiation, since this is less absorbed in bone and cartilage.

UNSETTLED CHILDREN

The concept of maladjustment in children is so loosely defined that its frequency must necessarily be uncertain. Recent estimates in Somerset, Birmingham, and Berkshire, as reported by the Committee on Maladjusted Children,¹ vary between 5.4% and 11.8% of school-children. This committee, though it embraced a wide definition of maladjustment, seemed to be considering it primarily in relation to child-guidance clinics, paying little attention to children, for example, whose maladjustment brings them before juvenile courts, and encouraging what may be regarded as an undesirable differentiation between the needs of maladjusted and of delinquent children. At least until a year ago 23 counties and 26 county boroughs had no child-guidance clinics, and even if the lowest estimates are accepted existing clinics can hardly be expected to cope with the maladjusted children of their locality.

D. H. Stott, whose previous writings have mainly been concerned with delinquency, has now published a book with the apt title *Unsettled Children and their Families*,² which is directed towards relieving the burden on child-guidance clinics and encouraging teachers and parents to deal more confidently and at an earlier stage with a proportion of their difficult children. He sets out to establish which of the common parental inadequacies matter little or much, to show in detail the kinds of family weakness which give rise to delinquency and to other unsettled behaviour. He lists half a dozen patterns of unsettled behaviour—overdemandingness, withdrawal, depression, and so on—and follows with a dozen "breakdown-producing" family patterns. He has as aids to diagnosis "adjustment pointers," "native-wit schedules," "life-history charts," and "diagnostic

¹ Ministry of Education, *Report of the Committee on Maladjusted Children*, 1955, H.M.S.O., London.

² Stott, D. H., *Unsettled Children and their Families*, 1956, London.

summary sheets"—all of which are to be used by those who are professionally concerned with children but have no formal training in clinical work. He also elaborates ten syndromes of parent-child attitudes, linking up observed behaviour with its meaning for the child. Some readers may think Dr. Stott oversimplifies the problem; he scarcely mentions previous classical work, and he makes some rash statements and alarming excursions into unknown territory. For him "all basic anxieties in children relate to some threat, real or imagined, to membership of the family group." Clinical interviews and the whole body of psychotherapy, individual and group, are rejected. Intelligence tests in clinics should be abandoned entirely. "Depressive reactions" and "irritable, intolerant states" suggest "neurophysical exhaustion" and should be treated by physical rest; even "some of the outbreaks and fits which are now thought to be epileptic" should be treated by "systematic rest-therapy." Enuresis should be looked upon as a "strain illness" of the same order as "infective illnesses of bronchi, ear, nose," and included in the same group are "bad co-ordination and other spastic conditions . . . fits, bad turns."

Nevertheless, there are some useful lessons to be learned from this book. It is probable that teachers and other understanding people, perhaps even parents, could effectively help a far larger proportion of those unsettled children now being sent to child-guidance clinics. In doing so their main need is not a high degree of psychological sophistication but the ability to step outside their immediate relationship with the child and to view the situation objectively. It will not matter very much whether they follow Dr. Stott or the many other authorities who have written on parent-child reaction patterns, so long as they realize that patterns exist, and that each child needs careful observation and assessment in relation to its family. A further point, which should appeal to general practitioners, is that by a confident bearing, a simple, perhaps empirical, prescription, and the prevention of further damage through panic action while Nature completes the cure, a doctor may often be of the greatest help to his patient; and so it undoubtedly often could be with disturbed children. There is surely a need for the child psychiatrist to emerge more frequently from his clinic, in order to help enlightened teachers and social workers to undertake as much of the treatment of unsettled children as possible; and the psychiatrist will have to play the major part in effecting that enlightenment.

EMERGENCY OBSTETRIC SERVICE

Flying squads to give emergency obstetric treatment are now based on 172 maternity hospitals or units in England and Wales. They receive about 3,000 calls per year, or, expressed in another way, their assistance is sought in 10 out of every 1,000 domiciliary deliveries. About three-quarters of the calls are for complications arising during the third stage of labour, but among the other emergencies flying squads are being called on to treat are abortion, antepartum haemorrhage, eclampsia, prolonged labour, undiagnosed malpresentations, mul-

tiple pregnancies, prolapse of the cord, and acute inversion of the uterus. Elsewhere in this issue (p. 455) we report the twenty-first birthday celebrations of the emergency obstetric service at Newcastle upon Tyne, which answered its first call on October 15, 1935, and is thus one of the oldest units in the country. Before the setting up of this service in Newcastle investigations had shown that, while some maternal deaths arose from failure to refer complicated cases to hospital, some women lost their lives as a consequence of their transportation to hospital. This was especially true of patients with the third-stage complications of haemorrhage, retained placenta, and shock—and it was to this group that the obstetric emergency service was primarily directed. An excellent account¹ of the work of the Newcastle service was published in this *Journal* some years ago. In that area it has always been the practice to send out an experienced obstetrician as a member of the team, and this good example has for the most part been followed in other parts of the country. More recently it has been found that invaluable help can often be given by a specialist anaesthetist. In the early days of flying squads there was a fear that obstetricians might be forced by the circumstances of the case "to perform operations at home that would have a wider margin of safety in hospital"²; but according to London experience this fear proved without foundation.³

Though the country is reasonably well served by obstetric emergency services, long distances have to be covered by the flying squads in some regions, with inevitable delay in the treatment of the patient. Consequently the alternative suggestion has been made of distributing emergency equipment among doctors, district midwives, cottage hospitals, or maternity homes—and actually put into effect in the Winchester group of hospitals. Such arrangements will enable transfusion to be given while the flying squad is en route.

With the great reduction of puerperal sepsis, the commonest causes of maternal mortality and morbidity are the toxæmias and haemorrhages. Improved antenatal care and selection of cases for hospital can further reduce maternal mortality and relieve the flying squads of some of their most anxious problems. Early diagnosis and treatment of anaemia, the early detection of pre-eclampsia and hypertension, fuller investigation of the "high head" in relation to placenta praevia before bleeding, immediate admittance to hospital (without internal examination) of every case of bleeding, however slight—all these will make their contribution. So long as domiciliary delivery continues, however, there will be need for efficient service of flying squads. Since the midwife alone attends many patients in need of emergency treatment it would seem reasonable that she should be permitted to summon the service herself in extreme emergency when she is unable to obtain immediate help from the patient's practitioner. Finally, so that full advantage may be taken of the service, executive councils and medical officers of health should keep general practitioners and domiciliary midwives informed

¹ Stabler, F., *British Medical Journal*, 1947, 2, 878.

² Mills, W. G., *ibid.*, 1947, 2, 1056.

³ Fairfield, Letitia, *ibid.*, 1948, 1, 1204.

³ Gray, L. H., *Brit. J. Radiol.*, 1953, 26, 609.

⁴ — Congor, A. D., Ebert, M., Hornsey, S., and Scott, O. C. A., *ibid.*, 1953, 26, 638.

⁵ Thomlinson, R. H., and Gray, L. H., *Brit. J. Cancer*, 1955, 9, 539.

⁶ Hultborn, K. A., and Forssberg, A., *Acta Radiol. (Stockh.)*, 1954, 42, 475.

⁷ Churchill-Davidson, I., Sanger, C., and Thomlinson, R. H., *Lancet*, 1955, 1, 1091.

⁸ Sanger, C., Churchill-Davidson, I., and Thomlinson, R. H., *Brit. J. Anaesth.*, 1955, 27, 436.

⁹ Howard-Flanders, P., and Wright, E. A., *Nature (Lond.)*, 1955, 175, 428.

about the location of the flying squads and the method of summoning them to an emergency.

PHYSIOLOGICAL FUNCTIONS OF ZINC

In 1940 D. Keilin and T. Mann claimed to have demonstrated for the first time the physiological function of zinc in organisms.¹ They showed it to be the active part in the molecule of the enzyme carbonic anhydrase. Later workers have shown that this was in fact only the first clue to the varied activities of this widely distributed element. The average human dietary uptake of zinc is 10-15 mg. a day.² A similar amount is excreted in the faeces. Urinary output is relatively insignificant in health. Some patients with albuminuria have been shown to lose more in their urine and to have a negative zinc balance.³ Young male rats fed on a zinc-depleted diet show retarded growth, loss of fur,⁴ and failure of genital development,⁴ but no deficiency syndrome has been recognized in man. These changes may all be secondary to pituitary hypoplasia. Pigs have a relatively high requirement of zinc, and if it is not supplied they develop dermatitis.⁵

Most human organs contain 40 to 200 µg. of the metal per gramme of dry weight.⁶ Normal prostate has been shown to contain about 700 µg. and spermatozoa about 2,000 µg. per gramme.⁷ Several groups of workers have reported that malignant tissues may differ from normal tissues in their zinc content.⁸⁻¹⁰ Zinc has been found not only in carbonic anhydrase but also in uricase¹¹ and in alkaline phosphatase.¹² In recent years B. L. Vallee and his colleagues at Harvard have shown it to be a component of a number of dehydrogenases. By means of statistical methods they related their findings to some important clinical conditions. They showed¹³ that the level of zinc in the serum is reduced in patients with liver cirrhosis of Laennec type, and that this reduction is quantitatively related to the severity of the disease. In two patients who improved clinically under treatment the serum levels of zinc returned to the normal range. Eight patients with infectious hepatitis had normal serum levels of zinc. Hepatic alcohol dehydrogenase and glutamic dehydrogenase, which catalyses the release of ammonia from glutamic acid, are both zinc enzymes. Most of these writers' patients were alcoholics, and accumulation of ammonia is considered to be related to hepatic coma.¹⁴ Consequently their findings give rise to some interesting speculations. In another paper¹⁵ the

Harvard workers show that zinc levels in the serum fall and that the activity of lactic and malic dehydrogenase in the serum increases after myocardial infarction. Some patients with signs of coronary artery disease but none of infarction had normal lactic dehydrogenase activity in the serum. Lactic dehydrogenase certainly and malic dehydrogenase possibly contain zinc; both are related to the liver dehydrogenases. Further work is clearly required to see whether these changes occur in clinically similar conditions.

INTELLIGENCE AND CLEFT PALATE

The intelligence of children with congenital malformations, apart from those such as mongolism in which the brain is directly affected, has been little investigated. There is a clinical impression that mental defect is more common in some instances, but few direct measurements have been made. Professor R. S. Illingworth and Dr. L. B. Birch,¹ of Sheffield, recently made a survey of children with cleft palate all treated by the same plastic surgeon, Mr. Hynes. There were 112 in the original sample who had reached the age of 4 years. Of these, 54 had hare lip and cleft palate and 58 the genetically distinct condition of cleft palate alone. The authors were able to test 61 of these children, 19 were tested by the local authorities, and 17 were not tested but school reports were available for them. No information was to be had on 15, of whom 2 had died. The Terman-Merrill test was used both by Illingworth and Birch and by the local authorities. The mean I.Q. was found to be 95.4, which was significantly different from the assumed mean of 100. Unfortunately no figures were available for the normal test score in Sheffield, and large regional variations in mean intelligence test score are known to exist.² However, of the 80 tested, 3 had an I.Q. below 50, 5 had an I.Q. between 50 and 70, and there were 5 with an I.Q. of over 120. No difference was found between the group with hare lip as well as cleft palate and those with cleft palate alone. The 17 on whom only school reports were available appeared if anything rather less intelligent than the main group.

This evidence that there is a tendency for children with cleft palate to be below average intelligence is borne out by P. Fogh-Andersen's finding in Denmark that 59 instead of an expected 20 children with hare lip and cleft palate were present among 17,000 mentally defective children.³ Illingworth and Birch put forward two possible explanations of their finding. One is that the lower intelligence is due to the same factors, genetic and environmental, as are responsible for the malformation. The other is that there will have been a tendency for independent genetic factors for the deformity and dull intellect to have become associated in the lower strata of society. This second theory, which the authors prefer, is perhaps less probable, since there appears, for example in Fogh-Andersen's Danish study, to be no tendency for the two malformations to be more common in the lower social strata.

¹ Illingworth, R. S., and Birch, L. B., *Arch. Dis. Childh.*, 1956, **31**, 300.
² Vernon, P. E., *Eugen. Rev.*, 1951, **43**, 125.
³ Fogh-Andersen, P., *Inheritance of Hare Lip and Cleft Palate* Copenhagen, 1943.

ROYAL COLLEGE OF SURGEONS

HUNTERIAN FESTIVAL

As in previous years the Hunterian Oration at the Royal College of Surgeons, Lincoln's Inn Fields, on St. Valentine's Day was followed by the Hunterian Festival Dinner with the President of the College, Sir HARRY PLATT, in the Chair.

The toast of "The College" was proposed by Sir ALBERT RICHARDSON, a past president of the Royal Academy of Arts, who in his speech stressed the importance of anatomy both in art and in the more intimate mystery of surgery. Hunter, he reminded his audience, was not only a great anatomist, but he was also a patron of the arts—he collected good pictures and kept many academicians from starving. He recommended them to do likewise. They had already shown that they had leanings that way in their patronage of an architect and their regard for good pictures, but modern art, he thought, would have to go back again and study anatomy, and the same applied to architecture. He welcomed the association between the arts and the great profession of surgery.

The President on the Rebuilding of the College

The President, Sir HARRY PLATT, who responded to the toast, reviewed the progress made towards the rebuilding of the College. The Nuffield College was now, he said, a heritage, a new heritage for the twentieth century for the College of Surgeons. They had also to record with deep gratitude a number of benefactions. The Wellcome Trustees, whose generous gift of £100,000 had made possible the construction of the beautiful museum which lay above the Great Hall, had given them an additional sum of £35,000 to cover unforeseen costs already incurred in the first stage of their rebuilding programme which had been completed three years ago. Mr. Edward Lumley's gift of £35,000 was no longer shrouded in anonymity, and they thanked him for his support and continuing interest in the affairs of the College. They had also received in the past few months tangible recognition of the great interest shown by leaders of industry in the importance of the College to the nation.

So far he had only spoken of the buildings of the College as an appropriate response to the toast, but their research and teaching activities had inspired new support on a most generous scale. The boards of their two faculties, dental surgery and anaesthetics, had placed research in the forefront of their new activities and ambitions. Of the two, the research department of anaesthetics, already generously endowed, was launched on its career in spacious quarters on the top of the Nuffield College.

Research in the older scientific departments of the College, long established and increasingly expanding, should not have its growing needs overlooked. Their programme of teaching drew students from all parts of the world and they had already outgrown the accommodation in the old College and in the new Wellcome Museum floors. Two years ago, when he had reported on the state of the College, they were looking with confidence beyond the completion of the Nuffield College to the final stage of the restoration and rebuilding of the College—to phase three of the scheme. The first stage of phase three had been designed to provide for extensions to the departments of anatomy and physiology, the new research department in dental science, and logy, the new research department in research in new accommodation for the department of research in ophthalmology. The second stage was to give a much-needed lecture room for teaching departments at present housed temporarily in the Examination Hall in Queen's Square, and, finally, a new Hunterian Museum to display the great collection committed to the care of the College by the nation under the leadership of William Pitt 150 years ago.

Two years ago they saw the new buildings clearly. Their hopes then were high, but they had been brought face to

face with hard facts. Phase 3a would be completed by September, but as a shell only, and there they would be compelled to halt—a breathing-space only, they trusted—until the nation came to realize that the world-wide prestige of British surgical science demanded that the College be restored, extended, and maintained in order that it might fulfil its manifest destination as an academy of surgery, international in its influence and achievements.

Hunterian Oration

Earlier in the day Sir ERNEST FINCH, of Sheffield, had delivered the 89th Hunterian Oration, taking as his subject "The Influence of the Hunters on Medical Education." Both William Hunter and his brother John had been teachers, he said. Coming to London in 1741, William entered St. George's Hospital as a surgeon's pupil. Of his early training he said he had learned much by his ears and almost nothing by his eyes, and therefore nothing to the purpose. His ability to teach was obvious, and by 1746 he was giving anatomy classes and advocating the establishment of a museum of anatomy and surgery for London. John Hunter joined his brother in 1748. During the subsequent years the brothers taught anatomy and conducted research to such good purpose that their school became famous and attracted pupils from all over England and the Colonies. Those pupils, in many cases, returning to their native towns carried with them such a respect for the methods of the Hunters that they became responsible for the founding of similar medical schools. Thus the College at Philadelphia had been founded, the New York Hospital, and the Medical Faculty in Pennsylvania. In Great Britain, Manchester, Edinburgh, Glasgow, and Leeds became centres of training in the same way.

What was it that had so influenced the Hunters' pupils, and made the Hunters such pre-eminent teachers? Teaching by example rather than precept seemed to have been their guiding principle: throughout their lives both Hunters continually urged that practising surgeons should also teach. John Hunter particularly impressed on his pupils the importance of observation and experiment.

John Hunter himself had practically no formal education at school—what we would now call "general education." This made one ponder on the effects of trying to force people into a common mould. Indeed, the heart attack which caused Hunter's death was brought on by his vigorous protests about the advisability of his teaching two would-be pupils whose education fell short of official requirements. At the present time educational standards were governed by examination, and that had resulted in competition between the universities and other licensing bodies. The time seemed opportune for a reconsideration of John Hunter's contribution to medical education. In the lectures attributed to him he seemed to present his students with a fully integrated subject. With the growth of natural science, subjects now tended to be presented independently of each other. It was for the universities to restore their integration.

THE NEWCASTLE FLYING SQUAD

TWENTY-FIRST BIRTHDAY CELEBRATION

The Newcastle Flying Squad—or more correctly the Newcastle Obstetric Emergency Service—celebrated its twenty-first birthday by a party on February 21. A pioneer of such services in Britain, the squad answered its first call in October, 1935. Since then it has responded to 1,377 urgent calls, the peak being in 1955, when 146 calls were received. The party, given by the Governors of the United Newcastle-upon-Tyne Hospitals, was held at the Princess Mary Maternity Hospital, the squad's base. The opportunity was taken to honour Professor E. FARQUHAR MURRAY, formerly professor of midwifery and gynaecology at Newcastle and now professor emeritus, the prime mover in establishing the

squad. His portrait was presented to him by VISCOUNTESS RIDLEY, chairman of the Princess Mary Maternity Hospital's management committee. Those at the party included senior members of the medical and nursing staffs of the Royal Victoria Infirmary, the Princess Mary Maternity Hospital, and the Newcastle General Hospital; representatives of the Board of Governors, the Regional Hospital Board, the Regional Blood Transfusion Service, and the College of General Practitioners; and the Medical Officers of Health of Newcastle, Northumberland, and Durham.

Organization of the Squad

Telephone calls for the squad are switched direct to the labour room at the Princess Mary, where a senior sister is always available. The words "Flying Squad" give priority. The sister then informs the antenatal sister on duty and calls the obstetrician and the anaesthetist. Great care is taken to record accurately the name and full address of the patient, the nature of the emergency, and the ABO and Rh blood-group of the patient. The caller is told to station at an agreed point near the house a guide, armed during darkness with a white towel or large handkerchief for identification.

The squad's equipment is in the care of the antenatal sister, and she always accompanies the squad when it goes out. Her intimate knowledge of the equipment and her wide experience in converting the most unpromising environment into an adequate labour room are of great value to the service. Owing to the considerable distances to be covered by the squad (up to 60 miles—96 km.), it has been found quicker for the consultants to collect the sister and the equipment at the hospital. To avoid any possible delay, the anaesthetist travels in his own car. This arrangement works well, as all the consultants concerned live within a short distance of the hospital, and it is extremely rare for the patient to be moved to hospital. The equipment is comprehensive and quite adequate for whatever treatment may be needed—even caesarean section, although this has been performed only in exceptionally urgent circumstances where the squad was called to a small remote maternity unit. Some squads operating in very restricted areas advocate simple resuscitation and rapid transfer to hospital by ambulance, but at Newcastle this has never been regarded as the service's proper role. Treatment is carried out on the spot.

The teaching and research undertaken last year at the London School of Hygiene and Tropical Medicine is described in its recently issued annual report. All the school's main courses of instruction were filled to capacity. The dean, Professor A. BRADFORD HILL, F.R.S., mentions that the new course for the academic diploma in applied parasitology and entomology seems likely to attract medical, veterinary, and zoological graduates of high quality. The investigation of the protein value of tropical dietaries and supplementary foodstuffs by the department of human nutrition has been greatly helped by a grant of £17,000 by the Rockefeller Foundation. The department of statistics and epidemiology has many subjects under review, in addition to the well-known continuing investigation by Dr. Doll and Professor Bradford Hill of the mortality of doctors whose smoking habits were recorded five years ago. Poliomyelitis, whooping-cough, and B.C.G. vaccines are being assessed, the epidemiology of cardio-respiratory disease is being investigated, and general practitioners have collaborated in the study of otitis media. A survey is being made of the incidence of tuberculous illness among pathologists, post-mortem room attendants, and young technicians. The department of applied physiology has looked into the problem of ventilating lecture-rooms, and in the section devoted to the work of the department of public health there is an informative account of "The Natural History of Study Groups," based on experience gained during the courses for the D.P.H.

Preparations and Appliances

MODIFIED BRONCHOSCOPIC FORCEPS

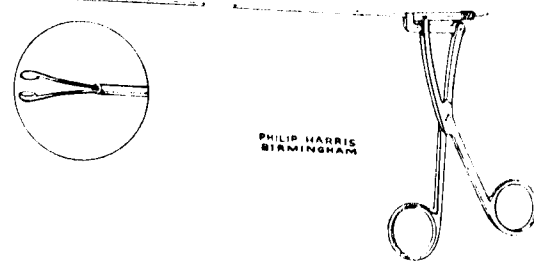
Mr. KEITH D. ROBERTS, F.R.C.S., of the Children's Hospital, Birmingham, writes: Foreign bodies in the adult's and child's bronchial tree may be dealt with adequately using the present range of biopsy and grasping forceps. However, in neonates and infants the size of the bronchoscope introduced (3 or 4 mm. diameter) precludes the use of a normal-sized forceps, as the view obtained with the forceps down the bronchoscope is extremely poor, and in addition the airway is almost completely obstructed.

A boy of 21 months was admitted to hospital having inhaled a widely open safety-pin; this was lying with the point directed up the trachea, the remainder of the pin being in the left main bronchus. A 3-mm bronchoscope was introduced through the larynx, which was extremely small, but the pin could not be grasped with the available forceps owing to the poor view; a tracheotomy was done and a 4-mm. bronchoscope inserted through this. Again the pin could not be extracted, and a bronchotomy had to be done in order to remove it. Unfortunately the child became anoxic and cardiac arrest occurred before the endotracheal tube had been passed. Although the child's heart-beat was restored by endotracheal insufflation with oxygen and cardiac massage, irreversible cerebral damage had resulted and he died 20 hours later.

In view of this tragedy two biopsy forceps of 2-mm. and 3-mm. diameter, of Chevalier Jackson type, were specially made and have recently been used successfully in several children under 2 years of age.

A boy of 2 years had a post-anaesthetic aspiration of vomit in another hospital following an operation for strangulated inguinal hernia. A tracheotomy was done there in order to clear the airway by suction, as the hospital had no small endoscopic forceps available. A radiograph showed atelectasis of the right upper and middle lobe with obstructive emphysema of the lower lobe, suggesting the presence of a foreign body in the right main bronchus. He was transferred to the Children's Hospital, Birmingham, where a 4-mm. bronchoscope was introduced through the tracheotomy. A nut was seen in the right main bronchus, and was easily extracted under direct vision using the 3-mm. biopsy forceps.

It was felt that the best pattern of forceps to be constructed was the biopsy type, as metallic foreign bodies can be grasped with these, while vegetable matter, such as nuts, are more easily held than with the ordinary type of grasping forceps.



Details of these forceps are as follows: (a) Biopsy forceps, 2 mm. diameter cup jaws; inserting length 35 cm., with 2 mm. shaft; stainless-steel handle; suitable for use through Chevalier Jackson and Negus type newborn infants' bronchoscopes having an internal diameter of 2.5 mm. or more over the light-carrier. (b) Biopsy forceps, 3 mm. diameter cup jaw; inserting length 35 cm., with 2.4 mm. shaft; stainless-steel handle; suitable for use through Chevalier Jackson and Negus type infants' bronchoscopes having an internal diameter of 3.5 mm. or more over the light-carrier. Both forceps are of the usual tubular type—that is, the action of the handle forces a slender tube over the stylet which carries the jaws.

I am indebted to Mr. J. Blair, of Messrs. Philip Harris, Ltd., Birmingham, 3, for his help in the construction of these forceps.

Reports of Societies

**PSYCHIATRIC INDICATIONS FOR
TERMINATING PREGNANCY**

The Section of Psychiatry of the Royal Society of Medicine met on February 12, with the President, Dr. WILLIAM SARGANT, in the chair, to discuss "The Psychiatric Indications for the Termination of Pregnancy." Members of the General Practice Section were specially invited to attend. The meeting was distinguished by the complete lack of agreement on what constituted grounds for advising termination in women suffering from mental illness.

Quot Homines, Tot Sententiae

Dr. J. D. W. PEARCE (St. Mary's Hospital, London) opened the discussion by reminding the audience that in Britain abortion was a felony punishable by life imprisonment. It could be condoned only when the life of the mother or her mental or physical health was at stake. The psychiatrist must ask two questions—what psychiatric conditions were likely to be aggravated by pregnancy, and how serious must these be to warrant termination? A review of the literature revealed distressingly little uniformity of opinion: in general, termination was recommended for organic psychoses, severe depression, and suicidal tendencies, but there were those who said it was rarely needed even in the most severe cases. Very often mental disorders arising early in pregnancy improved with time, while those appearing later persisted after the puerperium and were not influenced by termination. It was therefore wise to wait until quickening rather than advise premature hysterectomy. There was more agreement, however, on when not to terminate: psychoneurosis, for example, was never an indication, and psychopaths benefited from pregnancy. There was a very real danger that abortion would produce a guilt complex in the mother.

Dr. Pearce found a similar lack of common ground when he analysed questionnaires sent to 45 psychiatrists and one general practitioner. The majority agreed that there must be a clear causal relationship—for example, a previous breakdown during pregnancy—between the psychiatric illness and pregnancy, and that severity was a useful criterion. There was a deplorable lack of precise knowledge of the effects of pregnancy and abortion on the course of mental illness. What was needed was a group of specialists, including the general practitioner, to study each patient on her merits, preferably in hospital. With adequate medical care in the fullest sense probably very few women would be advised to seek termination. So often those in a position to offer advice were influenced by emotional, ethical, moral, and religious views rather than by objective criteria based on scientific evidence.

Experience at Manchester

Professor E. W. ANDERSON (Manchester Royal Infirmary) also stressed the paucity of the material and the difficulty of scientific investigation in a field which by its nature precluded accurate assessment. There had been remarkably few attempts to systematize what knowledge there was. Up to 1933 in England the weight of evidence was against the increasing tendency to terminate pregnancy. Since then experience in countries like Switzerland and Sweden, where abortion laws had been relaxed, suggested that, while a majority of women expressed satisfaction with termination, a definite proportion continued to have mental symptoms. He had analysed the records of 52 patients with psychiatric illness who had been referred for termination and/or sterilization. Half of these had threatened suicide; diagnoses were mixed, but there were no certain schizophrenics in the series. Only one of the twelve patients whose pregnancies had been

terminated showed definite improvement, and half of those who were allowed to proceed to term had had no further trouble. On the other hand one of the very definite risks of refusing termination was that the patient herself would attempt abortion. The resilience of women in the face of stress was often underestimated, and there seemed very little medical justification for termination of pregnancy on psychiatric grounds. But if the State insisted on continuation of pregnancy, said Professor Anderson, then it must provide adequate social services to protect the mentally ill or unstable mother.

Winchester Abortion Panel

Professor W. C. W. Nixon (University College Hospital, London) made an impassioned plea for the gynaecologist, on whom fell the onus of performing the operation "in good faith." It was very difficult for him to assess the risk to the patient, especially where there were threats of suicide, but if there was a likelihood of injury to health then abortion was justified. Antagonism must never be allowed to develop between the psychiatrist and the gynaecologist, though this was likely to happen if the latter felt that he was being used merely as a technician. There was a great need for an "abortion panel" on the lines of that started at Winchester ten years ago by Mr. Philip Mitchell. This consisted of six members of the hospital staff elected annually, and proceeded as informally as possible. The patient was referred by the general practitioner in the usual way for an opinion from the gynaecologist and the appropriate specialist. The whole case was then reviewed by the panel. The patient and her husband and the general practitioner were invited to attend. For such a scheme to work successfully it was vital that both the clinician and the gynaecologist should abide by the majority opinion of the panel, even if it was contrary to their personal view. Equally important in the whole problem of termination was the fullest possible follow-up, and particularly adequate contraceptive advice. In one Swedish series no less than 20% of the patients had unintentionally become pregnant again in the 12 months following termination in spite of such advice. This should not be allowed to happen.

A review of just over 500 patients whose pregnancies had been terminated in the last 18 years at University College Hospital showed that 39% had had psychiatric disorders, and these headed the list of indications. On the other hand mental symptoms would yield to early and sympathetic care, particularly in hospital. No gynaecologist should be asked to terminate a pregnancy at a stage later than the 14th week. The hazards of therapeutic abortion in the second trimester were very real: long-term effects such as sterility, habitual abortion, and endocrine shock were as important as the operative risks involved; in addition there was the overwhelming sense of detestation in those who had to carry out what amounted to no less than a caesarean section in miniature.

Discussion

In the discussion which followed Dr. ALECK BOURNE said that termination was useless in established psychoses. Dr. E. TYLDEN quoted case histories to show that it was virtually impossible to predict the effect of a particular course of action in the individual patient, except possibly in puerperal psychosis, where prodromal symptoms might be recognized early enough to make termination of value. Dr. BRIAN ACKNER hoped that psychiatrists would not prejudice the decision of the gynaecologist by what they said to the patient about termination. Dr. E. STENGEL assured the audience that in spite of the frequency of threats of suicide the incidence in pregnancy of the act itself was extremely low. Other speakers confirmed the general impression that it was quite impossible to lay down definite criteria for termination, and that there was a pressing need for study by groups of interested persons. The tone of the meeting was summed up by a general practitioner, who said that he was becoming increasingly convinced that termination for mental illness was not the right answer.

Levene and Michaels," you have misquoted as a case of Hodgkin's disease: in fact there was not more than a superficial resemblance histologically to Hodgkin's disease; the case was a difficult and complex one, but there is no justification for interpreting it as Hodgkin's disease. Well-proved cases of Hodgkin's disease in which torulosis developed as a terminal infection have now been recorded often enough for the fact of this association to merit acceptance. In view of the evidence, does your annotation not err too far on the side of caution in describing the association as between torulosis and a lymphadenopathy closely resembling Hodgkin's disease? Cannot the words which I have put in italics be left out?

If you will allow me the space, Sir, may I mention what seems to be a bibliographical anomaly in the annotation? Your reference to Busse and Buschke suggests a joint communication. In fact Busse and Buschke never collaborated in print, although each published a number of contributions based on the same case. The journal reference which you printed is to a summary of the proceedings of a session of the *Greifswalder medizinischer Verein* on July 7, 1894: the various papers are clearly numbered as separate abstracts: the first two, which relate to the case in question, are attributed respectively to Buschke and Busse, and should surely be listed independently in a bibliography.^{10, 11} In any event, priority in print must be conceded to Busse, whose lecture to the Greifswald meeting was published in full¹² before the abstract appeared, although Buschke seems to have had the first word at the meeting itself.

In conclusion, then, it may be said that the great majority of cases of Hodgkin's disease remain free from torulosis, and that most cases of torulosis occur without any evident predisposing cause. It is impossible to say how frequently the two diseases are associated: Zimmerman and Rappaport³ found the association 11 times among their 60 cases of torulosis, and the 60 cases were filed at the A.F.I.P. during about the same period as "over 1,000" cases of Hodgkin's disease. This suggests an incidence of one case of torulosis among about a hundred cases of Hodgkin's disease, and there are obvious reasons for taking this figure as only the roughest guide to the real incidence. A search for predisposing factors in patients with torulosis, and a complementary study of immunological behaviour in patients with Hodgkin's disease and the like, are potentially useful lines of research. Meanwhile, it is worth remembering that recurring headaches in a patient with Hodgkin's disease can signify the clinical onset of torulosis of the brain or meninges and should not too readily be attributed to radiation malaise or other passing cause.—I am, etc.,

Northwood, Middx.

WILLIAM ST. C. SYMMERS.

REFERENCES

- 1 Cox, L. B., and Tolhurst, J. C., *Human Torulosis*, 1946. Melbourne University Press.
- 2 Littman, M. L., and Zimmerman, L. E., *Cryptococcosis—Torulosis or European Blastomycosis*, 1956. Grunc and Stratton, New York and London.
- 3 Zimmerman, L. E., and Rappaport, H., *Amer. J. clin. Path.*, 1954, **24**, 1050.
- 4 Zimmerman, L. E., *ibid.*, 1955, **25**, 46.
- 5 Rodger, R. C., Terry, L. L., and Binford, C. H., *ibid.*, 1951, **21**, 153.
- 6 Dubin, I. N., *Ann. Intern. Med.*, 1947, **27**, 898.
- 7 Schier, W. W., Roth, A., Ostroff, G., and Schriff, M. H., *Amer. J. Med.*, 1956, **20**, 94.
- 8 Symmers, W. St. C., *Lancet*, 1953, **2**, 1068.
- 9 Levene, M., and Michaels, L., *J. clin. Path.*, 1955, **8**, 201.
- 10 Buschke, A., *Dtsch. med. Wschr.*, 1895, **21**, Vereins-Beilage, 14.
- 11 Busse, O., *ibid.*, 1895, **21**, Vereins-Beilage, 14.
- 12 —, *Cbl. Bakt.*, 1894, **16**, 175.

Antibiotic Cover for Dental Extractions

SIR.—The thought-provoking article by Drs. F. G. Hobson and B. E. Juel-Jensen (*Journal*, December 29, 1956, p. 1501) contains statements leading to far-reaching therapeutic conclusions that cannot be accepted uncritically. Cases of subacute bacterial endocarditis are classed in two groups as due to *Str. viridans* or other organisms; in 42% of the former, however, blood cultures were negative, bacteriological diagnosis resting thus on clinical grounds, which are hardly ever conclusive. Nevertheless, the essential difference between patients with positive and negative haemocultures is amply revealed by the fact that only 18% of the

former, but 39% of the latter, died in course of active treatment. Due consideration for the more serious prognosis of abacteraemic subacute bacterial endocarditis as already demonstrated by us¹ on over 1,000 cases observed during 1945–51 in Hungary—would have guarded the authors against the statement contradicting most literary data that immediate mortality is unaffected by the intensity of antibiotic therapy. As a matter of fact, they had almost identical numbers of deaths in 1946–50 with low, and in 1951–5 with higher, penicillin doses; the different composition of both groups, however, should not be disregarded, as negative blood cultures totalled a third of the first, but one-half of the second. Within this prognostically unfavourable fraction, 4 out of 7 died during 1946–50, and 4 out of 14 during 1950–5, increased dosage of the antibiotic producing thus a 50% reduction of mortality, quite in accordance with our own findings. In the light of the authors' own data, the view that the organism concerned and the antibiotic used will largely determine the final success or failure seems justified and the search for some other explanation less imperative.

No experienced physician will underrate the importance of infected teeth and incautious dental surgery in the pathogenesis of subacute bacterial endocarditis. The authors' observation that no case of viridans-caused or abacteraemic endocarditis ever occurred in an edentulous individual is very interesting and calls for confirmation on greater material (the high frequency of completely toothless persons in the control group—40% in the fifth and 62% in the sixth decade of life—somewhat surprises me, but may be accounted for by local and national differences). While fully agreeing with the authors concerning the necessity of removing infected teeth under adequate "cover," I hardly see my way to live up to their postulate of extracting all intact teeth too as an essential item of the therapeutic attack upon subacute bacterial endocarditis. I am almost sure the majority of physicians will abstain from extracting prophylactically all the excellent teeth of a patient in symptomless remission (Case 4) as long as there is little more standing for it than the statistically rather insignificant fact that, of seven patients stripped of all teeth, none relapsed, although 1.4 relapse should have been observed according to the computed rate of expectation.—I am, etc.,

Budapest, Hungary.

REFERENCE

- 1 Biro, L., and Gottsegen, G., *Acta med. Hung.*, 1955, **7**, 21.

Long-acting Antibiotics

SIR.—While pharmaceutical manufacturers are searching the earth for new antibiotics they have neglected one aspect of research which would be of greater benefit to patients in general practice. I am writing this letter as a plea to drug houses to provide us with the newer antibiotics in a form that can be injected at infrequent intervals. In hospital a drug can be administered six-hourly by a stroke of the pen, but outside we are all familiar with the patient who has a few capsules remaining a week after we have prescribed a five-day course, and with little Willy "who was much better after he had a dose of Johnny's medicine." Many of our patients, given careful instructions, can be trusted with oral antibiotics, but others cannot, and for these we need the newer antibiotics in forms similar to procaine and benethamine penicillin.—I am, etc.,

South Shields.

R. W. NEWMARK.

Toxic Psychosis Caused by "Preludin"

SIR.—Dr. M. F. Bethell (*Journal*, January 5, p. 30) and Dr. Lewis Clein (*Journal*, February 2, p. 282) reported the cases of two female psychopaths who developed abnormal mental states after taking excessive doses of Preludin for several months. The history of a patient recently admitted to this hospital shows several features closely resembling in particular those of Dr. Clein's patient.

A male neurotic alcoholic, aged 35 years, had in the past taken amphetamine, dexamphetamine, and, to counteract their effects,

pentobarbitone at night-time to excess. In August, 1956, he stopped drinking, and, anxious to reduce his overweight, he began to take Preludin. He soon found that by increasing the dosage he experienced a "kick" similar to that obtained from alcohol and a feeling of exhilaration and well-being, three or four Preludin tablets having an effect on him comparable to that of one amphetamine or dexamphetamine tablet. However, gradually Preludin took "a worse grip" on him than alcohol had before. He needed more and more tablets to achieve the same effect, and, as he could not acquire nearly enough Preludin on prescription to satisfy his craving for it, he began to buy it from chemists in different districts of the town. For the first two weeks the pleasant effects of five to eight tablets lasted two to three hours and were then followed by feelings of depression and irritation, headache, and difficulty in concentrating and insomnia. To dispel this "hangover" he regularly took three butobarbitone tablets at night-time. By December the doses of Preludin had gradually increased to 20 tablets in the morning and 50 in the evening, followed later by eight butobarbitone tablets taken as an "antidote." The effect of 50 Preludin tablets lasted about six hours, during which time he was excited, over-confident, and garrulous. When the effect of Preludin began to wear off he felt that people were staring at him and looking at his eyes.

During the whole of this period he had been off alcohol, except on one occasion when he had no sleeping tablets in stock after having taken 40 Preludin tablets. He therefore took 4 pints (2.3 l.) of cider in the evening, but these did not prevent a severe hangover next morning. He then consumed 20 more Preludin tablets and a double gin, afterwards feeling confused, walking unsteadily, and thinking that a policeman was watching him. According to the patient's own estimate his average daily Preludin dose over the four months had been about 50 tablets. At the end of this period he was—according to his wife's account—in an excitable and irritable state; he avoided going to public places, as he felt people were looking at him, and he complained that people were insulting him. He had lost 3 stone (19 kg.) in weight in the four months. Both the craving, and especially the hangover, were described by the patient as stronger with Preludin than in the case of alcohol. It was only when the Preludin effect was wearing off that he felt depressed and had other disagreeable symptoms. When the supply of butobarbitone tablets was stopped by his doctor early in December the fear of the unpleasant Preludin withdrawal symptoms apparently proved greater than his craving for the exhilarating effect of Preludin, and he then took Preludin tablets at the same time as butobarbitone. In the next few days he felt restless, "vague mentally," depressed, and he could not sleep at night. Four days afterwards he suffered an epileptiform convulsion (? barbiturate withdrawal) and was taken to hospital. An E.E.G. there is said to have been normal. He reverted to excess drinking a fortnight after stopping Preludin.

As in the case of Dr. Clein's patient, the history reported here shows some of the features described as characteristic of drug addiction¹—i.e., craving, a tendency to increase the dose, and a (psychological) dependence on the effects of the drug. These cases also bear out the opinion of the W.H.O. Expert Committee that "any substance which . . . will adequately replace the drug which has produced the addiction" (in this case alcohol and amphetamines) "must be considered as also capable of producing an addiction." Like the amphetamines, Preludin seems to belong to that group of drugs "whose pharmacological action is intermediate" between habit-forming and addiction-producing drugs, so that addiction to this drug can develop in certain unstable individuals.—I am, etc.,

Warrington, Surrey.

REFERENCES

- 1 *Wld Hlth Org. techn. Rep. Ser.*, 1950, **21**, 6.
- 2 *ibid.*, 1952, **57**, 10.

M. M. GLATT.

Prednisone and Prednisolone

SIR.—In your leading article on prednisone and prednisolone (*Journal*, January 26, p. 215) no mention was made of the importance of steroid therapy in the management of certain acute phases of leprosy. I would like to draw the attention of your readers to this omission and to the fact that references to the literature on this subject can be found in a recent paper¹ in *Leprosy Review*.—I am, etc.,

London, N.W.1.

REFERENCE

- 1 Jopling, W. H., and Cochrane, R. G., *Leprosy Rev.*, 1957, **28**, 5.

W. H. JOPLING.

Apartheid in Blood Transfusion

SIR.—Since you have not yet closed the correspondence on this pathetic topic, I should like to comment on Dr. P. G. Preston's letter (*Journal*, December 22, 1956, p. 1487), which has just reached here. A major reason for our presence in Africa has been the impulse to eradicate harmful superstitions by education, and this process should eventually solve Dr. Preston's problems of tribal incompatibility. Unfortunately, there appears to be little secular machinery to combat the racial myths still current among literate people, while the laudable work of certain religious organizations is slow and at present of only limited appeal. Surely those international bodies which are so generous with grants for technical study could be persuaded to support a scheme in which, for example, some of our colleagues from South Africa or the southern U.S.A. could visit an area like Trinidad where many races are living in harmony. I believe that they would return with a vastly different approach to the problem of race relations and that they could do much to curb their more fanatical countrymen. Meanwhile I can assure them that it is not difficult for a hospital with staff and patients of many African, European, and Asian origins, with a variety of religious beliefs, to run with efficiency and harmony. Our blood bank is organized on a scientific, not a superstitious, basis, without harm to patients or donors.—I am, etc.,

Trinidad.

B. SYMONDS.

Mass X-ray of Refugees

SIR.—It seems that the arrival of 11,000 aliens recently in this country without any preliminary screening is quite likely to swell the tuberculous "infector pool" which we are all so concerned to empty. From every authoritative source come exhortations to weed out the old chronic infectious case, while at the same time considerable numbers of far more mobile persons are admitted to the country without any question of a systematic x-ray check on arrival. Apparently any amount of money is forthcoming to treat those aliens who fall ill with tuberculosis—after they have been allowed to infect those with whom they live and work—and it seems there is no lack of money for treating those whom they infect. Neither money, nor forethought, nor any national policy is apparently available for steps which would help to prevent such a state of affairs.

In 1950 my unit visited a Polish hostel for displaced persons, finding no fewer than 9 cases of extensive tuberculosis among 300 persons examined—a case rate of over 27 per thousand. Two weeks ago we visited a transit camp for Hungarians and found 2 sputum-positive cases among 240 young persons, and 8 other persons requiring further supervision. In addition, two persons with extensive disease had already been admitted to hospital before we arrived. The camp had thus a case rate of 16 per thousand, as compared with the 6 persons per thousand in the general population estimated by Cochrane¹ (Rhondda Fach survey) to have active disease. These experiences have been frequently paralleled and reported by colleagues in the mass radiography service examining groups of foreign workers in this country, yet over 7 years this seems to have caused little or no concern to our authorities, and the admission of aliens without any systematic check proceeds exactly as before.

However sympathetic we may feel towards the unfortunate Hungarians or other refugees, our first consideration is for the health of our own people, especially school-leavers and young people who may come in contact with them at work, and it seems urgently necessary that all those admitted so far should be x-rayed before they are placed in employment, or before they go to live or work in families with young children. Unfortunately about half the refugees have already started work, and are now scattered far and wide throughout the country. The only way they could be reached would be through the Ministry of Labour, their employers, the police, or through general practitioners with

whom they may register. May I urge the latter to arrange for a routine chest film for any new foreigner who comes on to their list? Canada, Australia, and the United States require a clear chest x-ray as a condition of entry for every intending emigrant. Must this country gradually accumulate the unfit or those rejected by our own Dominions? We certainly cannot afford to have 7,000 persons die a year from tuberculosis any more than they can.

It would be interesting to know whether arrangements are being made to x-ray the next influx of refugees from the Austrian camps, and to ask why several mass radiography units were not immediately detached at the beginning of the emergency to deal with refugees at their first holding units. As a taxpayer, and as a doctor who has spent several years endeavouring to empty the pool of potential tuberculosis infectors in the community, one takes grave exception to the lack of any firm policy in this country about allowing the uncontrolled admission of aliens who may have communicable tuberculosis. It seems quite disgraceful that no steps are being taken to stop feeding the infector pool from outside sources. It costs the country over £1,000 to keep and treat a man in a sanatorium for a year and provide for his dependants, and it is still apparently not fully recognized that mass radiography justifies itself economically if a single unit can find only a small number of cases a year at a sufficiently early stage to obviate or reduce the necessity for costly hospital treatment. If we cannot afford any extension of mass radiography facilities, surely deployment of certain units to check foreigners entering this country would be more than justified.—I am, etc.,

Cambridge.

D. SMITH.

REFERENCE

- ¹ Cochrane, A. L., Cox, J. G., and Jarman, T. F., *British Medical Journal*, 1955, 1, 371.

Treatment of the Cord in the Newborn

SIR,—Reading, as unfortunately frequently seems to occur, back numbers of medical journals, I have come across Dr. Victoria Smallpeice's note on treatment of the cord in the newborn (*Journal*, July 14, 1956, p. 104) in which she refers to Dr. A. B. Murray's memorandum (*Journal*, June 30, p. 1530) which I had already seen, and more recently there has been another reference by Mr. A. L. Deacon (*Journal*, December 1, p. 1299). The method used here in the Hadassah Hospital has proved thoroughly satisfactory in over 8,000 deliveries for which I have been responsible during the last five years. I learnt the method here and would certainly not be tempted to revert to any other treatment. At birth in all babies known to be Rh-positive the cord is clamped by Kocher's forceps as close as possible to the umbilicus. About three hours later the cord is cut with a scalpel close to the closed Kocher's. The stump is painted with iodine tincture and the forceps are removed. Bismuth subgallate powder is then applied on a sterile gauze swab which is attached by a binder for 24 hours. The dressing is inspected after half an hour, and thereafter whenever the babies have their napkins changed. Only about four cases of slight haemorrhage have occurred and were easily controlled by a suture. If any cases of infection occurred they must have been very mild, as none returned, and we are the only hospital available. The umbilicus is dry and clean from the beginning, which is a particular advantage here where the patients are discharged from hospital three or four days after delivery. The method needs a little courage on the part of the obstetrician and nursing staff for the first half-dozen cases, but conviction quickly follows.—I am, etc.,

Beersheba, Israel.

DORIS SELBY.

Varicose Ulcers

SIR,—I am replying to Dr. Peter Darby's letter on varicose ulcers (*Journal*, February 2, p. 287), because I have met in the literature an astonishing amount of dogma on this subject that does not agree with my findings when I was working in ulcer clinics at the London Hospital. Perhaps the difficulty in treatment stems from the varied pathology which

can be found in this "lower leg syndrome," even when thrombosis has apparently been excluded. Nevertheless, Foote² asserts that all varicose ulcers can be cured, but I agree with Naide,³ who says that some cases appear to be incurable.

Nobody will dispute that the application of some salve⁴ and some kind of support may suffice. Brodie⁵ described supportive treatment in 1846, although I had heard a rumour that a German peasant brought the idea over during the last war. The addition of a "venous heart" (a rubber sponge which contracts as the patients walks) may promote healing. I agree with Foote and your correspondent that good, even bandaging is very important. Indeed, many patients insist that experienced bandagers gave them most relief. But it is untrue to say that one simple treatment is a panacea, and this bears out my belief that there is a varied pathology, either locally, or in the venous drainage of the limb, or in the arterial supply. To this are added the personal idiosyncrasies of the patient. The only series I have found claiming 100% success is MacAuley and Carey's⁶ series of popliteal vein resections, followed by grafting in some cases.—I am, etc.,

Dublin.

T. HEATON WILLIAMS.

REFERENCES

- ¹ Bauer, G., *J. int. Chir.*, 1948, 8, 937.
² Foote, R. R., *Med. Press*, 1943, 210, 318.
³ Naide, M., *Amer. J. med. Sci.*, 1943, 205, 489.
⁴ Brodie, B. C., *Lectures Illustrative of Various Subjects in Pathology and Surgery*, 1846, Longmans, London.
⁵ McPheeters, H. D., and Merkert, C. E., *Surg. Gynec. Obstet.*, 1931, 52, 1164.
⁶ MacAuley, C., and Carey, P., *Irish J. med. Sci.*, 1950, 68, 370.

Neostigmine-resistant Curarization

SIR,—I am surprised to find that in a discussion of cases of neostigmine-resistant curarization the dose of the offending drug is often omitted, and therefore places under some doubt the conclusions drawn. Dr. A. R. Hunter (*Journal*, October 20, 1956, p. 919) does not mention the dosage of suxamethonium, D-tubocurarine, or gallamine in any of his six cases. There seems to be, among anaesthetists, a wide variation in the doses of relaxants considered necessary for the production of satisfactory operative conditions. For endotracheal intubation, in the induction phase, 15 mg. D-tubocurarine is regarded as adequate by one anaesthetist, while another would not regard 30 mg. as being unduly high. Drs. W. E. B. Scott and J. C. Clarke (*Journal*, November 17, p. 1174) gave to a "small, wizened lady of 67, weighing 64 st. (41 kg.)," with a small-bowel obstruction, as an initial dose 80 mg. of gallamine, whereas from the information given others may regard 40 mg. as being more suitable for the occasion. Dr. P. A. Foster (*Journal*, December 22, p. 1485) used 35 mg. of D-tubocurarine and 40 mg. of gallamine, which also appears to be a large dose, although admittedly we are not told the weight of the patient or the duration of operation.

And what of the criteria for administering further increments? They may be given when abdominal muscle tone is about to delay the surgeon's rate of progress or to maintain "finger-tip" controlled respirations by suppressing the first flicker of spontaneous respiration. The total relaxant given, therefore, during an operation is subject to wide variation because of the individuality of the anaesthetist, quite apart from the individuality of the patient. A record of the dosage of the relaxants, age and weight of the patient, and operative duration would, I think, provide some useful data for discussion with regard to the optimum management of these cases.

I hope that the advice of Dr. C. Langton Hower (*Journal*, January 5, p. 45) and many others against the use of both types of relaxant in the one case will not pass unheeded. Unless the combination of relaxants is proved to have no adverse effect the luxury of intubation under suxamethonium should be forgone, thus eliminating one unnecessary complicating factor. In view of the fact that D-tubocurarine may depress cholinesterase activity and that suxamethonium produces marked depletion of muscle potassium, their combined use on a moribund patient would appear unwise.

I feel that overdosage of relaxant may account for many of these cases. This may occur (1) when a justifiable anxiety over vomiting makes a rapid, trouble-free intubation highly desirable and leads to a too liberal administration in the induction phase, and (2) at the point where we have to decide whether the surgeon's difficulties are due to abdominal distension or to inadequate relaxation.

Perhaps I have been fortunate not to have met neostigmine-resistant curarization using an orthodox technique of thiopentone, D-tubocurarine, nitrous oxide/oxygen, with controlled respiration, avoiding pethidine and using the thiopentone for the induction only. I have found that controlled respiration can often be maintained for an hour or so using only 15 mg. of D-tubocurarine. It is a method in which I still have every confidence.—I am, etc.,

Liverpool.

ITHEL LL. FRANCIS.

SIR,—It was with great interest that I read Dr. A. R. Hunter's article (*Journal*, October 20, 1956, p. 919) and the additional reports and comments (*Journal*, November 10, p. 1113; November 17, p. 1174; November 24, p. 1240). It may well be that the cases reported can be divided into two groups.

The first group is characterized by a circulatory failure which does not respond to intravenous fluids or vasopressors for more than a short time. The accompanying general muscular weakness with its associated respiratory insufficiency seems to me to be related to the same primary cause as the circulatory disturbance. Patients of this group are old or debilitated and have a considerable upset of nutrition, with or without accompanying sepsis. This clinical picture suggests a diagnosis of acute suprarenal cortical insufficiency provoked by surgical stress, anaesthesia, or anoxaemia in a severely ill patient. These patients die, as Dr. Hunter described, of "circulatory degeneration and peripheral vascular failure . . . in spite of adequate artificial respiration." It seems to me possible that these patients could be saved by the rapid infusion of hydrocortisone, and there is probably no connexion between this complication and the use of relaxant drugs or neostigmine.

On the other hand, there is a second group characterized by profound derangement of the central respiratory modulation with muscular weakness or paralysis, but there is in them no circulatory failure, provided adequate artificial or assisted respiration is maintained. Curiously enough, these patients are sometimes able to move their limbs, though weakly, but are unable to breathe. There is a relationship between this complication and the use of fully controlled respiration, particularly in patients with emphysema. In my experience this complication occurs as often after the administration of D-tubocurarine as after an infusion of suxamethonium, and always when complete apnoea with artificial ventilation has been maintained for some time. So far I have never heard of a similar case when partial muscular relaxation with assisted respiration and small doses of relaxants have been used. Hence there is, in addition to the use of local analgesia, a possible way of avoiding this complication. If it appears in a patient, one must consider whether unnecessarily high doses of the relaxant drug have been given, or whether artificial respiration in excess of the needs of the patient has been continued for too long a time. The prognosis is not bad if the anaesthetist is patient enough to assist respiration carefully and manually until it becomes adequate again—a process which may take as long as four hours after the operation.—I am, etc.,

Basle.

W. HÜGIN.

Noradrenaline in Shock Due to Visceral Perforation

SIR,—I wish Dr. D. D. Davies had given more information on the anaesthetic technique used in his report of three cases of post-operative circulatory collapse treated successfully with noradrenaline (*Journal*, February 2, p. 261). Each case showed an initial rise of blood pressure before the fall. This and other features suggest that the effects of carbon-dioxide retention were being added to those produced by the surgical

condition. Was the respiration assisted or controlled? What type of breathing system and gas flows were used?

Trichlorethylene is an interesting agent to choose for abdominal surgery. When positive-pressure ventilation is used without carbon-dioxide absorption a non-breathing system is required to avoid respiratory acidosis. This can be achieved with devices such as the Cardiff inflating piston-type valve,¹ or a flap rubber non-return valve. The Magill semi-closed attachment will eliminate rebreathing when the patient is breathing spontaneously and when the gas flow is at least equal to the patient's minute volume.^{2,3} As soon as the reservoir bag is compressed by hand, the conditions change. The expiratory valve lifts during the last part of the inspiratory phase, discharging relatively fresh gases into the room. The expired mixture is pushed back into the lungs first. Luckily a variable amount of longitudinal mixing takes place, and a healthy subject is able to withstand this not uncommon practice for a short time, but the poor risk is poorer.

Dr. Davies also questions the safety of long-acting muscle relaxants in these shocked patients. Many anaesthetists would consider D-tubocurarine to be safer than the mixed neuromuscular block produced by the suxamethonium-gallamine-suxamethonium sequence used in the three cases described.—I am, etc.,

London, E.14.

J. V. I. YOUNG.

REFERENCES

- ¹ Mushin, W. W., *British Medical Journal*, 1953, 2, 202.
² Molyneux, L., and Pask, E. A., *Brit. J. Anaesth.*, 1951, 23, 81.
³ Mapleson, W. W., *ibid.*, 1954, 26, 323.

Glycyrrhetic Acid

SIR,—In view of the conflicting reports of the therapeutic effectiveness of glycyrrhetic acid preparations and the suggestion by Dr. E. Colin-Jones that some isomers are active and others inactive (*Journal*, January 19, p. 161), I am carrying out a series of planned experiments in animals to investigate the anti-inflammatory actions of glycyrrhetic acid. I am finding that some fractions of glycyrrhetic acid are definitely active against certain types of induced inflammation, details of which will be published shortly. In reply to the letter by Drs. J. W. Cornforth and D. A. Long (*Journal*, February 9, p. 340), I have in one experiment tested an active fraction of glycyrrhetic acid by the method described by Long and Miles,¹ and found it to actively depress the sensitivity to tuberculin in B.C.G.-infected guinea-pigs in a manner similar to cortisone. Further tests are in progress.—I am, etc.,

London, W.C.1.

G. F. SOMERS.

REFERENCE

- ¹ Long, D. A., and Miles, A. A., *Lancet*, 1950, 1, 492.

"Pacatal"

SIR,—We were interested in the article by Drs. P. H. Mitchell, P. Sykes, and A. King on effects of "pacatal" on symptoms (*Journal*, January 26, p. 204). Pacatal has been in constant use in Prestwich Hospital for the past 12 months, during which time 300 patients were treated for periods of from 2 to 6 months. Their ages ranged from 20 to 80 years, and the period of hospitalization from 7 weeks to over 20 years. Our routine dosage has been as follows: During the first week, 150 mg. daily, increased, if necessary, after the seventh day to 300 mg. daily. In a few cases the maximum dose was 600 mg. daily. The average duration of a course was about 8 weeks, but in some cases as long as 24 weeks. A full blood count was carried out before commencing treatment, the white cells being estimated at weekly intervals during the first month of treatment and thereafter at fortnightly intervals during the remainder of the course.

The symptoms described in the *Journal*—noisiness, incontinence, and aggressive behaviour—were, generally speaking, well controlled by pacatal. We have experienced no serious side-effects with the drug. We have seen hypotonia, the symptoms of which disappear completely on cessation of the drug, but the minor side-effects, such as

dryness of the mouth, do not necessitate discontinuation of the treatment. The more serious side-effects, such as jaundice and agranulocytosis, have not been encountered in our cases, and no patient undergoing treatment by this drug has suffered any ill effects or died. We feel it is only fair to say, therefore, that we have had at least 12 months' experience with this drug on a fairly extensive scale, and consider that its use is justified. In many cases it is preferable to chlorpromazine, and certainly sensitivity reactions, such as dermatitis, have not been encountered with pacatal. —We are, etc.,

Prestwich, Lancs.

M. KRZANOWSKI.
M. ROGERS.

SIR,—We were interested in the article by Dr. P. H. Mitchell, Dr. P. Sykes, and Dr. A. King on "pacatal" (*Journal*, January 26, p. 204). We cannot give figures, but we have used it with some enthusiasm in place of chlorpromazine, since it seemed to have, and still seems to have, a qualitatively and quantitatively better action on the patient's mental state and behaviour. We now find, however, that it is the side-effects which are troublesome, and sufficiently so for us to revert to chlorpromazine not infrequently. Disturbances of accommodation are not very troublesome in the chronic psychotic, but constipation is, and is sometimes difficult to detect early. Dryness of the mouth is also common and troublesome, frequently causing appearances like those of vitamin B deficiency, and in two of our cases there was a sudden acute parotitis. We have seen mild hypotensive and ataxic symptoms but no leucopenia or jaundice (we have, however, had only one case of jaundice from chlorpromazine in the hospital in spite of extensive use of the drug).—We are, etc.,

Norwich.

E. A. BURKITT.
P. E. RIXON.

SIR,—I should like to comment on the article on "pacatal" by Drs. P. H. Mitchell, P. Sykes, and A. King which appeared in the *Journal* of January 26 (p. 204).

I have recently completed an investigation with pacatal on 50 (25 male and 25 female) chronic psychotic patients, the results of which have not yet been published, and found very little in the way of toxic complications. Although two deaths occurred in the course of the trial, they were not unexpected and were not due to pacatal, but it was considered that the effects of the drug as a contributory factor could not be entirely excluded. One, a woman aged 68, had been on 150 mg. of pacatal daily for six weeks when she developed a temperature and was found to have a *Bact. coli* urinary infection. The drug was stopped and the pyelitis responded to antibiotics, but she died 17 days after pacatal was stopped. The cause of death, ascertained by necropsy, was (1) acute congestive heart failure, (2) myocardial degeneration, (3) coronary atherosclerosis. Eight days after stopping pacatal she developed an adenitis of the submandibular salivary glands which may well have been connected with the decreased salivation produced by the drug. The other death was in a male, aged 48, a mental defective with superimposed schizophrenia in poor physical condition at the onset of treatment who required every nursing attention. He received pacatal 150 mg. daily for six weeks, pacatal 75 mg. and chlorpromazine 75 mg. for four weeks, chlorpromazine 150 mg. daily for five weeks, and finally pacatal 300 mg. daily for eight days. His physical condition continued to deteriorate slowly during the investigation, and all drugs were eventually stopped. The physical deterioration continued, and he died 19 days after pacatal was stopped. The cause of death, ascertained by necropsy, was (1) acute congestive heart failure, (2) myocardial degeneration, (3) schizophrenia.

The average age in my series was 46.3 years as against 59.5 years in the group of Dr. Mitchell and his colleagues, and the average stay in hospital 12 years against 21 years. No case of jaundice occurred. In their cases, 10 patients developed hypotonia. Seven of my patients (2 male and 5 female) showed unsteadiness and loss of balance, and two

of these had other features suggestive of incipient Parkinsonism. However, in my series this toxic feature appeared in all but one case on 300 mg. of pacatal daily and soon disappeared on reducing the dose. Only in one male patient did the loss of balance persist with the reduced dosage, and this necessitated stopping the treatment. When this investigation was begun the danger of agranulocytosis had not been reported, but a careful clinical check was kept on all patients, although routine white counts were not done. There was no suspicion of this complication in any of the 50 cases. Our consultant pathologist, who conducted the necropsies on the two patients who died, reported that there were no findings suggestive of agranulocytosis. There were two instances of recurrent vomiting, but again only on the higher dosage.

Dr. Mitchell and his colleagues quote the report of Kline and Jacob,¹ who also recorded serious toxic effects. However, Kline² has since written that his material, supplied from Germany, was probably either contaminated or inadequately prepared. He has used the product manufactured in the U.S. for nine months, and, although this has side-effects (as does any effective medicament, including those in the psychiatric field), there is evidence that there was something wrong with the batch on which they did their original examination. Bowes³ reports that constipation occurred in 10% of a series of 250 cases, and if this was overlooked the patients became quite toxic and started vomiting. In my investigation a laxative was given as a routine twice weekly, and this might well account for the relatively few serious toxic side-effects that I found. In Bowes's 250 cases there was no evidence of liver or kidney damage and no cases of agranulocytosis, although he did have two instances of leucopenia, in one of which the white count gradually returned to normal in spite of persisting with the drug.

From reports, which my findings confirm, pacatal would seem to be a valuable tranquillizing agent which is worthy of further investigation. However, a careful physical check must be kept on patients to whom it is administered, and I fully agree with Dr. Mitchell and his colleagues that it should not at present be used in out-patient practice.—I am, etc.,

Fareham, Hants.

R. WALLACE SIMPSON.

REFERENCES

- 1 Kline, N. S., and Jacob, G. M., *Amer. J. Psychiat.*, 1955, 112, 63.
- 2 — *ibid.*, 1956, 113, 565.
- 3 Bowes, H. A., *ibid.*, 1956, 113, 530.

Vaginitis

SIR,—In your annotation (*Journal*, January 19, p. 155) you rightly stress the increase in the incidence of non-bacterial vaginitis in recent years and the numerous chemicals which have been advocated for treatment. There is no doubt that, if reinfection is avoided, most patients get cured by one or other method of treatment in a shorter or longer time. The patient, however, wants treatment to be as short as possible, and for this to be achieved it is essential that (1) the partner be examined and treated if necessary; (2) the chemical used by the patient (whether in the form of tablets or vaginal pessaries, etc.) must be applied accurately, and this means after individual instruction—furthermore, the medicament must be used in the first instance every day between two menstrual periods and then continued for a week after each period until at least four months have elapsed since treatment was begun; (3) a reminder should be given that while under treatment the use of contraceptive jellies and creams should be avoided—this is because it is essential that the pH of vaginal secretions should remain reasonably constant and not be affected by the addition of substances used for contraception to those prescribed for the treatment of *Trichomonas vaginalis* and allied infections.—I am, etc.,

London, W.1.

G. M. SANDES.

SIR,—We have been very interested to read the letter of Dr. R. D. Catterall *et al.* (*Journal*, February 2, p. 287) regarding the treatment of trichomonas vaginitis, also that

due to *Candida albicans*, with oral trichomonocides such as aminitrazole. Their findings have been confirmed in all our cases thus treated; also in three cases of urethritis in the male due to the *Trichomonas vaginalis* in which there has also been no response whatever. We have come to the conclusion that these preparations are therapeutically valueless in the treatment of these conditions.—We are, etc.,

NEVILLE MASCALL.
J. CHESNEY.F. G. MACDONALD.
R. BAKER.

London, W.C.2.

SIR,—We would like to support the opinion expressed in the letter from Drs. R. D. Catterall, E. M. C. Dunlop, and Eva Gallagher (*Journal*, February 2, p. 287) concerning the use of "an oral trichomonocide such as aminitrazole." In our clinic we have treated a small series of female patients suffering from trichomonas vaginitis with combined aminitrazole by mouth and local vaginal treatment as recommended. The *T. vaginalis* reappeared in the vaginal secretions after the completion of treatment in every case where follow-up was possible. These patients denied further sex contact after treatment, so that reinfection was unlikely as a cause of the reappearance of the *T. vaginalis*.—We are, etc.,

London, E.C.1.

CLAUDE NICOL.
AIDAN REDMOND.

Weight Trends During Pregnancy

SIR,—An important and not very uncommon cause of weight gain during pregnancy, not mentioned by Dr. A. M. Thomson and Mr. W. Z. Billewicz in their article (*Journal*, February 2, p. 243), is depression. Some mothers who are upset by an unwanted pregnancy react by over-eating and put on weight, the pathogenesis here being identical with that of simple obesity. The excess weight may persist after the birth unless the depression is dealt with. In such women the mother-child relationship is likely to be disturbed.—I am, etc.,

London, W.1.

D. F. O'NEILL.

Sign of Wind in Infants

SIR,—I was interested to read the letter by Dr. Jean McEwen (*Journal*, January 26, p. 229) regarding facial pallor and wind in infants. I recently saw two infants exhibiting facial pallor, which disappeared after eructation. One infant developed a typical attack of "three months' colic," with high-pitched scream, drawing-up of legs, and red congested facies. Approximately five minutes after the attack began I noticed a definite circumoral pallor, more marked over the upper lip, and thought it may have been due to vasoconstriction caused purely by mechanical stretching of the skin over the gums.

On observing another attack, also with pallor, I gently applied pressure to the cheeks, so releasing the tension on the circumoral skin, with resultant return of colour to the pallid area.—I am, etc.,

Llantwit Major, Glam.

MALCOLM J. PHILLIPS.

SIR,—In view of the interesting observation made by Dr. Jean McEwen (*Journal*, January 26, p. 229), I should like to record a personal observation in connexion with the diagnosis of "wind" in infants. The sign is a purely mechanical one and is comparable to the Hippocratic succussion splash which may be elicited in a case of hydropneumothorax.

To elicit the sign after a milk feed the baby is sat up on the observer's right knee facing his left. The baby is held upright between the observer's right hand, which is placed over the back of the baby's chest, and his left hand, which is placed over the lower part of the front of the baby's chest. The infant is now gently rocked towards and away from the observer. If there is "wind" to be brought up a sound not unlike that obtained when a glass of champagne is being poured will be easily audible. At times the sound produced is not dissimilar to the sound of waves lapping up against a boat. In the smaller infant who is unable

to hold his head erect he can be made more comfortable during the manoeuvre by supporting the chin between the thumb and index finger of the left hand.

The gastric succussion splash (as I have called it) is, of course, due to the splashing movement back and forth of fluid gastric contents made possible by the presence of the stomach gas bubble. Once eructation has occurred the sign cannot be elicited, and the absence of the succussion splash excludes the presence of "wind" in any significant amount. The sign should be elicited cautiously in the infant who tends to regurgitate more than the average amount with eructation.

The prime importance of the sign is in the prevention of "three-month colic," where it is essential to know whether there is any "wind" left before the baby is put down to sleep.—I am, etc.,

Brighton.

RONALD J. CANTWELL.

Bowel Obstruction

SIR,—Mr. R. J. Williams in his letter on bowel obstruction (*Journal*, February 2, p. 285) states that brussels sprouts have not been cited before as a cause of such obstructions. This brings to mind a case of lower small-bowel obstruction I saw about three years ago. On laparotomy and subsequent enterotomy the cause was found to be a brussels sprout more or less undigested. It may be of interest to note that this patient had previously had a partial gastrectomy of a full-width stoma type of operation performed.—I am, etc.,

Bradford.

B. N. COLABAWALLA.

Rupture of Hind-waters and Haemorrhage

SIR,—I see that two cases of infant death are discussed by Drs. J. K. Russell, D. F. Smith, and R. Yule (*Journal*, December 15, 1956, p. 1414), both being due to trauma of the placenta by a Drew Smythe catheter used to rupture the hind-waters. After the recording of the two cases the authors went on to elaborate on a test that may be done to differentiate between foetal and maternal blood. This seems a completely unnecessary elaboration of what should be a straightforward procedure. Would it not be more simple to suggest that the Drew Smythe catheters be withdrawn from service and rupture of the fore-waters be substituted when surgical induction of labour is contemplated? In the hospital with which I am associated 112,000 babies have been delivered in the past thirty years without a recorded loss of infant life due to such an accident—the point being that no Drew Smythe catheters are used.—I am, etc.,

Montreal.

THOMAS PRIMROSE.

Rheumatic Carditis

SIR,—Everyone who has been interested in the institutional care of children with rheumatic carditis will be interested in Professor N. B. Capon's article on the subject (*Journal*, February 9, p. 335).

What is missing from any article that I have read on this subject is the results of any organized follow-up of these important cases into later life. Such centres as London and Liverpool must surely have unique facilities for inquiring into the subsequent life histories of these patients.—I am, etc.,

Broadstairs.

MARTIN O. RAVEN.

Cricket

SIR,—The B.M.A. v. Law Society cricket match this year will take place at Hurlingham on Sunday, May 26. In order that the B.M.A. XI should be truly representative I would be very grateful if members interested in cricket would write to me, recommending the names of fellow-members whom they consider ought to play in this side. There are, I know, many doctors playing first-class club cricket who do not like to put themselves forward because they are too modest but who would be only too pleased to play if invited.—I am, etc.,

91, Warren Road,
Worthing, Sussex.

P. C. RUSHTON.

Obituary

Sir PERCIVAL HARTLEY, C.B.E., M.C., D.Sc., F.R.S.

Sir Percival Hartley, formerly director of biological standards at the National Institute for Medical Research, died at a London nursing-home on February 16. He was 75 years of age.

Percival Hartley was born on May 28, 1881, the son of Mr. W. T. Hartley, of Calverley, Yorkshire, and was educated at the Bradford Technical College and at Leeds University, where he graduated B.Sc. in 1905. With a Grocers Company Research Scholarship he then went to the Lister Institute of Preventive Medicine, where he



was from 1906 to 1908. In 1909 he obtained the London D.Sc., and in the same year went to India to join the staff of the Imperial Bacteriological Laboratory at Muktesar, in the United Provinces. He returned to the Lister Institute from India in 1913, but left during the first world war to serve as a captain in the R.A.M.C. from 1915 to 1919, being awarded the Military Cross in 1917. After demobilization he spent two years at the Wellcome Physiological Research Laboratories and then, in 1922, joined the staff of the National Institute for Medical Research. There his work gained him the William Julius Mickle Fellowship of the University of London in 1927. His achievements there were further recognized when, in 1936, he was appointed C.B.E., and by his election the next year to the Fellowship of the Royal Society. In 1944, two years before he left the National Institute, he was created a knight for his work in connexion with the development of penicillin for medical use. While at the National Institute he was appointed to the responsible post of director of biological standards. He continued his research work as a Wandsworth Fellow at the London School of Hygiene and Tropical Medicine from 1946 to 1948; at the Sir William Dunn School of Pathology, Oxford, in 1948-9; and at the Lister Institute again from 1949 to 1953. He was a member of the British Pharmacopoeia Commission from 1933 to 1948 and of the Medical Research Council from 1949 to 1953. In 1948 the University of Leeds conferred on him the honorary degree of D.Sc. He married Miss Olga Parnell in 1920. Lady Hartley died in 1950, and he is survived by the two daughters of the marriage.

Professor A. A. MILES, Director of the Lister Institute of Preventive Medicine, writes:

Percival Hartley's outstanding qualities are perhaps best appreciated against a background of biological standards, because they fitted him admirably for work in the important field that he made peculiarly his own. To it he brought enthusiasm, devotion, extreme care in bench work, and a determination to fight for principles. The many immunological standards that Hartley made, and the methods he devised for doing so, have been models for

the rest of the world and the principles of standardization on which he worked a part of the canon. He never tired of preaching these and became impatient only when he thought they were wilfully ignored. I remember a conference on the standardization of a drug at which a visiting expert defended certification of all batches without test on the recommendation of a committee, and, while Hartley chafed, detailed the qualifications of each eminent committee member. Hartley, leaping up, exploded with, "I don't care if you have Matthew, Mark, Luke, and John on it, what they are doing isn't standardization." He had little respect for mere authority and would protest to anyone he thought was violating either scientific principles or his own firm principles of decent behaviour. A diffident man, he would worry for some time about what form his protests should take, but he never hesitated to make them.

Hartley was an admirable teacher of his own subject, and no one ever acquired a shoddy technique from him. He was modest about his researches, but justifiably realized their value, especially his work on diphtheria immunity and on the effect of species differences, or refining techniques on the protective and sensitizing action of antibody. He was wont, a little slyly and perhaps a little wryly, to say that he was chiefly known for "Hartley's broth." But he will be remembered for much else in the science of immunology and for his integrity and charm—and remembered with the affection that can be inspired only by a kindly and devoted man.

Dr. D. A. LONG writes:

Sir Percival's standing as man and scientist will be acknowledged by those of his contemporaries all over the world who shared with him in the real achievements of the League of Nations and later the World Health Organization. More than anyone else he was responsible for the introduction of the international biological standards, and he never tired of describing the contributions, direct and indirect, that they have made to research. The scientific world will mourn the passing of a Fellow of the Royal Society. The medical practitioner will remember the man who fought long and effectively to eradicate diphtheria. Lady Hartley shared in his research in this field, and Sir Percival used to boast that his wife taught him all he knew in this branch of immunology.

The things of which he would boast were few—his family, the achievements of his country in international medicine, the National Institute for Medical Research, his assistants, his pride at being an Englishman. He never boasted of his own achievements. One story will suffice to show his selflessness and humility. As a young man he had accepted a major chair at an English university, but as the time of his appointment approached he asked for it to be given to another; his reason was that he felt that he could not fill it adequately. This was the only instance in which I knew his judgment to be false. He could unite a group of temperamental, even disagreeable, individuals into a team by the affection they felt for him. His enthusiasm for his subject was intense. He taught well and with great simplicity. He loathed shoddy technique, and one of his favourite sayings was, "A man is as good as his methods." No man could have been more kind to his juniors, and as the number of people who had served under him mounted with the years so the respect and affection in which he was held also increased.

Possibly the most remarkable thing about Sir Percival was his courage. He was a very sensitive man. Sometimes his simplicity and youthful enthusiasm—for he remained a young man all his life—led him to be the victim of the cynical and sophisticated scientist. On such occasions he was easily and deeply wounded. In spite of all his honours he was unconscious of his own ability, and worried a great deal even if he had to give a lecture to students. A shy port. Though he survived his wife for some years, he never fully recovered from her death. Those of us whom he taught will remember him in the techniques we use each

day at the laboratory bench. I shall always think of him when I read in *King Henry VIII* the King's tribute to Cranmer: "This good man—few of you deserve that title."

Mr. HARRY COOPER

It is with much regret that we record the death on February 14 of Mr. Harry Cooper, official reporter to the *British Medical Journal*. Mr. Cooper was 76 years old, and had been in ill-health for the past five years. Harry Cooper left school at the age of 15 and entered the office of a coal merchant and cornchandler in Boston, Lincolnshire. He taught himself in his spare time, among other things learning shorthand. At the age of 20 he went to London and was employed by the Amalgamated Press. He joined the Camera Club and



began to report for the Röntgen Society, now the British Institute of Radiology, thus beginning a connexion with the medical profession that grew as the years went by and earned him the gratitude and respect of a large number of medical men both within the British Medical Association and in the numerous medical societies that sought Cooper's help. In 1907 he reported the Section of Radiology at the Annual Meeting of the Association in Exeter, and in the then editor of the *Journal*, Dr. (later Sir) Dawson Williams, quickly appreciated Cooper's qualities. Cooper helped in the reporting of the meeting of the Association in Sheffield in 1908, and in 1909 accepted the position as reporter to the *British Medical Journal*, a position he held until his death.

For nearly 50 years Mr. Harry Cooper has been responsible for reporting the Annual Representative Meeting of the B.M.A., the proceedings of the Council and of its committees, and some of the scientific sections of the Annual Meeting and of the Royal Society of Medicine. He had an amazing capacity for concentrating his whole attention on the work he was doing, and this absorption in his task made him in time as familiar with medical terminology as were the speakers he reported. Cooper's "copy" was so excellent that it could go straight to the printer without much more attention than a few straight "cuts" to adjust it to the limitations of space. No pains were too great for him to achieve accuracy and conciseness, and no call for help in reporting was ever too late in the day. Over the years he acquired a remarkable knowledge of the medical profession and its personalities, and for all his modesty and self-effacement he was not slow in measuring a man's worth. Three editors of this *Journal* learned just how valuable were these qualities of mind and of character, and as time went on Cooper's developing ability as a journalist found increasing application in the writing of memoirs of the eminent, of leading articles on general topics, of concise summaries of voluminous official reports. His writing was lucid and direct and free from the cliché and the overworked phrase. Although, as one became aware, the *Journal* was first in his affections, Cooper's activities as a re-

porter and journalist spread far beyond it. Before the war, for example, he used to report matters coming before the annual assemblies of the League of Nations and the International Court at The Hague. His working day must have been as full as that of the busiest general practitioner.

Harry Cooper was a deeply religious man whose modesty was as much a part of himself as was his natural courtesy of manner. His finely tempered mind enabled him to outstrip the handicaps of his early education, and he looked upon his work as as much a contribution to something he valued as a way of earning a living. He was a most unusual man, and nothing would have surprised him more than to be told this.

Medical Notes in Parliament

Chronic Rheumatism

The MINISTER OF HEALTH was asked by Mr. P. COLLUCK (Birkenhead, Lab.) what was the estimated number of people in Britain suffering from rheumatism, arthritis, and kindred diseases, and what was the proportion of the population. He stated on February 13 that precise figures were not available, but surveys in particular areas and other evidence suggested that the rate of incidence of the chronic rheumatic diseases might be between 2 and 4% of the population per annum.

Prescriptions for Skin Complaints

Mr. PHILIPS PRICE (Gloucestershire, West, Lab.) asked the Minister of Health whether he was aware that in dermatological clinics the average prescription requiring more than one preparation was higher than any other type of clinic; and whether, in view of the heavy burden that this put on patients suffering from skin trouble in comparison with other types of cases, he would abolish making a charge of 1s. on all items in excess of a certain figure. Mr. D. VOSPER, replying on February 12, said his information was that there was some tendency for the average number of items for these prescriptions to be higher than the general average; but he was not satisfied that any special action was needed in addition to the existing arrangements to give assistance when it was required.

Poliomyelitis Vaccinations

Mr. B. JANNER (Leicester, North-west, Lab.) asked the Minister of Health on February 14 how many children had now been vaccinated against poliomyelitis since this method was put into effect; what report on the new batch of vaccine he had received from the Medical Research Council; and what reasons had they given in support of their views. Mr. VOSPER said the number was approximately 178,000. The report on the first batch of vaccine expected this year stated that it had passed all tests for freedom from active poliomyelitis virus and for potency, but that it failed to reach the required standards of purity. Tests on a second batch were still in progress.

Multi-racial Hospitals

Mrs. LENA JEGGER (Holborn and St. Pancras, South, Lab.) asked the Secretary of State for the Colonies how far it was his policy to encourage hospital development in the colonies on a multi-racial basis. Mr. A. LENNOX-BOYD stated on February 13 that the development of "group" or multi-racial hospitals in the territories was encouraged so far as religious beliefs and social customs permitted, but the basic aim was to produce an efficient hospital service acceptable to the inhabitants.

Composite Packs

Mr. NESS EDWARDS (Caerphilly, Lab.) asked the Minister of Health on February 18 what were the composite

packages now issued on one prescription, and whether any further composite packages had been proposed by the British Medical Association. Mr. VOSPER informed him that the following sets of apparatus or dressings, each of which included two or more articles, might be ordered as one prescription: atomizer, colostomy apparatus, douche, hypodermic syringe, smog mask, multiple pack dressing, perfusion fittings, suprapubic belt, Higginson's enema syringe, urine sugar analysis set, vaporizer. He said he was still awaiting the views of the Association on further packs.

Radiation Dangers

Mrs. E. HILL (Manchester, Wythenshawe, Con.) asked whether the Minister of Health could make a statement on the technical and administrative steps taken to reduce the amount of radiation from hospital and other radiology units; and, in view of the increased evidence of the danger of leukaemia and of general hazard to health arising from radiation, what steps were being taken to ensure that patients received strictly limited and not indiscriminate or repeated exposure when undergoing x-ray examination. Mr. VOSPER stated that radiologists and other members of the medical profession were well aware of these hazards, and he could not accept the implication that patients were exposed indiscriminately or unnecessarily to radiation. The whole question was, however, under review by a committee under the chairmanship of Lord Adrian, and any further action must await its report.

Increased Contributions to N.H.S.

In a statement on February 19 Mr. PETER THORNEYCROFT, Chancellor of the Exchequer, spoke of the savings in civil expenses to be concurrent with the expected saving in defence. The price of welfare milk is to be increased to 4d. a pint and the charge for school meals by 2d. to 1s. When the National Health Service was first introduced it was expected to cost £175m. a year. In 1957-8 the total cost of the Service would be £690m. Towards this a sum of £40m. would come from the contributions from the National Insurance fund (which collected 10d. from an adult man every week), £100m. from other receipts, including charges to patients, and the balance of £550m. from general taxation. It was proposed to increase National Insurance contributions by 10d. for an adult man and proportionate sums for women and juveniles. The employer would pay the same proportionate share as he did now. The purpose was to establish a separate National Health Service contribution towards the cost of the Service, and the results of the increase would be that the contributory element next year would rise from one-seventeenth to one-ninth of the total cost of the Service. It would provide an additional £40m. for the Chancellor in a full year.

Welfare of the Handicapped.—The Minister of Health is to reconstitute the Advisory Council for the Welfare of Handicapped Persons on April 1 as an advisory committee to advise him on questions relating to the health as well as the welfare of the handicapped. It is hoped to hold the first meeting of the new committee in April.

Medico-Legal

POLICE EVIDENCE PREFERRED

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

On February 11 Robert King, a Stranraer general dealer, was prosecuted before the Ayr Sheriff Court for driving a car while under the influence of drink to such an extent as to be incapable of having proper control over it, and for careless driving and failure to stop after an accident.

King, who had bought the car for £8 and later sold it for scrap for £5, said that on the evening in question he

Scotsman, February 13, 1957.

was driving in search of his wife, who had left him. He had had one drink of beer in an Ayr public house. The evidence for the prosecution was that his car had swerved and caused a van to mount the verge of the road; had gone round two corners on its wrong side; had collided with a taxi; had ignored diversion signs and gone down a road under repair; had zigzagged down a street, making people run to safety; and had reversed into a cul-de-sac and crashed into a hedge and railings.

King was arrested, and was examined by the police doctor, Dr. R. L. Leask. Dr. Leask, who was medical officer of health for Ayr and had 20 years' experience as police doctor, certified that, though King smelt of alcohol and at one point during the examination staggered slightly, he was not unfit to drive. In spite of this the sheriff-substitute, Mr. James Frame, convicted him after hearing the facts about his driving and the opinions of a police inspector, two sergeants, and two constables as to his condition. The depute procurator-fiscal observed that in spite of Dr. Leask's "failure" to certify King as unfit to drive he had the evidence of policemen of experience who would not let him leave the police station, and "no policeman would be likely to detain a man, knowing the rights of the subject in this country."

The sheriff-substitute relied on the "expert" evidence of the five policemen in preference to the view of Dr. Leask, who had said after a full examination that in his opinion it was not even a borderline case. Some short time must have elapsed between King's arrest and the doctor's examination, so the police had the advantage of him there, and no doubt the driving described in the prosecution evidence required explanation. But, as the agent who appeared for the defence said with some force, there seems to be little purpose in asking accused persons to undergo a test by the police doctor if, when the result is favourable to the accused, the prosecution can disregard it and ask the court to convict on the visual evidence of laymen.

King was sent to prison for 30 days and fined £20 for careless driving and failing to stop, and was disqualified from driving for three years.

Universities and Colleges

UNIVERSITY OF OXFORD

In Congregation on December 15, 1956, the following degrees were conferred:

B.M.—G. H. Fowler, D. C. S. Hutchison, A. J. Pemberton, M. S. Whitehouse, H. G. Nicol, W. D. Stone, E. D. A. Hay, Y. E. Hsia, S. R. Richardson, E. W. Sturton, J. B. Dawson, B. A. Roper, E. M. Swannie, T. Osborn, F. P. Greenwell, R. D. Last, R. C. Poynting-Wright, J. B. Sayer, T. P. Snell, G. C. Rivett, M. W. B. Bradbury, R. L. Buchanan, D. N. Cousins, P. F. Binnion, P. S. H. Browne, C. B. Clay, R. W. Griffith, J. R. Cousins, D. R. Laney, Joyce I. A. Little, Rosemary E. Troughton.

Dr. R. G. Eager has been appointed representative of the University on the governing body of Burford Grammar School, in place of Mr. H. A. Smith, until September 1, 1958.

Dr. W. H. Taylor has been elected to an Official Fellowship at St. Peter's Hall, as Tutor in Natural Science from October 1, 1957.

UNIVERSITY OF CAMBRIDGE

In Congregation on January 26 the following degrees were conferred:

M.D.—J. B. Lyon, N. B. Malleon.
M.B., B.Ch.—G. Screech, *C. Cohen, *E. W. Lord, *F. B. Grossmark, P. H. W. Sheard, *S. J. M. Fernando, St. J. Dowling, *M. K. T. Valentine, *P. G. C. Beney, F. K. Amarquaye, D. B. Hill.
M.B.—R. J. Rushton, D. H. Hull, *A. E. H. Mence, G. A. Irving, *B. H. Gooch, W. E. Ince, *H. M. Melville, *Patsy J. M. Lachelin, *Gillian A. Watson, *Marguerite A. M. von Bergen.

Dr. J. D. Lever has been elected into a Fellowship of Trinity College, on appointment as College Lecturer in Anatomy.
*By proxy.

UNIVERSITY OF LONDON

The following degrees were awarded by the Senate on December 19, 1956:

M.D.—R. Goulding, H. R. C. Riches
M.S.—S. M. Chris, E. M. Elmhirst.

The degree of M.D. was awarded by the Senate on January 30 to P. H. Connell and J. G. P. Hutchison.

Professor J. M. Mackintosh has been appointed a representative of the University on the governing body of the London School of Economics and Political Science.

Professor R. W. Scarff has been appointed the representative of the Board of Studies in Pathology on the Board of the Faculty of Medicine for 1957.

The following have been recognized as teachers of the University in the subjects indicated in parentheses: *Postgraduate Medical School of London*, Dr. B. E. Heard and Dr. A. G. E. Pearce (Pathology). *Institute of Ophthalmology*, Mr. S. J. H. Miller (Ophthalmology). *Institute of Diseases of the Chest*, Dr. F. J. Prime (Medicine). *Charling Cross Hospital Medical School*, Mr. N. C. Tanner (Surgery) and Dr. J. F. D. Frazer (Physiology). *St. Mary's Hospital Medical School*, Dr. Victor Wynn (Chemical Pathology) and Dr. R. F. Mottram (Physiology).

UNIVERSITY OF WALES

At a Degree Congregation held at Cardiff on January 12 the following degrees were conferred:

M.B., B.Ch.—D. J. W. Anderson, D. Davies, A. E. Dudley, E. G. H. Edmunds, Gwenda Harcombe, I. H. Horn, C. D. Jones, H. V. R. Jones, Margaret Jones, Thelma Lancaster, B. R. Lewis, D. N. D. Lewis, H. B. Lewis, Olwen G. M. Rees, J. H. Thomas.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examination indicated:

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—J. A. Attard, F. P. Brown, J. J. Y. Ch'Uai, B. Das, G. S. Dhalwal, Nishat Fahmy, K. N. Ghose, Mehar Q. Hasan, H. Hollis, T. J. G. Howie, A. Lanzo, Yvonne G. R. Mahabir, M. Masuduzzaman, P. N. Mehrotra, G. A. Parsons, F. Rahim, A. Z. Rizavi, S. Sen, A. K. Shakir, O. P. Sharma, P. N. Sharma, Premila Singh, S. Sukondhamana, C. R. W. Turner.

In Congregation on December 14, 1956, the following degrees were conferred:

M.D.—J. Ainsworth, N. Coulshed, J. A. Donnellan, J. F. Foulkes, D. Heibert, E. S. Watkins.
M.Ch.Orth.—R. M. Bhansali, J. C. N. Joshipura, A. H. McKenzie, R. B. J. Peiris, A. E. Pritchard, S. K. Roy, W. A. L. Thompson.
M.B., Ch.B.—Stella R. Alsop, J. L. Bowmer, P. G. Bullough, G. G. Copeland, H. W. C. Davies, H. J. P. Digory, H. Gordon, H. G. P. Jones, Zoë Kenyon, W. W. Littler, Eileen M. Millward, Mary W. Pritchard, F. Richards, N. G. Roberts, P. F. Teebay, A. J. Williams, Margaret V. Wilson.

The following candidates have been approved at the examinations indicated:

M.B., Ch.B.—Passed in separate subjects: W. G. Clayton (Medicine and Surgery).

DIPLOMA IN PUBLIC HEALTH.—Part I: Frances Allan, G. W. Danger, L. H. Dutchie, P. H. Grace, T. L. Hobday, P. G. Holt, Marie T. Hyde, Brenda Jones, A. L. Kirkland, Margaret M. Lewis, Dora Marren, J. E. O'Malley, D. C. Pattison, D. P. W. Roberts, W. G. Timmis, Mary P. K. Williams. Part II: W. A. Jones, B. J. Kelly, N. T. W. Pover.

QUEEN'S UNIVERSITY OF BELFAST

At a graduation ceremony on December 21, 1956, the following degrees were conferred:

PH.D.—In the Faculty of Medicine: John Bowden.
M.B., B.Ch., B.A.O.—S. W. Agnew, W. A. Beck, J. P. Bradley, S. S. Brown, G. J. Cole, M. D. L. Eakin, E. T. T. Hu, H. R. McGaughey, R. M. H. Malone, J. Noble, J. P. Savage, Y. E. Shirazi.

UNIVERSITY OF BRISTOL

The dissertations submitted by the following candidates for the degrees indicated have been approved:

M.D.—D. R. Coles, C. H. Gurd, Lisa E. Hill, R. Hill.
PH.D.—In the Faculty of Medicine: S. M. A. Zaidi.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

The following were admitted to Membership of the College on February 1:

Elizabeth A. A. Awoliji, W. D. Linehan, R. J. P. Skelly.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At the meeting of the Council of the College held on January 26, with the President, Sir Charles Read, in the chair, the following were elected to Membership of the College:

D. C. Aird, G. B. Batchelor, R. A. T. Boland, G. D. D. Cable, M. I. Cassimjee, J. S. W. Chambers, P. K. Choudhuri, C. A. B. Clementson, K. I. Digwood, A. Freier, W. J. Garrett, W. Gault, W. Gavin, I. Goldman, C. J. Goosen, B. Kirsch, Margaret A. Lakeman, E. W. Lillie, H. H. C. J. Marks, A. E. B. Matthews, T. T. E. Michael, A. B. McCrosbie, J. G. Marks, A. E. B. Matthews, T. T. E. Michael, A. B. Miller, A. K. Mitra, Jessie M. B. Muirhead, A. G. Muttuthamby, A. B. L. Peake, A. C. C. Pinaon, L. J. Rice, R. Richards, T. J. Ryan, G. J. W. Stamp, S. M. Thanevala, K. F. G. Wilson, R. Yule.

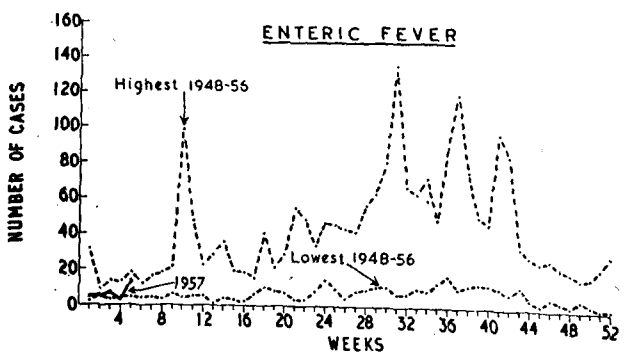
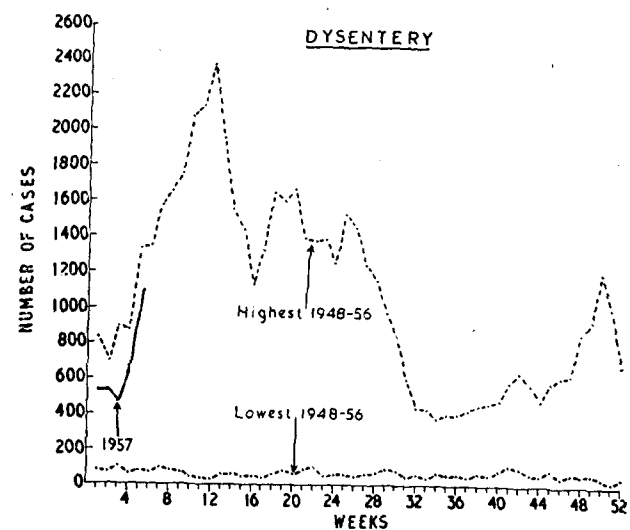
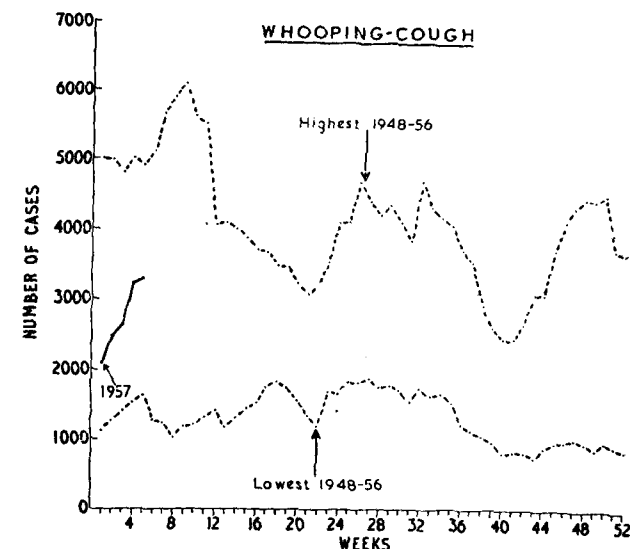
ROYAL FACULTY OF PHYSICIANS AND SURGEONS

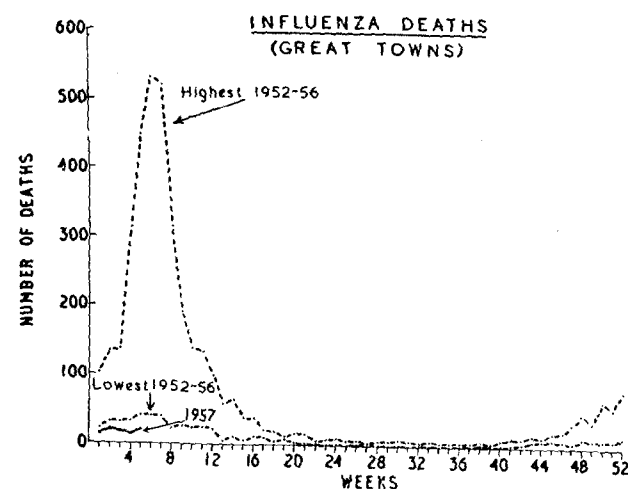
At a meeting of the Faculty held on January 7, with Professor Stanley Alstead, President, in the chair, the following were admitted Fellows of Faculty: N. K. Barber and G. C. Robin.

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the years 1948-56 (influenza, 1952-6) are shown thus ———, the figures for 1957 thus ———. Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





Infectious Diseases

In England and Wales during the week ending February 2 a rise in the number of notifications of most infectious diseases was recorded. The largest rises were 3,481 for measles, from 9,527 to 13,008, 462 for dysentery, from 635 to 1,097, 89 for acute pneumonia, from 572 to 661, 69 for whooping-cough, from 3,233 to 3,302, and 36 for scarlet fever, from 829 to 865.

The largest increases in the incidence of measles were 633 in Lancashire, from 2,304 to 2,937, 310 in Essex, from 803 to 1,113, 289 in London, from 682 to 971, 278 in Durham, from 810 to 1,088, 277 in Middlesex, from 224 to 501, 271 in Yorkshire West Riding, from 484 to 755, 223 in Cheshire, from 259 to 482, 171 in Staffordshire, from 215 to 386, 144 in Kent, from 104 to 248, 128 in Oxfordshire, from 87 to 215, and 121 in Surrey, from 404 to 525; the only large fall was 121 in Lincolnshire, from 264 to 143. The largest fluctuations in the returns of whooping-cough were an increase of 42 in Kent, from 208 to 250, and a fall of 46 in Suffolk, from 99 to 53. The only large variations in the number of notifications of scarlet fever were a rise of 30 in London, from 47 to 77, and a fall of 44 in Shropshire, from 47 to 3. 5 cases of diphtheria were notified, 4 more than in the preceding week, and 2 of these cases were notified in Birmingham C.B.

37 cases of acute poliomyelitis were notified, and these were 7 more for paralytic and 3 more for non-paralytic cases than in the preceding week. The largest returns were Lancashire 5 (Liverpool C.B. 2), London 4 (Islington 2), Southampton 4.

A rise in the incidence of dysentery was general throughout the country. The largest local increase was 127 in Accrington M.B., from 4 to 131. The largest returns, during the week, were Lancashire 299 (Accrington M.B. 131, Stretford M.B. 85, Liverpool C.B. 14), Warwickshire 121 (Coventry C.B. 66, Birmingham C.B. 40), Yorkshire West Riding 96 (Sheffield C.B. 21, Bradford C.B. 20, Worsborough U.D. 15, Leeds C.B. 13), London 80 (Islington 14, Lewisham 11), Nottinghamshire 72 (Arnold U.D. 47, Nottingham C.B. 19), Yorkshire East Riding 52 (Kingston-upon-Hull C.B. 41), Durham 41 (Gateshead C.B. 14), Northumberland 32 (Blyth M.B. 13, Alnwick U.D. 12), Middlesex 29 (Tottenham M.B. 9), Oxfordshire 25 (Oxford C.B. 24), Leicestershire 22 (Hinckley U.D. 14), Essex 21 (Thurrock U.D. 11), Carmarthenshire 21 (Kidwelly M.B. 21).

Week Ending February 9

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 869, whooping-cough 3,148, diphtheria 9, measles 16,752, acute pneumonia 720, acute poliomyelitis 34, dysentery 1,290, paratyphoid fever 5, and typhoid fever 6.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending February 2 (No. 5) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1957					1956				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria	5	0	2	0	5	11	3	2	0	8
Dysentery	1,097	80	195	6	1	1,325	125	147	11	4
Encephalitis, acute	2	0	0	0	0	5	0	0	0	0
Enteric fever: Typhoid	3	0	0	0	3	4	0	0	0	2
Paratyphoid	10	1	0	0	0	1	0	2	0	0
Food-poisoning	181	38	35	1	0	164	21	0	0	55
Infective enteritis or diarrhoea under 2 years				10	24				17	7
Measles*	13,008	971	494	451	316	2,425	26	56	23	41
Meningococcal in- fection	32	1	15	0	0	25	1	16	2	2
Ophthalmia neonat- orum	21	1	2	0	0	18	0	8	0	0
Pneumonia†	661	41	300	15	4	941	65	334	10	4
Poliomyelitis, acute: Paralytic	28	3	7	1	4	25	3	1	1	1
Non-paralytic	9	1	0	0	0	12	0	0	0	0
Puerperal fever‡	234	47	11	0	0	261	41	6	1	0
Scarlet fever	865	77	83	34	22	949	33	103	25	11
Tuberculosis: Respiratory	631	73	124	14	4	679	90	113	17	4
Non-respiratory	87	7	14	4	0	67	6	14	4	0
Whooping-cough	3,302	173	502	19	67	1,621	77	96	82	221

DEATHS in Great Towns	1957					1956				
	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire	Eng. & Wales	Lon.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	1	0	0	0	0	0
Dysentery	1	0	0	0	0	0	0	0	0	0
Encephalitis, acute	0	0	0	0	0	0	0	0	0	0
Enteric fever	0	0	0	0	0	0	0	0	0	0
Infective enteritis or diarrhoea under 2 years	9	1	2	0	1	8	0	1	0	0
Influenza	21	0	1	1	1	45	3	4	0	2
Measles	1	1	0	1	1	0	0	0	0	0
Meningococcal in- fection	0	1	0	0	0	0	2	0	0	0
Pneumonia	327	60	230	15	7	402	69	42	14	12
Poliomyelitis, acute	1	0	0	0	0	1	0	1	0	0
Scarlet fever	0	0	0	0	0	0	0	0	0	0
Tuberculosis: Respiratory	56	7	14	4	1	104	15	18	2	9
Non-respiratory	0	0	0	0	0	0	1	1	0	0
Whooping-cough	1	0	0	0	0	1	0	0	0	0
Deaths 0-1 year	251	38	38	8	8	220	30	35	4	9
Deaths (excluding stillbirths)	5,986	828	692	147	171	6,735	988	825	111	214
LIVE BIRTHS	7,970	1167	1003	181	446	6,945	1044	915	205	339
STILLBIRTHS	228	31	25	0	0	205	17	28	0	0

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenza pneumonia.
‡ Includes puerperal pyrexia.

LATE PARLIAMENTARY NEWS

After the printing of the JOURNAL had begun we received the following Parliamentary report:

The PRIME MINISTER announced on February 20 that the whole question of medical remuneration is to be referred to a Royal Commission. He said that the claim for a 24% increase in the remuneration of doctors in the Health Service would mean an extra cost to the country of about £20m. a year, and in present circumstances the Government did not feel able to admit that claim. "This does not mean that the Government has reached any conclusion as to the merits of the claim." They decided that the time "was opportune for a full review of medical remuneration from an independent inquiry, which would look into the remuneration of the medical profession in relation to other professional classes in the community and would suggest how the matter could be kept under review. I have accordingly recommended to the Queen, and Her Majesty has approved, that a Royal Commission be appointed for this purpose." He added that within the last few days a similar claim had been received on behalf of the dental profession, and that the dental profession would be included in the review. The question whether the remuneration of doctors and dentists employed by local authorities should be included was under consideration. The names of the members and terms of reference of the Royal Commission would be announced later.

Mr. H. GAITSKELL, Leader of the Opposition, immediately asked how long this review was expected to take, if it was to be in the nature of an arbitration tribunal on the claim. Would the terms of reference include specialists as well as general practitioners, and would it have the power to recommend back-dating the award if there was one? Mr. MACMILLAN said the Commission would be able to recommend that any award and proposals should be retrospective. The review would include specialists. But as regards the character of the Commission, he thought that would be best set out in detail when he could announce the names and terms of reference. He thought it was generally agreed that it would be a good thing if the relations of this profession with other professions could be established and if some satisfactory system could be adopted by which reviews could be carried out from time to time.

Mr. HERBERT MORRISON (Lewisham, South, Lab.) described this as a very doubtful way of seeking to settle the remuneration claim. He recalled that the Spens Committee in similar circumstances landed the country into expenditure and repercussions which had been embarrassing. Mr. MACMILLAN said this was a difficult problem, and he felt that the work of the Royal Commission on the Civil Service—similar but not exactly parallel—had been to advantage, and if some equally good results could follow from this Royal Commission he thought it would be generally acceptable.

Mr. G. NABARRO (Kidderminster, Con.) asked the Prime Minister to make it clear that a primary purpose of the review should be to eliminate all the legal and other uncertainties that had arisen from the Spens Report and Danckwerts award. Mr. MACMILLAN said one purpose of the Commission would be to clear up this situation and lay down a system which through the years would be more workable and more acceptable.

Dr. EDITH SUMMERSKILL (Warrington, Lab.) said this was virtually a repudiation of the Spens Reports and asked what the reaction of the professional organizations was to this suggestion. Mr. MACMILLAN said that the discussion between representatives of the profession and the Minister of Health was one matter. To-day he had confined himself to the announcement of the appointment of the Commission. Detailed questions had better be left to the Minister responsible.

MEETINGS TO BE CALLED

Immediately after receiving the above report the Negotiating Committee met at B.M.A. House. It was decided to

summon at once meetings of the constituent bodies of the Committee. The Council of the B.M.A. is to meet next week. The Negotiating Committee authorized the dispatch to the Prime Minister of a personal letter signed by Sir Russell Brain and Dr. A. Talbot Rogers, joint chairmen of the Committee.

Medical News

Hunterian Society.—The annual dinner to commemorate John Hunter's birth was held in London on February 14, with the president of the Society, Dr. CECIL COYLE, in the chair. It was the 229th anniversary. The dinner was also a double jubilee. It was fifty years ago that a Lord Mayor of London first attended the commemoration dinner, and the presence at the High Table of this year's Lord Mayor, Sir CULLUM WELCH, with the LADY MAYORESS and the Serjeant-at-Arms, Commander JOHN POLAND, attested to the Society's traditional links with the City. The other jubilee was of the first admittance of ladies. Indeed, at this year's dinner, so fast have times altered and prejudices softened, there seemed more women than men in the large gathering. To mark the day—it was St. Valentine's too—the last speech of the evening was entrusted to a lady, Miss ROSE HEILBRON, Q.C., Recorder of Birmingham. After the Loyal Toasts and the "immortal memory" had been honoured, LORD LUKE, proposing the health of the Society, neatly epitomized the reason for John Hunter's continuing influence: "His life," he said, "was a challenge to worn-out theories." Dr. COYLE in his reply spoke of the Society's tradition of "informal but serious thought" which enlivened their clinical meetings. Two honorary fellows had been elected this year, he said—Sir Robert Young and Sir John Weir. "The Lord Mayor and the Corporation of the City of London" was proposed in a speech of quicksilver wit by Dr. MACDONALD CRITCHLEY, himself the Master of a City Company (the Apothecaries), as the Lord Mayor was quick to note in his reply. The Hunterian Society, said Sir CULLUM WELCH, had been born and bred in the City. It was renowned for its addiction to meeting in the taverns there. Replying to Mr. IAN ROBIN'S toast of "The Guests and Kindred Societies," Miss HEILBRON expressed her special pleasure at being at the dinner, not only on account of the close and usually most happy relationship that existed between Medicine and the Law, but also for personal reasons as the wife of a doctor. She complimented the Society—and the medical profession generally—on their forward-looking attitude to women. "Even at this dinner," she said, "the ladies have the last word."

Leverhulme Associates of R.S.M.—The council of the Royal Society of Medicine invites applications for the one hundred Leverhulme associateships which are available each year thanks to the generosity of the Trustees of the Leverhulme Trust Fund. The associates enjoy nearly all the privileges of the Society's fellows but without paying any subscription. The scheme started a year ago, and is intended for the holders of full-time clinical or non-clinical teaching or research appointments in medical, dental, or veterinary departments of British universities whose total income from academic or professional sources does not exceed £1,500 a year. Awards are made for one year in the first instance but may be extended annually up to a maximum of three years. Most vacancies are filled in the last week of March, for the year beginning April 1, so candidates are advised to apply between March 1 and 15, though applications may be made at any time. Application forms may be obtained from the deans of medical schools or the secretary of the Royal Society of Medicine, 1, Wimpole Street, London, W.1.

Mentally Handicapped in Scotland.—Local authorities have been asked by the Department of Health to ascertain the number of mentally handicapped in their areas needing care and guidance. This is recommended in a circular on the welfare of the mentally handicapped. The circular also

draws attention to the need to encourage voluntary effort in this field and for the provision of occupation centres, aftercare hostels, and clubs. So far out of the fifty-five local health authorities in Scotland only two have provided occupation centres suitable for both school-age and adult mental defectives.

Royal College of Surgeons.—The College council, at a meeting on February 14, agreed to the holding of a primary fellowship examination at Colombo in January, 1958. This had been requested by Ceylon University. The council also appointed Sir HARRY PLATT, president of the College, visitor to the first primary fellowship examination of the College of Physicians and Surgeons of South Africa. The College's honorary medal was presented to Lady WEBB-JOHNSON.

COMING EVENTS

Harveian Society.—Sir RUSSELL BRAIN, P.R.C.P., will deliver the Harveian Lecture on March 27 at 8.15 p.m. at 11, Chandos Street, London, W.1. His subject will be "Some Disorders of the Cerebral Circulation." The lecture is open to any member of the medical profession.

Twelfth International Congress on Occupational Health.—Helsinki, July 1-6. Registration before April 1. Details from the organizing committee, Työterveyslaitos, Haartmaninkatu 1, Helsinki-Töölö, Finland.

"Child and Family Psychiatry."—Refresher course for medical practitioners (including postgraduate students), April 8-12, at the Ipswich and East Suffolk Hospital. Details from Dr. H. G. HOWELLS, Department of Child Psychiatry, 11, Fore Street, Ipswich. No fee.

National Association for Mental Health.—Annual conference will be held at Church House, Westminster, London, S.W.1, April 11 and 12. The theme will be "The Maladjusted Child: The Underwood Report and After." Details from the Association, 39, Queen Anne Street, London, W.1.

British Tuberculosis Association.—Provincial meeting in Oxford, April 12 and 13. Details from the hon. secretary, 59, Portland Place, London, W.1.

NEW ISSUES

Abstracts of World Medicine.—Issued in the first week of each month, this journal contains abstracts of important papers selected from the current medical literature of the world. Annual subscription £4 4s., single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

British Journal of Ophthalmology.—The new issue (Vol. 41, No. 2) is now available. The contents include:

ACTION OF DIAMOX AND AMMONIUM CHLORIDE ON FORMATION OF AQUEOUS HUMOUR. MAURICE E. Lankham and Patience M. Lee.
DISTENSIBILITY OF THE EYE. E. S. Perkins and J. Gloster.
EXTENSIBILITY OF STRIPS OF SCLERA AND CORNEA. J. Gloster, E. S. Perkins, and Marie-Louise Pommer.
SUMMERSKILL'S DACTYLOSCOPIC RHINOSTOMY. R. W. B. Holland.
AIR IN THE EYE. A. Lister.
CONGENITAL IRIS LESION. W. J. Levy.
LEUCOBIOTE OF THE CORNEA. M. Gilkes.
CORRESPONDENCE.
BOOK REVIEW.
NOTES.
OBITUARY.

Issued monthly; annual subscription £4 4s.; single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, February 25

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Professor M. L. Rosenheim: Pyelonephritis.
ROYAL INSTITUTE OF CHEMISTRY: THAMES VALLEY SECTION.—At Physical Chemistry Laboratory, South Parks Road, Oxford, 8.15 p.m., joint meeting with Alembic Club. Professor W. C. Fernelius (Pennsylvania): Polonium.
UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C., 5.30 p.m., Dr. T. S. Work: Biochemical Approach to the Problems of Protein Synthesis.

Tuesday, February 26

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor J. B. Duruid: Arterial Occlusion.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Mr. B. E. D. Cooke: Disorders of Buccal Mucosa.
ROYAL ARMY MEDICAL COLLEGE.—5 p.m., Professor W. Melville Arnott: Physiological Features of Emphysema.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor D. F. E. Nash: Congenital Spinal Palsy—The Management of Incontinence.
ROYAL STATISTICAL SOCIETY: MEDICAL SECTION.—At Keene Lecture Theatre, Westminster Medical School, S.W., 5.30 p.m., Mr. D. J. Newell and Dr. A. T. Elder: Provision of Hospital Beds.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Dr. P. M. F. Bishop: Problems of Intercerebral Vascular Disease.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Dr. J. N. Milnes: neurological demonstration.

Wednesday, February 27

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—8 p.m., Dr. Stephen J. L. Taylor: Psychiatry and Politics.
COUNCIL OF SCIENTIFIC MANAGEMENT IN THE HOME: WOMEN'S GROUP ON PUBLIC WELFARE.—At British Institute of Management, 8, Hill Street, W., 3.30 p.m., public lecture by Dr. C. A. Boucher: Planning for Safety in the Home.
HARVEIAN SOCIETY OF LONDON.—At 11, Chandos Street, W., 8.15 p.m., clinico-pathological meeting.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Miss Phyllis Wade: Radiation Treatment of Skin Cancer (Part II).
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Mr. Vernon C. Thompson: Surgery of Mitral Stenosis.
INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. A. R. C. Higham: Neoplasms of the Kidney.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. J. H. Humphrey: Biochemical Mechanisms Underlying Hypersensitivity Reactions (2).
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE: EDINBURGH BRANCH.—At West Medical Theatre, Edinburgh Royal Infirmary, 5 p.m., Lieutenant-Colonel John Morison, I.M.S. (ret.): How the Problem of Plague Was Solved.

Thursday, February 28

BRITISH POSTGRADUATE MEDICAL FEDERATION.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Professor H. Grunberger, F.R.S.: Localization of Inherited Diseases in the Body.
GLASGOW UNIVERSITY MEDICO-CHIRURGICAL SOCIETY.—7.30 p.m., joint meeting with Dialectic and Law Societies: "Royal Commission" on Homosexuality.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Cutaneous Manifestations of Syphilis.
LIVERPOOL MEDICAL INSTITUTION.—8 p.m., Symposium: Poliomyelitis. Speakers, Dr. A. B. Christie; Professor A. W. Downie, Mr. G. E. Thomas, and Dr. J. R. Esplen.
NORTHFIELD ORTHOPAEDIC CENTRE.—At Wingfield-Morris Orthopaedic Hospital, 8.30 p.m., Mr. O. J. Vaughan-Jackson: Some Surgical Aspects of the Rheumatoid Hand.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.30 p.m., Otolaryngology Lecture by Dr. D. B. Fry: Speech and Language.
ROYAL NORTHERN HOSPITAL.—2.45 p.m., Mr. R. S. Murley: Carcinoma of the Breast and its Treatment.
ROYAL SOCIETY OF HEALTH.—At the Town Hall, West Bromwich, 10 a.m., Dr. J. F. Skone: The Coloured Worker.

Friday, March 1

BRITISH TUBERCULOSIS ASSOCIATION.—At 26, Portland Place, W., 4.30 p.m., Subject: Acute Emergencies in Chest Medicine. Speakers, Dr. Thomas Simpson, Mr. N. R. Barrett, and Mr. T. Holmes Sellers.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. E. J. Moynahan: clinical demonstration.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. R. W. Riddell: clinical demonstration.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—10 a.m., Mr. A. Dickson Wright: Intestinal Obstruction. 4 p.m., Dr. J. N. Morris: Epidemiology of Coronary Heart Disease.
ROYAL MEDICAL SOCIETY, EDINBURGH.—8 p.m., dissertation by Mr. D. Fleinley: Bronchitis.
ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.—At Royal Faculty of Physicians and Surgeons of Glasgow, 8.30 p.m., Dr. A. T. Dore: Prevention of Industrial Diseases.
ST. MARY ABBOTS HOSPITAL.—At Lecture Room, School of Nursing, 6 p.m., Third Annual James Yearsley Memorial Lecture by Mr. I. Simpson Hall: Mobilization Operation in the Treatment of Otosclerosis.
WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—At Occupational Therapy Department, 8.30 p.m., lecture and demonstration by Dr. B. E. Brooks: Occupational Therapy as a Factor in Treatment.

Sunday, March 3

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.—10.15 a.m., clinical demonstration for general practitioners. Dr. G. I. M. Swyer: Use of Hormones in General Practice.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Bush.—On February 13, 1957, at Edgware General Hospital, Middlesex, to Lois and Dr. Richard Bush, of New Zealand, a sister for Tony Woods.—On February 9, 1957, at the Jesson Hospital for Women, Sheffield, to Gilbert and Sheila Woods (formerly Costello), a daughter.

DEATHS

Gluscepi.—On January 19, 1957, in a hospital, London, Paul Eugène Hedwige Gluscepi, M.B., C.M., aged 88.
May.—On January 26, 1957, at Woodleigh, Ware, Herts, George Ernest May, M.R.C.S., I.R.C.P., aged 89.
Robinson.—On January 26, 1957, at 36, Mayfield Avenue, Orpington, Kent, Harold Joseph Robinson, M.B., B.Ch., formerly of Kirkoswald, Cumberland.
Sinnette.—On January 22, 1957, Margaret Mitchell Sinnette, M.B., Ch.B., of "Wayside," Barkend Road, Bradford, Yorks.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Weight Gain in Pregnancy

Q.—(1) What are the principal factors contributing to the gain in weight during pregnancy? (2) What is the normal range of the gain, and does the mother's starting weight, age, or parity affect this? (3) How should an excessive weight gain be managed?

A.—Gain in weight during pregnancy is determined by: an increase in the volume of the blood; an increase in tissue fluids; the foetus; the liquor amnii; the placenta; the increase in size of the breasts; the growth of the uterus; and a deposition of fat in subcutaneous and other tissues. An excessive overall gain in weight during pregnancy may be determined by any of these factors, but the ones which matter most are the foetus (multiple pregnancy, for example), the liquor amnii (hydramnios), tissue fluids (oedema), and deposition of fat. The last is usually the most common. An excessive gain occurring suddenly or during a short period generally denotes abnormal fluid retention, but can also be accounted for by acute hydramnios.

The average weight gain during the whole of normal pregnancy, in which no attempt has been made by dieting to increase or decrease the rate of gain, is of the order of 28 lb. (12.7 kg.). Of this only about 2 or 3 lb. (0.90 or 1.36 kg.) are usually gained during the first trimester. When the nausea and vomiting of early pregnancy has ceased it is probably normal for patients to have a hearty appetite and to gain weight at the rate of about 1½ lb. (0.68 kg.) weekly until about the end of the fifth month. During the second half of pregnancy an average weekly gain of about 1 lb. (0.45 kg.)—within limits of ¾ to 1½ lb. (0.34 to 0.57 kg.)—appears to be consistent with the greatest chances of a satisfactory outcome. The rate of gain usually decreases during the last few weeks, and a slight loss of weight may occur after term. Total weight gains ranging from over 50 lb. (22.7 kg.) to practically nothing may be associated with a satisfactory outcome, but towards both extremes the chances of abnormality are relatively high. Starting weight, age, and parity seem to exert relatively little influence upon the rate at which weight is gained, but many obese women gain less than the average during pregnancy.

A high but steady rate of weight gain seems in most cases to be due to deposition of fat and other tissues, and does not affect adversely the outcome of pregnancy. But a high rate of gain, and particularly a sudden increase in the rate, may foreshadow the onset of pre-eclampsia; careful examination for rising blood pressure, albuminuria, and oedema is therefore indicated. Before oedema appears clinically the patient may report that her ankles swell at night or that her rings have become tight. It must be remembered that high rates of weight gain may also be associated with recovery from vomiting or an infection, or, as stated above, with hydramnios or twin pregnancy. There is strong evidence that control of weight gain by dietary restriction does help to reduce the incidence of eclampsia and severe pre-eclampsia, at least in primigravidae.

While the dangers associated with excessive gains of weight are well known, it is less commonly appreciated that unduly low gains, especially in undersized women, are often associated with premature labour or the birth of an underweight baby at term; there is, however, little evidence so far that the incidence of prematurity can be reduced by encouraging such patients to eat more and so to put on more weight. Loss of weight may be useful in assessing the severity of vomiting or infection during pregnancy, and in late pregnancy or after term may precede intrauterine death.

Allergy to Mascara

Q.—A patient is allergic to all the varieties of mascara she has tried. What is the responsible ingredient, and are any makes of mascara suitable for allergic subjects?

A.—Mascara is a generic term applied to all forms of colouring material applied to the eyelids. A very large number of bases and tinting materials are used commercially. Universal allergy is most unlikely. Carbon black, for example, is quite inert. Possibly the patient is upset by the vehicle—e.g., soap. A number of quite inactive and non-sensitizing formulae can be found in *Modern Cosmetology*.¹

REFERENCE

¹ Harry, R. G., *Modern Cosmetology*, 4th ed., 1955, p. 228. Leonard Hill Ltd., London.

Luminous Dials

Q.—In the light of recent knowledge about the hazards of ionizing radiations, what advice should be given to patients who inquire about the safety of objects such as clocks, watches, etc., where luminous paint is used for the numerals?

A.—This point is covered in the Medical Research Council's recent report, *The Hazards to Man of Nuclear and Allied Radiations* (Cmd. 9780, H.M.S.O., 1956). The contribution of radiation from the estimated four million watches and ten million clocks with luminous dials in Britain is small but real (equivalent to about 1% of natural background). The main hazard is to workers in the luminizing industry, but the risk from the widespread use of such instruments is not entirely negligible. While there are circumstances which require and justify the use of instruments with self-luminous dials, for most people there is no such necessity and their wider use constitutes an avoidable, if small, genetical risk as regards the population as a whole, which could be minimized for all concerned if the amount of radioactive material in these instruments were reduced to the lowest possible level.

To this may be added the comment that, as regards the individual, possessors of luminous wrist-watches, and especially children, should be discouraged from taking these articles into bed with them. If at any time the watch-glass is broken, the timepiece should not be used at all until adequate repairs have been effected.

Treatment of Otosclerosis

Q.—Are hearing-aids of value in otosclerosis? If so, what kind of aid is required, and how much benefit may be expected? What are the indications for operative treatment in this condition?

A.—Deafness in otosclerosis is typically of the conductive type and results from fixation of the stapes in the oval window by the disease process, thus impeding the passage of sound waves to the cochlea. In this type of deafness practically all of the hearing loss is regained by hearing-aids of the valve amplifier type.¹ The Medresco hearing-aid, which is obtained and serviced without cost to the patient under the National Health Service, may be used with great benefit. If commercial hearing-aids are preferred, information about reliable firms who supply these may be obtained through the National Institute for the Deaf, 105, Gower Street, London, W.C.1.

Operative treatment in otosclerosis is directed towards breaking through the bony barrier that prevents sounds from reaching the cochlea. Various methods of achieving this have been described.² The most successful has been the so-called fenestration operation in which a window is drilled above the oval window opening into the vestibule and adjacent ampulla of the lateral semicircular canal. A second method which has lately given promising results is that of mobilization of the stapes.³ Such operations are unlikely to be successful unless undertaken by a surgeon with special

experience of the technique, and are usually performed in a magnified field using a binocular dissecting microscope.

If the nerve of hearing is affected to any great extent, surgical treatment will not help. Indications of such nervous involvement include voice changes, intolerance of amplification, disappearance of paracusis, and, very often, loss of acuity for bone-conducted sounds. On an average there will be an improvement of 25 decibels for the critical speech frequencies (512, 1024, 2048 c.p.s.). For patients with a much greater initial hearing loss than 50 decibels, the benefit they are likely to experience from operation will be limited.

REFERENCES

- ¹ Dix, M. R., Hallpike, C. S., and Hood, J. D., *Proc. roy. Soc. Med.*, 1949, 42, 527.
² Cawthorne, T., *Brit. med. Bull.*, 1956, 12, 143.
³ Rosen, S., *J. Mt Sinai Hosp.*, 1956, 23, 200.

Transmission of Toxoplasmosis

Q.—Can you give me some information on the mode of transmission of toxoplasmosis? I have come across a case in which a mother transmitted it to her child in utero. Is there a likelihood of its being transmitted to another baby if she should conceive again?

A.—Toxoplasmosis can be congenital or acquired. It is thought that congenital infection arises when the mother undergoes her initial infection with toxoplasms during pregnancy, the accompanying parasitaemia promoting transplacental spread of the infection. It is most unlikely, therefore, that more than one infant of the same mother could suffer from congenital toxoplasmosis. Clinical congenital toxoplasmosis must be distinguished from positive serological tests in the infant due to antibodies passively transferred from the maternal circulation.

In acquired toxoplasmosis, where our knowledge is incomplete, the reservoir of infection appears to be domestic animals and food products from them, such as meat, which have been insufficiently cooked to kill the contained toxoplasms. Further details about the animal reservoirs will be found in a report of a recent meeting of the Royal Society of Tropical Medicine and Hygiene.¹ There is also some evidence to suggest a direct spread from human to human by contact or droplet infection.

REFERENCE

- ¹ *British Medical Journal*, 1957, 1, 280.

Chinese Liver Fluke

Q.—What treatment is advised for infection with the Chinese liver fluke (*Clonorchis sinensis*)? Here in south-west Korea chloroquine is popular but successful in only about half the patients treated. What is known of the pathology of the condition?

A.—The treatment of *Clonorchis sinensis* infection is unfortunately unsatisfactory. In addition to the use of chloroquine, which is generally regarded as being of very limited if any value, sodium antimony tartrate and gentian violet are commonly used. Sodium antimony tartrate is given in a 0.5% solution in sterile isotonic glucose or sodium chloride solution. The solution may be boiled for five minutes in order to sterilize it, but it should not be autoclaved. The first dose consists of 0.5 gr. (32 mg.), and this may be increased by amounts of 0.5 gr. (32 mg.) until doses of 2–2.5 gr. (130–160 mg.) are being given. These should be administered intravenously at 24- or 48-hour intervals, the solution being injected slowly over a period of 15 minutes. The total course consists of 25–35 gr. (1.65–2.3 g.). Patients usually complain of nausea while having the larger doses in this treatment. Gentian violet is administered in enteric-coated capsules containing 1–2.5 gr. (65–160 mg.) thrice daily; the course of treatment should be continued for two to four weeks.

A recent comprehensive study of the pathology of the condition has been made by P. C. Hou.¹

REFERENCE

- ¹ Hou, P. C., *J. Path. Bact.*, 1955, 70, 53.

Management after Intra-articular Hydrocortisone

Q.—What is the best treatment after an injection of hydrocortisone into (a) a joint, and (b) a tendon sheath, e.g., in tennis elbow? Should the joint be moved or rested, and what form of physiotherapy is recommended?

A.—Injection of hydrocortisone into a joint after aspiration of excess synovial fluid is performed with the object of exerting an anti-inflammatory effect. Therefore it is wise to rest the joint for a period afterwards—usually about 48 hours. Following this the muscles around the joint should be built up to provide as strong a support as possible. This can best be done by means of exercises. Preliminary faradism may be used to show the patient how the muscles can be contracted if they are weak.

On the other hand, when hydrocortisone is given into the soft tissues for lesions such as tennis elbow, the object of treatment is to free any adhesions between the muscles. Therefore the structures should be moved actively after a short time.

Threadworms

Q.—What order of number of threadworms may be present in the intestine of a heavily infected child? Where do they principally congregate, and can they interfere with the child's nutrition by reason either of their bulk alone or of their own metabolic demands?

A.—There may be hundreds or only a few. No one has taken the trouble to count the number in one individual, although over 40% of the children in this country are infected with threadworms.

The worms normally inhabit the caecum, but may occasionally be found in the ileum or appendix, and rarely in the stomach, oesophagus, or nose. In a few instances they have migrated into the peritoneum and Fallopian tubes. Unlike the males, which remain in the caecum, the gravid females migrate via the rectum to the perianal region where they normally lay their eggs. Sometimes they also enter the vagina. The movements of the worms on the anal folds cause intense itching.

Heavily infected children may show some anaemia with loss of appetite and malnutrition. This cannot be due to the "bulk" of the worms, as the latter are very small. More probably it is attributable to catarrhal inflammation resulting from mechanical irritation of the intestinal mucosa. The possibly toxic effects, if any, of the worms' metabolic products have not been investigated. But the nervous symptoms shown by heavily infected children and occasionally by adults are due, partly, to the psychological effects of the movements of the gravid worms on the perianal surface. The "metabolic demand" of the worms is, of itself, unlikely to interfere with the patient's nutrition.

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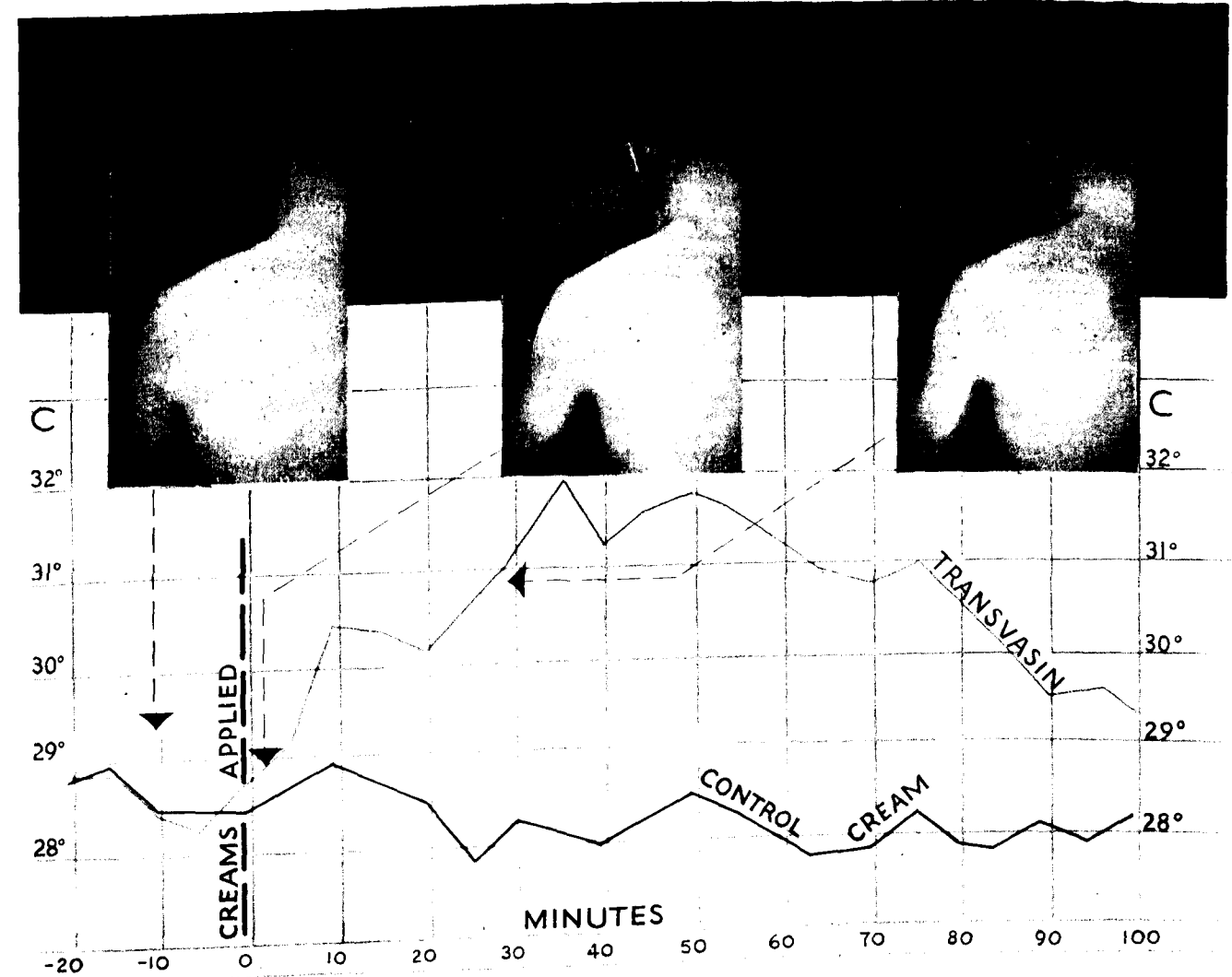
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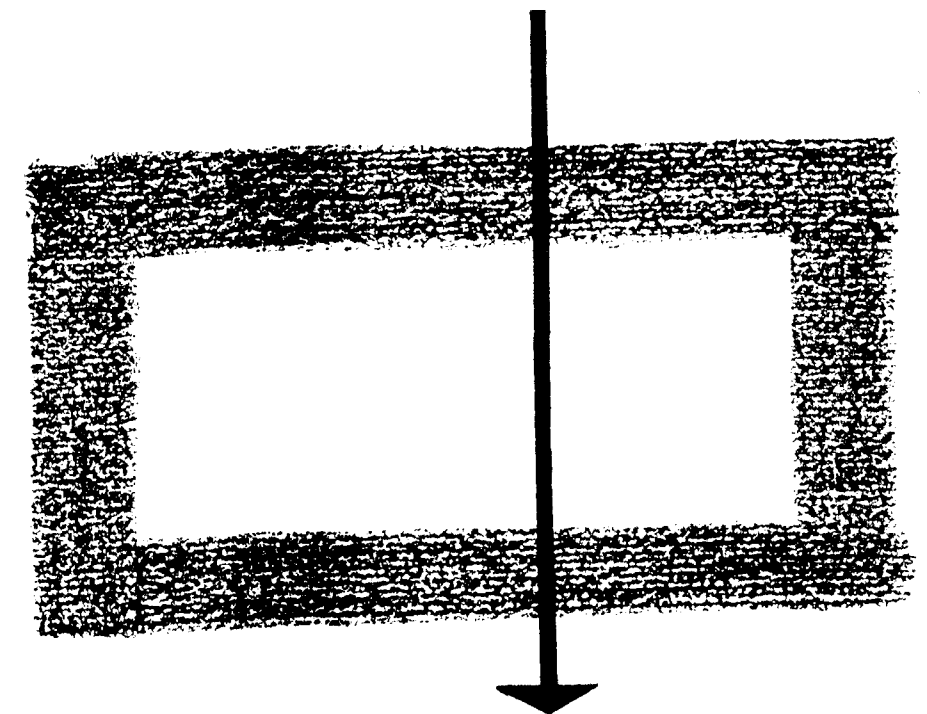
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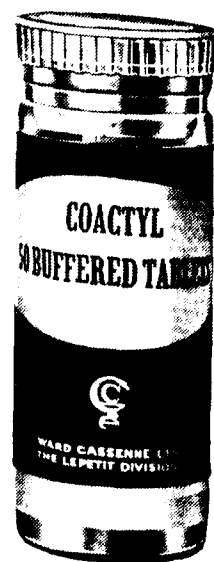
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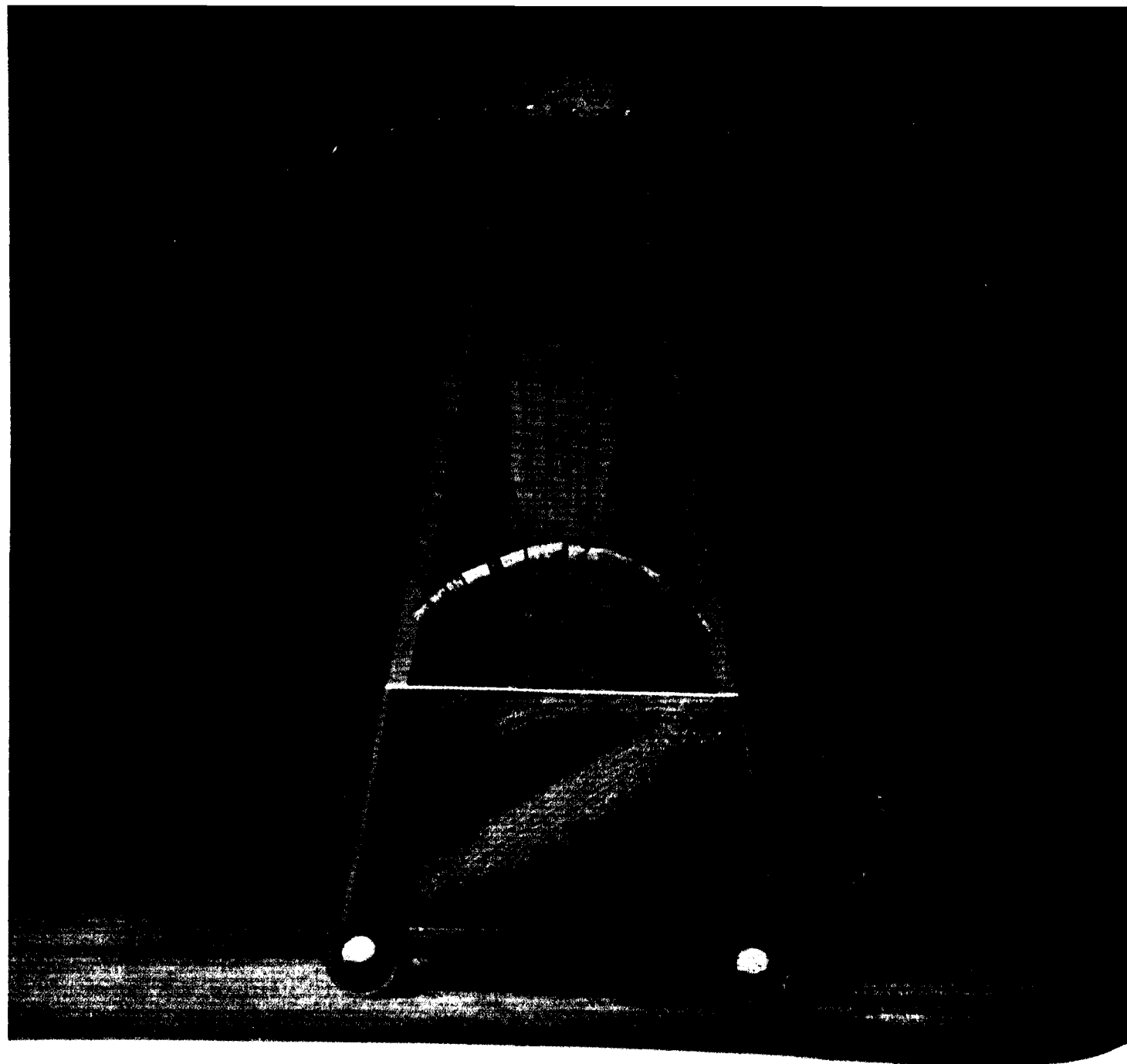


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MULTIPLE SCLEROSIS

A PLEA FOR A FRESH OUTLOOK*

BY

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Despite its importance the subject of multiple sclerosis tends to be obscured by an aura of defeatism and even apathy for which there appear to be four main causes: (1) the apparent lack of progress in discovering the cause; (2) the generally accepted view that diagnosis is seldom possible in the early stages and cannot be made unless certain signs are present; (3) the belief that, variable though the course may be, sooner or later increasing disability is inevitable, leading to premature death; and (4) the lack of any therapeutic measure which can be relied upon to influence the disease.

I propose to deal with these points in some detail.

Aetiology—The Allergic Theory

Until quite recently the belief that multiple sclerosis was due to a single cause has dominated thought on this problem. This is well exemplified by the infective theory, which postulates that multiple sclerosis may be caused by a particular form of bacterium or virus. The negative results of earlier experimental work, particularly on the virus theory, are not entirely trustworthy because of limitations in technique. However, Lumsden (1955) has described a tissue-culture method for the detection of virus in plaques. His failure to confirm the presence of virus in a small series of plaques should not discourage others from repeating his experiments. It should be recalled that Dawson (1916), as a result of intensive histological study, concluded that multiple sclerosis might be caused by a soluble toxin conveyed to the nervous tissues, probably by the blood stream. It may well be that this concept, if viewed broadly and translated into terms of immuno-chemistry, may yet prove to be near the truth.

The so-called allergic theory, to which increasing attention has been paid in recent years, carries with it the implication of a multifactorial causation. The idea that a hypersensitivity reaction to an infection might cause disease of the nervous system was probably first put forward by Glanzmann (1927) in connexion with the neurological complications of chicken-pox, smallpox, and vaccination. In 1932 van Bogaert postulated that a similar mechanism might be at work in multiple sclerosis. In 1942 Pette further developed the theory of neuro-allergy when considering the acute forms of demyelinating disease. Ferraro (1944), on the basis of histological studies, suggested neuro-allergy as a common basis in all the demyelinating diseases, including multiple sclerosis.

*Based on the Annual Address given to the Newcastle upon Tyne and Northern Counties Medical Society on December 6, 1956.

Clinical support for this viewpoint came from studies of the natural history of the disease (McAlpine, 1946; McAlpine and Compston, 1952). The possibility that multiple sclerosis may be due to an antigen-antibody reaction within the nervous system is at present based on deduction from a number of widely different observations.

Familial Tendency

In England (Pratt, Compston, and McAlpine, 1951) and Northern Ireland (Millar and Allison, 1954) the familial incidence lies between 6 and 7%. In Northern Scotland, Sutherland (1956) obtained the high figure of 11%. Siblings are more frequently attacked than other relatives. Examples of the disease in three generations are exceedingly rare. Studies by Thums (1951) in twins has shown that the disease does not necessarily occur in identical twins. These facts suggest that, when present, the genetic influence is usually weak and must be reinforced by constitutional and environmental factors before the nervous system is attacked, and, furthermore, that the disease may develop in the absence of any obvious genetic influence.

Occurrence of Allergy in Multiple-sclerosis Subjects

In a study of 250 cases of multiple sclerosis and of 250 controls from a hospital population we did not find any difference in the incidence of allergy in the two groups, but just before and after the onset of symptoms of multiple sclerosis a history of some form of allergy was obtained in 9% of this series as compared with 2.5% of the control series (McAlpine and Compston, 1952). In multiple-sclerosis patients the occasional reaction in the nervous system to organic arsenical preparations and to vaccines suggests a similar mechanism.

Precipitating Factors

Although the first symptom of the disease may appear in an apparently healthy individual without any recent incidents in the general health that can be related to the onset, more usually one of the following closely precedes it:

Fatigue.—Long recognized as a factor which may precipitate or aggravate the disease, excessive tiredness, with or without physical or mental cause, is not unusual in the history of these patients. Just as signs of paralysis may be hastened in the laboratory animal, previously injected with brain emulsion, by causing it to run about the cage, so in multiple sclerosis physical exertion may bring the disease to light or cause a relapse.

Infection.—Roughly 10% of patients give a history of an infection, usually in the form of a "cold" or "sore throat" or an attack of influenza preceding the onset. The Table illustrates this point. "Whenever I get a cold,

Infection Preceding Onset (From McAlpine, Compston, and Lumdsen, 1955)

Author	%	No. of Cases
Bramwell (1917)	14.0	200
Hoesslin (1934)	10.5	109*
Kolb <i>et al.</i> (1942)	2.0	199
McAlpine (1946)	5.0	142
Adams <i>et al.</i> (1950)	14.0	389†
McAlpine and Compston (1952)	10.0	250

* Acute. † Within six months of onset.

it goes to my legs" is an expression sometimes used by these patients; it illustrates the part which an intercurrent infection may play in causing either a temporary exacerbation of symptoms or a true relapse.

Trauma.—Since the end of the last century references may be found in medical literature, especially German, to the relation between trauma and multiple sclerosis. In Hoesslin's study of 516 cases trauma (including operation) precipitated the onset in 11.4% of cases. In our series of 250 cases we obtained a history of trauma, including dental extraction but not surgical operations, in 14% as compared with 5.2% in the control series. In a recent series Abb and Schaltenbrand (1956) estimated a figure of 10%. Hoesslin first suggested that there may be a relationship between the site of the trauma and the level of the lesion in the central nervous system, a finding which we confirmed in certain of our cases and which has a parallel in acute poliomyelitis.

Emotional Stress.—Although statistical evidence that an emotional upset can be regarded as a valid precipitating factor is lacking (Pratt, 1951), in individual cases it can be so regarded. Of its importance during the course of the disease, particularly as a cause of temporary exacerbations of symptoms, there can be no doubt.

Mode of Onset and Course of Disease

An abrupt onset and a natural tendency for symptoms to remit and later recur are features which have long been recognized as likely to provide a clue to the underlying cause of multiple sclerosis. Particularly in the middle-aged, there may be a slow progression of symptoms from the onset (the progressive spinal form of the disease). It would seem likely, as in certain other diseases, notably rheumatoid arthritis, that age may be a factor in modifying the individual's reaction to the morbid process.

Changes in Cerebrospinal Fluid

In roughly 70% of cases the C.S.F. is abnormal at some stage of the disease, as shown by a mild pleocytosis, an increase of protein, or an abnormal Lange colloidal gold curve. It is known that any one of these abnormalities may occur as an isolated finding. At the present stage of our knowledge it is impossible to estimate the significance of these changes in relation to the course of the disease. Recent electrophoretic studies have shown that the gamma-globulin fraction in the C.S.F. is usually increased, while that of the serum is not significantly raised. Furthermore, it is known that a change in the colloidal gold curve is closely linked with the gamma-globulin content of the fluid. Press (1956) has reported the presence of a protein in the C.S.F., component "S," which she isolated from the gamma-globulin fraction; this substance has the effect of inhibiting the colloidal gold reaction. In multiple sclerosis the proportion of component "S" tends to be decreased as compared with the amount in normal C.S.F.

Since antibodies migrate mostly with the gamma-globulin fraction of the serum it is reasonable to suppose that this component of the C.S.F. performs the same function. From the above findings it seems permissible to make two tentative deductions: first, that the changes in the C.S.F. are the result of an immunological reaction, and, secondly, that this reaction may be in the nervous tissues rather than due to an increased selective permeability of the blood/C.S.F. barrier.

Experimental Evidence

The experimental pathologist now has at his command an established technique by which he can produce a demyelinating disease (encephalomyelitis) in animals by injecting them with homologous or heterologous brain tissue. This injection has a greatly increased effect if it is given with an adjuvant, such as heat-killed tubercle bacilli. Neither the injection of an emulsion of other organs nor that of the adjuvant alone produces this effect. Brain antibodies have been demonstrated by complement-fixation tests, but they are not capable of passive transfer. All grades of encephalomyelitis, ranging from acute to chronic, can be produced by varying either the number of injections or the amount of brain tissue injected. When a chronic form is produced in the monkey, cerebellar and pyramidal signs are prominent, partial remissions may occur, and at post-mortem examination plaques of demyelination may be found in the optic nerve and brain stem that, superficially at least, bear a striking similarity to the plaques of multiple sclerosis. The literature on the subject, the reasons for supposing that this reaction may represent an immunological mechanism, and the light which these experiments may throw on the cause of multiple sclerosis have been discussed by Lumdsen (1949, 1951, 1956) and by Wolf (1952).

Until more is known about the nature of the hypothetical antigen in brain tissue, the significance of experimental encephalomyelitis in relation to multiple sclerosis must remain *sub judice*. However, grounds for the belief that a form of allergy may be operative in both of these diseases have been strengthened by the marked similarity that exists between the type of polyneuritis which can be produced in rabbits by injecting them intradermally with rabbit sciatic nerve or spinal ganglia and the clinical picture of the Guillain-Barré syndrome or acute toxic polyneuritis (Waksman and Adams 1955).

Comment

It is clear that none of the clinical facts which I have briefly mentioned are in any way conclusive with regard to the allergic theory of multiple sclerosis. However, when viewed collectively the occasional familial incidence, the nature of the precipitating factors, the occurrence in some patients of a known form of allergy or a hypersensitivity to drugs, the abrupt onset and fluctuating course, and the change in the C.S.F. are all compatible with this theory.

Until disproved, the allergic theory of multiple sclerosis should be used as a basis for further research, particularly in the direction of determining the nature of the hypothetical antigen or antigens. By analogy with the results of experimental encephalomyelitis it would seem likely that, if an antigen-antibody reaction is concerned in the genesis of multiple sclerosis, part of the antigen is derived from a chemical component of the central nervous system; in other words, multiple sclerosis could in part be explained by auto-sensitization (Kabat, Wolf, and Bezer, 1947; Wolf, 1952; Lumdsen, 1956). In addition to an *intrinsic* component of the antigen it is necessary to postulate an *extrinsic* one. Theoretically this could be a specific chemical agent derived from one or more sources.

The work of Colover (1956) on the chemistry of the tubercle bacillus may point the way to the type of chemical agent that might be expected to serve as the source of extrinsic antigen in multiple sclerosis; he has shown that the residue in the tubercle bacillus, which is active in producing encephalomyelitis, is largely protein in character with

glutamic acid and alanine as predominant amino-acids. From clinical observations, it would seem necessary first to consider as possible sources of allergen the breakdown products of the common pathogens. From the foregoing remarks it is obvious that for the elucidation of this fascinating problem we must rely on the immuno-chemist and experimental pathologist, but there remains a place in research not only for the epidemiologist but also for the clinician who is prepared to view the problem broadly.

Early Diagnosis

A diagnosis of multiple sclerosis is usually not made until at least the fourth or fifth year of the disease. There are two main reasons for this delay. (1) The patient fails to report to his or her general practitioner early symptoms—for example, an episode of tingling or of numbness or of tiredness in a limb. Only by making the public aware of the existence of the disease and its early manifestations could this difficulty be overcome. Until the medical profession adopts a less defeatist attitude towards treatment it is doubtful whether such a step is at present justified, although as an indirect result of the activities of lay societies knowledge of the disease is slowly spreading. (2) The fallibility of us all, consultant and general practitioner alike, when confronted with a minor disturbance of function of any part of the body, more especially of the nervous system. Instead of dismissing an apparently trivial complaint regarding vision, sensation, or use of a limb, sometimes with labels as "eye-strain" or "neuritis," we must train ourselves to think of multiple sclerosis as a possible cause, even though on examination of the patient we can find little or no evidence to suggest organic disease.

There are certain features of the clinical picture which individually or collectively may lead to a correct diagnosis.

History.—This is of major importance, since it often raises suspicion of the disease, especially if after careful probing of the past one or more episodes come to light, often trivial and almost forgotten, suggesting a previous lesion in the central nervous system.

Family History.—In a suspected case of multiple sclerosis discreet inquiries should always be made for any neurological disorder in a near relative. Occasionally a positive history of multiple sclerosis in another member, or of paralysis occurring in youth or early middle age, which hospital records may confirm as due to multiple sclerosis, will heighten the suspicion of the same disease in the patient.

Prodromata.—Lassitude, easily induced fatigue, headache, irritability, difficulty in concentrating, and vague pains in the limbs are among the symptoms which may occasionally precede or accompany the onset and which may indicate a constitutional phase of the disease.

Behaviour of Early Symptoms.—Of major importance in diagnosis is the tendency for early symptoms to clear up, entirely or partially. Often, however, this important feature of multiple sclerosis, instead of arousing suspicion, has the opposite effect, and the reassurance given to the patient may seem well founded when perhaps months or even a few years pass by without any recurrence. The word "transitory" as applied to early symptoms is usually interpreted as meaning days or even weeks. However, quite commonly when taking the history one comes across episodes of disturbed vision, giddiness, or of tingling or numbness that lasted only hours or even minutes. Just because these early symptoms may be very short-lived they should not be dismissed as insignificant.

Evidence of Multiple Lesions.—It is often held that a diagnosis of multiple sclerosis cannot be entertained unless there is evidence of multiple lesions. It is quite true that such evidence—for example, the association of double or blurred vision and of paraesthesiae or weakness in a limb—is extremely helpful. However, a monosymptomatic type of onset is relatively common. In a recent analysis of 309 cases admitted to the Middlesex Hospital over a five-year period, in no less than 63% a history of a single symptom

was obtained at the onset: retrobulbar neuritis (21%) headed the list, followed by paraesthesiae (17%), motor weakness (14%), double vision (7%), and vertigo or vomiting (5%) (McAlpine, 1955).

Distribution of Symptoms.—Highly characteristic of multiple sclerosis is the irregular distribution of plaques in the central nervous system; consequently symptoms tend to be asymmetrically distributed. However, it is important to realize that they may occasionally show a remarkable degree of symmetry; for example, an attack of blurred vision in both eyes or paraesthesiae appearing symmetrically in the upper or lower limbs. If this feature of the disease is not recognized, difficulties in diagnosis may arise, especially when symmetrical paraesthesiae are present, thus imitating the distribution seen in acute polyneuritis.

Tendency for Local Spread of Early Plaques.—While it is quite common for a symptom to remain localized, not uncommonly there is a tendency towards spread. For example, a patient may describe how she first noticed a blurring in the centre of the field of vision which rapidly spread to involve the whole field. Or, again, numbness may spread locally; for example, from the little and ring fingers to the remaining fingers and rest of the hand, or widely from the upper limb to the trunk and lower limb on the same side, or in the reverse direction. This type of spread does not occur haphazardly, but is determined by the anatomical arrangement of fibres in the neighbourhood of the plaque. For example, paraesthesiae such as tingling and numbness are usually caused by a plaque in the posterior column, and if they spread widely it is sometimes possible to correlate the mode of spread with the arrangement of the proprioceptive fibres. The rapid manner in which spread may occur in multiple sclerosis is of diagnostic importance.

Physical Signs.—It is still widely held that a diagnosis of multiple sclerosis cannot be made unless certain signs are present, notably nystagmus and an extensor plantar response. It is of course true that the presence of these and other signs, particularly temporal pallor of a disk, are of the utmost value; nevertheless their relative or complete absence should not allay suspicion if the history is suggestive.

Cerebrospinal Fluid Findings.—A mistaken idea that lumbar puncture may be harmful in cases of multiple sclerosis may be one reason why this important diagnostic procedure is not used more often. Replacement of the fluid by 5 ml. of sterile normal saline solution reduces the risk of headache.

Some Remarks on Early Symptoms

Retrobulbar Neuritis

The clinical picture of an acute retrobulbar neuritis and its close association with multiple sclerosis is well known. I wish to draw attention to certain atypical features of this condition, some of which, so far as I can judge, are not well recognized. The first concerns short-lived attacks of blurred vision in both eyes, a history of which may sometimes be obtained in a patient who presents with a frank retrobulbar neuritis or with other evidence of the disease. Frequently, but not invariably, these attacks are brought on by exertion, fatigue, bright light, or reading. Multiple sclerosis is, of course, not the only condition in which temporary attacks of blurred vision occur; it may, for example, be caused by cerebral anoxia, or by posterior fossa tumours (Shepherd and Wadia, 1956). In multiple sclerosis this symptom has a significance, not only for early diagnosis, and as a probable explanation of temporal pallor of a disk in the absence of a positive history of a frank attack of retrobulbar neuritis, but also in relation to the physiopathology of the early plaque.

The next point concerns field defects. Although usually centrally placed, a scotoma may vary not only in density but also in its position in the visual field. Whatever the site of the original defect, there is a tendency for the scotoma to spread. Retrobulbar neuritis may be painless; on the other hand, pain in or behind the eye, especially on upward or

inward movement, is not uncommon. Of particular interest is the fact that pain in this situation may precede any subjective alteration in vision by a week or even longer. I have seen patients with retrobulbar neuritis who have had one or more attacks of pain in the eye without any visual failure. Pain preceding retrobulbar neuritis may be referred sometimes to the same frontal region or more widely over the whole of the side of the head. Where is the site of the pain in such cases? Ophthalmologists usually localize pain in and around the eye to the attachment of the superior and internal recti in the sheath of the optic nerve. This explanation does not adequately account for the occasional widespread pain met with in retrobulbar neuritis. Obviously this is a subject much in need of study, since if we knew what structures were involved we might have a valuable clue to the site of the early lesion.

Paraesthesiae

When a young or middle-aged patient presents with a disturbance of sensation as a solitary symptom the possibility of disease of the central nervous system does not readily come to mind. However, before explaining such symptoms as tingling, pins-and-needles, numbness, or deadness on the basis of a disturbance of the peripheral nervous system, the distribution, mode of onset, and duration of paraesthesiae should be carefully noted. If they are referred to the periphery of one limb confusion with a mononeuritis may readily occur; if, however, pins-and-needles or numbness is referred to the proximal half of a limb or to the trunk, then a root or cord lesion must be considered. I have already drawn attention to the symmetry sometimes shown by the paraesthesiae of multiple sclerosis and their striking resemblance to those occurring in some forms of polyneuritis (including the opening phase of subacute combined degeneration of the cord). Rapidity of onset and of spread characterize the paraesthesiae of multiple sclerosis. A spreading tingling going on to numbness and clumsiness of the affected part, with diminution or loss of two-point discrimination and vibration and postural senses, are well-recognized features of a plaque in the posterior column. A feeling of warmth or of coldness or dampness in a lower limb or inability to appreciate the warmth of a hot bath, coming on abruptly, should arouse suspicion of a plaque in the contralateral spinothalamic tract. The issue as between a peripheral and a central cause of paraesthesiae may be clarified first by the results of clinical examination and secondly by the clearing up of symptoms. Symmetrical or four-limb paraesthesiae when due to a peripheral neuritis tend to progress, while depression of the deep reflexes is followed by their disappearance.

Pain is not at all uncommon in the opening phase of multiple sclerosis. It is usually described as an ache referred to the back or the upper or lower limbs. Occasionally it may be sharp, though it is not aggravated by coughing or straining. A recent history of pain should not automatically exclude multiple sclerosis as a possible cause of an episode of paraesthesiae.

Motor Weakness

Here again it is the minor degree of disability, disguised as a "tiredness," a "heaviness," or a "stiffness" in one or both limbs, especially after walking, that is often misinterpreted. In some cases pyramidal signs are evident; in others a careful examination is required to bring out fatigability or depression of the abdominal reflexes, a slight inequality in knee- and ankle-jerks, and an equivocal plantar response. When the first plaque or plaques giving rise to symptoms are situated in the optic nerve or the dorsal half of the brain stem or posterior columns, pyramidal signs may be absent.

Sphincter Disturbance

Sphincter disturbance is uncommon as an early symptom unless there is evidence of a myelitis due to the disease. Occasionally, however, frequency and urgency of micturition

or, rarely, incontinence are presenting symptoms, and I have met with a few cases of this type in which pyramidal signs were indefinite or even absent. If the urologist's report is negative, then the possibility of multiple sclerosis should be considered and lumbar puncture performed.

Progressive Spinal Form of Multiple Sclerosis

In approximately 10% of all cases of multiple sclerosis the onset is insidious and the course progressive. This form is more common in the middle-aged than in the young. Differentiation from other causes of paraplegia in the middle-aged may be extremely difficult. Two conditions are apt to be confused with it: cervical spondylosis and spinal cord compression. Some progressive cases of multiple sclerosis have relapses superimposed on their progression, and this fact may be helpful in diagnosis. More important may be the detection of an extraspinal lesion, either from the history or from the clinical findings. Among the latter, nystagmus, other than purely horizontal, temporal pallor of a disk, dysarthria, or intention tremor in an upper limb should be looked for. A positive Lange colloidal gold curve in the C.S.F. may decide the issue. Lastly, radiological proof of a cervical spondylosis does not necessarily mean that associated cord signs are due to it; multiple sclerosis and cervical spondylosis may coexist. Myelography is necessary to establish this fact, as well as exclude the possibility of spinal-cord tumour.

Brain-stem Signs

An early case of multiple sclerosis may present signs which clearly indicate the presence of plaques in both brain stem and spinal cord. However, when signs are confined to the brain stem the diagnosis may not be clear. There are three ways in which multiple sclerosis of the brain stem may present.

(1) *As an Acute or Subacute Encephalitis.* An abrupt onset of drowsiness, paresis of one or more cranial nerves, especially the third or sixth, with the appearance of motor, sensory, and cerebellar signs in the limbs, may closely simulate a virus encephalitis, particularly that due to poliomyelitis virus, and it is understandable that such cases should sometimes be admitted to infectious-fever hospitals. The absence of fever and neck stiffness, a positive Lange colloidal gold curve in the spinal fluid, a tendency for fresh symptoms to develop in the second or third week of the illness, and the persistence of sensory disturbance are some of the features which would suggest acute multiple sclerosis. Euphoria is occasionally met with in both these types of acute encephalitis, but is relatively more common in multiple sclerosis.

(2) The second group of cases are characterized by focal signs, sometimes suggesting a unilateral lesion, for example, of the pons, but more usually a paresis of a single cranial nerve. *Double vision* occurs at the onset of multiple sclerosis in roughly 15% of cases, in half this percentage as an isolated symptom. The sixth nerve is more commonly affected than the third. Multiple sclerosis is a common cause of a transitory diplopia in a young adult, and here again lumbar puncture may be of the greatest value. *Numbness in the face* may occur either as part of a unilateral pontine picture or as an isolated symptom. If, after extraction of a tooth, numbness persists for a few days it should not be attributed to the effect of a procaine injection. *Bell's palsy* may on rare occasions be the first symptom. Although an absence of pain and of loss of taste with rapid recovery may be noted as unusual features, its possible relationship to multiple sclerosis is usually not considered until later, when the patient presents with undoubted signs of the disease.

(3) *Vertigo* in varying degrees of severity is a relatively common symptom during the course of multiple sclerosis and occasionally it may be the presenting symptom. Vomiting may accompany or precede giddiness. The resemblance to Ménière's syndrome may be close, particularly when a degree of deafness is present. As a rule, however, in multiple sclerosis hearing appears to be normal though audiometry

may show some degree of nerve deafness on one or both sides. Although "epidemic vertigo" and "vestibular neuronitis" are better-recognized causes of an acute vestibular upset with normal hearing, multiple sclerosis should not be forgotten as a possible cause, more especially when nystagmus persists after vertigo has disappeared or other signs are present. *Cerebellar signs* may be prominent at the onset, as shown by dysarthria and a reeling or drunken gait without vertigo; as a rule other evidence of the disease can be found.

Course of the Disease

Most textbook descriptions of multiple sclerosis imply that, although its course is extremely variable, sooner or later a severe degree of disability is inevitable. Although this statement is unfortunately true of the majority of cases, it fails to take into account the possibility of a high resistance to the disease. For example, in the Middlesex Hospital series of 586 cases, 13% of those followed for 15 years showed no disability (McAlpine and Compston, 1952). The preliminary results of a fresh follow-up on which I am at present engaged would appear to confirm the existence of a *benign form* of the disease, characterized in the main by a good recovery from the initial attack and a tendency for relapses to be mild and infrequent or cease altogether. It has long been recognized that after an attack of retrobulbar neuritis the disease may remain quiescent for many years; for this reason such cases are often excluded from a follow-up of this type, and accordingly I have adopted this practice unless on one or more occasions there have been other signs of the disease or changes in the cerebrospinal fluid. However, the emphasis on retrobulbar neuritis in relation to long latency of the disease has tended to obscure the fact that other isolated symptoms such as diplopia or an episode of paraesthesiae may be followed by an equally long latent interval.

Earlier I mentioned certain factors that might influence not only the onset but also the course of the disease. These in order of importance are (1) intercurrent infection, (2) fatigue, (3) emotional upset, and (4) trauma. From work on the effects of pregnancy (Müller, 1949; Tillman, 1950; McAlpine and Compston, 1952) it is clear that its role has in the past been exaggerated. The risk of relapse can be further minimized by discouraging pregnancy until the disease has been stabilized for at least two years, by an extra period of rest after confinement, and by the provision of adequate help in the house so as to reduce fatigue, consequent upon the care of a young baby.

Treatment

The lack of a realistic approach to the problem of multiple sclerosis is chiefly responsible for the negative attitude towards its treatment. The knowledge that no drug is available that can be relied upon to prevent relapses and thus modify the course of the disease is not a valid reason for neglecting general principles in treatment. In a case of rheumatoid arthritis or of chronic asthma the physician is not content to focus his attention on joint or chest but realizes that success or failure may depend on the extent to which he can improve his patient's physical and mental health.

Likewise in treating an early case of multiple sclerosis our attention should be fixed on the constitutional and environmental background of the patient rather than on the nervous system. If arrest of the disease may occasionally occur spontaneously, this fact should encourage us to do our utmost for the early case. Failing an effective remedy, I suggest that the greatest contribution that we can make towards early treatment is to adopt the same attitude of mind as that taken towards the tuberculous patient. If this were done I feel convinced that, in a worth-while proportion of cases, the disastrous results which we see all too often would be avoided or at least mitigated. Therefore every effort should be made to establish the diagnosis at the earliest possible moment.

Turning to general principles, there are two that should be in the forefront of our minds when confronted by an early case. (1) To ensure the maximum degree of recovery from the initial attack and early relapses. This is best attained by an adequate period of rest in bed during the active phase of the disease, followed by prolonged convalescence, varying from two to six months. (2) To adopt all measures which may reduce the risk of relapses. In practice this means careful attention to general health and mode of life. When the diagnosis of multiple sclerosis is suspected admission to hospital should be arranged, preferably under the care of a neurologist, for a fourfold purpose: (a) to confirm the diagnosis from clinical and cerebrospinal fluid findings; (b) to ensure proper rest in bed; (c) to afford an opportunity of correcting any abnormalities in the general health suggested by the history—in particular, possible foci of infection (for example, sinuses, tonsils, teeth, and urinary tract), and to discuss frankly the cause of any anxiety symptoms; and (d) to carry out any therapeutic measure that may increase resistance.

The variety of remedies at present advocated scarcely suggests that any will eventually prove to be of value. They include isoniazid, vasodilators, a low-fat diet (Swank, 1955), Evers's uncooked food diet, and lastly vaccines and serums. Of those preparations used in Great Britain liver and vitamin B₁₂ are the most popular; multiple sclerosis is not a deficiency disease, therefore their use does not extend beyond the possible effect on general health. Theoretically a claim could be made out for trace elements, in particular copper and cobalt, but in practice they have not so far proved effective. Judged by reports in the literature, the results from the use of corticotrophin and cortisone have been disappointing. If the allergic origin of the disease be used as a working hypothesis some method of stimulating the defence mechanism of the body would seem worth a further trial. In the meantime we must rely on an old-established remedy—namely, arsenic. I have used this for many years in the form of intravenous neoarsphenamine, four courses yearly, with Fowler's solution in between the courses. Although this treatment, if begun early in the disease and kept up for five years or more, does not necessarily prevent relapses, I believe that in some patients it may modify their frequency and severity and so delay or even prevent the stage of progression. In those patients whose resistance is low a downward course occurs despite this or any other form of treatment. An antihistamine drug is indicated when there is an associated allergic disorder or in those patients who can tolerate arsenic only in the form of Fowler's solution.

Many of those who advocate a particular line of treatment in multiple sclerosis are inclined to quote individual cases in which a cure seems to have been produced. They should bear in mind that in at least one patient in every ten resistance is high and there may be no disability after 15 years. In order to prove the efficacy of any method of treatment it would have to be shown that in a series of cases relapses were prevented, and that disability was negligible in more than 20% of a series of cases followed up for a similar period.

Under what circumstances should a patient with multiple sclerosis be informed of the diagnosis? Neurological opinion, in this country, would, on the whole, appear to be in favour of withholding this knowledge until the disease is well established. However, a positive attitude towards the management of the early case demands the intelligent co-operation of the patient, and therefore in responsible adults an explanation of the nature of their illness is essential. A comparison with the known allergic disorders is useful as it affords an opportunity of referring to relapses, to the circumstances which may lead up to them and which therefore must so far as is possible be avoided, and to the importance of complete rest should a relapse occur. A decision to recommend long-term treatment, for example with arsenic, is usually accepted by the patient if the advice is given with a degree of conviction. If tactfully conducted, this method of approach nearly always leads to a quick

adjustment and a readiness to co-operate to the full during the first crucial years of the disease. Above all, the impression must not be left on the patient's mind that he or she is suffering from a mysterious disease about which nothing is known and for which there is no treatment.

Summary

An air of defeatism tends to surround the subject of multiple sclerosis. The reasons for this attitude are examined in some detail.

Aetiology is discussed with especial reference to the allergic theory.

A diagnosis of multiple sclerosis is usually not made until the fourth or fifth year of the disease. The causes of this delay are discussed and early symptomatology is reviewed.

The traditional belief that multiple sclerosis inevitably leads to increasing disability and premature death requires modification in the light of recent studies. A brief reference is made to the concept of varying degrees of resistance and to a benign form of the disease.

A plea is made for a more positive attitude towards treatment. In an early case more attention should be paid to the constitutional and environmental background of the patient. Stress is laid on the importance of rest during active phases of the disease, followed by prolonged convalescence. In responsible adults an explanation of the nature of their illness is essential in order to obtain intelligent co-operation in treatment.

REFERENCES

- Abb, L., and Schaltenbrand, G. (1956). *Dtsch. Z. Nervenheilk.*, 174, 201.
 Adams, D. K., Sutherland, J. M., and Fletcher, W. B. (1950). *British Medical Journal*, 2, 431.
 Bogaert, L. van (1932). *Rev. neurol. (Paris)*, 2, 1.
 Bramwell, B. (1917). *Edinb. med. J.*, 18, 16.
 Colover, J. (1956). *Nature (Lond.)*, 177, 949.
 Dawson, J. W. (1916). *Trans. roy. Soc. Edinb.*, 50, 517.
 Ferraro, A. (1944). *Arch. Neurol. Psychiat. (Chicago)*, 52, 443.
 Glanzmann, E. (1927). *Schweiz. med. Wschr.*, 57, 145.
 Hoesslin, R. von (1934). *Über multiple Sklerose exogene Aetiologie. Pathogenese und Verlauf*. Lehmanns, Munich.
 Kabat, E. A., Wolf, A., and Bezzer, A. E. (1949). *J. exp. Med.*, 89, 395.
 Kolb, L. C., Langworthy, O. R., and Cakrova, M. (1942). *Amer. J. Hyg.*, 35, 1.
 Lumsden, C. E. (1949). *Brain*, 72, 198.
 — (1951). *British Medical Journal*, 1, 1035.
 — (1957). *Proc. Second Int. Congr. Neuropathol. London*. In press.
 — (1956). *Proc. roy. Soc. Med.*, 49, 148.
 McAlpine, D. (1946). *Brain*, 69, 233.
 — (1955). *Lancet*, 1, 1033.
 — and Compston, N. D. (1952). *Quart. J. Med.*, 21, 135.
 — and Lumsden, C. E. (1955). *Multiple Sclerosis*. Livingstone, Edinburgh.
 Millar, J. H. D., and Allison, R. S. (1954). *Ulster med. J. Suppl.*, 23, 29.
 Müller, R. (1949). *Acta med. scand.*, Suppl. 222.
 Pette, H. (1942). *Die akut entzündlichen Erkrankungen des Nervensystems*. Thieme, Leipzig.
 Pratt, R. T. C. (1951). *J. Neurol. Psychiat.*, 14, 326.
 — Compston, N. D., and McAlpine, D. (1951). *Brain*, 74, 191.
 Press, E. M. (1956). *Biochem. J.*, 63, 367.
 Shephard, R. H., and Wadia, N. H. (1956). *Brain*, 79, 282.
 Sutherland, J. (1956). *Ibid.*, 79, 635.
 Swank, R. L. (1955). *A.M.A. Arch. Neurol. Psychiat.*, 73, 631.
 Thums, K. (1951). *Wien. Z. Nervenheilk.*, 4, 173.
 Tillman, A. J. B. (1950). *Proc. Ass. Res. nerv. Dis.*, 28, 548.
 Waksman, B. H., and Adams, R. D. (1955). *J. exp. Med.*, 102, 213.
 Wolf, A. (1952). *Proc. First Int. Congr. Neuropath. Rome*, 1, 121.

A new British Standard (2805:1957) specifies a range of straight artery (haemostatic) forceps of the Spencer Wells pattern having a screw joint and made of stainless steel. Provision is made for the 5 in., 6 in., 7 in., 8 in., and 9 in. (12.7–22.8 cm.) sizes. The preparation of this Standard was recommended by the Ministry of Health and authorized by the Surgical Instruments and Medical Appliances Industry Standards Committee of the British Standards Institution. British Standard 2805 may be obtained through the Sales Branch of the British Standards Institution, 2, Park Street, London, W.1, price 3s. 6d.

POLYRADICULITIS (LANDRY-GUILLAIN-BARRÉ SYNDROME)

TREATMENT WITH CORTISONE AND CORTICOTROPHIN

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The clinical and pathological identity of Landry's ascending paralysis and the Guillain-Barré syndrome (polyradiculoneuritis; acute infectious, toxic, or febrile polyneuritis; or infectious neuronitis, polyneuritis cranialis, etc.) was fully established by the important review of Haymaker and Kernohan (1949). Since then the non-specific nature of the syndrome and its relation to other acute inflammatory diseases of the nervous system, and possibly to allergy, have been noted (Stanton *et al.*, 1953), while the results of treatment with corticotrophin and cortisone have been described by Clarke *et al.* (1954) and others.

In the past three years we have treated five deteriorating cases of this condition with corticotrophin or cortisone, and in this paper we present these cases, review the available literature on the subject, and endeavour to draw some general conclusions.

Case 1

On November 6, 1953, three weeks after a brief attack of acute febrile bronchitis, a 28-year-old docker developed an illness initially regarded as influenzal, characterized by fever, backache, and headache. Twenty-four hours later he developed tingling in the tip and dorsum of the tongue, and, after a similar interval, ascending paraesthesiae and weakness in both lower limbs. By November 9 he could progress round the room only by holding on to the furniture. Weakness of the legs increased further, and on November 13 he noticed paraesthesiae in both hands. His speech became slurred, and food stuck in his throat; there was slight dysuria and some constipation. At this stage he came under medical observation, and over the course of the next few days all deep reflexes disappeared, asymmetrically bilateral facial weakness developed, and loss of superficial sensibility became evident over the whole of both lower limbs, the forearms, and a band round the trunk between nipples and umbilicus. The legs were much weaker than the arms, and when he was admitted to our care on November 18 he was unable to stand. Weakness and muscle tenderness were generalized, but were most marked in the proximal limb muscles. Blood examination, E.S.R., E.C.G., and x-ray films of the chest and spine showed nothing abnormal. The only abnormality in the spinal fluid was a protein content of 240 mg. per 100 ml., rising subsequently to 480 mg.

In view of continuing deterioration, and especially pharyngeal pooling of mucus owing to bulbar weakness, oral administration of cortisone was begun at once. He was initially given 300 mg. daily, but this was reduced gradually to 100 mg. daily by the fifth day, and the smaller amount administered daily for a further five days.

Within 18 hours of first receiving cortisone (225 mg.) the patient claimed to feel much better and that his voice was stronger, but examination failed to substantiate his claim of improvement, which was attributed to pharmacologically induced euphoria. Within 36 hours of instituting treatment, however, the facial diplegia showed unequivocal improvement and he could whistle feebly. His voice appeared to be somewhat stronger, but his own claims of improvement in swallowing and improved power in the limbs were unsupported by objective evidence, which showed no change in power, reflexes, or sensation.

Reassessment at the end of 10 days' treatment suggested that the condition had ceased to progress. Facial weakness was greatly improved, the voice stronger, and swallowing normal. Sensory loss was less extensive on limbs and trunk, while pain and muscle tenderness had disappeared. Motor weakness in upper and lower limbs, however, was as severe as on admission, while there was no return of reflex activity.

Subsequent improvement was slow but steady, and five months later his sole disability was some weakness of the left leg. By August, 1954, there was no residual disability and all deep reflexes had recovered.

Comment.—In this severe case of polyradiculitis the administration of cortisone was followed by unequivocal clinical improvement within 36 hours, and at the end of 10 days' treatment this improvement was striking. From this point onwards, however, further improvement was slow, and it was eight months before recovery was complete.

Case 2

A 33-year-old housewife was admitted to hospital under the care of Dr. H. A. Dewar on November 16, 1955, with an eight-weeks history of tingling of the fingers and hands, followed by slight loss of grip. Five weeks before admission she had developed weakness of her ankles and legs and had been put to bed for one week, following which she got up again, but was able to get about the house only with the aid of sticks. The weakness increased and two days before admission she was unable to walk. Constipation had been troublesome throughout the illness.

On examination she appeared to be in good health. The cranial nerves were normal, but there was some loss of power in the forearms and marked loss of power in both legs, with severe bilateral foot-drop. All deep reflexes were absent, and muscle pains and tenderness were conspicuous. There was loss of superficial and deep sensibility in both feet. The spinal fluid contained 800 mg. of protein per 100 ml. Other ancillary investigations were negative.

During an initial period of two days' observation there was no improvement in her condition, and after this time cortisone was administered. She was given 200 mg. daily for three days, 100 mg. daily for 18 days, the drug being then gradually withdrawn over the course of a week. Within 48 hours subjective and objective improvement was evident: her grip was improved and toe movements had returned. Within eight days she could move the legs weakly, and improvement of power in the hands permitted knitting. There was improvement in sensibility in the legs, and the deep reflexes had returned weakly in the arms.

From this time progress was slower. Within three weeks, however, she was able to walk with assistance, and was discharged from hospital on December 31—six weeks after admission.

When the case was reviewed six months later, progress had been continuous but slow, and the patient was able to walk without the use of sticks. Her only complaint was that she put her feet down rather heavily when walking. All limbs showed absence of deep reflexes, but power was good apart from slight weakness of dorsiflexion of the feet; sensation was normal.

Comment.—This patient, an example of mild polyradiculitis, showed what appeared to be a satisfactory initial

response to treatment with cortisone, followed by slow improvement indistinguishable from that seen in untreated cases which recovered.

Case 3

A 40-year-old driver was well until a month before admission to hospital, when he noticed some tingling in his fingers and toes. A week later he developed stiffness and pain in the neck and shoulders, and four days after this sharp cramping pain occurred in the muscles of the left thigh. During the next two weeks muscle pains became severe and generalized; he developed a moderate fever, a right facial palsy of peripheral type, mistiness of vision, and slurred speech.

On his admission to hospital on December 30, 1955, examination revealed slurring dysarthria, neck stiffness, bilateral facial palsies more evident on the right, loss of power in the limbs which was more marked peripherally in the lower and proximally in the upper limbs, general hypotonia, and loss of reflexes with widespread muscle tenderness, especially marked in the calves. There was no sensory loss, but the soles were hyperaesthetic. The left plantar response was flexor, the right variably extensor. Ancillary investigations were normal, but spinal fluid examination yielded as the only abnormality a protein content of 290 mg. per 100 ml., a figure which was almost doubled on subsequent examination.

Clinical deterioration continued, and, as the patient developed slight difficulty in swallowing, 200 mg. of cortisone was administered at once, followed by 100 mg. thrice daily. Some improvement was evident within 18 hours of the first dose and was quite marked in 48 hours, by which time the facial palsies were much less conspicuous (the severe right-sided paralysis showing the more striking response), he was able to whistle a little, and speech was distinctly clearer. The dose of cortisone was gradually reduced to 200 mg. and then to 100 mg. daily, and its administration was stopped on the seventh day. At this time, in addition to the improvement already noted, there was increased power in the lower limbs; he was able to dorsiflex both feet, while both plantar responses had become clearly flexor.

Twenty-four hours after the last dose of cortisone the patient, a phlegmatic individual, complained of suddenly feeling very ill with intense pain in the limbs, particularly the legs. These symptoms cleared up within half an hour, but by this time a marked deterioration in physical signs was evident. His right facial weakness was again much more pronounced, vision in the left eye was blurred (without objective findings), his legs were weaker, and the plantar responses were unobtainable. By the next day this deterioration was more evident. His speech had once more become slurred, and he was having some difficulty in passing water.

In view of these developments he was given a further course of cortisone, beginning five days after the end of the previous treatment. On this occasion no dramatic response was obtained. He claimed to feel better, and there was certainly no further deterioration, but on re-examination after 10 days on cortisone his objective improvement was negligible.

From this time the slow but progressive improvement in function which occurred was similar to that with which we are familiar in a severe case of the untreated disease. It was four months before he was able to stand, and even in September, 1956, walking was still much impaired, while the deep reflexes had not yet reappeared.

Comment.—This patient showed unequivocal improvement within 24 hours of the administration of cortisone, but a relapse which occurred when the drug was withdrawn showed little response to a further course of treatment given within four days of the onset of deterioration. On this second occasion the drug relieved pain but produced no improvement in physical signs.

Case 4

A 5-year-old girl was admitted to the Sunderland Children's Hospital under the care of Dr. J. B. Heycock on February 7, 1956. Six weeks before admission she developed tonsillitis, and after this had subsided she remained unwell in herself for a week, during which time she was kept in bed. At the end of this period she developed spontaneous pains and painful cramps in the legs and was observed to limp. These symptoms became more pronounced during the fortnight preceding admission, and she was noticed to lie down a good deal with knees flexed in order to obtain relief.

On admission she was unwell and miserable, with flaccid weakness of all limbs, especially in the legs, and with total disappearance of deep reflexes. The muscles were tender, but no loss of sensation was demonstrable. The spinal fluid protein was 100 mg. per 100 ml., and all other ancillary investigations were negative.

Over a period of 48 hours' observation there was unequivocal deterioration with increasing weakness and at the end of this period (February 17) cortisone was started by mouth, 100 mg. daily being given in four doses for five days, and then 200 mg. daily for seven days, after which time the drug was gradually withdrawn over the course of four days.

The response was not dramatic. What had previously been a steadily deteriorating course ceased to progress, and pain disappeared within 24 hours and the child's general condition also appeared to be improved. There was, however, no convincing change in the neurological findings, except for the disappearance of the muscle tenderness, until seven days after the end of treatment, when the condition began to show unequivocal improvement with increase in power in the legs which was rapidly progressive. Within a month there was a marked degree of improvement in the power of all limb groups, though the deep reflexes remained absent.

She was discharged from hospital on April 4, and continued with exercises and physiotherapy for a further month, when she was again reviewed. Re-examination showed steady but slow improvement; there still being some weakness of the arms and legs, most pronounced in the quadriceps. The deep reflexes were still absent.

Comment.—Except for disappearance of pain and muscle tenderness, this child showed no evident improvement on cortisone, the administration of which coincided, however, with the arrest of progressive deterioration in her condition. Objective improvement in physical signs was not evident until after treatment was withdrawn, following which the course of the illness was characteristic.

Case 5

A 40-year-old stone-mason presented on August 24, 1956, with a story of four days' numbness and weakness spreading up the arms and legs. His weakness rapidly became so profound that the condition was at first thought to be hysterical, but he was seen by a physician, who discovered absence of reflexes, muscle tenderness, and peripheral sensory loss. The condition remained fairly static for three weeks and then quite rapidly became worse, with ascending intercostal parestheses, facial diplegia, and bulbar weakness with pooling of mucus in the pharynx. At this stage spinal puncture showed 800 mg. of protein per 100 ml. In view of increasing difficulty in breathing, the patient, who was now under the care of Professor G. A. Smart, was given intermittent assisted respiration and 40 units of corticotrophin twice daily. Improvement was dramatic. Within 24 hours he was able to whistle, there was a surprising improvement in the power of the left arm, and his cough was stronger. Six days later breathing was normal, both arms were stronger, there was some return of power in the legs, and sensory change was beginning to shrink. Within a month of beginning treatment the only disability was partial bilateral foot-drop, rapidly improving, though knee- and ankle-jerks remained

absent. As a safeguard against possible relapse, 5 mg. of prednisone was given three times daily for three weeks after the completion of 10 days' treatment with corticotrophin.

Comment.—An apparently dramatic response to corticotrophin in a severe and advancing case of polyradiculitis was followed by unusually rapid recovery.

Review of Literature

Since Stillman and Ganong (1952) first reported a case of Landry-Guillain-Barré syndrome treated with corticotrophin, there have been 34 papers in which the treatment of 68 cases has been described. Review of these shows that in 50 there has been some response and in 18 the response has been negligible. In one case the disease developed during cortisone therapy (Grant and Leopold, 1954), but in no other case was deterioration reported during treatment.

In evaluating the treatment of the Landry-Guillain-Barré syndrome with corticotrophin and cortisone, it would be desirable theoretically to have a sufficiently large series of cases under the care of one observer, so that variations in the amount, duration, and route of treatment could be standardized, allowance made for the wide variation in clinical picture, and a control series of non-treated cases arranged. Practically, however, this is impossible, and we would emphasize that we have been able to draw only a few general conclusions; the wide variations in the degree of detail of these reports have made it impossible to study the exact clinical pictures. In general, cases in which there has been a gratifying response have been reported in greater detail than those in which the response has been less dramatic, and it must be borne in mind also that there is always a tendency to report successfully treated cases while the unsuccessful ones remain in obscurity.

One further difficulty in analysing the literature of such a pleomorphic condition as Landry-Guillain-Barré syndrome is to know whether in fact the cases reported are examples of this condition. There is no easy solution to this problem, for it is difficult to draw up a list of criteria which have to be fulfilled before a particular case can be accepted as Landry-Guillain-Barré syndrome, and we have therefore included in our survey all cases so described.

In analysing the literature note has been made of the following points: sex, age, association with any other disease (such as infective hepatitis, periarteritis nodosa, etc.), severity of the disease, protein level of the spinal fluid, length of history prior to admission to hospital, duration of observation before treatment, dosage and mode of administration of the drug, and duration of treatment. These have been assessed to see if they have any bearing on the response to treatment. The severity of the disease has been arbitrarily defined as "severe" if there have been bulbar or cranial nerve involvement, phenomena such as sudden circulatory collapse sufficient to endanger life seriously, and extensive and profound limb involvement. "Moderate" is used to describe cases in which there has been no bulbar involvement but in which the limb paralysis has proceeded as far as a complete paralysis or tetraplegia. "Mild" means limb weakness only, without complete paralysis, even if widespread. It is felt that some such classification as this is useful in relating severity of disease to response to treatment.

As mentioned above, 18 cases failed to respond, but 12 were unsuitable for analysis as no details are given, and it is felt that the six cases in which details are available do not constitute a large enough group to make an analysis valid. It is not possible, therefore, to compare a group of cases which respond to treatment with a group which failed to respond. Consequently we have no means of predicting which cases are likely to respond.

The 50 cases showing response seem to fall naturally into three types: type 1, in which there is an immediate and sustained response to treatment, and in which recovery is complete within one month of starting treatment (21 cases);

type 2, in which there is a brisk initial response with early partial improvement, but in which final recovery does not occur so rapidly and the tempo of the initial improvement is not sustained (full and final recovery is usual—this type comprises 23 cases and also Cases 1 to 3 described above); and type 3 (6 cases), a miscellaneous group in which the type of response is not readily classified under the other two headings. Examples of types 1 and 2 are as follows:

Type 1.—A 17-year-old girl (Seltzer *et al.*, 1952) developed symptoms of Landry-Guillain-Barré syndrome 10 days before admission to hospital. During the next 10 days she continued to deteriorate and required tracheotomy. On the twentieth day of the illness—that is, 10 days after admission—treatment with 25 mg. of corticotrophin eight-hourly for five days was started, with effect within 24 hours. Improvement was maintained and she progressed so satisfactorily that the tracheotomy was closed nine days after the commencement of treatment, walking was possible seven days later, and 28 days after admission the patient was well enough to be discharged; a fortnight later she returned to school.

Type 2.—A boy aged 15 (Hay, 1955) was admitted to hospital with a five-weeks history of difficulty in walking, paraesthesia for a fortnight, and complete inability to walk for two days before admission. Examination showed generalized lower-limb weakness associated with loss of deep tendon reflexes. Steady deterioration, manifested by increasing weakness in both arms associated with loss of tendon reflexes, was noted during the initial period of nine days' observation, at the end of which time a course of cortisone was started. Subjective and objective improvement in both hands was noted within 24 hours. The patient was able to sit up on the fifth day, and by the 26th day was able to walk, although some weakness persisted until five months later, when full recovery of muscle power had taken place (at that time, loss of tendon reflexes in both legs was still evident).

The dramatic and possibly life-saving effect of corticotrophin or cortisone as typified in the type 1 case made us examine the cases further to decide if there were any indications of the type of case which would produce this response. However, there is no obvious difference between types 1 and 2 in sex, age, severity, spinal fluid protein, or in the dosage or route of administration of the drug employed. Cases in which treatment was started within one month of the onset show a slightly increased tendency to show a sudden and sustained response, though the difference is not statistically significant.

In fact, although the occasional dramatic response to cortisone is at least suggestive, statistical proof of its value is lacking. No control trial has been reported in the literature, and information on the natural history of the disease is curiously lacking in terms of concrete figures which can be used for comparison. Brain (1951) states that in the most favourable cases the patient may not be convalescent until from three to six months. Bradford *et al.* (1919) state: "In cases of a severe type it would seem that a period of about two months elapses between the onset of the palsy and a degree of recovery that renders evacuation feasible, and that a period as long as six months may be necessary for the patient to regain his usual health." Holmes (1917), in a series of 12 cases, noted "steady and rapid improvement which usually sets in within two or three weeks of onset. The pains and hyperaesthesia diminish quickly after the first fortnight or so, and somewhat later the power of the paretic muscles begins to return gradually." However, in none of his cases was recovery complete. Gilpin *et al.* (1936) state that the entire duration of the illness in 20 cases varied from 10 weeks to 2½ years, the average being about 6½ months. The fact that 21 cases out of 68 treated with cortisone recovered completely within one month does at least suggest that the rate of recovery is hastened as a result of the treatment.

Reported death rates vary considerably. Guillain *et al.* (1916), in their original paper, laid down complete recovery as one of the criteria for diagnosis, and Guillain (1936) much later affirmed that none of his patients died. Other authors (see Table) give a mortality rate varying from 8.7% to 42% in cases not treated with cortisone.

Of reported cases treated with cortisone or corticotrophin, only two patients have died. In one (Guiang and Leones-Guiang, 1954) the patient, a boy aged 2, was removed from hospital by his mother when he appeared to be responding to treatment. He relapsed and died at home. In the second

Mortality Rate of Landry-Guillain-Barré Syndrome

Author	No. of Cases	Deaths
Holmes (1917)	12	2 (16.6%)
Bradford <i>et al.</i> (1919)	30	8 (26.4%)
Gilpin <i>et al.</i> (1936)	20	4 (20%)
Roseman and Aring (1941)	16	3 (18.8%)
Forster <i>et al.</i> (1941)	26	11 (42%)
Von Hagen and Baker (1953)	23	2 (8.7%)

(Fazlullah, 1956) the patient died of acute pulmonary oedema associated with adrenal failure following a complex and bizarre illness with some features suggesting polyarteritis nodosa.

Discussion

The general features of the condition are familiar—a rapidly or insidiously ascending flaccid paralysis, sensory impairment often being inconspicuous or absent, with muscle tenderness, loss of deep reflexes, and, in classical though not in all cases, cytoalbuminological dissociation in the spinal fluid. A considerable number of these cases show meningism, while an occasional transient extensor plantar response bespeaks extension of the lesion into the spinal cord. Frank myelitic or encephalitic concomitants are rare, but such mixed forms undoubtedly occur.

Aetiology is multiple. The condition occurs as an occasional complication, much less frequent than encephalitis or myelitis, of many specific infections, among which measles, varicella, rubella, and mumps are conspicuous examples, while its occurrence in infectious mononucleosis and infective hepatitis has recently attracted attention. Significantly, its occurrence is not limited to such infections, and it is seen also as a complication of serum sickness and of many sterile prophylactic inoculations such as T.A.B. or rabies vaccine, diphtheria toxoid, etc. (Miller and Stanton, 1954). Most cases, however, arise "spontaneously," though in many such patients there is a recent history of banal infection.

According to Von Hagen and Baker (1953), Bergamasco and Bottigioni have claimed evidence of a neurotropic virus, but Aring and Sabin (1942) found that culture and transmission experiments were unsuccessful (quoted by Chusid and Marquardt, 1945).

Histopathological changes are maximal in the spinal nerve roots; Scheinker (1949) found that the axis cylinders in the nerve roots were enlarged owing to oedema, and that fragmentation and "corkscrew" formation were also present. Changes in the myelin sheaths—beading and irregular swelling—were also found in some cases. In the cord itself there was some swelling of the anterior horn cells and the axis cylinders, and the white matter showed marked swelling. Inflammatory reaction was conspicuous by its absence. These findings agree largely with those of Gilpin *et al.* (1936) and of Roseman and Aring (1941), and are similar to those described in polyradiculitis complicating frankly allergic disorders such as serum sickness.

An explanation of the clinical picture and the cytoalbuminological dissociation is put forward by Scheinker (1949) and by Reitman and Rothschild (1950), who suggest that the oedema of the nerve roots and trunks produces compression within the firm perineural sheaths. Hassin (1948) claims that about one-fifth of the spinal fluid is absorbed through the perineural spaces in the spinal canal, and Aring (1945) showed that in cases of Landry-Guillain-Barré syndrome the spinal fluid protein level in the lumbar theca was much higher than that in fluid obtained by

cisternal puncture. Boshes and Sherman (1953) point out also that if spinal fluid is allowed to drain off during a lumbar puncture the fluid collected in the first tube and therefore coming from low down in the spinal canal has a higher protein content than fluid collected in subsequent tubes coming from higher up. As Reitman and Rothschild (1950) point out, it is possible that the oedema of the nerve roots prevents the passage of the larger protein molecules, but allows selective absorption of the fluid, and this leads to the high protein level that Guillain regards as the *sine qua non* of the diagnosis of the Landry-Guillain-Barré syndrome.

It appears probable that oedema and nerve-root compression may give rise to the clinical features of the syndrome by an immediate loss of function of the nerve, which may be temporary and quickly reversible if the oedema subsides rapidly. If, however, pressure from the oedema persists or is unduly severe, permanent damage is produced with demyelination, recovery from which can take place only by regrowth of axons down the nerve. This view is in agreement with Seddon's (1948) concept of peripheral nerve injury.

Recovery from the Landry-Guillain-Barré syndrome therefore might be expected to take place in two stages: first, an immediate recovery resulting from the regression of the oedema, and, secondly, a more gradual recovery of some months' duration, while the axons are growing down the nerve. This "two-stage" recovery is precisely what appears to happen during treatment with corticotrophin or cortisone; the degree of recovery may be rapid and complete if the lesion is due to oedema only (this corresponds to type 1 cases noted in our analysis of the literature), or a partial recovery may be followed by a longer period of disability during regeneration of the demyelinated axon (type 2).

This perhaps rather speculative interpretation of the histological changes observed in the disease provides at any rate a plausible explanation for the two main types of response to cortisone which we have noted above.

Stanton *et al.* (1953) have pointed out that Landry-Guillain-Barré syndrome can be related closely to other acute "inflammatory" diseases of the C.S.N., and possibly to allergy, and since all these syndromes, whether mixed or pure, arise on a similarly non-specific aetiological basis it seems possible that to regard them as varying manifestations of an "allergic neuraxitis" may be something more than merely a facile oversimplification.

In this context a case seen by one of us (H.M.) is of interest:

A physician aged 49 was given 1,500 units of antitetanic serum into the left upper arm, and six days later developed signs and symptoms of serum sickness, with joint pains, high fever, and sweating. On the second day he developed a headache with neck stiffness and photophobia, and became mentally confused. Within six hours of the onset of the headache he was given cortisone and salicylates, a therapeutic response occurring within six hours. Next morning he was so much better that the cortisone was stopped after 50 mg. had been given. The same evening he developed severe pains and paraesthesiae in all limbs, and 48 hours later marked weakness of the right arm, loss of both ankle-jerks and of the left knee-jerk, and impaired vibration sense in the toes. A diagnosis of polyradiculitis complicating serum sickness was made but no lumbar puncture was done. He was given cortisone again as he appeared to be deteriorating, and again dramatic clinical improvement occurred within 12 hours, power recovering and paraesthesiae and pain completely disappearing. Within three days the deep reflexes had also recovered completely.

The Landry-Guillain-Barré syndrome appears, then, to belong to a spectrum of diseases of the nervous system which are secondary to a wide variety of aetiological agents but which have in common a probable basis of allergy. The effect of cortisone is unpredictable, inconstant, and difficult to analyse statistically, but, as in other allergic disorders, its use is justified on theoretical grounds as well as in practice.

Summary

Five cases are described of the Landry-Guillain-Barré syndrome treated with cortisone or corticotrophin.

The literature recording similar cases is reviewed.

The response to the drugs is unpredictable and inconstant, and the material available is not suitable for statistical analysis. However, in 21 out of 68 recorded cases complete recovery occurred within a month. This is unusual in untreated cases. Twenty-three other patients showed a rapid initial response followed by slower subsequent recovery. Arrest of deterioration is usual, and the mortality in this admittedly heterogeneous collection of treated cases was much lower than in previously recorded series.

The aetiology and pathology of the disease are discussed. It is considered that the clinical features, pathology, and response to treatment are compatible with an allergic pathogenesis.

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BIBLIOGRAPHY

- Airing, C. D. (1945). *Clinics*, 4, 263.
 — and Sabin, A. B. (1942). *Arch. Neurol. Psychiat. (Chicago)*, 47, 938.
 de Assis, J. L. (1953). *Arch. Neuro-psiquiat. (S. Paulo)*, 11, 133.
 — and Netto, A. S. F. (1953). *Ibid.*, 11, 414.
 Benassi, G. (1954). *G. Psichiat. Neuropat.*, 82, 1126.
 Blood, A., Locke, W., and Carabasi, R. (1953). *J. Amer. med. Ass.*, 152, 139.
 Bolt, W., Tietz, N., and Venrath, H. (1954). *Med. Klin.*, 49, 1252.
 Boshes, B., and Sherman, I. C. (1953). *Neurology (Minneapolis)*, 3, 789.
 Bradford, J. R., Bashford, E. F., and Wilson, J. A. (1919). *Quart. J. Med.*, 12, 88.
 Brain, W. R. (1951). *Diseases of the Nervous System*, p. 816. Oxford Univ. Press, London.
 Chusid, J. G., and Marquardt, G. H. (1945). *Ann. Intern. Med.*, 23, 852.
 Clarke, E., Bayliss, R. I. S., and Cooper, R. (1954). *British Medical Journal*, 2, 1504.
 Crozier, R. E., and Ainley, A. B. (1955). *New Engl. J. Med.*, 252, 83.
 Czachorowska-Wroblewska, M., and Lukaszewicz-Dancowa, D. (1954). *Pediat. pol.*, 29, 807.
 Drenick, E. J., and Avol, M. (1953). *Neurology (Minneapolis)*, 3, 915.
 Essellier, A. F., and Kopp, E. (1954). *Schweiz. med. Wschr.*, 84, 485.
 Fazlulahi, S. (1956). *Postgrad. med. J.*, 32, 150.
 Fernandez, J. J., jun. (1954). *Arch. Col. med. Salvador*, 7, 13.
 Fiese, M. J., Cheu, S., and Radding, J. (1953). *A.M.A. Arch. Intern. Med.*, 92, 438.
 Forster, F. M., Brown, M., and Merritt, H. H. (1941). *New Engl. J. Med.*, 225, 51.
 Foster, T. L., and Pokorny, C. (1954). *J. Kans. med. Soc.*, 55, 256.
 Gilpin, S. F., Moersca, F. P., and Kernohan, J. W. (1936). *Arch. Neurol. Psychiat. (Chicago)*, 35, 937.
 Gilsanz, V., Palacios, J. M., and Segovia, J. M. (1954). *Rev. clin. esp.*, 53, 44.
 Grant, H., and Leopold, H. N. (1954). *J. Amer. med. Ass.*, 155, 252.
 Guinard, R. V., and Leones-Guinard, M. A. (1954). *J. Philipp. med. Ass.*, 30, 282.
 Guichard, A., Delahaye, J. P., and Pellet, M. (1955). *Lyon méd.*, 193, 51.
 — (1936). *Arch. Neurol. Psychiat. (Chicago)*, 36, 975.
 — Barré, J. A., and Strohl, A. (1916). *Bull. Soc. méd. Paris*, 40, 1462.
 Hassing, G. B. (1948). *J. Neuropath.*, 7, 172.
 Hay, P. (1955). *Glasg. med. J.*, 36, 216.
 Haymaker, W., and Kernohan, J. W. (1949). *Medicine (Baltimore)*, 28, 59.
 Holmes, G. (1917). *British Medical Journal*, 2, 37.
 Liversedge, L. A., and Leather, H. M. (1953). *Lancet*, 2, 1241.
 Luzes, P. M. (1954). *Rev. neurol. (Paris)*, 90, 132.
 Merritt, H. H. (1952). *Yale J. Biol. Med.*, 24, 466.
 Miller, H. G., and Stanton, J. B. (1954). *Quart. J. Med.*, 23, 1.
 Newey, J. A., and Lubin, R. I. (1953). *J. Amer. med. Ass.*, 152, 137.
 Plough, I. C., and Ayerle, R. S. (1953). *New Engl. J. Med.*, 249, 61.
 Plum, F. (1953). *Neurology*, 3, 661.
 Polvan, N. (1955). *Istanbul Univ. Tıp Fak. Mec.*, 18, 183.
 Reitman, N., and Rothschild, K. (1950). *Ann. intern. Med.*, 32, 923.
 Roseman, E., and Airing, C. D. (1941). *Medicine (Baltimore)*, 20, 463.
 Scheinker, I. M. (1949). *J. Neuropath.*, 8, 184.
 Seddon, H. J. (1948). *Brit. J. Surg.*, War Surg. Suppl. No. 2, p. 325.
 Seltzer, H. S., Lichty, D. E., and Conn, J. W. (1952). *Univ. Mich. med. Bull.*, 18, 27.
 Senseman, L. A., and Greenstein, J. (1953). *R.I. med. J.*, 36, 718.
 Stanton, J. B., Miller, H. G., and Gibbons, J. L. (1953). *Rev. neurol. (Paris)*, 89, 46.
 Stillman, J. S., and Ganong, W. F. (1952). *New Engl. J. Med.*, 246, 293.
 Szefer, I. (1954). *Pediat. pol.*, 29, 805.
 Tolentino, P. (1952). *Minerva pediat. (Torino)*, 4, 1032.
 Tupper, C. J., and Foster, R. D. (1954). *U.S. Armed Forces med. J.*, 5, 532.
 Vernon, M. A. (1954). *Canad. med. Ass. J.*, 70, 75.
 Virgili, R., and Francesconi, G. (1955). *Riv. Neurol.*, 25, 337.
 Von Hagen, K. O., and Baker, R. N. (1933). *J. Amer. med. Ass.*, 151, 1465.
 Wilkins, C. F. (1953). *J. med. Ass. Ga.*, 42, 241.

PULMONARY FUNCTION BEFORE AND AFTER SEGMENTAL RESECTION AND AFTER "IDEAL" PNEUMOTHORAX TREATMENT*

BY

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Before the advent of antituberculous drug therapy, pulmonary tuberculosis remained a serious disease and the available methods of treatment were limited. In that era the success of treatment was justifiably chiefly assessed by such simple criteria as survival of the patient over a number of years (Foster-Carter, Myers, Goddard, Young, and Benjamin, 1952). With modern advances, which so greatly increase the effectiveness and types of treatment, the patient almost invariably survives and the merits of the various forms of treatment must be assessed on more exacting grounds. These will include freedom from relapse, persistently negative sputum, and return to full activity without any symptoms. In fulfilling this last criterion the pulmonary function of the patient is very important, and as the years of survival approach the normal span this importance will increase. Defects of function that cause little trouble in early life may well produce symptoms in later years, when irreversible changes have continued over a long period and been added to the normal degenerative effects. It is thus now desirable that in the assessment of any form of treatment for tuberculosis it should be considered not only from the point of view of its success against the disease process but also the success with which it preserves, or at least does not further interfere with, normal lung function.

Pneumothorax played a most important part in the preservation of life and health in the days before antituberculous drug therapy and resectional surgery. Recent studies (Scadding, Nicholson, and Hoyle, 1951; Foster-Carter *et al.*, 1952) leave no doubt about this aspect of the matter. However, the complication rate has been high, and, as Savage and Fleming (1955) have mentioned, complications may have ruined the health of the patient and caused marked loss of pulmonary function and chest-wall deformity. The use of antituberculous drug therapy in conjunction with pneumothorax (Birath, 1953; Scadding, 1955) will undoubtedly reduce the number of these tragedies, but the functional results of no such series have yet been reported, and with the loss of popularity of pneumothorax as a form of treatment it will be some time before enough cases can be collected.

Fleming and West (1954) have confirmed Pinner, Leiner, and Zavod's (1942) observation that even trouble-free pneumothoraces may cause gross reduction in function which can only certainly be known by measuring the differential lung function. Functional loss is apt to be much greater where there has been an effusion, even though it has appeared to clear very satisfactorily. Any such loss of function is an unfortunate accompaniment of successful treatment of the disease process, particularly if the original lesion might have been adequately treated by other methods.

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Resection has been increasingly used in the treatment of pulmonary tuberculosis, and in recent years has been extended particularly into the field of localized lesions which can be removed by resection of the one or two segments in which they lie. Many series reported (including Overholt, Woods, and Wilson, 1953; Thompson, Savage, and Rosser, 1954; Eerland and Seghers, 1955; Douglass, Bosworth, Judd, and Chang, 1955) demonstrate that in good hands the mortality and the morbidity rates are very low.

In the present study pulmonary function has been assessed before and after thoracotomy for segmental resection, and the results are compared with those obtained in cases of uncomplicated pneumothorax treatment. Few of the pneumothorax cases had the benefit of effective modern antibacterial treatment.

Pneumothorax

At Sully Hospital routine pneumothorax maintenance treatment is not carried out and cases available for study were therefore patients in whom the pneumothorax had either failed to control the disease satisfactorily or who had developed contralateral activation and had then been admitted for further treatment. A total of 62 cases of old pneumothorax have been studied from the point of view of pulmonary function, and from these were chosen all those which had had unilateral collapse for localized disease and which at no time in the course of treatment had developed any detectable fluid or other complication. It is thought that these ideal cases should closely resemble cases of pneumothorax which have the added benefit of anti-tuberculous drug therapy.

Sixteen such cases (about 25% of the total) fulfilled these criteria. In 10 of these (62%) there was localized contralateral disease, the presence of which would tend, because of the method of expressing differential lung function results by the percentage of total function, to minimize the apparent functional loss on the pneumothorax side.

In these 16 cases the extent of the parenchymal disease under the pneumothorax was of the same order as that in the segmental resection series, and the losses of function due to the disease process would be similar.

Segmental Resection

Cases were chosen in which, after full assessment, it was decided that segmental resection was indicated and that the removal of one or two segments or less would be sufficient. In most cases this procedure would remove all known disease. The 27 cases formed a consecutive series, and all cases had had prolonged antituberculous drug therapy and showed cavity closure and radiological stability, and were sputum-negative repeatedly. These patients had the purpose of the study explained to them. It was made clear that their co-operation would be entirely voluntary and that the investigations would be of no particular value to their individual case. It was also explained that the necessary information would be obtained only on repetition of the tests after operation. Following on previous studies (Fleming and West, 1954) showing that there were no adverse effects and that the investigation was no great ordeal to the patient, it was thought justifiable to use these methods for purely research purposes. The series of cases studied by bronchospirrometry with the Carlen's catheter at this hospital now stands at over 400, and the complete absence of complications reported in the first 125 of this series is fully substantiated.

Methods

The chest was examined with particular attention to movements and breath sounds, and diaphragmatic movement was studied fluoroscopically. Investigation of the maximum breathing capacity and differential function was carried out by previously described methods (Fleming and West, 1954).

Segmental resection was in all cases performed at Sully Hospital in the latter part of 1954 and early 1955, using the methods described by Thompson *et al.* (1954). The investigations were repeated as late as possible after operation. This was often little more than six weeks, as at that stage most of the patients were transferred to widely scattered institutions for graded convalescence. The average time after operation was 8.7 weeks (range 6 to 20 weeks) and the grade of activity of the patients was much the same as before operation.

The number of segments removed in each case averaged 1.3, with a range of 0.5 to 3 (only one case had an upper lobectomy, because of a caseous node adherent to the upper lobe bronchus). The segments were all in the upper lobe or the apex of the lower lobe, with one exception when a lateral basal segment was removed.

Results in "Ideal" Pneumothorax Cases

The group consisted of 16 patients (5 women, 11 men) with an average age of 30 years and a range of 21 to 49 years. The average value of the maximum breathing capacity was 106.6 litres a minute (range 55 to 150).

The average duration of the pneumothorax was 3.09 years (range 1 to 4.5 years) and the average time that had elapsed since the lung expanded was 3.2 years (range, 2 months to 13 years). Five pneumothoraces were on the right side and 11 on the left.

From bronchspirometric studies the departure of the function on the pneumothorax side from the average normal values (right side = 55%; left side = 45%) (Baldwin, Courmand, and Richards, 1948) was as shown in Table I.

TABLE I.—Departure of Function on Pneumothorax Side From Average Normal Value. Standard Deviations are Given in Parentheses

Oxygen uptake	..	-10.86% (6.2); range -20 to -1
Minute-ventilation	..	-7.46% (5.9); .. -23 .. +5
Vital capacity	..	-8.3% (5.45); .. -16 .. -4

It should be remembered that over 60% of these cases had contralateral disease, which would cause a small loss of function in the "more normal" lung and tend to diminish the apparent loss on the pneumothorax side when the results are expressed in this way.

Results in Segmental Cases

The average age of the 27 patients in this group was 27 years (range, 15 to 54 years), and there were 9 women and 18 men. The age and sex distributions are thus very similar to those in the pneumothorax group. In 17 the disease was on the right side and in 10 on the left.

Bronchspirometric studies before operation showed the functional loss as compared with the normal (R.L. = 55%; L.L. = 45%) as shown in Table II. This loss is entirely due to the disease process. The average number of segments found to be diseased at operation was 1.3 (range 0.5 to 3). From a consideration of the detailed operation reports and the pathological findings on the resected material Table III is composed. In 26 cases (96%) caseous material

TABLE II.—Departure of Function on Side With Segmental Disease from Average Normal Value. Standard Deviations are Given in Parentheses

Oxygen uptake	..	-4.98% (4.9); range -16 to +5
Minute-ventilation	..	-3.42% (5.7); .. -13 .. +6
Vital capacity	..	-2.8% (4.73); .. -10 .. +5

TABLE III.—State of Expansion of Diseased Segments

Predominantly well aerated	..	17 (63%)
" collapsed and fibrosed	..	10 (37%)

was found in the resected segment, but it is evident that in most cases this segment was by no means entirely destroyed and functionless. This is fully confirmed by the bronchographic appearances, which in the 17 cases with an aerated segment showed either no abnormality or minor changes in the subsegmental bronchi, while in the 10 cases of collapsed segment there was invariably bronchiectasis of the segmental bronchus. There was a close relationship

between the appearances in the bronchogram and the state of aeration of the segment.

In these cases, taken as a group, there is thus only a small amount of destruction of lung tissue, and in only 37% of them was the involved segment largely destroyed.

Other changes that might adversely affect function were also looked for, but none were found. Localized adhesions over the lesion, present in 48%, had no apparent effect on function.

Findings After Segmental Resection

Chest movement and breath sounds were in all cases normal before operation. After operation, at the time of the repeated function studies, the findings were normal in 89%. In all cases with less than normal chest movement (11%) there was considerable improvement in the ensuing months.

Diaphragmatic Movement.—Before operation this was normal in all except two cases in which the phrenic nerve had been crushed two years previously. The early results after operation are shown in Table IV. In the following

TABLE IV.—Diaphragmatic Movement in Early Post-operative Period

Normal full range	..	11 (41%)
50-80% of normal	..	10 (37%)
25% of normal	..	3 (11%)
Fixed but no paradox (2 previous phrenic crushes)	..	3 (11%)

months all cases with 50% or more of normal function improved until the diaphragm movement appeared entirely normal, though in a few cases this took nearly a year to be achieved. In the cases with less than 50% of normal movement the range of excursion increased steadily, usually to the region of 60%, though the cases with previous phrenic interruption showed no such change. There was no obvious relationship between this impairment of diaphragmatic function and the immediate post-operative course or the functional results, though under conditions of stress it is likely that there must have been considerable effect on function.

Maximum breathing capacity had fallen by an average of 4.8% (S.D. = 11.4; range -47 to +24) of the pre-operative value. This is surprisingly good considering that the patients had not only lost some functioning lung tissue but were only two months removed from a thoracotomy and still on a very modest grade of activity. The average maximum breathing capacity was 120 litres a minute in 27 cases. This is somewhat higher than in the pneumothorax group.

Bronchspirometric Studies

In 27 cases the loss from the normal value (R.L. = 55%; L.L. = 45%) on the affected side is as shown in Table V, which does not take into account the change from the actually observed pre-operative figure which is discussed below. The losses presented here arise from the disease plus the operation. Table VI shows the loss of function

TABLE V.—Average Departure of Function on the Operated Side from the Normal Figure in 27 Cases. Average Number of Segments Removed = 1.3 Per Case. Standard Deviations are Given in Parentheses

Oxygen uptake	..	-8.1% (4.7); range -18 to +5
Minute-ventilation	..	-5.6% (5.75); .. -20 .. +5
Vital capacity	..	-8.75% (5.5); .. -19 .. +7

TABLE VI.—Reduction of Function of Operated Lung Following Resection. Standard Deviations are Given in Parentheses

Oxygen uptake	..	-3.2% (3.66); range -9 to +3
Minute-ventilation	..	-2.2% (6.4); .. -11 .. +6
Vital capacity	..	-5.2% (4.7); .. -12 .. +5

on the operated side following resection. The figure is obtained by working out the percentage of the total function contributed by that lung in each case and subtracting the post-operative from the pre-operative result. These losses represent those due to the operation alone.

Loss of Function

The methods already used in presenting the results in this paper are those usually employed in the expression of

results and changes of function measured by bronchspirometry. However, such methods refer only to the fraction of the total function being performed by the lung under consideration and give no accurate picture of the amount of function lost by that individual lung due to any procedure to which it has been subjected. In the present study the figures already recorded are a useful index for comparison with the pneumothorax series and with other series in the literature where other methods of treatment have been used. We are now chiefly interested in the actual loss of function in the operated lung due to the segmental resection and compared with the measured pre-operative function.

In working out the percentage function of, for instance, the left lung in the ordinary way, the following simple fraction is used:

$$\% \text{ function contributed by the left lung} = \frac{L}{L+R} \times 100,$$

where L is the function of the left lung in absolute values and R is the function of the right lung in absolute values.

On repeating such function studies the state of the patient is rarely the same as in the first examination, and even in the normal and unchanging lung the recorded absolute measurements of function have changed. It is for this very reason that the results of such tests are usually expressed as a percentage of the total function.

In the cases in this series post-operative control was good, and there was no reason to suspect that any change in the function of the healthy lung had occurred between the pre-operative and the post-operative studies. Presuming this to be so, it is possible by simple proportion to obtain a "corrected" value for the absolute figure of the function recorded on the operated side. This is then directly comparable with the absolute figure obtained before operation, as they are both with reference to the same figure—that is, the initial absolute figure for the unoperated side.

In the case of the left lung

$$\text{"Corrected" } L_2 = \frac{L_2}{R_2} \times R_1,$$

where R₁ is the pre-operative absolute value for the right lung, R₂ is the post-operative absolute value for the right lung, and L₂ is the post-operative absolute value for the left lung.

This calculation is carried out separately for the oxygen uptake, the minute-ventilation, and the vital capacity.

The percentage loss of function of the left lung is then

$$\frac{L_1 - \text{"Corrected" } L_2}{L_1} \times 100,$$

the result giving an easily recognizable estimate of the amount of function that the individual lung has lost from the procedure.

I am not aware of results being previously reported in this way, but it has obvious advantages, and, further, allows the loss per segment removed to be calculated.

Table VII shows the loss of function per segment removed. This is expressed as a percentage of the pre-operative function of the operated lung (100%). For the compilation of Table VII the total percentage loss of function in the lung is divided by the number of segments removed. For these purposes anything less than a segment was counted as 0.5, the apical lower as 1.5, and the left apico-posterior as one segment. In the intact lung this gives 10.5 segments on the right and 9.5 on the left, so that each segment is contributing

approximately 10% of the function of one lung. The results given in Table VII are thus very satisfactory, as the loss of oxygen uptake is much less than that figure and the ventilation only slightly more. The loss of vital capacity is somewhat greater, but this may be largely accounted for by the early stage in the post-operative period at which the tests were done, and the already-mentioned improvement in diaphragmatic movement in many cases in the ensuing months would suggest that the vital capacity would improve with time.

TABLE VII.—Percentage Loss of Lung Function Per Segment Removed. Standard Deviations are Given in Parentheses

Oxygen uptake	..	-7.13% (17.3); range -26 to +14
Minute-ventilation	..	-10.8% (27.2); .. -40 .. +10
Vital capacity	..	-17.5% (20.0); .. -35 .. +22

It should be remembered that the actual disease in the segment had caused a small loss of function from the average normal figure, and this would tend to reduce the loss demonstrated after removal of that portion of the lung.

The higher standard deviations in Table VII are largely due to the fact that the length of the scale in use has been doubled as compared with previous tables (previous tables 0-50%, this table 0-100%).

This method of presenting the results throws markedly into prominence losses that are not at all conspicuous in the standard method of presentation.

An average good result is illustrated by the following case.

A woman aged 26 had cavitated disease in the apical segment of the right lower lobe. Bronchography showed bronchiectasis of the segmental bronchus, and at thoracotomy the segment was found to be collapsed and fibrosed, with a caseous lesion. Fig. 1 shows the traces taken at bronchspirometry and the results obtained.

These figures show a moderate pre-operative decrease in function (6-9%) due to the destruction of the segment. This is followed by an increase in the maximum breathing capacity and a very small further loss of function (1-2%) when expressed in the usual way. For this single and functionless segment (counting as 1.5) the percentages of loss of the functions of the right lung were 4.3, 4.0, and 2.7 respectively.

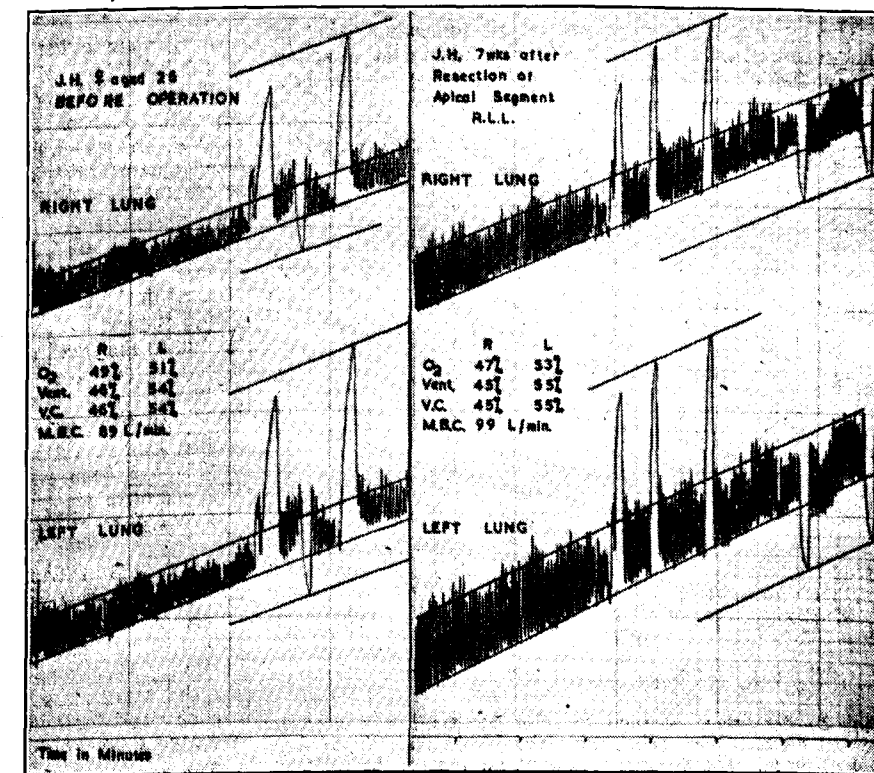


FIG. 1.—Example of average good functional result after segmental resection. Bronchspirometry traces and results before and after segmental resection.

Discussion

The pneumothorax cases are not the most satisfactory series as a basis for comparison, but this is a difficulty commonly met with. As Gaensler, Watson, and Patton (1953) point out, the really successful cases of re-expanded pneumothorax are not hospitalized and are unlikely to be accessible for study, while most of the cases still connected with hospitals are in some way complicated. It should be clearly realized that the cases in this group are ideal pneumothoraces and by no means represent the average result in the past. They are intended to give only an indication of the loss of function that may be expected from a pneumothorax induced at the present time with the advantages of antituberculous drug therapy, and they do not give any indication of the state of affairs to date. Gaensler *et al.* (1953) found that in 62 patients who had at one time had a therapeutic pneumothorax the re-expanded lung contributed on the average only 30% of the total oxygen uptake. They also found, as encountered in the 62 cases in this study, that many of these cases were complicated in various ways and the average was produced from a great variety of results. The 16 cases were selected to avoid this difficulty as much as possible. The comparison of them with the resection cases is admittedly open to criticism, but it is suggested they do provide some yardstick on which to judge the functional results following surgery.

TABLE VIII.—Percentage Loss of Function Below Normal Values. Mean Values. Standard Deviations are Given in Parentheses

	M.B.C. (l./min.)	Oxygen Uptake	Ventilation	Vital Capacity
Ideal pneumothorax (16 cases)	106.6	-10.86 (6.2)	-7.46 (5.9)	-8.3 (5.45)
Segmental lesion (27 cases)	—	-4.98 (4.9)	-3.42 (5.7)	-2.8 (4.73)
Segmental resection (27 cases)	120	-8.1 (4.7)	-5.6 (5.75)	-8.75 (5.5)

Table VIII gathers together the results shown in Tables I, II, and V for ease of comparison. These results are diagrammatically presented in Fig. 2, where the average normal value is taken as 50%. The numbers on top of the columns state the loss from this value.

The maximum breathing capacity is somewhat lower in the pneumothorax group than in the segmental resection group, though these groups are well matched with respect

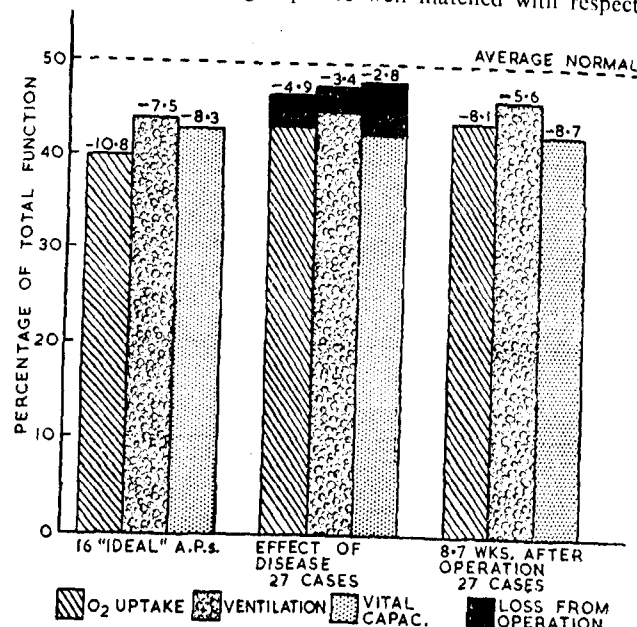


FIG. 2.—Percentage of total function compared with average normal figures. The second and third blocks refer to the segmental series. The distance separating the tops of the columns from the average normal line represents the reduction in function. The loss following operation is very small.

to age and sex. In the pneumothorax group the slightly greater loss of oxygen uptake than ventilation and vital capacity suggests that pleural factors are of importance even in this group without definite pleural complications. It can be seen that the deviation of the function from the average normal value is slightly less in the cases subjected to segmental resection than in the pneumothorax cases. Thus, from the point of view of function segmental resection is rather preferable to the best that has been offered with pneumothorax treatment. This is emphasized when it is remembered that the loss of function due to contralateral disease is concealing some of the loss due to the pneumothorax. It is not intended to discuss at any length the more general aspects of the merits of these treatments, but it is relevant to mention that in 96% of the cases in this series of resections actual caseous disease was still present after many months of antituberculous drug therapy. Such caseation must remain a constant menace to the health of the patient and is surely better removed if this can be done with safety.

Really prolonged drug treatment appears to reduce the number of such cases in which tubercle bacilli can be cultured from the residual caseous lesions, and if these findings are further substantiated the attitude to resection will obviously need modification.

In assessing cases before surgery, when radiological stability has been achieved after some months of antituberculous drug therapy, it has been possible, using all previous radiographs, two-plane tomography, and bronchography, to come to an accurate estimate of the extent of the disease. In the present cases the assessment made at thoracotomy was identical with that made before operation. This experience is, with very few exceptions, borne out by large numbers of patients at Sully Hospital and is contrary to the findings of Logan (1955), who reported that the correlation was good in only slightly more than 50% and fair or poor in the rest. In our cases bronchography procedure, and in many hundreds of cases there have been none of the unfortunate experiences of the type recorded by Perry (1955) with oily media. In this series the cases present have invariably had a contracted and fibrosed segment with little or no function. In those cases where the bronchi were either normal or the changes were limited to the subsegmental level, the segment was predominantly well aerated, of approximately normal volume, and there was little loss of function. Our experience is thus, in general, in agreement with that of Shaw, Collins, and MacNamara (1954) on the value of bronchography in the segmental localization of tuberculous disease.

In the series as a whole, before operation (Table II and Fig. 2) there were small losses of function due to the disease. In these the oxygen uptake was slightly more affected than the ventilation and vital capacity, a fact which would suggest a slight pleural factor but is more likely to be due to the small amount of bronchiectasis. This is confirmed by the observation that in the individual cases with segmental collapse there was a tendency for the oxygen uptake to be more affected than usual.

The studies following segmental resection could with profit have been postponed to a later date, but for the administrative reasons mentioned this was not possible. At the stage of eight weeks after thoracotomy it is unlikely that the chest wall has returned to its maximum mobility, and the observations made on the movements of the diaphragm show that at this stage it is impaired to some degree in nearly 60% of cases, but that in all it improves over a period of months and in 78% it returns to the normal excursion. This impairment of function probably accounts for the small drop (-4.8%) in the maximum breathing capacity and for much of the loss of vital capacity on the operated side.

The results of the differential function studies following resection recorded in Tables V and VI and Fig. 2 show a small loss of function which is similar to that recorded for

small numbers of segments by Taylor, Petter, and Whittenberger (1955), using the same methods of presentation.

These losses are somewhat less than those described by Gaensler *et al.* (1953) after resection of one or two segments. They also fail to show any striking excess of loss of oxygen uptake over ventilation, a finding which the work of Gaensler *et al.* (1953) prompted them to suggest that much of the loss of function following segmental resection was due not so much to decrease of functioning lung tissue as to post-operative haemothorax, parietal pleural fixation, and eventual fibrothorax. The figures presented here do not support this contention, and suggest that the great part of the loss of function is due to removal of lung tissue. It is felt that the careful technique (Thompson *et al.*, 1954) aimed at the early and complete re-expansion of the lung and the avoidance of the accumulation of any fluid in the chest is of the greatest importance in achieving this result.

It is apparent that the usual method of presenting the function of one lung as a percentage of the total function, while being useful in isolated studies, has in follow-up studies the disadvantage of obscuring changes that have taken place in the only lung which has been subjected to procedures likely to change the function. It is surprising that the method described here has not been used in previous reports on function following surgery. While the mathematics involved in bronchspirometry results are of the simplest, they are not always so regarded by those not familiar with them, and one is therefore reluctant to introduce a different method of presentation. However, the calculation of the change in function of the actual lung under consideration is not only a more useful but also a simpler and more easily understood concept. This enables (Table VII) the actual percentage loss of the lung per segment removed to be calculated. The results so obtained have been shown to be of a very reasonable order, particularly as in 63% of the cases the lung tissue was predominantly aerated and functioning.

The losses from segmental resection are similar to those reported for extrapleural pneumothorax (Gaensler and Strieder, 1950) and for five-rib thoracoplasty (Lindahl, 1954).

In this study the rather wide scatter of the results as indicated by the high standard deviation and range is a matter of some concern. Other reports do not include estimations of the standard deviation, but Taylor *et al.* (1955) give their range of values, and these appear to be much the same as those observed in the present study. Such scatter would appear to be inevitable in this type of biometric work.

Summary

From 62 cases of old pneumothorax studied, 16 (about 25%) were chosen as being "ideal" and the functional results analysed; 10 of these also had contralateral disease.

Twenty-seven cases with localized tuberculosis were studied before and after segmental resection. Physical signs, fluoroscopy, maximum breathing capacity, and differential lung function were investigated in the early post-operative period (8.7 weeks average).

In the "ideal" pneumothorax series the average loss of function was a little greater than that due to segmental resection.

In the segmental series the loss of function due to the disease was small, and in 63% of cases the segment was predominantly well aerated. The bronchographic appearances were closely related to these findings.

After operation there was often limitation of the movement of the diaphragm, but this almost invariably improved in later months.

The loss of function after resection was small. A method of expressing this as a percentage of the initial function of the operated lung is described and the per-

centage loss per segment is calculated. This demonstrates that the loss is of the order to be expected from the removal of the lung tissue alone.

The extent of the disease can almost invariably be accurately assessed by study of all previous radiographs, two-plane tomography, and bronchography.

Thanks are due to the patients whose willing co-operation has made this study possible and to the consultant staff of Sully Hospital for permission to investigate patients under their care. I thank Dr. L. R. West, who constructed the excellent equipment used and whose practical assistance has been invaluable.

REFERENCES

- Baldwin, E. de F., Cournaud, A., and Richards, D. W. (1948). *Medicine (Baltimore)*, 27, 243.
 Birath, D. C. (1953). *Dis. Chest*, 24, 245.
 Douglass, R., Bosworth, E. B., Judd, J. M., and Chang, K. H. (1955). *J. thorac. Surg.*, 29, 136.
 Eerland, L. D., and Seghers, K. K. M. F. (1955). *Dis. Chest*, 27, 165.
 Fleming, H. A., and West, L. R. (1954). *Thorax*, 9, 273.
 Foster-Carter, A. F., Myers, M., Goddard, D. L. H., Young, F. H., and Benjamin, B. (1952). *Brompton Hosp. Rep.*, 21, 1.
 Gaensler, E. A., and Strieder, J. W. (1950). *J. thorac. Surg.*, 20, 774.
 ———, Watson, T. R., and Patton, W. E. (1953). *J. Lab. clin. Med.*, 41, 436.
 Lindahl, T. (1954). *Thorax*, 9, 285.
 Logan, P. L. (1955). *Amer. Rev. Tuberc.*, 71, 830.
 Overholt, R. H., Woods, F. M., and Wilson, N. J. (1953). *Dis. Chest*, 23, 255.
 Perry, K. M. A. (1955). *Brit. J. Tuberc.*, 49, 284.
 Pinner, M., Leiner, G., and Zavod, W. A. (1942). *J. thorac. Surg.*, 11, 241.
 Savage, T., and Fleming, H. A. (1955). *Thorax*, 10, 293.
 Scadding, F., Nicholson, H., and Hoyle, C. (1951). *Quart. J. Med.*, 20, 313.
 Scadding, J. G. (1955). *Lancet*, 2, 49, 99, 154.
 Shaw, K. M., Collins, D. M., and MacNamara, J. (1954). *Amer. Rev. Tuberc.*, 70, 274.
 Taylor, W. J., Petter, J. B., and Whittenberger, J. L. (1955). *Ibid.*, 72, 453.
 Thompson, H. T., Savage, T., and Rosser, T. H. L. (1954). *Thorax*, 9, 1.

TOTAL COLECTOMY AND ILEO-RECTAL ANASTOMOSIS IN DIFFUSE ULCERATIVE COLITIS

BY

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In view of the increasing incidence of surgery in the treatment of ulcerative colitis it seems an appropriate time to record the results achieved by total excision of the colon and restoration of continuity by ileo-rectal anastomosis. The results reported in this paper are those of a consecutive series of 47 cases of the diffuse disease involving the colon and the rectum treated by this method since 1951. Before operation every patient had been under experienced medical treatment, and surgery was undertaken only because this had failed to arrest the progress of the disease. On some desperately ill patients operation was performed as an emergency life-saving measure.

The concept of the preservation of the rectum in all except the very rare case, so that a normal route of evacuation may be established, has been referred to previously (Aylett, 1954, 1955). It can only be justified if it can be shown that: (a) the procedure can be carried out with low mortality and low post-operative morbidity; (b) the large majority of the patients return to full health and full economic ability and that the number of bowel actions, increased as a result of the excision of the colon, interferes little if at all with their lives; (c) the inflammatory changes in the rectum resolve in most cases; and (d) should the disease persist or recur in the remaining rectum to an extent sufficient to endanger health an ileostomy can be established and the rectum removed without risk.

It is proposed that each of these questions shall be answered by reference to the series under review, because if they can be replied to satisfactorily the suggested method of treatment must surely be regarded as preferable to the routine total ablation of the whole of the large intestine and the formation of a permanent ileostomy without any attempt to restore the continuity of the intestinal tract. However great the improvement in modern ileostomy-bag design, such a stoma is a very real handicap to inflict upon a patient often entering the threshold of his or her full adult life, and, moreover, it is one that is not infrequently the source of both major and minor surgical complications.

Can Total Colectomy and Ileo-rectal Anastomosis be Carried Out with Low Mortality and Morbidity?

On setting out upon this procedure it seemed that a direct anastomosis of ileum to rectum after removal of the colon would be fraught with the danger of failure of union

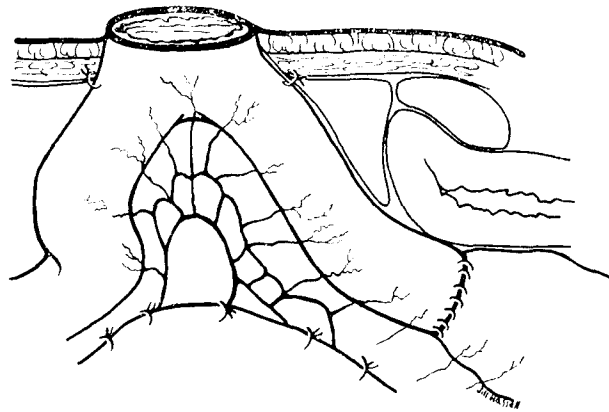


FIG. 1.—Line drawing showing the "safety-valve" temporary ileostomy made in continuity a few inches from the end-to-end anastomosis of ileum and rectum.

or at least of leakage, with consequent pelvic cellulitis and fistula formation. The end of the rectum is friable, inflamed, and oedematous, so that if the anastomosis was to be subjected to any increased intraluminal pressure, such as might readily occur in the immediate post-operative period as a result of the development of a minor degree of ileus, the possibility of disruption of an uncertain suture line appeared to constitute a very real risk.



FIG. 2.—Photograph showing the position of the temporary ileostomy with a disposable ileostomy bag in position.

It was thought that this risk would be eliminated if a side-to-side anastomosis of ileum to rectum was carried out and if, after mobilization of the rectum by division of the upper thirds of its lateral ligaments and of its posterior attachments, its upper end was to be exteriorized on the anterior abdominal wall, preferably through the lower-most part of the

paramedian incision. A "safety-valve" would thus be formed through which gaseous and intestinal content would discharge if the intraluminal pressure became raised. Thereby the anastomotic line would be protected from the effects of any distension.

This method was therefore adopted, and in no case in which it was employed did any leakage occur from the line of anastomosis. The only case of leakage in the series was in a patient with lesser inflammatory changes in the rectum in whom, misguidedly, anastomosis without this safety-valve was considered safe. In spite of drainage down to the anastomotic site the patient developed a pelvic abscess and a faecal fistula. Although final recovery resulted, the fistula required full exploration and weeks of drainage to effect its ultimate closure.

More recently we have carried out an end-to-end anastomosis of the ileum to the rectum decompressing the line of suture by means of a temporary ileostomy made in continuity and established through a separate stab incision in the left iliac fossa (Figs. 1 and 2). It is, of course, essential in such cases to obliterate the gap existing between the ileostomy and the lateral abdominal wall to prevent the possibility of post-operative obstruction resulting from the insinuation of coils of small intestine into this hiatus. This method was adopted because the closure of the proctostomy had at times proved difficult, and in some cases several operations were required to effect a final closure. The temporary ileostomy, sited as it is some distance away from the anastomosis, is readily closed, and it seems that as this method protects the anastomotic line equally well it will be the operation of choice.

The second way of achieving operative safety is, in the severely or desperately ill case, to carry out the procedure in two stages. We believe that in such cases the essential requirement is the excision of the colon, and we consider that the formation of an ileostomy alone has no place in the emergency surgery of ulcerative colitis. Haemorrhage and grave toxæmia can continue, and disruption of the

colon proceed, in spite of the presence of a defunctioning ileostomy. The excision of the colon, therefore, must be undertaken, but owing to the grave condition of these patients further operative time must not be expended in attempting an immediate restoration of continuity. Thus, as a routine in these cases, following the colectomy, the upper end of the rectum is exteriorized through the lower end of the paramedian incision and the terminal ileum through the same wound at a slightly higher level (Fig. 3). The union of the two exteriorized ends, which does not involve the opening of the general peritoneal cavity, is undertaken when the patient has recovered from the effects of his or her colitis.

With these techniques and with the closest attention to post-operative care the mortality has been well under 5%. 2 of the 47 patients having died. In one the cause of death was obstruction following secondary suture of a burst abdomen. The second patient died from anuria. He was admitted with acute ulcerative colitis and an associated complete prostatic obstruction and uræmia. Whilst the bladder was being decompressed and the colitis treated with

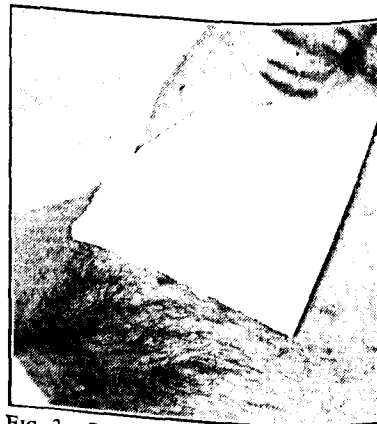


FIG. 3.—Photograph showing completion of first stage of two-stage procedure. Ileum and upper end of rectum have been exteriorized through lower end of paramedian incision.

cortisone perforation occurred. Emergency colectomy was undertaken, but anuria subsequently developed.

Post-operative morbidity has not been excessive. One patient had three episodes of obstruction—two due to adhesions and one to the volvulus of the small intestine—in the first post-operative month. Two patients developed intestinal obstruction two years after their operation, the result of band formation. Five operations were therefore undertaken for obstruction and all three patients recovered. In another patient secondary haemorrhage into the pelvis 10 days after operation necessitated reopening the abdomen for its control.

One patient who had had a side-to-side anastomosis of ileum and rectum, with the formation of a safety-valve proctostomy, developed a fulminating staphylococcal enteritis with associated heavy infection and disruption of the abdominal wall. As it seemed likely that the anastomosis might break down it was undone and the end of the ileum brought out through a separate incision in the left iliac fossa. The patient recovered with antibiotic therapy, and restoration of continuity will be undertaken subsequently.

In seven patients closure of the safety-valve proctostomy was not effected at the first attempt, and in one patient five operations were required for its final closure. The method of eliminating this difficulty has been referred to. A further patient referred to above, in whom a safety-valve was not included in the operation, developed a faecal fistula.

Mild perianal excoriation has been present in four cases, one of which was complicated by a minor fistula-in-ano, which after operation healed completely. All these cases have responded to local applications of ointment.

With the exception of one case in which a transient arthritis of the knee-joint occurred six months after operation and which could have been attributable to other causes apart from the colitis, no systemic complications have resulted.

Do the Majority of Patients Return to Good Health Without an Excessive Number of Bowel Actions?

In the assessment of this question in respect of the 45 live patients in this series, five have been excluded, as the final stages of their treatment have not yet been completed. Forty patients therefore remain for consideration. These have been divided into four categories as follows:

1. Those whose health has returned completely, who have regained or in some cases exceeded their normal weight, who are engaged fully in their former occupations, who enjoy a normal social life, and whose number of bowel actions do not exceed six in 24 hours. Many, as will be seen from the table, have a smaller number of evacuations.

Number of Bowel Actions Experienced by Patients in Category 1

No. of bowel actions in 24 hours	1	2	3	4	5	6
No. of patients	1	1	2	7	10	8

IsoGel, and in some cases the occasional codeine tablet, is all that is required to control their bowels. Twenty-nine, or approximately 70%, of the cases in this series fall into this category (Fig. 4).

2. Those who are in good health, who have gained weight, who are back to work, but whose number of bowel actions, varying between 7 and 10 in 24 hours, limits slightly their full return to a normal life. Nevertheless in this category is included an engine-driver, a long-distance lorry-driver, and a foreman builder. Our experience has been that after about 12 months some in this category join those in category 1. At present there are six patients in this group, or 15% of the total.

3. Those who have returned to good general health but whose number of bowel actions is over 10. There are two female patients in this group, and both have weak sphincters. Each is 67 years of age. One suffered from complete prolapse of the rectum in addition to her colitis and prior to operation had not been outside her house for two years. The excessive number of bowel actions in this small group would undoubtedly seem to be associated with laxity of the sphincters, and the urgency with which the frequency is associated also suggests this. In the older female patient with patulous sphincters a permanent ileostomy may be preferable, but neither of the patients in this group would consider this step, as in spite of their disability they appear to manage reasonably well.

4. Those who at present have a residual proctitis producing symptoms. In this category are three patients, or approximately 8% of the series. Although two of these patients have been back to full work and the third, a girl, has been attending school with few absences, periodic anaemia has had to be treated. The two adult patients are now under treatment with intrarectal ultra-violet light, and the degree of subsidence of the inflammation in the rectal mucosa has so far been most pronounced.

Do the Inflammatory Changes in the Remaining Rectum Resolve in Most Cases?

We had noted, before undertaking ileo-rectal anastomosis, that in certain cases treated successfully by a medical regime the gross ulcerative changes visible on sigmoidoscopy subsided with apparent re-epithelization of the ulcerated areas. In such cases the resolution appeared to follow the control of the toxæmia associated with the disease and the return of the patient to normal health.

Biopsies from the rectum taken before and after a successful end to medical treatment confirmed our visual impression that the wall of the bowel had in fact become re-covered with epithelium. It was indeed true that the normal regimented pattern of mucosal glandular structure was not re-formed, but nevertheless the underlying partially fibrosed rectal wall did become covered with epithelium.

As a result of this observation it seemed reasonable to suppose that if in those cases



FIG. 4.—Pre- and post-operative photographs of a patient treated by the method described. Her bowel is opened once in each 24 hours. Pre-operative weight 5 st. 11 lb. (36.7 kg.), post-operative weight six months later 8 st. 9 lb. (54.9 kg.).



FIG. 5.—Pre-operative (a) and post-operative (b) rectal biopsies.

which were not responding to medical treatment the colon containing the vast bulk of the disease was to be excised, then the cause of the gross toxæmia would be removed and with the consequent return of the patient to good health the inflammatory changes in the residual rectum might well resolve.

If the toxæmia was to be overcome it seemed essential that the whole of the colon, including the pelvic colon, should be excised, as clinical and pathological examination of many specimens of the disease had shown that the distal regions were often the most heavily affected. Should a lesser excision be undertaken it appeared likely that ill-health associated with the presence of a segment of the pelvic colon might well continue in a considerable proportion of the cases, so that resolution of the inflammation would not take place. The whole of the colon was therefore excised in the cases in this series and ileo-rectal anastomosis carried out, and we believe that the resolution of the inflammation in the remaining rectum that has taken place in all but three of the patients is dependent upon this total excision.

All patients have been repeatedly examined in the follow-up department and have been examined by a narrow-bore proctoscope. The mucosa appears to have regenerated in all except the three cases referred to. As a result of fibrosis the rectum will not distend as will a normal rectum, which is the reason for the use of a proctoscope with a smaller lumen. The mucosa, too, appears fixed to the underlying structures and has not the mobility of the normal rectal lining.

To record this resolution of the inflammatory change we have in many of the cases taken a rectal biopsy before and after operation, and the healing suggested by macroscopic examination has been confirmed to have taken place by the pathological examination of these specimens (Fig. 5).

It is therefore established that, following total colectomy and ileo-rectal anastomosis, resolution of the residual inflam-

mation in the rectum can occur, but, as will be seen from the sections, the normal pattern of palisaded glandular formation is only partially regained.

Should the Disease Persist or Recur in the Remaining Rectum can the Latter be Removed and an Ileostomy Established Without Risk?

No case has been converted to a permanent ileostomy, as the indications for this have not arisen in the present series. It would seem, however, that the conversion would not present any great surgical problem.

Summary

A series of 47 cases of diffuse ulcerative colitis treated by total colectomy and ileo-rectal anastomosis is analysed.

It is concluded that the operation can be carried out with a low mortality rate and low post-operative morbidity, and that 70% of the patients return to a normal economic and social life and a further 15% have only minor limitations, the result of some frequency of bowel action.

It is suggested that the procedure described should be the primary method of choice in the surgery of diffuse ulcerative colitis.

[Since the completion of this article several months ago the residual rectal ulceration in the two cases treated by intracavitary ultra-violet light has resolved. These patients could now be included in the first category.]

REFERENCES

- Aylett, S. O. (1954). *Surgery of the Caecum and Colon*. Livingstone, Edinburgh and London.
— (1955). *British Medical Journal*, 1, 1060.

SIMPLIFIED RADIOACTIVE IODINE THERAPY

BY

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The treatment of thyrotoxicosis with radioactive iodine (^{131}I) is now an established procedure for the management of selected patients.

The long-term experience of one of the pioneer groups of American workers has been reported (Chapman and Maloof, 1955), and Myant (1956) has reviewed the results achieved throughout the world from 1942 to 1954. In this country the most extensive reported experience has been that of Blomfield, Jones, Macgregor, Miller, Wayne, and Weetch (1955), who reviewed results in the first 140 patients treated in Sheffield.

Varying techniques have been used to obtain consistent and satisfactory results. Some workers attempt to simulate partial thyroidectomy by achieving remission in as many patients as possible by a single treatment with the isotope (Blomfield, Jones, Macgregor, Miller, and Wayne, 1951; Freedberg, Kurland, Chamovitz, and Ureles, 1952; Fraser, Abbott, and Stewart, 1954; Chapman and Maloof, 1955). Others give small and repeated doses of the isotope, preferring to treat the patient gradually and slowly, hoping thereby to minimize the likelihood of producing myxoedema (Williams, Towery, Jaffe, Rogers, and Taggon, 1949).

Whatever technique is adopted, however, the prime consideration is that when the dose is prescribed for an individual patient the need for an early remission of symptoms is balanced against the likelihood of producing eventual myxoedema (Myant and Pochin, 1955).

Any technique which attempts to cure the patient quickly and effectively by a single treatment with ^{131}I involves the selection of a dose thought to be optimal in terms of ^{131}I concentration in the thyroid gland (Chapman and Maloof, 1955; Fraser *et al.*, 1954) or of radiation dosage in rads delivered to the thyroid (Blomfield *et al.*, 1951; Freedberg *et al.*, 1952). The calculations necessary to determine these doses are complicated (Myant and Pochin, 1955), and depend upon a number of assumptions that are not always valid.

This paper is a preliminary account of the experience of one observer who endeavoured to employ a precise and quantitative technique for a number of years (Blomfield *et al.*, 1955) and then, as a result of the experience gained, followed thereafter a different and, by previously accepted standards, completely heretical technique. The results are reported on the first 150 consecutive cases so treated after a minimum observation period of one year.

Principles Involved in Dosage Prediction

Any attempt to use a predetermined dosage of radiation in terms of rads or of ^{131}I concentration makes a number of assumptions the validity of which is doubtful.

(1) It is assumed that the dose of radiation is delivered uniformly throughout the gland. It has, however, been shown (Kelsey, Haines, and Keating, 1949) that there is an uneven distribution of ^{131}I in the thyroid gland. Oddie (1951) has moreover calculated that, even where a uniform concentration throughout the gland is assumed, there could theoretically be a hundredfold difference between the highest and lowest dosage received within any one gland. So, at best, any prediction of dose concentration is no more than an inaccurate mean value.

(2) The variable factors required to calculate the radiation dosage are the peak percentage uptake of the isotope by the gland, the effective half-life of the isotope in the gland, and the mass of the gland itself. For the calculated dosage to have any meaning these preliminary measurements must be exact, and although uptake and half-life can be defined accurately there is no sure method of assessing thyroid gland mass. Soley, Miller, and Foreman (1949) accepted that the mass, as judged by inspection and palpation, might be inaccurate by as much as 30 to 40%. Many attempts have been made to devise objective techniques, such as that of Blomfield *et al.* (1953), by which gland volume may be calculated. Measurements can be made in two planes with a collimated Geiger or scintillation counter, but even such techniques cannot be dissociated from a possible subjective bias by the observer. Kelly (1954) found that there might be very large errors inherent in similar and even more refined methods. Gland size is undoubtedly the most important factor in dose determination, and its accurate calculation is essential if doses are to be expressed either in rads or in microcuries per gramme of thyroid tissue. If a figure is applied to an estimate of gland mass it may acquire undue significance, and on subsequent review it is easy to forget the fictitious accuracy of the original estimate. The false precision of many of the calculations previously performed in relation to isotope therapy has often deluded the protagonists of such calculations that they have a value in excess of their real worth.

(3) Predetermined dosage techniques require that the metabolism of the ^{131}I be similar following both the tracer investigation and the therapeutic dose. Uptake measurements are usually in reasonable agreement, but Blomfield *et al.* (1951, 1953) and Freedberg *et al.* (1952) found

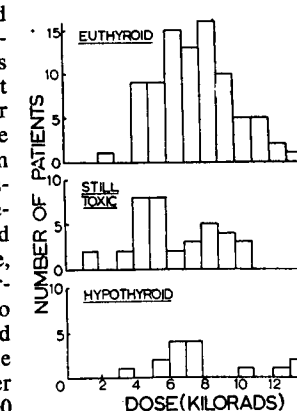
occasional alterations in effective half-life. The biological elimination of the isotope from the gland was often shorter after treatment, presumably owing to an early release of hormone as a result of radiation damage. Table I demon-

TABLE I.—Comparison of Predicted and Measured Radiation Doses (rep)

Case No.	Predicted from Tracer Measurements	Measured after Therapy
1	8,000	8,600
2	10,800	13,500
3	7,900	7,500
4	8,700	8,300
5	9,000	5,600
6	8,000	7,300
7	11,000	11,800
8	6,200	6,200
9	8,500	11,300
10	8,000	7,300

strates the sort of variation in dosage that may ensue, and the calculated radiation dose delivered is thus significantly different from that originally planned. In this series of 10 cases, originally discussed by Blomfield *et al.* (1953), the actual dose delivered in Cases 2, 5, and 9 is appreciably different from that envisaged. The same gland size was used in the estimation of both doses, and the variations in these cases were chiefly due to differing effective half-lives. Miller and Sheline (1951) also found a very wide range of values for the actual dose delivered to the patient. When they "pre-selected" a dose of 6,000 reps (roentgen-equivalent physical) the doses actually delivered varied from 2,000 to 20,000 reps.

(4) The use of a predetermined dose schedule assumes that the biological response to a given dose of radiation or concentration of ^{131}I is constant and predictable. This is certainly not the case. The radiosensitivity of different glands is a biological variable. This results in some patients



Relationship of rad dosage delivered to the thyroid gland to the clinical result, after the first treatment with radioactive iodine (from Blomfield *et al.*, 1955).

between clinical result and the actual dosage of radiation delivered was shown by Miller and Sheline (1951). Myant (1956) has fully discussed the factors which may be partly responsible for these results, but, making all possible allowances, it is apparent that such a degree of biological variability renders dose prediction impracticable.

Alternative Therapeutic Techniques

It is apparent that precise calculation of ^{131}I concentration in the gland demands an accurate knowledge of gland mass, and this is not easy to ascertain. The technique involving dosage fractionation by means of the repeated administration of small doses of ^{131}I involves numerous measurements of thyroid function. These may be of prognostic value (Myant, 1953), but the inevitable time-lag before treatment is complete makes the method unsatisfactory and inconvenient for patient and physician.

Alternatively, the disease can be treated more simply by adjusting the dose in millicuries to that most likely to effect a rapid clinical cure while avoiding as far as possible the development of myxoedema. An attempt has therefore been made to treat patients on these lines, without considering the details of uptake measurements and without attempting to assign a figure in grammes to the size of any given thyroid gland.

Method Used

Patients judged suitable for ^{131}I therapy by criteria defined previously (Blomfield *et al.*, 1955) were given a preliminary tracer dose of ^{131}I . This confirmed the diagnosis and ensured that the thyroid gland was able to absorb a high proportion of the administered dose. The criteria of toxicity were those of Goodwin, Macgregor, Miller, Wayne (1951) and Fraser, Hobson, Arnott, and Emery (1953).

Patients who lived within a reasonable distance from hospital were treated as out-patients, and comparatively few required to be admitted. ^{131}I was then given, the size of the dose being judged on the simple principle of a small dose for a patient with a small gland and a large dose for a patient with a large gland. Past experience had shown that myxoedema was seldom produced by doses as low as 5 millicuries even where gland enlargement was minimal. Chapman and Maloof (1955) have since shown that among 520 patients the smallest single dose to produce myxoedema was 6 millicuries. Our practice was to give 4 millicuries to patients in whom the thyroid was palpable, 5 or 6 millicuries for minimally enlarged glands, and increasing doses up to the highest single dose of 15 millicuries, which was given to a patient with a large nodular gland. Other factors besides that of gland mass also influenced the size of dose prescribed: for example, larger doses were given to patients with significant cardiac failure, if the gland was nodular, or if the need to obtain a rapid remission of symptoms was greater than the risk of the production of hypothyroidism.

A few of the most thyrotoxic patients received a course of carbimazole before ^{131}I , but normally no preliminary treatment of this nature was prescribed. In such cases, however, the principles governing the prescription of the dose remained unaltered, and the ^{131}I was given after the administration of the antithyroid drug had been stopped for at least four days and after the tracer-dose investigation had been completed. If it was thought advisable to diminish the patient's toxicity before the effect of the ^{131}I therapy had had time to develop, a course of potassium iodide, 60 mg. daily, was given, starting not earlier than one week after the ^{131}I had been given, and continuing for not longer than three weeks. On general principles it was felt undesirable to give antithyroid drugs after ^{131}I therapy, but this was in fact done on a few occasions as a preliminary to further isotope treatment.

Patients were normally seen six weeks after treatment, and thereafter at successively longer intervals. If, however, there was no clinical improvement after six to ten weeks, it was our custom to arrange for a further tracer-dose investigation and for the administration of additional ^{131}I . The same principles governed the size of dose prescribed. Many patients who have been inadequately treated experience appreciable shrinkage of the thyroid gland, and this may determine that a smaller dose should be used on a subsequent occasion.

Results

We are here concerned only in reporting these initial results so that this technique may be compared with the more elaborate methods previously employed. It is not intended to detail the sequence of recovery and complications which ensues after ^{131}I therapy, as this has been fully discussed elsewhere (Blomfield *et al.*, 1955; Myant, 1956).

Between January 1, 1953, and October 31, 1956, 267 patients were treated by this technique. Table II summarizes the results in the first 150 consecutive patients followed for a minimum period of one year after they were first treated.

TABLE II.—Clinical Results of Radioactive Iodine Therapy (Minimum Follow-up, One Year)

	Result of First Treatment				Clinical State after 12-46 Months	
	Patients		Dose (mc.)		Patients	
	No.	%	Mean	Range	No.	%
<i>Present Series (150 Patients)</i>						
Euthyroid	89	59	8.0	4-15	130 (3 dead)	87
Still toxic	48	32	8.4	6-12	3 (2 dead)	2
Hypothyroid	13	9	7.9	4-10	17 (1 dead)	11
<i>Blomfield <i>et al.</i> (1955) (140 Patients)</i>						
Euthyroid	—	62	9.6	2.4-22.4	—	84
Still toxic	—	27	12.2	4.0-31.6	—	4
Hypothyroid	—	11	9.2	5.2-15.9	—	12

At the time of follow up 87% of the patients had been rendered euthyroid; 11% had become hypothyroid and were receiving thyroxine maintenance treatment; and 2% (3 patients) had either died while still thyrotoxic or required further treatment. Fifty-nine per cent. of the patients were rendered euthyroid, and 9% became myxoedematous after their first dose of the isotope.

Of the 48 patients (32%) who required more than one treatment, 41 later became euthyroid; of these, 28 required two, 11 required three, and 2 required four therapeutic doses. Four of these 48 patients became myxoedematous after their second treatment. Of these four, two were made hypothyroid intentionally because of associated intractable cardiac failure.

Two patients died within a year of receiving ^{131}I . One died as a result of long-standing portal hypertension, but, although improved, she was still thyrotoxic at the time of death despite having been treated on three occasions. The other was a woman aged 70 who died a few days after her second treatment. She fell heavily while in hospital and fractured the neck of her femur; fatal hypostatic pneumonia ensued. A third patient was still toxic after one year, but became euthyroid following further treatment.

Apart from the two patients who died while still thyrotoxic, four others had succumbed by the time the review was made (November 1, 1956). Three were elderly men who had been rendered euthyroid and who later had myocardial infarctions. The fourth was a patient with advanced diabetic nephropathy who died in uraemia two and a half years after severe hyperthyroidism had been adequately controlled.

Table II also includes for comparison the corresponding percentage figures for the 140 patients reported by Blomfield *et al.* (1955), who had been treated by a method of dose selection involving an elaborate and quantitative technique. It can be seen that the results in Edinburgh were essentially similar and the differences between the two groups are insignificant. The range of doses in millicuries employed in both centres is roughly comparable, but the mean figures are slightly lower in Edinburgh.

Discussion

The results achieved with this simple clinical technique are in no way different from those previously obtained when the prescription of the dose was governed by more meticulous and elaborate methods. Furthermore, they are essentially the same as have been reported by other centres. The four patients who became myxoedematous after a second therapeutic dose were all among the first 60 who received treatment. The production of hypothyroidism in this way can usually be avoided if sufficient patience is exercised and the physician is prepared to wait for the late remission that sometimes occurs. Nevertheless, our experience coincides with that of Myant (1956), who found that if no improvement has occurred after 10 weeks further therapy is almost invariably necessary.

If it is confirmed that similar or better results can be obtained by the use of this technique, ^{131}I therapy could be

greatly extended. The principles are essentially so simple that there is no reason why other physicians should not achieve the same results even if they have not previously had the advantage of experience with more meticulous methods. It is important that tracer-dose investigations should always precede ^{131}I therapy, because they confirm the diagnosis, and ensure that the uptake of ^{131}I by the thyroid gland is high. Failing such tests it is inevitable that mistakes in diagnosis and management will occur.

The majority of patients who receive ^{131}I therapy would in the absence of the isotope be treated by partial thyroidectomy. This operation, including the pre-operative preparation and recovery, usually involves at least three weeks in hospital, with all the expense to the National Health Service that such an admission entails. Thereafter a shorter or longer period of convalescence is necessary before the resumption of ordinary activities. When patients are treated with ^{131}I in hospital they need not remain for longer than three or four days unless their general condition warrants it. Treatment of out-patients, on the other hand, involves no expense except that of the isotope itself. This is trivial in comparison with the costs of the hospital admission. Including transport charges, an average dose of 8 millicuries costs less than £2. The economies effected by isotope therapy are therefore considerable.

The elaborate methods previously used in an attempt to determine precisely the dose to be prescribed are expensive. The detailed measurements necessary, particularly when gland size is estimated by scanning techniques, involve physicists and technicians in an expenditure of time and effort probably unjustified by any advantage which accrues.

From the long-term point of view it is important that some centres with adequate facilities, and a sufficient staff of physicists and technicians, should continue to make quantitative observations upon the amount of radiation delivered in isotope therapy. Only then can further knowledge be obtained about the factors responsible for the variation in response. Effective and safe treatment, however, can be carried out at any centre with a minimum of equipment and technical personnel. The cases here reported have been treated by one physician with the assistance of a single technician. It therefore should not be thought that the application of radioactive iodine in the treatment of thyrotoxicosis is necessarily a complex procedure.

Summary

A series of 150 consecutive cases of thyrotoxicosis have been treated with radioactive iodine. A simple clinical dosage technique has been used, based primarily upon an approximate estimate, by inspection and palpation, of thyroid gland mass, although certain other clinical factors were also taken into consideration.

On review after a minimum period of one year, 87% of patients had become euthyroid, 11% were myxoedematous, and 2% had been inadequately treated. Fifty-nine per cent. of the patients were satisfactorily treated with a single dose of the isotope.

The results achieved did not differ appreciably from those previously reported in which a method had been employed for dose selection involving an elaborate and quantitative technique.

The prescription of an entirely accurate radiation dose is impracticable, chiefly because of the errors inherent in the techniques for the estimation of gland mass, and because of the biological variability in the radiosensitivity of different glands. Elaborate techniques are unnecessary for the safe and effective treatment of thyrotoxic patients.

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REFERENCES

- Blomfield, G. W., Jones, J. C., Macgregor, A. G., Miller, H., and Wayne, E. J. (1951). *British Medical Journal*, 2, 373.
 — (1953). In *Radionuclide Techniques*, 1, 23. H.M.S.O., London.
 — and Weetch, R. S. (1955). *British Medical Journal*, 2, 1223.
 Chapman, E. M., and Maloof, F. (1955). *Medicine (Baltimore)*, 34, 261.
 Fraser, R., Abbott, J. D., and Stewart, F. S. (1954). *Brit. J. Radiol.*, 27, 23.
 — Hobson, Q. J. G., Arnott, D. G., and Emery, E. W. (1953). *Quart. J. Med.*, 22, 99.
 Freedberg, A. S., Kurland, G. S., Chamovitz, D. L., and Ureles, A. L. (1952). *J. clin. Endocr.*, 12, 86.
 Goodwin, J. F., Macgregor, A. G., Miller, H., and Wayne, E. J. (1951). *Quart. J. Med.*, 20, 353.
 Kelly, F. J. (1954). *J. clin. Endocr.*, 14, 326.
 Kelsey, M. P., Haines, S. F., and Keating, F. R. (1949). *Ibid.*, 9, 171.
 Miller, E. R. and Shelton, G. E. (1951). *Radiology*, 57, 720.
 Myant, N. B. (1953). *Brit. J. Radiol.*, 26, 139.
 — (1956). In *Therapeutic Use of Artificial Radionuclides*, edited by P. F. Hahn, p. 148. John Wiley, New York.
 — and Pochin, E. E. (1955). In *British Practice in Radiotherapy*, edited by E. R. Carling, B. W. Windeyer, and D. W. Smithers, p. 382. Butterworth, London.
 Oddie, T. H. (1951). *Brit. J. Radiol.*, 24, 333.
 Soley, M. H., Miller, E. R., and Foreman, N. (1949). *J. clin. Endocr.*, 9, 29.
 Williams, R. H., Towery, B. T., Jaffe, H., Rogers, W. F., and Tagnon, R. (1949). *Amer. J. Med.*, 7, 702.

DANGEROUS BLEEDING ASSOCIATED WITH CARCINOMA OF PROSTATE

BY

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Excessive bleeding sometimes develops in patients with metastatic carcinoma of the prostate. The bleeding may occur either spontaneously or in association with surgical procedures, especially those directly involving the malignant prostate. Bleeding of varying degree may arise from any site, particularly the urinary tract and the nose, and in the skin as ecchymoses. If surgery is performed dangerous bleeding may take place into the traumatized area. Scott (1956) reports the loss of 1.5 litres of blood into the scrotum following orchidectomy in such a case. The haemorrhage may be severe enough to cause death if properly directed treatment is not given.

The relationship between bleeding and carcinoma of the prostate has not been fully explained. Recent studies of abnormal clotting have shown, however, that in certain cases of metastatic carcinoma of the prostate the phenomenon of fibrinolysis develops and that this is associated at times with a drop in the level of plasma fibrinogen (Tagnon *et al.*, 1953a, 1953b). Such fibrinolysis is thought to be due to proteolytic enzymes which dissolve away blood clot by digesting fibrin (fibrinolysis), in some cases also lysing fibrinogen (fibrinogenolysis) and other clotting factors such as prothrombin and factor V. Tagnon *et al.* (1953b) have demonstrated an abnormal fibrinolysin in the blood of 12% of their patients with metastatic carcinoma of the prostate, and

they have shown that this proteolytic enzyme is produced by the carcinomatous tissue itself.

In the following two cases of metastatic carcinoma of the prostate profuse bleeding occurred, sufficient to endanger life.

Case 1

First Admission

A 60-year-old man was admitted to hospital on December 27, 1953, with acute urinary retention and one month's history of urinary frequency, urgency, dribbling, and haematuria. Examination revealed a bladder distended to the umbilicus and enlarged nodes in the left groin. The left lobe of the prostate was enlarged, hard, and irregular, and a clinical diagnosis of carcinoma of the prostate was made. The patient was catheterized and 2 pints (1,140 ml.) of clear urine was obtained. A few hours after this procedure he started to bleed from the nose, rectum, and bladder. The bleeding was of moderate degree and did not require blood transfusion, but it lasted for four days.

Investigations.—Hb, 86% (12.7 g. per 100 ml.); W.B.C., 8,800 per c.mm.; platelets (Lempert), 77,000 per c.mm.; blood urea, 46 mg. per 100 ml.; serum acid phosphatase, 35 Gutman units; serum alkaline phosphatase, 29 K.A. units; plasma albumin, 3.1 g. per 100 ml., globulin, 2.9 g. per 100 ml., fibrinogen "practically zero." The patient's recalcified plasma formed a tiny pellicle of fibrin which disappeared during overnight incubation at 37° C. This test was not carried out aseptically, but even without proof of sterility the evidence was very suggestive of abnormal fibrinolysis.

On December 31, while he was still bleeding, he began treatment with stilboestrol, 10 mg. t.d.s., and this dose was increased to 15 mg. t.d.s. five days later. This therapy coincided with, or was responsible for, the cessation of all bleeding. Moreover, his platelet count, which had remained between 50,000 and 70,000 per c.mm. while he was bleeding, rose steadily to 230,000 per c.mm. over the succeeding five days and remained at that level. Subsequently his urological symptoms improved so much that there was no further need to consider transurethral prostatectomy.

Second Admission

Seven months later, while still receiving stilboestrol, 15 mg. t.d.s., the patient was admitted again with acute urinary retention. On this occasion he looked pale, and his chest, abdomen, and right wrist were covered with petechiae. Urine obtained by catheter was clear.

Investigations.—Hb, 60% (8.9 g. per 100 ml.); W.B.C., 7,900 per c.mm.; platelets, 86,000 per c.mm.; blood urea, 52 mg. per 100 ml.; serum acid phosphatase, 68 Gutman units; serum alkaline phosphatase, 33 K.A. units. Radiographs of the pelvis revealed secondary deposits in the bones, but the chest films showed no abnormality.

On the day after his readmission the patient suddenly collapsed, complaining of pain in the right shoulder and scapular region. He began to bleed round his indwelling catheter, and blood began to ooze from a venepuncture wound of the previous day. His nose started to bleed, and further showers of petechiae appeared on his arms and trunk. He became very shocked, and his clinical condition was not improved by the transfusion of three bottles of stored and one of fresh blood. Eight hours after the onset of bleeding he died from shock due to exsanguination from massive bowel haemorrhage.

A post-mortem examination confirmed the presence of a poorly differentiated adenocarcinoma of the prostate penetrating the capsule. There were metastases in the lungs, ribs, vertebrae, and pelvis. Petechiae were seen on the serosal surface of the gall-bladder, on the submucosal surface of the renal pelvis, and in the mucosa of the bladder as well as the skin, and there were haemorrhages into the wall of the pharynx, liver, and bowel. No local lesion was found to account for the large amount of blood in the alimentary tract.

Comment

At this time (1954) the condition of hypofibrinogenaemia associated with fibrinolysis in cases of carcinoma of the prostate was not recognized by us. It is possible, however, that fibrinogen depletion and fibrinolysis caused the haemorrhagic tendency which ultimately proved fatal to the patient even though this diagnosis is substantiated by relatively few haematological investigations.

Case 2

On February 13, 1956, a man aged 71 presented with haematuria which had developed over the previous week. He gave a history of six months of unremitting backache and of scalding and frequency of micturition. The liver was palpable 1½ in. (3.8 cm.) below the costal margin. He had a large fixed prostate gland which was thought to be probably malignant. By the time of his admission to hospital on March 6 the haematuria had stopped spontaneously.

Investigations

Hb, 97% (14.4 g. per 100 ml.); total serum acid phosphatase, 220 Gutman units; serum alkaline phosphatase, 30 K.A. units; serum bilirubin 1.1 mg. per 100 ml.; thymol turbidity, 1 unit; total serum proteins, 6.5 g. per 100 ml. Radiographs of the pelvis did not show any evidence of bony metastases, but an intravenous pyelogram revealed a moderately severe left hydronephrosis and a lobulated filling defect on the bladder base.

As an initial therapeutic procedure bilateral orchidectomy was performed, and a perineal biopsy of the prostate was also taken. This ultimately confirmed the presence of an anaplastic carcinoma of the prostate. After the biopsy had been taken all the traumatized tissue began to bleed freely, and the patient developed peripheral circulatory failure. Post-operatively the perineal wound continued to bleed, and his condition deteriorated. No improvement was observed as a result of the emergency transfusion of three bottles of stored blood over four hours; indeed, he began to develop spontaneous subcutaneous bruising around the shoulder-girdle and arms. At this stage it was reported that the original specimen of venous blood removed for the emergency cross-matching had still failed to clot. The syndrome was fully investigated by the following laboratory tests.

1. **Failure of Blood to Clot.**—The specimen of blood removed immediately after the operation had not been in contact with an anticoagulant, and yet it appeared to remain completely fluid apart from a very minute clot which comprised little more than a few fibrin strands lying loose within the specimen. This tiny clot did not increase in size thereafter. Indeed, it became less visible during the succeeding five hours.

This single observation, which was made in the blood bank, was enough to suggest the diagnosis of fibrinogen depletion in such a patient. The following emergency test confirmed the presumptive diagnosis.

2. **Thrombin Plus Whole Blood.**—Since thrombin acts directly on fibrinogen and by-passes all the earlier clotting factors, it is, in the absence of inhibitors, a specific indicator of the presence of fibrinogen. 0.2 ml. of commercial thrombin (Maw, 50 N.I.H. of oxalated whole blood (Scott, 1955). When assessed some 60 seconds later a very poor clot had formed. It was small in size, occupied a mere fraction of the total volume, and was ineffective in enmeshing red cells. By contrast, normal blood produced a large firm clot occupying the whole volume and enmeshing almost all the red cells.

When the original specimen which had been sent for cross-matching without an anticoagulant was then used in place of the oxalated specimen, and thrombin was added, no clot at all was formed. This showed the complete absence of fibrinogen. One presumes that such fibrinogen as had been present originally had all gone to form the few strands of fibrin described above.

This simple thrombin test demonstrated hypofibrinogenaemia, and this was enough to be the basis of specific emergency therapy. It did not supply information about the presence or absence of fibrinolysis such as affects formed clots. Perhaps the simplest demonstration of abnormal fibrinolysis occurs when sterile clotted blood liquefies spontaneously within 24 hours, but in this case lack of fibrinogen precluded the test in that form.

Treatment of the Bleeding.—Dried fibrinogen kept in readiness by the Sheffield Regional Blood Transfusion Service for such an occasion as this was used. This had been fractionated from pooled human plasma. About 4 g. was dissolved in 200 ml. of pyrogen-free distilled water and given to the patient intravenously over 20 minutes. At that time he was dangerously shocked, with blood running freely from the wound, and had a weak pulse of 130 a minute. All serious bleeding ceased within half an hour, and within one hour of the fibrinogen transfusion all oozing had stopped, with dramatic clinical improvement. No further fibrinogen therapy ever became necessary. The wound subsequently healed well.

Subsequent Investigations

The time interval between operation and removal of blood for the test described is given in parentheses.

1. **Platelet count** (Lempert) (12 hours), 150,000 per c.mm.
2. **Whole-blood Clotting-time** (Lee and White).—(12 hours):—A clot formed at about 20 minutes. This was still not a whole-volume clot, and it shrank considerably, until two hours later it was scarcely apparent amongst the red cells.

3. **Thrombin Plus Whole Blood.**—(12 hours):—Repetition of this test for the presence of fibrinogen (see above) showed a moderate-sized but nevertheless incomplete clot when examined at 60 seconds. The clot was much larger than it had been the previous night. (60 hours):—Identical with the control.

4. **Serial Plasma Dilution with Added Thrombin** (0, 12, 60 hours).—This is a simple emergency method for fibrinogen assay as advocated by Wolf (1954). The principle of the test is evident from the Table.

Serial Plasma Dilutions

Dilution in Saline:	1:10	1:20	1:40	1:80	1:160	1:320
Patient's plasma:						
Before fibrinogen therapy (0 hrs.)	+	+	—	—	—	—
After fibrinogen therapy (12 hrs.)	+	+	+	+	—	—
After fibrinogen therapy (60 hrs.)	++	++	+	+	+	+
Normal plasma as control (0, 12, and 60 hrs.)	++	++	+	+	+	+

+ = large clot, ++ = small or very small clot. Formed by the addition of thrombin to all tubes.

It will be appreciated that the clot formed by the addition of thrombin to a dilution of normal plasma of 1:320 is very minute and, to be seen, requires close scrutiny in a good light. From the Table the fibrinogen level in the patient's plasma can be calculated on the basis of a dilution factor of $\times 2$ between each tube. Thus, if one assumes the control fibrinogen level to be 200–400 mg. per 100 ml., then the pre-fibrinogen therapy specimen of the patient would be 12.5–25 mg. per 100 ml. and the post-therapy specimen would be 50–80 mg. per 100 ml. An estimate of fibrinogen by the Kjeldahl method later showed this second specimen to have in fact a fibrinogen content of 80 mg. per 100 ml. It thus confirmed the approximate range as given by this emergency method. The latter, however, took only 20–30 minutes to perform and read, as compared with hours by the Kjeldahl method.

5. **Estimation of Plasma Fibrinogen by Kjeldahl Method.**—At 12 hours, 80 mg. per 100 ml.; at 60 hours, 390 mg. per 100 ml.

6. **Quantitative Test for Fibrinolysis** (Biggs and Macfarlane, 1953a).—(12 hours):—Serial estimations showed no evidence of commencing fibrinolysis up to four hours. The blood was not kept chilled before the test. (60 hours):—A minimal increase of lysis was found after 19 hours when compared with the control, but the difference was not regarded as significant.

7. **Examination for Lysis of Normal Clot by Patient's Plasma.**—(12 hours):—No lysis was visible to the naked eye following the immersion of a washed fibrin clot (formed by

the addition of thrombin to normal plasma) into undiluted patient's plasma, followed by incubation at 37° C. for 24 hours.

8. **Quick's One-stage "Prothrombin" Time.**—(12 hours):—Control 15", patient 25", prothrombin index 60%, prothrombin arbitrary efficiency 18%. A prolongation of the "prothrombin" time may be expected in the presence of a low fibrinogen level, but this does not exclude the possibility of other defects (see below).

9. **Two-stage Prothrombin Time** (Biggs and Douglas, 1953a).—(36 hours):—True prothrombin was 77% of normal. This level is within our normal range allowed by the method.

10. **Qualitative Test for Deficiency of Factor V or of Factor VII** (Biggs and Macfarlane, 1953b).—(12 hours):—No deficiency of factor V or of factor VII.

11. **Thromboplastin Generation Test** (Biggs and Douglas, 1953b).—(36 hours):—No abnormality demonstrated by this test in the patient's plasma, serum, or platelets.

Discussion

In Case 2 it was demonstrated that a dangerous fall occurred in the plasma fibrinogen level during a minor operative procedure on a malignant prostate gland followed by bilateral orchidectomy. Furthermore, the plasma fibrinogen rose to an adequate haemostatic level after a single intravenous infusion of 4 g. of human fibrinogen. The plasma fibrinogen was only 80 mg. per 100 ml., however, some hours after all bleeding had ceased, and this level is lower than that which is commonly believed to be haemostatic. The plasma fibrinogen then continued to increase, apparently spontaneously, until it reached normality on the third day. This recovery may have been assisted by the orchidectomy. The bleeding in Case 1 appeared to develop in the absence of any surgical trauma to the prostate gland, unless catheterization can be described as such.

Fibrinolytic activity was probably present in Case 1, as shown by the complete lysis of the clot left overnight. In Case 2 it is unfortunate that the first specimen examined specifically for fibrinolysis was taken from the patient 12 hours after bleeding had stopped as the result of treatment. By then there was no satisfactory evidence of fibrinolysis by the method used. Possibly a modification of the cold method advocated by Fearnley and Lackner (1955) might have given more information. Hypofibrinogenaemia therefore remains the unequivocal feature of these two patients. Fibrinolysis remains a probability in Case 1 but an unproved factor in Case 2.

Tagnon *et al.* (1953b) have shown in cases of metastatic carcinoma of the prostate with fibrinolysis that, while the platelet count is often depressed, it may remain normal despite the fibrinolysis. In Case 1 the platelet count was abnormally low at the time of the bleeding and recovered subsequently during oestrogen therapy. The exact significance of this is not clear.

An unusual feature present in Case 2 was the apparently isolated fall in plasma fibrinogen. There was no obvious fibrinolytic activity to which proteolytic digestion of fibrinogen could be attributed. Nor do we know of any evidence to suggest that the mechanism is the same as that found in premature separation of the placenta (Stevenson *et al.*, 1953) and perhaps in certain lung operations (Chalnot *et al.*, 1952), where it seems that intravascular clotting may take place with consequent depletion of fibrinogen, as a result of the release into the circulation of excessive thromboplastin from the organ involved. The fibrinolytic factor, when it is present, is more easily understood, since tissue juices from a prostatic carcinoma have been shown *in vitro* to cause clot lysis and also to digest fibrinogen, factor V (ac-globulin), and probably prothrombin (Tagnon *et al.*, 1953a, 1953b).

Therapy is directed to controlling fibrinolysis and correcting hypofibrinogenaemia. In practice these two may perforce have to be treated together. Oestrogen therapy has an important place in controlling the lytic factor when present

(Tagnon *et al.*, 1953a) and this is substantiated by Case 1. The position in Case 2 is less certain. Also it seems that removal of the source of testosterone by orchidectomy has an experimental justification over and above the mere need to make the female hormone preponderant over the male hormone, since it was shown by Tagnon *et al.* (1953a) that the addition of testosterone to a maintenance dose of oestrogen made the latter ineffective in their patient. Corticotrophin has also been claimed to diminish the lysis, thereby helping to control the bleeding manifestations in these patients, and Stefanini *et al.* (1953) claimed that response to this treatment was more rapid than with oestrogens. Therapy of the hypofibrinogenaemia is extremely important, and must be as specific as possible. It will be appreciated that whole blood is relatively useless for this purpose, since it supplies so little fibrinogen in each bottle. Fractionated fibrinogen or triple-strength reconstituted dried plasma is the only type of emergency therapy. If whole blood must be given to replace blood loss, fibrinogen infusion should be given first, or at least simultaneously. About 4 g. of fibrinogen should be given intravenously in the first place, and subsequent additions to this should depend on the patient's recovery and on laboratory findings. As Case 2 has shown, one injection alone may be sufficient.

In conclusion, therefore, we suggest that the association of abnormal bleeding and carcinoma of the prostate is not infrequent, and, when suspected, should be confirmed by the more simple tests described in Case 2. The control of hypofibrinogenaemic bleeding depends on its recognition and the immediate availability of human fibrinogen.

Summary

Two cases are described in which the patients suffered from metastatic carcinoma of the prostate and developed a generalized haemorrhagic state. During these episodes the blood of both patients was incoagulable owing to a deficiency of plasma fibrinogen. In the first patient, who died as a result of the bleeding, this loss was probably associated with a fibrinolytic mechanism. The second patient recovered dramatically on receiving 4 g. of human fibrinogen intravenously.

Simple methods are described for the emergency laboratory diagnosis of hypofibrinogenaemia, using commercial bovine thrombin.

Whole blood is almost valueless as a specific therapy for hypofibrinogenaemia, and should be used only for its bulk, its cellular constituents, and its other clotting factors. Hypofibrinogenaemia should be treated by fractionated fibrinogen intravenously or by triple-strength reconstituted dried plasma.

The treatment of fibrinolysis is discussed.

We thank Professor R. P. Jepson for permission to describe these patients, who were under his care; Dr. H. Lempert, of the Royal Infirmary, Manchester, for allowing us to use the results of his haematological investigations in the first patient; and Dr. E. K. Blackburn for his help. We are indebted to Miss Pauline Hall for technical assistance, and to the Endowment Fund of the Board of Governors of the United Sheffield Hospitals for a grant towards the cost of laboratory expenses.

REFERENCES

- Biggs, R., and Douglas, A. S. (1953a). *J. clin. Path.*, 6, 15.
 — (1953b). *Ibid.*, 6, 23.
 — and Macfarlane, R. G. (1953a). *Human Blood Coagulation and its Disorders*, p. 358. Blackwell, Oxford.
 — (1953b). *Ibid.*, p. 352.
 Chabot, P., Michon, P., and Mme Lochar (1952). *Rev. Hémat.*, 7, 25.
 Fearnley, G. R., and Lackner, R. (1955). *Brit. J. Haemat.*, 1, 189.
 Scott, E. van Zile (1956). *J. Urol.*, 75, 116.
 Scott, J. S. (1955). *British Medical Journal*, 2, 290.
 Stefanini, M., Campbell, E. W., Pittman, G. I., and Salomon, L. (1953). *Bull. New Engl. med. Cent.*, 15, 23.
 Stevenson, C. S., Braden, R. G., Schneider, C. L., Johnson, J. F., and Seegers, W. H. (1953). *Amer. J. Obstet. Gynec.*, 65, 88.
 Tagnon, H. J., Schulman, P., Whitmore, W. F., and Leone, L. A. (1953a). *Amer. J. Med.*, 15, 875.
 — Whitmore, W. F., Schulman, P., and Kravitz, S. C. (1953b). *Cancer (N.Y.)*, 6, 63.
 Wolf, P. (1954). *British Medical Journal*, 2, 1226.

PROPHYLACTIC VALUE OF TETANUS ANTITOXIN IN MICE PREVIOUSLY INJECTED WITH HORSE SERUM

BY

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Littlewood, Mant, and Payling Wright (1954) reported a case in which a patient died of tetanus despite the fact that he was given the generally accepted prophylactic dose of tetanus antitoxin (1,500 units) shortly after injury. The patient was shown to be allergic to tetanus antitoxin (via a positive skin test), and his case history revealed that he had been given a prophylactic dose of tetanus antitoxin after an injury six months previously. Littlewood *et al.* suggested that the therapeutic ineffectiveness of the tetanus antitoxin was due to the state of hypersensitivity to the antitoxin which resulted in its accelerated removal from the circulation. They cited data from investigations of Glenny and Hopkins (1924). Talmage *et al.* (1951), and others which clearly indicate that previous experience with an antigen results in an accelerated removal of that antigen from the circulation upon its subsequent injection. The following experiment tests the hypothesis of Littlewood *et al.* by noting the duration of the prophylactic effectiveness of tetanus antitoxin in normal mice and in mice previously injected with horse serum.

Methods

Female 22–30 g. Carworth Farms CF strain of mice were divided into three groups. Group I was injected intraperitoneally with 0.1 ml. of *Haemophilus pertussis* vaccine† and 0.5 ml. of undiluted horse serum. Groups II and III received only 0.1 ml. of pertussis vaccine. Normal horse serum rather than horse-serum antitoxin was used to sensitize mice to a subsequent injection of antitoxin, since preliminary experiments indicated the superiority of normal horse serum as a sensitizing antigen. This result was not surprising in view of the fact that the antitoxin employed (Lederle) was of the type that is treated with proteolytic enzymes to modify its allergenic properties. Pertussis vaccine was administered along with the horse serum since it has been shown by Malkiel and Hargis (1952), Kind (1953), and Munoz *et al.* (1954) that this vaccine increases the sensitivity of mice to anaphylactic shock. Eleven days later the mice in groups I and II were inoculated intraperitoneally with 0.2 ml. (300 units) of tetanus antitoxin.

Of 62 mice sensitized with horse serum and injected with the antitoxin, 2 died and 4 others showed symptoms of severe anaphylaxis but recovered. On the third, seventh, fifteenth, nineteenth, and twenty-fourth day after receiving antitoxin, 12 mice from group I and 12 mice from group II were challenged intraperitoneally with approximately 1 M.L.D. of tetanus toxin. On each of these days 12 mice from group III (previously injected with only pertussis vaccine) were similarly challenged with tetanus toxin. The tetanus toxin employed in this experiment was obtained from Lederle Laboratories (lot No. 1872M). The fluid toxin had been stored at refrigerator temperatures for two years, but possessed considerable potency; 0.1 ml. of a 1:200 dilution injected intraperitoneally was approximately 1 M.L.D. Toxin dilution was made in nutrient broth, and deaths were noted for four days after injection.

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†48.8 billion organisms per ml.

Results

The data in the Table and the Chart indicate that up to the fifteenth day after the administration of tetanus antitoxin all mice possessed sufficient antitoxin to neutralize the

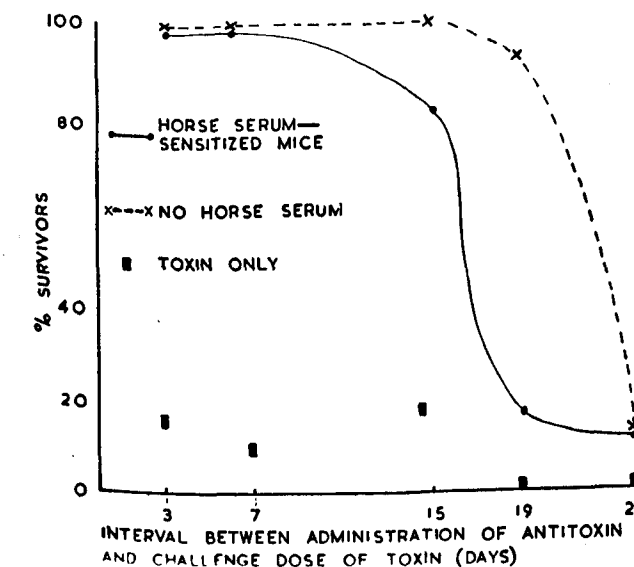
Effect of Previous Administration of Horse Serum on Duration of Protective Ability of Tetanus Antitoxin

Group	On Day 0	On Day 11	No. of Mice Surviving Challenge (Survivors/Total) with Approximately 1 M.L.D. of Tetanus Toxin				
			Days After Administration of Antitoxin*				
			3	7	15	19	24
I	0.1 ml. pertussis vaccine + 0.05 ml. horse serum	0.2 ml. tetanus antitoxin (300 units)†	12/12	12/12	9/11	4/13‡	2/12
II	0.1 ml. pertussis vaccine	"	12/12	12/12	12/12	11/12‡	2/12
III	"	"	2/12	1/12	2/11	0/12	0/12

*Note that the mice in group III received no antitoxin; they served as controls for the potency of the toxin.

†Two mice died of anaphylactic shock; 4 showed symptoms of severe anaphylaxis and recovered.

‡The difference in the percentage of survivors in these two groups is statistically significant ($P < 0.01$).



Duration of prophylactic effectiveness of tetanus antitoxin in mice inoculated with horse serum and in mice not so inoculated.

challenge dose of toxin. Of the mice challenged on the fifteenth day, two deaths occurred among the animals of group I which had been inoculated with horse serum 11 days prior to antitoxin. No deaths occurred among the animals which had no previous experience with horse serum (group II). Of the mice challenged on the nineteenth day after the administration of antitoxin, only 4 of 13 (30%) of the animals inoculated with horse serum survived the challenge dose of tetanus toxin, as compared with 11 of 12 (91%) of the mice which had not previously received horse serum. The difference between the percentage of survivors in the two groups is a significant one ($P < 0.01$). In a second experiment conducted in a similar manner, comparable results were obtained. Of 23 mice inoculated with horse serum and challenged with tetanus toxin on the seventeenth day after the administration of tetanus antitoxin, only 7 survived. In contrast, of 24 mice with no previous experience with horse serum, 22 survived challenge doses of toxin administered on the seventeenth day after injections of antitoxin. The difference between the percentage of survivors in the two groups is a significant one ($P < 0.01$).

Discussion

The data presented here support the contention of Littlewood *et al.* that previous experience with horse serum may

result in failure of antitoxin to protect. However, we agree with Beeson (1955–6) that an alternative explanation of the fatal case of tetanus cited by the aforementioned authors may be that the conventional prophylactic dose of tetanus antitoxin (1,500 units) was insufficient to neutralize the toxin present. Beeson cites other cases of prophylactic failure of 1,500 units of tetanus antitoxin and suggests that 10,000 units should be used for adequate passive immunization.

An increase in the prophylactic doses of tetanus antitoxin from 1,500 to 10,000 units would thus seem to be advantageous for two reasons. Ten thousand units would offer better protection in cases in which unusually large amounts of toxin were being produced. Ten thousand units of tetanus antitoxin might also be more effective in cases in which the antitoxin was being rapidly eliminated because of the patient's previous experience with horse serum.

REFERENCES

- Beeson, P. B. (1955–6). *Year Book of Medicine*. The Year Book Publishers, Chicago.
 Glenny, A. T., and Hopkins, B. E. (1924). *J. Hyg. (Camb.)*, 22, 208.
 Kind, L. S. (1953). *J. Immunol.*, 70, 411.
 Littlewood, A. H. M., Mant, A. K., and Wright, G. Payling (1954). *British Medical Journal*, 2, 444.
 Malkiel, S., and Hargis, B. J. (1952). *Proc. Soc. exp. Biol. (N.Y.)*, 80, 122.
 Munoz, J., Schuchardt, L. F., and Verwey, W. F. (1954). *Fed. Proc.*, 13, 507.
 Talmage, D. W., Dixon, F. J., Bukantz, S. C., and Dammin, G. J. (1951). *J. Immunol.*, 67, 243.

A SIMPLE QUICK TEST FOR GLUCOSE IN URINE

REPORT ON USE OF CLINISTIX

BY

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Two extremely simple enzyme tests have been developed which are highly specific for glucose in urine. These are "tes-tape" and "clinistix," but the present paper is concerned only with the latter. The method consists in dipping a specially treated thick paper stick approximately the size of a book-match, the last half-inch of which is impregnated with reagents containing an enzyme system, into a specimen of urine. The stick turns blue in the presence of glucose, and the blue colour should have developed in one minute. If the stick remains colourless there is no significant glucose in the specimen.

Application of the Test

This paper reports on a field trial in which clinistix was used for detecting glucose in urine and the effectiveness of the test compared with "clinitest" reagent tablets as standard. The trial was limited to patients over the age of 11 years attending the Birmingham Chest Clinic for the first time. Nursing staff were responsible for obtaining a specimen of urine from all new patients in the specified group. This was normally done in the interval between the taking of the chest radiograph and the clinical examination, so that the tests were completed before the patient was seen by the physician. Nurses performed the actual tests after being trained in the technique, and recorded the results. The technique is simple, no special apparatus or boiling is required, and specificity is beyond doubt. Hunt, Gray, and Thorogood (1956) have already stressed that the test is essentially an ultra-micro-method in the strictest sense and requires all the standards of chemical cleanliness such methods demand.

In the small number of patients whose specimens gave a positive result, blood-sugar estimations were carried

out in the pathological laboratory within 10 minutes of the positive finding. The details of the further management of patients with positive findings in the urine depended on whether any pulmonary abnormality was present in addition or not. All cases of glycosuria, however, were fully investigated either as out-patients, if their lungs were normal, or as in-patients if pulmonary disease was present.

Results

During a period of five months, from June 1, 1956, to October 31, 1956, 942 patients (593 males and 349 females) attended for examination. Positive findings on clinitest or clinistix, or both, were found in only 26 (2.76%). These are set out in Table I. Of the 26 with positive findings on urine examination, 20 were males and 6 were females, and these are discussed below.

TABLE I.—Results of Tests in 26 Cases with Positive Findings

Case No.	Age	Sex	Urine Test		Blood Sugar mg./100 ml.	Remarks
			Clinitest	Clinistix		
1	41	M	Positive	Positive	280	Diabetic
2	62	M	"	Negative	100	Non-diabetic
3	74	M	"	Positive	300	Diabetic
4	40	M	"	Negative	85	Non-diabetic
5	21	M	"	Positive	75	Renal glycosuria
6	46	M	Negative	"	100	"
7	47	M	Positive	"	260	Diabetic
8	53	M	"	"	290	"
9	17	F	"	"	270	"
10	50	M	"	"	170	"
11	44	F	"	Negative	124	Non-diabetic
12	60	M	"	Renal glycosuria	120	"
13	72	F	"	Negative	110	Non-diabetic
14	25	M	"	Positive	340	Diabetic
15	26	M	"	"	90	Renal glycosuria
16	34	M	"	"	220	Diabetic
17	55	M	"	Negative	100	Non-diabetic
18	65	M	Negative	Positive	130	Renal glycosuria
19	48	M	Positive	"	125	"
20	47	F	"	Negative	100	Non-diabetic
21	51	F	"	Positive	270	Diabetic
22	22	F	"	"	104	Renal glycosuria
23	67	M	"	Negative	183	Diabetic
24	35	M	Negative	Positive	90	Renal glycosuria
25	21	M	"	"	190	Diabetic
26	52	M	"	"	210	Post-gastrectomy hyperglycaemia

Six were known diabetics referred with chest symptoms and found to have active tuberculosis (Cases 7, 9, 14, 16, 21, and 25). Clinitest and clinistix were positive in five, but in one (Case 25) clinistix only was positive. Blood-sugar levels were 260, 270, 340, 220, 270, and 190 mg. per 100 ml. respectively.

In five cases diabetes was diagnosed without the patients being aware of their diabetic symptoms (Nos. 1, 3, 8, 10, and 23); three of these had tuberculosis and the other two had carcinoma of the lung. Clinitest and clinistix were both positive in the first four but clinitest only in the fifth, whilst blood-sugar estimations at the time of the positive findings were 280, 300, 290, 170, and 183 mg. per 100 ml. respectively.

In eight cases renal glycosuria was present (Nos 5, 6, 12, 15, 18, 19, 22, and 24). Clinitest and clinistix were both positive in all but three (Cases 6, 18, and 24), in which clinistix only was positive. The blood-sugar levels in these eight cases were 75, 100, 120, 90, 130, 125, 104, and 90 mg. per 100 ml. respectively. Oral glucose-tolerance tests confirmed the presence of a low renal threshold for glucose in the eight cases. The lowest threshold was 75 mg. per 100 ml. (Case 5).

In the six non-diabetics clinitest gave a positive result owing to the presence of reducing substances, but clinistix gave a negative result, indicating that there was no glucose present (Cases 2, 4, 11, 13, 17, and 20). The blood-sugar levels were 100, 85, 124, 110, 100, and 100 mg. per 100 ml. respectively, and the reducing substances giving a "trace" reaction with clinitest in these six cases were accounted for by the drugs being taken by the patients at the time.

In one patient clinitest was negative and clinistix positive, with a blood-sugar level of 210 mg. per 100 ml. (Case 26). This patient, a non-diabetic, was found to have a post-gastrectomy hyperglycaemia.

Discussion

Clinistix was used specifically for detection purposes, and is extremely accurate and reliable. It is more specific than clinitest for detecting glucose in that there are fewer false positives, and from the point of view of detecting diabetics clinistix is more dependable than clinitest. In 930 out of 942 cases the results of the two tests were identical (Table II)—916

TABLE II.—Results of Urine Tests in 942 Cases

Clinitest	Positive	Negative	Total
Positive	14	7	21
Negative	5	916	921
Total	19	923	942

being negative and 14 positive. In seven instances clinitest was positive and clinistix negative. Further investigation showed that in all these cases the positive result was due to reducing substances other than glucose. It is worth emphasizing that there have been only a few false positives, although the tests have been carried out by nurses outside the laboratory. In five cases clinistix was positive and the clinitest negative (Cases 6, 18, 24, 25, and 26): these included three renal glycosurics, one diabetic, and one patient with a post-gastrectomy hyperglycaemia. In all these the trace of glucose present was detected by clinistix but failed to be seen on clinitest.

A number of factors such as variations in the temperature and pH of the specimen of urine, and also variations in the amount of ascorbic acid present, affect the sensitivity of the enzyme test and the intensity of the colours, thus making the test unreliable for quantitative use. Warnings about the unreliability of the enzyme test as a quantitative test have already been given by Hunt *et al.* (1956), and Tunbridge, Paley, and Coulson (1956).

The test is, however, of great value in detecting glycosuria and may be used for screening purposes in any busy clinic, such as a chest clinic, medical, surgical, and ophthalmological out-patient departments, and antenatal and post-natal clinics. It should prove invaluable to the general practitioner both in his surgery and during domiciliary consultations. The test has little place in the day-to-day management of diabetic patients having insulin.

Conclusion

This study has shown the reliability of clinistix in detecting glucose. The simplicity of applying and interpreting the test has been substantiated during the course of this trial.

I thank the Ames Company (London) Limited for supplies of clinitest reagent tablets and clinistix reagent strips; Dr. Victor Springett for helpful criticism and permission to carry out the field trial; the consultant staff of the Birmingham Chest Clinic for permission to study patients under their care; Sister M. Hamilton and her staff for carrying out a large number of urine tests; and Miss F. L. Tomkins for assistance with the estimation of blood-sugar levels.

REFERENCES

- Hunt, J. A., Gray, C. H., and Thorogood, D. E. (1956). *British Medical Journal*, 2, 586.
Tunbridge, R. E., Paley, R. G., and Coulson, D. (1956). *Ibid.*, 2, 588.

The University of London has authorized the expenditure of the total amount of money necessary for completing the School of Pharmacy in Brunswick Square, Professor W. H. Linnell, Dean of the School, told the council of the Pharmaceutical Society recently. In 1935 the cost was put at £350,000. To-day it would be £1,300,000. Although the official date for the completion of the new building was next December, teaching, he said, would begin in October.

A QUICK AND EASY METHOD FOR BLOOD-SUGAR ESTIMATION

BY

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The need for a speedy and easy method of blood-sugar estimation has long been recognized, especially in the prompt diagnosis and correct treatment of certain medical emergencies, and particularly those associated with diabetes mellitus. Most of the standard methods of blood-sugar estimations require apparatus and techniques rendering them unsuitable for use outside the laboratory.

Hall (1950) and Lee (1954) respectively modified Haslewood and Strookman's (1939) method and Sumner and Graham's original work using dinitro-salicylic acid (Sumner and Graham, 1921; Sumner, 1924-5, 1925). The final methods are quick but still require a number of manipulations and the external application of heat.

The method presented here is extremely easy, apparatus is compact, no external heat is required, and it is very quick.

Method

Reagents.—(1) Tablet A: salicylsulphonic acid is the protein-precipitating agent. (2) Tablet B, for determining the reducing sugars, consists of copper sulphate, sodium hydroxide, sodium bicarbonate, and citric acid (Patent Nos. 2, 387, 244).

Procedure.—In a small test-tube provided with the kit,* water is added to mark 2, and tablet A is then placed in this water. The solution thus formed precipitates proteins; blood is then added to mark 3 on this test-tube. In the present study blood was actually delivered to the deproteinizing fluid by means of a 1-ml. shellback pipette. A rubber bung is placed in the mouth of the test-tube, which is vigorously shaken. A very fine precipitate ensues. A filter cone provided is placed in the top of a second, identical test-tube. The brown mixture is filtered into the second tube and the clear filtrate collected up to mark 1. One tablet B is added to the filtered solution. The fluid boils without external heat being applied, and when this stops the test-tube is shaken three or four times; after a wait of 30 seconds the colour is compared with the scale provided in the kit: blue=100 mg./100 ml., green=150 mg./100 ml., and orange=200 mg./100 ml.

Selection of Patients and Experimental Design.—The blood samples were obtained by venepuncture from patients during visits to the Diabetic Clinic, General Infirmary at Leeds. The blood was placed in a special oxalated tube. At the close of each clinic, estimations were done on these samples by an independent worker using the new method under constant and ideal conditions, while routine Hagedorn-Jensen estimations (Hagedorn, Halstrom, and Jensen, 1935) were also made on the same specimens, with only 1-2% error, and these were done in a different laboratory. This eliminated any unconscious bias in either estimation. Three workers with varying laboratory experience used the new method. Workers X and Y did the estimations with the new

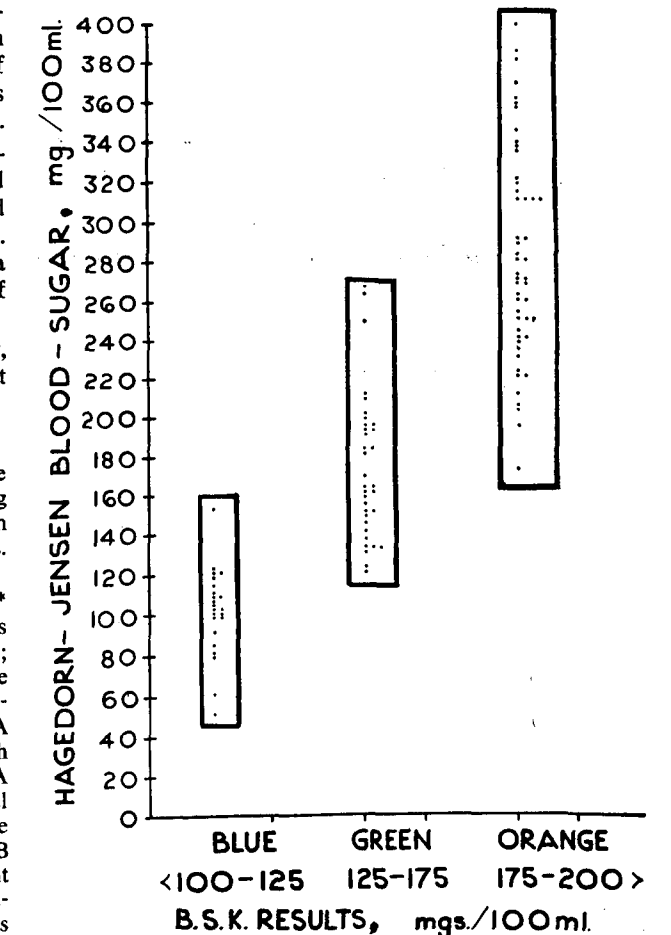
*Kindly supplied by Ames Co. (London) Ltd.

blood-sugar kit (B.S.K.) under standard conditions with respect to light, time, and continuity. Worker Z was not allowed such constant conditions.

Results

The results obtained by the Hagedorn-Jensen method showed that none of the groups estimated by three workers was biased by an excess of either high or low blood-sugar levels.

Worker X did 105 estimations with the B.S.K., and these were graded blue, green, and orange according to the chart. The division between blue and green was arbitrarily taken at 125 mg./100 ml. and between green and orange at 175 mg./100 ml. Thus individual results were given not only a grading according to colour but also an estimate of blood sugar in mg./100 ml. For example, a greenish-yellow colour resulting from the B.S.K. was estimated as 170 mg./100 ml., whilst the standard Hagedorn-Jensen method for blood-sugar estimation revealed 184 mg./100 ml. When all the



Comparison of blood-sugar determinations by the Hagedorn-Jensen method with the new blood-sugar kit.

B.S.K. estimations done by worker X are compared with the independent Hagedorn-Jensen estimations there is a remarkable agreement (see Chart). The correlation coefficient r is + 0.9. When the 88 results from worker Y are analysed there is not such close agreement, and the correlation coefficient $r = + 0.78$. The 106 results from worker Z gave a correlation coefficient of + 0.85.

Discussion

It will be seen from the Chart that no patient given an "orange" rating by B.S.K. had a true blood sugar as revealed by the Hagedorn-Jensen method below 160 mg./100 ml. Conversely, only one patient given a "blue" rating by the B.S.K. had a blood sugar level over 125 mg./

100 ml. when estimated by the Hagedorn-Jensen method. In over 300 estimations, only once was there a widely differing result which could have caused an error in treatment. The B.S.K. revealed 110 mg./100 ml. whilst the Hagedorn-Jensen method showed 212 mg./100 ml. The worker questioned the blue-grey colour of the B.S.K. reaction, and this estimation should have been repeated.

The accuracy of results depends on the appreciation of a range of colours. In a few estimations this was difficult, particularly when a muddy or grey tinge appeared in the final sample. Worker X was able to distinguish a muddy blue from an orange grey with reasonable accuracy in all shades, whilst workers Y and Z had difficulty. This problem was resolved by repeating all estimations when an unreliable colour was obtained. Usually a pure colour was finally produced. No explanation has been found for this "muddy" colour, and it occurred 22 times out of 300 estimations.

There is no doubt that ideal conditions and laboratory experience improve the accuracy of this method. Nevertheless, with a little practice, proficiency is attained whereby blood-sugar estimations can be done that are of inestimable value in the correct treatment of emergency medical patients.

It was felt that further refinement of the test was not essential since the B.S.K. was not designed to usurp the established blood-sugar methods. In emergency practice the question is usually not the actual level of blood sugar but whether the level is low or whether it is high. The B.S.K. would appear to be capable of giving this information speedily and accurately enough for clinical purposes. A further extensive trial is under way to test these laboratory findings under emergency conditions.

Summary

A new simple and quick blood-sugar estimation is described. Results when compared with the Hagedorn-Jensen method are in remarkable agreement. Varying conditions and experience of the workers are shown to influence the results. The new blood-sugar method would appear to be helpful in medical emergencies.

We thank all the patients for their kind co-operation in this study; Professor R. E. Tunbridge for permission to study his patients and helpful criticism of the MS.; and Mr. J. Bunce, Director, Ames Company (London) Ltd., for the supply of B.S.K. and his help at all times.

REFERENCES

- Hagedorn, H. C., Halstrom, F., and Jensen, B. N. (1935). *Hospitaltidende*, 78, 1193.
Hall, D. A. (1950). *British Medical Journal*, 1, 351.
Haslewood, G. A. D., and Stookman, T. A. (1939). *Biochem. J.*, 33, 920.
Lee, J. (1954). *British Medical Journal*, 2, 1087.
Sumner, J. B. (1924-5). *J. biol. Chem.*, 62, 287.
— (1925). *Ibid.*, 65, 397.
— and Graham, V. A. (1921). *Ibid.*, 47, 5.

The John Horniman Home is a home for children with severe physical handicaps such as cerebral palsy, muscular dystrophies, paralysis due to poliomyelitis, or severe heart disease. The home, situated in Worthing, is run by the Invalid Children's Aid Association, and can accommodate 24 children. It takes both boys and girls between the ages of 7 and 16. They are usually admitted for periods of two to eight weeks, either as a holiday to give their parents a respite or for convalescence after illness. The first object of the home is to help families in carrying the burden of a severely handicapped child. In special cases a long stay with education can be arranged. A serious difficulty in running the home, which has now been open for nearly three years, is that there is a peak demand during the summer holidays but vacancies at other times of year. With the skilled staff needed for such work this makes for uneconomic operation, and a more even flow of admissions, especially during the winter months, is wanted. Full details may be obtained from the Invalid Children's Aid Association, 4, Palace Gate, London, W.8.

A RAPID METHOD FOR THE ESTIMATION OF BLOOD SUGAR

BY

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A number of rapid and simple methods for the estimation of the blood sugar have been described (Hall, 1950; Lee, 1954). Although the results obtained by these methods agree with those in routine laboratories, they are not really suitable for performance by a busy house-physician at the bedside or in a ward side-room. A very simple procedure involving the use of tablets has recently been developed, and its use has been studied in the wards and the Diabetic Clinic of the Middlesex Hospital.

Method

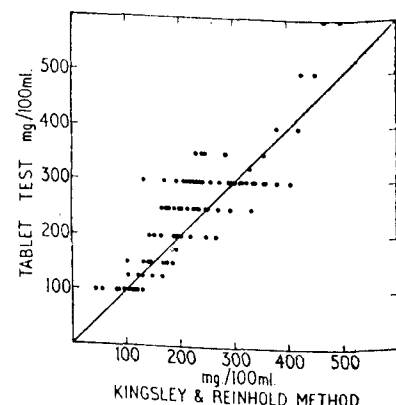
The equipment is contained in a small box and consists of two test-tubes each with three graduations (at 1, 2, and 3 ml.), a test-tube stand, a dropper, a box of filter cones, and two bottles of tablets (A and B). Tablet A is dissolved in 2 ml. of water in one of the tubes and blood is added to the 3-ml. mark. The proteins are rapidly precipitated and the mixture is allowed to filter through one of the filter cones into the second tube until 1 ml. of filtrate has collected. Tablet B is then added, and after the contents of the tube have boiled the froth is shaken down and 30 seconds later the colour is compared with that on a chart provided: blue or blue-green = 100 mg./100 ml. or less, green = 150 mg./100 ml., and orange = 200 mg./100 ml. or more.

Blood samples were obtained by venepuncture and a fluoride-oxalate anticoagulant mixture was used. If for any reason the estimation could not be performed immediately the specimen was stored, but not frozen, in a refrigerator. In practice it was found preferable to measure the volumes of blood and water with an ordinary 2-ml. insulin syringe. If the result was more than 200 mg./100 ml. the estimation was repeated, using 2.5 ml. of water with tablet A and adding 0.5 ml. of blood. If this still gave maximum reduction the test was repeated, using 2.75 ml. of water and 0.25 ml. of blood. For higher dilutions the blood was diluted with water first. No attempt has been made to perform the estimations under set conditions of lighting; so far as possible, the method has been studied as it would be used in practice—artificial or daylight being used as circumstances required.

Duplicate samples of each specimen were sent to the Courtauld Institute of Biochemistry at the Middlesex Hospital, where blood sugars were estimated by the method of Kingsley and Reinhold (1949), using sodium tungstate and sulphuric acid as protein precipitant. The error of this method is ± 6 mg./100 ml.

Results

The results obtained by the tablet method and the Kingsley-Reinhold method are compared in the Chart. The



Comparison of blood-sugar determinations by the method of Kingsley and Reinhold with the new blood-sugar kit.

correlation coefficient is 0.84, but there is a slight overall tendency for the tablets to give a high reading. In practice it was found that the mid-point between 100 and 150 mg./100 ml. gave a colour that could be recognized quite satisfactorily, and some readings of 125 mg./100 ml. are therefore shown. The mid-point 150-200 mg./100 ml. proved less easy to detect. Occasionally an impure colour was obtained and it was found necessary to repeat the test.

Discussion

A rapid and simple method for the performance of blood-sugar estimations in the out-patient clinic, consulting-room, or ward side-room would help the control of treatment of diabetes and in the management of diabetic emergencies.

This method cannot be recommended even as a screening procedure for the diagnosis or exclusion of diabetes. Definite diagnosis of this condition is of great significance to the patient and only methods of proved accuracy should be used. The tablet method is not really suitable for control of treatment in hospital diabetic clinics, where arrangements can usually be made for blood-sugar estimations by routine methods. It may be helpful for practitioners supervising the treatment of diabetics in their surgeries, an occasional check on the blood being desirable in all cases.

The method has proved very useful in the management of diabetic emergencies in hospital. In post-operative patients, in cases of ketosis, and in cases of suspected hypoglycaemia a rapid guide to treatment has been obtained. At night and at week-ends its use has often made it unnecessary to call on the services of the resident biochemist. In hospitals without a 24-hour biochemistry service this equipment would be very valuable.

I am indebted to the staff of the routine laboratories of the Courtauld Institute of Biochemistry of the Middlesex Hospital, where the control estimations of the blood sugar were made. I thank Dr. J. D. N. Nabarro, under whose guidance this paper was written, for allowing me to perform these tests on his patients, and the Ames Company (London) Ltd. for the provision of the blood-sugar kit.

REFERENCES

- Hall, D. A. (1950). *British Medical Journal*, 1, 351.
Kingsley, G. R., and Reinhold, J. G. (1949). *J. Lab. clin. Med.*, 34, 713.
Lee, J. (1954). *British Medical Journal*, 2, 1087.

Medical Memoranda

Treatment of Ammoniacal Dermatitis with Folic Acid and Soya-bean Milk

The oral administration of either folic acid or soya-bean flour encourages the growth of lactobacilli and possibly inhibits the growth of ammonia-producing organisms in the stools. It would seem rational to try to cure ammoniacal dermatitis in infants by the oral administration of these substances.

The following report concerning the treatment of chronic napkin rash by the administration of (a) folic acid and (b) soya-bean milk may prove of value to others faced with a similar problem.

Five infants aged between 3 and 16 months, who had suffered from severe ammoniacal dermatitis in which there was desquamation and exudation for periods ranging from 1 to 12 months, and who failed to respond to routine methods of treatment, were given folic acid by mouth. The dosage was 10 mg. daily as an elixir. Routine treatment to napkins and buttocks continued unchanged, while in each case the infant's diet remained similar to that in use immediately before the start of folic acid therapy. After a month three patients showed slight improvement, but the other two were no better. In view of this unsatisfactory response to treatment folic acid was withheld and soya-bean

milk was given. The milk consisted of 1½ oz. (42 g.) of soya-bean flour added to a pint (570 ml.) of water. This was used to replace half the quantity of cow's milk normally taken daily, so that patients consumed 10 to 20 oz. (285 to 570 ml.) of soya-bean milk each day. The routine treatment of the napkins and buttocks continued as before and the infants' diets were not altered. Within five days of starting the treatment all the patients had shown some improvement in the condition of the buttocks, while four of them had become more contented. Within two weeks the appearance of the skin was normal in all cases. During the third and fourth weeks of treatment there was no deterioration, though very transitory erythema of the skin in the napkin area was sometimes noted.

In view of these findings further observations on the effect of treatment with soya-bean milk in cases of ammoniacal dermatitis would be useful, and it should be given a trial in all resistant cases of this condition. Soya-bean flour can be obtained from Soya Foods, Ltd., London, E.C.3, and possibly from grocers. Its food value compares favourably with cow's milk, so that it is possible to rear infants from birth on this food. The cost of soya-bean milk is approximately twopence a pint. It is possible that treatment with larger doses of folic acid than were used in these few cases might prove more satisfactory, and it may be that cases resistant to soya-bean therapy might respond to large doses of folic acid.

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Pregnancy in Addison's Disease

Adrenocortical insufficiency is not necessarily incompatible with fertility. In earlier days the hazards of pregnancy in such circumstances were well known and were such as to make conception inadvisable or therapeutic abortion necessary. Now with modern complete substitution therapy the prognosis of pregnancy in Addisonian patients is much better. Approximately 60 such cases are on record, and in 14 of these pregnancy has occurred in the past five years when potent adrenocortical hormones have been available (Hendon and Melick, 1955). Only 7 cases appear to have been reported since cortisone has been used for maintenance. Below is a further case in which pregnancy occurring during treatment of Addison's disease was brought to a successful conclusion.

CASE REPORT

A nulliparous 23-year-old woman who had been married for four years presented with generalized weakness, tiredness, loss of weight, oligomenorrhoea, and skin pigmentation. There was no gastro-intestinal upset and no past history of tuberculosis. She was dehydrated, the skin was inelastic, the tongue dry, and the oral mucous membrane pigmented. Her blood pressure was 70/50 mm. Hg. Serum electrolyte values were compatible with Addison's disease: sodium 130, potassium 5.7, chlorides 69 mEq. per litre. Blood urea 93 mg. per 100 ml.; haemoglobin 85% (Haldane). Urinary 17-ketosteroid excretion 2.9 mg. in 24 hours. Radiographs of chest and abdomen normal. On a standard water load a diuresis of only 50% was recorded in the first four hours.

Initial therapy consisted of deoxycortone acetate (D.C.A.) 10 mg. daily by injection, together with 6 g. of salt a day and an adequate fluid intake. Her general condition improved on this treatment; the blood pressure rose to 110/70 mm. Hg, the electrolytes returned to normal values, and she gained 10 lb. (4.54 kg.) in weight, thus confirming the diagnosis of Addison's disease. A month later it was decided to institute maintenance therapy consisting of an implant of 200 mg. D.C.A. and 3 g. of salt a day. After about six months additional salt was given to overcome increased weakness and lethargy. Her blood pressure and serum electrolytes continued normal. It was decided to

give a further implant of D.C.A., 200 mg., and to continue 3 g. of salt a day.

Two months later she was found to be eight weeks pregnant. She complained of morning sickness, weakness, and lassitude at the end of the third month of pregnancy in spite of continued maintenance therapy. She was admitted to hospital, and improved on bed rest, adequate fluid intake, and dimanhydrinate ("dramamine") to a total of 100 mg. daily. As previous maintenance therapy had been inadequate this was changed to cortisone, 25 mg. daily by mouth, with trimethyl deoxycorticosterone, 60 mg. intramuscularly monthly, and salt, 3 g. a day. The pregnancy progressed satisfactorily on this regimen.

Four weeks before term the patient was again admitted to hospital, and, in addition to the maintenance therapy of 3 g. of salt and 25 mg. of cortisone a day, was now given daily injections of 10-15 mg. of D.C.A., her general condition, blood pressure, and electrolyte levels being the main guide. It was considered inadvisable to give her a longer-acting steroid at this stage. When labour started she was given 100 mg. of cortisone. The second stage was prolonged over eight hours and low forceps under pudendal block analgesia were applied. She was delivered of a living female child of 9 lb. (4.082 kg.). Next day she was given 100 mg. of cortisone, 10 mg. D.C.A., and 3 g. of salt, and the day after a return was made to the previous level of cortisone 25 mg., D.C.A. 10 mg., and salt 3 g. daily.

She had a mild puerperal infection which responded adequately to chemotherapy. Two weeks later she had oedema of the ankles and a blood pressure of 160/110 mm., together with serum electrolyte values of sodium 148, potassium 3, and chlorides 108 mEq. per litre. D.C.A. and salt were therefore stopped but cortisone continued. Within a week the blood pressure was normal and the oedema had subsided. Smaller doses of D.C.A. with a varying salt supplement were started again, and a week later D.C.A. was replaced by trimethyl deoxycorticosterone. The skin pigmentation, which decreased with the initial treatment, increased again near term, but had become less marked by the end of the puerperium. Lactation was successful to start with, but because of cracked nipples it was artificially suppressed after the second week by ethinylloestradiol.

COMMENT

Before 1949 the maternal mortality among patients with Addison's disease who became pregnant was 35-45% (Brent, 1950), but since the introduction of replacement therapy with adrenocortical hormones and cortisone the prognosis is much better. Cases of successful pregnancy in Addison's disease have been recorded by Simpson (1946), Knowlton *et al.* (1949), Brent (1950), Richards (1952), Rolland *et al.* (1953), Lutwyche (1953), Hunt and McConahey (1953), Hendon and Melick (1955), and De Gennes *et al.* (1956). In cases reported so far in which maintenance has been by cortisone in addition to D.C.A. and salt there has been no maternal mortality and the incidence of associated complications has been much lower.

In the case now described Addison's disease was diagnosed and treatment started ten months before pregnancy occurred. The rapidity with which conception followed therapy suggests that the treatment was an important factor in the patient's fertility.

In the first trimester of pregnancy nausea, vomiting, and other gastro-intestinal disorders are more likely to occur, leading to electrolyte disturbance and thus precipitating an adrenal crisis (Brent; Hunt and McConahey; De Gennes *et al.*). In the present case there was only a slight upset at this stage, which was easily corrected. It was thought advisable to start cortisone at this point. In the second half of pregnancy in Addisonian patients there may be an increase in the remaining adrenal function which may ameliorate the adrenal insufficiency state, and substitution therapy may have to be reduced accordingly (Knowlton *et al.*; Hunt and McConahey; De Gennes *et al.*).

Before the introduction of cortisone 25-50% of patients being treated for Addison's disease had hypoglycaemic episodes (Soffer, 1946). In the present case there were no symptoms to suggest this, nor did blood sugar determination, which was carried out monthly throughout the pregnancy, give abnormal results at any time. During labour the added stress of physical exertion, haemorrhage, pain, surgical intervention, and anaesthesia may be too great, and in the early puerperium the physiological diuresis with excretion of sodium, and the removal of adrenal hormones provided by the foetal adrenals, may lead to development of an Addisonian crisis (Knowlton *et al.*; Brent; De Gennes *et al.*). Immediately before delivery, therefore, the patient should be treated as for an impending crisis and every measure taken to avoid undue stress. In this case the dosage of cortisone was increased before delivery and the second stage of labour curtailed by the application of low forceps under regional block analgesia with minimal sedation.

Before the advent of cortisone lactation rarely occurred in these cases, and it has been suggested (Rowntree and Snell, 1931) that this might be due to atrophy of the mammary glands. Breast-feeding used to be forbidden, as it acted as an additional stress on the already deficient metabolism of the mother. There are earlier reports of lactation being artificially suppressed, but with adequate replacement therapy successful lactation is possible without great risk to the mother (Lutwyche, 1953). In the present case lactation was successful, and was artificially suppressed only because of technical difficulties.

Hypertension, cardiac failure, oedema, or potassium deficiency may occur from overdosage with D.C.A., and such symptoms arising in the latter half of pregnancy might lead to confusion with pregnancy toxemia (Brent). Alterations in blood chemistry and disappearance of symptoms on withholding steroid therapy for a few days will assist the differential diagnosis. Hence it is preferable at this stage to give short-term daily injections of D.C.A. rather than such long-term therapy as pellet implantation or trimethyl deoxycorticosterone injections. Theoretically less D.C.A. should be needed in the second and third trimesters because of the adrenal hormones supplied by the foetal adrenals and the high level of circulating sex hormones, which also have a salt-retaining effect (Soffer, 1946; Samuels *et al.*, 1943; Knowlton *et al.*, 1950). However, in the present case an increased dosage of D.C.A. was necessary during this period.

Signs of steroid overdosage appeared two weeks after the puerperium, but responded well to withdrawal of treatment for a week, after which a maintenance dose of D.C.A. and salt was easily achieved. Three weeks later the patient was discharged from hospital. Mother and child are both doing well.

I am grateful to Dr. I. Gilbert, consultant physician, and Dr. R. Crawford, consultant obstetrician, under whose supervision the patient was treated, for their permission to report this case.

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REFERENCES

- Brent, F. (1950). *Amer. J. Surg.*, 79, 645.
De Gennes, L., Bricaire, H., Hazard, J., and Beaulieu, E. (1956). *Presse méd.*, 64, 689.
Hunt, A. B., and McConahey, W. M. (1953). *Amer. J. Obstet. Gynec.*, 66, 970.
Hendon, J. R., and Melick, R. A. (1955). *J. Kentucky med. Ass.*, 53, 141.
Knowlton, A. I., Mudge, G. H., and Jailer, J. W. (1949). *J. clin. Endocrin.*, 9, 514.
Lutwyche, V. U. (1953). *British Medical Journal*, 1, 313.
Richards, T. A. (1952). *Ibid.*, 1, 421.
Rolland, C. F., Matthews, J. D., and Matthews, G. D. (1953). *J. Obstet. Gynaec. Brit. Emp.*, 60, 57.
Rowntree, L. G., and Snell, A. M. (1931). *A Clinical Study of Addison's Disease*. Saunders, Philadelphia and London.
Samuels, L. T., Evans, G. T., and McKelvey, J. L. (1943). *Endocrinology*, 32, 422.
Simpson, S. L. (1946). *Proc. roy. Soc. Med.*, 39, 511.
Soffer, L. J. (1946). *Diseases of the Adrenals*. Lea and Febiger, Philadelphia.

Reviews

BRITISH SURGERY

Operative Surgery. Under the general editorship of Charles Rob, M.C., M.Chir., F.R.C.S., and Rodney Smith, M.S., F.R.C.S. (Volume I—Introductory, Surgery of Trauma, Abdomen (Part); Volume II—Abdomen (Completion). £5 10s. per volume. Index to all eight volumes £2.) London: Butterworth and Co. (Publishers) Ltd. 1956.

In the introduction to this work the editors wisely state that the best way to learn how to operate is to act as assistant to a master of the craft. Failing that, the next best way is to learn from a well-illustrated account of the various operations. In such an account the emphasis may be greater either on the written description or on the pictorial representation. In these superb volumes, which are but the advance-guard of a monumental series, the emphasis is purposely laid on the illustrations, which are very numerous. The descriptive part is just sufficient to give a connected account of the operative procedures. When complete this will be the most elaborate and ambitious work of its kind ever published in Great Britain.

The general editorship has been undertaken by two distinguished surgeons, who have as associate editors men whose names are a guarantee of good judgment. The contributors have been selected because of their special skill or interest in a particular subject; they form a representative cross-section of the younger school of surgeons throughout Britain. An interesting editorial problem is mentioned in the introduction. Each contributor was asked to describe those methods which he had found most efficient; on certain occasions the two chief editors felt "a certain disapproval," but left the matter to the expert. As to which particular methods their remark applies to they discreetly keep silence.

The first volume, after an introductory section dealing with technique and about 100 pages given to the surgery of trauma, is chiefly devoted to gastric surgery; Norman Tanner deals with partial gastrectomy and with gastrectomy for cancer, while Professor Rob describes the operation of vagotomy. Volume II deals with the surgery of the small and large intestines, the pancreas, spleen, liver, and bile passages. As might be expected, Rodney Smith contributes the section dealing with pancreatotomy, and we note that he received a personal communication from that master of technique, Cattell.

In a short review there is no space for a detailed survey of all the contributions. Suffice it to say that the illustrations, which come from many artists, reach a high standard, and the whole production provides a welcome testimony to the authoritative place which British surgery has attained. We look forward to the succeeding volumes with great expectation.

ZACHARY COPE.

ANAESTHETIC ACCIDENTS

Anaesthetic Accidents. By V. Keating, M.B., B.Ch., D.A., F.F.A.R.C.S. (Pp. 261+vi; illustrated. 25s.) London: Lloyd-Luke (Medical Books) Ltd. 1956.

The reports on anaesthetic deaths recently published under the auspices of the Association of Anaesthetists have pointed in no uncertain manner the way in which these and other less serious preventable accidents occur. Not only anaesthetists but also medical practitioners in general, and both nursing and lay administrators, are taking a very close interest in this matter. Any book on this subject is therefore topical and will be read widely with critical eyes.

Keating's book is a scholarly and up-to-date account of anaesthetic accidents, in what might be called the classical manner. Thus pride of place is given to the circulatory and respiratory accidents, and these are discussed fully from the pharmacological and physiological aspects. Pulmonary and neurological complications and those due to intravenous and spinal anaesthesia follow and are all treated at length.

Further chapters deal with endotracheal anaesthesia, posture, and the relaxants, while a few remarks are included on explosions, safety precautions in general, and medico-legal considerations. The emphasis, however, might have been different. Inhalation of vomit, for example, is more important as a preventable cause of death and morbidity than primary cardiac arrest: a future edition should include vomiting in the index. The more traditional arrangement of the text used here is an orderly one, and is helpful in what is essentially a book for those studying for examinations and for those who seek for references to the literature on the complications of anaesthesia. Illustrations are not a strong point, there being only 13 simple line drawings, though these are very helpful as far as they go.

For anyone who really wants to get to practical grips with the problem of anaesthetic accidents and deaths the reports of the Association of Anaesthetists should be a first choice. For more leisurely study of the complications from an academic point of view Keating's book is invaluable and its place on the library shelf assured.

W. W. MUSHIN.

PRACTICAL UROLOGY

Practical Urology. Case-Comments and Late Results. By Alex. E. Roche, M.A., M.D., M.Ch., F.R.C.S. (Pp. 258+xii; illustrated. 35s.) London: H. K. Lewis and Co. Ltd. 1956.

This short, very readable volume describes the clinical and radiological aspects of 51 urological cases, some of them typical. The symptoms in each are presented first, and are followed by the clinical and pathological details, also the after-history and the late result when it is known. The work is entirely from the experience of the author, with no references to the literature. A commentary is usually given in which the writer emphasizes various principles of urological diagnosis which the case illustrates, with details of the pathology of the condition or variations which may occur in the symptoms and physical signs, often flavoured with his well-known humour or adorned with classic quotation. Among the cases described are a number of renal, ureteric, and vesical calculi, in their many clinical variations. Several cases of renal tumour, renal tuberculosis, and hydro-nephrosis of special interest, congenital lesions of the upper urinary tract, and a few rarities such as aneurysms of the renal artery, are also included. Only about one-fifth of the reports relate to diseases of the bladder, prostate, and urethra, so that the emphasis is on diseases of the upper urinary tract, in which radiographic diagnostic aids are so valuable. There is no pretence at over-elaboration in the method of investigation by techniques such as aortography, but a simple, straightforward, over-all picture in each instance is given. The reports contain much surgical wisdom presented in a way easy to remember.

The book is a valuable and interesting ancillary to the standard textbooks of urology. In addition to being of use to the urologist, the radiologist, and the general surgeon, it should be of help to senior students and to general practitioners. It is well produced, and the illustrations in general are good.

L. N. PYRAH.

FREUDIAN PSYCHOLOGY

A Primer of Freudian Psychology. By Calvin S. Hall. (Pp. 137+xii. 13s. 6d.) London: George Allen and Unwin Ltd. 1956.

The author of this primer, who is a professor of psychology in Ohio, has grasped the fact that the importance of Freudian psychology lies in its formulation of a theory of mind which is relevant to normal as well as to abnormal psychology. It has seemed to him, therefore, a good idea to extract from Freud's writings such passages as deal with normal mental function, to paraphrase them so far as possible in non-technical language, and so to build up an outline of normal psychology suitable at the same time for university students and for the general reader. The risks of this procedure, of which the author is well aware, are that in the work of

collation, paraphrase, and exposition the substance of the original texts may be distorted by faulty definition, lack of precise understanding, and defects in the balance of presentation. In his preface Professor Hall expresses the hope that he has been able to escape such errors of commission or omission; and up to a point—as where he quotes directly from Freud or holds closely to the original texts—he has achieved some measure of success. This is offset, however, by a considerable number of theoretical misprisions; also by the fact that his illustrations are drawn largely from the field of preconscious rather than that of unconscious psychology—a labour-saving but often misleading device. It would be invidious in a short notice to single out and argue particular examples of misunderstanding of Freudian definitions; and perhaps it is sufficient to say that, while the primer may serve the purposes of the university student, who needs no more than a smattering of psycho-analysis, it would not do for any accredited student of the subject. The general reader would in any case do better to study some of Freud's own hornbooks, even if these are concerned with abnormal as well as normal psychology.

EDWARD GLOVER.

CURRENT CONCEPTS OF PSYCHOTHERAPY

Contemporary Psychotherapists Examine Themselves. By Werner Wolff, Ph.D. (Pp. 299+xvii. 51s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1956.

The author states in his preface: "The present study is a consideration of the status of psychotherapy as viewed by the adherents of various schools. The tremendous growth of psychotherapy in our time has resulted in a need for clear information on the basic differences, goals, and successes of the various schools of therapy." The method employed was a "guided interview" based upon the answers given to an elaborate questionnaire. Of the 50 psychotherapists approached 43 responded, the majority it would seem with alacrity. Specimen interviews fill the major part of the book.

The author concludes that "the present survey seems to indicate that contemporary psychotherapists recognize that psychotherapy is in a state of fermentation and development." Put more bluntly, they disagreed on most of the wide issues put before them. It is, however, interesting to note among "major trends": (1) The desirable length of treatment on the average was held to be one to two years with two or three sessions a week. (2) Directive and didactic as opposed to a more passive approach was becoming more common. (3) "The average rate of cure was: full cure in 15-20% of patients, improvement in 20-50%, and failure in 15-20%." (4) Psychotherapists found they got their best results with neuroses and hysterias, were less effective with phobias, psychopaths, and delinquents, and least effective with psychotics, obsessionals, and homosexuals. (5) "Very few definite statements concerning the permanency of cures were made. The reason was a lack of systematic follow-up studies. Only 10% of our interviewees made a systematic follow-up of their cases; 34% made an occasional follow-up of their patients; 34% stated that they left the initiative to their patients; and 22% did not care for a follow-up." The reply given by Dr. Joseph Wortis to the question: "Which type of psychotherapy do you think is best and why?" illustrates the difficulties and may commend itself to many:

"Before answering this question, it would be well to define our terms. Psychotherapy, according to my dictionary, is 'treatment of disease, especially nervous disorders, by psychological means.' Unfortunately, however, we do not all agree on what disease and treatment mean. I would like to say at the outset that I cannot accept a definition of nervous and mental disease that includes practically every kind of disorder or discontent and involves almost all humanity.

"I also think it would be better if we did not use a concept of treatment that includes every kind of real

and sensible advice, insight, and help that can be held out to troubled people. I should prefer, from a practical point of view, to limit the concept of disease to the relatively few kinds of disorders that draw on the specific technical equipment of physicians. Unfortunately, however, so large a section of our educated population has been persuaded that the way to achieve personal happiness is through psychotherapy that all private practising psychiatrists, including myself, are called upon to 'treat' people who for one or another reason are very unhappy but by no means diseased. From this point of view, psychiatry has nowadays spread itself out too far and taken on a bigger piece of human discontent than it can ever handle. To say nothing of eliminate. Unless psychiatrists make a distinction between the common or garden variety of unhappiness encountered in our society and bona-fide psychiatric disease, they will be contributing to the current confusion."

DESMOND CURRAN.

The publishers of *Blakiston's New Gould Medical Dictionary* say that 12,000 new terms have been added and 8,000 changes made for the second edition of this 1,463-page dictionary. Some of these are of surprisingly recent introduction for a work of this kind, which includes, for example, meprobamate, prednisone, and penicillin V. The proprietary names of many drugs are also included, though whether a dictionary is the place for them seems questionable. The spelling is American, so that "hematology," for instance, is only to be found so spelt. But the range of words and proper names is commendably international; even the names of living Englishmen appear—among them Geoffrey Hadfield, Sir Leonard Rogers, and F. Parkes Ltd. for 86s. 6d.

About 500 tables in *Handbook of Biological Data* list the measurable attributes of a very wide range of plants and animals, including man. The data include such variables as nutrient requirements, biochemical changes, composition of tissues, chromosome numbers, environmental effects on living creatures, and taxonomic classifications. It is edited by W. D. Spector for the American National Academy of Sciences-National Research Council, and published by W. B. Saunders for 52s. 6d.

The third edition of *List of Films on Human and Comparative Parasitology* has now been compiled under the aegis of the International Scientific Film Association and published by its Netherlands branch. The catalogue includes all the known films on the subject. The third edition has an index according to the general classification of parasites, simplified for the purpose of the list. The information is given under countries; the films available from each country are listed, together with a short description of the subject matter, type of photography, running time, and address from which it is obtainable. Nineteen countries are represented. The catalogue is obtainable from the Hon. Treasurer, Netherland Scientific Film Association, Catharijnesingel 59, ingang Sterrenbos, Utrecht, Holland, price 10s.

In their *Textbook of Physiology and Biochemistry* Professors G. H. Bell, J. N. Davidson, and H. Scarborough give students the conjoined experience of a physiologist, a biochemist, and a clinician. First issued in 1950, the book has gone through a second edition, been twice reprinted, and now reached a third edition. The demand for it is thus evident, and so that it may continue to be adequately satisfied the authors have made considerable alterations to keep the book abreast of recent developments. Text and illustrations remain admirably clear. This fine standard work is published by E. and S. Livingstone Ltd. for 60s.

Professor Alan Moncrieff's booklet *Infant Feeding* was described in these columns as "a clear and practical account, based on much experience," when it first appeared in 1940. Since then it has been reprinted eight times and has now been revised by the author for a second edition. He briefly describes the principles and practice of breast-feeding, artificial feeding, and feeding the premature infant, combining a useful array of detailed instructions with the injunction set out in the preface "to regard each baby as an individual with his or her own ideas about feeding times and quantities." Young doctors, whether in hospital or general practice, will find much worth learning in this booklet. Edward Arnold Ltd. publish it for 2s.

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THROUGH THE LOOKING-GLASS

In a leading article which went to press before the profession's negotiators on Wednesday last week met the Minister of Health, Mr. D. F. Vosper, we said that if the Government refused, through him, to admit the validity of the Spens recommendations "relations between it and the profession will be at breaking point." The breaking point has been reached. The Government has repudiated the Spens reports, reports drawn up to decide the basis of remuneration of consultants and specialists and of general practitioners in a publicly organized medical service, reports accepted by both Government and profession, the terms of which satisfied doctors that, in a National Health Service they for the most part disliked, their status would be preserved and their remuneration adjusted to the changing value of money. Once doctors were safely inside the Health Service Ministers of Health have tried to avoid honouring their obligation to a nationalized profession. Their efforts were rudely shaken when an independent adjudicator, Mr. Justice Danckwerts, made an award to general practitioners in 1952 based on the Spens formula. Just a year ago the then Minister of Health, Mr. R. H. Turton, was informed that a further claim would be made during 1956, and the profession's negotiators, under the combined chairmanship of Sir Russell Brain for the consultants and Dr. A. Talbot Rogers for the general practitioners, presented their claim in June. They took expert economic and statistical advice before arriving at a betterment factor of 24%. As the Minister denied that the Government had a contractual obligation to honour the terms of the Spens reports our negotiators sought the legal advice of Sir James Millard Tucker on this point. His careful analysis of the situation was presented to the Minister of Health in a cogent document of some 6,000 words. The reply to this was a curt rebuttal in a letter of 94 words from Sir John Hawton, the Permanent Secretary of the Ministry of Health, which in effect said: "We don't agree with you. Test it in the courts." The reply was unmannerly in its curtness. In the Government reshuffle under Mr. Macmillan Mr. Turton was replaced by Mr. Vosper, and

last week the Prime Minister took the matter out of Mr. Vosper's hands by recommending the Queen to set up a Royal Commission to inquire into doctors' pay. The *Manchester Guardian* describes this "as quite the wrong instrument for this task." If Mr. Macmillan had given a small advance without prejudice to the major claim and had proposed a Royal Commission on the working and structure of the Health Service generally he would have stood on firm ground, the *Guardian* states, concluding thus: "Now we face a quagmire." It is all a very sad story of evasion and subterfuge, of political expediency, and of double dealing. At any one time during the past years any one of many Ministers of Health could have said: "We don't think the Spens formula and the methods of applying it are really satisfactory. Let's have a look at it together to see if anything more suitable and more practicable can be worked out." But such a straightforward and simple approach seems uncongenial to the political mind and not complicated enough for the civil servant. All they could do was to repeat the White Queen's dictum: "The rule is, jam to-morrow and jam yesterday—but never jam to-day." As we go to press we learn that Mr. Macmillan, in a letter to the Negotiating Committee's chairmen, says that a Royal Commission "does not preclude some interim adjustment." As Alice observed: "It *must* come sometimes to jam to-day."

The White Queen might have been bluffing, but the Chairman of Council, Dr. S. Wand, in an admirably firm reply to the Editor of *Truth* in a broadcast last week made it plain that the medical profession is not, in its present attitude to the Government's attitude. Dr. Wand repeated what he told the General Medical Services Committee last Thursday: the Minister of Health had admitted to the negotiators that "No one can dispute that there is justice in an increase for the doctors." And at the same meeting of the G.M.S. Committee Dr. Wand recalled that in the course of the negotiations with the Ministry of Health in 1950 the Minister of Health had admitted the validity of the Spens formula. The actual words used by the Secretary of the Ministry, in a letter to the B.M.A., were as follows (May 2, 1950): "*The Minister agrees that the Spens Report remains the basis of the remuneration of general medical practitioners until such time as after the usual consultations some other basis is substituted.*" (Our italics.) The Prime Minister's decision to set up a Royal Commission—"some other basis"—has been reached without any consultation. Therefore the Spens report remains the basis of the remuneration of general practitioners, and surely, too, of consultants and specialists, and of hospital staff. The affinity of the

Ministers and the Ministry to the White Queen in *Through the Looking-Glass* is remarkably close.

"It is a poor sort of memory that only works backwards," the Queen remarked.

"What sort of things do you remember best?" Alice ventured to ask.

"Oh, things that happened the week after next," the Queen replied in a careless tone.

What is going to happen the week after next?—a Royal Commission, which is to consider the pay of doctors and dentists and possibly of medical auxiliaries, and "the position of the medical profession in relation to other professional classes in the community." The terms of reference of the Royal Commission have not been announced, nor its composition, but the terms will presumably include what the Prime Minister said would be opportune for an inquiry to embrace: an inquiry wide enough to last two or three years. In the meanwhile, our negotiators were informed last week that the Government are willing to instruct the management side of Whitley Committee B to agree to an interim increase to junior medical staff and dental staff in hospitals. And presumably the management side will be instructed that the increase will be determined "by all relevant factors" and not by the terms of the consultant Spens report. The farce of negotiation with the staff side will be duly conducted but with one side acting on instructions from which it will not dare to budge: it will be conducted "Through the Looking-Glass."

ACTION AND REACTION

The reaction of the G.M.S. Committee to the action of the Minister of Health and the Prime Minister was the same as that of those negotiating for both consultants and general practitioners—anger and distrust. As our report in this week's *Supplement* shows, the G.M.S. Committee seized upon the one essential point in this grave crisis: it is nothing more nor less than the fate of an ancient and learned profession which, trusting in a Government's word, allowed itself to become nationalized in a State-provided medical service. It is not a question of this per cent. or that per cent. in the doctors' pay. The Chairman of Council made this plain in his broadcast last week when he said, to quote *The Times* report, "that if an adjudicator, who ought to be a judge, produced a fair figure in response to the doctors' pay claim, the doctors would accept it." The G.M.S. Committee had no doubt at all that the Spens reports, accepted by the Governments of 1946 and 1948 and by the Minister of Health in 1950, gave the profession a charter of rights in the hazardous experiment of a National Health Service. Without such a charter it would have been folly to

enter the Service. Without such a charter it will be folly to continue in it. That is why the G.M.S. Committee is recommending to a special conference of local medical committees that, "unless the Government agrees to an immediate and satisfactory settlement of the profession's claim or to arbitration, general practitioners throughout the country will be advised to send in their resignations from the Service." The Public Health Committee of the B.M.A. last week resolved to back up their colleagues in the present struggle. The Joint Consultants Committee met on Thursday this week and the Council of the B.M.A. had a special meeting on the same day. Sir Russell Brain informed *The Times* last week that the work of the hospitals will not be interrupted, and that the Committee of which he is chairman "will consider what other action they can most usefully take in support of the claim." General practitioners will, of course, also continue to look after their patients, but if this has to be done outside the present N.H.S. it will be according to a scheme the details of which will be made public at the appropriate time. Hospital staffs cannot provide an alternative scheme, because they have to work in hospitals owned by the State. *The Times* of February 23 gave reports from different parts of the country which showed, for example, that doctors in Wales and Scotland, Birmingham, Manchester, Liverpool, Plymouth, Leicester, were behind the B.M.A. in this crisis: "The doctors' trust in the Government has been badly shaken . . . feelings were running very high among Manchester doctors. . . . There seemed little doubt yesterday that very few Scottish areas would fail to respond to the B.M.A. lead—even Edinburgh, a traditionally conservative city in every way, being highly dissatisfied, according to local opinion, with the Government's attitude to the salary claim," *The Times* reports. The same story is told over and over again in the provincial press.

The medical profession to-day is 24% worse off than it was in 1951, and insists upon some readjustment of pay according to the Spens formula. It insists upon sticking to a principle. The Government rejects the principle and seeks for an expedient. This has brought to a head present discontents with many aspects of Britain's National Health Service. Young men are finding it difficult to enter general practice; the frustrated and overworked general practitioner unloads some—and at times much—of his clinical burden on to hospitals; senior registrars are frozen in their jobs and see little prospect of advancing to more responsible positions. Many have emigrated and many are considering this course. All are deeply disturbed at the way Medicine has got mixed up in politics, and long to see it freed from this unnatural

embrace. Dr. Wand gave expression to this when he said to the G.M.S. Committee last week:

"I am going to ask you, and this is a very serious question, that we have to consider very carefully, not merely whether we can go on working for such an employer now, but whether we can go on working for such an employer in the more distant future. The whole basis on which doctors enter service of this kind depends on trust. Can we any longer trust the Government? If we cannot trust the Government it is not a matter of resigning now, it is a matter of saying we will have nothing to do with any service which is run by any Government; that is, as I see it, the issue before us. The issue is no longer one only of remuneration for the immediate future. . . ."

Before it is too late, as many correspondents suggest, a Health Service might be moulded into a structure within which doctors could work contentedly and so be able to give of their best to the community they live in and care for. There is far more to be settled than the present claim for the fulfilment of the Spens recommendations. That must be settled first. But after that has been done, many consider that the N.H.S. must be overhauled if Medicine is to continue to be a calling and a profession which will attract men and women able to make a valuable contribution to the art and science of Medicine in practice and research.

ANAEMIA IN RHEUMATOID ARTHRITIS

Anaemia is a frequent accompaniment of many chronic diseases not primarily or obviously affecting the haemopoietic system. Thus, chronic renal and hepatic disease, disseminated cancer, and chronic infections are all usually associated with secondary anaemia. Secondary anaemia is also found in rheumatoid arthritis, particularly in patients with active disease, but despite its frequency the exact mechanism of its production is uncertain. Its pathogenesis is undoubtedly complex—which is also true of other secondary anaemias—for not only is the production of red cells impaired but their life-span is shortened. In addition, some patients appear to suffer from genuine iron deficiency. The relevant literature is summarized in three recent papers.¹⁻³

The typical anaemia of rheumatoid arthritis differs significantly from that of true iron deficiency, although there are some similarities. The red cells are normocytic rather than microcytic,⁴⁻⁷ and there is less anisopoikilocytosis than in iron deficiency; similarly, the haemoglobin concentration is reduced,^{4-6,7} but not to the same extent as in iron deficiency; the same is true of the serum-iron level.⁷ The total iron-binding capacity of the serum (siderophyllin content) is normal in rheumatoid arthritis,⁷ but typically increased in

iron deficiency. The free erythrocyte protoporphyrin is usually increased.⁸ These findings, and the unusually rapid clearance from the plasma of iron injected intravenously,⁹ are similar to those found in anaemia associated with infection, in which an increased demand for iron by the tissues has been postulated.⁸ J. J. R. Duthie and his colleagues¹ suggest that extensive tissue damage may be the common factor. The low levels of serum iron cannot be accounted for by impaired absorption.¹ That simple iron deficiency—due to failure of absorption or loss of blood—is not an important aetiological factor is shown by the fact that the haemoglobin levels of only a minority of patients can be improved by oral iron; it is possible that genuine iron deficiency plays a part in causing the anaemia in such patients. Intravenous iron therapy with saccharated iron oxide is a more successful treatment^{5,10,11}; nevertheless, the blood picture seldom returns to normal in patients with active rheumatic disease. The reason for the superiority of intravenous over oral therapy is unknown.

The haemolytic aspect of the anaemia has received attention from several groups of workers.^{2,9,12,13} The classical signs of haemolysis are usually lacking; that is, the concentration of serum bilirubin is not raised, and the excretion of urobilinogen in the faeces is not often demonstrably increased,^{6,7} while the reticulocyte count is usually less than 2%. These apparent anomalies are due in part to the fact that destruction of red cells is only slightly to moderately increased in rate, as a rule not more than three to four times the normal. The greatest increase in destruction of red cells is found in patients whose rheumatoid arthritis is active and progressive. Even so, the degree of excess destruction would not lead to anaemia unless the function of the marrow was impaired; W. H. Crosby and J. H. Akeroyd¹⁴ calculated that healthy bone marrow was capable of a sixfold increase in haemopoiesis and haemoglobin formation. The cause of the shortened life of the red cells is obscure. There is no evidence of an immune mechanism for the haemolysis; the direct antiglobulin test is typically negative.

¹ Roy, L. M. H., Alexander, W. R. M., and Duthie, J. J. R., *Ann. rheum. Dis.*, 1955, 14, 63.

² Alexander, W. R. M., Richmond, J., Roy, L. M. H., and Duthie, J. J. R., *Ibid.*, 1956, 15, 12.

³ Richmond, J., Gardner, D. L., Roy, L. M. H., and Duthie, J. J. R., *Ibid.*, 1956, 15, 217.

⁴ Nilsson, F., *Acta med. scand.*, 1948, suppl. 210.

⁵ Ross, D. N., *Ann. rheum. Dis.*, 1950, 9, 358.

⁶ Jeffrey, M. R., *Ibid.*, 1952, 11, 162.

⁷ ———, *Blood*, 1953, 8, 502.

⁸ Cartwright, G. E., and Wintrobe, M. M., *Advanc. intern. Med.*, 1952, 1, 165.

⁹ Freireich, E. J., Ross, J. F., Bayles, T. B., Emerson, C. P., and Finch, S. C., *Ann. rheum. Dis.*, 1954, 13, 365.

¹⁰ Sinclair, R. J. G., and Duthie, J. J. R., *Lancet*, 1949, 2, 646.

¹¹ ———, *British Medical Journal*, 1950, 2, 1257.

¹² ———, *British Medical Journal*, 1954, 13, 365.

¹³ Bunim, J. J., *Ann. rheum. Dis.*, 1954, 13, 365.

¹⁴ McCrea, P. C., quoted by Mollison, P. L., *Blood Transfusion in Clinical Medicine*, 2nd ed., 1956, p. 168, Oxford.

The evidence for a defect in the function of the bone marrow in cases of rheumatoid arthritis has recently been summarized.³ Microscopical studies on the marrow revealed no striking abnormalities. Iron, detected by the Prussian blue reaction or other chemical means, was present in the majority of marrows (69% of 61 samples) despite the hypochromia of the red cells in the peripheral blood. The cellularity of the marrow was generally normal, with the normoblast count ranging from 10.0 to 46.8%. In only 16 of the 61 marrow samples did the percentage of normoblasts exceed the normal range; this observation is in accord with the peripheral reticulocyte count being normal or only slightly raised. The only other abnormality was a slight excess of plasma cells in 35% of the cases. This could be correlated directly with the concentration of serum globulins. Duthie and his colleagues conclude,³ in agreement with E. J. Freireich and co-workers,⁹ that the anaemia cannot be explained by a deficiency of iron or by haemolysis. It is caused rather by the inability of the marrow to increase the rate of erythropoiesis above the normal level. This in some mysterious way is brought about by the patient's underlying disease.

QUINQUAGENARY OF THE M.I.A.

During the coming week the Medical Insurance Agency, which has its headquarters in B.M.A. House, is celebrating its fiftieth anniversary. Its genesis was a conversation during lunch between the editors of the *British Medical Journal* and of the *Lancet*, Dr. (later Sir) Dawson Williams and Dr. (later Sir) Squire Sprigge. They took notice of the size of the commission paid by an insurance office to the agent through whom a medical man had taken out a large life assurance policy. If such commissions could go to an agency which would arrange policies with most suitable terms for doctors, and if the insured could receive rebates and medical charities the surpluses left over, the benefits of such an enterprise would be kept within the medical profession: this was the idea Dawson Williams and Squire Sprigge had. Early in 1907 Dawson Williams accordingly persuaded the Journal and Finance Committee of the B.M.A. to consider a scheme which would enable doctors to insure against their risks under the Workmen's Compensation Act of 1906. The first meeting of the Insurance Committee met on March 7, 1907, and the minutes of this meeting were headed British Medical Association Medical Insurance Committee, with the first three words scored through with red ink. It was decided, in fact, that the Committee should be independent of the B.M.A., but the Council of the Association promised to assist in any way it

could "the proposed scheme for an Insurance Agency." In November, 1913, the Committee changed its name to the Medical Insurance Agency, so that it should not be confounded with the committees under the National Insurance Act. For many years now it has been known familiarly to thousands of medical men simply as "The M.I.A."

Some idea of its growth and of its great donations to medical charities may be gathered from the following figures. The premiums collected by the agency in 1907 amounted to £1,400; in 1921 to £31,000; in 1936 to £280,000; and in 1956 to more than £2,000,000. In 1909 the Agency gave £47 to medical charities; in 1946, £4,980; and the annual donations since 1951 have been between £23,000 and £25,000. These remarkable results illustrate the growth of confidence of the medical profession in the M.I.A., and *pari passu* with this the increased efficiency of a management whose expertness in the field of insurance has been matched with great integrity in the conduct of business. Many distinguished medical men have acted as chairmen of the M.I.A., but it would not be invidious here to mention the impetus given to its development when Dr. Henry Robinson became Honorary Secretary of the M.I.A. in 1938—as he still is. He made it his first job to secure for the M.I.A. the services of a properly trained expert in insurance, and Mr. A. N. Dixon, now the general manager, was appointed in this capacity. The remarkable expansion of the business of the M.I.A., with its benefits to doctors and medical charities, owes much to these two men. From a single office in the B.M.A.'s premises in the Strand the agency has grown to departmental dimensions in B.M.A. House with branches in many English cities, in Scotland, Wales, and Eire. The two men from whose minds the idea of the M.I.A. sprang are commemorated by a Dawson Williams Scholarship for boys at Epsom College and a Squire Sprigge Fund for orphan girls, both established and endowed by the M.I.A. The M.I.A. to-day is a magnificent monument to the practical wisdom of two medical editors.

CONGENITAL INDIFFERENCE TO PAIN

An otherwise normal person may have a congenital indifference to pain. The condition may pass unrecognized for many years, parents simply congratulating themselves on an unusually stoical child. In other cases some accident which ought to cause pain may occur early in life and the child's behaviour be so unexpected as to lead to the diagnosis. Tests to a full range of painful stimuli will then reveal that they are not appreciated as painful. In some cases some slight element of pain may be experienced, as E. C. O. Jewesbury¹ and others have found, but appreciation is so slight as to be in striking

contrast to that of a normal individual. In equally great contrast is the almost normal appreciation of sharp and blunt and hot and cold sensations—the primary elements of classical "spinothalamic" sensation. Once the condition is recognized, there is usually plenty of confirmatory evidence that it has been present for some time. Thus many and extensive scars, old fractures, often ununited and malunited, or traumatic arthropathies, even to the extent of a fully developed Charcot joint, may be present. In the majority of such cases other modes of sensation are entirely normal, and intelligence is well preserved. Behaviour is altered only in so far as reaction to pain is concerned.

There is another and larger group of individuals who also show indifference to pain. The condition is here part of a more general mental defect, and will fairly commonly be found if looked for in mental deficiency hospitals. The disadvantages and slight advantages of the condition are well illustrated in this setting. The diagnosis of severe disease can be made much more difficult by the absence of reaction to pain, and the onset of major catastrophes may pass unnoticed. On the other hand, the patient bears without apprehension a course of treatment entailing frequent painful injections. In this group the unusual reaction to pain is rightly regarded as dependent on the known structural abnormalities of the central nervous system which accompany mental defect. But in the first group, for which the term congenital indifference to pain should be reserved, the problem of what neurological deficit exists is a fascinating and unsolved one. What evidence there is does not suggest any peripheral abnormality.

At the central end of the pain mechanism two conditions have some similarities to this. The lesion of frontal leucotomy is sometimes used to produce an indifference to pain when it is severe and caused by irremediable disease such as carcinomatosis. But here the picture differs in an important respect. After leucotomy the apprehension of pain to come—so important a part of the suffering in chronic recurrent pain—is abolished and the clinical benefit may be enormous. Yet the immediate reaction to pain may not be reduced; indeed, it may sometimes be enhanced by the uninhibited behaviour that follows this operation. The other condition which may provide a clue is one described by P. Schilder and E. Stengel² as "asymbolia for pain." In this a condition of indifference to pain occurs in adult life, probably as a result of lesions in the posterior parietal region of the dominant hemisphere, and is commonly associated with dysphasic difficulties. A congenital defect in the same cortical area could account for the cases with an innate indifference. This argument is strengthened by the occasional report of other agnosias in association with congenital indifference to pain. For the time being this is perhaps the most satisfactory explanation, and we may tentatively regard the condition as one form of limited congenital agnosia. This is to some extent simply cloaking our ignorance in fine language, since the detailed cerebral abnormalities

(anatomical and physiological) in all these conditions are largely unknown. While they remain a matter for further investigation, the removal of all pain experience from an individual's life suggests interesting avenues of speculation. In the words of Macdonald Critchley, who with his flair for the neurological borderland has several times discussed this condition,³⁻⁵ "the subject may well prove to be richer and still more rewarding to the psychologist and also to the philosopher."

DANGERS OF CHICKEN-POX

Chicken-pox is one of the most benign diseases. It seldom provides interest for the clinician or the epidemiologist, nor stimulus to the specialist in preventive medicine. Children are expected to contract the infection before or during their schooldays, and generally there seems little reason to prevent this from happening. Complications are uncommon, often taking the form of skin sepsis or respiratory infections as a result of secondary invasion by staphylococci or streptococci, but they are seldom serious. Neurological lesions such as encephalitis, myelitis, and polyneuritis are rarely encountered but carry a mortality of 10%, coma and convulsions being the two signs of most serious omen.¹

Primary chicken-pox pneumonia has been described on few occasions, but is fully discussed in two recent papers,^{2,3} one of which gives details of 16 cases seen in Boston, Massachusetts. The condition is an interesting one and could easily be overlooked or ascribed to secondary pneumonia. In nearly all cases the rash is widespread if not actually confluent, and many vesicles are present in the mouth and pharynx. Within five days of the appearance of the rash the patient, usually an adult, develops a distressing cough productive of a little blood-streaked sputum, and may be critically ill. The temperature, which is high at the onset, settles by lysis after one or two weeks. Antibiotics do not influence the course of the disease but probably help to prevent secondary infection. The radiological changes in the lungs are remarkably typical. There are widespread nodular shadows, rather larger than those seen in miliary tuberculosis, superimposed on increased lung markings. Rapid changes can be followed in serial radiographs, some lesions resolving while new ones appear. There is no lobular consolidation or collapse. Resolution in most cases is complete within two weeks. In general the patients with the severest skin lesions develop the most marked radiological changes, but even then the physical signs in the lungs are few. There were no deaths in the Boston series, but the authors refer to reports of four fatal cases in which the histological appearances were in keeping with a virus infection. Similar lung changes associated with widespread visceral lesions have also been found in newborn infants when the infection has started *in utero*.⁴

There has recently been evidence, also from Boston,

¹ Miller, H. G., Stanton, J. B., and Gibbons, J. L., *Quart. J. Med.*, 1956, **25**, 427.

² Tan, D. Y. M., Kaufman, S. A., and Levene, G., *Amer. J. Roentgenol.*, 1956, **76**, 527.

³ Southard, M. E., *ibid.*, 1956, **76**, 533.

⁴ Lucchesi, P. F., La Boccetta, A. C., and Peale, A. R., *Amer. J. Dis. Child.*, 1947, **73**, 44.

⁵ Haggerty, R. J., and Eley, R. C., *Pediatrics*, 1956, **18**, 160.

¹ Jewesbury, E. C. O., *Brain*, 1951, **74**, 336.

² Schilder, P., and Stengel, E., *Arch. Neurol. Psychiat. (Chicago)*, 1931, **25**, 598.

³ Critchley, M., *British Medical Journal*, 1934, **2**, 891.

⁴ *Bristol med.-chir. J.*, 1935, **82**, 191.

⁵ *Ann. Intern. Med.*, 1956, **48**, 737.

that varicella may become a diffuse fulminating infection in a patient who is receiving cortisone.⁵ After seeing two such cases in two years R. J. Haggerty and R. C. Eley suspected something more than a coincidence and sought further information. Inquiries directed to sixty-five physicians in the United States, Canada, and England brought to light ten similar fatalities. The ages of children affected ranged from eleven months to eight years, and they had received cortisone for periods of a few days to two months. Other patients receiving cortisone had severe skin lesions, or an atypical rash making early diagnosis difficult. Although varicella sometimes takes an uneventful course in spite of the administration of cortisone the Americans now advise the rapid withdrawal of such treatment from susceptible children who have been exposed to the infection. These observations may be difficult to explain but should be widely known, for the use of cortisone is increasing and chicken-pox is ubiquitous.

PYROGENS AND FEVER

The process by which fever is produced has puzzled clinicians since the earliest days of medicine. With the advent of the bacteriological era it soon became apparent that fever was usually the result of microbial infection. But the frequency with which a febrile response is associated with infarction, internal haemorrhage, and trauma, even when uncomplicated by microbial infection, emphasizes that infection is by no means the whole story. The parenteral introduction into the body of warm-blooded animals not only of bacteria, dead or alive, but of almost any foreign protein is nearly always followed by a rise in body temperature. A single explanation of these diverse observations postulates that the ultimate stimulus to the heat-regulating centres in the hypothalamus is an endogenous substance resulting from cellular or tissue injury.

V. Menkin, who has done so much to formulate a dynamic concept of inflammation, has isolated from sterile inflammatory exudates a series of substances capable of eliciting more or less separately the various components of the inflammatory reaction, including the development of fever.¹ To the substance so isolated, which causes a distinct rise of temperature when injected into experimental animals, he has given the name pyrexin. More recently two non-protein substances of bacterial origin have been widely used in the study of experimentally induced fever. These are the polysaccharide from *Serratia marcescens*² and a lipopolysaccharide from *S. abortus equi*.³ The relationship between these substances and pyrexin is therefore of considerable interest, and Menkin himself has done much to clarify it.⁴ Not only is the intravenous injection of one of these substances followed within an hour or so by a rise in temperature of 2-3°F. (1-2°C.), but the serum of the recipient simultaneously acquires the

property of inducing a similar febrile response when injected into another animal. The serum of animals injected with pyrexin, however, does not acquire this capacity to induce a further febrile response in another recipient. Menkin has therefore suggested, on the basis of further experiments, that these pyrogens of bacterial origin do not themselves directly influence the thermoregulating centres but that an interaction in some way with the euglobulin of the plasma results in the formation of a pyrexin-like material. It is then this material in the blood stream that directly influences the regulating centres of the animal itself and can in addition similarly affect those centres in another animal when passively transferred. Much the same conclusion was reached by E. Atkins and W. B. Wood⁵ as a result of their work on the pathogenesis of the fever produced in rabbits by the injection of typhoid vaccine. Their results strongly support the view that the bacterial pyrogen excites in some way the formation of an endogenous pyrogen. Thus, if blood is withdrawn from rabbits 5 minutes and 120 minutes after the injection of the vaccine and injected into other rabbits, then the febrile response to the 120-minute sample is significantly quicker than the response to the 5-minute sample. Presumably the increased latent period with the earlier sample represents the time required for the formation of the endogenous agent.

While Menkin regards the pyrogen in sterile inflammatory exudates as arising in some way, possibly by proteolysis, from plasma euglobulin, I. L. Bennett and P. B. Beeson⁶ have produced considerable evidence that in rabbits a main source is the polymorphonuclear leucocyte. Of the many types of cell extract studied by them only extracts of these leucocytes were active. The properties of this pyrogen differ in many ways from those of pyrexin, which they suggest might well be nothing more than the result of bacterial contamination of Menkin's preparations. This contention has been convincingly rebutted in Menkin's most recent paper.⁴

Some at least of the considerable differences of opinion held by workers in this field might be due to the different methods of assessing a febrile response. Individual responses to a fixed dose of pyrogen vary not only in the height of the fever attained but in its duration. In a well-controlled experiment to determine the best method of assessing these responses F. Wendt and colleagues⁷ found no correlation between the quantity of pyrogen and the duration of the subsequent fever, but a definite correlation with the maximum height of the fever. A still better correlation was found between the dose and the area under the time-temperature response curve. This curve is simply obtained by plotting the temperature at regular intervals after the injection of the pyrogen. The coefficient of correlation between the dose and this area is 0.817, which is significantly better than the figure of 0.501 obtained for the relationship between dose and maximum height of fever. A further point of great interest in the work of Wendt and his colleagues is that it is carried out entirely on human subjects. From the experimentalist's point of view it is most gratifying to find how similar are the responses of man and animals.

¹ Menkin, V., *New Concepts of Inflammation*, 1950, Springfield, Ill.

² Shear, M. J., *J. nat. Cancer Inst.*, 1944, 4, 461.

³ Westphal, O., and Luderitz, O., *Angew. Chem.*, 1954, 66, 407.

⁴ Menkin, V., *J. Lab. clin. Med.*, 1955, 46, 423.

⁵ Atkins, E., and Wood, W. B., *J. exp. Med.*, 1955, 101, 519.

⁶ Bennett, I. L., and Beeson, P. B., *J. exp. Med.*, 1953, 98, 477 and 493.

⁷ Wendt, F., Snell, E. S., Goodale, F., Jr., and Cranston, W. L., *Clin. Sci.*, 1956, 16, 485.

UNDERWRITING SUBSTANDARD LIVES

MODERN LIFE ASSURANCE PRACTICE

The revision of underwriting standards necessitated by medical progress was the theme of Dr. K. SHIRLEY SMITH'S presidential address to the Assurance Medical Society on February 6. Speaking as a cardiologist, he dealt particularly with the creation of "substandard pools" as a means of extending life cover to those with certain well-defined types of disability, such as diabetes, hypertension, and coronary disease, without at the same time financially penalizing the "first-class life." Of all proposals for life assurance, he said, about 90% were accepted at ordinary rates, 3-4% rejected outright or postponed, and 6-7% accepted as substandard lives. In Britain in 1951 assurances on substandard lives totalled £230m.—a substantial volume of business.

How should an impaired life be translated into terms for a policy? There were many answers. In Britain the usual practice was to assess each proposer individually and to express the extra risk in terms of years added to his age: rating up by five years, for instance, corresponded to an extra mortality of about 9% when the age of entry was 30 and to about 34% when it was 50. But, unless the extra mortality due to the proposer's disability ran exactly parallel with the general mortality curve, this method of rating was unsatisfactory. Another way was to accept substandard lives in large groups or pools. There was nothing new about this. The first of the big substandard pools—for diabetics—was started in 1949 by the Mercantile and General Reinsurance Company. Since then a pool had been formed for hypertensives, which had been going for about four years, and now a coronary pool had just been begun. The premiums for those in these substandard pools were weighted so as to discount the effect of their inclusion on the with-profit policies of first-class lives.

The Coronary Pool

Into the coronary pool were accepted those with angina insufficiently severe to prevent their working, and those who had had a single coronary thrombosis. Any additional impairment excluded them.

Coronary disease was becoming a particularly acute problem for assurance companies. An increasing number of men in their sixties and seventies were seeking life cover, and often for substantial sums—in itself a factor known from mortality statistics to be associated with a higher than average mortality. A further difficulty was the importance of the history—and therefore of the proposer's frankness—in assessing a coronary case. Estimates of the long-term prognosis in angina had become increasingly optimistic during the past three decades. Last year P. D. White and his colleagues¹ in Boston had published the results of a 25-year follow-up of patients with angina, finding an average survival from onset of nearly 10 years. In those who survived longest hypertension, cardiac infarction, cardiac enlargement, and abnormal electrocardiograms were infrequent findings. During the period of follow-up the excess annual mortality of this anginal group—7% for the men and 5.3% for the women—had remained constant, and there was no difference between a younger and an older group of patients in this respect.

The Boston team had also completed a similar follow-up of 200 patients with cardiac infarction.² Thirty-eight had died within four weeks of the initial attack. Of the remaining 162 about one-half had survived for five years and one-third for 10 years; only 14% lived on for 15 years and 5% for 20 years. The best index for long-term prognosis was the degree of clinical recovery from the attack: when this was complete 56% were alive after 10 years—nearly double

¹ Richards, D. W., Bland, E. F., and White, P. D., *J. chron. Dis.*, 1956, 4, 423.

² *ibid.*, 1956, 4, 415.

³ Cole, D. R., Singian, E. B., and Katz, L. N., *Circulation*, 1954, 9, 321.

the average survival. In another important follow-up of 461 cases of cardiac infarction³ two-thirds had survived for more than five years and nearly half for more than 10 years. It was on these findings that the coronary pool was based. The other principle on which the pool was founded was the recently established fact that the long-term prognosis depended on the severity of the initial attack. Another study from Boston, of 100 patients under 40 years of age with cardiac infarction, had shown that 37 of their fathers had died from coronary attacks compared with only 18 in a matched control group, and that a heavy muscular build rather than obesity was predisposing. More notice, therefore, said Dr. Shirley Smith, should be taken of family history and build, and probably also of heavy smoking.

Outlook in Other Disabilities

Surveys in both Britain and America had revealed a striking fall in the incidence of rheumatic fever: first attacks were now only one-third as frequent as twenty years ago. There had been a corresponding drop in the mortality of children from rheumatic heart disease, but the rate for adults had not fallen. The view was now that if acute rheumatism was going to cause heart disease definite physical signs would become apparent within five years in almost every instance.

Cancer was an increasing menace. In his own recent review of 735 claims cancer had accounted for between 11 and 12%; and as a cause of claims within the first two or three years of life assurance malignant disease had been said to rank second only to road accidents. No relaxation of underwriting standards was possible here, and care was still needed if precancerous lesions such as duct papilloma of the breast or polyposis of the colon were found.

On the other side of the picture, the decline in mortality from respiratory tuberculosis was one of the most arresting developments in public health. It was not so very long ago that any personal history of the disease automatically disqualified a proposer from life assurance. Nowadays many medical officers would advise acceptance if the proposer had been symptom-free and the disease clinically inactive for five years—provided it had never been extensive. A history of pleurisy with effusion within the past five years, however, still called for a most careful appraisal.

The general relaxation of underwriting standards in many cases of peptic ulceration reflected the improvements in treatment of both the disease itself and its main complication, gastro-duodenal haemorrhage. However, gastric ulcer was still a difficult disease to assess, as freedom from symptoms did not necessarily mean cure. In spite of the increasing tendency to treat peptic ulceration surgically, the Society of Actuaries' "impairment study" in 1951 had shown a significantly lower mortality in the medically treated cases. No doubt this was due to a higher proportion of the more severe cases being included among those coming to surgery.

The widening scope of life assurance, and especially the group systems, Dr. Shirley Smith said in conclusion, not only represented a great advantage to the community but also brought the life assurance offices increasing credit.

The Common Cold Research Unit at Harvard Hospital, Salisbury, has received over 900 inquiries from prospective volunteers as a result of its appeal in January. Of the total, 844 were from people living in England, 323 of these being from London and the Home Counties. Outside this area, the largest number of inquiries, 55, came from Yorkshire. Scotland produced 35 people who showed interest, Wales 23, and Ireland only 3—one fewer, in fact, than India, from which four letters were received. One person wrote from France. Those volunteers who go to the hospital have their fares paid up to a maximum of £3, and 3s. a day pocket money for the 10 days they spend at the Unit. Not more than half the volunteers are likely to catch cold during their visit.

MEDICINE BY THE PERSIAN GULF

NEW HOSPITAL IN QATAR

On February 5 the Shaikh of Qatar, His Excellency SHAIKH ALI BIN ABDULLA THANI, opened what one experienced British observer describes as perhaps the most luxurious hospital to be found in any country. The hospital is the General Hospital at Doha, the capital of the Shaikhdom. Qatar is an oil-bearing peninsula projecting into the Persian Gulf, about 8,000 square miles (20,700 square km.) in extent, with a population of about 30,000. The oil is worked by a British company under a concession granted by the Shaikh.

Luxurious Design

The hospital, whose design was the subject of an R.I.B.A. competition some years ago, cost about £3m. to build. It has 130 beds, 44 of which are in single-bed wards. The remainder are in two-, four-, and six-bed wards. Each single-bed ward has a large verandah with a bathroom and lavatory; altogether there are 128 lavatories in the hospital. There is an isolation block, an orthopaedic wing, and a paediatric unit. The five operating theatres are equipped with the most modern fittings and surgical instruments. They are supplied with filtered dust-free sterile air from a special heating, cooling, and humidifying plant, which is controlled electronically from a switchboard in the theatre, and there is piped oxygen and nitrous oxide to the wards and theatres. First-class diagnostic and therapeutic x-ray equipment has been installed. The physiotherapy department is lavishly equipped. The pathological department comprises laboratories for biochemistry, haematology, serology, and histology. The pharmacy is equipped with electric mixers and machines for making ampoules and tablets. A small Arabic and English press prints hospital literature. There is a signalling system for summoning doctors and staff. The kitchen and laundry are exceedingly well provided, and there is even a piped supply of chilled water running everywhere in the building. The main A.C. plant to the wards is claimed to be the largest in the Middle East.

At the opening ceremony the B.M.A. was represented by Dr. IAN GRANT, who was visiting Qatar as a guest of the Government. Distinguished medical representatives had also come from Saudi Arabia; the medical faculties of Bagdad, Cairo, and Damascus; from the American University at Beirut; from Kuwait, Bahrain, and the Lebanon. And there were also the medical officers of the local oil companies.

Health in a Desert Community

The Shaikh of Qatar deems himself the Father of his People, and regards it as his duty to promote a very high standard of health in his country. Already almost 100% of the population have been vaccinated. All the children have had B.C.G. vaccination, and mass miniature radiography of the whole population is being done; so far over 6,000 persons have been x-rayed. The incidence of tuberculosis in this sample was 12 per 1,000. At present all active cases of tuberculosis amongst the native population are sent to a sanatorium in the Lebanon, but plans are afoot to build a 60-bed sanatorium in Doha. If foreign nationals develop the disease they are given 100 rupees and a free passage to their own homes. In all this preventive work, and much else, the head of the State medical department, Colonel A. E. KINGSTON, has played an outstanding part. In addition, during the last five years he has not only supervised the building of the new hospital but has undertaken the administrative and much of the routine medical and surgical work at the old hospital it replaces. At the new hospital there are at present a consultant physician (Dr. C. ELGOOD) and a consultant surgeon (Mr. R. D. EWING). Additional staff is required, however, and there will be vacancies for well-qualified specialists in ophthalmology, anaesthetics, pathology, E.N.T., radiology, and gynaecology.

RADIATION HAZARD FROM DIAGNOSTIC RADIOLOGY

U.N. COMMITTEE SEEKS FACTS

The United Nations' scientific committee on the effects of atomic radiation has issued a statement headed "The Responsibilities of the Medical Profession in the Use of X-Rays and Other Ionizing Radiations." In it the committee asks for information from the profession in each country on how the medical hazards might be minimized, and for an estimate of the total radiation to the gonads received by the population before and during the reproductive age. Where estimates have been made, states the committee, diagnostic radiology appears to account for "the greatest gonad irradiation of the population." The committee, which was established by the General Assembly in December, 1955, consists of scientific delegates from fifteen nations, including the United Kingdom, Australia, Canada, India, the United States, and Russia.

Limiting the Gonad Dose

Discussing permissible levels of irradiation for the whole population, the committee states: "It is considered prudent to limit the average dose to germinal tissues from artificial sources to the order of magnitude of that received from all natural sources." In estimating this dose, the relevant dose is defined as the "mean gonad irradiation among the population as a whole up to the end of the average reproductive period." In Sweden and the United States, says the committee, genetic irradiation from diagnostic radiology is known to be at least equal to that from natural sources, while in Britain a minimum figure of 22% has been given. It is clear, therefore, even without more exact data, continues the statement, that this type of exposure can be substantial in countries with extensive medical facilities.

The committee accordingly asks radiologists to suggest ways of reducing such exposure. In particular the committee would like to know the extent to which attention to the following points might be expected to reduce irradiation of the gonads: (a) Better design or shielding of equipment; (b) fuller training of those carrying out radiography and fluoroscopy; (c) local shielding of the gonads; (d) the use of radiography rather than fluoroscopy when the information given would be equally satisfactory; (e) avoidance, by better administrative arrangements, of unnecessary repetition of the same examination; (f) studies of various medical conditions such as peptic ulcer to define the exact circumstances in which a radiological examination really assists in treatment or prognosis. In Britain the committee recently appointed under Lord Adrian's chairmanship to review radiological practice (see *Journal*, February 16, p. 413) is expected shortly to be sending a questionnaire on these and kindred matters to departments of radiology and radiotherapy and to others concerned. This body will receive evidence from British radiologists. Its secretariat is at the Ministry of Health, Savile Row, London, W.1.

Monthly meetings are held at the Royal Northern Hospital, London, between the hospital staff and family doctors. Many day-to-day medical difficulties have been discussed, but recently there was a more general debate on "The Medical Out-patient Service and the Family Doctor's Problems." Most of those present emphasized the importance of the exchange of careful and adequate letters between general practitioner and consultant. The former could sometimes provide more information about the home situation, previous investigations, and drugs given, while those from hospitals were often delayed in arrival and on occasion a trifle inhuman or obscure. Follow-up letters, both from the family doctors and from hospital, were to be encouraged, and the value to the G.P. of negative findings at hospital was also stressed.

Reports of Societies

CORONARY THROMBOSIS

PET THEORIES AND AWKWARD FACTS

The reason for the present high mortality in Britain from coronary disease is still obscure. Speaking as an epidemiologist before the Manchester Medical Society recently, Dr. J. N. MORRIS could find no proof of the view that fats are the main cause; and he was at some pains to point out that neither the incidence nor necessarily the aetiology of coronary atheroma runs parallel to those of ischaemic heart disease. Dr. Morris is director of the Medical Research Council's social medicine research unit. In Britain before the first world war coronary atheroma was apparently rife but ischaemic heart disease less common than now, he said. An increase of massive thrombosis in atheromatous coronary arteries seemed to be one element in the modern transformation. Moreover, it was possible to distinguish occlusive from merely mural coronary artery disease—thus in deaths from peptic ulcer, in contrast with what happened in hypertension, there seemed to be a selective increase of occlusive disease—and this might provide another approach in the search for environmental factors.

A nation-wide survey of necropsies in middle-aged males, in which 200 departments of pathology had co-operated, had shown an excess of ischaemic myocardial fibrosis in those with light occupations dying of cancer, injuries, etc. This excess was most noticeable in the case of solitary scars of large healed infarcts, a finding which might link up with the previous observation of an excess of "sudden deaths" and other rapidly fatal ischaemic heart disease in sedentary workers such as bus drivers and clerks.

Doubts about Dietary Fats

Discussing the main social pathology now postulated—that Western man was eating himself into the disease—Dr. Morris regretted that he could do no more than share his own confusions. What might be called the "appeal to epidemiology" was persistently refusing to confirm hypotheses of a single or simple dietary aetiology for ischaemic heart disease. In the present climate of opinion he found such a negative role exceedingly uncomfortable. But it was impossible to match in any logical way what was known about mortality from coronary heart disease with the known trends in fat consumption. Thus, the marked variations in mortality among Western countries with similar high fat-intakes disposed of any story that total fat consumption was the critical factor. Changes in the consumption of animal fat in Britain during the present century could be related to changes in the incidence of coronary atheroma as recorded at the London Hospital, but they showed no relation to the Registrar-General's figures of mortality from coronary heart disease. The trend of consumption of butter-fat in Britain showed less than no relation; the steep increase in coronary deaths since 1943 was only one illustration of this.

Changes in the intake of vegetable fats resembled the mortality experience better, and those in hydrogenated fat much better, except that the distribution of coronary mortality by social classes disagreed with the class pattern of margarine intake. International experience was even more contradictory: Norwegians, who had a very high consumption of margarine, seemed to have far less fatal "coronary thrombosis" than New Zealanders, who ate very little. Perhaps the fish the Norwegians ate protected them, but this did not seem to help Aberdeen, which registered twice the coronary death rate of Oslo. In terms of total essential fatty acids the only data available for Britain gave no support to the hypothesis that the population was now suffering from an absolute or relative deficiency of these nutrients, and international comparison again showed anything but a homogeneous picture. Perhaps we were still dealing with rather a dim reflection of the true dietary causes; perhaps several

dietary factors were involved; perhaps diet was only one of several causes of ischaemic heart disease. More and better statistics of disease and food trends were urgently needed, said Dr. Morris in conclusion. It seemed to him a hopeful sign that the World Health Organization had now entered this field.

PSYCHOLOGICAL PRECIPITATION OF EPILEPSY IN CHILDREN

[FROM A SPECIAL CORRESPONDENT]

On February 14 the Child Psychiatry Section of the Royal Medico-Psychological Association, under its chairman Dr. K. CAMERON, discussed the role of psychological factors in the precipitation of epileptic attacks. Paediatricians were specially invited, and two of them, Dr. J. P. M. Tizard (Institute of Child Health) and Dr. Robert Shanks (Glasgow), opened the discussion with Dr. D. A. Pond (Maudsley Hospital).

Petit Mal and Temporal-lobe Epilepsy

Dr. POND referred particularly to two groups of children—those with petit mal and those with temporal-lobe attacks. The former type of attack could be precipitated almost instantaneously, he said, by certain disturbing situations or even by asking emotionally charged questions during an interview. The attack seemed to repress the unpleasant emotion from consciousness and sometimes even the question causing it. Of course, not all petit-mal attacks were so produced, and other more directly physical factors such as overbreathing, intermittent photic stimulation, and occasionally noise were usually more important. A rare condition of particular interest was that in which the child apparently discovered for itself the epileptogenic effect of photic stimulation, which he would then simulate by flickering his fingers across his eyes while staring at the sun or a bright light, thus producing brief petit-mal attacks. All of the opening speakers had seen one or two such cases and all stressed the compulsive nature of the act in these children. Dr. Pond's case, which had received three months' in-patient psychotherapy, had shown the same passivity and stubbornness he had previously described as characteristic of many children with petit mal.

By contrast with petit mal, the psychogenic precipitation of temporal-lobe attacks was never so instantaneous, but increase of emotional tension over days or weeks often greatly added to the number of attacks. This was more easily appreciated when children were discharged from hospital to emotionally disturbed homes than from retrospective histories from their parents.

Dr. Pond then turned to the mechanism of psychogenic precipitation, and mentioned briefly the older theories of the possible influence of emotion on the cerebrovascular system, the autonomic nervous system, and the endocrine glands. None of these theories could satisfactorily explain the instantaneous precipitation of petit mal. During the attack the abnormal activity was bilaterally synchronous and probably related to the normal symmetrical activity of waking and sleeping that was controlled by the so-called centrencephalic system. This similarity, he thought, helped one to understand the mechanism of the seizures. But to explain their precipitation by emotion it was necessary to postulate a further process akin to conditioning. Temporal-lobe seizures originated, it seemed, in those parts of the cerebral cortex where was to be found the highest level "representation" of the somatic concomitants of emotion. But here again the mechanism of the seizures was better understood than their psychological triggering. The stimulus appeared to be a build-up of emotional tension, and sometimes the stimulus was quite specific, as in those cases of epilepsy where the attacks were provoked by particular pieces of music.

Breath-holding Attacks

Dr. J. P. M. TIZARD first spoke of the breath-holding spells of infants. These were certainly precipitated by frustration,

he said, and occurred in children who seemed unusually bad-tempered and irritable. Some of the spells ended in a brief tonic-clonic attack, presumably as a result of anoxia from the breath-holding. But a small proportion of such babies developed epileptic attacks in later years. He thought that fright was the most important emotion precipitating petit-mal attacks. One of his children with compulsive autophotic stimulation had been seen by Dr. D. W. WINNICOTT, who made the interesting suggestion that the compulsive flickering was an attempt by the child to bring the spontaneous attacks under some sort of voluntary control. Dr. Tizard went on to say that he thought the psychogenic precipitation of major seizures was much less obvious, since there was nearly always an interval of hours between the fit and the preceding emotional upset. In these cases the emotion usually seemed to be related to anger and rage rather than fright. He also wondered if the fact of major seizures being commoner by night than by day was related to night terrors acting as precipitating factors.

Dr. ROBERT SHANKS also thought that major seizures were precipitated, if at all by emotions, only by fear and rage, whereas anxiety produced petit mal. He contrasted the older view of epilepsy as a psychological illness with typical personality changes with the current view that all fits were caused by lesions, some of which, if in the temporal lobe, also produced personality change. Breath-holding produced major seizures by anoxia, whereas the apparently opposite state of overbreathing produced petit mal. Both paediatricians agreed with Dr. Pond that the frequency of attacks of petit mal depended closely on the patient's emotional state.

Television and Photic Stimulation

In the ensuing discussion several speakers expressed similar views supported by case histories. Dr. MARGARET LOWENFELD (London) made the interesting point that sometimes one had to choose between controlling the patient's fits, or leaving him psychologically more normal and alert though having seizures. Dr. R. W. TIBBETTS (Birmingham) and others had seen cases of epilepsy, both major and minor, apparently precipitated by watching television, but these might be a special instance of intermittent photic stimulation.

Your correspondent was impressed by the unanimity of paediatricians and psychiatrists on the facts of the psychogenic precipitation of seizures, but much remains to be learnt about the underlying mechanisms, both physiological and psychological.

Further details have now been released about the research laboratories for medical physics and urology at Leeds General Infirmary, towards the cost of whose building the Wellcome Trust has made a grant of up to £60,000 (see *Journal*, February 2, p. 295). The total cost of the laboratories and their equipment is put at about £120,000, and both the United Leeds Hospitals Board and Leeds University will be contributing substantially to the extra cost. The urological unit was formed in 1950, under Mr. L. N. PYRAH, who was appointed to a personal chair in urological surgery last October, with departments at the General Infirmary and St. James's Hospital. Last year the Medical Research Council accepted major responsibility for the unit's research programme and assisted in creating an associated clinical research unit with Professor Pyrah as honorary director and Dr. F. M. PARSONS as assistant director. The university department of medical physics was also established in 1950, Dr. F. W. SPIERS being appointed to the chair, and increasingly its clinical and research programmes have been associated with those of the urological unit. In addition, the department is carrying out research on electromyography and electroencephalography, the application of electronic scanning to radiology, the measurement of whole-body radioactivity for such purposes as the estimation of occupational hazard, and the physical aspects of x-ray and radium therapy.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Vagotomy for Duodenal Ulceration

SIR,—Restoring gastric digestion and bodily nutrition to as near a normal state as possible at the minimum risk is our aim in the surgery of duodenal ulcer. Analyses of follow-up records, discussions, and correspondence, such as have appeared recently, continue to contribute to this end, but there is yet no general acceptance of one operation which so fulfils our criteria that standardization seems in sight. I would like space in your columns to endorse one point of view and hope that something useful may be added.

Since Dr. George Crile told me some five years ago of their large and encouraging experience with gastro-jejuno-stomy and vagotomy at Cleveland, I have used this procedure increasingly until now it is routine, and up to date there have been no exceptions to the content of our patients. Dr. Crile said, if I remember him rightly, that up to 7% might develop marginal ulceration, and these cases were cured by gastrectomy, still leaving the scales weighted heavily in favour of the less mutilating operation. He also made the point that there was a definite economic advantage, since these patients were out of hospital and back to work in a shorter time. This, too, has been our experience—most are out of hospital within ten days and back to work within the month. Nutrition is unaffected and post-prandial discomforts are rare. In all hands it is a safer operation, even in these days of safe gastrectomy. In the very young patient, on whom most surgeons are reluctant to perform a major reaction, it makes the decision less onerous. Results are excellent in women, whereas they do not seem to take kindly to gastrectomy for duodenal ulcer. Incidentally this operation, in addition to apposition of the hernia syndrome and is particularly applicable if a duodenal ulcer is present. Last, and of course least, but not unimportant, is that vagal section and short circuit is a much less time-consuming technique, and this factor cannot be regarded of small significance when the waiting time for these patients in some hospitals is over three years.

These advantages are countered only by the threat of marginal ulceration. However, the published incidence in this country has shown a remarkable variation, and the highest figure quoted is difficult to reconcile with personal experience. It would seem that this operation deserves a more extensive trial under scrutiny. I believe myself that to-day a duodenal ulcer patient is offered his best chance by finding a keen physician, who uses a reluctant surgeon, who in turn uses gastro-jejuno-stomy and vagotomy as his first line in surgical treatment.

As to other procedures, let it be said categorically that the Billroth I resection and vagotomy achieves results as good, in terms of function, morbidity, and mortality rate, as the best by any other operation. The factor which militates against its general use, and which has not been sufficiently emphasized, is that exceptional skill and experience are required if it is employed in all cases. The modern Polya comings in spite of a well-formed valve. A modification which embodies Mr. Capper's recommendations and does seem to mitigate these troubles is to use the original Billroth II, in which the stomach remnant is closed: the distal end is then brought across to the right side and sutured in the region of the right free margin of the lesser omentum so that the axis of the gastric remnant approximates to that of the normal stomach. A short loop, small stoma, iso-peristaltic gastro-jejuno-stomy is then added.—I am, etc.,

London, W.1.

D. LANG STEVENSON.

Vaginitis

SIR,—The clinical trials of Dr. R. F. Jennison and Dr. J. D. Llywelyn-Jones (*Journal*, January 19, p. 145) have shown that a 1% watery solution of gentian violet applied to the vagina was not effective in monilial vaginitis. In my experience the inefficacy is probably due to the acid reaction of the vagina: an acid reaction is known to decrease the permeability of living bacteria and fungi for basic substances.

Recently I advanced a general principle of pharmacodynamics. The efficacy of any drug or chemical will be increased or decreased by diminishing or increasing respectively its solubility in the solvent or vehicle in which it is applied.¹ Based on this principle, a very effective fungicidal paint was evolved, consisting of an alcoholic solution of methyl violet (1–2%), which is diluted before use with an equal part of 0.1% solution of bicarbonate. I found this paint to give rapid curative results, apparently without recurrences, in athlete's foot, pityriasis versicolor (axillaris), and in chronic subungual fungus infections. For monilial vaginitis I would suggest the use of a 0.1–0.5% alcoholic solution of methyl violet to be applied immediately after rinsing the vagina thoroughly with a weak solution of NaHCO₃. I am confident that this method will give highly satisfactory therapeutic results.—I am, etc.,

London, N.W.11.

M. G. GOOD.

REFERENCE

- Good, M. G., *Indian med. Rec.*, 1956, 76, No. 5.

SIR,—In the annotation on vaginitis (*Journal*, January 19, p. 155) mention is made of the difficulty of treating vaginitis due to *Candida albicans*, because of the rapidly developing resistance of this organism to the various antifungal agents: "The difficulty with all these preparations lies not in finding an effective fungicide . . . but in overcoming the drug resistance which the organisms acquire with such rapidity and persistence." While this may be true of chemotherapeutic agents, although I am not aware of any work showing actual drug resistance, this has not been the case with nystatin. Some of the cases treated by Dr. J. D. Llywelyn-Jones and myself and reported in the same issue (p. 145) did recur after treatment, but the strain of *C. albicans* isolated at the time of the recurrence was still sensitive by laboratory tests to nystatin, and the recurrence should most probably be called a reinfection. During the last year in the St. Mary's Hospitals we have tested more than 200 strains of *C. albicans*, including those from recurrent cases of monilial vaginitis, and have so far found no change in the original sensitivity of *C. albicans* strains to nystatin. This has always seemed to us a particular asset of nystatin treatment.

Since the publication of the series reported in your issue of January 19 we have in fact increased the course of local nystatin treatment to 14 days, but have not used oral therapy because of complaints of nausea. The results with this system of treatment have been better than any other form of therapy used in this hospital for some years, and there have been no patients showing sensitivity to the drug.

I should also like to confirm the observations of Drs. R. D. Catterall, E. M. C. Dunlop, and Eva Gallagher (*Journal*, February 2, p. 287) that oral aminotriazole therapy by itself is completely ineffective in the treatment of vaginal trichomoniasis. In a series of 30 patients treated with 100 mg. aminotriazole three times a day for 10 days and controlled by a similar number of patients given placebo tablets, one patient was "cured" in each group.—I am, etc.,

Manchester, 13.

R. F. JENNISON.

SIR,—I agree with your correspondents, Drs. R. D. Catterall, E. M. C. Dunlop, and Eva Gallagher (*Journal*, February 2, p. 287), that oral trichomonocides are so far not of proved value in the treatment of trichomonas infection, either alone or in combination with local treatment. Further, statements in the annotation (*Journal*, January 19, p. 155) on this subject require modification. Monilial infection seems

to be essentially a disease of "clean" people. An interesting point has been the apparent increase of thrush infection in relation to trichomonas in this area. *Candida albicans* often worries husbands and gives them pruritus, and I cannot agree with your statement that this is rarely found. As regards the use of nystatin, it has not been employed long enough for its value to be fully assessed, and it occasionally gives rise to reaction. "Pruvagol" is not mentioned in treatment, but it has proved its worth as a bland and efficient therapy over the last few years, unlike other suggested treatments.—I am, etc.,

Cheltenham.

STANLEY A. BOND.

Fever after Mitral Valvotomy

SIR,—Your annotation (*Journal*, February 9, p. 332) on the post-commissurotomy syndrome (p.c.s.), while referring to American papers, omits reference to the only British publication on the subject.¹ Though this appeared a few months after the paper of Dresdale and his colleagues,² the results were made public in a joint communication with Dr. M. M. Zion at the annual meeting of the British Cardiac Society in May, 1955.³ We were then able to prove that the p.c.s. was not, as hitherto believed in America, a super-added rheumatic pericarditis, but was the accentuation, persistence, and recurrence of the normal post-operative sequelae, of which traumatic pericarditis is one. Since the pleural effusion, contrary to what happened in the uncomplicated cases, remained blood-stained for weeks after the operation in the p.c.s. cases, we believed that oozing from the auricular wound was responsible for the recurrent pleuro-pericarditis. Loculation of the effusion and left basal lung consolidation were additional factors in some of our patients. At the time when our material was collected the incidence of p.c.s. was 20%. At present, when loose suture of the pericardium has been adopted, as suggested by your leader writer, the syndrome has become a rarity.—I am, etc.,

London, N.W.3.

REFERENCES

- Papp, C., and Zion, M. M., *Brit. Heart J.*, 1956, 18, 153.
- Dresdale, D. T., Ripstein, C. B., Guzman, S. V., and Greene, M. A., *Amer. J. Med.*, 1956, 21, 57.
- Papp, C., and Zion, M. M., *Brit. Heart J.*, 1955, 17, 575.

Pathogenesis of Rheumatic Endocarditis

SIR,—The leading article on the pathogenesis of rheumatic endocarditis (*Journal*, February 2, p. 273) contains several misleading and controversial statements and omits discussion of the evidence against the views expressed. While the work of Magarey¹ and Tweedy² describes one mechanism for the production of rheumatic valvular deformities—i.e., the deposition of fibrin on the surface and its incorporation into the valves—Tweedy is on much more debatable ground with his view that the eosinophilic material found deep in the valves in acute rheumatic disease is entirely due to the same mechanism. Having shown that it is possible to have fibrin incorporated into valves from the surface, Tweedy's main argument appears to be based on the comparative absence of a fibrin-staining component in Aschoff nodules in the myocardium. He omits, however, to describe the type of lesion called "reticular" Aschoff body by Gross and Ehrlich³ which appears to correspond with the "Früh-infiltrat" of Klinge.⁴

In this type of lesion there is an interlacing group of eosinophilic homogeneous fibres, many of which are continuous with uninvolved collagen fibres at the periphery of the lesion, and these eosinophilic fibres frequently stain with all the usual fibrin stains. This material is similar in staining properties to the eosinophilic material found in the valves. This is an uncommon type of lesion, and, according to Gross and Ehrlich, is found only in acute rheumatic fever, usually in children, and most frequently in a first acute attack. Similar material is also found in the joints, blood vessels, and subcutaneous nodules. Because of the variations in morphology and staining reactions this material has been called "fibrinoid." The debate on the nature of this substance in rheumatic fever still continues, and substances with similar staining characteristics are found in other diseases—rheumatoid arthritis, disseminated lupus erythematosus, dermatomyositis,

polyarteritis nodosa, etc. There is considerable evidence that these substances do not consist of fibrin and may not be the same in different diseases.⁵⁻⁸ The fibrinoid hypothesis, however unsatisfactory the name, does not depend on the nature of the lesions in the valves of acute rheumatic disease. It is a concept based on the changes in many tissues in many diseases. The views expressed by Tweedy on the "myxomatous" material in the valves of acute rheumatic disease are also open to question. A certain amount of mucoid material is present in many normal heart valves, and this is greatly increased in active rheumatic disease, where it may also be found in the subendocardium, mainly on the left side of the heart, the myocardium, and around and within blood-vessel walls. It is commonly associated with developed Aschoff lesions in these situations, and, according to Talalajew⁹ and others, precedes the deposition of the eosinophilic material. My own observations on this mucoid material will be published shortly. It is found in situations where organizing thrombus can be ruled out. Organizing thrombus also contains similar material. It may not be justified to interpret its appearance in the valves as due to organizing thrombus.

The most recent evidence of rheumatic heart disease has been provided by biopsy material from patients undergoing valvotomy. These patients have no clinical evidence of rheumatic activity, and in this centre approximately half give no history of a previous attack of acute rheumatic fever. The surprisingly high incidence of histologically active lesions (approximately 64% of 350 cases in this centre), which include some of the earliest described forms of lesions, makes it likely that subclinical active rheumatic disease may be just as important a factor in producing valvular deformities as organizing thrombus. As Tweedy himself admits, definite Aschoff nodules are found in the valves of some cases of rheumatic heart disease. It seems a more reasonable hypothesis that both factors—repeated attacks of subclinical rheumatism and organization of deposited fibrin—contribute to the valvular deformities.

The fibres demonstrated by the electron microscope in normal aorta and atheromatous plaques by Levene¹⁰ and in the endocardium in fibro-elastosis by Still and Boulton¹¹ have a 230 Å banding similar to fibrin, but Porter¹² has shown that tissue cultures of fibroblasts grown in media containing no fibrinogen produce fibres with a periodicity of 200–220 Å, and these thicken and mature to fibres with a 640 Å periodicity. It appears from this work that young collagen fibres have electron-microscopic appearances similar to that of fibrin. More evidence will be required before one can accept the conclusions of Levene and Still and Boulton.—I am, etc.,

Birmingham.

R. LANNIGAN.

REFERENCES

1. Magarey, F. R., *British Medical Journal*, 1951, 1, 856.
2. Tweedy, P. S., *Brit. Heart J.*, 1956, 18, 173.
3. Gross, L., and Ehrlich, J. C., *Amer. J. Path.*, 1934, 10, 467 and 489.
4. Kline, F., *Ergebn. allg. Path. path. Anat.*, 1933, 27, 1.
5. Glynn, L. E., and Loewi, G., *J. Path. Bact.*, 1952, 64, 329.
6. Guelfi, B., and Lauffer, A., *A.M.A. Arch. Path.*, 1954, 57, 201.
7. Conden, R., Glynn, L. E., and Stanier, W. M., *Biochem. J.*, 1951, 50, 193.
8. Kellgren, J. H., Ball, J., Astbury, W. T., Reed, R., and Beighton, E., *Nature (Lond.)*, 1951, 168, 493.
9. Talalajew, W. T., *Klin. Wschr.*, 1929, 8, 124.
10. Levene, C. T., *Lancet*, 1955, 2, 1216.
11. Still, W. J. S., and Boulton, E. H., *ibid.*, 1956, 2, 117.
12. Porter, K. R., *Transactions of the Second Josiah Macy Conference on Connective Tissues*, New York, 1951, p. 126.

Synthetic Amino-acid Diet

SIR,—Cases exist where intolerance to protein develops so swiftly and severely that it is difficult to supply sufficient nutrition to keep the patients alive. The use of cortisone preparations or protein hydrolysates, such as "hepovite," is often of use. However, when all else fails it has been found, in the case of two twin children at least, that a diet made of pure synthetic amino-acids is of value. The formula used was: glycine, 30 parts by weight; L-arginine, 30; L-histidine, 20; L-lysine, 70; glutamic acid, 120; L-aspartic acid, 70; L-α-alanine, 10; DL-valine, 60; L-leucine, 100; L-isoleucine, 10; L-proline, 40; DL-β-phenylalanine, 40; DL-serine, 40; DL-threonine, 40; L-tyrosine, 30; L-tryptophan, 4; L-cystine, 40; L-methionine, 20. This was supplemented with glucose and vitamins to make the complete diet. A major dis-

advantage is the high cost (£180 a kilogram) of the treatment. However, the symptomatic improvement is considerable. It is hoped to publish a fuller report in due course.—I am, etc.,

Marlow, Bucks.

B. JAMES.

Translumbar Aortography

SIR,—Mr. H. Gaylis and Dr. J. W. Laws (*Journal*, November 17, 1956, p. 1141) are to be congratulated on their fine demonstration of dissection of the aorta as an occasional complication of translumbar aortography. Recently I analysed the possible causes of spinal cord damage during aortography,¹ and I would like to mention several points relevant to the present discussion.

The cord may be damaged either by ischaemia, secondary to occlusion of a lumbar artery, or by a chemotoxic effect of the contrast medium. Occlusion of a lumbar artery during aortography may occur in a number of ways. First, the lumbar arteries, as they run posteriorly around the vertebral bodies, are particularly exposed to the risk of trauma during the introduction of the needle. Secondly, an atheromatous plaque, such as is commonly found surrounding the mouth of a lumbar artery, may be disturbed so as to block the artery. Thirdly, an intramural collection of contrast medium or blood may occlude the artery, as shown by Mr. Gaylis and Dr. Laws. Thus, although I agree that the instances of paraplegia reported by Antoni and Lindgren² and by Boyarsky³ were probably the result of ischaemia, it is not necessary to postulate that this was the result of aortic dissection. Occlusion of a lumbar artery will result in spinal cord damage only if that artery supplies blood to the cord substance and probably only if the collateral circulation is poor; this is the likely explanation of the rarity of such an injury. However, the risk is inherent in the method when aortography is performed by the translumbar route. This is one reason why the retrograde method of Seldinger⁴ should be used where possible.

Chemotoxicity of the contrast medium was almost certainly the cause of spinal cord damage in the case which I reported, and I believe that this is responsible for the recent increase in the incidence of complications following aortography. However, the incidence may be minimized by a careful technique. In this regard I heartily endorse the opinion of Dr. David Sutton (*Journal*, January 26, p. 225), that a test injection is essential to show that the tip of the needle is centrally placed in the aorta, at the correct level. If this is done, and a short bevelled needle used, dissection of the aorta should be rare and the risk of chemotoxic injuries reduced. The latter is diminished further by lowering the volume and rate of injection, as suggested by Dr. Sutton. In addition, as a summation effect of the contrast medium on the tissues probably exists,⁵ it is unwise to repeat the injection at the one examination. Finally, the trend towards selective angiography by the Seldinger method, using small injections, should be associated with a very low incidence of complications. It is only by careful analysis that the cause of these complications can be elucidated, and in this manner Mr. Gaylis and Dr. Laws have made a valuable contribution.—I am, etc.,

Melbourne, Australia.

W. S. C. HARE.

REFERENCES

1. Hare, W. S. C., *J. Fac. Radiol. (Lond.)*, in press.
2. Antoni, N., and Lindgren, E., *Acta chir. scand.*, 1949, 98, 230.
3. Boyarsky, S., *J. Amer. med. Ass.*, 1954, 156, 599.
4. Seldinger, S. I., *Acta radiol. (Stockh.)*, 1953, 39, 368.
5. Broman, T., and Olsson, O., *ibid.*, 1948, 30, 326.

SIR,—We would like to comment on the correspondence which has followed our article on aortic dissection as a complication of translumbar aortography (*Journal*, November 17, 1956, p. 1141).

We agree with Dr. David Sutton (*Journal*, January 26, p. 225) that a trial injection of a small quantity of contrast medium to localize the needle point is a precaution of value in that it will prevent the injection of the bulk of the contrast medium into a major branch of the aorta. But, as Lindgren¹ has already pointed out, although this

precaution will reduce the incidence of extra-luminal injection it will not prevent it altogether. As Dr. Sutton has stated, we do not use a hand-pressure pump in order to inject the contrast medium unduly rapidly, but simply as a matter of convenience. We use a long length of tubing in order to keep at a distance from the patient during the exposure of the films. This naturally increases the resistance to the flow of the concentrated contrast medium and makes hand injection difficult. While we deprecate unduly rapid injection, our experiments have shown that it requires very little pressure for an intramural injection to cause dissection. It can occur even with gentle hand injection.

Dr. Sutton refers to two cases in which paraplegia followed aortography, one reported by Boyarsky² and the other by Antoni and Lindgren.³ We attributed these cases of paraplegia to aortic dissection, but Dr. Sutton suggests that excessive doses of contrast was the major factor. We find this suggestion difficult to accept since reference to the original papers gives no evidence that excessive quantities were used. In the case reported by Antoni and Lindgren the dose is not stated, and in that of Boyarsky a total of 15 ml. of 70% sodium acetate was used. Moreover, from the description of both aortograms there is strong evidence of aortic dissection. In the case described by Boyarsky there was technical difficulty and the left common iliac artery was not outlined. This was not due to thrombosis of the left common iliac artery, since before the procedure all "peripheral pulsations were symmetrical and normal." These appearances are very suspicious of aortic dissection and are similar to those in Case 2 described in our paper. Incidentally, it should be noted that in this case a trial injection was given; a pressure apparatus was not used, and the injection was given by hand. In the case described by Antoni and Lindgren "an increased resistance was felt during the injection which was therefore interrupted, but a certain amount of contrast medium had, however, been injected paravascularly. . . . Contrast injection showed that only a part of the aorta down to the superior border of L 2 and the vessels in the upper part of the abdomen became contrast filled." Not only is there no evidence that excessive contrast was used, but it seems clear that some of the contrast was injected outside the lumen. It should be noted, in this case too, the injection was made by hand.

The case of paraplegia reported by Hare,⁴ and referred to by Dr. Sutton, is quite different in that a large volume of contrast medium was injected, and we agree that this may well have been the major factor in this case. But it should be noted that Hare himself states that an intramural injection causing blockage of a lumbar artery and ischaemia of the cord is a possible explanation. Hare considers this analogous to the "transverse lesion of the spinal cord which may accompany a dissecting aneurysm of the aorta which almost certainly results from occlusion of the mouths of intercostal arteries," a point not mentioned by Dr. Sutton.

Again we would stress that aortic dissection in minor or major degree is not uncommon, and that its significance in the past has not been universally appreciated even by experienced radiologists. Two recent examples will suffice. A recent American textbook on peripheral vascular disease⁵ illustrates an aortogram in which the bulk of the contrast was injected into the superior mesenteric artery. The patient died from infarction of the bowel, allegedly from the toxic effects of the contrast medium. A close study of the illustrated aortogram, however, shows a double contrast shadow extending along the superior mesenteric artery and some of its branches—clear evidence of arterial dissection. Again, in the *British Medical Bulletin*⁶ there is an illustration of "a normal arteriogram of the left kidney" in which a minor degree of aortic dissection is clearly shown but not commented upon. The letter from Mr. R. E. Horton and Dr. F. G. M. Ross (*Journal*, February 9, p. 340), in which they quote Dr. Sutton, may give the impression that we consider the toxicity of contrast media to be of no importance. This is not the case. A discussion of the toxicity of contrast media, a subject of which much has been written already, was outside the scope of our original paper, which was concerned solely with the complication of aortic dissection. We make no claim that dissection is responsible for all the complications of aortography, but simply that it is important because it "may give rise to misinterpretation in diagnosis if its true significance is not appreciated; there may be serious sequelae; and it may occur in spite of the most scrupulous technique. Furthermore, we believe that

this event is not uncommon and that it offers an explanation for some of the complications of aortography usually ascribed to arterial thrombosis or to the direct toxic effect of the contrast medium." In our opinion, some complications are caused by the toxicity of the contrast medium, some by dissection, and some by a combination of these two potential hazards.—We are, etc.,

H. GAYLIS.

J. W. LAWS.

London, W.12.

REFERENCES

1. Lindgren, E., *Acta radiol. (Stockh.)*, 1953, 39, 205.
2. Boyarsky, S., *J. Amer. med. Ass.*, 1954, 156, 599.
3. Antoni, N., and Lindgren, E., *Acta chir. scand.*, 1949, 98, 230.
4. Hare, W. S. C., *J. Fac. Radiol. (Lond.)*, in press.
5. *Diagnosis and Treatment of Vascular Disorders*, 1956, edited by S. S. Samuels, Williams and Wilkins, Baltimore.
6. Murray, R. S., and Tresidder, G. C., *Brit. med. Bull.*, 1957, 13, 61.

Cancer of the Bladder and Tobacco

SIR,—An annotation in your *Journal* (January 26, p. 218) discussed the reported increase in incidence of carcinoma of the bladder in males (as opposed to females) in Denmark and England. The trends are regarded as so similar in type to those which have been reported for cancer of the lung that it was thought that a common factor might be operative for the two types of cancer. Two pieces of evidence were brought forward to support this concept: an American investigation into the smoking histories of hospital patients, in which it was shown that more men with cancer of the bladder had been smokers than had those with benign bladder disease, no disease, or prostatic cancer; and an experiment performed by L. R. Holsti and P. Ermala in Finland.¹ These authors swabbed the lips and oral cavity of mice with tobacco tar for 140 consecutive days and observed the animals for 12 months from the beginning of treatment. They claimed that papillomatosis of the urinary bladder was present at death in 35 of 40 mice and that in 6 animals there was malignant papillary carcinoma. It is not stated that the bladders were distended before fixation, and the one photomicrograph of a benign papilloma presents the appearance observed with a mucosa folded as a result of muscular contraction. The other photomicrograph illustrating the paper is open to interpretations other than that of infiltrating carcinoma.

I know of only one chemical which after oral administration has induced true papillomas and carcinomas of the bladder in mice. This is 2-acetylaminofluorene,² a carcinogen potent to other species. In groups of approximately 20 mice of different strains the yield of tumours ranged from 22 to 78% of animals surviving 20 to 77 weeks, and most of the tumours arose after 52 weeks of treatment. Both benign and malignant tumours could be demonstrated in the distended bladder, some of the latter invading completely the muscular wall.

My desire is to advise caution in accepting experimental data as supporting evidence for the carcinogenic activity of tobacco tar until convincing experiments have been performed.—I am, etc.,

GEORGINA M. BONSER.

REFERENCES

1. Holsti, L. R., and Ermala, P., *Cancer*, 1955, 8, 679.
2. Armstrong, Elizabeth C., and Bonser, Georgina M., *J. Path. Bact.*, 1947, 59, 19.

Cancer of the Larynx in Women

SIR,—Sir Ernest Kennaway, F.R.S. (*Journal*, February 9, p. 299), draws attention to the peculiar "reversed gradient" in statistical graphs of cancer of the larynx in women. He suggests as a possible explanation the consumption of white bread, and tea by the rural housewife. I do not know whether there are any records available to show that more white bread is consumed in the agricultural areas; if there are I would be inclined to think that the feeding of bread to poultry would account for it, since white bread is an excellent food for chickens. The country housewife spends a great deal of her time indoors of necessity, probably more than her city sister. The urban housewife has clean electricity and gas to assist her in cooking and in laundry work. The air of the countryside is clean, but any doctor

visiting a rural house on wash-day, or any day for that matter, will know how much "smog" can be confined in the kitchen. The drudgery of stoking the stove and cleaning the grate must surely produce its morning dose of carcinogen. The chronic bronchitic is often benefited when his spouse persuades him to let her have a modern solid-fuel cooker. The drudgery is hastily abandoned when electricity is made available to the rural housewife, a change proceeding apace. If this is one of the factors, there should soon be an alteration in the graph.

During the last few decades there has been another change in the customs of the rural dweller—the advent of the pressure paraffin mantle lamp and pressure stove. These two have possibly altered the home atmosphere, adding hotter fumes to the living-rooms at night. These "transitional" rural amenities will, of course, gradually give way to electricity. The rural housewife, of course, might take up cigarette smoking to while away the time and idle hours brought by electricity, and so transfer the carcinogen from the upper to the lower respiratory tract.

It occurs to me that, in all the various reports on the search for a carcinogen in cigarette smoke, the mode of ignition has apparently been neglected. The 40-a-day smoker, after all, might use 40 matches a day. Lighter, fusee, humble match, or safety-match—is there any difference? Is the safety-match really safe?—I am, etc.,

Camborne, Cornwall.

S. W. V. DAVIES.

Poliomyelitis Vaccine

SIR,—As a general practitioner who expects to be using the poliomyelitis vaccine as soon as it becomes available, I feel that the nature of the contaminant which has held up distribution should be revealed to the profession; all we have to go on so far is the statement in general terms put out recently by the press and B.B.C. Assuming, as anticipated in this statement, that the batch will get through after further tests, it would be important also to let us know if the antigenic action of the vaccine will be in any way impaired.—I am, etc.,

Huddersfield.

LESLIE BALLON.

Intramedullary Nailing

SIR,—Mr. A. E. Stevens and Mr. J. Pett Turney (*Journal*, January 26, p. 208) describe intramedullary nailing as the ideal treatment for fractures of the shaft of the femur. A method which involves the risks of an open operation is being advocated for the treatment of a fracture which commonly unites without difficulty when simply immobilized with sufficient traction to restore reasonable length to the limb. If no other protest is heard, mine shall be: not against the method, for which there are certain indications, but against its indiscriminate employment, which betrays a lack of any sense of proportion.

They mention that four of their patients died; they say that blood for transfusion should always be ready when this operation is performed; and then use the operation for fractures in Paget's disease, the pathological fracture above all others which is known to unite whatever else happens. The powerful muscle spasm which is revealed by a bent nail and delayed union means nothing, except that a bigger and better nail should be inserted. They do not mention that variety of fractured femur where the muscles are completely stripped from one or both fragments, which usually occurs in the upper third of the shaft, and where deformity is quite uncontrollable except by an intramedullary nail. Such fractures are not common, but when encountered the risks of major operation weigh less in the balance than persistent crippling deformity. Intramedullary nailing is very clearly indicated in these fractures.

The truth is that most fractures of the femoral shaft unite readily with simple treatment and at little risk to the patient. Furthermore, the result is a good functional limb. The radiographic appearances are not always very pretty; and therein, I suspect, lies the trouble.—I am, etc.,

Liverpool, 1.

E. N. WARDLE.

Methyltestosterone Therapy

SIR,—In reply to the letter from Drs. G. L. Foss and S. L. Simpson (*Journal*, December 15, 1956, p. 1426), I report a case of a woman aged 56 with generalized osteoporosis attributed to 20 years' immobilization in bed for supposed spinal disease. In the course of rehabilitation she was treated, *inter alia*, with methyltestosterone 30 mg. daily. After five months on this dosage she developed deep jaundice with pruritus and the general picture of obstructive jaundice. Investigation one month after the onset showed: serum bilirubin, 4.4; direct positive van den Bergh; alkaline phosphatase, 20; thymol turbidity, 2; serum albumin, 2.68; globulin, 3.12; E.S.R., 25; blood count normal. Testosterone had been stopped immediately at the onset of jaundice, and this began to subside in about a month; it has since completely disappeared and the patient is apparently well. There is no proof that jaundice was due to testosterone, and infective hepatitis is a possibility, but the sequence of events is suggestive.—I am, etc.,

Leamington Spa.

W. M. PRIEST.

Stereotaxis as an Aid to Neurosurgery

SIR,—In your annotation (*Journal*, February 9, p. 333) on stereotaxis as an aid to neurosurgery, the credit for the application of the Horsley and Clarke¹ stereotaxic technique to human neurosurgery is given correctly to Spiegel, Wycis, and their co-workers.² It should also be emphasized, however, that these workers recognized from the outset the impossibility of defining the co-ordinates of human sub-cortical structures from bony landmarks alone. Thus, while Horsley and Clarke defined the position of a point in the animal brain solely by reference to the interaural, mid-sagittal, and Reid's basal (through external auditory meati and inferior margins of the orbits) planes, Spiegel and Wycis made use of the auditory meati and orbital margins solely in the preliminary step of fixing the basal part of their apparatus to the skull. The co-ordinates of the target nucleus were then based on a "reference point" within the brain and not in the skull. The use of such a point was necessitated by the observation that the centre of the pineal might lie anywhere from 4 to 20 mm. behind the interaural plane, and thus the position of the whole diencephalon would exhibit a corresponding variation in position. The pineal, as identified in a lateral x-ray film (with or without encephalography), was in fact chosen as the reference point, and the antero-posterior co-ordinate of the target was measured from this at right angles to the interaural plane.

It may thus be concluded, from the wide variation in pineal position alone, that the neuroanatomist will never be able (as suggested by your annotator) to provide the neurosurgeon with an atlas of the human brain "based on the type of co-ordinates used in the experimental animal." Further, individual variation affects not only the position but also the size of diencephalic structures. An attempt to take into account variations in thalamic size has been made by Hassler and Riechert,³ who employ a ventricular "base line" connecting the interventricular foramen and the posterior commissure. This line is drawn and measured (with adjustment for x-ray magnification) in the patient's lateral encephalogram and in a normal formalin-fixed brain used as an "atlas." The ratio between these two lengths is used to correct the antero-posterior co-ordinate of the target nucleus as measured from the posterior commissure in the atlas brain.

It will be apparent that the use of any co-ordinate system based upon the posterior commissure must involve the assumption that this structure maintains a constant relationship to thalamic and other nuclei. An investigation designed to test the validity of this assumption is nearing completion in the neuropathology department laboratory, Institute of Psychiatry. In a series of 50 hemispheres from 35 normal, formalin-fixed, and suspended brains the ventricular "base line" was marked and coronal cuts made at right angles to this at the posterior commissure and at other more anterior levels. The nuclei present at each level have

been identified in frozen sections stained for nerve cells and for myelin sheaths. It has been found that the coronal planes representing the extreme anterior and posterior positions of the posterior commissure in the series, when identified in any one normal brain (1,350–1,400 g.), are separated by a distance of about 6 mm. It is thus clear that the use of the posterior commissure as a reference point may lead to quite undesirable errors in needle placement. Preliminary studies suggest that the tip of the pulvinar of the thalamus is a more reliable point from which to measure the antero-posterior co-ordinate in that the various thalamic nuclei appear to occupy relatively constant positions along the antero-posterior axis irrespective of its length.

Individual variation within the diencephalon, recognized by Spiegel and Wycis and most subsequent workers, remains nevertheless the central problem in human stereotaxic brain surgery. Until this variation can be accurately measured and corrected for, any one stereotaxic "atlas" used in conjunction with any one apparatus (however mechanically accurate) can only lead the neurosurgeon to believe that he employs a technique endowed with a degree of precision that has all too little basis in fact.—We are, etc.,

J. B. BRIERLEY.
E. BECK.

London, S.E.5.

REFERENCES

- ¹ Horsley, V., and Clarke, R. H., *Brain*, 1908, 31, 45.
- ² Spiegel, E. A., Wycis, H. T., Marks, M., and Lee, A. J., *Science*, 1947, 106, 349.
- ³ Hassler, R., and Riechert, T., *Nervenarzt*, 1954, 25, 441.

Mild Endogenous Depression

SIR,—Dr. C. A. H. Watts (*Journal*, January 5, p. 4) has performed a valuable service in again emphasizing the frequency and importance of endogenous depression. But, like Dr. R. J. T. Woodland (*Journal*, January 19, p. 167), I believe that most endogenous depressive illnesses do not clear up spontaneously as quickly as could be desired. I agree that the understanding support of the family doctor can be of great help to the depressed patient, but this support alone is not likely to curtail the illness, and I consider that E.C.T. should be considered in even quite mild depressive states.

In the course of seven years' experience with E.C.T. as a therapeutic tool used in the out-patient departments of general hospitals, I have repeatedly met patients who have been depressed for many weeks or months before finally being referred to a psychiatrist. One patient referred recently had been depressed for about 12 years, and so retarded that he had developed a severe postural oedema of the feet (with incipient gangrene of the toes) before being referred; he required only four out-patient attendances for E.C.T. to gain a complete remission of his depression. Even quite "mildly" depressed patients may become more seriously ill, and even suicidally so, if treatment is unduly delayed. Dr. Watts himself tells us that, of his patients who took overdoses of sedatives, "it must be admitted that three of the four cases were viewed before this episode as cases of mild depression." Again, Dr. Watts's patient, described as simulating gastric carcinoma, was diagnosed as being in need of E.C.T., and had not recovered until eight months later because he refused to enter a mental hospital for E.C.T. Had out-patient E.C.T. been available to him, he might have been saved a long period of illness.

My plea is twofold: first, for the establishment in all districts of clinics where E.C.T. can be given on an out-patient basis to suitable patients; and, secondly, that practitioners faced with depressed patients, showing the symptoms so admirably recounted by Dr. Watts, should refer them without delay for a psychiatric assessment with a view to E.C.T. in suitable cases. I am sure that by this means a great deal of unnecessary suffering and perhaps a number of suicides can be averted. It is dangerous to delay E.C.T. pending the development of a more serious depression, and it should be remembered that many depressed patients feel ashamed of their symptoms, and therefore cover them up as much as they can; these patients may be far more ill than they appear. A suicidal attempt in an endogenous

depressive illness is the commonest cause of suicide in older people; but suicidal attempts in a depressed patient undergoing E.C.T. are rare.—I am, etc.,

Coulsdon, Surrey.

H. E. S. MARSHALL.

SIR,—In view of the interesting correspondence which has arisen on this subject, I wonder if you can spare room to publish a few more observations. In my opinion this condition is a mild psychosis, and not a form of neurosis as suggested by Dr. R. Macdonald Ladell (*Journal*, January 26, p. 226). At any rate it does not respond to the kind of psychotherapy I am used to giving to anxiety states. I realize that there is sometimes great difficulty in arriving at an accurate diagnosis, and that at times we all attach the wrong label. In a personal note on my paper (*Journal*, January 5, p. 4) an eminent consultant suggested that many of these cases were wrongly diagnosed by the psychiatrists, and exposed to psychotherapy of a kind which they find hard to bear because it asks too much of them. It is as well to realize that psychotherapy, as well as the physical forms of treatment, has its dangers.

Dr. R. J. T. Woodland (*Journal*, January 19, p. 167) agrees with the high incidence of the condition in general practice, and together with Dr. R. Thompson (*Journal*, February 16, p. 401) he suggests that these patients should be given immediate E.C.T. This form of treatment is a traumatic operation, and about 30% of my patients who have had it have failed to respond adequately. While I am grateful for the relief that it gives to most, at this stage of our knowledge I would hesitate to recommend it for all my mild cases. I feel that it is important to take time to observe the patient, to win his confidence, and in general to size the case up. I think that I may have misled readers when in my paper I suggested that a depression which had not cleared after three months needed E.C.T. This does not mean that I sit and watch the case for that period of time. Most of them have been ill for weeks before they consult me, and that time is taken into account. If every mild depression was sent along for E.C.T. the present psychiatric services would be overwhelmed. About five cases in every thousand patients at risk would require E.C.T. every year. They do not all need it. The condition can be very short-lived. I have a patient who has had a dozen severe episodes, and in her case there is no doubt about the diagnosis. Usually the attacks only last for two weeks. On the two occasions when E.C.T. was given the disease lasted longer.

It seems to me that there should be a further stage in this investigation. These depressed patients, all of them, must be seen by both the psychiatrist and the general practitioner. The diagnoses can be cross-checked, and a policy as regards E.C.T. can be undertaken. I am not prepared to come down on either side of Dr. Ladell's fence. I would prefer to sit on it.—I am, etc.,

Leicester.

C. A. H. WATTS.

Fatal Reactions to Local Anaesthetics

SIR,—In days when new drugs and, indeed, new groups of drugs are being offered to the profession with quite extraordinary frequency, it is highly commendable that you should issue yet another warning on the dangers of these useful agents unless they are used with the utmost respect and care.

It is difficult to come upon an explicit and complete setting forth of the multiplex posology of procaine hydrochloride, lignocaine hydrochloride, etc. Nevertheless, one does know that the stronger—e.g., 2%—solutions of lignocaine hydrochloride become, by virtue of the drug's relatively slow destruction, about half as toxic again as procaine hydrochloride; 500 mg. thus becomes a maximum dose for lignocaine hydrochloride—i.e., 25 ml. of 2% solution. Without adrenaline this maximum should be substantially reduced to, say, 200–300 mg. (10–15 ml. of 2% solution). This is not to say that these doses may not, in experienced hands, be exceeded. I feel, nevertheless, that your annotation implying that the dose of 2% lignocaine hydrochloride solution

for injection can be 30 ml. errs on the side of buoyancy, bearing in mind the notorious history of accidents surrounding this class of drugs. Rather than an upper limit dose, surely it would be perhaps wiser to advertise that the occasions on which it is necessary to use more than a few ml. of so strong a solution are infrequent indeed. Furthermore, to give a simple and unqualified number of ml. below which the drug is safe and above which it is presumed to be highly dangerous takes no account of the many factors of patient variation.—I am, etc.,

London, N.3.

ERIC K. GARDNER.

The Black Sheep

SIR,—There is a saying "Fingers were made before forks." It is equally true, and less futile, that forks are an improvement on fingers. I am a retired general practitioner, and, still retaining a car, can be a little helpful visiting the shops. I have been astonished at the lax way of dealing with the sale of cooked meats, and have come to the conclusion that they should not be sold as a sideline in butchers' shops without more stringent supervision by the sanitary authorities.

I have seen cooked meats cut with the knife used for cutting raw meat and handled by hands which are still "sanguinary." I have also seen corned beef, boiled ham, roast pork, and jellied veal cut on the machine used for cutting raw bacon, and meat pies lifted by the same unclean fingers. The idea of using a separate knife and fork for these cooked meats is never thought of by the butchers, nor enforced by the authorities.

Confectioners and grocers are often remiss in their handling of these goods. The other day I saw some boiled ham being cut by a grocer, and watched him almost daintily arrange the pieces on the wrapping-paper with fingers in marked contrast to his movements. I noticed also that he sold potatoes. As to confectioners, at this time of the year with its colds and many nasal-borne organisms, one's imagination boggles at the thought of diminutive handkerchiefs, furtively used, and the handling of cakes and bread. Why cannot uncut bread be wrapped in the same way as cut bread? And why not cake-lifters?

I have turned this over in my mind for a long time, and now felt that this would be a good opportunity for its insertion between the profound technical and clinical comments of the well-informed.—I am, etc.,

Bradford, 5.

ALLEN GLENN.

SIR,—It is only necessary to look closely at plug handle or lever in public lavatories to appreciate how gross contamination of the right hand can be. Washing can save oneself from any consequence, but the crowds that would fail to wait for free tap or basin at peak periods in market towns and holiday resorts defy estimate. Pedal flush control appears to be the solution of this chain of infection. A pedal lever is relatively foolproof, far more difficult to remove than chain or handle; manufacturers stock them and say that they need not cost more than pull plugs if the sale were greater. The demand for installation in public lavatories is almost non-existent. Why is that? Should not the medical profession express an opinion on the matter?—I am, etc.,

London, W.2.

ANNIS GILLIE.

Rh-Hr Nomenclature

SIR,—Logic does not seem to be Dr. A. S. Wiener's strong point lately (*Journal*, February 9, p. 339). 50% of letters go against him, so his committee is fortified "in its conclusion that the C-D-E notations must be discarded." A lesser man might have thought that such a response showed the need for a compromise, using both systems, in the United States at any rate.

Sometimes he uses specious arguments,¹ which can often be turned against him.² All too frequently, however, he descends to rhetoric rather than make any pretence at scientific argument, and the last paragraph of his letter to you

is a good example of this. He has used the word phenotype for a list of antiserum reactions, and has separated C from $\bar{c}$, and E from e, thus making his hypothetical student do an entirely unnecessary mental anagram. There is no problem so simple that it cannot be made difficult by being expressed badly. Even Dr. Wiener would not, I hope, use the Red Queen's arithmetical problem as an argument for abolishing the numeral 1 or the process of counting.

Dr. Wiener should remember that rhetoric is the harlot of the arts; what she will do for him she will do equally well for his opponents—in this case even better. Let us rewrite his question in his own nomenclature, misusing the word phenotype just as he does: "What genotypes correspond to the phenotype little rh single prime plus, large Rh nought minus, little rh double prime plus, little hr single prime minus, little hr double prime plus?" asked the professor.

If one is to take parallels from Lewis Carroll, Jabberwocky is a more appropriate one than the Red Queen's question, which is, after all, as simple as counting up to ten.—I am, etc.,

Colchester.

J. W. NICHOLAS.

REFERENCES

- 1 Wiener, A. S., *Lancet*, 1957, 1, 105.
- 2 Nicholas, J. W., *ibid.*, 1957, 1, 157.

Non-ulcer Dyspepsia

SIR,—In your comment (*Journal*, February 16, p. 391) on the excellent paper by Dr. A. Wynn Williams and his colleagues on the investigation of non-ulcer dyspepsia by gastric biopsy (p. 372) you point out that "this procedure [of gastric biopsy] does not seem likely to enter into routine medical practice for the investigation of dyspepsia." May I therefore suggest that their observations could be usefully extended by co-ordinating the x-ray appearance of the motor function of the stomach with its secretory function?

In a recent monograph¹ I have summarized the evidence which supports the view that the secretory and motor functions are parallel manifestations which respond simultaneously and in an identical manner to a given stimulus and that they cannot be dissociated; the gastric motility (which should not be confused with the emptying time of the gastric content) gives, therefore, a fair indication of the gastric secretion.

The authors also show how difficult it is to classify gastritis on a histological basis. I have suggested² that the behaviour of the gastric secretions provides a basis for a clinical classification, because hypersecretion and hyposecretion are manifestations of two unrelated disease entities and not simple quantitative variations due to the same causes.—I am, etc.,

London, W.1.

J.-JACQUES SPIRA.

REFERENCES

- 1 Spira, J.-J., *Gastro-duodenal Ulcer*, 1956, p. 68. Butterworth, London.
- 2 ——— *Proc. roy. Soc. Med.*, 1944, 38, 87.

Incidence of Tuberculosis

SIR,—I note from your report of the proceedings of the Consultants and Specialists Committee of the B.M.A. (*Supplement*, February 16, p. 66) that the Ministry of Health takes the usual attitude of complacency regarding the question of tuberculosis in this country. We are always reading statements in the press that tuberculosis is on the way out and that it is practically non-existent in an infectious form. The presumption is that chest clinics will soon not be required. I would draw your readers' attention (let us hope some of them are M.O.s from the Ministry of Health) to the fact that, in one London Borough alone, 100 cases of active infectious tuberculosis were found through mass x-ray examination from February, 1955–6, making a rate of 6.4 per 1,000. In addition, another 72 cases of active tuberculosis were found by the Islington Chest Clinic unit in people working, but not living, in the borough. This quite aside from the fact that 45 cases of bronchial carcinoma were also discovered by the unit.—I am, etc.,

London, N.19.

J. WALLACE CRAIG.

Treatment of Herpes Zoster

SIR,—There have been numerous letters and articles concerning the treatment of herpes zoster, and textbooks differ in their advice regarding treatment.

We in this practice have treated over 21 cases in the past year, and, except in two cases, there has been no post-herpetic pain, and in these two cases the post-herpetic pain lasted three months. In no cases did we have to resort to prolonged use of sedatives or analgesics, nor at any time did we have to use powerful analgesics—e.g., morphine, pethidine, amidone, etc. In most of the cases the eruption had been present for two or three days, but in one case it had been present for five days, completely involved T.8, and in addition the patient was seven months pregnant. The method we used was injections of cyanocobalamin, 100 μ g. daily for six days, and we painted the eruptions with flexible collodion twice a day, not removing the old paint. If the pain was troublesome the patients were given tab. codein. co., 2 as required. In all cases it was observed—except in the two cases mentioned above—that the pain ceased towards the end of the injections and not later than ten days. The two exceptions were cases in which we tried (1) one injection of cyanocobalamin (1,000 μ g.) on the first and third day, and (2) three injections of cyanocobalamin (250 μ g.) on three alternate days. In both cases we noticed that the pain was more severe and there was post-herpetic pain.

We are of the opinion that this condition appears to respond to daily injections of cyanocobalamin (100 μ g.) and painting with flexible collodion, and that bigger doses do not have the same effect.—We are, etc.,

R. G. B. WIGODER.

H. G. JEFFS.

London, S.E.6.

Tibial Traction

SIR,—All orthopaedic surgeons will agree with Dr. W. L. Turner (*Journal*, February 9, p. 344) that it is regrettable how many patients, having been treated for a fractured femur, are left with a stiff knee-joint. Unfortunately the cause of this stiffness is more complex than she suggests, and the remedy she advocates—the insertion of skeletal traction devices through the femur instead of the tibial tubercle—would have little effect on the end-result.

The truth of the matter is that some restriction of knee flexion is very often seen after a femoral-shaft fracture, however it has been treated. Adherence of the quadriceps muscles, and a fibrosis in their substance, at the fracture site is apparently the most important cause of this disability, and this often occurs even in cases in which no traction has been applied. Muscle wasting leading to joint instability and retropatellar adhesions are frequently encountered ancillary features.

Even so, and merely on commonsense-grounds, it may at first sight appear desirable to drill the Kirschner wire and Steinmann pins commonly used through the lower end of the broken bone itself rather than through the tibia. But such a procedure has risks of its own—the wire may enter the fracture haematoma or even one of the synovial recesses of the knee-joint. The penalties of infection at either site are such as to make most of my colleagues frown upon the method.—I am, etc.,

London, W.C.1.

RICHARD HARRISON.

Haemoglobin Measurements

SIR,—It is becoming a practice in writing, in giving communications, and sometimes in routine reports from laboratories, to record the haemoglobin in grammes rather than the traditional percentage. While not wishing to depreciate purist tendencies, the value of this terminology alone is questionable. It may be easy for the erudite to think in terms of grammes, but many reactionaries like myself still prefer to think in percentages. There was an excellent purpose in insisting on grammes when the scale in different laboratories varied, but this is now uniform (14.8 g. = 100%), so that a return to a percentage scale would be

reasonable. Preferably, both should be given, as measurement in grammes is necessary for calculation of the absolute values. At any rate, may I beg that the habit of certain laboratories in sending out their reports with the haemoglobin in grammes only should cease? It can lead to the bewilderment of the general practitioner, and sometimes the consultant, and bespeaks of "one-upmanship" on the part of the laboratory. My impression is that most directors of clinical laboratories still think and dream of haemoglobin in percentages rather than grammes, or is this accusation unfair?—I am, etc.,

Birmingham.

C. F. HAWKINS.

Suxamethonium and Post-operative Muscle Pain

SIR,—The article by Drs. D. D. B. Morris and C. H. Dunn (*Journal*, February 16, p. 383) describes ways of reducing muscle fasciculations following suxamethonium. They mention chlorpromazine, tubocurarine, procaine, and slow administration of the drug. I have an article awaiting publication which describes a further means of reducing or abolishing these fasciculations. It is based on the slow administration of a diluted solution of suxamethonium under thiopentone narcosis of moderate depth.

The technique for an adult is as follows: Two 20-ml. syringes are used; the first contains 1 g. thiopentone in 20 ml. water (5%), the second contains 100 mg. suxamethonium in 20 ml. water. Thiopentone solution is injected intravenously at the rate of 1 ml. every 5 seconds until the patient is on the verge of respiratory arrest, actual arrest being avoided; oxygen is given from a face-mask from the time that the patient loses consciousness. Suxamethonium solution is now injected at the same rate until respiratory paralysis occurs. By this method muscle fasciculations can, with practice, be abolished in every case. A far simpler method to abolish fasciculations is, of course, to use gallamine or tubocurarine. For an adult I use 50 mg. of the former, and 10 mg. of the latter, given before the thiopentone, or mixed with it; time has to be allowed for the curarizing drug to act if the fasciculations are to be abolished entirely. Bizarre effects may, of course, occur from using two different types of relaxant in one case. If 10 ml. suxamethonium is injected rapidly fasciculations will occur, and this possibly accounts for the failure of this method as described by Drs. Morris and Dunn.

While I do not believe that the intensity of visible fasciculations is the whole story as regards post-operative muscle pain, I do think that abolition of the visible fasciculations reduces it. I have no figures to offer for the incidence of post-operative pain in my practice, as, for some reason, no case has ever been drawn to my attention. Perhaps this is because I almost invariably use more than 0.5 g. thiopentone for induction.—I am, etc.,

Dartford, Kent.

JOHN BULLOUGH.

Compound Aspirin and Steroid Tablets

SIR,—The argument, as presented in your annotation (*Journal*, February 16, p. 395), tends to be slightly one-sided, and, in addition, contains certain inaccuracies requiring correction. Presumably, this is because the writer did not have all the relevant information at his disposal. In view of this, you may wish your readers to have the following information so that they will be in possession of all the available evidence and thus able to draw valid conclusions.

Using the "cotton pellet" test¹ and the "granuloma pouch" test,² it has been shown that approximately the same anti-inflammatory effect is produced by a combination of aspirin and prednisolone as that produced by double the amounts of either ingredient alone. The conditions of these tests differ slightly, but the findings suggest that the combination results in an additive anti-inflammatory effect. Thus there would appear to be reasonable grounds for believing that the combination would be more effective clinically than either ingredient alone.

Reports of clinical studies^{3,4} indicate that the combination of 0.3 g. aspirin and 0.5 mg. prednisolone is effective in the control of cases of rheumatoid arthritis and allied conditions. Further, some investigators⁵ find that the highest daily maintenance dose of cortisone tolerated by post-meno-

pausal women is 25–30 mg., by pre-menopausal women 35–40 mg., and by adult males 40–50 mg. (these doses correspond respectively to 5–6 mg., 7–8 mg., and 8–10 mg. prednisolone). They state that they prefer to keep below these maximum doses, and so it is reasonable to infer that doses of prednisolone below these levels can be effective. Thus, if the additive factor is taken into consideration, the recommended daily dose of this combination of aspirin and prednisolone can reasonably be expected to produce a therapeutic effect.

The above evidence tends to suggest that this particular combination of aspirin and prednisolone may well deserve a place in therapeutics—at least it is founded on a rational basis.—I am, etc.,

J. A. BRAUN,
Managing Director,
Upjohn of England Ltd.

REFERENCES

- Meyer, R. K., Stucki J. C., and Aulsebrook, K. A., *Proc. Soc. exp. Biol. (N.Y.)*, 1953, **84**, 624.
- Selye, H., Fourth Conference on the Adrenal Cortex, November 13–15, 1952, Josiah Macy Foundation, New York.
- Spies, T. D., Stone, R. E., Lopez, G. G., Tellechea, C. M. D., Toca, R. L., Reboredo, A., and Suarez, R. M., *J. Amer. med. Ass.*, 1955, **159**, 645.
- Szucs, M. M., Holonko, V., Forster, K. M., and Nalagan, D., *Ohio St. med. J.*, 1956, **52**, 122.
- Polley, H. F., Stocumb, C. H., Ward, L. E., and Hench, P. S., *Ann. rheum. Dis.*, 1955, **14**, 416.

Bowel Obstruction

SIR,—Recent letters on the above subject prompt me to record the following case. A man, age 50 years, who had had a polya gastrectomy performed in 1949 for a chronic gastric ulcer, consulted me at my morning surgery, which he had to pass on his way home from work. I may add that he was cycling. He complained of abdominal pain of a gripping character. There had been no vomiting at that time, although he did vomit before he arrived in hospital. The bowels were said to be open that morning and the stools loose. On examination there was very marked visible peristalsis in the right iliac fossa and extreme tenderness. He was admitted to the General Hospital, Northampton, under the care of Mr. R. O. Lee, by whom the partial gastrectomy had been performed. At operation three segments of orange were found impacted in the terminal ileum. The patient subsequently remembered eating a rather dry, pithy orange some fifteen hours previously.

The object of this note is to suggest that, with the increasing popularity of surgical treatment for peptic ulcer, it is extremely important that we should warn these patients how important thorough mastication of the food can be. Previous letters have recorded cases of small-intestine obstruction with a green fig and with a brussels sprout. These patients had a normal pylorus. How much greater must be the hazard of the patient whose pylorus has been removed.—I am, etc.,

Wellingborough.

JOHN T. CORBETT.

Neostigmine-resistant Curarization

SIR,—Dr. K. H. Oldfield's letter (*Journal*, December 29, 1956, p. 1544) is of great interest, but whether it offers proof that intracellular potassium loss is not concerned in neostigmine-resistant curarization is questionable. Should one be influenced by the evidence of this one case; or accept the contradictory findings of an experimentally proved antagonism between potassium and curare, coupled with not infrequent clinical accounts of improvement or reversal of persistent curarization by potassium infusions? In fact, it is doubtful whether the case he reports bears more than a superficial resemblance to the type of case in which neostigmine resistance occurs.^{1,2} Further information, not provided in Dr. Oldfield's abridged report, would be needed to decide this matter, but his account suggests his patient's illness resembled a condition of primary aldosteronism as described by Conn^{3,4} and later by others.^{5–10} Recent reviews suggest a well-defined syndrome^{11,12} with a long history (usually over a year), and a low serum-potassium level falling below 2

mEq/l., but with surprisingly inconstant muscle weakness. Marked weakness often occurred only during an infective episode, and spared respiration. Hypertension is a constant feature, and acidosis has not been encountered; metabolic alkalosis is frequent, with the appearance of tetany.

This picture is very different from that of the patient dying after his anaesthetic: he is starved, weak, and has a hypotension that responds poorly to vasopressors—a state characteristic of hypokalaemia.¹³ Electrolyte depletion has been rapid, and there is a metabolic acidosis which contributes considerably to the intracellular potassium loss and hinders its replacement. The endocrinological background of these two types of case is probably different: secretion of aldosterone is largely independent of the pituitary influence that promotes secretion of other corticoids.^{11,14,15} The acutely ill patient generally shows a strong pituitary-adrenal type of response producing a different range of steroid hormones.^{16,17} If the development of neostigmine resistance is due to a defect of neuromuscular transmission, then certain of these differences become important.

Hypokalaemia with alkalosis is less likely to produce paralysis than with acidosis.^{12,18} Acidosis is accepted as causing a loss of intracellular potassium,¹⁹ and it is known that alkalosis raises the intracellular potassium at the expense of extracellular levels.²⁰ The muscle end-plate potential is closely linked to the ratio of extracellular to intracellular potassium.²¹ Rapid alterations of this ratio could lead either to hyperpolarization or to partial depolarization of the end-plate, thus interfering with the muscle's response to nerve impulses.^{22–24} Such a swing between the two extremes may have been achieved by Dr. Bourne and Dr. Shackleton by rapid transition from respiratory acidosis to respiratory alkalosis (*Journal*, December 22, 1956, p. 1485). Perhaps this is the connexion between persistent curarization and respiratory acidosis that several of your correspondents recently have remarked.

It appears that the body can readjust the potassium ratio about the plasma membrane towards normal, but with lower total values, only when the loss from the body is slow. This is suggested by experimental findings that rapid potassium loss frequently produces weakness or paralysis that is seldom seen when the loss is slow,²⁵ and the importance of the rate of potassium depletion in producing weakness has also been noted clinically.¹² If function is maintained with smaller total quantities of potassium, one could expect it to be disturbed more readily than normal by such changes as respiratory acidosis or depolarizing relaxants may produce.

In the case of primary aldosteronism reported by van Buchem *et al.*^{9,12} there had been no complaint of weakness despite a serum potassium level under 2 mEq/l. However, marked weakness appeared in the immediate post-operative period when serum potassium levels had been returned to normal. This may well have resulted from a state of relative hyperkalaemia in a person whose intracellular potassium had become adjusted over many years to a low serum value. The serum level is much more easily restored than the intracellular store.²⁶

Therefore it would be interesting to learn whether Dr. Oldfield's case did not have a long history of developing hypokalaemia with an associated alkalosis. Indeed, this woman may have been in a state of relative intracellular potassium excess, despite a total deficiency, so that the vigorous pre-operative potassium replacement produced a patient requiring relatively large quantities of relaxant because of a curare-potassium antagonism. The muscle potassium level quoted was indeed low, and one wonders whether the biopsy specimen was not taken from traumatized muscle at the abdominal wound edge during closure of the incision. Muscle biopsy figures reported by Chalmers *et al.*⁷ showed an increased chloride content; possibly this shows that the extracellular fluid space was enlarged, making the true intracellular potassium loss less than it at first appears.

The postulated penetration of the C.N.S. by curare to produce a picture of neostigmine resistance² might also not occur if alkalosis accompanies the potassium loss. In any

Obituary

S. S. BARTON, O.B.E., F.R.F.P.S., M.R.C.O.G.

Mr. S. S. Barton, consultant in obstetrics and gynaecology to the Liverpool and the Welsh Regional Hospital Boards, died at Walton Hospital, Liverpool, on February 17 from injuries received in a motor accident near Holywell, North Wales, on February 4. He was 66 years of age.

Samuel Saxon Barton was born at St. Michael's, near Liverpool, on August 29, 1890, and was educated at Green Bank School, Liverpool, and Loretto School, Musselburgh, receiving his medical training at the University of Liverpool and at Edinburgh. He qualified by taking the Scottish triple qualification in 1917, and three years later was elected a Fellow of the Royal Faculty of Physicians and Surgeons of Glasgow. After qualification he held the appointments of house-surgeon at the Hospital for Women and house-physician at the David Lewis Northern Hospital, Liverpool, before entering the Royal Navy as a temporary surgeon lieutenant for service during the remainder of the first world war. He served in H.M.S. *Dwarf* in the waters of the Cameroons and off the west coast of Africa, being appointed O.B.E. in 1919.

After the war Barton settled in Liverpool. In addition to the work of his practice he became honorary clinical assistant at the Hospital for Women, and he also served on a medical board of the Ministry of Pensions as a specialist in tropical diseases. Later he was appointed honorary assistant surgeon to the Hospital for Women and to the Samaritan Hospital for Women. After relinquishing the latter post he was elected honorary obstetrical and gynaecological surgeon to the Hahnemann Hospital (now the Liverpool Homoeopathic Hospital), an appointment which he held until his death. When an opportunity arose to join a gynaecological and obstetrical partnership in Llandudno he gave the larger part of his medical services to North Wales and built up a large practice there. In 1933 he was elected a Member of the Royal College of Obstetricians and Gynaecologists, and in 1941 became consultant in obstetrics and gynaecology to the Liverpool and Welsh Regional Hospital Boards. His wife, Dr. Dorothy Atherton Barton, and three sons survive him.

H. R. writes: Saxon Barton will be remembered particularly as an antiquarian and as an able artist in oils and water colours. At the Royal Cambrian Academy of Art he founded a prize awarded annually to encourage young artists to exhibit their work. A recognized authority on King Richard III, he founded the Fellowship of the White Boar (the Plantagenet coat-of-arms), and, as president of the society in 1934, erected a stained-glass window in Middleham Church, Yorkshire, to commemorate the last of the great Plantagenets. His latest ambition was to erect a monument to Richard III in Bosworth Field. Barton was also a former president and secretary of the Historic Society of Lancashire and Cheshire, and a Fellow of the Society of Antiquaries of Scotland, and published several works on the subject of antiquities.

W. H. WILSON, D.M.

The obituary of Professor W. H. Wilson was printed in the *Journal* of February 16 (p. 406).

B. G. P.-S. writes: Everyone knew him in Mataria, so we had no difficulty in finding his house in a street named in Arabic after him. We turned, leaving all the dust behind

case, the brain is probably resistant to a slow potassium loss, but may be markedly depleted by a rapid loss such as could have occurred in the cases which died.^{27,28} There is also evidence that mucoproteins are concerned in the integrity of the blood-brain barrier.^{29,30} These substances, being constituents of collagen tissue, may have their physico-chemical characteristics influenced by adrenal steroids.^{31–33} Glucocorticoids and mineralocorticoids appear to have opposing actions on glycoproteins,³⁴ so that the response seen in a case such as Dr. Oldfield's could well be different from that seen in the patients who slowly deteriorated and died after relaxants.

The uninvestigated problems posed by the present discussion bring one near the limits of practicable argument; but it would be a just concession to the dynamic nature of nerve and muscle function if one were to attempt to express body electrolyte levels in the ratios in which they exist about the plasma membrane, and not in total, dead, weights.—I am, etc.,

Bellville, C.P., S. Africa.

P. A. FOSTER.

REFERENCES

- Hunter, A. R., *British Medical Journal*, 1956, **2**, 919.
- Foster, P. A., *Brit. J. Anaesth.*, 1956, **28**, 488.
- Conn, J. W., *J. Lab. clin. Med.*, 1955, **45**, 3.
- *ibid.*, 1955, **45**, 661.
- Foye, L. V., and Feinmair, T. V., *Amer. J. Med.*, 1955, **19**, 966.
- Mader, I. J., and Iseri, L. T., *ibid.*, 1955, **19**, 976.
- Chalmers, T. M., Fitzgerald, M. G., James, A. H., and Scarborough, H., *Lancet*, 1956, **1**, 127.
- Milne, M. D., and Muehrcke, R. C., *Proc. roy. Soc. Med.*, 1956, **49**, 883.
- van Buchem, F. S. P., Doorenbos, H., and Elings, H. S., *Lancet*, 1956, **2**, 335.
- Hellem, A. J., *Acta med. scand.*, 1956, **155**, 271.
- Lancet*, 1956, **1**, 141.
- van Buchem, F. S. P., Doorenbos, H., and Elings, H. S., *Acta endocr. (Kbh.)*, 1956, **23**, 313.
- Freed, S. C., and Rosenman, R. H., *Amer. J. Physiol.*, 1956, **184**, 183.
- Robson, J. M., and Keele, C. A., *Recent Advances in Pharmacology*, 1956, 2nd ed. Churchill, London.
- Liddle, G. W., Duncan, L. E., and Bartter, F. C., *Amer. J. Med.*, 1956, **21**, 380.
- Selye, H., *Stress*, 1950, 1st ed. Acta Inc., Montreal.
- Sanberg, A. A., Eik-Nes, K., Migeon, C. J., and Samuels, L. T., *J. clin. Endocr.*, 1956, **16**, 1001.
- Evans, B. M., and Milne, M. D., *British Medical Journal*, 1954, **2**, 1067.
- Wright, S., *Applied Physiology*, 1952, 9th ed. Oxford University Press, London.
- Burnell, J. M., Villamil, M. F., Uyeno, B. T., and Scribner, B. H., *J. clin. Invest.*, 1956, **35**, 935.
- Eccles, J. C., *The Neurophysiological Basis of Mind*, 1953. Oxford University Press, London.
- Haidu, S., Knox, J. A. C., and McDowall, R. J. S., *J. Physiol. (Lond.)*, 1950, **111**, 382.
- Sandow, A., and Kahn, A. J., *J. cell. comp. Physiol.*, 1952, **40**, 89.
- McArdle, B., *Brit. med. Bull.*, 1956, **12**, 226.
- Miller, H. C., and Darrow, D. C., *Amer. J. Physiol.*, 1940, **129**, 264.
- Mahler, R. F., and Stanbury, S. W., *Quart. J. Med.*, 1956, **25**, 21.
- Davenport, V. D., *Amer. J. Physiol.*, 1949, **156**, 322.
- Swinyard, E. A., *ibid.*, 1949, **156**, 163.
- Hess, A., *Nature (Lond.)*, 1955, **175**, 387.
- *Arch. Neurol. Psychiat.*, 1955, **74**, 149.
- Kulonen, E., *Acta physiol. scand.*, 1952, **27**, 82.
- Mathews, M. B., and Dorfman, A., *Physiol. Rev.*, 1955, **35**, 381.
- Taubenhaus, M., Fritz, I. B., and Morton, J. V., *Endocrinology*, 1956, **59**, 458.

Wagner-Jauregg's Symptom

SIR,—March 7 will be the centenary of Professor Wagner-Jauregg's birth. His name will for ever be remembered in connexion with the malaria treatment of general paralysis of the insane, for which discovery he received the Nobel Prize. There is also a "Wagner-Jauregg's symptom," but no record of this symptom is to be found in any standard textbook. Professor Stefan Jellinek,¹ pioneer in electropathology, who in 1904 discovered a brownish pigmentation in many cases of hyperthyroidism (Jellinek's sign), and at 86 is still doing research work at Queen's College, Oxford, described the "Wagner-Jauregg's symptom": if one exercises gentle pressure on the eyeball, the zygomatic muscle will contract, drawing the angle of the mouth upward and laterally. In a case of hemiparesis this trigeminal-facial reflex is lost and the musculature of the paralysed side of the face remains uncontracted. This symptom is especially valuable in the differential diagnosis of hysterical and organic hemiparesis of the face.—I am, etc.,

London, E.17.

B. JUHN.

REFERENCE

- Jellinek, S., *Wien. klin. Wschr.*, 1916, **29**, 1546.

Mr. G. NABARRO (Kidderminster, Con.) said: While wishing warmly to congratulate my right hon. Friend, may I ask him to make it perfectly clear, in framing the terms of reference for the Royal Commission, that a primary purpose should be to endeavour to eliminate all the legal and other uncertainties which have arisen during the last few years from the Spens Report and the Danckwerts award made under it, all of which are responsible for the present difficult position with the doctors?

Mr. MACMILLAN answered: One of the purposes of the Royal Commission will be to clear up this situation and to lay down a system which, through the years, will be more workable and more acceptable.

Dr. EDITH SUMMERSKILL (Warrington, Lab.) asked: As this is virtually a repudiation of the recommendations of the Spens Report, could the Prime Minister say what was the reaction of the professional organizations towards this new suggestion?

Mr. MACMILLAN said: No, sir. The discussions between the representatives of the profession and the Minister of Health are another matter. To-day, I have simply preferred to confine myself to stating that I have recommended the appointment of the Commission, that Her Majesty has been pleased to accept the recommendation, and that the terms of reference and the membership will be announced. I think that all the detailed questions had better be put to the Minister responsible.

Statement in House of Lords

After Lord SALISBURY (Lord President of the Council) had given to the House of Lords the same statement as the Prime Minister gave to the House of Commons, Lord ALEXANDER OF HILLSBOROUGH (Lab.) said: My Lords, I am much obliged to the noble Marquess the Leader of the House for making here on behalf of the Government the statement that is now being made by the Prime Minister in another place. I must say that the first impressions of this statement upon me are not very cheerful. Having regard to the long, outstanding application of the great profession of medical men and women to the State service, I feel it is extraordinary that, after this length of time, the question of their remuneration should be referred to a Royal Commission. That is a most extraordinary procedure to adopt. It was only last week that the noble Marquess, in that very difficult hour when he performed so brilliantly at the Box, said how much he deprecated the long delays and the odd form of inquiry which would be brought about by applying a Royal Commission to such a comparatively simple question as the roads in Oxford. Here we are dealing with something which is urgent, outstanding, and necessary to retain the good will of the medical profession in maintaining a great national service to the people. To me, it seems like cowardice on the part of the Government for them not to deal with, and decide their policy upon, what is an urgent matter. Instead of that, they refer it to a Royal Commission.

There was no such reference to a Royal Commission, no such delay, before the Government made the statement in the other place the other day about the increased costs of welfare milk and the weekly contribution of the worker to the Health Service as there is going to be in regard to the remuneration of the doctors. There was no sort of cowardice or hesitation in referring that matter to a Royal Commission. Those are people of a different type. But here it looks as if the medical profession may be "got at" with a view to putting up with a Royal Commission. Having regard to his former association with the great medical profession, no doubt the Chancellor of the Duchy of Lancaster will be busy trying to spin the necessary story of glamour to his professional colleagues. I only hope that the country will take as strong and as sincere a view about this sort of thing as I do myself.

The MARQUESS OF SALISBURY said: My Lords, if the noble Viscount the Leader of the Opposition was asking a supplementary question, it is what I might call a rhetorical question. He referred—I rather expected he would refer to it—to a debate which took place last week on the Oxford roads,

in which the Government rejected the idea of a Royal Commission. The noble Viscount must remember that the circumstances were entirely different in that case, as I explained—or, at least, I hoped I had explained—to the satisfaction of the House. There was in existence under the Town and Country Planning Act alternative machinery which was already in operation, and the fact that it was a very limited question—a limited problem, as the noble Viscount has said—made it easy to use that machinery. This is a very wide and complex question. I would remind the noble Viscount that I said in the statement I have just made:

"... the time is opportune for a full review of medical remuneration through an independent inquiry which would take into account the position of the medical profession in relation to other professional classes in the community."

That is, indeed, one of the great problems which has to be faced. It is no good the noble Viscount and others saying that the medical profession can be dealt with entirely in isolation; it cannot be done. This is one of the most complicated questions that exist, as I know from my connexions with the research bodies in this country, and it is an eminently suitable question to be dealt with by a body of this kind.

Viscount ALEXANDER OF HILLSBOROUGH asked: How long did it take the Government to discover that this was so complicated a question in comparison with others? For months and months this matter has been under discussion with the medical profession, and it has certainly been within the knowledge of the Ministry of Health from the moment the State scheme was launched. Now, at this stage, when the doctors are in a very poor position—at least, some of them are—in relation to the increasing cost of living, that they should be dealt with by means of a Royal Commission seems to me almost unthinkable. Will the noble Marquess say whether, while the Royal Commission is sitting, any adjustment is going to be made to ease the position of the doctors?

The MARQUESS OF SALISBURY: My Lords, I think I can say something about that. I understand that my right honourable friends the Minister of Health and the Secretary of State for Scotland have told the doctors and dentists that they are willing to agree to the granting of an interim increase to the junior hospital medical and dental staff. This is on the basis that they can justifiably be regarded as underpaid at present. The offer will be negotiated through the established Whitley machinery. It will not be extended beyond this limited class to, for example, the lower-paid general-practitioner doctors or dentists; it is meant to apply to those who are in most need at the present time.

Lord WILMOT OF SELMESTON (Lab.) said: My Lords, in view of what the noble Marquess the Leader of the House says, and in my view rightly says, about the bearing on research workers, may I take it that consideration of those bearings will be included in the terms of reference of the Royal Commission?

The MARQUESS OF SALISBURY answered: My Lords, the actual terms of reference I hope to be able to announce later. As I have said, anything which is done with regard to doctors and dentists has a bearing on these wider categories, though, obviously, there is a limit even to the subjects with which a Royal Commission can concern itself. But there are categories outside the limits of such terms of reference which have a bearing on the recommendations which such a Commission could make.

Lord AMULREE (Lib.) said: My Lords, I thank the noble Marquess for the statement he has made. I must agree that the questions raised by the medical profession have been going on for a long time, and I hope that the Royal Commission will now settle them quickly. Secondly, I and dentists, which the noble Marquess states is under consideration, will come under the terms of reference of the Royal Commission. We were told during a debate on the Oxford roads that some Royal Commissions could report in six months, while others might take six years. This is a

matter of some urgency, and I trust that in this case the period will be one of six months and not a longer period.

The MARQUESS OF SALISBURY said: My Lords, the period which the Royal Commission will take is a matter for the Commission. Her Majesty's Government desire, as much as the noble Lord, that it shall be as rapid and efficient as possible in its work. With regard to the other question, perhaps the noble Lord will allow me to let him know exactly what will be included within the terms of reference when I am able to do so. I will certainly bear in mind the point that he has made.

Lord CONESFORD (Con.) said: My Lords, may I ask my noble friend whether, in settling the terms of reference of the Royal Commission, he will consider the advisability of making them wide enough to enable the Royal Commission to compare, not only professional earnings as between different professions, but professional earnings with non-professional earnings? The MARQUESS OF SALISBURY said there had to be some limitation of the terms of reference, even of a Royal Commission.

Viscount ALEXANDER OF HILLSBOROUGH said: My Lords, on this important matter we should be glad to know the date by which we may have the terms of reference and (although this is a question we may then ask) how long the Royal Commission will sit. This is such an extraordinary announcement that we should be informed of these terms of reference as soon as possible.

The MARQUESS OF SALISBURY said: My Lords, I can assure the noble Viscount that we will let him know as soon as we are in a position to do so.

Antidote to Nerve Gases

Mr. S. AWBERY (Bristol, Central, Lab.) asked the Minister of Supply what experiments had been made at the Chemical Defence Station, Salisbury Plain, on the use of atropine as an antidote to nerve gases; what was the purpose of these; to what extent volunteers were used for the experiments; and what proposals he had for issuing this drug to soldiers to be used for self-injection. Mr. W. J. TAYLOR, the Parliamentary Secretary, replied that comprehensive experiments had been carried out over a number of years by the Chemical Defence Experimental Establishment to assess the value of atropine as an antidote against nerve gases and to determine the tolerance of effective dosages by men. The results of these trials, which included experiments with volunteers, had been published in the scientific press from time to time. No decision had yet been taken to issue this drug to soldiers for self-injection.

Benefit for Respiratory Disease

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked the Minister of Pensions and National Insurance whether he would pay benefit under the Industrial Injuries Act to those who suffered from respiratory disease as a result of living in areas where the atmosphere was heavily contaminated by commercial processes. Mr. J. BOYD-CARPENTER replied on February 18 that the proposal, which raised wide questions, went far beyond the provisions of the Industrial Injuries Act, 1946.

Alcoholic Psychosis

Mr. SOMERVILLE HASTINGS (Barking, Lab.) asked the Minister of Health on February 22 for an estimate of the number of cases of mental disease admitted to hospitals under his direction during 1955 in which alcohol was the principal or contributory cause, respectively. Mr. D. VOSPER stated that during 1955 there were 1,053 admissions to mental hospitals which were recorded as principally due to alcoholic psychosis or alcoholism. No estimate could be made of the number of admissions to mental hospitals in which alcohol was a contributory cause.

Homicide Bill

The House of Lords accepted without a division, but not without dissent, the Homicide Bill on second reading on February 21. The MARQUESS OF SALISBURY, for the Government, said it was hoped the House would not wish to make any drastic amendments, but any that were proposed would be considered on their merits, and the Government were free to accept any which they considered would be an improvement in the Bill. Lord GODDARD, the Lord Chief Justice, indicated during the debate that he would call attention in committee to some drafting difficulties; and Lord SILKIN expressed the Opposition's hope that it would be possible to "improve" the Bill along the road to complete abolition of capital punishment.

Lung Cancer

Mr. SOMERVILLE HASTINGS (Barking, Lab.) asked the Minister what communication he had received from the Standing Medical Advisory Committee or the Central Health Services Council as to the relationship between cigarette smoking and cancer of the lung, and as to any action to be taken accordingly. Mr. VOSPER replied that at their meetings in December last these bodies repeated the advice already given to his predecessor. Like him, he proposed to ensure that the public were kept informed of all relevant information as and when it became available.

Health Service Cost

Mr. ARTHUR LEWIS (West Ham, North, Lab.) asked what was the total cost of the Health Service in 1950 and at the latest convenient stated date respectively; and, taking the pound sterling as having a purchasing value of 20s. in 1950, what was the relative purchasing value of the current National Health charge compared with 1950, after allowing for the depreciation of the purchasing value of the pound sterling. Mr. VOSPER told him that the total cost of the Health Service in 1949-50 was about £450m., of which £345m. was met by the Exchequer. The corresponding figures estimated for 1957-8 were about £690m. and £550m. respectively. The equivalent of these latter figures in terms of the purchasing value of the pound in 1949-50 (measured by the estimated change in the Consumer Price Index between 1949-50 and December, 1956) were about £515m. and £410m.

Whitehaven Hospital.—The Minister of Health has authorized the regional hospital board to proceed with the site works for the new hospital at Whitehaven. The total estimated cost of the hospital is £2,500,000, and plans for the first stage are nearing completion.

Hospital Confinements.—During 1955 the number of institutional confinements in England and Wales was 440,857, which was 64.75% of the total.

Universities and Colleges

UNIVERSITY OF OXFORD

The following have been reappointed University Demonstrators from October 1, 1957, to September 30, 1962, in the subjects indicated in parentheses: Dr. R. Barer (Human Anatomy), Dr. J. M. Walker (Pharmacology), Dr. E. M. Vaughan Williams (Pharmacology), Dr. D. S. Parsons (Biochemistry), Dr. D. J. C. Cunningham (Physiology).

Dr. D. St. C. Roberts has been reappointed Clinical Tutor in Ophthalmology and Dr. G. M. Ardran radiologist at the Nuffield Institute for Medical Research, both from October 1, 1957, to September 30, 1962.

In Congregation on January 24 the following degrees were conferred:

B.M.—G. R. Pate, D. A. Wheelwright, D. W. Boyd, P. Owen-Lloyd, Jennifer L. Murray, H. M. Williams (in absence).

UNIVERSITY OF ST. ANDREWS

The following candidates have been approved at the examination indicated:

M.B., B.S.—I. M. Aitkenhead, L. R. Butler-Manuel, D. C. Crawford, R. A. Haddow, P. Hossen, M. J. Illingworth, *D. W. Jarvis, J. L. Maddison, J. P. M. Penney, D. J. Sutherland, *T. T. Thompson, H. E. G. Thomson, Mrs. Elinor M. Whyte.
*In absentia.

UNIVERSITY OF GLASGOW

On January 7 the degree of M.D. was conferred, *in absentia*, on the following candidates: *D. I. Buchanan, *M. B. Divertie, J. M. Smith, *C. M. Wylie.

The following degrees were conferred on January 12:

M.D.—Mary G. Coyle, *Margaret M. Kerr, *R. Lannigan, *C. J. Mackinlay, *R. G. Whitelaw.
M.B., Ch.B.—A. V. Anderson, A. Auld, Evelyn F. Barclay, H. Bart-Plange, J. Caplan, B. C. Colvin, A. H. Frame, S. MacF. Gaird, D. S. Gilchrist, H. K. Gooding, J. C. Gray, A. Hare, Moira B. M. Hendry, T. P. Howat, Christine M. Hyslop, Anne P. Johnstone, J. Lee, J. W. Little, W. MacDonald, R. E. McIntosh, G. D. Mackenzie, D. G. Muirhead, A. M. Orr, T. Orr, M. C. G. Rennie, A. E. Roberts, A. P. Scott, R. G. Stark, Helen J. Stewart, P. M. Stoker-Murdy, Seana R. Sutherland, G. J. Thomson, R. J. Wylie, W. J. Young.

*With high commendation. *With commendation.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At the quarterly comitia of the College held on January 31, with the President, Sir Russell Brain, in the chair, the death on December 20, 1956, at St. Thomas's Hospital, of the Treasurer of the College, Professor W. G. Barnard, was recorded with deep regret.

Dr. E. R. Boland, Dr. J. B. Harman, and Dr. T. C. Hunt were reappointed College representatives on the Central Medical Recruitment Committee, Dr. Janet Vaughan on the Advisory Board on Nursing Education of the Royal College of Nursing. Dr. Neville Goodman was appointed College representative at the Health Congress of the Royal Society of Health to be held at Folkestone from April 30 to May 3, 1957.

Licences

Licences to practise were conferred upon the following 84 candidates who have passed the final examination in medicine, surgery, and midwifery of the Conjoint Board and who have complied with the by-laws of the College:

K. A. Anderson, E. L. R. Andrews, M. V. R. Appa Rao, J. B. G. Arthur, P. Atkins, S. E. August-Moffatt, A. G. Barrow, E. E. Basse, G. P. E. Beange, P. G. Benson, G. T. Birchall, A. J. Blakeman, J. J. B. Brand, T. J. Carter, J. V. F. Catto, A. M. A. Clark, C. Cook, E. J. Cooney, Mary Corbett, Barbara C. Dean, I. E. Doney, J. I. Edwards, M. W. Everitt, K. Finney, A. F. Fleming, M. E. Gloster, W. I. M. Goodrick, C. J. Goodwill, Z. Grahovac, B. J. G. Greenhill, Jean A. Hagger, D. W. Hall, T. L. R. Hall, Rosalie M. Harrison-Bloom, Veira F. A. Hauxwell, L. P. J. Holt, Y. E. Hsia, C. M. Jadwat, P. Knight, Audrey M. Lake, C. W. Landon, Patricia O. Lane, Jean C. Le Riche, I. Lewis, W. J. Lush, I. McColl, C. A. G. Mackenzie, K. P. Mehta, A. H. Miller, C. P. Monty, D. R. Morgan, E. B. Morgan, B. R. P. Murray, Norma G. Newbury, Lotte T. Newman, J. D. J. Parker, P. C. C. Pitt, D. R. Potter, Sheila M. Power, Edna O. S. Renwick, R. B. Roberts, David S. Robertson, Donald S. Robertson, Charmian A. Russell, R. de K. G. Samuel, T. D. Sayer, J. H. Scotson, Mary P. Shepherd, I. D. Simpson, J. F. Tattersfield, S. G. Taylor, J. G. Teall, J. A. P. Trafford, J. Tudor, Joyce Warner, C. Wastell, B. Weinstein, W. M. Weir, P. S. Welch, P. B. Whatmore, S. R. Williams, Susan M. Wilson, T. Woodward, A. J. Zuckerman.

Diplomas

Diplomas in Laryngology and Otolaryngology, in Anaesthetics, in Psychological Medicine, in Tropical Medicine and Hygiene, in Pathology, and in Medical Radiotherapy were granted, jointly with the Royal College of Surgeons of England, to the successful candidates whose names are printed below in the report of the meeting of the Royal College of Surgeons of England held on January 10.

Diplomas in Medical Radiodiagnosis were granted, jointly with the Royal College of Surgeons of England, to B. W. A. Leeming and to the other successful candidates whose names are printed below in the report of the meeting of the Royal College of Surgeons of England held on January 10.

The following diplomas were granted jointly with the Royal College of Surgeons of England:

DIPLOMA IN CHILD HEALTH.—Uda S. Ellis, C. G. Gallagher.
DIPLOMA IN INDUSTRIAL HEALTH.—D. R. Belletty, D. E. Marchant, R. G. Orr, J. S. Robertson, F. G. M. Seager, O. P. Verma.
DIPLOMA IN PUBLIC HEALTH.—H. Bancroft, E. E. Bowen, Seonaid C. Cameron, J. C. Chakrabarti, D. M. Dignes La Touche, C. P. A. Dupont, C. B. Higgin, C. D. Hopkins, W. G. J. Hughes, I. Khan, Audrey J. Lacey, Hilda E. McNamara, R. K. Mukhopadhyay, W. L. Palmer, Brenda K. Rimmer, M. Ryan, S. W. Smith, R. A. Stenhouse, I. O. Taylor, R. W. Watton, P. A. C. Wright.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College held on January 10, with Sir Harry Platt, President, in the chair, Mr. A. C. McEarchern (Adelaide) was awarded a Hunterian Professorship.

A diploma of Fellowship was granted to W. G. Lucas. The following diplomas were granted, jointly with the Royal College of Physicians of London:

DIPLOMA IN LARYNGOLOGY AND OTOLARYNGOLOGY.—M. A. K. Afridi, J. A. Coombes, J. T. Dunn, J. A. Fajemisin, T. Fazleabas, Hla Saw Khine, C. M. Jain, J. McKenzie, A. G. May, N. R. Sarkar, S. Sarkar, P. A. Shah, E. G. Weyhausen, M. Y. Wipat.
DIPLOMA IN ANAESTHETICS.—D. A. L. Ashforth, Anne Bewley, P. Borg-Brigid, M. J. Brennan, J. F. Burdon, J. K. A. Burn, Rhoda M. R. Burt, G. H. Bush, M. P. Cardew, W. B. Chamberlain, J. Chari, Elizabeth F. H. Clarke, E. M. Coates, R. A. Davidson, W. MacF. Davidson, D. S. Dick, Diana F. J. Duncan, Barbara C. Edwards, L. Essex, J. N. T. Evans, Phillida M. Frost, M. R. Golin, Joyce Y. Graham, J. O. Hancock, Maureen E. Hardean, Margaret A. Hayes, Catherine Henderson, June R. Hill, Mary G. C. A. Hunter, Ruth Hutchinson, D. S. Hutton, Mary C. Irvine, J. M. James, W. H. James, Elsie Jaques, S. G. Jones, Lila Kalappa, A. N. Kalra, A. Mel, K. Kelly, F. M. Kinsman, Margaret A. Lawrence, Julia I. Leitch, A. B. Lodge, Joyce B. H. Longmore, Krystyna M. Lubomirska, G. W. Macnab, A. S. Manavalan, G. C. Mansfield, M. B. Marshall, Renate M. Meyer, N. K. Misra, D. D. Moir, A. Moore, D. K. R. C. Nainby-Luxmoore, F. Nimmi, G. K. Nixon, J. S. Ogilvie, R. C. Oliva, J. G. Opie, B. G. Pirie, Caroline R. F. Port, C. H. Pryor, Marion G. Ralston, Margaret E. Riddoch, E. D. T. Ross, H. N. Sadhu, G. Screech, B. C. Sengupta, J. G. Sheehy, F. B. Singleton, A. J. Slim, W. D. A. R. V. Li. Thomas, R. A. Truesdell, M. Urshan, L. Walker, D. A. Walmsley, P. T. Watters, K. P. Williams, E. G. Wilson.
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DIPLOMA IN MEDICAL RADIO-THERAPY.—I. G. Emmanuel, W. E. Freeman, N. Gupta, H. Horwitz, S. F. Huq, Elizabeth M. Kingsley Piliers, R. Li, Morgan, D. L. Phillips, T. K. Rithuparnan, A. D. Shetty, H. D. Suit.

Vital Statistics

Influenza in Armed Forces

The only notable outbreaks of influenza so far this winter have been in Service units. An outbreak of virus A influenza has occurred in the R.A.F. at Halton, Bucks, and small outbreaks are reported from Army units at Chelsea and Wellington Barracks, at the Tower of London, and in two training units at Rhyl, Flintshire. Virus isolated so far has been of the Dutch 1956 group.

Week Ending February 16

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 830, whooping-cough 3,163, diphtheria 2, measles 19,710, acute pneumonia 676, acute poliomyelitis 37, dysentery 1,274, paratyphoid fever 6, and typhoid fever 1.

Infectious Diseases

In England and Wales during the week ending February 9 the largest rises in the notifications of infectious diseases were 3,744 for measles, from 13,008 to 16,752, 193 for dysentery, from 1,097 to 1,290, and 59 for acute pneumonia, from 661 to 720; the only large fall was 154 for whooping-cough, from 3,302 to 3,148.

The largest increases in the incidence of measles were 501 in Lancashire, from 2,937 to 3,438, 382 in London, from 971 to 1,353, 348 in Durham, from 1,088 to 1,436, 343 in Essex, from 1,113 to 1,456, 231 in Northumberland, from 734 to 965, 197 in Surrey, from 525 to 722, 175 in Yorkshire West Riding, from 755 to 930, 151 in Middlesex, from 501 to 652, 146 in Gloucestershire, from 220 to 366, and 135 in Staffordshire, from 386 to 521. The largest fluctuations in the trends of whooping-cough were a fall of 90 in Kent, from 250 to 160, and a rise of 45 in Sussex, from 55 to 100. The notifications of scarlet fever numbered 869, 4 more than in the

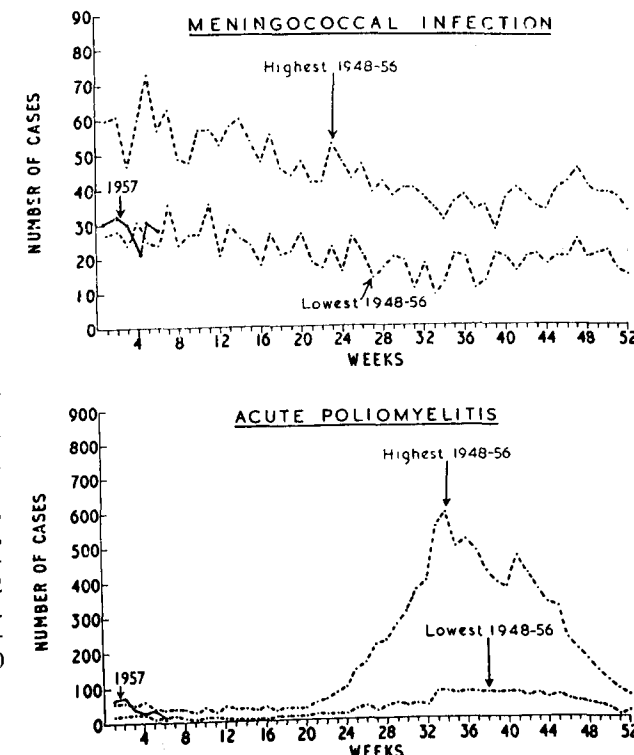
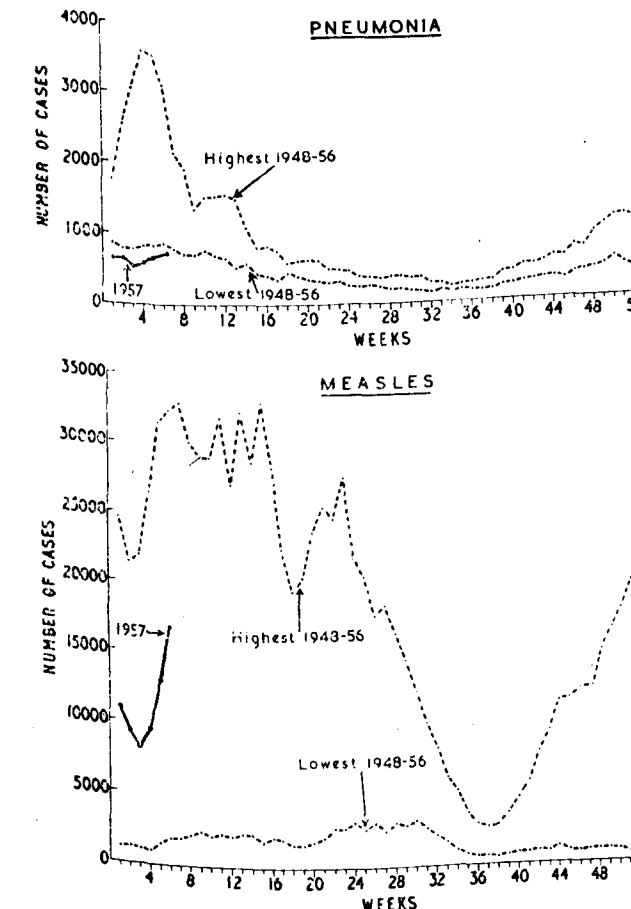
preceding week, and there were no large fluctuations in the local returns. 9 cases of diphtheria were notified, being 4 more than in the preceding week; 2 of the cases were notified in the metropolitan borough of Islington.

34 cases of acute poliomyelitis were notified during the week, and these were 7 fewer for paralytic and 4 more for non-paralytic cases than in the preceding week. The largest returns were London 8 (Kensington 2), Kent 4, and Lancashire 4.

The largest centres of dysentery were Lancashire 337 (Stretford M.B. 111, Accrington M.B. 106, Droylsden U.D. 15, Urmston U.D. 15, Blackburn C.B. 10), Yorkshire West Riding 174 (Rotherham C.B. 31, York C.B. 27, Dewsbury C.B. 24, Leeds C.B. 20, Bradford C.B. 17, Sheffield C.B. 15), Warwickshire 75 (Coventry C.B. 38, Birmingham C.B. 18, Nuneaton M.B. 12), London 67 (Chelsea 22, Hackney 15), Durham 61 (Gateshead C.B. 22, Blaydon U.D. 14), Yorkshire East Riding 51 (Kingston-upon-Hull C.B. 26, Haltemprice U.D. 25), Northumberland 50 (Blyth M.B. 23, Alnwick U.D. 22), Nottinghamshire 45 (Arnold U.D. 25, Nottingham C.B. 15), Surrey 40 (Mitcham M.B. 17, Surbiton M.B. 12), Staffordshire 38 (Kidsgrove U.D. 13, Stoke-on-Trent C.B. 11), Essex 38 (East Ham C.B. 13, Chigwell U.D. 10), Glamorgan-shire 35 (Cardiff C.B. 13, Rhondda M.B. 13), Bedfordshire 32 (Luton M.B. 30), Middlesex 31 (Hayes and Harlington U.D. 14), Wiltshire 27 (Calne and Chippenham R.D. 19), Berkshire 21 (Wokingham R.D. 13), and Leicestershire 20 (Hinckley U.D. 10).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1948-56 are shown thus ----, the figures for 1957 are shown as a solid line. Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Drinks and Smokes

Since the end of the second world war the consumption of beer in the United Kingdom has tended to decline slightly, while that of spirits has risen. The amount of tobacco consumed has steadily increased from 1947-8, though without yet reaching the figure for 1946-7. The Table below gives details. The figures are from the *Forty-Seventh Report of the Commissioners of Her Majesty's Customs and Excise for the Year Ended March 31, 1956* (H.M.S.O., 7s. 6d.).

Year	Beer Brewed in U.K., Bulk Barrels* (Millions)	Spirits Retained for Consumption, Proof Gallons (Millions)	Tobacco Retained for Consumption, lb.† (Millions)
1946-7	29.23	9.99	255.57
1947-8	30.01	9.98	211.79
1948-9	27.05	8.91	212.33
1949-50	25.76	9.77	213.19
1950-1	24.75	11.40	214.88
1951-2	24.67	9.67	218.81
1952-3	24.39	10.22	220.11
1953-4	24.20	10.64	224.22
1954-5	23.61	11.51	232.43
1955-6	24.12	12.35	239.26

* 1 bulk barrel = 36 gallons (164 litres). † 1 lb. = 0.45 kg.

The consumption of sugar, both home-grown and imported, has also increased in the last decade, as the following Table shows. Figures are given in the same Table to show the great increase in use of heavy fuel oils by road vehicles.

Year	Sugar Retained for Consumption, Cwt.* (Millions)	Heavy Fuel Oil for Road Vehicles, Gallons† (Millions)
1946-7	32.76	147.60
1947-8	37.72	175.30
1948-9	37.73	200.39
1949-50	39.05	230.15
1950-1	39.65	259.33
1951-2	40.43	283.79
1952-3	38.71	294.88
1953-4	41.48	321.86
1954-5	47.12	364.26
1955-6	47.60	421.07

* 1 cwt. = 50 kg. approx. † 1 gallon = 4.5 litres.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending February 9 (No. 6) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	9	2	1	0	2	8	0	3	0	10
Dysentery ..	1,290	67	213	7	1	1,336	152	134	21	3
Encephalitis, acute	5	1		0		0	0		0	
Enteric fever:										
Typhoid ..	6	1	0	0		2	0	0	0	
Paratyphoid ..	5	0	2 (B)	0		5	0	0	0	
Food-poisoning ..	165	31	60	1		121	14		0	
Infective enteritis or diarrhoea under 2 years ..					16					6
Measles* ..	16,752	1,353	504	508	301	2,889	51	63	17	98
Meningococcal infection ..	28	2	10	3	1	37	4	14	1	2
Ophthalmia neonatorum ..	29	2	7	0		18	1	2	1	
Pneumonia† ..	720	58	270	59	2	1,176	68	422	16	10
Poliomyelitis, acute:										
Paralytic ..	21	5	3	1	9	19	2	1	4	0
Non-paralytic ..	13	3				7	1			2
Puerperal fever§ ..	222	45	9	0	1	266	55	8	3	
Scarlet fever ..	869	62	74	35	26	961	44	89	30	24
Tuberculosis:										
Respiratory ..	666	86	121	16	5	667	63	114	23	
Non-respiratory ..	75	6	21	5		83	7	14	3	
Whooping-cough ..	3,148	164	423	14	44	1,285	69	90	103	225

DEATHS in Great Towns	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute		0			0		1			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	8	0	0	0	0	6	0	0	0	0
Influenza ..	11	2	1	0	0	82	8	17	0	1
Measles ..		0	0	0	0		0	0	0	0
Meningococcal infection ..		0	0				0	2		
Pneumonia ..	299	43	20	11	12	549	76	55	11	10
Poliomyelitis, acute	4	0			0	4	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory ..	62	6	10	2	0	87	19	19	4	7
Non-respiratory ..		2	0	0	1		1	1	0	0
Whooping-cough ..	2	0	0	0	0	1	0	0	1	0
Deaths 0-1 year ..	261	38	19	10	9	274	28	37	12	22
Deaths (excluding stillbirths) ..	5,669	786	653	128	180	7,890	1,130	976	128	196
LIVE BIRTHS ..	7,981	1,213	1,031	245	368	7,903	1,130	999	195	354
STILLBIRTHS ..	218	23	17			195	25	29		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

§ Includes puerperal pyrexia.

Medical News

Mass Radiography of Hungarian Refugees.—Mass miniature radiography of several hundred Hungarian refugees has disclosed a higher incidence of pulmonary tuberculosis than is general in Britain. The Ministry of Health has therefore advised medical officers of health to offer mass radiography to those Hungarians who are still housed together in sufficient numbers to justify a visit by a mobile unit. Hostels with a hundred or more refugees are mentioned as suitable for such a visit. For small hostels it is suggested that the refugees should go to a convenient centre. It is emphasized in the Ministry's letter, which was dated February 7, that the examination is voluntary.

Medical School at Durban.—Natal University and the local branch of the Medical Association of South Africa have protested vigorously against the Union Government's decision to remove the non-European medical school at Durban from the control of Natal University, writes the *Times* correspondent in Durban. It appears that the school is to be administered by the Department of Native Affairs. According to the *Times* correspondent, protests have been filed by the whole of Natal University's medical faculty. The heads of all the other faculties, and student bodies. The heads of faculties are reported as stating: "Assurances previously given are apparently no longer valid. At the official opening of the new medical school the present Minister of Education emphasized that the Government would not interfere with the University's development of this faculty. If transfer of control of the faculty without interference, then moral values have little meaning." The Natal coastal branch of the Medical Association of South Africa is quoted as declining "to co-operate in any way with any authority other than the University of Natal in the staffing of the medical school." Dr. E. G. MALHERBE, Mr. STRYDOM, the Prime Minister, is heading a delegation to medical school.

Triple Course for Nurses.—A comprehensive 4-year course in nursing leading to the triple qualifications of S.R.N., Health Visitor, and Queen's District Nurse begins at Hammersmith Hospital in September. The course is described as probably the most important experiment in the training of nurses since the 1949 Nurses Act. The aim is to bring together the preventive and curative aspects of nursing by The course will be held at Hammersmith Hospital (Post-graduate Medical School of London), Battersea College of Technology, and the Queen's Institute of District Nursing. Besides the three qualifications mentioned, the students will also take Part I of the Central Midwives Board Certificate. Candidates for this course will be required to hold a General Certificate of Education in three subjects at ordinary level and two other subjects at advanced level.

"Medical History."—The first issue of a new quarterly journal, *Medical History*, made its appearance in January. It is edited by Mr. W. J. BISHOP, formerly librarian of the organ of the Cambridge University History of Medicine Society, the Norwegian Society for the History of Medicine, the Scottish Society of the History of Medicine, and the Osler Club of London. Its stated purpose is to record the history and bibliography of medicine and the related sciences. The publishers are William Dawson and Sons Ltd., 4, Duke Street, Manchester Square, London, W.1, from whom it may be obtained for £2 10s. or \$7.50 a year (single and eight full-page art plates. On the attractively designed Linacre, inset into the binding of a book in the Wellcome Historical Medical Library. Besides six original articles,

the first issue of *Medical History* has sections headed: Texts and Documents; Society Reports; News, Notes, and Queries; Book Reviews; and Medical Anniversaries of 1957. Among the principal journals in English now current in this field besides *Medical History* are the *Journal of the History of Medicine and Allied Sciences* (New York; started in 1946), the *Bulletin of the History of Medicine*, Johns Hopkins University (Baltimore; started in 1933), *Centaureus* (Copenhagen; started in 1950), and in the *Proceedings of the Royal Society of Medicine* (London) the records of the Section of the History of Medicine which first appeared there in 1913.

Chair of Therapeutics at Belfast.—Dr. O. L. WADE, senior lecturer in medicine at Birmingham University, has been appointed to the Chair of Therapeutics and Pharmacology at Queen's University, Belfast. He succeeds Professor E. B. C. MAYRS, who is retiring. His appointment is from April 1, and the duties of the post include charge of beds in the teaching hospital. Dr. Wade is 35. He was a scholar of Emmanuel College, Cambridge, where he gained a double first in the Natural Sciences Tripos, thereafter proceeding to University College Hospital, London, where he was Acheson scholar. After a series of junior hospital appointments he became for a short time clinical assistant at the Medical Research Council's pneumoconiosis research unit at Cardiff. Since 1951 Dr. Wade has been a member of the medical professorial unit at the Queen Elizabeth Hospital, Birmingham. In 1954 he held a Rockefeller Traveling Fellowship in Medicine, which he spent with Dr. Robert Loeb and Dr. Stanley Bradley at the Columbia Medical Centre, New York. Dr. Wade's investigations have been into the haemodynamics of the pulmonary and hepatic circulations.

Empire Rheumatism Council.—To celebrate its 21st birthday the Empire Rheumatism Council has launched an appeal for £250,000 for research. The fund is under the chairmanship of Lord ASTOR OF HEVER, and the appeal is mainly being directed to industry. In a pamphlet entitled "Industry and Rheumatism," issued in connexion with the appeal, rheumatic diseases are stated to account for 10% of all working days lost through illness. In the year beginning June, 1953, 27.5 million days were lost to industry from rheumatic disorders compared with two million from industrial stoppages. Tuberculosis and bronchitis each accounted for a loss of 25.5 million days, and industrial accidents for 16 million days. These figures for illness are minimum estimates, as absences of less than four days are not included.

Poliomyelitis Research.—The National Fund for Poliomyelitis Research allocated £69,000 in research grants during the year ended October 31 last. All grants were made after consultation with the Medical Research Council. The largest grant, £50,000, was for the M.R.C. virus production laboratory at Carshalton (see *Journal*, December 1, 1956, p. 1315). The net income raised by the Fund during the year was £109,000. Further details of the Fund's work and the investigations towards which grants have been made are given in the Fund's fourth annual report. The address of the National Fund for Poliomyelitis Research is Vincent House, Vincent Square, London, S.W.1.

Deteriorated Poliomyelitis Vaccine.—A few phials of the latest batch of poliomyelitis vaccine ready for issue have been found to show signs of possible deterioration during storage. The Ministry of Health states that distribution will be deferred while the matter is investigated.

Royal College of Surgeons in Ireland.—At a ceremony held at the College on the occasion of the Charter Day dinner the College's honorary fellowship was conferred on Mr. T. J. D. LANE, visiting surgeon at the Meath Hospital, Dublin. On February 11 Mr. E. W. RICHES, of the Middlesex Hospital, delivered the second Abraham Colles post-graduate lecture. He lectured on the management of carcinoma of the bladder.

M.R.C.P. (London).—The following were elected Members of the Royal College of Physicians of London at the quarterly comitia on January 31: S. Ahmed, G. L. Asherson, N. H. Ashton, A. I. Cheyne, Etain A. Cronin, W. J. Fessel, R. F. Fletcher, G. Harris, Marion Hildick-Smith, I. A. Horton, J. W. Howie, N. L. Jones, H. Keen, L. Kreel, Lesley P. Leader, J. T. Leeming, M. H. Lees, R. D. Lele, A. H. E. Marshall, P. R. Montgomery, J. A. Parrish, K. Schwarz, E. D. Sever, T. P. Telfer, A. G. Wallace, J. C. Willan, and L. Wollner.

Consultant Haematologist to Army.—The Army Council has appointed Dr. R. BODLEY SCOTT as honorary consultant in haematology to the Army at Home, in succession to the late Sir LIONEL WHITBY.

London University.—Dr. M. J. BLUNT, senior lecturer in anatomy at St. Bartholomew's Hospital Medical College, has been appointed to the university readership in anatomy tenable there.

B.M.J. Index.—The half-yearly indexes to Volume II of the *Journal* and the *Supplement* for 1956 are now being sent to members who receive them regularly and to subscribers. Members who have not previously asked for the indexes to be sent regularly to them can obtain copies, post free, on application to the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1; those wishing to receive the indexes regularly should mention this.

COMING EVENTS

Oliver-Sharpey Lectures.—Professor J. R. SQUIRE will deliver the Oliver-Sharpey Lectures on March 12 and 14 at 5 p.m. at the Royal College of Physicians, Pall Mall East, London, S.W.1. His subject will be "The Functions of the Plasma Proteins."

Manchester University Medical Dinner.—Annual dinner on March 14 in the Manchester University Unions. Tickets, graduates 25s., from Mr. T. G. RAMSELL, Medical School, University, Manchester, 13.

Grey Turner Surgical Club.—Meeting at Leeds, March 25-27. Details from Mr. GORDON N. BAILEY, F.R.C.S., 2A, Lancaster Road, Harrogate.

NEW ISSUES

British Heart Journal.—The new issue (Vol. 19, No. 1) is now available. The contents include:

- TRICUSPID INCOMPETENCE AND RIGHT VENTRICULAR OUTPUT IN CONGESTIVE HEART FAILURE. Paul Korner and John Shillington.
- DIAGNOSIS OF CONGENITAL ANEURYSM OF THE VENTRICULAR SEPTUM. Israel Steinberg.
- PATENT DUCTUS ARTERIOSUS. A FOLLOW-UP OF 73 CASES. J. A. Cosh.
- EFFECTS OF INTRAVENOUS DIGOXIN IN AURICULAR FIBRILLATION. John Hammond and William Whitaker.
- VENTRICULAR EXTENSION INTO THE ABDOMINAL WALL. Clifford Parsons.
- BARORECEPTOR RESPONSES TO ACUTE RHYTHM CHANGES. Sheila Howarth and E. P. Sharpey-Schafer.
- ADRENALINE SENSITIVITY OF PERIPHERAL BLOOD VESSELS IN HYPERTENSION. Robert S. Duff.
- RADIATION REACTIONS IN THE HEART. A. G. W. Whitfield and P. B. Kunkler.
- ELECTROCARDIOGRAPHIC CHANGES IN HYPOTHERMIA IN MAN. Peter R. Fleming and Frank H. Muir.
- EXTRA-CORPOREAL CIRCULATION AND HEART SURGERY. Ch. Dubost, R. Heim de Baisac, R. de Wall, C. Lenfant, J. Guery, J. Passelecq, M. Weiss, and J. Rouanet.
- CLINICAL, PHYSIOLOGICAL, AND PATHOLOGICAL CONSIDERATIONS IN IDIOPATHIC PULMONARY HYPERTENSION. John T. Shepherd, Jesse E. Edwards, Howard B. Burchell, H. J. C. Swan, and Earl H. Wood.
- IDIOPATHIC PULMONARY HYPERTENSION. Donald Heath, William Whitaker, and James W. Brown.
- SOLITARY PULMONARY HYPERTENSION. William Evans, D. S. Short, and D. Evan Bedford.
- TOTAL AND PERIPHERAL BLOOD FLOW IN ACUTE MYOCARDIAL INFARCTION. G. J. Lee.
- THE GRAPHIC CONFIGURATION OF INNOCENT SYSTOLIC MURMURS. B. G. Wells.
- CASE REPORTS:
- CONGENITAL ARTERIOVENOUS FISTULA OF THE INTERNAL MAMMARY VESSELS. B. G. Wells and R. L. Hurt.
- RUPTURE OF AN ANEURYSM OF THE RIGHT AORTIC SINUS (OF VALSALVA). Leonard Weiss.
- ANEURYSM OF AN ANOMALOUS RIGHT SUBCLAVIAN ARTERY. W. C. D. Richards and C. E. Elliott.
- THE SECOND EUROPEAN CONGRESS OF CARDIOLOGY.
- ABSTRACTS OF CARDIOLOGY.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

British Journal of Industrial Medicine.—The new issue (Vol. 14, No. 1) is now available. The contents include:

- THE DANGER OF DERMATOSES DUE TO COLD-SETTING ETHOXYLINE RESINS (EPOXIDE RESINS). E. Grandjean.
DECOMPRESSION SICKNESS DURING THE SINKING OF A CAISSON. H. E. Lewis and W. D. M. Paton.
THE EFFECTS OF THE TEMPERATURES OF THE FLOOR SURFACE AND OF THE AIR ON THERMAL SENSATIONS AND THE SKIN TEMPERATURE OF THE FEET. F. A. Chienko.
FOOT RINGWORM IN COAL-MINERS. J. C. Gentles and J. G. Holmes.
AN EXPERIMENTAL STUDY OF THE PATHOGENESIS OF SILICOTIC GRANULOMA IN THE ANTERIOR EYE CHAMBER IN RABBITS AND CHANGES IN ITS DEVELOPMENT INDUCED BY THE ACTION OF A.C.T.H., INSULIN, COMBINATIONS OF BOTH, AND SALICYLATES. Jiri Vyskočil.
THE PREVALENCE OF TUBERCULOSIS AT NECROPSY IN PROGRESSIVE MASSIVE FIBROSIS OF COAL-WORKERS. D. Rivers, W. R. L. James, D. G. Davies, and S. Thompson.
THE INFLUENCE OF THE SHAPE OF DUST PARTICLES ON THE RATE OF PHAGOCYTOSIS IN VITRO. A. Lengertová, V. J. Lengert, M. Esslová, R. Tuscany, and M. Volfová.
THE TOXICITY OF FUMES FROM A DIESEL ENGINE UNDER FOUR DIFFERENT RUNNING CONDITIONS. R. E. Pattie, H. Stretch, F. Burgess, K. Sinclair, and J. A. G. Edginton.
DELAYED DEATH CAUSED BY GASSING IN A SILO CONTAINING GREEN FORAGE. F. M. Troisi.
OBITUARY: HUBERT WYERS, M.D.
MISCELLANEA:
ASSOCIATION OF INDUSTRIAL MEDICAL OFFICERS: 21ST ANNIVERSARY MEETING.
INDUSTRIAL MEDICINE AND HYGIENE: A Review by L. G. Norman.
PERCIVAL PUTT (1714-1788) AND CHIMNEY SWEEPERS' CANCER OF THE SCROTUM. John R. Brown and John L. Thornton.
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BRITISH OCCUPATIONAL HYGIENE SOCIETY AND ERGONOMICS RESEARCH SOCIETY. D. Turner.

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SOCIETIES AND LECTURES

A fee is charged of a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Friday, March 1

LIVERPOOL UNIVERSITY.—At Surgery Theatre, Medical School, 5.15 p.m., Faculty of Medicine Lecture by Dr. H. M. Sinclair: Dietary Fat and Human Disease.

Monday, March 4

MARLBOROUGH DAY HOSPITAL.—8.15 p.m., Mr. M. M. Simmons, M.A., and Dr. D. R. Davis: The Intelligent Offender: His Treatment in an Approved School.

UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, Gower Street, W.C.2, 5 p.m., public lecture by Dr. G. J. Popják: Biochemistry of Fatty Acids and Cholesterol—Biological Oxidation of Fatty Acids.

UNITED HOSPITALS CATHOLIC SOCIETY.—At 13, Devonshire Place, W., 6.15 p.m., Mr. L. H. W. Williams: Abortion.

Tuesday, March 5

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Mr. B. E. D. Cooke: Disorders of Buccal Mucosa.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Erasmus Wilson Demonstration by Dr. A. J. M. Reese: Atheroma.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Mr. R. M. Feroze: Dysfunctional Uterine Haemorrhage.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Mr. G. C. Knight: Diagnosis of Cerebral Tumours.

Wednesday, March 6

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Problems of Therapy in Fungus Diseases.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. B. G. B. Lucas: Man and His Ventilation.

INSTITUTE OF UROLOGY.—4.30 for 5 p.m., Mr. G. F. Murnaghan: Congenital Hydronephrosis.

MIDLAND MEDICAL SOCIETY.—At 154, Great Charles Street, Birmingham, 8.15 p.m., Dr. C. G. Parsons: General Practitioner and the Chesty Child.

OXFORD UNIVERSITY.—At Radcliffe Infirmary, 5 p.m., Litchfield Lecture by Dr. P. H. Wood: Pulmonary Hypertension.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. R. E. B. Hudson: The Heart Septa.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Finlayson Lecture by Mr. D. W. Currie: Results of Twenty-one Years of Surgical Treatment of Cancer of the Cervix.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Dr. B. G. C. Ackner: Emotional Aspects of Bodily Complaints.

ROYAL SOCIETY OF HEALTH.—2.30 p.m., symposium by Professor A. C. Frazer and Dr. H. M. Sinclair: Composition and Nutritive Value of Flour.

SOCIETY FOR ANALYTICAL CHEMISTRY: BIOLOGICAL METHODS GROUP.—At the Feathers, Tudor Street, E.C.2, 6.30 p.m., discussion to be introduced by Dr. A. Spinks, Ph.D.: Experimental Assessment of Tranquillizers.

WELSH NATIONAL SCHOOL OF MEDICINE.—At Reardon-Smith Lecture Theatre, Park Place, Cardiff, 8 p.m., Sixth William Sheen Memorial Lecture by Sir Harry Platt, P.R.C.S.: Backache-Sciatica Problem.

Thursday, March 7

FACULTY OF HOMOPATHY.—5 p.m., Dr. A. E. Strigener: Similarity and the Synergistic Action Observed Between Hypnosis and Homoeopathy. Joint LIVERPOOL MEDICAL INSTITUTION.—At Liverpool University, 5.15 p.m., Joint History of Medicine Lecture by Mr. J. B. Oldham: Two Centuries Ago. MIDLAND THORACIC SOCIETY.—At Queen Elizabeth Hospital, Birmingham, 7.30 p.m., Dr. W. W. Jones: Pneumococcosis.

ROYAL INSTITUTE OF CHEMISTRY: THAMES VALLEY SECTION.—At Reading University, 5.15 p.m., joint meeting with Reading University Chemical Society. Professor E. J. King: Use of Enzymes in Medical Chemistry.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—5 p.m., symposium: Psychiatry as an Aid to Dermatology.

Friday, March 8

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. P. J. Hare: clinical demonstration.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Air Commodore C. A. Rumball: Some Problems in Cardio-respiratory Assessment.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., Mr. A. Radcliffe: Nasal Catarrh.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—10 a.m., Mr. S. H. Wass: Present Position of Surgery in the Treatment of Ulcerative Colitis.

ROYAL MEDICAL SOCIETY, EDINBURGH.—8 p.m., Valedictory Address by the Senior President.

Saturday, March 9

KENT PAEDIATRIC AND CHILD HEALTH SOCIETY.—At Royal Star Hotel, Maidstone, 3 p.m., Presidential Address by Mr. Richard Church: The Humble Layman.

●ST. STEPHEN'S HOSPITAL.—At Rheumatism Unit, Fulham Road, S.W., March 9 and 10, 10 a.m. each day, concentrated week-end course in the "Rheumatic Diseases."

NORTHAMPTON MEDICAL SOCIETY.—8 p.m., Dr. D. Evan Bedford: Common Errors in the Diagnosis of Heart Disease.

Sunday, March 10

APPOINTMENTS

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—J. T. Bergin, M.B., B.Ch., Senior Registrar in Mental Deficiency and Child Psychiatry, Little Plumstead Hospital Group; J. Ghoshal, M.B., B.S., Registrar in Psychiatry, Suffolk Mental Hospitals; A. S. F. Butcher, M.B., B.Chir., Registrar in Obstetrics and Gynaecology, East Suffolk and Ipswich Area; N. B. Das, M.B., B.S., T.D.D., Medical Registrar, Papworth Hospital; V. J. Coffey, M.B., B.S., D.P.M., Assistant Radiotherapist, Ipswich and East Suffolk Hospital; Wendy A. Cook, M.B., B.S., D.Obst.R.C.O.G., Registrar in Obstetrics and Gynaecology, Peterborough Group of Hospitals; W. D. Proudman, M.B., B.S., Surgical Registrar, Ipswich and East Suffolk Hospital; J. R. Kirkup, M.B., B.Chir., Orthopaedic Registrar, Norfolk and Norwich Hospital.

NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD.—D. R. McPherson, M.B., D.T.M.&H., D.M.R.E., Consultant Radiologist, Harefield Hospital; Judith M. Watelow, M.B., B.S., Child Psychiatrist (S.H.M.O.), Bedfordshire Child Guidance Service; Eithne J. O'Riordan, M.B., B.Ch., D.O.M.S., Ophthalmologist (S.H.M.O.), St. Pancras School Treatment Centre.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—J. B. Gordon-Russell, M.B., Ch.B., M.R.C.P., D.P.M., Medical Superintendent at Roundway Hospital, Devizes; Grace E. Woods, M.D., D.P.H., D.C.H., Deputy Medical Superintendent at Northam Hospital, Almondsbury, near Bristol; Marguerite A. R. King, M.B., Ch.B., Registrar in Department of Pathology at Frenchay Hospital, Bristol; Patricia M. Russell, M.D., D.Obst.R.C.O.G., D.C.H., Registrar in Obstetrics and Gynaecology at Southmead Hospital, Bristol; Audrey Halloran, M.B., B.S., F.R.C.S.Ed., Surgical Registrar at Gloucestershire Royal Hospital, Gloucester; N. P. Lancaster, M.D., D.P.M., Consultant Psychiatrist at Bristol Mental Hospitals; M. T. Statner-Dunne, M.B., B.S., Registrar in Psychiatry at Bristol Mental Hospitals; M. G. Cox, M.B., B.Chir., F.R.C.S., Registrar in Ear, Nose, and Throat Department at South Devon and East Cornwall Hospital, Plymouth; M. W. Reece, M.B., B.S., F.R.C.S., Senior Surgical Registrar at Royal Devon and Exeter Hospital, Exeter (joint appointment with the United Bristol Hospitals); C. H. Talbot, M.B., B.Chir., F.R.C.S., Senior Surgical Registrar at Southmead Hospital, Bristol (joint appointment with the United Bristol Hospitals); E. S. Watkins, M.D., Surgical Registrar at Weston-super-Mare General Hospital.

BIRTHS, MARRIAGES, AND DEATHS

DEATHS

Body.—On January 28, 1957, Thomas Munn Body, M.R.C.S., L.R.C.P., D.L., J.P., of 22, The Grove, Marton-in-Cleveland, Yorks, aged 80.

Daniel.—On January 27, 1957, at Essex House, Chard, Somerset, Francis Rennie Daniel, M.C., M.B., Ch.B.

Hillery.—On January 20, 1957, at the Devonshire Royal Hospital, Buxton, Derbyshire, Maureen Elizabeth Hillery, L.R.C.P.&S.Ed., L.R.F.P.S., of 24, Princes Street, Bishop Auckland, Co. Durham, aged 29.

Kerby.—On January 28, 1957, at Victoria Hospital, Blackpool, Lancs., Clement Carlyon Kerby, M.R.C.S., L.R.C.P., late of Truro, Cornwall, M.D., of 151, Brigstock Road, Thornton Heath, Surrey, aged 74.

Preston.—On January 31, 1957, John Alexander Preston, M.D., of Dromore, Maresfield, Sussex.

Sunderland.—On January 29, 1957, at Runcion House, Haverhill, Suffolk, Edward Benjamin Sunderland, M.R.C.S., L.R.C.P.

Walker.—On January 25, 1957, Harry Bertram Walker, M.C., M.B., F.R.C.S., of 34, The Avenue, Minehead, Somerset.

Watt.—On February 1, 1957, at Drumduan, Royal Esplanade, Margate, Kent, Arthur John Watt, M.B., Ch.B., formerly of Reading, Berks, aged 75.

Wharton.—On January 29, 1957, Effie Adela Wharton, M.R.C.S., L.R.C.P., of Buckhurst Cottage, Withyham, Sussex.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Severe Depression during Rauwolfia Therapy

Q.—Severe mental depression may occur during the treatment of hypertension with Rauwolfia alkaloids and ganglion-blocking compounds. Do any of the recent "antidepressive" drugs allow treatment to be continued safely? Or will changing the Rauwolfia preparation or reducing the dose relieve the depression?

A.—Severe mental depression occurs in a small proportion of patients taking Rauwolfia alkaloids, either alone or in combination with ganglion-blocking compounds. It may occur after the administration of reserpine, rescinnamine, or mixed alkaloidal preparations. Mental depression occurs more frequently when large doses are taken. The dose of reserpine should not exceed 0.25 mg. twice daily, and the dose of rescinnamine should not exceed 0.25 mg. thrice daily. The usual dose of the mixed alkaloid preparations is 250 mg. twice daily.

When mild depression is noted another preparation may be substituted, for some patients seem less liable to develop depression with one substance than with others. If the depression persists, or if it is initially severe, Rauwolfia therapy should be stopped immediately. There is as yet no evidence that any of the agents recently introduced to combat mental depression enable Rauwolfia therapy to be continued safely, once severe depression has occurred.

Gynaecomastia from Oestrogen Therapy in Prostatic Cancer

Q.—A patient who had a carcinoma of prostate is now stabilized on 5 mg. daily of dienoestrol after bilateral orchidectomy. He has very considerable resulting gynaecomastia which causes him physical inconvenience and much psychological distress. What treatment is advised for the gynaecomastia? The question of having the breasts amputated has been raised in this case.

A.—The occurrence of troublesome gynaecomastia in this case raises the fundamental question how far it is necessary to supplement castration by giving oestrogens. Theoretically the latter are believed to act mainly by reducing pituitary gonadotrophic activity and to have little effect on extra-gonadal androgen production. On this assumption, if all functional testicular tissue has been removed, their value would appear doubtful. On the other hand, statistical studies indicate a significant prolongation of survival in some cases where both methods of treatment have been given, though it is not always clear from the reports to what extent and in what manner they have been combined.

It is assumed from the description of the present case that the addition of dienoestrol after castration has afforded tangible evidence of improved control. If so, it cannot lightly be discarded merely on account of the inconvenience of the side-effect produced. Breast changes during treatment are often ephemeral, however, and even with sustained dosage of a higher order partial or complete resolution may occur in due course. Failing this, the use of an alternative oestrogen such as chlorotrianisine ("tace") might be considered. This preparation has been recommended as less likely to induce gynaecomastia, although in a small series of cases treated by the writer there was no significant reduction in the incidence of this complication. Furthermore, there is some doubt whether its control of prostatic malignancy is either as positive or as rapid as with other oestrogens, and in general the liability to breast changes

seems roughly related to the general efficacy of the oestrogen preparation employed. While it is thus evident that the effective suppression of prostatic cancer will in some instances be accompanied by mammary enlargement and discomfort, the latter seems a small price to pay for avoiding the dangers of active malignancy. Viewing the matter in this light may help to alleviate the patient's psychological distress, and, since any physical abnormality should be capable of easy concealment on all formal occasions, mastectomy would seem avoidable.

Control of Haemophilia

Q.—What specific therapy is of value in the prevention and treatment of bleeding episodes in haemophilia? Is any other drug therapy of value? Claims are made for a preparation of egg white, for instance.

A.—Haemophilia is caused by a congenital deficiency in the blood of a factor (antihæmophilic globulin) required for normal coagulation. The only treatment which can prevent or cure bleeding is the replacement of this substance in the patient's blood. The substance may be supplied by the transfusion of whole fresh blood or fresh plasma. To be effective it is necessary to use large amounts of blood or plasma. For an adult patient haemostatic levels of antihæmophilic globulin are not achieved with less than a litre of fresh plasma, and most of the activity disappears from the patient's blood in 24 hours. For this reason it is most desirable to have a concentrated form of antihæmophilic globulin. Unfortunately it has so far not been possible to make concentrated material from human blood. Antihæmophilic globulin made from animal blood has been made and used successfully for volunteers and for dangerously ill patients at Oxford,¹⁻⁴ but the material is impure and antigenic and is not available for general use.

It seems to be the general experience of medical workers that the egg-white preparation mentioned in the question has no effect on the coagulation defect in haemophilia.

REFERENCES

- 1 Bidwell, E., *Brit. J. Haemat.*, 1955, 1, 35.
- 2 ——— *ibid.*, 1955, 1, 386.
- 3 Fraenkel, G. J., and Honey, G. E., *Lancet*, 1955, 2, 1117.
- 4 Macfarlane, R. G., Biggs, R., and Bidwell, E., *ibid.*, 1954, 1, 1316.

Medico-Legal Aspects of Artificial Insemination

Q.—If artificial insemination with husband's semen is to be undertaken, what precautions should the doctor take to guard himself against subsequent medico-legal difficulties? Is it essential, for instance, to obtain written permission from both husband and wife, and is it necessary to establish the origin of the semen in any way? Should it be established, before carrying out the insemination, that the wife is not in fact already pregnant?

A.—It is certainly necessary to exclude pregnancy so far as possible, especially if the insemination is intracervical. In practice this means paying attention to the date of the last menstrual period and restricting insemination to the fertile period—that is, avoiding the premenstrual phase.

The medico-legal aspects of insemination with the husband's semen only will be considered here, not those where the donor is some other person. The procedure is probably then to be regarded as any other operation or treatment, the parties being protected by the usual laws relating to negligence and malpractice. There might, however, be difficulty in establishing the origin of the semen for certain. If the specimen is presented to the doctor by the husband himself, and especially if it is collected on the doctor's premises, it seems reasonable to assume that it has been obtained from the husband and not from someone else. The temperature and viscosity of the specimen might be confirmatory evidence of the time of collection: it takes approximately half an hour for semen to liquefy and to become homogeneous.

In view of the possible ethical if not medico-legal difficulties, most general practitioners avoid procedures of this kind and, when such treatment seems indicated, prefer to send their patients to a gynaecologist or to an infertility clinic. If the general practitioner in this case decides to proceed with artificial insemination he would be well advised to: (a) Obtain from the patient and her husband a document signed by both, giving consent to the operation. This document should clearly state the nature of the operation, the reasons for it, and the origin of the semen to be used. (b) Only carry out the operation in the presence of a third party, preferably a nurse. After the operation the nurse should be asked to sign the document of consent. (c) Keep a careful record of the details of the procedure.

Painless Local Analgesia

Q.—Is there any completely painless way of administering a local analgesic? I need such a method to allow the insertion of needle electrodes into children for electromyography. Is there not an instrument for giving subcutaneous injections that dispenses with the need for a needle?

A.—A subcuticular skin weal can be raised quite painlessly. A syringe is fitted with a fine, short-bevel hypodermic needle. The flat of the bevel is placed against the skin, and while the local analgesic solution (which must be isotonic) is gently forced out through the needle the point is slid under the cuticular layer. A tiny white bleb appears without any pain. Through this bleb a heavier gauge needle can be passed painlessly. Confirmation that the method is painless can be obtained by doing it on one's own arm. The success of this method in children will naturally depend on how well the administrator can prevent any fear or strain on the part of his young patient.

The instrument for giving subcutaneous injections without a needle is the "hypo-spray" described by R. A. Hingson.¹ The solution to be injected was contained in a small round-nosed metal ampoule with a tiny orifice of about 75 microns diameter. A powerful spring inside the instrument generated a pressure sufficient to force the liquid in the ampoule through the tiny orifice and through the skin into the subcutaneous tissues. The injection, though very nearly, was not always entirely painless. In addition, unless the instrument was held absolutely still the tiny puncture in the skin might be converted into a slit. So far as is known, neither the instrument nor the necessary ampoules were ever made available on the British market.

REFERENCE

¹ Hingson, R. A., *Anesthesiology*, 1949, 10, 66.

Urinary 17-ketosteroids

Q.—What is the normal range for urinary 17-ketosteroids in men and women, respectively? In what clinical conditions does the information gained from this estimation justify its use?

A.—The normal range for 17-ketosteroids in the urine differs in the two sexes, owing to their being derived partly from adrenal cortical sources and partly from testosterone in the testes. Slight differences in the normal range depend upon differences in the techniques used for analysis. The most generally used technique gives values for men of 8-23 (average 14.5) mg. daily and for women 5-18 (9.5) mg. daily.

The commonest causes of elevation of these values are certain adrenal cortical tumours and the prepubertal virilizing syndrome associated with hyperplasia of the adrenal cortex. Low values may be obtained in a variety of non-specific chronic disease processes and in myxoedema and anorexia nervosa. Particularly low levels are found in women with Addison's disease, and to a less extent in men because of the presence of functioning testes. In well-established hypopituitarism a value of only 1 or 2 mg. per day is often found in either sex. The subject has been recently discussed in *Clinical Pathology in General Practice* (1955; B.M.A., London).

NOTES AND COMMENTS

Dental Caries During Pregnancy and Lactation.—Dr. B. J. BOUCHÉ (London, S.W.19) writes: Your expert's answer to the question on dental caries during pregnancy and lactation ("Any Questions?" January 26, p. 239) does not appear to be complete or comprehensive. The questioner asks what "dietary supplements" are advised during pregnancy and lactation to prevent dental caries in the ordinary case, but your expert talks only about supplementing the intake of minerals, which he states is unlikely to prevent caries of the mother's teeth. Is it not true to say that the enamel ameloblasts and dentine odontoblasts take up calcium and phosphorus from the maternal blood to make enamel or dentine in the developing foetus and for this vitamins D, A, and C are all necessary? Can it not be imagined that if antenatal care does not provide these items adequately the result may be disastrous for both mother and baby? In addition to pregnancy and lactation, would it not be reasonable to add prolonged illness also when such a need must be met?

OUR EXPERT replies: Dr. Bouché is quite correct in thinking that, if an antenatal diet does not provide adequate amounts of calcium, phosphorus, and vitamins A, D, and C, the result may be disastrous for both mother and baby. The teeth, however, would be one of the structures least likely to be affected in such a disaster. It would also be correct to add vitamins A, D, and C to the list of dietary supplements which have been tested for power to protect teeth against caries and found ineffective in adults. The only dietary agent to date which has been clearly shown to protect against caries is the fluoride ion, and it would have little effect on the mother, as its protection appears to be conferred during the period when the teeth are calcifying.

Local factors seem to be of more importance than systemic ones in causing caries. The best advice that can be given to prevent dental caries in the ordinary case is to pay regular attention to cleaning the teeth and to have the dental practitioner attend to any particular places in the mouth where food debris might stagnate. This need for oral hygiene is particularly important in pregnancy in view of the possibility of pregnancy gingivitis causing tender gums and so discouraging the use of the toothbrush. It is also of great importance in illnesses where the natural cleansing action of saliva may be lost owing to impaired function of the salivary glands.

Flowers in the Sickroom.—Dr. GEORGE GRAHAM (London, W.1) writes: Your expert has given the reasons for thinking that it is unnecessary to remove flowers from the sickroom because they excrete carbon dioxide at night ("Any Questions?" January 26, p. 239). But he does not offer any explanation for this widespread belief which few nurses would dare to brave. Many years ago I had a patient with asthma who had to be discharged from the ward because he said that flowers caused his attacks. I suspect that this happened to someone many, many years ago, and that the authorities at the time did not know that the pollen of some flowers caused attacks of asthma in some patients. They knew that flowers gave off carbon dioxide at night which they thought, very foolishly, was harmful, and banned all flowers from all sickrooms irrespective of whether the patient had asthma or not. This belief causes much unnecessary work for the nurses who have to remove the flowers, which in some cases are very numerous, to draughty corridors and bathrooms. This change of temperature and the knocking about which the flowers and plants receive may damage them. I hope your expert's authoritative answer will stop this practice, but I fear the belief is too ingrained in nurses and all nursing authorities to be stopped by any explanation.

Correction.—In the letter on methyltestosterone therapy by Drs. S. Oleesky and D. S. Munro (*Journal*, February 16, p. 404) the word "linguets" should have been in quotation marks to indicate that it is a registered trade mark, used by Ciba Laboratories Ltd.

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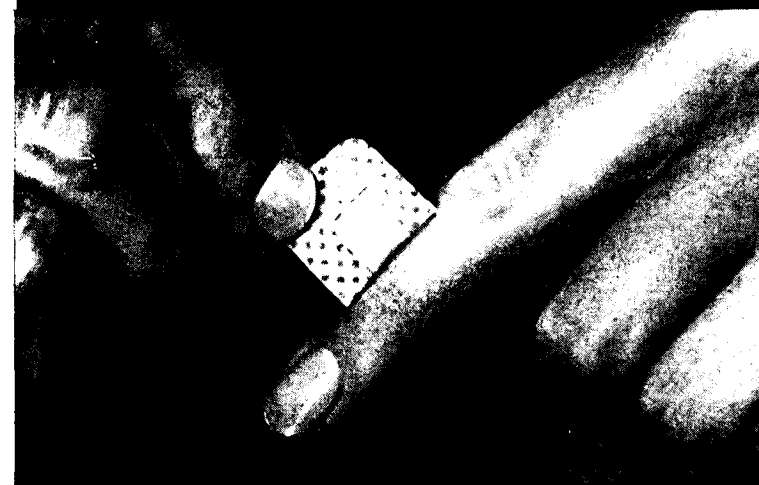
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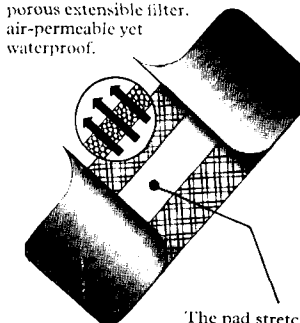
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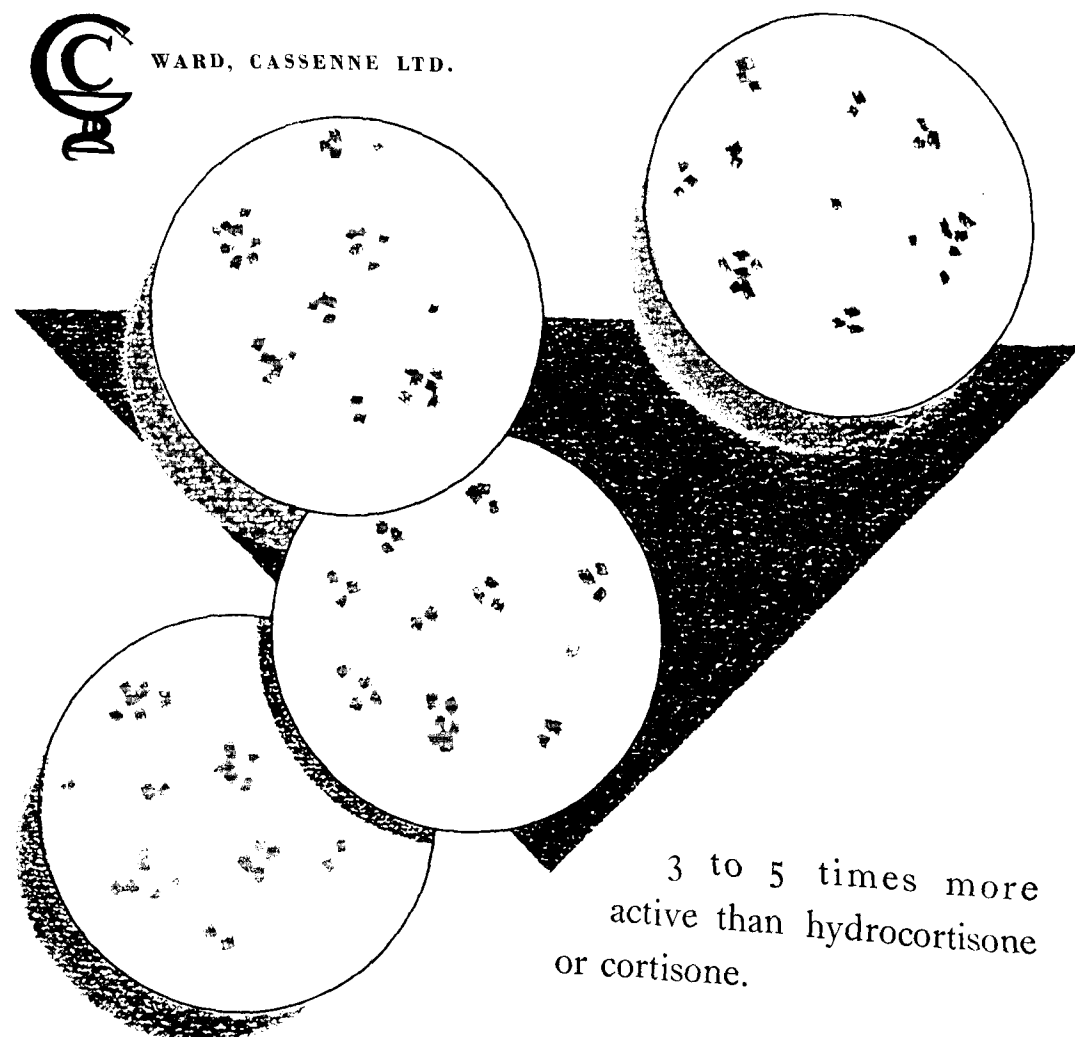
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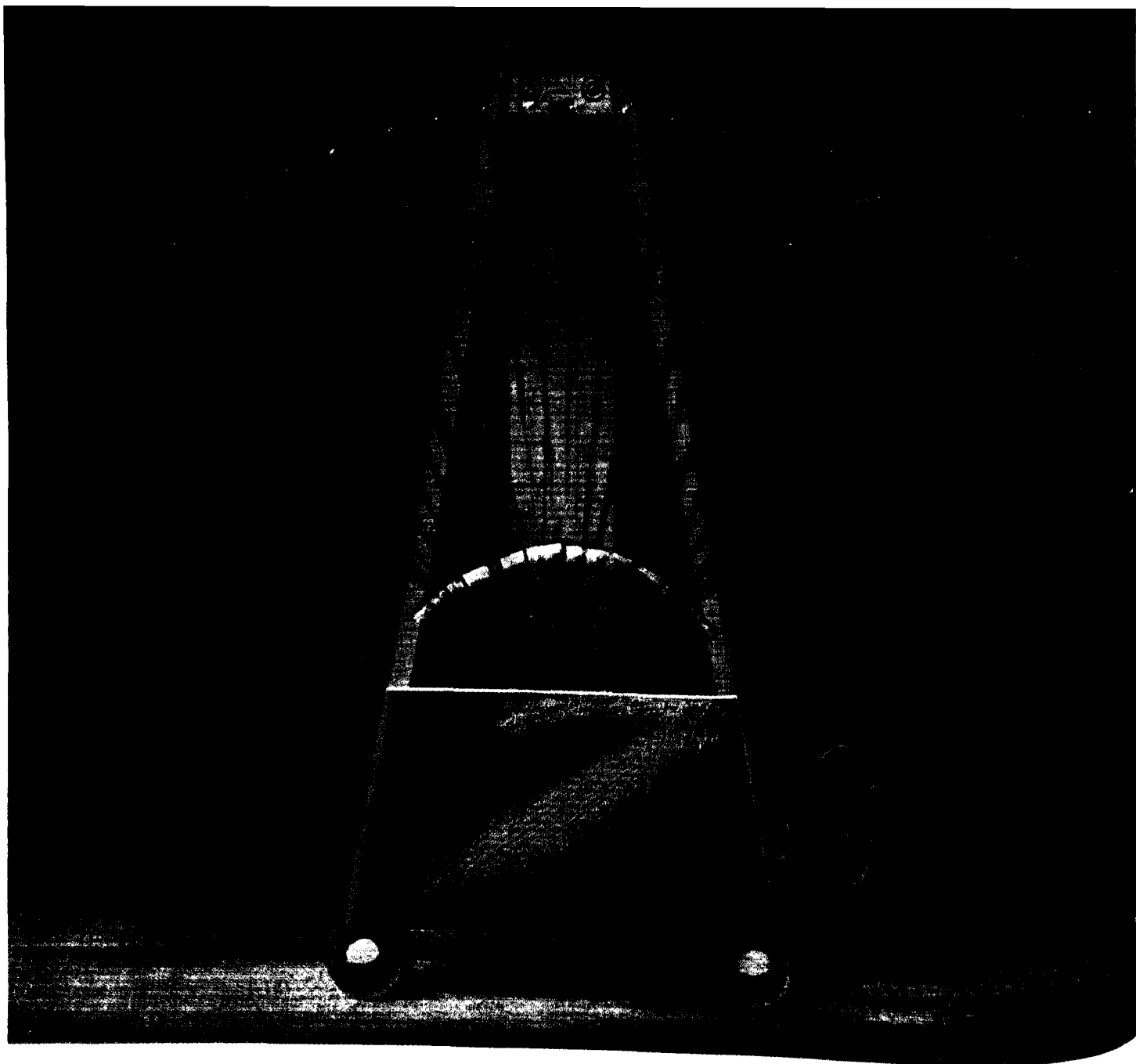
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BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 9 1957

THE ROLE OF VALVULAR INCOMPETENCE IN HEART FAILURE*

BY

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AND

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Within fifty years of Laennec's introduction of the stethoscope a practical understanding of the meaning of cardiac sounds and murmurs had been reached and auscultation held a pre-eminent place in cardiac diagnosis. Then early in this century Mackenzie, having made by his polygraph the most spectacular advances in clinical analysis of cardiac irregularities, began to preach his doctrine of the all-important myocardium to the detriment of interest in the meaning of murmurs. His pupil, Lewis, perpetuated this policy, and the authoritative position of these two men discouraged further auscultatory studies. Since 1945 phonocardiography has become accepted as a diagnostic technique, and, by focusing interest on the auscultatory signs of valvular disease, has led to renewed interest in an old and important subject.

As the left side of the heart is more sheltered from our modern instrumental methods it is better to begin this discussion on the place of valvular incompetence in heart failure on the right side, where observation can be made with greater ease and frequency.

Historical Note on Tricuspid Incompetence

In 1836 Benson noted accurately some characters of the systolic venous pulsation in the neck in a case of tricuspid incompetence proved at necropsy. King (1837), of Guy's Hospital, expressed the view that "on occasions of most copious influx [the right ventricle] becomes distended; upon which the curtains of the tricuspid valve are drawn aside, an aperture of reflux is produced, and the force of the ventricle is diverted from the pulmonary circulation." He termed this the safety-valve action of the tricuspid valve. Rosenbach (1878) recorded that avulsion of the tricuspid valve in the dog was followed by a loud systolic murmur. Byrom Bramwell (1884) was able to give a nearly perfect clinical account and haemodynamic interpretation of tricuspid incompetence, and pointed out that "the tricuspid sphincter is thinner and weaker than the muscular wall of the left ventricle, and relative and muscular incompetence are therefore more

readily produced at the tricuspid than at the mitral orifice. Relative incompetence secondary to an obstruction either in the lungs or at the mitral orifice is extremely common... it may be a temporary and curable condition."

James Mackenzie (1908), though recognizing the rarity of organic affections of the tricuspid valve, thought that functional tricuspid incompetence was extremely common, "so common indeed that I am inclined to look upon the valves as being unable to close the orifice properly." He showed in jugular phlebograms the stages of development of the systolic venous wave of tricuspid incompetence, though in later years neither he nor Lewis paid much attention to the condition. Because of the confusion of tricuspid with other systolic murmurs more recent French writers, such as Laubry and Routier (1928) and Soulié *et al.* (1952), have been hesitant in recognizing the importance and frequency of tricuspid incompetence. Fishberg (1937) took a somewhat similar view of the difficulties of diagnosis and regarded systolic pulsation of the liver as the only unequivocal sign of tricuspid incompetence.

Methods of Study

Right Atrial Pulse

Gross incompetence of the tricuspid valve has long been associated with positive systolic pulsation in the jugular veins; detection of lesser degrees of tricuspid incompetence, however, has only recently been made possible by the analysis of right atrial pressure pulses recorded through a cardiac catheter (Korner and Shillingford, 1954). The normal right atrial pulse consists first of the "a" wave, which occurs at the time of right atrial systole. Then towards the end of atrial diastole ventricular contraction pulls the closed valvular diaphragm towards the left, and, as the atrium is becomes elongated and a further drop in pressure in the right atrium (the X descent of Mackenzie) occurs. With continuing inflow into the atria from the great veins the atrial pressure again rises (V ascent) until, with relaxation of the ventricles, the tricuspid valve opens and blood passes from the atrium to the ventricle. This again

produces a fall in atrial pressure (the Y descent). Normally the X descent is much greater than the Y. In atrial fibrillation without tricuspid regurgitation the same pattern is found but without the "a" wave (Fig. 1).

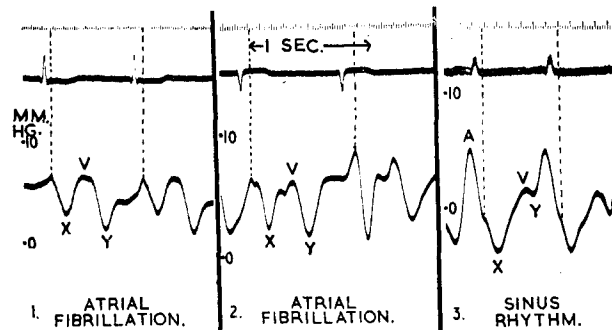


Fig. 1.—Right atrial pulse in patients with sinus rhythm and atrial fibrillation. The dotted line shows the point at which the X descent begins.

As tricuspid incompetence develops the normal fall in pressure in the right atrium during ventricular systole is counteracted by the blood regurgitating through the incompetent valve. A higher pressure than normal is then built up in the right atrium, which in turn falls more rapidly when the tricuspid valve opens. With the development of tricuspid regurgitation, therefore, the X descent becomes less and the Y descent greater, and as the regurgitation becomes gross the X descent is obliterated and is replaced by the familiar positive systolic pulsation (Fig. 2).

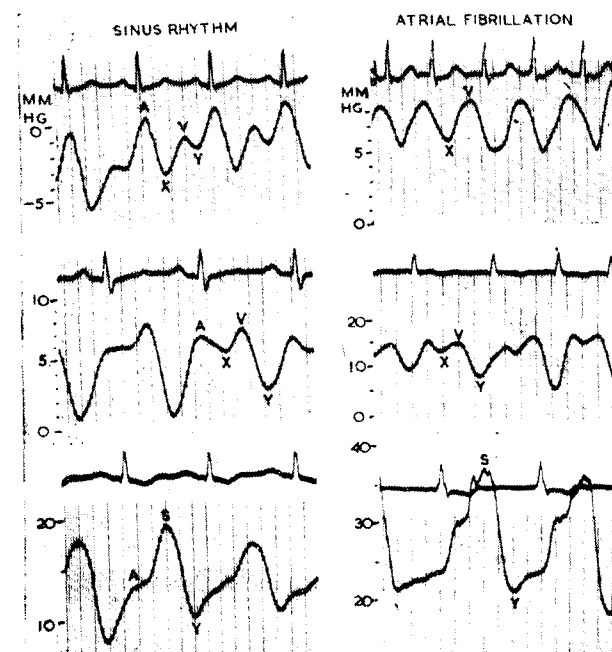


Fig. 2.—Right atrial pressure curves in sinus rhythm and in atrial fibrillation. Top line: normal X descent. Middle line: impaired X descent. Bottom line: X descent replaced by a positive systolic wave.

Some modern writers are still impressed by the difficulty of differentiating the jugular pulse of atrial fibrillation from that of tricuspid incompetence (Scherf and Boyd, 1948; Wood, 1956). Daley *et al.* (1955) claimed that the experimental production of atrial fibrillation in dogs in fact produced mitral incompetence. Using a somewhat similar technique, Friedman *et al.* (1956), however, failed to confirm their findings. The tracings in

Fig. 1 show quite clearly that a true X descent can occur in the presence of atrial fibrillation. In pathological conditions of the heart it is apparent that atrial fibrillation and tricuspid incompetence may occur together not infrequently; no doubt this association has added to the confusion. Any doubts should be readily resolved by observing the ease with which the poor descent of the base pattern is converted to a positive systolic pulse by mild exercise or even by deep inspiration.

Blood Flow in Right Atrium

The direction of blood flow in the right atrium and great vessels from moment to moment during the cardiac cycle can be demonstrated by using a double-lumen cardiac catheter as a Pitot flow-meter (Müller and Shillingford, 1955). The catheter is placed with the end hole in the right atrium and the side hole in the superior vena cava. The other end of the catheter is then connected to a differential manometer and the recording apparatus, so arranged that if the pressures in the side hole and end hole are the same there is no deflection; if the pressure in the end hole is greater than in the side hole the instrument will record downwards, while if it is higher in the side than in the end the deflection will be upwards. In this way direction of flow can be indicated. Fig. 3 shows a flow curve between

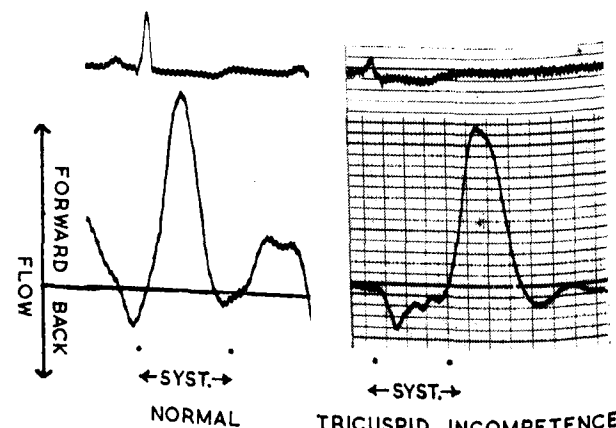


Fig. 3.—Blood flow between the superior vena cava and right atrium in patients with and without tricuspid incompetence.

the superior vena cava and right atrium in a normal patient and in one with tricuspid incompetence. When tricuspid incompetence occurs the normal forward flow during ventricular systole and descent of the base of the heart is replaced by a back-flow. Although this method shows the presence of a regurgitant flow it does not accurately measure the amount of blood passing back.

Estimation of Valvular Incompetence by Dye Dilution Curves

The quantitative estimation of the part played by valvular incompetence in cardiac failure has been made possible by the recent observation that indicator dilution curves are altered in a specific way by the presence of valvular insufficiency (Korner and Shillingford, 1955, 1956). Stewart (1894) and later Hamilton *et al.* (1932) showed that if an indicator substance—for example, Evans blue—was injected into the venous side of the circulation and collected on the arterial side the dye particles would spread out during their passage through the heart and vessels and produce a time-concentration curve at the point of sampling. They pointed out that from this curve it was possible to measure not only the cardiac output but also the volume of blood through which the dye had passed. Korner and Shillingford (1955) have demonstrated that for a given calculated cardiac output and volume the spread of the dye particles is constant, but that the addition of valvular incompetence causes an increase in the spread of the particles quite apart from that produced by variations in the cardiac output and cardio-

pulmonary volume. This effect can be used to compute the amount of regurgitant flow, and, tested in a model circulation, has been found to be accurate, with a maximum error of 15%.

This new approach to the problem of valvular incompetence in cardiac failure has enabled us not only to recognize valvular incompetence of lesser degree than was formerly possible, but also accurately to assess the part it plays in the haemodynamics of cardiac failure.

Functional Tricuspid Incompetence in Congestive Cardiac Failure

Functional tricuspid incompetence has long been recognized as a frequent late development in congestive cardiac failure. A recent analysis (Korner and Shillingford, 1955) of the right atrial pressure pulse in a series of 50 patients with various forms of heart disease with and without congestive cardiac failure has revealed a remarkably close relationship between the level of the mean venous pressure and the development of functional tricuspid incompetence. As the venous pressure rises so the normal X descent becomes impaired and takes on the form of a positive systolic pulsation. The critical level of venous pressure at which tricuspid incompetence becomes recognizable is approximately 8 mm. of mercury above the normal mean zero pressure. Development of functional tricuspid incompetence takes place about this level of venous pressure in many aetiological varieties of heart failure, and when the venous pressure becomes more grossly raised functional tricuspid incompetence is even more obvious and beyond argument (Fig. 4).

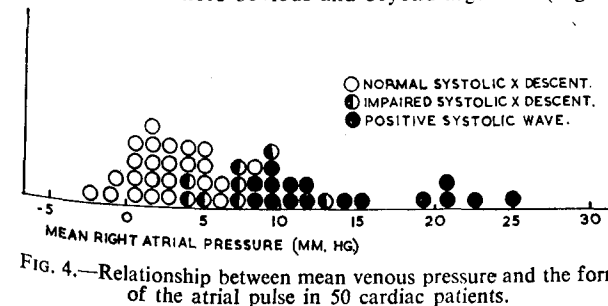


Fig. 4.—Relationship between mean venous pressure and the form of the atrial pulse in 50 cardiac patients.

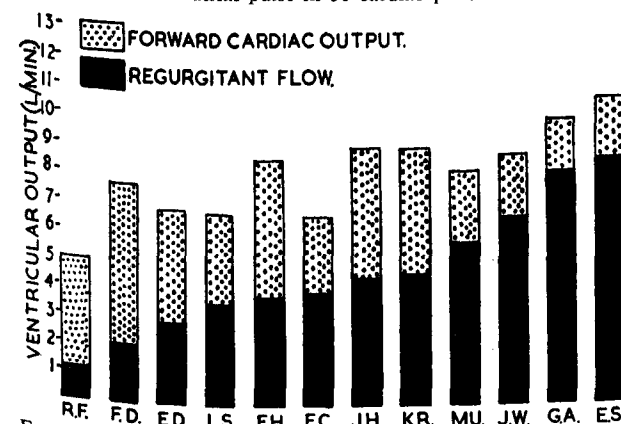


Fig. 5.—Forward output and phasic regurgitant flow estimated by the indicator dilution method in 12 patients with varying degrees of congestive cardiac failure.

Thus a considerable number of cardiac patients with grossly raised venous pressure also have functional tricuspid incompetence. The only exceptions to this are found in constrictive pericarditis and conditions with a very rapid venous inflow (anaemia, early thyrotoxicosis). The importance of these clinical phenomena has been overlooked, probably because of the difficulty of timing the pulse waves in the neck at the bedside, especially when the heart is beating rapidly. Only by graphic recording methods is it possible accurately to assess the form of the venous pulse.

The magnitude of the back-flow through the functionally incompetent tricuspid valve in cardiac failure can be con-

siderable. As the right ventricle and the tricuspid valve dilate, the aperture of reflux may become as great as, or greater than, the pulmonary valve orifice when fully open (Lottenbach and Shillingford, in press). As the mean right atrial pressure is considerably lower than the mean pulmonary arterial resistance to back-flow the oscillating back-flow may easily exceed the forward flow into the pulmonary vessels. Measurement of this back-flow by dye-dilution methods shows it in some cases to reach 6 or 7 litres a minute, while the forward cardiac output is only 2 or 3 litres a minute (Fig. 5). In other words, the stroke regurgitant flow oscillating backwards and forwards through the valve would be of the order of 60–70 ml. back and 80–100 ml. forward at a pulse rate of 100 beats a minute. This observation of a total high right ventricular output in the presence of heart failure and a low forward cardiac output can be appreciated by palpating the excessively large right ventricular pulsations even in patients in advanced congestive cardiac failure.

The physical signs correlate with the presence of this backward flow in congestive failure. The systolic wave in the venous pulse is apparent on careful examination; a systolic murmur heard best at the lower end and just to the left of the sternum is present in most cases; and in the same area, when the phasic regurgitant flow is great, there may be a low-pitched early diastolic murmur; this murmur is probably associated with the rapid inflow of blood from the right atrium to ventricle during this phase of the cardiac cycle, and does not necessarily denote an organic change in the valve itself. It must be remembered that diastolic inflow to the right ventricle under these circumstances equals the sum of backward and forward flow and may therefore be very large. Liver pulsation becomes apparent to nearly all clinical observers if the regurgitant stroke output exceeds 40 ml.

The regurgitant flow through an incompetent valve is not a fixed reflux but is varying from minute to minute under the influence of rest and exercise, emotion, respiration. The effect of these factors may be studied clinically or by means of the newer techniques for quantitative measurement of regurgitant flow.

Influence of Changing Inflow: Respiration: Rest: Exercise

Functional tricuspid incompetence varies with the degree of distension of the right ventricle. It may be seen to vary from beat to beat; for example, under the influence of respiration a deep inspiration may produce or intensify the tricuspid systolic murmur and bring out a strong systolic venous pulse in the jugular vein (Fig. 6). In atrial fibrillation a long diastolic pause may permit an increase in right

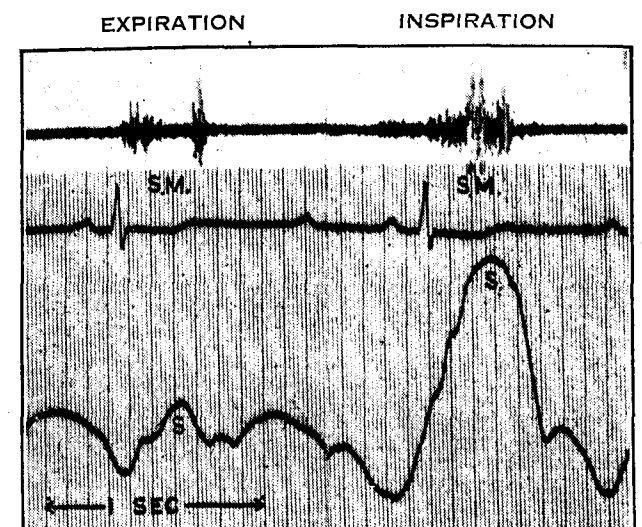


Fig. 6.—Effect of deep inspiration on jugular pulse and tricuspid systolic murmur in a patient with congestive heart failure.

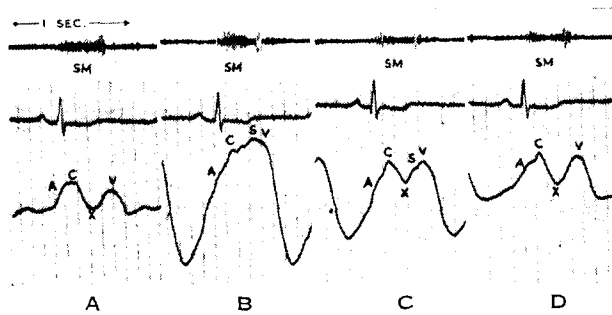


FIG. 7.—Effect of exercise and rest on jugular venous pulse in a patient with chronic rheumatic heart disease and early congestive cardiac failure. A, before exercise. B, after three minutes' mild exercise, showing development of positive systolic pulsation and increase of functional tricuspid systolic murmur (phonocardiographic record taken at lower end of sternum). C, after three minutes' rest. D, after six minutes' rest, showing return to X descent pattern and diminution in intensity of tricuspid murmur.

ventricular distension which makes the valve more incompetent; and as a result tricuspid systolic murmurs may diminish in intensity after a short diastole and increase again when the pause is long between ventricular beats.

Rest and exercise have a profound effect on the amount of regurgitant flow through the tricuspid valve (Figs. 7 and 8). Fig. 9 shows two examples of this in patients with

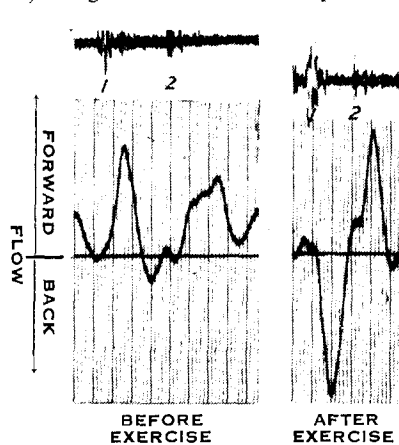


FIG. 8.—Effect of exercise on blood flow between superior vena cava and right atrium in a patient with chronic rheumatic heart disease and early congestive cardiac failure. The development of a regurgitant flow through the tricuspid valve on exercise is shown by the deep downward deflection in systole (measured by differential manometer).

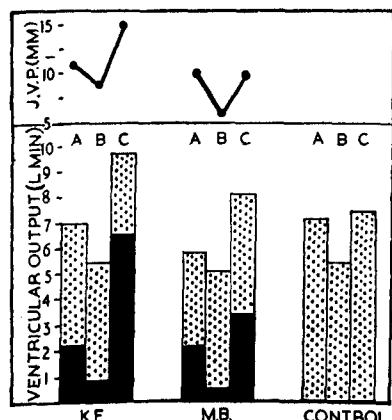


FIG. 9.—Effect of rest and exercise on right ventricular output in congestive cardiac failure with functional tricuspid incompetence (see text).

chronic rheumatic heart disease and mild or moderate venous congestion. It will be seen in the second patient (M. B.) that the regurgitant flow on the first dye injection was 2.2 litres a minute, while the forward output was 3.7 l./min. The mean jugular venous pressure was 10 mm. Hg. On resting quietly for 20 minutes the venous pressure had fallen to 7 mm. Hg and the regurgitant flow to 0.5 l./min., but the forward cardiac output had risen to 4.6 l./min. Gentle exercise by moving the legs for two minutes reversed this process and diminished the forward cardiac output to 4.3 l./min., with a rise in the regurgitant flow to 3.6 l./min. and the jugular venous pressure (Fig. 6). This increase in regurgitant flow is confirmed by measurements by the flowmeter (Fig. 8).

It will thus be seen that exercise in congestive heart

failure may increase the total right ventricular output but decrease the forward output of the heart, while rest has the opposite effect.

Organic Tricuspid Incompetence

Although functional tricuspid incompetence is common, organic lesions of the valve are comparatively rare. Rheumatic disease affects the tricuspid valve in 10 to 15% of all our cases of chronic rheumatic heart disease coming to necropsy. Nearly all these have more incompetence than stenosis, valve-cusp fusion being limited to the margins. In the earlier stages it is possible to have all the signs of tricuspid incompetence without much dilatation of the right ventricle. In fact, the right ventricle may be able to carry the additional load of mild regurgitant flow for many years without signs of failing; the patient during this time has a raised venous pressure and may even have cardiac cirrhosis, ascites, and oedema.

Influence on General Haemodynamics of Cardiac Failure

The study of cardiac output in heart disease has revealed that the resting output often remains in the normal range until the last bedridden stage, when it falls towards half the normal; at this last stage the venous pressure is grossly raised. Venesection in these patients may be followed by a rise in cardiac output, while exercise, producing elevation of the venous filling pressure, often engenders a fall in cardiac output.

More than a decade ago McMichael and Sharpey-Schafer (1944) compared these changes with the measurements made by Starling and his school on the isolated dog heart. An elevation of venous filling pressure which normally increases the cardiac output may, if pushed to extremes, have the reverse effect of bringing about a fall in minute-volume. It was thought that possibly this fall in output resulted from some breakdown of the cardiac contractile mechanism, because it was at this stage of human heart failure that favourable digitalis and venesection responses were often encountered.

Sarnoff and Berglund (1954) have made extensive studies of the conditions under which Starling's law becomes applicable. They have demonstrated its general validity when applied to a single ventricle—for example, the left—and have reconstructed curves which show the rising cardiac output curve flattening off in a plateau with continuing elevation of venous pressure, but a falling output response was seen only when atrio-ventricular valve incompetence was induced by overstretching.

If we accept this finding and link it to our own more recent observations the following tentative suggestions seem permissible:

1. The falling cardiac output with gross venous congestion may almost entirely be accounted for by reduction of forward cardiac output consequent on the development of tricuspid incompetence.
2. The improvement in cardiac output after venesection is simply the result of a decreased filling pressure which diminishes right ventricular dilatation; the tricuspid valve becomes more competent and back-flow is reduced.
3. Falling output and elevation of venous pressure on exercise—for example, like that noted by Hickam and Cargill (1948)—may result from increased distension of the right ventricle increasing the tricuspid leak, while the reverse occurs with rest.
4. There is no necessity to postulate a metabolic breakdown of the myocardium at this stage. Such a breakdown invoked by our earlier hypothesis was subject to the criticism that it would have entailed "vicious circle" consequences, increasing venous pressure leading to further and further degrees of myocardial breakdown.

A further comment may be made in relation to the flow-work of the right ventricle. In the presence of tricuspid incompetence the bidirectional output of this chamber at each systole may be nearly double the normal. The falling forward output may thus reduce only the work of the left ventricle, while the right ventricle is maintaining a greatly increased output. No doubt this local overload imposed by an incompetent tricuspid valve helps to produce the final right ventricular breakdown. It is amazing sometimes to see how long it may be tolerated—six or seven years—before final dissolution. We must think again about low cardiac output states. It may be only the forward output which is reduced, as an incompetent valve may actually increase the total output of the affected chamber. Older subdivisions of heart failure into "high" and "low" output types will give way to the concept that nearly all failing hearts have been overworking for a very long time against the mechanical embarrassments of diseased valves or increased pressure loads.

Valvular Incompetence and Failure of the Left Ventricle

Owing to the technical difficulties encountered in studying left atrial and ventricular pressures the information on left heart failure is not so complete as that on the right. It is likely, too, that there is a considerable basic difference in the haemodynamics of the two sides in cardiac failure. Whereas the tricuspid valve probably only just closes in normal subjects and is readily made incompetent by dilatation of the right ventricle, the mitral valve attached by its chordae to the thicker-walled left ventricle does not seem to become functionally incompetent so easily. At the same time the venous reservoir of the left atrium and lung bed is considerably less than that of the right atrium, caval veins, and their large valveless tributaries. This results in a difference in pressure-volume relationships in the veno-atrial systems on the right and left sides which tends to limit the amount of blood regurgitating through the mitral valve compared with that which may flow back through the tricuspid valve.

Recent work on organic mitral incompetence has shown that the to-and-fro regurgitant flow in established cases may be 2 or 3 litres a minute, which, added to the forward flow, makes a high total output of the left ventricle. The regurgitant flow is not constant, but varies from moment to moment. Any factor tending to lower the peripheral resistance and thus lessen the obstruction to the aortic outflow will at the same time reduce the back flow through the mitral valve relative to the forward flow through the aortic valve; this occurs in exercise. The administration of amyl nitrite causes the forward output to increase considerably, while the regurgitant flow becomes less, a finding which may also be suspected clinically by noting the diminution in the intensity of the murmur of mitral incompetence. The administration of a vasoconstrictor substance, on the other hand, produces an increase in the regurgitant flow. Rest and exercise may thus have opposite effects on the volume of regurgitant flow through the tricuspid and mitral valves.

Aortic Incompetence

The haemodynamics of aortic incompetence present several important differences from those of the atrio-ventricular valves. The regurgitant flow in the latter takes place during systole and is dependent on the full force of ventricular contraction during the part of the cardiac cycle. In aortic incompetence the regurgitant flow depends on the potential energy built up by distension of the aorta and its branches during systole; the amount of this energy developed depends on the stroke volume of the left ventricle, and on resistance and elasticity of the arterial system. In the first part of diastole this energy is rapidly expended forwards through the peripheral arteries and backwards through the incompetent aortic valve. As in mitral incompetence, therefore, lowering peripheral resistance re-

duces the regurgitant flow through the valve, and so does loss of elasticity in the aorta. The peripheral resistance in aortic incompetence is in fact reduced by physiological reactions producing vasodilatation and thus reducing the back-flow. The mechanism of this is not clear, but may well be a reflex initiated in the pressor-receptor areas in the arch of the aorta and carotid sinus. This vasodilatation also has the effect of accommodating a high stroke output of the left ventricle over and above that due to the additional load of regurgitant flow.

Without detracting from the importance of the myocardium it is clear that the volumes of back-flow involved in valvular incompetence are often very large, and constitute a factor of major importance in the development of the syndromes of heart failure. While measurements of valvular regurgitation on the right side of the heart may be made with relative ease and safety by a variety of complementary methods, the techniques applicable to the problems of the left side are more restricted and difficult of application. Observations made so far suggest that the anatomical and haemodynamic factors differ on the left and right sides and indicate somewhat different mechanisms in the process of final cardiac breakdown.

Summary

The part played by valvular incompetence in cardiac failure is discussed.

Functional tricuspid incompetence often occurs in congestive cardiac failure when the venous pressure is raised above 8 mm. of mercury. This regurgitation can be demonstrated by the form of the venous pulse, the tricuspid systolic murmur, and special techniques to demonstrate direction and volume of flow between the right ventricle and atrium during the cardiac cycle.

The development of tricuspid incompetence causes an increase in the total output of the right ventricle at the expense of the forward cardiac output, and even in advanced clinical congestive failure with low cardiac output the right ventricular output remains high.

Exercise increases the functional tricuspid incompetence, with a corresponding fall in forward cardiac output, and probably explains both the phenomena of fixed or falling cardiac outputs on exercise in congestive cardiac failure and the breakdown of Starling's law with a rising venous pressure.

The haemodynamics associated with mitral and aortic insufficiency are discussed and are shown to differ considerably from those involving the tricuspid valve.

REFERENCES

- Benson, C. (1836). *Dublin J. med. chem. Sci.*, 8, 324.
Bramwell, B. (1884). *Diseases of the Heart and Thoracic Aorta*. Edinburgh.
Daley, R., McMillan, I. K. R., and Gorlin, R. (1955). *Lancet*, 2, 18.
Fishberg, A. M. (1937). *Heart Failure*. Kimpton, London.
Friedman, B., Daily, W. M., and Wilson, R. H. (1956). *Circulat. Res.*, 4, 33.
Hamilton, W. F., Moore, J. W., Kinsman, J. M., and Spurling, R. G. (1932). *Amer. J. Physiol.*, 99, 534.
Hickam, J. B., and Cargill, W. H. (1948). *J. clin. Invest.*, 27, 10.
King, T. W. (1837). *Guy's Hosp. Rep.*, 2, 104.
Korner, P., and Shillingford, J. (1954). *Brit. Heart J.*, 16, 447.
— (1955). *Clin. Sci.*, 14, 553.
— (1956). *Ibid.*, 15, 417.
Laubry, Ch., and Routier, D. (1928). *Bull. méd. (Paris)*, 42, 91.
Mackenzie, J. (1908). *Diseases of the Heart*. Oxford Univ. Press, London.
McMichael, J., and Sharpey-Schafer, E. P. (1944). *Quart. J. Med.*, 37, 123.
Müller, O., and Shillingford, J. (1955). *Brit. Heart J.*, 17, 163.
Rosenbach, O. (1878). *Arch. exp. Path. Pharmacol.*, 9, 1.
Sarnoff, S. I., and Berglund, E. (1954). *Circulation*, 9, 706.
Scherf, D., and Boyd, L. J. (1948). *Cardiovascular Diseases*. Heinemann, London.
Soulié, P., Rouvray, Y., and Di Matteo, J. (1952). *Bull. Soc. méd. Hôp. Paris*, 68, 332.
Stewart, G. N. (1894). *J. Physiol. (Lond.)*, 15, 31.
Wood, P. (1956). *Diseases of the Heart and Circulation*. Eyre and Spottiswoode, London.

STAPHYLOCOCCAL DIARRHOEA

WITH AN ACCOUNT OF TWO OUTBREAKS IN
THE SAME HOSPITAL

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During the years 1953-5, 31 cases of diarrhoea following antibiotic therapy were investigated in the Radcliffe Infirmary. *Staphylococcus aureus* was cultured from the faeces of 20 of them (Table I). Fourteen of the 31 patients died. Of the 31, 14 had had partial gastrectomies, and seven of these were among the 14 who died (Table I).

Of the total number of cases, 17 occurred in one male surgical ward, where the incidence of the disease reached the proportions of a small outbreak in the spring of 1954 (see Chart). The epidemic nature of this condition has not been stressed in previous reports, though the parts which *Staph. aureus* and the antibiotics play in the genesis of the disease are generally acknowledged.

The epidemiology, bacteriology, diagnosis, and treatment of the condition are discussed below, where the term "staphylococcal diarrhoea" is applied to those cases in which *Staph. aureus* was isolated from the diarrhoeic stools. Special culture methods were used to isolate the *Staph. aureus* to prevent its being overgrown by other organisms (see Appendix).

The term "staphylococcal enterocolitis" has been avoided because evidence was not always available, even at post-mortem examination, that both the small and the large bowel were affected. Similarly, the term "pseudomembranous enterocolitis," which is a descriptive term of pathology and not a disease entity, has also been avoided except in those cases in which pseudomembrane was actually found. From many reports it is seen that pseudomembranous lesions are found in many patients who have not had diarrhoea.

Review of the Literature

Finney (1893) gave what is possibly the earliest report of a similar condition, in a young woman, which developed 15 days after a gastro-enterostomy. She had severe diarrhoea and died, a "diphtheritic" membrane being found over the mucosa of the lower bowel. Descriptions of numerous cases of pseudomembranous enterocolitis have been published (Penner and Bernheim, 1939; Penner and Druckermann, 1948; Dixon and Weismann, 1948). The consensus of opinion of these authors was that shock was probably the cause of pseudomembranous enterocolitis, and no mention was made of bacteria except as secondary invaders.

Pettet *et al.* (1954), at the Mayo Clinic, reviewed 107 cases occurring during the 27 years prior to 1952 and did not think then that the incidence of pseudomembranous enterocolitis had significantly increased since the advent of antibiotics, but they acknowledged the possibility of disturbance by antibiotics of the normal balance of intestinal flora. At the post-mortem examination most of the cases were shown to have a pseudomembrane. *Staph. aureus*, though not specifically sought for, was found in the stools of five of them.

It is difficult to compare these series with those more recently described, because the clinical features are often very different—for example, intestinal obstruction, colonic carcinoma, and generalized peritonitis were common; diarrhoea was often not present; bacteriological examination of the stools was seldom reported; and antibiotics, of course, were not available for many of the early cases.

Kramer (1948) reported what is probably the first case of staphylococcal diarrhoea associated with oral streptomycin.

During the last few years many authors have reported cases of diarrhoea or enterocolitis following the use of antibiotics, more especially the "broad-spectrum" types. Disturbance of the balance of the normal bacterial flora, or its elimination, has usually been thought to be the cause, but more recently infection by *Staph. aureus* has been emphasized.

It is interesting to note, in retrospect, a warning given by the Council of Pharmacy and Chemistry of the American Medical Association (1951): "The new antibiotics, chloramphenicol, aureomycin and terramycin are highly bacteriostatic for many bacteria. Susceptible bacteria are suppressed and monilia and other yeast-like organisms may replace the normal or abnormal bacterial flora. This most frequently occurs in the large bowel and is of little consequence." (There followed a brief warning of possible infections of the lungs and other organs by fungi but no warning of invasion by bacteria resistant to these antibiotics.)

Since then there have been many reports, from both sides of the Atlantic, of fatal intestinal infections with *Staph. aureus* following the use of antibiotics in various conditions: Jackson *et al.* (1951) in treating pneumonia with oxytetracycline ("terramycin"); the same group (Womack *et al.*, 1952) in using oxytetracycline for urinary infections; Hay and McKenzie (1954) in treating dysentery in children with oxytetracycline; Dearing and Heilman (1953) in employing oxytetracycline and chlortetracycline ("aureomycin") in medical and surgical conditions. The last-mentioned authors found erythromycin effective in eliminating *Staph. aureus*, resistant to other antibiotics, from the faeces. From Greece, Choremis *et al.* (1954) reported 22 cases of severe diarrhoea, with 14 deaths, in 195 children with measles treated by antibiotics. Other affected children who did not receive antibiotics had no diarrhoea. Of the 22 cases, only six were studied bacteriologically, and in only two was *Staph. aureus* found in the faeces.

There are several similar reports of deaths, after various operations, due to staphylococcal diarrhoea following antibiotic therapy (Terplan *et al.*, 1953; Fairlie and Kendall, 1953; Wakefield and Sommers, 1953; Gardner, 1953; Williams, 1954; Fowler, 1955). *Staph. aureus* resistant to the antibiotics employed was often cultured from the faeces. Chlortetracycline and oxytetracycline were most frequently used, but in Fairlie and Kendall's series all but one of their five cases (three of them fatal) received penicillin and streptomycin. Pettet *et al.* (1955) described a case of staphylococcal enterocolitis following pre-operative preparation of the bowel with neomycin.

Not all authors agree that *Staph. aureus* and antibiotics together are the chief cause of severe post-operative enterocolitis—for example, Williams and Pullan (1953), although *Staph. aureus* was found in five of their severe cases examined bacteriologically. Their 10 fatal cases all occurred after partial gastrectomy. Dawson-Edwards and Morrissey

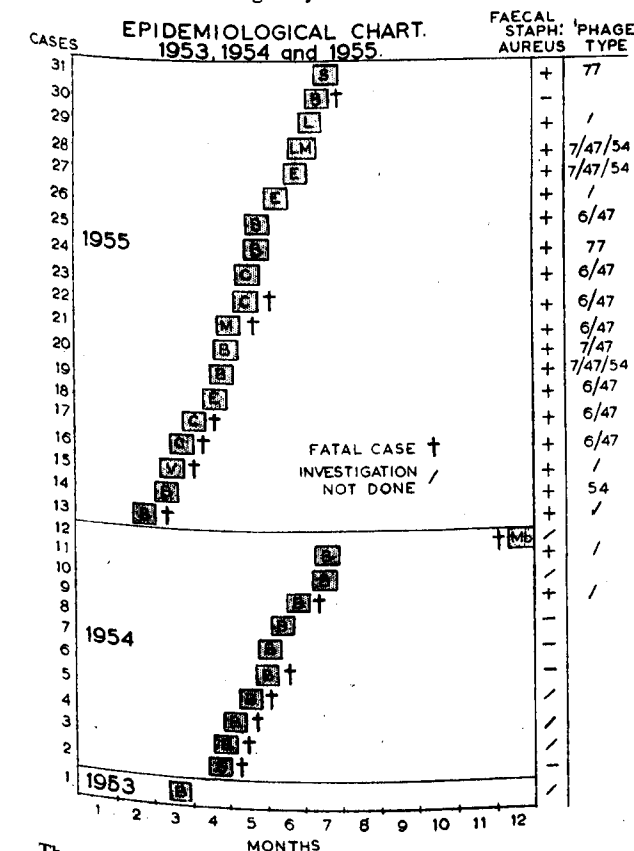
(1955) found *Staph. aureus* in only one of their 35 cases of enterocolitis following gastro-intestinal operations, but it was not sought routinely.

The epidemic nature of staphylococcal intestinal infection is illustrated by the report of Todd and Hopps (1955), who recorded two deaths from enterocolitis—one after partial gastrectomy, the other in a case of erythema multiforme. Both patients were in the same ward and died within seven days of one another, both received "broad-spectrum" antibiotics, and both were infected with *Staph. aureus* of the same phage type. The same strain of staphylococcus was widespread over the ward furnishings.

The Radcliffe Infirmary Outbreaks

During six weeks of the spring of 1954, in one male surgical ward (B) of this infirmary, six "good risk" patients developed severe diarrhoea following partial gastrectomy, and four of them died. Their progress after operation was uneventful until the onset of diarrhoea on the second or third post-operative day. A similar time of onset was described by Williams and Pullan (1953). During the next six weeks three more patients in the same ward—one after prostatectomy and two after partial gastrectomy—were similarly afflicted and one died. Unfortunately four cases were not fully investigated bacteriologically, but in retrospect it seems likely from the clinical features that they were staphylococcal infections.

During the following 15 months 20 other patients undergoing various treatments developed diarrhoea of varying severity. All of them, in addition to the above-mentioned 11 early cases, had been treated with antibiotics. The relevant details of these 31 cases are summarized in the epidemiological Chart and in Table I. Seventeen were patients in the same male surgical ward (B). Fourteen had operations for partial gastrectomy, and seven of them died following severe diarrhoea. All these cases were fully investigated bacteriologically.



The squares represent the 31 individual cases and the letters in them the seven wards involved. No phage-typing of the strains of *Staph. aureus* was done during the years 1953-4. See also Table II.

TABLE I.—Summary of 31 Cases of Diarrhoea, Giving the Incidence of *Staph. Aureus* in the Faeces

Operations Performed	Severe Diarrhoea		Moderate Diarrhoea	Total
	Fatal	Recovered		
Partial gastrectomy	7 (1:4)	5 (3:4)	2 (0:2)	14 (4:10)
Other gastro-intestinal operations	2 (1:2)	0	1 (1:1)	3 (2:3)
Others	5 (5:5)	1 (1:1)	5 (5:5)	11 (11:11)
None	0	1 (1:1)	2 (2:2)	3 (3:3)
Total	14 (7:11)	7 (5:6)	10 (8:10)	31 (20:27)

Note.—The carriage rate of *Staph. aureus* in the faeces of 49 patients, before and after operation, who did not develop diarrhoea was 12%. Figures in parentheses are the proportion of the specimens which gave *Staph. aureus* on culture—for example (2:3) indicates that 2 specimens out of 3 cultured were positive for *Staph. aureus*.

Clinical Features.—The cases may be divided into two groups. (A) *The 21 severe cases*:—Severe watery diarrhoea usually developed suddenly, sometimes with a premonitory tachycardia or a fall in blood pressure. The small bowel was distended and hyperactive, although in the later stages it became paralysed. The stools were often of the "rice-water" type, the patient being incontinent. In many cases the temperature rose to 101-102° F. (38.3-38.9° C.) at the onset, but some patients remained afebrile. Within a few hours the patient was collapsed, with circulatory failure, but occasionally he remained calm and almost euphoric. Few of these patients recovered. (B) *The 10 less severe cases*:—These ranged from severe diarrhoea with little systemic upset to milder cases in which the diarrhoea was troublesome for a few days, but ceased spontaneously. Recovery in this group was usual.

Diagnosis

In those cases presenting with tachycardia and a fall in blood pressure, other conditions—for example, pulmonary atelectasis or embolism, coronary thrombosis, a leaking suture line, or internal haemorrhage—were suspected until the onset of abdominal distension and diarrhoea made probable the diagnosis of staphylococcal intestinal infection, especially in those patients who had been given antibiotics.

A specimen of diarrhoeic stool which had been allowed to stand in a glass jar often showed three layers: a lower layer consisting of dirty white flakes of mucus and sometimes mucus membrane; a middle layer of faecal detritus; and a supernatant layer of murky fluid. A Gram-stained film of the faeces often showed large numbers of Gram-positive cocci and pus cells. Cultures of *Staph. aureus* and other pathogens were made from the faeces (and gastric aspirates if a tube was in place), and the sensitivity to antibiotic drugs was determined for all strains isolated.

Typical Cases

Case 11.—This reasonably fit man of 71 years had a Billroth I partial gastrectomy carried out for a chronic duodenal ulcer. Penicillin and streptomycin were given post-operatively. Two days after the operation he developed a profuse watery diarrhoea accompanied by severe systemic upset, fever, and tachycardia. The diarrhoea, with tympanites, persisted for nine days but eventually cleared up. *Staph. aureus* was isolated from the faeces. Treatment was by massive intravenous replacement of the lost fluid, pil. codein., and chlortetracycline, to which the staphylococcus was sensitive. Though this was one of the most severe cases of post-operative diarrhoea the patient recovered.

Case 13.—This fit man, aged 63, had a transthoracic repair and vagotomy for a large intrathoracic stomach. Penicillin and streptomycin were given prophylactically and his condition was satisfactory until the second post-operative day, when his pulse rose to 130 a minute with a fever of 101° F. (38.3° C.). It was thought that he had a pulmonary infection, and oxytetracycline was given. The next day he began to pass melaenic stools and collapsed. He was resuscitated by blood transfusion and laparotomy was then performed. There was marked congestion of the splanchnic veins and

the small bowel was purplish in colour. No bleeding-point was found in the stomach or duodenum. He died the same evening. At necropsy was seen the typical appearance of pseudomembranous enterocolitis, all the large and small bowel being affected. There was, in addition, a large chronic gastric ulcer which could have been the source of bleeding. A penicillin-resistant *Staph. aureus* was isolated from the intestinal contents at necropsy.

Case 14.—This man, aged 53, had had a nephrectomy for renal tuberculosis 20 years previously, but was otherwise fit. He was admitted to hospital on February 24, 1955, and an elective Billroth I partial gastrectomy was performed for a chronic duodenal ulcer. The operation and the patient's early progress were straightforward until the evening of the second day, when some abdominal distension was noticed. The pulse rate was 100 all day, the temperature 99–100° F. (37.2–37.8° C.). Early on the third day he developed a profuse offensive watery diarrhoea, appeared very ill, and showed a mild degree of peripheral circulatory failure. A provisional diagnosis of staphylococcal enteritis was made and treatment with intravenous fluids, erythromycin, 300 mg. six-hourly, and oral yoghurt four-hourly was started. He had been fed by jejunal tube for the first 48 hours after operation and had been given penicillin and streptomycin during that time. These measures were discontinued. On this regime his condition improved dramatically and the diarrhoea ceased after four days. No obvious membrane was ever found in the stools, but there were numerous suspicious shreds in most specimens. *Staph. aureus*, resistant to streptomycin, oxytetracycline, and penicillin was found in the faeces and in the nose.

Case 23.—This healthy man, aged 30, was struck by a car and received a moderately severe head injury and dislocations of the left acromioclavicular and knee joints. He was transferred to hospital three days later because of deepening coma, the chief cause for which seemed to be a severe bronchopneumonia with a temperature of 104° F. (40° C.). Nasal swabs and tracheal aspirate showed a *Staph. aureus* sensitive only to erythromycin. He had already been treated with chlortetracycline. Oxytetracycline and chloramphenicol improved his chest condition, but a week later he developed a very severe watery diarrhoea and *Staph. aureus* was grown from the stools. Erythromycin was then given with excellent results and he made a complete recovery.

Treatment

Antibiotic therapy in current use was discontinued. Fluid loss was replaced by intravenous infusions guided by daily biochemical estimations. One patient who survived produced over 47 pints (26.7 litres) of fluid faeces in 12 days, and was given in that time 141 pints (80 litres) of intravenous fluid. If the patient was seriously ill and had not previously received erythromycin, this drug was given (300 mg. six-hourly) by stomach tube without waiting for the bacteriological report. The patient was nursed in an isolation ward in order to minimize the spread of erythromycin-resistant staphylococci. This is extremely important, because Lepper (1953) reported that five months after the introduction of erythromycin into his hospital the nasal carrier rate of *Staph. aureus* resistant to erythromycin rose to 75%.

To several patients yoghurt, which contains lactobacilli, was given in the hope of replacing the pathogenic bacteria (Lancet, 1954a). Rettger and Cheplin (1921) showed that it was possible to create and maintain a lactobacillary intestinal flora in normal subjects by strenuous efforts at feeding cultures of lactobacilli and large amounts of lactose. Although from one patient given yoghurt a lactobacillus was cultured from the stools (Case 20) no evidence of the value of this treatment in staphylococcal diarrhoea was obtained.

Epidemiology

Staph. aureus was isolated from the diarrhoeic stools of 20 of the 31 patients in the present series. Six of the

remaining 11 were not investigated bacteriologically; from the stools of the other five no pathogenic bacteria were isolated (Table II). It should be noted that nine of these cases occurred before the special culture methods for faecal *Staph. aureus* were being used. Since then *Staph. aureus* has been isolated from the stools of 17 out of 19 cases of diarrhoea in surgical patients in this hospital. (It is noteworthy that in any given patient it may not be possible to isolate *Staph. aureus* from every specimen of faeces.) In every case antibiotic therapy had preceded the diarrhoea and in every case the patient's faecal *Staph. aureus* was resistant to the antibiotic he had received. Penicillin and streptomycin were given in 14 cases; penicillin or penicillin and sulphonamides in 10; streptomycin and sulphonamides in one; penicillin, streptomycin, and oxytetracycline in two; penicillin and chlortetracycline in two; penicillin, streptomycin, and chloramphenicol in one; and erythromycin and sulphonamides in one. The usual doses were: penicillin 500,000 units b.d. intramuscularly; streptomycin 0.5 g. b.d. intramuscularly; chlortetracycline, oxytetracycline, and chloramphenicol 250 mg. six-hourly orally.

Of our 31 cases, 17 occurred in ward B and 29 fell into one of two outbreaks. The first outbreak, comprising 10 cases (nine of which were in ward B), occurred in the period April to July, 1954; the second outbreak, comprising 19 cases (eight of which were in ward B), occurred in the period February to July, 1955. It was during the latter outbreak that a more comprehensive epidemiological picture was obtained.

Of the 19 cases in the second outbreak, seven gave *Staph. aureus* of phage type 6/47, three type 7/47/54, two type 77, one each of types 7/47 and 54, and four were not typed. From one case *Staph. aureus* was not isolated. Seven of these 18 strains were resistant to penicillin, streptomycin, chlortetracycline, and oxytetracycline, three in addition being resistant to erythromycin and three to chloramphenicol. Of the remaining five only one was sensitive to penicillin (Table II).

The staff of ward B were swabbed during the second outbreak and *Staph. aureus* type 6/47 with a typical pattern of resistance to antibiotics was found in the noses of the house-surgeon, ward sister, two nurses, and five unaffected patients. Type 54 was also found in the nose and on the hands of one nurse. The majority of the rest of the staff were carrying other strains of *Staph. aureus* in their noses, but none of these strains was isolated from the diarrhoeic stools.

The environment of the patients was also examined. In ward B *Staph. aureus* was isolated without difficulty on three occasions from dust, furniture, soft furnishings, and blankets.

On May 30, 1955, ward B was closed, cleaned, and repainted. On June 30 the ward was again tested and no *Staph. aureus* was isolated from some 40 swabs taken from every situation that might have harboured the organism. Patient No. 24, who had been transferred to an isolation hospital, was then readmitted and nursed in isolation in a side ward. However, in three days the immediate environment of the patient was heavily contaminated with *Staph. aureus* phage type 77 and the same organism was found in other situations in the ward.

In ward C patient No. 16, with a fractured femur, was infected with *Staph. aureus* phage type 6/47 and succumbed. The side ward in which he had been nursed was cleaned and fumigated with formalin. Patient No. 17, eight days later, after a craniotomy, was nursed in the same bed, developed staphylococcal diarrhoea from organisms of the same phage type, and also died.

From 6 of the 19 cases occurring in 1955, *Staph. aureus*, of the phage type corresponding to that grown from their faeces, was grown from the nose prior to the disease developing. In only 2 of the 13 nasal carriers tested was *Staph. aureus*, of the phage type corresponding to that grown from their faeces, grown from the gastric aspirate before the disease developed.

TABLE II.—Summary of 31 Cases of Diarrhoea

Case No.	Ward	Sex and Age	Diagnosis and/or Operation	Stomach Tube	Pre-diarrhoeal Chemotherapy	Diarrhoea			Faecal <i>Staph. aureus</i> and Phage Type†	Resistance Pattern	Erythromycin Therapy	Outcome
						Day*	Severity	Duration				
1	B	M 38	Billroth I	+	P.	2	Severe	7	N/D	—	—	Recovered
2	S	M 68	Polya	+	P.	2	"	3	—	—	—	Died
3	B	M 57	"	+	P.S.	3	"	2	N/D	—	—	"
4	B	M 64	Billroth I	+	P.S.	2	"	9	N/D	P.A.S.T.	—	"
5	B	M 67	"	+	P.S.	2	"	2	—	—	—	"
6	B	M 60	Polya	+	P.	3	"	10	—	—	—	Recovered
7	B	M 47	"	+	P.S.	3	Mod.	6	—	—	—	"
8	B	M 66	Billroth I	+	P.S.	2	Severe	3	+	—	—	Died
9	B	M 65	Prostatectomy	+	P.S.	2	Severe	11	N/D	—	—	Recovered
10	B	M 47	Billroth I	+	P.S.	2	Severe	9	+	—	—	"
11	B	M 71	"	+	P.S.	3	"	2	N/D	—	—	Died
12	Mb	M 62	"	+	P.S.T.	3	"	2	+	P.	—	"
13	B	M 63	Repair of hiatus hernia	+	P.S.	3	"	4	+ (54)	P.S.T.	+	Recovered
14	B	M 53	Billroth I	+	S.Sul.	13	"	3	+	P.A.S.T.C.	—	Died
15	V	F 66	S.P. pin femur	—	P.S.	11	"	1	+ (6/47)	P.A.S.T.C.	+	"
16	C	M 85	"	—	P.Sul.	5	"	1	+ (6/47)	P.A.S.T.	—	"
17	C	M 81	G.S.W. head. Craniotomy	+	P.S.	14	Mod.	1	+ (6/47)	P.A.S.T.	—	Recovered
18	E	M 63	Laryngectomy	—	P.S.	2	"	12	+ (7/47/54)	Sensitive	+	"
19	B	M 81	Prostatectomy	—	P.Sul.	6	"	20	+ (7/47)	P.A.S.T.	+	"
20	B	M 72	Partial ilectomy	+	P.Sul.	1	Severe	3	+ (6/47)	P.A.S.T.	+	Died
21	M	M 68	Polya	+	P.S.T.	2	"	1	+ (6/47)	P.A.S.T.	+	"
22	C	M 67	Extradural haematoma. Craniotomy	+	P.Sul.	8	Mod.	1	+ (6/47)	P.A.S.T.C.	—	Recovered
23	C	M 30	Multiple injuries	+	E.Sul.	1	"	3	+ (77)	P.A.S.T.E.	—	"
24	B	M 57	Excision of papilloma of bladder	—	P.S.C.	3	Severe	14	+ (6/47)	P.A.S.T.E.	+	"
25	B	M 29	Billroth I	+	P.S.	12	Mod.	5	+	P.A.S.T.E.	—	"
26	E	F 78	Laryngectomy	—	P.	15	Severe	5	+ (7/47/54)	P.S.	+	"
27	E	F 71	Carcinoma maxillary antrum	—	P.A.	12	"	10	+ (7/47/54)	P.A.S.T.	—	"
28	L.M.	F 6	Rheumatic fever	—	P.A.	13	Mod.	2	+	P.A.S.T.	—	"
29	L	F 46	Status asthmaticus	—	P.S.	4	Severe	7	+	—	—	Died
30	B	M 71	Perforated ileum	+	P.Sul.	4	Mod.	3	+ (77)	P.A.T.	—	Recovered
31	S	F 78	Abdominal pain	—	P.Sul.	4	"	3	+	—	—	"

P.=penicillin. S.=streptomycin. C.=chloramphenicol. A.=aureomycin (chlortetracycline). T.=tetracycline (oxytetracycline). E.=erythromycin. Sul.=sulphonamides.
* Number of days either after operation or after commencement of antibiotic treatment that diarrhoea began.
† N/D=not done—i.e., not cultured. The phage type where known is given in parentheses.

Aetiology

The present series of cases points to *Staph. aureus* being the chief cause of post-operative diarrhoea in this hospital; it was isolated from the faeces of 20 of the 31 cases. Of these cases 17 were consecutive. Six cases, four of them fatal, were not investigated bacteriologically (Table II).

The arguments brought against *Staph. aureus* as the aetiological agent are as follows: (1) the presence of *Staph. aureus* is not significant of disease, as it is found in 17% of normal adult stools (Brodie *et al.*, 1956); (2) the staphylococci become significant only after the patient has been weakened already by some other initial cause of the diarrhoea; and (3) the resistance of the *Staph. aureus* to the antibiotics in use is not in itself necessarily significant, since its very survival implies resistance.

However, in three severe and three moderately severe cases in this series erythromycin seemed to stop the diarrhoea and cleared the faeces of *Staph. aureus*. This was also the experience of Dearing and Heilman (1953) in 21 of their cases. In three of our cases erythromycin proved ineffective, but two were by that time moribund. The successful use of erythromycin is therefore strong evidence for *Staph. aureus* as the cause of the diarrhoea.

In a given patient it may not be possible to isolate *Staph. aureus* from every specimen of faeces. For example, in one of the worst cases of the series (No. 25) *Staph. aureus* was not isolated from 4 of the 11 specimens of faeces cultured. There may even be cases where, although the *Staph. aureus* is not isolated, it is nevertheless the cause of the condition. Similar difficulty is sometimes experienced in isolating *Salmonella* or *Shigella* organisms from infected faeces.

The relationship between staphylococcal diarrhoea and pseudomembranous enterocolitis is not clear. Penner and Bernheim (1939) and Penner and Druckermann (1948) suggested that the pseudomembrane was caused by submucosal vasospasm resulting from post-operative shock. However, it must be stressed that many of their cases, and those of Pettet *et al.* (1954), did not have diarrhoea. Shock and peritonitis were often present, and in many cases occurred before the advent of antibiotics. The role of bacteria was not thought to be important. Moon's (1938) observation may be relevant here; he noted bloody mucous

diarrhoea with congested oedematous bowel mucosa after severe experimental shock in animals. Possibly some of the cases of necrotizing haemorrhagic jejunitis described by Fick and Wolken (1949) are similar to these animal cases, for profound shock and similar intestinal changes were reported. In addition they found *Clostridium welchii* in all cases. However, in this present series severe staphylococcal diarrhoea occurred in patients who were not previously shocked.

Pseudomembranous enterocolitis has also been described in other conditions—for example, diphtheria and poisoning with heavy metals (Lancet, 1954b). Many fatal cases of diarrhoea following antibiotic therapy and showing pseudomembranous lesions at post-mortem examination have been attributed to staphylococcal infections (Terplan *et al.*, 1953; Wakefield and Sommers, 1953; Dearing and Heilman, 1953). It is probable that formation of pseudomembrane is a non-specific reaction of the body to a variety of noxious and exhausting stimuli, staphylococcal diarrhoea being one of them. However, we believe that *Staph. aureus* is likely to be incriminated more often if special cultural methods are used in investigating cases of diarrhoea following antibiotic therapy.

At the 14 post-mortem examinations which we made in this series a macroscopic pseudomembrane was found lining the intestines in two cases, macroscopic inflammatory changes without pseudomembrane formation in four, and of the other eight, although inflammatory changes had occurred in the intestines, autolysis prevented histological examination in these. An excellent account of the typical pseudomembranous lesions is given by Dawson-Edwards and Morrissey (1955).

We believe that the indiscriminate prophylactic use of antibiotics, chiefly penicillin and streptomycin in combination, was the chief predisposing cause of the diarrhoea in the outbreak in the spring of 1954, when five deaths occurred in one ward. A strain of *Staph. aureus* resistant to the antibiotics in use at the time was presumably able to establish itself in the usually sterile small bowel and to dominate the complex and usually stable flora of the large bowel.

The portal of entry of this resistant organism may have been the mouth or nasopharynx, or any or all of the

processes of ingestion, inhalation, and intubation. The organism itself may have been exogenous or, less often, endogenous (from the nose of the patient himself). The prevalent use of antibiotics, it seems, substantially assisted these organisms to invade the intestines of their victims. In order to appreciate the changes in bacterial population which occur during these abnormal states, it is necessary to consider first the normal intestinal flora.

The normal flora of the human small and large intestine has not yet been fully investigated. Cushing and Livingood (1900) noted that patients with perforations of the lower bowel succumbed rapidly to peritonitis, but that those with perforations of the stomach or upper intestine often recovered well. This observation led them to investigate the bacterial flora of the gut. They took samples direct from the intestines of many animals and patients, and concluded that the upper and middle small intestines were virtually sterile, and that any bacteria present had been ingested. Kendall *et al.* (1927) confirmed these findings.

Bacteriological examination of the contents of the gut at necropsy has been shown to be unreliable because the whole of the small intestine is invaded by coliform bacteria shortly after death (Blacklock *et al.*, 1937).

Cregan and Hayward (1953), of Melbourne, by taking samples direct by syringe from the healthy gut at various levels during abdominal operation, concluded that the whole length of the small intestine contains only a transient flora, chiefly of Gram-positive species that are more commonly associated with the mouth than with the large intestine. However, of 14 specimens from the lower ileum, three contained *Bact. coli* type 1, and one *Bact. aerogenes* type 1—that is, large-bowel organisms. In a second similar series of investigations (Cregan *et al.*, 1953) on 22 patients with gastric lesions, with varying gastric acidity and gastric bacterial flora, they again found few bacteria in the small intestine. *Staph. aureus* was found twice. They concluded that the small intestine has an antibacterial mechanism independent of the gastric barrier.

We have been able to confirm, in a small series, the findings of Cregan and Hayward (1953), using their technique. Eleven aspirates from normal small intestines gave no growth, and five gave scanty growth of mouth organisms—for example, *Streptococcus viridans*, and diphtheroids. One of the latter group of five gave a scanty growth of *Bact. coli* also, and gave another scanty growth of *Staph. aureus* sensitive to penicillin.

Colonic bacteria are, however, found in the small intestine in abnormal conditions. For example, *Bact. coli* type 1 (faecal) was cultured from the aspirated intestinal contents of three patients with strangulated or obstructed small bowel and also from one patient with symptomless jejunal diverticulosis.

Broadly speaking, then, the healthy human being has a small bowel which is largely free of bacteria and a large bowel which has an extremely large and complex flora. Although the flow of intestinal contents in the large bowel is unidirectional, organisms can invade it from the anal end, and the last few inches of the small bowel often contains organisms typical to the flora of the large bowel. Thus an exchange of organisms between the large and small bowels can occur, but presumably, under normal conditions, some mechanism maintains the difference in flora between the two.

The oral administration of antibiotics active against coliform organisms can bring about a profound though usually temporary reduction in the coliform flora of the faeces. This has been demonstrated by Zintel *et al.* (1947), Morton and Smith (1948), Hertfort and Standard (1948), Spaulding *et al.* (1949), and Metzger and Shapse (1950). It is difficult to see, however, how antibiotics can influence the susceptibility of the small bowel to infection. Possible reasons for the increased tendency to infection include: (1) a lowered general resistance of the patient due to operation or illness, or possibly due to toxic action of the antibiotic on the protoplasm of the host; (2) a lowering of

local resistance in the intestinal tract by interference with the natural defences—for example, by the removal of gastric acidity, by intestinal ileus, or possibly by the local action of antibiotics themselves on the tissues; (3) suppression of normal intestinal flora by antibiotics, enabling antibiotic-resistant organisms to flourish; (4) an increase in "virulence" of the organism stimulated by exposure to sublethal concentration of antibiotics, or of the changed metabolism of a resistant organism exposed to full concentration, enabling it to infect the small bowel (Garrod, 1951); and (5) the introduction of staphylococci direct into the bowel by means of a transnasal stomach tube.

An experiment illustrative of this increased tendency to infection is described by Freter (1955), who was able regularly to produce cholera in adult guinea-pigs, which are normally resistant to *Vibrio cholerae*, by preparing the animals with oral streptomycin.

Prevention of Staphylococcal Diarrhoea

The most important preventive measures in our view are the restriction of the use of antibiotics and reduction of the numbers of *Staph. aureus* present in the environment.

Since June, 1955, our use of antibiotics has greatly diminished (other routine therapeutic procedures not having been changed) and since then there has been no severe case of staphylococcal diarrhoea in ward B. That the use of the newer antibiotics is no guarantee against staphylococcal enterocolitis is seen from a case following neomycin therapy, quoted by Pettet *et al.* (1955). We feel that these drugs should be used only if specific indications exist, and then only with the patient in isolation. Antibiotics remain effective only as long as bacteria are sensitive to them.

During the period under review, owing to structural alterations there was no ward in the hospital in which septic surgical cases could be isolated. Isolation of such cases in the side wards of general wards was ineffective, *Staph. aureus* spreading rapidly from them to the whole ward area, particularly when it was being excreted in large numbers in the faeces. Thus it is obviously desirable to separate completely infected and "cold" surgical cases, and this should be done wherever possible.

Since October, 1955, the staff of ward B have had hands and noses swabbed every fortnight for the presence of *Staph. aureus*. This was done for the twofold purpose of research into the epidemiology of *Staph. aureus* in the ward and to try to eliminate heavy carriers. Local application of such antiseptics as chlorhexidine ("hibitane") may help to lessen the spread of organisms from these carriers.

The floor of ward B had been treated with spindle oil for some years before staphylococcal diarrhoea became a problem. This method of laying dust has been continued to the present time. Vacuum cleaners with air filters are used to remove any loose dust from the floor.

Since October, 1955, the problem of blankets has also been investigated. The findings will be published elsewhere, and it will suffice to say here that with the ordinary woollen blankets the method of cleaning described by Blowers and Wallace (1955) was adequate, provided that each patient was issued with a freshly laundered set of blankets on admission to the ward.

We feel that mattresses and pillows should also receive attention and that they should probably both be made of foam rubber with sealed air cells and be enclosed in rubber sheeting for easy swabbing with lysol after use by each patient.

The provision of more cubicles, single wards, and smaller nursing units generally will also militate against the spread of staphylococcal infection.

Gastro-intestinal aspiration may be a cause of spread of *Staph. aureus*, and all tubes must be boiled after being used for this purpose. A sterile syringe should be supplied for each aspiration, and any feeds given by this route should also be sterile and handled aseptically.

It will probably never be possible to eliminate *Staph. aureus* completely from patients and staff, but, by the measures outlined above, conditions under which resistant organisms can invade and flourish in post-operative and medical cases may be avoided.

Conclusions

Staphylococcal diarrhoea is a common and often fatal post-operative complication when antibiotics are being used prophylactically as a routine. In the Radcliffe Infirmary it became the major cause of death after elective partial gastrectomy. In medical patients, too, prolonged courses of antibiotics—for example, in chronic respiratory infections—are fraught with danger, especially when given in hospital. We submit, therefore, that the routine prophylactic use of these antibiotics is not justified. The relatively insoluble sulphonamides provide adequate preparation for colonic surgery, and it is unnecessary, and even dangerous, to use antibiotics in order to prepare the patient for operation either on the stomach or on the unobstructed small bowel.

However, if post-operative complications ensue, or if definite indications are present at operation (for example, a grossly soiled peritoneal cavity), the appropriate antibiotic should be used—at full strength and in short courses. Garrod (1955) outlined the principles for the correct use of antibiotics. Their abuse may lead to tragedy.

In conjunction with these measures, every effort must be made to reduce the numbers of *Staph. aureus* in the environment of the patient, not only to avoid surgical sepsis but to allow the safe and effective use of antibiotics when this is necessary.

Summary

Thirty-one cases of diarrhoea are described. Fourteen patients died, seven from one surgical ward. Fourteen cases occurred after partial gastrectomy.

Infection with *Staph. aureus* following antibiotic therapy was the chief cause of diarrhoea in this series.

The literature concerned with enterocolitis and staphylococcal diarrhoea is reviewed.

The epidemiology of two outbreaks of staphylococcal diarrhoea is described. Of the 31 cases, 29 occurred in two short periods in 1954 and 1955.

The aetiology of the condition is discussed and an account is given of an investigation into the bacteriology of the small bowel.

It is strongly recommended that antibiotics should not be used as a routine prophylaxis in abdominal surgery, but should be restricted to cases with special indication and then in isolation.

Measures to reduce the numbers of *Staph. aureus* in the ward environment are discussed.

We thank the surgeons and physicians who gave permission to publish details of their cases; Dr. A. H. T. Robb-Smith for the post-mortem and histological reports; Dr. R. E. O. Williams, of the Central Public Health Laboratory, Colindale, for the phage-typing report; Professor A. D. Gardner for his helpful criticism; and Miss M. C. McLarty for drawing the Chart.

APPENDIX: METHOD OF BACTERIOLOGICAL EXAMINATION OF THE FAECES AND GASTRIC ASPIRATES

The faeces and aspirates were plated on to blood agar, one plate for aerobic and another for anaerobic incubation. They were also plated on to nutrient agar containing an added 7% of sodium chloride and inoculated into Robertson's cooked-meat medium containing an added 10% of sodium chloride. The latter was plated out after 24 hours' incubation at 37° C. on to blood agar (aerobic) and salt agar. Suspicious colonies after 24 and 48 hours' incubation were tested by the coagulase test and their sensitivity to antibiotics was determined.

REFERENCES

- Blacklock, J. W. S., Guthrie, K. J., and Macpherson, I. (1937). *J. Path. Bact.*, 44, 321.
Blowers, R., and Wallace, K. R. (1955). *Lancet*, 1, 1250.
British Medical Journal, 1954, 2, 221.
Brodie, J., Kerr, M. R., and Sommerville, T. (1956). *Lancet*, 1, 19.
Choremis, C., Tseng, C., and Economou-Mavrou, C. (1954). *Ibid.*, 2, 1236.
Council of Pharmacy and Chemistry (1951). *J. Amer. med. Ass.*, 145, 1267.
Cregan, J., Dunlop, E. E., and Hayward, N. J. (1953). *British Medical Journal*, 2, 1248.
— and Hayward, N. J. (1953). *Ibid.*, 1, 1356.
Cushing, H., and Livingood, L. E. (1900). *Johns Hopk. Hosp. Rep.*, 9, 543.
Dawson-Edwards, P., and Morrissey, D. M. (1955). *Brit. J. Surg.*, 42, 643.
Dearing, W. H., and Helman, P. R. (1953). *Proc. Mayo Clin.*, 28, 121.
Dixon, C. F., and Weismann, R. E. (1948). *Surg. Clin. N. Amer.*, 28, 999.
Fairlie, C. W., and Kendall, R. E. (1953). *J. Amer. med. Ass.*, 153, 90.
Fick, K. A., and Wolken, A. P. (1949). *Lancet*, 1, 519.
Finney, J. M. T. (1893). *Johns Hopk. Hosp. Bull.*, 4, 54.
Fowler, B. J. (1955). *British Medical Journal*, 1, 1313.
Freter, R. (1955). *J. infect. Dis.*, 97, 57.
Gardner, D. L. (1953). *Lancet*, 2, 1236.
Garrod, L. P. (1951). *British Medical Journal*, 1, 205.
— (1955). *Ibid.*, 2, 756.
Hay, P., and McKenzie, P. (1954). *Lancet*, 1, 945.
Hertfort, R. A., and Standard, S. (1948). *Ann. Surg.*, 128, 987.
Jackson, G. G., Haight, T. H., Kass, E. H., Womack, C. R., Gocke, T. M., and Finland, M. (1951). *Ann. intern. Med.*, 35, 1175.
Kendall, A. I., Day, A. A., Walker, A. W., and Hauer, R. C. (1927). *J. infect. Dis.*, 40, 677.
Kramer, I. R. H. (1948). *Lancet*, 2, 646.
Lancet, 1954a, 1, 967.
— 1954b, 2, 228.
Lepper, M. H. (1953). *British Medical Journal*, 2, 1044.
Metzger, W. J., and Shapse, J. B. (1950). *J. Bact.*, 59, 309.
Moon, V. H. (1938). *Shock and Related Capillary Phenomena*, p. 189. Oxf. Univ. Press, New York.
Morton, H. S., and Smith, F. (1948). *Arch. Surg. (Chicago)*, 57, 520.
Penner, A., and Bernheim, A. I. (1939). *Arch. Path. (Chicago)*, 27, 966.
— and Drucker, L. J. (1948). *Gastroenterology*, 11, 478.
Pettet, J. D., Bagenstoss, A. H., Dearing, W. H., and Judd, E. S. (1954). *Surg. Gynec. Obstet.*, 98, 546.
— Judd, E. S., and Dearing, W. H. (1955). *Proc. Mayo Clin.*, 30, 371.
Rettinger, L. F., and Cheplin, H. A. (1921). *Treatise on the Transformation of the Intestinal Flora*. New Haven.
Spaulding, E. H., Madajewski, D. S., Rowe, R. J., and Bacon, H. E. (1949). *J. Bact.*, 58, 279.
Terplan, T., Paine, J. R., Sheffer, J., Egan, R., and Lansky, H. (1953). *Gastroenterology*, 24, 476.
Todd, A. S., and Hopps, P. O. D. (1955). *Lancet*, 2, 749.
Wakefield, R. D., and Sommers, S. C. (1953). *Ann. Surg.*, 138, 249.
Williams, E. (1954). *Lancet*, 2, 999.
Williams, M. R., and Fullan, I. M. (1953). *Ibid.*, 2, 1013.
Womack, C. R., Finland, M., Gocke, T. M., Jackson, G. G., Haight, T. H., and Kass, E. H. (1952). *A.M.A. Arch. intern. Med.*, 89, 240.
Zintel, H. A., Wiley, M., Nichols, A., and Rhoads, J. E. (1947). *Surgery*, 21, 175.

EXPERIENCE OF THE BURNS UNIT A REVIEW OF 520 CASES

BY

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Colebrook (1950) advocated the establishment of special burns units where difficult and often long-term cases could be treated by trained teams and full use made of special facilities and equipment. In 1952 the Ministry of Health recommended the setting up of special centres in all regions. Burns have been treated at the Basingstoke Plastic Unit since 1940, but not until 1950 was it decided to form a burns unit within the hospital where these cases could be grouped together for the necessary specialized attention. The unit consists of 18 beds, divided into one six-bed ward, one four-bed ward, a five-bed nursery, and three single rooms. A major dressing-room includes a saline-bath unit; a minor dressing-room is available for ambulant and less severe cases, and skin-grafting operations are performed in one of the major operating-theatres normally set aside for that purpose.

Up to the end of 1955, 520 cases had been admitted to the unit, the admission rate gradually increasing up to the present level of 120–130 cases annually.

In Table I the cases are classified according to age groups, and also according to the percentage area of body surface burnt.

The majority of cases are referred direct from neighbouring practitioners or transferred within a few hours

TABLE I

Age Groups		Area of Burns	
0-5 years	189	0-9%	309
6-15 "	69	10-19%	104
16-30 "	100	20-29%	50
31-59 "	95	30-39%	25
60 and over	67	40-49%	13
	520	50-59%	11
		60% and over	8
			520

from hospitals in the eastern area of the S.W. Metropolitan Region. Some of the latter may be held in the referring hospitals for the two to three days of the shock period, advice on early treatment often being given by telephone or the case being visited by one of the staff of this unit.

Those admitted within 72 hours are classified as "fresh cases" and constitute two-thirds of all admissions. The remainder are referred after a longer period, possibly in many cases because of initial failure to recognize the severity of the injury. Commonly the presence of full-thickness skin destruction is not appreciated, and the case is transferred only after a delay of two to three weeks, when it is increasingly obvious that spontaneous healing is not going to occur. In this group unsuitable dressings or abortive attempts at skin grafting may have been carried out, and the importance of a high-protein high-calorie diet has not always been appreciated. It is here that one may still occasionally see the picture of the "chronic burn" with offensive dressings, anorexia and weight loss, low morale, and continued dependence on analgesics.

In Table II the cases are divided into these two groups. The average in-patient stay of 34.5 days for the fresh cases compares favourably with the national average of

TABLE II

Fresh Cases (admitted within 72 hours)	Delayed Cases (average delay, 17.8 days)
Total No. 348	Total No. 172
Fatal cases 30	Fatal cases 16
Surviving cases 318	Surviving cases 156
Average total in-patient stay, 34.5 days	Average total in-patient stay, 65.5 days

50 days (Colebrook, 1950). It will be seen that in the delayed cases the average (total) in-patient stay is 65.5 days, an increase of 31 days. The cost to the N.H.S. of this prolonged hospitalization can only be guessed at, but it provides strong support to the Ministry's recommendation for the establishment of these units. It will be appreciated also that delayed healing increases the degree of harmful scarring and the production of severe deformities which may require prolonged reconstructive treatment by the plastic surgeon.

The general principles of treatment have become well established in the post-war years, and, broadly speaking, differ from unit to unit mainly in matters of detail. As so much has been written on this subject recently, the following brief account deals only with salient points, and much technical detail has been omitted.

Treatment of Shock

The rapid and severe depletion of blood volume consequent on fluid loss from damaged capillaries is made good by controlled intravenous fluid replacement. This is necessary in all burns greater than 18% of body surface burnt in the adult, and 12% in the child, and the intravenous drip must be maintained for a period of 48 hours from the time of the burn. Fluid balance is carefully recorded and an indwelling catheter is employed if there is any difficulty in assessing renal output.

There is an increasing tendency to rely on a formula for dosage control and these formulae are tending to become simpler. The following schemes of dosage are in use at this unit:

Fluid Replacement Formula in Adults

120 ml. dextran for 1% body surface area burned. This gives total quantity of intravenous fluid in 48 hours, and is divided as follows:

one-half in first 8 hours after burn
one-quarter in next 16 hours
one-quarter in final 24 hours
(N.B.—Ceiling figure—6 litres)

Deep burns: Up to one-third of total quantity given as whole blood. Metabolic requirements: Given as additional oral fluids 50 ml./kg. daily (in a 10-stone (63.5-kg.) adult, approximately 3 litres daily).

Fluid Replacement Formula in Children*

A. Burns less than 30% of body surface area

Age	Months				Years										
	<3	3-6	6-9	9-12	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11
Dextran†	15	21	24	27	30	42	48	54	63	69	81	87	93	102	111

The above figure multiplied by the % area of the burn gives the total quantity of intravenous fluid in 48 hours, and is divided into three equal portions:
one-third in first 8 hours after burn
one-third in next 16 hours
one-third in final 24 hours

B. Burns greater than 30% of body surface area

Calculate 10% of body weight. This gives total quantity of intravenous fluid in 48 hours, and is divided as follows:

one-half in first 8 hours after burn
one-quarter in next 16 hours
one-quarter in final 24 hours

Deep burns: Up to one-quarter of total quantity given as whole blood. Metabolic requirements: Given as additional oral fluids daily.

<2 years 160 ml./kg. 5- years 80 ml./kg.
2- " 100 " 8-11 " 50 "

* Developed from a chart published by Wallace (1951).
† In millilitres for each 1%.

It will be noticed that no extra electrolytes are provided for, the emphasis being on restoration of the circulating blood volume by dextran, with inclusion of whole blood if there is much destruction of deep tissue. Plasma has been completely replaced by dextran and has not been used in this unit for six years.

It is well at this point to underline the danger of overheating these patients when treated in first-aid or casualty department, and certainly the electric "shock cradle" should never be used. Surface heating accelerates the circulation through damaged capillaries and thus intensifies the depletion of blood volume.

Local Treatment

Once the shock state is under control attention is paid to the burned areas, which are treated by exposure, and in this unit it is regarded as the method of choice in all fresh cases. It gives the greatest opportunity for damaged tissues to heal, and maintains the deeper lesions in that state of dry necrosis which makes surgery so much more favourable. Some difficulty has been experienced in the past with circumferential burns of the trunk, but considerable improvement has been achieved by nursing on the special frame shown in Fig. 2. This is strung with rug canvas (4-in. (6-mm.) mesh), and the patient lies on sections of "polythene" sponge which are directly in contact with the burns. This allows maximum evaporation from the surface in contact, and there is practically no adhesion. The polythene sponge is changed daily and is re-sterilized. A cradle is placed over the patient to prevent draughts, and the air under the frame is warmed with hot-water bottles or, better still, a fan heater which circulates slightly warmed dry air.

Involved limbs are, of course, suspended to reduce oedema, and the necessity of relieving incisions must be borne in mind where there are deep circumferential burns of the extremities.

In superficial burns the coagulum usually comes away in 12-16 days, when healing is found to be complete. The deeper burns will require excision and skin-graft replacement.

There is no doubt in this unit that the introduction of exposure has led to a definite lowering of infection, less pain and discomfort, and a marked improvement in the general condition of the extensively burned patient.

Surgical Excision and Skin Grafting

The procedure usual with most closed-dressing techniques of awaiting separation of moist sloughs and then grafting the resulting granulation tissues is employed here only in those late infected cases in which dry treatment is no longer practicable on admission. It is felt that in all fresh cases the areas of full-thickness skin destruction should be excised at the optimum time for the particular case (often the 14th-16th day) and maximum skin cover achieved at the same operation.

This extensive but necessary operation on a patient, whose general condition has been maintained only with considerable difficulty, is not undertaken lightly. Although the procedure has been made shorter and safer by technical advances such as the use of electric or pneumatic dermatomes, more rapid excisional techniques, etc., the greatest emphasis must always be placed on theatre team-work. Excision and grafting of a major burn should not be attempted unless a team of at least two surgeons and two sisters is available, and even with an experienced team it is often advisable to rehearse the various stages beforehand. It will be appreciated that most burns of 30% and upwards will require application of skin grafts on more than one occasion, although these secondary operations are comparatively minor. Full skin cover may not be achieved at the first operation, and areas of patchy graft failure are not uncommon.

Homografting is sometimes resorted to as a means of increasing the area of skin coverage possible in a patient whose own donor sites are limited, usually a child with extensive deep burns. The donated skin is preferably applied in the form of strips alternating with the autografts.

General Treatment

A high-protein high-calorie diet has long been regarded as essential for these patients, and this has recently been emphasized by the nutritional studies carried out in Wallace's unit in Edinburgh (Sutherland, 1953). The pronounced stress response of the burned patient in the early stages leads to a rapid and extreme loss of nitrogen in the urine, and this may be accentuated by the continuing loss of protein from the extensive areas of skin destruction. If this negative nitrogen-balance is not countered rapidly and efficiently, weight loss is soon apparent, the general condition deteriorates, and healing is considerably retarded. It is not possible to achieve the necessary levels of intake by ordinary diet, and reliance must be placed on supplementary feeds.

The recent introduction of "complan" has greatly simplified this problem and has almost completely removed the difficulty of meeting protein and calorie requirements. One pound (450 g.) of complan contains 140 g. of protein and provides 2,000 calories, and this daily quantity is easily managed by even the most difficult of patients. As this is supplementary to solid diet, and in addition may be given in milk, it is easy to maintain daily levels of 3 g. of protein per kg. of body weight and the equivalent number of calories. Even higher levels have been achieved where necessary and without having to resort to tube-feeding.

In addition haemoglobin levels must be watched, and repeated blood transfusions may be called for to combat the anaemia to which these patients are prone. Physiotherapy is employed to maintain joint movements, and occupational therapy may assist in this and also help to maintain morale.

Complete cessation of healing is fortunately a rare but extremely difficult complication, and appears to be predisposed to by inadequate early treatment.

A 20-year-old man was admitted from the Middle East some six weeks after he had sustained a 60% burn, most of which was full-thickness skin loss. Nine months later healing was still

far from complete in spite of repeated grafting operations and intensive supportive therapy. Investigation showed that his urinary excretion of 17-ketosteroids was down to 1.5 mg. daily (normal, 9-24 mg.), and a course of systemic cortisone, 100 mg. daily, together with methyltestosterone, 10 mg. daily, was started. Within three weeks more healing occurred than in the previous four months, and previously grafted skin became obviously more stable.

Experiments are also being made with local hydrocortisone applied to similar areas of slow healing, and it is obvious that further investigation is required in this type of case. In passing, it may be noted that this form of graft failure and instability is similar to that seen after unsuccessful homografting.

The Late, Infected Case

A somewhat different approach may be necessary for these patients. Frequent saline baths are combined with closed dressings, and there may be some delay before raw surfaces are suitable for skin grafting. Anaemia and protein deficiency may be pronounced and require intensive treatment as described above.

Illustrative Case

Only the following case has been chosen for detailed presentation, as it exemplifies most of the important features of present-day treatment of the more difficult type of case—the circumferential burn of the trunk.

A German maidservant aged 19 was admitted to the unit on February 12, 1956, after her nightdress had caught fire one and a half hours previously. She had sustained burns of both surfaces of the body, both thighs, the left arm, and the right hand. The posterior surface was the more severely involved, the burn extending almost completely from the neck down to just above the knees (Fig. 1). The extent of the burn was estimated at 45% of the body surface area, about two-thirds of this representing full-thickness skin destruction. Her weight shortly after admission was 67 kg.

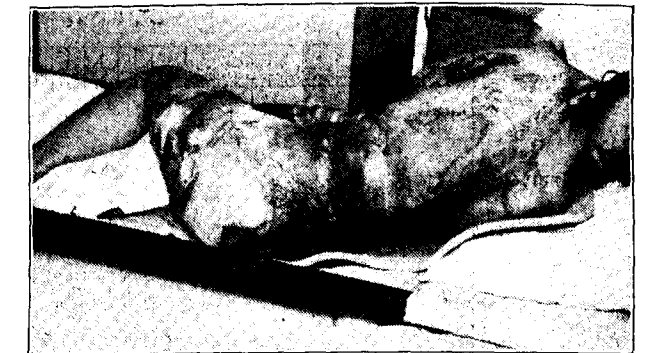


FIG. 1.—Photograph of a girl aged 19 with burns of 45% of the body surface area, taken on admission.

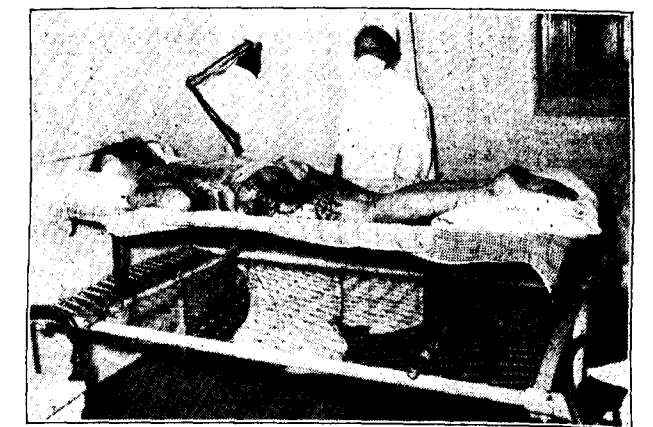


FIG. 2.—Exposure treatment of extensive circumferential burn on special frame. The polythene sponge is not visible in the photograph.

The delay of the first heart sound (Q-1 interval) was measured from the beginning of the QRS complex of the electrocardiogram to the beginning of the maximal vibrations of the first heart sound. These vibrations are of high frequency and are usually quite clearly distinguished from the coarser and smaller vibrations of the diastolic or pre-systolic murmurs and the first component of the first heart sound. The delay of the opening snap (2-O.S. interval) was measured from the beginning of the second component of the second heart sound (Rappaport and Sprague, 1942) to the beginning of the opening snap. The length of the preceding cardiac cycle was measured from the R-R interval of the electrocardiogram. The intervals were measured in at least 20 cardiac cycles in each patient, and were plotted against the previous cycle length (Fig. 1). From this graph the Q-1

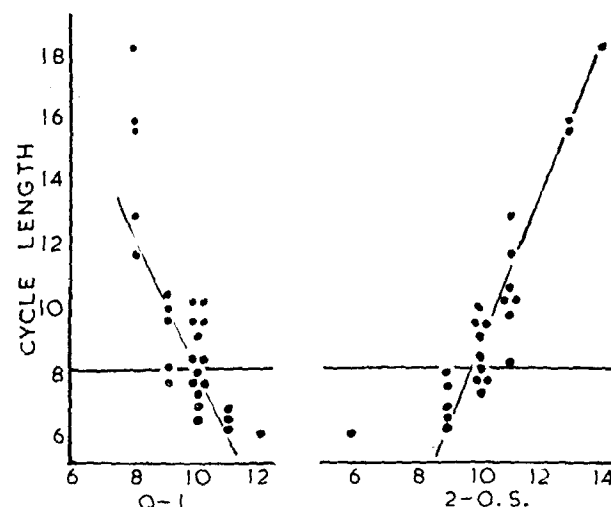


FIG. 1.—Graphs of the interval between the onset of the QRS complex of the electrocardiogram and the onset of the maximal vibrations of the first heart sound (Q-1), the interval between the second sound and the opening snap (2-O.S.), and the length of the preceding cardiac cycle. From such graphs drawn for each patient the values for the Q-1 and 2-O.S. are estimated for a cycle length of 0.8 second. Cycle lengths in tenths of a second, and Q-1 and 2-O.S. in hundredths of a second.

and 2-O.S. intervals were determined for a cycle length of 0.8 second. This cycle length was chosen because it was such that an extrapolation of the graph was rarely necessary. The figures appropriate to this cycle length were called the "corrected Q-1" and "corrected 2-O.S." The other measurements taken from the phonocardiogram were the heart rate, the diastolic filling period, and the duration of systole per minute. The diastolic filling period is the total duration in one minute of the intervals between the opening snap and the next first heart sound. The remainder of the minute was taken as the duration of systole per minute.

The size of the mitral orifice was assessed at operation by the surgeon. The area of the orifice was calculated from its length and breadth by multiplying these by pi over 4. The pressure gradient across the mitral valve has usually been obtained at operation by a Sanborn electromanometer by simultaneous needle puncture of the left atrium and the left ventricle. The mitral gradient has been taken as the mean left atrial pressure during ventricular diastole minus the mean left ventricular pressure in diastole. In a few cases only the mean left atrial pressure by a saline manometer was available, and in these cases the mitral gradient was taken as this figure minus 5 mm. of mercury.

The cardiac output was estimated by means of Gorlin's formula (Gorlin and Gorlin, 1951). This formula uses the pressure gradient across the mitral valve, the size of the mitral orifice, and the diastolic filling period. In the calculation of cardiac output the diastolic filling period was not measured at the time of operation but was obtained from the pre-operative phonocardiogram. This will introduce some error, but it will not be large, as the total variations of the diastolic filling period are small.

There is a definite relationship between the pre-operative "corrected Q-1 minus 2-O.S." and the pressure gradient across the mitral valve at operation. The relationship is shown in Fig. 2. When the "corrected Q-1 minus 2-O.S." lies between $+5\frac{1}{2}$ and $-1\frac{1}{2}$ the mitral pressure gradient is found to be high, while for figures between $-1\frac{1}{2}$ and $-4\frac{1}{2}$ the gradient is found to be low. The pressure gradient may therefore be predicted by the pre-operative phonocardiogram. Such a prediction appears valid despite the modifications of the pressure gradient that are caused by anaesthesia, thoracotomy, and pericardiectomy. These modifications are not well understood, but their presence is indicated by an increase in pulse rate and a reduction in pulse volume and systemic blood pressure. A reduction of cardiac output is probably present, and this would mean that the pressure gradient across the mitral valve would be lower than before operation. For this reason the cases in which the systemic blood pressure fell below 70 mm. Hg at the time the mitral pressure gradient was measured, rendering the estimation of the gradient misleading.

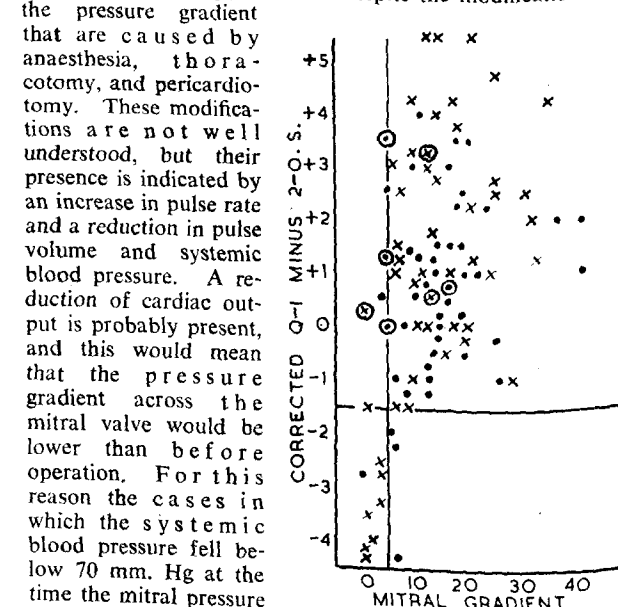


FIG. 2.—Graph showing the relationship between the "corrected Q-1 minus 2-O.S." and the pressure gradient across the mitral valve (in mm. Hg). The crosses denote patients with sinus rhythm and the dots patients with atrial fibrillation. Those cases enclosed in a ring had a systemic blood pressure of below 70 mm. Hg at the time the mitral pressure gradient was measured, rendering the estimation of the gradient misleading.

When the corrected Q-1 and the corrected 2-O.S. are considered separately they do not give as accurate a prediction of the mitral pressure gradient as when they are combined. This could be due to the fact that the combination reduces the error of measurement to a half. Fig. 3 suggests that the corrected Q-1 and the corrected 2-O.S. are too poorly related to each other for this explanation to be satisfactory.

Since the stroke volume in mitral stenosis is reduced (Gorlin *et al.*, 1951) it is possible that the abnormality of the heart sounds might reflect the altered form of the left ven-

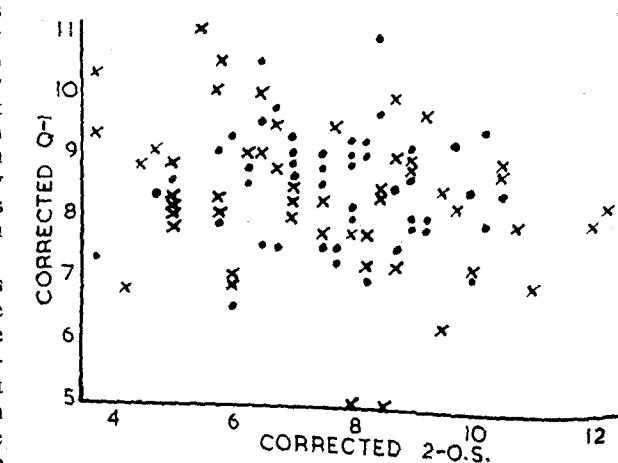


FIG. 3.—Graph showing the corrected Q-1 and corrected 2-O.S. Crosses=sinus rhythm. Dots=atrial fibrillation.

Results

tricular pressure curve. Studies of the left ventricular pressure tracings show that after a brief period of ventricular filling the onset of pressure rise is not delayed but the rise is slower than it is after a long period of filling (Fig. 4). The fall of ventricular pressure is slower and earlier after a short period of filling. Such curves might explain the variations of the Q-1 interval but would not explain the variation of the 2-O.S. interval.

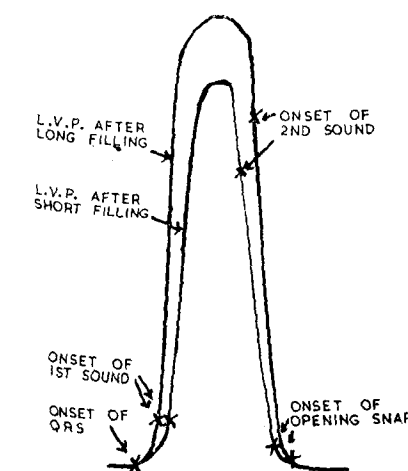


FIG. 4.—Left ventricular pressure curves after long and short diastolic intervals superimposed for contrast. With synchronous onset of QRS the first sounds are separated by 0.04 second, the second sounds by 0.03 second, and the opening snaps by 0.06 second.

the exposed heart at operation together with synchronous pressure tracings from the left atrium and the left ventricle. It is difficult to obtain satisfactory sealing of the microphone bell to the surface of the exposed heart without causing ventricular premature beats which confuse the investigation. Such tracings as have been obtained show that the delay of the first heart sound is due to a number of factors. The raised atrial pressure delays the time of crossover of atrial and ventricular pressures; the slow rise of ventricular pressure after a brief period of ventricular filling increases the delay; and, finally, the delay is further increased by an interval between the crossover of pressures and the first heart sound. The last factor is probably due to the difficulty of closure of the deformed mitral valve cusps when there is a small volume of blood in the left ventricle. This is supported by the observations of Smith *et al.* (1950), who

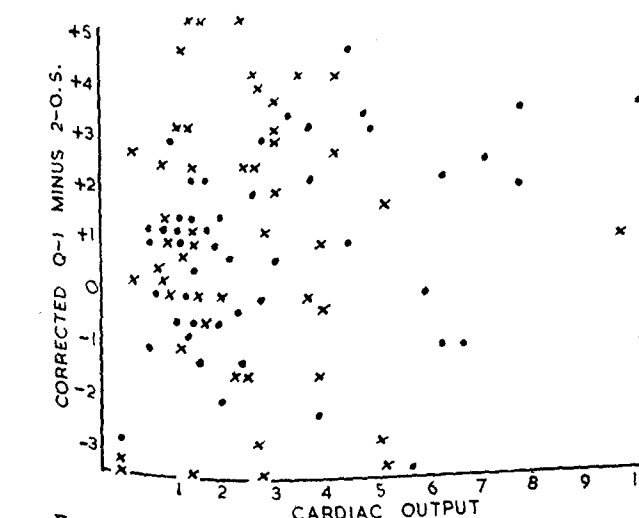


FIG. 5.—Graph showing the "corrected Q-1 minus 2-O.S." and the cardiac output estimated from the mitral orifice size, the mitral pressure gradient, and the diastolic filling period (using Gorlin's formula). Crosses=sinus rhythm. Dots=atrial fibrillation. Cardiac output in litres a minute.

showed that in the case of the normal mitral valve it is necessary for blood to flow between the cusps and the ventricular wall before closure of the valves is possible.

The 2-O.S. interval is not prolonged by the reduced rate of fall of the ventricular pressure in the isometric relaxation period following a short diastolic interval. Indeed, the 2-O.S. interval is actually shorter in these circumstances than after a longer diastolic interval. There are three reasons for this.

Firstly, the reduced stroke volume of such a beat causes the second heart sound to occur at a lower ventricular pressure and consequently nearer to the opening snap, as has been pointed out by Bayer *et al.* (1956). Secondly, the raised left atrial pressure causes an earlier crossover of atrial and ventricular pressures. Finally, the higher pressure gradient between atrium and ventricle appears to reduce the delay between the crossover of atrial and ventricular pressures and the occurrence of the opening snap.

A further measurement made in this study has been the duration of systole per minute. Normally the duration of systole is measured from the onset of ventricular contraction to the beginning of the second heart sound. In mitral stenosis there is still a pressure gradient and probably a flow of blood between the left atrium and the left ventricle after the onset of ventricular systole. In addition to this the period of isometric relaxation is reduced so that ventricular filling starts earlier than is normal. In view of these features the duration of systole was measured from the beginning of the first heart sound to the beginning of the opening snap. The "duration of systole per minute" was then calculated by finding the number of seconds in each minute occupied by systole. The heart rate was also measured, and the two were recorded on a graph. Fig. 6 shows the findings in the present series, and indicates that there is no difference between the patients with atrial fibrillation and those with normal rhythm. Fig. 7 shows the same patients separated into those with low and those with high mitral pressure

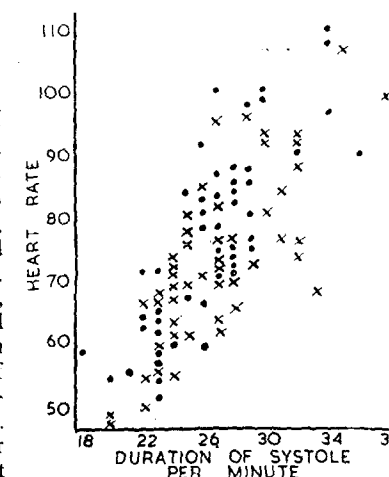


FIG. 6.—Graph showing the heart rate and duration of systole per minute. The latter is expressed in seconds, being the number of seconds in each minute that the mitral valve is closed (first heart sound to opening snap). Crosses=sinus rhythm. Dots=atrial fibrillation.

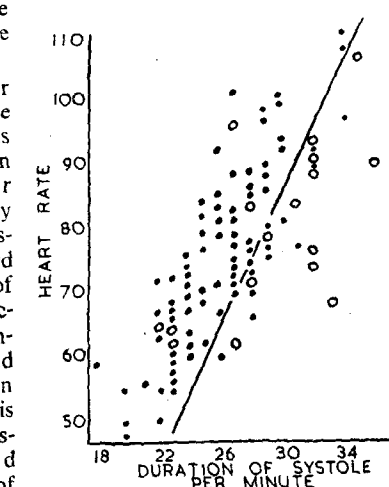


FIG. 7.—Graph showing the heart rate and duration of systole per minute as in Fig. 6. Open circles=cases with low mitral pressure gradient. Small dots=cases with high mitral pressure gradient. The line should separate the cases with a low gradient from those with a high gradient, and might do so more accurately if the duration of systole were measured at the time of measuring the mitral gradient.

gradients. When the duration of systole is long for a given heart rate the pressure gradient across the mitral valve is usually small.

No mention has so far been made of the patients who had mild degrees of mitral regurgitation, aortic valve disease, or hypertension. In none of this series were any of these additional abnormalities considered to be significant from the clinical point of view. The cases have nevertheless been carefully watched throughout the study, and they have shown no feature to distinguish them from the cases of uncomplicated mitral stenosis.

Discussion

The assessment of the severity of mitral stenosis involves the evaluation of a large number of symptoms and signs and special investigations. The precise obstruction at the mitral orifice is indicated by the pressure gradients across the mitral valve considered in conjunction with the cardiac output. The closest approach to this information short of direct puncture of the heart is provided by cardiac catheterization. This test requires an expert team, and even then is not always reliable. Although the present study only shows that the pressure gradient can be predicted by the phonocardiogram it is nevertheless of great practical importance. It also demonstrates that the information hitherto obtainable only by cardiac catheterization may in future be obtained very much more simply.

The 2-O.S. interval has been considered by Bayer *et al.* (1956) to indicate the left atrial pressure. These workers have made no correction for cycle length, which is particularly necessary in the presence of atrial fibrillation. They have demonstrated the changes that occur on exertion, but these are changes that may also occur from increase in the heart rate. In the present study the 2-O.S. interval has not provided as good a correlation with the mean mitral pressure gradient in ventricular diastole as the combination of Q-1 and 2-O.S. One reason for this is that while the 2-O.S. interval may indicate the pressure gradient at the beginning of diastole it will not indicate the gradient at the end of diastole. It does not therefore give an indication of the mean pressure gradient in ventricular diastole. Another reason for subtracting the 2-O.S. from the Q-1 is the theory that the rigidity of the valve material may alter the timing of opening and closing. In the presence of rigid valve cusps a delay of the first heart sound after the crossover of atrial and ventricular pressures could be associated with a delay of the opening snap after the second crossover of pressures. This would explain the wide scatter of Q-1 and 2-O.S. in Fig. 3. When the one interval is subtracted from the other any such factor would be eliminated.

There is much to be learned about the form of atrial pressure curves. When the valve cusps are freely mobile and can be displaced far into the atrial cavity the pressure curve in mitral stenosis may suggest the presence of mitral regurgitation even when this is not present. In these circumstances the tall V wave starts to fall well before the crossover of atrial and ventricular pressures occurs. This pattern is abolished by valvotomy, and the crossover of pressures now occurs near the apex of the V wave. When the mitral valve is rigid there is less rise of left atrial pressure during ventricular systole. When the left atrial cavity is very large the size of the V wave is small even when considerable mitral regurgitation is present.

The pressure gradient across the mitral valve is not constant throughout ventricular diastole but usually increases rapidly to a maximal gradient and then falls at first with moderate speed and then more slowly. When there is sinus rhythm there is usually an increase in gradient during atrial systole. The variations of pressure gradient are indicated by the variations in intensity of the diastolic murmur. The murmur does not, however, indicate the degree of pressure gradient. This information may be provided by the timing of the first heart sound and the opening snap.

Experiments have shown that in the normal subject there is an increase in the duration of mechanical systole if the

previous cycle length is long, but that a greater increase occurs if the diastolic volume of the left ventricle is increased (Hafkesbring and Ashman, 1928). Other workers have found that the duration of systole is normally dependent not on the cycle length but on the initial ventricular pressure and stroke volume (Wiggers, 1921; Remington *et al.*, 1948). When the duration of systole is reduced by increasing the arterial resistance there is a lengthening of isometric contraction. The changes in the duration of systole in mitral stenosis have received little attention since Lewis (1913) stated that it was practically the same as in normal subjects. The present study shows that the duration of systole is short and the period of isometric contraction is confused by the fact that there is a considerable interval between the onset of systole and the closure of the mitral valve. The period of isometric relaxation is shortened. Other workers have found the stroke volume low (Meakins *et al.*, 1923; Gorlin *et al.*, 1951) and this would suggest a shortening of the duration of systole. Although the degree of shortening of systole has not hitherto been used as a measure of the severity of mitral stenosis the present study shows that it may be possible in future to assess the severity of mitral stenosis by this measurement alone.

Summary

A pre-operative phonocardiogram is compared with the operative findings in 100 patients undergoing mitral valvotomy.

The mean pressure gradient across the mitral valve in ventricular diastole may be predicted from a measurement of the time relationships between the electrocardiogram and the heart sounds.

The delay between the QRS and the first heart sound and the interval between the second heart sound and the opening snap are estimated for a cycle length of 0.8 second. The intervals are called "corrected Q-1" and "corrected 2-O.S."

The corrected Q-1 is not related to the corrected 2-O.S., but the difference between the two (corrected Q-1 minus 2-O.S.) enables a prediction of the mean mitral pressure gradient to be made.

A simpler but less accurate prediction can be made from the duration of systole per minute.

I am indebted to Mr. O. S. Tubbs and Mr. I. M. Hill for their assistance, and for permission to make this study on their patients. I am also indebted to Miss L. Farrar for her technical assistance.

REFERENCES

- Bayer, O., Looren, F., and Wolter, H. H. (1956). *Amer. Heart J.*, 51, 234.
Gorlin, R., and Gorlin, S. G. (1951). *Ibid.*, 41, 1.
Haynes, F. W., Goodale, W. T., Sawyer, C. G., Dow, J. W., and Dexter, L. (1951). *Ibid.*, 41, 30.
Hafkesbring, R., and Ashman, R. (1928). *Amer. J. Physiol.*, 87, 305.
Lewis, T. (1913). *Heart*, 4, 241.
Meakins, J., Dautreband, L., and Fetter, W. J. (1923). *Ibid.*, 10, 153.
Rappaport, M. B., and Sprague, H. B. (1942). *Amer. Heart J.*, 23, 591.
Remington, J. W., Hamilton, W. F., and Ahlquist, R. P. (1948). *Amer. J. Physiol.*, 154, 6.
Smith, H. L., Essex, H. E., and Baldes, E. J. (1950). *Ann. intern. Med.*, 33, 1357.
Wells, B. G. (1954). *Brit. Heart J.*, 16, 261.
Rappaport, M. B., and Sprague, H. B. (1949). *Amer. Heart J.*, 37, 586.
Wiggers, C. J. (1921). *Amer. J. Physiol.*, 56, 439.

The Deaf Children's Society has started a quarterly magazine called *Talk*. Its aim is to increase knowledge and understanding about deaf children, both among those working in this field and among the public generally. The second issue contains articles by an educational psychologist and an otologist, descriptions of the school for deaf children at Penang and of the B.B.C. programmes for deaf children, and the story of a deaf girl who has made a successful career for herself as a fashion model. *Talk* is distributed free to those interested, and copies may be obtained from the Deaf Children's Society, 1, Macklin Street, London, W.C.2.

SERUM TRANSAMINASE DETERMINATIONS AS A DIAGNOSTIC AID IN MYOCARDIAL INFARCTION

BY

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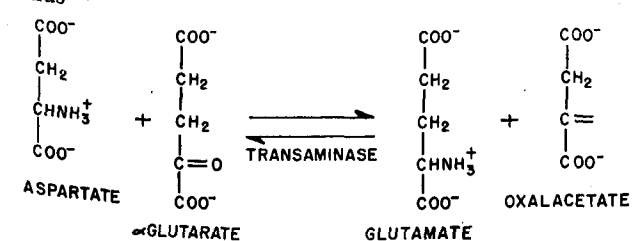
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In 1955 La Due and Wróblewski observed that the serum level of glutamic oxalacetic transaminase (transaminase) activity rises after acute myocardial infarction. Thus to the well-established criteria of clinical history and examination, together with the changes in the electrocardiogram, blood sedimentation rate, white-cell count, temperature chart, and urobilinogen excretion, a new biochemical test has been added which helps to determine whether or not recent myocardial infarction has occurred. Since that time several other reports describing increased serum transaminase activity following myocardial infarction have been published (Chinsky *et al.*, 1956; Kattus *et al.*, 1956; Merrill *et al.*, 1956).

Transaminase is present in many mammalian tissues and was found by Cohen and Hekhuis (1941) to be particularly abundant in cardiac and skeletal muscle. Brain, liver, and kidney follow muscle in decreasing order in transaminase content (La Due *et al.*, 1954). These authors define transamination as the enzymatic catalysed reversible transfer of the alpha-amino-nitrogen of an amino-acid to the alpha-keto-acid, with the synthesis of a second amino-acid and a second alpha-keto-acid.

The transaminase reaction—which may be written thus—



is coupled *in vitro* to a second reaction, the reduction of the oxalacetate (produced in the transamination reaction) to malate by reduced diphosphopyridine nucleotide (D.P.N.H.). The light absorption peak of D.P.N.H. at 340 mμ is used to measure the transamination reaction spectrophotometrically by observing the decrease in light absorption at that wavelength as D.P.N.H. is oxidized. The Beckman D.U. model spectrophotometer is employed. In this study the details of the method described by Karmen *et al.* (1955)

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have been followed. Transaminase activity is expressed as units per ml. of serum per minute. One unit equals a decrease in optical density of 0.001.

Nydick *et al.* (1955) produced experimental myocardial infarctions in dogs. They demonstrated that the enzyme activity of infarcted muscle is reduced to 2–10% of that of normal cardiac tissue, and they conclude that serum transaminase activity increases significantly following myocardial infarction because transaminase is released into the blood stream as a result of an increase in the permeability of the injured heart-muscle cells. They also showed that ischaemia of 45 minutes' duration failed significantly to influence the transaminase activity. It follows that increased activity may be predicted only in the presence of tissue destruction and not where ischaemia has been insufficient to cause necrosis. There have also been reports on transaminase levels in liver disorders and other conditions (Chinsky *et al.*, 1956; Wróblewski and La Due, 1956).

Present Investigation

The present study has been limited to the application of the test to patients with coronary sclerosis. Twenty patients were studied in order to determine the normal range of serum transaminase activity in our laboratory. Six of these attended the long-term anticoagulant clinic, and none of them was suspected of a recent thrombo-embolic incident. They all had serum transaminase values within the normal range of previous workers—that is, 10–40 units.

A group of five random post-operative patients was also studied. Each had undergone operation within the 24 hours preceding transaminase determination. All except one showed results within the normal range. This patient had had cholecystectomy for obstruction of the common bile duct and showed evidence of jaundice and impaired liver function. In her the level was raised to 64 units.

A further random group of nine were medical in-patients without evidence of recent myocardial infarction. The results in all but one were within the normal range. The one exception was an elderly man admitted with haematemesis. His electrocardiogram was abnormal, and although not diagnostic did not exclude myocardial infarction. He underwent partial gastrectomy and died a few days later. Post-mortem examination revealed that there was a small recent myocardial infarction. The pathologist reported that its age was consistent with the occlusion having occurred shortly before the specimen for transaminase determination was drawn.

Normal values were thus obtained in 18 control patients, including four who had had operations within the previous 24 hours. In two patients abnormal values were obtained, but one of these had liver disease and the other was eventually shown to have suffered acute myocardial infarction.

Determinations were made on an additional group of 39 patients who were suspected of coronary artery disease. In 13 of the 39 the clinical and electrocardiographic findings were typical of acute myocardial infarction. Of this group all but one had increased serum transaminase activity (Table I). The exception was a patient whose only sample was drawn two hours after the onset of pain, and who died before further samples were obtained. Necropsy revealed a massive posterior myocardial infarction.

In 4 of the 39 cases the electrocardiograms made upon admission to the hospital were not helpful in diagnosing or excluding the presence of acute myocardial infarction. In two of these the clinical findings also were atypical. In all patients of this group a final diagnosis of acute myocardial infarction was eventually made after several days by a critical survey of the clinical and electrocardiographic course. The results in this group are shown in Table II, from which it is seen that positive transaminase levels were found in all.

TABLE I.—Serial Serum Transaminase Activity in Patients With Typical Myocardial Infarction

Case No.	Time After Clinical Onset				
	0-10 Hrs. (Units)	10-24 Hrs. (Units)	48 Hrs. (Units)	96 Hrs. (Units)	1 Week (Units)
1	20	196	248	60	31
3	6	—	—	—	—
5	32	144	42	36	33
6	22	64	83	41	32
10	39	206	25	33	26
11	26	75	103	44	—
15	19	270	196	61	44
17	92	116	45	21	17
19	47	60	34	—	8
25	—	—	86	—	—
33	21	166	101	28	16
35	12	68	34	—	18
36	24	—	62	32	22

TABLE II.—Serial Serum Transaminase Activity in Patients With Myocardial Infarction Presenting Diagnostic Difficulty

Case No.	Time After Clinical Onset				
	0-10 Hrs. (Units)	10-24 Hrs. (Units)	48 Hrs. (Units)	96 Hrs. (Units)	1 Week (Units)
2	—	59	58	27	26
9	39	101	51	26	27
13	—	—	50	39	18
39	—	—	60	22	33

In Case 9 serial electrocardiograms over a period of a month never showed a pattern diagnostic of myocardial infarction, but in this patient the clinical history and subsequent course were in every way typical.

In Case 2 the patient was a 76-year-old woman with chronic lung disease who was admitted with acute pulmonary oedema and whose electrocardiogram on admission showed complete right bundle-branch block. There were marked ST-T shifts, but it was not possible to tell whether these were primary and due to developing infarction or whether they were merely secondary to the large QRS complexes. Inspection of serial records made over a period of a week revealed changes in the shape and deflection of the ST-T segments and allowed of a retrospective diagnosis of myocardial infarction.

In Case 13 the patient had been suffering from prolonged anginal attacks, and the onset of infarction was impossible to date. It was not until several days after admission that a high postero-lateral infarction pattern was demonstrated on her electrocardiogram.

Case 39 was clinically in every way typical, but T-wave inversions were the only electrocardiographic abnormalities demonstrable in serial records.

Twelve patients on admission to hospital were suspected on clinical and electrocardiographic grounds of having sus-

TABLE III.—Serial Serum Transaminase Activities in Patients Initially Suspected of Myocardial Infarction

Case No.	Time After Clinical Onset					Final Diagnosis
	0-10 Hrs. (Units)	10-24 Hrs. (Units)	48 Hrs. (Units)	96 Hrs. (Units)	1 Week (Units)	
4	15	23	22	30	26	Hydrops of gall-bladder
7	27	26	16	15	21	Angina pectoris
8	—	23	24	36	19	Coronary insufficiency
12	—	13	26	22	—	Angina pectoris
16	—	8	16	15	12	Angina pectoris. Marked superimposed neurosis
18	—	19	22	22	18	Residual from thoracic injury
20	—	23	26	38	—	Two severe attacks of coronary insufficiency one month apart
27	—	12	—	—	—	Bronchitis
28	—	—	12	14	—	Coronary insufficiency, probable. Definite diagnosis not established
29	—	35	—	18	—	Coronary insufficiency
32	40	28	20	12	14	Severe coronary insufficiency. Marked hypercholesterolaemia
37	—	14	14	14	17	Coronary insufficiency

tained acute myocardial infarction. Follow-up did not substantiate the diagnosis in any patient in this group. The negative results of serum transaminase determinations, together with the diagnosis upon discharge, are shown in Table III. The results of transaminase determinations were not taken into consideration by the physicians making the final diagnoses.

In Case 4 a 63-year-old man had complained for some months of pain in the chest and was admitted complaining of severe xiphisternal and epigastric pain. He had had previous electrocardiograms showing complete right bundle-branch block. The electrocardiogram made on admission was similar, except that there was depression of ST-T in lead aVF. A provisional diagnosis of posterior myocardial infarction was made, and it was not until a week after the onset that a large palpable mass in the right upper abdominal quadrant betrayed the diagnosis of hydrops of the gall-bladder.

In Case 18 the patient was a 35-year-old man who one year previously had sustained a steering-wheel accident, with injury to his sternum and with the development of an acute antero-septal myocardial infarction pattern in an electrocardiogram recorded immediately after the accident. He was admitted to hospital complaining of severe precordial pain of one hour's duration, and his electrocardiogram showed ST-T elevations in leads V2, V3, and V4, and Q waves in leads V5 and V6. No change was observed in serial records made over a three-weeks period.

In Case 32 the patient was a 39-year-old woman with profound coronary insufficiency and hypercholesterolaemia. An infarction pattern was not observed on any of several electrocardiograms. No sample of serum showed abnormally elevated transaminase activity, but the falling titre from the upper toward the lower limit of the normal range suggested the possibility that minimal infarction may in fact have occurred.

Single specimens from six patients with classical angina pectoris were drawn on a day in which there had been at least one attack. The results are shown in Table IV. All were negative.

TABLE IV.—Serum Transaminase Activity in Patients With Severe Angina Pectoris

Case No.	23	24	30	31	34	38
Result in units	16	9	14	20	16	14

Raised serum transaminase activity was demonstrated in a patient with intractable cardiac failure and a very large congested liver (44 units), in a patient with cirrhosis of the liver and ascites (72 units), and in a patient with acute pancreatitis (serum amylase 1,600 units, serum transaminase 238 units).

One patient, a 65-year-old man with arteriosclerotic heart disease, was admitted with shock, pulmonary oedema, and cold, pale, pulseless lower extremities. A diagnosis of saddle embolus of the aorta and possible complicating myocardial infarction was made, but the transaminase determination on a sample drawn 15 hours after the onset was negative (8 units). He died 48 hours after the onset, and permission for necropsy was refused. The negative result was unexpected, as Merrill *et al.* (1956) recorded high levels in two patients, one with a saddle embolus at the aortic bifurcation and the other with severe diabetic gangrene of the lower extremities.

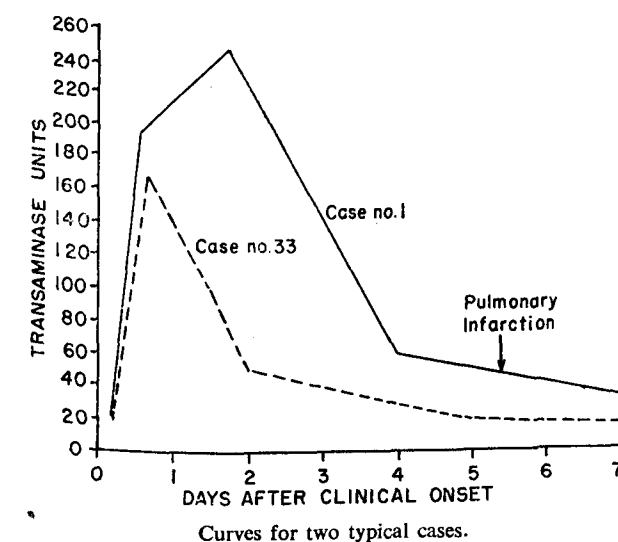
Discussion

The discovery of a test useful in the recognition of myocardial infarction and the extraordinarily high incidence of coronary sclerosis among the patients admitted to a private hospital in a busy American city prompted us to test the value of the method on our own patients and in our own laboratory and to report our results.

No "false positives" or "false negatives" were recorded. The test found its greatest application where myocardial

infarction was suspected, but could not be proved, and in cases where infarction was not strongly suspected but had to be excluded.

In myocardial infarction the peak values of heightened activity occurred early, being found 12 to 24 hours after the clinical onset. Normal values were found in samples taken within the first few hours following the onset of pain. Values were again normal in samples withdrawn five to eight days following myocardial infarction. The Chart illustrates the curve obtained in two typical cases when the serum transaminase is plotted against time. These time relationships agree closely with those reported by La Due and Wróblewski (1955) and by Kattus *et al.* (1956).



Curves for two typical cases.

The test is most useful in myocardial infarction if a sample can be obtained within a few hours after the onset. Such a sample will show a normal transaminase. One and preferably more samples should be obtained over the ensuing 36 hours to demonstrate high levels and a final sample tested a week after infarction to demonstrate return to normal levels.

Liver and renal disease are unlikely to cause confusion, since they can be differentiated on clinical grounds. Furthermore, Wróblewski and La Due (1956) have shown that, as would be expected in these conditions, abnormal values persist not for a few days but over prolonged periods. Acute pancreatitis may be responsible for very high levels, as in our own case and in the cases of Chinsky *et al.* (1956). Unfortunately, therefore, the test is of no value in making the important differential diagnosis of this condition from myocardial infarction.

Our results suggest that a major surgical operation does not cause enough muscle damage to influence the serum transaminase activity. This observation may be helpful in cases where sudden collapse following operation has occurred and the transaminase test is employed to help determine whether or not the cause is acute myocardial infarction. We have not as yet studied a large post-operative group with serial determinations.

The persistently negative results recorded in patients with angina pectoris of greater or lesser severity, especially where interpretation of the electrocardiogram is difficult because of previous infarctions or left bundle-branch block or arrhythmia, is particularly helpful for the exclusion of acute myocardial infarction.

Case 1 was complicated by a pulmonary infarction on the fifth day following myocardial infarction. This event did not disturb the smooth descent of the transaminase to normal. A rise in serum transaminase was not to be anticipated, since Agress *et al.* (1956) produced massive infarction experimentally in dog lungs without a significant rise in their serum transaminase activity.

Summary

Serial serum transaminase activity determinations were made on 39 patients. Abnormally high levels were recorded in 16 out of 17 cases of acute myocardial infarction. One patient did not survive long enough for serial samples to be obtained. Four patients in this group were clinically atypical.

Normal values were obtained from 12 patients who were suspected of having acute myocardial infarction at the time of their admission to hospital but whose subsequent courses negated this diagnosis. Most of these patients were the subjects of coronary sclerosis.

In six cases of classical angina pectoris the serum transaminase activity was normal.

In one patient with acute pancreatitis the level was very high.

Serial serum transaminase determinations serve as a useful test in distinguishing cardiac pain caused by ischaemia alone from that in which necrosis of myocardial cells has occurred.

The time relationships found by previous workers are confirmed. Normal levels may be anticipated during the first 6 to 10 hours; thereafter, and up to the third day, abnormally high values are found. The peak level usually occurs between 12 and 24 hours after infarction. High levels sometimes persist into the fourth day. Serum transaminase activity returns to normal within a week from clinical onset of pain. The importance of obtaining early samples is evident.

Liver disorders and conditions other than coronary sclerosis were not studied.

Recent surgical operation did not interfere with transaminase levels.

We are grateful to all physicians referring cases for this study. We gladly acknowledge the courtesy of Dr. H. Schiro, Director of the Department of Internal Medicine, Jewish Hospital, Cincinnati, in allowing us to study patients under his care and to publish this report.

REFERENCES

- Agress, C. M., Glassner, H. F., and Jacobs, H. I. (1956). *Circulat. Res.*, 4, 220.
Chinsky, M., Shmagranoff, G. L., and Sherry, S. (1956). *J. Lab. clin. Med.*, 47, 108.
Cohen, P. P., and Hekhuis, G. L. (1941). *J. biol. Chem.*, 140, 711.
Karmen, A., Wróblewski, F., and La Due, J. S. (1955). *J. clin. Invest.*, 34, 126.
Kattus, A. A., Watanabe, R., Semenson, C., Drell, W., and Agress, C. (1956). *J. Amer. med. Ass.*, 160, 16.
La Due, J. S., and Wróblewski, F. (1955). *Circulation*, 11, 871.
— and Karmen, A. (1954). *Science*, 120, 497.
Merrill, J. M., Lemley-Stone, J., Grace, J. T., and Meneely, G. R. (1956). *J. Amer. med. Ass.*, 160, 1454.
Nydyck, I., Wróblewski, F., and La Due, J. S. (1955). *Circulation*, 12, 161.
Wróblewski, F., and La Due, J. S. (1956). *J. Amer. med. Ass.*, 160, 1130.

"We intend to use every legal means within our power to protect consumers from being victimized by this worthless treatment," states the U.S. Commissioner of Food and Drugs, Mr. G. P. LARRICK, in a statement on the Hoxsey cancer treatment. The statement was issued by the Federal Department of Health, Education, and Welfare. "For the second time," continues Mr. Larrick, "a Federal court has determined that the Hoxsey medicines for internal cancer are worthless. On November 15, 1956, after a six-week trial in the Federal court at Pittsburgh, the jury returned a verdict that these medicines, in pill form, were illegally offered as an effective treatment for cancer. On November 16 U.S. District Judge JOHN L. MILLER signed an order of condemnation stating that the pills were misbranded as charged by the Government and ordering their destruction."

TERMINATION OF PREGNANCY ON
PSYCHIATRIC GROUNDS

BY

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Whilst there is general agreement that certain physical illnesses may justify the termination of a pregnancy, there is a wide divergence of opinion on what may be held to justify the operation on so-called "psychiatric grounds." As the field of psychiatry has enlarged to embrace wide biological issues, so has there been a tendency for the psychiatrist to condone the operation of abortion for reasons which appear to deviate from both the ethic of medicine and the law of the land. That this has confused the general practitioner is indicated by the frequency with which psychiatrists are called into consultation in cases in which the therapeutic termination of pregnancy is the point at issue. It is true that in many consultations the practitioner is merely seeking a second opinion in order to support his own refusal to interfere, but in some cases there is genuine surprise at the information that social considerations have no place in the consultation or that mental symptoms of one kind or another are not necessarily a justification for emptying the uterus.

The consultant who refuses to recommend the operation will sometimes be suspected of allowing his religious scruples to override his medical judgment, but, in point of fact, the Christian opposition to therapeutic abortion is far less securely based than that of the physician whose sole interest is the preservation of life and health. The Christian opposition is based to some extent on a mistranslation of the abstract laws of the ancients, whilst the medical opposition is based wholly on a scientific appraisal of the actual results of pregnancies in the sick. A survey of this kind was carried out by A. L. Robinson in 1933, and nearly a hundred alienists answered his questionnaire. The majority opposed the induction of abortion in the treatment of mental disorder, but it is probable that a similar survey at the present time would reveal a larger proportion of psychiatrists as being in favour of the operation, the treatment of mental disorder having become adulterated with considerations which have little bearing on the actual course of a particular illness in a particular patient.

My own experience in a small series of cases supports the view that therapeutic abortion is hardly ever justified on psychiatric grounds. The subject is, however, so surrounded with personal prejudices, often founded on a misinterpretation of history or the law, that it is worth while outlining the historical background and the present legal position.

Historical Background

There would appear to be a primordial revulsion from the destruction of the embryo, and most of the early religious and legal authorities condemned it; thus we have the Vedidad of Zoroaster and the Manu of the Hindus expressing unqualified disapproval over a thousand years before the birth of Christ. Centuries later we find the Greeks divided in their views. Whilst Hippocrates was expounding the Medical Ethic, "I will not give to a woman a pessary to produce abortion," Aristotle was teaching, "If in marriage couples have children in excess, then shall abortion be procured before life and sensation have commenced; what may or may not be lawfully done in matters of this kind depends on this question of life and sensation." The Romans were

even more liberal in their views. Intentional abortion was not only legal but fashionable. By the Lex Aquilia, the inducing of abortion was treated only as a personal attack upon the mother, and if she consented to the assault there was no offence.

The ancient Hebrews, too, allowed the operation if the husband agreed: thus in the Hebrew version of Exodus (Ch. XXI, v. 22) we find, "If men strive together and hurt a pregnant woman so that she hath a miscarriage and yet no harm to her result, he shall be fined, as the woman's husband shall determine, and he shall pay for the miscarriage." It follows that if the woman was unharmed and the husband agreed to the operation, there was no punishment. The passage continues, however, "But if any harm follow then shalt thou give life for life, eye for eye," etc. This comparatively liberal point of view was mistranslated in the Septuagint, and the Christians were subsequently to base their own doctrine on this inaccurate Greek version of Hebrew law. Instead of laying down that punishment should depend on whether the mother is harmed or unharmed, as in the Hebrew version, this translation maintains that it depends on whether the foetus is formed or unformed (Kent, 1907). This led the Christians to formulate much more uncompromising laws than was intended by those who framed the original passage in Exodus. It also had the disadvantage of focusing too much attention upon the embryo as a separate unit rather than upon the pregnant woman as a whole.

Thus Tertullian, following the teaching of Aristotle, devoted all his ingenuity to deducing when the embryo became "formed," that is to say, when it acquired a soul. As the ritual purification after delivery was laid down as 40 days for a male child and as 80 days for a female child, he concluded that a male embryo acquired its soul 40 days after conception and a female after 80 days. This astonishing piece of logic was translated into Latin by Jerome, extolled by St. Augustine, and perpetuated in the 1st Section of the Corpus Juris Canonici (Cap. 9). Legislation in the various European countries followed the teaching of the Church: thus in Germany the Bamberg Enactment of 1507 regarded abortion as murder if the foetus were animate (that is to say, more than 40 days old), and in England the Ellenborough Act of 1803 adhered to the difference between the "quick" and the "not quick." The first revolt against this artificial distinction had come from the medical profession in protestant Germany. Thus at the beginning of the eighteenth century August Leyser, Professor at Wittenberg, had stressed that there was no special moment of animation, and a century later the lawyer Philip van der Broecke was to claim that the foetus was merely part of the mother's body and, as such, had no special privileges.

Present Legal Position in England

Against this background various Statutes on the subject have been drawn up and various important judgments given. In this country, 1861 marked the introduction of the Offences Against the Person Act, in which Section 58 gives almost unequivocal protection to the embryo. In 1929 the Infant Life (Preservation) Act was introduced to legalize destructive operations on the foetus of 28 weeks or more, such an operation being allowed unless it should be shown that the act causing the death of the child was not done in good faith for the purpose only of preserving the life of the mother. It will be noted that there is still undue emphasis on the age of the foetus, the embryo of less than 28 weeks being protected by the older and more conservative Statute; even this, however, implying by the nature of its wording that there are lawful indications for "procuring a miscarriage," although these are not defined.

The task of interpreting these Statutes, and of supporting lawful indications as they arise, has fallen to the courts. Mr. Justice Macnaghten, summing up in the case against Bourne in 1938, was able to digress from purely physical indications in order to give support to the view that termination is also

lawful in those cases where the mental health of the mother is seriously threatened. After indicating that the wording of the relevant Acts threw the onus of proof of bad faith upon prosecution, the learned judge concluded:

"Mr. Oliver wanted you to give what he called a wide and liberal meaning to the words 'for preserving the life of the mother.' I should prefer the word reasonable to the words wide and liberal. . . . Apparently there is a great difference of opinion, even in the medical profession itself. Some there may be, for all I know, who hold the view that the fact that a woman desires the operation to be performed is a sufficient justification for it. Well, that is not the law; the desire of a woman to be relieved of her pregnancy is no justification at all for performing the operation. On the other hand, there are people who, from what are said to be religious reasons, object to the operation being performed in any circumstances. That is not the law either. On the contrary, a person who holds such a view ought not to be an obstetrical surgeon for, if a case arose where the life of the woman could be saved by performing an operation and the doctor refused to perform it because of his religious opinions and the woman died, he would be in grave peril of being brought before this court on a charge of manslaughter by negligence. . . . If pregnancy is likely to make the woman a physical or mental wreck, the jury is entitled to take the view that a doctor, who in the circumstances and led by his belief operates, is operating for the purpose of preserving the life of the mother."

For the psychiatrist, the importance of this statement is that it makes it justifiable for him to recommend termination if he honestly believes that continuation of a pregnancy will make a woman a mental wreck. Lesser degrees of emotional upset are not enough, nor are social disturbances of any magnitude nor eugenic forebodings of any kind. More recent attempts to extend his scope have not succeeded; thus Lord Amulree's Bill, which was introduced to the House of Lords on January 26, 1954, was withdrawn, and a recommendation by the Magistrates' Association that abortion should be per-

mitted if there is a grave risk of the child being born mentally defective has not yet been given the authority of law (*British Medical Journal*, 1955).

Present Investigation

The cases here reviewed were assessed entirely in the light of Mr. Justice Macnaghten's observations, and, in point of fact, in none was there considered to be sufficient justification for termination. The patients were seen consecutively during a period of two years, but they have been classified in the Table in a different order from that in which they were seen.

Patients fell broadly into one of three classes. First, there were those who were known to have had a previous psychotic episode associated with a pregnancy; secondly, there were those who were known to have had treatment for serious mental illness not associated with pregnancy; finally—and this was by far the largest group—there were those who were referred, not on the basis of their previous history, but on account of the symptoms present when seen.

The diagnosis given is in each case that of the predominant condition when seen. The remarks which cover the course of the pregnancy have likewise been simplified to indicate only whether the behaviour of the patient was such as to require hospital care or such that could be tolerated at home: "domestic disturbance only" could be of severe degree, for it included one patient who jumped down a flight of stairs regularly until she sprained her ankle and had to abandon this method of drawing attention to her plight.

Similarly, the social summary illustrates only the extent of the mother's failure in the home a year after her confinement. In the highest category, and the one which can be regarded as normal, are those mothers who are able to look after a baby themselves with only slight neglect of other household duties; in the second category are those who can

Analysis of Cases

Case No.	Age of Patient	Marital Status	No. of Pregnancy	State of Pregnancy (in Weeks)	Reason for Referral	Previous Psychiatric History	Diagnosis When Seen	Course of Pregnancy and Puerperium	Mental State One Year After Confinement	Social Aspect One Year After Confinement
1	28	M	4	8	Previous puerperal psychosis	Puerperal psychosis (3rd pregnancy). Vol. patient for 12 months	Anxiety state	Uneventful	Improved	Able to care for child
2	32	M	7	12	" "	Puerperal psychosis (6th pregnancy). Vol. patient for 3 months	Hysteria	Domestic disturbance only	No change	Unable to care for child
3	25	M	3	20	" "	Puerperal psychosis (2nd pregnancy). Vol. patient for 2 months	Depressive psychosis	Vol. patient during pregnancy and puerperium	Improved	Able to care for child
4	37	M	4	8	Psychosis unrelated pregnancy	Schizophrenia. Vol. patient on two occasions (E.C.T.)	Schizophrenia	Vol. patient during pregnancy and puerperium	No change	(Child stillborn, anencephalic)
5	18	S	1	12	" "	Schizophrenia. Vol. patient for 2 months	"	Vol. patient during pregnancy and puerperium	Worse	Unable to care for child
6	37	S	1	28	" "	Manic-depressive. Cert. patient for 3 years (leucotomy)	Hypomanic state	Uneventful	No change	" "
7	39	M	3	22	" "	Schizophrenia. Vol. patient for 3 months (deep insulin)	Schizophrenia	Domestic disturbance only	" "	Grossly neglecting home
8	29	M	2	16	" "	Schizophrenia. Cert. patient for 5 months (deep insulin)	"	Uneventful pregnancy. Vol. patient in puerperium	" "	Able to care for child
9	31	M	4	10	Patient's symptoms	Previous pregnancies uneventful	Hysteria	"Spontaneous abortion" at 12 weeks	—	—
10	37	M	4	6	" "	" " "	"	"Spontaneous abortion" at 8 weeks	—	—
11	33	M	3	8	" "	Hysteria in 2nd pregnancy (terminated)	"	Unknown (patient left the area)	—	—
12	35	M	3	8	" "	Hysteria in 2nd pregnancy	"	Domestic disturbance only	No change	Able to care for child
13	31	M	11	8	" "	Depression in 10th puerperium	"	Vol. patient during pregnancy	" "	" "
14	32	M	4	12	" "	Hysteria in 1st, 2nd, and 3rd pregnancies	"	"Therapeutic termination" (in another area)	" "	" "
15	26	M	3	14	" "	Previous pregnancies uneventful	Anxiety state	Uneventful	Improved	Able to care for child
16	35	M	4	8	" "	" " "	" "	"	No change	" "
17	38	W	5	13	" "	" " "	" "	"	" "	" "
18	30	M	3	7	" "	Hysteria in 1st pregnancy (illegitimate)	" "	"	" "	" "
19	27	M	2	12	" "	Previous pregnancies uneventful	Psychopath	Domestic disturbance only	" "	Unable to care for child
20	28	S	1	8	" "	History of delinquency	" "	"	" "	Grossly neglecting home
21	25	M	3	8	" "	Previous pregnancies uneventful	Mental defect	" " "	" "	" "
22	32	M	4	12	" "	" " "	" "	" " "	" "	" "

manage their home only if the child is cared for by someone else; in the third group are those who grossly neglect their home whether their child is there or not. The lowest category was to have included those who had deteriorated to such an extent that more or less permanent hospital care was required, but fortunately there were no such examples in this series.

The assessment of the changes in mental state which occurred as the result of each pregnancy presented great difficulties. The patients were reviewed one year after their confinement, but few had been assessed from a psychiatric standpoint prior to becoming pregnant, and their state in the early stages of pregnancy was not a fair guide. The comparison is intended to be with their mental state immediately before the pregnancy under review and is based largely on accounts given by relatives and family doctors, the gradings being the simplest possible—"improved," "no change," "worse," and "grossly deteriorated."

The inevitable conclusion to be drawn from these results is that in the vast majority of cases the decision not to intervene was the correct one as judged by the law in this country. Not a single one of these patients has become a mental wreck to the extent that mental hospital care is now required. In the one case which appeared to show deterioration the impression gained was that this deterioration was the natural progress of the disease and that the pregnancy had had little effect on it. In some cases, indeed, the mental state of the mother appeared to show improvement, and it seems likely that, to an unbalanced woman, the stimulus of a normal pregnancy is less deleterious than the sudden interruption by operation of the normal physiological changes taking place.

Discussion

It will be seen from the above results that, although the various confinements produced no serious ill effects from the purely medical standpoint, there were, nevertheless, unsatisfactory repercussions in the general social field. This aspect of the problem has received special attention in the legislation of certain other countries. Thus in Sweden, by Statutes dating from 1946, abortions are permitted to an extent unequalled by the laws of any other country. There the operation may be performed for any one of four reasons—medical, social-medical, humanitarian, or eugenic. The first, or medical, consideration permits abortion for the same reasons as it is permitted in this country—that is, to preserve the life or health of the mother if the pregnancy directly endangers her. The second, or social-medical, consideration allows the operation if the mental or physical health of the mother is likely to be severely impaired as the result of childbirth or even by the subsequent care of the child. The third, or humanitarian, consideration justifies abortion in cases where the mother has been raped or is under age. The fourth, or eugenic, consideration allows the operation if there is reason to believe that either of the parents of the child may be causing the hereditary transmission to the offspring of insanity, mental weakness, or any other serious disease.

The emergence of these laws in a country freer than most from interference by Church, if not by State, is bound to cause us to ask whether our own legislation takes too little account of social-medical, humanitarian, and eugenic considerations.

In the above series, in only about half of the cases could the social aspect of the situation be regarded as even moderately satisfactory; in several cases, indeed, the mother appeared to be permanently incapable of looking after the child. The humanitarian motive for terminating pregnancy in the case of a young schizophrenic (Case 5) was almost irresistible, and the possible eugenic justification for termination stood out in several cases, notably in the known psychotics and defectives.

Be that as it may, the lack of deterioration in the mental state of these patients as the result of their pregnancies does not give support to the recommendation of termination as a

therapeutic measure in the mentally disturbed. This absence, or otherwise, of mental deterioration can be the only criterion in this matter. If once other considerations are allowed to obtrude, then there is no end to the catalogue of the various degrees of social inconvenience or of genetic undesirability that may result from a pregnancy. The psychiatrist must not allow the sociologists and the geneticists to deceive him into exceeding his duty as a physician. The law of the land should be sufficient guide to those who cannot accept the Hippocratic tradition. Some further observations by Mr. Justice Macnaghten do, indeed, sum up the whole matter: "The killing of the unborn child was, by the Common Law of England, a grave crime. The protection which the Common Law afforded to human life extended to the unborn child in the womb of its mother. But, as in the case of homicide so also when an unborn child is killed, there may be justification for the act." For the medical practitioner the only justification is the protection of his patient from harm; and let it never be forgotten that the amputation of her child is the most harmful operation that the soul of woman can be asked to bear.

Summary

Attention is drawn to the frequency of requests by patients and practitioners for termination of pregnancy on psychiatric grounds.

The historical background and the present legal position are outlined, and the results of pregnancy in a series of cases referred for consultation on account of the mental state of the patients are summarized.

The conclusion is drawn that termination of pregnancy on account of the mental state of a patient is rarely justified by the law of this country, and the doubtful wisdom of extending the indications for abortion, as in certain foreign countries, is discussed.

I am indebted to my general-practitioner colleagues not only for much help in the assessment of these cases, but also for the example they set in managing the more histrionic patients with such forbearance and humour.

BIBLIOGRAPHY

- Aristotle, *Politics*, VII, 16; *De Anim. hist.*, VII, 3.
Bourne, R. V. (1939). *J. K. B.*, 687.
British Medical Journal, 1955, 2, 1093.
Ellenborough Act, 43 Geo III, c. 58.
Kent, C. F. (1907). *Israel's Laws and Legal Precedents*, p. 117. London.
Robinson, A. L. (1933). *J. Obstet. Gynaec. Brit. Emp.*, 40, 54.
Van der Broecke (1830). *De Crimine abacti*.
Zoroaster, *Fargard XV*, 13(40), 14(43).

Dr. J. F. SKONE, M.O.H. of West Bromwich, Birmingham, gave some figures about coloured immigrants in his area at a recent sectional meeting of the Royal Society of Health. By 1955, he said, it was apparent that the number of coloured people in West Bromwich was beginning to increase rapidly. Last year a census had shown a total of 838 in the area, of whom 505 were West Indians. The remainder were Indians (248) and Pakistanis (85). As immigrants from the Commonwealth who are not aliens are not subject to a detailed medical examination on arrival in Britain, a local survey of their health and welfare problems was carried out. Since 1951 17 had been notified as suffering from tuberculosis, but, said Dr. Skone, there was nothing to suggest they had the disease on arrival in Britain. Of the 17 cases only one was in a West Indian. Coloured persons formed the majority of patients seen at the local V.D. clinics in 1955 and 1956. West Indians formed the majority of those with gonorrhoea, and an increasing number of cases of granuloma inguinale were being seen—a disease formerly only rarely encountered here. One Indian had been diagnosed as having non-infectious leprosy. He had returned to India.

CLINICAL FEATURES AND PATHOGENESIS OF MACROGLOBULINAEMIA

BY

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Serum protein abnormalities may be classified into "dysproteinemias"—quantitative alterations in normal serum components—and "paraproteinemias," in which serum globulins normally absent or present in only minimal concentration (myeloma globulins, cryoglobulins, and macroglobulins) are found in greatly increased amount. Macroglobulins are globulins of high molecular weight (over one million) whose presence is associated with a definite syndrome, "macroglobulinaemia," which requires ultracentrifugal analysis of the serum for conclusive diagnosis (Waldenström, 1944, 1948).

This paper describes three new cases of macroglobulinaemia and refers briefly to one (Case 4) previously reported (Mackay, 1956). The condition cannot be regarded as rare in Australia, for these four cases came under notice in Melbourne in a period of eight months. Patients are elderly, and males exceed females. The outstanding symptoms are lethargy and a bleeding tendency (epistaxis, oral bleeding, and easy bruising). There may be a history of vague ill-health for several years, with recurrent infections, often of the respiratory tract. Examination discloses slight painless enlargement of the liver, spleen, and lymph nodes in most cases, but bulky lymphoid hyperplasia seldom occurs (Mackay, 1956; Jahnke *et al.*, 1956).

Peripheral blood examination reveals some degree of anaemia, and usually pancytopenia. Despite the pronounced bleeding tendency, no consistent coagulation defect is observed (Jahnke *et al.*, 1956). A skeletal survey shows, at most, osteoporosis, but no focal translucencies. Many of the laboratory findings depend on the hyperglobulinaemia, which ranges from 4 to 8 g. per 100 ml.: these include rouleaux formation in blood smears, a high erythrocyte sedimentation rate, a positive formol-gel test, and a myeloma-like protein component on filter-paper electrophoresis of serum. The serum viscosity increases with a fall in temperature, often with the formation of a gel which redissolves on warming; this gel represents one type of cryoglobulin. The Sia test (a dense white precipitate on adding a drop of serum to distilled water) is a useful screening test, although false positives may occur, notably in multiple myeloma.

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A suspected diagnosis is supported by the myelogram showing gross marrow invasion (40–80%) by so-called "lymphocytoid" cells (Waldenström, 1944), often indistinguishable from true lymphocytes. Many show cytoplasmic loss or irregularity ("protoplasmic shedding," "naked nuclei"), but this feature does not differentiate them from lymphocytes seen in the marrow in other conditions. Ultracentrifugal analysis of serum will demonstrate one or more components of high molecular weight, the major one having a sedimentation coefficient of 14–20 Svedberg (S.) units, depending on the protein concentration in the ultracentrifugal cell.

Methods

The erythrocyte sedimentation rate (E.S.R.) was read in a Westergren tube after one hour. The serum glucosamine was estimated by the Elson-Morgan (1933) method. The plasma of three patients was tested for a factor stimulating lymphocytosis in baby mice (Metcalf, 1956a). This factor is demonstrable only in chronic lymphatic leukaemia, lymphosarcoma, and myelofibrosis (Metcalf, 1956b). Ultracentrifuge analyses were carried out with a Phwyre air-turbine ultracentrifuge at 830 r.p.s. for 60 minutes, with serum dilutions of 1 in 8 in 0.2/M saline. Sedimentation coefficients are expressed in conventional Svedberg (S.) units.

A highly elevated serum glucosamine has been found only in macroglobulinaemia and, occasionally, in multiple myeloma and Hodgkin's disease; it thus appears to be a useful diagnostic test. In three of the following cases (Nos. 1, 2, and 4) a highly raised serum glucosamine was present.

Case 1

A woman aged 56 who was first seen in 1956 had noticed enlargement of the cervical lymph nodes five years previously. She experienced "fuzzy heads" and weakness for one year, frequent prolonged spontaneous nose-bleeds for three months, and extreme lethargy for one month.

Examination showed several walnut-sized lymph nodes in the neck, axillae, and groins, and enlarged lacrimal and salivary glands. The liver and spleen were just palpable. Defective hearing was associated with impaired vestibular function tests. There were many spider angiomas about the face and neck. Laboratory findings included pancytopenia, hyperglobulinaemia (7.2 g. per 100 ml.), and a normal bromsulphthalein retention test. E.S.R., 73 mm. per hour; serum glucosamine, 286 mg. per 100 ml. (normal range 70–124 mg.); myelogram, 81% lymphocytes. A skeletal survey showed no significant changes. An electrophoretically homogeneous gamma-globulin component was proved by ultracentrifugal analysis to be a 14.8-S. macroglobulin. A lymph-node biopsy was characteristic of lymphosarcoma. A mouse-lymphocyte-stimulating factor was not detected. The patient is being maintained in moderate comfort with frequent blood transfusions.

Comment.—The clinical findings and course are characteristic of macroglobulinaemia. Anaemia developed rapidly, although there was no evidence of haemolysis or gross blood loss. The suspicion of liver dysfunction aroused by the florid facial telangiectasia was not confirmed. Histological appearances were in keeping with a diagnosis of lymphosarcoma.

Case 2

A 55-year-old farmer consulted a physician in October, 1955, because his relatives were concerned about him. He had felt weak for about five years, had bruised easily for two years, and had lost one stone (6.4 kg.) in weight. He was moderately deaf. The cervical, axillary, and inguinal lymph nodes were enlarged, the liver was felt 2 in. (5 cm.) below the costal margin, and the spleen tip was palpable.

A lymph-node biopsy was diagnosed as "lymphosarcoma," and three courses of x-ray therapy were given. In June, 1956, he complained of weakness and severe nose-bleeds. The physical findings were unchanged. Blood examination showed pancytopenia and a monocytosis. Myelogram, 40% lymphocytes; E.S.R., 103 mm. per hour; serum glucosamine, highly elevated to 284 mg. per 100 ml. A skeletal survey was negative. A mouse-lymphocyte-stimulating factor was present in the plasma. Electrophoresis showed a "spike" component with beta-globulin mobility, which by ultracentrifuge proved to be a macroglobulin with a sedimentation coefficient of 14.2-S. units.

In September he developed personality changes and irritability. In hospital he became irrational and had delusions of persecution; a gross tremor of both hands was noted. An electroencephalogram showed a mildly abnormal record without specific diagnostic implications. Psychological testing suggested reduced intellectual activity and a type of thought disorder indicative of deterioration of "organic" origin.

Comment.—The clinical manifestations are again typical; the long preceding history of weakness is noteworthy. Of particular interest is the occurrence of neuropsychiatric disturbance with abnormal serum globulin—the Bing-Neel syndrome (Bing and Neel, 1936; Mandema, 1954). Later, Bichel, Bing, and Harboe (1950) reported the case of a patient with established macroglobulinaemia, who was shown at necropsy to have perivascular invasion of cerebral vessels by lymphocytes.

Case 3

A 50-year-old woman presented with tiredness of two years' duration. Five years previously hysterectomy had been performed for menorrhagia; the wound took three months to heal. She had noticed splenic enlargement for eighteen months. No x-ray therapy or chemotherapeutic agents were given.

Examination showed an enormously enlarged spleen, and a few small nodes in the left cervical region. Blood examination: pronounced rouleaux formation; anaemia; granulocytopenia; lymphocyte count of 5,670 per c.mm.; platelet count, 777,000 per c.mm. Bone marrow: 56% small lymphocytes, many appearing as "naked nuclei." Other significant findings included Bence Jones proteinuria, a positive Sia test, and a negative skeletal survey. Serum glucosamine was moderately elevated to 172 mg. per 100 ml. Electrophoresis and ultracentrifugal analysis of serum revealed a macroglobulin component in high concentration. Splenic aspiration biopsy was performed with a Franseen needle. Examination of smears showed that 91% of the nucleated cells were lymphocytes and naked lymphocytic nuclei, similar to the cells present in the bone marrow; tissue fragments showed diffuse lymphocytic infiltration without obliteration of the follicular pattern. The appearances were compatible with lymphosarcoma.

Comment.—Serum macroglobulins were detected in a woman with lassitude and splenomegaly who showed characteristic findings on bone-marrow smear and paper electrophoretic analysis of serum. Gross splenomegaly and the absence of a bleeding diathesis are unusual features. Splenic biopsy suggested the diagnosis of lymphosarcoma.

Case 4

A man aged 50 had an eight-months history of lethargy following an unresolved pneumonia, petechiae, bruising, and prolonged bleeding from superficial wounds. The liver, spleen, and lymph nodes were moderately enlarged. A pancytopenia was associated with an absolute lymphocytosis (16,000–50,000 lymphocytes per c.mm.), with some primitive cells and "smear" cells, suggesting chronic lymphatic leukaemia. Hyperglobulinaemia (5.6 g. per 100 ml.), a positive Sia test, and Bence Jones proteinuria were present. Serum glucosamine, 228 mg. per 100 ml. Myelogram, 80%

small lymphocytes and rouleaux formation. Ultracentrifugal analysis late in the illness revealed macroglobulinaemia. A mouse-lymphocyte-stimulating factor was present in the plasma. Triethylene melamine, cortisone, and finally splenectomy were only of temporary benefit. Histological examination of the spleen suggested the diagnosis of lymphosarcoma. A persistent haemorrhagic left pleural effusion followed an attack of pneumonia, and death occurred after an illness lasting 15 months. A necropsy was not performed.

Comment.—An illness simulating chronic lymphatic leukaemia progressed to a fatal termination within 15 months. Macroglobulins were demonstrated late in the illness, after treatment with cytotoxic drugs. The association of macroglobulinaemia with a leukaemic blood picture is unusual (Waldenström, 1952); however, the histological changes in the spleen were those of lymphosarcoma.

Discussion

The clinical features of macroglobulinaemia are fairly distinctive and largely depend on the presence in the blood of abnormal proteins. Although a low-grade non-specific increase in serum macroglobulin ("secondary macroglobulinaemia") occurs in various conditions (Mackay *et al.*, 1956; Jim and Steinkamp, 1956), a massive increase of pathological macroglobulin ("primary macroglobulinaemia") is almost invariably associated with diffuse involvement of the lymphocyte/plasma-cell system. However, the morphological basis of primary macroglobulinaemia remains poorly defined, and histological diagnoses accompanying published case reports serve to illustrate the current confusion in nomenclature of the "reticulosis" and "lymphoma" group of diseases. These mostly suggest a lymphocytic proliferative disorder, and include "atypical lymphatic hyperplasia" (Dalgaard, 1950), "lymphoid leucosis" (Layani *et al.*, 1955), "aleukaemic lymphadenosis" (Schaub, 1952), and "lymphosarcoma" (Abrams *et al.*, 1949), whereas occasional diagnoses such as "aleukaemic plasmacytosis" (Bianchi *et al.*, 1949) and "diffuse plasmacytosis" (McFarlane *et al.*, 1952) incriminate the plasma cell.

In a collected series of 25 cases of macroglobulinaemia (Mackay, 1956) the histological picture was that of lymphocytic hyperplasia in 12, lymphocyte and plasma-cell hyperplasia in 7, transitional-cell types in 4, and no abnormal cells were identified in 2. Plasma cells may rarely appear in the blood and bone marrow in the late stages of the disease (Waldenström, 1944; Bianchi *et al.*, 1949), and the histological appearances of the lymphoid tissues may change from a lymphocytic to a plasma-cell reaction during the course of the illness (Schaub, 1952; Jahnke *et al.*, 1956).

Mixed lymphocyte and plasma-cell proliferations may well be a result of the close relationship in the differentiation processes of lymphocytes, and plasma cells from a common precursor (Marshall, 1956). The occurrence of these morphological variants of a single cell system justifies an attempt to classify the disease on the basis of cell function (macroglobulin synthesis) rather than cell structure.

Mandema (1954) states that macroglobulinaemia is a variant of multiple myeloma despite differences in the cell morphology and the physicochemical properties of the globulins in the two diseases; however, most authors maintain that macroglobulinaemia is a single independent disease entity, possibly related to the lymphoreticular hyperplasias (Kanzow, 1954; Layani *et al.*, 1955; Jim and Steinkamp, 1956). Consideration of the clinical and pathological features of the present cases, and of others previously reviewed (Mackay, 1956), suggests that primary macroglobulinaemia may, in fact, be an epiphenomenon in the course of lymphosarcoma. Macroglobulinaemia resembles lymphosarcoma in its clinical features, in the occurrence of marrow invasion by lymphocytes, and in the presence of a mouse-lymphocyte-stimulating factor in the plasma. Moreover, the available histological material (lymph nodes and spleen) from these four patients was interpreted as a classical

lymphosarcoma. Finally, synthesis of macroglobulins by lymphosarcoma tissue *in vitro* has been described by Abrams *et al.* (1949).

Malignant lymphosarcoma tissue may acquire the functional capacity to synthesize "paraproteins" following the occurrence of a somatic mutation. Habich (1953) and Kanzow *et al.* (1955) have performed immunological experiments with human macroglobulins which supports this concept. They found, by precipitin testing, that the abnormal proteins from different cases of macroglobulinaemia differ antigenically (and therefore chemically) from each other. Moreover, a rabbit sensitized to a human macroglobulin developed anaphylactic shock when the same macroglobulin was reinjected, but not when challenged by a macroglobulin from a different patient (Di Guglielmo and Salvini, 1954). Immunological differences among macroglobulins must reflect genetic differences in the cells synthesizing these proteins; such genetic differences are best accounted for by postulating the occurrence of a somatic mutation in the malignant cell line (Mackay, 1956). This mutation may occur independently or result from the disturbing effects of x-rays or chemical agents on cell mitoses. Macroglobulins were detected after such therapy in two of our four cases, but may have been present before therapy was given. A similar suggestion of a mutation process has been invoked by Rosenthal *et al.* (1955) to account for the development of haemolytic antibiotics in lymphomas.

Thus macroglobulinaemia is considered to result from an independent or an induced mutation in a malignant lymphoma which is usually, if not always, a lymphocytic lymphosarcoma. This concept of macroglobulinaemia most adequately accounts for the observed features of the disease. Moreover, it provides evidence suggesting that the occurrence of somatic mutation does, in fact, play a general part in the evolution of cancer (Mackay, 1956).

Summary

Four cases have been described to illustrate the clinical features of the syndrome of primary macroglobulinaemia. The diagnosis was established by ultracentrifuge analysis in each case. The condition should be suspected in lympho-reticular hyperplasias simulating lymphosarcoma with evidence of an abnormal protein in the serum (rouleaux formation, elevated sedimentation rate, cryoglobulinaemia, and positive Sia test). Filter-paper electrophoresis of serum reveals a component indistinguishable from a myeloma protein; if the bone marrow shows a marked lymphocytic increase (40–80%), with scanty plasma cells, the diagnosis is almost certain.

The disease may be an individual entity, although there is a strong resemblance to lymphosarcoma. Histological and immunochemical evidence suggests that macroglobulin synthesis may be the result of a somatic mutation in malignant lymphocytic tissue, which may occur independently or be induced by x rays or cytotoxic drugs. This concept is in harmony with the general somatic mutation theory of cancer.

The concept of the origin of macroglobulinaemia in a somatic mutation was developed in discussions with Sir Macfarlane Burnet. We are indebted to Dr. Ian Wood for assistance in the preparation of this paper, and to Professor R. H. Lovell, Dr. Eric Clarke, Dr. Leslie Hurley, Dr. T. H. Hurley, and Dr. J. H. Bolton for kindly allowing us to study patients under their care. We are indebted to Miss Sara Weiden for glucosamine analyses.

REFERENCES

- Abrams, A., Cohen, P. P., and Meyer, O. O. (1949). *J. biol. Chem.*, **181**, 237.
- Bianchi, V., Giampalmo, A., and Marmont, A. (1949). *Minerva med. (Torino)*, **40**, 101.
- Bichel, J., Bing, J., and Harboe, N. (1950). *Acta med. scand.*, **138**, 1.
- Bing, J., and Neel, A. V. (1936). *Ibid.*, **88**, 492.
- Dalgaard, E. B. (1950). *Acta path. microbiol. scand.*, **27**, 506.
- Di Guglielmo, R., and Salvini, L. (1954). *Progr. med. (Napoli)*, **10**, 260. Abstracted in *Blood*, 1955, **10**, 1177.
- Elson, L. A. and Morgan, W. T. J. (1933). *Biochem. J.*, **27**, 1824.
- Habich, H. (1953). *Schweiz. med. Wschr.*, **83**, 1253.
- Jahnke, K., Kanzow, U., and Scholtan, W. (1956). *Artz. Wschr.*, **11**, 25.
- Jim, R. T. S., and Steinkamp, R. C. (1956). *J. Lab. clin. Med.*, **47**, 540.
- Kanzow, U. (1954). *Klin. Wschr.*, **32**, 154.
- , Scholtan, W., and Mütting, A. (1955). *Ibid.*, **33**, 1043.
- Layani, F., Aschkenasy, A., and Bengui, A. (1955). *Presse méd.*, **63**, 44.
- McFarlane, A. S., Dovey, A., Slack, H. G. B., and Papastamatis, S. C. (1952). *J. Path. Bact.*, **64**, 335.
- Mackay, I. R. (1956). *Aust. Ann. Med.*, **5**, 244.
- , Eriksen, N., Motulsky, A. G., and Volwiler, W. (1956). *Amer. J. Med.*, **20**, 564.
- Mandema, E. (1954). *Ned. T. Geneesk.*, **98**, 2109.
- Marshall, A. H. E. (1956). *An Outline of the Cytology and Pathology of the Reticular Tissue*, p. 185. Oliver and Boyd, London.
- Metcalf, D. (1956a). *Brit. J. Cancer*, **10**, 169.
- (1956b). *Ibid.*, in press.
- Rosenthal, M. V., Pisciotto, A. V., Komninos, Z. D., Goldenberg, H., and Damasek, W. (1955). *Blood*, **10**, 197.
- Schaub, F. (1952). *Schweiz. med. Wschr.*, **82**, 890.
- Waldenström, J. (1944). *Acta med. scand.*, **117**, 216.
- (1948). *Schweiz. med. Wschr.*, **78**, 927.
- (1952). *Advanc. intern. Med.*, **5**, 398.

CLINICAL TRIAL OF GLUTETHIMIDE IN LABOUR

BY

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The new drug glutethimide (α -phenyl- α -ethylglutarimide; "doriden") has been described as a rapidly acting non-barbiturate hypnotic and an effective sedative producing minimal side-effects. These qualities, coupled with encouraging results obtained from a small pilot survey, suggested its possible value as a sedative in the management of the first stage of labour. Accordingly, a clinical programme was drawn up, and answers to the following four questions were sought for and ascertained from the collected data: (1) Is glutethimide an effective sedative early in the first stage of labour, and how does it compare with the more commonly employed drug, chloral hydrate? (2) Will the use of glutethimide reduce the amount of analgesic drugs required during labour? (3) Is there evidence that glutethimide is effective in lessening the apprehension which is commonly a feature of the first stage of labour, particularly in primiparae? (4) Are there any maternal or foetal hazards associated with the administration of glutethimide in labour?

Literature.—Since the introduction of α -phenyl- α -ethylglutarimide by Hoffmann and Kebrle (1952), several papers have appeared in the literature confirming its sedative and hypnotic value. It has been successfully employed in cases of insomnia by Rushbrooke *et al.* (1956), in neuropsychiatric anxiety states, and as a pre-anaesthetic medication by Matlin (1956). Electroencephalograms have also shown that a dose of 0.5 g. of the drug compares favourably with that of 1½ gr. (0.1 g.) of quinalbarbitone sodium (Ladwig, 1955). An extensive pharmacological study of glutethimide has been made by Gross *et al.* (1955), and few toxic side-effects were recorded. There are no reports in the literature on its possible value in labour.

Method and Procedure

This study is based upon a survey of 100 normal parturient patients aged between 16 and 43 years, admitted to the professorial unit at Southmead Hospital, Bristol. There were equal numbers of primiparae and multiparae. All patients were given two tablets of glutethimide (each containing 250 mg.) early in the first stage of labour, when it

was certain that labour was well established and uterine contractions were causing some distress. Before each administration cervical dilatation was assessed per vaginam or per rectum.

Of the 100 cases reviewed, 91 received two tablets of glutethimide, eight had two such doses within four hours, and one required three doses in eight hours. Dilatation of the cervix in the latter case had not exceeded four finger-breadths when the third dose was given.

The effect of this form of sedation was studied from the subjective and objective points of view, and all results were appraised according to the degree of relief of pain, relaxation, sleep, and general well-being of the patient. Regular observations of blood pressure, pulse rate, foetal heart rate, and uterine contractions were made, and notes taken of any untoward side-effects. The duration and complications of all three stages of labour, the need for additional sedation or the administration of analgesic drugs, and the condition of the infant at birth were carefully noted.

For control purposes a second series of 100 cases, also normal parturient patients within a similar age range and comparable in other respects, were treated with 30 gr. (2 g.) of chloral hydrate in the form of the syrup. The choice of this drug as a yardstick was made because of its traditional use as a sedative in early labour.

Evaluation of Results in the Treated Group

Subjective Reactions.—Each patient was interviewed within two hours of the administration of glutethimide and subjective reactions were recorded as poor, where no relief was experienced whatsoever; fair, where patient noted some relief; good, where the pain was considerably alleviated; and very good, where only slight pain was noticed at the height of each contraction. Of the treated patients, 9 were rated very good, 61 good, 42 fair, and 18 poor.

Objective Reactions.—These were also noted within two hours of the administration of glutethimide, and were as follows: poor, where the patient remained restless; fair, where restlessness was reduced but patients were unable to sleep between contractions; good, where mental and physical relaxation were sufficient to permit sleep between contractions; and very good, where, in addition to good mental and physical relaxation, the patient was very cheerful and optimistic. Eighteen were rated as poor, 10 as fair, 63 as good, and 9* as very good.

Effect on Labour

Of the 100 patients reviewed in the glutethimide group, 98 had their infants presenting by the vertex, and, of these, 88 confinements terminated spontaneously. There were 10 forceps deliveries (nine occurred in primiparae), and in six of these the indication was malrotation with occipito-posterior position of the foetal head. In the remaining two cases the babies presented by the breech; one had a caesarean section on account of relative disproportion, the infant weighing over 9 lb. (4 kg.) at birth, and the other was delivered successfully per vaginam.

In the control series, 79 had a spontaneous delivery and 16 required forceps. In nine of the forceps deliveries the occiput was posterior in position. Two cases had a caesarean section on account of disordered uterine action and foetal distress respectively. There were also three assisted breech births.

Table I shows the comparative length of the various stages of labour. In the glutethimide group the average length of labour was 12 hours for primiparae and 7½ hours for multiparae. In the control series the corresponding figures

*One of these nine cases which showed very good subjective and objective reactions was that of a young unmarried mother who was particularly apprehensive and depressed on admission. Shortly after the administration of glutethimide there was a dramatic change in mood and she became euphoric. This persisted throughout labour.

were 13½ and 8 hours. The apparently shorter labours in the glutethimide cases may well have been due to the rapid cervical dilatation brought about by the calming and relaxing effect of the drug.

The total amount of blood loss in the third stage of all cases treated with glutethimide was 920 oz. (26.1 litres), as compared with 895 oz. (25.4 litres) in the control group. Examination of these figures, however, revealed that there was no significant difference in the incidence of post-partum haemorrhage in the two groups (see Table II).

TABLE I

Stage of Labour	Time	Glutethimide Group	Chloral Hydrate Group
First	Up to 10 hrs.	69	65
	11-15 hrs.	16	21
	16-24 "	12	10
	24+ hrs.	3	4
	Average duration	11.72 hrs.	12.16 hrs.
Second	Up to 1 hr.	85	79
	1-2 hrs.	14	18
	Over 2 hrs.	1	3
	Average duration	1.08 hrs.	1.12 hrs.
Third	Up to 10 mins.	76	70
	11-30 mins.	17	19
	31-60 "	5	9
	Over 1 hr.	2	2
	Average duration	14.45 mins.	16.05 mins.
Average length of labour:			
Primiparae	.. ..	12 hrs.	13½ hrs.
Multiparae	.. ..	7½ "	8 "

TABLE II

	Chloral Hydrate Group	Glutethimide Group
Manual removal of placenta	2	3
Post-partum haemorrhage	13	12

Effect on the Newborn

The effect on the newborn infant of glutethimide sedation as employed in this study is shown in Table III. Class A consisted of infants who breathed and cried immediately after birth, appeared in no way narcotized or cyanotic, and

TABLE III

	Chloral Hydrate Group	Glutethimide Group
Class A	75	68
" B	23	27
" C	2	3
" D	0	2
Total	100	100

required no resuscitation. Class B included infants who were cyanosed and at no time gave cause for anxiety, and responded well to oxygen administered by face-mask and aspiration of the upper respiratory passages by catheter. Infants failing to respond to whiffs of oxygen and appearing deeply narcotized, apnoeic, and showing a fair degree of anoxia, but responding satisfactorily within half an hour, were classed as C. Those failing to respond adequately within half an hour were regarded as severely affected, and were grouped as class D.

No infant in the glutethimide group was placed under class D, thus substantiating the impression obtained in the pilot survey that infants born of mothers receiving glutethimide were quite alert and active. The two babies classed under C were born after a general anaesthetic had been administered to the mother, in one case for a caesarean section and in the second for a forceps delivery after manual rotation of the head. Absence of any harmful effect of glutethimide on the newborn infants was particularly notice-

able in the 16 infants born within three hours after administration of the drug. All the 16 infants were classed as A.

Discussion

In this series of cases treated with glutethimide there were no maternal or foetal deaths and no significant untoward effects attributable to the drug. Four patients complained of nausea and a further five vomited within three hours of administration of the drug. These figures are more striking when one considers that the corresponding incidence of vomiting in the chloral hydrate group was 77.

Sleep ensued about 30 minutes after administration of the drug in 65 cases, and in 17 of these the level of the systolic blood pressure fell by 10 mm. Hg and the diastolic by 5 mm. This drop in blood pressure was maintained for three hours.

Table IV shows that the total amount of pethidine needed for additional sedation and analgesia in the glutethimide group was substantially below that required in the control

TABLE IV

Amount of Pethidine Required	Glutethimide Group	Chloral Hydrate Group
None	9	2
100 mg.	78	63
200 "	11	28
Over 200 mg.	2	7

For the purpose of the χ^2 test, two classes only were formed: (1) none and 100 mg.; and (2) 200 mg. and over. χ^2 corrected for continuity results as 12.08, which, on pure chance, would arise less often than about 1 in 1,000. It is therefore regarded as highly significant of a real difference in the amount of pethidine required.

series. In the glutethimide group, 87 patients required 100 mg. or less of pethidine, while 13 required 200 mg. or more. In the control group, 65 patients required 100 mg. or less, whilst 35 required 200 mg. or more.

Glutethimide was well tolerated by all patients, and none showed any allergic reaction. The normal course of labour in the glutethimide series was unaffected, the average duration of each stage of labour (see Table I) being slightly less—though not significantly so—than in the control group, and the general management of the first stage was greatly facilitated by the mental and physical relaxation induced by the drug. All patients who initially were apprehensive lost their fear and became fully co-operative shortly after administration of the drug.

There was no significant difference in the incidence of post-partum haemorrhage between the two groups (see Table II).

Conclusion and Summary

Administered in early labour, glutethimide was found to be an effective sedative, and was more easily administered and showed less evidence of gastric irritation than chloral hydrate.

It greatly reduced the requirements of pethidine for analgesia and additional sedation, the difference being statistically significant.

It alleviated apprehension, thereby encouraging relaxation and co-operation, and produced no evidence of any maternal or foetal hazard.

I am indebted to Ciba Laboratories, Ltd., for the supply of doriden employed in this trial and to their medical adviser, Dr. A. K. Pittman. I thank the sisters in charge of the labour ward for their assistance during this clinical trial. I am also indebted to Dr. G. Hurden for his statistical analysis of this paper. I am grateful to Professor G. G. Lennon for helpful advice and criticism.

REFERENCES

- Gross, F., Tripod, J., and Meier, R. (1955). *Schweiz. med. Wschr.*, 85, 305.
Hoffmann, K., and Kebler, J. (1952). *Helv. chim. Acta*, 35, 1235, 1541.
Ladwig, H. A. (1955). *A.M.A. Arch. Neurol. Psychiat.*, 74, 351.
Matlin, E. (1956). *Med. Tms (N.Y.)*, 84, 68.
Rushbrooke, M., Wilson, E. S. B., Acland, J. D., and Wilson, G. M. (1956). *British Medical Journal*, 1, 139.

Medical Memoranda

Chronic Bromism

Although there are four mixtures containing potassium bromide in the *National Formulary* 1955, the drug is not so frequently prescribed as previously. Barbour, Pilkington, and Sargent (1936) found that 14% of 200 consecutive prescriptions contained potassium bromide. For the year 1949, in England, the figure of 5.8% has been quoted by Dunlop, Inch, and Paul (1953). These authors, in a survey of prescribing in Scotland in 1951, found a further decline in the use of bromide; in that year 1% of prescriptions contained potassium bromide. This 1%, however, represents an appreciable number of prescriptions, since in the month of October, 1951, alone 4,000 prescriptions containing bromide and chloral hydrate were dispensed in Scotland. A personal scrutiny of 10,000 prescriptions issued by general practitioners in Aberdeen between January and December, 1954, revealed 1.1% with potassium bromide as a constituent.

It is well known that the long-continued use of bromide may produce symptoms of "intoxication," but because of the decline in its use chronic bromism may be forgotten and overlooked. Attention is again drawn to the insidious onset and clinical picture of that condition.

CASE REPORT

A housewife aged 52 was admitted to hospital in October, 1953, suffering from mitral stenosis and congestive heart failure, manifest by dyspnoea, venous congestion, hepatomegaly, and slight oedema. She was successfully treated, and was discharged a few weeks later on a regime which included digitalis, 2 ml. of a mercurial diuretic intramuscularly once a week, and a diet of ordinary food with no added salt.

On October 13, 1954, she was readmitted at the request of her general practitioner on account of dysarthria, ataxia, and fatigue. After leaving hospital in 1953 she had complained of increasing tiredness. In August, 1954, progressive slurring of speech was noted by the patient and by her friends. At no time was there weakness of any one limb, but she complained of generalized stiffness, and in September her gait became unsteady. By this time she was spending most of the day in bed, rising at 9 a.m. and returning to bed again at 11 a.m. because of overwhelming fatigue. When she was readmitted in October she was unable to stand without support and was complaining of inability to express her thoughts in words; she also had difficulty in using her arms because of tremor.

On examination she was drowsy, lethargic, and uncooperative. She wept frequently, and was completely disinterested in her surroundings, but at no time were hallucinations or delusions noted. Speech was slurred, but there was no nominal aphasia. There was a coarse tremor of the hands and some apraxia was present. The gait was grossly ataxic and she was quite unable to stand without support. There were no other abnormal neurological signs. The mouth was dry and salivation scanty. There was no skin rash. Mitral stenosis was present, associated with mild congestive heart failure, the neck veins being distended and the liver palpable; there was no oedema.

Further inquiry revealed that for a year she had been taking a dose of a mixture containing, in each fluid ounce (30 ml.), 30 gr. (2 g.) of potassium bromide, 30 gr. (2 g.) of chloral hydrate, and 30 minims (1.8 ml.) of tincture of opium every night. She regularly took ½ oz. (15 ml.) of this mixture, but on many occasions repeated the dose. During this period she was having a diet low in sodium chloride and was being given a mercurial diuretic, 2 ml. weekly by intramuscu-

lar injection. Latterly she had been eating very little food. It seemed likely that these factors, which tend to decrease the chloride content of body fluids, would lead to retention of bromide. A clinical diagnosis of chronic bromism was confirmed by a serum bromide estimation of 175 mg. per 100 ml. (17 mEq).

The bromide mixture was discontinued on October 14, and sodium chloride, 1 g. daily, was given by mouth. The signs of congestive cardiac failure increased and the sodium chloride was discontinued six days later. On October 19 there was some improvement in speech, but she was still drowsy, querulous, and ataxic; tremor was still present. By October 26 she was more alert and taking an interest in herself and her surroundings. On November 2 the serum bromide level was 100 mg. per 100 ml. (9.7 mEq). At this time she was much improved, although still drowsy and unable to walk unaided. Five weeks after discontinuing the bromide mixture she had recovered and was transferred to a convalescent hospital. Her personality had reverted to normal; she was alert and co-operative, and no longer had tremor, ataxia, or slurring of speech. On December 2 the serum bromide level was 10 mg. per 100 ml. (0.97 mEq). Subsequently a mitral valvotomy was performed, resulting in improvement in exercise tolerance.

COMMENT

Several aspects of the diagnosis of chronic bromism mentioned by Barbour *et al.* (1936) can usefully be re-emphasized. Of their five cases, ataxia occurred in three, and tremor, speech difficulty, and depression in two. Memory impairment and hallucinations were common symptoms. None of the five had a skin rash. Patients with atherosclerosis, anaemia, impaired renal function, and organic heart disease are more susceptible to bromide intoxication. There is a wide individual variation in the level at which symptoms appear—for example, a patient suffering from one of the above conditions may develop symptoms of bromism with a serum bromide level of 150 mg. per 100 ml. (14.5 mEq), whereas a healthy young man is able to tolerate the same level with no symptoms at all.

Barbour *et al.* point out that bromide acts by replacing chloride in the body and that the rate of substitution depends on the quantity of bromide given, the fluid and electrolyte intake, and the renal efficiency of the patient. Therefore a patient on a low-fluid and low-chloride regime will develop a higher level of bromide in the serum more quickly than a patient on a normal diet receiving the same amount of bromide. Rosenheim (1951) and Holt and Litchfield (1951) point out the dangers of giving a low-salt diet to patients with hypertension receiving hexamethonium bromide. A high ratio of bromide to chloride in the body fluids will also develop in a patient taking bromide and little or no food (Nabarro, 1954).

Chronic bromism of slight or moderate degree is easily overlooked because of the insidious development of the clinical picture. Vague symptoms such as fatigue, depression, and memory impairment may be attributed to senility, mental disorder, cerebral atherosclerosis, or the cerebral anoxaemia of congestive heart failure. The dangers of giving bromides to patients taking a diet low in sodium chloride or undergoing treatment with mercurial diuretics cannot be too strongly emphasized.

I thank Dr. Ian Gordon for permission to publish this case report.

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REFERENCES

- Barbour, R. F., Pilkington, F., and Sargent, W. (1936). *British Medical Journal*, 2, 957.
Dunlop, D. M., Inch, R. S., and Paul, J. (1953). *Ibid.*, 1, 694.
Holt, M. C., and Litchfield, J. W. (1951). *Lancet*, 1, 347.
Nabarro, J. D. N. (1954). *Biochemical Investigations in Diagnosis and Treatment*. Lewis, London.
Rosenheim, M. L. (1951). *Lancet*, 1, 347.

Lactosuria following Burns

Baar and Bull (1952) reported lactosuria in severely burned patients treated with a local application of penicillin lactose powder. The following report of a similar case illustrates again the absorptive capacity of "raw" cutaneous areas and indicates the danger of applying toxic substances to such damaged surfaces. In this case, however, the absorbed substance was harmless.

CASE REPORT

A woman aged 56 was admitted with burns of the back, buttocks, and thighs—approximately 2% of the surface area of the body. Her general condition was found to be satisfactory and the burns were dressed. The following day routine ward-testing of the urine with Benedict's reagent showed the presence of a reducing substance. In addition, it was noticed that both Rothera's test and Gerhardt's (ferric chloride) reaction were positive.

The presence of glycosuria in the first 36 hours after burning is not an uncommon occurrence, but, in order to eliminate the possibility of a coincident diabetes mellitus, a glucose-tolerance test was undertaken, the blood-sugar method of Kingsley and Reinhold (1949), with tungstic acid filtrates, being used.

Specimen	Glucose-tolerance Test			
	Venous Blood	Urine		
	Blood-sugar Level (mg./100 ml.)	Reducing Substance (Approx. % as Glucose)	Rothera	Gerhardt
Fasting	105	0.5	Positive	Positive
1 hour after 50 g. glucose	150	0.5	"	"
2 hours after 50 g. glucose	105	0.5	"	"

The test showed no impairment of glucose tolerance, so the condition was obviously not diabetes mellitus. The positive Gerhardt (ferric chloride) reaction resulted from the administration of tab. codein. co. The positive Rothera reaction was explained by the mild ketosis that might be expected from the patient's condition.

The presence of a reducing substance in approximately constant concentration in all the urine samples prompted investigation into the nature of this substance.

Paper chromatography of the urine showed the following: fasting, lactose; at 1 hour, lactose and glucose; at 2 hours, lactose. The solvent used was *n*-butanol 60%, acetic acid 15%, distilled water 25%; the spray reagent was 3:5 dinitrosalicylic acid.

The lactosuria was found to be associated with the use of lactose as a bland dressing for the burned areas. It was thought, at first, that the urine samples had been contaminated with lactose at the time of collection, but a catheter specimen of the urine again showed the presence of lactose. Lactose was absent from a specimen of urine obtained one week after cessation of the lactose dressings.

There is no doubt that the lactose had been absorbed from the burned areas and excreted by the kidney. I am unaware of any evidence suggesting that such a temporary lactosuria is at all harmful.

My thanks are due to Mr. D. H. Patey for permission to publish this case.

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REFERENCES

- Baar, S., and Bull, J. P. (1952). *Lancet*, 1, 978.
Kingsley, G. R., and Reinhold, J. G. (1949). *J. Lab. clin. Med.*, 34, 713

Reviews

A GREAT HUMANITARIAN SERVICE

The International Refugee Organization: A Specialized Agency of the United Nations. Its History and Work, 1946-1952. By Louise W. Holborn. (Pp. 805+xi; maps and charts. 45s.) London, New York, Toronto: Oxford University Press under the auspices of the Liquidation Board of the International Refugee Organization. 1956.

It is a lamentable fact that the work of assisting refugees is once more on the increase, and the Hungarian tragedy serves to emphasize the need for international collaboration. A comprehensive and fully documented book, *The International Refugee Organization*, presents the brief history of a great humanitarian service undertaken by a specialized agency of the United Nations. Although it is essentially a reference work for the expert, this exhaustive study brings together much matter of human interest. The chapters on medical care, counselling, and the problems of adaptation to a new life are all of interest and value; and the longer anxieties and achievements of resettlement are fully discussed.

The organization was created in 1947, replacing and extending the work of the Army authorities and of U.N.R.R.A. During its period of operation its expenditure amounted to \$430 million, of which nearly \$400 million was contributed by 18 governments—a remarkable achievement in a distracted world already oppressed beyond belief by intensely nationalistic movements and tending to regard refugees as in some sense traitors. At the same time the participation of voluntary societies contributed immeasurably to the human solicitude which could not be readily fitted into the huge organization. They filled the crevices admirably.

The provision of medical care alone was a colossal task, but fortunately, in war areas at all events, actual hospitals were sufficient for basic needs. The essential basis of the service was, as it should be, the clinic providing preventive care, including immunizations, for mothers, infants, and children. In addition, a great deal of simple health education was carried out, especially in relation to infant and child care and the prevention of tuberculosis. In its health programme the I.R.O. relied greatly on the services of refugees and displaced persons. In the first year more than 2,500 refugee physicians and 2,000 nurses worked with the small staff of professional I.R.O. personnel. Good as their service was, it was found that there was a serious lack of medical staff trained in health and in administration, and special courses had to be set up in these subjects.

It was realized from the start that the work of I.R.O. was a temporary measure; this led to the wise decision that it should undertake its own liquidation and not leave such a vital task to the haphazard efforts of individual Governments. The I.R.O. was set up to perform a particular function. When that work was finished it went out of existence. It had coped with 1½ million refugees, and has made a pattern for any future action for refugees.

J. M. MACKINTOSH.

POLIOMYELITIS IN DENMARK

Management of Life-threatening Poliomyelitis, Copenhagen, 1952-1956. With a Survey of Autopsy Findings in 115 Cases. Edited by H. C. A. Lassen, M.D. (Pp. 176+xi; illustrated. 22s. 6d.) Edinburgh and London: E. and S. Livingstone Ltd. 1956.

In 1952 Denmark experienced an outbreak of poliomyelitis of unprecedented severity, as many as 1,250 cases of the paralytic form of the disease being admitted to one hospital under Dr. Lassen's direction. There was no adequate preparation for such a situation, and no fewer than 345 patients developed insufficiency of respiration or paralysis of swallowing. The dramatic and courageous measures taken to deal with this situation made a profound impression in many countries, and have led to the establishment of many

special centres for the handling of the dangerous types of the disease. The most startling news regarding the methods employed was that tracheotomy was used very freely, and that where necessary artificial respiration was maintained by intermittent positive-pressure respiration through a cuffed tracheotomy tube, while tank types of respirator were discarded. These revolutionary measures were not everywhere approved of, but great interest was aroused, and this had a most valuable effect in encouraging the development of respiration units.

This book is more concerned with what happened in 1952 than with the most up-to-date developments of the subject, and most of what is presented has already been published elsewhere. The reader therefore gets the impression that the authors are content "to rest on their laurels," and there are few references to work after 1952. This is unfortunate, as many hoped that Copenhagen would maintain a leading position in this research. Nevertheless those working on poliomyelitis will wish to have a copy of this book.

W. RITCHIE RUSSELL.

EDUCATING SPASTIC CHILDREN

Educating Spastic Children: The Education and Guidance of the Cerebral Palsied. By F. Eleanor Schonell, M.A., Ph.D. (Pp. 242+xv; illustrated. 21s.) Edinburgh: Oliver and Boyd. 1956.

This book is, as its publishers claim, an eminently practical contribution to the care of children with cerebral palsy. Dr. Schonell quotes mainly her detailed survey of 354 cases seen with Dr. Asher from November, 1947, to March, 1949, in the West Midland area of England, but has drawn also on her observations in America, Canada, and New Zealand and further work in Australia.

Her custom of calculating a modified I.Q. with alterations in the standard tests as required by physical handicaps, and if necessary on estimated I.Q. using any available evidence of a child's intelligence, is interesting. Her opportunities of checking the reliability of these alterations, both by retesting the children concerned and studying their progress at Carlson House School, add considerably to their value. This appears to be an important method of recording formally the allowances which many psychologists make in testing athetoid children especially.

Dr. Schonell puts at 70 the I.Q. level above which children with cerebral palsy can be expected to benefit from educational opportunities of a scholastic type. This dividing line means that five out of every ten of these children merit special education, just over half of them in the level from 70 to 89 I.Q., which some educational psychologists would exclude from special arrangements of this type. The results in teaching reading and other subjects to a group in Carlson House School justify this optimistic attitude to the problem which is of the greatest importance to parents and to educational and medical authorities. The final part of the book contains a sensible and helpful discussion of the psychological and social aspects of cerebral palsy, with due regard to the importance of the part which parents must play.

Altogether this is a most encouraging and useful discussion of the problem of cerebral palsy and can be heartily recommended to all who are interested in this difficult and many-sided but fascinating field of study.

MARY O'DONNELL.

INFANT FEEDING

Feeding in Infancy and Early Childhood. By Ursula James, M.R.C.P. (Pp. 135; illustrated. 10s. 6d.) London: Faber and Faber Ltd. 1956.

This is a useful little book which can be carried in the pocket. It provides abundant information about proprietary feeds of all sorts and has an excellent list of recipes for young children and for patients with nephrosis, coeliac disease, fibrocystic disease of the pancreas, and diabetes. Breast-feeding is well discussed, as are some of the feeding problems. There is little to criticize in the advice given, although the feeding of premature babies is not always as easy as

suggested. The statement, "The average premature baby will take 50 calories per lb. of body weight every 24 hours by the end of the first week of feeding," depends for its veracity on the definition of "average." The recommendation that mixed feeding should be started for premature infants at approximately three months "regardless of the baby's weight" clearly overlooks the difficulties encountered with very small premature infants. There are 15 illustrations, but these could have been omitted without detriment. The book is suitable for health visitors, midwives, and nursery nurses, and indeed for anyone who undertakes the professional task of caring for infants and small children.

WILFRID GAISFORD.

OBSTETRICS

The Queen Charlotte's Textbook of Obstetrics. By members of the Clinical Staff of the Queen Charlotte's Maternity Hospital, London. Ninth edition. (Pp. 547+xi; illustrated. 45s.) London: J. and A. Churchill Ltd. 1956.

New editions of this book have appeared at approximately three-yearly intervals since 1927. It now represents the work of 15 members of the staff who include a physician, paediatrician, pathologist, radiologist, psychiatrist, and anaesthetist as well as nine obstetricians. The initials to the preface suggest that Mr. S. G. Clayton has acted in an editorial capacity; otherwise it is impossible to guess the contribution of each individual obstetrician. This speaks well for the blending of what must inevitably be differing opinions to make a harmonious whole. The book is well balanced as well as harmonious, and has a practical approach to subjects which generally keep well within the range of what is expected of the present-day undergraduate. For such a reader it can fairly be described as a sound textbook, as up to date as any textbook ought to be, and at the same time possessing clarity and logic which make for easy reading and learning. The subject-matter is orthodox without being too conservative; indeed, it is interesting to see how much it contains which would have been regarded as unorthodox (or even heresy) five years ago. Moreover, the modernization is consistent and there is no sign of one section lagging behind another. The result is a book which, even though it contains only the bare essentials, should, if used in conjunction with clinical work, see any student through the midwifery part of a qualifying examination.

T. N. A. JEFFCOATE.

MANAGEMENT OF FRACTURES

The Management of Fractures, Dislocations, and Sprains. By John Albert Key, B.S., M.D., F.A.C.S., and H. Earle Conwell, M.D., F.A.C.S. Sixth edition. (Pp. 1,168; illustrated. £7 10s.) London: Henry Kimpton. 1956.

The first edition was published in 1934, and both authors have been responsible for all editions of this book on fracture management, which has been read in many countries. This is not just a reprint, for revisions have been drastic, particularly of the chapters concerned with spinal, hip, and ankle injuries. The treatment of compound fractures is now up to date in regard to the systemic use of antibiotics and the suitable local treatment. There are many additions and deletions of illustrations.

The book is easy to read, descriptions are clear, and nearly all the illustrations are helpful. The names of Pott, Thomas, Jones, and Colles survive, but Lane is not mentioned. Bankart, Bennett, and Bryant are not forgotten. The management of injuries is orthodox, and all the methods described are used in British clinics. It would appear that the authors are little interested in rehabilitation, in particular in physiotherapy. As some clinics favour a basic principle, such as skeletal traction, in the treatment of many fractures, whereas others will employ manipulative reduction with plaster splintage, resorting to open operation should this fail, a book of this type has to describe a number of methods of treatment. The authors recognize this and often state which method each author himself uses. The latter is helpful, but the description of several methods does make it

difficult for the young surgeon who feels he must resort to a textbook when faced with difficulty. Further, this book, in common with others, seldom indicates what procedure should be adopted if the first method fails.

Readers will find useful the description of the first-aid and emergency hospital treatment of injury, especially of compound fractures. There is a comprehensive section on spinal injuries, based largely on British teaching. There is excellent advice on injuries around the hip, including the dislocation and fractures of the femoral neck, although the number of methods available for treatment of the latter tend to confuse the reader. The latter is also the case with the difficult compression fracture of the os calcis. The description and treatment of the upper limb fractures are most helpful and the brief remarks on Volkmann's contracture valuable. It is interesting that at early open operation absorbable material or wire is used for holding bones in place (for example, radius or ulna), since many people think that non-union is more liable to occur with such small fixation.

This book records the practice and teaching of two experienced orthopaedic surgeons and is of particular value to the trainee and young surgeon. It is well produced and illustrated, and should replace the former edition on library shelves.

ST. J. D. BUXTON.

PAINFUL HEEL

Der Fersenschmerz: Funktionelle und Organische Störungen im Bereich der Ferse und Achillessehne. By Professor Dr. Med. Kurt Stucke. Foreword by Professor Dr. Med. Werner Wachsmuth. (Pp. 163+xv; illustrated. D.M. 29.70.) Stuttgart: Georg Thieme. 1956.

All monographs on an anatomical basis suffer from the disadvantage of not being able to explore fully a particular disease affecting the region under consideration without overburdening the volume. In this volume injuries around the calcaneus and to it get scant attention. As have many monographs, this has an air of omniscience. But some complaints still defy explanation. Thus, although there is an excellent description of the heel pad and its anatomical construction, no mention is made of the diffuse fatty tenderness which is often found, which can be distinguished from most other causes of pain, and which is often peculiarly resistant to treatment. Admission of its occurrence and its inexplicability, perhaps together with some indication of the cases which might be confused with it, would encourage the doctor lacking in diagnostic over-confidence.

The text includes too many reference names (hence the common preference for small reference numbers). On one page twenty-two names follow one another, occupying one-eighth of the page. No one wishes to deprive an author of the credit for his work, but it can be given elsewhere than in the text. Many are chosen here for reference, few for special mention. The effect of the height of the heel on calcaneal weight-bearing is not discussed. There is not more than an occasional reference to footwear as a cause of heel disability, and no description of alterations in the heel which might offer relief. The calcaneal spur is rightly relegated to a secondary position as a cause of pain and encouragement given in seeking the primary cause of irritation.

These are no more than minor blemishes. The book is a stimulating review of a limited field, well produced and set out and neatly illustrated. The bibliography is compendious and satisfactory. It merits more than a rapid perusal and relegation to a library shelf.

J. G. BONNIN.

A Practical Manual of Medical and Biological Staining Techniques, by Mr. Edward Gurr, F.L.S., is a compendium of formulae and instructions for the use of stains in microscopy. The second edition, 1956, which appeared three years after the first, is larger and includes a new section on histochemical methods. It is published by Leonard Hill Books Ltd. for 42s.

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CONNECTED OCCUPATIONS

Mr. R. A. Butler is fond of explaining each governmental blunder as just a question of faulty public relations. He can add the present crisis with the profession to his list. Mr. Turton for seven months went on saying No! Mr. Vosper had barely a week or two in office before he had to echo this instruction from the Treasury. Then Mr. Macmillan announced the setting up of a Royal Commission, and left it to Lord Salisbury to state in the House of Lords that an interim increase could be granted to junior medical and dental staffs in hospitals. After the public statement of the G.M.S. Committee about a possible withdrawal from the Health Service Mr. Macmillan told the joint chairmen of the Negotiating Committee that the work of the Royal Commission would not preclude some interim adjustment, apparently over and above any interim increase for junior hospital staff. Only six years before the present claim was put forward the then Minister of Health (Mr. Aneurin Bevan) informed the B.M.A. through the Secretary to the Ministry that the Spens Report remained the basis of remuneration of general practitioners until some other basis was substituted after the usual consultations. The present Government has ignored this completely. Without any consultation at all it sets up a Royal Commission with the following terms of reference.

"To consider:

"(a) How the levels of professional remuneration from all sources now received by doctors and dentists taking any part in the National Health Service compare with the remuneration received by members of other professions, by other members of the medical and dental professions, and by people engaged in connected occupations.

"(b) What, in the light of the foregoing, should be the proper current levels of remuneration of such doctors and dentists by the National Health Service.

"(c) Whether, and if so what, arrangements should be made to keep that remuneration under review.

"And to make recommendations."

The absence of reference to changing values of money, or to the status of doctors, means the Govern-

ment has discarded Spens. "We leave to others," says the Consultant Spens Report, "the problem of the necessary adjustments to present-day values of money, but we desire to emphasize as strongly as possible that such adjustments should have direct regard not only to estimates of the change in the value of money but to the increases which have in fact taken place since 1939 in incomes both in the medical and in other professions." The Royal Commission is being restricted solely to a comparison with the incomes of other professions *and connected occupations*. The G.M.S. Committee were in no doubt that the Government was determined to ignore the recommendations of the Spens Reports. The Royal Commission's terms of reference remove any doubts on this. The Prime Minister himself has revoked the Spens recommendations without any consultation with the profession. The unfortunate Minister of Health, Mr. Vosper, is left with the power—"at an appropriate moment"—to negotiate an interim increase with the profession's negotiators. At least so it appears. But on what basis? On a comparison with the incomes of other professions, on the changed value of money, or on both? Or is the Government thinking of offering a sop to the profession—"at an appropriate moment"—in order with an appropriate bribe to confuse their counsels?

The Joint Consultants Committee and the Public Health Committee have backed to the full the decisions of the G.M.S. Committee. And to these the Council of the B.M.A. has added the weight of its great authority. The profession is completely united in its opposition to the Government's action. It is angry and distrustful, and has lost faith and confidence in an employer who breaks pledges with the abandon of the traditional bull in a china shop. The Council last week, under its Chairman, Dr. S. Wand, was clear that more was at stake than the settlement of the present claim—a claim it is quite willing to submit to arbitration but the Government is not. What is at stake is the future of the profession—not only the future welfare of those working in it but its future power to attract able men and women into it, a matter which was one of the principal concerns of the two Spens Committees. The medical profession continues to be willing to discuss, to negotiate, and if negotiations break down to submit the points of dispute to arbitration. And surely this is a reasonable attitude. It refuses to be pushed on one side as of no account. It refuses to accept the appointment of a Royal Commission, with terms of reference which prejudice the issue, as a proper approach to the problem, an approach severely criticized by the whole of the national press. It refuses to yield to Government dictatorship

on the terms and conditions of service of doctors in the Health Service, and will agree to these only on the democratic basis of discussion, negotiation, and, if necessary, arbitration by an independent adjudicator.

The Council does not consider that the Prime Minister's implied promise of an interim increase alters the fundamental position. Faced with broken pledges and promises, what steps can the profession take? It has already taken one, and that is to call meetings of the Conference of Representatives of Local Medical Committees and of the Representative Body of the B.M.A. They will be asked to consider the withdrawal of general practitioners from the Health Service. This has been wrongly described as a threat to strike. A strike means withholding of services from the public. If railwaymen strike trains don't run. If general practitioners withdraw from the N.H.S. they will continue to work, continue to look after their patients. Details of a scheme for withdrawal have been prepared and will be published, and if the Conference and the R.B. decide on a policy of withdrawal it should be made clear to the public that this decision has been forced upon it by the Government, by politicians. If politicians say that such an action is an attempt to wreck the Health Service, who is the wrecker? The Government. The medical profession does not wish to wreck the Health Service. It acknowledges that to-day some public organization of medical services is necessary, and it has played a large part in planning for them. Many wish to see a better Health Service, and no one is so conscious of the present defects of the N.H.S. as those doctors working in it; and the greatest of all defects is the intervention of the party politician between patient and doctor. Unfortunately there is no other way of bringing home to public and Parliament the present profound distrust of the profession with its employer than by action such as that recommended. The Government can break this deadlock to-morrow by redeeming its pledges, by negotiating directly with the profession, and by agreeing to arbitration if an impasse is reached.

IMMUNOLOGICAL TOLERANCE

In the past ten years immunology has been obliged, not for the first time, to change its tack. The chemical and analytical approach that made such splendid progress in the years before the war took immunology as far as it could go without a further transfusion of empirical knowledge, and much of the research going on to-day, in its exploratory style and broadly biological approach, recalls the pioneering work of

Bordet, Metchnikoff, and Ehrlich. Many immunologists now are particularly concerned with the specific inhibition of immunological responses—that is, with causing certain immunological reactions not to occur. The most promising and important of the four or five methods that have so far been devised for this purpose is that which is embodied in the concept of "immunological tolerance," the subject at a discussion meeting of the Royal Society held under Sir Macfarlane Burnet's leadership in March last year, and now published in the Society's *Proceedings*.¹

The train of thought which led to the idea of immunological tolerance can be traced back to R. D. Owen's² remarkable discovery of the phenomenon of red-cell chimerism in twin cattle. Cattle twins almost always share the same chorion; the consequence is that they can exchange blood and blood-borne cells from an early stage of foetal life until birth. When the twins are dizygotic they can be shown at birth to contain a mixture of each other's red cells; and, so far from being merely transient, the state of chimerism may last throughout their lives. The twins must therefore have exchanged blood-forming cells before birth, and these cells, in apparent defiance of the laws of transplantation immunity, must have survived in an alien environment and have continued to manufacture red blood corpuscles of their own distinctive antigenic type. Stable red-cell chimerism is probably the rule in twin chickens³—chickens which are of dizygotic origin, though uniovular in the sense that they hatch from a single egg—and probably a rare exception in twin sheep.⁴ In human beings it must be rarer still, for only one clear case has so far been described⁵: Mrs. McK., a woman now nearing 30, whose own group O corpuscles are mixed with corpuscles of group A₁, the legacy of a synchorial union with a long-dead twin.

Sir Macfarlane Burnet and F. Fenner⁶ were guided by their theory of antibody formation to predict that the phenomenon observed by Owen might be of general validity; to predict, in fact, that if an embryo

¹ *Proc. roy. Soc., B*, 1956, **146**, 1.

² Owen, R. D., *Science*, 1945, **102**, 400.

³ Billingham, R. E., Brent, L., and Medawar, P. B., *Philos. Trans., B*, 1956, **239**, 357.

⁴ Stormont, C., Weir, W. C., and Lane, L. L., *Science*, 1953, **118**, 695.

⁵ Dunsford, I., Bowley, C. C., Hutchison, A. M., Thompson, J. S., Sanger, R., and Race, R. R., *British Medical Journal*, 1953, **2**, 81.

⁶ Burnet, F. M., and Fenner, F., *The Production of Antibodies*, 1949, Melbourne.

⁷ Billingham, R. E., Brent, L., and Medawar, P. B., *Nature (Lond.)*, 1953, **172**, 603.

⁸ ———, *Heredity*, 1951, **5**, 379.

⁹ ———, *ibid.*, 1952, **6**, 201.

¹⁰ Hašek, M., *Csl. Biol.*, 1953, **2**, 25 and 265.

¹¹ Hanan, R., and Oyama, J., *J. Immunol.*, 1954, **73**, 49.

¹² Dixon, F. J., and Maurer, P. H., *J. exp. Med.*, 1955, **101**, 245.

¹³ Cinader, B., and Dubert, J. M., *Brit. J. exp. Path.*, 1955, **36**, 515.

¹⁴ Smith, R. T., and Bridges, R. A., *Transplantation Bull.*, 1956, **3**, 145.

¹⁵ Stark, O. K., *J. Immunol.*, 1955, **74**, 130.

¹⁶ Kerr, W. R., and Robertson, M., *J. Hyg. (Lond.)*, 1954, **52**, 253.

¹⁷ Buxton, A., *J. gen. Microbiol.*, 1954, **10**, 398.

¹⁸ Bauer, J. A., Peckham, P. E., and Osler, A., *Proc. Soc. exp. Biol. (N.Y.)*, 1956, **92**, 714.

¹⁹ Simonsen, M., *Acta path. microbiol. scand.*, 1956, **39**, 21.

were to be exposed to an antigenic substance then its power to react against that substance when it grew up would be abolished or at least impaired. The prediction was fulfilled by the work of R. E. Billingham, L. Brent, and P. B. Medawar,⁷ who had already shown that dizygotic twin cattle were mutually tolerant of homografts of each other's skin^{8,9} and had expressed their determination to reproduce this strange state of affairs by artificial means. In short, they found that mice or chickens of different strains or breeds could be caused to accept skin homografts from each other in adult life, provided they had been injected in embryonic life with cells taken from their future donors, or from animals antigenically similar to their future donors. A detailed analysis of the phenomenon³ has shown, among other things, that actively acquired tolerance is highly specific, in the sense that an animal which has been caused to become unreactive towards one antigen will retain in full its power to react against any other; and that it is due to some kind of central failure of the machinery of reaction, for normal reactivity can be restored to a "tolerant" animal simply by re-equipping it with normal lymphoid cells.

It is clear then that Burnet and Fenner's concept holds good for transplantation immunity, and the work of Owen and of M. Hašek¹⁰ shows that it applies equally well to the immunological reactions provoked by red blood corpuscles. It is demonstrable, then, with immunological reactions of two entirely different types, for, as Medawar pointed out when opening the Royal Society discussion, transplantation immunity and red-cell immunity could hardly be more unlike. But does the concept hold good for still other immunological systems? There are some grounds for believing that it does. Several groups of immunologists¹¹⁻¹⁴ have shown that rabbits which have been injected with protein antigens from birth onwards lose—or rather never acquire—the power to make antibodies against those antigens when challenged to do so in adult life. The state of non-reactivity seems to persist after the disappearance of the antigen that produced it, a property which distinguishes it from immunological paralysis, which is now generally thought to be due to the persistence of antigen in excess.¹⁵ There is some evidence, too, of the production of tolerance by the injection of bacterial antigens.^{16,17} The term is perhaps unfortunate in this context, because tolerance might here be thought to bear the more usual connotation of "putting up with" virulent micro-organisms, the very faculty of which tolerance in its technical sense would deprive them. But then there has always been something rather odd about the semantics of immunology.

Other investigators, injecting antigens of various kinds into the embryos of chicks or rats, have not succeeded in demonstrating any subsequent impairment of response.¹⁸ The recent work of M. Simonsen¹⁹ may go some way towards explaining why they have failed. All investigators intent upon securing tolerance have been on their guard against injecting their antigens too late in life; Simonsen's work shows that an injection may also fail if it is done too early. Presumably there is some critical period of maturation during which the injection of an antigen will prevent the development of the power of response: if non-living antigens are injected too early, they may be disposed of before that period begins.

The papers delivered at the Royal Society's meeting give a foretaste of the uses to which the technique of inducing tolerance can be put. R. J. C. Harris, for example, has used it in a way that throws important light on the antigenic make-up of the Rous sarcoma virus, and H. Koprowski and his colleagues have used it to cultivate mouse tumours in alien strains, a process which leads to deep-seated cellular transformations of a type which should be studied by all who dream of a genetic theory of asexually reproducing adult cells. The phenomenon of tolerance is not yet explicable by any chemical theory of the immunological response; on the contrary, its ability to explain the phenomenon of tolerance will be a crucial test for the adequacy of any theory that immunochemists may eventually devise.

POLIO FANTASIES

Just over a year has passed since the then Minister of Health and his retinue trooped in front of the television cameras to announce the scheme for poliomyelitis vaccination in Great Britain.¹ The dream-like stage thus set before the arc lights has proved to be more fitting than seemed possible at the time. The medical profession in general was then in the dark about the precise nature of the vaccine, and remained so until the Medical Research Council was permitted some weeks later to issue some detailed information on its production, constitution, and testing.² Meanwhile the Ministry had announced that enough vaccine for 300,000 to 500,000 children would be ready for injection before the end of June.³ Events proved this figure to be optimistic, for so far, a year later, only 200,000 have been vaccinated, and some thousands of these have received only one injection. Fortunately

¹ *British Medical Journal*, 1956, **1**, 220.

² *Ibid.*, 1956, **1**, 566.

³ *Ibid.*, 1956, **1**, 225.

⁴ *Ibid.*, 1956, **2**, 929.

⁵ *Ibid.*, 1956, **2**, 1496.

⁶ *Daily Express*, January 29, 1957.

the poliomyelitis outbreak last summer was a relatively small one. Not only were cases rather few, but as often happens they were patchily distributed. The Medical Research Council had been collecting statistics of reported cases in order to study the efficacy of the vaccine, but before—indeed, long before—the Council could publish an analysis of the figures the then Parliamentary Secretary to the Ministry had mangled them, in an analysis all her own, to the plaudits of a political audience.⁴ In December the Ministry announced that supplies of vaccine were expected to be available from the middle of January,⁵ but when the time came a batch of 200,000 doses was found to be faulty and had to be scrapped. The first news of this appeared in a daily newspaper⁶ as a result of its science reporter's acumen, and the Ministry later issued a statement. Last week the Ministry called a press conference to communicate the melancholy news that 47 vials in the next and latest batch showed an inexplicable change of pH towards acidity. The whole batch must therefore be held back for the time being. How many children can be vaccinated before the poliomyelitis season begins this year is at present conjectural.

The Medical Research Council and the manufacturers are naturally taking every precaution against letting defective vaccine reach the public; their standards, and those prescribed by statute, are such that only a faultless product can, so far as present knowledge goes, successfully pass all the tests. These are not only elaborate and time-consuming but make use of materials, such as live monkeys and tissue cultures, whose variability may be sufficient in itself to vitiate a test even though the product being tested is satisfactory. It is therefore impossible for anyone to predict with certainty, on the resources put into the manufacture of this vaccine, that a batch will be ready at any particular time. The manufacturers hope that another lot will be ready in about two to four weeks, but neither they nor anyone else can be blamed if it is not. What is open to censure is a Ministry that presents genial fantasies of the vaccination programme to the general public. Doubt about the scheme may lead to doubt about the product, while doctors have to suffer the ignominy of being unable to satisfy their patients' falsely raised expectations.

D.D.T. IN MAN

It is natural that concern should be felt about the possible harm to man of the many new chemicals in use to-day for a multitude of homely purposes. The possible toxicity of insecticides is a problem requiring continuous surveillance, according to the report of a Study Group recently convened by the World Health Organization.¹

The group considered the hazards arising from the use of insecticides both in public health and in agriculture. While effective insecticides are of necessity extremely toxic to insects, mammals may not necessarily be so susceptible to their action. An estimate of the acute toxicity or the size of a single fatal dose may be gained from animal experiments, and if no great variation in the sensitivity of different species is demonstrable it is reasonable to conclude that man will be as sensitive as these laboratory animals to any particular insecticide. This may sometimes be demonstrated accidentally as a result of exposure of man while working with insecticides or, more unexpectedly perhaps, as the result of accidental gross contamination of food. A good instance of the latter kind of episode was published in the *Journal* recently.² A large number of people were poisoned by a comparatively new insecticide named endrin which accidentally contaminated some flour subsequently used to make bread. Fortunately no one died, though many had severe convulsions from which they made a rapid and complete recovery. Unfortunately we do not know the actual dose of endrin the victims of this episode consumed.

Acute and subacute poisoning are readily recognizable, and also readily prevented by proper care in handling toxic materials. But concern is often felt that repeated small doses of a toxic material may cause chronic poisoning. This undoubtedly happens when the poison accumulates in the body or produces a progressive and irreversible change in the tissues. However, it remains problematical whether a substance like endrin, for example, which produces dramatic and short-lived effects in a single poisonous dose, can also have a chronic toxic effect when ingested over long periods in quantities that are not obviously poisonous. Endrin is a new insecticide, but for over ten years D.D.T. has been widely used in public health work and agriculture and for the treatment of stored crops. The only undisputed cases of poisoning have followed the ingestion of large doses accidentally incorporated in food.³ Though there is probably some D.D.T. in the food we eat, attempts to find out how much it is have not yet been made in Britain; in the U.S.A. analysis of restaurant meals gave an average D.D.T. content of 0.31 p.p.m.⁴ Conclusive evidence of the absorption of D.D.T. by people not occupationally exposed to it was provided by an analysis of human fat from otherwise healthy people⁵; an average of 5 p.p.m. of D.D.T. was found.

Because D.D.T. has been in use for a long period, and because it is still extensively used for all kinds of purposes, a deliberate study of its effects on man was undertaken by W. J. Hayes and his colleagues⁶ on 51 inmates of a Federal Correctional Institution. Six groups of men, including two control groups, received daily doses of D.D.T. either in a capsule or as an emulsion in milk for periods of up to eighteen months. The daily dose was 3.5 mg. in two of the groups and 35 mg. in the other

¹ *Wild Hlth Org. techn. Rep. Ser.*, 1956, 114, 1956, Geneva.

² Davies, G. M., and Lewis, I., *British Medical Journal*, 1956, 2, 393.

³ Garrett, R. M., *J. med. Ass. Ala.*, 1947, 17, 74.

⁴ Walker, K. C., Goette, M. B., and Batchelor, G. S., *J. agric. Food Chem.*, 1954, 2, 1034.

⁵ Pearce, G. W., Mattson, A. M., and Hayes, W. J., *Science*, 1952, 116, 254.

⁶ Hayes, W. J., Durham, W. F., and Cueto, C., *J. Amer. med. Ass.*, 1956, 162, 890.

two groups. This last dose is about 200 times the dose ingested in the normal daily food. In addition to a general physical examination and a few special tests, many of the subjects submitted to fat biopsy before, during, and at the close of the experiment. The level of D.D.T. in the fat was related to the intake, reaching levels of 200–300 p.p.m. in those subjects on the highest dose, but the amount in the fat did not increase after about the first twelve months of the experiment. This finding agrees with observations on animals. At no time during the experiment did the subjects taking D.D.T. complain of anything that could not be attributed to an easily recognizable cause unrelated to their exposure to D.D.T. These findings are reassuring and to some extent confirm general observations on the safety of this particular material.

Naturally an experiment even of this duration does not cover every possibility. The problem of looking for possible long-term effects in men and women heavily exposed to insecticides was also considered by the exposed to insecticides was also considered by the W.H.O. Study Group. They point out the need for a continued watch to be maintained over the health of populations much exposed to pesticides. This will be a difficult procedure to initiate and maintain, and W.H.O. would require active support from member countries if such a study were ever considered worth making. Meanwhile, however, much more information is needed about the actual degree to which exposure does occur. Although data for American food are available, no comparable figures from other countries have been published. Some of the alarm sometimes expressed about pesticides in food might be allayed if quantitative data on their presence in food were obtained. Exposure arising during the manufacture and application of pesticides has been studied more widely, and the sensitive blood cholinesterase test is informative in cases of exposure to organo-phosphorus insecticides. Hayes and his colleagues used the opportunities provided by their experiment to develop the test for estimating urinary D.D.A. (bis (*p*-chlorophenyl) acetic acid), a water-soluble metabolite of D.D.T. A knowledge of the amount of D.D.A. excreted by a man will give some measure of his exposure to, and absorption of, D.D.T. If tests of this nature could be developed for the other insecticides of this group a valuable tool in preventive medicine would be provided, but success depends on further knowledge of the metabolism of these other insecticides. Experiments on man of the type described by Hayes and his colleagues are not usually performed in Britain, but we might at least make a start in assessing the magnitude of our problem by analysing prepared meals and examining the urine of exposed workers.

TRANSAMINASE IN MYOCARDIAL INFARCTION

The reversible transfer of amino-nitrogen from an amino-acid to a keto-acid in the intermediary metabolism of the body is known as transamination. One of the most active of these transfer processes is catalysed by an enzyme, glutamic oxalacetic aminophenase (trans-

aminase). It is present in many tissues, notably cardiac and skeletal muscle, brain, liver, and kidney. In 1955 workers at the Sloan-Kettering Institute in New York devised a spectrophotometric method for measuring transaminase activity in serum,¹ and they, together with a group at the University of California in Los Angeles, have subsequently defined experimental and clinical conditions in which abnormally high values may be encountered.^{2–6} Levels are raised when muscles or other tissues are extensively damaged—for instance, by certain operations and in particular by myocardial infarction. The levels are persistently abnormal, and often very high, in hepatic and renal disease. Severe brain lesions, such as cerebral haemorrhage, are likely to increase serum activity, though these have not yet been studied in such detail as have other conditions. The consensus of opinion is that serum transaminase remains normal in patients with coronary ischaemia, pulmonary infarction,⁷ and acute abdominal emergencies, the one important exception to the last being acute pancreatitis.⁸

The greatest interest has been aroused in the use of the serum transaminase as a test for myocardial infarction, and we publish this week (p. 555) an investigation by Dr. R. Shabetai, Dr. A. Iglauer, and Miss D. M. Anderson which substantiates much of the previous work. Normal values ranging from 10 to 40 units per ml. of serum per minute are found during the first few hours after infarction. The level then rises to a peak between 12 and 24 hours and gradually returns to normal by the end of the first week. The incidence of false positives and negatives is apparently negligible, though it may be difficult to avoid bias when diagnosis is of necessity retrospective. Perhaps the most important finding is that normal values occur in patients with coronary insufficiency, even during attacks of angina. If this is confirmed and the possibility of false negatives can be ruled out, then serum transaminase tests may be of value when the electrocardiogram is equivocal and other tests such as the white cell count and the erythrocyte sedimentation rate contribute no useful information. Serial values are obviously more useful than a single estimation. There is some evidence that the rise in serum transaminase bears some relation to the amount of myocardial damage, and if it could be applied quantitatively it might be used for assessing management and prognosis.

The disadvantage of the test in myocardial infarction is its lack of specificity. It is possible that other enzymes may prove to be more suitable, and lactic dehydrogenase is being investigated. A simple screening method, based on an enzyme as specific as that used in the latest tests for glycosuria, would certainly be valuable for the general practitioner in those puzzling cases when it is difficult to decide whether infarction has occurred or not.

¹ Karmen, A., Wróblewski, F., and LaDue, J. S., *J. clin. Invest.*, 1955, 34, 126.

² LaDue, J. S., and Wróblewski, F., *Circulation*, 1955, 11, 871.

³ Nydick, I., Wróblewski, F., and LaDue, J. S., *ibid.*, 1955, 12, 161.

⁴ Agrest, C. M., *et al.*, *ibid.*, 1955, 11, 711.

⁵ — Glassner, H. F., and Jacobs, H. I., *Circulat. Res.*, 1956, 4, 220.

⁶ Wróblewski, F., and LaDue, J. S., *J. Amer. med. Ass.*, 1956, 160, 1130.

⁷ Baron, D. N., Bell, J., and Oakley, C., *Lancet*, 1956, 2, 897.

⁸ Chinsky, M., Shmagranoff, G. L., and Sherry, S., *J. Lab. clin. Med.*, 1956, 47, 108.

ANTHRAX INQUIRY

It is nearly forty years since the problem of anthrax was examined in all its aspects, and the present Minister of Labour and National Service has decided that the time is now ripe for a full-scale investigation. As reported at p. 593, he proposes to set up a committee of inquiry "to consider the existing legal provisions concerning the importation of goods infected or likely to be infected with anthrax and the precautions to be taken in connexion with such imported goods for the protection of the health of persons, and to make recommendations." The disinfection of goods likely to be infected with anthrax, especially hides and skins, was considerably hampered in the early days by the possible destruction of their commercial value. The disease affected wool-sorters, furriers, felt-makers, rag-sorters, and others who come in contact with animals or their hides or fur. A departmental committee appointed in 1895 to consider disinfection found it in fact impracticable. It was not until 1921 that the Government Wool Disinfecting Station was established at Liverpool, following the Anthrax Prevention Act of 1919, which gave powers to make arrangements for the compulsory disinfection of materials of specified classes and origins, with certain exceptions—namely, imported goat hair and all goods mixed with goat hair. The Hides and Skins Regulations of 1921, enforceable under Section 79 of the Factory and Workshop Act, did not apply to all tan-yards, irrespective of the nature of the hides and skins, and it is noteworthy that between 1922 and 1926 eight cases of anthrax, one of which was fatal, occurred in workers not subject to the regulations.

The annual incidence of reported cases of anthrax has certainly shown a decline during the last three decades, as also has the number of fatal cases. From 1920 to 1930 the number reported annually varied between 40 and 48, with fatalities ranging from 11 in 1920 to 6 in 1930. Between 1930 and 1940 the annual average was from 30 to 40 cases, with between one and five fatalities, except for 1935, when the number of fatal cases rose to 8. From 1940 onwards the highest number was recorded in 1950 (36 cases, but none fatal), and 1955 showed the lowest incidence since 1946—15 cases, none fatal. In Great Britain, as in the U.S.A., the great majority of cases are cutaneous. This is the so-called malignant pustule, which is not necessarily associated with broken skin, and may develop within twenty-four hours from a small itching papule to a black necrotic sore, followed, in fatal cases, by anthrax septicaemia, sometimes within a few hours. Gastro-intestinal anthrax is usually contracted from the ingestion of spores in food contaminated by the hands, and the pulmonary variety, almost always fatal within four to ten days, from inhalation of infected wool or hair. Intravenous and intramuscular injection of serum of artificially immunized animals has almost entirely replaced surgical removal of the pustule, and penicillin is notably efficacious. Under the existing law not all goods likely to cause anthrax in human beings are subject to prohibition of import, to compulsory disinfection,

or even to rigid compulsory precautions at the factory where they are to be handled. It is to be hoped that the forthcoming inquiry will bring under control all imported goods which bear the risk of transmitting anthrax.

ENDOCRINES AND DISORDERED SEXUAL BEHAVIOUR

For many years opinion has been sharply divided on the causation of disorders of sexual behaviour. The contention that homosexuality, for example, is due to endocrine imbalance was firmly expressed by R. von Krafft-Ebing¹ and subsequently by many others writing after him; and in more recent years the assumption has crystallized that it is due to an oestrogen-androgen imbalance.² On the other hand, many other students of the subject have taken precisely the opposite view—namely, that homosexuality and other disorders of sexual behaviour are the results not of endocrine disturbance but of psychological maladjustments.³⁻⁶ In discussing the endocrinological aspects of homosexuality, G. I. M. Swyer⁷ reviewed the strong evidence against an endocrine causation and came to the following conclusion: "The capacity for sexual response is not primarily dependent upon the sex hormones, and the direction of sexual development is influenced mainly by psychological and environmental conditioning. The levels of sex hormones appear to do little more than modify the intensity of sexual activity. There is no convincing evidence that human homosexuality is dependent upon hormonal aberrations. The use of sex hormones in the treatment of homosexuality is mainly disappointing."

A notable further contribution to the literature on the excretion of hormones by patients with anomalies of sexual behaviour has been made by G. Garrone and S. Mutrux.⁸ These workers studied a group of 50 patients with anomalies of sexual behaviour including homosexuality, pedophilia, and exhibitionism, and sought evidence of suprarenal or testicular dysfunction by determining the urinary excretion of total 17-ketosteroids and their different fractions, 3- α -steroids, formaldehydogenic corticoids, "total corticoids," and 17,21-dihydroxy-20-ketosteroids. With a few exceptions (of more than doubtful significance) the daily excretion of these steroid metabolites did not differ from that of normal men of corresponding ages. The conclusion was therefore reached that this group of patients did not provide any evidence of endocrine disturbance such as could account for their disordered sexual behaviour. This was a careful and extensive study, which adds materially to the now almost overwhelming evidence against endocrine causes, and therefore for psychological causes, of these behavioural disorders.

¹ Krafft-Ebing, R. von, *Psychopathia Sexualis*, 1893, Philadelphia.
² Heller, C. G., and Maddock, W. O., *Vitam. and Horm.*, 1947, 5, 393.
³ Freud, A., *Collected Papers*, 1924, vol. 2, London.
⁴ Adler, A., *Alienist and Neurol.*, 1917, 38, 268.
⁵ Beach, F. A., *J. clin. Endocr.*, 1944, 4, 126.
⁶ Kinsey, A. C., *ibid.*, 1941, 1, 424.
⁷ Swyer, G. I. M., *Practitioner*, 1954, 172, 374.
⁸ Garrone, G., and Mutrux, S., *Schweiz. med. Wschr.*, 1956, 86, 1001.

HARVEY IN SPACE AND TIME*

BY

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Since Andrew Duncan delivered the first of the Edinburgh Harveian Orations in April, 1778, on the 200th anniversary of the birth of William Harvey, there have been many memorable orations on a great variety of subjects. Only about one-fifth of the orations deal directly with Harvey and his work, because the Laws of the Society, very wisely, impose no restriction upon the choice of a topic. Each orator is faced with a problem which becomes steadily more difficult each year.

Every aspect of Harvey's life and doctrine has been subjected to the most detailed scrutiny, not once but many times. Notwithstanding all this, the oft-repeated tale may still prove stimulating to a new generation of "neophytes," as well as refreshing to mature and seasoned Harveians. I have therefore decided to stick to Harvey, and to delineate him against a background of geography and history, space and time. Under the first heading, some account is given of Harvey's three Continental journeys, and, in the second place, an attempt is made to trace the history of his discovery of the circulation and to explain the long delay in its acceptance.

During the past year I have made various pilgrimages in pursuit of Harvey; to his birthplace at Folkestone; his school at Canterbury; Caius College, Cambridge; St. Bartholomew's Hospital; and the Royal College of Physicians of London (though Harvey would scarce recognize any of those scenes to-day); to Oxford, where in the last stages of the Civil War he continued his studies in embryology, using the eggs of a hen which his friend George Bathurst obligingly accommodated in his rooms; and, finally, to Harvey's last resting-place in the little village church of Hempstead in Essex, now perhaps better known as the birthplace of Dick Turpin, the highwayman, than as the burial-place of William Harvey.

How vastly the British scene of Harvey's labours has changed. Abroad, he seems more clearly to fit the picture, especially in Padua, where, though the city is sadly scarred by bombing, one may still see the anatomical theatre where Harvey followed the demonstrations of Fabricius; and the pulpit used by Galileo. Almost certainly Harvey attended the lectures of Galileo, who did for science what Harvey did for medicine, replacing vague argument by accurate measurement.

Let me give you a brief account of Harvey's three visits to the Continent, as the influence of foreign travel upon his lifework is not always fully recognized.

I suppose Scotland at that time (as occasionally to-day) was regarded by the English as a foreign land. Harvey was with the Court when his Royal employer, Charles I, was crowned at Holyrood in 1633, and he came north again in 1634 and 1641.

But those Scottish journeys were so well described by Sir Henry Wade in a recent Harveian Oration¹ that I shall concentrate on the Continental wanderings, so significant in the colourful life of William Harvey.

*Oration to the Harveian Society of Edinburgh, met in the Royal College of Physicians of Edinburgh on June 15, 1956.
¹ Wade, Henry, *Edinb. med. J.*, 1938, 45, 761.

Student Days at Padua

The wandering physician is a familiar figure in history. Hippocrates, Galen, Paracelsus, and others were never very long in one place. The founders of the Edinburgh Medical School drew their inspiration from Leyden; and Sir William Osler, himself a mobile professor, was wont to say that permanence of residence, good for the pocket, was bad for the brain.

Harvey was fully aware of the advantages of study abroad, and it was fortunate for him that after he had taken his degree at Cambridge his father was eager to send him to the Continent and could well afford to finance such a venture. The choice of Padua as his postgraduate school was probably influenced by the fact that John Caius had studied there. To Padua, then, at the age of 19, William Harvey went, taking his degree in 1602, and, as representative of the English "nation," leaving his "stemma" or coat of arms, which was discovered by Professor George Darwin in 1892, in the cloister surrounding the old quadrangle of the University.

Unfortunately Harvey kept no diary, or, if he did, it has long since disappeared. Accordingly, in order to reconstruct for ourselves the Padua of that day we must refer to the records of contemporary travellers.

Boorde, Lithgow, and Coryat

Half a century before Harvey, the agile and versatile Dr. Andrew Boorde (or Borde), he who wrote the first medical book in English to be printed in England, *The Breviarie of Health*, in 1547, had journeyed far and wide, and had written *The First Boke of the Introduction of Knowledge* (1542), which may be regarded as the first Continental guide-book, a lively and informative account which is still well worth reading.

Another early traveller, not a medical man, was the Lanark-born William Lithgow, "lugless Willie," whose ears had been cut off because of a youthful misdemeanour. His book entitled *Rare Adventures and Painful Peregrinations*, 1632,² was very widely read in its many editions, although his information is not always accurate or credible.

More interesting than either of those, and more close to the time of Harvey, was Tom Coryat, son of the Rector of Odcombe, in Somerset. His was one of the most fascinating books of travel, under the title *Coryat's Crudities, Hastily Gobbled up in Five Months' Travels*, etc., and dated 1603, the year after Harvey left Padua. Coryat's description of Padua is interesting, although of course he had no special interest in the medical school. Venice he regarded as the most beautiful of all cities, "The richest paragon and Queen of Christendom," he called it. From there he walked all the way home, about a thousand miles, in one pair of shoes, which he hung up in his father's church, and there they remained for over a century. The exploit is recorded in verses contributed by his friends to the preface of his book. One of them wrote of Coryat,

How he did go at least nine hundred mile
With one poore paire of shooes, saving alone-a
He onely once did sole them at Verona
So that it grew a question whether
The shooes or feete were of more lasting leather.

Coryat mentions the Bills of Health, which, as we shall see, caused Harvey so much annoyance, and he may have

² The full title is: "The Totall Discourse, of the Rare Adventures, and painefull Peregrinations of long nineteene Yeares Travayles, from Scotland to the most Famous Kingdomes in Europe, Asia, and Affrica."

³ "Coryat's Crudities, hastily gobbled up in five moneths travells in France, Savoy, Italy, Rhetia commonly called the Grisons country Helvetia alias Switzerland, some parts of high Germany and the Netherlands: Newly digested in the hungry aire of Odcombe in the County of Somerset, and now dispersed to the nourishment of the travelling Members of this Kingdome."

been the first to introduce into England forks and umbrellas.⁴ He wrote, "The Italians cannot endure to have their food touched with the fingers, and do always use a little fork, of iron or steel or sometimes if they are gentlemen, of silver. Many do carry things they call umbrellas that minister shelter against the scorching sun." But let us return to Harvey.

There can be no doubt that the years in Padua had a profound influence upon his career. His teacher, Fabricius of Aquapendente, was a worthy successor of Vesalius, Colombo, and Fallopius. The work of Fabricius on the valves of the veins may well have initiated in the mind of young Harvey that train of thought which led to so spectacular a discovery.⁵

During the twenty-five years or so following his return from Padua, Harvey was busily engaged in London, as physician to St. Bartholomew's Hospital (1609), and in private practice, as Physician to the King, and as Lumleian Lecturer to the College of Physicians (1615). His title, be it noted, was that of Professor of Anatomy and Surgery. This period culminated in the publication of his book in 1628.

The Second and Third Continental Journeys

Harvey's second Continental journey took place in 1630, when he was chosen to accompany a wealthy young nobleman, the Duke of Lennox, on a grand tour of France and Spain. It was hoped to include Italy, but the visit was cancelled on account of plague. Of this tour there exists only the scanty detail contained in a letter from Harvey to Lord Dorchester. He writes from Spain, in a letter which reveals his inquiring mind, "We could scarce see a dog, crow, kite or raven or any other bird or anything to anatomise; only some few miserable people the relics of war and plague where famine had made anatomies before I came."

A few years later, in 1636, Harvey had the good fortune to make his third Continental journey, and of this tour we have a clearer record, revealed in a number of letters which came to light in 1911: letters from Harvey to Basil Fielding, afterwards Earl of Denbigh, who was, at the time, English Ambassador at Venice.

After he performed the famous post-mortem examination of Thomas Parr, the old countryman aged, or said to be aged, 152 years, who was brought from Shropshire to London by the Earl of Arundel, Harvey was invited by the Earl to accompany him on a political mission to Vienna, ostensibly an embassy, but also an expedition to acquire art treasures for the King. Harvey, a patron of the arts, and an expert critic, readily assented.⁶ The party left England on April 7, 1636, sailing from Margate in the ship *Happy Entrance*, and landing in Holland. They proceeded up the Rhine, then up the River Main, "in a boat drawn by nine horses." It was a leisurely journey, and Harvey had plenty of time to make observations on strange trees and plants, and would often wander so far that the Ambassador was angry with him, as there was real danger from thieves and wild beasts. Coryat, who had travelled by the same route, records the prevalence of robbers, and advises all travellers to carry a stout stick. At length they reached Frankfurt on May 3, and then Nuremberg May 11 to 22, where Harvey demonstrated the circulation of the blood to the Professor of Anatomy, Caspar

⁴ "Coryat's Crudities": *A Continental Tour in 1608*, by Douglas Guthrie. University of Edinburgh Journal, Autumn, 1943.
⁵ The Hon. Robert Boyle had an interview with Harvey in later years, and was told that this was so. It is mentioned in one of the rarest of Boyle's works—*Disquisition about final causes of natural things*, 1688, p. 159.

⁶ The journey is described by William Crowne, a member of the expedition, in a little book of 70 pages which is now rather rare. It is entitled "A true relation of all the remarkable places and passages observed in the travels of the Rt. Hon. Thomas Lord Howard, Earl of Arundel and Surrey, Premier Earl and Earl Marshall of England, Ambassador Extraordinary, etc. (1637). A more modern and extensive account is given in *The Life, Correspondence, and Collections of Thomas Howard, Earl of Arundel*, by Mary S. Hervey (1921), Ch. XXVI, pp. 357-395, which describes "The Great Embassy to Germany."

Hoffmann, who had been his fellow-student at Padua, but who was among those who misunderstood the discovery, saying that it was "contrary to the wisdom of Nature." "I beg you to observe," Harvey had written, "and to see the thing with your own eyes." Nevertheless Hoffmann remained unconvinced, and asked such stupid questions that eventually Harvey laid down his knife and left the theatre.⁷

Harvey in Quarantine

The second misfortune of this tour was of an entirely different nature. On the return journey from Vienna, Harvey had left the main party at Augsburg with the intention of travelling to Italy. He went by way of Munich and Innsbruck, then over the Brenner Pass, and on to Treviso on August 3, where, he writes, "I have received a very unjust affront." It was alleged that he had passed through a plague-stricken area without having his Bill of Health or "sede," the all-important passport, duly countersigned and cleared. Harvey, detained for this reason, writes to Lord Fielding, who expects him at Venice, "I am fallen into the hands of a base and evil people, and while they delight to exercise their tyranny, I am to lie in the open fields for God knows how long, and I fear it will do hurt to my health."

As a result of this letter Harvey was offered a roof and a bed, but this he declined, as he said "such offers were unseasonable, like physick when a man was dead"; and his next letter, on August 16, to Lord Fielding is even more doleful. "Their manners and cruelty have been shameful and I now have a sciatica that maketh me lame. I have never longed for anything so much as to be gone from this base place." It is difficult to understand why Harvey, then aged 58, a medical man, and a person of importance, should have been singled out and virtually imprisoned in quarantine for about a month. England was not held in high esteem on the Continent at that time. Perhaps the delay explains why Harvey did not return to visit his old friends at Padua. Besides, the thirty-five years which had elapsed since his student days must have brought many changes, and it is often very depressing to revisit the old scenes of one's youth.⁸

Eventually set free, he did reach Venice, where his reception was very different, as the next letter, dated from Florence on September 7, states, "I can never forget your many favours and your kind entertainment at Venice." He was joined at Rome by his friend Dr. George Ent in October, and although we have little knowledge of the homeward journey, we are told that Harvey visited the School of Anatomy at Leyden, that he had a rough crossing from Rotterdam, and that he landed at Deal on December 27, 1636.

Aubrey, who is at best a gossipy biographer, states that Harvey made a fourth journey to the Continent in 1649, but of this we have no certain knowledge.

The Slow Acceptance of Harvey's Discovery

Now let us turn to another aspect of Harvey's activity—namely, his work on the circulation of the blood, and the events which followed its publication. The foregoing references to Harvey as a traveller may be regarded as a fitting introduction to the adventures of his famous book and the curiously tardy acceptance of his great discovery.

⁷ The most significant reference of recent date to this journey is the paper by Sir D'Arcy Power on "A Revised Chapter in the Life of Dr. William Harvey, 1636," in *Proceedings of the Royal Society of Medicine*, Sect. Hist., 1917, x, 33. Sir D'Arcy suggests that the demonstration to Hoffmann may have taken place on the homeward journey, when Nuremberg was again visited, from November 10-13.

⁸ *Eleven Letters of William Harvey to Lord Fielding, June 9-Nov. 15, 1636*. Purchased from the Earl of Denbigh and presented to the Royal College of Physicians by Sir Thomas Barlow, Bt., President: October 18, 1912.

Comments upon the letters are given in a chronicle of the family of Lord Fielding called "Royalist Father and Roundhead Son, being the memoirs of the first and second Earls of Denbigh, 1600-1675," by Cecilia, Countess of Denbigh (1915). Chapter VI, pp. 111-121, deals with "The Tribulations of Doctor Harvey."

I do not propose to refer in detail to his second work, *De Generatione*, 1651, dealing with those researches which arose quite naturally as a sequel to his work on the circulation, which occupied many years and which was eventually published in 1651, at the urgent request of Harvey's friend Sir George Ent. This work advanced embryology as far as that science could have gone without the aid of the microscope. Harvey, who laid great stress upon comparative anatomy, tells us that he used "a magnifying glass" to study the prototype of the heart in insects, shrimps, and other creatures, but he was not familiar with the microscope. It was left to Malpighi in 1661, and to Leeuwenhoek in 1674, to supply proof of the existence of the capillaries which Harvey presumed to exist as "pores in the solid parts, permeable to the blood, connecting the arteries with the veins" (*De Motu*, Ch. XI).

Harvey's masterpiece, the *Anatomical Disquisition on the Motion of the Heart and Blood in Animals*, often called for short, *De Motu Cordis*,¹⁰ published at Frankfurt in 1628, was printed on poor paper and was full of printers' errors. As an example of book production it ranks very low, but as a clear, brief, and logical account of the author's researches it is beyond praise.

The first English translation appeared in 1653 and the first Dutch edition in 1650. Other translations were much later products—German 1878, French 1879, Russian 1927, Danish 1929, and Spanish 1936. I can find no translation into Italian—a strange yet significant fact.

You will recollect how Harvey begins his "Disquisition" with a concise review of the existing knowledge, although, as he tells us in the preface, he has no intention of making a large volume. "I teach anatomy," he writes, "not from books but from dissections: not from the positions of philosophers but from the fabric of nature." Then he proceeds to defend the three propositions of his thesis, and to develop and expound the argument which you all, as Harveians, know so well.

As we read this little classic, the most important medical book every written, we find the discovery so plainly set forth that we marvel why it was not immediately accepted. The philosopher Thomas Hobbes said that Harvey was one of the few pioneers who saw his discovery universally accepted during his lifetime; but this is hardly true. Indeed, the real significance of Harvey's work in the practice of medicine was not apparent for at least two centuries, and it took about fifty years before those best qualified to judge, the anatomists and scientists, appreciated its significance.

Delay in Publication

Why this long delay in the acceptance of a truth so obvious? For the first part of the delay the discoverer himself was responsible. Harvey had not rushed into print. Darwin waited 20 years, Jenner 18 years, and Lister 8 years before publishing their results. Their work was not fully appreciated for many more years. Lind's recommendations for the prevention of scurvy were ignored by the Royal Navy for 43 years.

Harvey, from the first, made no secret of his discovery. He lectured on the circulation, as Lumleian Professor to the College of Physicians, for 12 years before stating his views in print. Thus when the book did appear some of his pupils and friends were ready to accept the new teaching, but others regarded Harvey as a crank. As Aubrey remarks, "Twas believed by the vulgar that he was crack-brained and he fell mightily in his practice."

It is sometimes said that Harvey's discovery was a mere accident, that all the evidence was there, awaiting the genius who would grasp the opportunity of assembling the facts.¹¹ There could be no greater error. Since student days at

¹⁰ *Exercitatio anatomica de motu cordis et sanguinis in animalibus*.

¹¹ The full story is admirably discussed in a series of papers by the late Dr. H. P. Bayon, entitled *William Harvey, physician and biologist: his precursors, opponents and successors*, in *Annals of Science*, 1938-9.

Padua, and perhaps even then, Harvey had been continuously at work building up his argument and confirming each step by observation and experiment. His novel methods of investigation, so revolutionary in his day, and so different from the bookish methods of his predecessors, were in themselves deterrents to the acceptance of his results. It cannot be too strongly stated that Harvey had not only discovered the circulation of the blood, he had proved the efficiency of the scientific method in medical research, a proof which was to be stated even more clearly by Claude Bernard more than two centuries later. The discovery of a principle is always more important than the discovery of a fact, as it leads to further advances. Ehrlich's discovery of chemotherapy outshone his introduction of salvarsan as the remedy for syphilis. Lister's use of the antiseptic method was much more outstanding than was his use of carbolic acid, because here was a new principle, not just a new remedy. That is one reason for the long delay in belief in the circulation of the blood.

Tenacity of the Old Idea

And there is this further point—not only did the new discovery arise from the application of new methods of research; it could be accepted only by those who were prepared to discard the old beliefs. Before the new idea could be approved it was necessary to disprove the old. And at that time the dead hand of Galen still lay heavy upon medical science, if indeed it could be called "science." Prior to Harvey's day it was known that the blood moved, but with an ebb-and-flow motion in the veins, like the tides of the sea. The heart was not regarded as a pump; it drew to itself the blood as it dilated; in other words, diastole, not systole, was the important movement. The liver, not the heart, was the central organ concerned in the production and movement of the blood. It was thought that there were two kinds of blood—the dark variety, which originated in the liver and carried nourishment to the body, and the brighter-coloured blood, which came from the heart and supplied heat. The blood conveyed three kinds of spirit—natural, animal, and vital. The ideas were all very obscure and very hypothetical. It is to the credit of Servetus, the only real predecessor of Harvey, that he discovered that natural spirit and animal spirit were one, and that they became transformed into vital spirit in passing through the lungs.

Harvey himself stated that the cause of the change of colour was that the blood was "strained" as it passed through the lungs, just as earlier anatomists thought that the blood was strained, and thus altered in some way, as it oozed through the pores between the right and left ventricle of the heart. The foetal circulation was also ill understood, and Botallo (of Paris) in 1565 had added to the confusion by describing as a normal appearance a persistent foramen ovale which he found in an adult body.¹² It is true that Vesalius had shown that the septum between the ventricles was not porous; but the new anatomy of Vesalius had not been entirely accepted, and ancient textbooks with the Galenic descriptions were still in use. Many contemporary anatomists—Alexander Read at Barber Surgeons' Hall, Crooke and Collins at Cambridge, and Winston at Gresham College¹³—simply ignored Harvey's doctrine, and continued

¹² Castiglioni, A., *A History of Medicine* (Eng. trans.), New York, 1941, p. 428; Willins, F. A., and Dry, T. J., *A History of the Heart and Circulation*, Philadelphia, 1948, p. 45. (A pioneer in the anatomy of the foetus was Giulio Cesare Aranzio (1530-89) of Bologna.)

¹³ *The Reception of Harvey's Doctrine of the Circulation of the Blood in England as exhibited in the writings of two contemporaries*, by Sir Humphry Rolleston, in *Essays on the History of Medicine*, Sudhoff 70th Birthday Volume (1924). The two contemporaries are Winston and Power, and they illustrate the two extreme points of view. Thomas Winston, 1575-1655, repeats the description of pores in the septum which "cannot be seen in dead bodies because they fall together," but which serve to "strain" the blood. Henry Power, 1623-68, on the other hand, repeated and confirmed Harvey's experiments, and showed that "the partition wall is firm and compact, and absolutely devoid of any perforations."

to teach along the well-worn lines, refusing to abandon the old ideas. Others were actively opposed to the new explanation, for various reasons, and often for very little reason at all.

For example, there were the clinicians, the so-called "practical" folk, who asked what was to be the use of this teaching. Did it really matter which way the blood moved? Had the so-called discovery saved any lives? According to the loquacious Dean, Gui Patin, of Paris, it was simply "an ingenious piece of fiction." This demand for a clinical outcome of his discovery was anticipated by Harvey when he wrote, "Many questions in medicine, physiology, pathology, and therapeutics can be answered by the truth we have declared, on which I might expatiate, but my whole life would not suffice for the completion of the work." More than once he refers to his "Medical Anatomy, or Anatomy in its application to Medicine." Perhaps this manuscript, like his notes on the Generation of Insects, was lost when the College library was destroyed by fire or when his rooms in Westminster were raided by a mob during the Civil War: "Rapacious hands stripped my house of its furniture, and, a subject of far greater regret to me, my enemies abstracted from my museum the fruits of many years of toil." Those were calamities which he greatly deplored.

Thus was the propagation of Harvey's doctrine delayed, a very different state of affairs from that which obtains to-day, when the discovery of a new antibiotic reaches the practitioner almost in advance of its time and with a speed which may even be dangerous.

Early Printed Criticisms

One of the earliest critics of Harvey to state his views in print was James Primerose (Primrosius), a physician of Hull who had studied under Riolan in Paris, and who evidently wrote for the sake of writing, upholding the older views in a work printed in 1630.¹⁴ He would probably have attracted little attention had he not been answered in a thesis at Leyden, *De circulatione*, by Roger Drake, a Cambridge student who upheld Harvey's views. Drake was supported by one of his teachers, Hendryk du Roy (Henricius Regius), of Utrecht, who entitled his work "A sponge to wash away the dirt of Primrosius,"¹⁵ which called forth from Primerose a reply headed, "An antidote to the poisonous sponge of Henricius."¹⁶ Both are dated 1640.

Another antagonist of Harvey was Emilio Parigiano (Parisianus), of Venice, who was answered with more dignity by Dr. George Ent, Harvey's lifelong friend, in his work, *An Apology for the Circulation of the Blood*, 1641. Harvey took no part in those controversies, well knowing that none of the critics had taken the trouble to really understand his views, and that they based all their arguments on the old conception. The only critic who received a detailed reply from Harvey (a reply printed in English editions of *De Motu Cordis*) was Jean Riolan, of Paris, who had been his fellow-student in Padua. When Riolan remained unconvinced Harvey wrote a second letter in rather stronger terms. The duel of words ended in 1690, when Pierre Dionis, a supporter of Harvey and a teacher of his doctrine, assumed the Chair of Anatomy in Paris.

The famous anatomist Thomas Bartholin, 1616-80, was the first to introduce the knowledge of the circulation into Denmark,¹⁷ but he did not do so wholeheartedly, as he described in his textbook, *Institutiones Anatomicae*, 1641, both the old and the new view, apparently leaving the reader to form his own judgment. Harvey's views are contained in a Supplement by Jan de Wale (Walaesus), of Leyden.

¹⁴ Flourens, P., *Histoire de la Découverte de la Circulation du Sang*, 1854.

¹⁵ Regius Henricius, *Spongia pro eluendis sordibus animadversionum J. Primrosii*, Leyden, 1640.

¹⁶ Primrosius, Jacobus, *Antidotum adversus spongium venatum Henrici Regii*, Leyden, 1640.

¹⁷ Gottfredsen, E., *The Reception of Harvey's Doctrine in Denmark*, *Acta med. scand.*, 1952, 142.

Spain was one of the last countries to accept the new knowledge. It has been said that Harvey's work was banned by the Inquisition, but I have been unable to discover the source of this statement. Even in the eighteenth century, Galenic anatomy was still taught in Spain, and Professor Izquierdo, who in 1936 undertook the first translation of *De Motu* into Spanish, tells us that while Sobremonte, in 1649, and Morello, in 1678, accepted and wrote upon the Harveian view, Piquer, of Valencia,¹⁸ as late as 1751, was antagonistic, and still taught the older idea. Izquierdo also states that the first book on physiology written and printed in the New World in 1727 was the *Cursus Medicus Mexicanus*, by Salgado, of Los Angeles.¹⁹ It gave "a confused idea of the circulation," and probably the author had never seen Harvey's treatise. Nevertheless, Salgado's work was still used as a textbook at the end of the eighteenth century.

Harvey's First Supporters

From those critics, most of them slaves of the age-long teaching, and sworn Galenists, it is a relief to turn to those who were ready to free themselves from the influence of Galen, and to accept the new view regarding the circulation, or at least to ascertain for themselves by experimental methods whether it could be true. Of those supporters, one of the first was Robert Fludd, a man four years younger than Harvey, who was a leader of the so-called Rosicrucians, and whose mystical works were printed in Frankfurt by William Fitzer, who also published Harvey's masterpiece.²⁰ In his *Integrum Morbium*, of 1631, Fludd makes a favourable reference to the discovery of the circulation.

René Descartes, in his *Discours de la Méthode*, 1637, accepted Harvey's principles, and so did Francis Glisson, whose classic work on the liver, *Anatomia Hepatis*, 1654, reinstated the liver in correct perspective. As early as 1639 the renowned Francis de la Boe (Franciscus Sylvius) was giving demonstrations of the circulation, in dogs, to his class at Leyden.

Werner Rolfinck, of Jena, was a well-known anatomist who in 1641 believed and taught that the blood circulated, while Nathaniel Highmore introduced the new discovery into his book on anatomy, dedicated to Harvey, which gives one of the earliest descriptions of the circulation.²¹

Sir Thomas Browne, whose view must have carried weight, said that he regarded Harvey's discovery as better than the discovery of America, and few to-day would disagree with that opinion.

Of course the most helpful of the critics were those who took the trouble to repeat Harvey's experiments rather than merely argue about them. Such a one was Hermann Corning, of Helmstadt, whose book, *De Sanguinis Circulatione*, 1643, brought strong support to the doctrine, as also did the work of Henry Power, one of the first to use the microscope, whose experiments are described in his *Microscopical Observations on the Lamprey*, 1664 (see footnote 13). This, surely, was the only true method of appraising Harvey's work, by repeating his experiments, by applying to his results the method which he himself used to secure them.²²

No reference to Harvey's discovery is complete without some mention of the controversy regarding priority which continues unabated to this day, especially, perhaps, in Italy. All manner of absurd claims have been made, often on very slender evidence: that the circulation was known to the ancients—to the early Chinese and to Hippocrates, to

¹⁸ Piquer, Don Andres, *Institutiones Medicae*, Madrid, 1751.

¹⁹ Izquierdo, J. J., *Harvey, iniciador del metodo Experimental*, Mexico, 1936.

²⁰ Weil, E., "William Fitzer, the publisher of Harvey's *De motu cordis*," *Library*, 1944, 24, 142.

²¹ Highmore, Nathaniel, *Corporis humani disquisitio anatomica in qua sanguinis circulationem . . . prosequitur est*, 1651.

²² There is an unpublished manuscript (Sloane MS., 1543) in the British Museum dated 1652 in which Henry Power describes experiments to demonstrate the circulation, performed by Harvey in 1614, two years before the usually accepted date of the discovery.

Arabian physicians and to a numerous band of anatomists, mainly of Italian birth, who lived shortly before the time of Harvey. The confusion of ideas was increased by frequent misinterpretation of the word "circulation," which at first simply denoted movement. Everyone who has driven a car in France must be familiar with the policeman swinging his baton and urging the traffic to move on. "Circulez, circulez," is his order.

Late Claims for Priority

It is sometimes forgotten that nothing was said of other claims to the discovery until Harvey's view was beginning to meet with general acceptance, about 1650. Not one of the earlier critics claimed that the circulation of the blood was already known, or had been discovered by someone else before Harvey.²³ The claim of Cesalpino was mentioned for the first time in 1655 by Nardi. There is a statue of Cesalpino in Rome, proclaiming him to be the discoverer of the circulation of the blood. This claim was followed by allegations that the discovery was made before the time of Harvey by Colombo, Ruini, Servetus, and others. It is true that Servetus had discovered the lesser circulation, as also had Colombo and the thirteenth-century Arab physician Ibn Nafis, whose work has come to light recently. But both Servetus and Colombo adhered to the pre-Vesalian anatomy: they believed that the blood was prepared in the liver, and then flowed through the heart to the veins.

The interest of Servetus in the blood stream arose from his desire to find a habitat for the soul. The physiological work of Servetus was first quoted by William Wotton in 1694²⁴; it had attracted no attention until then. The trend of Servetus was to theology rather to physiology, and it was on account of his Unitarian views that he suffered martyrdom in 1551. Edinburgh University, possessing one of the three surviving copies of his *Restitutio Christianismi*, has a peculiar interest in Servetus. Further discussion of those claims for priority of discovery, which continue to this day, would carry us far from the present theme—namely, the reasons for the long delay in the acceptance of the circulation of the blood.

Conclusions

An attempt has been made to explain this delay, which arose from a variety of causes. These may be summarized in conclusion as follows:

1. The so-called "practical" physicians of Harvey's time, who demanded that every new discovery should be immediately applicable as a life-saving or health-restoring measure, regarded the circulation of the blood as a matter of academic importance only.²⁵
2. The refusal to abandon the fixed age-long traditions, dating even from the days of Galen, prevented many from accepting, or even from studying for themselves, a conception so contrary to current opinion.
3. The new doctrine of the circulation involved not only a change of view regarding the motion of the heart and blood but also a revolutionary change in methods of investigation; a completely new outlook; the replacement of scholastic argument by direct observation and experiment. The change was so staggering that it could hope to gain acceptance only by slow degrees.

The delay in the acknowledgment of the circulation of the blood was a phenomenon peculiar to the age in which Harvey lived.

²³ Johannes Antonides Van der Linden, 1609-64, a famous Dutch physician, did all he could to discredit Harvey, and stated that it was George Heriot, 1563-1624, jeweller to James VI of Scotland, who first suggested to Harvey the idea of the circulation of the blood.

²⁴ Wotton, William, *Reflections upon Ancient and Modern Learning*, 1694.

²⁵ At first Harvey's doctrine exercised a more profound effect upon biology than upon medicine; it formed a starting-point for a vast number of further biological investigations.

Few were prepared to write, as Abraham Cowley did:

Thus Harvey sought for Truth in Truth's own book
The Creatures which by God himself was writ
And wisely thought 'twas fit
Not to read Comments only upon it
But on th' Original itself to look.

The experimental method of investigation, as novel to Harvey's critics, is now familiar to the most junior medical student. It has long since ceased to be a matter for argument. Moreover, increased facilities of transport and communication have made it possible for a new discovery to be known throughout the world in a matter of hours. Within a few weeks, or months at most, each addition to the existing knowledge is examined and assessed at its true value. Indeed, the speed of integration of new discoveries and new ideas has become almost terrifying. Thus, it is not only right and proper, but even salutary, for us to turn back the pages of history, to recall Harvey's experience, to assess his achievement, at this Festival when we are met to honour his memory.

Reports of Societies

HOW MANY HOSPITAL BEDS?

A FRESH APPROACH

The capital cost of providing one new hospital bed in Britain is now about £4,000. This fact was the background to two papers read to the Medical Section of the Royal Statistical Society at a meeting at Westminster Hospital on February 26. Dr. A. T. ELDER, deputy C.M.O., Ministry of Health and Local Government, Northern Ireland, described the use of "case-load" studies in estimating a community's need of beds. Mr. D. J. NEWELL, who is a lecturer in statistics at Durham University, dealt with the question of beds for emergency admissions, and was able to offer a novel solution to this knotty problem.

"Pooled Discharge Wards" and Emergency Beds

How many beds should a hospital keep for emergencies? What figure most nearly combined maximum preparedness with maximum economy? Mr. NEWELL had studied emergency admissions at a non-teaching hospital in the North-eastern Region. The number of such admissions, he said, followed a well-known statistical pattern, the "expected" level remaining remarkably constant on week-days throughout the year and only falling slightly on Sundays. Using this finding as a basis, he was able to show that each day a "unit" must set aside two more beds than the expected number of daily emergency admissions if it was to keep the chance of refusing a patient (or putting up an extra bed) below 5%. If, for example, a hospital had 10 units—and for this purpose male and female wards must be counted separately—each of which expected an average of two emergency admissions a day, then the hospital must set aside 40 beds every day. In these circumstances, on an average day about half the beds would be wasted. These calculations assumed that emergency admissions were not interchangeable between the units. But if all the emergency admissions, regardless of sex and specialty, went into a special ward set aside for the purpose, it would need only 22 beds to cope with the "expected" figure of 20 admissions a day—a daily saving of 18 beds.

Mr. Newell went on to point out the obvious disadvantages of such a "pooled admissions ward"—for example, the difficulty of providing special facilities and methods of nursing for all types of emergencies, and the dislocation involved in moving a patient at what was perhaps a critical stage in his treatment. In its place Mr. Newell suggested a

"pooled discharge ward." He calculated that in any hospital perhaps 10% of patients at any given time were known to be ready for discharge within a few days. If a ward were to be set aside for such patients, then the procedure would be that as soon as an emergency patient was admitted to the hospital a place would be found for him in the appropriate ward by transferring a patient to the "discharge ward." This ward would not need the same special facilities as would an admission ward; but it would need to have provision for male and female patients in any proportion. On a day when emergency admissions were normal they would be balanced by normal discharges from the discharge ward, but if there was an excess of emergencies a few patients from the discharge ward would have to go home a day or two earlier than planned. The effect of the scheme would be to transfer the difficulties and uncertainties involved in the admission of emergency patients from one end of their stay to the other, with, as Mr. Newell claimed, many advantages from the point of view of both the patient and the hospital. Mr. Newell emphasized that many administrative difficulties remained to be solved before such a scheme could be put into practice; in particular the discharge ward must not be made a dumping ground for patients who would not go home.

"Case-load" Studies

Dr. ELDER began by describing some of the studies made in Britain during the past 20 years to determine the ideal number of hospital beds per head of population. Estimates varied widely, but many of the differences were due to differences in definition. Taking "acute" beds only, and excluding those in maternity departments, there was some measure of agreement on a figure of 6-7 beds per 1,000 of population. The ideal figure for a particular community could only be determined, however, by studying existing hospitals and attempting to assess how far they met the community's needs. This involved a certain amount of mathematical juggling with average lengths of stay, turnover intervals, percentage occupancy, and lengths of waiting-lists. Dr. Elder then proceeded to give the results of some case-load studies he had made on these lines in Northern Ireland. The calculated requirements did not always agree with those made on general grounds by the people on the spot, and Dr. Elder gave examples to show how illuminating the comparison was in particular instances. The method was still in its infancy, but Dr. Elder felt that it had much to offer. An extension of the problem was to forecast the needs for 10 years ahead; this was obviously very much more difficult, particularly, for example, in the fields of tuberculosis and maternity. The demand for maternity beds depended largely on what length of lying-in was thought desirable at any given time.

In the discussion after Dr. Elder's paper many speakers pointed out the limitations of the "case-load" method of analysis: the differences between specialties, the uncertainty of what is meant by the length of a waiting-list, and so on. It was stressed that in forward planning flexibility offered the best chance of economy; in particular the provision of "bi-sexual" wards was urged.

DISORDERS DUE TO HEAT

Some new ideas on the role of water and salt in the production of heat cramps and heat exhaustion were put forward by Dr. W. S. S. LADELL at a meeting of the Royal Society of Tropical Medicine on February 21. Dr. Ladell was until recently in charge of the Hot Climate Physiological Research Unit at Lagos in Nigeria.

Dangers of Salt

Heat exhaustion and heat cramps were probably due to the strain of extra effort in a person chronically slightly

short of water, he said. At one time salt deficiency was thought to be the major factor, but now he believed that water debt—in people who consistently drank too little—was the predisposing cause. When it was hot, extracellular fluid was lost first. About two litres could be spared before the intracellular water was affected. The loss of much extracellular water made a person susceptible to heat exhaustion, while depletion of intracellular water was definitely dangerous.

The role of salt was complex. In the state of water debt, if water were taken but no salt, the intracellular fluid would be maintained and any deficit fall on the extracellular fluid; if, however, salt were taken, particularly in the absence of enough water, the intracellular fluid volume fell and the extracellular fluid volume was maintained at the expense of the intracellular fluid. This intracellular dehydration led to collapse. Treatment consisted in giving plenty of water and a controlled supply of salt; excess of salt would deplete the intracellular fluid and make the patient worse. Therefore in persons in slight but chronic water debt extra salt should never be taken, except in a sudden emergency demanding an extra output of sweat, and then only if ample water was drunk at the same time. Moreover, extra salt might also depress aldosterone secretion, and this could be dangerous. Man, said Dr. Ladell, had become addicted to salt as a habit, not as a necessity in the amounts normally consumed.

Tropical Asthenia and Heat Hyperpyrexia

Tropical anidrotic asthenia was seen at the end of the hot season; there was no collapse, but lack of energy, failure to sweat properly, and polyuria. The symptoms could be explained, first, by failure of the renal tubules to respond to antidiuretic hormone, which would lead to excessive production of that hormone, and this might suppress sweating. Secondly, there was diminished activity by the adrenal cortex, which resulted in electrolyte imbalance and asthenia. The condition was often associated with prickly heat or lichen tropicalis. The only satisfactory treatment was prolonged rest in the cool.

Heat hyperpyrexia, however, seemed essentially a physiological, not a pathological, process. Its aetiology was not clearly understood, but it might be related to "sweat-gland fatigue" (which, being reversible, was not true fatigue). Experiments had shown that the response of the sweat glands in the normal person became progressively less as the rectal temperature rose, and a critical point could be reached—for instance, after hard work in the heat, or if physiological cooling was prevented by too many clothes or lack of ventilation—at which sweating stopped and cooling ceased, with rapidly fatal results if untreated. Treatment consisted in cooling the patient by tepid sponging, wrapping in wet towels, and the use of fans to accelerate evaporation.

In the discussion Lieutenant-Colonel J. H. WALTERS quoted a series of cases of heat hyperpyrexia seen in Iraq and Kuwait. Some of the patients were middle-aged pilgrims or fat coolies, subject to great heat stress, and some were men with arsenical dermatitis after treatment for syphilis; in the latter sweating was inhibited. There might be an element of acute anoxia in heat hyperpyrexia, he thought, which would indicate the use of oxygen in treatment. In some patients who recovered there was evidence of serious damage to the nervous system. Major-General A. SACHS recalled the pathological findings in hyperpyrexia—haemorrhages into the suprarenals and cerebellum and circulatory collapse.

Mr. GEORGE WILSON, librarian of the Manchester University medical library, has been made an honorary member of the Manchester Medical Society. He has been associated with the Society's library, which forms a part of the university medical library, for more than forty years.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Erythromycin, Spiramycin, and Oleandomycin

SIR,—The time lag between the introduction of some of the newer antibiotics into the United States and into this country has not been without its advantages. We have been able to profit from American experience and possibly to avoid some of the American pitfalls. Especially has this been the case with erythromycin. The unrestricted use of erythromycin in one hospital in the United States was attended by the appearance of resistant strains within a month, and after five months the carriage rate for erythromycin-resistant staphylococci had reached 70%.¹ From other centres two years after the introduction of the drug 7% to 10% of hospital staphylococci were reported to be resistant.^{2,3} This experience does not appear to have been paralleled in this country. After 2½ years of use in the United Kingdom there have been, as far as we are aware, only two isolated reports of the development of erythromycin-resistant staphylococci.^{4,5} A variety of factors have no doubt contributed to our more favourable experience, among them stricter limitation of use, adequate dosage over short periods only, and the avoidance of local preparations. Thus in this country erythromycin remains an extremely valuable antibiotic, and, if used with intelligence and discretion, there seems to be no reason why it should not continue to be so for years to come.

It is therefore disturbing to find that there is a danger that such a valuable therapeutic weapon may be struck from our hand before we have had a chance to put it to full use. It has been reported that at least some degree of cross-resistance exists between erythromycin and both spiramycin and oleandomycin, and there is also evidence that the latter antibiotics are less effective than erythromycin.⁶ Spiramycin and oleandomycin have now been made generally available. In one commercial preparation oleandomycin is combined with tetracycline in the ratio of one part to two. Finland and Wilcox⁷ have shown that the combining of two antibiotics does not prevent resistance in the presence of an organism which is resistant to one of them. About 10% of hospital staphylococci are resistant to tetracycline, and it thus seems likely that the use of this combined preparation against these will result in the exposure of organisms already tetracycline-resistant to low concentrations of oleandomycin, encouraging the development of oleandomycin-resistance. Under these circumstances the very organisms for which erythromycin may be specifically needed—those resistant to the tetracyclines—may, because of cross-resistance between oleandomycin and erythromycin, be rendered erythromycin-resistant.

There would thus appear to be a great need for controlled trials to determine which, among the antibiotics erythromycin, spiramycin, and oleandomycin, is most effective, and for comparative investigations as to which is least likely to induce drug resistance. Until further evidence on these and other points is available the widespread use of all three antibiotics would appear to be fraught with danger, and there is likely to be a very real risk that in extending our antibiotic armamentarium we are in fact reducing it.—We are, etc.,

J. O. FORFAR.
A. F. MACCABE.

REFERENCES

1. Lepper M. H., Dowling H. F., Jackson, G. G., Moulton, B., and Spies, H. W., *J. Lab. clin. Med.*, 1953, 42, 832.
2. Grisham, M. E., Chappelle, E., and Peacock, T., *Antibiot. and Chemother.*, 1955, 5, 350.
3. Martin, W. J., Nichols, D. R., Wellman, W. E., and Geraci, J. E., *Proc. Mayo Clin.*, 1954, 29, 379.
4. Lowbury, E. J. L., and Cason, J. S., *British Medical Journal*, 1954, 2, 914.
5. Maccabe, A. F., and Gould, J. C., *Scot. med. J.*, 1956, 1, 223.
6. Leading article, *British Medical Journal*, 1957, 1, 150.
7. Finland, M., and Wilcox, C., *Proc. Soc. exp. Biol. (N.Y.)*, 1953, 83, 605.

ABO Blood-group Substances in Gastro-intestinal Tract

SIR,—Dr. C. A. Clarke and his collaborators (*Journal*, September 29, 1956, p. 725) discuss the possible connexion between the sites of production of ABO substances in the gut and the incidence of ulcerative diseases in these regions. In this respect they refer to some of our work on guinea-pigs—namely, that gastric mucins show strong anti-agglutination activity whereas intestinal ones do not.^{1,2} We feel it worthy of note that a similar situation appears to exist in man: Witebsky and Neter³ and Satoh⁴ both find blood-group activity to be strongly displayed by the mucins of the stomach, and to decrease progressively in lower regions of the gut.

A chemical interpretation of these observations may be attempted. Blood-group substances contain several carbohydrate constituents, D-galactose, L-fucose, and the amino sugars, D-glucosamine and D-galactosamine, being the chief components. An examination of analytical data, made by three independent authors, indicates a correlation between the distribution of carbohydrate constituents and the site of mucin production in the gut. Thus, Werner⁵ and Whitehouse,⁶ using material obtained from pigs, and Satoh,⁴ working with human gastro-intestinal mucosa, all find a higher percentage of amino sugar in the mucins of stomach than in similar substances from lower regions of the intestine; Werner⁵ has also studied the distribution of D-galactose and L-fucose in such mucins, and finds the highest percentage of D-galactose in the stomach. Gastric mucin isolated by Whitehouse, moreover, was found to exhibit weak blood-group A specificity, whereas duodenal mucin was inactive.⁷ The activity of Satoh's preparations has already been mentioned.

If one compares these results with the recent findings of Côté and Morgan⁸ an explanation of the distribution of ABO activity in the gastro-intestinal tract emerges. Côté and Morgan have shown that the determinant structure in human blood-group substances apparently consists of two components, amino sugar and D-galactose. The nature of the amino sugar in this grouping seems to control the serological specificity of these substances: group A (and perhaps B and O as well) activity is conferred by D-galactosamine, type XIV pneumococcus cross-reactivity (frequently observed in derived blood-group substances) by D-glucosamine.⁹ We therefore suggest that a consideration of the D-galactose content, coupled with an evaluation of the D-galactosamine:D-glucosamine ratio (first proposed by Leskowitz and Kabat,¹⁰ may prove useful in the correlation of chemical constitution and biological activity in gastro-intestinal mucosubstances. In view of these observations it would be interesting to supplement the researches carried out by Dr. Clarke and his colleagues with a chemical study of intestinal mucins produced by secretors and non-secretors.—We are, etc.,

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P. W. KENT.

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REFERENCES

1. Pasternak, C. A., Whitehouse, M. W., and Kent, P. W., Abstracts Third Int. Cong. Biochem., Brussels, 1955, p. 42.
2. ———, Kent, P. W., and Davies, R. E., in preparation.
3. Witebsky, E., and Neter, E., *J. exp. Med.*, 1935, 62, 589.
4. Satoh, T., *Tohoku J. exp. Med.*, 1949, 51, 275, 281.
5. Werner, I., *Acta Soc. Med. Upsalien.*, 1953, 58, 1.
6. Whitehouse, M. W., D.Phil. Thesis, University of Oxford, 1955.
7. Macfarlane, R. G., unpublished results.
8. Côté, R. H., and Morgan, W. T. J., *Nature (Lond.)*, 1956, 178, 1171.
9. ———, and Morgan, W. T. J., *ibid.*, 1956, 178, 1289.
10. Leskowitz, S., and Kabat, E. A., *J. Amer. chem. Soc.*, 1954, 76, 5060.

Material of Early Contraceptive Sheaths

SIR,—Dr. E. J. Dingwall published a short paper (*Journal*, January 3, 1953, p. 40) on a number of condoms (sheaths), dating apparently from between 1790 and 1810, found in a locked box in the muniment room of an English country house. The condoms were of three different sizes, in packets of eight. The paper contained much interesting information on the subject of early contraceptive sheaths,

but does not go into the question of the material from which these particular specimens were made, apart from stating that its thickness was 0.038 mm. (as against 0.075 mm. for a thin rubber sheath), and that it is somewhat permeable to water and to solutions of common salt. The objects are very stiff, and would have needed softening before use. This would explain Boswell's reference in his *Journal* to his dipping his "armour" in the Serpentine in the Park before using it.

One of these sheaths has now been examined by Professor J. Z. Young in the department of anatomy of University College, London. It proved to be made of a sheep's caecum. The pattern of the blood vessels in the material is clearly recognizable, and it was found possible to make similar objects in the laboratory by drying sheep's caeca on wood, curing in alum, scraping, oiling, and pressing. However, the original specimens were of rather finer texture than any Professor Young succeeded in making. It is known that some early condoms were made from the swim-bladders of fish and from various sorts of skin, and Dr. James Ziegler, of the New York University College of Medicine, has drawn my attention to two early references to the use of sheep's caeca for this purpose.

In Robley Dunglison's *A New Dictionary of Medical Science and Literature* (3rd edition, but including the preface of the 2nd edition of 1839), *Condom* is described as: "Armour, Posthocalypton, French letter, Cytherean shield, (Fr.) Baudruche, Redingote anglaise, Gant des dames, Calotte d'assurance, Peau divine, Chemisette. The intestinal caecum of a sheep, soaked for some hours in water, turned inside out, macerated again in weak alkaline ley [*sic*], changed every twelve hours, scraped carefully to abstract the mucous membrane, leaving the peritoneal and muscular coats exposed to the vapour of burning brimstone, and afterwards washed with soap and water. It is then blown up, dried, cut to the length of seven or eight inches, and bordered at the open end with a riband. It is drawn over the penis prior to coition, to prevent venereal infection and pregnancy."

In Grose's *A Classical Dictionary of the Vulgar Tongue*,² *Cundum* is defined as "the dried gut of a sheep, worn by men in the act of coition, to prevent venereal infection; said to have been invented by one Colonel Cundum." The entry adds the following interesting details: "These machines were long prepared and sold by a matron of the name of Phillips, at the Green Canister, in Half-Moon Street, in the Strand [*sic*]. That good lady having acquired a fortune, retired from business; but learning that the town was not well served by her successors, she, out of patriotic zeal for the public welfare, returned to her occupation; of which she gave notice by divers handbills, in circulation in the year 1776. Also a false scabbard over a sword, and the oil-skin case for holding the colours of a regiment."—I am, etc.,

London, N.W.3.

JULIAN HUXLEY.

REFERENCES

- Dunglison, R., *A New Dictionary of Medical Science and Literature*, 1874, 3rd ed. Philadelphia.
- Grose, F., *A Classical Dictionary of the Vulgar Tongue*, 1795, 3rd ed. London.

Amphetamine Psychosis

SIR,—From time to time reports appear in the medical press of toxic reactions due to overdosage with amphetamine and related compounds. Since these drugs became available for therapy some twenty years ago there has been an increasing number of reports of psychotic illness as one of the manifestations of amphetamine intoxication. In Great Britain, however, there have been only six such reports, two of which were of psychotic illness following inhalation only. This form of toxic reaction might seem, therefore, to be rare in this country. The investigation of a case of a paranoid psychosis occurring after ingestion of the contents of a "methedrine" (methylamphetamine hydrochloride) inhaler led me to study the matter more fully. Forty-two such cases were discovered with comparative ease. The analysis of the physical and mental features of the

intoxication, the family and personal histories of the patients, their personalities, etc., together with biochemical studies of the excretion of the drug in the urine, can be seen elsewhere.^{1,2} These findings will be published as a Maudsley monograph.

It is the purpose of this letter to draw attention to the widespread abuse of amphetamine in this country, which has not previously been demonstrated, and to mention that a common result of amphetamine intoxication is the development of a paranoid psychosis indistinguishable from schizophrenia, during which the patient may be a serious social danger. A further point of general social importance is that many of the patients studied obtained the drug from inhalers freely available to the general public, each inhaler containing as much amphetamine as would be present in 110 5-mg. tablets of amphetamine sulphate. The anomaly of the law which permits the free sale of such inhalers while restricting the sale of tablets has been pointed out on a number of occasions,³⁻⁵ but there has been a lack of evidence demonstrating the real need for such a restriction. This evidence is now available. It is of interest to note that some drug firms withdrew their amphetamine inhalers from the market because of the considerable increase in the sale of inhalers which took place after amphetamine had been placed on schedule 4 of the poisons rules.—I am, etc.,

London, S.E.5.

P. H. CONNELL.

REFERENCES

- Connell, P. H., M.D. Thesis (London), 1956.
- , *Biochem. J.*, 1957, 65, 7P.
- Mathias, J. G., *Lancet*, 1951, 1, 1420.
- Nicholson, R. G., *British Medical Journal*, 1954, 2, 101.
- Potellakhoff, A., and Roughton, B. C., *ibid.*, 1956, 1, 26.
- Shanson, R., *ibid.*, 1956, 1, 576.

Benactyzine

SIR,—The article on benactyzine as an aid in treatment of anxiety states (*Journal*, February 9, p. 306) by Professor G. R. Hargreaves and Drs. M. Hamilton and J. M. Roberts is commendable as a contribution to the problem of designing a satisfactory method for drug trials in psychiatry. But the problem is a long way from being solved. In pointing out many of the weaknesses of previous studies the authors are, I think, doing a service to psychiatry, for it is largely by noting such criticism that workers in this difficult field learn to improve their technique. I hope therefore that the authors will not take it amiss if in turn—and with great respect—I list what seem to me certain weaknesses in their own valuable paper.

In 8 of the 14 patients receiving the drug there were side-effects of such severity that the dosage had to be reduced. We must inevitably suspect that the assessors guessed these patients to be on the drug and so may have been biased in their assessments. Such bias is always to be suspected where any drug with side-effects is tested against an inert control and, in general, can only be eliminated by the use of a positive control—i.e., another drug with similar side-effects. The bias might not be very serious if that such cases scored no better than those not under suspicion; but when it concerns more than half the group, and when the response of these particular cases is not mentioned, I think our confidence in the results must be shaken. This possibility of bias is especially unfortunate in the present trial on account of the following criticism.

Six cases were "rejected" from the trial before the drug code was known. Of these six, the five who showed considerable improvement had all been on the control, while the one who showed worsening had been on the drug. Surely the whole point of a controlled trial is that variables other than those being tested are assumed to be either eliminated or the same in each of the trial groups. Without arguing whether a patient's "life situation" can be satisfactorily assessed by the bare criterion of "changed" or "unchanged" during a three-week period, I think it would be generally considered an error of principle to "discard" cases that have successfully completed the trial. It is clear that if these six rejected cases are added to the results of table II the mean difference between the improvement score for the control and for the benactyzine group becomes unimpressive (7.8 against 9.4). Incidentally—though it is a small point—the mean improvement score for the control group in table II should clearly be 5.7 and not 5.6.

The authors draw the conclusion that their group of patients on benactyzine, as compared with the control group, showed a degree of improvement which could "reasonably" be attributed to the effect of the drug. We may pertinently ask why the authors calculate statistical probabilities if they are not going to accept the usual implications of a significance test. Surely the accepted conclusion from a finding that $P=0.08$ is that the results, although suggestive, might well be due to chance and that a larger series of cases must be studied before a firm opinion can be given.

The summation of a set of rating scores allotted to a range of symptoms is, I think, a questionable procedure. If the authors had reversed their rating scale and given 4 points for the absence of a symptom and 0 for its maximum severity, their results might well have been quite different—as I have found to my surprise in trials of my own. But, even accepting the principle of summation, we may question whether a gross score, obtained by adding together the scores for 13 symptoms, is any better an index than a simple "global" assessment; if, for example, a patient presented at the first interview with a troublesome gastro-intestinal disturbance from which he had recovered at the second interview his summed score might show an improvement even though his "anxious mood" had deteriorated from mild to grossly disabling.

When a group of patients on a treatment is compared with a group receiving another or no treatment, it is usually considered incumbent on the clinician to show that the two groups are comparable for sex, age, duration of illness, severity of symptoms, and other factors likely to influence the prognosis. This may not be very important where the allocation is random and the number of cases large; but where the groups are only of 12 and 14 cases, where no mention is made of sex, where the age may vary between 20 and 65, and the duration of illness from very recent to four years, I should have thought it essential for the authors to indicate that their groups were in fact well matched.

The authors dismiss the self-controlled trial as "providing no information on the course of the malady in comparable patients who do not receive the drug being investigated"; but, since all their own patients were given "known" benactyzine soon after completing the trial, they would seem to have deprived themselves of the only real advantage to be gained from using independent controls. The value of a self-controlled trial is that it eliminates the need for matched groups of cases. Its use depends, of course, on an assumption that the drug under test acts by suppressing symptoms rather than by causing any fundamental or lasting cure; but I should have thought that in the drug treatment of anxiety states this was a reasonable assumption.—I am, etc.,

E. H. HARE.

Warrington, Surrey.

Herpes Zoster and Chicken-pox

SIR,—My patient, a young married woman of 25 years, developed a small patch of herpes on the inner side of her left forearm on January 17, which rapidly subsided. On February 4 her small daughter, aged 6 months, developed a very severe attack of chicken-pox. So far as I can gather, neither had been in contact with any cases, and the child had not been out of the house since the beginning of January because of an attack of infantile eczema.—I am, etc.,

Bourne, Lincs.

GEORGE HOLLOWAY.

Dissecting Aneurysm and Physical Stress

SIR,—Mr. J. B. Cleland's speculations (*Journal*, February 2, p. 282) on the role of physical stress in producing dissecting aneurysm prompts me to record the following case.

A man, aged 36, was admitted to this hospital at 4.30 p.m. on January 10 last. He gave a very precise history. A few hours previously, just after lunch, while leaning over the table to play a shot at snooker, he experienced severe epigastric pain while, simultaneously, his right leg "failed under him" so that he had to clutch the table to save himself from falling. His opponent brought him a chair and massaged the leg—which was numb—without avail, and finally assisted him home. There he was seen by a doctor, who sent him into hospital at once as a possible case of poliomyelitis.

On admission he looked anxious and ill. He was shivering, his temperature was subnormal, and the tips of his ears were cyanosed, but, although his heart rate was only 50, his B.P. was 170/90. The abdomen did not move well on respiration, and there

was some tenderness and slight guarding in both upper quadrants. Bowel sounds were present. The leg in question, however, now appeared normal, the reflexes were present, and he could move it easily. Soon after admission he vomited several times, and this was followed later in the evening by severe and almost continuous diarrhoea producing a convincing picture of acute food poisoning. On the following day there was slight fever, but the diarrhoea was less and the pulse rate rose to normal. Epigastric pain was still present but not disproportionately severe. Thereafter the patient settled down fairly well. He was now constipated and his appetite was poor, but the pain was less and he was afebrile. On January 16, the pain was quite gone and he felt much more comfortable, though an aortic diastolic bruit was detected for the first time, and he still retained his expression of anxiety and strain. That afternoon, after he had taken his tea, he died suddenly.

At necropsy (Dr. W. F. Hamilton, of Ashford Hospital) the cause of death was found to be a rupture of the aorta through the anterior wall into the pericardial sac. In addition, on the posterior wall there was a small slit leading to a dissecting aneurysm which passed down through the abdominal aorta and into the right common iliac artery, about two-thirds of the way along which there was a second slit through which, presumably, the aneurysm had once again erupted into the main channel. The left common iliac artery was normal. There was some naked-eye evidence of atheroma in the abdominal aorta but none in the thoracic.

Clearly, the rupture into the pericardium was terminal. The dissecting aneurysm occurred presumably while he was bending over the snooker table, and, although at first sight it sounds absurd to speak of "physical stress" in this context, on reflection this may not be so. Frequently to reach an awkward ball without the rest a player may stretch violently over the table, leaning heavily against the side or corner, thus producing severe pressure in the abdomen generally and compressing one or other common iliac artery. In any event, it seems beyond doubt that this is what happened in the present instance, resulting in an accident which, to be sure, was sooner or later probably inevitable.—I am, etc.,

Isleworth, Middx.

G. E. BREEN.

Non-ulcer Dyspepsia

SIR,—In your leading article on the importance of non-ulcer dyspepsia (*Journal*, February 16, p. 391), you cite us¹—unfortunately in error—as having found that "patients with non-ulcerative dyspepsia are even more common in an urban general practice than are patients with peptic ulcer." What, in fact, our figures did show was that in a general practice, after careful and repeated screening of all cases of dyspepsia with the Gregersen slide test and x-ray follow-up—such as is normally impracticable in hospital—the prevalence of true ulcer dyspepsia was greater than non-ulcer dyspepsia.

There are two probable reasons why Wynn Williams and his colleagues (p. 372) were unable to find a cause for dyspepsia in over 60% of their cases. First, many patients with proved organic cause for their symptoms would not find their way to a hospital out-patient department. Secondly, many of the patients with dyspepsia are likely to have been previously investigated by the general practitioner to exclude the possibility of alimentary ulceration and would therefore have been referred only because no explanation of their symptoms had been found.

The non-ulcer dyspepsias are, as you say, a formidable challenge to physicians. The contrast between the ulcer/non-ulcer dyspepsia ratios in our general practice population and the ratios reported for such hospital series as those of Wynn Williams and his colleagues draws attention to the need for close and continuing co-operation between general practitioners and the hospitals in the further study of the natural history of dyspepsia and peptic ulcer.—We are, etc.,

S. LIPETZ.
S. A. SKLAROFF.
LILLI STEIN.

Edinburgh.

REFERENCE

- Lipetz, S., Sklaroff, S. A., and Stein, L., *British Medical Journal*, 1955, 2, 172.

Penetrating Ulcer of Tongue

SIR,—Dr. Gordon F. Cassie in his most interesting article on penetrating ulcer of the tongue (*Journal*, February 9, p. 325) describes a case in a man aged 63 years, edentulous, who had worn the same dentures for 20 years with no sign of any irritating factor on the dentures. The ulcer was in the centre of the tongue.

If the same dentures had been worn for 20 years it can in most cases be assumed that gross absorption of the alveolar ridges has taken place, resulting in a poor fit of the dentures, with little or no suction due to a lack of peripheral seal. When this means of retention fails, it becomes necessary for the cheek muscles, and more particularly the tongue, to keep the denture in place. When the incisors are used the tongue is thrust up into the palate of the denture in order to counter-balance the force of bite. After the food passes to the premolar and molar region for grinding, the tongue and cheek muscles grip the dentures on the palatal and labial surfaces of the denture base. If the denture base was constructed of vulcanite, which is most likely owing to their age, it can also be presumed that it was infected, as this material is porous. In this case there are therefore present the two necessary factors for producing a penetrating ulcer: (1) irritation due to the tongue thrusting up on to the palate of the denture in order to keep it in position, especially while eating, but also at rest; and (2) bacterial infection from the porous vulcanite base of the denture. It would be interesting to hear of any other cases of this type where a methyl methacrylate base has been used, as this material does not cause infection because it is non-porous and retains its polished surface better than vulcanite, and is also 25% lighter in weight—I am, etc.,

Exeter.

A. J. WALTERS.

Compound Aspirin and Steroid Tablets

SIR,—The recent annotation (*Journal*, February 16, p. 395) has suggested that a combination of corticosteroid and aspirin is of no advantage, and in fact may be disadvantageous in the treatment of rheumatoid arthritis. I have treated patients in my clinic since this combination has become available who have failed for years on aspirin. They have also been given corticosteroids with disappointing results, for one reason or another, but they responded very well to a combination of aspirin—5 gr. (0.3 g.)—and prednisolone (0.5 mg.), usually in doses of 10 to 12 tablets daily. There have been no unwanted side-effects.

This evidence is not without support. Spies *et al.*¹ have shown that combined therapy with salicylates and corticosteroids offered a more practical means than steroids alone for treating many arthritic patients when enough salicylate to produce a strong additive effect was given, so that less steroid was required to produce the desired result. Szucs *et al.*² treated 400 cases of various types of arthritis with this combination with notable improvement and a minimum of side-effects. Although I do not consider this combination to be preferable to steroids alone, nevertheless there are many cases which have benefited when all other recognized methods have failed. I am sure as experience is gained with this combination its place in the treatment of arthritic conditions will be assured—I am, etc.,

Birmingham.

R. O. GILLHESPY.

REFERENCES

- Spies, T. D., *et al.*, *J. Amer. med. Ass.*, 1955, 159, 645.
- Szucs, M. M., Holonko, V., Forster, K. M., and Nalagan, D., *Ohio St. med. J.*, 1956, 52, 722.

Glycyrrhetic Acid

SIR,—I am sorry to have to encroach again upon your columns, but I cannot allow the rather personal comments made by Dr. R. D. Sweet (*Journal*, February 9, p. 340) to remain unanswered. First, if Dr. Sweet had taken the trouble to read and understand the large volume of chemical and scientific publications on this subject, as I have done, then I am sure he would not have felt blinded with science

or that this work had a "pseudo-scientific ring." Secondly, the fact that glycyrrhetic acid is "frightfully complex chemically" has not influenced me either for or against the drug. Thirdly, the difference between an active and an inactive isomer can easily be assessed by comparative trials. Fourthly, the expression "biosone G.A." side-chain is unfamiliar to me. Fifthly, I strongly object to the suggestion that I have repeated the commercial claims for any particular product. In this case the trade name was essential, due to the fact that all glycyrrhetic acid ointments available on the market do not have the same efficacy. In fact the editor of the *Lancet* commented that "the name of the substance . . . was included at our request, because we thought it an essential piece of information." I hope I have made my point of view clear, and any "experienced colleagues" who are "patently unconvinced" may care to visit me any week-end, by arrangement, when I could show them the medical files of the many patients successfully treated.

I note the comments of Drs. J. W. Cornforth and D. A. Long (p. 340). I was fully aware that they did not refer to glycyrrhetic acid in their patent, and in my letter I referred to "products which they obtained from liquorice root," which is in accordance with their patent specification. However, the resultant materials obtained by them by passing liquorice derivatives through an ion exchange column do not appear to have been chemically identified by the patentees. The results, however, in B.C.G.-infected guinea-pigs may in time be found to vary dependent upon different isomers or fractions of glycyrrhetic acid used. In conclusion, I can only agree with Dr. J. Sommerville (*Journal*, February 2, p. 282) "that any inference or statement that glycyrrhetic acid is an inactive substance is both misleading and wrong."—I am, etc.,

Hove.

E. COLIN-JONES.

REFERENCE

- Lancet*, 1956, 2, 253.

Statistical Analysis in Progressive Disease

SIR,—In his article on a controlled trial of nicotinic alcohol tartrate (*Journal*, January 26, p. 207) Dr. R. O. Gillhespy states: "It should be noted that statistical analysis takes no account of the fact that this is a progressive disease and is therefore no substitute for clinical experience." A comparison of the number of patients who were worse at the end of the trial period in the treated and control series would show what influence the drug had in preventing progress of the disease. The usual statistical analysis would then take this into account, as well as the improvements due to the drug.—I am, etc.,

Sheffield.

D. KERRIDGE.

Chemotherapy in Primary Tuberculosis

SIR,—I was interested to read Dr. J. B. Ryder's article (*Journal*, February 9, p. 324) and to note his references to my previous work on this subject.¹ In my communication tuberculosis treated with antibiotics, who subsequently developed segmental lesions. I recalled that a number of children that we might be observing a larger incidence with this complication with our present methods. I said: "These figures are small, but they are disturbing." Dr. Ryder's contribution to this problem is interesting, but does it justify a conclusion that "there is no obvious increase in the natural frequency of segmental lesions as a result of antimicrobial treatment"? Particularly when dealing with small numbers, it would seem unwise to compare Eskimo and Indian children treated by antibiotics with children treated in the pre-antibiotic era in England.

We are making another study at High Wood of our recent groups of small children treated by antibiotics and comparing these with similar cases treated in the same hospital without these drugs, and it is hoped that this will elucidate the matter further. The numbers, however, may still be too

small to be conclusive. As I wrote previously, "A carefully planned trial is called for on a national scale to settle in this and in many other respects the proper place of antibiotic therapy in the treatment of tuberculosis in young people."—I am, etc.,

Brentwood, Essex.

F. J. BENTLEY.

REFERENCE

- Bentley, F. J., *British Medical Journal*, 1955, 2, 1084.

Two New Human Genes

SIR,—Professor L. S. Penrose's letter (*Journal*, February 2, p. 282) seems to have conveyed the impression to some readers that the characters we have been investigating are not well differentiated. In fact, we have found that biochemical tests for the presence or absence of methyl mercaptan after eating asparagus are consistently either negative or positive on the same individual. With regard to the excretion of beet pigment, as we indicated in our original communication,¹ "Most positive subjects develop typical red urinary pigmentation whenever they eat beet-root; but in a minority the red pigment appears only intermittently, sometimes being replaced by a dark-brown pigment." Professor Penrose draws attention to the relatively small number of observations (219) which we included in our report. However, the technical difficulties are such that it is impossible to work on the scale customary in blood-grouping laboratories. We should be very pleased to see further family studies on both these characters, but additional data collected by us, which we intend to publish shortly, are entirely consistent with our original genetic hypothesis.

This is based upon more substantial evidence than Professor Penrose implies; even the findings originally published would occur by chance less than once in a million times. Professor Penrose's alternative hypothesis of "peculiarities of intestinal flora" must clearly be considered; experiments designed to introduce the precursor parenterally would presumably decide the point. Nevertheless, it is clear from our data that the appearance of the two characters in the same family is independent. On Professor Penrose's hypothesis, it would be necessary to postulate the simultaneous existence in the intestine of two groups of bacteria, the presence or absence of one of which simulates a recessive type of Mendelian inheritance, while the other appears in the ratios characteristic of a dominant type of inheritance. This does not seem to us to be the most economical hypothesis, and we suggest that it is simpler to postulate the existence of two pairs of genes ("As and "bt") operating in the way we described.—We are, etc.,

Oxford.

A. C. ALLISON.

K. G. McWHIRTER.

REFERENCE

- Allison, A. C., and McWhirter, K. G., *Nature (Lond.)*, 1956, 178, 748.

Tear-test for Glucose

SIR,—Glucose-oxidase has been shown to be useful in the detection of glucose in the urine and is commercially available as "clintix." It was decided to try clintix for the detection of glucose in lacrimal secretion. Clintix is either applied to the conjunctiva of the lower eyelid until the tip is moistened, or alternatively a tip moistened with water is applied for a few minutes. The results should be read after two to three minutes, preferably in daylight against a white background. If glucose is present a blue colour will develop. If, as in some cases, a momentary stinging in the eye occurs this can be minimized by moistening the stick with water, or by cutting the stick lengthwise to reduce its bulk. It has been found that in those with a blood sugar above 200 mg. a blue colour appears. The depth of the colour is roughly related to the blood sugar level. Where this value is over 300 mg. often a blue reaction quickly develops. It is suggested that this "tear-test" might be used to supplement existing orthodox tests, as illustrated by the following case. An undiscovered diabetic with long-standing symptoms was referred with gangrene. A tear-test was

strongly positive. Her urine showed 2% glycosuria and blood sugar was 307 mg.%. Following admission, her blood sugar dropped to below 175 mg., her tear-test was negative. The urine remained at 2%. It is possible that the test may be of value in certain circumstances, though it is not claimed to be quantitative. It might be specially useful to general practitioners suspecting diabetes but unable to obtain urine specimens. Diabetics with heavy glycosuria due to low renal threshold tend to give a weaker reaction than those with higher levels. Finally, as a bedside test it is possible that it could be an extra point of information in the differential diagnosis of coma in the diabetic.—I am, etc.,

London, N.W.3.

J. G. LEWIS.

Care of Discharged Mental Defectives

SIR,—In a recent letter (*Journal*, January 26, p. 226) Dr. J. Newcombe emphasizes the need for care and supervision of aments when the order under the Mental Deficiency Acts has been discharged. I agree with his suggestion. In this area discharged aments are kept under friendly observation by my mental health officers. We believe that unofficial observation is the best method of ensuring timely help and re-ascertainment if the need arises.—I am, etc.,

Halifax.

G. C. F. ROE.

Treatment of Acute Appendicitis

SIR,—Mr. Eric Coldrey's advocacy (*Journal*, December 22, 1956, p. 1458) of conservative treatment for acute appendicitis has received little support in your correspondence columns and indeed even less support from his own excellent figures for surgery—no deaths in 395 cases. There is one aspect of conservative treatment of the acute abdomen, in the matter of correct diagnosis, which receives little mention in all such articles. The conservative regime may be started for supposed acute appendicitis or perforated peptic ulcer; deterioration with subsequent laparotomy or necropsy may reveal gangrenous gut, ruptured spleen, or ectopic gestation, or a perforated diverticulum, and the corpse does not even have the honour of appearing in the statistics of the conservative treatment advocated. Any large series of acute abdominal cases must include a few such catastrophes, and to leave them out may be statistically correct, but is surgically misleading.—I am, etc.,

London, W.1.

G. QVIST.

SIR,—I wish to correct the inference in Dr. E. C. Atkinson's letter (*Journal*, February 16, p. 400) that the advice give to Captain R. S. Paton, of the *Tahsinia*, originated from a professional source. Whence that ill-conceived advice emanated, I do not know. As the surgeon who gave the advice *not* to operate, but to return to Ireland, I strongly advised against any attempt whatsoever to undertake operative measures, for very obvious reasons.

The hospital in Weston-super-Mare is unique, as far as I know, in that it is the only hospital in Great Britain which gives radio advice to ships at sea when illness occurs in the crew, and this is not the first occasion by any means when advice on conservative measures for acute appendicitis, even with peritonitis as in the case of the *Tahsinia*, has been given. In conclusion, may I add that we were informed a week ago that the patient had made an excellent recovery, the diagnosis having been confirmed?—I am, etc.,

Weston-super-Mare.

W. R. BLACK.

SIR,—I was most interested to read the letters in the *Journal* on the treatment of acute appendicitis. I entirely agree with Dr. E. C. Atkinson's observation (*Journal*, February 16, p. 400) that conservative treatment should be adopted when the "surgeon" is a layman, and in any case when facilities render surgical intervention hazardous. In my book¹ a case is described in which appendicectomy was performed during the late war by a laboratory technician in a submarine in enemy waters. The operation took 2½

hours, during which 5 lb. (2.3 kg.) of ether was administered by the communications officer.

My late chief James Sherren, of the London Hospital, a recognized authority on abdominal surgery, always emphasized that no case of acute appendicitis in an adult would prove fatal if treated by starvation and morphine. An abscess might develop, and if necessary be drained by means of a simple incision. Children are in a different category, as their resistance to infection is less than that of adults, and their short and flimsy omentum is not sufficiently developed to reach the right iliac fossa and so circumscribe the spread of inflammation. It is my conviction that conservative treatment of acute appendicitis in an adult is far safer, although less theatrical, than an improvised operation by an unqualified enthusiast, or even by a medical man with inadequate surgical experience.—I am, etc.,

London, W.1.

MCNEILL LOVE.

REFERENCE

¹ Love, R. J. M., *The Appendix*, 1947. H. K. Lewis, London.

Viruses Made to Order

SIR,—Your leading article (*Journal*, February 16, p. 390) draws attention to an aspect of biological and medical research which may undoubtedly bring great benefits to mankind in due course. However, it may also lead to terrible suffering if such research is taken up by the bacteriological warfare departments of various nations. Once it has become possible to change the structure of a virus all previously acquired immunity to it would disappear, and one could imagine with horror a changed influenza virus let loose upon an unsuspecting country by an enemy who had carefully inoculated his own troops and population against it.

I understand that work is going on at present in Australia to change the myxomatosis virus in order to kill those rabbits which have become immune to the established virus. While this research appears useful to mankind, it would be terrible if it should become the prototype of other similar but more dangerous experiments.—I am, etc.,

London, W.C.1.

A. R. MICHAELIS,
Editor, *Discovery*.

Mongolism in Siblings

SIR,—More than one mongol in a family may not be as rare as is suggested by Dr. Freda M. Paul's letter (*Journal*, January 26, p. 212). In our practice of just over 3,000 patients, of five families with mongol children, one family has two; and one of us remembers another family of two.

A mother born in 1910 gave birth to a boy in 1944, who died at three weeks from convulsions. In 1947 and in January, 1950, she had normal girls, who are still thriving. In September, 1950, she had an early miscarriage, and in 1951 her first mongoloid child, a boy, was born. In February, 1952, there was a second miscarriage, and in December, 1952, a second boy mongol. Both mongols are in good health and free from other congenital abnormality.

This mother gave birth to mongolian children late in her reproductive life, but the usual long period of sterility preceding them both was absent. Rather might one suggest that the rapid succession of her pregnancies did not give time for preparation for normal maturation of gametes or ovum.—We are, etc.,

York.

MARGARET DUDLEY-BROWN.
L. JOAN LETTY.

Living with a Colostomy

SIR,—Your leading article on living with a colostomy (*Journal*, February 2, p. 274) should do much to enlighten the ignorance and indifference—still all too prevalent—of all concerned, be they patient, surgeon, physician, or nurse. May I, an active surgeon for some forty years, and by no means passive patient for three years, comment, suggest, and advise?

In the strict sense of the word, we have no methods of gaining control of the colostomy. The sphincterless colos-

tomy is impotent, uncontrollable, and incontinent, and will remain so until some ingenious surgeon devises an adequate and controllable sphincter such as is present at the normal exits of bladder and bowel. Restriction of roughage may result in vitamin deficiency with bowel looseness. This remote risk can be prevented or remedied by judicious intake of vegetable and "forbidden fruit" juice, yeast, etc. Other factors hitherto little appreciated deserve consideration—body build, previous bowel habit, mental make-up, climatic conditions, etc. Those of sthenic build possess a relatively shorter and more active colon than do their counterparts, the asthenic visceroptotics. The intestine, like other organs and tissues innervated by the autonomic system (well named sympathetic), is both sensitive and reactive to emotional states—worry, anxiety, trepidation, etc. A true sense of humour inhibits or minimizes both cause and effect, and enables one to face and cope with most situations with equanimity. Chilling should be avoided. The colostomite in these circumstances is more prone to suffer from diarrhoea.

I neither require nor use drugs of any kind, nor have I ever had a wash-out. Inhibitory drugs, I found, simply postpone the inevitable evacuation, which is likely to be more bulky or even a "gusher." Tea and coffee with lots of energizing sugar are well tolerated, so is whisky (with a little water), which diminishes the effects of emotional disturbances and helps to maintain morale. As a practical adjunct to the armamentarium of all colostomites I most strongly advocate the inclusion of an ordinary glass jam-jar, the use of which, I have found, ensures confidence and comfort and substantially reduces the amount and cost of dressings. After breakfast I go to the bathroom for shaving, etc. There, by a very simple adjustment of my belt, I fix the jam-jar over the colostomy, and with complete comfort and confidence proceed to do two things at once. A little gentle massage or squeezing over the terminal subcutaneous inch or two of the pelvic colon stimulates desirable activity. On my person I carry a spare dressing, and in my car the same, plus jam-jar. Thus all emergencies can be anticipated and in most circumstances circumvented.

I learned a lot as a patient in bed. I am convinced that ritual heavy-handed rubbing and scrubbing of bony prominences does more harm than good. Frequent change of posture and position, as is normally exercised and accomplished by the healthy and strong, is all that is necessary to prevent bed-sores, thrombosis, pulmonary oedema, etc. But so tightly was I tucked in that I could hardly move or breathe in freedom or comfort until I took evasive action. My bed was uncomfortable: it sagged so that I had no support between pelvis and heels. I demanded a soft pillow which when supine I placed under my thighs and when in a lateral position used as a very comfortable inter-knee pad. Somewhat to the chagrin, I suspect, of all concerned (to whom I am most grateful) I made a complication-free and rapid recovery.—I am, etc.,

"COLOSTOMY."

Distribution of Red Bone Marrow

SIR,—I had occasion recently to look up the accounts of the distribution of red bone marrow in long bones given in the common textbooks of anatomy used by students to-day. The results were surprising and exemplify the considerable delay which may occur before recent work of immediate use to the student is made readily available in his textbooks. Since much discussion centres round the teaching of anatomy, may I beg the hospitality of your columns to illustrate my point?

Gray's Anatomy, 1944.¹—Marrow is red "in the articular ends of long bones." *Gray's Anatomy*, 1954.²—"By the age of twenty the medullary cavities of the long bones, the spaces in the spongy substance of their extremities . . . are . . . occupied by yellow marrow." *Cunningham*, 1951.³—"At puberty the red marrow is found only in the spongy bone; and, as age advances, it is replaced by yellow marrow in the spongy bone of peripheral parts—distal ends of long bones and the lower part of the backbone." *Buchanan's*

Anatomy, 1937.⁴—" . . . red marrow occurs in (1) articular ends of long bones, (2) medullary spaces of cancellated bone . . ." *Buchanan's Anatomy*, 1946.⁵—"At the end of the period of later childhood fat has become apparent at the centre of the shaft and, as puberty approaches, smaller patches of fat make their appearance on the distal side of the central fatty area. These changes . . . are earlier in appearance and more marked . . . in the more distal bones and in the distal ends of individual bones. The change from red to yellow marrow is earlier in the foot and hand than in radius and ulna or tibia and fibula and these in turn earlier than in the humerus and femur." *Grant's Anatomy*, 1940.⁶—"Gives an account of some changes in childhood and continues, 'By the 14th year red marrow is almost entirely replaced by yellow in the limb bones.'" *Textbook of Human Anatomy*, 1956.⁷—"In the long bones the marrow in early childhood is red, but during late childhood and adolescence this is replaced by yellow marrow in most of its extent, though some red marrow may still be present at the ends."

Of these volumes, Cunningham³ refers to the excellent paper by Piney⁸ which appeared many years ago in your *Journal* and in which a good description of the regional variations in the appearance of marrow, based upon personal observation, is set out. At the end of Dr. Piney's paper, in a brief discussion of its contents, Dr. Graham remarked that medical students had as a rule no clear conception of the anatomy and physiology of bone marrow until they came to study pathology.—I am, etc.,

E. J. FIELD.

Bristol.

REFERENCES

- ¹ *Gray's Anatomy*, 1944, edited by T. B. Johnston and J. Whillis, 28th ed. Longmans, Green and Co., London.
- ² *Ibid.*, 1954, edited by T. B. Johnston and J. Whillis, 31st ed. Longmans, Green and Co., London.
- ³ *Textbook of Anatomy*, 1951, edited by J. C. Brash. Oxford Medical Publications, London.
- ⁴ *Manual of Anatomy*, 1937, edited by J. E. Frazer. Baillière, Tindall and Cox, London.
- ⁵ *Ibid.*, 1946, edited by F. Wood Jones. Baillière, Tindall and Cox, London.
- ⁶ Grant, J. C. B., *Method of Anatomy*, 1940. Baillière, Tindall and Cox, London.
- ⁷ Boyd, J. D., Le Gros Clark, W. E., Hamilton, W. J., Yoffey, J. M., Zuckerman, S., and Appleton, A. B., *Textbook of Human Anatomy*, 1956. Macmillan, London.
- ⁸ Piney, A., *British Medical Journal*, 1922, 2, 792.

Fatal Hospital Falls

SIR,—I was interested to see in Dr. Gavin Thurston's paper (*Journal*, February 16, p. 396) that the incidence of fatal falls in hospitals is not much higher than the current suicide rate in the general population. This being so, I feel some concern at his suggestion that such precautions should be taken against this type of risk as virtually to transform hospitals into prisons—i.e., bars fitted to the windows, etc. Great efforts are being made to "humanize" hospitals, to allay as far as possible the patient's fears, and to preserve his sense of individuality. It would be a pity if, by emphasizing the possibility of legal liability, this desirable trend was reversed. I am naturally in full agreement with the other suggestions made by Dr. Thurston.—I am, etc.,

Cheam, Surrey.

WILLIAM N. ROGERS.

Treatment of Adrenocortical Deficiency States

SIR,—The problem of references in any article dealing with endocrinology, especially in the adrenal field, is becoming increasingly difficult and almost impossible. Further, medical history, as all history, is of practical importance only in regard to its influence in assessing modern situations. Nevertheless, such brevities as "The only treatment for adrenal deficiency prior to the advent of cortisone in 1949 lay in increasing the salt intake in the diet and in giving drugs to cause salt retention; deoxycortone was the most effective agent in this respect" (Dr. F. Dudley Hart, *Journal*, February 23, p. 417) do inadvertently miss out the very important 1930–1938 (even 1930–1950) era of cortical extracts, aqueous and lipid. I venture to draw attention to this because I was Fellow in Medicine at the Mayo Clinic in 1930 when L. G. Rowntree first used Swingle and Pfiffner's

extract with dramatic results in Addison's disease, which clinical results I was able to demonstrate to the Royal Society of Medicine in London a few months later; and I happen to be the first clinician to use deoxycortone, in 1938, supplied by Reichstein. Cortisone has undoubtedly superseded older methods of therapy; and as Dr. Dudley Hart (from whose excellent paper I quoted above) has shown in his remarkable series of adrenalectomy cases, as also in Addison's disease, 9 α -fluorohydrocortisone by mouth, in relatively minute doses (and intravenously if need be), will supersede deoxycortone. For those interested in the evolution of hormone therapy in adrenal insufficiency, the 1953 paper will give much relevant information, further brought up to date in a brief but excellent paper by Drs. R. N. Beck and D. A. D. Montgomery on the treatment of Addison's disease (*Journal*, October 20, 1956, p. 921).—I am, etc.,

London, W.1.

S. LEONARD SIMPSON.

REFERENCE

¹ Simpson, S. L., *Proc. roy. Soc. Med.*, 1953, 46, 566.

Primary Dislocation of Shoulder-joint

SIR,—Mr. R. Salisbury Woods's interesting account of primary dislocation of the left shoulder-joint in the boxing-ring (*Journal*, February 16, p. 387) reminds me that I witnessed an exactly similar incident in 1941 while acting as M.O. at an Army boxing contest. As far as I can remember, the conditions were exactly the same; the one boxer attempted a left hook, the arm being almost fully abducted, and this was parried by the right arm of the other, which struck the abducted arm from below upwards and laterally. There was no history of a previous dislocation. Reduction was performed at once and without difficulty.—I am, etc.,

Starcross, Devon.

FRANK BLAKE.

G. L. Alexander

SIR,—

Of Alexanders, G. L., please note there are two, In Bristol to boot, and in area 8. One, a ship's surgeon, writes oft to the press, On appendices hot; would long leaves advocate; And on broadcasting's failings would strongly lay stress. The other, a surgeon, from Auld Reekie came His craft neurosurgery here to perform. That the names are the same There is no one to blame. Such identical names are so far from the norm That confounded confusion is sure to arise; Which is why these few lines seem both timely and wise.

—I am, etc.,

Leigh Woods, Bristol.

G. L. ALEXANDER.

Smoking in the Wards

SIR,—In my practice I have been trying to discourage smoking among my patients as far as possible, after pointing out the harmful effects attributed to it. I was rather taken aback when one patient, who had recently been discharged from hospital, said, "Well, Doctor, I can't see why some doctors think smoking is harmful. Look at the notices in all the hospital wards stating the hours between which smoking is allowed." Surely hospitals should help in the campaign against smoking by discouraging this habit among patients under their care.—I am, etc.,

London, E.3.

BERNARD TAYLOR.

Abdominal Periarthritis Nodosa

SIR,—I would like to congratulate Mr. A. G. Norman and Dr. P. S. Wilkins for their memorandum on abdominal periarthritis nodosa (*Journal*, February 23, p. 445). This will be a much more valuable contribution if they can tell us what drugs—using the word in its broadest sense—this young

man consumed during the three weeks he had suffered from vague gastric upset, and what he was in the habit of taking for his asthma.

The more cases of polyarteritis nodosa one sees, the more common appears to be the association between many of these cases and a peculiar sensitivity to drugs. Although the question of drugs is usually implicated, particularly the sulphonamide group, I feel that those cases of malignant iodism which were reported years ago were really cases of this syndrome.—I am, etc.,

Sheffield, 10.

H. R. VICKERS.

Supply of Bodies for Dissection

SIR,—Dr. G. C. Milner's gruesome suggestion (*Journal*, January 12, p. 108), as quoted by Dr. E. N. Russell (*Journal*, February 9, p. 343), is quite unnecessary. Many people have a subconscious dread of being buried alive. And I have simply told them that such a misfortune would not be my lot, as I have given my solicitor the form supplied by the Ministry of Health, and have obtained the consent of my next of kin to have my body removed to a school of anatomy for the good of future students, and through them for the benefit of mankind.—I am, etc.,

Swindon

R. P. BEATTY.

Distinctive Tubes

SIR,—At the present time there is a large increase in the number of proprietary ointments being dispensed in tubes, and for some reason or other easily removable labels are being attached. This is probably a condescension to those practitioners who do not wish their patients to know what is being prescribed. Would it not be reasonable to suggest that the trade should adopt characteristic colours for their containers? It is a simple matter, particularly in hospital practice, for a tube of chloramphenicol and one of atropine to lose their respective labels and become indistinguishable, or even for their loosened labels to be incorrectly reattached by a conscientious nurse with, perhaps, disastrous results. Might I suggest that all atropine should be dispensed in red tubes, antibiotics in green, the sulphonamides in blue, cortisone in white, and, for those who still use it, ung. hydrarg. oxi. flav. in golden tubes, and so on?—I am, etc.,

Guernsey.

FRANK R. NEUBERT.

Medical Aspects of Boxing

SIR,—I congratulate Dr. Macdonald Critchley on his brilliant paper "Medical Aspects of Boxing" (*Journal*, February 16, p. 357). Your leading article (p. 392) also was timely. The horrors of boxing are well known, but it is surprising how this sport is going on without any adverse comment. As Dr. Critchley says, "One important distinction, however, distinguishes boxing from most other forms of athleticism. . . . In boxing the aim and object—explicit or implied—is to render the opponent *hors de combat*. Traumatata are therefore not so much regretted as regrettable."

The gradual decline of a boxer's career—from the height of glory to a life in a mental asylum (I have known a few)—is a fact which cannot be too strongly condemned. This sport should be banned, and I hope I shall have many colleagues who will agree with me.—I am, etc.,

Edinburgh.

A. K. CHATTERJEE.

Cancer of the Larynx in Women

SIR,—Dr. S. W. V. Davies (*Journal*, March 2, p. 519) refers to my suggestion (*Journal*, February 9, p. 299) of a possible connexion between defective diet and the high incidence of cancer of the larynx in women in rural areas, and asks if the consumption of white bread is greater in the country. There is no such statistical evidence, but this

suspicion rests upon a certain amount of basis which could not be stated fully in the paper to which he refers.

(1) The standard mortality ratio for cancer of the larynx in women in Wales (202) is twice that (100) for women in the whole of England and Wales.¹ (2) Stocks² has examined dietetic conditions in North Wales. "The statistical association between cancer and the amount of fresh milk and certain fresh vegetables in dietaries which was found some years ago by comparing the diets of 400 cancer patients with those of 400 control patients of the same ages from the same localities³ may help to provide a key to this. Fresh milk and vegetables seem to be very poorly represented in the diet of the bulk of the population of North Wales." (3) Visitors to Wales, who make no claim to have investigated the matter upon a statistical basis, may get the impression, from what they see in rural restaurants, that the big plate of white bread-and-butter and the teapot are the usual provision for a woman customer. (4) The Paterson-Kelly syndrome is more prevalent in Sweden than in any other country,⁴ and is thought there to be connected with defective diet.

Dr. Davies describes some occupational factors to which housewives are exposed, a subject to which more attention might very well be given. In an investigation carried out in the Pathology Department of St. Bartholomew's Hospital⁵ the carbon and ash were estimated in the lungs of (1) 26 males and 16 females dying in London, with and without bronchial carcinoma, and of (2) 4 males and 4 females of Iceland, without bronchial carcinoma (obtained through the kindness of Professor Niels Dungal, of Reykjavik). The Icelandic women showed mean and maximum figures for both carbon and ash higher than those of any of the London subjects. Professor Dungal writes of the woman giving the highest figure for ash, that she spent most of her life in the country on a farm. "If she has worked in one of our old-fashioned farm kitchens she will have inhaled a lot of smoke. These kitchens were small rooms with an open hearth, where a fire was kept burning day and night between two stones and the place was frequently full of smoke. There was no chimney. I have seen many of these kitchens in my young days; and as often as not they were full of smoke. In the lungs of this woman we found microscopically lots of black material, also in a lymphatic node from the neck. The fuel which was burned, and is still chiefly burned in the country, is peat. In spite of all the enormous amounts of peat smoke which must have been inhaled by our womenfolk in their old-time kitchens, cancer of the lung has been practically unknown among them."

The hearth in the living-room in the middle of the floor will be familiar to readers of the Icelandic and Heims-kringla sagas and can be seen in the reconstructed Viking house at Trelleborg in Denmark.⁶

Thus in the *Heimskringla Saga* of Snorre Sturlason (1178–1241) we read: ". . . there were many sea-kings who ruled over many people, but had no lands, and he might well be called a sea-king who never slept beneath sooty roof-timbers" (*Ynglinga Saga*), and King Sigurd "cast the book on the fire which was burning on the hall-floor . . ." (*The Sons of Magnas*).

There are perhaps racial differences in reaction to smoke from a domestic fire. Sheep farmers in New Zealand 100 years ago, my father and his brothers among them, left a hole in the wall when building their huts, to be filled by a chimney made, from lack of other suitable material, of turf. This structure, not very easy to build, had the defect that after prolonged wet weather it might collapse upon the hearth, giving the freest entry to wind and rain.—I am, etc.,

London, E.C.1.

E. L. KENNAWAY.

REFERENCES

- Curwen, H. P., Kennaway E. L., and Kennaway, N. M., *Brit. J. Cancer*, 1954, 8, 181.
- Stocks, P., *A.R. Brit. Emp. Cancer Campgn.*, 1939, 15, 26.
- and J. Karn, M. N., *Ann. Eugen. (Camb.)*, 1933, 5, 237.
- Blacklock, J. W. S., Kennaway, E. L., Lewis, G. M., and Urquhart, M. E., *Brit. J. Cancer*, 1954, 8, 40.
- Kennaway, E. L., *British Medical Journal*, 1955, 2, 1382.

Obituary

J. B. MENNELL, M.D.

Dr. J. B. Mennell, consulting physician in physical medicine to St. Thomas's Hospital and consulting physician to the British Red Cross Society's Physical Treatment Centre, Kensington, died at his home at Liss, Hampshire, on March 2. He was 77 years of age. Largely through his efforts the school of physiotherapy at St. Thomas's Hospital became one of the leading training schools in Britain.

James Beaver Mennell was born in London on January 31, 1880, the youngest son of Dr. Zebulon Mennell. From St. Paul's School he went on to Pembroke College, Cambridge, where he took the natural sciences tripos in 1902. Like his father, James Mennell was a student at St. Thomas's Hospital Medical School, which he entered in 1904. At this period the after-treatment of fractures had made little progress, and while still a dresser Mennell decided to try the effects of massage. After graduating M.B., B.Chir. in 1908 he continued his researches in an unofficial out-patient clinic for the after-treatment of fractures (which he had established himself). From 1908 to 1910 Mennell was casualty assistant, clinical assistant, physician to the exercise department, and house-surgeon at St. Thomas's Hospital. In 1910 he obtained his M.D., and from 1910 to 1911 was resident medical officer to St. Thomas's Home. He afterwards became medical officer to the physical therapy department at St. Thomas's Hospital, where he remained in charge until he retired in 1935. He was also a life governor of the hospital.

During the opening years of this century there were few hospital training schools for masseuses compared with to-day. They received their training in private schools, and relied for clinical experience on the out-patient departments of those hospitals which admitted masseuses. Mennell devoted a great deal of time and energy not only to building up the physiotherapy school at St. Thomas's Hospital, where he was lecturer, but to the welfare and recognition of properly qualified physiotherapists. He took an early interest in their Chartered Society, and actively inspired the establishment of provincial branches. When he resigned from the chairmanship of the council of the society in 1938 the members showed their appreciation of his services by making a presentation to him. He later became a vice-president and an honorary fellow of the society.

Mennell was at one time medical officer at a special military surgical hospital in Shepherd's Bush and formerly honorary consultant to the Royal West Sussex Hospital, Chichester. He was a past president of the section of physical medicine at the Royal Society of Medicine, and a past member of the council of the British Association of Physical Medicine. His fame was international and some of his publications were translated into several languages. He was president of the physiotherapy section at the Bilingual Congress of Radiology and Physiotherapy in 1922, and of the section of kinesitherapy at the International Congress of Physical Medicine in 1936. He became an honorary member of the Netherlands Society of Physiotherapy in 1945, and was awarded the golden key of the American Congress of Physical Medicine in 1940 and of the

American Physiotherapists Association in 1947. During the academic year 1947–8 he was visiting associate professor of physical medicine at the University of Southern California.

James Mennell's most important publications were *Treatment of Fractures by Mobilization and Massage* (1911); *Backache* (second edition, 1935); *Physical Treatment by Movement, Manipulation and Massage* (fifth edition, 1945); and *Science and Art of Joint Manipulation: Volume 1, The Extremities* (second edition, 1950), and Volume 2, *The Spinal Column* (1952).

The medical students who attended his department or clinical lectures at St. Thomas's found his views on diagnosis and treatment stimulating and useful, if sometimes outside their curriculum. Fortunately Mennell was able to continue to lecture at the physiotherapy school after his retirement from the hospital staff in 1935. Despite a very busy professional life he found time for his favourite recreations of walking and golf. He married Elisabeth Walton, youngest daughter of George W. Allen, of St. Louis, Missouri, in 1912, and had three sons.

H. S. STANNUS, C.B.E., M.D., Ph.D., F.R.C.P.
D.T.M.&H.

Dr. H. S. Stannus, consulting physician to the French Hospital, London, and an authority on tropical diseases and nutrition, died at his home in London on February 27. He was 79 years of age.

Hugh Stannus Stannus was born in London on June 18, 1877, the son of an architect, and received his medical training at St. Thomas's Hospital, qualifying M.R.C.S., L.R.C.P. in 1901. Two years later he graduated M.B. from the University of London, proceeding to the M.D. with gold medal in 1911. In 1912 he obtained the Cambridge D.T.M.&H. He took the London Ph.D. in 1926. Elected a Member of the Royal College of Physicians of London in 1920, he became a Fellow of the College in 1931. After qualification he held a number of appointments at St. Thomas's Hospital, and later the posts of clinical assistant at the East London Hospital for Children and resident medical officer at the Bethlem Royal Hospital. He was then appointed resident surgeon to the Hertford British Hospital, Paris. In 1905 he became medical officer to the King's African Rifles in British Central Africa. Here he found much to interest him. Not only did he investigate the endemic diseases of man and animals in the area, but he also engaged in ethnological studies. On the outbreak of the first world war in 1914 he became principal medical officer to the Nyasa-Rhodesian Forces operating in the south of German East Africa. He served throughout the campaign, and was three times mentioned in dispatches. On his return to England after the war Stannus had the opportunity of becoming director of medical services of the newly constituted Tanganyika Territory, but, on health grounds, he was advised to refuse the appointment. He became instead physician to the French Hospital, in London; a member of the associate staff of the Hospital for Tropical Diseases; and medical adviser to the Board of Inland Revenue. For some time he examined in tropical medicine for the University of Liverpool. His Lumleian Lectures delivered before the Royal College of Physicians of London on "Some Problems in Riboflavin and Allied Deficiencies" were printed in this *Journal* in 1944. He was awarded the Treacher Collins Prize by the Ophthalmological Society of the United Kingdom in

1948 for an essay on nutritional eye disease. During his period of service in Africa he wrote papers on a great variety of subjects, but in later years his published work was mainly on nutritional disorders, especially pellagra. He contributed the section on yaws to the *British Encyclopaedia of Medical Practice*.

During the second world war Stannus's services as an expert on nutritional disorders were utilized by the Ministry of Health, and he helped to initiate the rapid nutritional surveys which were carried out during the war. He was also specialist in tropical diseases to the Ministry of Pensions. For his work on tropical medicine he received the French award of Chevalier de l'Ordre de la Santé Publique; for his services to the French Hospital he was appointed a Chevalier of the Légion d'Honneur; and he was awarded the Médaille de la Reconnaissance Française for his work during the second world war. He was appointed C.B.E. in the Birthday Honours last year. He was a past-president of the section on tropical medicine of the Royal Society of Medicine; an original Fellow and a vice-president of the Royal Society of Tropical Medicine and Hygiene; and a Fellow of the Royal Anthropological Institute, the African Society, and the Society of Genealogists. A member of the British Medical Association for fifty-six years, he served as a vice-president of the Section of Nutrition when the Association held its Annual Meeting at Cambridge in 1948. A Freeman of the City of London, he was a Liveryman of the Worshipful Company of Founders, serving as Master of the Company in 1930-1 and again in 1953-4. He was unmarried.

WILLIAM STOBIE, O.B.E., M.D., F.R.C.P.

The sudden death of Dr. William Stobie at the age of 70 has removed from the life of Oxford an outstanding civic figure as well as one of its best-known medical practitioners.

William Stobie was born at Edinburgh on May 2, 1886, and was educated at George Watson's College and at Edinburgh University, where he graduated M.B., Ch.B. in 1908. In the following year he came to Oxford as house-physician to Sir William Osler, and ever since that time was closely connected with the Radcliffe Infirmary. From 1910 until he joined the Army he was medical officer to the Oxford Association for the Prevention of Tuberculosis. During the first world war he served in the R.A.M.C. as medical officer to the Oxford and Bucks Light Infantry; he was twice mentioned in dispatches and was appointed O.B.E. in 1919. After the war he returned to his medical work in Oxford, proceeding to the M.D. of Edinburgh in 1921 and becoming a member of the Royal College of Physicians of London in the following year. In 1926 he was appointed physician to the Osler Pavilion and in 1934 consultant for tuberculosis to Oxford City and Oxfordshire County. It was in this latter year that he was elected F.R.C.P. With the coming of the National Health Service in 1948 he was appointed consultant in diseases of the chest to the United Oxford Hospitals and clinical lecturer in the University of Oxford.

A member of the British Medical Association for some 40 years, Stobie was honorary secretary of the Oxford Division from 1923 to 1928 and of the Oxford and Reading Branch from 1924 to 1926; chairman of the Oxford Division in 1935-6 and again from 1940 to 1942; and president of the Berks, Bucks, and Oxford

Branch in 1938-9. At Headquarters he was a member of Council from 1933 to 1935, and served on a number of committees, including that on medical education (1933-5). At the Annual Meeting of the B.M.A. in 1936 at Oxford he held office as president of the Section of Tuberculosis.

In addition to his medical work Dr. Stobie was keenly interested in municipal affairs, becoming a councillor and subsequently an alderman on the Oxford City Council. He was appointed sheriff in 1927 and elected mayor in 1930. He was also a magistrate and a former chairman of the Oxford bench. Keenly interested in Rugby football, he became a very active supporter of the game at Oxford, and he was very proud of being the father of two Oxford University rugger blues. In his student days he played golf for Edinburgh University.

Dr. Stobie's work for the prevention and treatment of tuberculosis will be long remembered with gratitude, and his civic commitments showed what an active and full life he led in Oxford, where he will be greatly missed. Our sympathy is extended to his widow and family.—W. S. H.

W. C. MacFETRIDGE, M.D.

Mr. W. C. MacFetridge, surgeon emeritus to the Sussex Eye Hospital, Brighton, died at the Hereford General Hospital on February 23 at the age of 78.

William Christopher MacFetridge was born at Rushbrook, Co. Cork, on June 16, 1878, the son of the late Archdeacon of Ross, and was educated at Portora Royal School, Enniskillen, and at Trinity College, Dublin. He graduated M.B., B.Ch. from the University of Dublin in 1905, proceeding to the M.D. two years later. While at Trinity College he was a junior and senior exhibitioner, gaining first-class honours in classics and modern history. After graduation he held house appointments at Sir Patrick Dun's Hospital, Dublin, and at the Worcester General Infirmary. Later he was clinical assistant at the Royal Westminster Ophthalmic Hospital. From 1915 to 1919 he served as an ophthalmic specialist in the R.A.M.C. in Egypt with the 31st General Hospital and at the Military Hospital, Curragh.

After the war MacFetridge settled in practice in Dublin, where he became ophthalmic surgeon to Sir Patrick Dun's Hospital and to the Drumcondra Hospital and assistant ophthalmic surgeon to the Royal Victoria Eye and Ear Hospital. He was also an examiner in ophthalmic surgery for the University of Dublin. For a few years he acted as honorary secretary of the Irish Ophthalmological Society.

MacFetridge left Ireland in 1934 and lived at Cheltenham until he finally settled at Hove in 1936, becoming surgeon, and subsequently emeritus surgeon, to the Sussex Eye Hospital. He married Miss Louisa Carter in 1912, and had three sons and three daughters. Mrs. MacFetridge died in 1951.

J. P. S. W. writes: Many years ago an honorary surgeon at St. Thomas's Hospital said, "It is a great art to grow old gracefully." William Christopher MacFetridge undoubtedly had this art. Before coming to Brighton and Hove he had been an examiner and lecturer in ophthalmic surgery at Dublin University, and surgeon at the Royal Victoria Eye and Ear Hospital, and ophthalmic surgeon at Sir Patrick Dun's Hospital, Dublin. He came to Hove a few years before the second world war, and practised as a consultant in ophthalmology. During the war, when the honorary

Medico-Legal

E.C.T. FRACTURES

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

Mr. John Hector Bolam was admitted to Friern Hospital on April 29, 1954, as a voluntary patient. He had been a car salesman earning £1,000 a year in 1939 and had been commissioned in the Royal Engineers, but was discharged in 1942 suffering from serious nervous debility and depression. He had a series of jobs, but his mental condition became such by 1954 that during an attack of depression he had tried to take his own life.

After admission he had no treatment other than rest, and made good recovery. He was discharged on June 30, 1954, and went back to work, but depression returned and he was again admitted as a voluntary patient on August 16. On August 23, during the absence on holiday of Dr. J. de Bastarrechea, the consultant psychiatrist, he was given E.C.T. by the senior registrar, Dr. C. F. Allfrey. Dr. Allfrey found nothing in Mr. Bolam's history or on examination which suggested to him that a relaxant drug ought to be used, and the treatment was given with no restraint other than control of the shoulders, support for the jaw, and a pillow under the back.

As a result of the convulsion Mr. Bolam suffered from fractures shattering both acetabula, and would never walk properly again.

He subsequently brought an action for damages against the Friern Hospital Management Committee, alleging that the treatment given was negligent in that neither physical restraint through a restraining sheet nor manual pressure on shoulders and pelvis was used, nor was the alternative precaution of using relaxant drugs taken.

The action was tried before Mr. Justice McNair and a jury in the Queen's Bench Division.¹ Dr. J. B. Randell, consultant psychiatrist, called on behalf of Mr. Bolam, said that when relaxants were used the movement in convulsion was very slight and he knew of no case where a fracture had occurred. Relaxants were not commonly used in E.C.T. until 1946 or 1947, and the drugs then available were dangerous and unpredictable, and in 1954 they were not as commonly used as to-day. He knew that fractures did occur before the use of relaxants, but knew of the occurrence of only one among the cases under his supervision where a restraining sheet had been used. He would not in 1954 have carried out E.C.T. without any form of restraint, though he knew there was a school of medical thought which would do so. In cross-examination Dr. Randell agreed that there were real dangers in the use of relaxant drugs coupled with anaesthetics, which should be used in conjunction with them, but in the 6,000 to 10,000 cases of which he had experience in which they were used he had never had a death. He agreed that there existed to-day a large body of medical opinion which thought it wiser to give E.C.T. without the use of relaxant drugs, and which thought that the less restraint applied except to the chin the better. He had learnt with surprise that restraint was not used as often as he expected. It was a body of medical opinion which he would respect even though he did not agree with it.

Called for the defence, Dr. de Bastarrechea said that he was opposed to the use of relaxant drugs in E.C.T. owing to the mortality risk. He had been able to find no English statistics, but a United States survey covering the years 1948 to 1953 showed deaths at the rate of 1 in 370, and if the figures were broken down 1 in 2,000 would be acceptable. These figures confirmed his impression from the general theory of medicine of the danger involved in the use of anything which paralysed respiration. He used relaxant drugs only where the patient's life might be risked by straight E.C.T. Each case had to be considered from every aspect,

¹ *The Times*, February 21, 22, 23, 26, and 27.

staff of the Sussex Eye Hospital was reduced almost to vanishing point, he volunteered to act in any capacity. He assisted me in the out-patient department until the staff was once more completed by the return from the Forces of the younger consultants. This was no mean task for a man of his age, for the clinics would often last for 5½ to 6 hours. In order to mark our gratitude for his services the statutes of the Sussex Eye Hospital were specially altered so that he could be elected surgeon emeritus, a richly deserved honour. He was a handsome man and looked splendid in his white flannels on the lawn tennis court, at which game he excelled. The death of his wife a few years ago was a sad blow to him. His personal charm displayed the country of his origin, and he will be greatly missed by his patients and his colleagues alike, who extend to his children their sincere condolences.

Dr. D. A. DEWAR died at his home at Stanley, County Durham, on January 24 at the age of 86. Born at Portsmouth in 1870, David Alexander Dewar studied medicine at Glasgow and graduated M.B., Ch.B., with commendation, in 1893. After serving an assistantship at Low Fell he joined his brother-in-law, the late Dr. John Charles, in partnership in Stanley, where, except for some years in the Army in the first world war, he continued to practise until his own retirement fifty-three years later. Although of a reserved disposition, he soon won the confidence and affection of his patients, who appreciated his shrewd common sense, his innate kindness, and his high sense of duty. From his early training in Glasgow under Professor F. O. Bower he acquired an enthusiasm for botany which stayed with him all his life, so that no flower or plant grew in hedgerow or field to which he could not affix the name and order. This interest matched well with his own lifelong hobby of entomology, and in the countryside around his home he became a very familiar and well-loved figure. He leaves a widow and three sons, two of them in his own profession.

Lieutenant-Colonel H. ST. MAUR CARTER died at his home at Mortimer, near Reading, on February 10 at the age of 78, Herbert St. Maur Carter was born on May 7, 1878, of a military family, and was educated at Trinity College, Dublin, graduating M.B., B.Ch. from the University of Dublin in 1904 and proceeding to the M.D. in the same year. After holding the appointment of house-surgeon at the Adelaide Hospital, Dublin, he took out a regular commission in the R.A.M.C., in which he served until 1930.

A. S. W. writes: H. St. Maur Carter was one of the generation of officers before the first world war, when the prestige of the R.A.M.C. reached its highest peak; an era associated with the names of Bruce, Leishman, and many other officers who gained international fame. Colonel Carter's specialty was surgery, and he held important surgical appointments at the Cambridge Hospital, Aldershot, and elsewhere. In 1912-13 he was twice granted special leave to accompany Red Cross units to the Middle East, and for his services in Serbia was awarded the Order of St. Sava. He saw active service in France and Italy from 1914 to 1918. He was awarded the D.S.O. in 1915 and was three times mentioned in dispatches. He was the ideal Army doctor, being a keen soldier, but a doctor first and last. Cultured and well-informed, he possessed a kindly nature which endeared him to all his friends. With a keen sense of humour and a store of anecdotes and reminiscences derived from his service in various parts of the world, he was always the best of company. After retiring from the Service in 1930, he eventually settled in the village of Mortimer, where he took a great interest in people and in village affairs. During the second world war he undertook duties with the Civil Defence. In the last year of his life he bore a painful illness with the utmost courage.

and his technique was non-restraint. In cross-examination he said that six fractures during E.C.T. during the past seven years at Friern Hospital meant six in about 70,000 cases. Of the ten doctors giving E.C.T. in his hospital some always used relaxants, including one of his own juniors, some used them only in selected cases, but they had nearly all ceased using manual restraint at about the same time. The hospital records showed four deaths associated with E.C.T. using "scoline" (succinylcholine chloride) as a relaxant and two associated with straight E.C.T., in one of which the coroner's jury had found a verdict of death from natural causes.

Dr. Allfrey himself said that, though he had left neither the "non-relaxant" nor the "non-restraining" camp, he was now using relaxants to a greater extent than in 1954 because a new one, "brevdil," was considered safer. After the accident to Mr. Bolam he gave a relaxant in all cases of E.C.T. for the following seven days, because until he had become certain in his own mind that there had been nothing wrong with his technique he thought he ought to take no risk of further fractures till Dr. de Bastarrechea returned.

Dr. L. G. M. Page, deputy medical officer of the Three Counties Hospital, Bedfordshire, and Dr. A. A. Baker, consultant psychiatrist and deputy superintendent at Banstead Hospital, also gave evidence for the defence.

Summing up to the jury, Mr. Justice McNair said that a professional man was not guilty of negligence if he acted in accordance with a practice which was accepted by a competent body of professional men skilled in that particular art merely because there was a body of opinion which took the contrary view. They must not look through 1957 spectacles at what had happened in 1954.

The jury returned a verdict for the defendants, and judgment was entered accordingly.

MEDICAL NEGLIGENCE

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

Lord Nathan's express intention in writing this book¹ has been to give medical men and hospital administrators an idea of how they stand in law in the varying circumstances in which they may find themselves in the exercise of their profession. He was moved to write it because as chairman of the board of governors of the Westminster Hospital he had become very conscious of the effect upon them, and especially upon doctors of junior standing, of the apprehension of litigation.

Lord Nathan, with the collaboration of Mr. Anthony Barrowclough, has made a comprehensive examination of medical negligence. He has also explored a problem less widely canvassed but no less important—that of the legal implications of consent of the patient to treatment or operation. He points out that in this field there are few English decisions, and illustrates his argument and conclusions from United States and Commonwealth cases. If more of such cases come to be decided in England in future this will be very helpful. The fact that not many such cases have been reported in England so far is one of the few grains of relief from apprehension of litigation to be derived by doctors and hospital administrators from Lord Nathan's book. He cannot in the nature of things do more otherwise to relieve them than to explain that their legal duty to the patient is to take reasonable care for his safety, no more and no less, and to do so in the light of medical knowledge at the time when the treatment is given or operation performed. But the wide variety of cases cited by Lord Nathan in which this duty has been found to have been broken is a depressing reminder of medical fallibility.

While Lord Nathan amply succeeds in covering the many varying circumstances in which doctors and hospital administrators in the exercise of their profession may find

themselves in collision with the law, this is rather a lawyers' than a doctors' book. It will be an excellent source of lecture material for the medical school, making as it does a clear analysis of the legal relation between doctor and patient and its implications. But doctors may conclude it would have been safer to have gone to the Bar than take up medicine. Counsel, as Lord Nathan, being a solicitor, does not fail to observe in the opening paragraph of his preface, if not actually incapable of negligence, are at any rate immune from its consequences.

Medical Notes in Parliament

ROYAL COMMISSION ANNOUNCED

The PRIME MINISTER announced on February 28 the terms of reference of the Royal Commission on the remuneration of doctors in the Health Service. He said, in answer to questions by three members, the terms of reference will be as follows:

To consider:

- How the levels of professional remuneration from all sources now received by doctors and dentists taking any part in the National Health Service compare with the remuneration received by members of other professions, by other members of the medical and dental professions, and by people engaged in connected occupations;
- What, in the light of the foregoing, should be the proper current levels of remuneration of such doctors and dentists by the National Health Service;
- Whether, and if so what, arrangements should be made to keep that remuneration under review;

He said he would announce as soon as possible the names of the chairman and members. He could not fix a date by which the commission must report, but he would certainly urge the chairman to proceed without delay.

Mr. J. RANKIN (Glasgow, Govan, Lab.) asked if the Prime Minister was aware that a B.M.A. spokesman quoted in the press had said that his reference to an interim adjustment was extremely obscure, and that it might mean any of a number of things, some of which would be entirely unacceptable. Would the Prime Minister not make his attitude on the interim adjustment clear beyond a peradventure, or did he wish to give the tough boys in the B.M.A. the ammunition necessary to destroy the Health Service?

Mr. MACMILLAN: The sentence which I put into the letter means exactly what it says, and I do not wish to make any interpretation of it this afternoon. At the same time, we are always in touch with the leading members of the profession, and either the Minister of Health or I will be very willing to make any further explanation at an appropriate moment.

Mrs. E. HILL (Manchester, Wythenshawe, Con.): Is it not a fact that the Government are prepared to negotiate an immediate increase for junior hospital staff?

Mr. MACMILLAN: Yes.

Mr. F. BESWICK (Uxbridge, Lab.): Is the Prime Minister aware that if, as a result of any uncertainty as to the meaning of the phrase interim adjustment, any damage is done to the Health Service, the people of this country will not forgive him? Can he say why he cannot make it clear, both to allay apprehension on the part of doctors and also in fairness to those who may be invited to serve on this commission, that the commission is not now intended, as was originally the case, simply to dodge the issue, and does not preclude any interim negotiations on salary scales?

Mr. MACMILLAN said Mr. Beswick was very fond of making statements for which he had little ground; he preferred to rely rather on innuendo than fact. The commission was never intended for the purpose of dodging this issue. Members on both sides of the House knew the very difficult circumstances that surrounded some of these problems. "I am convinced that the commission will be able to act

rapidly and effectively, and I am very hopeful that we shall be able to reach a good point of view between all concerned in this matter."

Dr. EDITH SUMMERSKILL (Warrington, Lab.): Will not the Prime Minister say whether the terms of reference will enable the commission to take into account the conversations conducted at the inception of the Service between the Government and the doctors? Further, will he again consider interpreting this phrase, because the attitude of the profession during the next few months may be guided by what he says now?

Mr. MACMILLAN: On the first point, I have not the record of these conversations with me. Therefore if she pressed me on the matter I should have to ask for notice. I think it would be a matter for the commission itself to decide. With regard to the second point, I should prefer to leave the matter as it is at the moment. I feel quite certain we shall be able to make good progress in this affair.

Dr. DONALD JOHNSON (Carlisle, Con.), questioning the Prime Minister the previous day about the terms of reference, asked if he would extend them to include the examination of the method of payment by capitation fee, which had not always been satisfactory to either doctor or patient, and the substitution of another method of payment according to the nature of the service rendered to the individual.

Mr. MACMILLAN: I will consider that. We have not yet decided on the terms of reference, but I will be glad to consider what Dr. Johnson has said.

Mr. H. GAITSKELL, Leader of the Opposition: Is the Prime Minister aware that there is widespread anxiety that the Royal Commission will take a very long time before reaching its conclusions, and that while there may be a case for reviewing the whole question of the method of payments to doctors there is also a case surely for coming to some interim settlement on their claims?

Mr. MACMILLAN: If Mr. Gaitskell had read the letter that I wrote, which was published this morning, he would have seen that that was exactly the point I made.

Mr. GAITSKELL: The Prime Minister said nothing in the letter as to exactly how this interim settlement was to be arrived at. Is it to be left to the Royal Commission, or are the Government prepared to do their duty and reach an agreement?

Mr. MACMILLAN: I have nothing to add to the letter I wrote, which I think was explicit, clear, and helpful.

Leukaemia and Bomb Tests

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked the Prime Minister on February 28 whether his attention had been drawn to the rising incidence of leukaemia in many parts of the world where reliable statistics were available; and whether, in view of the increasing risks from this and other diseases which closely followed the explosion of nuclear weapons, he would suggest to Mr. Eisenhower and Marshal Bulganin that a meeting be called for further discussion on the abolition of the tests.

Mr. MACMILLAN stated that he was aware that there had been an increase in the death rate from leukaemia over at least the last 25 years, but he understood that, while it would be generally agreed that exposure to radiation was probably one factor causing this, the amount of external radiation due to fall-out from nuclear test explosions formed a very small proportion of the radiation to which man was exposed from all sources. Various proposals on nuclear and conventional disarmament would be considered when the Disarmament Subcommittee met on March 18.

Anthrax Investigation

Commander C. E. DONALDSON (Roxburgh, Selkirk, and Peebles, Con.), asked the Minister of Labour whether he proposed to review the operation of the Orders under the Anthrax Prevention Act, 1919.

Mr. IAIN MACLEOD announced on February 28 that he had received a number of representations which indicated the need for such a review. The last full-scale inquiry into the question of precautions against anthrax was made 40 years

ago, and he had decided, after consulting the Minister of Health, the President of the Board of Trade, and the Secretary of State for Scotland, and also the Medical Research Council, to appoint a committee of inquiry with the following terms of reference: "To consider the existing legal provisions concerning the importation of goods infected or likely to be infected with anthrax and the precautions to be taken in connexion with such imported goods for the protection of the health of persons and to make recommendations." Mr. R. F. Levy, Q.C., had agreed to act as chairman of the committee. He would announce shortly the names of the other members.

Lung Cancer Research

The firm intention of the Government to reveal the truth about the connexion between smoking and lung cancer as it came to light was declared by Mr. J. K. VAUGHAN-MORGAN, Parliamentary Secretary to the Ministry of Health, at the end of a short debate in the House of Commons on March 1. In the meantime, he said, they must avoid sensationalism.

Mr. M. LIPTON (Brixton, Lab.) opened the debate with a criticism of the Government for its failure to sponsor an anti-smoking campaign.

Mr. VAUGHAN-MORGAN asserted that the Government had not hesitated to announce any discovery as and when it became available. There had been very little advance since the Government statement in May, 1956. Carefully controlled inquiries had shown statistically that smokers had a significantly higher mortality rate from lung cancer than non-smokers.

There were many ways of interpreting the statistical evidence available. Without doubt the findings did constitute prima facie statistical evidence that smoking carried a risk of lung cancer. These mortality rates, and these risks, must be viewed with a due sense of proportion.

Lung cancer was not the only problem, nor must it be the only preoccupation. It continued to show a steady increase, which had varied from 5.7 to 8.7% over the past five years. The Medical Research Council was engaged in an extensive programme for the purpose of throwing more light on the exact nature of the relationship between smoking and lung cancer, the long-term aim being to identify those constituents of tobacco smoke which might be active in provoking cancer. Research was continuing also on far wider aspects than this. It could fairly be said that there was no promising line of investigation that was being neglected for lack of funds. The Government were spending £364,000 a year on cancer research of all kinds through the Medical Research Council alone. In addition, there was research in the hospitals and universities, and the voluntary associations were making large contributions. The M.R.C. were currently reviewing the existing evidence, and their considered views should be available before long. The Government would give these their full and urgent consideration, and he repeated the pledge that the public would be informed of all the evidence as it became available.

Periods of Hospital Treatment

The MINISTER OF HEALTH informed Mr. D. FREETH (Basingstoke, Con.) on March 1 that the average length of stay in hospital of in-patients who died or were discharged in 1955 was:—mental illness: treatment under Lunacy and Mental Treatment Acts, 552.1 days, others 103.9 days; mental deficiency 4,123.1 days; diseases of the chest 139.8 days; chronic sick 172.5 days; all others 15.7 days.

Interim Pay Adjustment

Mr. M. LIPTON (Brixton, Lab.) asked the Prime Minister on March 4 what communications he had received from medical organizations since his announcement of a Royal Commission on doctors' pay.

Mr. HAROLD MACMILLAN.—I have received a letter from the negotiating committee of the medical profession, which has been published together with a copy of my reply.

Mr. LIPTON.—If the Prime Minister has another look at his reply he will see that the English is bad and the meaning obscure. Will he say why he is so curiously unwilling to

¹ *Medical Negligence: Being the Law of Negligence in Relation to the Medical Profession and Hospitals.* By the Right Hon. Lord Nathan, P.C., with the collaboration of Anthony R. Barrowclough, B.A. (Pp. 218+xxxii; 35s.) London: Butterworth and Co. Ltd. 1957.

say whether this proposed interim adjustment may also apply to general practitioners?

Mr. MACMILLAN.—I am sorry about the English. I am always ready to take advice from a very expert source. I think the best thing I can do is to try and get the Commission started, and I hope, with great confidence, that we shall be able to clear up the other issues as we go on.

Mr. ERIC FLETCHER (Islington, East, Lab.) asked if the Prime Minister would not agree that, whatever might be the case for a Royal Commission to examine the overall question of doctors' pay, there was a strong case for some interim immediate adjustment of doctors' remuneration, and would he acknowledge that and remove all this misunderstanding by making his position clear? Mr. MACMILLAN said that it was for that reason he had made reference to it in his letter.

Mr. A. BLENKINSOP (Newcastle upon Tyne, East, Lab.).—Would the Prime Minister not agree that, since he has made this specific reference in his letter to the B.M.A., it is highly desirable that he should clarify it so that possibly some further dispute may be avoided?

Mr. MACMILLAN.—No. I think all these things will move along satisfactorily. The first thing to do is to get the Commission appointed, which, I am very hopeful, will be quite soon. Then, as I said in answer to supplementary questions, it will be made quite clear that the Minister of Health and I are very ready to take up these further questions with the negotiating committee.

Mr. BLENKINSOP asked the Minister of Health whether he would reopen negotiations with the medical profession for an interim settlement of their claim, pending the full review to be undertaken by a Royal Commission. Mr. D. VOSPER replied that the Government was prepared immediately to recommend the Management Side of the appropriate Whitley Council to offer to negotiate an interim increase in the remuneration of hospital medical and dental staff up to and including the grade of senior registrar. Beyond this he would refer the Member to the replies given by the Prime Minister on February 28.

Mr. BLENKINSOP said this was merely a stone-walling answer. When would the Minister give some information with regard to the interim negotiations in respect of general practitioners? Mr. VOSPER said it was not a stone-walling answer, because it related to the Government's decision to offer to negotiate immediately for junior hospital doctors. On that question he was still awaiting a reply from the negotiating committee. Beyond that, he had nothing to add to the Prime Minister's statement.

Prescription Costs

Mr. BLENKINSOP asked the Minister of Health what was the average cost per prescription under the National Health Service for the month of December, 1956; and how this compared with the average cost in December, 1955. Mr. VOSPER said it was approximately 5s. 6½d., which was about 11d. more than in December, 1955. Mr. BLENKINSOP said there had been a serious further increase in the cost since the new charges were imposed. Did not that show the grave danger of the advice to doctors to prescribe larger quantities per prescription? Mr. VOSPER pointed out that a great part of this increase occurred before the new prescription charge was introduced, and it was due in part to the increased chemists' remuneration and the release of new drugs. Only in part was it due to the new prescription charge. He would like to see the results for February and March before coming to a definite conclusion.

Mr. G. NICHOLSON (Farnham, Lab.) asked if the Ministry were doing anything to see that during their training doctors were made cost-conscious. Mr. VOSPER said "Yes."

Dr. EDITH SUMMERSKILL (Warrington, Lab.) said the high average cost of prescriptions was related to the high cost of proprietary drugs. What action was the Minister taking to keep this factor within reasonable limits? Mr. VOSPER told her the matter was under review. He could not say, on the figures for December, how much of the cost related to proprietary medicines.

Vital Statistics

Tetanus Deaths

Though deaths in England and Wales assigned to tetanus in 1954 numbered 37, a special examination of death certificates by the Registrar-General showed that in another 24 cases death was primarily due to tetanus.¹ Proportionately to population, twice as many occurred in the country as in towns. Among the causes of the tetanus were a few cases of the classical type of injury—"rusty iron spike penetrated foot," "wound from garden fork"—and several in which the source of infection was so inapparent as not to be traced. In between came some cases in which the injury was known but trivial and likely to be disregarded—for example, "grazed knee," "puncture wound in leg from splinter off park bench," "splinter in hand," "infection of ingrowing toenail." Four infections followed surgical operations—correction of foot deformity, hysterectomy for fibroids, gastrectomy for duodenal ulcer, and triple arthrodesis to correct foot deformity. Two cases of tetanus neonatorum occurred. Some noteworthy causes of the infection included: "associated with acute otitis media," "sprained ankle, developing osteomyelitis," "blister infected by fish manure," "abrasion of skin on removal of plaster strapping for fracture of humerus," and "infected epithelioma of scalp."

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in January was 85, compared with 116 in the previous month and 92 (revised figure) in January, 1956.

The numbers of cases of industrial diseases in the United Kingdom reported during January, 1957, were as follows: lead poisoning 4, aniline poisoning 1, epitheliomatous ulceration 10, chrome ulceration 4; total 19. There were no deaths.—*Ministry of Labour Gazette*, February, 1957.

Defective Poliomyelitis Vaccine

The Ministry of Health announced on February 27 that in the latest batch of poliomyelitis vaccine 47 vials were defective. They showed a change of pH towards acidity. These vials contain enough vaccine for 235 children, while the whole batch could vaccinate 200,000 children (with two doses). This change has not previously been encountered, but it is said not to be due to the presence of live virus, and probably not due to bacterial contamination. The cause of it is being investigated with the utmost speed, and meanwhile the rest of the batch is not being distributed.

A batch of vaccine takes about six months to prepare, and on the average the batches are now expected to emerge from production about two to four weeks apart. This batch was put into its final containers last November, since when it has been stored at 4°C. The material drawn off for testing had satisfactorily passed all the tests. These are biological in character, so that the material is used up by them. The material in the vials was divided into eight subdivisions, and the 47 faulty vials were in two of these subdivisions. The possibility of other vials developing this change is also being investigated.

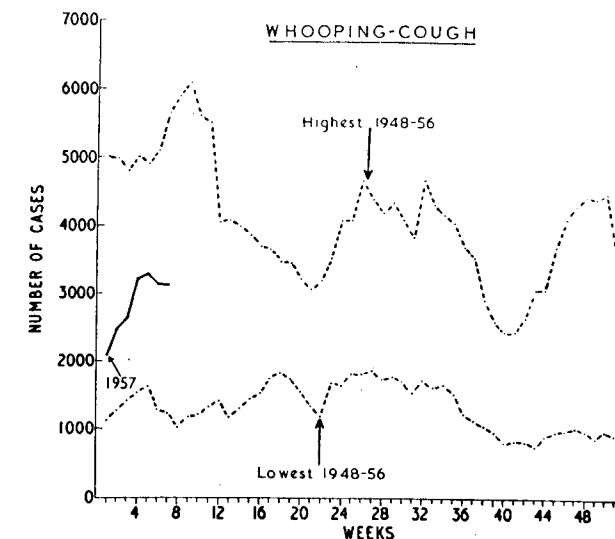
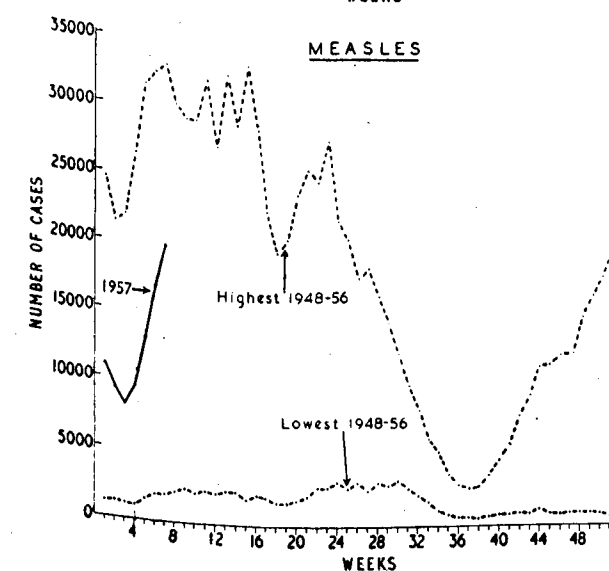
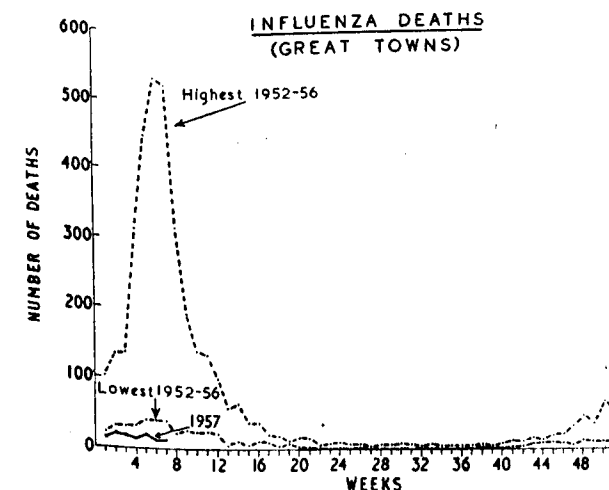
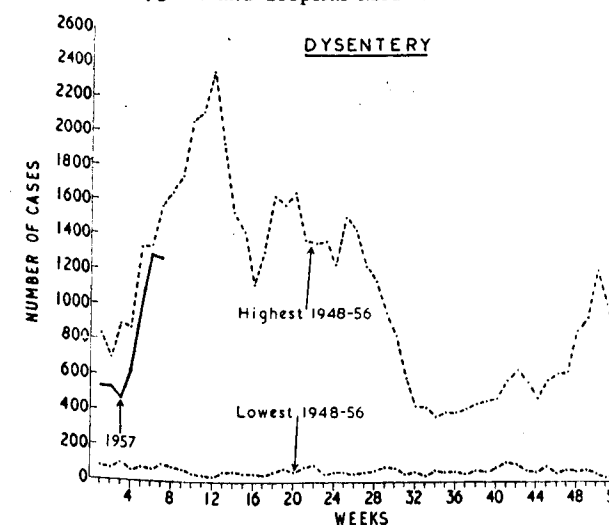
Week Ending February 23

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 890, whooping-cough 3,190, diphtheria 2, measles 21,317, acute pneumonia 625, acute poliomyelitis 39, dysentery 1,296, paratyphoid fever 8, typhoid fever 1.

¹ The Registrar-General's Statistical Review for the year 1954, Part 3, Commentary. H.M.S.O. (8s.).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the years 1948-56 (influenza 1952-6) are shown thus -----, the figures for 1957 thus ————. Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

Only small changes were recorded in the incidence of most infectious diseases in England and Wales during the week ending February 16. The only exception was an increase of 2,958 in the number of notifications of measles, from 16,752 to 19,710.

The largest rises in the incidence of measles were 466 in Lancashire, from 3,438 to 3,904, 277 in Middlesex, from 652 to 929, 266 in Yorkshire West Riding, from 930 to 1,196, 226 in Surrey, from 722 to 948, 211 in Yorkshire East Riding, from 367 to 578, 199 in Cheshire, from 586 to 785, 187 in Oxfordshire, from 159 to 346, 158 in Kent, from 291 to 449, and 155 in London, from 1,353 to 1,508; the only large exception to the general rise was a fall of 100 in Yorkshire North Riding, from 237 to 137. 830 cases of scarlet fever were notified, 39 fewer than in the preceding week, and only small changes were recorded in the local trends. 3,163 cases of whooping-cough were notified, being 15 more than in the preceding week. The largest fluctuations in the returns of whooping-cough were decreases of 51 in Essex, from 209 to 158, 47 in Lancashire, from 346 to 299, and an increase of 44 in Kent, from 160 to 204. Only 2 cases of diphtheria were notified, being 7 fewer than in the preceding week.

37 cases of acute poliomyelitis were notified during the week, and these were 10 more for paralytic and 7 fewer for non-paralytic cases than in the preceding week. The largest returns were 3 cases in Leicestershire and in Yorkshire West Riding (Barnsley C.B. 2).

The notifications of dysentery numbered 1,274 and were 16 fewer than in the preceding week. The largest variations in the local outbreaks were increases of 50 in Yorkshire West Riding, 48 in Warwickshire, and a decrease of 61 in Lancashire. The largest returns during the week were Lancashire 275 (Accrington M.B. 84, Stretford M.B. 58, Urmston U.D. 25, Tyldesley U.D. 14, Salford C.B. 10), Yorkshire West Riding 224 (York C.B. 46, Rotherham C.B. 34, Batley M.B. 31, Leeds C.B. 29, Sheffield C.B. 16, Dewsbury C.B. 14, Bradford C.B. 13, Colne Valley U.D. 11, Worsbrough U.D. 10), Warwickshire 123 (Coventry C.B. 66, Birmingham C.B. 47), London 92 (Hackney 16, Southwark 10, Wandsworth 10), Essex 67 (East Ham C.B. 55), Northumberland 63 (Blyth M.B. 30, Newcastle upon Tyne C.B. 19, Alnwick U.D. 14), Durham 61 (Gateshead C.B. 26, Blaydon U.D. 20), Middlesex 43 (Harrow M.B. 20), Nottinghamshire 43 (Arnold U.D. 14, Nottingham C.B. 11, Basford R.D. 10), Yorkshire East Riding 42 (Kingston upon Hull C.B. 33), Staffordshire 36 (Kidsgrove U.D. 15, Stoke on Trent C.B. 10), Surrey 30 (Surbiton M.B. 21), and Bedfordshire 20 (Luton M.B. 17).

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending February 16 (No. 7) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1957					1956				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	2	0	5	0	1	9	1	5	0	4
Dysentery ..	1,274	92	218	31	4	1,568	190	200	8	2
Encephalitis, acute	6	0		0		2	0		0	
Enteric fever: Typhoid ..	1	0	0	1		0	0	1	0	
Paratyphoid ..	6	1	2 (B)	0		7	0	0	0	
Food-poisoning ..	187	27	23	2		88	9		0	
Infective enteritis or diarrhoea under 2 years ..					3	24			10	16
Measles * ..	19,710	1508	491	595	286	3,152	61	95	19	111
Meningococcal infection ..	29	2	11	1	1	36	3	13	3	1
Ophthalmia neonatorum ..	21	1	6	0		28	0		0	
Pneumonia † ..	676	54	253	26	4	1,187	69	381	23	3
Poliomyelitis, acute: Paralytic ..	31	0		4	1	6	12	0	4	1
Non-paralytic ..	6	2				6	1			5
Puerperal fever § ..	270	59	10	0	1	238	36	2	1	
Scarlet fever ..	830	55	88	20	29	860	28	91	47	22
Tuberculosis: Respiratory ..	643	107	130	24		664	86	118	15	
Non-respiratory ..	81	5	18	9		73	6	15	4	
Whooping-cough ..	3,163	157	394	9	38	1,235	64	105	99	176

DEATHS In Great Towns	1957					1956				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	1	0	0	0	0	0	0	0	0	1
Dysentery ..	0	0		0		1	0		0	
Encephalitis, acute		0			0		0			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	6	0	1	0	1	3	0	1	1	1
Influenza ..	12	1	1	0	0	97	13	18	1	2
Measles ..		0	0	0	0		0	0	0	0
Meningococcal infection ..		0	0			1	0			
Pneumonia ..	291	36	21	15	12	602	83	58	12	14
Poliomyelitis, acute	1	0			0	4	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	66	5	16	1	0	97	13	10	2	7
Non-respiratory ..	0	1	0	0	1	0	2	0	0	1
Whooping-cough ..	3	0	2	0	1	2	0	0	0	0
Deaths 0-1 year ..	212	33	35	5	13	266	30	32	11	20
Deaths (excluding stillbirths) ..	5,666	733	600	124	200	7,946	1124	809	130	238
LIVE BIRTHS ..	8,076	1160	1088	231	360	7,737	1171	887	187	349
STILLBIRTHS ..	221	33	24			219	17	25		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Medical News

Rockefeller Grants.—In the last quarter of 1956 grants totalling over \$8 million were awarded by the Rockefeller Foundation. Medical education and public health, and biological and medical research, received between them \$2.2 million. The principal grant to Britain during the quarter was £10,000 towards the initial costs of the Institute of Statistics at Aberdeen, established recently by Aberdeen University and the Agricultural Research Council. The Institute offers postgraduate training in statistics (leading to a degree) and advises on the design of experiments. Although mainly concerned with agricultural problems, the Institute's staff also help other departments in the university. Other grants include \$9,500 to Sheffield University towards the cost of a study group in Holland arranged by the International Corresponding Club for Preventive and Social Medicine; \$5,000 for research equipment for the department of biochemistry at Glasgow; and a grant towards the expenses of a visit to surgical laboratories in the United States by Professor P. R. ALLISON, Nuffield professor of surgery at Oxford.

Chair of Chemical Pathology, Leeds.—Dr. G. H. LATHE, research biochemist at Queen Charlotte's Maternity Hospital, London, has been appointed professor of chemical pathology at Leeds University. He succeeds Professor F. S. FOW-WEATHER. Dr. Lathe, who is 43, graduated at McGill University in both science (1934) and medicine (1938). He also obtained the M.Sc. (1936) and later the Ph.D. (1947). After holding research appointments in physiology at McGill, Dr. Lathe was commissioned in the Royal Canadian Army Medical Corps in 1941, serving as an R.M.O. and later as biochemist. He was demobilized in 1945. Coming to England in 1946, Dr. Lathe went to Oxford with an I.C.I. research fellowship until 1948, when he moved to the Postgraduate Medical School of London. Here he continued his research. In 1949 he was appointed biochemist in the Bernhard Baron Research Laboratories at Queen Charlotte's. Dr. Lathe's main subjects of research have been alimentary absorption, the metabolic effects of wounds, and the bile pigments.

Medical Cinematography.—An international society dealing with "cine-endoscopy" and "cine-radiology" was officially inaugurated in Paris last December. It is the Société Médicale Internationale de Photo-cinématographie et Télévision Endoscopiques et de Radiocinématographie. Its headquarters are at Rheims, and the permanent honorary secretary is Dr. J. M. DUBOIS DE MONTREYNAUD, 4, Rue du Général Baratier, Rheims, Marne, France, from whom further information may be obtained. The society's first annual meeting will be held in New York on June 3 and 4, under the presidency of Dr. P. H. HOLINGER.

Clinics for Men with Sexual Problems.—The Family Planning Association now has six branches, in addition to its headquarters, where clinics for men are held. The latest to open is one at Birmingham. The commonest disabilities encountered in these clinics are impotence, infertility, and premature ejaculation. Doctors wishing for further information should apply to the Family Planning Association, 64, Sloane Street, London, S.W.1.

M.R.C.P. (Edinburgh).—The following were elected Members of the Royal College of Physicians of Edinburgh at the quarterly meeting of the college on February 5: R. F. Guymer, M. A. O'Halloran, M. M. Prasad, J. Allan, J. Wilkinson, B. Levin, S. Ahmed, Elaine H. McNeil-Smith, M. S. N. Pathy, S. S. Khandpur, R. D. Pasi, B. J. Baldachin, J. R. Roy, A. C. Gibson, P. S. Mukherji, Flora M. Bisset-Smith, J. P. F. Fogarty, N. Z. Sacks, T. B. Patel, A. Jain, J. H. Learmonth, K. A. Krishnamurthy, B. P. Mozoomdar, W. B. Hudson, and P. Dayal.

Otago University.—Dr. J. R. ROBINSON, of the department of experimental medicine, Cambridge, has been appointed associate professor in physiology at Otago University. Dr. Robinson is a fellow and assistant tutor of Emmanuel College, Cambridge, assistant director of research in the department of experimental medicine, and secretary to the faculty board of medicine. He is leaving for New Zealand in August.

London University.—Professor J. B. S. HALDANE, F.R.S., is resigning from the Weldon Chair of Biometry at University College on September 30. Professor J. L. D'SILVA, professor of physiology at the London Medical College, has been appointed a fellow of King's College.

University College of West Indies.—Dr. R. J. GOURLAY, assistant S.M.O. of the North-West Metropolitan Regional Hospital Board, has been appointed senior lecturer in preventive medicine at the College. He is expected to arrive in Jamaica early next month.

Birmingham University.—Mr. A. L. T. EASTON, F.R.C.S., has been appointed lecturer in obstetrics and gynaecology from March 1.

Leeds University.—Dr. J. M. ROBERTS has been appointed lecturer in the department of psychiatry. He was formerly tutor in psychiatry.

COMING EVENTS

Bradshaw Lecture.—Mr. A. LAWRENCE ABEL, F.R.C.S., will deliver the Bradshaw lecture on March 14 at 5 p.m. at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2. His subject will be "Diagnosis and Treatment of Diseases of the Large Intestine."

British Association of Physical Medicine.—Annual meeting at the Middlesex Hospital, London, W.1, April 5 and 6. Dinner at the Royal College of Surgeons on April 5 (tickets 30s.; apply before March 23). Further details from the secretary of the association, 45, Lincoln's Inn Fields, London, W.C.2.

Institute of Diseases of the Chest.—A discussion for general practitioners on hay fever and asthma, April 9 at 2.30 p.m. at the Institute. Details from the secretary of the Institute, Brompton, London, S.W.3.

Victor Horsley Memorial Lecture.—Sir GEOFFREY JEFFERSON will deliver the Victor Horsley Memorial Lecture on April 12 at 5.30 p.m. at B.M.A. House. His subject will be "Victor Horsley—His Life and Work."

Tuberculosis Educational Institute.—Intensive course for medical practitioners on "Chest Diseases and the Family Doctor," Norwich, April 13 and 14. Details from the Institute, Tavistock House North, Tavistock Square, London, W.C.1.

Society for General Microbiology.—Twenty-fourth general meeting, at the Royal Institution, Albemarle Street, London, W.1, April 15-17. Details from the Society, c/o Institute of Biology, 41, Queen's Gate, London, S.W.7.

Nutrition Society.—A symposium on "Clean Food" will be held by the Scottish Group in Aberdeen on April 20. Details from Dr. J. DAVIDSON, Rowett Research Institute, Bucksburn, Aberdeenshire.

Association of Surgeons of Great Britain and Ireland.—Annual meeting, April 25-27, at Newcastle upon Tyne. Registration before April 11. Details from the secretary of the association, 45, Lincoln's Inn Fields, London, W.C.2.

Welsh National School of Medicine.—Postgraduate course for general practitioners, April 29 to May 11. Details from the secretary of the school, 34, Newport Road, Cardiff.

Medical Exhibition at Glasgow.—The 1957 Regional Exhibition of the London Medical Exhibition will be held at the McLellan Galleries, Sauchiehall Street, Glasgow, April 29 to May 3. The exhibition will be open from 11 a.m. to 6.30 p.m. (8 p.m. on April 30).

British Diabetic Association.—The eleventh Banting Memorial meeting will be held on July 12 and 13 in Oxford. Professor H. A. KREBS, F.R.S., will deliver the memorial lecture. Early application for accommodation should be made to the British Diabetic Association, 152, Harley Street, London, W.1.

Universities Federation for Animal Welfare.—A symposium on "Humane Technique in the Laboratory" will be held on May 8 at Birkbeck College, Malet Street, London, W.C.1. Details from the secretary, Laboratory Animals Bureau, M.R.C. Laboratories, London, N.W.3.

NEW ISSUES

Archives of Disease in Childhood.—The new issue (Vol. 31, No. 160) is now available. The contents include:

THE ADOLESCENCE OF NUTRITION. L. Emmett Holt, jun.
THE DAY AND NIGHT OUTPUT OF URINE IN ENURESIS. David Vulliamy.
THE REBOUND PHENOMENON IN ACUTE RHEUMATIC FEVER. K. S. Holt.
PHENYLALANINE-RESTRICTED DIETS IN THE TREATMENT OF PHENYLKETONURIA. J. D. Blainey and R. Gulliford.
TUBERCLES OF THE CHOROID. R. S. Illingworth and J. Lorber.
ENCEPHALITIS AND THROMBOCYTOPENIC PURPURA AFTER RUBELLA. Emil Steen and K. H. Tord.
MASSIVE PULMONARY EMBOLISM IN A BOY AGED 9. Maureen Cashman.
SALIVARY ELECTROLYTES IN FIBROCYSTIC DISEASE OF THE PANCREAS. William H. Johnston.
THE INCIDENCE OF INFANTILE PYLORIC STENOSIS IN THE NORTH-EAST OF SCOTLAND. Muriel M. McLean.
THE POSSIBLE INFLUENCE OF HYPERADRENOCORTICISM ON THE FOETUS OF THE DIABETIC WOMAN. James W. Farquhar.
MESENTERIC LYMPHANGIOMA AS A CAUSE OF ACUTE ABDOMINAL SYMPTOMS. M. Levene, P. A. Walker, and T. A. White.
PROTEOLYTIC ACTIVITY OF THE PANCREAS. J. G. Bate and Ursula James.
ANURIA ASCRIBED TO ACUTE TUBULAR NECROSIS IN INFANCY AND EARLY CHILDHOOD. I. J. Carré and J. R. Squire.
THE EFFECT OF ORAL LACTULOSE ON FAECAL FLORA AND pH IN INFANTILE GASTRO-ENTERITIS. B. Zilberg.
BOOK REVIEWS.
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Journal of Neurology, Neurosurgery, and Psychiatry.—The new issue (Vol. 20, No. 1) is now available. The contents include:

ABNORMAL IMMUNOLOGICAL REACTIONS IN DISSEMINATED SCLEROSIS. Honor V. Smith, M. L. E. Espir, C. W. M. Whitty, and W. Ritchie Russell.
LOSS OF RECENT MEMORY AFTER BILATERAL HIPPOCAMPAL LESIONS. W. B. Scoville and Brenda Milner.
THE RECURRENCE OF INTRACRANIAL MENINGIOMAS AFTER SURGICAL TREATMENT. Donald Simpson.
A VARIETY OF PARAMYOTONIA CONGENITA. E. B. French and R. Kilpatrick.
A SIMPLIFIED NEUROSURGICAL TECHNIQUE FOR APPROACHING AND DAMAGING THE REGION OF THE GLOBUS PALLIDUS IN PARKINSON'S DISEASE. S. Obrador.
AN UNUSUAL FORM OF WIDESPREAD VASCULAR DISEASE OF THE BRAIN IN A YOUTH. C. S. Treip and R. J. Porter.
SOME RELATIONSHIPS BETWEEN PERIPHERAL VASOMOTOR AND E.E.G. CHANGES. Brian Ackner and G. Pampiglione.
CONDUCT DISORDERS IN EPILEPTIC CHILDREN. F. Grunberg and D. A. Pond.
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British Journal of Ophthalmology.—The new issue (Vol. 41, No. 3) is now available. The contents include:

PROGNOSIS IN CASES OF STRABISMUS WITH SPECIAL REFERENCE TO ORTHOPTIC TREATMENT. T. Keith Lyle and Jill Foley.
KERATOCONJUNCTIVITIS SICCA DUE TO SARCOIDOSIS. Barrie R. Jones and C. J. Stevenson.
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INTRA-EPITHELIAL EPITHELIOMA (BOWEN'S DISEASE). P. D. Trevor-Roper.
METHOD FOR THE DIRECT OBSERVATION OF RETINAL VESSELS IN THE EXPERIMENTAL ANIMAL. Christopher Pedler.
STUDIES ON DEVELOPING RETINAL VESSELS. IV. THE EFFECT OF IONIZING RADIATION. Christopher Pedler.
26 CASES OF EXTRA-CONJUNCTIVAL IMPLANTS. M. L. Nairac.
HEREDITY OF GREEN-BLINDNESS. W. M. Jablonski.
THE ZAGORA ROD TEST. Edward Zagora.
TAY-SACHS'S DISEASE (AMAUROTIC FAMILY IDIOCY). S. S. Manchanda, M. S. Nirankari, and M. C. Maudgal.
CORRESPONDENCE.
NOTES.

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into cortisone and related compounds in some 20 stages. The two latter methods are being employed in this country.

Corticotrophin is obtained from the pituitary glands of oxen, pigs, or sheep. The glands may be minced and extracted with acid, aqueous acetone, and a concentrate precipitated by addition of more acetone. Alternatively the glands, preserved in acetone or as an acetone-dried powder, may be extracted with acetic acid and the extract fractionated. The crude material is a mixture of active polypeptides of high molecular weight; homogeneous material—e.g., β -corticotrophin—is obtainable by fractionation using selective adsorption and distribution between solvents. In recent years the various methods which have been used have yielded crude protein, purified protein, and active products obtained after partial hydrolysis, particularly with pepsin, and there has been much confusion about the clinical response to be expected from a biological unit.¹

REFERENCE

¹ Prunty, F. T. G., *British Medical Journal*, 1956, 2, 615.

Mammary Hyperplasia in a Girl

Q.—A girl of 17 has a diffuse painless hyperplasia of her breasts, which reach almost to her umbilicus and are becoming difficult to control by a brassière. In all other respects she is normal. (1) Are her breasts likely to continue increasing in size? (2) Is it still true that hormone therapy has no beneficial effect? (3) What are the results of plastic operations to reduce the breasts?

A.—As the girl has reached the age of 17 it is unlikely that her breasts will increase in size, except as part of a progressively developing obesity.

Hormone therapy has no beneficial effect. Though in some cases androgens may relieve the pain and tenderness of premenstrual mastalgia, they never cause the breasts to shrink.

The results of plastic reduction are usually satisfactory, and this operation would seem indicated in this case.

Glutamic Acid and Mental Retardation

Q.—What place has glutamic acid in the treatment of mental retardation?

A.—There is no good evidence that glutamic acid has any place in the treatment of mental retardation. There is no rationale for its use. It is a component of any balanced diet and a considerable quantity is present in milk. Albert *et al.*¹ gave 8–10 gr. (0.52–0.65 g.) of glutamic acid per day and reported an "unmistakable" rise in mental level, and Zimmerman *et al.*² were similarly enthusiastic in regard to its effect both on epilepsy and on intelligence. However, subsequent carefully controlled work³ has failed to justify these conclusions.

REFERENCES

- ¹ Albert, K., Hoch, P., and Waelsch, H., *J. nerv. ment. Dis.*, 1946, 104, 263.
- ² Zimmerman, F. T., Burgemeister B. B., and Putnam, T. J., *Amer. J. Psychiat.*, 1948, 104, 593.
- ³ Milliken, J. R., and Standen, J. L., *J. Neurol. Neurosurg. Psychiat.*, 1951, 14, 47.

Oral Test for Achlorhydria

Q.—What is the rationale of the oral test for achlorhydria which depends on a colour reaction in the urine? How reliable is this test?

A.—The test depends upon the combination of the hydrogen cation (H⁺) of the hydrochloric acid in gastric juice with a resin which is loaded with quinine. The hydrogen ion displaces the quinine which is absorbed from the gut and excreted in the urine, where it can be estimated by its fluorescence in ultra-violet light. Even in achlorhydric patients there is some small release of quinine in exchange for sodium and potassium, and in patients who have recently

been taking aluminium, magnesium, barium, etc., there may be further release of quinine.

Without knowing the purpose for which the test is to be used it is not possible to discuss the reliability of the method. The questioner should consult the excellent paper by Harkness and Durant.¹

REFERENCE

¹ Harkness, J., and Durant, J. A., *J. clin. Path.*, 1953, 6, 178.

NOTES AND COMMENTS

Varicose Eczema.—Dr. S. RIVLIN (London, W.1) writes: I doubt whether your correspondent's patients will derive a great deal of help from your reply ("Any Questions?" February 16, p. 415), for your expert would appear to be confusing varicose eczema with varicose ulceration. Whilst it is true that oedema is a *sine qua non* in the latter condition, it is certainly not so in the disease for which the questioner sought advice, and in any case occlusive compression bandaging does eczema far more harm than good. These patients produce their eczema themselves by scratching (who can blame them?) in response to intense irritation produced by dilating venules. Stop the itching and the eczema disappears. If the area is a small one, say the size of half the palm, then by all means use 1% hydrocortisone applied as a very thin film last thing at night (they usually scratch in bed), first thing in the morning, and once if necessary during the day. A local cotton bandage is all that is required. With a large area, soak the leg two or three times daily (10–15 minutes) in a 1:4,000 solution of potassium permanganate. Apply a thin film of Lassar's paste with 3% crude coal tar and cover lightly with a crêpe bandage in between the soaks. A bad eczema will clear in a fortnight, a dreadful one in three weeks. Do not operate upon the veins until the eczema is healed.

OUR EXPERT replies: One cannot but wonder what authority Dr. Rivlin has for his dogmatic opinions on this subject. I can assure him there was no confusion between varicose eczema and varicose ulceration in my reply. However, the term varicose eczema is not very satisfactory, and the condition is better called gravitational eczema or the American stasis eczema. The mere presence of eczema of the leg with varicose veins alone (and no signs of chronic venous insufficiency such as oedema and pigmentation) does not constitute varicose eczema. Frequently lichen simplex is found in this situation, the aetiology of which is quite different. It seems likely that Dr. Rivlin has himself confused the issue by failing to distinguish the two conditions. There is no evidence to support Dr. Rivlin's theory, stated as though it were a fact, that the itching of varicose eczema is produced by dilating venules. It is more likely to be caused by the presence of oedema, poor nutrition of the skin, and the accumulation of metabolites in a person prone to eczema.

Two Anencephalic Monsters.—Dr. J. H. S. GEGGIE (Quebec, Canada) writes: You were asked for an estimate of risk in a third pregnancy following the birth of two anencephalic monsters ("Any Questions?" January 5, p. 57). I have recently delivered a young woman of her second successive normal baby following two successive anencephalic monsters.

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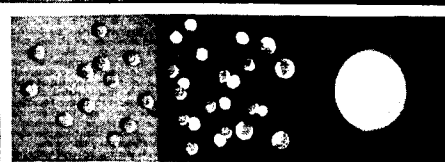
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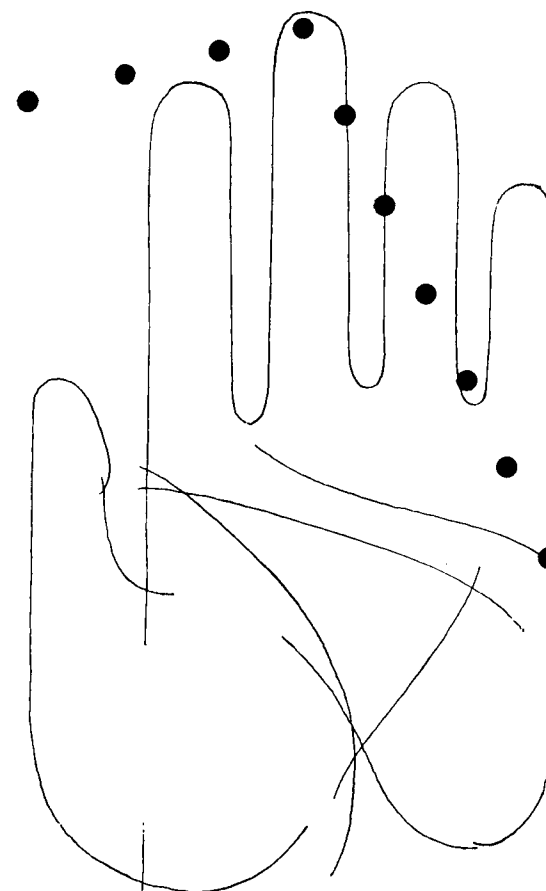
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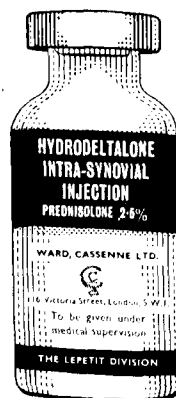
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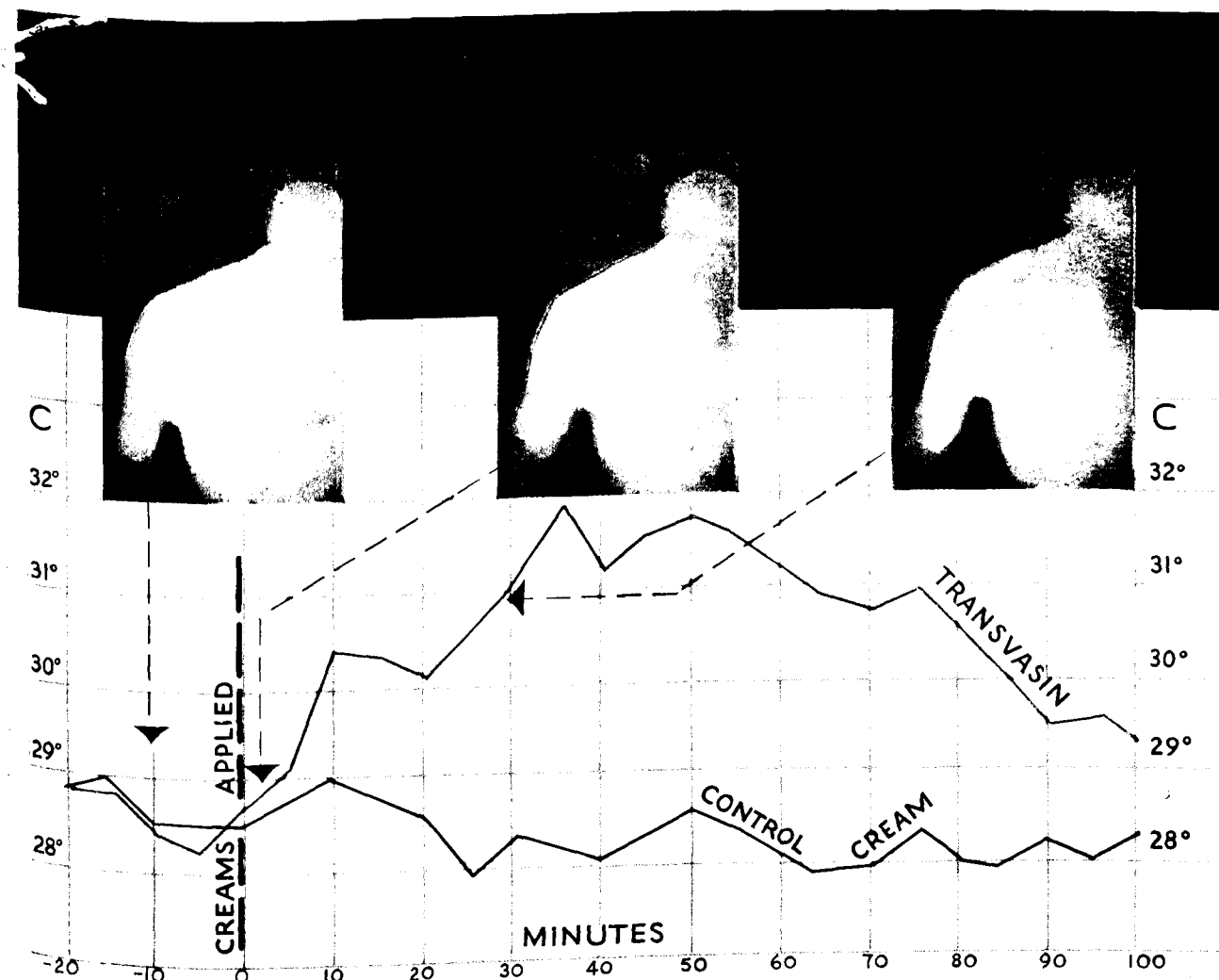
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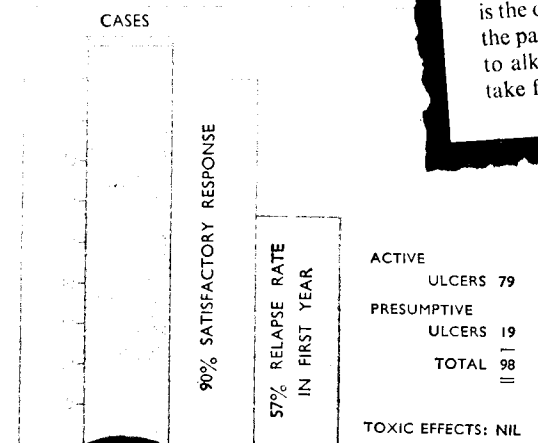
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TABLE II

Group	Active Ulcers	Presumptive Ulcers	Totals
A	63 (79.6%)	17 (89.0%)	80 (81.7%)
B	8 (10.2%)	1 (5.5%)	9 (9.2%)
C	6 (7.6%)	1 (5.5%)	7 (7.1%)
D	2 (2.5%)	0 (—)	2 (2.0%)
TOTALS	79 (100%)	19 (100%)	98 (100%)

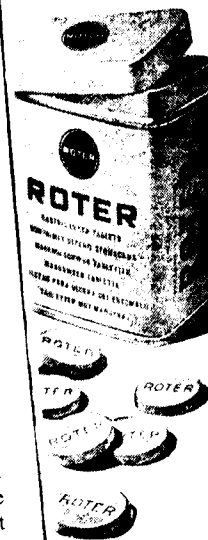
"Four of the nine cases in groups C and D have elected to go to surgery, and one of the remaining cases has a hiatus hernia as well as a duodenal ulcer. Experience of treating these 'Failures' over the past six years leads one to believe that no form of medical treatment will be effective and that surgery is the only hope of relieving their symptoms. In 75% of cases the patients were of the opinion that the tablets were superior to alkaline powders, and they found that they were able to take foods which they had avoided for years."

Extracts from the
BRITISH MEDICAL JOURNAL
1955, 2, 827

"SUMMARY: Seventy-nine cases of peptic ulcer and 19 of presumptive peptic ulcer have been treated with Roter tablets. Immediate clinical response was satisfactory in 90% of patients, with a relapse rate of 57% in the first year; a reduction in the average number of relapses was recorded in 15 cases kept on a maintenance dose for one year."

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 16 1957

HORMONAL INFLUENCE ON GROWTH*

BY

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Growth depends on the anabolism of protein, and its measurable *chemical* index is the retention of nitrogen and its measurable *clinical* index is the growth in length of the skeleton. If, for the sake of convenience and simplicity, we limit ourselves to the consideration of deviations of height as we discuss hormonal influences on growth we shall not forget that the growth of certain organs and certain cells is dependent on a specific stimulus, so that, for example, even in the presence of dwarfism due to athyroidism or hypothyroidism, enlargement of the anterior pituitary (Hubble, 1956), increased growth of hair (Perloff, 1955), and genital hyperplasia may all be observed (Hubble, 1955). Again, some growth occurs in all organs, even in the total absence of hormonal influences, for, while the hormones stimulate or inhibit growth processes, cellular growth is not entirely dependent on hormonal action.

The hormones which support growth are those which assist in the anabolism of protein, and those which inhibit growth are the hormones which are catabolic or anti-anabolic.

Childhood is the predominantly protein-anabolic phase, and the infant adds 10 in. (25 cm.) to its stature in the first year and 4 in. (10 cm.) in the second year;

in the second year 13%, and it falls to 3% in the thirteenth year, to rise again to 4.4% with the onset of puberty. This annual percentage increase in height offers us, disease and malnutrition apart, an approximate clinical index of the activity of the protein-anabolic hormones.

Protein Anabolism

What are the hormones which influence growth in man? The most powerful of the protein-anabolic hormones is the *growth hormone*—and it is unfortunate that we know less about its function in man than we do of any other hormone. No preparation of it which is potent in man has yet been produced, and, unlike all other pituitary hormones, it has no endocrine target-organ by whose function we might indirectly assess its activity. We can only assume its presence in man, and we have to be content with applying to man the considerable knowledge of its action in experimental animals. The experimental evidence is that growth hormone acts by directly stimulating tissue synthesis from amino-acids (Russell, 1951). It has also an effect on fat and carbohydrate metabolism, to which I refer later.

Thyroxine is necessary for the complete action of the growth hormone, and these two hormones have a synergistic action on protein anabolism—neither achieves its full effect without the help of the other. The effects of thyroxine-lack and thyroxine-excess on growth in both man and animals are so well documented that it is unnecessary to consider them further here.

Insulin also has a synergistic action with the growth hormone in its effect on protein anabolism in animals (Gaunt, 1954). Lawrence, Salter, and Best (1954) showed that insulin is a protein anabolizer in its own right and that growth in hypophysectomized animals can be maintained by insulin. In its action on protein anabolism, and therefore on growth, it is probably less important quantitatively than thyroxine and certainly less so than the growth hormone; but for our clinical purposes, and certainly until we have available chemical assays of these hormones, we should regard them as an integrated group of protein-anabolic hormones—growth hormone, thyroxine, and insulin. At puberty new and powerful protein anabolizers are introduced in the adrenal androgens in both girls and boys, and in boys by the testicular androgens. The effect of these androgens on protein anabolism and growth is well seen at puberty (the evidence has been reviewed by Tanner, 1955) and in diseases such as the adrenogenital syndrome, in

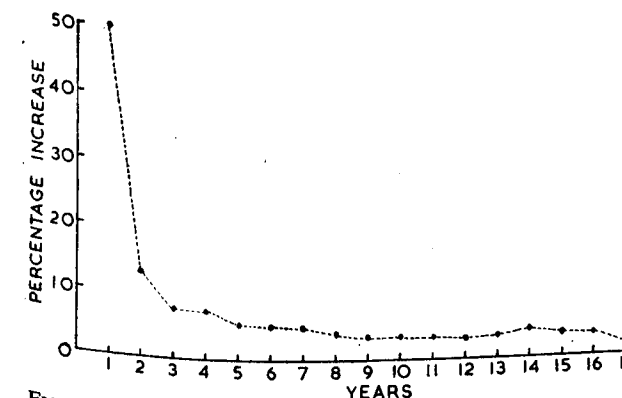


Fig. 1.—Average annual increments in height in boys, expressed as a percentage increase.

annual growth increments continue to occur at a diminished rate, expressed as a percentage increase of skeletal length, until the puberty growth spurt, when the rate temporarily increases, to fall away quickly until the time of epiphyseal closure occurs. In Fig. 1 these average annual increments in boys are shown as a percentage increase of height. In the first year it is 50%,

*Presidential address delivered to the Paediatric Section of the Royal Society of Medicine on October 26, 1956.

virilizing tumours of the adrenal and the ovary, and in interstitial-cell tumours of the testis. Except for one patient with congenital virilism I shall not refer again to this interesting group of children. In the estimation of the urinary 17-ketosteroids we have a well-established and sufficiently accurate method of assaying these androgens.

Protein Catabolism

In the group of protein anabolizers it has been necessary to include hormones from five organs: the anterior pituitary, the thyroid, the pancreas, the adrenal cortex, and the testis. For the protein catabolizers, the growth inhibitors, it is necessary to consider only the adrenal cortex, and for practical purposes we may regard this protein catabolism as the work of one hormone, cortisol (compound F). Its action is directly opposed to the action of the growth hormone, since it inhibits the incorporation of amino-acids into protein, particularly in connective and lymphoid tissue.

Cortisol and cortisone (compound E), prednisone and prednisolone, will inhibit, partially or completely, the growth of children, as you will see if you watch the growth of children who are having continued steroid therapy for diseases such as chronic asthma, nephrosis, rheumatoid arthritis, and collagen diseases. It is unusual for cortisone to depress the rate of growth if it is used in doses of less than 35 to 60 mg. per square metre of body surface (this is an average surface area for a child of 10 years) (Blodgett *et al.*, 1956). Sensitivity of children to this inhibition of growth by glucocorticoids shows, however, an individual variation. The amino-acids which are not being used for protein synthesis are then converted to glucose by the action of cortisol, a process known as gluconeogenesis. This is one of the homeostatic mechanisms by which the body corrects hypoglycaemia.

Protein Metabolism

I want now to introduce a concept which I have found useful in considering these problems of growth and protein metabolism; although it is not possible to provide proof for all the steps in this hypothesis it gives a ready explanation of well-established clinical facts, and I shall use it throughout this paper when dealing with various disorders of growth. Hypotheses, in medicine as in physics, should be regarded as valid for as long as they provide a useful explanation of the known facts.

Protein metabolism provides the site for a contest between the anabolic and the catabolic hormones. During the phases of active growth the anabolic hormones are in the ascendant. If you look again at Fig. 1, depicting the rapid growth of children in the first two years of life, you may correctly conclude that I assume either that children at this age are making a large amount of growth hormone or that their tissues are very sensitive to its action. This hypothesis is summarized as follows:

Competition for Protein in Childhood

A (Protein-Anabolizers)	K (Protein-Catabolizers)
G (Growth Hormones)	
+ T (Thyroxine)	C (Glucocorticoids)
+ I (Insulin)	

In normal growth the protein-anabolizers are more powerful than the protein-catabolizers. $A > K$.

In infancy the anabolic hormones (growth hormone, thyroid, and insulin) are much more powerful than the catabolic hormones from the adrenal cortex (the glucocorticoids), and rapid growth occurs. Growth hormone not only spares protein for growth, as I have already said, but it also inhibits the oxidation of carbohydrate. This means

that fat has to be used in large amounts by the growing child for its daily requirements of energy (Gaunt, 1954), and explains the clinical observation that ketosis is more common in young children than in older children and adults. Hypoglycaemia is difficult to deal with in young children and sometimes is disastrous in its consequences. This is explained by the fact that the action of the growth hormone allows little protein for gluconeogenesis and, in addition, it tends to suppress the utilization of carbohydrate by the tissues.

These are common clinical observations, but this formula also explains a rarer observation made by Blodgett *et al.* (1956): children with hypopituitarism are sensitive to the action of cortisone, so that as little as 5 to 20 mg. of cortisone per square metre of body surface daily will, in them, produce Cushing's syndrome and total cessation of growth. In hypopituitarism there is a disappearance of the protein-anabolic hormones (with the exception of insulin, which is itself reduced in amount since its output is regulated by the height of the blood sugar), so that when these contenders for protein are removed a small dose of cortisone is sufficient to claim all the protein in the metabolic pool.

These hormonal influences on the female skeleton are summarized as follows:

The Four Skeletal Ages of Woman

G + T + I	>C	Growth in infancy and childhood
G + T + I + A	>C	Growth in adolescence
g + T + I + A	≈C	Arrest or retardation of growth
g + T + I + a	<C	Post-menopausal osteoporosis

I have assumed that the quantitative effects of thyroid, insulin, and cortisol remain constant throughout life. In infancy the growth hormone (represented by a large G) captures the protein; in adolescence a diminishing amount of G is reinforced by the androgens (A); in adult life the anabolic hormones are in equilibrium—disease, disaster, and pregnancy apart—with the catabolic hormones, and the bones hold their protein; after the menopause the catabolism of decrecence arrives, with the protein anabolizers in decline (small g and small a) and the unhappy bones yield up their protein.

Disorders of Growth in Childhood

I will now consider some of the disorders of growth in children which illustrate this concept of growth as a competition for protein which is won by the anabolizers. The first two patients suffer from *primary hypopituitary dwarfism*, which can now be firmly differentiated from all other forms of dwarfism; the third child is a boy aged 8 years suffering from *Cushing's syndrome*, due to adrenocortical hyperplasia, with total arrest of growth; the fourth child is suffering from *congenital virilism*, despite her average growth and average bone-age; the fifth child suffers from *glycogen-storage disease* which induces catabolic consequences and defective growth; and the sixth child is an example of the catabolic phase with impaired growth which may occur in childhood in the course of a disease, *diabetes*, which is associated with a deficiency of one of the anabolic hormones, insulin.

Primary Hypopituitary Dwarfism

I have seen five examples of this constitutional disorder—which, let me emphasize, is quite unrelated to disease of the pituitary—three patients under my care and two by the courtesy of colleagues (Professor N. B. Capon and Dr. Cedric Harvey). Two are boys and three are girls. The appearances in all the cases are identical, so I will limit myself to the description of two of my own patients who have had a long follow-up and who have been carefully investigated by modern techniques.

P. T. B., aged 19½, weighed 7 lb. (3.2 kg.) at birth and his mother stated that his growth was normal up to the age of 2 years. I first knew him when he was 7½ years, but lost sight of him after six months; his height was then 39 in. (99 cm.). He

came under my care again at the age of 16½, when the photograph shown in Fig. 2 was taken and his height was 49 in. (124.5 cm.)—an average height increment without treatment of a little more than 1 in. (2.5 cm.) a year. At 19½ years his height was 56½ in. (143.5 cm.), an average annual increment of 2½ in. (6.3 cm.)—after much treatment—which gives him a height-age of 11 years; his bone-age is 14 to 15 years.

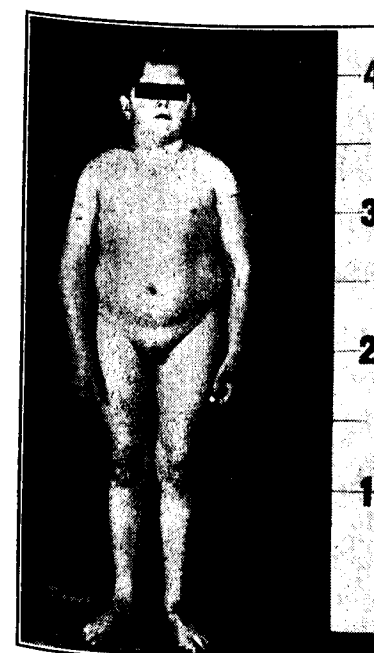


Fig. 2.—Primary hypopituitary dwarfism: P. T. B., aged 16½ years.

was first seen at the age of 7½ when his height was 36 in. (91.5 cm.) height-age 2 to 3 years) and his bone-age was 5 years. His birth weight was said to have been 7 lb. (3.2 kg.) and his growth was not thought to have been abnormal until he was 2 years old. The development of his facial bones was retarded, giving him a babyish appearance. He has had various treatments (see below). At 13½ years his height is 50 in. (127 cm.) (height-age about 7 years) and his bone-age 10 to 11 years. His maternal first-cousin, now aged 26, suffers from hypopituitary hypogonadism (Hubble, 1951) but has no deficiency of the growth hormone. After I published this description of the family hypopituitarism I discovered that his cousin had a double dose of the maternal grandfather's genes, for it was alleged that his grandfather was also his father.

The clinical criteria, then, in these cases are: normal birth weights, and growth that appears to have been normal for an indefinite period after birth; great retardation in height; a bone-age which although retarded is much less retarded than the height-age; a height increment, without treatment, of approximately 1 in. (2.5 cm.) a year; babyish facies; failure of sexual development as a rule; rarely, as in T. B., pituitary failure may be seen in another member of the family.

There is no clinical evidence of hypothyroidism, and the diagnosis of the "Tom Thumb" (proportionate) dwarf is easily excluded by the normal development of facial bones, by the average bone-age, and by a maturing personality which corresponds to the chronological age, all of which occur in the latter condition. Investigations have confirmed and extended the diagnosis of primary hypopituitarism in both these patients.

The *pituitary fossa* was of normal dimension in both boys. The *blood cholesterol* was high in both: in P. T. B. at the age of 16½–17 years the average of three values before treatment was 391 mg. per 100 ml., and in T. B., at the age of 7½ to 8 years, the average of three estimations before treatment was 270 mg. per 100 ml. The *insulin-sensitivity* test was normal in T. B., but in P. T. B., after 3.5 units intravenously, the fasting blood sugar of 78 mg. per 100 ml. fell to 11 mg. per 100 ml. in 30 minutes, but in a further half-hour had returned to 66 mg. per 100 ml. (increased insulin sensitivity but no hypoglycaemic unresponsiveness). The *response to water load* (Kepler 1) was normal in P. T. B.

Adrenocortical Urinary Assays.—17-Ketosteroids: In P. T. B. (aged 16–19 years) the average of four estimations was 2.7 mg./24 hours, and in T. B. (aged 10–13 years) 3.5 mg./24 hours. **17-Ketogenic steroids:** In P. T. B. (aged 16–19 years) the average of four estimations was 2.2 mg./24 hours and in T. B. (aged 10–13 years) 2.2 mg./24 hours. All these values are low, but the 17-ketogenic steroids are relatively much lower than the 17-ketosteroids (aged 6–10 years: average excretion of 17-ketosteroids 1–4 mg./24 hours and of 17-ketogenic steroids 2–8 mg./24 hours). **Response to intramuscular corticotrophin gel**, 20 units twice daily for four days (Fig. 3): the 17-ketogenic steroids per 24 hours in P. T. B. reached 36.4 mg. on the third day of treatment and in T. B. reached 27.8 mg. on the fourth day of treatment. This is a good response to corticotrophin, despite the low initial values. The basal metabolic rate in P. T. B. was +5%.

¹³¹I Uptake.

P. T. B. (aged 16½ and 19½ years) had a normal uptake curve over 48 hours, a normal plasma activity, and a normal response to T.S.H., 10 mg., given eight hours before the second uptake.

Gonadotrophins.—None present in P. T. B. (assayed five times between 16½ and 19½ years).

We may now add to the clinical criteria for primary hypopituitary dwarfism already cited the following metabolic and endocrinological data: hypercholesterolaemia of varying degree, increased insulin sensitivity (not invariable); normal thyroid function; reduced adrenocortical function responding normally to corticotrophin, and therefore itself dependent on deficient corticotrophin production by the pituitary.

If we now return to the formula for growth at puberty we see that these children with *primary hypopituitary dwarfism* lack G and A.

Competition for Protein in Primary Hypopituitary Dwarfism

G + T + I + A	>C	Normal adolescent growth
g + T + I + A	≈ or <C	Protein equilibrium in primary hypopituitary dwarfism

If G and A are absent there is a situation in which the protein anabolic hormones are represented by thyroid and insulin alone, and these are general rather than specific protein anabolizers. Cortisol should therefore be supreme—and the child would be in a state of Cushing-like catabolism were it not, as I have shown, that cortisol itself is also deficiently produced. It would have been possible to forecast from this formula that there must be reduced adrenocortical function in primary hypopituitary dwarfism, since these children do not present the picture of Cushing's syndrome.

Treatment of Primary Hypopituitary Dwarfism

These children are short of growth hormone and androgens so that treatment by methyltestosterone, combined with thyroid therapy, is reasonable. Nor, as I have shown, is much opposition to be expected from the glucocorticoids, whose urinary output has not been increased by androgen therapy. The results of treatment are good and one can achieve average annual height increments of 3 to 4%. The ultimate height depends, of course, on the age at which epiphyseal fusion occurs.

P. T. B. was 56½ in. (143.5 cm.) at 19½ years, and he had grown 2 in. (5 cm.) a year for the last three years. His bone-age was still no more than 15 years, so we may hope

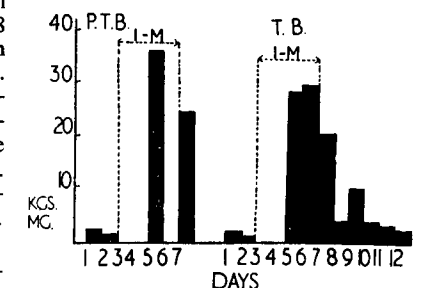


Fig. 3.—Response of 17-ketogenic steroids to intramuscular corticotrophin (20 units twice daily for four days).

that his ultimate height will exceed 5 ft. (152.5 cm.), which is what I promised him when he started treatment three years ago, at 49 in. (124.5 cm.) (Fig. 4). The development of his personality has been just as striking as the development of his facial bones, the increase in his height and musculature, and the disappearance of his puppy-fat. The

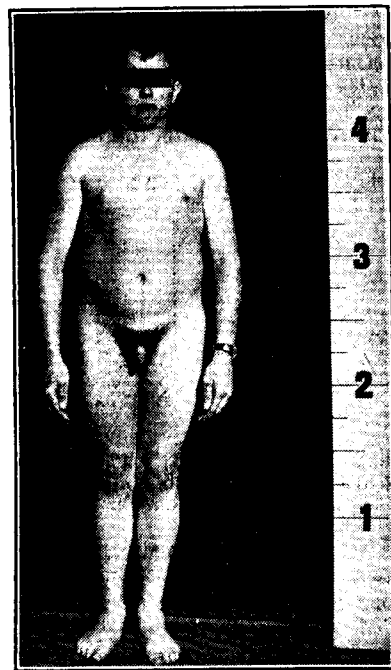


FIG. 4.—P. T. B., aged 19½ years, after treatment.

absence of axillary hair and the growth of hair limited to the female escutcheon is dependent on the continued deficiency of adrenal androgens.

Treatment by testosterone and thyroid should be continued until the bone-age matches the chronological age; then thyroid treatment may be continued alone, but no addition to ultimate height can then be expected. An obvious enlargement of the clitoris in girls requires cessation of testosterone therapy, at least for a year or two; but no fear of inhibition of pituitary sex hormones should be allowed to interfere with therapy, for, once the diagnosis is established, hope of sexual development may be abandoned. There is, I believe, only one case reported in the literature (Hewer, 1944) in which failure of the growth hormone has not been accompanied by failure of the sex hormones.

I have used other reputed growth factors in treatment—anterior pituitary hormones, GF4, androstenediol, 19-nortestosterone (a weak androgen), and insulin—but none of these is to be recommended. Insulin is the only one of these in which I have been much interested, and I was able to show in T. B.'s case, in an eight-day nitrogen balance, that a good nitrogen retention was achieved. Obesity was the result of therapy, however, and not a gain in height (Fig. 5)—for his height curve flattened out and he gained 14 lb. (6.4 kg.) in three months—a tolerable adiposity.

My last remark about therapy is that the response to treatment provides a further diagnostic criterion between hypopituitary dwarfism and the primordial "Tom Thumb" dwarf.

M. B., aged 9 years, has a weight-age of 2 years and a height-age of 2½ years. His genital hyperplasia was caused by over-enthusiastic testosterone therapy between the ages of 2 and 3 years, and this was the only period during which his height increment paralleled the average height curve (Fig. 6). Otherwise the gap in both his height and weight curves is gradually widening. He has for the last three years been treated by a long-acting insulin without benefit. The very slow growth in the "Tom Thumb" dwarf resists all forms of therapy.

Catabolic or Anti-anabolic Mechanisms

Robert (Fig. 7), aged 9 years, is suffering from Cushing's syndrome. He had ruddy cheeks, great fat deposits, especially in his buffalo hump, and hirsuties. His father told me that there had been no growth in height in the preceding two years. The boy was 43½ in. (110.5 cm.) at 6½ years, and he was still 43½ in. when I saw him at the age of 8½ years. This arrest of growth never occurs in simple obesity, and it was not difficult, despite his youth and his sex, to make the diagnosis of Cushing's syndrome.

Up to 1950 there were 26 authentic reported cases of Cushing's syndrome in childhood under the age of 10 years, only four of them in boys (Lawson Wilkins, 1950). The usual investigations made it improbable that there was a tumour of the adrenal cortex, despite the fact that all the reported cases of Cushing's syndrome under the age of 10 years had been due to an adrenal tumour.

In Table I is set out the supporting evidence from urinary endocrine assays that Robert is indeed suffering from Cushing's syndrome, that a neoplasm of the adrenal cortex is highly improbable, and that the excessive output of the adrenocortical steroids is dependent on pituitary stimulation. In the third and fourth columns the 17-ketosteroid and 17-hydroxycorticosteroid urinary output in mg. a day are given. The 17-ketogenic steroids have been omitted,

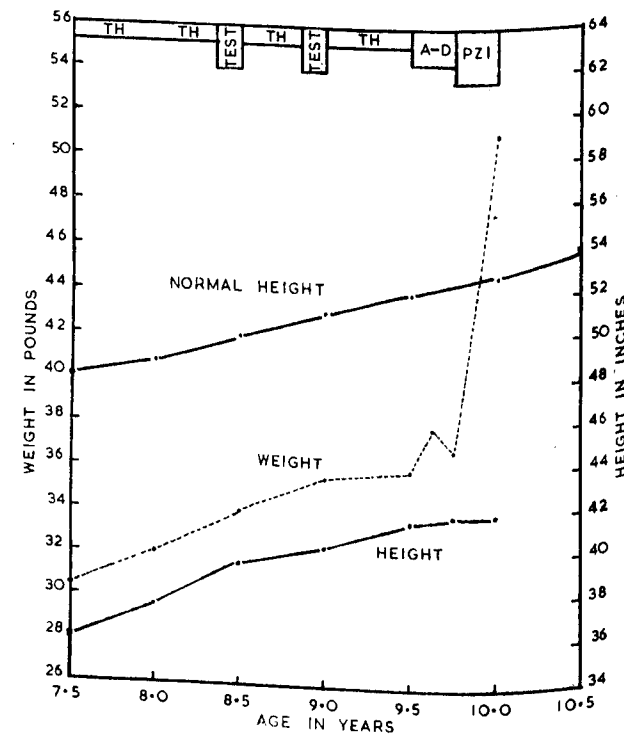


FIG. 5.—Case T. B. Treatment by protamine zinc insulin (16 units daily for three months, from age 9½ to 10 years) flattened out his height curve and increased his weight by 14 lb. (6.4 kg.).

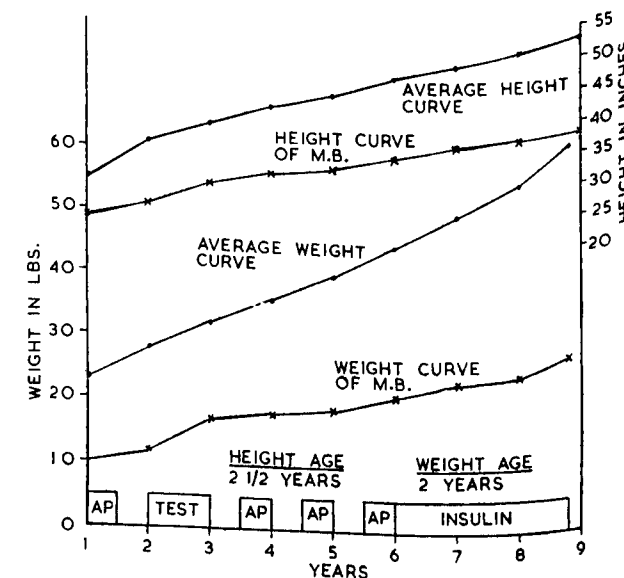


FIG. 6.—M. B., "Tom Thumb" dwarf. Treatment by testosterone from the age of 2 to 3 years produced an average height increment, but was discontinued on account of genital hyperplasia. Insulin used for three years has not accelerated either his weight or height gain.

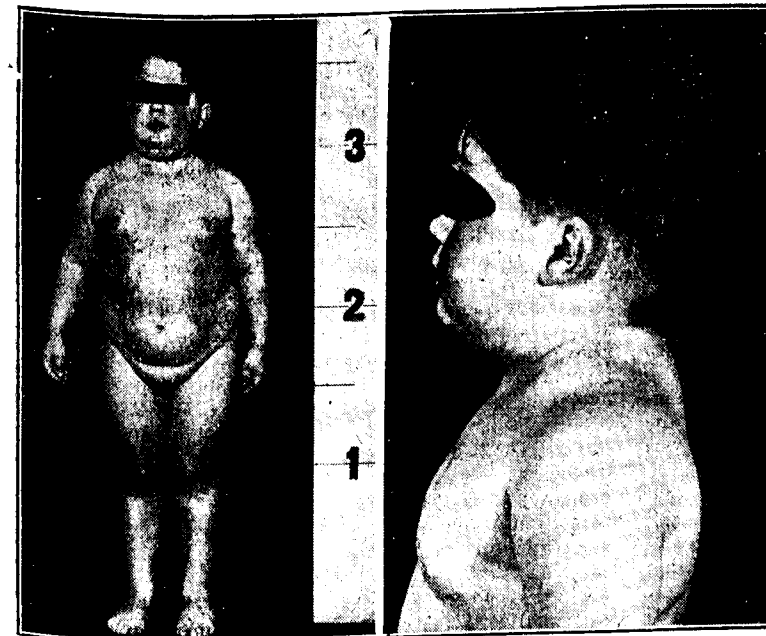


FIG. 7.—Robert, aged 8½ years. Cushing's syndrome due to adrenocortical hyperplasia.

TABLE I.—Robert. Creatinine, 17-Ketosteroid, 17-Hydroxycorticosteroid in Urinary Assays per 24 Hours, Together with the Response to 9- α -Fluorohydrocortisone (Dr. J. K. Norymberski)

Day	Creatinine	17-KS	17-OH CS	Treatment by 9- α -Fluorohydrocortisone
1	0.51 g.	6.8 mg.	21.7 mg.	2 mg.
2	0.56 "	7.1 "	20.9 "	2 "
3	0.54 "	7.7 "	17.4 "	2 "
4	0.58 "	9.3 "	16.2 "	5 "
5	0.54 "	6.8 "	16.4 "	5 "
6	0.33 "	3.5 "	8.0 "	5 "
7	0.28 "	3.6 "	9.1 "	5 "

but their level, always a little less than the 17-hydroxycorticosteroids, followed closely their changes.

It will be seen that the 17-hydroxycorticosteroids are three to four times as high as would be expected in a boy of his age, and the 17-ketosteroid output is approximately doubled. In the last column of Table I is set out the administered dose of 9- α -fluorohydrocortisone. Now, 9- α -fluorohydrocortisone is a very effective depressant of corticotrophin in these small doses—compared with cortisone—and it has the added advantage that its degradation products do not interfere with the urinary assays of 17-ketogenic steroids and 17-hydroxycorticosteroids (Cope and Harrison, 1955). During this five-day course of 9- α -fluorohydrocortisone the output of 17-ketosteroids was halved and the output of 17-hydroxycorticosteroids was reduced by more than half. Neoplasms of the adrenal cortex are not as a rule pituitary-dependent, so that this result assists in the exclusion of a tumour.

It is assumed that in Cushing's syndrome the adrenal cortex is hypersensitive to corticotrophin stimulation. This was so in the case of Robert, in whom 30 units of intramuscular corticotrophin gel twice daily raised the 17-ketosteroid excretion to 30 mg./24 hours and the 17-hydroxycorticosteroid excretion to 189 mg./24 hours. The excess of adrenal glucocorticoids has been sufficient in Robert's case to prevent the allocation of any protein to skeletal growth. This protein wastage is nicely demonstrated by an unpremeditated observation in the second column of Table I. Urinary creatinine output is used in many laboratories as a rough check on the accuracy of the 24-hour urinary collections. It will be seen that when the 17-hydroxycorticosteroid output was reduced to normal levels the creatinine urinary output is halved—from 560 to 280 mg. daily. Ex-

cessive protein wastage has been arrested and the catabolic hormones are once more held in check by the anabolic hormones.

It will be recalled that the characteristic striae of Cushing's syndrome are less common in children suffering with this disease than in adults (Lawson Wilkins, 1950) and they are absent in Robert. Also, striae occur rarely in children treated by steroids. The explanation is not clear. Fuller Albright (that great master of metabolism) in the Harvey Lectures for 1942-3 provided the classical account of the changes in Cushing's syndrome—a brilliant contribution to medical thinking—and related the "thin skin" to the defect in protein synthesis. It is tempting to say that the anabolizers of protein—the growth hormone and possibly the adrenal androgens—may be adequate in Cushing's syndrome of childhood to prevent protein wastage in the skin. It would be impossible to advance this explanation in the face of the complete arrest of growth which occurred in Robert.

Professor Illingworth, of Sheffield, has generously allowed me to discuss the next patient. Helen was 2 years and 2 months old when the photograph (Fig. 8) was taken, and when I saw her she was 2 years and 8

months. The enlargement of the clitoris which can be seen in Fig. 8 was present at birth. Her height at the age of 2 years 2 months was 36 in. (91.5 cm.)—on the 50 percentile—and her growth in the subsequent eight months has been 1 in. (2.5 cm.). Growth in one year at this age, on the fifty percentile, is 2.8 in. (7.1 cm.), so that Helen's growth is now less than average. Her bone-age, on the other hand, is a little in advance of her chronological age—perhaps by 2 years. In Table II are set out the values for the urinary steroid metabolites—and for these estimations and for those in the last patient with Cushing's syndrome Professor Illingworth and I are indebted to Dr. J. K. Norymberski, of Sheffield.

In the second and third columns the values are approximately the same as for Robert, the boy with Cushing's syndrome, and yet Helen is obviously not suffering from Cushing's syndrome. The fifth column is headed 21-deoxyketols. The urine of normal men and women contains less than 0.5 mg. of 21-deoxyketols/24 hours (Norymberski), and therefore the excretion of these substances is greatly raised in Helen. This finding is now regarded as characteristic of virilizing adrenal hyperplasia, in which there is assumed to be a block in the formation of cortisol from progesterone which normally occurs in four stages: this arrest is held to occur at the second of the four stages by an enzymic defect which blocks the synthesis at 17- α -hydroxyprogesterone; this substance and some of its urinary metabolites, such as pregnanetriol, are 21-deoxyketols, and in congenital adrenal hyperplasia large quantities appear in the urine (Bongiovanni *et al.*, 1956). This girl may then be assumed to be suffering from congenital adrenocortical hyperplasia.

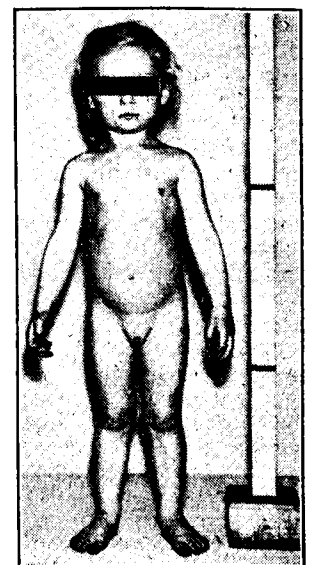


FIG. 8.—Helen, aged 2 years 2 months, suffering from congenital virilism but with normal height and bone-age. (Professor R. Illingworth's patient.)

TABLE II.—17-Ketosteroids, 17-Hydroxycorticosteroids, Iso-dehydroandrosterone, and 21-Deoxyketols in Urinary Assays per 24 Hours, Together with Response to 9- α -Fluorohydrocortisone (Dr. J. K. Norymberski)

Day	17-KS	17-OH CS	SDHA	21-Deoxyketols	Treatment by 9- α -fluoro-hydrocortisone
1	7.6	19.5	3.8	3.0	
2	7.0	19.3	2.2	2.4	
3	6.7	14.3	1.5	1.7	1 mg.
4	—	—	—	—	1 "
5	2.3	6.1	0.9	0.7	
6	3.8	11.1	1.6	2.1	
7	6.5	12.4	2.2	2.0	

Before considering still further difficulties let us take refuge, while looking at the last column, in some facts which are crystal clear. Helen was given 1 mg. of 9- α -fluorohydrocortisone daily for three days, and, with the consequent depression of corticotrophin output from the anterior pituitary, the output in the urinary steroids was reduced to one-third to one-quarter of their previous level. Therefore we may conclude, as in the case of Robert, that the excessive output of steroids is pituitary-dependent and the adrenal cortex in Helen is either exceptionally sensitive to corticotrophin or there is an excessive output of that hormone. The usual explanation of the elevated 17-ketosteroid excretion in congenital adrenocortical hyperplasia is that the production of cortisol is insufficient to hold in check the corticotropic activity of the pituitary; but in Helen the output of 17-hydroxycorticosteroids is high—let us say three to four times the average output. Dr. Norymberski tells me that the metabolites of 17- α -hydroxyprogesterone—both pregnanetriol and 21-deoxyketols—together with the metabolites of cortisol—both the dihydroxyacetones and the triols—contribute to the assay of the urinary 17-hydroxycorticosteroids.

The brilliant investigations of the steroid chemists have not yet fully explained the biological consequences of adrenocortical hyperplasia: it has not yet been established, for example, what is the androgenic substance circulating in excess, nor is it known whether 17- α -hydroxyprogesterone itself has any androgenic effect (Reifenstein, 1956). Without further analysis of the urinary steroids, can clinical observation and deduction make any contribution in the case of Helen? I believe they can. We may conclude from the enlargement of the clitoris, which has been present since birth, and from the moderate advancement of her epiphysal development, that there is excessive androgenic activity. Despite this excess of androgens there has been no acceleration of growth, and we may conclude from a consideration of the hormonal growth formula that the anabolic effect of the androgens has been held in check by the catabolic effect of a high output of cortisol. In fact, the struggle for protein in Helen is won by the anabolizers only in the same degree as in the normal child.

Why, then, does this high output of cortisol not suppress pituitary activity in the output of corticotrophin? This is still a problem in many cases of Cushing's syndrome, and I cannot debate it here (see Jailer *et al.*, 1956). I may advance, then, a final clinical conclusion that in Helen there are two separate abnormalities: (1) a partial but not a complete arrest at stage II in the formation of cortisol from progesterone, and (2) an unspecified derangement of the normal corticotrophin-cortisol homeostasis.

A full description of these two children, Robert and Helen, is to be published elsewhere (Hubble and Illingworth, 1957).

The Catabolic Mechanisms in Two Diseases

During the last ten years we have become accustomed, in dealing with acute illness, accidents, and operations, to the notion that in these stressful situations the catabolic side of the equation temporarily dominates the anabolic. There are two chronic diseases in childhood in which growth failure may occur because the competition for protein is lost by the anabolizers, and I will conclude this address

by a discussion of them. The first is glycogen-storage disease. Dwarfism is one of the features of glycogen-storage disease, and here the interference with growth is associated with the same metabolic effect on protein as is seen in Cushing's syndrome. The basic difficulty is the non-availability of hepatic glycogen, and the metabolic consequences of this were worked out in a classic paper by Bridge and Holt (1945).

D.W. was proved to be suffering from glycogen-storage disease by the failure of his blood sugar to rise after injections of adrenaline and glucagon, and by a liver biopsy which demonstrated an excess of glycogen in his liver. His height at 6 years was 4 in. (10 cm.) below the 10 percentile, and he was moderately obese, with a weight 10 lb. (4.5 kg.) above the average for his height. With the addition of protein to his diet, as recommended by Bridge and Holt (1945), he has grown 14 in. (35.5 cm.) in five years, so that his height has achieved the 50 percentile, as is shown in Fig. 9. His liver is smaller but still much enlarged. Gluconeogenesis from protein allows the correction of hypoglycaemia in this disorder, and the addition of protein, particularly at the night feed, gives enough substrate for the anabolic hormones to ensure normal growth.

The homeostatic correction of chronic hypoglycaemia by gluconeogenesis, presumably brought about by an increased secretion of corticotrophin, is one of the fundamental biological mechanisms (Long, 1952) and obviously in glycogen-storage disease it takes precedence of the growth hormone in the competition for protein.

Van Creveld (1952)—who, at the same time, but independently of Von Gierke, described glycogen-storage disease in 1928, and has therefore had the opportunity of watching his cases for 25 years—reported that two of his patients had not only achieved average growth but had exercised their reproductive functions. Having regard to the formula, this need not surprise us. As age advances there is a diminishing requirement of protein for growth, so that more protein is available for gluconeogenesis; and as the anabolic factors are increasingly counterbalanced by the catabolic hormones the conversion of protein to glucose is more easily achieved, with a correspondingly diminished dependence on hepatic glycogen and on the fat depots for the daily metabolic needs.

There is in diabetes a shortage of available carbohydrate, and the wastage of protein and fat which occurs in consequence in the untreated diabetic is well recognized. However, an interesting syndrome (Mauriac, 1930; Houet, 1949; Guest, 1953) which occurs in the imperfectly treated child diabetic has features in common both with Cushing's syndrome and with glycogen-storage disease. Its diagnostic features are dwarfism, obesity, florid facies, hypercholesterolaemia, greatly increased glycogen and fat deposit in the enlarged liver, and sexual retardation. Fig. 10 is a photograph of a child who died at the age of 15 years in consequence of this metabolic abnormality. Fig. 11 shows the progressive retardation of height from a 6-in. (15-cm.) to an 11-in. (28-cm.) deficiency in the space of four years. Fig. 10 shows the Cushing-like cheeks, the hepatomegaly sketched in, the obesity, and the absence of sexual development. At necropsy greatly increased glycogen and fat deposits in the liver were demonstrated.

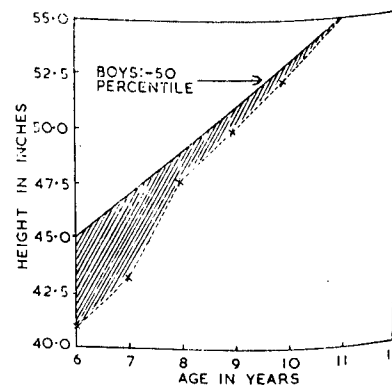


FIG. 9.—Better-than-average height increments in D.W., a boy with glycogen-storage disease given additional protein.



FIG. 10.—Mauriac syndrome in a diabetic aged 15 years. The shading shows the area of hepatomegaly.

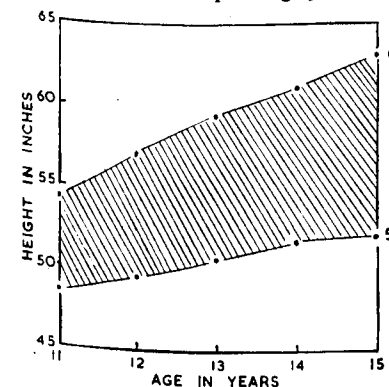


FIG. 11.—Progressive retardation of growth in patient shown in Fig. 10.

the excretion of 11-oxysteroids in their urine was three times the average amounts. These children are insulin-sensitive and run easily into hypoglycaemia; McArthur and her colleagues (1952) showed that there was a greatly increased corticosteroid excretion in a diabetic male mongol aged 19 years who had frequent daily insulin reactions. Children with the Mauriac syndrome have long periods of ketosis, and it has been shown that in diabetic ketosis increased adrenocortical activity occurs (Stowers, 1951; McArthur *et al.*, 1952). All the features of this syndrome—the moon-face, the obesity, the glycogen and fat deposits in the liver, and the failure of growth and of sexual development—are adequately explained by a deficiency of insulin and by an excess of cortisol.

Competition for Protein in the Mauriac Syndrome (Childhood Diabetes)

G + T + I > C Normal growth
G + T + i $\equiv$ or < C Arrest or retardation of growth

Summary and Conclusions

In childhood there is a competition for protein which is won by the protein anabolizers, and normal growth results.

The protein anabolizers are the growth hormone, thyroxine, insulin, and the androgens; the protein catabolizers are the glucocorticoids, of which the chief is cortisol.

To the classical picture of primary hypopituitary dwarfism these features are added—hypercholesterolaemia, adrenal hypocorticism, and deficient production of corticotrophin.

The treatment of primary hypopituitary dwarfism by methyltestosterone and thyroid is described, and its differentiation from primordial dwarfism is indicated.

Two examples of adrenocortical hyperplasia in childhood are described. In the first, a boy with Cushing's syndrome, arrest of growth resulted; and in the second, a girl with congenital virilism, average growth has occurred.

Two examples of catabolic diseases are discussed—glycogen-storage disease and the Mauriac syndrome in child diabetes.

The construction of a simple hormonal formula for growth explains many features of endocrine and metabolic disease in childhood.

My debt to the laboratories and those that work in them is heavy—and I acknowledge with gratitude the help I have had from Dr. A. Jordan and Mr. M. J. Level, M.Sc., of the Sheffield Royal Infirmary; from Dr. J. K. Norymberski, of the Rheumatic Centre, Sheffield; from Dr. C. G. Payne and Dr. F. L. Mitchell, of the Jessop Hospital for Women, Sheffield; and from Dr. G. R. Osborn, Mr. D. Watson, M.Sc., and Miss A. Matthews, B.Sc., of the Derbyshire Royal Infirmary.

REFERENCES

- Albright, F. (1942-3). *Harvey Lect.*, 38, 123.
Blodgett, F. M., Burgin, L., Jezzoni, D., Gribetz, D., and Talbot, N. B. (1956). *New Engl. J. Med.*, 254, 636.
Bongiovanni, A. M., and Eberlein, W. R. (1956). In *Adrenal Function in Infants and Children*, edited by L. I. Gardner. Grune and Stratton, New York.
Bridge, E. M., and Holt, L. E., jun. (1945). *J. Pediatr.*, 27, 299.
Cope, C. L., and Harrison, R. J. (1955). *British Medical Journal*, 2, 457.
Creveld, S. Van (1952). *Arch. Dis. Childh.*, 27, 113.
Gaut, R. (1954). In *Dynamics of Growth Processes*, edited by E. J. Boell. Princeton Univ. Press.
Guest, G. M. (1953). *Diabetes*, 2, 415.
Hewer, T. F. (1944). *J. Endocr.*, 3, 397.
Houet, R. (1949). *Presse méd.*, 57, 159.
Hubble, D. (1951). *Arch. Dis. Childh.*, 26, 530.
— (1955). *Lancet*, 1, 1.
— (1956). *British Medical Journal*, 1, 875.
— and Illingworth, R. S. (1957). In press.
Jailer, J. W., Longson, D., and Christy, N. P. (1956). *J. clin. Endocr.*, 16, 1276.
Lawrence, R. T. B., Salter, J. M., and Best, C. H. (1954). *British Medical Journal*, 2, 437.
Long, C. N. H. (1952). *Lancet*, 1, 325.
McArthur, J. W., *et al.* (1952). *J. clin. Invest.*, 31, 592.
Mauriac, P. (1930). *Gaz. heb. Sci. méd. Bordeaux*, 51, 402.
Perloff, W. H. (1955). *J. Amer. med. Ass.*, 157, 651.
Reifenstein, E. C. (1956). *J. clin. Endocr.*, 16, 1262.
Russell, J. A. (1951). *Endocrinology*, 49, 99.
Salter, J., and Best, C. H. (1953). *British Medical Journal*, 2, 353.
Stowers, J. M. (1951). *Clin. Sci.*, 10, 487.
Tanner, J. M. (1955). *Growth at Adolescence*. Blackwell, Oxford.
Wilkins, L. (1950). *The Diagnosis and Treatment of Endocrine Disorders in Childhood and Adolescence*. Thomas, Springfield, Ill.

The 1956-7 edition of *The London Medical Handbook* is the 39th in this annual series published by the organizers of the London Medical Exhibition. As usual, the bulk of the *Handbook* is taken up with the alphabetical guide to a very wide range of proprietary remedies. Medical contributors to this edition are Professor IAN AIRD, writing on "Artificial Materials in Surgery," Professor A. D. MACDONALD on "Some Recent Pharmacological and Therapeutic Advances," and Dr. R. D. TEARE and Dr. N. F. C. GOWING on "Modern Trends in Pathology." Copies of the *Handbook* may be obtained from the British and Colonial Druggist Ltd., 194-200, Bishopsgate, London, E.C.2, price 10s. 6d.

TREATMENT OF POLYARTERITIS NODOSA WITH CORTISONE: RESULTS AFTER ONE YEAR

REPORT TO THE MEDICAL RESEARCH
COUNCIL BY THE COLLAGEN DISEASES
AND HYPERSENSITIVITY PANEL*

The purpose of this study was to learn whether cortisone improves the expectation of life of patients suffering from polyarteritis nodosa, and whether it improves their well-being. The generally accepted method of answering such questions is the controlled therapeutic trial, in which a series of patients selected on well-defined criteria is divided at random into treated and control groups, and the results are compared. Unfortunately, in this case, three factors made the use of such a method both ethically undesirable and impracticable. First, untreated polyarteritis nodosa is a disease of grave prognosis; but published reports on cortisone therapy have been very favourable—for example, Rose *et al.* (1950) and Shick *et al.* (1951). Second, it is a rare disease, and for any one centre to obtain enough patients for the two groups seemed unlikely. Third, it seemed probable that any trial would have to be completed before enough cortisone became generally available. It was therefore decided that in this instance there was no practicable alternative to giving an agreed form of cortisone treatment to all cases fulfilling the criteria for diagnosis, and comparing their fates with those of patients selected retrospectively on the same criteria. If this report does nothing else, it serves to illustrate some of the limitations of retrospective control.

Selection of Patients

The manifestations of polyarteritis nodosa are often described as "protean." While certain combinations of symptoms and signs are so characteristic as to be diagnostic, no physician of wide experience is unfamiliar with the case in which a seemingly probable diagnosis of polyarteritis nodosa has been disproved at necropsy. It was therefore decided that before a patient could be admitted to the series the presence of polyarteritis must be proved histologically by biopsy. To minimize observer error, histological sections were submitted to a panel of pathologists: Professor G. Payling Wright, Professor C. V. Harrison, Dr. A. H. T. Robb-Smith, and Dr. H. Spencer. Dr. Spencer saw all sections and referred doubtful ones to the whole panel. We would like here gratefully to acknowledge his unstinted help. The following histological definition of polyarteritis was laid down:

"(a) Necrosis of the artery with local inflammatory response, or (b) evidence of previous necrotizing arteritis, as shown by medial scarring and interruption of the internal elastic lamina; but excluding (i) cases where the arteritis is in an area of tissue damage (infection or infarction) and might be secondary to such damage; (ii) cases with evidence of bacterial or mycotic infection spreading from within the lumen and producing the arteritis; (iii) giant-cell arteritis (temporal arteritis)."

*Members of the Panel: Professor G. W. Pickering, Dr. E. G. L. Bywaters, Professor J. F. Danielli, Dr. P. G. Gell, Professor J. H. Kellgren, Dr. D. A. Long, Dr. A. Neuberger, Dr. H. Nicholson, Professor F. T. G. Prunty, Dr. A. H. T. Robb-Smith, Professor G. Payling Wright, Dr. J. J. R. Duthie, Dr. E. T. Conybeare.

Schedule of Treatment with Cortisone

Before the introduction of cortisone and corticotrophin, polyarteritis nodosa was ultimately fatal in most cases. Death was sometimes due not to active polyarteritis but to the late effects of lesions in patients in whom active disease had ceased. This applied particularly to patients in whom renal involvement had led to the development of hypertension. For these reasons it was decided when planning the present trial to recommend the use in each patient of sufficient cortisone to maintain complete suppression of the disease, the dose being limited only by the need to avoid intolerable side-effects. Cortisone for patients in the trial was supplied by the Medical Research Council. The following regime was recommended to the various physicians who took part in the trial:

"(1) Treatment should be started as soon as a positive biopsy has been obtained; in seriously ill patients, however, it may be started as soon as a biopsy has been taken, without awaiting its result. The initial dose of cortisone should be 200 mg. daily by mouth for one week. If at the end of the first week symptoms and signs are not suppressed, the daily dose should be raised by 100 mg. each week until full suppression has been achieved or until intolerable side-effects appear.

"(2) If symptoms and signs are suppressed by 200 mg. daily for one week, an attempt should be made to reduce the dose as follows: 2nd week, 150 mg. daily; 3rd week, 100 mg. daily; 4th week, 50 mg. daily; 5th week, 25 mg. daily; and 6th week, 0. If symptoms or signs recur during or after this process of withdrawal, cortisone should at once be given in a dose which is judged to be sufficient to suppress the signs and symptoms without serious side-effects, and thereafter cortisone treatment should be continuous.

"(3) In cases requiring continuous therapy the maintenance dose should be the minimum required to suppress all symptoms and signs of the disease without intolerable side-effects.

"(4) In cases with blood urea over 60 mg. per 100 ml. or a diastolic blood pressure over 110 mm. Hg, special care should be used and the dose adjusted daily where necessary."

Records of treatment and of the clinical and laboratory findings were made daily for one week after the start of treatment, weekly for the next five weeks, and thereafter monthly. It is proposed, where possible, to continue the follow-up of all patients either to death or for a period of five years.

The Treated Group

It was at first hoped that members of the Panel might in their own clinics collect enough cases for this group. It was soon apparent that this could not be done, and an appeal was made to a wider group, particularly those handling cortisone for the Ministry of Health.

Up to the time of writing, 25 patients have been admitted to the trial. Four are excluded from the present analysis because they have not yet completed 12 months in the trial. Three others are excluded because the biopsy sections, although suggestive, were considered on review to be inconclusive. One patient is excluded because he removed from the district and no follow-up was possible. His withdrawal from the series occurred six weeks after starting cortisone, at which time there was still evidence of active polyarteritis in the skin. The present analysis is based on the remaining 17 patients.

Cases were admitted provisionally to the trial as soon as the physician in charge reported a positive biopsy, and treatment was started immediately afterwards in all but three patients. The exceptions were: (1) In Case 24 cortisone was started immediately after the taking of a biopsy, which subsequently proved to be negative. A positive biopsy was obtained in an exacerbation of the disease four months later; at this time the patient was receiving 150 mg. of cortisone daily. (2) Case 5 had received a very short course of cortisone two months before biopsy. (3) Case 8 had received a short course of corticotrophin one year before biopsy. Two patients were first given a short course of corticotrophin before being transferred to the standard cortisone regime described above.

The Untreated Group

To obtain a retrospective control, it was decided to search the diagnostic indices (both clinical and pathological) of the hospitals providing most of the treated cases, and to collect all cases proved by biopsy in the period from 1946 until the introduction of cortisone therapy in 1950. The Medical Research Council appointed Dr. G. A. Rose to do this work, and to him also we record our thanks. To obtain sufficient cases, it became necessary to extend his inquiry to cover the period from 1941, and also to include a total of 13 teaching hospitals, to whose administrative, clinical, and pathological staffs we also wish to express gratitude for generous co-operation.

In the treated series the disease began in 1950 or later in all cases except one which began in 1947 but was not diagnosed until 1950. The untreated control series consisted of all the cases found in the records in which the disease had started between 1941 and early 1950, and which had been proved by biopsy. The same panel of pathologists verified the biopsy sections from both series.

Comparison of the Two Groups at Time of Diagnosis by Biopsy

Table I compares the chief features shown by the control and treated groups at the time of biopsy.

TABLE I.—Comparison of Treated and Untreated Cases of Polyarteritis Nodosa up to the Time of Obtaining a Positive Biopsy

	Untreated		Treated	
	No.	%	No.	%
Total	19	100	17	100
Males	13	68	11	65
Females	6	32	6	35
Age at onset:				
<20 years	4	21	4	24
21-40	8	42	5	29
41-60	6	32	8	47
61+	1	5	0	0
Mean	32	—	36	—
Fever present	18	95	16	94
E.S.R. (Westergren):				
<30 mm. in 1 hr.	3/11	27	1	6
31-70	3/11	27	8	47
71+	5/11	46	8	47
Hypertension:				
Total	8	42	1	6
Malignant	2	11	1	6
Blood urea >45 mg./100 ml.	6/15	40	4/8	50
Involvement of:				
Kidneys	14	74	14	82
Heart	6	32	2	12
Guts	8	42	8	47
Peripheral nervous system	8	42	5	29
Central	2	11	0	0
Joints	6	32	9	53
Skin	10	53	15	88
Lungs	3	16	6	35
Sparing of all viscera	2	11	1	6
... major viscera (kidneys, heart, guts, C.N.S.)	4	21	2	12
Interval from onset to biopsy:				
0-1 month	2	11	0	0
2-5 months	10	53	10	58
6-11	4	21	2	12
12-23	3	16	4	24
24+	0	0	1	6
Mean	6.0	—	16.4	—
Mean, excluding treated Case 4	6.0	—	7.6	—

The treated group included a slightly higher proportion of older subjects. The severity of the constitutional illness appeared to be similar in the two groups. Loss of weight was recorded in all but four of the untreated patients and in all but three of the treated. The latter tended to show slightly higher fever, and high values for the erythrocyte sedimentation rate (E.S.R.) were more frequent.

There were few important differences in the incidence of polyarteritis in the various organs, but the treated group included slightly fewer patients in whom there was no evidence at all of polyarteritis in major viscera. This difference would tend to weight the prognosis of this group adversely, and would hence tend to lessen the apparent benefit, if any, derived from cortisone.

The duration of the disease from onset to biopsy was of comparable distribution in the two groups, except that the treated group included one patient in whom this interval was 13 years. This patient had had three previous episodes of polyarteritis, each of which had remitted spontaneously. The fourth episode had lasted one month when the patient entered the trial. At this time he was suffering from a severe constitutional illness and extensive involvement of the kidneys, skin, joints, and alimentary tract. Despite the long total duration of the disease, the prognosis at the time of entry into the trial appeared poor. Hence it is unlikely that the inclusion of this case has produced undue bias in favour of cortisone.

The chief difference was in the incidence of hypertension. This has been defined as being present (a) if the systolic arterial pressure exceeded by 30 mm. Hg or more the expected pressure for subjects of the same age and sex (the expected pressure being taken from the data of Hamilton, Pickering, Roberts, and Sowry, 1954); or (b) if the diastolic pressure exceeded its expected level by 20 mm. Hg or more. Using this definition, it was found that 8 (42%) of the untreated group had hypertension at the time of biopsy, but only 1 (6%) of the treated group. This difference is statistically significant (χ^2 corrected for continuity = 4.495; $P < 0.05$). Hypertension is one of the most serious complications of polyarteritis nodosa, and in fact all the eight hypertensive patients in the untreated group died within a year of biopsy. In the analysis below, results are therefore given separately (1) for all patients, and (2) for cases with normal blood pressure at the time of biopsy.

This large difference in the incidence of hypertension might be due to a change in the natural history of the disease over the two periods in question, or to a difference in the clinical features which were regarded by physicians as an indication for taking a biopsy. It could not be ascribed to any general tendency towards earlier diagnosis (Table I).

Comparison of the Two Groups One Year After Biopsy

The results of this comparison are shown in Table II. One year after biopsy only 7 of the 19 untreated cases were still alive, as compared with 14 of the 17 treated cases;

TABLE II.—Comparison of the 17 Treated and 19 Untreated Cases 12 Months After Biopsy

	Untreated		Treated	
	No.	%	No.	%
All cases: alive	7	37	14	82
Excluding cases with hypertension at time of biopsy:				
Alive	7	64	13	81
Clinically remitted	2	18	4	25

if patients with hypertension at the time of biopsy are excluded these figures become 7 out of 11 and 13 out of 16 respectively. At the end of the period active polyarteritis appeared to have ceased in two untreated survivors and in four treated survivors. One of the latter was still receiving 75 mg. of cortisone daily, but there was no recurrence of activity when this was stopped three months later.

In the fatal untreated cases the interval from biopsy to death ranged from 1 week to 7 months, with a mean of 3.0 months; in the fatal treated cases it ranged from 1 to 11 months, with a mean of 6.7 months. If cases with initial hypertension are excluded, the mean duration in the untreated group becomes 3.75 months; the other figures are unchanged.

Detailed Analysis of the Treated Group

The trial was undertaken not only to learn the effects of cortisone on survival, but also to gain experience in the practical problems of this method of treatment. The collection and assessment of this type of information was, however, made difficult by the number of hospitals and

physicians involved. Some details of the management of these patients and the results achieved are presented in Table III.

TABLE III.—Progress of Patients in the Cortisone-treated Group

Period (months) from start of cortisone	1-2	3-4	5-6	7-8	9-10	11-12
No. with no clinical evidence of active polyarteritis:						
Total	1	5	4	4	5	5
No. receiving cortisone	1	5	4	4	3	2
No. not receiving cortisone	0	0	0	0	2	3
No. with no clinical evidence of active polyarteritis and with E.S.R. consistently normal:						
Total	0	1	2	3	3	4
No. receiving cortisone	0	1	2	3	1	1
No. not receiving cortisone	0	0	0	0	2	3
Cortisone (mg./day):						
Mean dose for all patients	150	120	90	80	110	100
Range of individual means	50-450	0-280	0-260	0-290	0-400	0-350
Mean dose of cases not fully controlled	150	120	90	80	110	120
No. of deaths	1	0	0	1	0	1
" survivors	16	16	16	15	15	14

Initial Effects of Cortisone Treatment

In patients with a severe constitutional illness the initial effects of cortisone were always definite, and often they were dramatic. Within two or three days fever abated, appetite and well-being improved, and joint and muscle pains decreased. Early weight gain was usually noted (perhaps due to a combination of fluid retention and re-synthesis of wasted tissues).

Degree of Suppression Achieved

An ideal result—that is, suppression of all clinical evidence of active disease and maintenance of a normal E.S.R.—was achieved consistently in only a few patients. Even at the end of six months' treatment complete control (assessed over the next two months) was maintained in only 3 of the 15 survivors. Failure of control was sometimes only temporary, following a tentative attempt at dose reduction. But in 10 of the 15 patients a normal E.S.R. was not achieved even once during this two-months period; and in nine patients there was evidence of active renal lesions during the period. Similar results were observed during the remainder of the first year's treatment.

Included in Table III are the values for the mean daily cortisone dosage, calculated for all patients, and for those in whom full suppression of active disease was not being achieved. The results show that on average the dose used to treat the uncontrolled cases was not particularly high. In only one patient had it been considered necessary to limit cortisone dosage because of "intolerable side-effects." This patient had sustained a perforated gastric ulcer, following which no more cortisone was given.

It may thus be considered doubtful whether the dosage was in fact large enough to secure complete suppression of the disease; cortisone seems to have been used rather to control the more severe manifestations. The short-term results of this policy were often reasonably good; for example, despite microscopical haematuria and a high E.S.R., some patients had only trivial symptoms.

By contrast, at some other centres rigorous attempts were made to achieve complete suppression. The impression was gained at these centres that complete suppression is usually attainable, but that it not infrequently requires a sustained dosage of 300 to 500 mg. daily. The supervision of these patients was troublesome and time-consuming.

Side-effects of Cortisone Treatment

The commonest side-effect was oedema, which was noted in six patients. In three patients this was associated with

the general appearance of moderate or gross Cushing's syndrome. There was a good deal of individual variation in the relation between cortisone dosage and the development of these features. But, broadly speaking, it appeared that sustained doses of 150-200 mg. daily usually led, despite salt restriction, to the development of a "moon face" and often to ankle oedema; and that doses of 350 mg. daily or more produced gross features of Cushing's syndrome, including deposition of fat and skin atrophy with striae.

Glycosuria appeared during cortisone treatment in three patients, but was slight and inconstant. In one patient, in whom diabetes mellitus was already present, the daily insulin requirement was 30 units before the start of treatment, but rose to 60 units when she was receiving 300-400 mg. of cortisone daily.

Supplementary potassium was given to most patients who were receiving a sustained dosage of more than 150 mg. of cortisone daily. Potassium deficiency was recorded only once. In this patient the plasma potassium fell to 2.3 mEq/l., despite a regular daily dose of 4 g. of potassium chloride; there were no relevant symptoms. The cortisone dose at the time was 350 mg. daily.

As mentioned above, one patient developed perforation of a gastric ulcer; cortisone, which was being given at the time in a dose of 75 mg. daily, was discontinued. Another patient developed the symptoms and radiological appearances of duodenal ulcer whilst receiving 300 mg. of cortisone daily, but healing was achieved by medical treatment without any decrease in cortisone dosage. The same patient developed an ulcer of the leg during a phase of active cutaneous polyarteritis. Subsequently, complete suppression of active polyarteritis was achieved by 300 to 450 mg. of cortisone daily; nevertheless, the ulcer showed no tendency to heal, and over the next six months it slowly enlarged to a diameter of 7 cm. It was thought very possible that this failure to heal was attributable to cortisone.

Of the 14 patients still alive 12 months after starting cortisone, 4 had developed hypertension (defined, for this purpose, as a rise over the pre-cortisone level of either 30 mm. Hg or more in the systolic pressure or 20 mm. Hg or more in the diastolic pressure). The increase in the systolic pressures in these patients ranged from 10 to 80 mm. Hg (mean 36 mm.) and in the diastolic pressures from 20 to 40 mm. Hg (mean 31 mm.). In addition, the patient with hypertension initially showed a further rise in pressure; and another whose initial pressure was normal died with malignant hypertension 11 months after the start of treatment. Of these six patients whose blood pressures rose significantly during the period of treatment, four had definite urinary evidence of renal polyarteritis or glomerulitis, and in one other the record of urine examination was inadequate. No conclusions can therefore be drawn at this stage about the relative importance of specific renal lesions and of cortisone in causing the rise in pressure.

One patient developed bilateral pulmonary infiltrations and cavities, and was transferred to a tuberculosis sanatorium. Examination of the sputum for tubercle bacilli was, however, repeatedly negative, and there is little doubt that these were in fact the lung lesions of polyarteritis nodosa (Rose and Spencer, in press).

Deaths

Three deaths occurred during the first year of treatment:

In Case 10 death occurred two weeks after the start of treatment, as a result of acute cerebral polyarteritis. At the end of the patient's first week of treatment the E.S.R. was still 56 mm. in one hour, and the urine contained protein and red blood cells. According to the standard regime for the trial, the dose of cortisone should then have been increased from 200 to 300 mg. daily, since the disease was uncontrolled. Instead, however, it was decreased to 150 mg. daily, because the patient was looking and feeling so much better.

In Case 13 cortisone was discontinued because of a perforated gastric ulcer. For the next four weeks the patient progressed satisfactorily, and he was then discharged from hospital at his own request. A week later he deteriorated rapidly. He was readmitted with cachexia, peripheral nerve lesions, and gangrene of the fingers and toes, and died shortly afterwards.

Clearly this was a difficult case to manage. It is pure conjecture whether the risk of restarting cortisone would or would not have been greater than the risk of leaving active polyarteritis untreated.

In Case 14 the patient died with malignant hypertension 11 months after the start of treatment. Cortisone, which was originally started at the standard dosage of 200 mg. daily, had been decreased after four days because of the dramatic improvement in the patient's general condition. Thereafter the patient received only from 37.5 to 75 mg. daily, except for a terminal increase to 100 mg. Throughout this period there was persistent evidence of active polyarteritis in the skin and joints, and the E.S.R. (Westergren) ranged from 35 to 100 mm. in one hour. This level of cortisone dosage cannot be held directly responsible for the development of malignant hypertension, which was probably due to renal involvement by polyarteritis.

Discussion

This paper illustrates very clearly the difficulties of using retrospective controls. We tried to minimize the factors responsible for differences between treated and control series by choosing consecutive periods and drawing cases mainly from the same hospitals. The two series, as shown in Table II, are closely comparable except in one feature—namely, the incidence of hypertension, which is much higher in the control than in the treated group. Unfortunately, this is an important difference, since analysis of other cases shows hypertension to be one of the most important factors influencing prognosis. When the cases with hypertension are included, the results seem better in the treated than in the control series; when these cases are omitted, the differences are small, though still in favour of the treated series. But since the numbers are so small, and the series are dissimilar in an important respect, comparing them does not justify conclusions about the effect of cortisone on expectation of life in polyarteritis nodosa; though it is to be said that our results are consistent with the idea that cortisone may prolong life.

In view of the importance of the question asked, we felt a moral obligation to try to answer it; but, for the reasons explained earlier, the method of retrospective control seemed the only one possible. The uncertain meaning of the results obtained makes us wonder whether the labour was worth while. Its chief importance is perhaps to emphasize that the assessment of therapeutic activity by the use of retrospective controls is an inherently fallacious method and no substitute for the strictly controlled clinical trial (Hill, 1951).

Those who have used cortisone therapy in polyarteritis nodosa agree that nearly always it improves symptoms conspicuously and suppresses the major manifestations of active disease. To maintain suppression of symptoms may require doses of cortisone which provoke troublesome and occasionally dangerous side-effects. Whether the treatment is better or worse than the disease is a matter on which we have no unequivocal evidence to present.

Summary

Survival rates at the end of one year are recorded in a series of 17 cases of polyarteritis nodosa proved by biopsy and in a retrospective control series of 19 cases proved in the same way.

The results illustrate the fallacies of retrospective controls; at the time of diagnosis the incidence of hypertension, which materially affects prognosis, was greatly

different in the two groups. Differences in survival rate may thus be due to variations over these periods in such factors as the indications for biopsy or the course of the disease.

Cortisone treatment usually produces quick relief of symptoms and suppression of signs. To secure sustained suppression of outward manifestations may require large doses producing troublesome side-effects.

The panel is greatly indebted to Dr. G. A. Rose for compiling the data contained in this report.

The following hospitals co-operated by permitting access to their case material for the collection of information on the retrospective untreated group: Canadian Red Cross Memorial Hospital, Taplow (Special Unit for Juvenile Rheumatism); Guy's Hospital; London Hospital; Middlesex Hospital; Radcliffe Infirmary, Oxford; Royal Infirmary, Edinburgh, and hospitals served by the Edinburgh University Department of Pathology; Royal Infirmary, Manchester; Royal Victoria Infirmary, Newcastle upon Tyne; St. Bartholomew's Hospital; St. Mary's Hospital; St. Thomas's Hospital; University College Hospital; Westminster Hospital.

The following hospitals are co-operating in the clinical trial of cortisone treatment: Canadian Red Cross Memorial Hospital, Taplow (Special Unit for Juvenile Rheumatism); Hammersmith Hospital; Kingston Hospital; Norfolk and Norwich Hospital; Northern General Hospital, Edinburgh; Paddington Hospital; Royal Infirmary, Manchester; Royal Sussex Hospital; St. Mary's Hospital; St. Thomas's Hospital; University College Hospital.

REFERENCES

- Hamilton, M., Pickering, G. W., Roberts, J. A. F., and Sowry, G. S. C. (1954). *Clin. Sci.*, 13, 11, 37.
Hill, A. B. (1951). *Brit. med. Bull.*, 7, 278.
Rose, B., Pare, J. A. P., Pump, K., and Stanford, R. L. (1950). *Canad. med. Ass. J.*, 62, 6.
Shick, R. M., Baggenstoss, A. H., Fuller, B. F., and Polley, H. F. (1951). *Minn. Med.*, 34, 852.

PERINATAL DEATH FROM FOETAL EXSANGUINATION*

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Foetal exsanguination may not be a frequent cause of perinatal death, but it is a risk to the child's life that can be treated successfully if recognized early, and may on occasion be prevented. For these reasons we record the experience we have had of foetal exsanguination during the years 1951 to 1956. We have previously drawn attention to blood loss from the foetal circulation incurred at caesarean section (Neligan and Russell, 1954, 1955). This paper is concerned mainly with foetal blood loss as it may occur during vaginal delivery and with a method of detecting the foetal source of such bleeding with rapidity and certainty.

Foetal Blood Loss Associated with Vaginal Delivery

In the past five years we have noted at least nine cases where foetal blood has been lost before delivery of the

*This article is based on a symposium presented to the Edinburgh Obstetric Society on December 12, 1956.

baby. Seven of the nine babies lost their lives. In three cases blood was lost from ruptured vasa praevia, and in three others the ruptured vessels lay at a distance from the cervical os and were associated with a velamentous insertion of the cord or a succenturiate lobe of the placenta. In one case there was a circumvallate placenta, but no damage to foetal vessels could be demonstrated. In a further case the mechanism of foetal blood loss remains uncertain, for placenta and cord appeared normal in all respects. The most unusual case was one in which a large foetal vessel, in a normally situated placenta, was damaged at the time of induction of labour with a Drew Smythe catheter.

Brief clinical details of nine cases follow.

Case 1.—A gravida-3 aged 25 was admitted to hospital at term. During the 12 hours before admission there had been slight intermittent vaginal bleeding. The foetal heart was not heard on admission and a few hours later spontaneous delivery occurred of a fresh stillborn child; weight 8 lb. 6 oz. (3.8 kg.). Examination of the placenta revealed ruptured vasa praevia.

Case 2.—A gravida-2 aged 35 was admitted to a private nursing-home at term, following a sudden small vaginal haemorrhage. A slight ooze was noted once or twice during the next 24 hours and the patient was then transferred to our hospital; the foetal heart at this time was quite regular. Over the next few hours a trickle of blood was noted on one or two occasions, but the foetal heart remained regular. Suddenly, eight hours after admission, there was a short brisk vaginal loss and the foetal heart sounds disappeared. A stillborn child weighing 6 lb. 7 oz. (2.9 kg.) was delivered spontaneously two hours later and examination of the placenta showed ruptured vasa praevia.

Case 3.—A primigravida aged 24 was admitted to hospital at 38 weeks, having had a small haemorrhage a few hours previously. The foetal heart was noted to be regular. Four hours after admission a further loss was reported, but this soon ceased. Eight hours later there was a trickle of blood from the vagina, but again this quickly settled. Eleven hours later labour began with rupture of the membranes and the passage of blood-stained liquor. Without warning the foetal heart sounds disappeared. A vaginal examination at this stage revealed a cord-like structure running in the membranes. A fresh stillborn child weighing 5 lb. 14 oz. (2.7 kg.) was delivered spontaneously a few hours later. The placenta showed ruptured vasa praevia.

Case 4.—A primigravida aged 35 was admitted to hospital in labour at term. The foetal heart was regular. Labour progressed normally until the second stage was reached, when the foetal heart sounds suddenly disappeared. Ten minutes later the foetal head appeared at the vulva and was accompanied by a small gush of blood. A fresh stillborn child weighing 7 lb. 14 oz. (3.6 kg.) was delivered; the child was noted to be very pale. Examination of the placenta showed a velamentous insertion of the cord, and one large foetal vessel had ruptured.

Case 5.—A primigravida aged 20 had a surgical induction of labour at the 36th week of pregnancy because of pre-eclampsia associated with twin pregnancy. Twin babies were subsequently delivered spontaneously; neither before nor during labour was any haemorrhage observed. The second twin showed marked pallor at birth and the haemoglobin was 73%. There was a velamentous insertion of the cord and two foetal vessels were seen to be torn across. A blood transfusion was given and the baby recovered.

Case 6.—A gravida-5 aged 37 was admitted to hospital at term because four days previously there had been a small haemorrhage followed by intermittent staining. Vaginal examination in the theatre revealed a type I placenta praevia. The membranes were ruptured with a catheter and labour began shortly afterwards. The foetal heart was regular. At the end of the first stage of labour there was further small loss of blood and the foetal heart was not heard. The baby was stillborn and weighed 7 lb. 8 oz. (3.4 kg.). The praevia portion of the placenta was noted to be a succenturiate lobe

and one of the vessels joining it to the main placenta had ruptured.

Case 7.—A gravida-10 aged 30 was admitted to hospital at term in labour. Two hours before admission she had had a small vaginal haemorrhage. One hour after admission there was a further slight loss and the foetal heart became irregular. The patient was examined under anaesthesia; no placental tissue was felt and the membranes were ruptured. A baby weighing 6 lb. 4 oz. (2.8 kg.) was subsequently delivered by forceps and was noticed to be pale at birth. The haemoglobin was 95% and fell in one hour to 75%. A blood transfusion was given and the baby made good progress. The placenta was circumvallate, but no damage to foetal vessels was found.

Case 8.—A primigravida aged 32 was admitted to hospital at term in labour. When the cervix was 4 fingerbreadths dilated there was a loss of 2 to 3 oz. (60-90 ml.) of fresh blood and the foetal heart became irregular. A precipitate delivery occurred 15 minutes later. The baby was pale and died 45 minutes later. Post-mortem examination revealed marked exsanguination of all foetal organs. Examination of placenta and cord failed to show any injury to the foetal circulation.

Case 9.—A gravida-5 aged 29 had a surgical induction of labour at the 38th week of pregnancy because of pre-eclampsia. No placenta was felt, but a "blood-stained tap" was obtained with a Drew Smythe catheter. For the next 28 hours there was an intermittent slight ooze of blood from the vagina and then the foetal heart suddenly became irregular. The baby was delivered by caesarean section and was noted to be pale at birth. The baby's haemoglobin was 70% and a transfusion was given. The baby improved but died 52 hours later. Examination of the placenta revealed a puncture hole in a large foetal vessel and this area was surrounded by blood clot.

Comment on the Cases

It will be noted that in eight of these cases small antepartum or intra-partum haemorrhages occurred. The origin of the blood loss, however, was not appreciated until after delivery, and this drew our attention to the need for a simple and reliable test to differentiate foetal from maternal blood. In order to ascertain whether the application of such a test would be of practical value it was first of all necessary to determine the time interval between the onset of vaginal bleeding and the delivery or intrauterine death of the foetus. We believe that the test described below would have been of value in Cases 2, 3, 7, and 9 (Table I). The test might also

TABLE I.—Time Intervals in Hours Between Onset of Vaginal Bleeding and Delivery or Intrauterine Death of Foetus

Case No.	Intra-partum Death	Born Alive but Died	Recovery Following Blood Transfusion
2	32 hours		
3	25 "		
7		29 hours	
9			34 hours

have been of value in Case 1, but we cannot be sure, for we do not know when the foetal heart sounds disappeared in relation to the repeated small vaginal haemorrhages. In Case 4 the foetal heart sounds disappeared before there was any bleeding, and in Case 5 no vaginal bleeding was noted. We are uncertain about Case 6; for the first bleeding, four days before delivery, may well have been due to partial separation of the succenturiate placental lobe.

Detection of Foetal Bleeding before Delivery

Adult and foetal blood differ in several respects (Lancet, 1954), and, though methods for distinguishing the two types of blood on the basis of different properties are available, most of them, at present, are not suitable as a diagnostic test. Williamson (1912) suggested that foetal bleeding might

be detected in a vaginal blood loss by recognition of nucleated red blood cells, but this test is impracticable.

In our attempts to find a practicable and reliable diagnostic test for the detection of foetal bleeding use has been made of the fact that foetal haemoglobin is much more resistant to denaturation by alkali than is the adult haemoglobin. In the human foetus traces of adult haemoglobin first appear by the tenth week and the amount slowly increases so that, at term, on average, 20% of the total haemoglobin is of adult type. After birth the percentage of foetal haemoglobin decreases, and by the age of 4 months 90% is of adult type; in the normal adult foetal-type haemoglobin is present, but in minute amounts.

Singer, Chernoff, and Singer (1951) devised a method using the alkali-denaturation technique for the detection of foetal haemoglobin, but in its original form it is not suited to the needs of routine obstetrical practice. Clearly the test would have to be done in all cases of ante-partum and intra-partum haemorrhage in order to detect the few cases where the blood was of foetal origin: speed and simplicity are essential, for the clinician himself must usually do the test and act upon the result.

Rapid Modification of Singer Test

The following test, which is a modification of Singer, Chernoff, and Singer's method, was accordingly devised by one of us (G. S. A.) to meet the necessary requirements: the test takes between five and ten minutes.

Principle.—A sample of blood is allowed to react with an alkali for a set period of time. The reaction is then stopped by an acid solution which also precipitates non-haemoglobin chromogens. The mixture is filtered immediately and the filtrate examined by the naked eye and in a colorimeter.

Reagents.—Alkali: N/12 NaOH or N/12 KOH.* Acid-precipitating solution: 800 ml. of 50% saturated $(\text{NH}_4)_2\text{SO}_4$ plus 2 ml. of 10 N HCl. Blood:—The sample is either pure blood or a mixture of blood and other contaminants issuing from the vagina. It should be collected in a clean heparinized bottle. If collected in an oxalated tube or by means of a siliconed syringe there is a danger of "foetal results" being obtained from adult blood.

Technique.—The haemoglobin level of the blood sample is first determined. To 2 ml. of alkali, 0.1 ml. of blood is added and the mixture is shaken. The reaction is allowed to proceed for one minute at room temperature, when 4 ml. of acid-precipitating solution is added and the mixture again thoroughly shaken. It is then filtered through a No. 1 Whatman filter paper and the filtrate collected.

Results of Test

The results are usually obvious by naked-eye examination. With adult type haemoglobin the filtrate is either clear and colourless or a faint brown-amber colour. With foetal type haemoglobin it varies from a faint pink to a distinct cherry red, depending on the amount of haemoglobin in the sample.

Readings on the colorimeter have been determined, first, so that foetal blood might be detected even when mixed with blood; and, second, to lessen the danger of a mistaken result that might be possible on naked-eye examination alone. The readings obtained by us on an E.E.L. colorimeter, using a green Chance glass filter OGRI with the filtrate in small-bore tubes ($3\frac{1}{4}$ by $\frac{1}{4}$ in.—8 by 0.6 cm.), are presented in Table II. It will be seen that the haemoglobin level of the sample makes an appreciable difference in foetal blood (12 or more units) and a slight difference in adult blood (4 units), but that a range of readings for both types of blood at different haemoglobin levels has been established. It will also be noted that the range for adult blood of 50% haemoglobin (7.4 g.) and above approaches the range for foetal blood of 50% (8.5 g.) and under—that is, samples of

*Singer *et al.* specify N/12 KOH at exactly pH 12.7. It has been found that the concentrated volumetric solutions of NaOH (B.D.H.) can be used to make a satisfactory N/12 solution when one ampoule is dissolved in 600 ml. of distilled water.

TABLE II

Adult Blood		Foetal Blood	
Haemoglobin		Haemoglobin	
Above 50%	Below 50%	Above 50%	Below 50%
46 samples. Highest reading 10	40 samples. Highest reading 6	44 samples. Lowest reading 22	36 samples. Lowest reading 10

In all estimations of haemoglobin the M.R.C. grey-wedge photometer has been used.

foetal and adult blood may give a reading of 10 units, depending on the haemoglobin level. There seemed to be no advantage in making a more complicated division than the one adopted (50% haemoglobin level), for the reading of 10 units obtained with foetal blood was on one specimen only and this had been diluted to 16% (2.72 g.); all other samples gave readings well above 10 units. With adult specimens, only two gave readings of 10 units; four more gave readings above 7 units, but the remainder were below this figure.

There may be a failure to detect foetal blood when the sample contains very little haemoglobin—for example, below 15% (2.55 g.). The colour change under these circumstances may be so slight that the photometer reading falls into the adult range. This circumstance may arise when faintly blood-stained liquor is obtained at surgical induction of labour. With such a sample too little haemoglobin will be contained in 0.1 ml. to give either a clear visual change after alkali treatment or a reliable colorimeter reading after the rapid alkali denaturation test. The difficulty can be overcome by using a larger quantity of the blood-stained liquor. Into each of two test-tubes about 4 ml. of sanguineous liquor is placed and to one, the control, an equal amount of water is added. To the other an equal amount of N/12 alkali is added and the mixture shaken. With adult blood a colour change will be observed at five minutes, when the colour becomes greenish amber. Foetal blood does not show any changes at five minutes, but a colour change does begin at about 30 minutes, to be completed in several hours.

Meconium-stained liquor provides a complicating factor in that heavily contaminated liquor, if put through the rapid alkali denaturation test, will give a reading of 2 or 3 units. Pure meconium can give a reading of 10 units. Fortunately the occurrence of ante-partum haemorrhage with the escape of meconium-stained liquor is rare.

Mixtures of Adult and Foetal Blood

The circumstances under which loss of foetal blood might occur in a vaginal delivery or following a surgical induction of labour are such that only a small admixture by adult blood is likely. In this connexion it will be remembered that foetal blood itself is a mixture of adult (20%) and foetal (80%) haemoglobin at term, and before term the percentage of foetal haemoglobin is higher. Also the level of haemoglobin in the foetus is higher than the level in adults by 3 to 4 g. per 100 ml. It has been found by experiment that, provided the haemoglobin of the mixture of adult and foetal bloods is above 50%, as little as 1 part of foetal blood in 20 of adult can be detected. When the haemoglobin of the mixture is below 50%, this ratio becomes 1 in 10.

Foetal Haemoglobin in Adult Blood

Foetal haemoglobin in amounts that would be detected by the test described are not produced by normal adults. In sickle-cell anaemia and in thalassaemia (Cooley's anaemia; Mediterranean anaemia), however, appreciable amounts do occur. For all practical purposes these disorders are limited to the Negro and Mediterranean races, but an Italian woman with thalassaemia was recently seen in this hospital; foetal haemoglobin was present in the circulating blood and was detected by this test. The transplacental transfer of foetal red blood cells, first suggested by Wiener (1948), has been shown by Rucknagel and Chernoff (1955) to be an

uncommon occurrence. Using a more sensitive technique than alkali denaturation, they detected foetal haemoglobin in significant amounts in 10 out of 91 pregnant women, although the highest amount detected was only 1.37%. The original alkali-denaturation test of Singer *et al.* is insensitive to amounts of foetal haemoglobin of approximately 2% or less. The modified test, as we describe, is even less sensitive, detecting 5 to 10% of foetal haemoglobin, depending on the haemoglobin level of the sample.

To obtain a 5% mixture in a normal adult, assuming the total blood volume in the adult to be six litres, would require 300 ml. of foetal blood, and this seems to us to be more than could be lost from a viable infant. Bleeding by the foetus into the maternal circulation would not therefore invalidate the test.

Application and Interpretation of the Rapid Alkali-Denaturation Test

The following procedure is carried out in this hospital. In cases of ante- and intra-partum haemorrhage, and when a blood-stained tap has been obtained at surgical induction of labour, the sample of blood is collected and the haemoglobin is estimated. Blood is obtained by venepuncture from the mother and the haemoglobin estimated. The test, as outlined above, is carried out on both samples of blood and the interpretation made against the reading obtained on the venepuncture specimen and against the general background of colorimeter readings (Table II).*

If the colorimeter reading of the vaginal specimen of blood is 11 or above, then foetal blood is clearly present, although the mother's venous-blood reading must always be obtained to check the technique and to avoid the possibility that she is the source of the foetal haemoglobin. Where the vaginal specimen of blood gives a reading of from 7 to 11, then the various colorimeter results given in Table II cease to be of value, and one must then critically compare the colorimeter reading obtained on a venepuncture specimen of blood in which the haemoglobin level has been equated to that of the vaginal specimen. Since the experimental error in performing the test is not greater than one unit, it is considered safe to allow that, if the vaginal specimen of blood gives a reading of 2 or more units higher than the venepuncture specimen at an identical haemoglobin level, foetal blood is present.

Discussion

It has long been known that foetal vessels in the placenta may be damaged during a caesarean section. Leopold (1888) and Kelly (1891) both warned against the practice of boring through an anterior placenta; they pointed out that if this were done the foetus might bleed to death. Siddall and West (1952) and Wickster (1952) have drawn attention again to this accident. Neligan and Russell (1954, 1955) reported upon the circumstances of the accident, and upon its frequency and management. An operative technique was described in which they stressed the importance of circumventing the placenta and clamping the umbilical cord as soon as the baby's face had been delivered. Russell and Warwick (1955) have shown how radiology can help in the management of these cases by warning the obstetrician of the presence of an anterior placenta praevia. The operator may even receive guidance on how best to circumvent the placenta without injuring it. Since 1952 the obstetric and paediatric staffs in our hospital have followed the routine described by Neligan and Russell, and no baby born by caesarean section has lost its life from foetal exsanguination.

Whereas we feel confident that the risk to the baby's life incurred by damage to foetal vessels at caesarean section has been overcome, the danger of foetal exsanguination from other causes still remains. We have given details of nine known cases in the last five years, but there may have been others of lesser degree. Reliance on clinical features

*These results apply only to the E.E.L. colorimeter in this hospital.

alone will result in a high foetal mortality. In six of the nine cases foetal distress was either not noted or did not precede the vaginal bleeding by a sufficient length of time to be of practical value. This observation fits in well with the findings of Neligan and Russell (1954), who noted that the exsanguinated baby may appear deceptively well until shortly before death. In one case, however, foetal distress was present for almost one hour before delivery was effected by forceps. This baby received a blood transfusion and survived (Case 7). In Case 9, foetal distress was noted for half an hour before delivery by caesarean section. The warning, however, was too late, for the baby died in spite of blood transfusion. The other case (No. 1), an emergency admission, resulted in the death of the foetus before arrival in hospital, and no records are available about the duration of foetal distress.

A characteristic feature of the bleeding in eight of the nine cases has been its small amount—enough, however, in each case to warrant a diagnosis of ante-partum haemorrhage. Cases 7 and 8 are of some interest in that we could demonstrate no damaged foetal vessel, yet there was clear evidence of foetal exsanguination. These two cases may be examples of the foetus bleeding into the maternal circulation as has been reported by Wiener (1948), Wickster (1952), and Chown (1954). In both cases, however, there was some vaginal bleeding, and this may have been foetal blood from an undiscovered source. The exact pathological mechanism of blood loss in these cases still remains uncertain, but we record them because they draw attention to the possibility of haemorrhagic shock in babies noticed to be pallid at birth, despite the failure to detect damage to foetal vessels.

In the series of nine cases that we report here, only two babies survived. We hope that routine use of the test described above in cases of ante-partum haemorrhage will enable us to diagnose foetal blood loss earlier and lead to a higher foetal survival.

Summary

Foetal exsanguination, although an infrequent cause of perinatal death, is on occasion preventable.

By careful attention to obstetric and paediatric techniques it has been found possible to overcome the risk to the baby's life incurred by damage to foetal vessels at caesarean section.

The risk of foetal exsanguination from other causes remains, and nine cases are described. In these cases reliance on clinical features did not give sufficient warning for prompt treatment to be undertaken.

Attention is drawn to the need for a rapid, reliable test to show when foetal blood is present in the vaginal loss in cases of ante-partum haemorrhage. A rapid alkali denaturation test for the detection of foetal blood is described.

We are indebted to Professor Harvey Evers and Professor Donald Court for their advice and encouragement and for permission to publish details of cases admitted to the Princess Mary Maternity Hospital. We also thank Dr. R. B. Thompson for his interest and help in the development of the test to differentiate foetal from maternal blood.

REFERENCES

- Chown, B. (1954). *Lancet*, **1**, 1213.
 Kelly, H. A. (1891). *Amer. J. Obstet. Dis. Wom.*, **24**, 532.
Lancet, 1954, **2**, 905.
 Leopold, C. G. (1888). *Der Kaiserschmidt*, p. 169. Leipzig.
 Neligan, G. A., and Russell, J. K. (1954). *J. Obstet. Gynaec. Brit. Emp.*, **61**, 206.
 — (1955). *British Medical Journal*, **1**, 164.
 Rucknagel, D. L., and Chernoff, A. I. (1955). *Blood*, **10**, 1092.
 Russell, J. K., and Warwick, C. K. (1955). *Lancet*, **1**, 785.
 Siddall, R. S., and West, R. H. (1952). *Amer. J. Obstet. Gynec.*, **63**, 425.
 Singer, K., Chernoff, A. I., and Singer, L. (1951). *Blood*, **6**, 413.
 Wickster, G. Z. (1952). *Amer. J. Obstet. Gynec.*, **63**, 524.
 Wiener, A. S. (1948). *Ibid.*, **56**, 717.
 Williamson, H. (1912). *J. Obstet. Gynaec. Brit. Emp.*, **21**, 203.

INFLUENCE OF SELECTIVE INDUCTION OF LABOUR ON MORTALITY IN HAEMOLYTIC DISEASE OF THE NEWBORN

BY

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In the past few years the mortality in haemolytic disease of the newborn has fallen considerably, but obstetricians and paediatricians still differ in the management of the expectant mother with rhesus antibodies.

The Medical Research Council in 1949 initiated controlled trials of treatment: firstly, between exchange and simple transfusions; and, secondly, between routine induction of labour and spontaneous delivery. The preliminary results of the trials were published in 1952 by Mollison and Walker and showed that exchange transfusion resulted in a lower mortality (13%) than simple transfusion (37%), while the incidence of kernicterus was also lower after exchange transfusion than after simple transfusion. They concluded that routine premature induction of labour three to five weeks before the estimated date of delivery resulted in a higher mortality (36.4%) than when labour ended spontaneously (24.1%). A later review by Armitage and Mollison (1953) of the children born during these Medical Research Council trials showed that infants born prematurely were more liable to kernicterus and to mental and motor defects than those born spontaneously.

Since the official recommendations by the Medical Research Council in 1952 regarding exchange transfusion and premature induction of labour, other workers have also emphasized that premature induction of labour has no place in the routine treatment of haemolytic disease of the newborn—for example, Walker and Murray (1954). These expressed views have probably resulted in the virtual cessation of premature induction of labour for this disease in most obstetrical hospitals and units in the United Kingdom.

However, at the Royal Maternity Hospital, Belfast, these views have never been fully accepted in Professor Macafee's department, where induction of labour has been carried out when indicated. This approach has received support from Watson, Crosse, and Hatchuel (1954), who showed the strikingly beneficial results obtained by premature induction of labour on two occasions in one particular patient. Kelsall and Vos (1955) also reported a series of 246 consecutive cases of haemolytic disease of the newborn and suggested that the overall mortality could be lowered by the premature induction of labour at the optimal time after 35 weeks of gestation followed, where necessary, by exchange transfusion. The mortality rate of infants spontaneously delivered was 23.4%, compared with 10.7% in infants born after premature induction of labour. These figures show a statistically significant preference for controlled induction. Kelsall and Vos claimed to show that controlled induction of labour and subsequent exchange transfusion had virtually eliminated stillbirths after 35 weeks' gestation and had not been associated with an un-

due increase in neonatal deaths. They also stated that kernicterus had become so rare in their induced cases as to be practically never seen.

Present Investigation

Following these reports the results of 143 pregnancies complicated by rhesus incompatibility have been reviewed from January, 1951, to December 31, 1955, at the Royal Maternity Hospital, Belfast. Since the patients were admitted either to one unit in which, as a general rule, selective induction of labour was undertaken or to another unit in which spontaneous delivery was preferred, two roughly comparable series are available.

All the mothers were rhesus-negative and had rhesus antibodies in their serum. Each live-born infant had a positive Coombs test except in two cases. One was born with a cord haemoglobin level of 12.3 g. per 100 ml. (90%) and a negative Coombs test, but exchange transfusion was undertaken. The other infant was born with a cord haemoglobin level of 16 g. per 100 ml. (108%) and a serum bilirubin level of 3 mg. per 100 ml.; the Coombs test was not recorded but exchange transfusion was done, the mother having rhesus antibodies and a history of previous infants affected by haemolytic disease of the newborn. All stillbirths and neonatal deaths were assumed to be the result of haemolytic disease of the newborn. Only those patients delivered at or after the 36th week are considered, the period of gestation being calculated by Naegele's method from the date of the first day of the last menstrual period.

As a general rule, exchange transfusion was undertaken if the haemoglobin of the cord blood, estimated by the Medical Research Council photometer, was below 14.8 g. (100%) but not if it was above 17.7 g. (120%). When the haemoglobin was between 17.7 g. and 14.8 g. exchange transfusion was usually done if the serum bilirubin was greater than 2.7 mg. per 100 ml. (normal range, 1.5–2.5 mg. per 100 ml.; King, 1951), especially when associated with enlargement of the spleen, a previous family history of severe haemolytic disease of the newborn, prematurity, or if the umbilical cord was jaundiced. Warm rhesus-negative group O citrated blood was used, giving at least 50 ml. of packed cells per lb. (110 mg. per kg.) of body weight of the infant.

The obstetrician was responsible for the selection of patients for premature induction of labour, which was based on a clinical assessment of each case. The indications have been, to a certain extent, arbitrary, but a previous seriously affected or stillborn child with haemolytic disease, a rising rhesus antibody titre, and a homozygous rhesus-positive husband have had an important influence on the selection of cases for induction. During the last few weeks of a rhesus-incompatible pregnancy, alteration in the foetal heart or diminution of foetal movements may also indicate urgent delivery by caesarean section, and in some of the infants so born the cord haemoglobin has been found to be as low as 7.4 g. per 100 ml. (50%). In this series labour was usually induced in the 37th or 38th week, but the need for a more accurate method of determining when termination of pregnancy is indicated is discussed below.

Findings

If death *in utero* occurred before 36 weeks of gestation the possibility of induction of labour would have been excluded, and this might weight the total mortality unfavourably against the spontaneously delivered group. For this reason the mortality rate in the spontaneous group is shown in Table I, corrected by excluding any known deaths *in utero* before the 36th week of gestation (four in number). In the remainder, the foetal heart was heard after the 35th week; or the infant, if stillborn, was fresh and unmacerated. Table I also shows that the total mortality rate in the spontaneous group is notably higher (29%), than in the induced group (16%). Nevertheless, the severity of the haemolytic disease was probably greater in the induced cases, as the incidence of

exchange transfusion was higher (68 transfusions in 76 cases) in the induced group than in the spontaneous group (29 transfusions in 63 cases). The average haemoglobin level in the cord blood was slightly lower (87%) in the induced group than in the spontaneous group (93%). By conventional standards, however, the statistical analysis is not significant in such a small series.

Table II shows the duration of pregnancy at which delivery occurred after induction was carried out, compared with that at which spontaneous delivery occurred.

TABLE I.—Mortality At or After 36 Weeks in 139 Cases of Rhesus Incompatibility Known to be Viable After 35 Weeks (Royal Maternity Hospital, Belfast)

Labour	No. of Cases	Survival	Neo-natal Deaths	Still-births	Total Mortality	% Mortality
Induced ..	76	64	11	1	12	16
Spontaneous ..	63	45	6	12	18	29

$$\chi^2=2.6128. \text{ D.F.}=1. \quad 0.20>P>0.10.$$

TABLE II.—Number of Deliveries, Duration of Pregnancy, Stillbirths, and Neonatal Deaths Each Week Between 36 Weeks and Term, with Average Haemoglobin Values (Royal Maternity Hospital, Belfast)

	Week of Gestation						Total
	36	37	38	39	40	41+	
<i>Induced Group</i>							
Neonatal deaths ..	2	0	5	4	0	0	11
Stillbirths ..	1	0	0	0	0	0	1
Total deaths ..	3	0	5	4	0	0	12
.. deliveries ..	7	6	35	20	7	1	76
Average Hb level (%) ..	81	80	84	93	85	96	87
<i>Spontaneously Delivered Group</i>							
Neonatal deaths ..	2	1	0	1	1	1	6
Stillbirths ..	1	0	6	4	1	0	12
Total deaths ..	3	1	6	5	2	1	18
.. deliveries ..	3	5	14	13	16	12	63
Average Hb level (%) ..	61	101	91	82	94	99	93

The beneficial effect of selective premature induction of labour in haemolytic disease of the newborn can also be illustrated by individual case records.

Case 1.—A patient aged 29 had the following history. Her first infant was born at term weighing 9 lb. (4 kg.) and is alive and well; her second was also born at term weighing 9 lb. (4 kg.) but died at 3 days of age with jaundice; her third and fourth infants were stillborn at 38 weeks. In her fifth pregnancy she was found to be rhesus-negative and to have a rhesus antibody titre of 1/16. An elective caesarean section was undertaken at 37 weeks; the infant was born suffering from haemolytic disease of the newborn with a haemoglobin level of 12 g. per 100 ml. (82%). Exchange transfusion was performed, and the infant's subsequent progress has been excellent.

Case 2.—A patient, aged 35 and rhesus-negative, had the following history. Her first two infants, born at term, are alive and well; her third infant was stillborn at 39 weeks; her fourth infant, born at term, died on the fifth day with jaundice; her fifth infant was stillborn at term; her sixth infant, born at term, died 12 hours later with jaundice; her seventh infant was born at term, became slightly jaundiced later, did not require a transfusion, and is alive and well; her eighth and ninth infants were each born at term; both had exchange transfusions, but died 12 hours later with severe jaundice. In her tenth pregnancy rhesus antibodies were present. She was induced and delivered at the 38th week; the infant was born suffering from haemolytic disease, with haemoglobin of 9.6 g. per 100 ml. (65%). Exchange transfusion was performed and the child is alive and well.

Discussion

These individual family histories and the comparison of results in 139 infants with haemolytic disease of the newborn

TABLE III.—Comparison of Mollison and Walker (1952), Kelsall and Vos (1955), and Royal Maternity Hospital, Belfast. Mortality Rates in Haemolytic Disease of Newborn

	Mollison and Walker (1952)		Kelsall and Vos (1955)		Present Series	
	Induced	Spont.	Induced	Spont.	Induced	Spont.
No. ..	77	108	112	111	76	63
Survived ..	39	82	100	85	64	45
Neonatal deaths ..	22	12	11	1	11	6
Stillbirths ..	6	14	1	19	1	12
Deaths % ..	28	26	12	26	12	18
Deaths % ..	36.4	24.1	10.7	23.4	16.0	29.0

suggest that the mortality from this disease can be lowered by selective premature induction of labour rather than by awaiting spontaneous delivery. The reduction of the total mortality from 29% in the spontaneously delivered group to 16% in the induced group in this series is similar to that from 23.4% to 10.7% in Kelsall and Vos's series (Table III), but the reverse of the findings of the Medical Research Council trials.

Such results, however, cannot be compared with the findings in the Medical Research Council trials, where routine induction of labour was undertaken three to five weeks before term and the form of treatment was dictated by selection of random numbers. The difference in the mortality rates in the induced cases in the present series and in the Medical Research Council trials may have resulted partly because the random selection of patients for routine induction fails to distinguish between mildly and severely affected cases and therefore needlessly exposes to the hazards of prematurity a number of infants unaffected or only mildly affected. Likewise, the selected period for induction, about the 36th week, in the Medical Research Council trial, may not have been the optimal time to terminate a particular pregnancy.

It cannot be too strongly emphasized that each rhesus-incompatible pregnancy should be treated on its merits.

The mortality rates reported by Kelsall and Vos (1955) for the induced group and the group delivered spontaneously are much lower than those in the present series and may be due to several factors. An important difference in their technique of exchange transfusion is in the use of freshly collected heparinized blood in place of stored citrated blood. Campbell (1955) has drawn attention to the high plasma potassium content of stored blood and noted that toxic levels of potassium occur in infants undergoing exchange transfusion, which might be a factor in causing death during transfusion. Possibly of equal importance is an alteration of the ratio of diffusible to non-diffusible calcium in stored citrated blood, and work is proceeding on this problem.

Kelsall and Vos also exchanged larger quantities of blood, 150–250 ml. per lb. (330–550 ml. per kg.) body weight of the infant during transfusion, but this is not necessarily an advantage, as in the present series exchange transfusion has been repeated on a second or even a third occasion if indicated subsequently by a high serum bilirubin level.

It is obviously necessary to have a method of determining the severity of haemolytic disease of the newborn during the course of pregnancy so that the optimal time for induction of labour can be more accurately selected. In 1952 Kelsall and Vos published a method of carefully standardized and repeated antenatal titrations of maternal serum by the anti-globulin method of Coombs and found it to be an accurate guide to treatment. They tested the serum of pregnant rhesus-negative women at monthly intervals and, if antibodies were detected, at weekly intervals after the 32nd week. They claimed that a titre of 1/64 or higher was an indication for induction at 36 weeks or onwards. If the father was homozygous and the maternal antibodies were high but stationary, induction was carried out at 38 weeks. If the titre was lower and stationary, the pregnancy was allowed to continue, the antibody level being checked at weekly intervals.

On clinical grounds some guidance can be gained from the previous family history. Walker and Murray (1956) have shown that in their series of infants with haemolytic disease of the newborn there was a general trend to more severe disease in succeeding pregnancies. They also showed that the stillbirth rate was about 10% when there had been no previously affected baby but that it was nearly 30% in subsequently affected babies. Moreover, in families where a previous infant was stillborn as a result of haemolytic disease there was an 80% chance that the next baby, if allowed to go on to spontaneous delivery, would also be stillborn. This in itself justifies the need for premature induction of labour in these patients, for this procedure will increase the likelihood of the infant being born alive and give it a chance of survival with treatment in spite of the hazards of prematurity. It is, however, essential to know in such a rhesus-incompatible pregnancy that the husband is homozygous rhesus-positive, as this will influence the choice of treatment.

The rhesus antibody titres in saline and albumin media of the maternal blood in this series have not necessarily corresponded with the severity of the disease in the infant. The need for a reliable method of assessment such as the antibody titration method described by Kelsall and Vos (1952) and the importance of weekly estimations of antibody levels are well illustrated by the following case record.

A patient aged 30 had the following history. Her first infant, born weighing 4 lb. (1.8 kg.), suffers from cerebral palsy; her second infant is alive and well; her third child died at 9 days of age with jaundice; her fourth pregnancy terminated at 36 weeks and the infant was stillborn. In her fifth pregnancy she was found at 10 weeks to be rhesus-negative with an antibody titre of 1/2. At 34 weeks the foetal heart was heard. Arrangements were made for her to be admitted at 38 weeks for possible induction of labour. Spontaneous onset of labour at 37 weeks resulted in delivery of a macerated stillborn foetus which showed at post-mortem examination all the features of haemolytic disease of the newborn.

Allowing for the clinical difficulties and possible statistical variables inherent in comparing different series of such cases, selective induction of labour based on the family history and clinical assessment of each rhesus-incompatible pregnancy would seem to have reduced the total mortality in haemolytic disease of the newborn.

Summary and Conclusions

The results of 143 pregnancies of rhesus incompatibility delivered spontaneously or by selective premature induction of labour are reviewed.

There is a notable lowering in the total mortality in haemolytic disease of the newborn in the induced group (16%) compared with that of the group delivered spontaneously (29%).

The severity of the disease was probably greater in the induced group, as twice as many exchange transfusions were performed and the average haemoglobin level was lower than in the group spontaneously delivered.

The beneficial results of selective premature induction of labour are also illustrated by the individual case histories.

The time of induction was based on the previous maternal history and by clinical assessment of the individual patient.

Selective premature induction of labour is thought to reduce the total mortality from haemolytic disease of the newborn.

I thank my colleagues at the Royal Maternity Hospital, Belfast, and in particular Professor C. H. G. Macafee, Professor F. M. B. Allen, and Dr. Maurice Russell, for their assistance in preparing this report.

ADDENDUM.—Since this article was accepted for publication a further paper on the subject has been published by W. Walker, S. Murray, and G. K. Russell in the *Lancet* on February 16, 1957.

REFERENCES

- Armitage, P., and Mollison, P. L. (1953). *J. Obstet. Gynaec. Brit. Emp.*, 60, 605.
Campbell, W. A. B. (1955). *Arch. Dis. Child.*, 30, 513.
Kelsall, G. A., and Vos, G. H. (1952). *Med. J. Aust.*, 1, 349.
— (1955). *Lancet*, 2, 161.
King, E. J. (1951). *Microanalysis in Medical Biochemistry*, p. 37. Churchill, London.
Medical Research Council (1952). Memorandum No. 27. London.
Mollison, P. L., and Walker, W. (1952). *Lancet*, 1, 429.
Walker, W., and Murray, S. (1954). *British Medical Journal*, 2, 126.
— (1956). *Ibid.*, 1, 187.
Watson, H. B., Crosbie, V. M., and Hatchuel, W. L. F. (1954). *Ibid.*, 1, 679.

BRUCELLOSIS IN CHILDREN

BY

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Brucellosis is a disease of mistakes. If we do not think of it we miss it; or we may think of it and test for it, yet find nothing. It eludes us. Nevertheless, as a cause of pyrexia of undetermined origin it is important; and obscure headaches, lassitude, abdominal pain, or arthritis may be due to its smouldering activity.

Case 1.—A girl of 6 was referred to me because of abdominal pain, lassitude, and irritability. I could find no abnormality, and investigations proved negative. Her family had moved house a few months earlier and she had been sent to a new school. I assumed that her symptoms were due to psychological upset and hoped that they would settle down in the course of time. Three months later I was asked to see her again because she was no better. She then had some enlarged glands in the neck, axillae, and groins, and her liver was palpable. A white cell count showed a leucopenia, with a diminished number of neutrophil polymorphs. Serum agglutinations against *Brucella abortus* were positive at 1 in 320 dilution. Chlortetracycline and streptomycin were given for seven days. Her temperature fell rapidly and she felt better within a week. Her recovery was complete and permanent.

I was able to learn by my mistake in this case. From that time I was more keenly aware of the possibility that brucellosis might be the cause of vague or unexplained symptoms. In the course of time I met with a number of children who were undoubtedly suffering from brucella infection. I scrutinized the notes of 2,000 children I had seen in hospital during the previous four years and made a retrospective diagnosis in several others. It is important to record my findings in order that others may learn from my mistakes as I have done. I hope thereby to reduce the number of cases in which pain, fever, and arthritis remain unexplained, and also to shield children from unjustified accusations of neurosis and malingering.

Dalrymple-Champneys (1950) has given an excellent review of the history, ecology, and symptomatology of this disease, which he calls "a neglected problem." Full reference to the previous work has been made by Huddleson (1939) and Harris (1941, 1950) in their exhaustive monographs, and it is evident that any system of the body may be affected.

Sander (1933) said that the disease in children did not differ at all from that in adults; but Huddleson wrote that in Malta, where it is commonest in children, it is relatively mild and often passes unnoticed. Williamson

and Gibson (1931) reported the first case in this country, that of a boy of 20 months. Paterson and Hardwick (1938) also reported cases, and gave their opinion that many such cases are never recognized. In infancy the symptoms are more obscure. Repeated gastro-intestinal upsets, failure to gain weight, and pyelitis may be noted. Hagebusch and Frei (1941) believe that the infection may be acquired *in utero*. Epidemics have been reported in this country by Elkington *et al.* (1940) and Cruickshank and Stevenson (1942).

Case Reports

General.—For greater brevity all negative or normal investigations have been omitted. It may be assumed that the tuberculin and Widal reactions were negative, and that urine examinations and x-ray examinations of the chest, abdomen, and sinuses gave normal results unless otherwise stated. All the children lived in the country except one, who had recently moved into the city. All of them had drunk milk which had not been pasteurized, though in some cases it was from tuberculin-tested herds.

Case 2.—Acute Attack and Relapse

A boy of 8 lived in a village where there was an epidemic of brucellosis. He had drunk milk from a herd which was later proved to be infected with *Br. abortus*. In December, 1954, he had an acute attack of diarrhoea and abdominal pain. His temperature rose to 101° F. (38.3° C.), and he had a cough. The family doctor made a diagnosis of brucellosis, and the patient was admitted to hospital after a week. He was found to have glands in the neck, axillae, and groins, and a systolic murmur in the heart.

Investigations.—Haemoglobin, 98%; E.S.R., 22 mm.; total white count, 3,400 (polymorphs 1,750). Agglutinations against *Br. abortus*, negative. Brucellin skin test, strongly positive.

He was treated with chlortetracycline and streptomycin for one week. His temperature settled rapidly, and he was discharged home. A month later he had gained 4 lb. (1.8 kg.) weight, but was rather tired and irritable. His total white count was 7,200, with 3,000 polymorphs. Agglutinations were positive at 1 in 640 dilution.

He continued to make a good recovery, and at follow-up a year later he was very well. Soon after this he was kicked on the head while playing football. A week after the injury he had an attack of lethargy, anorexia, and malaise. On examination there were some small glands in the neck and axillae. The systolic murmur remained. At the site of the skin test there was still an area of induration and scaling of 5 by 5 mm. His mother said that the place broke down and wept after he left hospital, and that it had never healed since. During the next month he had headaches, irritability, and fever up to 102° F. (38.9° C.). He was admitted to hospital for further treatment. His liver was then palpable, and the agglutinations were positive at 1 in 160. After a second course of treatment he has again progressed well, and the systolic murmur is no longer audible.

Comment.—This may have been a reinfection; but in view of the behaviour of the skin test it is more likely to have been a relapse. Barrett and Rickards (1953) refer to the flaring-up of malaria after surgical operations and other insults, and suggest that the same may happen in brucellosis. Dalrymple-Champneys records a case where a fracture of the femur precipitated a relapse 35 years after the original attack.

Case 3.—“Influenza”

At a school in the country several boys had what was thought to be influenza. Most of them recovered rapidly, but one aged 8 had a persistent fever of 99 to 100° F. (37.2 to 37.8° C.) in the evenings for three weeks. Sulphonamides and penicillin had no effect. Examination then showed a fit pale boy with one gland in the left axilla.

Investigations.—Haemoglobin, 95%; E.S.R., 4 mm.; total white count, 7,000 (polymorphs, 3,500). Agglutinations against *Br. abortus*, positive 1 in 80. X-ray examination of the chest showed mottled shadows in the right and left lower zones and hilar enlargement on the left.

The temperature continued to be high in the evenings for another 14 days and he was seen again. His blood picture was unchanged except for a rise in titre of agglutinations to 1 in 160. The x-ray picture was clearer. A diagnosis of brucellosis was made at this time, and it was decided to wait before treating him. Fourteen days later he seemed to be worse. His appetite was poor and he had become short-tempered and apt to burst into tears without reason. He had had pain in one knee, and evening pyrexia. He was treated with chlortetracycline and streptomycin for 10 days, and made a good recovery.

Milk Supply.—The dairyman who supplied milk to the school obtained it from three farms. These were inspected, and positive evidence of infection of the herds with *Br. abortus* was found in two of them.

Case 4.—E.N.T. Problem

The patient was a boy of 10. His father worked on a farm and brought home raw milk in a can. In December, 1955, he had an acute pain in the neck. Next day his right knee and ankle were painful. The family doctor found that he had tenderness over one mastoid process and some meningism. He was admitted to an E.N.T. ward. On admission he had deep cervical adenitis, without definite ear disease. Haemoglobin, 87%; E.S.R., 42 mm.; total white count, 3,100 (polymorphs, 1,550).

Three days later his liver was found to be enlarged and tender and he was transferred to the paediatric department. He had a systolic murmur; but further investigations were negative. Agglutinations for *Br. abortus*, positive at 1 in 20 only. Fever up to 99° F. (37.2° C.) persisted, and he had some diarrhoea. A week later he complained of headaches and pain in the chest and abdomen. His spleen became palpable and there were glands in both axillae and posterior triangles. By this time the total white-cell count was 2,000, with only 1,020 polymorphs. The house-physician (who had trained in London and could not believe the diagnosis of brucellosis) became worried, and prepared to take a specimen of sternal marrow. However, a repeated test of the agglutinations showed a rise to 1 in 160. About this time there were some dry scaling patches on both cheeks, and the boy became constipated. A skin test was negative. His temperature settled, the liver and spleen receded, and he felt better. A month later there was a relapse, with abdominal pain and fever. He was treated for 14 days with chlortetracycline and streptomycin. Three months later he was well and considered to be cured. The systolic murmur was no longer heard.

Case 5.—Psychological Disturbance

A girl of 5 was referred by her family doctor with this note: “She is listless and pale, and has become rather a frightened child. Mamma has to work to keep herself and the child. A neighbour looks after the girl during the day, when she is not at school. I feel that the problem is really a social one, but would be glad of your reassurance that it is not physical.”

Examination revealed some glands in the neck, axillae, and groins, and a basal systolic murmur. There was also a golden-brown pigmentation on the forehead and temples.

Investigations.—Haemoglobin, 81%; E.S.R., 8 mm.; total white count, 4,500 (polymorphs, 3,150). Agglutinations against *Br. abortus*, positive 1 in 320. Brucellin skin test, positive. The urine contained 100 mg. of protein per litre and many pus cells, but it was sterile on culture.

She was treated with chlortetracycline and streptomycin for 10 days and made a rapid and complete recovery. A month after the end of treatment her mother said: “I

think you must have been feeding her with energy pills.” Three months later she was very well, the murmur had gone, and no glands were palpable in the neck or axillae.

Case 6.—Spontaneous Cure

A boy of 12 had had a dry cough, abdominal pain, and constipation for two months. On examination there were no abnormal physical signs.

Investigations.—Haemoglobin, 76%; E.S.R., 20 mm.; total white count, 3,200 (polymorphs 544). Agglutinations, negative. Brucellin skin test, negative. A month later the total white count was 7,000, with 4,760 polymorphs. The agglutinations were positive at 1 in 160. By then he had improved, and it was not thought justified to treat him. A year afterwards he was very well.

Comment.—A spontaneous cure. The very low polymorph count might have caused alarm if this disease had not been recognized.

Case 7.—Migraine

A boy of 9 had attacks of paroxysmal abdominal pain and headache associated with nausea and blurred vision. On admission to hospital no abnormalities were found except a few glands in the neck and groins and a systolic murmur. Haemoglobin, 90%; E.S.R., 2 mm.; total white count, 7,000 (polymorphs 2,590). Cerebral tumour and subdural haematoma were ruled out, and a diagnosis of migraine with a psychological background was made. A month later he was easily tired and could not concentrate at school. Brucellosis was considered, and he was admitted to hospital. Agglutination was positive at 1 in 40 only. A skin test was negative, and a week later the agglutination titre was unchanged. He was discharged with no firm diagnosis.

After another month he was still lacking in concentration, and had pains in the shoulders and knees. The headaches continued, and his evening temperature was raised to 99–100° F. (37.2–37.8° C.). A diagnosis of brucellosis was made on clinical grounds despite the absence of confirmatory pathological findings, and it was decided to treat him. He was given chlortetracycline and streptomycin for 10 days. After three days his temperature fell below 98° F. (36.7° C.) and remained low. He felt better and his cheeks became pink. Meanwhile the agglutinations had been repeated, and were reported as positive at 1 in 160. Since the end of treatment he has had no headaches or other symptoms. His mother states, “He is a different child.”

Milk Supply.—The medical officer of health was informed, and as a result herds at two farms were found to be affected.

Comment.—Note the delayed response to the skin test. The final specimen of serum which returned a titre of 1 in 160 was taken 40 days after the skin test, and after a diagnosis had been made without positive pathological evidence. Dixon and Roaf (1946) and Nichols (1951) have reported cases with transient migraine.

Cases Diagnosed in Retrospect

Case 8.—X-ray Picture Mimicking Miliary Tuberculosis

This boy of 11 lived on a farm. In November, 1953, he had an attack of vomiting and abdominal pain. A week later he had frontal headaches, dyspnoea, and a dry cough. On examination his temperature was 99° F. (37.2° C.), pulse rate 100, and respiratory rate 40. His breathing was shallow, and there were fine crepitations in all parts of the lungs. An x-ray film showed that both lung roots were rather prominent and there was a fine mottling throughout both lungs resembling miliary tuberculosis. Haemoglobin, 97%; E.S.R., 6 mm.; total white count, 6,000 (polymorphs 2,100). Mantoux test, negative to 100 T.U. His temperature settled quickly, and after 14 days he was discharged with a provisional diagnosis of bronchopneumonia. Six weeks later he was irritable and had no appetite. Small

glands were found in his axillae and neck. Crepitations were still heard in his lungs, and the x-ray picture was unchanged. He was admitted again. The tuberculin tests were still negative. A diagnosis of sarcoidosis was considered, but the plasma proteins and the albumin/globulin ratio were found to be normal. No abnormality was found in the x-ray films of his bones. He improved once more and was discharged again with a diagnosis of possible sarcoidosis.

He went downhill and was admitted for the third time six months after the onset of the disease. His spleen was then palpable, and extrasystoles were noted. Kahn and Wassermann reactions were negative. Brucellosis was considered and discarded as the agglutinations were negative. A lymph node removed from the axilla showed no histological evidence of lymphadenoma or sarcoidosis. An electrocardiogram was normal.

He again improved and was discharged with no final diagnosis. He was seen from time to time in the outpatient department. The x-ray picture cleared, and he was finally discharged from attendance over a year after the onset, still undiagnosed. A year after that he was sent for again. He was a fine fit boy, and had gained 19 lb. (8.6 kg.) weight. He had no symptoms. There were no abnormal physical signs, and x-ray films of the chest were normal. Haemoglobin, 89%; total white count, 5,000 (polymorphs 2,200). Agglutinations against *Br. abortus*, 1 in 160. Brucellin skin test, negative.

Comment.—If this boy had by chance been tuberculin-positive a diagnosis of miliary tuberculosis would have been almost irresistible. In the days before antibiotics were available there were a few legendary patients who recovered from miliary tuberculosis. Probably some of them were in fact suffering from brucellosis. It seems possible also that some obscure cases of “sarcoidosis” may really be victims of brucella infection. The only other child seen in this area with an index diagnosis of “query sarcoidosis” also had a leucopenia and a high titre of agglutinins. Note also that the leucopenia remains despite apparent clinical cure.

Case 9.—Spinal Radiculitis

A boy of 15 had an acute febrile illness with cough, lassitude, and anorexia. He was found to be tuberculin-positive and to have healed calcified glands in the abdomen. A month later he had pain in the chest, constipation, and fever. At this time the white count was 4,400, with 1,980 polymorphs. Six months later he had pain in the back which was unexplained. A year later there was an obscure disease of the right elbow which was variously diagnosed as early osteoarthritis and a cervical disk lesion. After another six months he complained of a stiff ankle with limited movement. A prolapsed intervertebral disk was suspected, and he was admitted to an orthopaedic hospital. Here the total white count was 2,800, with 1,512 polymorphs. The sedimentation rate was 2 mm. Some sensory loss appeared in the legs, and a diagnosis of cauda equina tumour was made. In a neurosurgical unit lumbar puncture was performed. The C.S.F. was faintly yellow. Protein, 208 mg. per 100 ml.; W.B.C., 87 per c.mm. (75% lymphocytes); Lange, 0001110000.

An operation was performed, and on opening the dura all of the roots of the cauda equina were seen to be injected and swollen to two or three times the normal diameter. This unexpected finding was noted as “a rare condition, not fully understood.” His progress after the operation was poor. He lost weight and became very depressed. The possibility of carcinomatous neuropathy was considered but not proved.

When the question of brucellosis was raised three years after the onset tests showed that agglutinations were negative and the skin test was strongly positive. Treatment with chlortetracycline brought much improvement.

Comment.—The leucopenia should have led to an earlier diagnosis, which would have saved this boy much suffering.

Huddleson (1939) and Nelson-Jones (1951) report cases of spinal radiculitis, and I have since seen one other. Neurologists should be on the alert for this disease.

Case 10.—"Tuberculous Rheumatism"

A girl of 12 had an acute attack of abdominal pain and constipation. In hospital her temperature and pulse rate were normal. Her appendix was removed and found to be normal also. Two months later she still had pain and some dysuria. A blood count showed: haemoglobin, 78%; E.S.R., 13 mm.; total white count, 4,200 (polymorphs 1,722). This was ignored.

Six months later she had a painful swollen knee. A systolic murmur was noted, and she was said to be nervous. A diagnosis of chondro-osteomalacia was made by an orthopaedic surgeon.

During the next six months she had low back pain and became easily tired. She was admitted to an orthopaedic hospital with the diagnosis of lumbo-sacral disk lesion. She was treated with a corset and some physiotherapy. Her response was not good. A tuberculin test was positive. Her urine contained a few pus cells on several occasions, but no tubercle bacilli could be found. An intravenous pyelogram was normal. Because of the constipation sigmoidoscopy was performed. Nothing abnormal was found. The house-surgeon wrote: "This child has probably been talked into her condition by over-solicitous parents. Away from them she seems to have improved a good deal. She should get up and persuade herself that she is not an ailing person."

About this time I saw her and made another mistake. Because an x-ray film of the abdomen revealed that there were calcified mesenteric glands, I made a diagnosis of tuberculous rheumatism. I advised treatment with calceferol, but there was no improvement. Later, as a result of this survey, she was sent for again. It was found that she had been sweating at night, her liver was palpable, and the systolic murmur remained. Her blood picture was normal and agglutinations against *Br. abortus* were less than 1 in 20. A brucellin skin test was negative; but a week later the agglutination titre was 1 in 80.

Comment.—The fourfold rise in titre after the skin test proves the diagnosis. This poor girl has been subjected to appendicectomy, intravenous pyelography, sigmoidoscopy, suspicion of psychoneurosis, and long months in hospital, all unnecessarily. If such cases of brucellosis could be recognized earlier not only would pain and suffering be relieved but the nation would be spared considerable expense.

Tuberculous rheumatism has been reported as an entity by Poncet and Leriche (1909) and Sheldon (1946). It consists of a short-lived and atypical arthritis occurring in the course of tuberculous disease. It seems possible that some of the cases so labelled are in fact suffering from two diseases, tuberculosis and brucellosis, both contracted from the same source—namely, infected milk. In Poncet and Leriche's book it is stated that one of their patients was "un vétérinaire de 50 ans." We now know that brucellosis is an occupational disease of veterinary surgeons, and perhaps that gentleman could be included among those diagnosed in retrospect.

Diagnosis

The proof of infection with brucella may be extremely difficult. The following steps should be taken.

1. Consideration of the history and clinical findings.
2. Studies of the blood. Usually the haemoglobin level is slightly but not severely lowered. The sedimentation rate of the red cells is often very low. The number of white cells is decreased, and there is a marked diminution in the number of neutrophil polymorphs. The total count is usually below 5,000, with fewer than 2,500 polymorphs. But a normal count does not rule out the disease.

3. Serum agglutination tests against a suspension of killed brucella organisms. According to Wilson and Miles

(1955) a positive reaction in a titre of 1/80 or over in a febrile patient can be regarded as indicative of active infection. But a negative reaction by no means excludes active infection, and a rising titre is usually indicative of activity. The history of Case 7 suggests that a titre of 1 in 40 can sometimes be accepted as evidence of activity.

4. An intradermal sensitivity test with brucellin. This is similar to the Mantoux test for tuberculosis. If it is positive it shows that the patient has at some time met with brucella infection, though it does not prove that his illness is due to such infection. On the other hand, unlike the Mantoux test, a negative result cannot be taken to preclude the diagnosis. Evans *et al.* (1938) found that the skin test was negative in 39% of affected patients. Harris (1941, 1950) has described delayed reactions, and it would seem wise to read the test at 48 hours and thereafter daily for a week or more.

5. A second estimate of the agglutinins. Sometimes the skin test provokes a rise in titre, but not always. A four-fold rise is usually taken as significant. It has been customary to take the second specimen for testing at six to eight days. Criscuolo (quoted by Harris) found in some cases that the rise was delayed till the 30th day (see also Case 7). The rise in titre may occur even though the skin test is negative (Cases 6, 7, and 10).

6. Blood culture. The results of this procedure seem to be variable, and are unsatisfactory in the obscure chronic cases where they would be of most help.

All of the five last-named investigations may give normal or negative results even though the patient is suffering from active infection. Failure to realize this fact has often led physicians into error in the past. It must be emphasized that laboratory aids are sometimes misleading, and that in obscure cases the diagnosis may have to be made on clinical grounds alone (see Case 7).

Various Factors

Time of Onset.—An analysis of the months of onset of these cases showed that the disease starts most often in the autumn and winter months. Organisms are excreted in the milk in greater numbers during the early months of lactation. In Malta the kidding season occurs in March and April, and there is a seasonal increase in brucellosis in the summer (Eyre, 1907). In this country calving takes place more commonly in the late summer and autumn. The increased autumnal incidence may also be due to the fact that many children nowadays go to the country or seaside for their summer holidays and to the modern practice of spending holidays in caravans. Even city children who have safe milk at home may be caught in this way, and practitioners in large cities should remember this. One drink may be enough. One boy of 8 had always had pasteurized milk. He went for a picnic but left the milk at home. He begged a drink from a farm and was given milk fresh from the cow. Three weeks later he had an acute attack of brucellosis.

Heart Murmurs.—Systolic murmurs were heard in half of the cases. This is a higher proportion than is generally found in healthy children. They were not due to dilution of the blood, as in no case was there any severe anaemia. In three cases they disappeared after treatment. Such murmurs may come to be regarded as useful pointers in the diagnosis. Care should be taken to rule out bacterial endocarditis and acute rheumatism. Hart, Morgan, and Lacey (1951) record cases of brucella endocarditis.

Pigmentation.—The type of pigmentation on the forehead and temples noted in Case 5 was seen in another case not included here. It has not previously been reported so far as I can determine, though Hughes (1897) describes "a certain amount of bronzing."

Urine.—In several cases protein or pus has been found in the urine. It seems likely that some chronic cases of low-grade pyelonephritis or abacterial pyuria may be due to brucellosis. Transient glycosuria was seen in one case.

Psychological Disturbances.—Several children were suspected by parents, family doctors, house staff, or consultants of being psychoneurotic. This is the fate at some time of most sufferers from chronic brucellosis, and we should guard against it.

Treatment, Prognosis, and Mortality

Good results have been reported from the use of various antibiotics, especially streptomycin and the tetracyclines. In America brucellin has been used alone. Léon *et al.* (1952) reported good results from a combination of these agents. Carpenter *et al.* (1955) found that in guinea-pigs the combination was more effective than either brucellin or oxytetracycline alone. This may be the method of choice in the future.

Most of the victims of brucellosis recover rapidly; but a few have a prolonged illness which entails investigations, repeated admissions to hospital, and even unnecessary operations, all of which have been noted in this small series. The number of deaths registered in England and Wales in 1953 as due to brucellosis was four (Registrar-General, 1954). It seems likely that death from this disease might easily be missed and classified as due to acute haemorrhagic pneumonia, nephritis, or possibly encephalitis.

Prophylaxis

The best method is to eradicate the disease from cattle. This can be done by inoculation of calves with a vaccine of attenuated *Brucella* known as strain 19. It is already in common use in this country, but it will be many years before all cows have been protected. In the meantime the only satisfactory way is to ensure that all milk is pasteurized. Tuberculin-tested milk is not safe. Unfortunately it has acquired amongst the general public a reputation for safety which is not justified.

It would be helpful if the disease were to be made compulsorily notifiable so that medical officers of health could apply their powers to stop the sale of infected milk.

In the modern world threat of legal process speaks louder than reasoned argument. Publicity might therefore be given to the following decisions. At Seattle, Washington, in 1937, a man who had contracted brucellosis from infected milk was awarded 1,946 dollars in a suit against the company which distributed the milk and the farmer who produced it (Harris, 1941, 1950). In London in 1939 a man was awarded £195 damages against a dairyman in a similar suit (*The Times*, 1939).

Conclusion

There is a tendency in the human race to look with suspicion on that which is new to it. The reaction of most doctors to the information that they have unwittingly been dealing with brucellosis is like that of M. Jourdain (*Le Bourgeois Gentilhomme*) when he found that he had been speaking prose for more than forty years: they can scarcely believe it.

Simpson (1941), introducing Harris's monograph in America, said that he hoped it would "help the great mass of people suffering from brucellosis by making their physicians brucellosis-minded." I trust that this paper may do the same in this country.

Summary

Ten cases of brucellosis in children are described. It is shown that the disease is common in country districts but is often missed. It may also be seen in cities, especially in the autumn after children have returned from holiday in the country, where they may have drunk raw milk. Of clinical importance are: fever; enlargement of the liver, lymph nodes, or spleen; arthritis; epistaxis; and chronic abdominal pain or headache. Constipation is common; and protein or pus cells may be found in the urine. A fallacious diagnosis of psychoneurosis

is often made. Systolic murmurs and skin pigmentation are two features of the disease described here for the first time.

Assistance in diagnosis may be had from pathological findings such as leucopenia with a low polymorph count, agglutinations of suspensions of *Brucella abortus* by the patient's serum, and by the reaction to the intradermal injection of brucellin. In some cases these tests may all be negative while the disease is still active, and the diagnosis must be made on clinical grounds alone.

Treatment with chlortetracycline and streptomycin appears to be successful, but relapses may occur. Prophylaxis is discussed, and universal pasteurization of milk is recommended.

I thank Dr. Paul Mann for his help and advice, and many general practitioners for their continued co-operation.

[ADDENDUM.—Extended experience shows that extra-systoles are fairly common in this disease, and that the abnormal bleeding tendency which causes epistaxis may also produce melaena, haematuria, and spontaneous bruising. Preliminary experiments with a multiple-puncture (Heaf) gun for the intradermal test have given good results. If a 1,000-fold concentrated solution of brucellin is used with it the results appear to be more reliable than those of the routine intradermal test. I am indebted to Messrs. Allen and Hanburys Ltd., who provided a Heaf gun for use in these experiments.]

REFERENCES

- Barrett, G. M., and Rickards, A. G. (1953). *Quart. J. Med.*, 22, 23.
Carpenter, C. M., Nelson, E. L., Klein, S. J., Rawlings, B. E., Boak, R. A., and Weimer, H. E. (1955). *J. Immunol.*, 74, 281.
Cruckshank, J. C., and Stevenson, G. A. (1942). *British Medical Journal*, 1, 522.
Dalrymple-Champneys, W. (1950). *Lancet*, 1, 429, 477.
Dixon, G. J., and Roaf, R. (1946). *British Medical Journal*, 2, 12.
Elkington, G. W., Wilson, G. S., Taylor, J., and Fulton, F. (1940). *Ibid.*, 1, 477.
Evans, A. C., Robinson, F. H., and Baumgartner, L. (1938). *Publ. Hlth Rep. (Wash.)*, 53, 1507.
Eyre, J. W. H. (1907). *Report of the Commission on Mediterranean Fever*, Part 6, p. 101. London.
Hagebusch, O. E., and Frei, C. F. (1941). *Amer. J. clin. Path.*, 11, 497.
Harris, H. J. (1941). *Brucellosis (Undulant Fever) Clinical and Subclinical*, 1st ed. New York.
— (1950). *Ibid.*, 2nd ed. New York.
Hart, F. D., Morgan, A., and Lacey, B. (1951). *British Medical Journal*, 1, 1048.
Huddleson, I. F. (1939). *Brucellosis in Man and Animals*. New York.
Hughes, M. L. (1897). *Mediterranean, Malta or Undulant Fever*. London.
Léon, A. P., Cano, C., and Vergara, M. E. (1952). *Science*, 115, 576.
Nelson-Jones, A. (1951). *Lancet*, 1, 495.
Nichols, E. (1951). *Ann. intern. Med.*, 35, 673.
Paterson, D. H., and Hardwick, C. (1938). *Arch. Dis. Childh.*, 13, 65.
Poncet, A., and Leriche, R. (1909). *Le Rhumatisme Tuberculeux*. Paris.
Registrar-General (1954). *Statistical Review of England and Wales, 1953*, Part I. Tables. Medical. H.M.S.O., London.
Sander, J. F. (1933). *J. Mich. med. Soc.*, 32, 109.
Sheldon, W. (1946). *Lancet*, 1, 119.
Simpson, W. M. (1941). In H. J. Harris's *Brucellosis (Undulant Fever) Clinical and Subclinical*, Foreword, p. vi.
The Times, March 18, 1939.
Williamson, B., and Gibson, A. J. (1931). *British Medical Journal*, 1, 748.
Wilson, G. S., and Miles, A. A. (1955). *Topley and Wilson's Principles of Bacteriology and Immunity*, 4th ed. London.

A reminder of the importance of providing fixtures to hold fireguards in position has been sent to local authorities by the Minister of Housing and Local Government. There are indications that so far few local authorities have installed the fixtures in their council houses, yet surveys have shown that at least 50% of burning accidents in the home are caused by unprotected fires. Many local authorities appear to have taken the view that the wide variety of fireguards makes it impracticable to provide fixtures. However, the British Standards Institution has recently produced a specification for fireguards, incorporating fixing hooks, for open fires, so that the difficulty can now be overcome. The cost of providing a suitable fixture in the wall or fire surround is small, and the Ministry understands that various models and sizes of fireguards which comply with the new specification are becoming available.—Statement from the Ministry of Housing and Local Government, dated February 26.

CELL EXCRETION IN NORMAL URINE

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The examination of the urinary deposit has long been accepted as a useful procedure in the diagnosis of renal disease. As usually performed, however, the value of the information that it affords is limited by the inaccuracy of the method employed, since the deposit derived from the untimed random sample of urine is not susceptible of quantitative study. This latter is essential, for example, in the diagnosis of chronic pyelonephritis, in which it is well known that, at least until renal destruction has become gross and renal failure is at hand, the urinary deposit is commonly small and inconstant. Repeated cultures may be necessary before a growth is obtained.

In the course of an investigation of pyelonephritis we employed a method more sensitive than usual for the culture of urinary deposits, and, since this inevitably might have increased the frequency with which contaminant or saprophytic organisms appeared, we felt it necessary to check the significance of our cultural methods by attempting to correlate them with an accurate count of the cells excreted in the urine.

The best-known method of quantitative estimation of the constituents of the urinary deposit is that of Addis (1925). This, however, seemed to us to suffer from various disadvantages. The method makes it necessary for female subjects, who have to be catheterized, to hold their urine for 12 hours. Moreover, the time over which the urine is collected allows a proportion of the cells in the urine to break up: this point is discussed below. Finally, the number of elements actually counted by the Addis technique is so small that it is multiplied by a factor of one million in order to arrive at the presumed excretion rate; errors of sampling and of counting thus figure largely in the final result.

More recently, Rofe (1955) has described a method in which the leucocytes and epithelial cells excreted in the urine are counted after staining. We considered this method to be rather too elaborate to be suitable for routine use.

It is the purpose of this paper to present a reliable, simple, and rapid method of counting the leucocytes and non-squamous epithelial cells in the urine. The range of normal values in thousands per hour is established, and a comparison made between this and the numbers passed in a few abnormal urines that on examination of the usual type would almost certainly have been reported as normal. No attempt has been made to enumerate casts or red blood cells, since the method was primarily evolved as an ancillary investigation in the diagnosis of chronic pyelonephritis; but their excretion rates could be measured in the same way.

Subjects and Methods

All the subjects were afebrile and had no evidence of active infection in any system of the body. Their ages varied from 20 to 64 years. In none was there any evidence

of present or past illness referable to the urinary tract. None had hypertension or other cardiovascular disease.

Of the male subjects, 22 were medical students or members of the staff of this hospital, ambulant, and carrying out their normal duties, while 19 were patients who fulfilled the criteria set out above. None of these latter had recently had any operation, or any investigation involving interference with the urinary tract.

To obtain normal female subjects was more difficult, as we were reluctant to expose them to the risk of urethral catheterization. The 28 female subjects were all ward patients fulfilling the criteria above and free from evidence of pelvic disease; they had to be catheterized either pre-operatively or in the course of some routine investigation unrelated to their urinary tract.

All the samples of urine used for the 127 counts were sterile on culture and free from protein by the salicyl-sulphonic acid test.

Although the primary purpose of this paper is to report the cell excretion in normal subjects, a few counts obtained from patients with renal infection are included. Of these patients those with the lower cell counts had deposits which by the usual method of examination showed little or no deviation from normal.

The cellular excretion rates were determined as follows. The subject emptied the bladder as completely as possible and the time was carefully noted. Three to four hours later, the time again being noted, the bladder was emptied by catheter in the female, and naturally in the male, avoiding preputial contamination. No restrictions were placed on fluid intake, but diuretics were not given. The specimen obtained was measured, and within two hours of collection it was thoroughly shaken. Precipitated phosphates were dissolved by adding a few drops of glacial acetic acid, and 10 ml. was measured into a graduated centrifuge tube. After spinning at 2,000 r.p.m. for five minutes, 9 ml. of the supernatant was discarded and the remaining 1 ml. thoroughly mixed by a clean Pasteur pipette. The leucocytes and non-squamous epithelial cells were then counted in 2 c.mm. of the ruled area of a Fuchs-Rosenthal counting chamber under a $\frac{1}{4}$ -in. (4.3-mm.) objective. No attempt was made to include disrupted or degenerated cells.

The result was calculated as follows, and expressed as the number of leucocytes and non-squamous epithelial cells excreted per hour:

$$N = \frac{500 \times C \times V}{10 \times T} = \frac{50 C V}{T}$$

where C=actual number of cells counted, V=volume of specimen in millilitres, T=time in hours over which the specimen was formed, and 500=factor to convert 2 c.mm. to 1 millilitre.

In the normal subjects studied the volume of the specimens excreted in three to four hours varied between 100 and 400 ml. Between 5 and 30 cells were actually counted. Deposits from small volumes of highly concentrated urine were more difficult to count, since more cells were present, and these had to be distinguished from the inevitably greater amount of detritus, crystals, and squames.

Errors of the Method

Nearly all the counts reported were carried out in duplicate. In most cases the difference did not exceed 10%, and

TABLE I.—Proportion of Leucocytes "Recovered" in a Series of Counts Performed on Four Different Suspensions Obtained by Diluting Blood Samples in Saline

Blood Sample	Expected Number of Cells in Suspension as Calculated from W.B.C. Count	Observed Count Expressed as Total Cells Present	% Recovery
A	2,000,000	2,000,000	100
B	5,950,000	6,240,000	105
C	3,875,000	3,160,000	81
D	3,050,000	2,775,000	91

MARCH 16, 1957

in none did it exceed 30%. Independent duplicate counts made by each of us in six specimens did not differ by more than 10%.

To test the accuracy of the method, 0.5 ml. of fresh blood was diluted in 400 ml. of 0.9% saline which had been adjusted to pH 5 by the addition of a few drops of glacial acetic acid. Then 10 ml. of the suspension was taken and treated in the same way as the urine, and while one of us performed the count the other did a leucocyte count on the blood. Table I shows the results obtained in four separate experiments.

Results

In all, 127 counts were performed, 99 being on 41 male subjects and 28 on 28 females, and the results are shown in Fig. 1. The limits lie between 18,000 and 196,000 leucocytes and non-squamous epithelial cells an hour, irrespective of the time of day during which the specimen was collected and the sex and age of the subjects and their activity before and during the period of collection. Within these limits, however, the posture of the subject and the time of day have some slight influence on the rate of cell excretion, and for this reason Fig. 1 does not represent the results from a strictly homogeneous population. We have therefore not attempted to subject

Fig. 1.—Block diagram for 127 normal urines, to show the rate of excretion of leucocytes and non-squamous epithelial cells.

it to a detailed statistical analysis.

Diurnal Variation in Ambulant Males.—To compare the values obtained in morning and afternoon periods, 12 ambulant male subjects were taken at random and counts were done for each period of the same day (Fig. 2). For the morning counts the mean was 87,700 an hour, while for the afternoon counts the corresponding values were 54,300 an

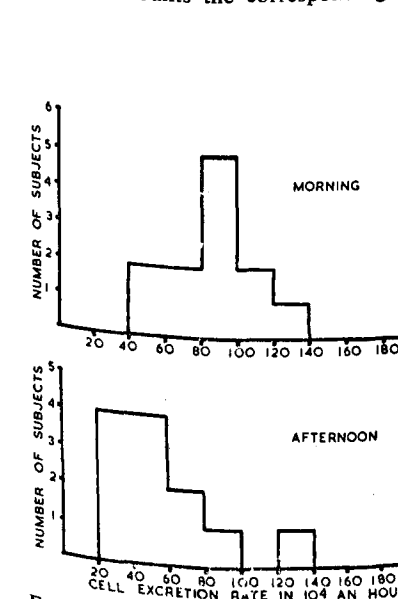


Fig. 2.—Morning and afternoon periods on 12 ambulant male subjects.

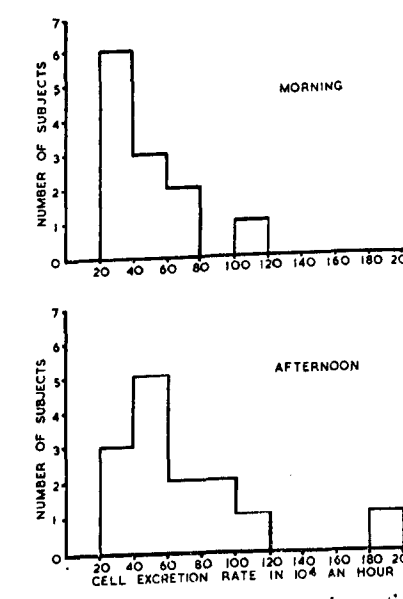


Fig. 3.—Cell excretion rates in resting male subjects during the morning and afternoon.

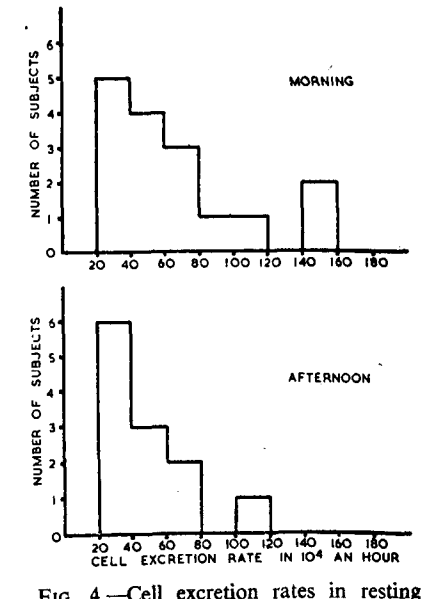


Fig. 4.—Cell excretion rates in resting female subjects during the morning and afternoon.

hour. The differences between the morning and the afternoon counts for each individual were calculated and the mean of these (34,700 an hour) differed significantly from zero ($t=3.18$; $0.001 < P < 0.01$).

Diurnal Variation in Resting Males.—Twelve counts were carried out in the morning on 12 resting male subjects, and 14 in the afternoon (Fig. 3). The means were 47,500 an hour (standard error 7,400) in the former, and 68,000 an hour in the latter (S.E. 11,600). The difference of the means was thus 20,500, which was of no significance ($t=1.43$; $0.1 < P < 0.2$).

Diurnal Variation in Females.—All females studied were supine and only one count was carried out on each. Of a total of 28 counts, 16 were performed in the morning, with a mean value of 66,100 per hour, S.E. 9,800, and 12 in the afternoon, with a mean of 56,400 an hour, S.E. 7,900 (Fig. 4). The difference of means, 9,700, is not significant ($t=0.79$; $0.4 < P < 0.5$).

Sex Difference.—In order to establish whether or not there was any difference between the rates of cell excretion in the sexes a comparison was made between the results obtained in resting males and females at each period of the day (Figs. 3 and 4). In the morning the counts from females, with a mean of 66,100, exceeded those from the males, whose mean was 47,500; but the difference of 18,600 was of no significance ($t=1.41$; $0.1 < P < 0.2$). In the afternoon the position was reversed, but the difference of the mean values (11,600) was not significant ($t=0.79$; $0.4 < P < 0.5$).

Influence of Posture.—A comparison was next made between excretion rates of ambulant and supine males during each period of the day (Fig. 5). The mean value obtained from counts of 14 ambulant subjects in the morning was 87,500 an hour, S.E. 8,715, while for 12 resting subjects the corresponding values were 47,500 an hour, S.E. 7,400. The difference of the means, 40,000, is statistically significant ($t=3.42$; $0.001 < P < 0.01$). The afternoon counts were performed on 24 ambulant subjects and 14 supine subjects, the mean for the former being 71,200 an hour, S.E. 7,700, while for the latter it was 68,000 an hour, S.E. 11,600. There is no significant difference between these groups ($t=0.24$; $0.8 < P < 0.9$).

Influence of Age.—In Fig. 6 the results of counts made on 24 resting female subjects are plotted against age. No correlation between age and cell excretion rate is apparent.

Individual Variance.—In three ambulant males repeated counts were made to see whether the range of cell excretion rate in each individual differed significantly from that of the group as a whole. Ten counts were made on each of two

individuals and eight on a third, covering both the morning and the afternoon. No characteristic pattern of excretion was shown for an individual. For the morning the variance ratio was 3.09 with 13 degrees of freedom (total), $0.2 < P < 0.5$; the afternoon variance ratio was 0.36 ($0.2 < P$).

Pathological Urines.—A small number of known cases of renal infection were next selected, since it seemed of interest to see how far counts from these departed from the normal range. It should be emphasized that these subjects were chosen for comparison because on routine examination their urinary deposits did not appear abnormal. The results are shown in Fig. 7 and demonstrate how limited is the information given by accepted methods of examination of the urinary deposit.

Cellular Lysis in Urine.—It seemed possible that cells kept in the bladder for long periods of time, as in the Addis technique, might undergo lysis. To investigate this possibility, five specimens of urine, secreted over a period of four hours, were counted immediately they were pro-

TABLE II.—Number of Cells Remaining Intact when a Specimen of Urine is Stored in a Sterile Container at 37° C. and at 22° C.

Specimen	Hours							
	0	2	4	6	8	10	12	
Urine at 37° C.								
A	21	15	10	10				
B	18	12	9	10				
C	20	17	15	11				
D	13	10	8	7				
E	30	—	18	18	18	16	18	
Urine at 22° C.								
F	20	20	20	16				
G	13	13	14	13				
H	20	21	20	21	13			
I	17	17	15	15	15			
J	11	10	11	8	9			

duced, placed in sterile containers in an incubator at 37° C., and counted at two-hourly intervals thereafter. Table II shows the results obtained.

The progress of cell lysis was also investigated in urines stored at room temperature, since this obviously might influence the results of counts, especially if the rate varied according to the time of storage. The results of counts carried out at intervals on five specimens of urine stored at room temperature are included in Table II.

Discussion

The method presented is simple and quick and requires no elaborate equipment. It does not take more than 30 minutes to perform a duplicate count on a urinary specimen. There is no need for fluid restrictions, nor for a long period of urinary retention with the inaccuracies that it may produce. Table II shows what happened to the cell count of urinary specimens maintained at body temperature. Addis (1948) gives the average excretion of white and non-squamous epithelial cells as 650,000 for 24 hours. This gives a figure of 27,000 an hour, which is substantially lower

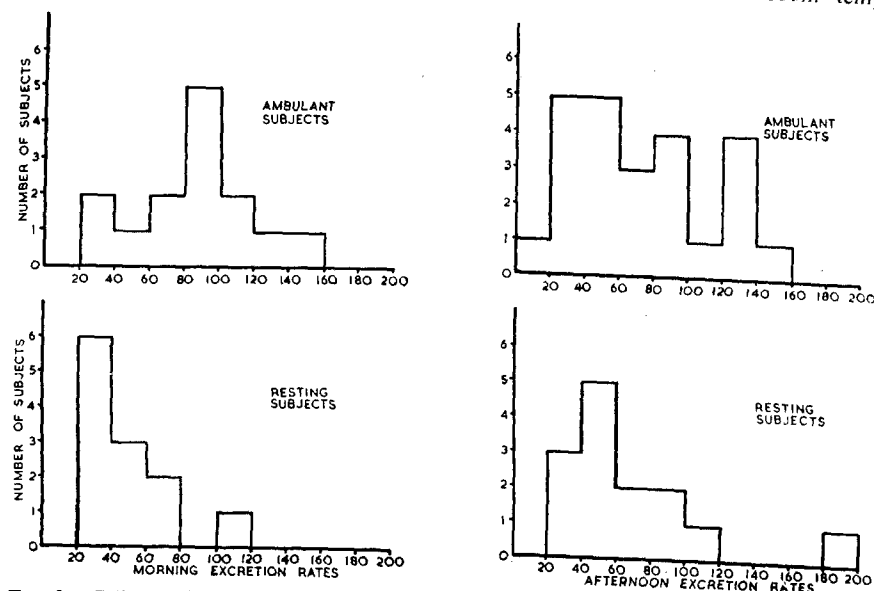


FIG. 5.—Cell excretion rates in tens of thousands an hour for ambulant and resting male subjects during the morning and afternoon.

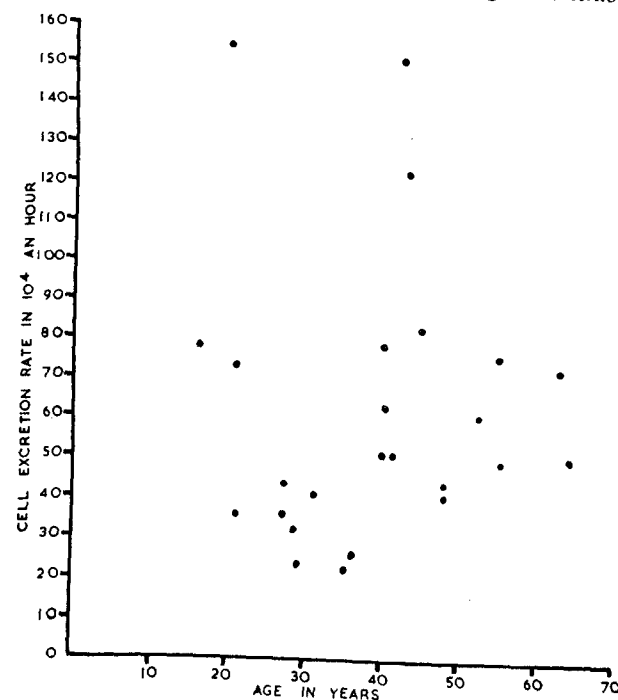


FIG. 6.—Cell excretion rates in thousands an hour plotted against age.

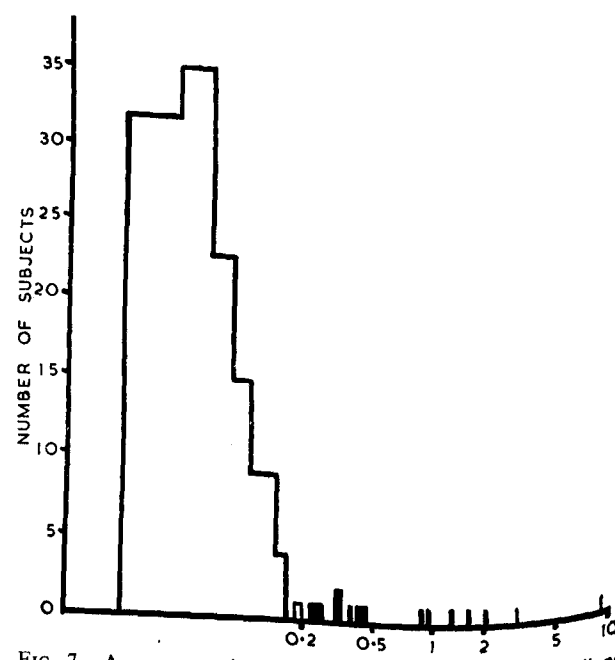


FIG. 7.—A representative group of cell excretion rates (millions per hour) in pathological urines (black rectangles) distributed on a logarithmic scale for comparison with the normal subjects (white area, reproduced from Fig. 1).

than 66,000, the mean value for all the counts presented here. It is possible that this discrepancy is to some extent due to the factor of cellular lysis in urine. This method is accurate to about 10%, and the limits of the normal range coincide very closely with those found by Rofe (1955), who investigated the urinary cellular excretion of 12 normal male subjects by a method rather more elaborate than that described here.

Since the completion of the work presented above, it came to our notice that Hamburger *et al.* (1950) had already described a similar method of estimating the urinary cell excretion rate. No details are given in their paper of the number of subjects used or the number of counts performed. They gave 30,000 white and epithelial cells an hour as the maximum normal excretion rate. This method was subsequently employed by Richet (1953) for the estimation of red-cell excretion rates in the urines of cases of nephritis.

Faced as he often is with a report of positive culture from a urinary specimen and a report on the deposit which, owing to the method by which it is obtained, is often meaningless, the clinician may well be at a loss to decide whether or not his patient has an infected urinary tract or whether the organisms grown represent no more than contaminants. It is felt that this method, by providing a reasonably accurate quantitative evaluation of the urinary deposit, may resolve this all too common difficulty.

Although the primary purpose of this paper is the presentation of a method, some of the results we have obtained are of sufficient interest to merit brief discussion.

The highest counts were obtained from ambulant males in the morning, all of whom had voided their night urine prior to the period of collection of the specimen. The difference between these counts and those from ambulant males in the afternoon and from resting males in the morning was significant. On the other hand, no such differences existed between the counts for ambulant and resting males in the afternoon, while the differences between resting males in the two periods in the day were not significant.

It appears that the resumption of activity at the beginning of the day may be responsible for a rise in the rate of cellular excretion and that this rate then falls later in the day irrespective of the posture of the subject at that time. This conclusion is supported by the results obtained from the resting male subjects in the afternoon and the female subjects at each period of the day. The males who were resting in the afternoon had been ambulant in the morning, and the mean of their cell excretion rates was higher than that of the males resting in the morning, who had been in bed all night, and had not been allowed up before the period of the count. The resting female patients, however, who were used for morning counts had been up for an hour or two before the period of urine collection began, and the counts obtained on them are slightly higher than the corresponding ones for the males. Similarly, those female subjects used for the afternoon counts were allowed up in the morning and their cell excretion rates did not differ from those of the resting males counted during the same period. Most of these differences do not attain a level of statistical significance, perhaps because the groups studied were not large enough, but they all show a consistent trend.

It should be emphasized that, as the results of the assessment of variance show, there is no characteristic pattern of cell excretion in any one subject, and therefore that the limits of the normal as defined for the groups apply equally to the individual.

All female subjects were catheterized, thereby eliminating the urethra as the source of the cells observed, and no difference between the rates of cell excretion in sexes was found. This would suggest that the cells counted originated above the urethra.

Summary

The rate of excretion of leucocytes and non-squamous epithelial cells has been estimated in normal subjects by

a simple and reliable method. The normal rate varied between 18,000 and 196,000 an hour.

The results are analysed according to the time of day at which the urine was collected and the posture, sex, and age of the subjects. In three normal males no characteristic rate of excretion over a period of several days was observed.

The rates of excretion in normal urines and in a few pathological urines are compared.

Our thanks are due to Professor G. W. Pickering and Professor R. Cruickshank for their invaluable criticism, encouragement, and advice; to Dr. W. I. Cranston and Mr. J. K. Fawcett for their help and advice on the statistical analyses; and to members of the staff, medical students, and ward sisters for their co-operation and help.

REFERENCES

- Addis, T. (1925). *J. Amer. med. Ass.*, **85**, 163.
 — (1948). *Glomerular Nephritis*. Macmillan, New York.
 Hamburger, J., Mathé, G., and de Verbizier, J. (1950). *Ann. Biol. clin.*, **8**, 627.
 Richet, G. (1953). *J. Urol. méd. chir.*, **59**, 295.
 Rofe, P. (1955). *J. clin. Path.*, **8**, 25.

MULTIPLE STOKES-ADAMS EPISODES DURING ANAESTHESIA

BY

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Many cases of cardiac arrest have been documented in the medical literature, and the treatment of such cases is becoming well established. An immediate diagnostic thoracotomy, should the peripheral pulses become impalpable, has been advocated by some authors (Rao *et al.*, 1954; Milstein and Brock, 1954; Mullens, 1955), but others have taken a more conservative attitude (Johnstone, 1955a). As thoracotomy may be definitely contraindicated in "arrest" associated with Stokes-Adams attacks, and because such episodes during anaesthesia have only rarely been reported, the recording of such a case appears justified. McLemore and Levine (1955) presented a series of cases in which, incidentally, Stokes-Adams episodes were associated with anaesthesia, but the details of the drugs administered and the techniques followed were not given.

Case Report

An 80-year-old white man (80 kg.) was admitted to hospital with acute intestinal obstruction. For 15 years he had had orthopnoea with arteriosclerotic heart disease, and for six years hypertension (170/100) with complete heart-block. Electrocardiograms had previously revealed myocardial infarction. He suffered from chronic pulmonary emphysema, and intermittent episodes of congestive heart failure had occurred until the time of admission, when he showed minimal oedema and crepitant rales at the lung bases. He had been fully digitalized. Abdominal distension and vomiting were present.

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Laparotomy was planned for undiagnosed intestinal obstruction. Following premedication (pethidine hydrochloride 50 mg.) the abdomen was opened under an "arrow-head" block (Evans, 1949) (lignocaine, 700 mg., and adrenaline, 0.3 mg.). A further 40 mg. of pethidine hydrochloride was given in intermittent doses through the intravenous drip during this period. On exploration of the peritoneal cavity it became apparent that the surgical manipulations would require supplementary anaesthesia. Thiopentone sodium (80 mg., followed by 160 mg.) was given intravenously to produce light anaesthesia. Oxygen (100%) was administered by mask and later by manual ventilation following suxamethonium (25 mg.) intravenously. "Cyclaine" (5%) was used to anaesthetize the larynx, the patient was again ventilated with oxygen, and a cuffed endotracheal tube was passed. Ventilation was continued with nitrous oxide (60%) and oxygen (40%) until spontaneous respirations returned.

During this time the patient developed transient but recurrent episodes in which he appeared pallid and pulseless. The electrocardiogram showed intermittent asystole, ventricular tachycardia, or ventricular fibrillation. A diagnosis of Stokes-Adams episodes was made. During the episodes, which lasted up to three or more minutes, and which followed each other at one- to three-minute intervals, the respirations remained of good volume, but they underwent transient depression, and a few seconds of apnoea occurred, following the return of the peripheral pulse on each occasion. During the latter part of each attack the patient's pupils became transiently dilated.

A large internal hernia was reduced and the surgery rapidly completed (40 minutes), during which time 100% oxygen was continually administered, and suxamethonium (105 mg.) injected intravenously as required for surgical relaxation. The patient was then extubated and oxygen continued by mask. The episodes persisted almost continually during surgery and post-operatively, and disappeared quite suddenly two hours and forty minutes after the onset. At the start of these incidents procaine amide (100 mg.) had been twice administered, as it was felt that the ventricular fibrillation justified this medication, but no other specific treatment was given. Later nikethamide (5 ml.) was administered and repeated, to lighten the thiopentone hypnosis, and thereafter the patient was conscious and rational between attacks. As the respiratory pattern suggested that a "chemoreceptor" drive was controlling his respirations, the oxygen which had been administered during all the attacks was withheld on two occasions. Only one further attack occurred.

The patient showed no signs of cerebral damage following these long periods of "arrest" and made an uninterrupted recovery, being discharged home on the 17th post-operative day.

Discussion

The mechanisms which may have contributed to the sudden occurrence of Stokes-Adams attacks in this patient include vagal or sympathetic overactivity, or factors concerning ventilation management.

Vagal Stimuli.—Even in the presence of complete heart-block, visceral, laryngeal, or pulmonary reflexes may have contributed to these episodes. In this respect, however, Johnstone (1955b) concludes (as a result of observations of laryngeal movements and electrocardiographic changes) that suxamethonium provides better and safer conditions for endotracheal intubation than other relaxants. In this patient, also, topical anaesthesia of the larynx was performed, and no irritant vapours were used. In spite of his conclusion, however, Johnstone has shown that a definite slowing of pulse occurs in some patients (a muscarinic acetylcholine-like effect) following the administration of suxamethonium, and in retrospect there seems very little doubt that atropine should have been included in the premedication of this patient. In one of the more severe cases reported by McLemore and Levine (1955) atropine had also been omitted from the premedication.

Sympathetic Overactivity.—The effect of excessive adrenaline on the intact Purkinje cells may give rise to ventricular arrhythmias which may be depressed by procaine, but in this patient it seems unlikely that the adrenaline in the infiltration and block could have caused any deleterious effect, and the administration of procaine amide can be shown to be definitely contraindicated in Stokes-Adams syndrome.

Ventilatory Management.—Anoxia, which may always be a factor in the administration of an anaesthetic, and which could contribute to cardiovascular collapse, had been avoided in this instance. Conversely, it is difficult to dissociate the onset of the attacks from the administration of 100% oxygen by manual inflation. It is known that the administration of high oxygen concentrations may have a deleterious effect on the respiratory mechanism in chronic pulmonary disease associated with hypercarbia, and Stead *et al.* (1954) have shown, in animals, that sudden lowering of the alveolar carbon dioxide levels, after prolonged hypercarbia, may raise the plasma potassium to cardiotoxic levels, precipitating ventricular fibrillation. It is an interesting conjecture whether efficient ventilation with a high percentage of oxygen, to which he was unaccustomed, might not have been a factor on the onset of these attacks in this patient. There is little doubt that the episodes disappeared when manual oxygenation was withheld.

This experience brings to the fore several points of interest, particularly the differentiation between these attacks and "true" cardiac arrest. It is doubtful whether this man would have survived a thoracotomy, and it is worth noting that these patients seem to recover with little specific treatment.

REFERENCES

- Evans, F. T. (1949). *Modern Practice in Anaesthesia*, p. 314. Butterworth, London.
Johnstone, M. (1955a). *Brit. J. Anaesth.*, 27, 566.
— (1955b). *Anaesthesia*, 10, 122.
McLemore, G. A., jun., and Levine, S. A. (1955). *Amer. J. med. Sci.*, 229, 386.
Milstein, B. B., and Brock, R. (1954). *Guy's Hosp. Rep.*, 103, 213.
Mullens, J. E. (1955). *Canad. med. Ass. J.*, 72, 838.
Rao, K. V. S., Jamison, W. L., Bolton, H. E., and Ruben, J. E. (1954). *Dis. Chest*, 26, 499.
Sealy, W. C., Young, W. G., and Harris, J. S. (1954). *J. thorac. Surg.*, 28, 447.

HEPARIN AND SYMPATHETIC BLOCK IN TREATMENT OF VENOUS THROMBOSIS

EXPERIMENTAL INVESTIGATIONS

BY

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At present there are two main methods of treatment of venous thrombosis: (1) by anticoagulant agents, and especially by two main compounds of this group—heparin and dicoumarol; and (2) by paravertebral procaine block of the sympathetic system. Both methods are supported by evaluation of clinical results, but it is difficult to compare them with precision. Encouraged by Professor T. Butkiewicz, I decided to investigate this problem experimentally.

Experiments were designed to produce thrombosis and then to apply treatment either by heparin or by procaine block of the sympathetic system. The importance of experiments such as we carried out on 50 dogs may be gathered when it is realized that in the accessible medical world literature we could find no experimental work evaluating comparatively these methods of treatment.

The results of treatment of phlebothromboses were analysed with the aid of microscopical examination of excised specimens of veins affected by the thrombotic process and by phlebographic examination (the latter being the subject of a separate paper). In the Polish literature of the last 60 years I found many papers concerned with the production and treatment of thrombosis.

I. Experimental Production of Venous Thrombosis (8 Dogs)

I had first to get acquainted with the microscopical structure of the veins of normal dogs and with technical problems of the experimental production of thrombosis. On the basis of experiments described by Gruca (1928) and Ochsner and de Bakey (1941) thrombosis was produced by intravenous injections of 2.5 ml. of 50% solution of sodium salicylate. The injections were made into the saphenous vein.

Segments of veins, including the site of injection, were excised at 6, 12, 24, and 72 hours, and at 7 and 10 days after the production of thrombosis. The specimens were fixed in formol solution and sections were prepared for microscopy. Examination proved that intravenous injection of 2.5 ml. of 50% solution of sodium salicylate initiates the thrombotic process in dogs. The beginning of thrombosis was distinctly seen 12 hours after the injection, and the first symptoms of thrombosis were apparent in seven days. At later stages (7 to 10 days) the changes characteristic of hyaline degeneration of the intima were noticeable in the walls of the vessels.

II. Experimental Evaluation of Action of Heparin on Course of Thrombosis (19 Dogs)

These experiments were carried out in two groups. In the first group (10 dogs) the therapeutic action of heparin on the early stage of the thrombotic process was investigated. Heparin treatment was started six hours from the time of the intravenous injection of 50% solution of sodium salicylate and lasted 1 to 10 days. The heparin used contained 5,000 units (50 mg.) per ml. Every six hours 50 mg. was injected into the cephalic vein, 100 mg. being injected for the night. Veins were excised at intervals of 1 to 10 days from the beginning of treatment and sections were prepared.

In the second group (9 dogs) the action of heparin on more advanced stages of the thrombotic process was investigated. The treatment was begun in three dogs after 24 hours, in three after 72 hours, and in three after five days from the production of thrombosis. Heparin was given in the same amounts as in the first group of experiments over a period of 10 days regardless of the time the treatment started. Each dog in the second group received 40 ml. (2,000 mg.) of heparin during the 10-day period.

At the end of treatment the prothrombin time was measured (in the dog in normal conditions it is 10–11 seconds).

The second group of experiments proved that heparin administered 6 to 24 hours after the injection of concentrated solutions of sodium salicylate does not prevent the production of thrombosis, which after 10 days is well organized and enters the stage of vascularization. In my experiments I could not assess the fibrinolytic action of heparin in cases in which the drug was given three days after production of thrombosis.

The following changes were noticed in microscopical pictures: (1) The contraction of vessels even when the thrombosis was absent. This sign is clearly seen in the vein of a dog owing to the strong development of smooth muscle in the venous wall. As a result of chronic contractures, extension and rupture of elastic fibres was seen. (2) The stimulation and proliferation of the intima of vessels characterized by production of endothelial finger-like papillomatous growths. (3) The presence of fragmented erythrocytes and haemosiderin granules located near the internal surface of

the veins in those dogs in which the treatment began less than six hours after the intravenous injection of sodium salicylate solution. This finding can be regarded as the beginning of the thrombotic process, not fully developed because of the therapeutic action of heparin.

III. Experimental Evaluation of Action of Paravertebral Procaine Block on Course of Thrombosis (23 Dogs)

It was necessary to study the technique of lumbar procaine block in dogs before the experimental work began. The experiments were carried out in two groups. The first comprised 14 dogs, the second 9 dogs. In the first group treatment started soon after the production of thrombosis, and procaine block was made not later than six hours from the time of injection of a 50% solution of sodium salicylate (eight experiments). In two cases treatment began 24 hours after the production of thrombosis. In four dogs procaine block started 11 days after—that is, in the late stage of the development of the thrombosis. The treatment by procaine paravertebral block was done bilaterally (with 50 ml. of 0.25% procaine each) and lasted in the early stages of thrombosis for 1 to 10 days. It was shown that procaine block starting not later than six hours from the production of thrombosis was without result when one, three, or five blocks were done. In such cases the thrombosis was fully developed. In contrast, the therapeutic effect of procaine was evident in animals receiving four, six, seven, and eight procaine injections. Treatment by blocks beginning 24 hours after the production of thrombosis did not prevent its development and did not influence the microscopical appearances.

The treatment of venous thrombosis by procaine block beginning after 11 days—that is, in the late stage of its development—influenced neither the microscopical picture nor the progress of organization of the thrombosis.

In the second group (9 dogs) treatment by procaine sympathetic block started 24 and 72 hours from the production of thrombosis and in five days from the intravenous injection of the solution of sodium salicylate. Treatment lasted 10 days with bilateral lumbar procaine block done once daily.

This systematically conducted treatment, starting 24 hours, 72 hours, and 5 days after the production of thrombosis, did not result in its dispersal. Histological examination of specimens of veins in animals treated by paravertebral procaine block gave the following results: (1) the hyaline changes in the intima of vessels were seen more often than in the series of examinations on the therapeutic action of heparin; (2) absence of distinct signs of chronic contracture and the decrease in diameter of veins: such changes are, however, quite difficult to appraise by histological methods owing to the differences in size and weights of the dogs used for experiments; (3) absence of distinct proliferative changes in the intima of veins as seen in the series of dogs treated with heparin; and (4) in cases treated by paravertebral procaine block, in which the thrombosis did occur, the organization and vascularization were evident. Such changes appeared earlier and were more obvious in animals treated by procaine block than in control animals. On the other hand, the proliferation of endothelial cells was much more evident in dogs treated with heparin.

Discussion

Analysing the microscopical findings, it should be emphasized that the histological criterion can be applied to the evaluation of morphological and statistical aspects of the problem, but is inadequate for appraisal of dynamic changes in the blood supply of the extremities. Therefore the evaluation of the results of treatment of venous thrombosis by heparin and procaine block should also include the phlebographic examinations.

In six experiments carried out on dogs treated with heparin or with procaine block the prothrombin time was measured 10 days after the administration of heparin and after 10 lumbar blocks carried out over 10 days. In all these experiments the prothrombin time was not prolonged.

Conclusions

Many questions connected with the problems tackled remain unsolved; nevertheless, while further investigations are necessary it seems that the following conclusions are justified:

1. The intravenous injection of a 50% solution of sodium salicylate results in thrombosis appearing 6-12 hours later. The first evidence of organization is seen after seven days.

2. The administration of heparin, in amounts of 200 mg. daily, 6-24 hours after the production of thrombosis prevents the development of the thrombotic process.

3. Heparin treatment given three or more days after the production of thrombosis does not prevent its development. Microscopically, symptoms of the fibrinolytic action of heparin are absent.

4. Veins of dogs treated with heparin present in most cases papillomatous proliferations of the endothelium, whereas in dogs treated with procaine block the picture of hyaline degeneration of the intima is prevalent.

5. The application of procaine block less than six hours from the production of the thrombosis prevents the full development of the thrombus, provided the treatment lasts for at least four days.

6. Procaine block applied 24 or more hours after the time of the injection of sodium salicylate solution does not disperse the existing thrombus; nevertheless it accelerates organization of the thrombosis as compared with non-treated animals.

7. The degree of organization of the thrombosis in dogs treated with heparin or with procaine block is approximately the same. The proliferation of endothelial cells is more marked in thrombosis after heparin treatment.

8. The prothrombin time after 10 days of heparin or procaine block shows no significant changes from the normal.

9. The histopathological examinations are not sufficient for the evaluation of dynamic changes of blood supply of the extremity and should be supplemented by the analysis of the phlebographic appearances.

BIBLIOGRAPHY

- Butkiewicz, T. (1947). *Pol. Tyg. lek.*, 2, 1383, 1444, 1489.
Cummine, H., and Lyons, R. N. (1948). *Brit. J. Surg.*, 35, 337.
Dryjski, J. (1954). *Pol. Tyg. lek.*, 9, 1318.
Eysholdt, K. G. (1954). *Arch. klin. Chir.*, 277, 455.
Gottlob, R., and May, R. (1954). *Angiology*, 5, 307.
Gruca, A. (1928). *Pol. Przegl. chir.*, 1, 182.
Homans, J., and Zollinger, R. (1929). *Arch. Surg. (Chicago)*, 18, 992.
Jewell, P., Pilkington, T., and Robinson, B. (1954). *British Medical Journal*, 1, 1013.
Jorpes, E. (1947). *Pol. Tyg. lek.*, 2, 71.
Leriche, R., and Kunlin, J. (1934). *Presse méd.*, 42, 1481.
Nielubowicz, J. (1948). *Pol. Tyg. lek.*, 3, 769, 855.
Nowicki, St. (1947). *Ibid.*, 2, 936.
Ochsner, A., and de Bakey, M. (1941). *J. Amer. med. Ass.*, 117, 1915.
Patey, D. H. (1937). *Surg. Gynec. Obstet.*, 64, 1002.
Proceedings of the First International Conference on Thrombosis and Embolism, edited by Th. Koller and W. R. Merz. Basel, 1954.
Raeburn, C. (1951). *British Medical Journal*, 2, 517.
Rappert, E. (1952a). *Wien. klin. Wschr.*, 64, 283.
— (1952b). *Zbl. Chir.*, 77, 1729.
Szymanowicz, J., and Woliczko, K. (1935). *Pol. Gaz. lek.*, 14, 854.
Weld, J. J., and Breynaert, R. (1951). *Presse méd.*, 59, 518.

A SALICYLSULPHONIC ACID TABLET TEST FOR PROTEIN IN URINE

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This communication describes the trial of a commercially available tablet test for protein in urine (albuminuria), which has been designed to take the place of the standard salicylsulphonic acid test. It must be emphasized, because of the common use of the term "albuminuria," that in all circumstances protein present in urine is a mixture of albumin and globulins, with albumin predominating; and this tablet test, the standard salicylsulphonic acid test, and the boiling test all detect every type of protein in urine, not albumin alone. We shall therefore only employ the term "proteinuria." Each tablet ("altest") contains about 25 mg. of salicylsulphonic acid, effervescing agents, and a trace of bromocresol green. A similar tablet called "bumintest" is marketed in the U.S.A. The latter test cannot be recommended for convenience because it entails dissolving the bumintest salicylsulphonic acid tablet in water to make a solution with which to test the urine, and we understand that bumintest is not being introduced into this country.

Method

A series of solutions of protein in urine were prepared using (1) normal human serum, (2) standard albumin solution, (3) urine from a nephrotic patient, at total protein concentrations of approximately 0.01, 0.005, 0.0025, and 0.001 g. per 100 ml. of urine. Each protein concentration was prepared in urines of approximately specific gravities 1002, 1010, and 1020, and separate samples of each were adjusted to approximate pH 5, 6, 7, and 8.

Urine containing Bence Jones protein, a high concentration of urates, and the radio-opaque substances iopanoic acid, diodone, sodium acetoazotate, and "biligratin" and "urogratin" were also examined.

Each urine was tested by three methods: (1) standard "boiling test" (Harrison, 1947). (2) Standard salicylsulphonic acid solution test (about 5 ml. of urine plus about 0.5 ml. of salicylsulphonic acid (=125 mg.) (Harrison, 1947)—called "solution test" below. (3) altest; the method recommended by the manufacturers was found generally satisfactory—called "tablet test" below.

Urine which is cloudy should be filtered before carrying out the tablet test, as with other tests for proteinuria. An "inch" (about 4 ml.) of urine is placed in a test-tube, and one tablet added. When the tablet has dissolved completely (which takes about one minute) the tube is gently shaken, the froth is allowed to clear, and the mixture is examined. (We find, however, that the tablet dissolves more easily if the tube is continuously shaken.) The fluid should be yellow; if it is blue or green this indicates that the mixture is still alkaline, and one or more tablets are added until the final solution is acid and the fluid becomes yellow. The result is read in the same way as other tests for proteinuria: no protein—clear (yellow) solution; protein present—cloudy mixture or white precipitate, depending on the concentration of protein.

Results

The tablet test could regularly detect a protein concentration of 0.005 g. per 100 ml. of urine: at 0.0025 g. per 100 ml. detection of proteinuria was inconstant. It was equally sensitive to the different proteins tested, and throughout the pH and specific gravity ranges which were examined. The tablets appeared to be stable, and tablets which had been stored at room temperature for three months were as effective as at the time the bottle of tablets was first opened. The solution test was also sensitive to 0.005 g. per 100 ml. and usually to 0.0025 g. per 100 ml., and the boiling test was regularly sensitive to 0.0025 g. per 100 ml. while inconstant results were obtained at 0.001 g. per 100 ml.; both these tests were also unaffected by the nature of the protein and the pH or specific gravity of the urine.

The ingenious internal indicator of the tablet test enables successful correction of the pH of alkaline urines. The urines of pH 7 sometimes needed two tablets, and the urines of pH 8 needed two or three tablets. (The solution test adds the equivalent of four tablets when properly performed, and the problem of excessive alkalinity of the urine therefore very rarely arises.) However, minimal turbidity was more difficult to detect in the resulting deeply coloured yellow solution.

Both the tablet test and the solution test gave a positive reaction with Bence Jones protein and a negative reaction with urates in solution.

The radio-opaque substances do not precipitate on boiling. They give a pseudo-positive reaction (deposit of crystals) with the solution test, and a negative reaction with the tablet test (one or two tablets). This is a quantitative and not a qualitative difference, because when four tablets were added to 4 ml. of urine containing these substances precipitation immediately developed.

Fifty consecutive urines, received in the department for routine examination, were tested for protein in parallel by the solution test and tablet test. (Fifteen urines required two tablets, and two urines required three tablets.) Twelve of these contained protein in varying concentration, and identical positive results were given by the solution test and the tablet test.

Discussion

Two previous reports (Bryan, 1956; Whittet, 1956) have briefly described the altest without critically examining its properties.

Possible users of the tablet test are general practitioners who have to test occasional specimens of urine in their patient's home or in their consulting-room, or nurses, students, or laboratory technicians who have to test larger numbers of urine specimens on frequent occasions.

The tablet test can be recommended for general practitioners. It is sufficiently sensitive for all clinical purposes. It is simpler and much more convenient than the boiling test, though it is less sensitive than this test. The great convenience to the practitioner of having to carry a bottle of small tablets rather than a bottle of acid liquid reagent outweighs, in our view, the slight disadvantages of the tablet test when compared with the solution test.

However, for frequent use in a laboratory or side room we consider that the tablet test does not replace the salicylsulphonic acid solution test. Although the tablets are inexpensive, the salicylsulphonic acid solution (which is also stable) can be prepared in bulk by a hospital at less than half the price of the tablets. The tablet test is slightly slower, because of the time necessary to dissolve the tablets and disperse the froth which otherwise interferes with the reading. The tablet test does not seem to be quite as sensitive, probably because the colour of the indicator makes it less easy to read; this could probably largely be remedied by reducing the quantity of bromocresol green. When the solution test is done, using the proper technique, enough salicylsulphonic acid is added to counteract all but the grossest alkalinity.

We must deplore the manufacturer's name for the tablet, altest, because it perpetuates the "albuminuria" fallacy.

Summary

A new manufactured tablet (altest) has been compared with the boiling test and the salicylsulphonic acid solution test. It can detect a concentration of 0.005 g. of protein per 100 ml. of urine throughout the physiological range of urine pH and specific gravity, and the results of the tablet test are generally comparable to those of the salicylsulphonic acid solution test, but are slightly less sensitive than the results of the boiling test.

The tablets contain an indicator which shows when additional tablets need be added to ensure acidity of the solution. The advantages and disadvantages of the new test are discussed.

We thank the Ames Company (London) Limited for supplies of altest, and the department of radiology, Royal Free Hospital, for the urine specimens containing the contrast media.

REFERENCES

- Bryan, G. (1956). *Brit. overseas Pharm.*, 109, 120.
Harrison, G. A. (1947). *Chemical Methods in Clinical Medicine*, 3rd ed. Churchill, London.
Whittet, T. D. (1956). *Pharm. J.*, 177, 19.

Medical Memorandum

Marfan's Syndrome

A small number of patients with Marfan's syndrome (Marfan, 1896) have come to necropsy (Reynolds, 1950; Moses, 1951; Marvel and Genovese, 1951; Whittaker and Sheehan, 1954; McKusick, 1955). A further case, in which Marfan's syndrome was associated with a patent ductus arteriosus and aortic aneurysm from cystic medionecrosis of the aortic wall, is here reported.

CASE REPORT

A married woman aged 32 was admitted to hospital on December 22, 1954. At 18 months of age she had nephritis and an enlarged heart. When 5 years old she was said to have valvular heart disease. She was dyspnoeic as a child, and later had winter bronchitis. From the age of 18 she had oedema of the ankles. Since 1950 she had had attacks of gripping pain in the left chest which radiated into the left arm and occurred both at rest and on exercise. In 1952 she collapsed with a sudden attack of pain in the back and fullness in the chest. After recovery she was breathless on slight exertion and had persistent ankle oedema and attacks of palpitation. For the last six months she had nocturnal dyspnoea accompanied by sweating and palpitations and a gripping retrosternal pain radiating into the left arm. Two weeks before admission a pleuritic pain developed in the middle and lower thoracic regions of the back with dyspnoea, cough, and increased ankle swelling. These improved slightly with digitalis and rest, but her condition again deteriorated.

Examination showed her to be thin, orthopnoeic, and cyanosed. She had arachnodactyly; height 68½ in. (1.74 m.); palate highly arched. No changes in eyes, and no other skeletal deformities. She was in congestive heart failure; pulse regular, rapid, and collapsing; blood pressure 140/40 mm. Hg; femoral pulses palpable. Bed shook with each heart-beat; visible arterial pulsation in neck. Cardiac impulse moved anterior chest wall. Apex beat in 9th left intercostal space in posterior axillary line. Systolic pulsation felt over most of praecordium. In left axilla between 5th and 9th intercostal spaces a loud rumbling diastolic murmur and a blowing pansystolic murmur heard. Below left clavicle, in pulmonary area, and down left sternal

edge, soft diastolic and blowing systolic murmurs heard. Pulmonary second sound accentuated. Spleen not felt; no ascites.

Radiography showed a huge heart with a dilated ascending aorta; lung fields were mottled, suggesting left-sided failure. Electrocardiography showed right and left ventricular enlargement. There was moderate anaemia (Hb 67%). Wassermann reaction negative.

This patient was thought to have Marfan's syndrome with a heart lesion. Aortic regurgitation and patent ductus arteriosus were considered. A diastolic and systolic murmur heard below the left clavicle favoured the latter diagnosis. Marfan's syndrome is, however, more commonly associated with aortic regurgitation and dilatation of the ascending aorta (Reynolds, 1950).

For the first two days her condition improved. She was digitalized and given a course of soluble penicillin. Two days later there was a sudden onset of dyspnoea, cyanosis, and coma; the pulse was rapid and feeble until she died a few minutes later.

POST-MORTEM FINDINGS

Anatomical Diagnosis: Massive haemopericardium. Patent ductus arteriosus with aneurysm of the aorta associated with cystic medionecrosis. The aneurysm had ruptured. Marfan's syndrome. **Internal Examination:** There was brown induration of both lungs, and mucopus was present throughout the bronchial tree. The oesophageal and gastric mucosae, spleen, and pancreas were congested. There was early cardiac cirrhosis in an enlarged liver.

Cardiovascular System.—The heart was greatly enlarged. The pericardial sac was distended by about 850 ml. of blood. Both ventricles were hypertrophied and dilated. The left auricle was normal in size and thickness, but running on its anterior surface, in a linear fashion, was an irregular area of calcified scarring, partly raised above the surface. The mitral valve showed slight nodularity along the free margins, which were fibrotic and not calcified. There was dilatation of the aortic ring and regurgitation, but the aortic cusps were normal. The pulmonary artery was greatly dilated, its greatest circumference 10.5 cm. The ductus arteriosus was widely patent and had a diameter of 0.8 cm.; it opened into the aorta at the usual site just distal to the origin of the left subclavian artery. The ascending aorta and arch were grossly dilated and thinned as far as the ductus arteriosus, mainly involving the right lateral wall. The external site of rupture of the aorta was posterior, at the uppermost part of the pericardial sac, and at this point communicated with the lumen at the top end of a long vertical split of the media which extended down the left posterior part of the aortic wall as far as the left anterior sinus of Valsalva, just missing the left coronary orifice. There was a separate transverse crack involving the intima on the posterior wall of the aorta and measuring 4 cm. The whole internal surface of the dilated part of the aorta was roughened, resembling tissue-paper scarring from previous intimal ruptures which had become covered by fresh endothelium. The aorta below the ductus appeared normal in calibre and showed atheroma. The other parts of the heart were normal.

HISTOLOGY

The thickened intima of the aorta showed fibrosis and hyaline change with some fragmentation and loss of elastic tissue. In the media there was marked fragmentation of elastic tissue. Between the elastic fibres were spaces, some empty, but others containing material which stained positively with mucicarmine. There was patchy atrophy of medial smooth muscle with partial replacement by fibrous tissue, and very marked hyaline thickening of the adventitia, which contained numerous dilated vessels.

These changes resemble those described by Erdheim (1929) as idiopathic cystic medionecrosis. The area of calcification and scarring in the left auricle showed a rather acellular hyaline thickening of the endocardium. There was much less elastic tissue than normal, and this change was asso-

ciated with marked fragmentation. Deposits of calcium salts were present in the hyaline area. This appearance has previously been described in the left auricle in cases of Marfan's syndrome (Baer *et al.*, 1943).

COMMENT

The dilatation of the ascending aorta with cystic medionecrosis of the aortic wall is considered to be characteristic of Marfan's syndrome. Erdheim (1929) described the following histological changes in the ascending aorta: (1) rarefaction of the media with disarrangement of the elastic tissue; (2) absence of a definite internal and external elastic lamina; (3) atrophy of the muscle with irregular branching of the fibres, separated by cystic spaces; (4) small blood vessels starting in the adventitia and penetrating into the media; and (5) slight thickening of the intima.

As in this case, death from rupture of the weakened and dilated ascending aorta is common in Marfan's syndrome. The history and necropsy findings suggest that there had been a previous small rupture of the aortic wall.

Patent ductus arteriosus associated with arachnodactyly is sometimes said to have been described by Apert (1938). He describes the heart lesion as "une béance du trou de Botall," which has been wrongly translated as "a patent ductus arteriosus." He was, however, referring to a patent foramen Botalli or patent foramen ovale. Later in his paper Apert mentions a similar patient (Parkes-Weber, 1933) who had a patent foramen ovale.

More recently (McKusick, 1955) reference has been made to the association of patent ductus arteriosus and Marfan's syndrome. The present case demonstrates the skeletal changes of Marfan's syndrome and the characteristic aortic lesions accompanying a patent ductus arteriosus. Records of three other aneurysms of the ascending aorta with patent ductus arteriosus that have come to necropsy have been found (Caylor, 1918; Hubeny, 1920; Hall, 1926). In the patients of Caylor and of Hall the histology of the ascending aorta resembles that described by Erdheim as cystic medionecrosis, which is closely associated with Marfan's syndrome. In Hubeny's patient the aneurysm of the ascending aorta was considered to have had a syphilitic origin. In these cases there is no mention of the other changes in Marfan's syndrome, but they may represent *formes frustes*.

I would like to thank Dr. Maxwell Telling for permission to publish this case, and Dr. I. M. P. Dawson for the post-mortem report.

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REFERENCES

- Apert, E. (1938). *Nourrisson*, 26, 1.
Baer, R. W., Taussig, H. B., and Oppenheimer, E. H. (1943). *Bull. Johns Hopk. Hosp.* 72, 309.
Caylor, H. D. (1918). *Trans. Chicago path. Soc.*, 10, 296.
Erdheim, J. (1929). *Virchows Arch. path. Anat.*, 273, 454.
Hall, E. M. (1926). *Arch. Path. (Chicago)*, 2, 41.
Hubeny, M. J. (1920). *Amer. J. Roentgenol.*, 7, 23.
McKusick, V. A. (1955). *Circulation (N.Y.)*, 11, 326.
Marfan, A. B. (1896). *Bull. Soc. méd. Hôp. Paris*, 13, 220.
Marvel, R. J., and Genovese, P. D. (1951). *Amer. Heart J.*, 42, 814.
Moses, M. F. (1951). *British Medical Journal*, 2, 81.
Parkes-Weber, F. (1933). *Lancet*, 2, 1472.
Reynolds, G. (1950). *Guy's Hosp. Rep.*, 99, 178.
Whittaker, S. R. F., and Sheehan, J. D. (1954). *Lancet*, 2, 791.

The third All-India Conference on Family Planning was held in Calcutta from January 5 to 10. The urgency of India's population problem was summed up by the Governor of West Bengal, SRIMATI PADMAJA NAIDU, when he opened a family planning exhibition, as follows: "If this mistake of increasing our population is not effectively checked, all our schemes of the second Five-year Plan for national development will prove to be pitifully inadequate." Among the subjects discussed at the conference were the shortage of family planning clinics and suitably trained staff for them; the use of group discussion to familiarize husbands and wives with the work of the clinics; marriage guidance; the use of metaxylhydroquinone as an oral contraceptive; and the Government's contraceptive-testing centre in Bombay.

Reviews

MINIMAL TUBERCULOUS LESIONS

Minimal Pulmonary Tuberculosis Found by Mass Radiography (Fluorography). A report to the Prophit Committee of the Royal College of Physicians by V. H. Springett, M.D., M.R.C.P., including results of work done by A. J. Eley, M.A., M.B., B.S., D.M.R.(D). (Pp. 233+xiv; illustrated. 42s.) London: H. K. Lewis and Co. Ltd. 1956.

There are few more debatable problems in tuberculosis than the minimal lesion; doubts and arguments arise with every aspect of the subject. Publication of the report by Dr. V. H. Springett to the Prophit Committee is an event of great importance and will be welcomed by all concerned.

The report covers diagnosis, treatment, and prognosis, and gives valuable information on the efficiency of static miniature radiographic units as compared with mobile ones. In the appendices are technical details of the methods and materials used, followed by the tables and references related to the text. The survey began in January, 1946, and was completed towards the end of 1953, during which period 1,213 patients with minimal tuberculous lesions were accepted into the survey from a total of 181,391 persons from London, aged 15-44 years, who were examined by two 35-mm. mass radiographic units, one static and one mobile. The patients were observed for a period of five years, at the end of which time 767 (63.2%) showed no change, 358 (29.5%) were worse, and in 88 (7.3%) the records were incomplete. Among those who deteriorated nine died, three from progressive tuberculosis, one from air embolism during an A.P. refill, and five from non-tuberculous causes. These are the results of the survey in the broadest outline.

The report gives much detail, particularly on the background of the patients examined, the relationship between clinical, radiological, and bacteriological findings, and the results of treatment. There is also a concise and informative chapter on the general management of the minimal lesion which should be of practical value to all who have to deal with these cases.

There are many points that arouse interest and suggest further lines of research. For instance, no association was found between the level of tuberculin sensitivity, either at first examination or subsequently, and the detection of activity. It is recommended that all homogeneous round foci more than 2 cm. in diameter should be treated by resection. On the other hand, it is concluded that one positive finding in a lesion of more than a few square centimetres should be taken as evidence that further spread is likely in the absence of treatment, but that in a few selected cases with very small lesions it is possible that the culture of tubercle bacilli on one occasion should not be regarded as of overriding importance but as an indication for close observation. It is, however, agreed that no lesion of determined recency should be considered safe and stable. These observations show how difficult it is to decide how to treat a minimal tuberculous lesion, and the need for careful observation and judgment in every case. An interesting feature was the rise in tuberculin sensitivity that occurred during the first six months of observation, followed in most cases by a decline. The reasons for this are discussed, but the conclusion that the rise is due to a process of supersensitization is not very satisfactory and does not solve the problem.

The committee is well aware of the incompleteness and shortcomings of the report, and points out that there were very few male patients in the two lowest social groups and in the 15-24 age group. Much of the treatment was carried out in the pre-antibiotic days and is therefore out of date. It will be noted that 121 patients were treated by artificial pneumothorax. Tubercle bacilli were isolated at some time within the five years from 369 patients (30.4%), so that the diagnosis was radiological in 59.6%. A great deal of work has been done on detailed analysis of the statistics in order to determine the relationship between the many factors influencing the prognosis of each case. This has tended to throw emphasis on the relative values of static and mobile miniature radiographic units, which is a side-issue that will

be of value in the immediate future. The report will stand as a milestone in our knowledge of minimal tuberculosis and will be a standard book of reference for many years to come.

FREDERICK HEAF.

PULMONARY TUBERCULOSIS

Die Lungentuberkulose: Diagnose und Therapie. By P. G. Schmidt. Third edition. (Pp. 384+xii; illustrated. D.M.58.) Stuttgart: Georg Thieme Verlag. 1956.

The third edition of Professor Schmidt's work on the diagnosis and treatment of pulmonary tuberculosis has necessarily been completely revised and brought up to date, for there is no doubt that the last decade has witnessed revolutionary changes in the treatment of this disease. It is a comprehensive work, and includes historical, bacteriological, immunological, pathological, clinical, radiological, and therapeutic aspects of pulmonary tuberculosis. The book lays great stress on history-taking and full clinical examination. The interpretation of physical signs in the light of modern advances is commendable, although in this connexion there is perhaps a tendency to foster certain traditions which have little factual basis. It is, however, noteworthy that chest radioscopy and radiography are regarded as part of the clinical examination. The anatomy of the bronchial tree and the modern international classification of the broncho-pulmonary segments are outlined. Ancillary aids such as tomography, bronchography, and bronchoscopy receive their due recognition, while a proper balance is maintained between bedside medicine and modern technical developments. The remarkable decline in tuberculosis mortality in striking contrast to the incidence of cases is apparently common to all Western civilizations and gives no cause for complacency.

Professor Schmidt devotes adequate space to chemotherapy (although prolonged chemotherapy receives little attention) and resectional surgery, while the somewhat disproportionate amount he allocates to collapse therapy does not suggest that this procedure has suffered even a partial eclipse, such as it unquestionably has in this country. It is disappointing to find so little on the preventive aspects, for surely in the management of this disease prevention, diagnosis, treatment, and aftercare should be co-ordinated as one continuous process. It is particularly disappointing that pressure on space should have been responsible for exclusion from this edition of a chapter on differential diagnosis, since many non-tuberculous diseases of the chest can closely simulate pulmonary tuberculosis and this disease itself can simulate many diseases in thoracic and, indeed, in general medicine as well. The book contains a good bibliography, but there are comparatively few references to the British literature. The views expressed are in the main acceptable to British workers and the volume is admirably produced, with x-ray illustrations of high quality—positive prints throughout—suitably interspersed through the text, so that, some criticisms apart, it is one that can be recommended.

PHILIP ELLMAN.

CARCINOMA OF THE BRONCHUS

Pulmonary Carcinoma: Pathogenesis, Diagnosis, and Treatment. Edited by Edgar Mayer, M.D., and Herbert C. Maier, M.D. (Pp. 540+xvi; illustrated. £6.) New York: University Press. London: Pitman Medical Publishing Co. Ltd. 1956.

Cancer of the Lung: Pathology, Diagnosis, and Treatment. By Milton B. Rosenblatt, M.D., and James R. Lisa, M.D. (Pp. 330+xiii; illustrated. £6.) New York: Oxford University Press. London: Oxford University Press. 1956.

These books concern carcinoma of the bronchus, and they are topical because the disease is increasing in frequency; it has become an important cause of death in men. Each contains a description of all aspects of the subject and both stress the following points. The only treatment which offers the patient any hope of cure is surgical excision, and this depends for its success upon early diagnosis. But the figures analysing the results of surgical treatment are still disappointing and suggest that early diagnosis is not being

made by general practitioners. It is hoped that, having read these books, the practitioners will be "alerted" to their responsibility. It is also agreed that early diagnosis is not the only factor upon which success depends; surgeons are well aware that the nature of the tumour itself is just as important in prognosis. Both books are well produced, fully illustrated, and each contains an index and long lists of references at the end of the chapters. They have been written by a variety of different authorities, and neither is uniformly excellent. Each costs £6, and this high price is bound to limit the circulations in the United Kingdom. The monograph edited by Rosenblatt and Lisa is the simpler of the two, and should be valuable to general practitioners in that it contains the facts which are accepted to-day; it is not a stimulating book. That edited by Mayer and Maier is more interesting and thoughtful; it will commend itself to those who have a special interest in this topic; and, being somewhat longer than the other book, it contains more information, some of which is speculative. There are sections devoted to experimental work, the biology of cancer, the functional and social aspects, psychology, and medical treatments. The chapter on the surgical treatment is by Dr. H. C. Maier, and the problems are clearly stated. Reading this book one gets the impression that none of the contributors are at all satisfied with the present methods of diagnosis or treatment of carcinoma of the bronchus.

N. R. BARRETT.

DIRTY AIR

Atmospheric Pollution: Its Origins and Prevention. By A. R. Meetham, D.Sc. Second edition. (Pp. 302+viii; illustrated. 63s.) London and New York: Pergamon Press. 1956.

It is four years since the first edition of this book appeared. Since then we have had the London "smog" of December, 1952, which killed 4,000 people, the appointment and report of the Beaver Committee, the enactment of the Clean Air Act, and developments in the peaceful uses of atomic energy with the consequent risk of a new form of danger from the air. All these are dealt with in the course of a comprehensive account of fuels of all types, where and how they are used, and the measurement, distribution, and effects of atmospheric pollution. There is a chapter on prevention, and another on the law and its administration. The large contribution to air pollution by coal burnt in open grates is well brought out. The origin of, and damage done by, sulphur dioxide in the air are described adequately. The harmful effects of the Los Angeles smog are attributed to ozone produced by the hot Californian sun acting on the products of combustion of petrol and oil. It is not generally realized that ozone is a toxic gas. A further interesting point is that the prize cattle killed by the London smog of 1952 might have survived if they had not been kept so clean. The near-by sheep and pigs did not have their straw changed so often; they lived. It may be that the ammonia produced by bacterial action on their urine and faeces neutralized the sulphur acids in the air they breathed.

For those interested, professionally or otherwise, in problems of air pollution the book will be a useful work of reference. Defects are that the figures showing the amounts of coal and coke used in industry and for domestic purposes are those for 1949, and therefore not up to date; the estimates of the cost of damage done by air pollution do not include those of the Beaver report; and pages 87-91 are missing from the review copy. Apart from these few criticisms the book can be recommended.

ALLEN DALEY.

A HISTORY OF PUBLIC HEALTH

A Short History of Public Health. By C. Fraser Brockington, M.A., M.D., D.P.H., B.Chir., M.Sc. (Pp. 235+vii. 15s.) London: J. and A. Churchill Ltd. 1956.

This book is divided into two parts. The first traces the development and growth of the public health movement in a general way from the early years of the eighteenth century to the present time, while the second deals in greater detail

with the growth of certain special aspects of public health. The story of the many vicissitudes which beset the development of present-day public health practice is well written, concise, and on the whole lucid, while the style is easy, though it is apt to be a little racy in places. The first part, however, tends to be rather sketchy—especially in the early chapters—while in a number of places in the second part of the book there is repetition of what has been said earlier. A number of omissions are noticeable. For instance, there is no reference to Ramazzini, and in the chapters on the growth of care for neglected children there is no reference to the pioneer work of George Armstrong or the observations of George Buchan, or to the establishment of the London Foundling Hospital by Thomas Coram. Elsewhere there are further omissions of less importance. A certain looseness of expression is noticeable when the author refers to a few of the great people of the past who played such valuable parts in the development of public health practice. The first time Sir Edwin Chadwick is mentioned, for example, he is simply referred to as "Chadwick," while elsewhere the majority of these personalities have been given their full and correct titles. Of the many footnotes throughout the book, most could with advantage have been incorporated in the text, while the occasional foot reference would have been better placed in the good bibliographical section at the end of the book.

These are but minor criticisms of an enjoyable book packed with detail, dates, and facts, a book which should prove to be of interest not only to that section of the profession associated with the several branches of public health practice, but to others, including the large numbers of laymen who to-day have a close and personal interest in the medical services of this country.

S. W. HINDS.

HOSPITAL ADMINISTRATION

Administering the Hospital Group: The Work of the Management Committee Member. By A. C. Stuart-Clark, M.A. (Pp. 66. 3s. 6d.) London: Institute of Hospital Administrators. 1956.

This valuable handbook was compiled in order to describe the essential background of the hospital service to hospital management committee members in general and to new members in particular, but also contains well-informed, albeit guarded, comments on some of the existing contentious problems in the hospital service.

The hospital management committee's place in the health service and the committee structure are outlined clearly, and there are chapters dealing with the more specific responsibilities of the management committee in group administration, finance, staffing, and the handling of complaints. There are some very enlightened observations concerning the relationship and respective responsibilities of management committees and regional hospital boards.

The methods of selection and training of the various grades of hospital staff—professional, technical, and administrative—are fully dealt with, and emphasis is thus placed upon a very important problem confronting hospital management committees to-day. The prominent role of group medical advisory committees is rightly stressed—in fact, the matter warrants a little more attention than is actually given in this handbook, so that lay members of management committees can fully appreciate the essential part which such committees can play in helping and guiding management committees in their local responsibilities.

The tripartite concept of hospital administration is described objectively and due acknowledgment given to the need for medical administration where professional medical knowledge is essential, but more details as to the content of medical administration would have been helpful.

This intelligent appraisal of the essentials of hospital administration will be of value not only to committee members but also to all who are interested in the efficient running of our hospitals.

T. LLOYD HUGHES.

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TUBERCULOSIS AND ENVIRONMENT

It might well be supposed that bad housing would increase the risk of general respiratory disease and at the same time lower resistance through poor nutrition, mental depression, and the like. Yet it is by no means easy to find unequivocal evidence that such conditions make for increased incidence of tuberculosis. One method of study is to correlate a series of towns or counties according to their tuberculosis death rate and their overcrowding index. Investigations of this kind have often failed to show any significant relationship between overcrowding in the home and the death rate from phthisis. Familial contact rather than numerical crowding is the factor of importance. Even in studies of the actual housing conditions found among persons diagnosed as tuberculous, there is apt to be a conflict of evidence. In Edinburgh (1950) and in Glasgow (1952) Lili Stein¹ made a careful analysis of well-defined localities, each of which was comparable in such respects as overcrowding, type of tenant, and economic situation. Her results showed a close association between overcrowding and respiratory tuberculosis.

There have been many inquiries of a similar kind in the United States, also with a conflict of evidence, except in the foremost place given to familial infection. One of the most recent of these investigations was conducted by A. M. Lowell² in New York City, covering the years 1949 to 1951. During the 1880s J. S. Billings³ made a detailed study of the population, general living conditions, and vital statistics of the different parts of New York. In commenting on the physical environment he noted the high mortality rates in the crowded areas of the city. In downtown Manhattan, above Maiden Lane, for example, the death rate from phthisis was 776 per 100,000 population. By contrast, the residential area on the West Side, between 68th and 77th Streets, had a death rate of only 49 per 100,000. In the first half of the present century similar findings have been consistently

reported. The city of New York to-day has just over 8 million residents, many of them concentrated in a small area in Manhattan. The whole area within the city boundaries now covers 315 square miles, and it is divided into five boroughs. For the purpose of health administration each borough, except Richmond, is further divided into health-centre districts, with a further break-up for statistical purposes into health areas. At the 1950 census there were just under 8 million residents (6,900,000 white, 730,000 negro, and nearly 250,000 Puerto Rican), but since then the population has increased by several hundred thousands. The non-white population and the Puerto Ricans tend at first to concentrate in certain neighbourhoods, but they are steadily becoming widely distributed. The following data for the three-year period 1949 to 1951 are useful as a guide:

Rate	White	Non-white	Total
Deaths per 1,000	9.5	9.1	9.5
Births	17.9	28.9	18.9
Infant deaths per 1,000 live births	22.0	38.1	24.4
Maternal deaths	0.58	1.77	0.76
Deaths from tuberculosis per 100,000 population	20	91	27

One of the most interesting features of this study is that the index used is the total annual tuberculosis prevalence rate, in this case for the three years 1949 to 1951. This is the yearly average of the known tuberculosis cases—namely, the active cases already known on the first day of the year, the new cases reported during the year, and the small number of former cases resumed (thus excluding the arrested or inactive cases). The rate is expressed as the number of active cases known during the year per 100,000 population. As to housing, "poor" conditions meant either dilapidation or inadequate plumbing, the latter covering lack of private toilet or bathing facilities or indoor water supply. The "cold-water" houses provided with toilet and bath were not included in the term "inadequate." It should also be noted, by way of contrast with the British figures, that overcrowding is expressed as the percentage of dwelling units with 1.51 or more persons per room, with the usual exclusions of bathrooms, pantries, halls, porches, and unfinished attics or basements.

In New York City tuberculosis rates in ten health areas with highest prevalence rates, located in the Borough of Manhattan, ranged from 1,087 to 2,392 and the family income from \$1,778 to \$2,637. Dwelling units reported as dilapidated or with inadequate plumbing rose from 19.1% in one health area to 57.5% in another. Overcrowding was present in from 5.8% to 17.5% of the dwellings, and the proportion of white population rose from 0.3% to 92.1%. At the other end of the scale, in ten health areas with

¹ Stein, Lili, *Brit. J. soc. Med.*, 1950, 4, 143; and 1952, 6, 1.

² Lowell, A. M., *Socio-economic Conditions and Tuberculosis Prevalence, New York City, 1949-1951*, 1956, New York Tuberculosis and Health Association.

³ Billings, J. S., *Vital Statistics of New York City and Brooklyn, Six Years ending May 31, 1890, 1894*, Washington, D.C.

⁴ Topley, W. W. C., and Wilson, G. S., *The Principles of Bacteriology and Immunity*, 1946, London, vol. 2, p. 1291.

⁵ Frost, W. H., *Papers of Wade H. Frost*, edited by K. F. Maxcy, 1941, London, p. 612.

the lowest tuberculosis prevalence rates, located in the Borough of Brooklyn, the rates ranged from 59 to 113. The family income was substantially higher (\$3,701 to \$4,798). For "poor" housing the percentages (0.8% to 2.4%) were much lower than the city average. The percentage of overcrowded dwellings in nine areas ranged from 2.4 to 4.2, but in the tenth area (Sheepshead Bay) the percentage was 15.7. The white residents made up 99% of the population. The age differences between the two groups was small, but the distribution of occupations was as follows:

Percentage of Population by Occupation

Occupation Group	High Tuberculosis Areas	Low Tuberculosis Areas
Professional, etc. . .	7.6	32.1
Clerical . . .	11.9	32.0
Skilled workers . . .	37.9	28.6
Unskilled . . .	42.6	7.3

There are, as might be expected, anomalies which require special investigation. In lower east Manhattan, for example, there are two areas of modern housing development, Stuyvesant Town and Cooper Village. Here only 0.2% of the dwelling units were listed as unfit, and the high tuberculosis rate of 790 seemed to contradict the general experience. Further study showed that the upper part of the area contained a large number of "homeless persons" who had been examined radiologically for pulmonary disease. Of the 216 new cases reported in this health area only 18 were in the part occupied by the new estates. Fifty new cases were found in 1954, and of these Stuyvesant Town contributed 5 and Cooper Village 1. It became obvious during the investigation that some adjustment would have to be made for an area of this kind in the neighbourhood of the Bellevue Hospital, where many persons with no permanent home address were assigned.

The report, which includes references to a long series of previous studies, examines the problem of housing and tuberculosis in great detail, both historically and as it is seen to-day. The comparison of American and English figures is instructive, the conflict of evidence being apparent in both countries. Probably New York is a more suitable socio-economic laboratory than any other city because areas of good housing are so often adjacent to, yet sharply differentiated from, the slums. The "old law" tenements were multiple dwellings built before 1901 to let at low rents under pressure of the rapid growth of population at the end of the nineteenth century. Mr. Lowell quotes Mr. J. P. McMurray, commissioner of housing in the State of New York, as saying that these tenements "were designed to permit the most concentrated use of land with a minimum regard for tenant convenience and sanitation. Interior bedrooms and

shared hall toilets were standard features, and the existence of running cold water or the availability of any sort of interior sanitary facilities were luxuries to many of the tenants." This account might well have been written of the English towns of half a century before, and indeed our records abound with similar descriptions. Mr. McMurray continued: "At the turn of the century new standards were prescribed by the Tenement House Law, and the construction of these 'ready-made slums' ended. But there were between 85,000 and 100,000 such dwellings in existence. To-day, more than fifty years later, over 50,000 of these remain, containing in the neighbourhood of 415,000 dwelling units and housing between 1,250,000 and 1,500,000 persons. While many of these have been reconditioned in accordance with newer laws, their continued prevalence is an indication of housing conditions generally. . . . It is probable that the total number of units that would need to be built would approach half a million."

There is a notable uniformity in the studies of the inverse correlation of economic status with tuberculosis mortality on both sides of the Atlantic, in Canada as well as the United States. The New York report adds its strong confirmation, in both white and non-white populations, of the association of tuberculosis with poor housing and inadequate income, and concludes that, "if optimum benefits are to be realized in mastering tuberculosis, progress in medicine and public health must be accompanied by comparable and parallel socio-economic improvements in living conditions." Nevertheless, without setting one approach against another, where both are essential, most epidemiologists would stress the importance of Topley and Wilson's comment⁴: "The spread of tuberculosis in the community is in great part the result of slowly progressive household epidemics which often lead to the transmission of the disease by contagion from one generation to another." As to the prevention of tuberculosis in the future, experience gathered during the last twenty years lends force to the advice given by Wade Frost⁵ in 1937:

"The soundest principle to follow seems to me that, as the cases become fewer and fewer, preventive measures should be centred more and more upon the open cases; that the protection thrown around these infective cases and their immediate contacts be not relaxed, but steadily and progressively increased. This is a sound principle of epidemiology, for it is to be expected that, as the prevalence of the tubercle bacillus in the general environment is diminished, infection and disease will become more distinctly focalized. In fact, there is already evidence of increasingly wide differentiation between the most sheltered and the most exposed groups of our population; and even now we should take more cognizance of this in directing our efforts."

PROGNOSIS OF NEPHRITIS IN CHILDHOOD

Reports on the prognosis of nephritis in childhood are widely conflicting, and recovery rates have ranged from 37%¹ to almost 100%.² The reasons for this are several. Various workers have used different classifications. Those who have regarded the nephrotic syndrome (subacute oedematous nephritis, Type 2) as a stage in the natural course of acute haemorrhagic nephritis (acute glomerulonephritis, Type 1) report a poorer prognosis than those who regard them as separate pathological processes.³ Writers who have reported the prognosis of only those patients who have been observed from the initial attack of acute haemorrhagic nephritis have recorded a higher recovery rate than those who have included patients referred to them at different stages of renal disease. The criteria of cure have also varied. Any discussion on the prognosis of nephritis must therefore begin by defining the diagnostic terms used and the criteria of cure.

Acute haemorrhagic nephritis, which usually follows a streptococcal infection, is a clearly defined disease. It may end in recovery, cause death in the initial stage, progress rapidly with persisting hypertension, haematuria, and oedema to death in uraemia some months later, or pass into a latent stage, with persistent albuminuria and raised Addis count of cells in the urinary sediment, which ends in death from hypertension or uraemia some years later.⁴ The nephrotic syndrome has an insidious onset with gross oedema, heavy albuminuria, low serum albumin, and high serum cholesterol. A history of a previous attack of acute haemorrhagic nephritis is rarely obtainable, and the textbook description of oedematous nephritis as a usual intermediate stage between acute and chronic nephritis is not in accord with clinical experience.⁴ N. S. Clark⁵ has recently analysed 265 cases of nephritis in children. While he agrees that a history of acute haemorrhagic nephritis is the exception in cases of subacute oedematous nephritis, he prefers to regard these two conditions as different expressions of the same disease. Although it would be wise at present to reserve judgment on this question, it is certainly true that they have a distinctly different

prognosis as well as a different mode of onset and clinical course. In the important matter of hazarding a prognosis, therefore, the physician will wish to know the probable course of acute haemorrhagic nephritis observed from the onset, and also what happens to cases of the nephrotic syndrome (or subacute oedematous nephritis) with its onset of oedema and massive albuminuria. It is generally accepted that the most sensitive index of recovery in acute haemorrhagic nephritis is the Addis count, and that cure is possible up to but not after two years from the onset. In the nephrotic syndrome it is safer to think in terms of remission than cure.

In 1939 A. W. Snoke,⁶ from Rochester, N.Y., described the outcome of 141 cases of glomerulonephritis with a definite initial stage one to nine years earlier. His findings were very different from those previously reported by him in 1937 from San Francisco.¹ In the Rochester series 74.5% had recovered; 13.7% were still active; 11.8% had died. J. H. Davis and H. K. Faber⁷ in 1945 published their findings in 102 cases from the same centre as Snoke's 1937 series,¹ and in fact 82 were of the original series. The second series,⁷ however, included only those patients seen in the initial stage of the disease and excluded those who had been transferred to the centre already in an advanced stage of nephritis. Of the 102 patients so selected, 81.3% recovered, 7.8% had active disease after two years, and 10.8% died. F. S. Gachet⁸ reported on 166 patients admitted to hospital early in the disease; twelve (7.2%) died, and forty were not adequately studied; of the other 114, complete recovery ensued in 90.5%, in 6.1% the disease became chronic, and 3.4% had residual albuminuria but normal Addis counts. The results reported by M. D. Giles⁹ from Glasgow show the same high recovery rate as in the American series. She followed up 218 cases of acute haemorrhagic nephritis for one to seven years, of which 72.9% ended in recovery, 18.8% remained in the latent stage, 1.4% were in the terminal stage, and 6.9% had ended fatally. None had passed into the subacute or oedematous stage.

A large and recent series in the British literature has been reported by N. S. Clark¹⁰ from Aberdeen. He studied the outcome in 265 cases of nephritis of all types. Within one year of onset 7.5% had died. Of the 245 survivors, 67 were followed up for less than a year. The remaining 178 included some with subacute oedematous nephritis, which would influence the prognosis adversely. None the less, 75% recovered, 8% were in the latent stage, 4% had active disease, 3% were dead, and 11% showed only slight albuminuria. The Addis count

¹ Snoke, A. W., *Amer. J. Dis. Child.*, 1937, 13, 673.

² Aldrich, C. A., *J. Pediatr.*, 1940, 17, 249.

³ Ellis, A., *Lancet*, 1942, 1, 34 and 72.

⁴ Davison, J., and Platt, R., *Quart. J. Med.*, 1949, 18, 149.

⁵ Clark, N. S., *Arch. Dis. Childh.*, 1956, 31, 12.

⁶ Snoke, A. W., *Amer. J. Dis. Child.*, 1939, 57, 1373.

⁷ Davis, J. H., and Faber, H. K., *J. Pediatr.*, 1945, 27, 453.

⁸ Gachet, F. S., *Amer. J. Dis. Child.*, 1941, 61, 1175.

⁹ Giles, M. D., *Arch. Dis. Childh.*, 1947, 22, 232.

¹⁰ Clark, N. S., *ibid.*, 1956, 31, 156.

¹¹ Roscoe, M. H., *Quart. J. Med.*, 1956, 25, 353.

¹² Barnes, L. A., Moll, G. H., and Janeway, C. A., *Pediatrics*, 1950, 5, 486.

¹³ Arneil, G. C., *Scot. med. J.*, 1956, 1, 275.

¹⁴ Squire, J. R., *British Medical Journal*, 1953, 2, 1389.

was recorded in only 34 cases. Analysis of the fatal cases in these series shows that death in many of the patients was due to intercurrent infections which would nowadays respond to the antibiotics. It is possible, therefore, to reach a fairly satisfactory assessment of the prognosis of acute haemorrhagic nephritis in modern practice. At least 80% will recover; less than 15% will pass into the latent stage on the way to terminal renal failure; the immediate mortality should not exceed 5%.

Much less information is available about the prognosis of the nephrotic syndrome, but the outlook is much better in children than in adults. This is related to the fact that in children "pure lipoid nephrosis" is not uncommon, but is rare in adults. M. H. Roscoe¹¹ has recently reviewed a series of 40 patients with the nephrotic syndrome only two of whom were young children. Even though she excluded cases due to amyloid disease, thrombosis of renal vein, diabetic glomerulosclerosis, and generalized lupus erythematosus, the rate of complete remission was only 12.5%; 50% had ended fatally, while in 37.5% the disease was still active after 2½ to 29 years. On the other hand, L. A. Barness, G. H. Moll, and C. A. Janeway¹² have reported complete remission in 41% of 107 children with lipoid nephrosis. G. C. Arneil¹³ has stressed that nephrosis is a disease largely confined to childhood. The average age at onset of 120 cases was 3.7 years. He notes "a recovery rate of at least 40%." Deaths from intercurrent infection such as pneumococcal peritonitis have been greatly reduced by the use of antibiotics, while new drugs such as corticotrophin, cortisone, and prednisolone can initiate remissions in many patients. J. R. Squire has emphasized the need for a diet high in protein.¹⁴ It is clear, therefore, that patients with acute haemorrhagic nephritis are likely to recover, and that the nephrotic syndrome in childhood, though still a serious and indeed depressing disease, no longer justifies a deeply pessimistic prognosis.

SERUM HEPATITIS AND DENTAL INJECTIONS

It is generally assumed that infectious hepatitis and serum hepatitis (or homologous serum jaundice) are different conditions caused by different viruses. Despite these differences there are also many points of resemblance, and there is little doubt that many cases labelled "infectious hepatitis" would be called "serum hepatitis" if a clear history were obtained of injections of serum or other material which might be contaminated with virus. Recently F. F. Foley and R. N. Gutheim¹ reported fifteen cases of hepatitis which followed dental

procedures, and they suggest that these were in fact cases of serum hepatitis transmitted by contaminated syringes or needles.

During a two-year period from June, 1953, to May 1955, fifty-seven patients were discharged from the General Hospital in Rochester, New York, with the diagnosis of viral hepatitis. Seven of these were known to have received blood or plasma transfusions. The remaining fifty patients would normally have been diagnosed as having suffered from infectious hepatitis, but fifteen of them gave a history of a dental injection within the preceding six months. In these fifteen patients there was no history of contact with a known case of infectious hepatitis, whereas there was such a history in six of the thirty-five patients who had no dental history. The incubation period in the fifteen cases varied from 47 to 142 days, with a mean of 96 days. The onset of illness was fairly gradual in most patients. The first symptoms were usually malaise, fatigue, and loss of appetite, with nausea and abdominal ache. The interval from the first symptom to the onset of jaundice was usually one to two weeks. Three patients died with diffuse or focal necrosis of the liver cells. Foley and Gutheim suggest that the association of these patients with a history of past dental treatment was not just due to chance. Whereas in the whole group of fifty patients with hepatitis included in this investigation fifteen (or 30%) had a history of dental injections, in two other control groups of patients the frequency of dental injections was five to seven times less—4.4% in one group of sixty-eight patients and 6% in another group of fifty patients.

These and other data which the authors give strongly suggest that dental injections must now be added to the list of injections which can be responsible for the transmission of virus hepatitis. Certainly the authors have established a case for careful investigation of this potential hazard. The risks of introducing infections by means of contaminated syringes or needles are not as widely appreciated as they should be. This is partly because many doctors and dentists are not aware of having had any trouble of this kind in their own practices, and if challenged on their technique for sterilizing syringes would point to the large numbers of injections they have given without any ill effects. But there is to-day an increased awareness that methods of sterilization both of syringes and of solutions frequently used in hospital and in general practice are far from safe. Foley and Gutheim recommend that chemical sterilization should be abandoned, and advise careful cleaning of syringes and needles and heat sterilization both of these and of procaine solutions. The days when every dentist will have his own small autoclave in his surgery may be some way off, but, if the risk of serum hepatitis suggested by Foley and Gutheim is confirmed by further investigation, then there will certainly be a case for overhauling the methods at present in use. The high mortality of serum hepatitis makes it a disease with which no chances must be taken.

¹ Foley, F. F., and Gutheim, R. N., *Ann. intern. Med.*, 1956, 45, 369.

DEFORMITIES OF THE CHEST

What Shakespeare said of greatness might be applied, in different words, to deformities of the chest, for they can be classified as congenital, acquired, or traumatic. The traumatic varieties, such as the cobbler's funnel chest, are becoming rare. Argument continues about the aetiology of the other types, congenital or acquired. J. M. Naish and H. R. E. Wallis¹ investigated the causes of Harrison's grooves and concluded that the insertion of the diaphragm had nothing to do with the production of these deformities, but that they occur at the site of a muscular gap or neutral zone between two parts of the thorax which normally move in different directions. In their opinion the important factors in the causation of the grooves were severe rickets, congenital heart disease, asthma, and deficient expansion of the lungs due to respiratory infections. Little work has been done in Britain on this subject since the appearance of Naish and Wallis's paper nearly ten years ago—though Wallis² has described several methods of recording the shape of the chest—and it has been left to American workers to explore the field further.

H. A. Brodtkin,^{3,4} of Newark, New Jersey, having previously ascribed funnel chest and pigeon breast to congenital weakness of the anterior segment of the diaphragm, now comes forward with a similar explanation for the appearance of Harrison's grooves.⁵ He points out that the diaphragm does not move up and down like a piston, but is more like a pair of balloons deflating. If there is a weak anterior segment, and "if greater and greater demands are made on the diaphragm for stronger and stronger contractions, the weak anterior segment will reach the limits of its power first. Beyond this point it will be overpowered by the stronger lateral and posterior segments, as in a tug of war, and will be pulled back." This causes an inspiratory retraction of the sixth costal cartilages, and so leads to the formation of grooves. The reasons for the strong contractions of the diaphragm may be dyspnoea or respiratory obstruction. Brodtkin stresses the importance of determining the age at which the deformities first occurred. His main argument for their congenital nature is that they are seen in newborn children and in those who have never suffered from respiratory infections. It seems that he is in agreement with Naish and Wallis on the factors which cause the grooves, but differs in his interpretation of the mechanism. His arguments, though interesting, are mainly theoretical, and proof should be forthcoming before they are accepted. It should be possible to learn something from post-mortem studies of patients with deformities of the chest, and from watching or filming the contractions of the diaphragm under fluoroscopy. Children with bronchial asthma might prove rewarding subjects, for here the obstruction is to expiratory effort rather than inspiration and yet grooves often occur.

¹ Naish, J. M., and Wallis, H. R. E., *British Medical Journal*, 1948, 1, 541.

² Wallis, H. R. E., *Brit. J. Tuberc.*, 1952, 46, 136.

³ Brodtkin, H. A., *Pediatrics*, 1949, 3, 286.

⁴ *Dis. Chest*, 1951, 19, 288.

⁵ *J. Amer. med. Ass.*, 1956, 161, 1555.

As to treatment, there is again division of opinion. Operations for purely cosmetic reasons are undertaken more commonly in the United States than in Britain. Symptoms which have been attributed to funnel chest, such as palpitations, retrosternal pain, and dyspnoea, could just as well be due to anxiety. Severe deformities no doubt require surgical correction, but the minor manifestations are probably best left alone.

THE PRIME MINISTER'S TERMS

Mr. Macmillan met Sir Russell Brain and Dr. A. Talbot Rogers, joint chairmen of the Negotiating Committee, on Tuesday this week. In the House of Commons, on the same day, Mr. Macmillan said that as from April 1 junior hospital staff up to and including senior registrars would receive a 10% increase in pay. They were considering what should be done by way of an interim adjustment for the other doctors and dentists covered by the Royal Commission's terms of reference, and he would make a further statement on this "in due course." It may be assumed that this will be after the Budget. Mr. Macmillan also gave the composition of the Royal Commission, whose terms of reference were published in last week's *Journal*. Sir Harry Pilkington, aged 51, chairman of Pilkington Brothers Ltd. and a director of the Bank of England, is to be chairman. The other members are as follows: Mrs. Baxter, secretary of Cambridge University Women's Appointments Board; Mr. J. H. Gunlake, vice-chairman of the Institute of Actuaries; Professor John Jewkes, Professor of Economic Organization, Oxford; Mr. A. D. Bonham-Carter, a director of Unilevers; Mr. I. D. McIntosh, headmaster of George Watson's College, Edinburgh; Sir David Hughes Parry, Q.C., Professor of English Law, University of London; Sir Hugh Watson, Edinburgh, Deputy Keeper of Her Majesty's Signet; Mr. Samuel Watson, secretary of the Durham Miners' Association.

Mr. Macmillan, in his letter of February 25 to the chairmen of the Negotiating Committee, said that "the work of the Royal Commission would not preclude some interim adjustment of doctors' remuneration." When explaining this in the Commons about a fortnight ago he said that a statement would be made at the appropriate moment. The Council of the B.M.A. considered the appropriate moment was now, and that was why the Negotiating Committee chairmen met Mr. Macmillan this week. All he has added now is that he would make a further statement "in due course." It is astonishing that the 10% increase for junior hospital staff was announced by the Prime Minister in the House of Commons when barely a fortnight ago the Government announced that the Management Side of Whitley Committee B would be instructed to negotiate an increase. Mr. Macmillan seems temporarily to have assumed the office of Minister of Health. So once again the Government has shifted its position. What is the profession to make of all this? What a confusion of tongues! In the meanwhile the Government refuses

to negotiate with the profession on its claim for a 24% increase or to agree to arbitration: its silence on this must be read as a refusal. Mr. Macmillan's replies to questions in the Commons on Tuesday were not designed to clear up the muddle, and the profession will find the present position more unsatisfactory and confusing than before.

DEODORANTS AND DEPILATORIES

From the time of ancient Egypt and perhaps earlier the axillae, especially in women, have received much attention for cosmetic reasons. The secretions of the apocrine glands, which abound in that situation and are a secondary sexual characteristic, have a peculiar odour which may become offensive, since fermentation readily occurs.¹ The search for deodorants is therefore an age-old problem. Moreover, in some periods of history fashion has demanded exposure of the axillae and required removal of hair from that site.

Deodorants must not only lessen or abolish odour but also reduce perspiration locally. They are usually astringent and may be applied as liquids, powders, creams, pastes, or as a stick made of a fat-wax mixture. Aluminium chloride or some other salt of aluminium is commonly used, and so are formaldehyde, boric acid, oxyquinoline sulphate, and zinc salts. The sticks, powders, and pastes usually contain some talc and occasionally kaolin. The removal of hair has probably been achieved more commonly by shaving than by other means such as the application of depilatory preparations. These often contain barium, calcium, strontium, or sodium sulphide, and in many powders and pastes there is talc or kaolin. Because it is dangerous, thallium acetate is no longer used. Cosmetic preparations designed to remove hair are, as a group, potentially more toxic than any other class of compounds applied for non-medical purposes to the skin and require discrimination in their use. Nevertheless, complications resulting from established brands of deodorant and depilatory agents must be extremely rare. Occasionally eczematous dermatitis is provoked in a person whose skin is liable to this affection, either by the development of sensitization to some constituent of the application or as the result of a primary irritant effect. Hidradenitis suppurativa, an acute inflammatory reaction of the apocrine glands, has been said to be caused by damage to the duct openings by deodorant applications or depilatories, though maceration of the skin by sweat, especially when rubber dress-protectors are worn, and endocrine factors are probably more important.

Recently L. Rubin and colleagues² have described an apparently new eruption of the axillae resulting from deodorants. Reddish-brown papules 1-4 mm. in diameter appeared in profusion after applying a deodorant stick (in three patients) or lotion (in one) for a few days or weeks. Histologically the papules were found to be granulomata with a tuberculoid re-

action. Talc and kaolin are not mentioned as constituents of the deodorants used, and polaroscopic examination of the sections showed no foreign bodies. Zirconium was present in the three sticks used but not in the lotion, which contained chlorhydroxy-aluminium sulphate. The cause of this unusual condition is still unknown, but the role of abrasion is being investigated, since the makers of these deodorants suggest in their advertisements that they may be used immediately after shaving.

NEW WAYS OF DRILLING TEETH

In recent years there have been a number of improvements in the conventional methods of preparing teeth for fillings and other restorations. These improvements aim at faster and more accurate cutting of the tooth and at reducing the risk of temporary discomfort or permanent damage to the sensitive dental pulp. Very much higher speeds are now attainable with the dental electric engine, and commercial models are available with hand-piece speeds of up to 25,000 revolutions per minute. This speed enables cutting instruments made with tungsten carbide or diamonds to be used with much greater efficiency than was possible with the old 3,000 to 3,500 r.p.m. normally achieved. As the cutting efficiency is increased so the working pressure on the tooth can be reduced, giving less discomfort to the patient and far more accurate control to the operator. The problem of the heat developed with this fast cutting is overcome by the use of a continuous spray of water on to the cutting instrument; this in itself reduces discomfort by "cushioning" the vibration inevitably produced when toothed burrs or diamond abrasives are used, besides maintaining a normal, or even slightly reduced, temperature of the tooth. Much higher speeds are attained by the use of newly developed motors of turbine type driven by compressed air, and speeds of 60,000 to 80,000 r.p.m. are reported. With these instruments the stream of used air is generally directed on to the tooth to disperse debris and effect cooling. Even higher speeds are being experimented with, but the maintenance of such high-speed equipment becomes a major difficulty.

An entirely different method of preparing teeth for fillings has been developed in the U.S.A.: a stream of compressed gas carrying particles of abrasive is directed on to the tooth through a small nozzle. The advantages claimed are that vibration, conducted noise, pressure, and heat can be entirely eliminated. But in using this method the operator lacks the guidance of his sense of touch and accurate shaping of cavities is difficult. It is not a complete replacement for the dental engine. Experimental work is being carried out with high-frequency vibrating instruments in conjunction with abrasives. These instruments are made to vibrate at frequencies of 25,000 cycles per second, which are beyond the range of human hearing and so are referred to as ultrasonic. Such instruments are widely used industrially and their possibilities in dentistry are promising, but work with them so far has not gone beyond the experimental stage.

NOTES ON PREVENTION OF TETANUS IN INJURED PERSONS

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The need for these notes was brought home to us by several requests for guidance from surgeons, casualty officers, and others. We do not consider the decision concerning which injuries require tetanus prevention falls within the scope of this paper,* but when, after clinical assessment of the injury, it has been decided that there is a risk of tetanus infection and that suitable preventive measures should therefore be taken, it is suggested that the following procedures should be adopted.

Suggested Procedures

Determination of Immunity Status.—Inquiry should be made into the possibility of previous tetanus toxoid administration, in order to determine whether the patient is non-immune or actively immune. (A difficulty may arise in taking the patient's history, as he may confuse previous injections of serum or various prophylactics with injections of tetanus toxoid.)

Definitions.—The following definitions are derived from those used in British Army practice. A person is considered to be:

Non-immune (this category includes those who may be incompletely immunized) (a) when he/she has never received any injection of tetanus toxoid; (b) when he/she has received only one injection of tetanus toxoid; (c) when more than six months have elapsed after two injections of tetanus toxoid, or when more than five years have elapsed after the initial course of three injections of tetanus toxoid or a subsequent boosting (reinforcing) dose; (d) where there is any doubt about previous tetanus toxoid administration.

Actively immune (a) for a period up to six months when he/she has received two injections of tetanus toxoid, the second injection being given not less than six weeks and not more than twelve weeks after the first injection; (b) for a period up to five years when he/she has received three injections of tetanus toxoid, the third injection being

*The following summary of the types of injuries which require specific preventive measures against tetanus is quoted by kind permission of Mr. W. Gissane, F.R.C.S., and Dr. E. J. L. Lowbury, of the Birmingham Accident Hospital: Tetanus antitoxin should not be given as a blind routine for all open wounds. Reactions are not uncommon, and may, though rarely, be fatal. Prophylactic injections against tetanus need not be given in the case of clean superficial wounds or abrasions not more than three to four hours old. Physical removal of any organisms by gentle or thorough washing for three to four minutes may be relied upon. Subsequent contamination must be prevented by a good cover dressing with or without closure by suture or grafting.

Prophylactic injection of either tetanus antitoxin or tetanus toxoid, according to the patient's state of immunity, is indicated in the following cases: (1) wounds more than three to four hours old; (2) wounds already infected by pyogenic organisms; (3) wounds through skin that may have been contaminated by soil or manure—for example, wounds in farmers, stablemen, agricultural labourers, sewage workers, gardeners, garage mechanics, football players, etc., and most children; (4) deep and punctured wounds, however small; (5) wounds in which the tissues have been devitalized by the force of the injury—for example, hand-press injuries; and (6) wounds that cannot be closed properly and may therefore be infected later.

given not less than six months and not more than twelve months after the second injection mentioned above; (c) for a period up to five years after he/she has received a boosting dose following a full primary course of immunization.

Preventive Measures Recommended

Non-immune (as defined above).—Passive immunization with tetanus antitoxin will be required. Keep a small sterile syringe and needle and a 1:1,000 solution of adrenaline ready for emergency use whenever antitoxin is injected. Keep the patient warm and under observation for at least 30 minutes after receiving antitoxin by any route.

Give tetanus antitoxin in accordance with the following procedure:

(1) Try to obtain the patient's previous history of: (a) injections of horse serum of any kind, and (b) allergic conditions, especially asthma and infantile eczema.

(2) If no previous serum and no history of allergy, give full dose of tetanus antitoxin, 1,500 international units subcutaneously or intramuscularly. If there are any doubts about previous injections of serum or allergic diathesis, proceed as in (3).

(3) If the patient has had serum before, but has no history of allergy, give a "trial dose" of 0.2 ml. of undiluted antitoxin subcutaneously. If no general symptoms develop within 30 minutes, give a full dose of tetanus antitoxin, 1,500 international units, subcutaneously or intramuscularly.

(4) If history of allergy, give a trial dose of 0.2 ml. of 1:10 dilution of antitoxin subcutaneously. If no general reaction within 30 minutes, give 0.2 ml. of undiluted antitoxin subcutaneously. If no general reaction within a further 30 minutes, give full dose of tetanus antitoxin, 1,500 international units subcutaneously or intramuscularly. The object of the trial dose is to determine any predisposition to general reaction and not to detect any local reaction, the latter having no practical significance. If symptoms develop, see "Types of Reactions which may follow Administration of Antitoxin, and their Treatment" and "Antitoxin after Anaphylaxis," below.

(5) Additional prophylactic doses (usually 1,500 international units), subcutaneously or intramuscularly, may be given at weekly intervals if the surgeon in charge of the case considers this necessary.

(6) Whenever antitoxin has been given, recommend toxoid later—see "Active Immunization," below.

Actively Immune.—Tetanus antitoxin will not be required. Give a boosting dose of 1 ml. of tetanus toxoid (unless the third dose of the primary course or a boosting dose has been given less than 18 months previously, when even a boosting dose is unnecessary).

Children in both non-immune and actively immune groups should be given the same dosage of antitoxin or toxoid as adults.

Records

Keep careful records of all injections (antitoxin, toxoid, etc.) noting: the dates of inoculation; the correct name of the preparations; the batch numbers; the dosage administered; and reactions, if any (local, general, etc.).

Give a record card to the patient or parent, and ask him/her to keep it in a safe place, as in the event of injury it will be required as soon as possible by either the hospital or the private doctor.

Types of Reaction which may follow Administration of Antitoxin, and their Treatment

Anaphylactic Shock.—Onset within few minutes, or, with less intensity, up to two hours. Dyspnoea, pallor, collapse; sometimes oedema or rash. **Treatment.**—Give 0.5 to 1 ml. of 1:1,000 solution of adrenaline intramuscularly. If recovery is not rapid, repeat the injection in 15 to 20 minutes. Give an antihistamine drug in full doses intramuscularly: specially useful if urticaria or oedema develops. Keep the patient recumbent with the head low, and warmed with blankets and hot-water bottles. Recovery from anaphylactic shock is usually rapid after adrenaline. Very rarely, the return of the blood pressure to normal is delayed for some hours; in these cases give a slow intravenous

¹ *British Medical Journal*, 1954, 1, 1198.

² Rubin, L., Slepian, A. H., Weber, L. F., and Neuhauser, I. J. *Amer. med. Ass.*, 1956, 162, 953.

drip of diluted noradrenaline, blood-pressure readings being taken frequently in order to avoid an unduly elevated pressure.

Serum Sickness.—Common ("delayed") type after 7 to 12 days; "accelerated" type after three to four days (typically seen in persons who have had a previous serum injection). Urticaria and other rashes, oedema of the tissues, joint pains, and pyrexia. **Treatment.**—Give an antihistamine drug by mouth for one to three days. In more serious cases, antihistamine drug, by injection; soothing lotions such as calamine to the skin. In rare cases of severe serum sickness, when symptoms reappear in spite of antihistamine drugs, give prednisolone, orally in doses of 5 mg. six-hourly or eight-hourly for one or two days; discontinue the drug gradually over the next two days. While this treatment will be found successful, bear in mind the dangers of prednisolone in the presence of peptic ulcer, diabetes, tuberculosis, and any uncontrolled infection.

Local Reaction without Constitutional Disturbance.—Often after 7 to 10 days, lasting two days. Localized erythema and urticaria: may be very irritating but never dangerous. **Treatment.**—Give an antihistamine drug orally; soothing lotions to the skin.

Local Hypersensitivity Analogous to the Arthus Phenomenon.—Swelling and induration, leading to sloughing of skin, subcutaneous tissues, and even muscle. Very rare. May appear after repeated injections of serum. The administration of serum should be avoided so far as possible while the patient is already suffering from serum sickness due to a previous injection.

Thermal Reaction.—Sudden pyrexia and severe chill, mostly after intravenous injections. Rare. **Treatment.**—Give adrenaline as above. Keep the patient warm.

Antitoxin after Anaphylaxis

Wait till blood pressure is normal and rashes (if any) have subsided. (This takes between 6 and 12 hours.)

Repeat the "trial dose" of 0.2 ml. of undiluted tetanus antitoxin subcutaneously. If no general reaction occurs after 30 minutes, give a full dose subcutaneously or intramuscularly.

The recurrence of anaphylactic shock is extremely rare, but the patient may develop so-called accelerated serum sickness.

Supplementary Notes

Active Immunization.—There is now general agreement that the ideal method for the prevention of tetanus is by active immunization. Patients who have been given tetanus antitoxin as a matter of urgency should be actively immunized afterwards. Some of them may have become sensitized to serum, with the result that if they are given antitoxin again at some future date they may eliminate it too rapidly for protection to be adequate. Active immunization may be achieved by either (a) inviting the patient to return to the hospital in six or eight weeks for active immunization with tetanus toxoid; or (b), when making a report on the case to the usual medical attendant, recommending that a full course of active immunization should be commenced six to eight weeks later. For primary immunization three 1-ml. doses of tetanus toxoid are injected subcutaneously or intramuscularly at intervals of 6 to 12 weeks between the first and second injections and 6 to 12 months between the second and third injections. A boosting dose of 1 ml. of toxoid needs to be given every five years to maintain immunity. As active immunization against tetanus is not yet undertaken routinely by either the general practitioner or the local public health authority, those hospitals which receive a large number of casualties with injuries of a type likely to develop tetanus may find it convenient to set up a monthly immunization clinic for implementing the above recommendations.

Routine Immunization of Allergic Subjects.—In our opinion known asthmatic and other allergic subjects should

always be actively immunized as a routine against both tetanus and diphtheria in order that injections of antitoxin for prophylaxis or treatment at a later date may be avoided.

Intravenous Injections of Antitoxin.—Intravenous injections of tetanus antitoxin are not necessary for prophylaxis: they are required only for the treatment of tetanus. The intravenous route should never be used unless an intramuscular injection (if necessary preceded by a trial dose), given at least half an hour before, has been tolerated. The antitoxin should be at room temperature, and the patient recumbent and kept warm. Everything should be in readiness for the treatment of anaphylactic shock. Intravenous injection should be given very slowly. The patient should be kept under observation for at least one hour afterwards.

Conclusion

The above notes and recommendations have been drafted in an attempt to assist all who are called upon to treat wounds which may be infected with *Clostridium tetani*. It is hoped that the recommendations made would facilitate the drawing up of a concise guide to procedure, as, for example, the preparation of a wall chart.

We would welcome criticism of our suggestions and an expression of the views of the many different categories of the doctors concerned.

We are grateful to a number of friends and colleagues, especially Dr. E. T. Conybeare, Ministry of Health, and Mr. A. T. Glenny, F.R.S., for helpful comments.

BIBLIOGRAPHY

- Barr, M., and Sachs, A. (1955). *Army Pathology Advisory Committee Report on the Investigation into the Prevention of Tetanus in the British Army*. London.
- Laurent, L. J. M., and Parish, H. J. (1952). *British Medical Journal*, 1, 1294.
- Moynihan, N. H. (1955). *Lancet*, 2, 264.
- (1956). *British Medical Journal*, 1, 260.
- Parish, H. J. (1954). *Antisera, Toxoids, Vaccines, and Tuberculin*, 3rd ed. Livingstone, Edinburgh and London.
- War Office (1956). *Memorandum on Immunological Procedures*, 2nd ed. H.M.S.O., London.

COLLECTIVE NEUROSES OF OUR DAY

A distinguished Viennese psychiatrist, Professor V. FRANKL, addressed the Austrian Institute in London on February 21 on "Collective Neuroses of the Present Day." Professor Frankl is head of the Neurological Polyclinic at Vienna. Professor E. STENGEL, of Sheffield University, presided, and he introduced Professor Frankl as one of the most productive of living psychiatrists. He had developed his theories, said Professor Stengel, not just from his armchair, but in the hard school of life. During the years Professor Frankl had spent in concentration camps he had had ample opportunity to observe both himself and others under conditions of extreme stress.

Contemporary Man and His Sickness

"Am I expected to give the opinion of psychiatrists on contemporary man?" asked Professor Frankl of his audience. They might well be tempted to think so, he said, if they had come across a book entitled *The Nervous Condition and Diseases of our Time*, particularly as the date was '53; but the full date was 1853, not 1953, and the nervous condition was not exactly a contemporary disease.

Neurosis had by no means increased in frequency during the last decade. All that had changed were the symptoms. But it was surprising to find that anxiety had decreased in prominence, although it could be said, not altogether untruthfully, that anxiety was at the root of the diseases of our time. What gave rise to the impression that neurosis had increased was that, thanks to the growth of psychotherapy, some of those who would do far better to see a priest—as in former days they would have done—now went to the psychiatrists. To-day they refused to go to the priest and the doctor was forced to become a medical minister.

There had been only a change of aspect—different symptoms. One was left with the impression that the content of patients' delusions was shaped by the spirit of the age and changed with it. The spirit of the age also made itself felt in the depth of spiritual life. But clinical neurosis had by no means become collective. Nor did it threaten to engulf mankind as a whole. What it was justifiable to call "collective neurosis" was not even necessarily a neurotic condition.

Ephemerism, Fatalism, and Collective Thinking

In contemporary man four categories of symptoms akin to collective neurosis could be discerned. There was first an *ephemeral attitude* towards life. In the last world war man learned of necessity to live from one day to the next. He never knew if he would see the next one dawn. Since the war that ephemeral attitude had remained and was to some extent justified by the fear of the atomic bomb. Such people gave up planning for the future or organizing their lives.

The second was the *fatalistic attitude*. This supposed it was not possible for man to plan his life. Man, it was thought, was the plaything of external circumstances—or conditions—and therefore had to submit to being pushed around; he felt himself the product of his physical make-up—just a reflex automaton. The popular misinterpretation of psycho-analysis provided plenty of arguments to support such fatalism.

Then there was *collective thinking*, which showed itself when the average man in ordinary life desired to be as little conspicuous as possible, preferring to be submerged in the mass. It was important in this context to distinguish between mass and community. The community needed personality to be a real community, just as personality was needed in the sphere of real activity. The mass was different; it was disturbed by personality and therefore it suppressed freedom of the individual and levelled personality down. Finally there was *fanaticism*. The fanatic denied the personality of others while in actual fact he had no personality of his own.

The Machine Age

They should not conceal from themselves, Professor Frankl continued, that the first two symptoms, ephemerism and fatalism, were widespread in the Western world. But to-day there was a further factor—a sense of meaninglessness in life: not a sense of being of less value than others, but a feeling that life itself no longer had meaning. This showed itself as a feeling of boredom, and boredom brought yet further problems for the psychologist. Boredom was a symptom which would become increasingly more typical. The second industrial revolution would probably give the average worker an enormous increase in his leisure, and he

would not know what to do with it. There were other dangers too. Man might begin to misinterpret himself by false analogy with the machine age in which he lived. Man first understood himself as a creature in the image of his creator, God; then came the machine age and he began to see himself as a creator; now he might see himself in the image of his creation, the machine. Already some serious psychiatrists believed that the electrical computer differed from the human mind only in that it worked almost faultlessly—something which could not be claimed for man.

But man was not driven, he was free, he was able to take decisions. We spoke with pride of our responsibilities and accepted liability for them. This was the stepping-stone to full personal freedom, said Professor Frankl; it was the realization of that unique and individual meaning which every one of us had to fulfil. It was dangerous and misleading to speak of self-fulfilment as the final goal of self-realization.



"This is all very fine, Hippocrates, but there's nothing here about pay."

[Reproduced by permission of "Punch"]

APPROVED NAMES

On September 8, 1956 (p. 602), we printed the last supplement (dated August, 1956) to the consolidated list of "approved names" selected by the British Pharmacopoeia Commission. Below is the latest list, dated February, 1957. We have added a brief note on the main use of each drug. Communications relating to "approved names" should be addressed to the secretary, British Pharmacopoeia Commission, General Medical Council Office, 44, Hallam Street, London, W.1.

Approved Name	Chemical and Other Names	Notes
Anileridine	Ethyl 1-(2- <i>p</i> -aminophenyl-ethyl)-4-phenylpiperidine-4-carboxylate	Morphine-like analgesic
Chlorisondamine chloride	4 : 5 : 6 : 7 : -Tetrachloro-2-(2-dimethylaminoethyl) iso-indoline dimethochloride "Ecolid"	Ganglionic blocking agent
Crotamiton	Croton- <i>N</i> -ethyl- <i>o</i> -toluidide "Eurax"	Acaricide
Dichlorophen	Di-(5-chloro-2-hydroxy-phenyl)methane "Anthiphen"	Anthelmintic
Dioxaphetyl butyrate	Ethyl 4-morpholino-2 : 2-diphenylbutyrate	Morphine-like analgesic
Diphenamyl methylsulphate	4-Diphenylmethylene-1 : 1-dimethylpiperidinium methylsulphate "Diphenamyl"	Anticholinergic
Ethinamate	1-Ethynylcyclohexyl carbamate "Valmid"; "Valmidate"	Hypnotic
Fludrocortisone	9 α -Fluorohydrocortisone "Alflorone"; "Florinef"	Modification of hydrocortisone for topical use
Hexetidine	5-Amino-1 : 3-di-(2-ethyl-hexyl)hexahydro-5-methylpyrimidine "Sterisil"	For use against <i>Trichomonas vaginalis</i>
Hydroxyzine	1- <i>p</i> -Chlorobenzhydryl-4-(2-(2-hydroxyethoxy)-ethyl)piperazine "Atarax"; is the hydrochloride	Tranquillizer
Morpheridine	Morpholinoethylmorphine	Analgesic
Novobiocin	An antibiotic produced by <i>Streptomyces niveus</i> and <i>Streptomyces spheroides</i> "Streptonivacin" "Albamycin" is the calcium salt; "Biotoxin" is the sodium salt; "Cathomycin" is the sodium salt	Antibiotic
Oleandomycin	An antibiotic produced by certain strains of <i>Streptomyces antibioticus</i> "Matromycin"; "Romicil"	Antibiotic
Ostreogrycin	An antibiotic produced by <i>Streptomyces ostreogriseus</i> "Ostreocin"	Antibiotic
Oxeladin	Diethylaminoethoxyethyl α : α -diethylphenylacetate "Pectamol" is the citrate	Cough sedative
Paracetamol	<i>p</i> -Acetamidophenol "Panadol"	Mild analgesic
Phenobutiodil	α -(2 : 4 : 6-Tri-iodophenoxy)-butyric acid "Biliodyl"	Oral cholecystographic agent
Phenomorphin	3-Hydroxy- <i>N</i> -(2-phenylethyl)morphinan	Morphine-like analgesic
Propoxyphene	4-Dimethylamino-1 : 2-diphenyl-3-methyl-2-propionyl oxybutane	Morphine-like analgesic
Thenalidine	1-Methyl-4- <i>N</i> -(2-thenyl)-anilino-piperidine "Sandosten" is the tartrate	Antihistaminic
Thyrotrophin	Thyrotrophic hormone "Thyrophin"	Thyrotrophic hormone
Vancomycin	An antibiotic produced by <i>Streptomyces orientalis</i> "Vancocin"	Antibiotic
Warfarin	3-(2-Acetyl-1-phenylethyl)-4-hydroxycoumarin "Coumadin"	Anticoagulant

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Polyradiculitis

SIR,—Since cortisone has become freely available several articles reporting its use in the Guillain-Barré syndrome have been published. The most recent of these, by Drs. R. Hugh Jackson, Henry Miller, and Kurt Schapira, appeared in your issue of March 2 (p. 480).

In order to justify the institution of a new treatment for a disease known to have a remarkable tendency towards spontaneous recovery it is clearly most desirable to have a rational concept of the mode of action of the treatment in question. The case for the administration of cortisone rests upon the supposition that the disease has an allergic basis. Recent advocates of its use (Graveson¹ and Dr. Jackson *et al.*) are at pains to bring to the reader's notice evidence which they consider suggestive of such a basis. They make, however, scant reference to other possible aetiologies, and, in particular, ignore Guillain's² recent statement of his belief in a viral origin, the evidence he puts forward in support of this, and his rejection of the allergic hypothesis. Guillain's article is of considerable interest. In it he puts forward certain criteria for the diagnosis of the Guillain-Barré syndrome which are an amplification of his earlier criteria, in the light of collective experience. By the application of these criteria it should be possible to prevent what may still be a disease entity, with a single cause, from being expanded into a group of miscellaneous conditions, united only by their involvement of the lower motor neurone and the acellular hyperalbuminosis of the cerebrospinal fluid. The cases collected by Landry over a hundred years ago are certainly a heterogeneous group. To add them to the Guillain-Barré syndrome will undoubtedly hamper our efforts to discover the aetiology of this syndrome, as originally described. We shall be forced to admit, as Dr. Jackson *et al.* have already done, that the aetiologies are multiple, and in this way we shall lose sight of our disease entity with the possible single cause. Oppenheim was less protective of his syndrome (amyotonia congenita) than Guillain, and in fifty years it was buried beneath a welter of infantile hypotonic states, of widely differing aetiology, dignified by the term "amyotonia congenita" syndrome. Only recently has it been possible for Walton³ to rediscover the original condition of amyotonia congenita—still without a known cause, but with a new name. We should be warned against repeating history by turning the rigidly defined Guillain-Barré syndrome into a nebulous "Landry-Guillain-Barré" syndrome.

The authors, favouring an allergic origin for the disease, base their theory, in part, upon the pathological changes. I do not wish to discuss these in detail, but would only say that, owing to the benign nature of the illness (as defined by Guillain), necropsy material is extremely scanty, and that the changes so far described are as compatible with a viral origin as they are with an allergic origin. It would seem that if we are to obtain more information as to the pathology of this disease we must rely largely upon biopsy study of the intramuscular nerve fibres and their endings. It is true that such changes as are observed in the endings may be secondary to involvement of more proximal portions of the neurone, but this is not certain. Nor is it certain that the changes in the spinal roots—which have attracted more than their share of attention—are not themselves secondary to disease of the anterior horn cells, which is unrecognizable or inconspicuous with available histological techniques.

Biopsy study of the intramuscular nerve endings has already proved of great value, in other forms of peripheral neuritis, in revealing a mechanism of reinnervation at the intramuscular level.⁴ This mechanism depends upon axona-

sprouts, which arise from surviving subterminal nerve fibres and eventually make contact with the denervated muscle fibres, upon which they form new end-plates. This mechanism is far easier to envisage as an explanation of gradual recovery of some months' duration than that postulated by Dr. Jackson *et al.*, who would suggest that, if oedema of the roots is unduly severe, recovery can only take place by growth of sprouts (presumably from the intrathecal part of the anterior roots), past the scarred area where the roots have been compressed at the intervertebral foramina, and on for 2-3 ft. (60-90 cm.) down the nerves to the muscles. Accepting the figure given by Seddon *et al.*⁵ for the rate of advance of the regenerating tip of a peripheral nerve after suture (1.5 mm. per day), it will be seen that even under the best conditions, which will certainly not obtain, it would take well over a year for regenerating sprouts to travel down the nerves from the lumbar roots to the distal muscles of the leg. Add to this time the period which elapses between onset of paralysis and the subsiding of oedema in the spinal roots and it will be obvious that the sprouts, should they ever reach the muscle, would find the latter almost completely atrophied and fibrosed. The formation of an end-plate on any surviving muscle fibre would be impossible. Of course, the clinical history of these cases would be quite incompatible with such a method of reinnervation. Recovery is gradual and continuous from within a few weeks of the paralysis reaching its maximum. If the explanation just rejected were correct, recovery would suddenly set in after many months. This mechanism of axonal growth down peripheral nerves, while so acceptable in the case of complete nerve section a short distance proximal to a muscle,⁶ must therefore be considered as improbable in the extreme as an explanation of the usually complete functional recovery which characterizes the Guillain-Barré syndrome. These observations do not in any way lessen the danger of severe damage to the nerve fibres in the spinal roots as emphasized by Graveson and Dr. Jackson and his collaborators. On the contrary, the significance of the damage is increased, since once the nerve fibres are totally destroyed at this level their regeneration is impossible, and if all are destroyed reinnervation even at the intramuscular level will also be impossible, and not, as Dr. Jackson *et al.* suggest, merely delayed. However, the good functional results usually obtained, even in untreated cases, suggest that total destruction of nerve fibres is rare, and it is usually well within the capacity of the surviving neurones to reinnervate such muscle fibres as have been denervated.

May I suggest, in conclusion, that before cortisone can be accepted as having a rational basis in the therapy of the Guillain-Barré syndrome much more information is required concerning the pathological changes, and that, in the absence of necropsy material, muscle biopsy using Coers's techniques may not be entirely without value.—I am, etc.,

A. L. WOOLF.

Smerthwick.

REFERENCES

- Graveson, G. S., *Lancet*, 1957, **1**, 340.
- Guillain, G., *Ann. Méd.*, 1953, **54**, 81.
- Walton, J. N., *Lancet*, 1956, **1**, 1023.
- Coers, C., *Acta neurol. psychiat. belg.*, 1955, **55**, 741.
- Seddon, H. J., Medawar, P. W., and Smith, H., *J. Physiol. (Lond.)*, 1943, **102**, 191.
- Brit. J. Surg.*, 1948, War Surg. Suppl., No. 2, p. 325.

Police Evidence Preferred

SIR,—May I comment on the report (*Journal*, February 23, p. 468) under the title "Police Evidence Preferred"? An experienced police officer who sees a motorist at the time he is driving, or attempting to drive, is in a far better position to assess his ability to drive than a doctor remotely, by tests, in a police station.

I quote another case to illustrate this. One evening a motorist, whose speech was slurred and who was excited, brought to my house a cyclist he had knocked over. I told him he had had too much to drink and advised him to leave his car and walk home. He was very incensed at this and

demanded that I should call a policeman, as I had insulted him. I rang up the police station, and asked the constable who arrived to persuade him to go home quietly without his car. The constable got him outside on the pavement, and, after testing his walking, told him that he would be wise to follow my advice but that he was at liberty to make his own choice.

The driver thereupon got into his car, started off at a fast speed down a hill, mounted the pavement on the opposite side of the road, returned to his own side, crossed the pavement there, and collided with the wall bordering the churchyard. He had no explanation to offer for this driving. He was arrested, brought back to my house, and I was asked to certify him. I refused to do this, and he was examined later at the station by a colleague who told me the rest of the story. After submitting the defendant to various inconclusive tests and fortified by the history, he told him he was drunk. He was then asked by the motorist: "Doctor, could a drunk man stand up in the middle of this room, jump into the air, turn a complete somersault, and land down on his feet?" My colleague was injudicious enough to say, "Certainly not"—and was then and there proved wrong.

Your correspondent's report induces further thoughts. The borderline case is mentioned. It can be proved that a single drink will invariably lengthen the reaction time, and must therefore impair the control of a vehicle. With further alcohol other impairments follow—lack of concentration, faulty visual accommodation, muscular incoordination, and so on—until the patient ultimately becomes paralytic. At this stage he is quite safe to be "in charge" of his car, as he can no longer start it. Where is the borderline? There is a perfectly good measure of alcoholism if it is really wanted, and that is the urine alcohol concentration. A figure can be fixed and it can be proved which side of the borderline any motorist may be. It has been argued that this is unfair to the man who can carry his drink, but it is no more unreasonable than the 30 m.p.h. limit is to the first-class driver. The limit is set for the average man and all must conform.

Finally, your correspondent asks why accused persons should be asked to submit to examination by a doctor. The purpose of the medical examination should be to exclude illness, accident, or infirmity which might be mistaken for alcoholism or contribute to its effects. The medical profession should be allowed to confine its evidence to such matters; for on these it is qualified to speak. On other matters, police evidence is to be preferred.—I am, etc.,

Warwick.

CHARLES L. WORTHINGTON.

Fatal Reactions to Local Anaesthetics

SIR,—Your annotation on fatal reactions to local anaesthetics (*Journal*, February 2, p. 276) is most timely, particularly in view of the tendency to look upon very ill cases as those best suited to surgical interference under this form of anaesthesia. Unfortunately, it is this particular type of case in whom untoward reactions are most likely to occur. It should be stressed that in such cases, as indeed in all cases, the least amount and the lowest concentration of the least toxic agent should be the rule in the application of local anaesthetic agents. Your annotation notes that adrenaline is often included in local anaesthetics in order to retard absorption and prolong effect. While this is true, and indeed desirable, I would underline the danger of too high concentrations of adrenaline being employed. A concentration of 1 in 300,000 is quite sufficient for all practical purposes.

Adequate sedative premedication with either a barbiturate or an opiate is not only humane but undoubtedly does raise the individual's threshold to the toxic effect of local anaesthetic agents. It should rarely, therefore, be omitted. 30 ml. of 2% lignocaine is mentioned in your annotation as constituting an overdose, and with this few would argue, although it was not sufficiently stressed that such an amount should be combined with adrenaline. But why use 2% lignocaine in such quantities? Lower concentrations provide adequate sensory loss. Indeed, the only justification

for using 2% lignocaine is where motor loss is required as well. When used in low concentrations with appropriate amounts of adrenaline in patients suitably premedicated, relatively large amounts of lignocaine can be used with safety. Scurr¹ and Wilson and Gordon² reported the routine use of as much as 1,000–1,200 mg. of lignocaine in cases of thoracoplasty, and they emphasize that the safety factors lie in premedication, low concentration of lignocaine, and low concentration of adrenaline. Perhaps as important as all these precautions is a more than passing knowledge of the techniques of performing local anaesthesia.—I am, etc.,

Aberdeen.

HOWARD BRUCE WILSON.

REFERENCES

- ¹ Scurr, C. F., *Curr. Res. Anesth.*, 1952, 31, 225.
- ² Wilson, H. B., and Gordon, H. E., *Anaesthesia*, 1952, 7, 157.

SIR,—May I congratulate you on your excellent and timely annotation on fatal reactions to local anaesthetics (*Journal*, February 2, p. 276)? There is, however, one small point in it which may confuse the inexperienced. It is stated that "more than 30 ml. of this strength [2%] would constitute an overdose in most patients." I would suggest that more than 25 ml. of 2% lignocaine should be considered an overdose, whereas the maximum dose of procaine is definitely higher than this, and is usually considered to be 1 g. Goldberg¹⁻³ and Hunter,⁴ after careful experiments with lignocaine, recommend that the safe maximum dose should not exceed 500 mg. (25 ml. of 2% solution). Since Goldberg considered lignocaine 2% to be twice as toxic as 2% procaine, it behoves the anaesthetist to be particularly careful when injecting the former into a particularly vascular area.

At St. Mark's Hospital, Mr. W. B. Gabriel has been using 2% procaine with 1 in 80,000 adrenaline into the perianal space and ischiorectal space, 20 ml. on each side, without any untoward result for many years. This amount of adrenaline is necessary to overcome the strong vasodilator action of procaine, and certainly delays absorption, the analgesia sometimes lasting for as much as five hours. I have never seen any reaction to this concentration of adrenaline other than a transient rise of pulse rate in some patients. Lignocaine 2% with 1 in 80,000 adrenaline is also used in the same manner at St. Mark's, but the dose injected is 10 ml. each side with equally good results. It has been my practice lately to give thiopentone 300 mg., followed by chlorpromazine 12 mg., promethazine 25 mg., and pethidine 25 mg. prior to the local injection in nervous patients, with excellent results. The patient does not rouse when the lignocaine is injected and sleeps for about two hours post-operatively. "Omnopon" $\frac{1}{2}$ gr. (22 mg.) and scopolamine $\frac{1}{150}$ gr. (0.43 mg.) are given as premedication one hour before operation.—I am, etc.,

London, W.1.

FRANKIS EVANS.

REFERENCES

- ¹ Goldberg, L., *Svensk tandläk. T.*, 1947, 40, 819.
- ² ———, *Svenska LäkT.*, 1948, 45, 107.
- ³ ———, *Acta physiol. scand.*, 1949, 18, 1.
- ⁴ Hunter, A. R., *Lancet*, 1956, 1, 158.

Paediatric Anaesthesia

SIR,—I read with interest Dr. W. N. Rollason's reply (*Journal*, September 29, 1956, p. 769) to Dr. John Bullough's letter (*Journal*, August 11, 1956, p. 360), in reference to premedication and anaesthesia for guillotine tonsillectomy in children. I agree with Dr. Rollason's criticism, and add with sincerity of purpose that in this era of prolific manufacture of drugs some of the older innocuous tranquillizers, in particular chloral hydrate, are not given the publicity they deserve. The crux of the matter is to achieve the tranquillity of the patient with safety before, during, and after the operation. I have used syrup of chloral in 4 gr. per stone (0.3 g. per 6.4 kg.) body weight, with excellent results, and would suggest that its overall safety should certainly justify its continued use as a sedative pre-operatively and post-operatively if necessary.—I am, etc.,

Gisborne, N. Zealand.

R. M. B. PENHEAROW.

Tonsils and Adenoids

SIR,—I have just read the article by Dr. J. Fry (*Journal*, January 19, p. 124). My comment is, I could not agree more. Tonsillectomy is recommended too often by some practitioners.

As far as my work as a school medical officer is concerned, practically speaking I never recommend tonsil or adenoid removal in school entrants (5- or 6-year-olds). I think a child has some tonsillar infection I arrange to see him again the following year, and often a third time another year or more later, before I refer him to an otolaryngologist. All indications mentioned by Dr. Fry are taken into account including the history as given by the parents. One thing is certain: we do see patients at school inspections who never attend their general practitioners and who eventually do require tonsillectomy. Even in these days of an apparent free Health Service some parents do not take their children to the doctor or call him when they ought to do so. These children have a history of frequent colds (the catarrhal child which I am convinced are undiagnosed (because not seen by a doctor) tonsillitis).

Dr. Fry says quite truthfully that children grow out of their tonsillitis tendency. In one's "critical assessment" one must take into account the amount of continuous or repeated discomfort and misery that the child may have to go through before growing out of it. I can remember vividly one poor boy whose parents would not give consent that he should see an otolaryngologist with a view to tonsillectomy. He was persistently deaf from his hypertrophic adenoids. Eventually at about the age of 10 years (not 6 as this passed off and the tonsils shrank. He was well behind the other children in his education, as, even when present at school, he could not hear properly. I could say more about this case and why tonsillectomy was not done, but I will not as I should probably get a come-back.—I am, etc.,

Kettering.

MURIEL C. GOODCHILD.

Antiseptics in Midwifery

SIR,—We have read with interest the paper "Antiseptic in Midwifery," by Dr. R. M. Calman and Dr. J. Murra (*Journal*, July 28, 1956, p. 200), and we note particularly the comparison of the quaternary ammonium (Q.A.) compounds, such as cetrimide and benzalkonium chloride, with chlorhexidine. These results are of particular interest in the light of similar investigations now being carried out in our laboratories with benzalkonium chloride and chlorhexidine.

The general intention of the authors is that the field of investigation should cover the value of the compounds not only *in vitro* but also in the field of the sterilization of the skin in midwifery practice and in the treatment of wounds. While we would agree that the *in vitro* tests show chlorhexidine to possess an advantage in activity over benzalkonium chloride against *Ps. pyocyanea*, we would submit that *in vitro* conditions are not those appertaining when attempting to measure sterilization of the skin. The authors have not attempted to measure the activity of chlorhexidine on the skin in the same manner as Colebrook¹ did in his investigations on chloroxylonol. It is now well known that the Q.A. compounds are highly adsorbed on certain surfaces and when so adsorbed retain their bactericidal action over a long period. Thus Steingold *et al.*² showed that benzalkonium chloride is adsorbed on to wool, such as blankets and that the adsorption is so pronounced and so firm that the blanket yielded three successive water extractions, all of which inhibited the growth of *Staphylococcus aureus* and streptococci in nutrient broth.

Blankets on which Q.A. compounds are adsorbed, even after rinsing with water and drying, have a surface which is highly bactericidal to droplet-infection of these organisms. We have now evidence that Q.A. compounds are similarly adsorbed on to the skin, and it would be interesting to know if chlorhexidine is adsorbed in the same manner. It

is therefore of importance to take this factor into account when assessing the value of a skin-sterilizing agent. We would suggest, therefore, that the authors should extend their work on chlorhexidine and the Q.A. compounds to include actual experiments on skin, as in Colebrook's experiments, and that the test organisms be the natural skin flora and a haemolytic streptococcus in blood. Our preliminary experiments in this field have shown that there is little difference between chlorhexidine and benzalkonium chloride against the natural skin flora, but a difference does occur in favour of the latter against a haemolytic streptococcus, which, after all, is of major importance in gynaecology.—I am, etc.,

London, E.16.

W. E. FINCH,
Prince Regent Laboratories.

REFERENCES

- ¹ Colebrook, L., and Maxted, W. R., *J. Obstet. Gynaec. Brit. Emp.*, 1933, 40, 966.
- ² Steingold, L., Wood, J. H. F., and Finch, W. E., *J. appl. Bact.*, 1954, 17, 159.

Hospital Confinement

SIR,—In many areas, our own included, there is still a shortage of beds for hospital confinement. The emphasis has therefore been on persuading patients to stay at home.

A recent tragedy, and several near tragedies, have made us think it necessary to stress once more those patients who should not be accepted for home confinement. They include: (1) patients having their fifth (or later) child; (2) patients with medical or surgical complications; (3) patients with past obstetric complications; (4) cases of pre-eclamptic toxæmia, essential hypertension, or kidney disease; (5) multiple pregnancies; (6) persistent breech presentation; (7) premature labours. This is a minimal list. Of course, some of these conditions may only become apparent late in pregnancy in a patient already booked for domiciliary delivery, but most hospitals reserve some beds for such late bookings, and all should do so.

We feel that all general practitioners and midwives should realize that a domiciliary booking is not irrevocable, and a direct simple reference to a hospital antenatal clinic, or a direct contact with the hospital, should enable them to shift the responsibility for such worrying cases. We would appreciate the views of general practitioners, midwives, and other obstetricians.—We are, etc.,

Windsor.

A. M. DICKINS. F. H. FINLAISON.
C. T. F. EALAND. D. MAXWELL.

Gestation and Sex

SIR,—The suggestion made by McKeown,¹ as quoted in your leading article (*Journal*, February 23, p. 451), that the sex of a child might be related to the time in the menstrual cycle when intercourse occurs, has already been investigated many years ago.

W. M. Feldman² relates an investigation carried out on 57 Jewish families where the ritual laws of "nidah" relating to intercourse had been strictly observed. These ritual laws prevent intercourse taking place at least 12 days from the beginning or seven days from the end of the menstrual flow. The figures show that, out of a total of 402 children, 205 were males and 197 were females, giving a sex ratio of 1,040:1,000, which is practically identical to the sex ratio given in the Registrar-General's return for 1911.³

On the strength of these statistics it was concluded at that time that "there is no evidence that in the human race the time of fertilization of the egg relative to the catamenial period has any influence on the sex ratio exhibited by the offspring." These same observations would also tend to discredit the suggestion of a relationship between the sex ratio of the offspring as related to the time of mating (pre- or post-ovulatory).—I am, etc.,

Stafford.

H. BINYSH.

REFERENCES

- ¹ McKeown, T., *First International Conference of Human Genetics*, 1956.
- ² Feldman, W. M., *The Jewish Child*, 1917, p. 143. London.
- ³ Registrar-General's Annual Report, 1911. H.M.S.O., London.

The Pill-box Mystery

SIR,—I appeal to the medical profession for support to my protest against the modern practice of dispensing chemists in Britain of removing proprietary drugs from their original containers into their own labelled bottles or cartons. This practice may occasion only temporary difficulty for people in Britain, but for people travelling abroad the consequences can be serious or even disastrous.

Nowadays, for the most part medicinal treatment is by proprietary drugs and to a minor degree by dispensed medicine. In France only drugs actually manufactured in France are on sale, and drugs issued in France the same as those made in other countries are generally given a different name. Constantly a doctor in France is faced by the problem of a travelling patient with one or several containers of tablets or capsules which bear only the dispensing chemist's name and address and a caption such as "One thrice daily."

This complaint is precipitated because of a very seriously ill patient who arrived with six containers each having drugs which it was impossible to identify. In the same week I was asked by a London consultant to administer an English drug which I do not know and is not sold in France under the same name, so I cabled to London for it to be sent out. Still I know nothing about it, nor how to administer it, because on arrival it had been removed from its original packing and put in the dispensing chemist's labelled box. I feel sure that it must be only in exceptional cases that doctors wish to disguise from patients the drugs they are being given.—I am, etc.,

Monte Carlo.

H. R. B. GIBSON.

The Hurt Brain

SIR,—Dr. E. E. Prebble's remarks (*Journal*, February 16, p. 399) on the validity of penicillin treatment of neurosyphilis is at variance with that of most authorities. J. Purdon Martin¹ says that penicillin is the standard and only remedy. If that fails nothing else will work. He says malaria is not justified and that arsenicals and bismuth are of no value. W. D. Nicol² recommends penicillin as the treatment of choice, but does occasionally favour malaria. C. S. Nicol³ concludes that penicillin alone is as good as penicillin plus malaria except in optic atrophy. He also warns that malarial therapy, except in expert hands, is dangerous.

Certainly the small number of cases I have treated during the last three years tends to support the view of these authorities. Out of six cases, four young acute cases with C.S.F. cell counts of over 100 showed complete or almost complete clinical recovery, and the cell counts returned to normal after not more than 10 injections of penicillin, each of one million units. One middle-aged case did not respond and died one month after malarial therapy. The other received malaria and arsenicals and bismuth and progressed to complete dementia. I should be interested to know the views of others, as, although as far as I can ascertain the authorities I have quoted and all the American authorities are agreed that penicillin is the only treatment, one does from time to time meet those who hold Dr. Prebble's opinion.—I am, etc.,

Wakefield, Yorks.

HUMPHRY B. KIDD.

REFERENCES

- ¹ Martin, J. P., *Practitioner*, 1956, 176, 142.
- ² Nicol, W. D., *Brit. J. vener. Dis.*, 1956, 32, 9.
- ³ Nicol, C. S., *Postgrad. med. J.*, 1953, 29, 27.

The Black Sheep

SIR,—Most members of the public health service would endorse what Dr. Allen Glenn says in his letter (*Journal*, March 2, p. 523), though with something of a rueful smile at his reference to "more stringent supervision by the sanitary authorities." In the first place, not even the new clean food legislation of the last year has given the health

department adequate powers. Broadly speaking, the law now requires that the food-handler and the food-seller shall be provided with the basic equipment in the way of premises and sanitary appliances and that persons who have good reason to believe that they may be sources of infection shall confess the fact and be excluded from food-handling. It does not demand that the premises and appliances shall be assiduously and intelligently used. One may lead the shop assistant to the wash-basin, but one cannot compel him to wash.

We might or might not get universal cleanliness in food-handling if public health inspectors were able to pay unheralded calls at every food-shop several times a day, but not even a quadrupling of the present strength of our staffs would provide for this. Even then there would be risks in momentary forgetfulness or deliberate time-saving dirtiness as soon as the inspector's back was turned. The long-term answer will have to be a multiple approach on some such lines as these:

(1) The individual food-handler will have to be educated in the importance of food hygiene and trained in its practice until scrupulous personal cleanliness and the use of "no-touch" techniques become virtually second nature. Most health departments are trying to do something on these lines, but the task is a big one and not all food-handlers are interested and intelligent enough to profit by such education.

(2) The public must be taught to understand at least the basic facts about food hygiene and to demand it of the shops from which they buy food (in the U.S.A. a good many food-handling establishments have realized that hygiene is a "selling-point," and have themselves helped to teach the public that it pays to buy hygienically processed, packed, and handled food).

(3) The law must no longer fight shy of the question of the protection of food in the shops, in handling, and in transit. There is no practical reason why all bread should not be wrapped, all meat covered while being carried across the street, all contaminable foods protected from contamination while on display, and all cooked meats ready weighed and wrapped before they are taken into the shop. Some of these might involve slight increases in cost (or decreases in profits), but others would not; some shops have found that the pre-packing of cooked meat actually saves cost and labour in the shop.

(4) The issue of compulsory registration of all food-handling and catering establishments must be squarely faced. The human element will always be present, and in the last resort what matters is the way in which a particular food or catering business is conducted. The carelessly conducted business is a public menace and ought not to be allowed to continue to operate. Again, some cities in the U.S.A. are a long way ahead of us. To quote from the report of one city's commissioner, "if the health inspector notifies a violation of the health code and the proprietor has not corrected it by the date of the inspector's next visit, the shop is closed down." It is a typical human paradox that if we had these powers the threat of their use would be enough and we should probably never need to use them.

The community, in short, has never taken its clean-food problems seriously, and every attempt to bring in progressive legislation has been impeded, delayed, and, in the event, partly frustrated by the vested interests. Perhaps if doctors as a whole woke up to the position their combined influence might possibly achieve something.—I am, etc.,

Colchester.

JOHN D. KERSHAW.

SIR,—I work in a mainly industrial practice, and cannot agree that 95% of bacillary dysentery is due to *Sonne bacillus* (*Journal*, January 26, p. 217). My figures are: 60% salmonella group (mainly *typhi-murium*); 35% *Sonne bacillus*; 5% miscellaneous. Both *Sonne* and salmonella are very difficult to control and treat because of the following: (1) the low standard of true hygiene in all walks of life—e.g., white coats often mean apparent rather than true cleanliness; (2) cloth towelling in toilets of schools, etc., used by numerous people before being washed—paper towelling is the ideal form; (3) working mothers are often prepared to send ill children to nursery or primary school because of loss of income if they stay at home; quite often the nursery staff are not informed of diarrhoea; (4) some women earn their living by caring for the children of several

working mothers, and are prepared to take children with diarrhoea, etc. When I tell mothers to keep cases of diarrhoea away from others the usual answer is, "I have to work, and it is only diarrhoea." To the average person "diarrhoea" means very little, but when labelled dysentery or gastro-enteritis everyone goes into a panic.

Clinically, bacillary dysentery varies from the apparently normal case (found by mass swabbing), or those with one small loose motion a day, to those with diarrhoea, vomiting, meningismus, and high pyrexia. The diarrhoea may not occur for up to three days after the onset of illness. I swab all cases of diarrhoea as a routine. My belief is that some of the increase in incidence of bacillary dysentery is real, but most is apparent. Mist. kaolin, and tab. vitamin B co., fluids (small and often), and grated raw apple relieve the diarrhoea and pain in 80% of cases, irrespective of the cause. *Sonne* dysentery responds well to sulphonamides, neomycin, or both, giving negative swabs in about 10 days. *Salmonella* responds to the above treatments clinically but not bacteriologically, and negative swabs are not obtained before four to six weeks. I tend to believe that sulphonamides and neomycin have a very small, if any, place in the treatment of salmonella. At least two negative swabs at weekly intervals are necessary to confirm successful treatment.

Recurrences in the same patient tend to suggest the possibility that the organisms, especially salmonella, are capable of existence in dust, clothing, or furniture.

With the increase in hospital confinements the possibility of introducing infection into maternity wards is great, if not real. The same applies to children.—I am, etc.,

Bradford, 1.

E. BREEN.

Hospital Falls

SIR,—A survivor can only welcome Dr. Gavin Thurston's article on this unpleasant subject (*Journal*, February 16, p. 396). There are, of course, certain objections to the placing of bars at windows, but at least let staff be discouraged from actually facilitating matters when there is already evidence of, for example, a toxic psychosis. One does not seek to make excuses for one's conduct, but the fact remains that the arrangement beside an open window of a table and chair with the chair pointing outwards may ultimately be the deciding factor for a mind that is confused, desperate, but still wavering.—I am, etc.,

Cambridge.

J. C. HALL.

Operation for Midline Epigastric Hernia

SIR,—Mr. H. A. McDonald has described (*Journal*, February 23, p. 446) an interesting repair of an epigastric incisional hernia, but admits to a fair amount of troublesome bleeding during the procedure. For some years I have followed the method first described by Cattell in 1942¹ and again in 1949,² and doubt if it can be bettered. It may be used for a ventral hernia above or below the umbilicus. As it does not seem to be widely known, a brief description may be helpful.

An oval of excess skin with the scar is first excised, the lateral flaps being dissected back to expose the fascia. The sac is opened, and then follows the principal point of his technique, which is very ingenious. He does not attempt to dissect out the various layers of the abdominal wall, but forthwith uses a continuous suture, passing it from within the sac through the full thickness of the hernial "ring," which consists of all the layers of the abdominal wall except skin and fat. When the "ring" is thus obliterated the recti are found to be drawn together. Then follows the suturing of the edges of the neck of the sac after its redundant portion has been excised. Next the rectus sheath on each side, close to the midline, is incised longitudinally and the medial flaps of fascia so formed are sutured. Thereafter by interrupted sutures, in separate layers, the rectus muscle of each side, the lateral cut edges of the rectus sheath of both sides (though it may not be possible to approximate these without relieving incisions still further out), and finally skin are brought together. Thus there are six rows of

suture overlying one another. The material used is optional. The technique is not difficult and relatively bloodless, and I have used it in a number of cases with satisfactory results. In some cases all the above layers may not require suturing. It does of course mean opening into the peritoneal cavity, but this allows of a quick exploration and freeing of near-by adhesions. On the other hand, Maingot³ advocates a "keel" repair and stresses the advantages of not opening the peritoneum. However, any surgeon interested in trying out this operation should read, if possible, Cattell's articles, or at least his later one.—I am, etc.,

Hitchin, Herts.

A. GREVILLE YOUNG.

REFERENCES

- Cattell, R. B., *Surg. Clin. N. Amer.*, 1942, 22, 795.
- Ibid.*, 1949, 29, 787.
- Maingot, R., *Abdominal Operations*, 1955, p. 1033. London.

Treatment of Hypopituitarism

SIR,—The interesting article by Drs. R. N. Beck and D. A. D. Montgomery (*Journal*, February 23, p. 441) contains the statement: "From a study of the patients and their response to treatment it seems clear that the only drugs which played a significant part in their recovery were thyroid and cortisone."

It is well known that the symptoms of hypopituitarism usually evolve slowly, often over a period of many years; the cases they cite had had post-partum haemorrhage 3, 15, and 17 years previously. Following diagnosis these were given what the authors call "combined therapy" for 10, 9, 9, and 20 months respectively. Subsequently they were given cortisone alone; one of the four required the addition of thyroid. Similar experience was mentioned in three other patients, one of whom needed thyroid also. The maximum specified time on this treatment was 11 months. Surely this period is inadequate to justify the statement they make.—I am, etc.,

Glasgow.

T. B. STRETTON.

Glycyrrhetic Acid

SIR,—Recently numbers of clinical trials have been carried out comparing the actions of glycyrrhetic acid and hydrocortisone as local applications in cases of eczema and other skin conditions. These have been based on a theory that glycyrrhetic acid has cortisone-like properties, and thus may be a substitute for the more expensive cortisone. The short review of the subject which follows shows that, far from having any cortisone-like anti-inflammatory effects, glycyrrhetic acid may actually increase the inflammatory response of the tissues to injury.

Card *et al.*¹ found that crude liquorice extract caused salt and water retention and potassium loss in normal persons, and that glycyrrhetic acid had the same effect. Although they were able to reverse the abnormal electrolyte pattern in a case of Addison's disease, yet they found the glycyrrhetic acid did not prolong the lives of adrenalectomized rats. Pelsner *et al.*² treated several cases of Addison's disease, and were able to correct the salt and water balance, but they found that there was no cortisone-like effect on the circulating eosinophils or the blood-sugar levels. Borst *et al.*³ found that glycyrrhetic acid did not correct the electrolyte balance in certain cases of Addison's disease until small amounts of cortisone were added, and therefore concluded that some functional adrenocortical tissue must be present before glycyrrhetic acid became effective. Rowland J. Calvert⁴ found that there was no significant change in the Kepler test, or in the blood-sugar levels, in a case of Addison's disease during treatment with glycyrrhetic acid. Louis and Conn⁵ found that glycyrrhetic acid caused great retention of sodium, chloride, and water, and had a mild effect in increasing urinary potassium, and that it had no demonstrable effect in the metabolism of protein, carbohydrate, uric acid, creatinine, or on the level of the circulating eosinophils, and they found a persistent diminution of the excretion of 17-ketosteroids and some inhibition of the production of corticotrophin. This evidence shows that

glycyrrhetic acid does resemble to some extent the desoxycorticoids, but, as it does not affect the metabolism of carbohydrate, protein, and uric acid, and has no effect on the circulating eosinophils, it cannot be said to have a cortisone-like action. Ingle and Baker⁶ state that the desoxycorticoids may increase the inflammatory response to tissue injury.

The position therefore seems to be that glycyrrhetic acid has no anti-inflammatory effects of a cortisone-like nature, and there would seem to be little or no justification for its use in the acute inflammatory dermatoses, either locally or systemically, especially in view of the observation of Louis and Conn that it inhibits the production of corticotrophin and therefore actually reduces the amount of cortisone available.—I am, etc.,

Glasgow.

JOHN NEILL.

REFERENCES

- Card, W. I., Mitchell, W., Strong, J. A., Taylor, N. R. W., Tompsett, S. L., and Wilson, J. M. G., *Lancet*, 1953, 1, 663.
- Pelsner, H. F., Willebrands, A. F., Frenkel, M., van der Hyde, R. M., and Groen, J., *Metabolism*, 1953, 2, 322.
- Borst, J. G. G., ten Holt, S. P., de Vries, L. A., and Molhuysen, J. A., *Lancet*, 1953, 1, 657.
- Calvert, R. J., *ibid.*, 1954, 1, 805.
- Louis, L. H., and Conn, J. W., *J. Lab. clin. Med.*, 1956, 47, 20.
- Ingle, D. J., and Baker, B. L., *Physiological and Therapeutic Effects of Corticotrophin (A.C.T.H.) and Cortisone*, 1953, p. 74. Charles C. Thomas, Springfield, Ill.

SIR,—In a recent letter (*Journal*, February 23, p. 463) our colleague, Dr. G. F. Somers, reported that in his experiments some fractions of glycyrrhetic acid were active against certain types of induced inflammation. We have also carried out animal experiments independently of Dr. Somers and have tested a sample of glycyrrhetic acid, obtained from a different source (melting point: 291–3°C.; specific rotation +156 in absolute alcohol at 19°C.). The sample was tested for anti-inflammatory activity by our modification of the cotton-pellet granulation tissue method of Meier, Schuler, and Desaulles.¹ Our results show that the sample has anti-inflammatory activity in this test, in which cortisone acetate and hydrocortisone acetate are active when tested under the same experimental conditions.

Dr. B. F. Russell, writing on this topic (*Journal*, December 22, 1956, p. 1483), mentioned that, although the first use of glycyrrhetic acid as a topical anti-inflammatory agent was based on the assumption that liquorice had a deoxycortone-like action, he was unaware of any report suggesting that deoxycortone had an anti-inflammatory action when applied to the skin. In our experiments we have also been able to show that deoxycortone has anti-inflammatory activity in the cotton-pellet test. We are carrying out further experiments to investigate the mode of action of glycyrrhetic acid in induced inflammatory conditions.—We are, etc.,

P. F. D'ARCY.
D. N. KELLETT.

London, W.C.1.

REFERENCE

- Meier, R., Schuler, W., and Desaulles, P., *Experientia (Basel)*, 1950, 6, 469.

Medical Advice in the Lay Press

SIR,—In a recent number of a national newspaper the newspaper's doctor published the following question and answer.

Question.—"I am troubled with shortness of breath and a fullness in the stomach. I can hardly eat anything, especially sweet food. My age is 60 and I am getting depressed."

Answer.—"Flatulence responds to half a teaspoonful of olive oil half an hour before each meal. If you are overweight, as I suspect, you should also diet. Cut down on everything made with flour, take no fat or greasy food, don't add salt to your food and reduce your fluid intake to a minimum."

The symptoms of the questioner, as published, could be due to heart failure or a carcinoma of the stomach, for example. This seems to raise the question of the desirability of such a postal service for making a diagnosis and prescribing treatment. In reply to my protest I was told that the question was abbreviated from a longer letter which seemed

to permit the answer given. If the service is for the individual questioner, then there is no need to publish question or answer. If both are intended for a wider public, then surely the answer published must apply to the question as published, for others beside the questioner may act on the advice given.

I draw attention to this in the probably vain hope that wider publicity may discourage such potentially dangerous practices in the lay press.—I am, etc.,

Edinburgh, 9.

M. B. MATTHEWS.

Relaxant Technique

SIR,—Drs. D. D. B. Morris and C. H. Dunn (*Journal*, February 16, p. 383) conclude that suxamethonium is not the relaxant of choice for anaesthesia in patients discharged from hospital within 48 hours. With this I would not disagree. I must strongly reject, however, their alternative recommendation that, to avoid post-operative muscle pains in these patients, D-tubocurarine should be administered before the suxamethonium. Their advice may lead anaesthetists to suppose that this technique is without danger of complications. Merely to observe the effects of a "test-dose" of D-tubocurarine is no guard against some of the possible mechanisms which may be initiated subsequently by such relaxant sequences.

It has recently been stressed that mixed relaxant techniques should be discouraged,^{1,2} a conclusion based on evidence that prolonged administration of a depolarizing drug makes the end-plate resistant to depolarizing influences—and consequently more susceptible to non-depolarizing relaxants. In the D-tubocurarine-suxamethonium technique recommended, should the surgical requirements necessitate an extended period of relaxation the resistance of the end-plate to depolarization may reach such a degree that the previously ineffective (but possibly still circulating) non-depolarizing drug might now lead to recurarization. Cases of prolonged apnoea have been reported after similar circumstances, and maybe it is not always justified to presume that the paralysis "could be definitely attributed to the suxamethonium."³

Other possible mechanisms by which this sequence of relaxants may not infrequently produce unexpected results can easily be demonstrated and have been experienced by anaesthetists who make a practice of using suxamethonium for closure of the surgical wound following D-tubocurarine maintenance. The administration of suxamethonium to a patient who has a minimal dose of a competitive blocking agent circulating is an encouragement to the former to act as a non-depolarizing drug. The non-depolarizing action of suxamethonium is still relatively "short-acting," but it is of a lesser intensity and of longer duration than its comparable depolarizing effect.⁴ Therefore, if attempts are made to maintain the level of paralysis usually associated with the normal action of suxamethonium, rapid accumulation may occur.

Some would have us believe that the relaxant agents are wayward drugs, continually running off the rails deliberately to betray the innocent administrator. Atypical, unexpected, and unpredictable are some of the adjectives used to describe their effects when the administrator finds himself in difficulties. In the light of the new facts now being established, these effects are to be expected; they are quite typical; they can be predicted with a great degree of certainty. Let the relaxants be your friend, and do not abuse them. The indiscriminate use of these agents in mixed sequences when the possible mechanisms and dangers involved are not fully understood can only aggravate much of the unpleasant and undeserved notoriety which neuromuscular blocking agents have received of late.—I am, etc.,

Portsmouth.

R. J. HAMER HODGES.

REFERENCES

- Hodges, R. J. H., and Foldes, F. F., *Lancet*, 1956, 2, 788.
- , *Brit. J. Anaesth.*, 1956, 28, 532.
- Brennan, H. J., *ibid.*, 1956, 28, 159.
- Hodges, R. J. H., to be published.

Obituary

EVARTS A. GRAHAM, M.D., LL.D., F.A.C.S.

Hon. F.R.C.S., Hon. F.R.C.S.Ed.

Dr. Evarts A. Graham, emeritus professor of surgery at the Washington University School of Medicine, St. Louis, and formerly surgeon-in-chief at the Barnes Hospital and St. Louis Children's Hospital, died in hospital at St. Louis on March 4 at the age of 73. Because of his technical brilliance and personal qualities as a teacher and leader he was one of the most distinguished surgeons in the world and will be remembered both for his research work and for his contributions to clinical surgery, which included the first successful removal of a lung for carcinoma of the bronchus.

Evarts Ambrose Graham was born in Chicago on March 19, 1883, and educated at Princeton University.

He studied medicine at Rush Medical College, Chicago, graduating M.D. in 1907 and shortly afterwards being appointed assistant surgeon there. In 1919 he became professor of surgery at Washington University School of Medicine, St. Louis, where for the next thirty years he worked as surgeon-in-chief at the Barnes Hospital and at the Children's Hospital. One of the advances with which his name will always be associated was

the introduction of cholecystography, his paper on the roentgenological examination of the gall-bladder being published in the *Journal of the American Medical Association* in 1924. One of the first to specialize in thoracic surgery, Dr. Graham in 1933 operated on a medical man with cancer of the lung. This was the first successful removal of an entire lung for this condition: the patient is still alive and for many years after the operation carried on a large obstetric practice.

Dr. Graham retired in 1951 from the active staff of the hospitals and university with which he had been so long associated, but he continued to undertake important research. During the second world war he served on many Government committees, holding among other important posts the chairmanship of the Committee in Surgery of the National Research Council in Washington, and did much to raise the standards of surgery throughout the United States, especially as one of the founders of the American Board of Surgery. In recent years he had assisted in the statistical investigation into the connexion between lung cancer and cigarette smoking, and in 1950, with Professor Wynder, he published one of the earliest reports on the subject.

Dr. Graham paid many visits to Britain, and in 1939 he worked for a time at St. Bartholomew's Hospital, London, as temporary professor; the medical college there awarded him the title of Honorary Perpetual Student, the highest honour in its power to confer on strangers. In his own country Dr. Graham was honoured by the presidency of the American College of Surgeons, of the American Surgical Association, and of



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the Association for Thoracic Surgery. He received numerous prizes, medals, and honorary degrees, including the honorary LL.D. of the Universities of Glasgow and Leeds. He was admitted to the honorary Fellowship of the Royal College of Surgeons of England in 1943, when Major-General W. H. (now Sir Heneage) Ogilvie visited Washington, and at the same time he was awarded the Lister Medal. He was also an honorary Fellow of the Royal Society of Medicine and an honorary member of the British Thoracic Society, and of many similar societies in other countries. It was not until 1947 that he was able to come to Britain to deliver the Lister Oration, the subject of which was "Some Aspects of Bronchogenic Carcinoma."

In addition to his other work Dr. Graham was a notable medical editor. For many years he was one of the co-editors of the *Archives of Surgery*, and he also edited the *Journal of Thoracic Surgery* and the *Year Book of Surgery*. In 1950 he was awarded the Distinguished Service Medal of the American Medical Association. Three years ago Dr. Graham came with other Fellows of the American College of Surgeons on a visit to Great Britain, and he was admitted to the honorary Fellowship of the Royal College of Surgeons of Edinburgh a few days after giving the second Sir John Fraser Memorial Lecture in the University of Edinburgh on the subject of cancer of the lung. In recent years he was chairman of the Board of Regents of the American College of Surgeons, and in 1953 he was President of the International Congress of Surgeons. A distinction he particularly valued was the Charles A. Mickle Fellowship, awarded to him in 1943 by the Council of the Faculty of Medicine of the University of Toronto. This honour is given "to that member of the medical profession who is considered by the council to have done the most during the preceding ten years to advance sound knowledge of a practical kind in medical art or science."

We are indebted to Sir RUSSELL BROCK for the following appreciation:

Evarts Graham was probably the greatest surgeon produced anywhere in the world in the first fifty years of this century. He went to St. Louis as professor of surgery after the first world war with already a considerable reputation as a surgical investigator as a result of his work on empyema. He found Barnes Hospital a rather small and unimportant place. When he retired two or three years ago it was transformed in many ways, all due to his genius. It had become a large collection of well-organized and well-equipped buildings comprising over 1,000 hospital beds. He had an unusual and apparently a very simple efficiency in persuading wealthy donors to provide what he wanted for expansion.

The hospital had become a world-renowned centre for much that was new and progressive in surgery. In the 1920's cholecystography was born and has continued a healthy existence. In the 1930's came his pioneer work on thoracic surgery, culminating in the first successful pneumonectomy for bronchial carcinoma. That first patient, still alive 24 years after, became an inspiration and stimulus to all surgeons who followed Graham's footsteps in those early difficult days of the surgical treatment of lung cancer, in which despair could easily quench enthusiasm.

By the time of the second world war he had become an elder statesman of surgery and nearly exhausted himself in the many government duties which he added to his routine work. In the last years of his active work he led the statistical and experimental research which drew world-wide attention to the causal relationship between cigarette smoking and lung cancer.

His personal contributions to surgery make him a surgical immortal, but to those who had the privilege of working with him he had yet another greatness, the power of inspiring and guiding young surgeons. Graham's "boys" are to be found the world over, many of them holding top-rank surgical professorships. There are at least half a dozen surgeons in Great Britain who can attest to the great and lifelong influence that he had on them and their work.

Graham was on the whole a quietly diffident man with a pleasant and friendly smile. When necessary, however, he was capable of holding his own with anyone. He was a charming and accomplished lecturer who put over his strongly held views with sincerity and conviction.

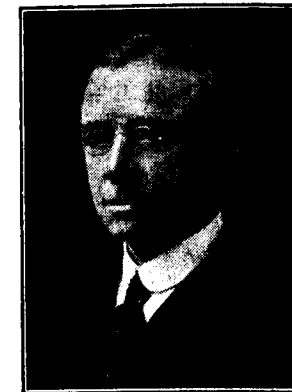
An honorary fellow of the Royal College of Surgeons of England, he was looked upon as a real friend and, indeed, almost an elder statesman of English surgery. We look back with pleasure to the numerous visits he was able to pay to Europe and to London during the last few years. The irony of fate decreed that he should die from the very disease he had done so much to alleviate. Fate, however, was kind in that the course of his final illness was mercifully swift.

D. W. CARMALT JONES, D.M., F.R.C.P.
F.R.A.C.P.

Professor D. W. Carmalt Jones, emeritus professor of systematic medicine in the University of Otago, New Zealand, died peacefully at his home at Edgware, Middlesex, on March 5. He was 82 years of age.

Dudley William Carmalt Jones was born in London on August 30, 1874, the eldest son of Mr. T. W. Carmalt Jones, who was a laryngologist. From Uppingham School he went on to Corpus Christi College, Oxford, where, intending to enter the teaching profession, he at first took classics. However, a year or two later he decided to become a doctor and entered St. Mary's Hospital for his clinical training, graduating B.M., B.Ch. in 1903. After holding the appointments of house-surgeon and house-physician at St. Mary's, he became senior house-physician at the National Hospital for the Paralyzed, Maida Vale. Returning to St. Mary's,

he was appointed an assistant in the laboratory of Sir Almroth Wright, whom he revered, saying that for him the world consisted of two kinds of people—Sir Almroth Wright and all the others. Elected a Member of the Royal College of Physicians of London in 1907, he joined the staff of the Seamen's Hospital, Greenwich, as an assistant physician. In the following year he became assistant physician at the Westminster Hospital, and in 1910 was appointed honorary director of the department of bacterio-therapeutics, a post he held until the end of 1913. Earlier in that year he was elected full physician to the hospital, and for a time was dean of the medical school. He proceeded to the D.M. in 1911 and was elected F.R.C.P. in 1914. He served in the R.A.M.C. throughout the first world war, in France from 1915 to 1918 and as consulting physician to the Egyptian Expeditionary Force in 1918–19, attaining the rank of temporary colonel. As a result of his wartime experience he published papers in *Brain* and



in the *Quarterly Journal of Medicine* on "war-neurasthenia" and on segmental hyperalgesia in visceral lesions.

Carmalt Jones was appointed Mary Glendining professor of systematic medicine in the University of Otago in 1920. When he resigned from the staff of the Westminster in order to take up his new appointment he was made consulting physician to the hospital, retaining this honorary appointment until his death. His work in New Zealand hardly offered the opportunities for research he had in London, for his main duty—and one he gladly accepted—was to teach elementary medicine to undergraduates. His clinical teaching was given in the wards of Dunedin Hospital, to which he became physician and, later, consulting physician. For a good many years he had a private consulting practice, but his work at the university and hospital increased to such an extent that he decided to give his whole time to it. In the wards he taught by example, insisting on a thorough examination of the patient and on the keeping of full and accurate records of clinical findings. By nature he was gentle and kindly, and patients were human beings to be treated with courtesy, kindness, and patience. All this was readily gleaned by his students, and he did not falter in his determination to give them the soundest possible instruction in the basic principles of medicine. His efforts did much to enhance the reputation of the New Zealand school of medicine, and many of his students made their mark in later years in Britain and elsewhere. Carmalt Jones retired from the chair of systematic medicine in 1939 and in the following year was appointed professor emeritus. Later he returned to live in England.

The Dunedin representative on the editorial committee of the *New Zealand Medical Journal* for many years, Carmalt Jones was also responsible for the first publication of the *Proceedings of the University of Otago Medical School*, which reached its sixteenth number in 1939 under his sole editorship. He was the author of *An Introduction to Therapeutic Inoculation* (1911) and *Organic Substances, Sera and Vaccines in Physiological Therapeutics* (1924). He also wrote *Elementary Medicine in Terms of Physiology* in 1929—a book clearly from the pen of a first-class teacher—and the *Annals of the University of Otago Medical School, 1875-1939*, published in 1945, which is an interesting volume recording not only the history of medicine in New Zealand but also the general history of the Dominion, with a chapter on its fauna and flora.

A member of the British Medical Association for nearly fifty years, he was president of the New Zealand Branch in 1935-6. In 1938 he became a foundation Fellow and Vice-President and a member of the first council of the Royal Australasian College of Physicians.

Carmalt Jones was a cultured man, educated in the old classical tradition. He had many interests outside medicine, literature in particular. Some of the sonnets which he wrote were put to music. He had an enviable talent as a draughtsman and often illustrated his own Christmas cards. In New Zealand he developed a keen interest in ceramics, and helped to look after one of the national collections. A great walker, he also became a renowned trout fisherman. In recent years, after his return to England, his eyesight began to fail, and this prompted his interest in the Edgware and District Club for the Blind, of which he was honorary secretary for some time.

In 1907 he married Miss Mabel G. Tottenham and had one son and one daughter. Mrs. Carmalt Jones died in 1955.

H. C. ELDER, M.B., M.R.C.P.Ed., D.P.H.

Dr. H. C. Elder, formerly chief tuberculosis officer for the Corporation of Edinburgh, died at his home in that city on February 23 at the age of 68.

A native of Dundee, Herbert Calder Elder studied medicine at the University of St. Andrews, and later at Edinburgh, where he graduated M.B., Ch.B. in 1917. He was then appointed house-physician to Sir Robert Philip's wards in the Royal Infirmary. In 1920 he was elected a Member of the Royal College of Physicians of Edinburgh and he took the D.P.H. of the Scottish Royal Colleges in 1929. His association for the first two years of his medical career with the most eminent phthisiologist of the period provoked and maintained an enthusiastic interest in tuberculosis for the remainder of his lifetime. This subsequently led to his appointment as consultant tuberculosis officer to Edinburgh Corporation in 1921 and to his promotion nine years later as chief of the department, from which he retired in December, 1953, after 32 years of conscientious service.

The clarity of vision which Elder brought to the diagnostic study of diseases of the chest and his excellent command of the French language allowed him to appreciate the significance of Forrester's work on the investigation of the broncho-pulmonary system by means of "lipiodol" at an early stage, and he was one of the first clinicians to introduce the method into this country. Written in collaboration with Dr. John Guy and published in the *Edinburgh Medical Journal* of May, 1926, their article on the results of their research into the possibilities of bronchography was the first British contribution to the literature on this subject. With his great ability as a linguist Elder gained a profound knowledge of the Continental literature on his subject, and he did not hesitate to adopt from this source any further innovations which he considered to be of advantage in his practice as a chest physician. His attainments were eventually recognized by his appointment as lecturer in tuberculosis to the medical school of the Edinburgh Royal College of Physicians in 1930, from which post he resigned in 1939.

Elder had many and diverse interests to which he brought the same concentration and scrupulous care for detail which characterized his professional life. He was an accomplished pianist, and had an extensive knowledge of classical literature, from which he quickly produced many a pertinent quotation to suit the occasion, no matter how unexpected it might be. In the realm of sport he concentrated mainly on golf, a game at which he was a scratch player. Shy and retiring by nature, he was apt to hide his reserve with a brusqueness which gave a mistaken impression of his essential kindness and sympathy and made him a difficult man with whom to establish any degree of intimacy. As physician-superintendent of the Royal Victoria Hospital, and physician in charge of the tuberculosis wards in the City Hospital and of the out-patient clinic at the Royal Victoria Dispensary during his tenure as chief tuberculosis officer, he had the affection of his patients, who seldom failed to appreciate his warm devotion and interest in their welfare. He is survived by his wife, to whom our sympathy is extended.—J. McD. S.

H. S. STANNUS, C.B.E., M.D., Ph.D., F.R.C.P., D.T.M.&H.

Dr. J. MOORE writes:

It was with great sorrow, I am sure, that those who knew him heard of the death of Hugh Stannus Stannus, whose obituary was published in the *Journal* of March 9 (p. 589). Having known him more than twoscore years and having been a colleague of his at the French Hospital for more than 30 years, it is with much emotion that I write these too few lines concerning him; frequent exchange of views on the same professional occupation and especially in medicine fosters most friendly ties and esteem. Having accepted the compliment of being chosen to honour his memory, I began to wonder why it had fallen upon me. I came to realize that, though academically different, our careers had often coincided with each other. I became a postgraduate student at St. Thomas's Hospital, where he had been house-physician and senior ophthalmic house-surgeon. I was resident medical officer at the British Hospital in Paris a few years after he had held that post; he had followed a postgraduate course in a Paris hospital where I was house-physician; I was appointed physician to the French Hospital, and for a number of years we were both in charge of out-patients on alternate days. If I mention these coincidences it is because they gave me the opportunities to discover to what extent he had been appreciated by staff and patients in all those instances. I also remember deputizing for him during two periods of six weeks at the Board of Inland Revenue, where he was medical adviser, and again I heard his praise. He was an inborn common-sense psychologist. His special knowledge in tropical medicine was recognized when he became physician on the associate staff to the Hospital for Tropical Diseases in London and examiner in tropical medicine at the University of Liverpool. I cannot illustrate better how he linked his enthusiastic scientific interest with his human feelings than by putting on record his attitude when, fresh from Paris, I told him of the successes obtained there with Wagner von Jauregg's malaria therapy in G.P.I., and I asked him to help me to give such pyrexia-choc-therapy to a man patient suffering from this condition and who after the cure was able to resume his occupation as manager to a large hotel. I recall this case because I shall never forget the great scientific care he took over it, as well as his most human anxiety for the patient in the course of the therapeutic procedure. On his retirement as senior physician to the French Hospital in London he was made consultant physician, and since 1934 had been a member of the committee of management, which will I am sure miss his impartial opinion. I feel that all the Fellows of the Royal Society of Medicine who knew him will, like myself, miss his greeting smile in the library and talks with him in the lounge, as well as his amiable manner and that happy smile which so often developed into a discreet, almost bashful, laugh: and we shall all keep the pleasant memory of very interesting and most congenial moments spent with him.

Medical Notes in Parliament

PRIME MINISTER ON DOCTORS' PAY

The PRIME MINISTER announced on March 12 the names of the Royal Commission to consider the remuneration of doctors in the Health Service. The chairman is Sir Harry Pilkington, chairman of Pilkington Bros., company director, director of the Bank of England, president of the F.B.I., 1953-5. The other members are: Mrs. Baxter, secretary to the Cambridge University Women's Appointments Board; Mr. A. D. Bonham-Carter, a director of Unilevers; Mr. J. H. Gunlake, vice-chairman of the Institute of Actuaries; Professor J. Jewkes, Professor of Economic Organization, Oxford University; Mr. I. D. McIntosh, headmaster of George Watson's College, Edinburgh; Sir D. Hughes Parry,

Q.C., Professor of English Law, London University; Sir Hugh Watson, Edinburgh, Deputy Keeper of Her Majesty's Signet; and Mr. Samuel Watson, secretary to the Durham Miners' Association.

More for Junior Hospital Staff

The PRIME MINISTER said he had asked the chairman to treat the work of the Royal Commission as a matter of urgency. He also explained that the appointment of the commission did not preclude an interim adjustment in advance and without prejudice to the recommendations. The Government had already decided to make such an adjustment without delay in the remuneration of junior hospital staff, medical and dental, up to and including the grade of senior registrar, all of whose remuneration would be increased by 10% from April 1. They were also considering what should be done by way of an interim adjustment for the other doctors and dentists covered by the commission's terms of reference. He would make a further statement on this in due course. The Government were convinced that this procedure was a fair and proper one. They were also confident that with good will on all sides it would result in the position of the medical and dental professions in the Health Service being placed on a mutually satisfactory and lasting basis.

Spens Recommendations

Dr. EDITH SUMMERSKILL (Warrington, Lab.) opened the interrogation of the Prime Minister by asking if this meant that the Spens recommendations were entirely repudiated and whether there would be some kind of arbitration machinery pending final recommendations of the commission. Mr. MACMILLAN said the Spens recommendations would be within the terms of the Royal Commission to consider. With regard to any interim arrangement, they were considering what could be done for those other than junior hospital staff who were covered by the commission's terms of reference. He also stated in answer to other questions that he thought the terms of reference were wide enough to deal with all the relevant matters, including assistant doctors. That would be for the commission itself to decide. He was asked what he meant by the phrase "in due course" and said he used these words because other expressions appeared to be unduly optimistic or unduly pessimistic.

Mr. SOMERVILLE HASTINGS (Barking, Lab.) said there was a strong feeling in the profession which had not existed with the passing of the Health Service Act, and he asked if the Prime Minister would instruct the commission to issue an interim report within a given time—say three months. Mr. MACMILLAN said he had considered that, but thought it better to deal immediately with the case that everybody thought well made out—the junior hospital staff—to try to get an interim adjustment for the remainder, and to let the commission produce a proper report as soon as it could.

Mr. M. LIPTON (Brixton, Lab.) said there would be a strong case for back-dating any interim adjustment for general practitioners to April 1, as for hospital doctors. Mr. MACMILLAN replied, "You had better wait and see from what date it is to start."

Hydrogen Bomb Tests

The Prime Minister was urged again on March 5 to take the initiative in halting further hydrogen bomb tests. Mr. W. WARBEY (Ashfield, Lab.) suggested that this should be done because of newly published evidence that the amount of strontium-90 and other radioactive particles released by such explosions had already reached a potentially dangerous level. Mr. MACMILLAN said he understood that the Medical Research Council had no evidence that the amount of strontium-90 and other radioactive particles released by hydrogen bomb explosions which might become sources of internal radiation had reached a potentially dangerous level. The present and foreseeable hazards, including genetic effects from external radiation due to fall-out from the test

explosions of nuclear weapons, fired at the present rate and in the present proportion of the different kinds, were considered to be negligible. Accordingly he was not prepared to postpone the forthcoming test in the Pacific. So far, however, as long-term policy was concerned, the policy of the Government had been clearly defined. Various proposals on nuclear and conventional disarmament would be considered when the United Nations Disarmament Subcommittee met on March 18.

Mr. WARBEY asked when the M.R.C. gave the Prime Minister this information, and if they took into account the new evidence produced by Dr. Libby, the American atomic energy commissioner, who according to a report showed that the level of strontium-90 would by 1970 reach a level as dangerous as that laid down in the M.R.C. standards. Mr. MACMILLAN said the M.R.C. report was published last June. The Council was in continuous touch with the matter. He stated in subsequent replies that the Government would prefer a broad disarmament agreement, covering the conventional as well as the unconventional weapons. Failing that, they would like an agreement for the limitation of tests. But he was not prepared to postpone the impending tests. Dr. EDITH SUMMERSKILL (Warrington, Lab.) said the Prime Minister's statement was considered out of date by the authorities, and could not be reconciled with what had been said by Professor Haddow, who was regarded as the greatest authority in this country on this subject. Mr. MACMILLAN replied that Governments could only rely on the best authorities they could find. The Medical Research Council comprised the best-organized and most efficient research on this matter that could be found.

Five Seconds Too Soon

Mr. GEOFFREY DE FREITAS (Lincoln, Lab.) asked the Minister of Supply by what type of Royal Air Force aircraft the damage done during an operation to the glass roof of the operating theatre of the Southport Infirmary was caused; and whether he would see that, in future, flights of this kind took place over the sea.

Mr. WILLIAM J. TAYLOR, the Parliamentary Secretary, stated that the aircraft concerned was a P.1 fighter flown by a pilot of the English Electric Company under contract with the Department. The aircraft was headed out to sea where the test was to take place. The pilot was obliged to get his position by radio bearings because there was cloud below him, and he passed through the sound barrier five seconds too early and just before crossing the coast. It was much regretted that damage was caused. For reasons that had been previously explained, no undertaking could be given to confine supersonic flying wholly to sea areas, although the Ministry did their utmost to avoid causing damage and inconvenience.

Meeting with Prime Minister

Mr. M. LIPTON (Brixton, Lab.) asked the Prime Minister on March 11 why he was arranging to meet representatives of the B.M.A. for the second time. Mr. R. A. BUTLER, who replied in the absence of Mr. Macmillan, said the Prime Minister would meet representatives of the joint negotiating committee of the medical profession on March 12, at their request. This would be the first time they had met. Mr. LIPTON.—If the Prime Minister is at last going to agree that the general practitioners are entitled to an interim adjustment of pay, why did he not say so clearly at the start, thus avoiding a lot of unnecessary ill-feeling? Is he trying to tiptoe out of an impossible situation? Mr. BUTLER replied "No," and explained that there were a number of questions on this subject for the following day, and he could not anticipate them. With reference to the Prime Minister's gait, he was not nearly so flat-footed as Mr. Lipton.

Royal Commission and Merit Awards

Mrs. LENA JEGER (Holborn and St. Pancras, South, Lab.) asked the Minister of Health whether it would be within

the terms of reference of the Royal Commission on doctors' and dentists' remuneration to consider the abolition of merit awards. Mr. VOSPER.—The Royal Commission will normally be concerned with levels of remuneration, not with methods as such. Whether or not questions such as that referred to are within its terms of reference must rest with the Commission itself to decide.

Group Practices

Sir KEITH JOSEPH (Leeds, North-east, Con.) asked the Minister of Health what was the proportion of general practitioners who at the latest available date were working single-handed, as opposed to working in partnership or group practice; and whether this was higher or lower than a year previously, and by how much. Mr. VOSPER said that on July 1, 1956, 34.42% of the general practitioners providing unrestricted medical services in the Health Service were in single-handed practice. This figure was 1.33% lower than the corresponding figure for a year earlier.

Prison Examination

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked the Home Secretary on March 7 whether he would institute procedure whereby every prisoner on entering prison would be fully examined in order to ascertain his full case history, and to assess his personality, in order that planned treatment should be available.

Mr. J. E. S. SIMON, Under-Secretary, Home Office, stated that such procedure already existed, and for prisoners sentenced to corrective training or preventive detention was carried out at an allocation centre with a specialized staff. For those sentenced to imprisonment it was not possible, pending the establishment of remand and observation centres, to carry out personality assessment on an equally satisfactory basis. In reply to a further question he said that, where the nature of the offence or other considerations suggested the need for special mental examination, the medical officer would make such an examination, and where there was a psychologist in post he would also have a psychological report.

Mr. Simon also told Dr. Stross that there were 46 doctors employed full-time in prisons in England and Wales, and six of them held the diploma of psychological medicine. Dr. STROSS suggested that it would be reasonable to ensure that as many as possible should have the diploma. Mr. SIMON said that for applications to the prison service the diploma was regarded as an advantage but not a prerequisite, because the posts did not involve full-time psychiatric work. When an outside consultant was brought in he was always a specialist.

Dental Repairs.—The cost to the general dental service of repairs to dental appliances is about £1m. a year in England and Wales. The Ministry of Health has no evidence suggesting that undue expenditure on repairs is being caused by deficiencies in the technical processes or materials employed.

Medico-Legal

PNEUMOCONIOSIS CASE RE-TRIED

A man who contracted pneumoconiosis and was awarded £9,645 damages against his employers in 1955 had the decision reversed at a re-trial by Mr. Justice Pearson in the High Court on March 7. Entering judgment with costs for defendants, Highway Ironfounders (West Bromwich) Ltd., his lordship said the misfortune of the case fell on the plaintiff, Walter Richards, of West Bromwich, and he was not entitled to damages.

In 1929 or 1930 Richards became a moulder in the employment of this firm. His job entailed filling moulds with molten metal, and, when they had cooled, knocking out the forms. During the knocking-out process clouds of

dust and sand are emitted. By 1946 Richards was seriously affected with silicosis; by 1948 he was incurably ill. By 1954, when he was in his forties, he was largely incapacitated. He then brought an action against his employers, claiming that, under s. 47 of the Factories Act, 1937, they ought to have provided him with a mask or respirator. Evidence was given at the original hearing that the silicosis had taken 15 years to develop and that in 1950 there were twenty different types of respirator, of which only one, the Mark IV, was known, in the light of later knowledge, to be capable of providing protection.

Mr. Justice Devlin had then decided that the mask ought to have been provided, and awarded £9,645 damages. On appeal the Court of Appeal directed a new trial on the question whether failure to provide Mark IV masks was a breach of the employers' obligation under s. 47, and, if so, to what extent Richards's condition was caused by their absence, since he had been in his job for 10 years before the masks became available.

Mr. Justice Pearson, giving judgment, said it was not appreciated by any competent person until about 1950 that a man doing the ordinary work of a foundry moulder could get pneumoconiosis. It was not known at the time the plaintiff contracted the disease, and the Master of the Rolls, during the Court of Appeal hearing, had said that precautions taken had to be in the light of established knowledge. It was admitted that the plaintiff contracted the disease in the course of his employment at the defendants' ironworks foundry from fine dust inhaled while making moulds. The materials used included sand and coal-dust, and the room was comparatively low. The silica dust which did the damage was in such small particles that it was invisible, but there was other dust which could be seen. Richards contended that, while it was true that the danger from the invisible dust was not known at the material time, masks should have been provided as a protection against the visible dust, and this would have afforded protection against the unknown invisible particles. This, said the judge, was an artificial issue. The employers had pleaded that it would have been futile to supply the masks, because the men would not have worn them. His lordship said this was untenable in law and did not absolve the defendants from their statutory duty, but he held that the use of the particular type of mask necessary under the circumstances—the Mark IV—would not have been a practicable measure. There had been no negligence or breach of statutory duty.

Vital Statistics

Tetanus in Hospital

Five cases of tetanus, two of them fatal, were reported last week as having occurred after surgical operations at the North Staffordshire Royal Infirmary, Stoke-on-Trent. On March 11 the city coroner, Mr. G. W. Huntbach, opened (and adjourned) an inquest on the two patients who died—men aged 52 and 43 respectively. The source of the infection is being investigated. When the inquest is resumed it will be held before a jury.

Defective Poliomyelitis Vaccine

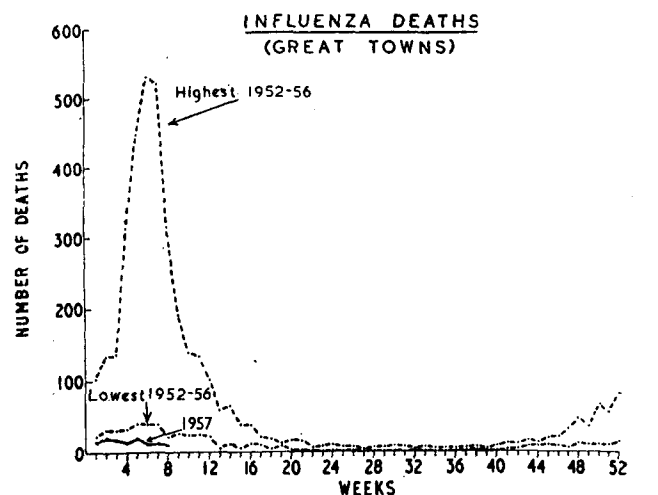
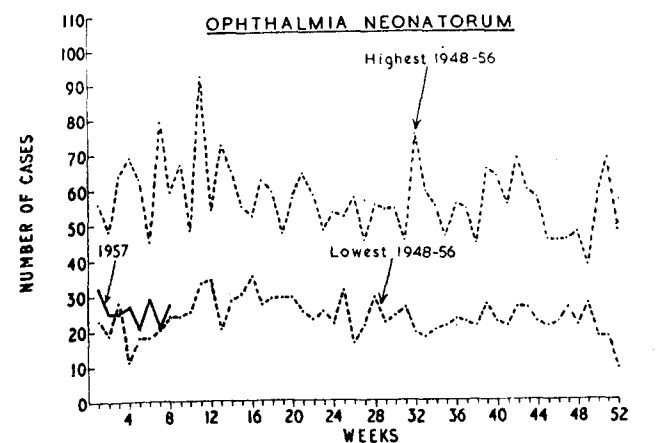
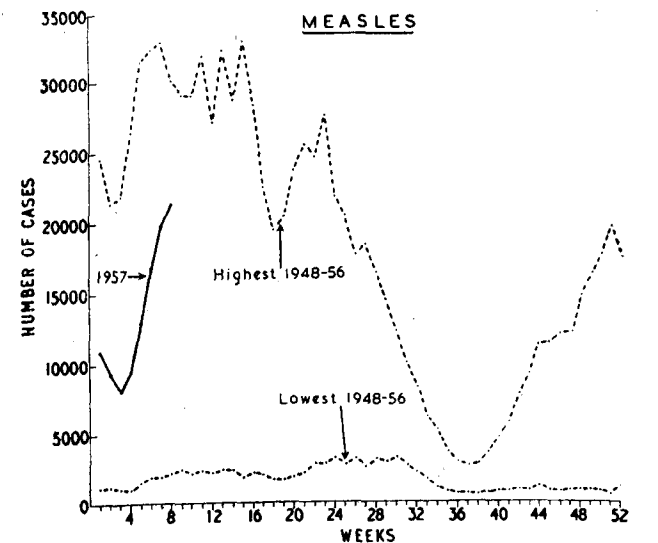
The defect in the 47 vials of poliomyelitis vaccine in the latest batch (*Journal*, March 9, p. 594) has been traced to contamination by a non-pathogenic organism, *Pseudomonas fluorescens*. The contamination is attributed to faulty containers. Repeated sterility tests on the remainder of the batch have been negative, and tests by incubation at various temperatures have caused no discoloration of normally coloured vaccine. It has consequently been decided in agreement with the Medical Research Council to issue the rest

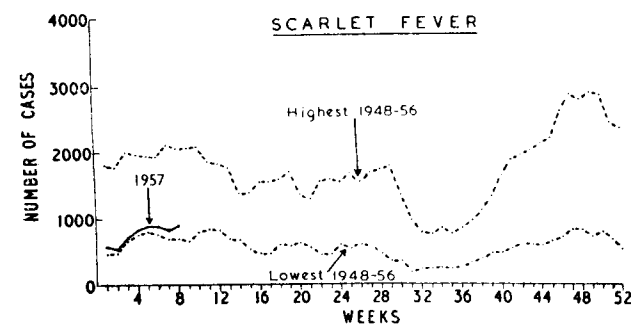
¹ *British Medical Journal*, 1955, 2, 1035.

of the vaccine. This information was given by the Chief Medical Officer of the Ministry of Health in a letter sent on March 11 to all medical officers of health.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the years 1948–56 (influenza 1952–6) are shown thus ———, the figures for 1957 thus ———. Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





Infectious Diseases

The largest rises in the notifications of infectious diseases in England and Wales during the week ending February 23 were 1,607 for measles, from 19,710 to 21,317, 60 for scarlet fever, from 830 to 890, 27 for whooping-cough, from 3,163 to 3,190, and 22 for dysentery, from 1,274 to 1,296; the only large falls were 51 for acute pneumonia, from 676 to 625, and 48 for food-poisoning, from 187 to 139.

The largest rises in the incidence of measles were 437 in London, from 1,508 to 1,945, 233 in Warwickshire, from 381 to 614, 233 in Yorkshire West Riding, from 1,196 to 1,429, 218 in Essex, from 1,545 to 1,763, 187 in Middlesex, from 929 to 1,116, and 159 in Durham, from 1,393 to 1,552; the largest falls were 99 in Yorkshire East Riding, from 578 to 479, 72 in Oxfordshire, from 346 to 274, and 61 in Cornwall, from 230 to 169. The largest fluctuations in the trends of whooping-cough were a rise of 51 in Durham, from 153 to 204, and a fall of 37 in Hertfordshire, from 101 to 64. Only small variations were recorded in the local returns of scarlet fever. 2 cases of diphtheria were notified, the same number as in the preceding week.

6 of the 8 cases of paratyphoid fever were notified in Yorkshire East Riding, Kingston-upon-Hull C.B.

39 cases of acute poliomyelitis were notified, and these were 1 fewer for paralytic and 3 more for non-paralytic cases than in the preceding week. The largest returns were Buckinghamshire 5 (Wing R.D. 3), Northamptonshire 4 (Brackley R.D. 3).

The chief centres of dysentery were Lancashire 272 (Accrington M.B. 47, Stretford M.B. 29, Tyldesley U.D. 26, Urmston U.D. 25, Ashton-under-Lyme M.B. 22, Blackburn C.B. 17, Salford C.B. 15, Liverpool C.B. 11); Yorkshire West Riding 267 (York C.B. 82, Rotherham C.B. 49, Leeds C.B. 41, Wetherby R.D. 19, Batley M.B. 17, Sheffield C.B. 11), London 93 (Wandsworth 28, Kensington 11, Fulham 10), Warwickshire 82 (Coventry C.B. 50, Birmingham C.B. 20), Carmarthenshire 76 (Kidwelly M.B. 59, Llanelly R.D. 10), Northumberland 60 (Blyth M.B. 32, Newcastle upon Tyne C.B. 13, Alnwick U.D. 11), Durham 58 (Sunderland C.B. 26, Gateshead C.B. 25), Middlesex 57 (Hayes and Harlington U.D. 32), Essex 57 (East Ham C.B. 24, Thurrock U.D. 16), Staffordshire 51 (West Bromwich C.B. 20, Kidsgrove U.D. 10), Nottinghamshire 42 (Arnold U.D. 13, Nottingham C.B. 10), Bedfordshire 40 (Luton M.B. 25, Bedford M.B. 13), Yorkshire East Riding 36 (Kingston-upon-Hull C.B. 27), Surrey 25 (Woking U.D. 14), Wiltshire 25 (Calne and Chippenham R.D. 23), and Yorkshire North Riding 21 (Middlesbrough C.B. 20).

414 cases of dysentery were notified in Scotland, 196 more than in the preceding week. The largest returns were Glasgow 209, Edinburgh 51, Lanark county 34, and Aberdeen 24.

Week Ending March 2

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 833, whooping-cough 3,000, diphtheria 7, measles 23,060, acute pneumonia 664, acute poliomyelitis 30, dysentery 1,291, paratyphoid fever 10.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending February 23 (No. 8) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1957					1956				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	2	0	2	0	4	5	1	4	0	8
Dysentery ..	1,296	93	414	15	5	1,653	123	166	13	7
Encephalitis, acute	1	0		0		1	0		0	
Enteric fever:										
Typhoid ..	1	1	2	0	1	0	0	0	0	0
Paratyphoid ..	8	1	1(B)	0		4	1	3(D)	0	
Food-poisoning ..	139	16	15	1		102	9		0	
Infective enteritis or diarrhoea under 2 years ..					10				10	
Measles * ..	21,317	1945	500	477	346	3,177	49	171	27	148
Meningococcal infection ..	26	1	10	1	1	41	1	8	1	3
Ophthalmia neonatorum ..	27	1	8	0	1	32	2	8	0	
Pneumonia † ..	625	45	241	16	2	1,406	73	410	21	3
Poliomyelitis, acute:										
Paralytic ..	30	0	1	0	5	12	0	0	2	0
Non-paralytic ..	9	2				5	0			
Puerperal fever § ..	237	40	10	1		241	39	5	1	
Scarlet fever ..	890	62	87	30	40	873	38	86	48	39
Tuberculosis:										
Respiratory ..	672	88	116	16		572	64	151	34	
Non-respiratory ..	86	4	12	5		52	1	22	4	
Whooping-cough ..	3,190	158	375	7	57	1,041	47	92	88	154

DEATHS In Great Towns	1957					1956				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	1
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute		0			0		1			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	8	0	0	0	0	7	0	0	1	2
Influenza ..	10	0	1	1	0	144	11	11	0	3
Measles ..		1	0	0	0		0	0	0	0
Meningococcal infection ..		0	0				1	1		
Pneumonia ..	249	42	31	14	8	675	95	44	31	9
Poliomyelitis, acute	1	0		0	0	2	0		0	0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory ..	59	5	8	1	6	96	14	9	0	4
Non-respiratory ..		1	2	0	0		1	1	0	2
Whooping-cough ..	1	0	1	1	0	1	1	0	1	1
Deaths 0-1 year ..	226	25	34	5	10	280	29	18	13	9
Deaths (excluding stillbirths) ..	5,904	845	647	128	208	8,574	1,257	793	172	207
LIVE BIRTHS ..	8,185	1,162	989	205	364	7,701	1,124	951	214	391
STILLBIRTHS ..	231	25	22			221	21	37		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenza pneumonia.
§ Includes puerperal pyrexia.

Medical News

Medical Society of London.—The Medical Society of London was founded in 1773 by John Coakley Lettson, and last week the Society held its 177th anniversary dinner in commemoration of this notable event. Lord EVERSHED proposed the health of the Society; in response, the President, Dr. T. C. HUNT, said that it was going from strength to strength, with a membership now of 700. He paid a special tribute to their newly elected honorary fellow, Sir Gordon Gordon-Taylor, and to the registrar and honorary secretaries. Dr. J. S. RICHARDSON proposed the health of the guests. In reply Dr. MACDONALD CRITCHLEY entertained the company by reading to it a note—apparently from the patient's doctor—which accompanied a very deaf old lady whom he had seen that morning as an out-patient. It read as follows: "Go to any hospital. Ask to see the psychiatrist. Tell him you are for ever moaning. I really can't stand it. I have my own troubles."

International Federation of Medical Student Associations.—Last week the federation's executive board met in London for the first time, the British Medical Students' Association acting as hosts. Sir CECIL WAKELEY performed the official welcoming ceremony. Receptions in honour of the federation were given by the B.M.A., London University, the *Practitioner*, and the Lord Mayor of London. The board's business included arrangements for student exchanges, summer schools, and European tours for medical students from Africa and Asia. The chairman of the board was Mr. ANDERS MOBERG, of Sweden, and other members came from Britain, Denmark, Germany, Holland, Italy, Norway, and Yugoslavia.

Nuclear Explosions.—On February 27 Professor A. HADDOW addressed the Parliamentary Association for World Government on the subject of nuclear test explosions. Professor Haddow is director of the Chester Beatty Research Institute at the Institute of Cancer Research, London. Even in the nine months since the publication of the reports by the Medical Research Council and the U.S. National Academy of Sciences on radiation hazards there had been certain significant shifts of emphasis, he said, which showed the need for continuous appraisal. Thus, newer ideas on selective or differential mutagenesis could, if substantiated, render obsolete even recent discussion of what were genetically significant doses. Second thoughts on permissible radiation levels were suggested by the proposal of the U.S. National Bureau of Standards for a threefold reduction in the maximum permissible exposure to high-energy radiation at present recommended by the International Commission on Radiological Protection. As to the risk of bone tumours from radiostrontium, this was not immediately alarming but could become so, and might prove a limiting factor to test explosions. It was estimated that if tests were to continue at their present rate the average world-wide concentration would in 1970 reach a figure corresponding at its upper limit to only 1/125 of the accepted maximum permissible concentration, but one which approached the level considered significant in the M.R.C. report, *The Hazards to Man of Nuclear and Allied Radiations*. Further, the probability of individual variation was of extreme importance. Professor Haddow made a plea that the hazards—both genetical and individual—should be neither over- nor under-estimated. Fuller and more frequent information should be provided, so that medical men, and the general public, could more easily judge the risks.

Doctor at Large.—This is the third of Richard Gordon's medical comedies to be filmed (Leicester Square Cinema), and it is just as entertaining as the others. The education offered by St. Swithin's Hospital in *Doctor in the House* was undoubtedly a broad one. It seems to have been just what was needed to equip Dr. Sparrow (Dirk Bogarde) for entry into

general practice. He soon discovers that an assistant can run into trouble with his principal if the principal's wife is young, pretty, ardent, and frustrated. Patients, too, are not what they were, or at least they have different ways of impressing that unpalatable truth on young doctors. Barrack-room lawyers who know their rights under the Health Service give Dr. Sparrow some trouble, and it is with relief that he finds himself in a locum job somewhere west of Harley Street. His first lesson here is that a good suit is worth more than a good stethoscope. His second is that patients, like principals' wives, can be troublesomely amorous. A pastoral interlude in the country follows, then a visit to the Riviera. But in the end he abandons the hazards of an on the whole enviable series of assistantships for the rigours of St. Swithin's again, this time as house-surgeon to the roaring Sir Lancelot Spratt (James Robertson Justice). And, as is customary in this genre, he puts a girl (Muriel Pavlow) out of her misery by intimating, albeit reluctantly, that he would like to marry her.

Universities in South Africa.—On March 11 the Government of South Africa introduced its university apartheid Bill in the House of Assembly. This Bill provides for compulsory apartheid in South Africa's universities, and for the transfer of control of the Durban Medical School and Fort Hare University College to the Government (see *British Medical Journal*, March 2, p. 532).

Awards for Bravery.—Flying Officer J. C. M. WILKINSON, medical officer to the R.A.F. station at Changi, Singapore, has been awarded the Air Force Cross. He executed a parachute landing on Christmas Island in very bad weather last December to render medical aid to a doctor's wife suffering from a severe post-partum haemorrhage. His "action, in parachuting over strange territory in adverse weather conditions, showed courage and determination of a very high order," states the citation. The drop was carried out when the wind over the island was blowing at about 18 knots. Dr. J. W. MORGAN, of Port Talbot, Glamorgan, has been awarded the Queen's Commendation for Brave Conduct for his services when two men were trapped in an iron-ore bunker.

Will Edmonds Clinical Research Fund.—Registered medical practitioners are invited to apply for a whole-time fellowship for clinical research in hospitals in the metropolitan area of London. The starting salary is at the rate of £1,250 a year, and the fellowship is renewable annually up to a total of three years. Further details may be obtained from the assistant secretary, Royal College of Physicians, Pall Mall East, London, S.W.1. The closing date for applications is May 31.

Glasgow Offers Prizes.—To stimulate attendance at the city's mass radiography campaign, the Corporation of Glasgow is offering substantial prizes, such as a motor-car, a bedroom suite, and a refrigerator. The prizes have been given by local firms. A scheme is also being worked out for smaller prizes. Another important incentive is an assurance from Dr. H. K. COWAN, chief medical officer of the Department of Health for Scotland, that anyone found to have tuberculosis will be admitted immediately to hospital should his condition require it.

Antihistamines for Motion Sickness.—Regulations are being drafted to exclude antihistamine preparations for motion sickness from the provisions of the Pharmacy and Poisons Act, 1933, and the Poisons Rules. This is stated in a notice from the Home Office.

Professor H. A. Krebs, F.R.S., Whitley professor of biochemistry at Oxford, has been elected to the University's hebdomadal council.

Dr. Frank Falkner, assistant professor of child health at Louisville University, Kentucky, has been appointed a Markle Foundation scholar in medicine. Dr. Falkner is co-ordinator of the International Children's Centre's growth studies of children.

COMING EVENTS

"Pleasure Painting."—Exhibition at the South London Art Gallery, Peckham Road, London, S.E.5. Included are works by members of the Medical Art Society. Open daily except Fridays, March 16 to April 11 (1-8 p.m.; Sundays, 3-7 p.m.).

C.M.F./M.E.F. Physicians' Dinner.—On March 30 at Simpson's-in-the-Strand, London. Details from Dr. A. Willcox, 59, Harley Street, London, W.1.

Boat Race.—Messrs. Vitamins Limited have available a number of tickets for doctors who may wish to view the Oxford and Cambridge Boat Race on March 30 from the Bemax premises. Early application should be made to Dept. B.R.1, Vitamins Limited, Upper Mall, London, W.6.

International Congress of Clinical Chemistry.—Stockholm, August 19-23, under the auspices of the Scandinavian Society for Clinical Chemistry and Clinical Physiology. Latest date for submission of papers, April 15; for registration, May 15. Details from Congress Secretariat, Box 12024, Stockholm, 12.

British Occupational Hygiene Society.—Conference on "Instruments used in Industrial Hygiene," April 16 and 17 in London. Fee for non-members one guinea (includes proceedings). Details from the hon. scientific secretary, M.R.C. Laboratories, Holly Hill, London, N.W.3.

Disorders of the Liver.—International conference at the Institute of Clinical Medicine, Perugia University, June 18-20. Liver biopsy and acute and subacute liver atrophy will be discussed. Last date for contributions, April 30. Further details from Dr. G. MENGHINI, Clinica Medica (Policlinico), Perugia, Italy.

Clinical Psychopharmacology.—International symposium at Milan, May 9-11. Details from the secretariat, 21, Via A. del Sarto, Milan, Italy.

NEW ISSUES

Ophthalmic Literature.—The new issue (Vol. 9, No. 6) is now available. It contains a comprehensive selection of abstracts of the literature on ophthalmology and related subjects. Six issues and a volume index each year; annual subscription £4 4s. (or in combination with *British Journal of Ophthalmology*, £7 7s.); single copy 25s.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Abstracts of World Medicine.—Issued in the first week of each month, this journal contains abstracts of important papers selected from the current medical literature of the world. Annual subscription £4 4s., single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, March 18

● **HUNTERIAN SOCIETY.**—At Talbot Restaurant, E.C., 7 for 7.30 p.m., dinner meeting. 8.30 p.m., discussion to be opened by Dr. Raymond Greene and Dr. E. F. Scowen: Hormonal Treatment of Disease.
● **INSTITUTE OF DERMATOLOGY.**—5.30 p.m., Dr. I. A. Magnus: Respiratory Activity of the Skin.
● **POSTGRADUATE MEDICAL SCHOOL OF LONDON.**—4 p.m., Professor G. M. Wilson: Thyrotoxicosis and Heart Disease.
● **UNITED HOSPITALS CATHOLIC SOCIETY.**—At 13, Devonshire Place, W., 6.15 p.m., Mr. J. V. O'Sullivan: Sterilization, Infertility, and Artificial Insemination.
● **UNIVERSITY COLLEGE LONDON: DEPARTMENT OF BIOCHEMISTRY.**—At Physiology Theatre, Gower Street, W.C., 5 p.m., public lecture by Dr. G. J. Popják: Biochemistry of Fatty Acids and Cholesterol—Biosynthesis of Cholesterol.

Tuesday, March 19

● **INSTITUTE OF DERMATOLOGY.**—5.30 p.m., Dr. F. R. Bettley: Industrial Dermatitis.
● **SOUTH-WEST LONDON MEDICAL SOCIETY.**—At Bolingbroke Hospital, Wandsworth Common, S.W., 8.30 p.m., Dr. R. T. Brain: Eczema and Dermatitis.
● **WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.**—5.30 p.m., Mr. K. I. Nissen: Orthopaedic Surgery for Neurological Conditions.

Wednesday, March 20

● **BRITISH ASSOCIATION OF SPORT AND MEDICINE.** At St. Mary's Hospital Medical School, 5.45 p.m., Dr. D. J. Cussey: Medical Aspect of the Olympic Games at Melbourne.
● **EUGENICS SOCIETY.**—At Royal Society, Burlington House, W., 5.30 p.m., Mr. G. Ainsworth Harrison, B.Sc.: Measurement and Inheritance of Skin Colour in Man.
● **INSTITUTE OF DERMATOLOGY.**—5.30 p.m., Dr. A. Tickner: Recent Experimental Work on Hormones.
● **INSTITUTE OF DISEASES OF THE CHEST.**—5 p.m., Dr. F. J. Prime: Physiological Mechanisms in Acute Asthma.
● **INSTITUTE OF UROLOGY.**—4.30 for 5 p.m., Mr. C. I. Murphy: Tuberculosis of the Urinary Tract.
● **MIDLAND MEDICAL SOCIETY.**—At Dudley Road Hospital, Birmingham, 8.15 p.m., clinical meeting.
● **POSTGRADUATE MEDICAL SCHOOL OF LONDON.**—2 p.m., Professor W. St. C. Symmers: Thrombotic Microangiopathy.
● **ROYAL COLLEGE OF SURGEONS OF ENGLAND.**—4 p.m., Joseph Clover Lecture by Sir James Learmonth: A Surgeon's Outlook.
● **ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.**—3.30 p.m., Dr. J. M. Alison: Lepidospiral Infection as an Occupational Risk to Health Throughout the World (illustrated).
● **ROYAL MICROSCOPICAL SOCIETY.**—5.30 p.m., Mr. E. H. Leach: Structural Changes in the Eye Caused by Various Diets.
● **WILLESDEN GENERAL HOSPITAL MEDICAL SOCIETY.**—At Department of Physical Medicine, 8.45 p.m., Mr. G. Qvist: Surgical Emergencies.

Thursday, March 21

● **EDINBURGH CLINICAL CLUB.**—At Royal College of Physicians of Edinburgh, 8 p.m., Dr. D. M. Douglas: Some Paediatric Problems.
● **HYPNOTHESIS GROUP.**—At Royal Society of Medicine, 8 p.m., Dr. Ainslie Meares (Australia): Hypnotism—A Technique in Hypno-analysis.
● **INSTITUTE OF CARDIOLOGY.**—9.30 a.m., Sir John Parkinson: Pain in the Chest.
● **LONDON JEWISH HOSPITAL MEDICAL SOCIETY.**—At Medical Society of London, 8.30 p.m., Dr. W. N. Goldsmith: Drug Eruptions.
● **NORTH-EAST CLINICAL SOCIETY.**—At Prince of Wales's General Hospital, N., 2.30 p.m., clinical meeting.
● **ROYAL COLLEGE OF SURGEONS OF ENGLAND.**—5 p.m., Hunterian Lecture by Professor E. Haigh: Acute Abdomen in Neonates.
● **ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.**—At Royal Army Medical College, Millbank, S.W., 7.30 p.m., laboratory meeting.

Friday, March 22

● **INSTITUTE OF DERMATOLOGY.**—5.30 p.m., Dr. S. C. Gold: clinical demonstration.
● **INSTITUTE OF DISEASES OF THE CHEST.**—5 p.m., Dr. K. E. Jefferson: Diffuse Interstitial Pulmonary Fibrosis.
● **INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.**—3.30 p.m., Mr. W. S. McKenzie: Modern Methods of Improving Hearing.

Saturday, March 23

● **KENT PAEDIATRIC AND CHILD HEALTH SOCIETY.** At West Kent General Hospital, Maidstone, 3 p.m., Dr. N. M. Jacoby: Conditions Which Require No Treatment. (Medical Members only.)
● **NORTH OF ENGLAND OTOLARYNGOLOGICAL SOCIETY.**—At Victoria Hospital, Blackpool, 2 p.m., clinical meeting.
● **NUTRITION SOCIETY.**—At Royal Society of Medicine, 10.15 a.m., symposium: Man's Need for Water. Contributions from Mr. H. W. Cremer, Dr. J. R. Robinson, Dr. J. R. Elkinton (Philadelphia), Dr. E. M. Widdowson, Dr. D. A. K. Black, and Dr. W. F. Young. (Members and guests only.)

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

● **Hetherington.**—On February 28, 1957, to Monica, wife of Dr. A. W. Hetherington, Redcote, Rainham, Essex, a daughter, Sara Alexandra.

DEATHS

● **Blockley.**—On February 20, 1957, at Malvernleigh, St. Marychurch, Torquay, Devon, John Phillips Blockley, M.B., F.R.C.S.Ed.
● **Cozens.**—On February 21, 1957, at Musgrove Park Hospital, Taunton, Som., Joan Edith Cozens, M.B., Ch.B., of Inglenook, Stockbridge, Hants, formerly of Wyke Lodge, Winchester, Hants.
● **Dean.**—On February 23, 1957, at 122, Shiffeld Road, Reading, Berks., Henry James Dean, L.R.C.P.J., L.R.C.S.Ed.
● **Elder.**—On February 23, 1957, at 153, Colinton Road, Edinburgh, Herbert Calder Elder, M.B., Ch.B., M.R.C.P.Ed., D.P.H.
● **France.**—On February 22, 1957, at Ludlow, Bromley Common, Kent, Francis George France, M.B., B.S., aged 58.
● **Harris.**—On February 23, 1957, at his home, Merrow Down, Rottingdean, Sussex, Charles Poulett Harris, M.D., aged 85.
● **Harrison.**—On February 21, 1957, at Keynsham, Bristol, Claude Charles Harrison, M.C., M.B., B.S.
● **Herman.**—On February 27, 1957, at Shipton Hill, Hambledon, Surrey, Ashley Ernest Herman, O.B.E., M.B., F.R.C.S.Ed., late of Tonbridge, Kent.
● **Lewis.**—On February 24, 1957, at Cuckfield Hospital, Frederick Lewis, M.R.C.S., L.R.C.P., of Henfield, Sussex, aged 90.
● **MacFetridge.**—On February 23, 1957, at the General Hospital, Hereford, William Christopher MacFetridge, M.D., of 4, Selborne Road, Hove, Sussex, aged 78.
● **Maclardy.**—On February 28, 1957, at his home, "Cawburn," Pumpherson, Mid Calder, Midlothian, John Allison Maclardy, L.R.C.P.&S.Ed., L.R.F.P.S., aged 89.
● **Mansbridge.**—On February 25, 1957, Josiah Mansbridge, M.R.C.S., L.R.C.P.
● **Mitchell.**—On February 19, 1957, at Fielding Johnson Hospital, Leicester, John George Mitchell, M.R.C.S., L.R.C.P., D.A., late of Aspley Guise, Bletchley, Bucks.
● **Thomas.**—On February 22, 1957, at 46, The Croft, Barnet, Herts, John Llewellyn Thomas, F.R.C.S., aged 92.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Two Malformed Stillbirths in a Radiographer

Q.—A woman aged 24 has had two stillbirths with congenital malformations. They had different fathers. She has been employed as a radiographer since the age of 18. There is no family history of hereditary defect or disease during the pregnancies. Should she be advised to start another pregnancy?

A.—(a) No satisfactory empiric figure is available for the risk of further congenital malformations at each birth after two malformed children. A figure often quoted is the 1 in 9 risk after one malformed child given by Murphy.¹ This referred to malformations of any type, nearly all severe or moderately severe, although the majority of the second malformations were in fact similar to the index malformation. In addition Murphy's figure is almost certainly too high; it was computed from the proportion of children born malformed after the first malformed child in the family, which gives an incorrect estimation of the hazard; and also it is known that the risk after each of the commonly occurring individual malformations is less than 1 in 9. Empiric figures are available for the risks after many of the individual malformations, and advice on risks should always be based so far as possible on the nature of the malformation as well as the family history. The fact that there were two different fathers in this case does not necessarily suggest a particular maternal predisposition to have malformed children, though such a predisposition—for example, due to a sex-linked recessive gene—is possible. Unless, therefore, either of the malformations was one of the rare types known to carry a high risk of recurrence, there is no reason to advise this woman against further pregnancies.

(b) It is unlikely that this woman's employment as a radiographer was responsible for the malformations in her children even if proper precautions were not observed. The genetic risks to an individual woman are small, as has been shown for women exposed to but surviving the Hiroshima and Nagasaki atomic explosions.² Direct radiation of the developing foetus may produce malformation, but large doses are required to cause this damage, and the most common malformation produced is microcephaly. There are no figures for the reproductive efficiency of radiographers. A survey by questionnaire sent in America to radiologists and other physicians disclosed a small but significant increase in the number of malformed children born to the radiologists compared with the remainder.³ But the response to the survey was far from complete and the value of the findings is in doubt.

REFERENCES

- 1 Murphy, D. P., *Congenital Malformations*, 1947. Lippincott, Philadelphia.
- 2 *The Effect of Exposure to the Atomic Bombs on Pregnancy Termination in Hiroshima and Nagasaki*, 1956. National Academy of Sciences: National Research Council Publication No. 461, Washington.
- 3 Macht, S. H., and Lawrence, P. S., *Amer. J. Roentgenol.*, 1955, 73, 442.

Gym Shoes in School

Q.—Is it harmful for schoolchildren to wear gym shoes throughout the day at school?

A.—Gym shoes cannot be regarded as satisfactory footwear—especially for the young child—to wear all day. When the foot is being actively used on natural surfaces such as grass, no footwear is necessary except to protect the sole of the foot from possible damage. When standing and walking on hard surfaces, however, some extra support is desir-

able for the young growing foot. Gym shoes do not provide this, and they have the added disadvantage that they rarely fit well and are likely to cramp the toes. On the other hand, as children often travel to school in Wellington boots, it is clearly desirable that they should change them on arrival, and it is economically unfair to expect parents to supply extra shoes to be worn only at school. Perhaps the best compromise is for the children to change into the instep-strap (not ankle-strap) type of sandals, of which there are several good makes on the market. These should, however, belong individually to the child and not just be picked out at random from a communal store. They should be checked at the beginning of each term for size and fit, and could be taken home at the end of term for use during holidays.

Excessive Wax in the Ears

Q.—Is there any effective way of preventing the accumulation of wax in the ears of those so predisposed—especially children?

A.—The normal secretion and elimination of aural cerumen is the means by which dust and other foreign material is removed from the external auditory meatus. Elimination takes place by virtue of a process of displacement from the tympanic membrane as far as the middle third of the meatus, where desquamation then occurs.¹ In congestive or inflammatory conditions of the external ear there is increased secretion of cerumen, and the normal displacement movement is replaced by desquamation in the depths of the meatus. This causes accumulation of ceruminous plugs.

The only effective way of preventing this condition is to avoid, so far as possible, the causes of excessive secretion and any interference with the normal elimination of cerumen—in particular, exposure of the ears to dirt and dust, the introduction of foreign bodies, and any misguided manoeuvres which push the wax deeper into the bony part of the canal.

REFERENCE

- 1 Simonetta, B., *Boll. Mal. Orecch.*, 1947, 65, 179.

Ulcer Diets and Coronary Disease

Q.—Do patients with peptic ulcer have an increased incidence of atherosclerosis? One would expect this because of their diet, which theoretically would increase the lipaemia. If this is not the case, then must one postulate a naturally occurring "protective factor"?—or perhaps the alkalis usually taken with the diet act in this way.

A.—On theoretical grounds it would appear likely that the classical dietary treatment of peptic ulcer, rich in cholesterol, might induce lipaemia and an increased risk of atherosclerosis. Similarly attractive theories exist for relating ulcer and coronary sclerosis; both have been termed "stress diseases," both have shown similar devastating increases in the male population in recent decades, while in the experimental animal prolonged vagal stimulation is said to induce a "viscerocardiac reflex" producing eventually both peptic ulcer and coronary thrombosis. Female sex-hormones are thought to exert a protective action against ulcer and atherosclerosis in the child-bearing years, the post-menopausal increase of clinical peptic ulcer and coronary disease in women further supporting this hypothesis.

Little controlled clinical information of any association exists and would indeed be difficult to collect. Necropsy surveys have yielded conflicting results and have the serious limitations that the standard of examination must vary from observer to observer, a varying proportion of the hospital population studied is submitted to necropsy, and at best the hospital population studied does not mirror the general population. Some surveys,^{1,2} open to some statistical criticism, have failed to show any relationship between coronary atheroma and ulcer, but in two recent studies^{3,4} some effort

was made to minimize the effects of population selection and of the variable observer error. The first of the latter two surveys, a retrospective study of some 13,000 necropsy records, showed that in male subjects in whom chronic ulcers had been found incidentally or had caused death the incidence and severity of coronary sclerosis were significantly greater than a control population of "non-ulcer deaths" suitably corrected for age distribution. No similar trend could be demonstrated in female subjects with ulcers. In the second forward planned study of the epidemiology of coronary artery disease, again an increased incidence of coronary sclerosis was demonstrated in male subjects dying from peptic ulcer. While these two surveys certainly suggest that there may be an association between ulcer and coronary disease, the fact that the populations studied were selected tends to reduce the value of the information obtained. Furthermore, the mechanism of any such association, whether dietary or neurogenically determined, and the presence of protective factors to explain sex differences are still open to conjecture.

REFERENCES

- Walsh, B. J., Bland, E. F., Taquini, A. C., and White, P. D., *Amer. Heart J.*, 1941, 21, 689.
- Douglas, D., and Melrose, A. G., *Glasg. med. J.*, 1955, 36, 147.
- Watkinson, G., *Gastroenterologia (Basel)*, 1956, 85, 201.
- Morris, J. N. In press.

Treatment of Alopecia Areata

Q.—What remedies are worth trying in alopecia areata? Have there been any useful recent advances, and what formerly commonly advocated remedies have now been shown to be ineffective? Is ultra-violet light therapy any use, and would it be safe to give a few weeks after treatment with thorium X?

A.—Only local remedies are worth trying in alopecia areata. Most dermatologists accept that in general rubefacients encourage the hair to grow rather sooner than it otherwise would, but it is not at all certain whether the outcome of the disorder is very much altered. However, treatments with applications such as cantharides lotion are still in favour. Thorium X and ultra-violet light are also still used.

Thorium X has the effect of inducing a temporary sensitivity to ultra-violet light, but provided two or three weeks have elapsed since the thorium-X therapy there is no objection to ultra-violet light being used. Some success has recently been recorded from the injection of hydrocortisone into the bald area, but the method is not of established practical value. It is generally agreed that hydrocortisone ointment is not effective.

Absorption Spectra and Therapeutic Activity

Q.—What part does spectroscopy play in selecting members of a series of related chemicals for trial of their therapeutic effect? Are there any established relationships between spectrographic appearances and therapeutic action?

A.—Absorption spectroscopy does not play any direct part in the selection of individual members of a series of related compounds for therapeutic trials. Furthermore, there are no established direct relationships between molecular absorption spectra and therapeutic properties.

The electronic (ultra-violet and visible) absorption spectrum of a compound is determined by the presence of one or more "chromophoric" structural elements with characteristic absorption properties. It follows that a group of therapeutically active compounds containing the same chromophoric structures will have similar electronic spectra (subject to certain reservations). Conversely other compounds with similar electronic spectra are likely to be structurally related and may also exhibit similar therapeutic activity, to the extent that this latter property is related to the presence of the chromophoric structural elements. The vibrational (infra-red) absorption spectrum of a compound is also deter-

mined by its molecular structure, but is much more sensitive than the electronic spectrum to small changes in molecular structure, symmetry, and polarity, and is in general more useful for distinguishing between closely related compounds.

Both electronic and vibrational absorption spectra are therefore techniques of great value in the elucidation of detailed molecular structure. The establishment of direct correlations between spectroscopic characteristics and therapeutic activity will have to be based, however, on fundamental correlations between molecular structure and therapeutic effect.

NOTES AND COMMENTS

Dental Caries During Pregnancy and Lactation.—Professor V. H. MOTTRAM (Donhead St. Mary, near Shaftesbury) writes: The work of the Toveruds¹ gives good evidence that a positive balance of calcium can be obtained in pregnant women by increasing their intake of calcium-containing foods ("Any Questions?" January 26, p. 239; "Notes and Comments," March 2, p. 536). The calcium intake had to be raised to 1.6 g. per day, and in the winter months cod-liver oil was added to the diet to obtain a positive balance. The use of cod-liver oil is perhaps significant. It is well known that vitamin D enables the gut to pick up calcium even from a diet deficient in that element. Consequently, when attempting to increase the uptake of calcium into the system it would be reasonable not only to increase the calcium-containing foods but also the vitamin D. Graham and Oakley² found that in cases of renal rickets 1 g. calcium per day needed 3,000–6,000 I.U. of vitamin D (as "calciferol") to obtain a positive balance. Someone ought to do some work on the calcium content of saliva as the result of a high-calcium, high-vitamin-D diet.

REFERENCES

- Toverud, K. U., and Toverud, G., *Acta Paediat. (Stockh.)*, 1931, 12, suppl. 2.
- Graham, G., and Oakley, W. G., *Arch. Dis. Childh.*, 1938, 13, 1.

Granuloma Annulare.—Dr. ROBERT J. D. TEMPLE (Ormskirk, Lancs) writes: It appears that the aetiology of granuloma annulare remains obscure ("Any Questions?" February 2, p. 297). Recently a patient of mine aged 10 years had a successful valvotomy for congenital pulmonary stenosis. Prior to this operation she had suffered continually from granuloma annulare on the hands for over six years, and it is interesting that this condition has remained clear and apparently cured since her operation four months ago. I am not in a position to say whether this observation is of any significance, but I should be very interested to know if there is any known association between this condition and congenital heart disease.

OUR EXPERT replies: I have never heard of any association with heart disease, and, indeed, circulatory conditions in the limbs do not seem to influence the development of granuloma annulare on those sites. It is, of course, in the nature of the disorder to clear up suddenly, and one can only attribute the sequence of events in the case described to coincidence.

Books of "Any Questions?" and Refresher Course Articles.—The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices include postage. *Any Questions?*, Volumes 2 and 3 (8s. each); *Refresher Course for General Practitioners*, Volumes 2 and 3 (26s. 6d. each inland, 26s. overseas); *Clinical Pathology in General Practice* (22s. 3d. inland, 21s. 9d. overseas).

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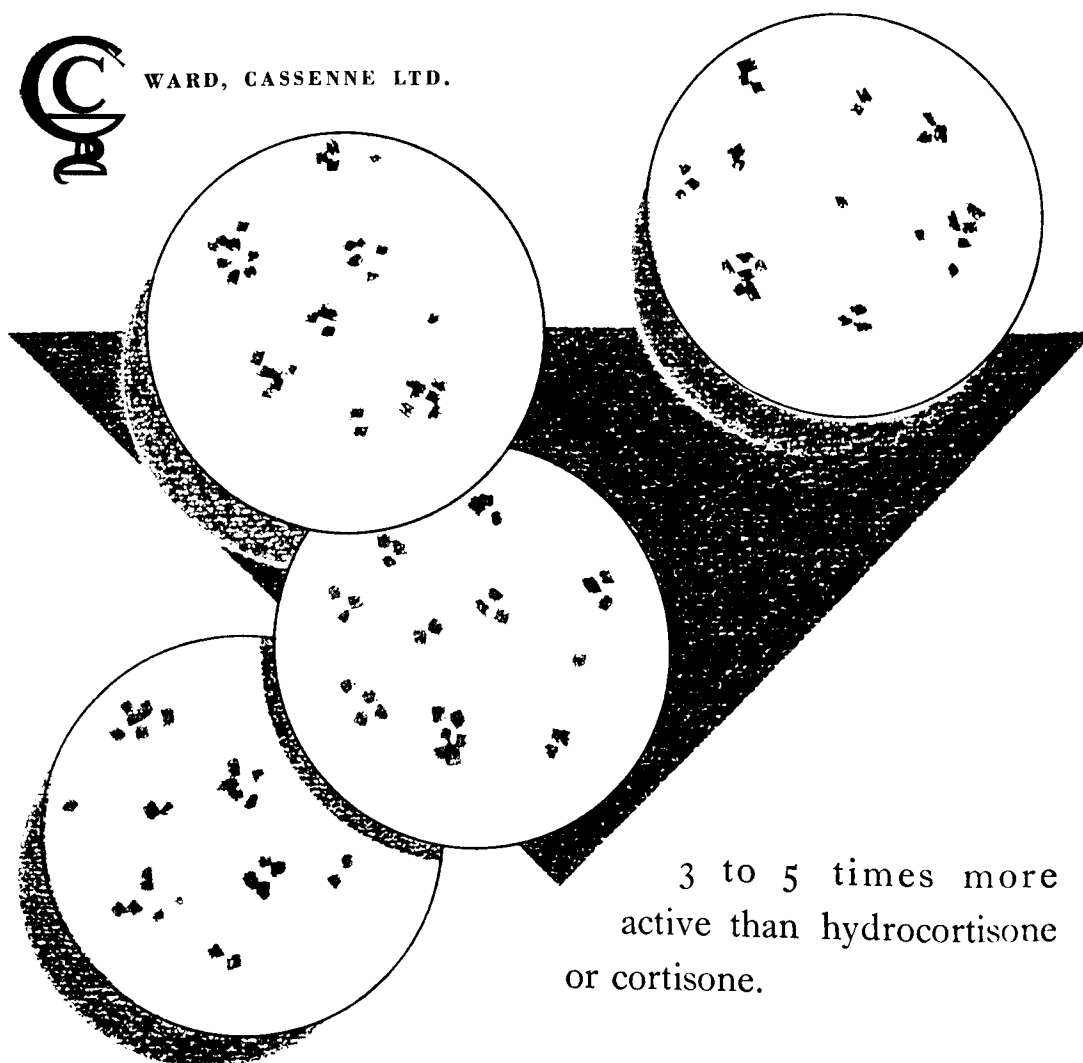
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BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 23 1957

THIRTY YEARS OF CARDIOLOGY*

BY

HAROLD COOKSON, M.D., B.Sc., F.R.C.P.

Physician, Poole General Hospital

I shall try to outline the growth of cardiology as I have seen it in the past 30 years. In the early 1920's cardiology was hardly admitted to be a specialty, whereas now it is said that there is a separate specialist for each heart valve. So far we have managed without one for each cusp. No science advances entirely on its own, of course, but mainly by using and adapting new techniques and ideas from other sciences. Among these the use of precision instruments takes a prominent place, so that we have electrocardiographs able to take four leads at once, and in the three dimensions of space, an instrument to record the complex movements of the body produced by each heart beat, one to record heart sounds, x-ray pictures to show the size and shape of the heart, and the kymograph to record its movements, and we can discover what the inside of the heart is like by x-ray examination after the intravenous injection of a radio-opaque substance; with a catheter pushed into the heart and vessels we can record the pressure in them and find out the state of oxygenation of the blood in each chamber.

Advances in pharmacology, bacteriology, and immunology have helped in the control of the infections of the heart, while improvements in anaesthesia and surgical technique, along with more exact diagnosis, opened up the field of heart and great vessel surgery to which there now seems no limit. A good knowledge of physics, algebra, and trigonometry is very useful in reading some of the papers in heart journals to-day.

Cardiology in 1923

Let me try to give some idea of the cardiology of 1923, when I was house-physician to the late Dr. W. H. Wynn and Dr. A. P. Thomson in the Birmingham General Hospital. We had not yet got an electrocardiograph, but used the polygraph to take simultaneous curves of the arterial and venous pulses. This allowed us to distinguish the various cardiac arrhythmias, but told us nothing about myocardial injury. We rarely had the heart x-rayed, but thought we could estimate its size by percussion, and this we recorded to as little as a quarter of an inch (6 mm.). Heart failure, if not due to valve disease, was caused by myocardial degeneration, either fibroid or fatty. Blood-pressure readings even then were taken as a routine, but the part played by hypertension in causing heart failure was not realized. Nor was the

right heart failure of chronic lung disease or other causes of pulmonary hypertension. Virus pericarditis, tuberculous constrictive pericarditis, familial cardiomegaly, and other rare but important kinds of heart disease were unknown. The terms "coronary thrombosis" and "cardiac infarction" had not arrived, and I remember only one case of prolonged angina in 18 months' hospital residence. This man was given incessant inhalations of amyl nitrite, but I do not think morphine was given or thought of. We called it status anginosus. At the necropsy, coronary disease was demonstrated, though I cannot remember that intra-arterial clot or infarction was mentioned.

The chest pains which must have been occurring at that time from coronary thrombosis were either overlooked or called indigestion, influenza, pleurisy, rheumatism, or fibrositis of the chest. Operations on the heart were undreamed of, but patients with toxic goitre were operated upon and there was a heavy mortality. The sight of the well-nourished body of a girl or young woman in the post-mortem room was familiar at that time after thyroidectomy. This was just before it was discovered that iodine was good for toxic goitre; there were medical measures such as removal to a cool bracing climate, or the use of milk or serum from goats and sheep which had had their thyroids removed, and x-radiation was just coming in.

For the treatment of congestive heart failure there was of course digitalis, and in doses little different from those used to-day, though its value in failure when the heart was regular was questioned. Mild salt restriction was considered useful and there was a feeble mercury diuretic in the form of Guy's pill. Other drugs were purges and iodides, and there was the usual recommendation regarding climate and geography: the patient would do best to be on a sandy or gravelly soil, where the rainfall was low but there was plenty of sunshine, a treatment to which the earlier practitioners of Bournemouth may have owed some of their prosperity.

In the 1920's the commonest infectious diseases which damaged the heart were rheumatic fever, syphilis, diphtheria, and bacterial endocarditis. Table I lists these and indicates how these have since been largely overcome.

TABLE I.—The Four Common Infections which Damage the Heart, and the Changes in Incidence in the Past 30 Years

Rheumatic fever	..	Lessening, but still a problem
Syphilis	..	Disappearing
Diphtheritic carditis	..	Almost wiped out
Bacterial endocarditis	..	Under control

*Presidential address delivered to the Bournemouth Medical Society on October 10, 1956.

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Rheumatic Fever

In my own experience rheumatic fever of the recognizable kind is becoming less common, while chorea in childhood has become rare. There is still the insidious rheumatic infection which damages the valves without obvious acute illness, and it may be that this form accounts for most cases of rheumatic heart disease now occurring. But it is difficult to get figures on the incidence of rheumatic fever. In 1945 there were 937 deaths certified as due to rheumatic fever in England and Wales, while in 1954 the total was only 299. The compulsory notification of rheumatic fever is confined to a few areas in the country, and even that is too recent for assessment of whatever change there may be in the incidence. On the other hand, notifications of scarlet fever, with which rheumatic fever is closely associated, have almost halved between 1948 and 1954.

Apart from this indirect evidence it would seem natural, with improved social conditions and new drugs to treat upper respiratory infections, that rheumatic fever should diminish. Perhaps its age incidence has also changed, with relatively more attacks in young adults and in the middle-aged. I have also seen, in young Service men, many cases of rheumatic fever typical in its joint symptoms and response to salicylates, but with no evidence of subsequent valve injury. As to treatment of the acute attacks, it is doubtful if there is much gain in the past few decades; the larger doses of salicylates given now may be more effective, but apart from that there is little to record. Cortisone has so far not been proved to have much to offer.

Syphilis

Thirty years ago syphilis accounted for about 10% of cases of heart disease, but the incidence has gradually diminished as a result of early treatment with arsenicals and later with penicillin. Effective treatment with arsenical preparations came in about 1910, and this accounts for the fact that cardiovascular syphilis is to-day generally seen in elderly people, usually over 65. The only case I have seen in recent years below this age was that of a man of 42 who, though he noticed the signs of his primary infection, was told by the friend responsible for it that it was due to sugar in the water and he did nothing about it. His specific lesions involved the ascending aorta, with aortic incompetence and obstruction of the coronary orifices and the right subclavian artery, which was almost obliterated. As students we were taught that aortic incompetence was most likely to be rheumatic in the young, luteic in the middle-aged, and atheromatous in the old. Nowadays it would be true to say that at all ages it is most likely to be rheumatic. In the 1920's lues was in mind whenever the murmur of aortic incompetence was heard and also whenever there was a suspicion of heart-block. But to-day the outlook is different, and it is not a case of

Ev'ry little breeze
Seems to whisper Louise.

Diphtheritic Carditis

Diphtheria causes the most intense form of infective or toxic myocardial damage known. In a large local outbreak of the disease in 1943 I was able to study 83 cases and see how the heart was affected. Several hundred electrocardiograms were taken, and 63 of the patients (76%) gave an abnormal picture. All kinds of rhythms and abnormal patterns were seen, including that characteristic of acute myocardial infarction. Six patients died of carditis, all of whom had been given antitoxin as early as the second day and not later than the fifth day of the disease. None had been immunized against diphtheria. Histology of the myocardium, which was undertaken by Dr. William McNaughton, showed the most widespread degeneration, necrosis, and areas of haemorrhage; little normal muscle might remain. The following details of one of the fatal cases shows the course taken by progressive cardiac damage.

A child aged 12 was admitted on the second day of the disease. Antitoxin was given 26 hours after the onset. Facial diphtheria,

bull-neck, and heavy albuminuria were present. An electrocardiogram on the third day showed normal rhythm with sinus arrhythmia, rate 120; depression of ST segments in leads II and III. Eighth day: neck swelling almost gone; palatal palsy; electrocardiogram showed regular rhythm with no visible P wave, rate 80; some widening of QRS and considerable depression of ST segments. Tenth day: vomiting; the duration of P-R and of QRS had increased; pattern of QRST as in posterior cardiac infarction; died suddenly on this day. Sections of the myocardium showed congestion, oedema, degeneration, necrosis, and cellular infiltration mainly with plasma cells in all chambers, particularly in the left ventricle; the pericardium also showed intense congestion and cellular infiltration.

As a result of prophylactic immunization the position to-day is that diphtheria is an almost extinct disease. In the county of Dorset only two cases have been notified in the past five years, and not one in 1955. This magnificent achievement in immunology is one for which Dr. G. Chesney, an early enthusiast for the method, deserves a share of credit.

Infective Endocarditis

Until the late 1930's both the acute and subacute forms of infective endocarditis were generally regarded as inevitably fatal. Then the introduction of chemotherapy and later the antibiotics changed the outlook from hopeless to hopeful. The infection can be eradicated in a high proportion, but certain complications and accidents mar the picture. Early recognition and treatment before the infection has bored holes in the valve cusps is essential, and to be able to kill the organism at this late stage is of little help. In fact, the healing process seems sometimes to aggravate the condition. I have also seen one or two fatalities, after the blood had been sterilized, from rupture of a mycotic cerebral aneurysm. Another cause of failure is the organism which is resistant to all antibiotics. I saw one such case, that of an elderly woman with recurrent pneumonitis, in which it seemed possible that a virus was the responsible organism. The necropsy showed that little was left of the aortic cusps.

Toxic Goitre

Hyperthyroidism is a common cause of auricular fibrillation in the middle-aged and elderly. If unrecognized this leads to congestive failure and death. Toxic goitre is now one of the most treatable diseases, but it was only in 1923 that treatment with iodine was introduced. This was found valuable for medical management alone, and it also reduced the mortality when used as a preparation for thyroidectomy. There was a further big step forward in 1943, when more powerful antithyroid drugs, thiouracil in particular, were discovered. Nearly always this drug can neutralize thyroid overactivity and make operation as safe as in non-toxic goitre. In some cases it may be used as the sole treatment. Particularly suitable subjects for this are the elderly, who may be averse from operation, who do not mind having a lump in the neck, and who often have other diseases which make them less safe for surgery.

A haggard emaciated woman of 77 was admitted to hospital although her doctor thought she was moribund and that the bed might be more profitably filled. A small nodular goitre just palpable in the suprasternal notch was the cause of her illness. After two weeks on thiouracil she had gained 19 lb. (8.6 kg.). After three months she had fully recovered.

Cardiac Surgery

The relief by surgery of defects within the heart and neighbouring great vessels is one of the great achievements in the history of cardiology.

The first attempt to relieve mitral stenosis by operation was made by Mr. Souttar (now Sir Henry) in 1925. He opened the left auricle in a young girl, and was able to stretch the mitral valve. I saw this patient a year or two later in the London Hospital, when she was in an advanced state of congestive failure, but in her opinion the operation had helped her considerably. Thirty to forty

years ago an operation on the outside of the heart, cardiomyolysis, was done to relieve external pericardial adhesions. This has been discarded, but a decade later came the valuable procedure of pericardectomy for chronic constrictive pericarditis. Also at about this time O'Shaughnessy, in this

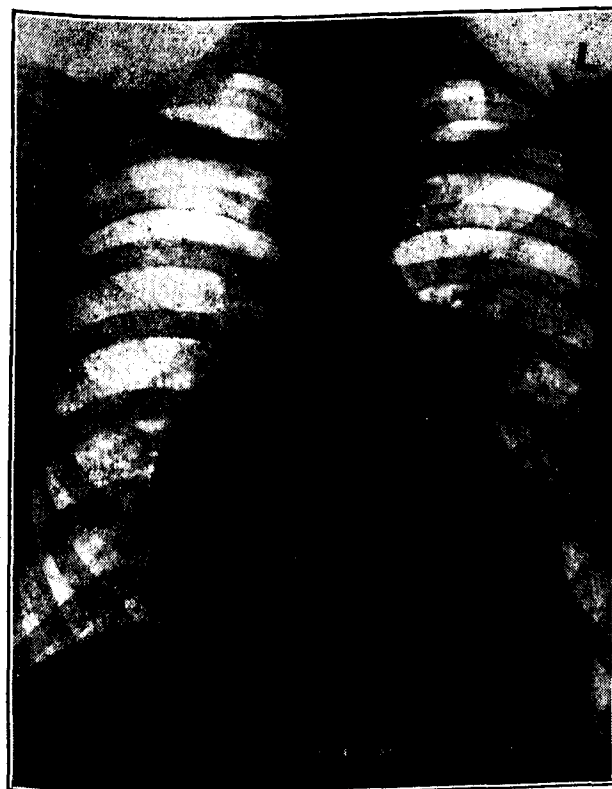


FIG. 1.—Chest x-ray film of man aged 41 with mitral stenosis; showing cardiac enlargement and severe pulmonary congestion.

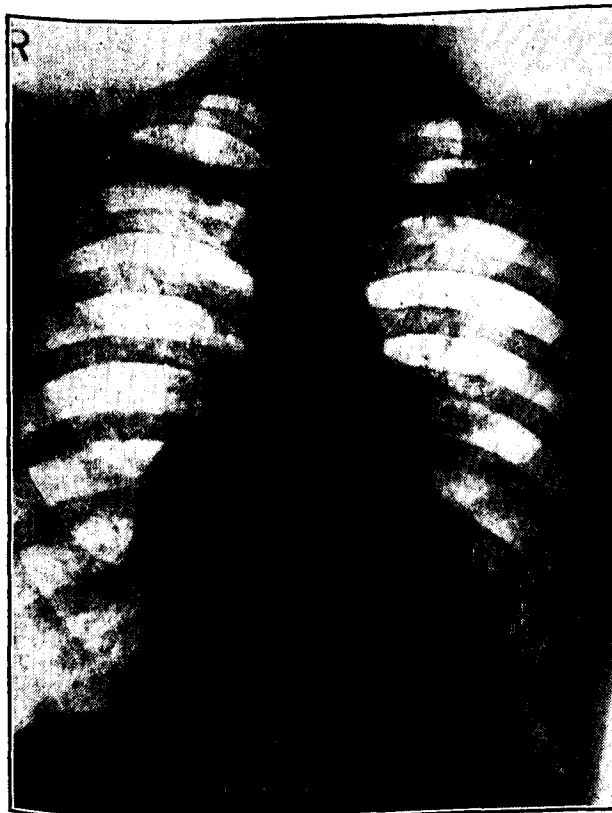


FIG. 2.—Same case as in Fig. 1 after mitral valvotomy; decrease in heart size and disappearance of pulmonary congestion.

country, and Beck, in America, devised another operation on the outside of the heart, which was designed to increase the blood supply of the ischaemic myocardium by stitching omentum or chest-wall tissue to its surface. This procedure has not stood the test of time. Not till 20 years after Souttar's attempt to relieve mitral stenosis was this operation successfully carried out, but in the past 10 years it has been done thousands of times. Given wise and perhaps lucky selection of cases, the results are good, sometimes dramatic and life-saving. The following is an example in this last category.

A man of 34 came under observation for haemoptysis due to mitral stenosis in 1943; over the next eight years there was increasing disability and recurrent haemoptysis; in 1950 aortic incompetence was discovered; attacks of acute pulmonary oedema and paroxysms of auricular fibrillation occurred and there was left recurrent laryngeal palsy. Fig. 1 shows the cardiac enlargement and pulmonary congestion. A successful valvotomy was done at Guy's Hospital, followed by decrease in heart size, disappearance of pulmonary congestion (Fig. 2), and return of good physical capacity.

Aortic stenosis, the other common acquired obstructive valve lesion, is now being treated by operation, but it presents a more difficult problem than the mitral valve. It is harder to get at, the subject is older, and the rigid ring of calcified cusps may be widened only at the cost of serious incompetence. A procedure for the relief of severe aortic incompetence has been practised in

America, and consists in placing a plastic valve in the upper part of the descending thoracic aorta. The operative mortality was heavy, but I was able to examine two patients at Georgetown Hospital. Washington, who had benefited. One said he played golf and was driving his car 500 miles (800 km.) that day to attend the meeting; while talking to him the triple click of his plastic valve was audible, and extreme pulsation of the neck arteries was visible. On the other hand, there was little pulsation in the abdominal aorta or popliteal arteries.

Congenital Lesions.—The operative cure of congenital lesions began when Gross, in 1939, reported successful closure of the persistent ductus arteriosus in four patients. To-day there is hardly one of the various abnormal orifices and obstructions in the heart and great vessels which constitute congenital heart disease which has not been operated upon. Operation on the ductus was followed by one for coarctation of the aorta, and these, lying beyond the heart itself, are relatively easy to deal with. Nowadays defects in the auricular and ventricular septa and stenosis of the pulmonary and aortic valves are being dealt with by operation. These are aided by developments such as hypothermia—that is, cooling of the body to 25–28° C. so that the circulation through the heart can be cut off for short periods; or, better and more logically, by carrying on the circulation artificially by a pump or by anastomosis with another subject.

Fig. 3 shows a congenital defect which is incompatible with long survival. There is transposition of the aorta and pulmonary artery, the aorta arising from the right ventricle and the pulmonary artery from the left. The patent ductus arteriosus is seen passing from the main pulmonary artery at its bifurcation to the aorta beyond the origin of the arteries from the aortic arch. The infant lived 12 hours. Such a defect is beyond surgery now, but it is no more unthinkable now than was any congenital heart operation 30 years ago.



FIG. 3.—Transposition of aorta and pulmonary artery in an infant who lived 12 hours.

Hypertension

Table II shows in the left-hand column the known causes of arterial hypertension as given in the first edition of Fishberg's book, *Hypertension and Nephritis*, published in 1931.

TABLE II.—Known Causes of High Blood Pressure; Adapted from "Hypertension and Nephritis," by A. M. Fishberg (Baillière, Tindall and Cox). Left-hand Column Shows Causes Listed in First Edition, 1931; Right-hand Column Shows Causes Listed in Fifth Edition, Published in 1954

1931	1954
Kidney disease—6 types	Diseases of kidney and renal blood vessels, 13 types
Toxaemia of pregnancy	Disseminated lupus
Lead-poisoning	Compression of kidney
Increased intracranial pressure	Experimental constriction of renal artery and nephrectomy
Tumours of suprarenal; ovarian hypofunction	Cushing's syndrome
Thyroid diseases	Bulbar poliomyelitis and other diseases of C.N.S.
Periarteritis nodosa	Experimental hypertension produced by corticotrophin, cortisone, D.C.A.
Polycythaemia	Cholesterol
Depressive psychoses	Salt
Coarctation of aorta	Section of moderator nerves
	Androgenic stimulation of rats

Twenty-three years later, in the fifth edition of this book, several new causes are added, as shown in the right-hand column. But now, as in 1931, the vast majority of cases of hypertension cannot be attributed to any of the causes shown. The work of Goldblatt in showing that hypertension could be produced in animals by clamping the renal artery was very important, but no one has yet provided enough evidence that hypertension without apparent cause is due to lesions of renal arteries without impairment of kidney function. There is therefore little more known about the aetiology of hypertension than there was 25 years ago, and we are thus handicapped in treatment. But symptomatic treatment has had some success in measures to reduce the tone of arterioles by depression of the sympathetic nervous system. This was first carried out by operation, now more often by drugs which depress the sympathetic ganglia, such as pentolinium and mecamylamine. These are certainly valuable in preventing hypertensive heart failure and may be life-saving in malignant hypertension, as exemplified by the following case.

A married woman aged 35 was seen in December, 1955, with all the cardinal symptoms of malignant hypertension: grade IV neuro-retinopathy, cardiac enlargement, triple heart sounds, tachycardia, albuminuria; blood urea, 26 mg. per 100 ml.; B.P. 285/170 mm. Hg; electrocardiogram showing the pattern of left ventricular predominance. Treatment with "rauwilloid" and "ansolysen" reversed these changes, retinal exudates and papilloedema cleared up, and the heart slowed and became normal in size. On October 1, 1956, the standing B.P. was 130/95; and the electrocardiogram showed return to normal. The patient is pursuing ordinary activities.

Coronary Heart Disease

In Sir James Mackenzie's book on angina pectoris published in 1923 he demonstrated the frequency of gross obstruction in the coronary arteries, and even mentions the presence in them of clots. However, the term "coronary thrombosis" is not to be found in the book, and the association of this condition with major attacks of cardiac pain was not then appreciated. The article by Parkinson and Bedford published in the *Lancet* in 1928 may be regarded as the source of a torrent of papers, and, although it was only accorded the secondary position in that journal, it became one of the most quoted papers in the medical literature. To-day patients, their relatives, and nurses diagnose what they call a "coronary," and may do so in any case of sudden collapse or for any pain between the neck and the abdomen. Perhaps the disease is on the increase, but it was undoubtedly occurring in large numbers 30 to 40 years ago, when some of the labels already mentioned were applied. Characteristic examples can be found in the careful case records in Mackenzie's book. Improved recognition is largely due to the electrocardiograph and the introduction of new leads. Whereas 20 years ago we were

content with three leads, we now rarely use fewer than 10 and sometimes twice that number.

In the treatment of acute coronary thrombosis the use of the anticlotting drugs may represent a slight advance, but their efficacy is still uncertain and the precise regulation of the coagulation and prothrombin times is difficult, not to say impossible. Obviously the prevention of coronary obstruction is the aim, and considerable work is now being done on these lines. This, however, is handicapped by doubt about the pathological nature of the obstruction. According to J. B. Duguid the main factor, apart from the occurrence of large clots, in obstructing the artery is a slow mural thrombosis which becomes organized, whereas the fatty changes and calcification of atherosclerosis tend to weaken the wall and thereby widen the lumen of the artery. So far as the prevention of atherosclerosis is concerned, diets low in fat content, oestrogenic sex hormones, and plant sterols are able to lower serum cholesterol and lipids, and are of potential though as yet unproved value. Heparin in doses insufficient to have a sustained anticoagulant effect is said to correct high serum lipoprotein levels, and may also prevent intimal deposits of platelets. Another possible line of attack on slow intravascular thrombosis is the use of enzymes such as trypsin and streptokinase, which are able to break up fibrin.

Conclusion

To summarize, the last 30 years or so have seen the conquest of three of the four common cardiac infections. Rheumatic fever alone remains a considerable source of disability; the position in thyrotoxic heart disease is very favourable; cardiac surgery has revolutionized the outlook in congenital heart disease and in some acquired valve lesions; and in hypertension, though the causes are still largely unknown, there is promising symptomatic treatment. Coronary disease has become the great problem of the day.

PERSISTENCE OF URINARY OESTROGEN EXCRETION AFTER OOPHORECTOMY AND ADRENALECTOMY

BY

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AND

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Surgeons of England

The development of a new and accurate method for the separate estimation of urinary oestrone, oestradiol-17 β , and oestriol (Brown, 1955a) made it possible for us to measure the amounts of these compounds in urine from a series of patients with cancer of the breast, to follow the effects of endocrine ablation on their urinary oestrogen levels, and to show that oophorectomy and adrenalectomy do not necessarily abolish oestrogen excretion. This study is based on the results of 500 oestrogen estimations from 40 patients.

Methods

Twenty-four-hour specimens of urine were collected, without preservative, and the amounts of oestrone, oestradiol-17 β , and oestriol were estimated in duplicate 200-ml. aliquots by Brown's method. We have obtained evidence (Brown *et al.*, 1957) that the method is considerably more sensitive than the author originally claimed.

About 1 μ g. of oestrone or oestradiol-17 β and 1.5 μ g. of oestriol a day have been taken as the lower limits; values below this are recorded as zero.

Phenolphthalein, which is used in a wide variety of aperients, interferes with the method (Brown, unpublished work). We have found that oestradiol-17 β cannot be measured in the urine of patients receiving stilb-oestrol. Oestrogen values in urine from patients treated with testosterone do not reflect endogenous secretion, since some conversion of testosterone to oestrogen has been demonstrated (see, for example, West *et al.*, 1956).

The two new oestrogens isolated by Marrian and Bauld (1955) and by Watson and Marrian (1955) cannot be estimated by Brown's method. The significance of these compounds as an additional measure of endogenous oestrogen production has not been evaluated.

The validity of any conclusions concerning the production of oestrogens in the body derived from the amount of oestrogen excreted in the urine may be questioned, for we have no definite knowledge of the nature and amount of circulating oestrogen; the nature, action, and metabolism of the primary hormone, or the differences in "target-organ" sensitivity. There is, however, indirect evidence that different levels of oestrogen excretion reflect differing levels of production, for there is close agreement between changes in the urinary oestrogen levels and the physiological sequence of the normal menstrual cycle and of pregnancy and lactation (Brown, 1955b, 1956). A significant correlation has been demonstrated between oestrogen excretion and the degree of oestrogenic stimulation of the vaginal mucosa as judged by the vaginal smear technique (Bulbrook *et al.*, 1955).

In this survey, with the exception of No. 2 (Fig. 2), all urine specimens examined were obtained from women with metastatic breast cancer.

Excretion Following Oophorectomy in Pre-menopausal Women

Women who were menstruating regularly are described as "pre-menopausal." The ovaries produce oestrogen during the menstrual cycle; their removal should therefore reduce urinary oestrogen levels. An example of this is shown (Fig. 1). This patient had previously menstruated regularly, and the first pre-operative specimen was obtained on the ninth day of the cycle, which proved to be abnormal, as menstruation started on the eighteenth day and continued until operation five days later. The amount of oestrogen excreted in the pre-operative period, however, was normal until bleeding started—according to the figures given by Brown (1955b) and our own controls. The pattern of ex-

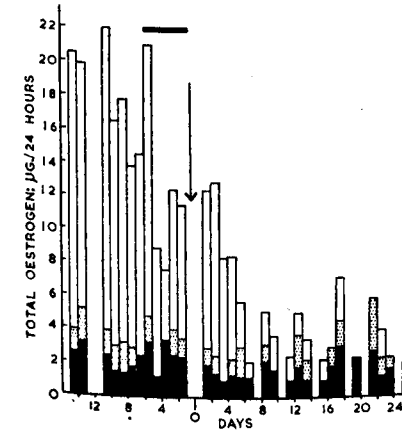


FIG. 1.—Excretion of oestrogen before and after oophorectomy. Patient 1, aged 49; pre-menopausal. Bleeding shown by horizontal bar. In Figs. 1 and 3-7 the day of operation (day 0) is indicated by a vertical arrow. The individual components of oestrogen excreted making up the total are denoted thus: black shading = oestrone; dotted area = oestradiol; white = oestriol.

cretion—that is, the relative amounts of oestrone, oestradiol-17 β , and oestriol—was also normal. Oophorectomy reduced the oestrogen excretion of this patient to a third of the pre-operative level, mainly at the expense of the oestriol fraction. Similar results were obtained before and after operation in a second pre-menopausal woman, but in this case rather more oestrogen than usual was excreted at the beginning of the luteal phase of the cycle.

Excretion in Menopausal and Post-menopausal Women

We have defined the "menopause" as the three-year period after the cessation of menstruation; women who have not menstruated for at least three years are designated as "post-menopausal."

There are almost no published data on the excretion of oestrogen by normal post-menopausal women. In one volunteer from whom we have been able to obtain serial urine specimens there was evidence of a cycle of oestrogen excretion shortly after the cessation of menstruation (Fig. 2), although the amount excreted was sub-normal when compared with that in the menstrual cycle. Six months later excretion became irregular, with no evidence of a cyclic rise and fall. It is possible that this cyclic excretion is a general occurrence of the beginning of the menopause.

The effect of oophorectomy on the excretion of oestrogen by a woman who had ceased to menstruate (as a result of palliative x-ray treatment) shortly before operation is shown in Fig. 3. In the 16 days after operation this patient excreted a good deal more oestrogen than in the pre-operative period; three months later oestrogen excretion had ceased. Seven months later oestrogen was again present in the urine in quantities greater than those found before operation.

A second menopausal patient ceased to excrete oestrogen directly after oophorectomy. Only two estimations were carried out, and in the absence of further specimens it was not possible to ascertain whether there was a return of oestrogen excretion.

Three post-menopausal women subjected to oophorectomy were studied. In one there was no change in the pattern or the amount of oestrogen excreted; in the second there was a slightly increased amount of oestrogen excreted in the 13

days after operation. In the third there was a slight increase in the amount of oestrogen excreted in the 13 days after operation.

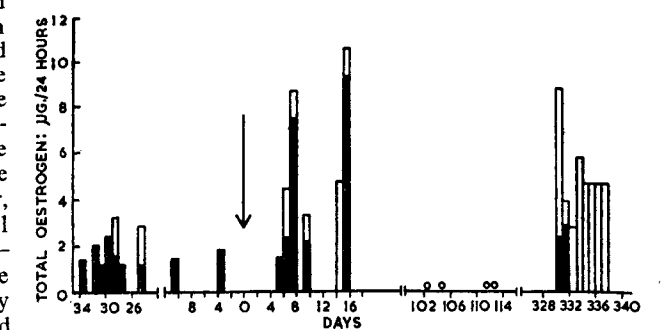


FIG. 3.—Excretion of oestrogen before and after oophorectomy. Patient 3, aged 45; menopausal.

post-operative days (Fig. 4). The third post-menopausal woman studied over a similar period showed an identical lack of response to oophorectomy.

Table I shows the amounts of oestrogen excreted by 14 patients at various times after removal of the ovaries. In

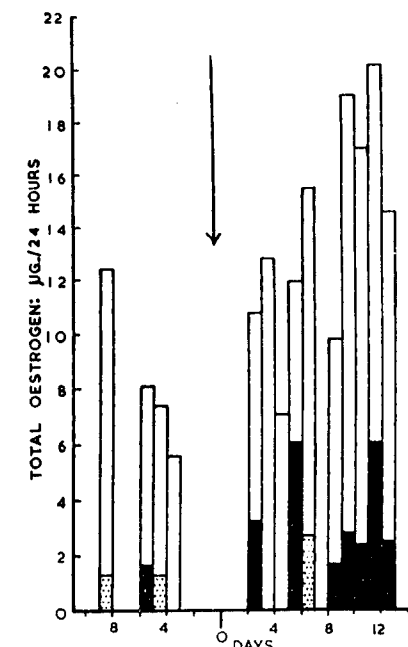


FIG. 4.—Excretion of oestrogen before and after oophorectomy. Patient 4, aged 52; post-menopausal.

TABLE I.—Excretion of Oestrogen after Oophorectomy

Patient	Age	Months After Operation	No. of Estimations	Oestrogen Excretion (µg. in 24 Hours)					
				Oestrone		Oestradiol		Oestriol	
				Range	Mean	Range	Mean	Range	Mean
A	35	36	4	0.0-2.4	0.9	0.0-0.3	0.0	0.0-4.3	1.3
B	38	6	4	0.0-1.9	1.3	0.0-2.8	0.7	0.0-4.1	2.3
C	38	8-9	10	0.0-18.6	3.2	0.0-4.7	1.4	1.7-11.0	5.1
D	41	1	6	0.0-6.2	1.8	0.0-12.1	2.3	0.0-5.8	3.5
E	43	6	4	2.0-8.0	4.9	1.5-6.0	4.3	3.6-5.5	4.5
F	43	17	2		4.4		1.4		2.7
G	49	1-2	19	0.0-3.0	1.5	0.0-1.5	1.0	0.0-10.5	2.6
H	49	20-26	26	0.0-2.9	1.6	0.0-2.5	0.6	0.0-6.7	1.0
I	50	8-9	6	0.0-4.6	2.0	0.0-5.3	1.3	0.0-1.9	0.6
J	52	1	11	0.0-6.1	2.3		0.0	7.1-16.4	11.1
K	50	66	5	0.0-2.4	1.0	0.0-5.1	1.6	8.2-9.5	8.9
L	52	11-12	13	0.0-5.3	2.2		0.0	0.0-3.6	0.8
M	53	1-2	15	0.0-6.1	1.9	0.0-2.2	0.8	0.0-4.7	3.5
N	70	1	3	0.0-5.4	2.4	0.0-3.0	1.4	0.0-15.0	5.4

Excretion Following Oophorectomy-adrenalectomy

Oestrogen excretion was measured in two patients who had both ovaries and one adrenal gland removed at operation, and the second adrenal gland removed about 10 days later. In Case 5 the patient was menopausal. Excretion was erratic from day to day (Fig. 5), but the proportions of oestrone, oestradiol-17 β , and oestriol were normal compared with those found in the menstrual cycle. After removal of both ovaries and one adrenal gland oestrogen excretion had ceased by the sixth day, but by the twelfth day small amounts of oestrogen could be detected in the urine. After removal of the second adrenal there was a transient but marked increase in oestrogen excretion, followed by a fall to zero. However, nine weeks later oestrogen excretion was at about pre-operative level. A second patient was 20 years post-menopausal, and in more than one-third of the number of specimens obtained before operation no oestrogen could be detected. Bilateral oophorectomy and unilateral adrenalectomy were followed by a sharp increase in oestriol excretion to 10 µg. on the day

after operation, but, unlike the preceding case, the level of excretion did not fall to zero until after the removal of the second adrenal gland. Death followed four days after the second operation.

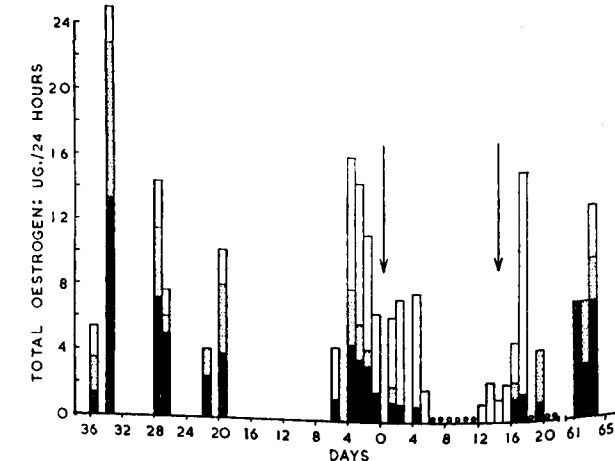


FIG. 5.—Excretion of oestrogen before and after oophorectomy-adrenalectomy. Patient 5, aged 48; menopausal.

Excretion Following Adrenalectomy

Three adrenalectomy cases are shown in Figs. 6, 7, and 8. In two it is difficult to assess the effects of the operation because an insufficient number of pre-operative specimens were examined. With this reservation in mind it should be noted that Case 6 excreted twice as much oestrogen after adrenalectomy as before (Fig. 6). Three months later oestrogen was still present in the urine. Almost a year after adrenalectomy the amount of oestrogen was practically double the pre-operative level. There was a change in the excretion pattern, previously characterized by the complete

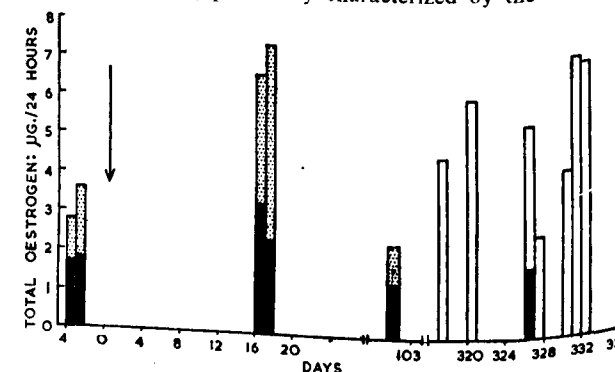


FIG. 6.—Excretion of oestrogen before and after adrenalectomy. Patient 6, aged 37. Oophorectomized 13 months before adrenalectomy.

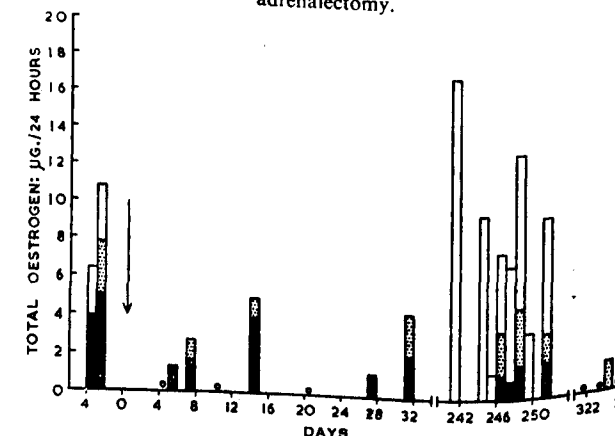


FIG. 7.—Excretion of oestrogen before and after adrenalectomy. Patient 7, aged 43. Oophorectomized 2½ years before adrenalectomy.

absence of oestriol, since after a year this compound was the main excretion product. In Case 17 there was a reduction in oestrogen excretion after adrenalectomy. Intermittent estimations showed an occasional zero titre (Fig. 7). Eight months after operation the amount of oestrogen found was higher than the pre-operative level, but three months later almost no oestrogen could be detected. The change in the oestrogen excretion pattern was similar to that in Case 6. Oestrone, oestradiol-17 β , and oestriol were found in the pre-operative specimens, but oestriol was completely absent immediately after adrenalectomy. Eight months later oestriol again predominated.

No specimens were obtained before operation from the third adrenalectomized patient (Fig. 8). On three occasions the amounts of oestrogen excreted were comparable with

adrenalectomy cannot be based on a single estimation. Serial estimations over long periods are essential; this is clearly demonstrated in Fig. 7.

A separate series of eight patients after oophorectomy and adrenalectomy is at present being investigated. In this group—referred to later as the “new series”—oestrogen excretion is determined each month on a 24-hour specimen of urine brought to an out-patient clinic. Two of these patients, from each of whom five specimens have been examined, were not excreting oestrogen. In 9 of 24 specimens obtained from the remaining six patients, amounts of oestrone varied from 1.1 to 3.7 µg. per 24 hours; trace amounts of oestradiol-17 β were found in three specimens and of oestriol in one specimen only.

Discussion

The main conclusion to be drawn from the results in this series of patients is that oestrogen excretion continues after oophorectomy and is not necessarily abolished by subsequent adrenalectomy. It is well established that endocrine ablation results in a temporary remission in some cases of mammary cancer. It remains to be determined whether the levels of oestrogen after oophorectomy and oophorectomy-adrenalectomy are correlated with the patient's clinical course.

Dao (1953) and Smith and Emerson (1954), using a biological assay, have detected oestrogen in the urine of oophorectomized women. Struthers (1956) has often found positive vaginal smears in such women. These findings agree with our results.

The extra-ovarian source of oestrogen is thought to be the adrenal glands. In addition to the evidence reviewed by Paschkis and Rakoff (1950) this concept is supported by reports that oestrogen excretion shows a transient rise after the injection of corticotrophin in oophorectomized women (Brown, unpublished results), after burns in men (Heller, 1944), and after oophorectomy in post-menopausal women (Smith and Smith, 1944). We have found that oestrogens, 17-ketosteroids, and ketogenic steroids rise together after prostatic biopsy. The reaction of the adrenal glands to stimulation by corticotrophin best explains the post-operative increases in oestrogen excretion shown in Figs. 3 and 4. The increase noted in Fig. 5 after the removal of the second adrenal gland supports the pathological evidence that in this patient the first adrenal was incompletely removed at operation.

If the adrenal glands are the main source of extra-ovarian oestrogen, the immediate effect of adrenalectomy should be the reduction or abolition of oestrogen excretion. We have only a few estimations in the period immediately after adrenalectomy, but in these cases (Figs. 5 to 7) oestrogen excretion fell to zero shortly after the operation. The fall to zero seems to be a temporary effect. Case 5, after an initial fall in oestrogen level, was excreting considerable quantities nine weeks after oophorectomy and adrenalectomy. In addition, with four exceptions (P and R in Table II and two patients in the “new series”) all patients studied excreted oestrogen in the urine at various times after adrenalectomy.

These results agree with the finding of positive vaginal smears in oophorectomized and adrenalectomized women, reported by Struthers (1956); but Dao (1953), using a bioassay method, was unable to detect oestrogen in the urine of such patients.

The oestrogen excreted may originate *inter alia* from diet or from cortisone metabolism. It seems most unlikely that these are important sources, since two of nine patients, all on fairly standard diet and on similar maintenance doses of cortisone, failed to excrete any oestrogen, and in two of the eight out-patients no oestrogen could be detected. Adrenal gland tissue not removed at operation and accessory adrenal tissue (Graham, 1953; Falls, 1955) are more likely sources of the oestrogen found in some patients after adrenalectomy.

One patient was treated with adrenocorticotrophin (100 units of corticotrophin gel, intramuscularly, daily for three days) in an attempt to test for the presence of adrenal tissue,

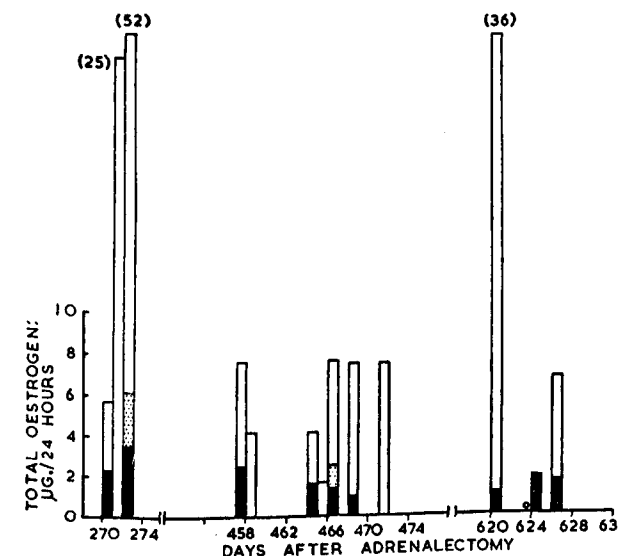


FIG. 8.—Excretion of oestrogen after adrenalectomy. Patient 8, aged 44. Oophorectomized 14 months before adrenalectomy.

those in the menstrual cycle (25, 52, and 36 µg. per 24 hours). This patient was not receiving testosterone. The extreme variation in the oestrogen excretion is shown by the fact that three days after an output of 36 µg. in 24 hours, no oestrogen was detected.

In one further case adrenalectomy reduced a mean pre-operative level of 12 µg. a day to zero in two specimens available before death.

Further studies limited to the post-adrenalectomy period are shown in Table II; this does not include post-operative figures of Cases 6, 7, and 8 already reported.

TABLE II.—Excretion of Oestrogen after Adrenalectomy in Previously Oophorectomized Patients

Patient	Age	Months After Operation	No. of Estimations	Oestrogen Excretion (µg. in 24 Hours)					
				Oestrone		Oestradiol		Oestriol	
				Range	Mean	Range	Mean	Range	Mean
O	34	1	4	1.3-2.5	2.0	0.0-2.0	0.5	0.0-1.6	0.0
P	43	13	4	0.0	0.0	0.0	0.0	0.0	0.0
R	45	12	7	0.0	0.0	0.0	0.0	0.0	0.0
S	48	16	7	0.0-1.5	1.0	0.0-3.8	1.0	0.0-5.2	0.4
T	51	5	5	0.0-5.2	5.5	0.0-6.1	3.0	0.0-2.5	1.1
U	62	17	5	1.7-4.5	2.3	0.0-3.2	1.2		0.0

* On testosterone.

A consideration of the post-adrenalectomy levels of oestrogen excretion in Table II and in Figs. 6 to 8 shows that oestrogen excretion by patients in this survey was generally not abolished by the operation. In only one case (P in Table II) was a consistent absence of oestrogen established over the period studied. Conclusions regarding continuation or cessation of oestrogen production in a patient after

but no stimulation of oestrogen excretion was observed. This test may be of doubtful value as an index of the capacity of the remaining adrenal tissue to secrete oestrogens. After adrenalectomy, with relatively low doses of oral cortisone, it is possible that the secretion of endogenous corticotrophin is sufficient to cause maximal or near maximal secretion rate by any remaining adrenal tissue. Exogenous corticotrophin would thus be likely to have little or no effect.

Taylor *et al.* (1949) found elevated corticotrophin levels in the blood of untreated patients with Addison's disease, and the levels did not return to normal with maintenance doses of cortisone (Sydnor *et al.*, 1953). It is well known that the level of urinary 17-ketosteroids and ketogenic steroids found in patients with Addison's disease cannot be elevated by administration of corticotrophin. On the other hand, Sayers (1955) has reported that the high level of corticotrophin in adrenalectomized patients is reduced by treatment with cortisone.

Whatever the origin of the urinary oestrogen found in some of our patients after oophorectomy and adrenalectomy may be, its immediate source is the oestrogen of the circulating blood. The hypothesis of oestrogen independence is often invoked when a breast cancer recurs in the absence of those endocrine organs assumed to produce oestrogen. The observations recorded in this paper strongly suggest that oestrogen independence cannot be assumed until oestrogen excretion has been fully investigated.

Summary

A chemical method has been applied to a study of urinary oestrogen levels of patients undergoing bilateral oophorectomy or bilateral adrenalectomy for metastatic breast cancer. Oophorectomy reduced oestrogen excretion in premenopausal women but had no effect after the menopause. Adrenalectomy carried out after oophorectomy did not always abolish oestrogen excretion.

It is concluded that, since oestrogen excretion continues after oophorectomy and may continue after adrenalectomy, failure to respond clinically to these operations is not necessarily due to the oestrogen independence of the tumour.

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REFERENCES

- Brown, J. B. (1955a). *Biochem. J.*, **60**, 185.
— (1955b). *Lancet*, **1**, 320.
— (1956). *Ibid.*, **1**, 704.
— Bulbrook, R. D., and Greenwood, F. C. (1957). In press.
Dao, T. L.-Y. (1953). *Science*, **118**, 21.
Falls, J. L. (1955). *Cancer*, **8**, 143.
Graham, L. S. (1953). *Ibid.*, **6**, 149.
Heller, C. H. (1944). Jos. Macy Jr. Foundation: 7th meeting, Chicago, Ill., p. 60.
Marrian, G. F., and Bauld, W. S. (1955). *Biochem. J.*, **59**, 136.
Paschkis, K. E., and Rakoff, A. E. (1950). *Recent Progr. Hormone Res.*, **5**, 115.
Sayers, G. (1955). *J. clin. Endocr.*, **15**, 754.
Smith, O. W., and Emerson, K., jun. (1954). *Proc. Soc. Exp. Biol. (N.Y.)*, **85**, 264.
— and Smith, G. V. (1944). Jos. Macy Jr. Foundation: 7th meeting, Chicago, Ill., p. 69.
Struthers, R. A. (1956). *British Medical Journal*, **1**, 1331.
Sydnor, K. L., Sayers, G., Brown, H., and Tyler, F. H. (1953). *J. clin. Endocr.*, **13**, 891.
Taylor, A. B., Albert, A., and Sprague, R. G. (1949). *Endocrinology*, **45**, 335.
Watson, E. J. D., and Marrian, G. F. (1955). *Biochem. J.*, **61**, xxiv.
West, C. D., Damast, B. L., Sarro, S. D., and Pearson, O. H. (1956). *J. biol. Chem.*, **218**, 409.
Young, Stretton, Bulbrook, R. D., and Greenwood, F. C. (1957). *Lancet*, **1**, 350.

EFFECT OF HYPOPHYSECTOMY ON URINARY OESTROGEN IN BREAST CANCER

BY

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It has been shown that patients with breast cancer may continue to excrete oestrogen in the urine after oophorectomy, adrenalectomy, or hypophysectomy (Greenwood and Bulbrook, 1956). The detailed results of the effects of the first two operations are published at page 662 in this issue (Bulbrook and Greenwood, 1957). The present paper, based on over 200 estimations on specimens from ten women and one man, describes the effect of hypophysectomy on urinary oestrogen excretion.

Method.—The method of Brown (1955a) was used to determine the amounts of oestrone, oestradiol-17 β , and oestriol in duplicate aliquots from 24-hour specimens of urine. Generally, 200-ml. aliquots were taken, but with very dilute post-hypophysectomy urine 400-ml. aliquots have occasionally been analysed. The accuracy, precision, sensitivity, and specificity of the method have been described by Brown, Bulbrook, and Greenwood (1957a). The specificity of the method has been checked in the urines obtained from one patient after hypophysectomy. There was a close agreement between chemical and biological assays of the urine in this patient (Bulbrook, Greenwood, and Williams, to be published). In some patients after hypophysectomy, maintained on cortisone, the levels of oestriol may be underestimated owing to interference in the final colour reaction. This interference is removed by an extra purification step involving saponification of the oestrogen fractions (Brown, Bulbrook, and Greenwood, 1957b).

Results

In all cases described in this paper the pituitary gland was removed surgically and the pituitary fossa was filled with Zenker's solution. The effect of hypophysectomy on the urinary oestrogen excretion of 10 patients is summarized in the Table.

Effect of Hypophysectomy on Urinary Oestrogens

Patient No.	No. of Estimations	Oestrogen Excretion Before Hypophysectomy (μ g./24 Hours)				No. of Estimations	Oestrogen Excretion After Hypophysectomy (μ g./24 Hours)			
		O	D	T	Total		O	D	T	Total
1	10	1.9	1.6	4.9	8.4	19	1.5	1.3	3.9	6.7
2	10	2.9	1.2	4.9	9.0	9	1.6	2.9	2.4	6.9
3	10	0.9	0.3	5.7	6.9	6	0.8	0.0	4.0	4.8
4	10	1.9	4.6	2.5	9.0	4	0.0	0.0	0.0	0.0
5	8	0.5	0.4	10.4	11.3*	4	1.0	0.6	0.0	1.6
6	3	0.0	0.0	0.5	0.5	7	0.3	0.0	0.0	0.3
7	22	1.9	0.2	1.7	3.8	6	6.0	1.1	0.6	7.7†
8	3	1.9	0.4	0.0	2.3	13	0.8	2.3	7.1	10.2
9	7	0.8	1.8	5.6	8.2	8	0.3	0.3	11.0	11.6
10	7	0.9	0.0	0.0	0.9	5	1.3	0.6	1.5	3.4‡
11	—	—	—	—	—	13	0.0	0.0	0.0	0.0
						29	2.6	1.2	0.8	4.6

* Estimations immediately after castration.

† On testosterone.

‡ Estimations immediately after hypophysectomy.

The figures in this table refer to the mean excretion of O=oestrone, D=oestradiol-17 β , T=oestriol, and their sum, the total amount of oestrogen excreted, expressed in μ g. per 24 hours.

The results fall roughly into three groups. The first consists of patients in whom hypophysectomy had virtually no effect on the total amount of oestrogen excreted. Patient 1, aged 41, ceased menstruating nine months before hypophysectomy. The amount of oestrogen excreted before operation (presumably of adrenal origin) fluctuated widely from day to day (Fig. 1), but the relative amounts of

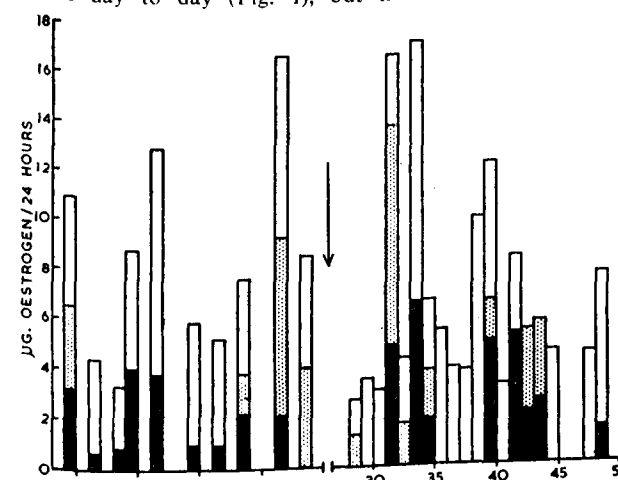


Fig. 1.—Excretion of oestrogen before and after hypophysectomy. Patient 1, aged 41; menopausal. (In all four graphs the ordinate shows the number of days or weeks before and after operation, the day of the operation being taken as day 0 and indicated by the vertical arrow. Height of vertical columns shows total amount of oestrogen excreted in 24 hours. Individual components are: black shading=oestrone, dotted area=oestradiol, white area=oestriol.)

oestrone, oestradiol, and oestriol were normal compared with the proportions found during the normal menstrual cycle (Brown, 1955b). After operation there was no change either in the pattern or in the amount of oestrogen excreted.

Patient 2, aged 39, was oophorectomized nine months before hypophysectomy. While there was little change in the total amount of oestrogen excreted after operation, a change in pattern occurred in that oestrone and oestriol were excreted in smaller amounts while the excretion of oestradiol increased. Patient 3, aged 45, was oophorectomized two years before hypophysectomy. After removal of the pituitary gland there was no significant change in either the pattern of excretion or the amount of oestrogen excreted.

The second group (Nos. 4-7) consists of patients who excreted either no oestrogen or only trace amounts after hypophysectomy. Patients 4 (Fig. 2) had not been previously oophorectomized, and the pre-operative level of

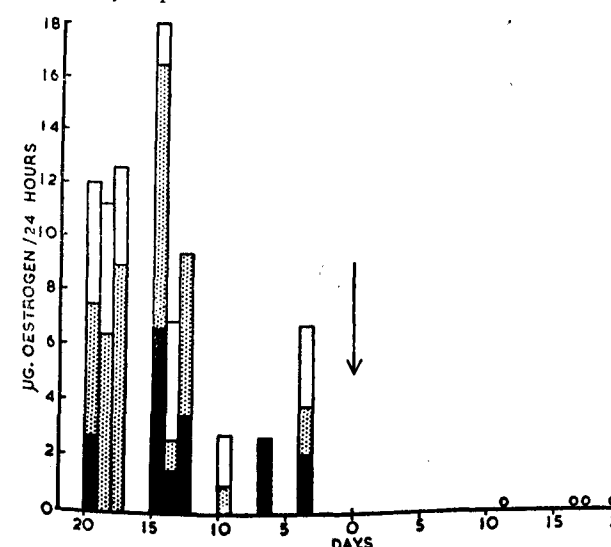


Fig. 2.—Excretion of oestrogen before and after hypophysectomy. Patient 4, aged 60; post-menopausal.

excretion seemed high for a woman aged 60. Abnormal amounts of oestradiol-17 β (relative to the amounts of oestrone and oestriol) were found in these specimens. After hypophysectomy no oestrogen could be found in the four specimens of urine available for analysis.

Patient 5, aged 50, had been oophorectomized three years before hypophysectomy. Twenty-four specimens of urine obtained intermittently over a period of 16 months before operation contained little oestrogen (mean=3.2 μ g. total oestrogen per 24 hours), and in the single specimen of urine available after hypophysectomy no oestrogen could be detected. Since only one analysis was possible this patient has not been included in the Table.

Patient 6, a man aged 58, had been castrated six months before hypophysectomy. Immediately after castration an average amount of 11.3 μ g. total oestrogen per 24 hours was excreted over an eight-day period, but just before hypophysectomy only trace amounts of oestrogen—that is, amounts approaching the limit of sensitivity of the method—could be detected in the urine. One month after hypophysectomy trace amounts of oestrone and oestriol were found in two of four specimens of urine.

Patient 7, aged 48, was oophorectomized 11 months before hypophysectomy. After the latter operation 2 μ g. of oestrone was found in one of six specimens. Later, appreciable amounts of oestrogen were found in the urine, but this oestrogen was almost certainly derived from administered testosterone (see, for example, West *et al.*, 1956).

The third group is made up of patients who showed an increased excretion of oestrogen after hypophysectomy (Nos. 8, 9, and 10).

Patient 8, aged 49, was oophorectomized three months before hypophysectomy. Only three specimens of urine were obtained before operation, and it is possible that the amount of oestrogen in these specimens may not have given a true picture of the functional activity of the adrenal glands. After removal of the pituitary gland this patient's oestrone excretion dropped to half the pre-operative level, but oestradiol excretion increased four-fold, and oestriol, absent in the pre-operative specimens of urine, was found in appreciable amounts (Fig. 3).

Patient 9, aged 46, was oophorectomized six months before hypophysectomy. Post-operatively the oestrone and oestradiol levels fell but the amount of oestriol excreted was almost doubled.

In Patient 10, a post-menopausal woman aged 64, hypophysectomy caused a temporary increase in oestrogen excretion. In four of seven specimens obtained before operation 1.5 to 2 μ g.

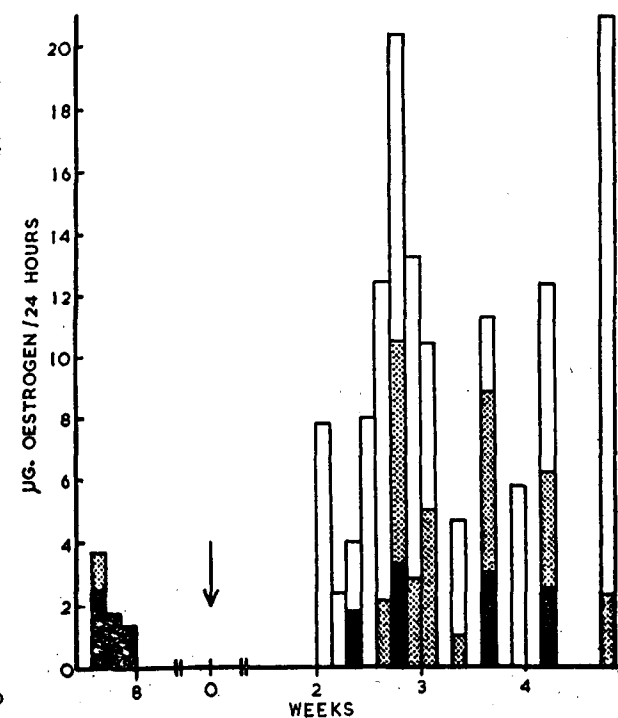


Fig. 3.—Excretion of oestrogen before and after hypophysectomy. Patient 8, aged 49; previously oophorectomized.

of oestrone per 24 hours was found. Twelve days after hypophysectomy amounts of oestrogen ranging from 2.7 to 7.4 μg . (total oestrogen per 24 hours) were found in five of six specimens. In nine subsequent assays no oestrogen could be detected in the urine.

The last patient, (No. 11, Fig. 4) cannot be grouped with the preceding ten since no pre-operative assays were carried out. However, specimens of urine were obtained intermittently between 8 and 11 months after hypophysectomy. This patient,

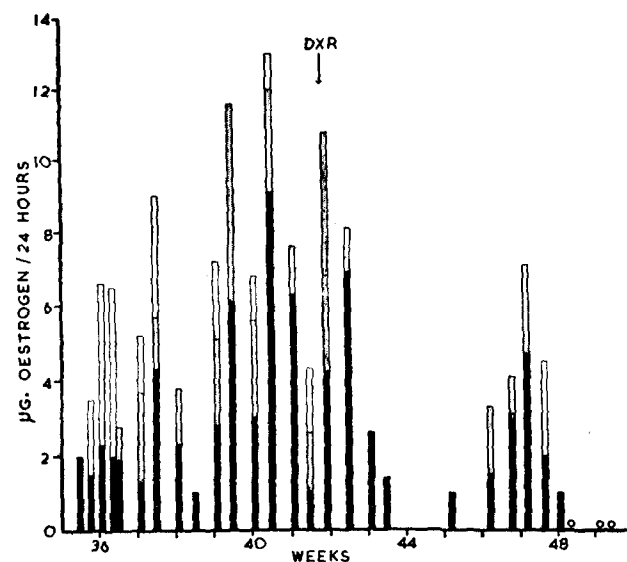


FIG. 4.—Excretion of oestrogen after hypophysectomy. Patient 11, aged 48; menopausal. DXR=deep x-ray treatment.

aged 48, with intact ovaries and adrenal glands, excreted between 1 and 12 μg . of total oestrogen per 24 hours over most of this period. After x-ray treatment there appeared to be a steady decline in the amount of oestrogen excreted, and in the last three specimens of urine available before death no oestrogen could be detected.

Discussion

The results show that oestrogen excretion continued after hypophysectomy in 7 of 11 patients in this series. If the secretion of oestrogen is controlled solely by the pituitary gland the simplest explanation of these results is that in only four cases (Nos. 4, 5, 6, and 7) was hypophysectomy effective in lowering the amount of circulating trophic hormones below that required for the continued secretion of oestrogen by the target organs. In the remaining cases enough pituitary tissue may have been left at operation to enable the target organs to function at an unchanged rate (Patients 1, 2, and 3), or rapidly regenerating tissue may have been responsible for an excessive production of trophic hormones to account for the increased excretion of oestrogen seen in Patients 8 and 9, and occurring temporarily in Patient 10.

An additional factor which may account for some part of the continued secretion of oestrogen is the presence of accessory pituitary tissue, which is often found in man (see Melchionna and Moore, 1938; Boyd, 1956). From a comparison of the histological appearance of this tissue in the presence and absence of the pituitary, Müller (1956) concluded that pharyngeal pituitary tissue in man after hypophysectomy is capable of secretory activity.

It is unlikely that the continued secretion of oestrogen was due to incomplete atrophy of the adrenal glands at the time the oestrogen estimations were carried out. Judged by 17-oxy steroid production, adrenal atrophy is complete within nine days (Luft *et al.*, 1955), but it is possible that different mechanisms for the synthesis of the various adrenal hormones may be differentially affected by removal of the pituitary gland. Most of the estimations were carried out at least three weeks after the removal of the pituitary, and Patient 11 was excreting oestrogen almost a year after operation.

Whatever the source of the oestrogen found in the urine of these patients, and whatever the factors controlling oestrogen secretion, it is clear that some caution must be exercised before the failure of a patient to respond clinically to hypophysectomy is ascribed to hormone independence of the tumour. Hormone independence cannot be assumed without appropriate measurement of hormone secretion.

Summary

In 4 of 10 patients little or no oestrogen was found in the urine after hypophysectomy. Three patients showed unchanged levels of oestrogen excretion and three showed increased levels. Yet another patient studied almost a year after operation was excreting appreciable amounts of oestrogen.

Since 7 of the 11 patients continued to excrete oestrogen after hypophysectomy, it cannot be safely assumed that a breast cancer is hormone-independent if, following operation, there is no favourable clinical response.

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REFERENCES

- Boyd, J. D. (1956). *J. Endocr.*, **14**, 66.
Brown, J. B. (1955a). *Biochem. J.*, **60**, 185.
— (1955b). *Lancet*, **i**, 320.
Bulbrook, R. D., and Greenwood, F. C. (1957a). In press.
— (1957b). In press.
Bulbrook, R. D., and Greenwood, F. C. (1957). *British Medical Journal*, **i**, 662.
Greenwood, F. C., and Bulbrook, R. D. (1956). *J. Endocr.*, **13**, xxxiii.
Luft, R., Olivecrona, H., Sjögren, B., Ikkos, D., and Ljunggren, H. (1955). *Ciba Foundation Colloquia on Endocrinology*, **8**, 438.
Melchionna, R. H., and Moore, R. A. (1938). *Am. J. Path.*, **14**, 763.
Müller, W. (1956). Second Acta Endocrinologica Congress, Oslo.
West, C. D., Damast, B. L., Sarro, S. D., and Pearson, O. H. (1956). *J. Biol. Chem.*, **218**, 409.

ACUTE DISSEMINATED ENCEPHALOMYELITIS AND RELATED SYNDROMES

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In addition to their clinical interest the well-defined neurological syndromes which occur in the course of the acute specific fevers form a useful starting-point for a consideration of the aetiology and pathogenesis of similar syndromes encountered in other clinical contexts. There is, for example, a well-recognized resemblance between post-exanthematous encephalitis and the similar illnesses which sometimes complicate Jennerian vaccination (Miller, 1953a) and other prophylactic inoculations (Miller and Stanton, 1954a). It is tempting also to speculate on possible relationships between these syndromes and other acute demyelinating diseases in which no such clear-cut aetiological agent is evident, and to compare such naturally occurring forms with the examples of demyelinating encephalitis which have been produced in experimental animals. It is our purpose in the present paper to compare and contrast these various

syndromes to see if we may reach any valid conclusions regarding the underlying pathogenetic mechanisms involved.

Complications of the Acute Specific Fevers

At the outset of this study we became aware of the paucity of reliable information about the natural history of neurological complications of the acute specific fevers, which constitute the paradigm of this group of diseases, and our first step was to review the available world literature on this subject. The results of this study, comprehensive in the case of measles, chicken-pox, and rubella, and less exhaustive but fairly complete in mumps, scarlet fever, and pertussis, are now complete (Miller, Stanton, and Gibbons, 1956). From this work we have been able to obtain a fairly clear picture of the forms which these complications may take. We have few valid figures regarding their incidence, but a good deal of reasonably reliable comparative information about their clinical features, natural history, prognosis, and sequelae. From a consideration of the relatively few fatal cases which have been adequately studied and reported we have also gained useful information concerning the march of histopathological changes involved.

If for a moment we consider only the neurological complications of measles, varicella, and rubella, on which our information is more complete, we can say that in all three fevers about 90% of neurological complications take the form of encephalitis or encephalomyelitis, the small minority comprising examples of uncomplicated myelitis or polyradiculitis. The average latent period between the appearance of the rash and the onset of encephalitis is from four days (rubella) to six days (varicella). In each disease polyradiculitis has an average latent period twice as long as that of encephalitis, myelitis occupying an intermediate position. Occasionally, and especially in rubella, encephalitis precedes the rash, but this has not been recorded in the case of myelitis or polyradiculitis. There is no correlation, positive or negative, between the severity of the exanthem and the appearance of encephalitis. Both sexes may be affected, but the sex ratio varies somewhat between the three diseases, while all these neurological complications are much commoner in the older subjects of the exanthemata—for example, over 10 years of age. Only in the case of measles are the data adequate for a reliable assessment of incidence, and in this disease encephalitis probably complicates 1 in every 1,000 cases: the incidence in rubella is almost certainly less. The mortality in measles and rubella encephalitis is about 20%, that of varicella encephalitis 10%.

Most often these encephalitic illnesses begin abruptly with convulsions followed by coma. Rather less frequently there is a gradual lapse into stupor. A rise of temperature usually accompanies the onset, and the neurological picture is polymorphic, some of the signs being transient and others more persistent. Hemiplegia, tetraplegia, ataxia, involuntary movements, retention of urine, cranial nerve palsies, and meningism are all common findings, and it is not possible to distinguish on neurological grounds between the encephalitis of measles and that of rubella or varicella. However, in the latter form coma, convulsions, hemiplegia, and extensor plantar responses are all comparatively less common, while ataxia and nystagmus are seen more than twice as often as in measles or rubella. The spinal fluid may be normal throughout, but often shows a lymphocytic pleocytosis, occasionally with a slight rise of protein content. When death occurs in para-exanthematous encephalitis, it usually takes place within three days, and practically always within a week of the onset. In surviving cases, a remarkable degree of recovery is usual, and 80% of surviving patients show no disability by the end of six weeks. Sequelae are more common in younger patients, and except for residual hemiplegia or paraplegia are more often psychiatric than neurological. The lowest incidence of sequelae appears to be after rubella encephalitis, though this may be in part due to the fact that this form of encephalitis, like the initiating exanthem, has the highest age incidence of the three.

Myelitis, both transverse and ascending in type, has been reported in measles, varicella, and rubella, also polyradiculitis, clinically indistinguishable from "acute infective polyneuritis" and in many cases showing the cyto-albuminological dissociation in the spinal fluid characteristic of the Landry-Guillain-Barré syndrome. Good recovery is usual in both the polyradicular and the myelitic forms, though the latter may have a mortality of up to 20% and occasionally results in a severe residual paraplegia.

Pathological Findings in Fatal Cases

The reports of pathological findings in fatal cases of encephalitis complicating measles, varicella, and rubella describe acute lesions disseminated throughout the nervous system, beginning with congestion and oedema and ending, if the patient survives long enough, with the fully developed picture of perivenous infiltration and demyelination (perivenous encephalomyelitis). These changes cannot be rigidly correlated with the severity or duration of clinical symptoms, but they do reveal a fairly well defined progression, which can be reconstructed by a consideration of material drawn from patients dying at varying intervals after the onset of encephalitic symptoms. The initial change in the brain appears to be congestion, followed within a few hours by patchy swelling in the walls of the smaller venules and their mural infiltration with mononuclear cells. Patchy perivenous oedema, which may progress to haemorrhage, follows rapidly.

In fulminating illnesses these changes give rise to rapidly fatal cerebral purpura, but in progressive cases perivenous infiltration with lymphocytes and microglial elements is seen, followed by demyelination. Such changes may be encountered within 48 hours of the clinical onset, and a few days later fat phagocytosis ensues, leaving demyelinated areas which may appear confluent. These changes affect mainly the white matter of the nervous system (leuco-encephalitis), while nerve-cell changes are much less constant and may indeed be absent throughout. Valuable information is provided by the reports of Malamud (1939) and Van Bogaert (1949) on cerebral histopathology in three patients dying from unrelated causes some years after measles encephalitis. Van Bogaert interpreted the findings in his case as revealing no residual pathological evidence of the preceding encephalitis, which must have arisen on the basis of entirely reversible changes, while Malamud found only well-defined areas of demyelination, non-progressive and with no sign of the extending fibrous gliosis characteristic of disseminated sclerosis.

Pathological evidence is not available in polyradiculitis complicating these fevers, but in myelitic cases both diffuse perivascular demyelinating lesions and focal vascular occlusions have been described, the latter possibly based on the arteritic lesions which are so common a histopathological feature of this group of disorders.

We have also found some evidence (Miller *et al.*, 1956) that a clinically and pathologically identical triad of encephalitis, myelitis, and polyradiculitis is occasionally encountered as a complication both of mumps and of scarlet fever. In both these diseases, however, such syndromes are much less frequent than a benign lymphocytic meningitis. In the case of scarlet fever, the situation is further confused by a group of neurological complications arising on the basis of secondary factors such as venous thrombophlebitis and renal hypertension. There can be no doubt, on the other hand, that the neurological complications of pertussis fall into an entirely separate class, radically different both clinically and pathologically from the perivenous demyelinating encephalomyelitis characteristic of measles, varicella, and rubella.

Syndromes Following Non-specific Infections

In comparing these para-exanthematous syndromes with other forms of encephalitis, myelitis, and polyradiculitis, we will leave aside both the virus encephalitides, and also such entities as syphilitic myelitis, and will consider primarily

those forms which fall within the group of acute disseminated encephalomyelitis, the diagnostic criteria of which were formulated in a classical paper by McAlpine (1931). These include forms of encephalitis, encephalomyelitis, myelitis, and neuromyelitis optica (Devic's disease) arising after comparatively trivial non-specific infections, body-chilling, mild or surgical trauma, or on occasion without any apparent external provoking factor. Such diseases are not very uncommon, and manifest themselves by an acute onset with coma or stupor in encephalitic forms, and rapidly increasing signs of spinal-cord damage in the myelitic forms, which may be transverse or ascending in type. After progressing for a period which varies from a few days to a few weeks, the condition becomes stationary and subsequent recovery is often surprisingly complete, although sequelae such as hemiplegia, paraplegia, or symptomless extensor plantar responses may be demonstrable. The mortality in encephalomyelitic types is between 20 and 30%.

It is interesting that in these spontaneous forms recurrence has often been observed (Miller and Evans, 1953; Miller and Gibbons, 1954), whereas it has never been reported in those cases arising in relation to the specific fevers. It is possible, however, that relapse may occasionally occur in the latter, and Sir Russell Brain (1956, personal communication) has seen this in a case of mumps polyradiculitis. Neuromyelitis optica, as well as occurring spontaneously and after banal infections, has also been observed as a complication of measles (Brain, 1951; Janbon *et al.*, 1951).

Histopathologically these cases are characterized by areas of patchy demyelination, but inflammatory cells and neuronal degeneration are both inconspicuous. Some perivascular cuffs of lymphocytes are present, and occasional petechial haemorrhages are found. These changes are clearly very similar qualitatively to those of para-exanthematous encephalomyelitis; indeed, pathologically as well as clinically it is impossible to identify any single feature which permits of clear differentiation between the two groups. In the absence of adequate pathological evidence we can do no more than draw attention at this point to the parallel similarity in clinical features of the Landry-Guillain-Barré syndrome whether it occurs "spontaneously" or as a complication of the acute specific fevers.

Mention has already been made of post-vaccinal encephalitis, and a further group of neurological cases bearing a striking resemblance to those complicating the exanthemata is encountered following the administration of serum and other prophylactic inoculations. We have described these in detail elsewhere (Miller and Stanton, 1954a), and here would merely emphasize that such complications may involve the neuraxis at any or every level, giving rise to encephalitis, myelitis, or polyradiculitis, in pure or mixed forms, and in proportions which vary to some extent with the nature of the antigen employed. Such pathological reports as have been made in these cases reveal changes analogous to those seen in non-specific acute disseminated encephalomyelitis, post-vaccinal encephalitis, and the para-exanthematous syndromes already described.

A Common Pattern

In all the conditions discussed above it is possible to discern a broad common pattern. The pathogenetic mechanisms involved, whatever they are, can damage the neuraxis at any level, whether nerve root, cord, or brain. The resulting clinical picture may be discrete or mixed, but the histopathological basis in all cases is remarkably similar, and essentially based on a lesion the end-result of which is perivenous demyelination. The origin of such a non-specific syndrome in invasion of the nervous system by a neurotropic virus is unsupported by any positive evidence, lies in the face of the aetiological facts, and has been generally discarded. The dissimilarity between the histopathological changes of perivenous encephalomyelitis and those of any authenticated virus infection of the nervous system militates equally against acceptance of the alternative hypothesis,

which regarded these diseases as manifestations of the activity of an unidentified latent and ubiquitous virus already present in the patient's tissues, potentiated by the recently preceding infection or other insult to the nervous system.

In this connexion it seems likely that some importance may attach to the evidence now available of experimental demyelination produced in animals by repeated injections of heterologous or homologous brain emulsions, with or without adjuvants. This evidence has been reviewed by Wolf (1952). By these means a perivenous demyelinating lesion can be produced, disseminated throughout brain and cord, which is closely analogous histopathologically to the human diseases under consideration. More recently Waksman and Adams (1955) have produced in rabbits a comparable experimental allergic polyneuritis with cyto-albuminological dissociation in the spinal fluid and characteristic lesions in spinal nerve roots, ganglia, and nerves. The similarity of these experiments to the occasional disastrous "neuromyolytic accidents" occurring during human inoculation with extracts of animal nervous tissue in the course of antirabic treatment is striking.

The resemblance of the histopathological changes described in these experimental animals to those of acute disseminated and para-exanthematous encephalitis in man suggests the possibility that these latter conditions may also be allergic in origin. Russell (1955), in comparing the rare acute haemorrhagic leuco-encephalitis in man with acute disseminated encephalomyelitis, has suggested that these are variants of a single pathological process, differing mainly in the acuteness and intensity with which the nervous system is attacked by a common pathological process. In support of the view that this process is allergic, she has demonstrated the development of foci of plasma cells in the human spleen both in acute disseminated encephalomyelitis and in haemorrhagic leuco-encephalitis. Marshall and White (1950) had already shown that plasma blasts, and later mature plasma cells, appear in the spleen in a few days when antigens are administered to rabbits. In this connexion also the recent finding by Lander (1955) of typical acute haemorrhagic leuco-encephalitis in the brain of a man dying on the fifth day of haemorrhagic varicella, and the earlier report by Shallard and Latham (1945) of the same condition complicating measles, are of particular interest.

Appearances similar to those of acute haemorrhagic leuco-encephalitis are occasionally encountered in fatal cases of drug encephalopathy, and Russell (1937), dealing with "encephalitis" due to arsphenamine, and Cavanagh (1953), describing similar cases following the administration of streptomycin and P.A.S., raise the possibility of hypersensitivity as the probable underlying mechanism.

Conclusions

A whole range of apparently related and strikingly similar syndromes of damage to the neuraxis can arise in widely differing clinical circumstances in man. Such syndromes may appear after chilling or trivial injury, following non-specific infections or the specific exanthemata, and after Jennerian vaccination, serum administration, or prophylactic inoculation of many kinds. There is evidence also that they may follow the administration of such drugs as arsphenamine, streptomycin, and P.A.S., and it would seem unlikely that these particular drugs will prove to be unique in this connexion. The neurological disorders under discussion may also arise apparently spontaneously. In all these varying circumstances the histopathological findings are those of an acute disseminated perivenous demyelinating encephalomyelitis or of acute haemorrhagic leuco-encephalitis, a variant of the same condition in hyperacute form.

These diseases seem to be essentially mesodermal, based primarily on an inflammatory-exudative reaction arising in the vascular and supporting tissues of the neuraxis, secondarily involving neuronal elements (axons), and producing neurological symptoms, either by pressure (radiculitis) or by toxic effusion (perivenous reaction). It seems probable that

some common pathogenetic factor intervenes between the operation of the initial aetiological agent and this non-specific disseminated tissue-reaction in the nervous system which is responsible for the clinical end-result. That the common intervening factor is anaphylactic sensitization is suggested not only by the striking similarity of the syndromes to the allergic encephalomyelitis and polyradiculitis which have been experimentally produced in the laboratory animal, but also by the graphic illustration of the "neuromyolytic accidents" of rabies therapy.

The not very infrequent recurrence of acute disseminated encephalomyelitis when it follows non-specific infections—for example, of the upper respiratory tract—and its extreme rarity in post-exanthematous cases is in such circumstances to be interpreted as a reflection of the brief immunity bestowed by banal infections, with the opportunities afforded for repeated antigenic insults to the nervous system, in contrast with the lasting immunity usually conferred by a specific fever. Evidence of some clinical variation within the group—for example, the predilection of varicella encephalitis for the cerebellar system, or that of allergic reactions to horse serum for the spinal roots—can also on this hypothesis be attributed, in part at any rate, to qualitative differences in the antigen involved. There is convincing evidence of an analogous variation in the localization of somatic pathological changes in serum reactions when changes are made in the serum fractions injected (Hawn and Janeway, 1947), while more direct evidence has recently been furnished by the demonstration of Waksman and Adams (1955) that, while an allergic encephalomyelitis can be regularly provoked in the rabbit by single or repeated injection of an extract prepared from brain, spinal cord, or optic nerve, this syndrome is replaced by polyradiculitis if peripheral nerve is the source of the extract employed. It is probable that there are other factors, both endogenous and exogenous, which operate in the localization of these pathological changes.

That some individuals are especially prone to such reactions appears to be beyond doubt: there are a number of cases on record where a patient survived one post-exanthematous illness to fall victim to a further neurological disorder in relation either to another fever or to a non-specific infection. The occurrence of familial cases both after specific and after banal infections similarly argues a familial as well as personal predisposition, and in one family personally reported (Miller and Gibbons, 1954) recurrent episodes of encephalitic illness in three patients followed a very similar clinical pattern, though they varied in severity. Like other observers we have been impressed also by the frequently encephalitic incidence of such syndromes in dull and backward, socially inadequate, or frankly psychopathic subjects. It is our impression that this does not apply in myelitic illnesses, in which there is fairly often, however, an unequivocal history of recent exposure to cold or wet, or of violent exertion.

As we have shown elsewhere (Stanton *et al.*, 1953), the conception of a disseminated neuraxitis of varying aetiology which may involve the nervous system at any level also makes it easier to understand some well-recognized clinical phenomena which remain inexplicable if we continue to think of encephalitis, myelitis, and polyradiculoneuritis as separate disease-entities; we have in mind such events as a phase of meningism and mental disorientation in myelitis or the Landry-Guillain-Barré syndrome, the discovery of a localized flaccid palsy of root distribution after recovery from measles encephalitis, or the finding of a transient sensory level on the trunk in a patient with encephalitis following vaccination.

The hypothesis that acute disseminated encephalomyelitis is an allergic disorder has led to various attempts at treatment. In view of the natural history of the syndrome, and especially its frequent tendency to dramatic spontaneous improvement, the assessment of such trials is difficult and cannot at present be considered to have furnished any valid evidence on the question of aetiology. That the development of allergic encephalomyelitis in the experimental animal can

be prevented by the prior administration of corticotrophin has, however, been conclusively demonstrated by Moyer *et al.* (1950). The use of corticotrophin and cortisone in human acute disseminated encephalomyelitis has been described by Ligerink (1951), Garrison (1952), Miller (1953b), and Miller and Gibbons (1953, 1954). This experience has recently been summarized by Selling and Meilman (1955). We find ourselves in substantial agreement with their assessment that two-thirds of such cases treated may be regarded as benefited, in that early unequivocal improvement has been observed in patients previously deteriorating. Very severe cases and illnesses of some duration may show little or no response. Occasionally, however, rapid restoration of consciousness or unequivocal improvement in spinal-cord function may occur within a few hours of instituting treatment, relapsing as quickly when the hormone is withdrawn, and promptly responding to further therapy. This has been observed too often to be coincidental.

Opportunities for the treatment of neurological complications of serum sickness are rare, but response was observed in one case personally treated with cortisone (Miller and Stanton, 1954b), while in a subsequent instance of acute polyradiculitis complicating severe serum sickness dramatic relief of paresis with restoration of deep reflexes was obtained within a matter of hours. The results of treatment of polyradiculitis with cortisone have recently been reviewed (Jackson, Miller, and Schapira, 1957). About three-quarters of such cases seem to show a response. In about half of these it would appear that the natural course of the disease is appreciably shortened. Many such patients make a complete recovery within a month, which is certainly very uncommon in untreated cases. In a considerable number of instances, however, striking partial initial improvement during the first few days of treatment is rapidly arrested, and, despite the continued administration of the drug, recovery thereafter takes its accustomed slow course. Jackson *et al.* (1957) suggest that symptoms of neurological deficit directly resulting from oedema are dissipated under the influence of the drug, which does not, however, affect signs due to axonal damage, repairable only by the slower natural processes of regeneration.

In general it may be said that the results of corticotrophin and cortisone therapy in these acute neurological illnesses do nothing to discredit the allergic hypothesis of their origin and even yield some admittedly equivocal evidence in its favour. Recorded evidence is compatible with the hypothesis that the hormone may diminish the initial mesodermal inflammatory reaction, but is without influence on symptoms due to established axonal damage.

Summary

The natural history of the neurological complications of various specific fevers is briefly indicated. These syndromes are compared with other forms of acute demyelinating encephalomyelitis arising after non-specific infections, vaccination and prophylactic inoculation, the administration of drugs, trivial injury, or occurring spontaneously. The clinical and histopathological resemblance between these diseases and the experimental allergic encephalomyelitis and polyradiculitis produced in animals by the injection of brain emulsions suggests that all these syndromes in man may represent manifestations of an anaphylactic neuraxitis. The implications of this conclusion in the field of therapy are discussed.

REFERENCES

- Brain, W. R. (1951). *Diseases of the Nervous System*. London.
- Cavanagh, J. B. (1953). *J. clin. Path.*, 6, 128.
- Clarke, E., Bayliss, R. I. S., and Cooper, R. (1954). *British Medical Journal*, 2, 1504.
- Garrison, S. C. (1952). *Amer. J. Med.*, 12, 135.
- Hawn, C. V., and Janeway, C. A. (1947). *J. exp. Med.*, 85, 571.
- Jackson, R. H., Miller, H. G., and Schapira, K. (1957). *British Medical Journal*, 1, 489.
- Janbon, M., Bertrand, L., Cazaban, R., and Salvaing, J. (1951). *Rev. neurol. (Paris)*, 84, 302.

- Lander, H. (1955). *J. Path. Bact.*, **70**, 157.
 Ligerink, J. A. T. (1951). *Ned. T. Genesck.*, **95**, 3490.
 McAlpine, D. (1931). *Lancet*, **1**, 846.
 Malamud, N. (1939). *Arch. Neurol. Psychiat.* (Chicago), **41**, 943.
 Marshall, A. H. E., and White, R. G. (1950). *Brit. J. exp. Path.*, **31**, 157.
 Miller, H. G. (1953a). *A.M.A. Arch. Neurol. Psychiat.*, **69**, 695.
 — (1953b). *British Medical Journal*, **1**, 177.
 — and Evans, M. J. (1953). *Quart. J. Med.*, **22**, 347.
 — and Gibbons, J. L. (1953). *British Medical Journal*, **2**, 1345.
 — (1954). *Ann. Intern. Med.*, **40**, 755.
 — and Stanton, J. B. (1954a). *Quart. J. Med.*, **23**, 1.
 — (1954b). *Nervenarzt*, **25**, 118.
 — and Gibbons, J. L. (1956). *Quart. J. Med.*, **25**, 427.
 Moyer, A. W., Jarvis, G. A., Black, J., Koprowski, H., and Cox, H. R. (1950). *Proc. Soc. exp. Biol. (N.Y.)*, **75**, 387.
 Russell, D. S. (1937). *J. Path. Bact.*, **45**, 357.
 — (1955). *Brain*, **78**, 369.
 Selling, B., and Meilman, E. (1955). *New Engl. J. Med.*, **253**, 275.
 Shailard, B., and Latham, O. (1945). *Med. J. Aust.*, **1**, 145.
 Stanton, J. B., Miller, H. G., and Gibbons, J. L. (1953). *Rev. Neurol. Psychiat.*, **69**, 46.
 Van Bogaert, L. (1949). *Acta neurol. psychiat. belg.*, **49**, 811.
 Waksman, B. H., and Adams, R. D. (1955). *J. exp. Med.*, **102**, 213.
 Wolf, A. (1952). *1st int. Congr. Neuropath. Rome*, 1952, **1**, 121.

LYMPHADENOID GOITRE (HASHIMOTO'S DISEASE)

DIAGNOSTIC AND BIOCHEMICAL ASPECTS

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In most cases the diagnosis of lymphadenoid goitre is first made by the pathologist after thyroidectomy (Statland *et al.*, 1951; Lindsay *et al.*, 1952). Clinically, this type of goitre may be confused with "simple" non-toxic goitre; but thyroid carcinoma is often suspected because of the firm texture of the gland, leading the surgeon to undertake total thyroidectomy, with the attendant risk of post-operative tetany and vocal-cord paralysis. Since lymphadenoid goitres are non-malignant and many respond to thyroxine administration, it is important to establish the diagnosis pre-operatively.

The clinical picture has already been fully described (Joll, 1939; Schilling, 1945; Statland *et al.*, 1951; Lindsay *et al.*, 1952; Blake and Sturgeon, 1953). In diagnosis much help can be obtained with radioactive iodine (^{131}I) tracer tests combined with basal metabolic rate (B.M.R.) and serum cholesterol estimation; the changes in serum protein pattern which occur are also of diagnostic value.

We report here various tests with ^{131}I on 28 patients with Hashimoto's disease, and biochemical studies in which the serum protein abnormalities before and after treatment with thyroid hormones were observed and correlated with the state of thyroid activity in 11 of the patients (Table I). Serum protein studies were also made in 25 cases previously subjected to thyroidectomy for Hashimoto's struma, and in two control series consisting of 25 patients with other types of goitre and 8 myxoedematous patients without goitre.

Clinical Features

The group tested with ^{131}I consisted of 26 women and two men aged 28–68 (mean 52 years) who had noticed the goitre a few weeks to 15 years previously. There was a history of thyrotoxicosis in one case, but most patients presented with a feeling of pressure in the neck and symptoms suggesting hypothyroidism (17 of the 28). Thyroid pain was present in four cases. All the goitres were firm, of uniform consistency, and involved the entire gland, the enlargement

being mostly symmetrical and thyroid-shaped with well-delineated upper poles and pyramidal lobe; but in five cases the swelling was predominantly unilateral, and in three others the gland had a nodular surface. Histological proof of lymphadenoid goitre is available in 12 cases, the diagnosis in the remainder being based on clinical findings and investigations and the subsequent shrinkage of the goitre on administration of thyroid hormones.

Five cases are described, two to illustrate atypical clinical features suggestive of subacute thyroiditis, and the other three for the detailed investigations.

Illustrative Cases

Case 1

E. M., housewife aged 43. May, 1953, rapid swelling of thyroid, with increasing tenderness and throbbing, four weeks after onset of stomatitis and gingivitis associated with removal of septic teeth, symptoms reaching a maximum within next two months, with general lassitude and pain radiating to ears and back of head, accompanied by feeling of pressure in neck. September, 1953, thyroid estimated three to four times normal size, right lobe large, firm, and tender, left lobe softer and smaller. Gingivitis still present, with enlarged, tender lymph nodes in neck. Skin cool, no tremor. T. 98° F. (36.7° C.), P.R. 70, B.P. 140/65 mm. Hg. W.B.C. 5,300 per c.mm. E.S.R. 49 mm. (Wintrobe). ^{131}I uptake 72% in 24 hours, with thyroid-shaped distribution showing uptake over area of maximum swelling and pain. Swelling gradually subsided without thyroid medication, reaching almost normal size in December, 1953, though gland still firm and tender. Repeat ^{131}I uptake 69%; E.S.R. 48 mm.; B.M.R. –26%. Partial thyroidectomy performed in view of persistent pain and pressure symptoms; weight of gland 20 g. Histology, lymphadenoid goitre.

Case 2

Y. C., housewife aged 56. On admission: three weeks' painful, firm thyroid swelling, more marked on right, with feeling of pressure. B.M.R. –10%. Serum cholesterol 233 mg. per 100 ml. E.S.R. 77 mm. (Westergren). Plasma proteins: total 8.25 g. per 100 ml. (albumin 4.45 g., globulin 3.8 g., gamma globulin 2.3 g.). Thymol turbidity 15 units; alkaline phosphatase 4.2 units; bilirubin 0.12 mg. per 100 ml. ^{131}I uptake 65%, urine excretion 13%, in 24 hours. Topography showed bilateral uptake with maximum over tender right lobe. Within two weeks pain subsided and swelling diminished. ^{131}I uptake three months later, 52% in 24 hours. Owing to persistent discomfort and patient's fear of cancer, subtotal thyroidectomy performed five months after onset of goitre; weight of gland 42 g. Histology, lymphadenoid goitre.

Comment.—Clinically, Cases 1 and 2 suggested either haemorrhage into a thyroid cyst or subacute thyroiditis. The tender, firm goitre and the raised E.S.R. were thought to indicate thyroiditis (Blake and Sturgeon, 1953). Iodine uptake is usually completely suppressed in the acute stage of de Quervain's thyroiditis (McConahey and Keating, 1951; Crile, 1952; Fraser and Harrison, 1952), but a raised uptake has been reported in the recovery stage (Freedberg *et al.*, 1952; Trunnell, 1955) and is thought to be a rebound phenomenon. Our patients were tested some time after the onset of illness, and this delay was thought to explain their high iodine uptake. The distribution of ^{131}I was unlike that in thyroid cyst or carcinoma. The other atypical feature was the fairly rapid onset and the subsequent recession of the goitre without treatment.

Case 3

J. C., housewife aged 38. Goitre since 1947, with attacks of neck pain since 1948 and increasing lassitude since 1950. When seen in 1953 there was a large, firm, horseshoe-shaped goitre. B.M.R. –18%. ^{131}I uptake 66% in 24 hours, with symmetrical distribution. Treated with thyroid, 2–3 gr. (0.13–0.2 g.) daily, with return of normal energy and reduction in size of goitre to less than half. Twice stopped taking

thyroid for two to four months, with prompt return of symptoms and increase in goitre. Results of serum protein estimations are shown in Table I. In February, 1956, following exacerbation of neck pain with enlargement of goitre in spite of continuous thyroid medication, operation decided on to establish diagnosis with more certainty. Tracer tests repeated pre-operatively showed neck uptake of ^{131}I 20%

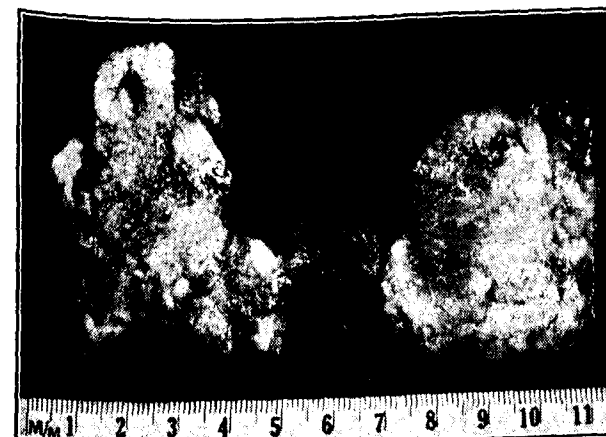


FIG. 1.—Case 3: Cut surface of thyroid gland.



FIG. 2.—Case 3: Contact autoradiograph from 10 μ section of gland.

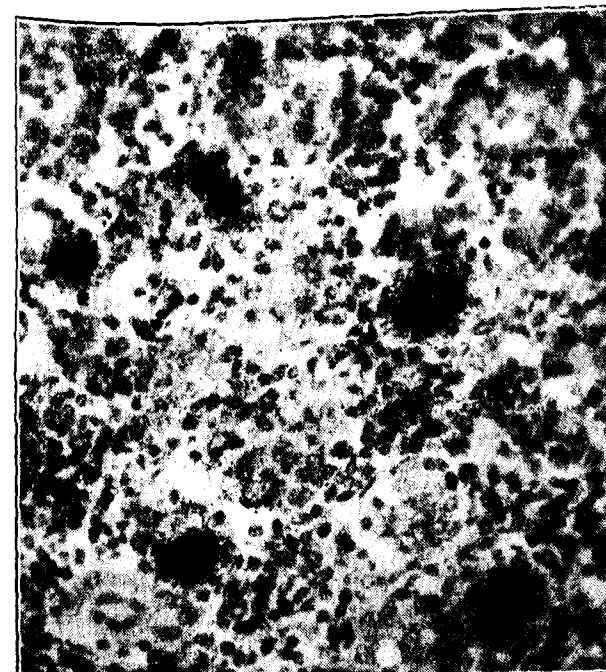


FIG. 3.—Case 3: Histological autoradiograph (S. R. Pelc) showing uptake of ^{131}I in colloid of scattered thyroid follicles.

in 24 hours (thyroxine suppression), biological half-life (B.H.L.) 2.8 days; 48-hour plasma ^{131}I 0.41% of dose per litre; protein-bound fraction 72% of total. B.M.R. –26%. Weight of thyroid removed, 80 g. Histology, lymphadenoid goitre. (Figs 1–3.)

Comment.—Pain is uncommon in Hashimoto's disease, and all four cases in which it was present had a greater iodine uptake than is usual, yet were indistinguishable histologically from cases without this symptom. We have noticed that patients often complain of aching in the thyroid after T.S.H. injections, and that tenderness also occurs in thyrotoxic patients overtreated with antithyroid drugs and whose goitre has enlarged owing to endogenous T.S.H. overproduction; medicinal goitres in which the enlargement is equally due to T.S.H. overproduction have also been reported to be occasionally painful (Bredahl and Fraser, 1955). In view of the evidence of T.S.H. overstimulation in Hashimoto goitres, it is conceivable that pain may be connected with a rapid hypertrophy of glandular elements and lymphoid invasion with resulting intracapsular tension in these firm glands.

Case 4

G. L., housewife aged 59. Two years' painless goitre with 6–12 months' slowing down, hoarseness, paraesthesiae of hands, puffiness of face. Clinically hypothyroid with large, firm, symmetrical goitre showing prominent pyramidal lobe. B.M.R. –8%. Serum cholesterol 380 mg. per 100 ml. ^{131}I uptake 63%. Plasma clearance rate at one hour, 29 ml. per minute. 48-hour plasma ^{131}I , 0.32% of dose per litre; B.H.L. 8.5 days. Potassium perchlorate, given one hour

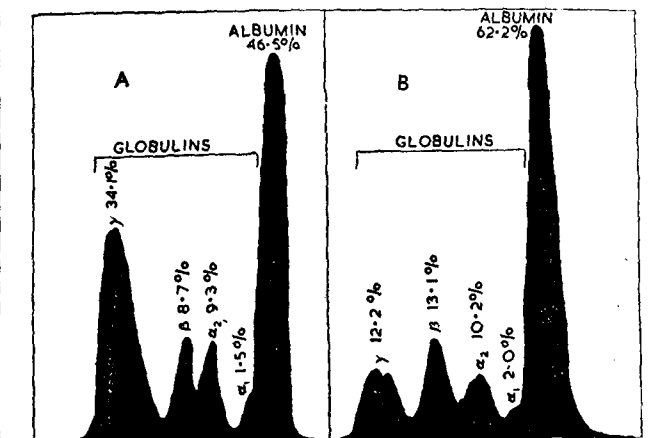


FIG. 4.—Case 4: Electrophoretic pattern of serum proteins, obtained by scanning of paper strip. A, Initial pattern before operation, showed raised gamma-globulin fraction. B, Four and a half months after operation, showing return of protein pattern to normal after removal of thyroid.

after a dose of ^{131}I to test protein-binding capacity of gland, produced a fall in neck uptake from 32% to 25%. Serum protein estimations are shown in Table I. Treated with thyroid, 2 gr. (0.13 g.) daily, but, as goitre was no smaller after two months, operation undertaken for pressure symptoms. Thyroid weight 165 g. Histology, lymphadenoid goitre with marked fibrosis. Four and a half months after operation serum protein pattern and flocculation tests returned to normal values.

Case 5

N. E., housekeeper aged 60. Eighteen months' increasing myxoedema; goitre noticed last three months. Firm, rubbery, diffuse enlargement of thyroid, estimated 2½ times normal size. B.M.R. –22%. Serum cholesterol 170 mg. per 100 ml. ^{131}I uptake 44%, excretion 32%, in 24 hours. Plasma clearance rate, 25 ml. per minute; 48-hour plasma activity, 0.4% per litre; protein-bound fraction, 65% of total. B.H.L. 12 days. No increase in iodine uptake after 5 units of T.S.H., suggesting impaired thyroid reserve. Goitre decreased on thyroid medication.

TABLE I—Differential Serum Protein Estimations and Liver Function Tests in Hashimoto's Disease

Patient	Sex and Age	Duration of Thyroid Treatment (2-3 gr. Daily) (Months)	Serum Cholesterol (mg. per 100 ml.)	E.S.R. (Wintrobe) P.C.V. of 45% (mm. in 1 Hour)	Serum Proteins*										Liver Function Tests					Clinical Details and Thyroid Function		
					Total Proteins (g. per 100 ml.)	Albumin		Globulins				Thymol Turbidity (Units)	Zinc Sulphate (Units)	Cephalin-Cholesterol (Units)	Alkaline Phosphatase (Units)	Serum Bilirubin (mg. per 100 ml.)						
						g. per 100 ml.	%	Alpha ₁	g. per 100 ml.	%	Alpha ₂						g. per 100 ml.	%	Beta		g. per 100 ml.	%	Gamma	g. per 100 ml.	%
J.C. (Case 3)	F 38	20	—	34	6.9	2.95	42.6	0.14	2.0	0.69	10.0	0.83	2.30	33.4	—	9	—	3	5.2	<0.4	8 yrs goitre with attacks of pain. B.M.R.: 1951, -16; 1956, -25. 131I uptake 66%. Thyroid weight 80 g.	
		30	—	42	6.9	2.35	34.0	0.21	2.9	1.06	15.3	1.28	2.00	28.6	—	15	—	3	6.5	<0.4		
		31	—	39	6.9	2.95	42.6	0.17	2.6	0.72	10.5	0.76	11.0	2.30	33.3	—	8	—	3	—		—
		24 post-op.	190	28	7.9	3.73	47.1	0.14	1.8	0.77	9.8	1.00	12.7	2.26	28.6	—	7	—	3	5.6		<0.4
J.L. (Case 4)	F 59	0	380	40	8.2	3.80	46.5	0.12	1.5	0.76	9.3	0.73	2.80	34.1	—	14	—	4	4.2	<0.4	2 yrs painless goitre. Progressive myxoedema. B.M.R. -8. 131I uptake 62%. Thyroid weight, 165 g.	
		2	220	37	7.7	2.52	32.7	0.13	1.7	1.32	17.1	1.23	16.0	2.50	32.5	—	17	—	3	3.4		—
		14 post-op.	500	32	7.1	2.63	32.1	0.17	2.4	1.00	14.0	1.15	16.2	2.15	30.4	—	12	—	2	5.4		<0.4
		3 post-op.	250	18	7.2	4.00	62.2	0.13	2.0	0.65	10.2	0.84	13.2	0.78	12.2	—	7	—	3	—		—
J.L.	M 68	0	300	36	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Increasing goitre since 1950, with myxoedema. Thyroid est. wt 150 g. + B.M.R. -26. 131I uptake 23%. Goitre decreased to est. wt 30 g. on thyroid gr. 3	
		3	140	40	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—
		8	—	38	7.5	2.98	39.6	0.19	2.1	0.64	8.5	0.59	7.9	3.10	41.4	—	30	—	4	5.8		<0.4
		16	160	25	—	42.0	—	—	—	—	—	—	—	—	29.6	—	4	—	3	5.9		<0.4
J.G.	F 43	20	210	—	6.8	3.04	44.6	0.13	1.9	0.88	13.0	0.94	13.9	1.81	26.6	—	8	—	4	4.9	0.6	Goitre since 1939. Increasing myxoedema since 1953. Thyroid est. wt 150 g. B.M.R. -24. 131I uptake 57% symmetrical distribution. Goitre decreased to est. wt 40 g. on thyroid gr. 3
		6	380	33	6.4	2.70	43.4	0.32	5.2	0.72	11.7	0.90	14.6	1.56	26.5	—	—	—	—	—	—	
		11	290	28	6.2	3.10	48.3	0.17	2.7	0.69	10.8	0.74	11.6	1.70	25.1	—	—	—	—	—	—	
		15	280	21	6.2	3.10	48.3	0.17	2.7	0.69	10.8	0.74	11.6	1.70	25.1	—	—	—	—	—	—	
F.	F 52	18	—	18	6.9	3.14	45.5	0.22	3.2	0.91	13.2	1.17	17.0	1.46	21.1	—	5	—	3	6.3	<0.4	1 yr increasing myxoedema. Firm and smooth goitre found. 131I uptake low. B.M.R. -30. On thyroxine 0.3 mg. daily
		21	7.9	3.38	42.8	0.36	4.6	1.16	14.7	1.30	16.4	1.70	21.5	—	4	—	3	9.8	<0.4	—		
		0	470	6.5	3.39	52.0	0.09	1.4	0.19	3.1	0.68	10.5	2.15	33.0	—	10	—	4	Normal	—	—	
		19	292	—	—	—	—	—	—	—	—	—	—	—	6	—	13	—	—	—	—	
N.	F 50	0	400	24	8.9	3.97	44.6	0.16	1.8	0.56	6.3	1.10	12.3	3.11	35.0	—	20	—	4	3.3	<0.4	8 mths goitre and increasing myxoedema. Thyroid smooth, firm, symmetrical. Est. wt 100 g. B.M.R. -20. 131I uptake 28%
		0	140	14	6.4	3.33	52.0	0.21	3.1	0.57	9.0	0.72	11.3	1.57	24.6	—	7	—	3	3.0	—	
S.	F 38	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6 mths goitre and hypothyroidism. Hard asymmetric goitre est. wt 40 g. B.M.R. -29. 131I uptake 25%; topography follows goitre	
		0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—
		0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—
		0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		—
S.	F 45	0	220	32	6.3	2.58	41.0	0.25	4.0	0.75	12.0	0.72	11.5	2.00	31.5	—	—	—	—	—	3 yrs painless goitre. Thyroid est. wt 50 g. Clinically euthyroid. B.M.R. -6. 131I uptake 38%; topography symmetrical	
		3	290	37	7.7	2.50	32.1	0.30	4.1	0.97	12.8	1.16	15.0	2.77	36.0	—	14	—	3	3.7		<0.4
		9	—	38	6.3	3.56	40.8	0.21	3.4	0.86	13.7	0.64	10.1	2.02	32.0	—	9	—	4	3.4		<0.4
		12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	18	—	3	2.6		0.4
..	F 64	15	—	27	—	2.57	40.8	0.21	3.4	0.86	13.7	0.64	10.1	2.02	32.0	—	10	—	4	—	—	Increasing goitre 7 yrs. B.M.R. -17. 131I uptake 51%; topography: more uptake on L. Thyroid firm. Goitre L>R. Est. wt 80 g. On thyroid gr. 3 daily goitre decreased
		17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10	—	4	—	—	
		4	—	30	6.7	2.70	42.0	0.17	2.4	0.62	9.3	0.95	14.2	2.26	32.1	—	9	—	3	13.1	<0.4	
		12	—	18	—	—	—	—	—	—	—	—	—	—	—	—	6	—	3	12.1	<0.4	
..	F 64	15	—	19	6.7	2.97	44.2	0.12	2.8	0.86	12.8	1.07	1.68	25.1	—	9	—	3	—	—	Increasing goitre 7 yrs. B.M.R. -17. 131I uptake 51%; topography: more uptake on L. Thyroid firm. Goitre L>R. Est. wt 80 g. On thyroid gr. 3 daily goitre decreased	
		18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6	—	3	—		—
		21	—	—	7.2	3.07	42.7	0.21	3.0	0.75	10.4	1.00	1.39	2.17	30.0	—	7	—	2	4		<0.4
		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		<0.4

TABLE I—continued

Patient	Sex and Age	Duration of Thyroid Treatment (2-3 gr. Daily) (Months)	Serum Cholesterol (mg. per 100 ml.)	E.S.R. (Wintrobe) P.C.V. of 45% < 20 (mm. in 1 Hour)	Serum Proteins*										Liver Function Tests					Clinical Details and Thyroid Function				
					Total Proteins (g. per 100 ml.)	Albumin		Alpha ₁				Alpha ₂		Beta		Gamma		Colloidal Gold (Units)	Thymol Turbidity (Units)		Zinc Sulphate (Units)	Cephalin-Cholesterol (Units)	Alkaline Phosphate (Units)	Serum Bilirubin (mg. per 100 ml.)
						g. per 100 ml.	%	g. per 100 ml.	%	g. per 100 ml.	%	g. per 100 ml.	%	g. per 100 ml.	%	g. per 100 ml.	%							
J. R.	F 52	1 10	190 —	17 23 —	6.7 — 7.2	2.54 —	37.8 45.7	0.30 —	4.1 2.8	0.86 —	12.4 13.5	1.00 —	15.6 15.0	2.00 —	29.7 22.5	2 2 2	3 3 3	— — 13	1 3 4	12.2	0.4	Goitre and slowing down B.M.R. -1. 131I uptake 37%. Firm, uniform goitre about 40-50 g. Improved on thyroid		
H. S.	F 49	24 30	— —	38 27	7.7 6.7	2.70 2.83	35.1 42.2	0.25 0.35	3.3 5.2	0.89 0.79	11.6 11.8	1.49 1.07	19.3 16.1	2.37 1.66	30.7 24.7	— 2	7 —	— —	3 —	— —	— —	Goitre since Jan., 1951. Lost 1 stone wt; nervousness. B.M.R.: April, 1951, +33; July, 1951, 0. Hard, symmetrical goitre in 1953. 131I uptake 41%. Goitre decreased with thyroid gr. 2 daily		

* The serum proteins were fractionated by paper electrophoresis after the method of Flynn and de Mayo; the strips were stained with azocarmine B and graphs made with a recording reflectance scanner (Joyce and Loebel). The patterns obtained were cut into their five component peaks and the area of paper corresponding to each was weighed to 0.1 mg. and expressed as a percentage of the total area. The total serum proteins were estimated by the biuret method; from this and the percentages obtained by scanning, the protein fractions were calculated in g. per 100 ml. Electrophoretic strips and flocculation tests were carried out in the routine laboratory of the Courtauld Institute.

TABLE II—Average Values and Range of Serum Protein Fractions and Liver Function Tests

Groups	Serum Proteins (Paper electrophoresis)										Liver Function Test†					
	Total Proteins (g. per 100 ml. Biuret Method)	Albumin		Globulins						Colloidal Gold (Units) Normal < 2	Thymol Turbidity (Units) Normal < 5	Zinc Sulphate Turbidity (Units) Normal < 12	Cephalin-cholesterol (Units) Normal < 3	Alkaline Phosphate (Units) Normal < 15	Serum Bilirubin (mg. per 100 ml.) Normal < 0.4	
		g. per 100 ml.	%	Alpha ₁		Alpha ₂	Beta		Gamma							
				g. per 100 ml.	%		g. per 100 ml.	%	g. per 100 ml.							%
Hashimoto goitre* (11 cases; av. age 50.1 years)	7.0 (6.2-8.9)	3.01 (2.35-3.97)	42 (32.1-52.0)	0.2 (0.09-0.36)	2.8 (1.4-5.2)	0.79 (0.2-1.3)	11.5 (3.1-17.1)	0.96 (0.59-1.49)	14.3 (7.9-17.4)	2.13 (1.46-3.11)	29.3 (21.1-41.4)	9.6 (3-30)	3 (1-4)	6.7 (2.6-15.3)	< 0.4 (highest 1.0)	
Hashimoto goitre: post-thyroidectomy (25 cases; av. age 55.1 years)	6.8 (5.6-8.7)	3.33 (1.85-4.4)	48.7 (33.1-62.2)	0.21 (0.08-0.3)	2.6 (1.2-4.7)	0.95 (0.3-1.94)	12.8 (3.8-28.5)	1.08 (0.65-1.77)	15.8 (10.0-26.4)	1.5 (0.78-2.97)	21.8 (12.2-35.2)	3.1 (1-12)	2.2 (1-4)	5.8 (2.5-16)	< 0.4 (highest 0.9)	
Controls: Euthyroid and hyperthyroid (25 cases; av. age 40.4 years)	6.55 (5.2-7.6)	3.39 (2.3-5.2)	51.1 (37.7-70.0)	0.17 (0.08-0.39)	2.6 (1.2-5.4)	0.73 (0.34-1.49)	11.4 (1.8-22.5)	1.01 (0.48-1.7)	15.5 (8.4-23.6)	1.22 (0.67-1.56)	19.1 (10.9-24.4)	2.4 (1-4)	2 (1-4)	4.1 (2.5-6.3)	< 0.4 (highest 0.8)	
Myxoedematous (8 cases; av. age 55 years; B.M.R. -30%)	6.9 (6.2-8.1)	3.2 (2.61-4.18)	44.7 (34.0-56.6)	0.26 (0.18-0.55)	3.6 (2.3-7.7)	0.83 (0.61-1.34)	12.5 (9.1-18.6)	1.18 (0.85-1.46)	17.9 (12.2-23.5)	1.4 (1.11-1.83)	21.1 (16.8-27.0)	3.5 (2-7)	2.4 (1-3)	—	—	

* Results in this group represent the average of 26 tests done on 11 patients.
† Results of flocculation tests are not usually expressed in fractions of units; these averages were calculated for comparison of the four groups.
‡ Zinc sulphate test carried out on only 14 patients and alkaline phosphatase on 16 patients in the control group.

Results of Radioactive Iodine Tests

Fig. 5 shows the thyroid ^{131}I uptake and B.M.R. in the 28 patients tested; 24-hour uptake varied between 19% and 73% and B.M.R. between -29% and $+3\%$, the mean being -16% as compared with -5% in normal subjects.

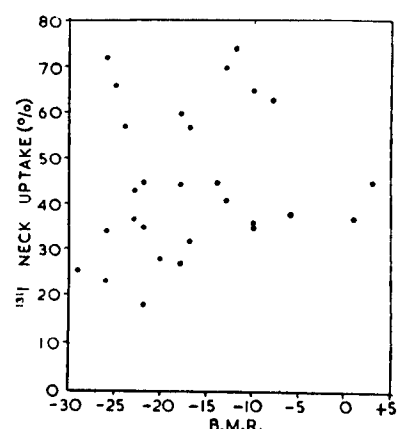


FIG. 5.—Twenty-four-hour neck uptake of ^{131}I and B.M.R. in 28 patients with untreated lymphadenoid goitre.

B.M.R. with the size of the goitre in our patients. Isotope distribution was invariably uniform and followed the outline of the goitre, the uptake being greater on the side of the larger lobe in asymmetric goitres.

In patients investigated more fully the results illustrate the functional behaviour of the thyroid in this condition. The biological half-life was short and varied between 2.8 and 12 days; 48-hour plasma activity was 0.39%, 0.41%, 0.32%, and 0.4% of the dose per litre in four patients tested, 65-75% of the total being protein-bound. These results are high, especially in view of the low B.M.R.s in these cases. Five units of T.S.H. had no effect on iodine uptake in a case of Hashimoto's disease, whereas the same dose in normal subjects increased the three- and six-hour readings two- to three-fold. Potassium perchlorate, 400 mg., caused the neck uptake to fall by 22% in 30 minutes, the drug having no effect in normal or thyrotoxic patients under the same conditions.

In Case 3, in which 800 microcuries of ^{131}I had been given 48 hours pre-operatively, direct analysis of the extirpated gland, using combined isotope and chromatography techniques (Mrs. R. Pitt-Rivers), showed only 12% of the total iodine stored as thyroxine, whereas a normal gland analysed by the same method contained 24.3% of thyroxine iodine. Figs. 2 and 3 show the macroscopic and histological autoradiographs of this gland; the isotope was taken up in fairly evenly scattered small foci, which explains why topographical surveys *in vivo* produce isocount pictures which follow the outline of the palpable goitre in Hashimoto's disease. The histological autoradiograph shows protein-bound iodine in the colloid of some follicles, none being present in the many clumps of epithelial cells devoid of colloid.

Biochemical Results

Serum protein studies were first undertaken to explain the consistently raised E.S.R. in Hashimoto's disease; a rise in gamma globulins was found, though total and differential serum proteins appeared normal in most cases when estimated by the conventional biuret method. Results of flocculation tests of liver function which depend on the relative concentrations of globulins and albumin were also abnormal, though none of the patients had a history or symptoms of liver disease. Since these studies were started, other reports of similar findings in lymphadenoid goitre have appeared. Table I shows the results in 11 cases of Hashimoto's disease; the rise in gamma globulins is still present after 2½ years of thyroid medication in some cases, but returned

to normal 4½ months after removal of the goitre in one case (Fig. 5) and after 8 months in another. The mean value for gamma globulins in these 11 cases was 2.13 g. per 100 ml. (29.3% of total protein). Table II shows the corresponding figures in the other three groups of patients tested.

The two control groups consisted of (1) 25 euthyroid and hyperthyroid patients, 21 with "simple" non-toxic goitre, and 4 with untreated Graves's disease; and (2) 8 cases of primary or secondary myxoedema, in view of the possible influence of thyroid deficiency on the gamma globulins. In the first group the average gamma globulin level was 1.22 g. per 100 ml. (19.1%). Results of flocculation tests were: colloidal gold "negative" in 19 patients, 1 unit in four, and 2 units in two patients. For thymol turbidity the highest value obtained was 4 units (5 cases); zinc sulphate turbidity ranged between 3 and 11 units. Group 2 had an average gamma globulin level of 1.4 g. per 100 ml. (21.1%) and normal flocculation values, except for one patient who had a thymol turbidity of 7 units with a colloidal gold of 2 units.

The post-operative group consisted of 25 proved cases of Hashimoto's disease thyroidectomized 6 months to 22 years previously, collected from the records of the Middlesex Hospital. The mean value for gamma globulins in this group was 1.5 g. per 100 ml. (21.8%). The colloidal gold test was "negative" in 15 cases, 1 unit in five, 2 units in one, 3 units in two, and 4 and 5 units in one case each. All the patients with negative colloidal gold results and five with colloidal gold of 1-3 units also had normal values for the other flocculation tests, except one with a thymol turbidity of 7 units, a zinc sulphate of 14 units, and gamma globulin 1.9 g. per 100 ml. This patient had had a hemithyroidectomy two years previously and still had an enlarged left thyroid lobe. Three other patients in this group had markedly raised gamma globulins and flocculation results, one of them (Case 2 described above) having gamma globulins 2.97 g. per 100 ml., colloidal gold 5 units, thymol turbidity 12 units, and zinc sulphate turbidity 29 units, three years after partial thyroidectomy.

Table II further shows that the other globulin fractions do not differ significantly in the four groups, and that the gamma globulins appear to be raised at the expense of the albumin fraction in cases of Hashimoto's disease.

Discussion

Radio-iodine Studies

The ^{131}I studies in patients with lymphadenoid goitre show a normal or high thyroid uptake, even in the presence of clinical myxoedema and a low B.M.R., and a uniform distribution of iodine which follows the outline of the palpable swelling. These characteristics help to distinguish lymphadenoid goitre from non-toxic nodular and from malignant goitres. In non-toxic nodular goitre the ^{131}I distribution is uneven and the isocount picture rarely portrays the shape and extent of the goitre. In malignant goitres and thyroid cysts the uptake is usually diminished or absent over the affected side, and the over-all uptake is never high unless the patient also shows signs of hyperthyroidism.

The more detailed studies carried out in four clinically subthyroid patients show a relatively high 48-hour plasma activity and a short B.H.L. compared with the normal, which was 55 to 106 days in four subjects studied by Hickey and Brownell (1954) and varied between 30 and 180 days in ten cases of non-toxic colloid goitre studied by us. These results suggest that in lymphadenoid goitre there is a small thyroidal iodine pool with a high specific activity. The same feature is often found in carcinoma of the thyroid, but here the isotope is localized to a small remnant of normal but overstimulated tissue (Rotblat and Owen, 1954). The lack of response to T.S.H. has also been reported by other workers (Levy *et al.*, 1955; Skillern *et al.*, 1956), and supports the histological evidence of T.S.H. overstimulation of the gland in Hashimoto's disease: the small number of intact follicles work at full capacity and cannot be further

MARCH 23, 1957

LYMPHADENOID GOITRE

stimulated. Protein-binding of iodine does not appear to proceed at a normal rate as shown by the perchlorate test. Dr. W. R. Trotter (personal communication), who suggested the test to us, has obtained similar results in other cases of lymphadenoid goitre. In health and in thyrotoxicosis protein-binding is so rapid and complete that no unbound iodide can be released, and neck readings continue to rise after giving perchlorate (Berson and Yalow, 1955). Direct analysis of the gland indicates that thyroxine storage is defective in Hashimoto's disease, since the percentage of thyroxine iodine was only half the normal in our patient.

Biochemical Studies

The first report of the occurrence of raised gamma globulins in Hashimoto's disease appeared in 1953, when Fromm *et al.* published differential protein estimations in four cases of this disease and one case each of de Quervain's and Riedel's thyroiditis. In three of their cases of Hashimoto's disease the gamma globulins were over 2 g. and in the other cases between 1.66 and 1.83 g. per 100 ml. Cooke and his colleagues (Cooke and Wilder, 1954; Cooke and Luxton, 1955; Luxton and Cooke, 1956) have reported abnormal colloidal gold curves in Hashimoto's disease. Observing patients on prolonged thyroid medication, they found that with adequate dosage the liver-function tests tended to return to normal, though the reversal was usually slow and took up to 29 months. At their suggestion an extensive study was made at the Cleveland Clinic, and the results (Skillern *et al.* 1956) confirm and extend previous observations.

Our findings similarly show the presence of raised gamma globulins and flocculation values in untreated lymphadenoid goitre, and it appears that the larger goitres were associated with the most striking changes in electrophoretic pattern, though the flocculation tests were also abnormal in patients with small lymphadenoid goitres whose gamma globulins were still within the normal range.

The thymol, colloidal gold, and zinc tests usually gave concordant results, though in a few instances the colloidal gold results disagreed with the other flocculation reactions and with the electrophoretic strip. The cephalin-cholesterol test proved least useful and gave the same results in simple goitre, thyrotoxicosis, myxoedema, and Hashimoto's disease, which was to be expected, since the test is more influenced by the beta-globulins than by those in the gamma fraction. The E.S.R. was always raised in Hashimoto's disease, but is so unspecific (Meyers *et al.*, 1953) that it was not infrequently raised in the control groups when all other tests were normal. In three cases of thyroid carcinoma so far tested we have found normal gamma globulins and flocculation tests. In one of the cases the goitre was uniform, the B.M.R. in the hypothyroid range, and the E.S.R. very high. Normal serum protein values and a unilateral iodine uptake decided in favour of thyroid carcinoma, and this was proved at operation.

Myxoedema is often associated with a raised E.S.R. (McAlpine, 1955) and sometimes with a rise in total serum proteins. The electrophoretic pattern did not show increased gamma globulins in our myxoedematous controls, though some had a raised beta fraction, as expected in the presence of high serum lipids.

Our post-operative survey shows that serum proteins are normal in most cases of Hashimoto's disease after removal of the goitre, and in two cases we have actual proof of this change from high pre-operative gamma globulins to normal values after operation. There was a lag of several months before this reversal took place, for three patients tested 10 days, 2½ months, and 3½ months post-operatively still had abnormal results.

It appears, therefore, that the abnormal gamma globulins are closely associated with the presence of the goitre, and we are unable to agree with Skillern *et al.* that they are entirely due to thyroid deficiency, since abnormal results were seen in patients who were euthyroid and had received more than physiological doses of thyroxine for over two years.

It is well known that gamma globulins are the serum protein fraction mainly associated with antibodies; moreover, the thyroid is grossly infiltrated with lymphoid tissue and plasma cells in Hashimoto's disease, and these cells have been shown to produce gamma-globulin antibodies elsewhere in the body (Harris and Harris, 1956). It is possible that a qualitative alteration of thyroid proteins or other special circumstances could provoke the formation of auto-antibodies. The presence of an antigen in the thyroid would explain the accumulation of antibody-producing cells in the gland and the enlargement of surrounding lymph nodes. If the antigenic protein escaped from the gland by breakdown of follicles, antibody production could also occur at other sites, which would account for the large quantity of gamma globulin produced and for the lag period in their disappearance after operation; since when the source of antigen is removed at thyroidectomy there might be some delay in the cessation of antibody production by the reticulo-endothelial system.

Summary

The pre-operative diagnosis of lymphadenoid goitre can now be made by a combination of ^{131}I tracer tests with the older tests of thyroid function and the addition of serum protein tests made available by the recent finding of increased gamma globulins in the serum in Hashimoto's disease, which, in the absence of liver disease, give rise to abnormal results of flocculation tests.

Five cases of lymphadenoid goitre are described, two of which were clinically atypical and suggested subacute thyroiditis, and three studied in some detail with ^{131}I and biochemically.

¹³¹I tests in 28 cases of Hashimoto's disease showed normal or high uptakes even in the presence of myxoedema, and a uniform distribution of isotope corresponding with the outline of the goitre. Short biological half-life and high plasma activity suggest a small thyroïdal iodine pool, other tests providing further evidence of deficient protein-binding and thyroxine storage in this type of goitre.

Liver function tests and differential serum protein estimations were carried out in 11 cases of Hashimoto's disease with 25 cases of other goitres and 8 of myxoedema as controls, and a post-operative group of 25 cases of Hashimoto's disease tested in order to study the effect of removal of the goitre on the serum proteins. The findings suggest that paper electrophoresis in combination with flocculation tests provide diagnostic help and distinguish lymphadenoid goitre from simple non-toxic goitre and from carcinoma of the thyroid. Results obtained in the post-operative survey suggest that removal of the goitre is associated with a return to normal of the gamma globulins.

It is put forward as a working hypothesis that the raised serum gamma globulins represent an immune response to an antigen released by the goitre.

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ADDENDUM

Since this paper was submitted, immunological studies have shown that the serum of patients with Hashimoto's disease contains a precipitating auto-antibody which reacts specifically with human thyroglobulin. A preliminary communication of this work has appeared (Roitt *et al.*, 1956). The thyroglobulin precipitin test was positive in all the patients listed in Table I and in several from the post-operative group where only part of the thyroid had been removed; Case 3 and Case 4 still show the precipitin nine and twelve months after subtotal thyroidectomy, though results of serum protein tests are now normal. Case 5 has failed to show precipitins by the method used after 3 years of thyroid administration. Full results will be published elsewhere.

REFERENCES

- Berson, S. A., and Yalow, R. S. (1955). *J. clin. Invest.*, 34, 186.
Blake, K. W., and Sturgeon, C. T. (1953). *Surg. Gynec. Obstet.*, 97, 312.
Bredahl, H., and Fraser, R. (1955). *Proc. roy. Soc. Med.*, 48, 1026.
Cooke, R. T., and Luxton, R. W. (1955). *Lancet*, 1, 968.
— and Wilder, E. (1954). *Ibid.*, 1, 984.
Crile, G., jun. (1952). *Ann. intern. Med.*, 37, 519.
Fraser, R., and Harrison, R. J. (1952). *Lancet*, 1, 382.
Freedberg, A. S., Chamovitz, D. L., and Kurland, G. S. (1952). *Metabolism*, 1, 36.
Fromm, G. A., Lascano, E. F., Bur, G. E., and Escalante, D. (1953). *Rev. Asoc. med. argent.*, 67, 162.
Harris, T. N., and Harris, S. (1956). *Amer. J. Med.*, 20, 114.
Hickey, F. C., and Brownell, G. L. (1954). *J. clin. Endocr.*, 14, 1423.
Joll, C. A. (1939). *Brit. J. Surg.*, 27, 351.
Levy, R. P., Kelly, L. W., and Jeffries, W. McK. (1955). *Amer. J. med. Sci.*, 231, 61.
Lindsay, S., Dailey, M. E., Friedlander, J., Yee, G., and Soley, M. H. (1952). *J. clin. Endocr.*, 12, 1578.
Luxton, R. W., and Cooke, R. T. (1956). *Lancet*, 2, 105.
McAlpine, S. G. (1955). *Ibid.*, 2, 58.
McConahey, W. M., and Keating, F. R. (1951). *J. clin. Endocr.*, 11, 1116.
Meyers, A. J., Trevorrow, V., Washburn, A. H., and Murrage, E. R. (1953). *Blood*, 8, 893.
Roitt, I. M., Doniach, D., Campbell, P. N., and Hudson, R. V. (1956). *Lancet*, 2, 820.
Rotblat, J., and Owen, G. M. (1954). Radioisotope Conference. Vol. 1, page 68.
Schilling, J. A. (1945). *Surg. Gynec. Obstet.*, 81, 533.
Skillern, P. G., Crile, G., McCullagh, E. P., Hazard, J. B., Lewis, L. A., and Brown, H. (1956). *J. clin. Endocr.*, 16, 35.
Statland, H., Wasserman, M., and Vickery, A. L. (1951). *Arch. intern. Med.*, 88, 659.
Truncell, J. B. (1955). *Trans. Amer. Goiter Ass.*, p. 453.

VISCERAL LESIONS IN HERPES ZOSTER

BY

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The peripheral nerves and posterior and trigeminal sensory nerve roots contain not only various sizes of myelinated, but also unmyelinated "afferent" fibres. Distally the afferent unmyelinated fibres originate (or end) as free nerve endings not only in the epidermis or dermis, but also between the deeper tissues, including muscles, periosteum, joints, and fascia (Ranson and Davenport, 1931; Feindel, Weddell, and Sinclair, 1948). They also arise (or end) on the blood-vessel walls. Some of them are visceral in origin (Kuntz and Hamilton, 1938). All the evidence suggests that in the somatic tissues these fibres conduct impulses which give rise to diffuse, radiating, compelling burning pain (see Fulton, 1949).

In the posterior nerve roots all the afferent unmyelinated fibres of the peripheral nerves, whether they originate in the skin, deep somatic tissues, blood vessels, or viscera, are grouped together laterally. Division of the lateral part of these roots cuts the unmyelinated fibres, and now on stimulation of the peripheral nerve

distal to the section no autonomic reflex changes occur as they do in intact animals (Ranson and Davenport, 1931; Clark, Hughes, and Gasser, 1935).

Mode of Production of Lesions of Herpes Zoster

The skin lesions of herpes zoster lie in the area of sensory supply of the posterior and trigeminal nerve roots. They manifest themselves firstly as a reddening of the skin followed by oedema and blister formation—that is, the appearance of fluid between the epidermal layers. Typical inflammatory changes are found in the skin papillae, in the deeper parts of the corium, and in the hair follicles. Subcutaneous fat may also contain knots of inflammatory cells. Lewis (1927), in his classical researches, showed that irritation of sensory nerves and the posterior nerve roots results in vasodilatation and the release of a vasodilator substance (H-substance), probably histamine, in the skin. He further demonstrated that in cases of herpes zoster the same substance was released in the affected tissues and that "herpetic and herpeticiform eruptions occur as sequels to lesions of the sensory nerve tracts; not only do they follow irritative lesions of the (root) ganglion, but they are produced also by lesions of those tracts distal to the ganglia themselves." It seems probable that the unmyelinated fibres of the posterior roots with free nerve endings in the skin and other tissues and on the blood vessels are those concerned.

Herpes Zoster and Lesions of Deep Somatic Tissues

When zoster is of gangrenous type the lesions extend deeply and lead to much scarring. Glandular swelling and inflammation in the region of the affected skin lesions is usual and may precede the latter (Bichelon, 1907; Lebel, 1920; Ramond, 1923), so that they cannot be due to secondary infection of the skin. The subcutaneous tissues, fat, and muscles may contain painful and swollen areas identical in character with "fibrositis" and "myositis" (see Brain, 1931; Wilson, 1940; Ford, 1946). Synovial effusions occur in the affected areas and the joints may become ankylosed with fibrous tissue. The pericapsular joint tissues are often swollen and painful, and, when the hand is affected, this gives appearances indistinguishable from those of rheumatoid arthritis, so-called "periartthritis chronica rheumatica" (Guillain and Pernet, 1910; Guillain and Rouvillier, 1913). The affected limb may exhibit oedema and cyanosis. When the lower limb is involved, permanent pitting oedema may remain (Wilson, 1940). The muscles sometimes waste either immediately or after a variable period. When a limb is affected, its bones may become osteoporotic (see Schönfeld, 1929), or show Sudeck's atrophy (Sudeck, 1910). Schleicher (1949) describes chronic inflammatory changes in the marrow of the affected bones. Pleural reactions and haemorrhagic pleural effusions may appear beneath zoster of the chest wall (Curtin, 1902; Mann, 1931) or there may be symptoms and signs of irritation of the parietal peritoneum (Ford, 1946).

In cases of ophthalmic herpes sterile inflammatory changes often occur in the eye, resulting in a panophthalmitis and not infrequently in the appearance of haemorrhages and thromboses in the retinal vessels. Afterwards the eyelids may remain permanently oedematous. It is reasonable to suppose that these manifestations in the deeper somatic tissues are produced in a manner analogous to those in the skin—namely, by disturbance in the unmyelinated fibres of the posterior spinal and trigeminal sensory nerve roots.

Herpes Zoster Accompanied by Visceral Lesions

Unmyelinated afferent fibres with their cell bodies in the posterior root ganglia run from the viscera uninterruptedly through the autonomic ganglia and white rami communicantes to enter the posterior nerve roots with those from somatic tissues. The posterior nerve roots through which

the afferent fibres from the various viscera enter the cord are as follows (Lewis, 1942; White and Smithwick, 1947; Kuntz, 1953):

Heart	C 8-D 4 (?)
Lungs	D 2-5
Oesophagus	D 4-5
Stomach and duodenum	D 6-8
Liver and gall-bladder	D 7-8 right
Pancreas	D 8 left
Small intestine	D 9-10
Appendix and ascending colon	D 10-L 1
Epididymis	D 10
Ovary, testis, and suprarenal	D 10-11
Bladder fundus	D 11-L 1
Kidney	
Uterine fundus	
Colonic flexure	L 2-3
Sigmoid and rectum	
Cervix	S 2-5
Neck of bladder, prostate, and urethra	

It might be expected that irritation of the unmyelinated afferent fibres in the posterior nerve roots or peripheral nerves, or their cell bodies in the posterior root ganglia, would produce changes not only in the skin and somatic tissues, but also in the viscera. In his classical paper on herpes zoster Head (1893) did not specifically mention visceral involvement. In the literature on herpes zoster, however, there are a number of descriptions of localized visceral disturbances accompanying the skin lesions. I have observed this association in numerous cases, of which Cases 1-8 cited below are typical examples. These cases and those taken from the literature are summarized in the Table.

Author	Site of Zoster	Visceral Disturbance
Case 1, present series	C 3-4	Redness, oedema, inflammatory changes, and bleeding on right side of larynx and trachea. Endocarditis and tachyarrhythmia.
Andréassian (1934)	L. cervico-scapulo-thoracic	Paroxysmal tachycardia during and following attack.
Turner (1909)	D 2	Marked bradycardia.
Mann (1931)	D 3-4	Followed 34 years later by progressively severe anginal pain at site of zoster, cardiac enlargement, and E.C.G. changes.
Case 2 of Spillane and White (1939)	C 8-D 2, and D 4-6	Pleuritic pain, friction rub or pleural effusion.
Curtin (1902)	D 7-8	" " "
Mann (1931)	D 7-8	" " "
Brain (1932)	D 7-8	" " "
Ryle (1932)	D 3-4	Gastro-intestinal disturbance.
Varior (1907)	Intercostal	Disturbance of passage of food down oesophagus.
Curtin (1902)	Upper abdominal	Anorexia and constipation.
" "	Lower thoracic	Bowel atony and abdominal distension.
Rayer (1935)	Abdominal	Gastro-intestinal disturbance preceding, during, and following rash.
Frisch (1908)	"	" " "
Bielschowsky (1914)	"	" " "
Fuchs (1840)	"	" " "
Case 2, present series	D 6-8	Abdominal colic. Severe spasm of pyloric region of stomach (Fig. 1) with reddening of gastric mucosa, symptoms being partly relieved by atropine.
Case 3, present series	D 7-8	Nausea, vomiting, and anorexia, followed by haematemesis and appearance of gastric ulcer on lesser curvature (Fig. 2).
Hess and Faltischek (1925)	D 6-10	Gastric hyperacidity cured by paravertebral sympathetic block.
Stone (1948)	D 9-10	Haematemesis.
Fitzpatrick (1948)	D 9-10	Nausea, anorexia, burning epigastric sensation, haematemesis, and achlorhydria. Radiographs showed no peptic ulcer. Symptoms unrelieved by alkalis and gradually disappeared with skin eruptions.
"Surgeon" (1950)	D 8-10	Intestinal paralysis and vomiting. Colon radiologically normal, "the disturbance presumably being in the small intestine."
Donaldson (1948)	D 9-11	Anorexia, nausea, and haematemesis, the symptoms disappearing with the skin changes.
Curtin (1902)	D 10-11	Fever and symptoms resembling appendicitis.
Case 4, present series	D 11-L 1	Intense constipation and local spasm of ascending colon with dilatation distal to this, symptoms being partly relieved by atropine.
Case 5, present series	D 11-L 1	Intense constipation, though taking no drugs. Laparotomy revealed inflammatory changes in ascending colon.
Curtin (1902)	Over kidney and passing to abdomen	Persistent haematuria.
Grossmann (1932)	D 10-L 2	Renal colic. No urinary disturbance or evidence of calculi.
Van der Scheer (1913)	D 12	Polyuria and severe persistent constipation.
Nieuwehuijse (1914)	D 12	Ileus.
Case 6, present series	D 11-L 2	Spasm of ascending and transverse colon and dilatation of distal colon. Inflammatory changes in bladder mucosa, especially on left. Symptoms partly relieved by hyoscine.
Darget (1929)	Inguinal	Cystitis and haematuria. Cystoscopy showed a raised inflammatory area on bladder wall.
Volk, quoted by Schönfeld (1929)	Buttock	Zoster of bladder and haemorrhagic cystitis.
Ford (1946)	Abdominal	Symptoms of bladder irritation.
Watts (1948)	Upper lumbar root zone	Disturbance of bladder function and haematuria.
Siding (1909)	L 1	Rectal and bladder disturbance.
Case 7, present series	D 12-L 2	Transient severe inflammatory changes in bladder mucosa. Spasm of descending colon and rectum and dilatation of transverse colon above (Fig. 3).
Case 8, present series	L 2-3	Inflammation of mucosa of sigmoid colon, spasm of descending colon (Fig. 4). Inflammation of neck of bladder. Symptoms partly relieved by hyoscine.
Dubois (1926)	Buttock	Frequency, dysuria, and eventually urinary retention. Cystoscopy showed vesicles on left side of base and lateral wall of bladder.
Wolbart, quoted by Dubois (1926)	"	Herpes of ureteric orifice.
Satani (1926)	"	Zoster of bladder on same side and suppuration of large intestine.
Rouyer (1903)	Gluteal region	Frequency and dysuria.
Chesterman (1932)	Buttock	Lesions of bladder.
Belgode (1924)	Gluteal and sacral	Uterine cervicitis and enlargement.
Davidsohn (1890)	"	Transient paralysis of bladder and rectum.
Bernhardt (1890)	" " "	" " "
Oppenheim (1911)	" " "	" " "
Tomey (1909)	Sacral	Frequency and disturbance of bowel emptying.
Parsat (1910)	Gluteal region, scrotum, and perineum	Urinary and faecal retention for 14 days.
Frankl-Hochwart (1913)	R. genital area	Dysuria and disturbance of bowel emptying.
Spitzer (1925-6)	Buttock and one leg	Severe urinary disturbance lasting 3 weeks.
Mann (1931)	Sacral	Rectal and bladder disturbance.

Case 1.—Male, aged 42. Ten days before he attended hospital severe pains began in right side of neck and shoulder, followed after three days by rash over right shoulder and front, back, and side of lower part of neck. Three days afterwards he complained of cough, thick mucoid expectoration streaked with blood, and some hoarseness. Examination: Typical painful zoster eruption in distribution of right C3 and 4 segmental zones with hyperalgesia. No abnormal physical signs in other systems. Radiographs of chest normal. Laryngoscopy: redness and oedema of right vocal cord. Bronchoscopy: marked oedema and redness, strictly limited to right side of tracheal mucosa, extending downwards to carina. With fading of the skin lesion the cough, expectoration, and hoarseness gradually ceased.

Case 2.—Female, aged 41. Three weeks before coming to hospital she developed hemigirdle pain in the right lower chest and between the shoulder-blades. Four days later zoster appeared in this region with a sensation of substernal pressure and epigastric aching immediately on swallowing, as though food was stuck. The aching was not improved by taking alkalis. Examination: Typical zoster eruption in right D 6-8 segmental areas. Barium meal: marked spasm in the prepyloric region as shown in Fig. 1. Fractional test meal: high acid curve. Gastroscopy: spasm of pyloric antrum, the mucosa of which was reddened and swollen. Vomiting relieved by belladonna, 12 min. (0.7 ml.) t.d.s.; it reappeared if drug omitted. The skin lesions and digestive disturb-

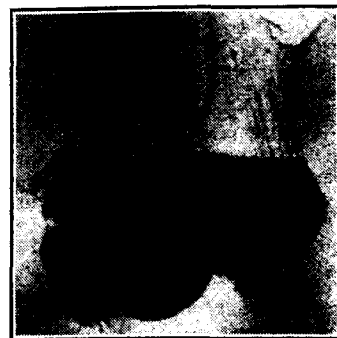


FIG. 1.—Case 2. Right D 6-8 zoster. Barium meal radiograph showing spasm of pyloric antrum.

ance died down in course of the next three months, by which time the spasm had disappeared radiologically. Fractional test meal now showed some fall in acid secretion.

Case 3.—Male, aged 72. No previous digestive disturbance. He developed herpes zoster of right D 7 and 8 zonal areas. At height of attack he complained of nausea, vomiting, and severe anorexia, which lasted for several months. Skin lesions, followed by post-herpetic pain of two types, a constant ache, and a sharp stabbing pain brought on by movement of trunk; pain varied in severity, but worse in damp and cold weather. Two months after onset two severe haematemeses, each of about 1 pint (570 ml.). A barium meal one month later showed an ulcer crater on the lesser curvature of the incisura (Fig. 2). Despite various antacids the digestive symptoms persisted.

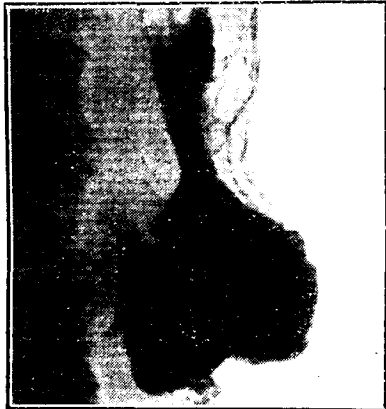


FIG. 2.—Case 3. Radiograph taken during barium meal, showing gastric ulcer on lesser curvature developing with zoster of right D 7-8 zonal areas.

sation and tenderness in region of right hip when he lay on it, and a week later this region became painful. Within a few days a segmental zoster eruption appeared in the painful region, extending from 1½ in. (3.8 cm.) below the umbilicus to groin and round to back in distribution of right D 11-L 1 nerve roots. With onset of rash complete constipation set in. A barium enema showed marked spasm of ascending colon with dilatation of gut distal to this. Constipation partly relieved by administration of atropine by mouth. With healing of rash marked post-herpetic pain remained, but more normal bowel function gradually returned. Two years after onset of herpes bowels still remained sluggish.

Case 5.—Female, aged 62. Developed herpes in right D 11-L 1 distribution. With onset of rash absolute constipation developed and persisted for three weeks, during which time no response to enemata was obtained. Laparotomy performed, but no obstructive lesion found in bowel. The ascending colon was, however, oedematous and engorged, and was excised. Histologically it showed non-specific inflammatory changes in all coats for a distance of 25 cm. Rash faded and the scars healed within six weeks, but pain persisted with some severity for nearly two months. For next 10 years the affected region remained tender and bowel function extremely sluggish. Emptying never occurred without use of purges. One month after development of the herpes her two daughters developed chicken-pox.

Case 6.—Female, aged 60. Two weeks previous to attendance at hospital she developed painful irritation of left lower abdomen followed by a herpetic rash passing to loin and back. Two days prior to attendance sudden severe frequency and burning micturition began, and on day of attendance some haematuria occurred. She was severely constipated. **Examination:** Typical herpetic rash and hyperalgesia in left D 11-12 segmental areas of abdomen and loin. Urine: albumin and blood; catheter specimen: numerous R.B.C. and pus cells; no organisms present. Cystoscopy: marked redness and oedema of bladder fundus, chiefly on left side. Barium enema: marked spasm of ascending and transverse colon and dilatation of descending colon. Treated with tincture of hyoscyamus, 30 min. (1.8 ml.) t.d.s., with some relief of urinary symptoms and constipation. With healing of the skin lesions urinary symptoms and constipation gradually diminished, though both these and pain persisted during the next six months.

Case 7.—Male, aged 50. Two months prior to attending hospital he developed severe left lumbar pain spreading into left loin, iliac fossa, and front of thigh. Three days later zoster appeared in this area. At the same time he complained of difficulty in defaecation and constipation, considerable frequency of micturition, difficulty in emptying the bladder, and burning pain in penis when bladder was full and during micturition. Symptoms at first severe, but diminished somewhat in severity in course of next two months. Visceral symptoms varied with pain. **Examination:** Site of zoster scabs very hyperalgesic and corresponding to left

D 12-L 2 segmental areas. Cystoscopy: marked congestion and submucous haemorrhages in the floor and roof of the bladder mucosa, which bled easily and appeared inflamed. Urine: no organisms, but some pus cells present. Barium enema: markedly spastic descending colon and rectum, with dilatation of transverse colon above (Fig. 3). Cerebrospinal fluid: normal. Repetition of barium enema four weeks later showed much diminution in spasm. Over the next two years he was subject to bouts of pain with inability to empty the bladder.

Case 8.—Male, aged 52. Two weeks previous to attending hospital he developed pain in front of left thigh and knee, extending to outer side of left hip. Four days later a rash appeared in painful area and after another four days he developed severe constipation with a desire to empty the bowels; he passed dark blood-stained mucus and had some difficulty and pain on micturition. **Examination:** Typical herpes zoster and hyperalgesia in left L 2-3 segmental areas. Urine: pus cells but no organisms. Rectal examination: normal. Sigmoidoscopy: swollen reddened mucosa at uppermost limit to which the instrument could be passed. Barium enema: severe spasm of descending colon. Cystoscopy: neck of bladder intensely red and oedematous. Intestinal and urinary symptoms considerably relieved by administration of tincture of hyoscyamus, 30 min. (1.8 ml.) t.d.s. Pain, skin lesions, and intestinal disturbance gradually disappeared in the next three months.



FIG. 3.—Case 7. Left D 12-L 2 zoster. Barium enema radiograph showing spasm of descending colon.

Comment

After reference to the course of the afferent visceral fibres shown in the Table it will be observed that the visceral disturbance in cases of herpes zoster occurs particularly in those viscera, or parts of viscera, supplied with afferent fibres by the posterior nerve roots corresponding to the zonal skin areas affected. As in the skin and deep tissues, so the effects on the viscera are to produce vasodilatation, oedema, haemorrhages, and inflammatory changes, and to predispose to vascular thromboses. The affected gut exhibits local hypermotility and spasm. The evidence suggests that, apart from the parasympathetic and sympathetic, the viscera receive a third type of nerve supply which may affect their activity. The bipolar cell bodies lie in the posterior root ganglia, and their peripheral axons pass to the viscera without relay through the autonomic ganglia. They are, in fact, the so-called visceral "afferent" fibres. This perhaps explains to some extent the frequently reported variable and uncertain effects on the viscera of stimulating the rami communicantes of the spinal nerves and the sympathetic chain in which such fibres run. It further raises the problem of whether "antidromic" centrifugal impulses are normally conducted by the "afferent" unmyelinated fibres.

Summary

In cases of herpes zoster the inflammatory skin lesions are thought to result from disturbance of the ganglion cells of the posterior or trigeminal root ganglia or of the "afferent" fibres of the posterior nerve roots or the peripheral nerves. Similar nerve fibres originate or end in the viscera. Evidence is adduced which seems to indicate that, accompanying the segmental skin lesions, there occurs disturbance of the viscus, or part of the

viscus, innervated by the corresponding nerve roots, which results in inflammatory lesions and spasm in the case of the hollow organs. This suggests that, in addition to the sympathetic and parasympathetic pathways, there exists a third nerve pathway by which visceral activity may be altered.

REFERENCES

- Andréassian (1934). *Paris med.*, 2, 533.
Belgode, G. (1924). *Ann. Mal. vénér.*, 19, 813.
Bernhardt, M. (1890). *Berl. klin. Wschr.*, 27, 695.
Bichellonne, H. (1907). *Bull. méd. (Paris)*, 21, 277.
Bielschowsky, M. (1914). In M. H. Lewandowsky's *Handbuch der Neurologie*, 5, 316. Springer, Berlin.
Brain, W. R. (1931). *British Medical Journal*, 1, 81.
Chesterman, C. C. (1932). *Ibid.*, 1, 563.
Clark, D., Hughes, J., and Gasser, H. S. (1935). *Amer. J. Physiol.*, 114, 69.
Curtin, R. G. (1922). *Amer. J. med. Sci.*, 123, 264.
Darret, R. (1929). *J. Urol. méd. chir.*, 27, 229.
Davidsohn, H. (1890). *Berl. klin. Wschr.*, 27, 695.
Donaldson, E. D. T. (1948). *British Medical Journal*, 2, 839.
Dubois, F. E. (1926). *J. Urol.*, 15, 583.
Feindel, W. H., Weddell, G., and Sinclair, D. C. (1948). *J. Neurol. Neurosurg. Psychiat.*, 11, 113.
Fitzpatrick, P. E. (1948). *British Medical Journal*, 1, 1206.
Ford, F. R. (1946). *Diseases of the Nervous System in Infancy, Childhood, and Adolescence*, 2nd ed. Thomas, Springfield, Ill.
v. Frankl-Hochwart, L. (1913). *Wien. klin. Wschr.*, 26, 2116.
Frisch, A. (1908). *Inaugural Dissertation*, Zurich.
Fuchs, C. H. (1840). *Die krankhaften Veränderungen der Haut und ihrer Anhangs in nosologischer und therapeutischer Beziehung*, 3, 1084. Göttingen.
Göttingen.
Fulton, J. F. (1949). *Physiology of the Nervous System*, 3rd ed. Oxford Univ. Press, London.
Grossmann, W. (1932). *Klin. Wschr.*, 11, 1181.
Guillain, G., and Pernet (1910). *Rev. neurol. (Paris)*, 535.
— and Rouvillier, D. (1913). *Bull. Soc. med. Hôp. Paris*, 36, 437.
Head, H. (1893). *Brain*, 16, 127.
Hess, L., and Faltuscheck, J. (1925). *Med. Klin.*, 21, 1683.
Kuntz, A. (1953). *The Autonomic Nervous System*, 4th ed. Lea and Febiger, Philadelphia.
— and Hamilton, J. W. (1938). *Anat. Rec.*, 71, 387.
Lebel, R. (1920). *Thèse de Paris*, No. 55. Masson.
Lewis, T. (1927). *Blood Vessel Responses of the Human Skin*. Shaw, London.
— (1942). *Pain*. Macmillan, London.
Mann, W. (1931). *Z. klin. Med.*, 118, 630.
Nieuwenhuis, P. (1914). *Z. ges. Neurol. Psychiat.*, 22, 45.
Oppenheim, H. (1911). *Textbook of Nervous Diseases*, translated by A. Bruce, vol. 1. Daren Press, Edinburgh.
Parsat (1910). *Ann. Derm. Syph. (Paris)*, 1, 332.
Ramond, L. (1923). *Progr. méd. (Paris)*, 38, 97.
Ranson, S. W., and Davenport, H. K. (1931). *Amer. J. Anat.*, 48, 331.
Rayer, P. (1935). *Traité des Maladies de la Peau*, 1, 240. Paris.
Rouyer, E. (1903). *Bull. méd. (Paris)*, 17, 655.
Ryle, J. A. (1932). *British Medical Journal*, 1, 726.
Satani (1926). *Jap. J. Derm. Urol.*, 26, 64.
Van der Scheer, W. M. (1913). *Z. Neurol. Psychiat.*, 16, 343.
Schleicher, E. M. (1949). *Amer. J. clin. Path.*, 19, 981.
Schönfeld, W. (1929). In *Handbuch der Haut und Geschlechtskrankheiten*, edited by J. Jadassohn, vol. VII/1. Springer, Berlin.
Siding, A. (1909). *Wien. klin. Wschr.*, 22, 269, 306.
Spillane, J. D., and White, P. D. (1939). *Brit. Heart J.*, 1, 291.
Spitzer, R. (1925-6). *Zbl. Haut- u. Geschlkr.*, 18, 755.
Stone, R. V. (1948). *British Medical Journal*, 1, 882.
Sudeck (1910). In M. H. Lewandowsky's *Handbuch der Neurologie*, 1, 1222. Springer, Berlin.
"Surgeon" (1950). *Lancet*, 2, 822.
Tomney, A. (1909). *J. Mal. cutan. syph.*, 20, 9.
Turner, A. C. (1909). *British Medical Journal*, 2, 1026.
Variot, G. (1907). *Bull. Soc. Pédiat. (Paris)*, 9, 297.
Watts, C. A. H. (1948). *British Medical Journal*, 1, 175.
White, J. C., and Smithwick, R. H. (1947). *The Autonomic Nervous System*, 2nd ed. Macmillan, New York.
Willson, S. A. K. (1940). *Neurology*. Arnold, London.

In a booklet entitled *Health Services in Britain* (H.M.S.O., 3s. net) the Central Office of Information has added another useful publication to its series of "Reference Pamphlets." Starting with water supply and sewerage, the booklet proceeds to describe the other public health services, the National Health Service, and industrial health. There are additional sections on the health services in Scotland and Northern Ireland, on the Medical Research Council, and on professional training in Britain; a bibliography of Government publications; and a useful list of the names and addresses of health departments and organizations. Some statistics are given of the National Health Service. About 97% of the population of Great Britain uses the Service; 98% of general practitioners, the "great majority" of specialists, 94% of dentists, and almost all chemists are taking part in it. The cost of the Service amounts to about 34% of the total national resources, and four-fifths of the gross cost (£570m.) falls on the Exchequer to be met from general taxation.

INFLUENCE OF HYDROCHLORIC ACID ON GASTRIC SECRETION AND EMPTYING IN PATIENTS WITH DUODENAL ULCER

BY

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There are at least three possible ways of accounting for gastric hyperfunction in patients with duodenal ulcer. They are: (1) an increased number of cells which secrete acid (Meyers, 1948; Guiss and Stewart, 1948; Hunt, 1950; Cox, 1952; Card, 1952; Hunt and Kay, 1954); (2) an increased vagal drive to the gastric mucosa (Dragstedt, 1956); and (3) a failure of the duodenal mechanisms which inhibit gastric activity; this hypothesis embraces both gastric secretion and emptying (Shay, 1944). The present paper is concerned with the last of these possibilities.

Methods

The main purpose of the present experiments was to examine the influence on gastric secretion of low concentrations of acid added to test meals. Such acid might be expected to have three effects: it should stimulate duodenal receptors which slow emptying and thus prolong gastric distension by the meal. Since gastric distension is a stimulus to secretion in man (Hunt and Macdonald, 1952; Macdonald and Spurrell, 1953) such slowing of emptying should increase gastric secretion; on the other hand, acid should depress secretion via the duodenal inhibitory mechanism or possibly by inhibiting the release of gastrin (Woodward, Lyon, Landor, and Dragstedt, 1954). Thus whether added acid increases or decreases gastric secretion will depend upon the balance between the increased stimulus of distension and the inhibition of secretion from the duodenum. It has been found that in most normal subjects adding sucrose to test meals delays emptying and reduces secretion, but in two the addition of sucrose caused an increase of secretion. On further examination it was found that in these two subjects increasing gastric distension produced an unduly large increase in gastric secretion (Hunt, 1954).

For the present experiments, which were mainly concerned with inhibition of secretion, it was decided to use a solution of glucose as the control meal to which acid could be added as a variable. By slowing the emptying of the meals with glucose it was hoped to minimize the effect of the added acid on emptying. A further advantage of adding glucose to both meals is that it minimizes (Bandes, Hollander, and Glickstein, 1940) the absorption of water from the stomach which occurs to some extent in man (Hunt, 1949), so that phenol red added to the meal may be used as a reliable marker to determine the volume of original meal remaining.

The methods used have been described (Hunt, 1954). In essence the technique involves giving a test meal containing a dye which is not absorbed in the stomach. After 30 minutes the gastric contents are recovered, and from the amount of dye remaining the volume of the original test meal in the stomach at the time of recovery may be calculated. Further, the volume of the gastric contents which has passed into the duodenum may be assessed, together with the total amounts of acid, chloride, and pepsin secreted. From the amounts of acid and chloride secreted the outputs of hypothetical parietal component and non-parietal secretions may be found. Twenty-seven volunteer students were studied and 18 tests were made in 16 patients with a diagnosis of duodenal ulcer without pyloric stenosis. The patients were under treatment in the medical and surgical wards, and the

majority were not having pain during the period of the tests, nor did any of them have pain during their test. The control meal was 750 ml. of solution containing 100 g. of glucose per litre; the experimental meal was similar except that 20 mEq HCl per litre of meal was added, a level of acidity which may be exceeded for 12 hours out of 24 in the gastric contents of normal subjects (Atkinson and Henley, 1955). By giving the meal down the tube and by not taking up the tube during the digestive period the slowing of emptying resulting from the stimulation by acid of receptors lying between the lips and the cardia was avoided (Hunt, 1956). Saliva was aspirated during the tests.

Results

Gastric Emptying.—Table I shows that no marked difference between the rates of gastric emptying in normal subjects and patients with duodenal ulcer was found. Moreover, the slowing of the emptying of the meal by added acid was equal in the two groups.

TABLE I.—Influence of 20 mEq HCl/litre of Test Meal on Gastric Emptying of a Solution of Glucose (100 g./litre)

	27 Normal Subjects		18 Tests in 16 Patients with Duodenal Ulcer	
	Glucose Solution	Mean Change with Acid	Glucose Solution	Mean Change with Acid
Mean volume of meal remaining in stomach at 30 min. (ml.)	489	+36.8	439	+37.7
S.E. of mean	±9	±9	±23	±13
Mean volume of gastric contents at 30 min. (ml.)	566	+10.8	542	+23
S.E. of mean	±9	±9	±21	±9

Gastric Secretion.—Table II shows that the patients with duodenal ulcer as a group secreted twice as much acid, chloride, and pepsin as did the normal subjects. Adding acid to the test meal reduced the secretion of acid in the

TABLE II.—Influence of 20 mEq HCl/litre of Test Meal on Gastric Secretion in Response to a Solution of Glucose (100 g./litre). All Data Refer to a Digestive Period of 30 Minutes

	27 Normal Subjects		18 Tests in 16 Patients with Duodenal Ulcer	
	Glucose Solution	Mean Change with Acid	Glucose Solution	Mean Change with Acid
Mean amount of acid (mEq)	5.1	-1.1	12.5	-0.7
S.E. of mean	±0.6	±0.3	±1.7	±0.8
Mean amount of chloride (mEq)	8.4	+0.1	18.5	-0.7
S.E. of mean	±0.7	..	±2.0	±1.0
Mean amount of pepsin (units)	6,300	No change*	11,300	No change*
S.E. of mean	±870		±1,900	
Mean volume parietal component (ml.)	36.7	-5.1	87.8	-3.9
S.E. of mean	±3.8	±2.1	±11.7	±4.1
Mean volume non-parietal secretions (ml.)	18.5	+6.5	35.0	-1.0
S.E. of mean	±1.8	±2.1	±3.4	..

* Because of very large changes occurring in some subjects the effect of acid was determined by comparisons of amount secreted with added acid $\log \frac{\text{amount secreted with added acid}}{\text{amount secreted with control meal}}$.

This gives an equal weight to halving and doubling the outputs of pepsin in each subject.

normal subjects by an average of one-fifth but produced no other significant mean change in the measurements of these quantities in either group.

Because the chloride of the gastric secretion has its origin in at least two types of cell it is often helpful to describe the gastric secretion of electrolytes in terms of the hypothetical acid or parietal component and the non-parietal secretions (Hollander, 1938; Fisher and Hunt, 1950), although with some reservations (Hunt, 1957). The data expressed in these terms show that the hypersecretion in the patients with duodenal ulcers involves not only the acid-secreting parietal cells but also the sources of the non-

parietal secretions. The addition of acid to the test meal decreased the mean secretion of parietal component and increased the output of non-parietal secretions in the normal subjects, but produced no significant mean changes in the patients with duodenal ulcers. It will be seen from Fig. 1,

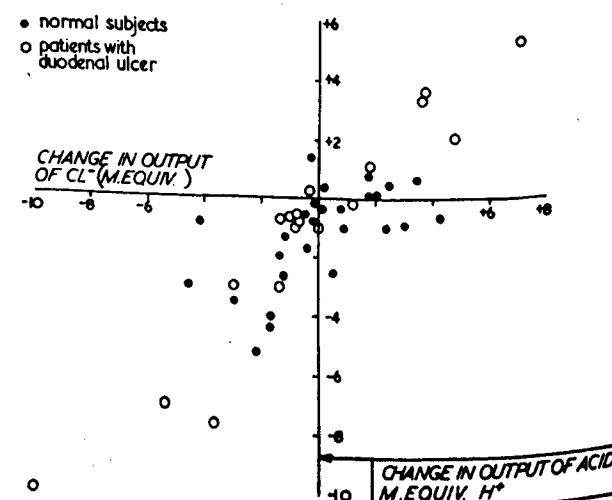


FIG. 1.—Relation between changes in outputs of acid and chloride on adding 20 mEq H⁺/l. of test meal (glucose 100 g./l.).

in which the change in the output of acid has been plotted against the change in the output of chloride for each subject, that the changes in the outputs of these two electrolytes on adding acid were considerable and correlated with each other in much the same way in both groups. This relationship is masked when only the mean data are considered.

Discussion

Gastric Emptying

It has so far proved impossible in this laboratory, using various test meals, to provide any convincing evidence that as a group patients with duodenal ulcers have stomachs which empty more rapidly than normal subjects. This could be the result of our normal subjects being younger or more

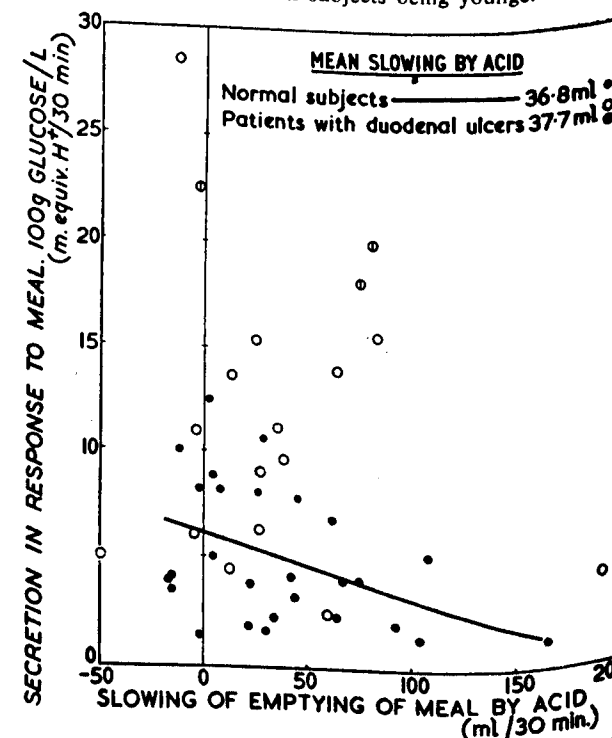


FIG. 2.—Relation between slowing of emptying of meal in response to 20 mEq HCl/litre of test meal (glucose 100 g./l.) and amount of acid secreted in response to meal in 30 minutes.

physically active than the patients, but it does not seem a probable explanation, since these factors have not masked the hypersecretion of acid and pepsin which is associated with duodenal ulcer.

In the data based on these experiments the magnitude of the influence of added acid on gastric emptying depends upon the gastric secretory response to the control meal, a finding which confirms that of Shay and Gershon-Cohen (1934).

In Fig. 2 the change in the volume of the meal remaining after adding acid to the test meal has been plotted against the secretion of acid in response to the control meal for each subject. For the normal subjects there is a tendency, significant at the 1 in 20 level, for the added acid to be more effective in slowing emptying in those subjects who secreted little acid in response to the control meal. Moreover, the subjects were unselected, whereas Shay and Gershon-Cohen (1934) chose subjects with hyperchlorhydria and achlorhydria in arriving at their conclusion. It is clear that the mechanism for the slowing of emptying responds effectively to such low concentrations of acid as 20 mEq/l. even under conditions chosen to minimize the influence of acid by adding glucose to the control meal.

The Shay (1944) hypothesis also suggests that in patients with duodenal ulcer the threshold of the mechanism which delays emptying is raised during the activity of the ulcer and returns to normal during remission. From what has been said above it is clear that comparisons of the reactivity of the mechanism which slows gastric emptying in response to acid must take into account the amount of acid secreted in response to the control meal. The line fitted to the data for normal subjects in Fig. 2 shows that a group of patients with a mean secretion of 6 mEq H⁺ would not be expected to show any slowing of emptying by added acid. When the points are considered individually it may be seen that the normal subject who secreted 12.5 mEq H⁺ showed no slowing of emptying by added acid. Since 12.5 mEq is the mean amount of acid secreted by the patients with duodenal ulcer, amount of acid secreted by the patients with duodenal ulcer, in these patients as a group if the mechanism were normal. In fact, the slowing of emptying was equal in the normal subjects and the patients with duodenal ulcer, a finding which implies that the mechanism which slows emptying in response to acid is overactive in patients with duodenal ulcers.

It is remarkable that the single-withdrawal method used here, which confirms that acid is more effective in slowing emptying in normal anacid subjects than it is in those secreting much acid, fails to confirm Shay's findings in patients with duodenal ulcers. It is possible that the discrepancy arises because Shay was principally recording "emptying time," which depends not only on the rate of emptying in the main part of the digestive period but also upon the final rapid emptying demonstrated by Hunt and Macdonald (1954), whereas the present data refer only to the first 30 minutes of the digestive period.

Gastric Secretion of Acid

The second part of the Shay hypothesis postulates that the gastric hypersecretion of patients with duodenal ulcer results from the failure of the duodenal inhibitory mechanism to slow gastric secretion as the gastric contents become more acid. In confirmation of this it will be seen from Table II that adding 20 mEq HCl/l. of test meal did depress the secretion of acid by about one-fifth in the normal subjects but that the mean depression of secretion in patients with duodenal ulcer was negligible.

A more detailed examination of the data on secretion, set out in Fig. 3, gives a somewhat different impression from that obtained by studying the mean data of Table II. It will be seen that for the normal subjects the greater the amount of acid secreted in response to the control meal the greater was the reduction in the secretory response when acid was added to the test meal (see also Hunt, Macdonald, and Spurrell, 1951). The data for 11 out of 18 tests in patients

with duodenal ulcer conform to this normal pattern, even though in one patient the secretion was five times greater than the mean for normal subjects. In 6 patients out of 16 with duodenal ulcers there was either a very small fall or an increase in secretion on adding acid to the test meal. No explanation of this increase in secretion is offered. It was not,

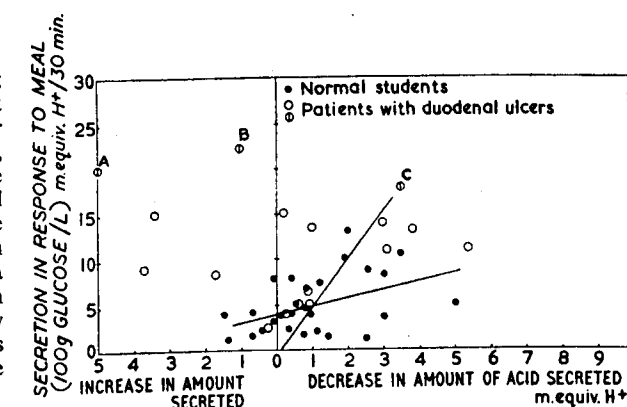


FIG. 3.—Relation between amount of acid secreted in response to a test meal of glucose solution (100 g./l.) and inhibition of secretion by acid added to test meal (20 mEq/l.). For explanation of A, B, and C, see text.

apparently, the result of increased distension by the meal containing acid, for acid did not especially delay emptying in these six patients.

One patient, noted in Fig. 3 by a special symbol, was tested three times. After six weeks of strict medical treatment his gastric secretion of acid was slightly augmented, although he felt extremely well at the end of this period and was entirely free from pain. In tests at the beginning (A) and end (B) of this six-weeks period, adding acid to the test meal increased secretion. Six months later he was readmitted to hospital and did not respond to strict medical treatment, although at this time his gastric secretion of acid was less and adding acid to the test meal did reduce secretion (C).

Gastric Secretion of Pepsin

The finding that the mean output of pepsin was unaffected in normal subjects when the mean output of acid fell was unexpected, for in previous experiments in which sucrose was used to inhibit secretion (Hunt *et al.*, 1951) the secretion of acid and pepsin fell together. Even when the present data for individual subjects were examined there was no correlation between the changes in the secretion of acid and pepsin. It is possible that the experimental conditions were responsible for concealing a change. Pepsin is partly inactivated at pH 5, so that with the control meal there was probably some inactivation of pepsin during the initial part of the digestive period until the pH fell. When acid was added to the meal this putative inactivation would not occur, so that a small fall in output of pepsin might be masked. In addition the secretion of pepsin may have been inhibited by the glucose in the control meal leaving very little possibility for further inhibition.

Significance of Failure of Inhibitory Mechanism

It is clear that the failure of the duodenal inhibitory mechanism is only an inconstant and minor factor in causing gastric hypersecretion in these patients with duodenal ulcer, for marked hypersecretion was found in some patients in whom the inhibitory mechanism was obviously effective. In addition it is known that, as compared with normal subjects, patients with duodenal ulcers have about 75% greater maximal parietal secretory capacity (Hunt and Kay, 1954) and about 75% more parietal cells (Cox, 1952), findings which can account for the majority of the gastric hypersecretion of acid in such patients.

Summary

The influence on gastric activity of adding 20 mEq HCl/litre of test meal containing 100 g. of glucose per litre has been investigated in 27 normal subjects and 16 patients with duodenal ulcer. The test meal contained a marker which allowed the volume of meal remaining and amounts of acid, chloride, and pepsin secreted to be calculated.

These experiments have not revealed any convincing evidence of abnormally rapid gastric emptying in patients with duodenal ulcers.

In normal subjects the less the secretion of acid in response to the control meal the more effective was the added acid in slowing emptying. The mean slowing of emptying by added acid in patients with duodenal ulcer was equal to that in the normal subjects. When the increased secretory response of the patients with duodenal ulcer is borne in mind this finding indicates that the mechanism which slows emptying in response to acid in patients with duodenal ulcer is more reactive than it is in normal subjects.

In response to the control meal the group of patients with duodenal ulcer had about twice the mean normal outputs of acid, chloride, and pepsin.

The added acid caused a mean fall in the output of acid in the normal subjects. In the patients with duodenal ulcer there were 10 out of 16 in whom the addition of acid reduced the output of acid. In the six others there was some augmentation of the output of acid.

The significance of these findings in the genesis of gastric hyperfunction in patients with duodenal ulcer is discussed.

It is a pleasure to thank many clinical colleagues for permission to investigate their patients with peptic ulcers, the patients themselves, and the students who have co-operated in these studies. I am also indebted to the Society of Apothecaries for the award of the Gilson Scholarship, out of which part of the expenses of this research was defrayed.

REFERENCES

- Atkinson, M., and Henley, K. S. (1955). *Clin. Sci.*, **14**, 1.
Bardes, J., Hollander, F., and Glickstein, J. (1940). *Amer. J. Physiol.*, **131**, 470.
Card, W. I. (1952). In *Modern Trends in Gastroenterology*, by F. Avery Jones, p. 340. Butterworth, London.
Cox, A. J. (1952). *A.M.A. Arch. Path.*, **54**, 407.
Dragstedt, L. R. (1956). *Gastroenterology*, **30**, 208.
Fisher, R. B., and Hunt, J. N. (1950). *J. Physiol. (Lond.)*, **111**, 138.
Guiss, L. W., and Stewart, F. W. (1948). *Arch. Surg. (Chicago)*, **57**, 618.
Hollander, F. (1938). *J. Biol. Chem.*, **125**, 161.
Hunt, J. N. (1949). *J. Physiol. (Lond.)*, **109**, 134.
— (1950). *Lancet*, **2**, 397.
— (1954). *Guy's Hosp. Rep.*, **103**, 161.
— (1956). *J. Physiol. (Lond.)*, **132**, 267.
— (1957). *Lectures on Scientific Basis of Medicine*. Athlone Press.
— and Kay, A. W. (1954). *British Medical Journal*, **2**, 1444.
— and Macdonald, I. (1952). *J. Physiol. (Lond.)*, **117**, 289.
— (1954). *Ibid.*, **126**, 459.
— and Spurrell, W. R. (1951). *Ibid.*, **115**, 185.
Macdonald, I., and Spurrell, W. R. (1953). *Ibid.*, **119**, 259.
Meyers, W. C. (1948). *Gastroenterology*, **10**, 923.
Shay, H. (1944). *Bull. N.Y. Acad. Med.*, **20**, 264.
— and Gershon-Cohen, J. (1934). *Surg. Gynec. Obstet.*, **58**, 935.
Woodward, E. R., Lyon, E. S., Landor, J., and Dragstedt, L. R. (1954). *Gastroenterology*, **27**, 766.

"The Australian Department of Health has issued a permit for the importation of the European rabbit flea, which it is hoped will intensify the spread of myxomatosis. The fleas are being collected from Europe this month, the time of the year when they are most plentiful. They will be bred under strict quarantine conditions. Tests will be carried out to ensure that the flea will not be harmful to Australian native animals; experts in wild life will determine whether the flea represents a hazard to such animals as the koala and other marsupials or to certain domestic animals and birds."—*New Scientist*, March 14.

POST-PARTUM BLOOD PICTURE IN SINGAPORE

BY

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Previous investigations carried out by Wadsworth (1952a, 1952b, 1954) in Singapore showed that healthy people of all races living in a tropical climate had normal packed red-cell volumes, red-cell counts, and haemoglobin levels. The poorer classes of the population were not included in those investigations, but Millis (1954) found only one case of anaemia among 106 infants of the poorest and worst-fed section of the Singapore population, and it was of interest to find out whether there was any great degree of anaemia among those most likely to be affected—mothers in the lower-income groups.

Material and Methods

A total of 212 mothers were investigated in the free post-natal wards of the Kandang Kerbau Hospital, Singapore, where the inmates are all from the lower income groups. All patients had normal full-time deliveries without any haemorrhage before or after delivery, and in each case the puerperium was proceeding normally. They were unselected in respect of race, age, or number of pregnancies, and they represented a typical cross-section of non-paying patients in the hospital. There were 174 Chinese, 36 Indians, and 2 Malays. Their ages ranged from 16 to 46 years, and the number of previous pregnancies from 0 to 11. The climate of Singapore is uniformly warm and humid (Wadsworth, 1954); there is no malaria, very little hookworm, and less poverty than almost anywhere else in Asia and Africa.

All samples of blood were taken from an antecubital vein, using minimal stasis, on the second, third, or fourth day after delivery. The blood was placed in a dry stoppered bottle containing an ammonium-potassium oxalate mixture (Heller and Paul, 1934), and examination of the blood was made within two hours of collection. Haemoglobin estimations were made in all cases and haematocrit estimations in 192, there being slight haemolysis in 20 samples.

Estimations of the haemoglobin concentration were made with an M.R.C. photometer (King *et al.*, 1948a, 1948b). Pipettes used were of N.P.I. standard, and special care was taken to ensure that glass cells were scrupulously clean. Blood was thoroughly mixed before dilution, and errors were eliminated so far as possible by making frequent checks with the calibrated neutral glass standard. The packed red-cell volume was estimated by Wintrobe's method, and the samples were centrifuged for 45 minutes at 3,000 r.p.m.

Results

The mean haemoglobin level was 11.85 g./100 ml. (S.D. 1.85), and the mean packed red-cell volume was 35.3% (S.D. 4.77). The distribution of haemoglobin values is shown in Fig. 1 and the distribution of packed red-cell volumes in Fig. 2. Of the haemoglobin values observed, 95% were above 9 g./100 ml., and 86% of the packed red-cell volumes were over 30%. There were only a few isolated cases of moderately severe anaemia. The lowest levels of haemoglobin were 4 g./100 ml. in one patient, 5 g./100 ml. in two patients, and 6 g./100 ml. in one patient. Two patients had packed cell volumes of less than 20%.

No difference was observed between different age groups, nor was any difference found between primiparae and multiparae, and there was no correlation between the results observed and the number of pregnancies. There was, however, a gradual decrease in haemoglobin levels between the second,

third, and fourth days. Samples of blood examined on the second day after delivery had a mean of 12.17 g./100 ml. (S.D. 1.65) while samples examined on the fourth day had a mean haemoglobin of 10.97 g./100 ml. (S.D. 1.82). This conforms with the observations of Tysoe and Lowenstein (1950), who found that minimal haematological values were obtained on the fourth post-partum day. Indians appeared to have lower haemoglobin levels and packed red-cell volumes than Chinese, but this could have been due to the fact that a larger proportion of Indians than Chinese

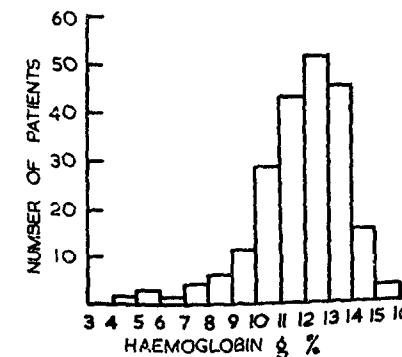


Fig. 1.—Distribution of haemoglobin levels, 212 patients.

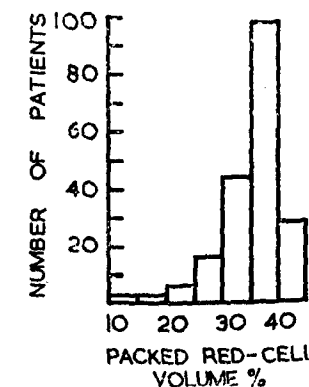


Fig. 2.—Distribution of packed red-cell volume, 192 patients.

after delivery and an average haematocrit value of 36%. In New Zealand, McGeorge (1935) found haemoglobin levels 15% below normal one to three days after delivery. In Britain Meyer-Wedell (1943) found a mean average haemoglobin level of 65% in the first four days of the puerperium. In Canada, Tysoe and Lowenstein (1950) found a mean haemoglobin concentration of 11.3 g./100 ml. and a mean packed cell volume of 34% on the fourth day after delivery. In spite of a few cases of moderately severe anaemia, the haematological levels in the present series are identical within the normal errors of estimation and sampling, with those quoted above, and it would appear that there is no great prevalence of anaemia among the poorer mothers of Singapore.

In Africa, Berry (1955) found a prevalence of severe anaemia before and after delivery, and he attributed this to the multiple deficiencies, parasitic infestation, and diseases of the liver. The climates of Singapore and Lagos are very similar, but there is no severe malnutrition in Singapore and no prevalence of serious disease. The present results confirm, therefore, that anaemias observed elsewhere in the tropics were not a result of the climate but of poor food or illness. At health (Wadsworth, 1952a, 1952b, 1954; Berry, 1955). At the same time, the high incidence of mild anaemia and the occasional existence of moderately severe anaemia observed during the present investigation show that the problem of post-partum anaemia should not be treated with complacency even in comparatively well-fed populations.

Summary

The haemoglobin levels and the packed red-cell volumes of working-class mothers in Singapore were estimated two to four days after delivery. The mean

haemoglobin level was 11.85 g./100 ml. and the mean packed red-cell concentration 35.3%, a finding which conforms closely with observations made in countries with a high standard of living and a temperate climate. This confirms that tropical anaemias are due to other causes than a warm climate.

My thanks are due to Professor E. M. Glaser for his help and encouragement with the investigations and to Professor B. H. Sheares for access to the maternity wards of the Kandang Kerbau Hospital.

REFERENCES

- Berry, C. G. (1955). *British Medical Journal*, **2**, 819.
Dieckmann, W. J., and Wegner, C. R. (1934). *Arch. Intern. Med.*, **53**, 188.
Heller, V. G., and Paul, H. (1934). *J. Lab. clin. Med.*, **19**, 777.
King, E. J., Gilchrist, M., Wootton, I. D. P., Donaldson, R., Sisson, R. B., Macfarlane, R. G., Jope, H. M., O'Brien, J. R. P., Peterson, J. M., and Strangeways, D. H. (1948a). *Lancet*, **2**, 563.
—, Wootton, I. D. P., Donaldson, R., Sisson, R. B., and Macfarlane, R. G. (1948b). *Ibid.*, **2**, 971.
McGeorge, M. (1935). *J. Obstet. Gynaec. Brit. Emp.*, **42**, 1027.
Meyer-Wedell, L. (1943). *Ibid.*, **50**, 405.
Millis, J. (1954). *J. Pediatr.*, **45**, 697.
Tysoe, F. W., and Lowenstein, L. (1950). *Amer. J. Obstet. Gynec.*, **60**, 1187.
Wadsworth, G. R. (1952a). *Nature (Lond.)*, **170**, 851.
— (1952b). *Med. J. Malaya*, **7**, 104.
— (1954). *British Medical Journal*, **2**, 910.

Medical Memoranda

Isoniazid Allergy

Isoniazid sensitivity is a rare occurrence. I have treated more than 500 patients with this drug and have never encountered marked allergic manifestations. This is also the experience of most chest workers in Europe and North America (Carr *et al.*, 1953; Castle, 1953).

Collins (1952) had a case in which a widespread purpuric rash developed after 28 days' treatment with the drug. This eruption subsided when therapy was stopped and reappeared when it was started again. Since then several papers have appeared in the French literature describing a purpuric rash (Levi-Valenski *et al.*, 1953) or bullous dermatitis (Martin, 1953), and in Germany erythroderma (Keller, 1955) and capillary haemorrhages (Merk and Weinreich, 1954; Walther and Winter, 1954) have also been recorded. Indeed, Gernez-Rieux *et al.* (1954) have reported fatalities in two patients treated with intravenous isoniazid. One death was attributed to anaphylactic shock and the other followed massive intestinal haemorrhage. Since then, Kalbian (1954) has reported pyrexia and malaise occurring in a patient following the oral administration of isoniazid.

The following account of isoniazid allergy is presented in view of the drug's extensive use in antituberculous work, the extreme rarity of the condition, and the interesting clinical manifestations of the hypersensitivity.

CASE REPORT

A man aged 45 was found to have tuberculous infiltration in the right apex and first and second right intercostal spaces. A 1-cm. cavity was visible tomographically in the 4 and 5 cm. cuts; acid-fast bacilli were recovered from his sputum on direct smear, and crepitations were audible on auscultation over the posterior segment of the right upper lobe. A diagnosis of active pulmonary tuberculosis was made. He was placed on absolute rest in bed and a course of intramuscular streptomycin, 1 g. daily, P.A.S., 12 g. daily, and isoniazid, 200 mg. daily, each of the latter in three divided doses, which were administered orally.

After 24 days he complained of rawness and burning behind his xiphisternum, with some nausea, abdominal distension, and discomfort on swallowing at the level of the lower end of the sternum. The following day his malaise

and nausea after meals were more marked and he complained of anorexia and frontal headaches. Nothing abnormal was detected on physical examination of his pulmonary, abdominal, or nervous systems. A barium-meal examination was negative and his symptoms were attributed to oesophageal reflux. He was propped up in bed and "aludrox" prescribed. On the twenty-sixth day of treatment he was observed to have a pyrexia of 101° F. (38.3° C.) and a generalized erythematous rash of the face, neck, trunk, and limbs. Three small petechial haemorrhages were noticed on his soft palate and also on the right pillar of his fauces. He complained of photophobia, slight lacrimation, and both eyes were severely injected.

During the next two days the anterior and posterior cervical chain of glands on both sides of the neck became enlarged and extremely tender. There were also swollen tender glands in the supraclavicular regions, in both axillae, and in the inguinal regions, and both epitrochlear glands were similarly involved. His spleen was palpable two fingerbreadths below the costal margin. There was puffiness of his face, ears, eyelids, and neck. He had a considerable sacral pad, and a moderate degree of oedema of his ankles was present. He experienced some discomfort and tightness of his chest on deep breathing, a moderate degree of bronchial spasm was audible on auscultation throughout both lung fields, and he complained of rawness and dryness of his pharynx, trachea, and bronchi. His sedimentation rate had risen from 7 to 22 mm. per hour; his total white-cell count mounted from 6,600 to 14,000 per c.mm. and his eosinophils gradually increased to 30% during the next five days. Serum electrolytes, proteins, and prothrombin time were within normal limits.

A diagnosis of drug allergy was made as soon as the rash appeared and all drug therapy was discontinued. Despite negative intradermal testing with streptomycin, 0.1 g., and a patch test with 20% P.A.S. solution, it was assumed that drug sensitivity was most probably attributable to streptomycin allergy, as isoniazid hypersensitivity had never been encountered previously. Five weeks later, when the erythematous rash had cleared, the entire skin had desquamated, and the adenopathy and splenomegaly had subsided, isoniazid alone was very cautiously recommenced. On the first day 50 mg., and on the second 100 mg., of isoniazid alone, were administered. Within 36 hours of the first tablet being ingested, the patient again complained of nausea, malaise, headaches, a generalized pruritus, with erythema of the face, trunk, and limbs, and a much milder generalized adenopathy of all the glands which had previously been involved. Once again his face, ears, lids, and sacrum became oedematous. His total white count rose to 13,200 per c.mm. and his eosinophils once more increased to 12%. The drug was promptly withdrawn and in nine days the symptoms and oedema had subsided.

COMMENT

This is a case of severe isoniazid hypersensitivity having features rather similar to a case of P.A.S. allergy reported by Mann (1953). Antihistamines, both orally and by direct application, were of no avail in easing this patient's profound pruritus, but considerable relief was obtained from the topical application of 2½% hydrocortisone acetate.

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REFERENCES

- Carr, D. T., et al. (1953). *Amer. Rev. Tuberc.*, 67, 269.
Castle, C. A. (1953). *Ibid.*, 68, 302.
Collins, D. M. (1952). *British Medical Journal*, 2, 391.
Gernez-Rieux, C., Clay, A., Goudenand, M., and Fournier, P. (1954). *Presse méd.*, 62, 842.
Kalbman, V. V. (1954). *Tubercle*, 35, 221.
Keller, P. (1955). *Derm. Wschr.*, 131, 17.
Levi-Valenski, A., Molina, C., Miguères, J., and Asseraf, W. (1953). *Presse méd.*, 61, 158.
Mann, B. (1953). *Tubercle*, 34, 24.
Martin, P. (1953). *Presse méd.*, 61, 1687.
Merk, R., and Weinreich, K. (1954). *Klin. Wschr.*, 32, 212.
Walther, G., and Winter, K. A. (1954). *Tuberculozeartzt.*, 8, 20.

Sudden Death from an Asymptomatic
Pheochromocytoma

The following case is recorded because it serves to illustrate the diversity of clinical picture produced by pheochromocytoma. The condition may be associated with symptoms due to paroxysmal or established hypertension with its concomitant complications. Between attacks the patient may be asymptomatic and not hypertensive (Mackeith, 1944) or, rarely, the tumour may produce no hypertension whatsoever. Cases are on record where the tumour has been found incidentally at necropsy, especially in elderly subjects, and has produced no disability during life. The present case is thought to be worth describing, since the tumour was apparently quite symptomless until it produced the sudden and dramatic death of the patient.

CASE REPORT

A married woman aged 42 was admitted to the Bradford Royal Infirmary in August, 1955, with a 24-hour history of vomiting. She had always enjoyed good health except for



a very transient episode of vomiting four years previously, and she was regarded by her relatives as an unusually robust, active person. On August 19 she went to work in a local mill and while there developed sudden severe vomiting. She was taken home and went to bed. The following day, as she felt very ill, her doctor was called and he recorded her temperature as 104° F. (40° C.) but could find no evident cause for her condition. Further examination revealed a mentally alert, restless, anxious, and dyspnoeic patient. Her skin was pale and grey and she was sweating profusely. There was pronounced blanching of the extremities and some diffuse cyanotic mottling of the skin. There was a tachycardia of 150 a minute, B.P. 140/100, and the fundi were normal. The heart did not appear enlarged. The patient died quite suddenly 15 minutes after admission.

At necropsy a large tumour of the right suprarenal gland was found (see Fig.). This weighed 665 g. and on section was cystic. It contained necrotic areas and a large amount of recent blood clot. There was no left ventricular hypertrophy. Histologically the tumour was found to be a pheochromocytoma.

COMMENT

The interesting feature in this case was the absence of any previous disability and the excellent health of the patient. The episode of vomiting which occurred four years previously may or may not have been caused by the tumour.

No previous clinical information is available, as she had never had occasion to visit her own doctor. Clinically the appearances were suggestive of a Waterhouse-Friderichsen syndrome. The suddenness of death suggested it was in some way related to the massive haemorrhage into the tumour, and this may also have produced the pyrexia.

I thank Dr. C. L. Davidson for permission to publish, and Dr. M. Golliker, who kindly performed the post-mortem examination.

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REFERENCE

Mackeith, R. (1944). *Brit. Heart J.*, 6, 1.

Mercury Dermatitis in a Tattoo: Treated with
Dimercaprol

A number of cases have been reported of mercury sensitivity arising in the red areas (cinnabar) of tattoos. In some cases the use of mercurial applications elsewhere has led to the development of sensitivity and the red areas of the tattoo have subsequently become swollen (Unna, 1930). Other cases are reported in which the sensitivity has developed spontaneously (Ballin, 1933; Sulzberger et al., 1944). A case is described here of a patient who had no other contact with mercury and who in addition to the local eczematous response developed a widespread eruption. The condition quickly responded to injections of dimercaprol.

CASE REPORT

A man aged 28 was tattooed eight years ago on the right forearm and showed at this time no abnormal reaction. The design showed a red heart pierced by a blue stiletto and intertwined with a blue scroll bearing the caption "True Love—Maisie." A few dots of red were present in the scroll and also represented blood near the tip of the stiletto. Later he married, but not Maisie. His wife objected to the tattoo, and on one occasion asked him to have the name altered. For other reasons family stress developed, and shortly after the onset of the eruption his wife left him.

The patient was first seen at the out-patient department in May, 1955. There was no previous history of skin disorders. His father and mother had unspecified rashes, but his two brothers and a sister had been free from skin eruptions. Two months before his first attendance the red areas of the tattoo became swollen and irritable. Treatment with zinc cream was given, but the whole area became red, oedematous, and vesicular, and after three to four weeks an eczematous rash developed over the face, trunk, and limbs. A diagnosis of mercury dermatitis was made and the patient admitted to hospital. After two days the condition was slightly worse and intramuscular injections of dimercaprol were begun, with a dose of 400 mg. on the first day, 200 mg. a day for five days, and then 100 mg. a day for three days. The condition improved rapidly and by the end of the course was clear except for scaling and a little swelling of the red areas of the tattoo. He was discharged home whilst awaiting surgical removal of the tattoo, and 7 to 10 days after the last dimercaprol injection the red areas again became more swollen and started weeping. After a few days the whole tattoo area was swollen, the red areas had become ulcerated, and a widespread eczema again developed.

He was readmitted to hospital, and after a period of four days in which no improvement occurred dimercaprol injections were restarted. A dose of 400 mg. was given on the first day; 300 mg. on the next day; 200 mg. a day for two days, and 100 mg. a day for two days. By the end of the course the condition had again subsided, although the red areas of the tattoo were still prominent. Seven days later these areas again became raised and weeping, and the whole area was swollen. Once more dimercaprol injections were recommenced and 150 mg. a day was given for the next 10 days. Improvement occurred in a few days, and

by the end of the 10 days the whole area was quiet except for the slightly raised and still ulcerated red areas. Three days later the tattoo was excised and grafted, since when there has been no further trouble.

It is of interest that for a few days when an in-patient he developed sore and scaling lips. This ceased when his temperature was taken with a thermometer not kept in biniodide of mercury.

Investigations.—Urine: Normal; specimens before and after the second course of dimercaprol showed no appreciable mercury content. Blood: W.R. and Kahn, negative; cytology within normal limits except for a neutrophil leucocytosis (total neutrophils 9,000 per c.mm.) when first admitted to hospital. Histology: During the second attack a piece of ulcerated red tattooed skin was excised. This was examined by Dr. R. L. Bishton, who reported: "The floor of the ulcer consists of necrotic material overlying inflammatory granulation tissue which extends deep into the dermis. The cellular reaction is very intense, and is composed of lymphocytes and monocytes with a few plasma cells. Although there are collections of blackish pigment particles no foreign-body giant cells are seen. No vascular lesions are observed and there is no tissue necrosis in the dermis itself. Patch tests: These were performed one day after stopping the last course of dimercaprol. 2% ammoniated mercury, 1% biniodide of mercury, 1% perchloride of mercury, and sulphide of mercury (cinnabar) powder all showed a well-marked positive reaction after 12 hours, which was greatest with the biniodide.

COMMENT

In this case there was no history of recent contact with mercury which might have sensitized his skin. The family tendency to "rashes" and the coincident considerable marital stress may well have played a part in the development of this allergic reaction.

The results of the patch tests are of interest. In the past some of these cases have shown a positive response to various mercury salts, but not cinnabar (Unna, 1930; Madden, 1939; Sulzberger et al., 1944). However, Sulzberger (1937) and Novy (1944) describe similar cases in which the patch tests were also positive to cinnabar. Commenting on the inconsistency of these findings, Rook and Thomas (1952) suggest that the hypersensitivity may be to a derivative compound. The very marked sensitivity to biniodide of mercury was obviously the cause of the eczematous reaction on the lips due to contact with a thermometer kept in biniodide of mercury.

It seemed clear that dimercaprol quickly reduced the reaction on all three occasions. The two relapses which occurred after courses of dimercaprol both started 7 to 10 days after it was discontinued. A single dose is said to be effective for only about four hours (Miles Weatherall, 1948). Presumably dimercaprol will only neutralize the mercury in close contact with the tissue fluids and not that towards the centre of the depots of cinnabar. It may be that the interval of 7 to 10 days was necessary for cinnabar in the depots to diffuse again into the tissue fluids or possibly to undergo some chemical change as suggested by Rook and Thomas.

We thank Dr. D. M. M. Thomson for his help in the clinical management of the case; Dr. C. D. Evans for his help with the paper; and Mr. D. C. Bodenham, who carried out the skin excision and graft.

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REFERENCES

- Ballin, D. B. (1933). *Arch. Derm. Syph. (Chicago)*, 27, 292.
Madden, J. F. (1939). *Ibid.*, 40, 256.
Novy, F. G. (1944). *Ibid.*, 49, 172.
Rook, A. J., and Thomas, P. J. B. (1952). *Practitioner*, 169, 60.
Sulzberger, M. B. (1937). *Arch. Derm. Syph. (Chicago)*, 36, 1265.
— Kano, A., and Baer, R. L. (1944). *Nav. med. Bull. (Wash.)*, 43, 889.
Unna, P. (1930). *Arch. Derm. Syph. (Berl.)*, 160, 153.
Weatherall, Miles (1948). *Practitioner*, 160, 239.

Reviews

SURGICAL HANDICRAFT

Pye's Surgical Handicraft: A Manual of Surgical Principles, Minor Surgery, and other matters connected with the work of Surgical Dressers, House Surgeons, and Practitioners. Edited by Hamilton Bailey, F.R.C.S., F.A.C.S., F.R.S.Ed. Seventeenth edition. (Pp. 800+xvi; illustrated. 52s.) Bristol: John Wright and Sons Ltd. 1956.

Pye's Surgical Handicraft was first published in 1884. Mr. Hamilton Bailey has edited every edition since 1938, and in this, the seventeenth edition, he has enlisted the help of more than 50 distinguished contributors. The result is an authoritative and reliable account of all the methods, techniques, and tests which pertain to the duties of the house-surgeon or surgical registrar. Many of the chapters are masterpieces of judicious compression, notably the ten pages on burns by Mr. A. B. Wallace, a short section on rectal operations by Mr. Gabriel, the 20 pages on eye conditions by Mr. Williamson-Noble, and the 70 pages in which Sir Reginald Watson-Jones gives a volume of information on fractures and dislocations. Mr. Bailey himself has written many articles full of practical wisdom, and we would particularly call attention to his suggestion that the practitioner should pass a gastric aspiration tube as a first-aid method of treatment in cases of perforated peptic ulcer. There is an interesting introductory tribute to Mr. Pye with an accompanying photograph. This is a book which the house-surgeon should buy. Anyone who says he cannot afford it must have a distorted sense of values.

ZACHARY COPE.

WIRE BRUSH SURGERY

Wire Brush Surgery in the Treatment of Certain Cosmetic Defects and Diseases of the Skin. By James W. Burks, Jr., M.S., M.D. (Pp. 154+xvi; illustrated. 51s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1956.

The removal of superficial lesions of the skin by means of a revolving wire brush, similar in action to the dentist's drill, seemed at first a rather crude suggestion. The late Dr. Kurtin, however, developed this technique to a point where dermatologists could no longer disregard its usefulness. This small volume from Dr. Burks, himself a dermatologist, is a lucid exposition of the potentialities of this development in plastic surgery, with valuable details concerning equipment and techniques, and with good illustrations.

The procedure was originally employed for the amelioration of the deep, pitted scarring of the face which may follow such ills as smallpox and acne. These cosmetic blemishes may be of serious significance to the adolescent, especially the female, and may, as Burks puts it, "scar the soul." Wire brush surgery has now been employed to remove tattoo marks, rhinophyma, naevi, keratoses, and superficial epitheliomata. It has been effectively used in the treatment of active acne with cystic lesions, "marsupialization" of which lesions is said to be followed by ready healing. Hidradenitis suppurativa of the axillae has also been treated with success.

The cosmetic results, while not giving a perfect skin, are very satisfactory in the majority of patients, whether coloured or white, and untoward effects such as keloidal scarring or infection are rare. Radiodermatitis, deep scars, keloids, and virulent coccal infection of the skin are contraindications, since regeneration is dependent upon blood supply and the presence of appendages. It is possible to exercise very exact control of the extent and depth of treatment, and most valuable histological studies of the process of regeneration have been conducted. Epithelialization begins three days after treatment and is complete in eight days.

I had the privilege of seeing Dr. Burks performing this treatment recently in New Orleans and of observing the

results of treatment. It is now widely employed by dermatologists in America and elsewhere and is being adopted by plastic surgeons in Great Britain. There is no doubt that it is a valuable addition to the armamentarium of the plastic surgeon in the treatment of many skin lesions, especially on the face.

J. T. INGRAM.

ENDOGENOUS UVEITIS

Endogenous Uveitis. By Alan C. Woods, M.D. Illustrated by Annette Smith Burgess. (Pp. 303+xvi; illustrated. £5.) London: Baillière, Tindall and Cox Ltd. 1956.

It often happens in medicine that someone makes the study of one aspect of a subject his life's work and the advances thereby gained in medical progress are usually great. But it rarely happens that the investigator is equipped with an unusually acute intellect, both integrative and critical, that he has had the enthusiasm to concentrate over many years on a subject of great complexity, and that these qualities have been sustained by the resources in material and personnel of one of the best medical schools of the world. The occurrence of such a fortunate combination is an event; and this volume, which epitomizes the life-work of Alan Woods, of Johns Hopkins Hospital, is indeed an event. More than 40 years ago he was publishing papers of great originality on uveitis; and to-day he stands unique in the world as an authority on the subject. We who have this book in our hands are fortunate.

The subject of endogenous uveitis is a relatively narrow one within the compass of inflammations of the uveal tract, and the author has further restricted it by omitting all pyogenic inflammations of the inner eye. Nevertheless the subject that remains is immense and much of it is still obscure. The endogenous inflammations are divided into two categories on a clinico-pathological basis which are generally known as infective and allergic, but for which Woods uses the terms introduced by him into American literature—granulomatous and non-granulomatous. There are objections to those terms, but names matter little so long as we know what we are talking about and that is made abundantly clear. The book is divided into four chapters—the pathogenesis, the clinical picture, the aetiological diagnosis, and the treatment of the various manifestation of these two types of disease. This arrangement has much to be said for it, for, though the reader has to cover all four chapters to obtain a comprehensive picture of (say) tuberculous uveitis, the subject is presented to him in the sequence in which it unfolds itself in the clinic. The great value of the book is that the views expressed are those of the author himself rather than being a compendium of the conflicting ideas of many authorities; and, since his views have been largely responsible for moulding ophthalmological thought on this subject over the last quarter of a century, it is good to have them clearly and consecutively summarized. The reader's appreciation of the book is much enhanced by the clarity of the writing, the excellence of its publishing, and by the beauty of the illustrations.

STEWART DUKE-ELDER.

ESSENTIALS OF DERMATOLOGY

Essentials of Dermatology. By Norman Tobias, M.D. Fifth edition. (Pp. 651+xv; illustrated. 64s.) Philadelphia, Montreal: J. B. Lippincott Company. London: Pitman Medical Publishing Co. 1956.

Five editions of this book have appeared in fifteen years. Its success is understandable, for here is readily accessible a great deal of information useful to general practitioners and senior students. The section on nursing at the end of each chapter makes it, furthermore, valuable as a book of reference in a nurses' library. In this new edition more space has been given to the common dermatoses. One is a little shaken to read that "since the cause of psoriasis is unknown, the physician may satisfy the patient's curiosity by explaining that the disease is a 'form of birthmark,'" and that "amputation is advisable in those cases of indurated

leg with chronic indolent ulcers and tissues of lowered vitality which do not respond to vein ligation or skin grafts." Nevertheless, the reader will find in summarized form much sound information about the appearance, aetiology, differential diagnosis, and treatment of all but the rarest of skin disorders.

The busy general practitioner uses a book of reference such as this mainly to attempt to diagnose some unrecognized condition which he has seen and to determine its treatment. Because observation plays such a large part in the diagnosis of these conditions the illustrations in a dermatological textbook are important. Here there are 211 black-and-white figures and five coloured plates. Though many are excellent, some, including those of erythema scarlatiniforme, erythema multiforme, necrobiosis lipoidica, and morphea, might mislead readers unfamiliar with their appearance. Treatment is dealt with clearly and succinctly. The chief difficulty for the British reader is that many proprietary preparations are mentioned with names which are unfamiliar on this side of the Atlantic. There is, however, a valuable chapter on "dermatologic therapeutics" which contains a great deal of practical information. The book is well produced and should prove even more popular than its previous editions.

S. T. ANNING.

ANATOMY FOR SURGEONS

The Thorax, Abdomen, and Pelvis. Anatomy for Surgeons, Volume 2. By W. Henry Hollinshead, Ph.D. (Pp. 934+xiv; illustrated. £7 7s.) London: Cassell and Co. Ltd. 1956.

This magnificent volume presents its subject from an entirely original aspect. The author describes himself as consultant in anatomy to the 600 physicians of the Mayo Clinic and Foundation, and it is obvious that the consultation has been very real and that it has played a large part in the wide outlook and the clarity of detail which characterizes every page. We are sure that there is no surgeon, we might even think no physician, who will not learn some new fact, perhaps of vital importance, from pages devoted to his own particular field.

Anatomy is now a vast subject, and to have covered every region with such scrupulous care is a great achievement. We can only refer to two regions where anatomical progress has been of vital importance to the surgeon. With the work of Blalock and his colleagues the heart and great vessels have become of peculiar interest, and the elaborate description which readers will here find comes at just the right moment for those who are working in this new field. In a very different region, every abdominal surgeon will appreciate the importance of an exact knowledge of the anatomy of the bile ducts and of the variations which may occur in their course and in their blood supply, and here they are set out in the fullest and clearest manner. The book is finely produced and superbly illustrated both by complete drawings and well-devised diagrams. There could be no better foundation for the advanced surgery of the present day.

HENRY SOUTTAR.

ANATOMICAL TECHNIQUES

Anatomical Techniques. By D. H. Tompsett, B.Sc., Ph.D. Foreword by Sir Cecil Wakeley, Bt., K.B.E., C.B., LL.D., F.R.C.S. Historical Introduction by Miss J. Dobson, B.A., M.Sc. (Pp. 240+xvi; illustrated. 35s.) Edinburgh and London: E. and S. Livingstone Ltd. 1956.

This book is designed to act as a guide to the production of anatomical teaching specimens. The first ten chapters are devoted to the technique of dissection and mounting; they put into print, largely for the first time, much information which was previously handed down by word of mouth from one generation of prosectors to the next. The section on anatomical illustration gives detailed instructions, and, though many professional artists might well criticize the

methods used, it is an honest attempt to obtain the best results from readers who might well have a minimum of natural talent. In the chapters on casting techniques Dr. Tompsett explains a craft which he has for some years pioneered in Great Britain. He sets out the details of each particular method clearly and concisely and shows a very real understanding of the pitfalls which are apt to beset the beginner.

Adequately illustrated with line diagrams and many colour plates, this book is a charming combination of the ancient traditions of the Royal College of Surgeons and the newer cult of "Do it yourself." It is to be recommended to all who are concerned with making anatomical and biological teaching material.

D. BROWN.

ACCIDENTS

The Accident Syndrome: The Genesis of Accidental Injury. A Clinical Approach. By Morris S. Schulzinger, M.A., M.D. (Pp. 234+xxiii. 50s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1956.

This book is based on the author's experience of some 35,000 accidents treated in a general medical practice in Cincinnati, Ohio, between 1930 and 1948. This extensive study was concerned with accidents arising in the home, in industry, and from transport; to some extent the sample is selective in that the more serious injuries would have been admitted direct to hospital. It is well known that there is a high accident rate in the U.S.A., and the book reminds us that in 1951 there were 96,300 accidental deaths in that country and 9,600,000 disabling injuries from accidents.

The book reveals some interesting contrasts to the accident picture in Great Britain. For example, it shows a cyclical pattern of distribution of accidents with the highest incidence in the summer months, whereas in this country it is in the winter months; it shows that males have a significantly higher accident rate than females, except in the first year of life, and that three-quarters of the accidents occur to individuals before the age of 35. It surprisingly pays little attention to accidents to the elderly. The author devotes much space to the consideration of accident proneness, but he prefers to maintain that the majority of accidents are solitary experiences of large numbers of individuals—predominantly the young, the male, and the maladjusted. He draws a clear picture of what he means by the "accident syndrome"; he refers to the universal risk, the abnormal environment, the maladjustment and irresponsibility, the trigger episode followed by the reaction of the individual, and the concluding accident with or without injury.

This book is full of information and includes an extensive bibliography. It is clearly written and easy to understand, although some of the charts are not very clear. It could prove a useful book of reference, but to those conversant with safety measures in Britain it would have more value if it devoted more space to the methods of accident prevention in the United States.

C. A. BOUCHER.

Public speakers no doubt soon get used to the sight of reporters below the platform industriously scribbling down their words—words which, in cold print, hardly ever seem adequate to their theme, however compelling when chosen, rehearsed, and uttered. And they must inure themselves, too, to the reproach of reporters not taking down anything, dismayed and bored by words for which no market exists anywhere. This worm's-eye view of public life has been put to good use in *British Hustings, 1924-1950*, by Mr. Arthur H. Booth, chief reporter of the Press Association. The author's many years of reporting at political meetings, including the election tours of all Prime Ministers during the period, have enabled him to record here an experience of party political strife that is both penetrating and judicious. Since politicians have taken to organizing the medical profession, doctors may be particularly interested in this at times revealing book on their new lords and masters. It is published by Frederick Muller Ltd. for 21s.

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WHAT IS THE CASE ?

The case the medical profession has against the present Government is quite simple. The case is that of a breach of contract, of a broken promise, of a failure to deal directly and simply with a body of men and women who entered the National Health Service in 1948 on what was in essence a gentleman's agreement—an agreement, moreover, that was publicly underwritten by both Government and profession. Mr. Aneurin Bevan—not the initiator but the executor of a scheme continuously modified from 1942 onwards—once said something to the effect that those working in the Health Service should be given an opportunity to behave. Like any other collection of men and women, doctors are subject to the usual frailties of human nature. *Humanum est errare*. But in the main practising doctors have put their best foot forward and have, in spite of the frustrations and pinpricks of officialdom—in spite of the blunderings of bumbledom—done a conscientious job of work during the past eight and a half years. They have looked after their patients, because that is what they were trained to do, and wanted to do. And the people of this country seem to approve of the result.

But the behaviour of Governments—and most regrettably of the present Government—has made doctors deeply disturbed not so much about their present condition as about the future of the profession to which they belong. The present case of doctors versus Government is not only the case for a 24% increase of pay. According to the Spens-Danckwerts formula this claim is at the least one which has the backing of justice and good faith to support it. It has been presented with sound statistical and judicial evidence behind it. Our negotiators have not put it forward in the spirit of a bargainer demanding his pound of flesh. They have asked that if the case is disputed to the point of disagreement it should be submitted to arbitration. They see an ex-Minister of Health, Mr. Iain Macleod, pleading for arbitration in the case of the dispute with the ship-

builders and engineers, and at the same time the present Minister of Health and the Prime Minister denying arbitration to the medical profession. And the doctors, through Dr. Wand, Chairman of the B.M.A. Council, have agreed in advance to accept the verdict of an independent adjudicator. Why does the Government seek for such a reasonable solution in the one case and avoid it in another? Such behaviour is unworthy of intelligent men who assume the mantle of statesmen. It seems to be the behaviour of men who put expedient before principle, of men who appear to discount a small section of the community they govern as politically expendable material. We would repeat to Mr. Macmillan what he himself said at Leicester this week: "*Surely this is a time when we should accept some form of arbitration rather than to have recourse to self-destructive struggles . . . the umpire is better than the duel.*"

If we say, *J'accuse*, is the accusation justifiable? Look at the record! The G.P. Spens Report was published in 1946 and the Consultant and Specialist Spens Report in 1948. Both reports were publicly accepted by profession and Government. Mr. Aneurin Bevan—for whom it would be idle to say the profession had any great affection—agreed as recently as 1950 that the Spens Report for General Practitioners remained the basis for remuneration until some other basis had been found as a result of consultation. This agreement and this confirmation had no statutory backing. They were not embodied in the letter of the law. And the medical profession did not seek to secure this, because it believed that in this delicate process of the nationalization of a profession a Government of decent men would behave decently. But look at the record! When the profession's claim—based upon a previous Government's acceptance of the Spens recommendations—was put to the Minister of Health, Mr. Turton, in July last year, he said the Government could not accept the premises upon which it was based. Mr. Turton contended that the Spens formula applied only at the point of entry of the profession into the N.H.S. He then hedged by asking for a legal justification—for the letter not the spirit of the law. And when our negotiators complied with this, they were met not with a request for discussion and negotiation but with a curt suggestion that they should test it in the courts. When Mr. Vosper took over office from Mr. Turton he said in January this year that the Government could not consider the claim on its merits. Then hard on the heels of this was the statement that the Government would recommend the setting up of a Royal Commission to review medical remuneration in the light of its relations to other professions and (as it finally

came to light) those in connected occupations. In other words, doctors' pay was not to be related to their own merits or to the Spens recommendations, but to the merits and incomes of others. All this was done without any consultation with the medical profession. Faced with the indignation of our negotiators Mr. Vosper said that the Government was prepared to *instruct* the Management Side of Whitley Committee B to negotiate an immediate increase for junior hospital staff—a move which was announced in the House of Lords by Lord Salisbury but not by Mr. Macmillan in the House of Commons. And then—within a fortnight—Mr. Macmillan brushes aside all custom, convention, and understanding between Government and profession, and arbitrarily announces from the floor of the House of Commons that junior hospital staff are to have a 10% increase of pay as from April 1 this year. Of course everyone welcomes at least some increase for these of our colleagues. But has the 10% been arrived at by discussion and negotiation, or, in the failure of agreement, by arbitration? No. These familiar processes of a free democracy have been swept aside by an arbitrary dictatorial decision of the Prime Minister. And as it happens to have been a decision which alleviates the position of those affected it seems to have been passed by with little appreciation of its implications. What would have been the reaction if the decision had been to reduce the pay of junior staff by 10%? There would have been no difference in principle. Having started with a *non possumus*, Mr. Macmillan then said that the work of the Royal Commission did not preclude some interim adjustment for doctors included in its terms of reference. Next he makes an award himself to junior hospital staff, saying that he will make a further statement "in due course" about an interim increase for the other doctors covered by the Commission's terms of reference. Surely this is not the time for a series of one-sided statements. "Surely," in Mr. Macmillan's most recent words, "this is a time when we should accept some form of arbitration. . . ."

Who are these other doctors covered by the terms of reference of the Royal Commission. They are those taking *any part* in the National Health Service of Great Britain. The G.M.S. Committee of the B.M.A. was dismayed last week to learn from its chairman, Dr. A. Talbot Rogers, joint chairman of the Negotiating Committee, that our colleagues in the Public Health Service are excluded from consideration by the Royal Commission. Quite apart from the fact that Medical Officers of Health (many of whom act only part-time in this capacity) *do take some part* in what one might describe as the obvious N.H.S.

services, they are all included in the provisions of N.H.S. Act Part III. But it appears that Sir John Hawton, Permanent Secretary to the Ministry of Health, explained to Dr. Rogers that the apparent inclusion of the Medical Officers of Health in terms of reference of the Royal Commission was just a mistake. This is intolerable and must not be tolerated.

It is extremely difficult to steer one's way through the fog of evasion, inconsistency, and misrepresentation of our present governors, our employers. But the issue is really quite simple. The present Government refuses to negotiate, refuses to admit the moral obligation to face up to the recommendations of the Spens Committees, and refuses the profession's request for arbitration—a method of settlement of dispute it is trying to enforce on the workers in the shipbuilding industry. It sets its inconsistent face against all custom, understanding, and convention which the profession has so far understood to be behind its dealing with the Ministry of Health—now, like so many other things, in the discard. The profession can understand honest disagreements honestly arrived at, and is willing and anxious to resolve them by discussion, negotiation, and, in the event of an impasse, arbitration. But it will not submit to dictation. And it is hard to see how else one can describe the present series of manoeuvres.

In a timely contribution to this week's *Supplement* Dr. W. N. Leak makes an analysis of the present situation which should be carefully studied by everyone who really cares about his profession, and wants to see it manned in the future by men and women who will worthily maintain a great tradition of service to the country in which they live. The Royal Commission, as Dr. Leak puts it, "seems to be a business committee to assess the financial result of doctors' pay without any bunkum about professional standards or traditions. . . ." The issue, as we have said, is simple. There are two questions which could be put to the Government. The first is, "Do you accept the recommendations of the two Spens Reports?" The second is, "If you think these recommendations are unrealistic or not adapted to the conditions of to-day, will you discuss with the profession an alternative set of recommendations on which we can both reach agreement?" The Royal Commission is designed to evade answers to either of these questions—and Dr. Leak adduces cogent reasons why this is so. What is at stake is the future of the medical profession, and its relation with an employer who lamentably fails to understand he is dealing with human beings who in 1948 really believed that in this country a man was as good as his word.

WITHDRAWAL FROM THE N.H.S.

The plan for withdrawal of general practitioners from the National Health Service is published in this week's *Supplement*. It has been drawn up by the General Medical Services Committee under the chairmanship of Dr. A. Talbot Rogers, and will be presented to the special conference of Local Medical Committees at its meeting on April 30. If this plan has to be put into effect withdrawal will initially take place in certain selected areas. It is not recommended that withdrawal shall be total at the outset. If the special conference accepts the plan, the British Medical Guild will take steps to obtain and hold resignations of all general practitioners in the Health Service. Practitioners in the areas selected will be advised to resign from the N.H.S. on October 2, and during that month will be asked to treat their former N.H.S. patients free of charge. If the Government still declines to agree to a satisfactory settlement or to arbitration, then after November 1 standard token fees will have to be charged. The British Medical Guild will have funds from which to give financial support to general practitioners in the selected areas. These and other details are fully set out in the *Supplement*.

The step recommended by the G.M.S. Committee is indeed grave. No one can pretend to welcome such a serious move. But doctors should make it plain to their patients that such a move has been forced on them by the Government. It is the only way in which the gravity of the present situation can be brought home to Parliament and people. It is the only way in which the profession can show its complete disapproval of an employer who refuses to negotiate a claim made under the Spens recommendations, and refuses to agree to arbitration if a satisfactory settlement cannot be reached. Discussions, memoranda, interviews, exchange of letters—all have been without avail. As the Government rejects a reasoned case and a reasonable plea for negotiation or arbitration, action of the kind proposed is all that is left.

OPERATIONS FOR VARICOSE VEINS

All the modern forms of surgical treatment for varices have a long ancestry. Injection treatment is based on the method which Hippocrates is reputed to have used in about 400 B.C.: many small punctures were made in the veins to obliterate them by scarring and thrombosis. The Roman Celsus described the operation of excision in his book written in A.D. 30, and Galen in the second century advocated stripping out the diseased veins with a hook. Ligation came later, and Paul of Aegina gave careful instructions for its performance in A.D. 690. All four methods— injection,

ligation, excision, and stripping—have their uses and their places in modern treatment, but the popularity of all of them has varied. Enthusiasm for one particular method and its use to the exclusion of others has often led to its application to unsuitable cases. Poor results have followed, and the method has been abandoned for another which held sway for a time with similar ultimate result.

The more recent history of the treatment of varices clearly shows the advantages or shortcomings of each method. Ligation of the great saphenous vein in the thigh was popularized by Trendelenburg in the late nineteenth century, and the operation became known by his name. He tied the vein in the middle of the thigh, but the operation was later improved by choosing the point of termination of the vein at the femoral vein for ligation. This was not always enough to give good results, because blood sometimes flowed back into the varices of the leg through incompetent communications with the deep veins at a lower level. Surgeons therefore performed more radical operations in which large reaches of the superficial veins were excised. This was often time-consuming and laborious for the surgeon and a major operation for the patient. When the American surgeons W. L. Keller,¹ C. H. Mayo,² and W. W. Babcock³ introduced their rapid methods of extensive ablation of veins by stripping, excision was soon abandoned. An even quicker method was introduced soon after, when injection treatment was introduced and became the widespread practice. Until the second world war injections combined with ligation remained the standard practice, but about that time it became apparent that the results were not always good and the method was subjected to scientific study by phlebography. A. M. Boyd and D. J. Robertson⁴ and J. B. Kinmonth and D. J. Robertson⁵ showed that the flow of injected fluid was often uncertain and that it might damage valves in the important communicating and deep veins: this would make their valves incompetent or even cause thrombosis and embolism from the deep veins. About the same time T. T. Myers, of the Mayo Clinic, introduced a more efficient flexible stripper which could be passed with greater ease and efficiency through more tortuous veins.

Stripping combined with ligation is now the established operation, and there have recently been reports⁷⁻⁹ of good results in curing varices. There

¹ Keller, W. L., *N.Y. med. J.*, 1905, 82, 385.

² Mayo, C. H., *Surg. Gynec. Obstet.*, 1906, 2, 385.

³ Babcock, W. W., *N.Y. med. J.*, 1907, 86, 153.

⁴ Boyd, A. M., and Robertson, D. J., *British Medical Journal*, 1947, 2, 452.

⁵ Kinmonth, J. B., *Proc. roy. Soc. Med.*, 1948, 41, 632.

⁶ — and Robertson, D. J., *Brit. J. Surg.*, 1949, 36, 294.

⁷ — *Proc. roy. Soc. Med.*, 1955, 48, 442.

⁸ Carter, J. F. B., *Lancet*, 1954, 1, 743.

⁹ Myers, T. T., *J. Amer. med. Ass.*, 1957, 163, 87.

¹⁰ Sherman, R. S., *Ann. Surg.*, 1949, 130, 218.

¹¹ Cockett, F. B., and Jones, D. E. E., *Lancet*, 1953, 1, 17.

¹² — *Brit. J. Surg.*, 1955, 43, 260.

has also been a satisfying freedom from post-operative embolism, probably owing to early ambulation and elevation of the limbs after operation. The incidence of embolism is one-half per cent. or less, which is no higher than for other surgical operations.⁷ Although the results from this modern combination of stripping and ligation are probably better than at any time in the past, perfection has not been reached. Improvement may lie in more accurate placing of the ligatures. The chief cause of formation of varices or of their recurrence after operation is incompetence of the valves in the veins which perforate the deep fascia to join the deep veins. This allows the high pressure in the deep veins to be transmitted to the superficial. A popular name for these incompetent perforating or communication veins is "blow-outs." They may occur in various places in the limb, and their distribution and anatomical variations have been described by R. S. Sherman.¹⁰ The most important and most anatomically constant is that at the sapheno-femoral junction, and this is readily dealt with. Those in the lower leg are more difficult to find, for they may vary in position. F. B. Cockett¹¹ has described those above the ankle which are most often at fault. They frequently escape when the great saphenous vein is stripped, and so a special effort must be made to find them should there be evidence that they are incompetent. The technique of stripping has reached a high degree of efficiency. It is in the methods of locating incompetent communications that most room for improvement lies.

"QUARTERLY JOURNAL OF MEDICINE"

Fifty years ago the first number of the *Q.J.M.* appeared. It then set a standard which, maintained ever since, has made it one of the finest medical periodicals in the world and indispensable reading in all teaching and clinical centres. The originator of this project, as of much else beneficent in British medicine, was William Osler. He joined forces in 1906 with John Rose Bradford, A. E. Garrod, H. D. Rolleston, W. Hale White, and R. Hutchison—now Sir Robert, happily still with us as the one surviving member of that great band of physicians. These men, who were to become jointly the first editors of the *Q.J.M.*, approached a number of their colleagues in order to form an association of physicians, and in the current number of the *Q.J.M.*, a jubilee issue, Sir Russell Brain records their endeavours and those of other leading physicians of the day to launch the new association and its journal. The first meeting was held on May 23-24, 1907, when the then President of the Royal College of Physicians, Sir Richard Douglas Powell, was voted into the chair and became the first president of the Association of Physicians of Great Britain and Ireland, as it was named. W. Hale White (later Sir William Hale-White)

became treasurer, and W. P. Herringham (later Sir Wilmot Herringham) general secretary. The objects of the association were defined in the simple words—"the advancement of internal medicine, and the promotion of friendship among physicians."

To the first object the *Q.J.M.* has been an invaluable ally. Arrangements were made at the 1907 meeting for its publication in conjunction with the Clarendon Press, Oxford, which has continued to publish it ever since. The idea in starting it was to publish papers which, "though scientifically important, were not suitable for the Journals, nor for the clinical or pathological societies." In practice this has usually meant that the papers were thorough and scholarly reports of investigations or series of cases, and of greater length than is acceptable to most journals. The emphasis to-day as formerly is rather on clinical medicine than the abstruser weapons of biochemical or mathematical attack. In the friendly informality that typifies the meetings of the Association, in fulfilment perhaps of its second aim, Sir Russell Brain sees the enduring impress of Osler's personality. He "overcame the medical isolation of the different parts of the British Isles, which had previously existed, and brought the physicians of Great Britain and Ireland together." The *Q.J.M.* may be seen likewise as bringing together, through the variety and excellence of the papers it publishes, all physicians who care for the advancement and sound practice of medicine.

COMEDO FORMATION

Comedones, the primary lesion of acne vulgaris, occur so frequently about puberty that they may almost be considered a physiological phenomenon. It is therefore surprising that the mechanism of their production is still a matter of controversy. Possible theories with their historical background have been well summarized recently by Lipman Cohen.¹ They may be divided roughly into two groups: those emphasizing obstruction to the outlet of the pilo-sebaceous follicle, and those based on some weakness of the forces which empty it. One of the oldest theories, suggested by Unna, was that the fundamental cause was hyperkeratosis of the follicular orifice, and H. W. Barber suggested that this might occur under the influence of androgens.² J. P. O'Brien in his work on prickly heat drew attention to the keratin ring which he showed obstructed the orifice of the sweat duct; he suggested that a similar mechanism might help to close the follicular orifice.³ Others have paid more attention to the sebum. This is almost certainly increased in quantity, but there is less agreement about its being altered in quality. It has been suggested that it is abnormally viscid, that it contains irritants which stimulate hyperkeratosis, or even that imperfectly involuted sebaceous cells block the ducts. But there is no convincing evidence so far for any of these theories.

¹ Cohen, E. L., *Brit. J. Derm.*, 1956, 68, 362.

² Barber, H. W., in *Modern Trends in Dermatology*, ed. R. M. B. MacKenna, London, 1948.

³ O'Brien, J. P., *Arch. Derm. Syph. (Chicago)*, 1952, 65, 206.

⁴ Grant, R. N. R., *Clin. J.*, 1951, 80, 260.

Unna and Sabouraud believed the so-called acne bacillus was important, but infection is now considered only a secondary phenomenon. Among the various writers favouring weakness of the *vis a tergo* several have pointed out that comedones arise at the site of lanugo hairs, and it has been suggested that these, possibly as a result of imperfect growth, may be unable to keep the mouth of the follicle open. R. N. R. Grant¹ observed the frequency with which the succeeding hair could be seen penetrating the orifice at the base of the mature hair; exacerbations of the acne were found to coincide with a fall in the proportion of follicles containing replacement hairs. Failure of the hair to pierce the follicular opening might be due to inadequate rate of growth or less commonly to the hair becoming curled within the follicle. In general those follicles which produced more sebum produced less hair. One other factor which has been suggested is weakness of the arrector pili muscle, which is unable to contract strongly enough to extrude the sebum. Probably several of these factors combine to produce the comedo, and the corollary is that treatment directed against one alone is unlikely to be successful.

UNIVERSITY TEACHERS' SALARIES

Last week the Chancellor of the Exchequer announced that a further review of the salaries of academic staff at universities was now necessary if the standard of recruitment was to be maintained during the forthcoming period of expansion in the universities, and he proposed to ask Parliament to increase the grant to universities by, at first, £3m. a year, so that new rates of salary for full-time staff could be paid from August 1, 1957. The details of these new scales are given at p. 711. It is just two years ago that the Full-time Non-professorial Medical Teachers and Research Workers Group Committee of the B.M.A. drew the attention of the Central Consultants and Specialists Committee to the difficulties of staffing medical schools because of the low salaries offered to medical teachers and of anomalies in the application of existing scales.¹ During the early part of last year many letters were published in the *Supplement* expressing the dissatisfaction of medical teachers with their remuneration, and the Council of the B.M.A. appointed a special committee to go into the matter.² Last summer a deputation from this committee, led by the Chairman of Council, had an interview with representatives of the University Grants Committee and received a sympathetic hearing.

While the increased rates of pay announced by the Chancellor will be welcomed by medical teachers as a contribution towards meeting higher costs of living, many will feel that the rises are too small and come too late. Further, there is no certainty that all the universities will put the new rates into effect: some have not yet been able to pay the present permissive scales³ of salary. Even without taking into account the medical profes-

sion's claim for increased remuneration, the proposed increases in university salaries will still allow too large a gap between pay in the universities and pay in the Health Service, and the medical schools will continue to fight a losing battle in trying to attract medically qualified teachers to preclinical posts.

HORMONE-DEPENDENT CANCER

The revival of castration^{1, 2} and, later, the introduction of adrenalectomy³ for the control of malignant disease of the breast and prostate have led to the conception of hormone-dependent cancer. At first a simple hypothesis appeared satisfactory: to remove the glands secreting a specific stimulus to a target organ which was the site of a hormone-sensitive neoplasm should result in regression of growth not only of the target organ itself but of the neoplasm. The results of treatment soon showed that such a simple explanation could not stand close scrutiny, and indeed that it ignored the profound readjustments and adaptations which occurred in the body after endocrine ablation. Even after castration alone the function of the pituitary is grossly altered and other structures elaborate hormones which even if not exactly chemically identical cause a physiological response indistinguishable from the primary hormone. It has long been known that oestrogen production often returns in women after the menopause, and sometimes never entirely ceases. The site of production was thought to be the adrenal glands, which had been shown to elaborate oestrogen in other circumstances. Further work on the effects of oophorectomy and adrenalectomy on the secretion of oestrogen has more recently become possible because of improved chemical methods of assay, and elsewhere in this issue R. D. Bulbrook and F. C. Greenwood describe their observations on a series of patients. They found that oophorectomy often failed to abolish oestrogen production, and also that adrenalectomy even after oophorectomy might fail to remove oestrogen entirely from the body, though in some cases it might remain absent for long periods of time. The variability of oestrogen excretion is great after adrenalectomy, and even when apparently absent for weeks or months oestrogen may well return either spasmodically or more permanently. In a second paper Greenwood and Bulbrook extend their observations to the effects of hypophysectomy on urinary oestrogen in cases of breast cancer and show that even after this operation oestrogen may continue to be secreted.

These observations are clearly of great importance in the study of hormone-dependent cancer and underline the necessity for further work along the same lines. It may be wrong to assume that, because production of oestrogen does not cease after oophorectomy and adrenalectomy or after hypophysectomy, the surgical ablation of these glands has been incomplete; in fact, evidence is now accumulating that this is not

necessarily the case. Other sources of oestrogen must be sought, and such sources may indeed be autonomous. Again the production of hormones in the tumour itself is a problem that has not yet been solved. Regression of cancer can also occur despite continuing oestrogen production, and therefore other factors in both the adrenal and pituitary glands may be of equal or possibly greater importance in determining the degree of hormone dependence. The intermittent character of oestrogen production also shows the necessity for prolonged and continuous observations before any firm conclusions can be drawn not only about dependence on oestrogen but also about the nature of other factors on which the growth of cancer may depend. At present much of the information on the secretion of oestrogen after surgical ablation of endocrine glands has of necessity been collected from patients suffering from malignant disease. It would be unwise to accept such evidence as necessarily representative of normal patterns, for some endocrine abnormality may be determined by the nature of the disease present at the time.

RENAL FAILURE AFTER BURNING

Severely burnt patients may develop renal failure, but it is uncertain how often this contributes to a fatal outcome. Despite modern methods of treatment, between a half and two-thirds of fatalities occur within the first four days after burning and are attributed in the main to "shock." Later deaths may be due to infection or what is loosely termed toxæmia. The toxæmic deaths tend to occur between four or five days and two weeks after burning,¹ and it is possible that renal failure may be a contributory factor or even the main cause of death in some of these. Pathological changes in the kidneys certainly occur very commonly in patients dying after burns. S. Sevt² in reviewing the necropsy material at the Birmingham accident hospital found significant renal lesions in 54 out of 86 patients dying after burns. Fifty-one of these showed the changes of tubular necrosis, but only a small proportion of them appear to have died because of renal failure. The tubular changes were of two main types—namely, distal or diffuse tubular necrosis, occurring in about two-thirds of cases, and proximal tubular necrosis in about one-third. The former type occurred at all ages and showed essentially the same histological picture as that described following crush injuries, incompatible blood transfusions, abortions, and variously named lower nephron nephrosis or acute tubular necrosis.³⁻⁷ The latter type, proximal tubular necrosis, occurred more commonly in elderly

patients, the majority of whom had nephrosclerosis with or without hypertension. It appears likely, as Sevt suggests, that the lesion is caused by a disturbance in the blood supply to the cortex. There would seem to be no satisfactory way of distinguishing between the two types on clinical grounds.

It is of interest that some patients may, after burns, develop renal failure without oliguria.⁸⁻¹⁰ The same clinical picture has been described by P. E. Teschan and others¹¹ after battle injuries in Korea. The histological changes are the same as in the more ordinary cases of acute tubular necrosis, but the kidneys behave as though, in the commoner type of failure, they were in the period of diuresis immediately following the oliguria. It is as though they had jumped from the onset phase to what is known as the early diuretic phase, without any prolonged period of anuria or oliguria. There are at this time dangers of water and mineral depletion, because the kidney's ability to retain these substances is impaired. It seems likely that more cases of this high-output renal failure would be discovered in other conditions, if patients who have been injured were observed more carefully. Not only should the volume of the urine be measured but also its specific gravity. Fixation of the specific gravity at about 1010 would suggest the need for further investigation, and an estimation of the level of urea in the blood would establish the presence of renal abnormality.

FIRST GASTROENTEROLOGICAL DEPARTMENT

The first gastroenterological department to be set up in this country was opened at the Central Middlesex Hospital on Friday last week by Sir Gordon Gordon-Taylor, who told the many visitors who witnessed this notable event that he had performed a gastrectomy probably before many of them were born. The director of this new department is Dr. F. Avery Jones, whose contributions in gastroenterology have received worldwide recognition. He is being assisted by Dr. T. D. Kellock, Dr. Richard Doll, and Dr. E. N. Rowlands. The new department contains four laboratories, an endoscopy theatre, an x-ray set, a library, and offices. It is a most efficiently and attractively designed unit situated in close proximity to the two wards where gastroenterological patients are treated. The building of this new unit in a hospital where so much pioneer work has been done on disorders of the alimentary tract has been made possible by the generosity of the Nuffield Foundation; the equipment has been provided by the Medical Research Council and the North-west Metropolitan Regional Hospital Board. It may be noted that the major contribution for this new enterprise has come from bodies outside the National Health Service, and this in itself is a reminder that there is still plenty of room for financial support of State hospitals from outside the Government. The Nuffield Foundation has once again put the profession in its debt by giving financial support to an institution and men best fitted to make the fullest use of it.

¹ *British Medical Journal Supplement*, 1956, 1, 36.

² *Ibid.*, 1956, 1, 287.

³ *British Medical Journal*, 1954, 2, 1300.

¹ Farrow, J. H., and Adair, F. E., *Science*, 1942, 95, 654.

² Adair, F. E., Treves, N., Farrow, J. H., and Scharnagel, I. M., *J. Amer. med. Ass.*, 1945, 128, 161.

³ Huggins, C., and Bergenstal, D. M., *ibid.*, 1951, 147, 101.

¹ Hay, E. B., and Cronin, T. D., *Amer. J. Surg.*, 1954, 87, 84.

² Sevt, S., *J. clin. Path.*, 1956, 9, 279.

³ Bywaters, E. G. L., and Beall, D., *British Medical Journal*, 1941, 1, 427.

⁴ Bratton, A. B., *Lancet*, 1941, 1, 345.

⁵ Lucké, B., *Millit. Surg.*, 1946, 99, 371.

⁶ Dible, J. H., in Hadfield, G., *Recent Advances in Pathology*, 6th ed., 1953, London.

⁷ Oliver, J., *Amer. J. Med.*, 1953, 15, 535.

⁸ Shen, S. C., Ham, T. H., and Fleming, E. M., *New Engl. J. Med.*, 1943, 229, 701.

⁹ Goodpastor, W. E., Levenson, S. M., Tagnon, H. J., Lund, C. C., and Taylor, F. H. L., *Surg. Gynec. Obstet.*, 1946, 82, 652.

¹⁰ Sevt, S., *J. clin. Path.*, 1956, 9, 12.

¹¹ Teschan, P. E., et al., *Amer. J. Med.*, 1955, 18, 172.

DOMICILIARY GENERAL PRACTICE IN PREVENTION AND TREATMENT OF ILLNESS

BY

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Fifty years and more ago the farming community was prevented by bad roads and poor communications from travelling far from home. The local market town might be visited once a week in good weather only. In times of sickness the doctor generally went out to the patients, and a wide range of procedures were performed with a high standard of skill in their homes. In spite of keeping a number of horses, the doctor's area was limited to that over which he could travel in bad weather.

Better roads, motor-cars, and public transport have opened up the countryside and widened the range of travel for patient and doctor alike. Health insurance legislation from 1911 onwards has put the patient under an obligation to attend at a surgery unless prevented by illness. Although at first rather less than a third of the population were covered by insurance, the encouragement of surgery attendance enabled the doctor to draw his patients from a wider area. The tendency has therefore been for fewer doctors to serve a country district now than formerly.

In 1948 the National Health Service made free medical service available to the whole population. Surgery attendance whenever possible was emphasized in the instructions printed on the back of medical cards, and accommodation that had previously been adequate had to undertake the reception of three times the numbers.

Overcrowded waiting-rooms would have been unavoidable even if attendances had not been increased by the service being free of charge. A surgery attendance is usually made because of some minor trouble, among which the upper respiratory infections form probably the biggest group. Attendance may be required for routine treatment or supervision, including antenatal and post-natal examination.

Waiting-rooms probably increase the spread of a great deal of what is termed minor illness, the cost in lost working time being very heavy. Attendance for treatment or supervision often involves rearrangement of household work, or discomfort, or expense in travelling, which discourages regular attendance and prevents regular supervision of, for instance, diabetics and the elderly.

There seems no reason why improved communications and modern equipment should not be used in a small and dispersed practice to revert to the older custom of mainly domiciliary work. The method would have to be within the framework of the National Health Service, and able to pay its way.

In outlying parts of the Colonies, and in other European countries, it is quite common for the well-equipped doctor to travel to the patient. During war-time it was quite normal for a G.D.M.O. based on a hospital to do a daily round by jeep or pickup truck, attending scattered groups of men. At the same time he was available if required in an emergency by any particular group.

Description of Practice and Office Routine

My district can conveniently be described in the form of two equilateral triangles lying respectively above and below a common base, formed by the main road, which runs east to west, and carries the only daily bus service. The total distance between the northern and southern apices is 15 miles (24 km.), and the base is 12 miles (19.3 km.) broad. The lower triangle consists of flat country intersected by narrow lanes; the upper triangle is formed of open moorland ridges which separate the deep valleys that run from north to south. There is no roadway over the moor from valley to valley, access being only from the southern ends. The ridges run together to shut off the northern ends. I live in a village of some 200 inhabitants, which forms the hub of my district.

Surgeries and chemists are available in the two market towns, $3\frac{1}{2}$ and $8\frac{1}{2}$ miles (5.6 and 13.6 km.) away. A bus goes to each of them once a week, on market day, and only those living near the main road are able to use more than a weekly service. The low roads are never completely blocked, but in bad winter weather the high roads may be inaccessible to traffic for several days at a time. There is one telephone in each of the dales, but elsewhere public or private instruments are accessible.

Time spent on office work has been reduced to a minimum by keeping accurate records and using proper equipment. N.H.S. folders (E.C.5 and 6) are filed away and used as envelopes for hospital or specialist's letters. Complete notes and summaries of hospital reports are kept on perforated Copeland Chatterson cards, which give writing space equal to a quarto sheet and fit the typewriter. Sixty of these cards occupy not quite an inch in thickness, whereas 15 E.C.5 or 6 folders have to be firmly compressed into the same thickness. Correspondence and recorded work are typed; on-the-spot notes are taken in shorthand. An alphabetical index of people on my list is kept up to date by pasting in additions and erasing departures as they occur.

Cards in current use are kept separate, and reviewed at the end of each month. I retain the cards that will still be needed, and return the others to the main file. While doing this monthly review, I fill in a nominal list, showing people seen and visits made. The cards held back give the names of those who still need attention, and will form the nucleus of the following month's work. These names are entered on loose-leaves having squares for each day of the month. I make a rough plan for the week's work, adding or altering as necessary from day to day, but in the main being able to arrange for routine work in any district to be done on the same day. This is specially useful for planning my regular visits to the elderly or chronic sick.

Transport

All my journeys can be done in a small light commercial van. I bought a chassis and put on a body to suit myself, so that I can comfortably carry equipment and a passenger if necessary. The overall cost was under £400, and I get over 40 miles to the gallon (14 km. per litre) on commercial petrol. It is easy to manoeuvre, and is reliable, having been designed for frequent stops and starts. Weather conditions have never prevented its use, but in suitable weather I sometimes go on foot, on a motor-cycle, or on skis.

I plan the day's round so that I do not have to retrace my steps, and leave time for delays or for diversion in response to additional calls that come in after I have left home. My patients understand this, and co-operate so well that almost all messages reach me during the advertised "surgery hours." It is also well known that I visit certain people at regular intervals, or certain districts on the same day each week, and I get quite a lot of messages asking me to call when next visiting as the matter is not urgent. New calls generally include an often very accurate indication of

the problem for which advice is being sought, so that I can take the necessary medicine with me.

Distance and accessibility are important in planning the journey, especially in winter-time. Some roads may not be cleared until later in the day in mid-winter, or it may be better to hope for a slight thaw to improve conditions. If possible I find it better to go to the distant places first, so that on the way back I have more chances to pick up additional messages, which are telephoned to places ahead of me. These messages are usually passed on very well, and it is unusual for me not to get the message until I arrive home.

When I started I thought I might be strained by a large number of extra calls or by having to cover a greatly increased monthly mileage. For the preceding four years I had been working from a surgery in the market town $3\frac{1}{2}$ miles (5.6 km.) away, and not dispensing. I was now undertaking to visit at home, and to dispense for three-quarters of all the people on my list. The average distance covered has not been increased by as much as 100 miles (160 km.) a week, and the number of visits made each month amount to only about 10% more than before, if visits and surgery attendances are added together. This supports my idea that, in country work, visits are often made to a village from which have come some of the visitors to the day's surgery. A surgery may not therefore save a lot of working time.

The scheme has been running smoothly for four and a half years, and I get very few seemingly trivial calls out of normal hours. A large number of calls ask me not necessarily to go that day, but to include the visit with others that I had intended to make in that village on the next day. I am probably helped in two ways. The countryman often finds a journey inconvenient, and is accustomed to acting with consideration when asking others to travel; and it is understood that I will go if required, attendance not depending on an arbitrary definition of "seriousness."

Most people are now able to use the telephone properly. In difficulty, someone is usually willing to telephone for the caller, but in a few cases I have had to instruct patients, either by giving them simple written instructions to keep by them when they go to the box, or in one case by taking an elderly man into the box and giving him a practical demonstration. Many messages come by hand or through the post.

Domestic and Public Hygiene

As my list is drawn from a predominantly farming community I am probably responsible for a higher proportion of elderly people and lower proportion of children than I would be if I lived in or near a town. In other respects the composition is similar to that of any ordinary general practice. I think that the conditions of work and of life account for an intelligence that is lower than average and a poor standard of personal hygiene, although there is much to be deplored in the local standards of domestic and public hygiene.

Many cottages and farms have no inside supply of piped water and no indoor sanitation; quite a high proportion have no piped supply at all, and draw their water from an open beck which is draining from the moor or hillside.

Although more than three-quarters of the houses in my own village have either an inside or an outside water-closet, the entire domestic and farm drainage passes either directly or through a septic tank into the beck which runs down the centre. Fish are rarely found nearer than half a mile (800 m.) downstream. The habit of dipping sheep may to some extent have a disinfectant action. Until two years ago the entire water supply was collected into a brick storage-tank partly from underground springs and partly from open drainage from manured meadows, or open cow or sheep pasture.

A knowledge of domestic conditions is of the greatest help in dealing with the cause or the treatment of illness, and there is no better way of knowing these conditions than by habitually visiting families at home.

Care of Aged and Infirm

The care of aged and infirm people, or the supervision of the chronically ill, may be more of a problem in the country than in a town. Families are smaller and young people are leaving the countryside in greater numbers to find better-paid work in the towns, so that neighbourly help is much more difficult to get than it used to be, and any "home help" scheme is defeated by being understaffed.

Four excellent district nurses share the work of a very wide area, and the M.O.H. is 9 miles (14.5 km.) away, but it is easy to miss cases that need help unless visits can be made at fairly frequent intervals. Many of the elderly are not able to travel to a surgery some miles from their home, and in such cases a doctor is often not asked to help until urgent illness compels his attendance. Chronically sick people, such as diabetics, can generally get to a surgery quite easily, but they put off the journey if they can, unless they feel unwell.

I keep a list of old people that I think ought to be watched, and visit many of them at regular fortnightly or monthly intervals. Others I see from time to time, very often when fine weather takes me walking in their direction. These old people have become accustomed to what I call "social calls," and do not think it incumbent on them to produce a symptom that will ensure another visit or justify a bottle of medicine. Several of them do have a regular supply of one of the harmless mixtures, not because I think the mixture has any physiological action, but because it makes the patient feel better, and therefore has a therapeutic effect. The majority are as easily and effectively helped by explanation of the cause of their symptoms or signs.

Diabetics and chronic sick are visited regularly, and know at what intervals to expect me. They do not phone when nearly out of insulin, for instance, because they know that enough has been given to last until my next visit. Diabetics are all members of the Diabetic Association, and I discuss with them points of interest in the *Diabetic Journal*; they all use "clintest" sets and test at variable but regular intervals, recording results on a calendar so that I can see them. At intervals I take blood, and have blood estimations done in hospital when I go up for my weekly anaesthetic session. In acute illness, especially when serious, I make a point of saying when I shall next call—if the family do not have to send for me in the meantime.

Maternal and Infant Welfare

I think of maternal and infant welfare as being two aspects of the same and most important part of my work, for in this branch I can concentrate from the beginning on prevention and education. Home visiting makes this most rewarding and professionally satisfactory, and the frequency of visits depends more on the type of home than on clinical necessity.

I like to know as soon as a woman thinks she is pregnant, and encourage home confinement whenever conditions are suitable. If I am told in time, I do a full physical examination at about 10 to 12 weeks, including a pelvic examination and an estimation (Sahli) of haemoglobin percentage. This routine applies to all cases, whether a first or subsequent pregnancy. Thereafter I visit monthly to 30 weeks, fortnightly to 36 weeks, and weekly or more often till confinement. The blood pressure and urinalysis are recorded at each visit up to 36 weeks, after which urinalysis is done only weekly unless otherwise indicated. The abdomen may not always be examined at each visit until the 30th week, but after that time it is examined at each visit. A full examination at the 30th to 32nd week is combined with a sample of venous blood, taken into a "venule" and sent for grouping, reports of rhesus factor, and a report on blood film. Haemoglobin is estimated on the spot, by Sahli's method. Compound vitamin capsules and iron are given at the latest from the 30th week in the form of "capsules abidec" and

"tabs. fersolate," one or two of each daily. When necessary, the father's blood group and rhesus factor are also determined.

I am told when labour begins, and try to visit as soon as possible. I may then decide to go and do some neighbouring visits, so long as I am sure to be able to be present for the latter half of labour. It is understood that nurse delivers the baby and acts as midwife unless she wants me to take over, so that I can concentrate on general management and upon giving analgesia.

General management may include the use of oxytocin in amounts of two or three units at a time when the os is fully dilated, if there is evidence of fatigue; or the use of pethidine in doses sufficient to slow rapid progress. Analgesia is by pethidine combined with trichlorethylene; the pethidine is put up for me by the hospital dispensary in amounts of 50 mg. in 5 ml.; trichlorethylene is given from a Friedman set that I have altered so that I can control the proportion of vapour in air up to approximately 5%. My technique is not suggested for general use because I have specialized training and a hospital appointment in anaesthesia.

Should any repair be needed, I try to leave the patient for 24 hours. This allows her to recover and gives time for oedema to subside; I then give intravenous thiopentone (nurse always being present) and suture the repair in comfort.

Post-natal visits are made daily, on alternate days and finally weekly until about six or eight weeks after confinement, when I do another complete physical examination similar to the one done at 10 to 12 weeks. Thereafter I visit up to 10 months at monthly intervals.

The infant is vaccinated at 6 months, by which time any upset is much less alarming. At 7, 8, and 9 months a combined injection of the Wellcome preparation is given to immunize against pertussis, diphtheria, and tetanus. So I follow the progress of the infant for the first 10 months of its life, and am by then well able to anticipate its future development.

A result of this system is that every child that I have attended in this way since I came here nine years ago has been successfully vaccinated against smallpox and properly immunized against diphtheria and pertussis, and also against tetanus since 18 months ago. Pertussis has not occurred in any child that I have immunized since I came here. Immunization against tetanus is of importance in this district where there have been two deaths in children under 7 years of age in the past eight years.

If home conditions are not suitable I arrange for confinement in the maternity hospital 30 miles (48 km.) away, but in all other respects the antenatal and post-natal supervision is conducted as before.

Neurosis

From correspondence in the medical press it is concluded that neurosis takes up about a third of the general practitioner's time; I should say that this is roughly true for the calls made upon my time. The common factor is anxiety, of which the manifestations are boundless; serious mental illness is rare. In case of serious illness I arrange a domiciliary consultation with a psychiatrist, and have so far had no trouble about getting the patient admitted voluntarily. The nearest duly authorized officer is 30 miles (48 km.) away, and he shares with one colleague the work over an enormous area.

The home background is of such importance in elucidating the cause of neurosis that I find the problems far less perplexing during a home visit than I used to do when I tried to deal with such cases in my surgery—with a door between me and a crowded waiting-room. During the first few visits I get a good idea of the background, and the patient gets over much of her shyness. I next make an appointment to visit, with nurse whenever possible, first

thing in the morning, in order to examine the patient in bed after a night's rest. If there are doubtful points, I follow them up by a special investigation or reference to an out-patient clinic.

Whatever the result, this is reassuring to the patient, who is satisfied that she has been thoroughly examined. She is not affronted, therefore, if told that her symptoms do not indicate definite organic illness, and is prepared to listen to an attempt to explain the relationship between psyche and soma. I do not try to hurry things, and as there is always some evidence (if only slight) of physiological dysfunction, I institute appropriate medical treatment while leading up to an attempt to explain the influence of anxiety.

In many cases, with the patient's consent, I ask their vicar or priest to call. Sometimes I discuss the problem with him; at other times I ask for his help and leave him to adopt his own approach. I find this very happy co-operation of the greatest help to those patients who let me take this line, and the results are better than in those cases where a conventional method is used.

If I am unable to make headway I refer the case to an out-patient clinic without delay, so that the patient has no time to feel that her case is hopeless or that nothing is going to be done to help her. Out-patient treatment entails at least a 30-mile (48-km.) journey in each direction; thus the patient is away from home for most of the day if she is having a course of shock therapy. I have insufficient experience to draw conclusions from my small number of cases, but my impression is that active therapy is not a great help. I think that if ordinary measures fail to get improvement it is better to try to get the patient to live with her neurosis. Family and friends are very helpful if the problem is explained to them, and this sort of explanation, combined with regular visits of the "social call" type, can maintain a remarkably stable outlook.

Whatever the form of treatment, the patient has ultimately to face the ordinary problems of home and family, and, although there is improvement while she is away having treatment, there is nearly always a relapse soon after her return to ordinary life.

Minor Surgery

The scope of the work undertaken need not be limited because it is done in the patient's home. All my equipment is portable and easy to transport from place to place, and very few modifications have been made to suit my present needs. In any case, so much country work has to be done in the home, where facilities are limited, that items like a battery-operated headlamp and a portable sterilizer are in everyday use.

Until quite recently it was customary to do a great deal of minor surgery in the home or at the doctor's surgery—some of it not really minor, as removal of tonsils and adenoids was considered quite reasonable. Although these procedures were generally done well, they can now be done so much better in hospital out-patient clinics that it is not justifiable to do them elsewhere. I arrange for cases to be taken into minor operations clinics at the local hospital, and to be brought back home soon afterwards. All the rest of the treatment is done at home, and when completed a note to that effect is sent to the hospital for filing with the clinic notes.

For instance, a patient requiring Trendelenburg's operation for varicose veins will be given written instructions about pre-operative preparation (diet, bowels, etc.) and sent by ambulance so that she reaches hospital by 9.30 a.m. The arrangement is that she is put down for the first part of the list, so that the operation has been finished by lunch-time. She is brought back home at about five in the evening, and is put to bed, where I see her that evening. I decide when she may get up and attend to the dressings and stitches. Two notes are sent to hospital: the first when all the stitches are out, the second about a month later, when I pay a final

visit and assess the result of treatment. I rarely find that I must keep the patient in bed for more than a day or two, and when in bed she can attend to innumerable household matters that require her decision or instructions. The result is that I have no difficulty in persuading people to go up for a minor operation, and they avoid the inconvenience of elastic stockings or similar appliances.

Extensive dental extractions are often more satisfactorily done at home than in the dental surgery, which is 9 miles (14.5 km.) from most of my patients. Domestic arrangements are made, and generally one of the nurses meets us at the house. I give an injection of atropine as soon as I get there, and nurse then prepares the patient while the dentist and I get our equipment ready. I give thiopentone and attend to the patient's head, so that I make sure of a proper airway and can keep the back of the mouth free from blood. After the extraction I wait until I am satisfied that the patient is completely conscious. The subsequent treatment is of course done at the dentist's surgery.

Dispensing

Three-quarters of my patients live more than two miles (3.2 km.) from a chemist, and I dispense for them on the tariff basis. Other doctors in the locality do not dispense, but it would be rather pointless for me to give my patients an E.C.10 to take to a distant chemist when I am trying to conduct a domiciliary practice. I simplify the monthly returns of E.C.10's, both for myself and for the pricing bureau, by typing them in different colours. By using the tabulator I can deal with three prescriptions at a time on my machine. Group A are typed in blue, and group S in red; sorting at the end of the month could hardly be made more simple, and every prescription is legible. Dispensing seems to give me more control over treatment, and I am able to give out as much medicine as I think necessary at one time, which is more economical than giving an E.C.10 for as much as might become necessary if the response is not as rapid as usual. That my monthly return of items dispensed shows a fairly steady decline over the four and a half years is, I think, one indication of the success of advice and education during visits. I use almost no placebos, but I do use a number of expensive chemotherapeutic and antibiotic agents, and a good deal of insulin; in spite of this my costs work out at considerably less than the national average per head. I have no difficulty in collecting the 1s. prescription charge, and am generally given it without having to ask. I think that most of my patients now know that this charge is a form of tax, and none of them think that it is one of my perquisites.

Conclusion

Home visiting restores a great deal of the old family doctor relationship, and it becomes an advantage to find out a little about taxation, official returns, welfare services, and a number of things which are outside the medical curriculum. But advice about such things can often be more efficacious than several bottles of medicine. Whether he likes it or not, a country doctor has an important part to play in the affairs of his parish or district, and the value of his help is greatly increased by an intimate knowledge of the homes and lives of his neighbours.

Summary

A country practice in a sparsely populated area, poorly supplied with bus services, is described.

All the work is done by visiting the patient's home, and a central surgery is not used. Drugs are dispensed for three-quarters of the small list, and specialist services are readily available at a hospital 30 miles (48 km.) away. It is claimed that the pressure of work is not increased by excluding a central surgery, and that the scope of the work is not limited by the absence of surgery facilities.

APARTHEID IN MEDICAL EDUCATION

REPORT BY DEAN OF FACULTY OF MEDICINE, NATAL UNIVERSITY

On March 11 the Government of South Africa introduced a Bill for university apartheid.* It provides, among other things, for the separation of the Faculty of Medicine, intended mainly for the training of Africans, from the University of Natal. At the request of the president of the Natal Coastal Branch of the Medical Association of South Africa and other interested persons, a report on the matter has been prepared by Professor I. GORDON, professor of pathology and dean of the Faculty of Medicine of the University of Natal, and this report, thanks largely to a donation from Mrs. FLORENCE A. E. POWELL, who in the past has contributed generously to the development of the Medical School, has now (March 4) been published.

The report is in the form of a quarto brochure of some 50 pages and contains as much printed matter as would fill some 25 columns of an average English newspaper; it is arranged in four sections and gives the whole history of the Medical Faculty from approximately 1922, when the first tentative efforts were made in Durban to train Africans to be doctors.

Background to the Bill

Section I of the Report is essentially historical and calls for little remark, except in that it includes an extract from a message from the present Minister of Education, Mr. J. H. VILJOEN, sent to the University when it was appealing for funds in 1952. In the course of the message the Minister stated, "University education should not be, and is not, State Education," and a little further on the message refers to "... this praiseworthy undertaking in respect of which great credit is due to the University of Natal. . . ." Section II, also largely historical, takes up the tale in 1953, November, when the Government appointed a commission of inquiry in regard to the provision of separate training facilities for non-Europeans at the universities. All too often this Section is punctuated by the phrase "heard unofficially."

The commission in its findings strongly recommended that the Faculty be left on its present basis within the University of Natal. However, the Government refused to accept the findings and appointed an interdepartmental committee to formulate an effective scheme for separate development. In March, 1956, the dean of the Faculty of Medicine first heard unofficially that the Cabinet had decided to transfer the control of the Faculty of Medicine away from Natal University to the University of South Africa. Vigorous efforts to secure an opportunity to present the complicated situation in the University of Natal at Durban, where the medical school existed, to the interdepartmental committee were unavailing. Towards the end of that year (November, 1956) the principal of the University, Dr. E. G. MALHERBE, heard, also unofficially, from the Secretary for Education of the Government's intention to place the Faculty under the control of the Department of Native Affairs, subsequently altered to Department of Education. But it was not until the end of January, 1957, that the first public information became available in the form of a reply by the Minister of Education to a question in Parliament.

Protests from Universities and Branches of Medical Association

Protests rapidly followed this announcement. On February 7 the Faculty and heads of departments of Natal University held an emergency meeting and passed a resolution of emphatic protest at the Government intention. On February 11 the students of the Faculty likewise protested. Two days later the Natal Coastal Branch of the Medical Association of South Africa added their protest, and pointed out that the Branch would find it impossible to co-operate

*See *British Medical Journal*, March 16, p. 655.

in any way with any authority other than the University of Natal in the staffing of the Medical School.

A day or so later the Cape Western Branch of the Medical Association of South Africa passed a resolution of support for its colleagues of the Coastal Branch. Convocation of Natal University added its voice of censure on the Government's intended action; so did the senior members of the University's academic staff, and within a day or so the 10 full-time professors in the Faculty of Medicine of Capetown University added their support. But at the end of February the Minister of Education told a parliamentary correspondent in Capetown that he did not think the Government could change its attitude.

Press comment and many letters relating to the negotiations are given in a fourth section of the Report in the form of 12 appendices. These give detail and add considerable edge to the protests.

Dean's Verdict

Section III, and it is the smallest section, is headed, "Comment on the Government's Intended Action," and as it bears no name or other indication of origin it must be assumed to be the considered opinion of the compiler of the Report, Professor Gordon. It states: "A feeling of frustration and of being regarded as political agitators has become common among responsible South Africans who have found themselves in disagreement with the Government. This sense of frustration is a tragic consequence of recent developments in the country which indicate that decisions are made without consultation and despite objectively defined arguments against the carrying out of predetermined policies. . . . The excision of our Faculty from the other more established Faculties of the University will have the effect of changing what is now a broadly based medical education to a narrowly defined and predominantly technical training. Thus a school which has been initiated and developed in accordance with modern educational trends in Medicine will at one stroke be profoundly modified. . . .

"It should be clearly understood that the University of South Africa, as presently constituted, acts only by providing extramural education for those in the country who wish to advance themselves by part-time studies through correspondence courses. . . . Consequently the functions being delegated to the University of South Africa by the Government subverts the full academic role which universities now have in South African medical education. . . . Apart from these considerations, it will be readily recognized that it is not possible to train good doctors unless the academic staff are able to work in an appropriate 'milieu.' The only 'milieu' possible in this country is that of a University which has effective and accessible inter-Faculty and inter-Departmental contacts. By separating a Faculty of Medicine from other University Faculties and by leaving its staff in isolation, there must inevitably be a fall in academic standards. No formula constituting a single Faculty as a University or constituent college of a University can hide this fact. . . .

"Apart from the interference with freedom of University action, this exclusion of European students from the Faculty of Medicine has important implications for the growth of Medicine in Africa. The European constitutes a minority of the people of South Africa, and an even smaller minority in Southern Africa. Medical services will increasingly be developed among the millions of Africans in this subcontinent, as well as among minority groups such as the Indian and coloured peoples. European doctors constitute the majority of those at present providing these services. Denying them the right to be admitted to a Faculty of Medicine, such as that at Durban, can only deprive them of an experience which would assist them in their future practices."

And the comments end with the observation: "Those concerned with initiating and developing the educational experience provided are deeply conscious of the wrong being done to their students. . . . It is clear that the future of Medicine in Africa will be determined by Faculties of Medicine in countries other than South Africa."

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Immunological Tolerance

SIR,—In your interesting leading article on immunological tolerance (*Journal*, March 9, p. 570) you quote Professor P.B. Medawar's view that transplantation immunity and red-cell immunity could hardly be more unlike. While Medawar's views naturally command respect, I should like to point out that in this context they are not universally accepted. It is only fair to point out that Medawar made it clear that he was contrasting the orthotopic skin graft with red-cell immunity. This is important, since not all tissues evoke the same type of homograft response.

Medawar based some of his arguments on the following grounds: (1) The antigens are different. Red-cell antigens are cytoplasmic, while those concerned with skin grafting are nuclear. The last statement is based on experiments by Medawar and his colleagues on cells subject to ultrasonic disintegration. In this case only the nuclear fraction was found to induce immunity to subsequent skin grafts. The interpretation of this result is not yet clear. For example, we do not yet know how far these nuclear preparations have been freed from other cell constituents. Further, it is very likely that several chemically distinct iso-antigens differentiate the skins of different individuals. (2) If free serum antibodies are essential in homograft reactions they are not gamma globulins. This statement rests entirely upon the observation that skin homografts will regress in foetal sheep at a time prior to the formation of gamma globulin. This might have some weight if the foetal sheep had been critically examined for their ability to form antibodies, particularly iso-antibodies. It has been argued that the skin homograft reaction is like tuberculin sensitivity, free antibodies being unnecessary. It is indeed likely that sensitivity of the delayed type is important in homograft reactions, but it is probably insufficient, at least in man. Patients with agammaglobulinaemia can neither form antibodies nor destroy skin homografts. They can develop sensitivity of the delayed type. In my opinion this makes it seem very probable that circulating antibodies do play a vital role in the destruction of skin homografts in man. The alternative is to invoke some unspecified secondary effect of the lack of gamma globulin. (3) The homograft reaction has not been reproduced *in vitro*. Nor has haemolytic disease of the newborn. (4) The immunity produced by a living tissue homograft is semi-permanent, while that produced by a single injection of foreign red cells is not. We have clinical evidence that "immunity" developed against a single transfusion of Rh-positive cells may last for over 20 years.

Red-cell immunity is not a simple entity even within a single species, the reactions to incompatible cells varying with the antigenic systems involved. Transplantation immunity probably embraces an even wider diversity of response. Those engaged in its study will be very unwise to neglect possible processes common to many types of iso-immune reactions.—I am, etc.,

London, S.E.1.

P. A. GORER.

Intramedullary Nailing

SIR,—Mr. E. N. Wardle (*Journal*, March 2, p. 520) is naturally at liberty to criticize any method of treating a fractured femur with which he does not agree, but he is a little unfair to the operation of intramedullary nailing in inferring that the four deaths in our series (*Journal*, January 26, p. 208) were due to the operation. If he consults the article again he will see that the four patients who died were over the age of 70 years, and three of them died four weeks or more after the operation, one from secondary carcinoma and the others from bronchopneumonia. The fourth death was from pulmonary embolus and could

possibly be attributed to the operation. We are unaware of the mortality rate in the aged for non-operative methods. Perhaps others can enlighten us.

We have not met the muscle-stripped type of fracture mentioned by Mr. Wardle, though eight of our cases were in the upper third of the femur, but our alleged "indiscriminate employment" and "lack of any sense of proportion" would doubtless guide us to insert a nail.

Since our article was written thirteen months ago we have treated a further twelve cases, and are still undeterred by Mr. Wardle's comments. In our view, the absence of cumbersome splints and traction apparatus, the early ambulation, the shorter stay in hospital, the good alignment and absence of shortening, and the good knee movements outweigh the disadvantages of an operation. And we can assure Mr. Wardle that the prettiness or otherwise of the radiological appearances has not been a factor in our enthusiasm for this method of treatment.—We are, etc.,

A. E. STEVENS.

J. P. TURNEY.

Redhill, Surrey.

Anaemia in Rheumatoid Arthritis

SIR,—Your leading article on the pathogenesis of anaemia in rheumatoid arthritis (*Journal*, March 2, p. 509) deals with a subject of great theoretical and practical interest. I want to add that recently we have been acquainted with the fact that salicylates not infrequently can cause gastro-intestinal bleeding, and we have seen that this has been followed by considerable anaemia.¹ Perhaps some of the confusing circumstances with some cases of anaemia in rheumatoid arthritis can be explained when this fact is taken into consideration.—I am, etc.,

Hillerød, Denmark.

TORBEN ANDERSEN.

REFERENCE

¹ Mellemgaard, L., *Ugeskr. Læg.*, in press.

Pathogenesis of Rheumatic Endocarditis

SIR,—After reading Dr. R. Lannigan's letter (*Journal*, March 2, p. 517) I still believe that the hypothesis of thrombus deposition and incorporation adequately explains the occurrence of clearly defined areas of homogeneous eosinophilic material in valves affected by rheumatic heart disease. In Aschoff nodes such clearly defined "clumps" are not found: when fibrin-staining material is present it is in small fragments or fibres, as in the reticular type described by Gross and Ehrlich.¹ As it happened, only the myocardial Aschoff nodes showed fragments of fibrin-staining material in my series; none of those present in valves did so. Furthermore, only an Aschoff node with a homogeneous, dense, clearly defined area of fibrinoid material would be comparable in appearance to the lesions found deep in valves.

In the literature I reviewed² there are two views about the nature of this eosinophilic material: (1) that it is always degenerated collagen; (2) that it is partly degenerated collagen and partly incorporated fibrin (or fibrin and platelets). I was driven to postulate that it was always thrombus by the difficulty of finding either in the literature or in my own observations any clear-cut criteria whereby one could distinguish incorporated partially organized thrombus from degenerated collagen. In fact the concept of fibrinoid necrosis of collagen seemed superfluous for the explanation of the origin of this type of lesion in valves. Small fragments or fibres of eosinophilic material, even if contiguous with collagen fibres, could be due to almost completely organized thrombus rather than fibrinoid necrosis of collagen, and there must be a stage in organization of thrombus when this appearance occurs.

The main reason for labelling a lesion "degenerative" is because it appears to be very deep in the valve. In recently affected valves no lesion can be very deep, because the valve cusp itself is so thin. In older, thicker valves single sections may give a very erroneous idea of the depths of a lesion, owing to the puckering and pocket formation that occur in these valves. Isolated lesions that appear at

first to be deep in a valve may actually turn out to be formed in the apex of such a pocket. I do believe that a further study of serial sections should be carried out with a view to seeing whether eosinophilic "clumps" genuinely occur deep in the valve at levels equidistant from endothelia on the two surfaces of the valve cusp, and well away from the apex of any pockets or fissures there might be.

As Dr. Lannigan states (quoting Talalajew),³ mucoid material (which shows metachromasia with toluidine blue) has been held to be a pre-fibrinoid change. Nevertheless, it does occur in organizing thrombi, it does occur in relation to organizing vegetation; therefore a proportion of that found in valves must arise from this latter source. Certainly its occurrence cannot *per se* be accepted as evidence of a pre-fibrinoid change, especially as an almost completely organized vegetation will give appearances mimicking fibrinoid degeneration.

I agree that repeated attacks of subclinical rheumatism contribute to valvular deformities. The problem, really, is whether subclinical rheumatism acts by leading to thrombus deposition or by fibroblastic proliferation with or without preceding oedema—or by both mechanisms. The difficulty of accepting oedema of the valve cusp as a factor in the early acute stages of the disease is that one would expect such a cusp to rupture, or become frayed.—I am, etc.,

Newcastle upon Tyne, 4.

P. S. TWEEDY.

REFERENCES

- Gross, L., and Ehrlich, J. C., *Amer. J. Path.*, 1934, 10, 467.
- Tweedy, P. S., *Brit. Heart J.*, 1956, 18, 173.
- Talalajew, W. T., *Klin. Wschr.*, 1929, 8, 124.

Rapid Serum Cholesterol Estimation

SIR,—The investigation of serum cholesterol levels in coronary-artery and associated diseases is now a fairly well established procedure. The following technique (which uses reagents commonly found in a clinical laboratory and takes approximately five minutes to perform) may be of value as a screening test. It is adapted from the method of Sols.¹

To 0.2 ml. haemolysis-free serum in a centrifuge tube is added 5 ml. acetic anhydride and the contents well mixed. The tube is stoppered with a cork pierced by a short length of narrow-bore glass tubing and placed in boiling water for exactly three minutes. After immediate cooling the tube is centrifuged one minute and the contents decanted into a similar tube. 0.15 ml. concentrated sulphuric acid is then added with vigorous shaking so that the temperature rises. After about 30 seconds the colour is read in the usual manner with a red filter in a photo-electric colorimeter. For the standard, which keeps a month, 19.3 mg. cholesterol and 8.8 ml. of water are added to 200 ml. acetic anhydride and the flask placed in boiling water for 20 minutes. Shake from time to time. Cool and make up to 250 ml. with anhydride. 5 ml. is treated with acid, as is the serum extract, but the tube should be left for 45 minutes at 20° C. before reading. The figure obtained corresponds to a serum cholesterol of 200 mg.%.

Standardization is, of course, only necessary at infrequent intervals dependent on reagent and colorimeter stability. Laboratories carrying out cholesterol determinations as a regular routine may find it more convenient to use the routine technique to standardize this screening test rather than prepare the standard as above.—I am, etc.,

Swansea.

E. B. LOVE.

REFERENCE

¹ Sols, R., *Rev. esp. Fitol.*, 1947, 3, 225.

Living with a Colostomy

SIR,—The leading article on care of patients who have colostomies (*Journal*, February 2, p. 274) is indeed timely, and can go a long way to alleviate the suffering of thousands of unfortunate individuals. The colostomy patient often finds that he is friendless, and, due to complaints from his fellow workers, frequently loses his job, particularly if he has not perfect control. This most affects executives and office workers, who are usually in close proximity to their fellows.

I find Clayton-Jones's advice on the home management of a colostomy¹ quite ideal for the patient. It gives him great confidence to know that he need not be ostracized, and from a practical point of view I have found this advice gives complete control of the colostomy in nearly all cases. Points of paramount importance are that a patient can take what is virtually a normal diet; the colostomy working is controlled and the faecal odours are absorbed; wash-outs are unnecessary and the patient ceases to be unwelcome in his home environment. Lastly, the taking of pure methyl cellulose, as advocated in the article, reduces the quantity of dressings to one-third, and this is a great saving on the cost of prescriptions.—I am, etc.,

Derby.

O. P. LLEWELLYN.

REFERENCE

- ¹ Clayton-Jones, E., *Med. Press*, 1956, 235, 551.

Toxic Effects of Methylpentynol

SIR,—Our article on the toxic effect of methylpentynol (*Journal*, December 22, 1956, p. 1467) was intended only in part to emphasize the undesirable features of the drug's effect. Although methylpentynol is prescribed both as a sedative and a hypnotic, Lasagna,¹ in a most stringent analysis, noted that its hypnotic effect (0.5 and 1.0 g. doses) was indistinguishable from placebo. An acceptable maximum sedative dose is 2.0 g. per diem, and 0.1–1.5 g. has been given daily by mouth for six months without ill effect.²

Our series was presumably composed of persons most susceptible to the action of central nervous system depressants, and as such represents one extreme of individual and biological variability. Consequently it would be fair to suppose that a reasonable proportion of subjects would exhibit no adverse features on a maximum dose level. As drug response increases in approximately arithmetical progression for a corresponding geometric progression in dose,³ those individuals manifesting sensitivity to the drug might have remained "symptom free" on dose levels of 0.25, 0.5, or 1.0 g. daily. This seems to be so, and there are data to substantiate it.⁴

In answer to criticism of our use of the serial sevens, we would reply that it is merely one aspect of a more comprehensive appraisal of the mental status. One bat does not make a belfry, and it would be equally presumptuous to suppose that the serial sevens test isolated from its context is anything more than meaningless. Finally, our results were not presented as a denigration of the drug. Methylpentynol has few serious effects. It is habit-forming in certain persons,⁵ but then, almost certainly, so would have been alternative drugs; only one case of exfoliative dermatitis has been reported in the world literature during four years⁶; and there is very meagre evidence to incriminate it as a potential hepatic toxin.⁷—We are, etc.,

EDWARD MARLEY.

JOHN S. W. CHAMBERS.

REFERENCES

- ¹ Lasagna, L., *J. Pharmacol.*, 1954, 111, 9.
² Chevalley, J., Heminway, N., Meyer, G., Frankhauser, R., and McGavack, T. H., *N.Y. St. J. Med.*, 1952, 52, 572.
³ Emmens, C. W., *Principles of Biological Assay*, 1948, p. 49. London.
⁴ Barholomew, A. A., and Marley, E., 1957, unpublished data.
⁵ May, P. R. A., and Ebaugh, F. G., *Amer. J. Psychiat.*, 1953, 109, 881.
⁶ DeLamater, J. N., *Calif. Med.*, 1952, 77, 339.
⁷ Schaffarzik, R. W., and Brown, B. J., *Science*, 1952, 116, 663.

Type Distribution of Coxsackie Viruses in Japan

SIR,—After the discovery of the immunological multiplicity of Coxsackie viruses¹ many papers appeared on the identification and classification of antigenic types of Coxsackie viruses isolated in many areas of the world.^{2–10} Here I present the results of typing of 157 Coxsackie viruses isolated in Tokyo for the past six years. The serological identification was carried out by means of neutralization

reaction in suckling mice, using 16 representative types kindly supplied by Dr. Gilbert Dalldorf, New York. Of 157 strains, 6 were isolated in 1951, 2 in 1952, 3 in 1953, 23 in 1954, 109 in 1955, and 14 in 1956. As the result of typing, 1 strain falls in A1, 38 in A2, 43 in A4, 35 in A5, 24 in A6, 3 in A8, 12 in A10, and 1 in B1 types of Dalldorf's classification.¹¹ An A1 virus was isolated from the patients suffering from mild febrile disease occurring in the summer of 1951 (51 cases were observed),¹⁰ and a B1 virus was isolated from an epidemic myalgia (Bornholm disease) patient in 1952 (32 cases were studied).¹² Of 109 strains isolated in 1955, 80 were isolated from herpangina patients, and the remaining 29 were from contacts with or without grip-like symptoms; 12 of 13 strains were also recovered from herpangina patients in 1956; 82 viruses isolated from herpangina patients belonged to A2 (28 strains), A4 (18 strains), A5 (29 strains), A6 (14 strains), and A10 (3 strains). Thus group A Coxsackie viruses isolated in Japan from herpangina patients were limited immunologically to only 5 of 19 types of A viruses. This finding is consistent with that of other countries, which showed that the viruses from herpangina were divided into 7 types—i.e., A2, A3, A4, A5, A6, A8, and A10.^{13–15} It is problematic whether other types than the 7 types mentioned above are able to cause herpangina in children or not. In my opinion, every type of group A Coxsackie virus can induce herpangina. With respect to the frequency of isolation, A4 was the most widely distributed type in Japan in 1951–6. In Sweden also, A4 virus is isolated most frequently.⁵ It seems to be true that type distribution of Coxsackie viruses does not differ in Japan from other areas in the world.—I am, etc.,

Tokyo, Japan.

TSUYOSHI YOKOTA.

REFERENCES

- ¹ Sickles, G. M., and Dalldorf, G., *Proc. Soc. exp. Biol. (N.Y.)*, 1949, 72, 30.
² Dalldorf, G., International Poliomyelitis Conference, at Second International Poliomyelitis Conference, Copenhagen, September 3–7, 1951.
³ Contreras, G., Barnett, V. H., and Melnick, J. L., *J. Immunol.*, 1952, 69, 395.
⁴ Beeman, E. A., Huebner, R. J., and Cole, R. M., *Amer. J. Hyg.*, 1952, 55, 83.
⁵ Johnson, T., *A Virological and Clinical Study of Infections with Coxsackie Virus*, 1955, Uppsala.
⁶ Rhodes, A. J., Clark, E. M., Knowles, D. S., and Shimada, F. T., *Canad. J. publ. Hlth.*, 1952, 43, 36.
⁷ Vivell, O., *Arch. ges. Virusforsch.*, 1955, 6, 329.
⁸ ———, *Dtsch. med. Wschr.*, 1955, 81, 405.
⁹ ———, and Schairer, J., *Arch. ges. Virusforsch.*, 1953, 5, 84.
¹⁰ Fukumi, H., and Yokota, T., *Jap. J. med. Sci.*, 1953, 6, 201.
¹¹ Yokota, T., *Virus*, 1956, 6, 461.
¹² ———, *ibid.*, 1955, 5, 19.
¹³ Huebner, R. J., Cole, R. M., Beeman, E. A., Bell, J. A., and Peers, J. H., *J. Amer. med. Ass.*, 1951, 145, 628.
¹⁴ David, J. K., Leavitt, D., and Howitt, B. F., *Pediatrics*, 1951, 8, 672.
¹⁵ Parrott, R. H., Ross, S., Burke, F. G., and Rice, E. C., *New Engl. J. Med.*, 1951, 245, 275.
¹⁶ Johnson, T., and Lindahl, J., *Arch. ges. Virusforsch.*, 1953, 5, 96.
¹⁷ Kravitz, L. P., Hummel, K., Siegel, M. M., and Lecks, H. L., *Pediatrics*, 1953, 11, 113.
¹⁸ Melnick, J. L., Walton, M., and Meyers, I. L., *Publ. Hlth Rep.*, 1953, 68, 1178.

Underfeeding of Babies

SIR,—A mother brought her 3-month-old baby to my out-patients recently because he was perpetually crying. The details she gave me about the quantity of dried milk he was receiving made me suspect that he was underfed, but the mother vigorously denied this and claimed, rightly as it turned out, that his inguinal hernia was the real cause. Apparently she had had breast-feeding troubles earlier and had been an in-patient with her baby at a well-known paediatric centre. There she had been strongly reprimanded by the sister for giving the baby too much milk, and this had made her decide not to tell the truth next time she was asked about feeding details. She confessed all this to me and admitted that in fact the baby was taking twice as much milk as she had led me to believe.

I thought it worth while recording this in case there are still some doctors who try to prevent mothers from giving young babies as much milk as they want, and to remind paediatricians that ward sisters sometimes give advice which would not meet with our approval.—I am, etc.,

Stock, Essex.

IAN G. WICKES.

Test for Handedness

SIR,—It is sometimes useful to determine whether a person is naturally right- or left-handed, and the following simple test, noted many years ago in a book on shooting, seems a little known. The person points with a finger, quickly, at a suitable slim object, and then at once, without any change of position, closes one eye to see if the finger is "on" and then opens it and closes the other. One eye wins at this test repeatedly and that is the dominant eye. Useful if shooting, the test can be useful in medicine if, as seems to be the case, dominant eye goes with dominant hand.—I am, etc.,

Manchester, 13.

M. Q. BIRKBECK.

Tibial Traction

SIR,—In further reply to Dr. Winifred L. Turner's letter (*Journal*, February 9, p. 344) deprecating tibial traction and advising femoral traction in fractures of the shaft of the femur, an opportunity arises to correct a very widely held misapprehension which Dr. Turner exemplifies.

The object of traction is twofold: to maintain alignment of the femoral fragments, when either femoral or tibial traction would serve, and, secondly, to overcome the shortening produced by the pull of the muscles spanning the fracture. All these muscles, with the exception of the lower fibres of adductor magnus, and a few fibres of adductor longus (Fig. 1),

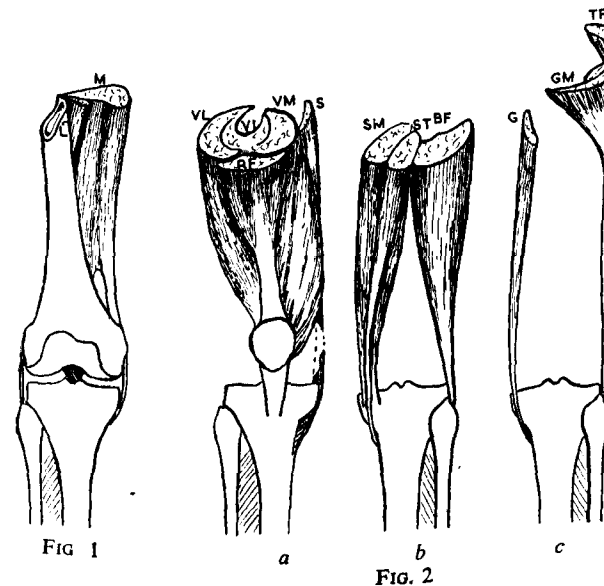


FIG. 1.—Anterior view of right knee and fracture, showing only muscles whose pull must be overcome by tibial traction acting through the ligaments. FIG. 2.—Anterior (a) and posterior (b) views of right knee showing muscles whose insertions are pulled on directly by tibial traction. Split up into three views for the sake of clarity.

are inserted below the knee-joint. Tibial traction, therefore, pulls on these muscles direct, and the strain transmitted through the ligaments of the knee-joint is extremely slight, merely drawing the flail-like lower fragment of the femur into alignment with virtually no resistance.

Femoral traction, to achieve the same effect, can only work by thrusting the loose lower femoral fragment down on to the tibia, whence the force can be transmitted to the insertions of the quadriceps, semimembranosus, semitendinosus, gracilis, sartorius, biceps femoris, much of gluteus maximus, and tensor fascia lata (Fig. 2a, b, and c). The diagrams demonstrate that no lower fragment or ligaments are needed at all to pull on any of these muscles with tibial traction. Similar considerations apply in the leg, where no muscle is inserted into the lower three-quarters of the tibia or into the talus.

If we want to rest a joint we apply traction to it, and this has been proved beneficial in tens of thousands of cases

of arthritis of every kind. Joint cartilage, on the other hand, atrophies under continuous compression, and this is inevitable with femoral skeletal traction.

As Mr. Richard Harrison (*Journal*, March 2, p. 523) indicates, the causes of stiff-knee after femoral shaft fractures are largely inherent in the fracture, but their incidence is reduced if thigh muscle exercises are instituted from the first, and, perhaps most important of all, if it is recognized that there may be a time factor, which is as yet undetermined but probably lies for adults in the vicinity of 12 to 14 weeks, beyond which maintenance of immobilization of the knee-joint may be followed by irreversible stiffness. Femoral traction, however, will ensure knee stiffness within a very much shorter time. The diagrams are based on illustrations from *Buchanan's Manual of Anatomy*.¹—I am, etc.,

Canterbury.

F. G. ST. CLAIR STRANGE.

REFERENCE

- ¹ *Buchanan's Manual of Anatomy*, 1925, edited by E. Barclay-Smith et al., 5th ed. Baillière, Tindall and Cox, London.

Intelligence and Cleft Palate

SIR,—In your leading article (*Journal*, February 23, p. 454) you discuss the relation between cleft palate and lowered intelligence as found recently by Illingworth and Birch.¹ The *Proceedings of the Royal Society of Medicine* record a paper read on December 9, 1930.² This began from the other side and examined the occurrence of developmental anomalies of all kinds in a large number of mental defectives. The field of study was the whole of the records of 2,464 idiots and imbeciles admitted to the Fountain Hospital between 1912 and 1930 and actual examination of a further 564 patients of those grades who were still present in 1930. In the earlier group 11 cleft palates were recorded, or 0.44%, and in the later group there were 3, or 0.53%. Tredgold³ quotes Langdon Down as finding 0.5% in aments and Ireland as finding 1.0% in idiots, whereas Grenzer reported only 0.06% in 14,466 "presumably normal" children. This compares with the 0.1% which Fogh-Andersen⁴ seems to have expected from normal children.

Without access to the detailed methods of these observers it is not easy to compare their conclusions. It seemed to me, 26 years ago, "that there are more physical anomalies in mental defectives than in the mentally normal," but that "the difference between the two is probably less marked than we have been given to believe."⁵—I am, etc.,

Lewes, Sussex.

NOEL H. M. BURKE.

REFERENCES

- ¹ Illingworth, R. S., and Birch, L. B., *Arch. Dis. Childh.*, 1956, 31, 300.
² Burke, N. H. M., *Proc. roy. Soc. Med.*, 1931, 24, 413.
³ Tredgold, A. F., *Mental Deficiency*, 1947, 7th ed., p. 124. London.
⁴ Fogh-Andersen, P., *Inheritance of Cleft Palate*, 1942. Copenhagen.

Psychiatry in Africa

SIR,—The *Journal* reaches me three weeks after publication, but I write to reply to Dr. A. Stewart Henderson's comment (*Journal*, February 2, p. 283) on Dr. A. Lambo's paper (*Journal*, December 15, 1956, p. 1388) in the hope that your columns remain open on this topic. Dr. Lambo's article was timely and informative, and answered some questions about the incidence of psychiatric illness which have interested psychiatrists everywhere. It has already received favourable comment in this country.¹

Dr. Henderson first appears not to understand a statement in which it is clear that Dr. Lambo quotes the native medicine-men as claiming greater success in the neuroses than in the psychoses. Having done so, Dr. Henderson is able to take offence at the thought that our "scientific disciplines" are "bettered by primitive magic in Africa." The remainder of Dr. Henderson's letter displays his concern that treatment by magic should be called "effective" and "scientifically sound." If this is so, he asks, what reasons have we to train Africans in psychiatry?

I think Dr. Henderson's real difficulty is with the word "magic," which seems to offend his scientific orientation. Yet is it not true that much of medicine has been based upon magical principles in the past, and do we not still

Are not the following facts acceptable: (1) that B.C.G. in a statistical sense, in some instances and in the early stages will reduce new infections to a benign state (whether first or reinfections); (2) that B.C.G. will not prevent clinical infection in all instances or even approximately all instances; (3) that the thought that B.C.G. should not be given to those with positive tuberculin tests is generally accepted; (4) that both historic evidence and experimental evidence indicate that overdoses of tuberculin should not be given to reactors; (5) that mass inoculation does superimpose B.C.G. on some tuberculous persons; (6) that the consequences of such mishaps, if serious, would be charged to an acknowledged ineffectiveness of B.C.G. rather than made a true and proper responsibility of B.C.G.; (7) that it would take few such instances to offset the good accomplished, since we are really weighing a relatively small amount of good against relatively small risks; (8) that a missed diagnosis because of masked tuberculin response, an unnecessary risk because of the assumed virtues of B.C.G., or a withdrawn measure of safety because of the time, expense, or assurance with B.C.G. should properly be charged against the benefits of the use

We had not read the paper "Subacute Bacterial Endocarditis: Its Changed Aspects," by Drs. L. Biro and G. Gottsegen.² This omission has been rectified. The material described by the authors is certainly large: 1,012 patients alleged to have subacute bacterial endocarditis. Unfortunately the data presented in this paper are not comparable with those found in English and American literature for several reasons. The survey was based on questionnaires which had been sent out to Hungarian hospitals: "the

answers were based on no equally exhaustive case records, and not every institute answered each question." No mention is made of the organism isolated in patients with a positive blood culture. Positive blood cultures were obtained in only 13.7% of the patients, and there is no mention of the criteria on which a diagnosis of subacute bacterial endocarditis was made in the patients with a negative blood culture. 10% of the patients in the latter group had a normal temperature. During the period 1945-8 only 57%, during the period 1949-51 only 87%, of the patients received antibiotic therapy. Of the 627 patients who had penicillin, only 106 received 1 mega unit or more. 174 necropsies were performed, but in only 55% was evidence of subacute bacterial endocarditis found. The data are set out in a most unusual way. For instance, "Results of treatment in patients treated with antibiotics": 1945-8, number of cases 193, recovery 32 (17%), deaths 60 (31%); 1949-51, number of cases 513, recovery 150 (35%), deaths 124 (27%). What happened to the 52% and 38% in the two groups respectively is not disclosed (table IV). We assume that your correspondent is referring to his table V when he mentions "the more serious prognosis of abacteraemic subacute bacterial endocarditis." This table gives the "relationship of haemoculture results and prognosis": 1945-8 haemoculture positive: recovered 13 (33%), died 4 (10%), total 39 (100%); haemoculture negative: recovered 19 (13%), died 48 (33%), total 145 (100%). 1949-51 haemoculture positive: recovered 25 (48%), died 17 (33%), total 52 (100%); haemoculture negative: recovered 115 (31%), died 86 (23%), total 374 (100%). The total figures analysed in this and the previous table quoted represent only a fraction of the total number of cases (1,012) included, and there is no record of the fate of the patients who have apparently been included in the table but neither died nor recovered. It will perhaps be evident, from the examples quoted, why we find ourselves unable to compare Dr. Gottsegen's data with those obtained by us and other writers here and in America. We pointed out in our paper that our figures are small and it would be dangerous to draw too many conclusions from the percentages of deaths and recurrence, even though our figures agree with those of other writers. Our findings regarding the dental state of patients with subacute bacterial endocarditis due to *Str. viridans*—namely, that they all had teeth—are, however, so definite that the possibility of this being due to pure chance is remote. We have found nothing in Dr. Gottsegen's paper which in our opinion invalidates our observations, particularly when it is doubtful whether the clinical and pathological criteria necessary for a diagnosis of subacute bacterial endocarditis are the same in this country and in Hungary.—We are, etc.,

F. G. HOBSON.

B. E. JUEL-JENSEN.

Oxford

REFERENCES

- 1 Bunn, P. A., and Cook, E. T., *Ann. intern. Med.*, 1954, 41, 487.
- 2 Biro, L., and Gottsegen, G., *Acta med. Hung.*, 1955, 7, 21.

Compound Aspirin and Steroid Tablets

SIR,—Your correspondent Mr. J. A. Braun (*Journal*, March 2, p. 523) has forgotten two important tests in his communication. In addition to the "cotton pellet" test and the "granuloma pouch" test I should like to submit the "national pocket" test and the "relative dangers" test in the appraisal of compound aspirin and steroid tablets. If, in fact, the results of the "cotton pellet" and "granuloma pouch" tests can be accepted it would appear that the anti-inflammatory effects of these tablets are simply additive and not synergistic (that word so beloved by the pharmaceutical advertiser). There can surely be no contradiction to the mixture of the ingredients of the compound aspirin and steroid tablet in the patient's stomach, and this would facilitate modification of the dosage to suit individual requirements. When the "national pocket" test is applied it will be seen that the country's economy will also benefit. The basic price of 100 aspirin tablets (5 gr.—0.3 g.) is 6d., that of 50 1-mg. prednisolone tablets 15s., and that of 100 compound aspirin and steroid tablets containing 5 gr. (0.3 g.)

of aspirin and 0.5 mg. of prednisolone is 22s. 7d., plus 6s. 9d. purchase tax—that is, 29s. 4d. From whatever viewpoint—except from that of the drug firms—the result of this test is obvious.

The application of the "relative dangers" test to prednisolone and aspirin makes the latter a sure winner. With aspirin there is no risk of hypertension, tuberculous flare-up, mental disorder, or masked pyogenic infection, to mention but a few of the disadvantages of steroid therapy, and gastric irritation leading to perforation or haematemesis must be extremely rare. It is assumed that the dangers associated with compound aspirin and prednisolone treatment will be less than when full doses of the steroid are used. On the other hand, the combined tablet can be expected to be used mainly in general practice, where the safeguards and routine checks advocated for patients on steroid therapy will inevitably be less rigid. In the end, because of the smaller doses of steroid used, we shall be lulled into a false sense of security and the dangers may be out of all proportion to the benefits anticipated.—I am, etc.,

Plymouth.

BERNARD J. PECK.

Prophylactic Value of Tetanus Antitoxin

SIR,—The article by Dr. Leon S. Kind (*Journal*, March 2, p. 498) once more brings up the larger question of the rationale of this form of therapy as practised in casualty departments. Usually any patient with a breach of continuity of the skin receives 1,500 units of tetanus antitoxin if an adult and 750 units if a child (unless they are known to be sensitive to it, to have asthma, or to have been actively immunized) as a routine, irrespective of the wound, with the object of preventing tetanus. My copy of Conybeare's *Textbook of Medicine* says on the subject of tetanus prophylaxis: "The value of antitetanic serum as a prophylactic measure is universally recognized. At least 3,000 units should be injected subcutaneously as early as possible after all wounds, particularly if these have occurred on a road or cultivated ground. Even a graze on the skin or small puncture wounds are potentially dangerous. Further injections should be given at weekly intervals until the wound is completely healed. Failure to give prophylactic serum can only be regarded as criminal negligence." Besides being mostly impractical, I suggest that in the light of modern knowledge this advice may be harmful.

Prophylactic A.T.S. is given, and may be justified, on the following grounds: (1) It combines with and neutralizes exotoxin from the established case of infection with *Clostridium tetani*. (2) A single dose delays the appearance of signs and symptoms, thus increasing the incubation period. This is beneficial, since it is known that the mortality is indirectly related to the length of the incubation period,² due to the time available for host resistance, in the full pathological sense, to be built up. (3) Forensically, combined with a patient's or doctor's request. (4) Traditionally. Abusive letters and returned patients to the casualty officer, who resists the easy way out, testify to this attitude.

Prophylactic A.T.S. when given may be harmful or useless on the following grounds: (1) A.T.S. is a horse protein which itself acts as an antigen when injected into humans, who react by producing antibodies, which are probably active in seven to ten days. Further antigens—that is, A.T.S.—may now be ineffective, when the toxin production of the clostridia in the tissues may be just getting under way.^{1,4} This condition is aggravated every time the patient receives A.T.S. prophylaxis. There is no doubt as to the efficacy of full therapeutic doses of antitoxin in the treatment of the disease in those who have not previously received A.T.S. (2) Sensitization to the horse serum of the A.T.S., a corollary of (1). I see at least one case a week with generalized urticaria from this cause, but not one case a year of tetanus. Deaths from anaphylaxis have occurred. (3) Doses as above are inadequate to have even the desired beneficial effect. 1,500 units of A.T.S. for children and 3,000 units for adults should be a minimum initial dose, which must be repeated in a week to protect adequately a person developing the disease, since the fall in blood antitoxin level is rapid in the unimmunized and the incubation period is prolonged for this time by the initial dose.^{5,6} Casualty departments give only single doses. (4) Most cases of tetanus come from trivial injuries or unrecognized

trauma which never find their way to a casualty department for treatment. We are not protecting those who are going to get the disease.

Other reasons, such as cost and delay in treatment (half an hour between test and immunizing doses, consent for minors where parents cannot be contacted, etc.) are valid in busy centres to a lesser extent.

Tetanus is not a common disease, and it has been suggested that this is because passive immunization with antitoxin, while not preventing infection, may suppress signs and symptoms, leading to a subclinical attack and active natural immunity. This is difficult to prove. On the other hand, for reasons above, the use of antiserum does not lower the incidence of tetanus in a community.² How prevalent must a disease be to justify measures taken against it on the scale of those taken against tetanus, in terms of cost, inconvenience to the patient, and possible dangers, assuming that the measures achieve what is claimed for them? Presumably gas gangrene is below that figure, yet *Cl. welchii* is as ubiquitous as *Cl. tetani*. Diphtheria antitoxin is not used in a comparable way for a comparable pathology. Should not all operative cases receive A.T.S. because of the danger of exogenous spores in catgut or powder, or endogenous reinfection from latent infection of bones? Why is it more criminally negligent of the doctor to "let" a patient die of tetanus than of diphtheria or poliomyelitis?

I suggest the following as a more rational procedure for antitetanus measures: (1) The active immunization with tetanus toxoid, along with pertussis vaccine and diphtheria toxoid, using a single dose triple antigen, of all babies possible. With appropriate booster doses this gives lasting immunity, covers the exceptional conditions of war, and obeys the first principle of medicine, prevention. (2) Use of tetanus toxoid as a booster or initial dose in the casualty department. This takes care of the delayed case, reactions are rare and mild, test doses are not required, and no serum is used in toxoid manufacture. (3) Abandoning indiscriminate routine use of tetanus antitoxin as an immunizing measure, and reserving its use for the treatment of suspected or established cases of the disease on clinical grounds. This would even apply to grossly contaminated wounds or compound fractures, thus keeping the best curative measure at its most potent for combating one of the few remaining infectious diseases with a distressingly high mortality.—I am, etc.,

London, N.14.

M. R. MADIGAN.

REFERENCES

- 1 Conybeare, J., *Textbook of Medicine*, 1947, 8th ed. E. and S. Livingstone, Edinburgh.
- 2 Johnson, D. W., *Med. J. Aust.*, 1956, 2, 710.
- 3 Last, P. M., and Nicholas, J., *ibid.*, 1956, 2, 373.
- 4 Littlewood, A. H. M., Mant, A. K., and Wright, G. Payling, *British Medical Journal*, 1954, 2, 444.
- 5 Bigler, J. A., and Werner, M., *J. Amer. med. Ass.*, 1941, 116, 2355.
- 6 Cooke, J. V., and Jones, F. G., *ibid.*, 1943, 121, 1201.

Crash Helmets

SIR,—To motor-cyclists suffering from head injuries I often pose the question: "Were you wearing a crash helmet?" Two recent replies have been brilliantly nonsensical: "No. You see, I only have a small motor-bike," and: "I remember deciding not to put it on, as it had stopped raining." I suppose a stupid question deserves a stupid answer. There may be even better to come, such as, "I only have a small brain," or, "I don't think they suit me." I shall continue to pop the question.—I am, etc.,

St. Andrews, Guernsey.

J. R. DICKSON.

The Silver Lining

SIR,—In 1954 Drs. T. H. Wilson and G. Wiseman, working in the department of physiology, University of Sheffield, introduced their technique for studying intestinal absorption by the use of sacs of everted small intestine. In doing so my colleagues had the temerity to turn an organ inside out in order to study its physiological function. In admiring their courage and ingenuity, I had also credited them with being pioneers in finding a biological use for the sac of everted mammalian intestine. The letter by Dr. Julian Huxley (*Journal*, March 9, p. 581) makes it clear that Drs. Wilson and Wiseman have not got this distinction, and were

in fact anticipated by more than 100 years. Furthermore, it would have to be admitted that the use described by Dr. Huxley can fairly be said to be a more penetrating investigation of the reliability of the everted intestinal sac. *Vixere fortes ante Agamemnona*.—I am, etc.,

Sheffield, 10.

D. H. SMYTH.

REFERENCE

- 1 Wilson, T. H., and Wiseman, G., *J. Physiol.*, 1954, 123, 116.

Senna and Morning Sickness

SIR,—In Professor A. S. Duncan's article (*Journal*, February 23, p. 439), in which he describes the value of "senokot" standardized senna as a laxative during pregnancy and in the puerperium, he mentions its use in morning sickness. For some time I have prescribed senokot to pregnant patients with constipation and have been interested to have been told that in many cases their morning sickness has disappeared. Recently I have given senokot to those with severe morning sickness and have the impression it is more effective than the usual drugs given. It would be interesting to hear of any actual series or similar cases. I should be grateful for any explanations of the mechanism of how senokot acts to help these patients.—I am, etc.,

Littlehampton.

ROBIN BEST.

Treatment of Acute Appendicitis

SIR,—I was much interested in the recent correspondence in your columns about acute appendicitis at sea. A good many years ago, while whaling in the Weddell Sea, we got news in the factory ship that a whaler was coming in with two whales and that a Norwegian seaman had been taken seriously ill with acute abdominal pain. The gunner thought this was due to acute appendicitis. His diagnosis was correct.

The seaman was a very big, well-built Norwegian. He had a pulse, I believe, of about 120. He had an ominously low temperature of 99° F. (37.2° C.) which I did not like. He was blue and cold, and very ill. There was a *B. coli* odour in his breath and he was exquisitely tender in the right iliac fossa, both on rectal examination and on palpation. I decided, rightly I think, that the only course here was immediate operation. I told the captain and the gunner manager that I saw nothing else for it, and so instruments were boiled up and the officers' mess prepared. The surgical equipment was adequate. I intended to operate under a spinal anaesthetic. The chief engineer and the chief steward were to assist. The scene was so like that depicted in *Doctor at Sea* that this might have been an identical case.

Myself and my two assistants had a very large tot of rum each, but the patient said he felt too ill to have some—he must have been ill, because he had a magnificent swallow. When the sheets were raised from the instruments and basins on another table, and before I could get the man into position for a spinal puncture, he took one look at the shining instruments and fled. Nothing on earth would beguile him out of the fo'c'sle, until a direct order from the captain landed him in the sick bay, which happened at the time to contain several skulls of sea leopards, etc. He was very ill indeed for some days, lost weight rapidly, and suffered from extreme toxæmia with a temperature swinging from normal to 103 and 104° F. (39.4 and 40° C.). A large abscess formed in the right iliac fossa and got bigger and bigger as sweats and physical deterioration increased. I told the captain that all I had to do was to put a knife in the swelling and insert a drain, and he would probably recover. The patient refused. One night I thought that he was dying, and in the early hours of the morning I was awakened by his feeble thumping on the bulkhead, and on going to him he asked for a bed-pan. He then evacuated an enormous quantity of the most foul-smelling pus per rectum—and proceeded to make an uninterrupted recovery. He ate enormously and actually rejoined the crew of the whale-catcher, only to be drowned the following year when his boat capsized in the pack ice.—I am, etc.,

Lanark.

JOSEPH BRYANT.

Obituary

J. G. HAMILTON, M.D.

Dr. J. G. Hamilton, the distinguished American medical scientist, died on February 14 in San Francisco, at the age of 48. He was professor of medical physics, experimental medicine, and radiology at the University of California, and was one of the first to study the use of radio-isotopes in man.

Joseph Gilbert Hamilton was born in Waverley, Mass. Educated at the University of California, he first graduated in science and then went on to study medicine, proceeding to the degree of M.D. in 1936. Until 1942 he worked as instructor in neurology and medicine in the medical school of the University of California at San Francisco. At the same time he was carrying out research in physics at the radiation laboratory at Berkeley, where he became professor of medical physics in 1950. This appointment was combined with the chair of experimental medicine and radiology at the medical school. Among his many public appointments he served as chairman of the radiological study section of the National Institute of Health and of the National Research Council's committee on radiology. He was a consultant to the U.S. Atomic Energy Commission, and during the war he directed part of the biological research undertaken in connexion with the Manhattan Project.

As a doctor with a training in physics, Hamilton was quick to grasp the value of artificial radio-isotopes in the study of biological problems. Within a few years of E. O. Lawrence's invention of the cyclotron at Berkeley, he had studied the metabolism of many radioactive elements in animals and humans. In 1938 he gave the radioactive elements, sodium, potassium, chlorine, bromine, and iodine, to normal humans by mouth, and followed their absorption from the intestine by measuring the rate of appearance of radioactivity in the hand. In his report of his results he pointed out that the rate of absorption of a radioactive element would give a measure of the rate of absorption of the naturally occurring stable isotope. In the following year, with Dr. Mayo H. Soley, he applied this principle to the study of the uptake of iodine by the human thyroid, and he also compared the uptake of a test dose of radio-iodine in thyrotoxic patients and normal people. This is the earliest report of the use of a radio-isotope as a diagnostic test.

In 1940, Hamilton, Soley, and Eichorn, making use of Hamilton's earlier observation that radio-iodine is selectively concentrated in the thyroid, gave radio-iodine to patients before an operation for removal of the thyroid. Autoradiographs were then made from thin sections of the thyroid. By this method they were able to localize the areas in which the radio-iodine was concentrated in pathological thyroid glands. Other workers had already used autoradiography for studying the deposition of radium in human bone, but Hamilton's work on the thyroid gland was probably the first attempt to use this technique for localizing an artificial radio-isotope in humans.

Hamilton's other important contribution to this field of study was his demonstration that the selective concentration of radio-iodine within the thyroid could be used to destroy the thyroid by irradiation without damaging

other tissues. With J. H. Lawrence he applied this discovery to the treatment of patients suffering from Graves's disease, and in 1942 they reported that they had successfully treated three patients with radio-iodine.

Hamilton continued his researches until shortly before his death. After he had developed leukaemia, from which he died, he visited this country to lecture on his work on the metabolism of astatine, a radioactive halogen. Although his work was confined to physiology and clinical medicine—he took no part in the application of radio-isotopes to biochemistry—he helped to establish many of the principles that have since become commonplace in the applications of nuclear physics to these branches of biological science. In this he was a pioneer.

A. A. GUILD, M.D., M.R.C.P.

Dr. A. A. Guild, consultant physician and physician superintendent of Lambeth Hospital, died at St. Thomas's Hospital on March 9. He was 40 years of age.

Alexander Alan Guild was born on May 22, 1916, and was educated at Edinburgh Academy and at Gonville and Caius College, Cambridge, returning to Edinburgh for his clinical training. At Cambridge he gained first-class honours in the Natural Sciences Tripos and was a college prizeman, and at Edinburgh he was medallist in pharmacology and therapeutics and in public health and obtained a Murchison scholarship in clinical medicine in 1941, the year in which he graduated M.B., Ch.B. Having completed a resident appointment at the Edinburgh Royal Infirmary, he joined the R.A.M.C., serving with the 159th Field Ambulance, first as medical officer and later as company commander, from 1942 to 1945. He was with the 78th and 4th Divisions in North Africa, Sicily, Italy, Palestine, and Greece. Appointed A.D.M.S. Land Forces (Greece) in December, 1945, he became deputy to the D.D.M.S. (Greece) in 1946, being demobilized in the latter year with the rank of lieutenant-colonel.

After the war Dr. Guild took the M.R.C.P.Ed. in 1947 and in the following year was admitted to the London M.R.C.P. In 1948 he was appointed clinical tutor to the university medical unit of the Western General Hospital, Edinburgh, under Professor L. S. P. (now Sir Stanley) Davidson, and medical registrar to Dr. W. I. Card. He was appointed senior registrar in 1949. Two years later he was appointed consultant physician and physician superintendent of Lambeth Hospital, where he remained until his death. He was joint author of the section on diseases of the nervous system in Davidson's *Principles and Practice of Medicine* (1952). He proceeded to the M.D. in 1953.

A colleague writes: Guild devoted his life to the art of medicine and took infinite pains in the treatment of the patients under his care. A man of wide culture, he was keenly interested in art, music, and architecture; he also maintained his connexion with the Territorial Army. He was a capable administrator and a loyal colleague. It is tragic that he died at such an early age, and he will be sadly missed at Lambeth Hospital. He leaves a widow and two young children, to whom we all extend our deepest sympathy.

J. F. MAHONEY, M.D.

Dr. J. F. Mahoney, who until recently was health commissioner of New York and formerly director of the venereal disease research laboratory at the U.S. Marine Hospital, Staten Island, died in New York on February 23. He was 67 years of age. He will be remembered as one of the pioneers of the penicillin

treatment of syphilis. John Friend Mahoney graduated in medicine at Marquette University, Milwaukee, in 1914. In that year he joined the U.S. Public Health Service, and in due course he became director of the venereal disease research laboratory at the U.S. Marine Hospital, Staten Island. He was also lecturer in dermatology at Columbia University, New York, and assistant professor of clinical syphilology and dermatology. It was in 1943 that he published a preliminary report with R. C. Arnold and A. Harris on the effect of penicillin in the treatment of syphilis. As a result of this successful clinical research he received many honours, including the honorary life membership (Wellcome prize) of the American Social Hygiene Association, and, in 1946, the Lasker Award of the American Public Health Service. At the time of his death Dr. Mahoney was director of the Bureau of Laboratories in New York City's Department of Health.

H. S. STANNUS, C.B.E., M.D., Ph.D., F.R.C.P. D.T.M.&H.

The obituary of Dr. H. S. Stannus was printed in the *Journal* of March 9 (p. 589).

Dr. J. B. DAVEY writes from Pietermaritzburg, Natal: By the passing of Hugh Stannus the profession has lost a man of outstanding ability and great charm. I came to know him in 1904 when home on leave from the British Central Africa Protectorate (later Nyasaland) and Stannus was considering an offer of appointment in that country. He had already held a number of house appointments at his old hospital, St. Thomas's, at the Bethlem Royal Hospital, and, for two years, at the Hertford Hospital in Paris. Into his fourteen years' service in Nyasaland he packed an immense amount of original work, both medical and anthropological, in addition to setting a very high standard in the execution of his official duties. Of a most inquiring mind and possessed of keen powers of observation, he recorded original investigations into such varied subjects as dietary deficiencies, congenital defects, yaws, leprosy, and trypanosomiasis, the customs, ceremonies, and industries of the African population, the diseases of domestic animals, and entomology. In 1911 he took the London M.D. and was awarded the university gold medal for a thesis in which some of these investigations were recorded. There is no doubt that he would have reached the highest positions in the Colonial Medical Service had not ill-health compelled retirement in 1919. After taking up medical work in London he continued to show an active interest in tropical medicine and contributed many papers on the subject to medical societies and journals. When his long service as medical adviser to the Board of Inland Revenue was recognized by a C.B.E. last year the award gave great pleasure to his numerous friends. In his younger days he possessed powers of physical endurance of a high order. He was a strong swimmer and walker, a keen big-game hunter, a vigorous hockey player, and an accomplished dancer. His interests were manifold, and anything he took up he pursued with great zest. He introduced the first motor-cycle to Nyasaland, and, later, was an enthusiastic motorist in England and on the Continent. Always full of new ideas, he was a most stimulating companion. On many questions he held strong views and was apt to express them with some pungency, and of slovenly work he was strongly critical. To those privileged to be admitted to his circle he was a most loyal friend and generous to a fault, and by them he will be sorely missed.

Dr. E. C. ASPINALL died in Birmingham on January 20 after a short illness. He was in his 63rd year. Eric Charles Aspinall was born at Wigan on February 20, 1894. After serving in the R.A.M.C. in the British Expeditionary Force

in the first world war he took up medicine, graduated M.B., Ch.B. at Birmingham University in 1924, and then acted as house-physician to the late Sir Leonard Parsons. In 1925 he joined the late Dr. W. B. Featherstone in Erdington as partner in a general medical practice and continued actively as senior partner in the same practice until 10 days before his death. He was medical officer to the Josiah Mason Orphanage, and he succeeded his senior partner as medical officer to Oscott College. At the time of his death the college had been served by the same practice for 67 years.

E. B. writes: Eric Aspinall was a family doctor of the best type. He was a bachelor, and his work was his hobby, but he interpreted his work in a very broad sense, and was a wise counsellor to his patients in their daily problems. To his close friends, of whom he had many, the memory of his funeral, through the lined streets of Erdington to the packed and overflowing parish church, will always linger as an inspiration.

Dr. E. B. SUNDERLAND died at his home at Haverhill, Suffolk, on January 29 at the age of 67. Edward Benjamin Sunderland, who was born on December 7, 1889, came of a Lincolnshire family. In 1914 he qualified M.R.C.S., L.R.C.P. from University College Hospital, where he later held the resident appointments of house-physician and obstetric house-surgeon. Soon afterwards he joined the R.A.M.C. and saw active service in the Gallipoli campaign. After the first world war he settled in practice, first in King's Lynn and later in Haverhill, where he remained for thirty years. He built up a good practice in Haverhill. His patients liked and respected him, and his clinical judgment was always sound. He was a man of few words and did not suffer fools gladly, but he was nevertheless most sympathetic where sympathy was required. He had many outside interests, including tennis, shooting, and fishing. He was well known in sporting circles for his achievements at the spaniel field trial championships, and he was a first-class shot. The sympathy of his many friends will go out to his widow.

Dr. W. DE W. WISHART died at Georgetown, British Guiana, on February 18 at the age of 84. After winning the British Guiana Scholarship in 1890 William de Wever Wishart became a medical student at Edinburgh University, where he graduated M.B., C.M., with first-class honours, in 1895. After graduation he held the appointment of house-physician at the Victoria Hospital for Consumption, Edinburgh. He took the D.P.H. of the Irish Royal Colleges in 1910. He was appointed the first medical officer of health for the city of Georgetown, and retired a few years ago. A member of the British Medical Association for over 60 years, he was a past president of the British Guiana Branch and had served on its council. He was appointed M.B.E. in the 1946 New Year Honours.

Dr. F. G. FRANCE, who was in general practice at Bromley, Kent, for some 30 years, died at his home there on February 22 at the age of 58. Francis George France was born at Ludlow on November 29, 1898, and was educated at Ludlow Grammar School and Bromsgrove School. During the first world war he joined the Welch Regiment and served in France, where in 1918, at the age of 19, he received severe shrapnel wounds in the chest which produced an arteriovenous fistula that was to prove a severe handicap for the rest of his life. As soon as he had recovered from his wounds he entered St. Bartholomew's Hospital as a medical student and qualified from there in 1924 by taking the London Conjoint diploma. He then became house-physician at Brompton Hospital, and while there obtained the London degrees of M.B., B.S. He was later resident medical officer at the Leicester Royal Infirmary. He entered general practice at Bromley in 1926, working first as a partner, and then as the successor, of Dr. D. R. McArthur in one of the two oldest-established practices in the area. He became an honorary physician at Bromley Hospital, and served there for many years, both before and during the

second world war. He relinquished this position on the re-organization of the hospital consultant staff to include visiting consultants from London, which took place shortly before the commencement of the National Health Service. On his retirement from the hospital he was given the title of emeritus physician of Bromley Hospital. In spite of the severe handicap of the disability resulting from his wounds, he was an active general practitioner caring for a widely scattered practice, and much beloved by his patients and his friends. A fine classical scholar, he continued throughout his life in practice to obtain enjoyment from his reading of the classics and of English and French literature. He was a founder member of the Bromley Chess Club and later its president, and he played chess for his county. He leaves a widow, two daughters, and a son. His elder daughter and his son have followed him in a medical career, both of them training at his own hospital, St. Bartholomew's.

P. S. writes: May I, who knew Dr. France during his last seven years, say how greatly he was admired by his friends and patients? Despite increasing disability he was a supremely happy man. He was the ideal family doctor, well informed technically, but above all liked, respected, and consulted as a man as well as a doctor. He devoted most of his leisure to books and read well and widely, being especially a student of Marcel Proust. He had travelled a great deal in France and the Mediterranean, which he loved. He was a superb host, and the combination of his warm personality, cultured conversation, and wide general knowledge made one feel a unique sense of civilization when at his table.

Dr. H. J. DEAN, formerly medical officer of health for the Willenhall and Short Heath urban district councils, died on February 23 at Reading, where he had been living in retirement for nearly a quarter of a century. He was 84 years of age. Henry James Dean was born on February 27, 1872, and received his medical education at the London Hospital, qualifying L.S.A. in 1893. Some three years later he entered general practice at Middleton, Lancashire, and while there obtained the diploma of L.R.C.P.I. in 1900. He moved to Willenhall, Staffordshire, in 1902, and was in partnership with the late Dr. J. T. Hartill before going into independent practice. In 1906 he took the L.R.C.S.Ed. and six years later the L.M.S.S.A. At Willenhall he held a number of appointments, becoming police surgeon, medical officer to the Post Office and to the Board of Education, certifying factory surgeon, and medical referee to the Ministry of Labour. For some twenty years he was also medical officer of health to the Short Heath and Willenhall urban district councils. He retired to Reading in 1933, but came out of retirement during the second world war to serve as chairman of the local medical board. He is survived by his widow and daughter.

Dr. JOHN WYLLIE died in Leeds on February 24 at the age of 55. John Wyllie was born on June 6, 1901, and was a medical student at Glasgow University, where he graduated M.B., Ch.B. in 1926. In the same year he joined a large practice at Hunslet, Leeds, as an assistant, and after a time became the partner of a very popular triumvirate, Drs. William Rodgers, W. J. B. Fergus, and Wyllie. He remained at Hunslet until his death, and endeared himself to the warm-hearted people there by his self-sacrifice on their behalf. Dr. Wyllie took a keen interest in local affairs. During the second world war he was in charge of a first-aid post, and it was as a result of discussions he had there with the then vicar of Hunslet, now Bishop of St. Albans, that he decided to found a much-needed boys' club in the district. The club is now one of the finest in the country, and Dr. Wyllie became the first chairman of its management committee, remaining in that position until shortly before his death. He was made a justice of the peace in 1949 and was very highly and affectionately regarded by all his associates on the bench: his interest in the youth movement led to his appointment to the juvenile panel, on which he served with distinction. He will not

be forgotten in Hunslet, where he was a family friend to many, carrying on his work in spite of grave physical disability until only a month or two before his death. One of his many interests was colour photography. A devoted husband and father, he had two daughters, one of whom is training as a nurse and the other in social welfare. His widow also survives him.

Dr. C. W. DE V. PRITCHARD died at St. Mary's Hospital, London, on March 9. He was born in South Africa of British and Huguenot stock, his father, W. H. Auret Pritchard, being one of those concerned in the early development of Johannesburg and the gold mines. His grandfather, Captain the Hon. Charles Pritchard, was a pioneer in the development of Cape Colony, and as a boy was often in the company of Napoleon on St. Helena. The family inherited many of the Emperor's personal possessions, which, some few years ago, were placed in a museum. Educated at St. John's College, Johannesburg, where he captained in cricket and football and won championships in swimming and long-distance running, Charles William de Villiers Pritchard studied medicine at Edinburgh and took the Scottish triple qualification in 1922. Subsequently he held appointments at the Larbert Mental Hospital, Edinburgh Royal Infirmary, and the Tavistock Clinic, and for a few years he had a consulting practice in Wimpole Street. But his main interest was in archaeology and travel, taking him to various parts of the world, where he collected many proofs of his adventures. He married Miss A. G. Seldon, who made her debut as Audrey Segnitz in Covent Garden opera in the early thirties. He was himself a polished amateur actor. During both world wars he served in the Royal Navy. His brother, Dr. Percival V. Pritchard, is medical officer of health for Gosport.

The obituary of Mr. S. S. BARTON was printed in the *Journal* of March 2 (p. 525). Dr. K. E. SCHMIDT writes: This is a small tribute to a man who to many like myself has been a guide, philosopher, and friend. A great personality indeed has gone from us and the world seems a much poorer place without him. He was not only an outstanding gynaecologist, beloved by his patients, blessed with that gift of inspiring confidence, optimism, and security, but was a poet (two books of his poems were published) and a painter of no mean achievement. The Cambrian Academy has not only lost one of its most outstanding members but also the founder of the Saxon Barton Prize. Mr. Barton had convictions and was not shy of making them known, nor did he leave anybody in doubt as to whether he liked a person or not. Somebody approved of by him was always worth knowing. To his juniors and students he was an inspiring teacher, encouraging initiative, responsibility, and, above all, work. He had a highly developed and kind-hearted sense of humour, and together with Mrs. Barton was a most generous and stately host in the manner of an era almost gone. Any meeting or assembly gained in status by his presence. A picnic and excursion with him into the North Wales hills was an experience. We will miss him very much indeed, and to him go our thanks for the privilege of his friendship. To Mrs. Barton and his sons goes our sympathy in their tragic loss.

Medical Notes in Parliament

APPEAL COSTS IN HEALTH SERVICE

The question of an award for costs in an appeal to the Ministry of Health from the decision of an executive council was raised in the House of Commons on March 14 by Mr. WILLIAM WELLS (Walsall, North, Lab.).

The case arose out of the death of Miss June Anne Evans, aged 17, of Walsall, in January, 1955. On January 4, Mr. Wells stated, she complained of severe pains and was vomiting. Dr. A was called and diagnosed gastro-enteritis. On

January 8 the symptoms became more severe, and Dr. A was again diagnosed gastro-enteritis. The following day was a Sunday, and the girl's father called at the surgery. Dr. B, who was standing in for Dr. A, visited the girl with Miss C, a medical student, who was allowed to conduct the whole examination, and who said there was no sign of appendicitis, which the parents had suggested. The father was dissatisfied with the conduct of the examination, and the next day called in a third doctor, who ordered the patient's immediate removal to hospital, where she died after an operation, the following day from peritonitis, a perforated appendix, and a perforated small intestine.

Her father made a complaint to the Walsall Executive Council. This was heard on June 3, and the executive council decided that there had been no breach of the doctor's terms of service. They also found that "the practice of allowing advanced students to accompany qualified medical practitioners in their day-to-day work is not only recommended but encouraged both by the Medical Committee of the Ministry of Health and the General Committee of the B.M.A., and has been accepted as a desirable and necessary procedure for a number of years." This finding, Mr. Wells said, could scarcely have been more misleading to all concerned. It was no part of the parents' complaint that a medical student had been present, nor even that the student had conducted an examination. The essence of the complaint was that the doctor rested content with an examination by the student, and took no trouble to verify what she had ascertained, so that at this critical stage of the illness diagnosis was conducted by an (at the time) unqualified person. The Walsall Executive Council misapprehended the essence of the complaint in this crucial finding, and that led to a false and misleading conclusion on the facts.

The father exercised his right to appeal to the Minister, who held that there had been a lack of proper medical attention in the visit on January 9, when the examination was conducted by Miss C. No order was made about costs, and Mr. Wells subsequently wrote to the Minister on the father's behalf, suggesting that it followed from the fact that the appeal had been allowed that the costs should to some extent at least follow the event. In a reply from the Minister on March 27, 1956, it was stated that it was an established practice to make an order for costs against one of the parties to an appeal only in quite exceptional circumstances—for example, where a case was pursued unreasonably; that it had never been held that a respondent was acting unreasonably in defending himself against an appeal seeking to reverse a decision that he had not failed to comply with his terms of service; and that "the doctor could not properly be penalized in this way, especially since the appeal was allowed only in relation to treatment on a particular day of Miss Evans's illness, and this was in effect allowed only in part."

To say that the appeal was allowed only in part, Mr. Wells complained, was certainly illogical and possibly evasive. The executive council itself, in a letter to him, had expressed the view that "on the Minister's decision the complainant's appeal was allowed, and therefore he should be recompensed for expenses incurred in exercising his right of appeal." The father had pursued the matter with success, and in plain justice and equity should be recompensed for the costs he had incurred in so doing.

Government Reply

Mr. J. K. VAUGHAN-MORGAN, Parliamentary Secretary, said that the result of the appeal to the Minister, which was issued after consultation with the Medical Advisory Committee, was that the doctor responsible should be reprimanded on the ground of a breach of the terms of service "in that her deputy failed on January 9 to render all proper and necessary treatment." The implication was that examination by the medical student without participation by the doctor was not adequate, but that the executive council had been right in taking the view that Dr. A had paid adequate visits and made adequate examinations.

It had been argued by Mr. Wells that, on the analogy of the normal rule in legal proceedings, costs should follow the event. But in so far as the procedure on appeal to the Minister related to complaints of infraction of obligations to the State, and was not an attempt to obtain restitution, the analogy with civil proceedings was not complete. The general principles of the award of costs by tribunals fell

within the terms of reference of the Committee on Administrative Tribunals and Inquiries, and were therefore in some measure *sub judice* that Committee.

Except perhaps for repayment of expenses they had incurred, usually small, complainants were not themselves hoping to obtain money under this procedure. They could, and often did, conduct appeals without incurring legal costs, and they would be deterred by the prospect of responsibility for the practitioner's legal costs if they were not successful. A rule that "costs follow the event" might seem on balance to work against complainants. Executive councils had occasionally been authorized or required to contribute to the costs of parties, usually associated with some form of mistake, unreasonableness, or undue severity on the part of the council. The executive council's finding in this case as a whole was supported in large measure and overturned on one point only. Thus it could not be regarded as widely wrong. It was a case in which costs following the event might have led to the award of a proportion of costs—perhaps, but not necessarily, one-third—of the fees incurred by Mr. Evans. In the light of practice in other cases this was not an occasion for payment by the executive council.

Tetanus Infection in N. Staffs

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked the Minister of Health for as full a statement as possible on the infection of five patients operated on recently in the North Staffordshire Royal Infirmary, of whom two had died from infection by tetanus. Mr. D. VOSPER stated on March 15 that tetanus had been diagnosed in five patients who were operated on between February 21 and 26. The symptoms appeared in the first case on February 26. Further cases developed symptoms on February 28, March 1, and March 3. The theatre suite in question was closed from February 28, and would not again be brought into use until any necessary measures had been taken to prevent any risk of further infection. All those operated on between February 21 and 26 were given a protective dose of tetanus antitoxin on March 1 and 2 except six patients who had been discharged, and their family doctors were advised to take the same action.

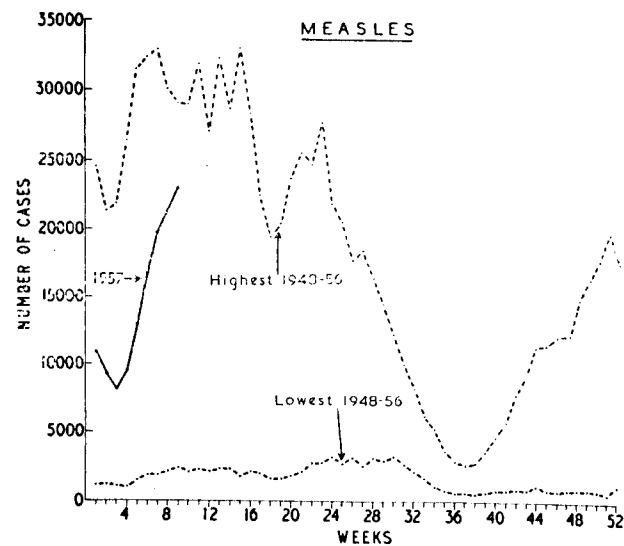
Poliomyelitis Vaccine

Mr. ERIC FLETCHER (Islington, East, Lab.) asked the Minister of Health on March 18 what were his proposals regarding the distribution of vaccines against poliomyelitis. Mr. VOSPER: A batch of vaccine was distributed last week and further batches would be distributed as they became available. They would be used in the first place for vaccinating children registered last year. There might on occasion be delay in this procedure, but the stringent safety precautions were in the interests of the parents and children concerned. Mr. FLETCHER asked for the Minister's assurance that he was completely satisfied with the safety of the vaccines that were to be distributed. Mr. VOSPER stated that he was completely satisfied.

Dr. REGINALD BENNETT (Gosport and Fareham, Con.) asked the Minister what evidence he had of the transmission of poliomyelitis in untreated sewage or water contaminated with it. Mr. VOSPER said he was advised that untreated sewage contained large amounts of poliomyelitis virus when infection occurred in a community, and that polluted water was assumed to be a constant risk. But there was no definite evidence in this country of the transmission of poliomyelitis from these sources.

University Salaries

Mr. K. ROBINSON (St. Pancras, North, Lab.) asked the Chancellor of the Exchequer on March 12 if he was aware of the concern that was felt by the Committee of Vice-Chancellors and amongst university teachers at his failure to announce any improvement in the salaries of university teachers, following the protracted negotiations that had recently taken place; and if he would now make a statement.



Infectious Diseases

The largest fluctuations in the number of notifications of infectious diseases in England and Wales during the week ending March 2 were decreases of 190 for whooping-cough, from 3,190 to 3,000, and 57 for scarlet fever, from 890 to 833, and a rise of 1,743 for measles, from 21,317 to 23,060.

The largest increases in the incidence of measles were 368 in Kent, from 433 to 801, 259 in Yorkshire West Riding, from 1,429 to 1,688, 244 in Staffordshire, from 627 to 871, 171 in Surrey, from 1,079 to 1,250, 157 in Cumberland, from 413 to 570, 145 in Lincolnshire, from 269 to 414, and the only large decreases were 112 in Northumberland, from 1,073 to 961, and 98 in Cornwall, from 169 to 71. The largest variation in the local returns of scarlet fever was a fall of 20 in Lancashire, from 130 to 110. The largest decreases in the incidence of whooping-cough were 50 in Durham, from 204 to 154, 44 in Kent, from 203 to 159, and 42 in Warwickshire, from 122 to 80. 7 cases of diphtheria were notified, being 5 more than in the preceding week; 2 of the cases were notified in Plymouth C.B.

3 cases of paratyphoid fever were notified in Lancashire, St. Helens C.B., and in Staffordshire, Kidsgrove U.D.

30 cases of acute poliomyelitis were notified. These cases were 9 fewer for paralytic and the same for non-paralytic as in the preceding week. The largest returns were Hertfordshire 5 (Barnet U.D. 2), London 3 (Lewisham 2), Middlesex 3, and Buckinghamshire 3.

The number of notifications of dysentery, 1,291, were 5 fewer than in the preceding week. The chief centres of infection were Lancashire 277 (Ashton under Lyne M.B. 54, Accrington M.B. 31, Stretford M.B. 25, Fylde R.D. 24, Urmston U.D. 23, Blackburn C.B. 19, Liverpool C.B. 18, Bolton C.B. 10), Yorkshire West Riding 245 (Rotherham C.B. 50, Leeds C.B. 38, Sheffield C.B. 36, Bradford C.B. 25, Dewsbury C.B. 16, York C.B. 16), London 85 (Woolwich 14 and the remaining 71 cases were scattered through 22 boroughs), Bedfordshire 77 (Luton M.B. 76), Warwickshire 58 (Coventry C.B. 32, Birmingham C.B. 18), Nottinghamshire 56 (Nottingham C.B. 23, Arnold U.D. 12, Mansfield M.B. 11), Durham 55 (Blaydon U.D. 13, Gateshead C.B. 10), Northumberland 50 (Blyth M.B. 32, Newcastle upon Tyne C.B. 10), Staffordshire 44 (Kidsgrove U.D. 16, West Bromwich C.B. 11), Middlesex 43 (Hayes and Harlington U.D. 18, Enfield M.B. 10), Surrey 33 (Surrey M.B. 19), Essex 31 (East Ham C.B. 18), Carmarthenshire 30 (Kidwelly M.B. 20), Wiltshire North Riding 27 (Middlesbrough C.B. 27), and Wiltshire 20 (Calne and Chippenham R.D. 13).

In Scotland the number of notifications of dysentery, 398, was 16 less than in the preceding week. The largest returns were Glasgow 161, Edinburgh 73, Lanark county 35, Stirling county 29, and Aberdeen 20.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending March 2 (No. 9) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1957					1956				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	7	1	8	0	3	6	1	7	0	8
Dysentery	1,291	85	398	8	2	1,752	281	142	60	9
Encephalitis, acute	3	1		0		1	0			
Enteric fever: Typhoid Paratyphoid	0 10	0 0	1 0	0 0		2 5	0 0	0 1	1 1	
Food-poisoning	174	25	19	2		158	29			
Infective enteritis or diarrhoea under 2 years				11	20				5	7
Measles*	23,060	1,876	565	446	340	2,815	76	82	10	161
Meningococcal infection	22	0	14	4	1	40	6	21	1	4
Ophthalmia neonatorum	28	1	6	0		25	3	3	0	
Pneumonia†	664	10	232	10	9	1,339	94	367	48	13
Poliomyelitis, acute: Paralytic Non-paralytic	21 9	1 2	1	0	5	14 1	3 0	1	1	1
Puerperal fever‡	222	49	8	0		237	44	4	2	
Scarlet fever	833	61	93	49	38	841	45	92	41	31
Tuberculosis: Respiratory Non-respiratory	608 93	64 11	119 18	25 6		593 78	62 13	151 17	10 3	
Whooping-cough	3,000	132	372	4	70	1,182	66	134	72	156

DEATHS In Great Towns	1957					1956				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	1	0	0	0	0	0
Dysentery	1	0		0		0	0		0	
Encephalitis, acute		0		0			0			
Enteric fever	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	5	0	0	1	0	6	0	0	0	0
Influenza	18	5	0	1	2	144	13	9	2	2
Measles		0	0	0	0		0	0	0	0
Meningococcal infection		0	0				2	0		
Pneumonia	325	44	36	13	6	804	119	64	14	13
Poliomyelitis, acute	1	0		0		1	0		0	
Scarlet fever		0	0	0	0		0	0	0	
Tuberculosis: Respiratory Non-respiratory	66 3	1 1	13 1	0 0	5 2	105 19	1 1	13 0	2 0	6 1
Whooping-cough	0	0	2	0	1	1	0	0	10	20
Deaths 0-1 year	229	31	35	9	10	295	33	33	10	229
Deaths (excluding stillbirths)	6,246	905	691	158	218	9,199	1,379	832	187	230
LIVE BIRTHS	8,518	1,223	951	215	426	8,198	1,221	991	230	338
STILLBIRTHS	183	19	27			247	26	29		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenza pneumonia.
‡ Includes puerperal pyrexia.

Medical News

Dame Dehra Parker.—The resignation of Dame DEHRA PARKER, Minister of Health and Local Government in Northern Ireland, was announced on March 14. The resignation is on the grounds of ill-health. Dame Dehra Parker, who was a member of the original Parliament of Northern Ireland, has held office as Minister of Health and Local Government since 1949. She will remain an M.P., and will resume her parliamentary duties as soon as her health permits. At the time of going to press the name of the new Minister had not been announced.

Mass Radiography in Glasgow.—The Glasgow mass radiography campaign is meeting with great success. By the end of last week—the first of the campaign—142,000 persons over the age of 14 had been radiographed. The health department had set itself a target of 250,000 for the five weeks of the campaign—which if achieved would constitute “a world record”—but now hopes to reach this figure in two weeks. If this happens the campaign will nevertheless continue for the full five weeks. The “possible” population for mass radiography in Glasgow is put at about 800,000.

Sims Commonwealth Professors.—Professor M. L. ROSENHEIM, professor of medicine at University College Hospital Medical School, London, and Professor R. M. JAMES, professor of surgery at Toronto University, have been appointed Sir Arthur Sims Commonwealth travelling professors for 1958. Professor Rosenheim is to visit Australia and New Zealand, Professor James parts of Africa. The appointments were made by the council of the Royal College of Surgeons of England at its meeting on March 14.

“British Medicine” on New York City Radio.—The New York Academy of Medicine is running a series of weekly broadcasts on British Medicine. The series is being given in the Academy’s postgraduate radio programme “For Doctors Only” which is broadcast by the city’s own wireless station on a private wavelength. The programme is addressed to “the medical profession of Greater New York.” Recordings for the series were made in Britain by the B.B.C., and the following speakers contributed: Lord COHEN OF BIRKENHEAD on “Continued Education of the Doctor,” Sir DAVID CAMPBELL on “The General Medical Council,” Professor A. A. MONCRIEFF on “Paediatrics,” Sir CHARLES DODDS on “Synthetic Oestrogens,” Mr. T. HOLMES SELLORS on “Cardiac Surgery,” Professor C. F. W. ILLINGWORTH on “Peptic Ulcer,” Professor J. MCMICHAEL on “Digitalis Therapy,” Dr. J. J. R. DUTHIE on “Cortisone and Rheumatoid Arthritis,” Sir JAMES PATERSON ROSS on “Vascular Surgery,” Professor L. J. WITTS on “Anaemia,” and Professor B. W. WINDEYER on “Surgery, Radiotherapy, and Chemotherapy of Advanced Malignant Disease.” Each contributor spoke for 20-30 minutes. The series began in February and will continue until the end of April.

Mental Health Research Fund.—The Fund’s annual meeting was held at the Royal Society of Medicine on March 19. Mr. IAN HENDERSON, chairman of the Fund, was able to record a year of satisfactory achievement, thanks largely to the “very welcome priming of the pump” last year by the £75,000 grant, spread over six years, from the Ford Foundation. During the calendar year 1956 £25,110 was allocated in fellowships and grants, and applications for worth-while projects were stated to be increasing as the Fund became better known to research workers. After the report Sir FREDERICK ARMER, chairman of the Board of Control, addressed the meeting. The Fund, whose address is 39, Queen Anne Street, London, W.1, exists to stimulate public interest in the possibilities of research in the field of mental health, to attract qualified research workers into this field, and to provide money for research.

British Universities.—In the autumn term, 1956, there were 13,035 students in the medical faculties of British Universities. This is a small decline from previous years, and is matched by a similar though proportionately somewhat larger decline in the new entry to medicine. Out of a total student body of 88,701 in Britain that term, medicine claimed 14.7% compared with arts 42.9%, pure science 21.9%, and technology 13.9%. In 1938-9 medicine had 23.8% of the students, and in 1953-4 16.4%. Commenting on these figures, the University Grants Committee in its recent report *University Development* (an interim report on the years 1952 to 1956) states: “The trends which were in evidence five years ago have continued, science and technology gaining at the expense of arts and medicine.” On the quality of university students the Committee writes: “In our last report we said that in general the proportion of outstandingly good and outstandingly weak students was lower, and of good second-class students was higher, than it was before the war. This remains the general position.”

Public Health and Nuclear Radiations.—On March 15 Lord SALISBURY opened an exhibition called “Atoms and Health” at the Royal Society of Health’s headquarters in London. The exhibition demonstrates the sources of nuclear radiation, both natural and artificial, and the steps the U.K. Atomic Energy Authority is taking to protect the general public and workers in nuclear industry. The exhibition will remain open daily (Monday to Friday, 10 a.m. to 5 p.m.) until May 31 at 90, Buckingham Palace Road, London, S.W.1.

London University.—Two readers at the Postgraduate Medical School of London, Dr. J. V. DACIE and Dr. T. RUSSELL FRASER, have had conferred on them the title of professor in the University of London. Dr. Dacie receives the title of professor of haematology; Dr. Russell Fraser the title of professor of clinical endocrinology. Both titles are in respect of their posts at the Postgraduate Medical School. Mr. J. D. S. FLEW, dean of University College Hospital Medical School, and Mr. H. DAVSON, D.Sc., a member of the scientific staff of the Medical Research Council, have been made fellows of University College, London.

R.C.P. and the Harveian Tercentenary.—The Royal College of Physicians of London has announced its plans for the Harveian Tercentenary in June. The College’s commemoration will be from June 3 to 8, coinciding with the Tercentenary Congress (see *British Medical Journal*, December 1, 1956, p. 1296). The principal events will be a memorial service at St. Paul’s Cathedral (12 noon, June 3); a reception at the College (8.30 p.m., June 4); four showings of a revised edition of the late Sir Thomas Lewis’s film illustrating experiments from Harvey’s *De Motu Cordis* (5-5.45 p.m. on June 3, 5, 6, and 7); and an exhibition of Harvey’s life and work (2-5 p.m., June 5; 10 a.m.-5 p.m., June 6 and 7; 10 a.m.-1 p.m., June 8). Admission to the film and exhibition is free to all the College’s fellows, members, and licentiates, and to members of the Tercentenary Congress.

Cardiovascular Research in Australasia.—The Life Insurance Medical Research Fund of Australia and New Zealand invites applications for grants-in-aid to institutions and research fellowships. The Fund limits its support at present to research on cardiovascular function and disease. Fellowships for work in Australia or New Zealand are at the rate of £1,800-£2,000 a year, travelling fellowships at £2,000-£2,250 a year plus approved travelling expenses. Applications should be submitted by July 1 to the medical director of the Fund (Dr. JOHN H. HALLIDAY), 87, Pitt Street, Sydney, New South Wales, from whom further details may be obtained.

Guigoz Fellowship.—The International Children’s Centre invites applications for this year’s Guigoz fellowship for work on nutrition. The fellowship, valued at one million French francs, is endowed by the Guigoz Company (makers of dietetic products) to allow a nutritionist or physician to

spend a year in Paris in research on the nutrition of infants and children. Applications must be lodged by May 15. Further details may be obtained from the International Children's Centre, Château de Longchamp, Bois de Boulogne, Paris 16.

Population Control in China.—Abortion and sterilization are now to be made legal in China, according to a report by the New China News Agency in London. This decision is said to have been taken "with the greatest reluctance." The agency was reporting an address by Madame Li TEI-CHUAN, the Minister of Health, made in Peking on March 7. She is quoted as saying that China's population was now rising at a rate of 15 million a year. During the past year, she said, the health departments had made strenuous efforts to popularize birth control, but this work was far from enough.

F.R.S. Edinburgh.—Among the new fellows of the Royal Society of Edinburgh announced this month are the following members of the medical profession: Dr. A. T. DOIG, lecturer in industrial hygiene at the Universities of Aberdeen and St. Andrews; Professor J. W. McLEOD, F.R.S., emeritus professor of bacteriology at Leeds University; and Professor E. W. WALLS, professor of anatomy at the Middlesex Hospital Medical School.

Sir Howard Florey, F.R.S., professor of pathology at Oxford, is to receive the honorary degree of LL.D. of Edinburgh University at a ceremony on July 5.

Dr. Hilary Koprowski, assistant director of viral and rickettsial research at the Lederle Laboratories of the American Cyanamid Company, has been appointed director of the Wistar Institute, University of Pennsylvania. Dr. Koprowski will take up his new appointment on May 1.

COMING EVENTS

Multiple Sclerosis Society.—Recital by Miss MURIEL SMITH at Royal Festival Hall, March 31, at 3 p.m., to raise funds for the Society.

Institute of Laryngology and Otology.—Demonstration on "Bone Structure and Bone Pathology" by Dr. H. A. Sissons, April 1-12. Open to all medical practitioners.

Indian Medical Association.—Annual dinner and dance at the Cumberland Hotel, London, W.1, April 4, at 7.30 p.m. Details from Dr. C. R. AMIN, 38, Newcomen Street, London, S.E.1 (Tel.: HOP 2024).

United Hospitals' Choir.—Mozart's Requiem Mass at the Church of St. George-the-Martyr, Queen Square, London, W.C.1, April 4 at 8.30 p.m. Admission by programme, price 3s. 6d., at the door.

Radioactive Isotopes in Medicine.—British Council course in London and Sheffield for overseas medical practitioners, September 15-28, fee £44. Apply to the local representative of the British Council.

NEW ISSUES

Archives of Disease in Childhood.—The new issue (Vol. 32, No. 161) is now available. The contents include:

THE DIAGNOSIS AND TREATMENT OF COMPLETE ANOMALOUS PULMONARY VENOUS DRAINAGE. W. T. Mustard.
THE OPERATIVE TREATMENT OF THE FUNNEL CHEST. F. Rehbein and H. H. Weiricke.

EVENTRATION OF THE DIAPHRAGM. Eric Goulston.
OESOPHAGEAL RECONSTRUCTION IN CHILDREN USING INTRATHORACIC COLON. Charles E. Sherman, jun., and David Waterston.

ABNORMALITIES IN MECONIUM OF THE FOETUS AND NEWBORN. John L. Emery.

MECONIUM AND FAECAL PLUGS IN THE NEWBORN. R. B. Zachary.

SEPTIC UMBILICAL ARTERITIS. Isabella Forshall.

INTRALUMINAL INTESTINAL CALCIFICATION IN THE NEWBORN. P. P. Rickham.

TISSUE CULTURE AS A POSSIBLE AID IN RECOGNIZING THE ORIGIN OF CYSTIC HYGROMA. John Greve and John D. B. MacDougall.

TENSION EMPHYSEMA IN INFANTS. T. Y. Nelson.

CONGENITAL LUMBAL HERNIA. C. Marshall Lee, jun., and Helmut Mattheis.

UROLITHIASIS IN CHILDHOOD. N. A. A. Myers.

THYROID CARCINOMA IN CHILDHOOD IN GREAT BRITAIN. Keith D. Roberts.

TREATMENT OF PORTAL HYPERTENSION IN CHILDREN. Philip Sandblom and Carl-Axel Ekman.

PAEDIATRIC SOCIETIES IN THE BRITISH ISLES.

BOOK REVIEWS.

Issued six times a year; annual subscription £3 3s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, March 25

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Ophthalmology Lecture by Professor Arnold Sorsby: Cycloplegics and Mydriatics.

Tuesday, March 26

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. D. G. James: Sarcoidosis—The Present Position.

LIVERPOOL UNIVERSITY.—At Physiology Lecture Theatre, 5.15 p.m., Professor B. Uvnäs (Stockholm): Sympathetic Vasodilator System.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor R. Cox: Management of Dysphagia Due to Malignant Lesions of the Thoracic and Abdominal Oesophagus.

ROYAL STATISTICAL SOCIETY: MEDICAL SECTION.—At Keene Lecture Theatre, 2nd Floor, Westminster Medical School, S.W., 5.30 p.m., Mr. P. D. Oldham: Arterial Blood Pressure in Population Samples.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL.—5.30 p.m., Thomas Young Lecture by Professor J. Z. Young, F.R.S.: Efferent Optic Nerve Fibres and the Crossing of the Visual Pathway. Some Speculations on the Mechanism of Vision.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Dr. T. Rowland Hill: Neurological demonstration.

Wednesday, March 27

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—8 p.m., Valdictory Address by Dr. May Pearce: Matrimonial Causes.

CHRISTIAN MEDICAL FELLOWSHIP.—At Royal Empire Society, Northumberland Avenue, W.C., 8.15 p.m., Mr. Harold Dodd: The Doctor as a Person.

HARVEIAN SOCIETY OF LONDON.—At 11, Chandos Street, W., 8.15 p.m., Harveian Lecture by Sir Russell Brain, P.R.C.P.: Some Disorders of the Cerebral Circulation.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Specific and Foreign Body Granulomas.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—5.30 p.m., Dr. E. Ann Mower White: Opportunities for Health Teaching in Schools.

Thursday, March 28

BIOCHEMICAL SOCIETY.—At Department of Biochemistry, University College, Gower Street, W.C., 10 a.m., annual general meeting.

CHADWICK TRUST.—At Royal Society of Health, 5.30 p.m., Sir Harold Whittingham: Problems of Hygiene in Civil Aviation.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. B. Russell: (1) Tuberculosis of the Skin; (2) Sarcoidosis of the Skin.

LIVERPOOL MEDICAL INSTITUTION.—8 p.m., symposium: Management of Coronary Thrombosis. Speakers, Dr. E. Noble Chamberlain, Dr. C. S. McKendrick, and Dr. W. P. O'Regan.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At Common Room, Royal Free Hospital School of Medicine, 8.30 p.m., talk by Dr. Cicely Williams on her work with W.H.O.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Savoy Hotel, W.C., 6.45 p.m., annual dinner dance.

LONDON UNIVERSITY.—At St. Thomas's Hospital Medical School, S.E., 5.30 p.m., special university lecture in pharmacology by Professor Björk Uvnäs (Stockholm): Mechanism of Histamine Release.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Arris and Gale Lecture by Mr. D. Greer Walker: Facial Development.

ROYAL NORTHERN HOSPITAL.—2.45 p.m., clinical demonstration by Mr. F. P. Fitzgerald: Some Common Fractures and Sprains.

WEST OF ENGLAND CHILD HEALTH GROUP.—At Department of Child Health Lecture Theatre, Bristol Royal Hospital for Sick Children, 8.30 p.m., Dr. R. Lightwood: Home Care of Sick Children.

Friday, March 29

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. P. D. Samman: clinical demonstration.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. K. Robson: clinical demonstration.

Saturday, March 30

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.—At Royal Hospital, Sheffield, 2.15 p.m., Mr. St. Elmo Hall: Problems of a Mixed Community.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Ward Platt.—On March 6, 1957, to Patricia (formerly Frodsham), B.M., B.Ch., D.C.H., and Walter Ward Platt, of 45, Hornby Lane, Liverpool, a daughter—Anne Heathcote.

Wolfson.—On February 17, 1957, at Dudley Road Hospital, Birmingham, to Nancy, wife of L. J. Wolfson, F.F.A.R.C.S., a third daughter—Barbara Hilary.

DEATHS

Allan.—On March 6, 1957, in a nursing-home, Edinburgh, Harry Allan, M.B., Ch.B., of 193, Mayfield Road, Edinburgh, late of Penang, Malaya, a daughter—Eric Charles Aspinall, M.B., Ch.B., of The Poplars, Erdington, Birmingham, aged 62.

Foley.—On February 13, 1957, in Sydney, Australia, John Foley, M.R.C.S., L.R.C.P., of Dee Why, New South Wales, aged 62.

Iredale.—On March 3, 1957, in hospital, Jabez Percival Iredale, M.B., B.S., of The Old House, Rushy Heath, Herts, aged 87.

Mennell.—On March 2, 1957, at his home, "Courts of the Mornings," Rake, Liss, Hants, James Beaver Mennell, M.D., aged 77.

Reid.—On March 7, 1957, at 64, Chapel Road, Forest Gate, London, E., Allan George Reid, M.C., M.R.C.S., L.R.C.P., aged 84.

Ross.—On February 28, 1957, at 7, Cannon Street, Accrington, Lancs., Robert Stewart Ross, M.C., M.B., B.Ch., aged 77.

Sperber.—On March 3, 1957, in Accra, Gold Coast, Karel Sperber, O.B.E., M.D., aged 46.

Tivy.—On February 27, 1957, at Downend, Galmpton, Brixham, Devon, Cecil Brian Forsyth Tivy, M.B., M.Ch., aged 76.

Wyllie.—On February 24, 1957, at Highgate Street Lane, Leeds, Yorks., John Wyllie, M.B., Ch.B., J.P.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Hair of the Dog

Q.—An allergic reaction to dog hair has been detected by skin tests in a patient with rhinitis. Must it be assumed that he is sensitive to all breeds of dog? Could he, for instance, keep a poodle, which is said to have a different type of hair from other breeds?

A.—It is accepted that danders from various species of dogs possess qualitative antigenic differences. It cannot, therefore, be presumed that because a patient is sensitive to one breed of dog he is sensitive to all dogs. Skin-testing with the dander from individual species is advisable or even from individual dogs. It must also be remembered that a skin test only indicates the presence or absence of skin-sensitizing antibodies. For proof of clinical sensitivity there must be symptoms on contact with the dog and, in the absence of other allergens, freedom from attacks when removed from contact.

Focal Sepsis and General Ill-health

Q.—What is the current view of the importance of focal sepsis in accounting for general diseases and ill-health? Has the view that toxins from bacteria at the root of the teeth or in the bowel may exact a general baneful effect on the body been completely exploded? If so, are the only arguments for attending to bad teeth local ones?

A.—The final clause of this question is the most easily answered, and the answer to it is emphatically "No." Dental sepsis can cause bacteraemia, which in a predisposed patient may result in bacterial endocarditis. Hobson¹ goes so far as to say that he has never seen this infection in an edentulous patient. It is also a frequent source of lung abscess, the mode of spread probably being embolic: pulmonary actinomycosis may be assumed to originate in the same way.

To pronounce judgment on the commonly held belief that "focal sepsis" can be the underlying cause of states of chronic ill-health, and in particular of chronic multiple arthritis and other painful or disabling conditions involving joints or muscles, is much more difficult. It is more difficult still to confirm or deny that this may be the cause of some forms of insanity and other such obscure conditions. Although much less has been heard lately of this belief, there are doubtless practitioners at the present day who would support it by adducing histories of cures or alleviations by treating such foci surgically or otherwise. A rational judgment on a theoretical basis might be as follows: Of evidence that bacterial toxins from the bowel, in the absence of intestinal lesions, can produce disease elsewhere there is none. Toxic absorption from any closed focus of sepsis can reasonably be supposed to be capable of causing degenerative changes elsewhere, but the focus in the only closed dental lesion, an "apical abscess," is very small. In extensive gingivitis (pyorrhoea) the material swallowed might cause a gastritis, and other consequences could follow from that. That arthritis is the result of dental sepsis could only be proved by finding a micro-organism derived from the primary lesion in the joint itself: it is true that this is not often attempted, but there is almost no evidence that bacteria are ever present in such lesions. It can of course be assumed, although it cannot be proved, that the arthritis is an allergic response to bacterial products. It is scarcely necessary to add that this field of medicine has been the happiest of all hunting-grounds for

purveyors of vaccines made from harmless mouth and throat bacteria. If these vaccines have done any good, only the most credulous will believe their effect to have been specific.

REFERENCE

¹ Hobson, F. G., and Juell-Jensen, B. E., *British Medical Journal*, 1956, 2, 1501.

Adrenal Apoplexy

Q.—What treatment is advised for a suspected case of adrenal apoplexy under field conditions? How should a case be treated where full facilities are available, as in hospital?

A.—The essentials of treatment are to restore the depleted body stores of salt and water, combat hypoglycaemia, and provide the deficient adrenocortical steroids. In hospital 500 ml. glucose in saline is infused intravenously over 2-4 hours, and to this is added 200 mg. hydrocortisone (40 ml. of concentrate in 50% alcohol or as the hemisuccinate salt). During the next 2-4 hours 500 ml. physiological saline containing 100 mg. hydrocortisone is given. Thereafter 500 ml. dextrose in saline and 500 ml. saline, each containing 100 mg. hydrocortisone, are given alternately until a total of 2,500 ml. fluid has been infused in 24 hours. An intramuscular injection of 5 mg. deoxycortone acetate in sesame oil is given as soon as the infusion has been started. If the blood pressure does not begin to rise after four hours 2-4 mg. noradrenaline is added to the infusion solution. Penicillin by intramuscular injection is given twice daily in a dose of 500,000 units procaine penicillin. Sedatives and morphine must on no account be given until 200 mg. hydrocortisone has entered the body. As soon as the patient can swallow and no longer vomits, cortisone is given by mouth in divided daily doses starting at 200-300 mg. and gradually reducing to 37.5-50 mg.

The outcome will probably be unsatisfactory unless intravenous treatment is possible. In these circumstances, if the patient is not vomiting, glucose and half-strength normal saline, flavoured with fruit juice, should be given by mouth, together with 100 mg. cortisone four-hourly until improvement occurs. Penicillin and deoxycortone acetate are given as described above, and 0.3-0.5 mg. phenylephrine hydrochloride ("neo-synephrine") injected subcutaneously every one or two hours to maintain the systolic blood pressure over 90-100 mm. Hg. The underlying cause of the adrenal insufficiency should be treated with the most specific chemotherapeutic or antibiotic agent available.

Local Analgesics in Rhinology

Q.—What is the maximum safe dosage of amethocaine hydrochloride for topical application in the nose and throat? I have recently had a fatality following the application of amethocaine flakes. Should the use of this drug in rhinology be abandoned in favour of some other local analgesic, and, if so, which is recommended?

A.—The toxicity of cocaine and other local analgesics varies considerably in different individuals, so that what may be a safe dose in one can cause rapid, severe, or even fatal collapse in another. The maximum safe dose depends not only on the above but on the rapidity of absorption by the mucous membrane of the respiratory tract and the gastric mucosa. Thus the pure substance, or concentrated solution, is very much more dangerous than the same total dose in a dilute solution applied over a prolonged period. Especially is this true of the synthetic analgesics, which are not vasoconstrictors. A safe topical application of amethocaine hydrochloride would be 40 to 50 mg. But to make doubly safe it is wise to dilute the solution to 0.5%, to use only about 3 ml. at a time, and to allow five minutes to elapse between applications. Lignocaine hydrochloride is considered to have a higher margin of safety, and is therefore preferred by some, but there is no need to abandon the use of amethocaine if used with due care. No local analgesic is devoid of fatal risk.

Albinism and Blindness

Q.—A couple have two children, the first a blind albino and the second quite normal. There has been only one other albino in the family so far as is known, and he was the great-grandfather of these two children. What is the risk of further children being albinos?

A.—The risk of a further child being an albino is very probably the 1-in-4 risk for conditions due to a recessive gene. The complete forms of albinism behave regularly as if due to a recessive gene. The association with blindness, if the blindness is total in this child, is unusual. Albinism leads to a loss of the appreciation of form which intensifies the effects of any coincidental cause of poor vision such as refractive errors, but is not known to be associated with any form of blindness.

Infra-red Apparatus

Q.—What points should be looked for in assessing the value of the various types of infra-red apparatus the public can buy on medical prescription, and what technical data should one expect to be given by the manufacturers? What is the value of the domestic gas or electric fire as a simple home substitute for such apparatus? Is the infra-red bulb, such as is used by poultry keepers in rearing chicks, another possible inexpensive substitute?

A.—The following points should be looked for in assessing an infra-red apparatus for home use: The lamp should be stable so that there is no danger of it falling upon the patient. The element should have an output of not less than 500 watts and should be within a parabolic reflector. A guard should be fixed to the reflector to prevent accidental contact with the element. The apparatus should be adequately earthed. The manufacturers should state the output of the lamp at any given voltage.

Domestic gas and electric fires are rich in infra-red rays and are an effective substitute. It is, however, usually difficult to maintain a comfortable and relaxed position in front of such appliances while irradiating a small area of the body. The infra-red bulbs used by poultry keepers in rearing chicks have too small an output to be useful for therapeutic purposes.

Anaesthetizing the Eyelid

Q.—What is the best way of anaesthetizing an eyelid for the removal of a meibomian cyst?

A.—A preliminary drop of 4% cocaine should be instilled into the eye, and then another drop after the lapse of two or three minutes. Then the affected eyelid should be injected with 4% novocain. An interval of two minutes should be allowed to elapse after the injection before the operation is started. There are, of course, various effective substitutes for cocaine and novocain.

NOTES AND COMMENTS

Threadworms.—Professor R. S. ILLINGWORTH (Sheffield, 10) writes: I would be grateful if your expert writing on threadworms ("Any Questions?" February 23, p. 474) would (a) supply the evidence for the statement that "heavily infected children may show some anaemia with loss of appetite and malnutrition," (b) explain how the worms cause "... catarrhal inflammation" by "mechanical irritation of the intestinal mucosa."

OUR EXPERT replies: The statements that (a) "heavily infected children may show some anaemia with loss of appetite and malnutrition" and (b) "catarrhal inflammation may result from mechanical irritation on the intestinal mucosa" were taken from *Textbook of Clinical Parasitology*¹ and *Clinical Parasitology*.² Froehlich has observed by speculum haemorrhagic points on the rectal mucosa caused by the worms (cited in Brumpt's *Précis de Parasitologie*). The statement (a) is supported by my own observation of the symptoms shown by one of my children who

contracted a very heavy infection of *Enterobius*. The symptoms rapidly disappeared after appropriate anthelmintic treatment and to been administered by my wife, without my knowledge and to my intense disgust, as I had hoped to use the case to carry out some further investigations on the biology of the parasite. With regard to statement (b), the worms are sometimes present in very large numbers. They live on the surface of the mucous membrane, and the associated catarrh is due presumably to their active wriggling movements. The worms have often been reported as the cause of "appendicopathia" by French writers.

REFERENCES

1. Belding, D. L., *Textbook of Clinical Parasitology*, 1952. New York.
2. Craig, C. F., and Faust, E. C., *Clinical Parasitology*, 1951. Philadelphia.
3. Brumpt, E., *Précis de Parasitologie*, 1, 1949. Paris.

Gustatory Sweating after Sympathectomy.—Mr. HERBERT HAXTON, F.R.C.S. (Manchester, 13), writes: Your expert ("Any Questions?" February 16, p. 416) appears to be unaware of all my investigations of this phenomenon.¹ I found that in all cases with gustatory sweating after sympathectomy the syndrome could be temporarily abolished by injections of local anaesthetic in the stellate ganglion, and, furthermore, thermoregulatory sweating is not completely absent in the head and neck. Some degree of sympathetic activity is thus essential for the syndrome. It is, of course, a cholinergic phenomenon, but it seems likely that the acetylcholine is liberated at cutaneous sympathetic nerve endings. I am aware of no reliable evidence that parasympathetic nerve endings, such as are mentioned by your expert, exist in the skin. The only effective treatment for a severe case is removal of the stellate ganglion, or section of the cervical sympathetic chain, after preliminary injection of a local anaesthetic has confirmed that the phenomenon can be abolished in this way.

REFERENCE

1. Haxton, H., *Brain*, 1948, 71, 16.

OUR EXPERT replies: I was quite familiar with Mr. Haxton's paper. Several excellent papers have been written on this subject, much of the interest of which lies in the physiological puzzle which it presents and the uncertainty about its exact cause and treatment. Mr. Haxton stresses two points in his paper: (1) "in all cases ... the syndrome could be temporarily abolished by injections of local anaesthetic"—in that case why does he consider it necessary to recommend preliminary injection of local anaesthetic before sympathectomy? (2) In his letter Mr. Haxton writes: "In all cases ... thermoregulatory sweating is not completely absent," but in his paper he says "there is always absent or reduced thermoregulatory sweating." Other workers (for example, Wilson¹) have also reported absence of thermoregulatory sweating. Its presence (and by inference the presence of intact sympathetic fibres) is not essential for the syndrome, which could be produced by sprouting from other nerves. Recent work by Murray and Thompson² is interesting in this respect. It follows that no one can be dogmatic about the cause or treatment of the syndrome and that thorough investigation is necessary before embarking on surgical treatment.

REFERENCES

1. Wilson, W. C., *Clin. Sci.*, 1936, 2, 273.
2. Murray, J. G., and Thompson, J. W., *J. Physiol.*, 1957, 135, 133.

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CLINICAL AND SOCIAL PROBLEMS OF
PEPTIC ULCER*

BY

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These two lectures aim to give a perspective of peptic ulcer as it exists among the community and a commentary on clinical problems of diagnosis and management.

It is well known that the pattern of peptic ulcer has changed greatly in the past century. Acute gastric ulcers in young women were formerly the main cause of hospital admissions for haematemesis and melaena, or acute perforation, but to-day such patients are rarely seen. The frequency of true chronic gastric ulcer has probably altered little since 1920, but that of juxta-pyloric (including duodenal) ulcers, affecting predominantly young and middle-aged men, had increased more than twofold in the twenty years between the two world wars (Illingworth, Scott, and Jamieson, 1944).

Has the prevalence of duodenal ulcer continued to increase since 1938? Evidence from the national mortality rates and hospital admissions for acute perforation suggest that this is so. The experience for acute perforations at the Central Middlesex Hospital, serving a population of 300,000 persons in North-west London, is recorded in Table I. Admissions for duodenal ulcer

TABLE I.—Acute Perforations

Years of Admission	G.U.	D.U.	G.U.:D.U. Ratio
Male			
1938-40	21	77	1:3.7
1941-3	27	81	1:3.0
1944-6	29	102	1:3.5
1947-9	26	142	1:5.4
1950-2	21	177	1:8.4
1953-5	15	134	1:8.9
	139	713	
Female			
1938-43	11	10	1:0.91
1944-9	12	15	1:1.25
1950-5	18	39	1:2.17
	41	64	

have increased, but there has been no increase and even a slight fall in admissions for perforated gastric ulcer, with consequent change in the G.U./D.U. ratio.

It is probable that this experience in North-west London reflects the national trend, for it fits in with the 1938-48 survey of perforations admitted to 40 British hospitals (Avery Jones, 1955b) and also with the continuing experience at Glasgow (Jamieson, 1955).

When the Registrar-General's figures for peptic ulcer are examined it will be found that for some years there

*The first of two Lumleian Lectures delivered before the Royal College of Physicians of London on April 10 and 12, 1956.

has been little change in the total number of deaths from peptic ulcer in Great Britain, but these figures may be misleading and must be interpreted separately for patients over and under the age of 65. Above this age, deaths from both gastric and duodenal ulcer have increased, but since 1948 there has been a drop in the death rate attributed to senility and it is possible that the apparent increase in mortality from peptic ulcer in the elderly reflects a greater precision in diagnosis. Under 65, the mortality of gastric and duodenal ulcer must be considered separately. Deaths from gastric ulcer have decreased. The risk to life from the complications of peptic ulcer has diminished greatly since the introduction of antibiotics and relaxant anaesthetics, and this is the most likely explanation for this fall in mortality. The death rate from duodenal ulcer in those under 65 has remained almost unchanged. This is very surprising in view of the known improvement in treatment, and it raises the possibility that the apparently stationary mortality for duodenal ulcer may be hiding an increasing prevalence. These trends, noted by Doll (1952) up to 1948, have continued since then (Table II).

A continuing rise in incidence of peptic ulcer has also been reported elsewhere. In Denmark, Alsted (1953)

TABLE II.—Deaths Per Million Living (To Nearest Whole Number)

Age in Years	1949	1950	1951	1952	1953
Duodenal Ulcer Male					
15-24	4	4	7	6	2
25-34	17	17	16	16	13
35-44	53	49	58	48	36
45-54	135	132	140	126	111
55-64	228	233	256	239	241
65+	328	380	508	504	492
Duodenal Ulcer Female					
15-24	1	0 (0.4)	1	1	0 (0.4)
25-34	2	2	2	2	2
35-44	5	6	7	6	4
45-54	14	14	15	15	13
55-64	28	33	31	32	30
65+	61	77	98	90	103
Gastric Ulcer Male					
15-24	4	3	3	3	1
25-34	10	9	9	5	6
35-44	44	43	33	30	22
45-54	147	110	126	105	92
55-64	295	286	272	239	211
65+	440	507	547	543	523
Gastric Ulcer Female					
15-24	2	1	0 (0.3)	1	0 (0.4)
25-34	2	3	3	2	3
35-44	9	9	7	9	7
45-54	26	22	22	24	20
55-64	68	66	63	55	52
65+	184	204	232	226	222

found peptic ulcer more than doubled in Denmark between 1940 and 1948. In Stockholm, Tomenius (1955) recorded almost a 50% increase between 1938 and 1952.

Present Prevalence

What is the present prevalence of peptic ulcer in this country, and what is its economic importance? With these questions in mind several studies were organized.

One of the problems in medical practice is to get a complete view of any medical problem. The consultant at the hospital and the general practitioner tend to see two different groups, for the severe cases are concentrated in hospital practice. An unbiased overall view was obtained from a survey of 6,047 members of the public, done in collaboration with Dr. Richard Doll and the assistance of a research almoner, Miss M. M. Buckatzsch (Doll, Jones, and Buckatzsch, 1951). In men, the incidence of peptic ulcer (active and inactive) was found to rise to a maximum little short of 10% in the age group 45-54. In women, the highest incidence was 6%, and was not found until the age of 55. The incidence in the older age groups of women reflects partly the prevalence of acute gastric ulcers among girls at the beginning of the century.

An impressive incidence may be demonstrated, but such large absolute figures do not indicate the degree of suffering and disability. Of the total number of persons with diagnosed ulcers in the survey—those who have had definite ulcer-like symptoms or complications of ulcer—approximately a quarter had had an episode of dyspepsia followed by some years of freedom from dyspepsia, or with perhaps only slight symptoms; in rather more than a half there were recurrent symptoms at varying intervals, but with some care and discretion these had caused little or no loss of time from work. The remaining quarter had had a great deal of pain or had suffered from troublesome complications, and if operation had not already been done the patient had earned it.

Incidence of Peptic Ulcer at Necropsy

Another approach to the question of incidence was made with the assistance of Dr. Donald Teare, who during 1952-3 recorded the presence of peptic ulcer and scars in coroner's necropsies. These were mainly patients who had died suddenly from either violence or natural causes. It was thought that such cases of sudden death would give a true

TABLE III.—Necropsy Incidence

Sex	Age	Total	Active		Scar	
			No.	%	No.	%
Gastric Ulcer						
Male	< 45	238	1	0.4	1	0.4
	45-	636	18	2.8	39	6.1
	65+	979	29	3.0	86	8.8
		1,853	48		126	
Female	< 45	150	1	0.7	2	1.3
	45-	324	7	2.2	13	4.0
	65+	896	29	3.2	65	7.3
		1,370	37		80	
Duodenal Ulcer						
Male	< 45	238	5	2.1	10	4.2
	45-	636	19	3.0	40	6.3
	65+	979	16	1.6	44	4.5
		1,853	40		94	
Female	< 45	150	1	0.7	2	1.3
	45-	324	2	0.6	11	3.4
	65+	896	9	1.0	16	1.8
		1,370	12		29	

picture of the incidence of ulcer among the general population, and the picture would not be complicated in some groups by the presence of a preceding illness which might perhaps cause or exacerbate the ulcer. The survey covered 3,223 necropsies, and the proportions in different age groups are shown in Table III. Between the two sexes the incidence of gastric ulcer is remarkably equal, but duodenal ulcer is between two and three times commoner in men, and reflects clinical experience. The incidence of gastric ulcer increases steadily with age, but duodenal ulcer generally occurs more commonly in the 45-64 group than in the over-65 group. This accords with our population study and also with clinical studies from Norway (Knutsen and Selvaag, 1947).

This difference in trend with age would fit in with the hypothesis that duodenal ulcer has increased in incidence, but the generation over 65 have not been exposed in youth to the ulcerogenic influences to the same extent as in the younger generations.

In general, necropsy studies show that gastric and duodenal ulcers are approximately equal in incidence, although clinical practice suggests that duodenal ulcer is in appreciable excess. This may be due perhaps to gastric ulcers having a greater tendency to develop terminally with other illnesses. This factor can be excluded in those who have met a sudden death in an accident and in those who have committed suicide without a known preceding organic illness. Such cases have been analysed in this necropsy series (Table IV), and it is interesting to note that in men duodenal ulcer was twice as common as gastric ulcer.

TABLE IV.—Violence and Suicide

Age	No.	Ulcers and Scars			
		G.U.	D.U.	Total	%
Males					
<45	70	—	3	3	4.3
45—	67	2	5	7	10.4
65+	56	3	2	5	8.9
Females					
<45	31	—	—	—	—
45—	26	3	1	4	15.4
65+	43	6	2	8	18.6

Liability to Develop a Peptic Ulcer

Which members of the community are more liable than others to develop peptic ulceration? It is by studying the difference in incidence that clues may be found towards the aetiology of peptic ulcer. There are differences in the frequency of association with other diseases. There are striking differences in relation to possible environmental influences, as demonstrated by studies on geographical distribution, social class pattern, and occupation. There are also important differences relating to constitutional factors such as blood groups and gastric secretory activity. Finally, there is the significance of the anxiety factor with its interplay between environmental stress and temperament.

Hospital practice certainly suggests that chronic bronchitis and emphysema has a special tendency to be associated with peptic ulceration. This association has been noted previously by Weber and Gregg (1956) and by Latts, Cummins, and Zieve (1956), who found more than three times

TABLE V.—Presence of Peptic Ulcers and/or Scars

	Persons Total		Persons G.U.		Persons D.U.		Persons G.U. + D.U. and J.U.	
	Obs.	Exp.	Obs.	Exp.	Obs.	Exp.	Obs.	Exp.
Violence and suicide	27	36.7	14	19.3	13	16.7	—	0.7
Cardiovascular	231	222.8	139	137.2	89	81.0	3	4.6
Chronic bronchitis	51	35.5	27	21.8	20	12.9	4	0.8
Mental	20	24.1	17	16.2	3	7.5	—	0.4
Miscellaneous	134	143.9	86	88.6	46	52.8	2	2.5
	463	463.0	283	283.1	171	170.9	9	9.0

the expected number of ulcers at necropsy among those who were noted to have hypertrophic pulmonary emphysema. Further information has been collected on this point. In the coroner's necropsy survey, a higher incidence of both gastric and duodenal ulcer was found among persons in whom death was associated with bronchitis (Table V) ($\chi^2=10.2874$; $N=4$; $0.02 < P < 0.05$).

Environmental Factors

Environmental factors are associated with varying incidence of peptic ulcer, and this is considered in relation to geography, social class pattern, and occupation.

Geographical Incidence

Between different populations there appear to be striking differences in the incidence of gastric and duodenal ulcer, but our knowledge is based more on varying G.U./D.U. ratios and clinical impressions than on comparisons of absolute incidence from population surveys. In considering G.U./D.U. ratio it is of interest that only from one centre, a fishing community in North Norway, has an excess of gastric over duodenal ulcers been reported (Schanke, 1946). Elsewhere there is an excess of duodenal over gastric ulcers.

Within Great Britain there are striking differences, with a much lower G.U./D.U. ratio in Scotland than in London. Tidy (1944) found a disproportionate rise in the male mortality from duodenal ulcer in Scotland up to 1937. Striking differences in incidence of peptic ulcer have been reported in Nigeria (Konstam, 1954), in Malaya (Kouwenaar, 1930), and in India (Dogra, 1940). Dogra made a very careful clinical study of the peptic ulcer problem throughout India. He found peptic ulcer was fifteen times as common in Madras (South) as in the Punjab. Everywhere duodenal ulcer greatly exceeded the incidence of gastric ulcer, the D.U./G.U. ratio being 30:1 and the male/female ratio 18:1. In Southern India duodenal ulcer was a disease of the poor agricultural and labouring classes and affected all castes and creeds, but was rare in the upper classes.

On a brief visit to India I had the opportunity of discussing the ulcer problem with many doctors, and the geographical difference was certainly very striking between Travancore and Karachi, but peptic ulcer seemed comparatively common in Calcutta and Bombay. Duodenal ulcer in Southern India tends to stenose and not to bleed or perforate, and those working there do not think this can be explained only by inadequate transport facilities, but clearly this factor plays a part. The stenosed patients might come a hundred miles to the hospital, but not those who bleed or perforate. It seems difficult to correlate ulcer with the use of spices, but there may well be some other dietary factor.

Social Class Incidence

There are marked social-class differences in the incidence of peptic ulcer. Duodenal ulcers are evenly distributed throughout the entire population, but there is a noticeable deficiency of gastric ulcers in the professional groups and a striking excess among the labouring classes (Doll *et al.*, 1951). It is possible that these social-class differences may be one factor in producing the geographical differences in the ratio of gastric and duodenal ulcer. Between different countries, however, this social-class distribution may not be generally applicable and needs testing. It may be untrue for Southern India, where duodenal ulcer is particularly a disease of the very poor.

Occupational Incidence

From the occupational survey (Doll *et al.*, 1951) an increased incidence of duodenal ulcer was found among doctors and amongst men in responsible positions in industry, foremen, and business executives. There was also a residual group of unskilled workers with an increased incidence, but this may have been due to a sheltered employment chosen by ulcer subjects. Better diagnosis undoubtedly contributed

towards the high incidence among doctors, as there was a disproportionate number with melaena only as a presenting symptom, which led to a barium-meal examination being carried out. This would, however, suggest that the figures in other groups have been underestimated rather than overestimated. No confirmation was found for the widely held belief that bus drivers were particularly prone to the disease. Agricultural workers were found to have a remarkably low incidence due to a deficiency of duodenal ulcer.

Constitutional Factors

Constitutional factors concern sex, age, blood groups, hereditary factors, and gastric secretory activity, and these reveal interesting differences in peptic ulcer incidence.

Sex Incidence

Peptic ulcer is essentially a disease of men, approximately 80% of the cases being male. During the reproductive years of life women have a relative immunity which is particularly marked during pregnancy and which seems to decline at the time of the menopause (Clark, 1953). The overall peptic ulcer population, both in-patient and out-patient, at the Central Middlesex Hospital showed that the sex ratio varies with the type of ulcer (Jones and Poliak, 1945), and it is interesting to note that the acute ulcers which were diagnosed gastroscopically after haematemesis and melaena showed an approximately equal sex ratio. From further analysis of this and other data, Avery Jones and Doll (1953) have demonstrated that the sex ratio is nearly constant for each site irrespective of age, and they also concluded that the gastric and duodenal ulcers are between one and a half times as fatal in men as in women. This is at least in part explained by a lower tendency for acute perforation to occur in women, as shown by the very high male/female ratios in studies on this complication.

Age

The incidence of peptic ulcer varies in different age groups, but this must be distinguished from the expectation of developing an ulcer. From the age of onset of the observed ulcers in the population survey and the number of man-years lived in each age group, it was possible to calculate the annual expectation of developing an ulcer; this is almost constant, and is probably at its maximum between 35 and 64, giving a rate of 3.2 ulcers per 1,000 men. The impression that ulcers occur more often in young men is due to a failure to take into account the relative size of the population at risk.

Blood Groups

A most interesting recent discovery concerning peptic ulcer has been the correlation of this disease with blood groups. The possible presence of appreciable differences in health in persons differing in such innate attributes as blood groups was predicted by Fisher (1930), but the first convincing evidence of any such difference within the ABO system was the demonstration by Aird, Bentall, and Roberts (1953) when they showed the increased susceptibility to gastric cancer of group A persons compared to those in groups O and B, the difference in incidence being 22%. This was followed by a similar survey for proved cases of peptic ulcer in which group A and B persons were found to be less liable than group O, group A having a relative liability to peptic ulceration of 72% and the liability to duodenal ulceration being less than that to gastric ulceration (Aird *et al.*, 1953). These results were confirmed by Clarke *et al.* (1955), whose figures combined with those of Aird's showed an appreciable distinction between duodenal and gastric ulcer.

The blood-group substances are mucopolysaccharides. They are distinguished from each other by their antigenic properties. There does not appear to be a specific antigenic blood-group substance for blood group O, but those who belong to group O have a mucopolysaccharide called H substance which appears to be present to a less extent in people who belong to other blood groups. These mucopoly-

saccharides are present in small quantities in red corpuscles and in much greater amounts in body tissues and fluids, and usually in the salivary and gastric secretions.

There are two possibilities: their effect may be indirect or humoral and related to genetic control of gastric acidity; or their effect may be direct and cellular and concerned with varying tissue resistance to an exogenous ulcerogenic or carcinogenic factor, with blood group A protecting against ulcerogenic factors and blood group O protecting against carcinogenic agents. Aird (1955) has suggested that a protective action like this may be more important than is suggested by the relatively small differences which are found between the different groups. It might be, for example, that all the blood-group mucopolysaccharides protect against both cancer of the stomach and peptic ulcer but that groups O and B protect more efficiently against cancer than A, and that A and B protect more effectively against ulcer than O. Important studies are at present in progress by Clarke and his co-workers on the correlation between duodenal ulcer and the presence of mucopolysaccharides in the saliva. It appears that non-secretors have a 45% greater liability to develop duodenal ulcer (Clarke *et al.*, 1956).

Hereditary Factors

Another point of interest is the tendency for peptic ulcer to run in families. There is no doubt that the prevalence of ulcer is greater among the relatives of ulcer subjects than among the general population. There have been a number of reports of excess incidence of ulcer in the near relatives of ulcer subjects compared with controls, but the difficulty has been to overcome the objection that the patient with an ulcer is more likely to be interested in searching out similar cases in his family than the patient who is suffering from some entirely different disease. Using the population survey as a control, Doll and Buch (1950) have demonstrated an excess incidence among close relatives of ulcer subjects. There is also evidence for the independent inheritance of gastric and duodenal ulcers (Doll and Kellock, 1951). Thus relatives of gastric ulcer patients tend to have gastric ulcers, and this appears to hold for the site of the ulcer in different generations as well as the same generation.

The interpretation of this hereditary pattern is still in doubt. Is it due to hereditary altered tissue resistance or susceptibility or, as suggested by Kirsner and Palmer (1952), should the attention be directed to environmental factors and "hereditary habits" rather than to hereditary tendencies? More information is certainly required about the role of hereditary habits, and studies of twins will be needed to solve this aspect of the problem.

Hypersecretion of Acid

It seems likely that hypersecretion is one of the constitutional factors related to duodenal ulcers. Hypersecretion of acid may be due either to a great amount of acid produced from the same mass of secretory cells as in a normal person subjected to the same stimulus or, alternatively, it may be due to a greater mass of secretory cells which are responding to nervous hormonal stimuli with the same intensity as in a normal stomach. Work by Kay (1953) has thrown important light on this point. By increasing the dose of histamine stimulus to the stomach and neutralizing the systemic effects with an antihistamine, he demonstrated that the volume of the gastric response increased with increasing doses up to four times the normal body-weight dose, but thereafter more histamine produced the same volume as with four body-weight doses. It is a reasonable assumption that at this dosage level the total secretory cell mass is operating and the volume of gastric juice represents the maximum secretory capacity of the stomach. With this test there is clear evidence of hypersecretion in patients with duodenal ulcer.

Hunt and Kay (1954) next demonstrated that with the same body-weight dose of histamine the same percentage response was obtained in relation to the maximum secretory

capacity in both normal and duodenal ulcer subjects. Therefore there is no greater reactivity of the gastric mucosa in duodenal ulcer subjects than in normal persons, suggesting that the duodenal ulcer subject with hypersecretion has a greater secretory cell mass than the normal individual. Further confirmation of this view came from Cox (1952), who from measurement of the stomach at necropsy demonstrated that those with duodenal ulcer are particularly concentrated amongst the larger stomachs, and a correlation clearly exists with the number of parietal cells as judged by cell counts.

There may be two components to this greater secretory cell mass. It may be hereditary in the same way as an individual's limbs or trunk may vary in size, or there may be hyperplasia as the result of long-continued nervous or dietetic overstimulation.

Support for the hereditary component comes from Dr. L. Cooke, who, using basal-secretion studies, has found that the near relatives of duodenal ulcer subjects have a significantly increased incidence of hypersecretion as indicated by this test.

With gastric ulcer there is a tendency to hyposecretion, best demonstrated when ulcers associated with pyloro-duodenal stenosis are excluded (Daintree Johnson, 1955). The nocturnal fall in pH (unlike that in normal subjects) raises the possibility that the lower acidity is due to a greater secretion of the non-parietal alkaline component of gastric juice. Alternatively, it may reflect the greater incidence of gastritis in the body of the stomach in patients with gastric ulcer.

Anxiety and Personality

So far, various environmental and constitutional correlations with peptic ulcer have been studied but no reference has been made to the role of anxiety and personality. Here there is a close interplay between environmental stress and constitutional nervous factors determining the reaction of the individual to those stresses.

All clinicians are agreed that acute anxiety is a most significant factor in precipitating complications in peptic ulcer and that a chronic anxiety state tends to lead to intractability of the ulcer. It is not merely a question of acute anxiety, but with this there is the ability to "bottle up" an emotional tension—"worrying inwardly." It is sometimes difficult to appreciate the degree of frustration or resentment that may be hidden. In practice it is impossible to say how much of a relapse is due to nervous tension and how much to other concomitant aggravating factors, particularly physical fatigue from insomnia or over-long hours of work and increased smoking as a reaction to the stress. Fatigue is probably as important as anxiety in promoting exacerbation of ulcer symptoms, a point frequently confirmed by doctors who themselves suffer from peptic ulcer. Those who are more exposed to sustained anxiety by their work, such as doctors or those responsible for maintaining industrial output, will have a higher proportion of clinically manifest ulcers than those who lead protected, quiet lives.

Anxiety, frustration, resentment, fatigue, smoking, and irregular meals may determine whether or not an acute ulcer, initiated by other factors, will become chronic. They spell intractability, complications, and surgery. They are not the primary cause but important aggravating factors.

This recognition of the anxiety factor is not the same as postulating that peptic ulcer develops particularly in a section of the community with a particular personality pattern (Kellock, 1951). The thesis that peptic ulcers tend to develop especially in those who are oversensitive, overactive, and overconscientious rests on very insecure evidence. The anxiety factor promotes chronicity and complications, but the personality of ulcer subjects corresponds with the rest of the population.

Why has pyloro-duodenal ulcer become more prevalent in the past thirty years in this country? It is difficult to believe that life has become so much more worrying. The changing incidence of ulcer must mean that it is associated

somewhat with our mode of living. Perhaps it may prove to be correlated with the great increase in tobacco consumption.

Integration

It does not seem possible to integrate the many aetiological considerations into one neat explanation, and it is probable that peptic ulcer is the end-product of a variety of mechanisms. Furthermore, the independent behaviour of gastric and duodenal ulcer in relation to social class, occupational incidence, and hereditary and epidemiological factors does suggest that different mechanisms may be operating, although there may well be many factors common to both sites.

How can all the differences in incidence be related to the causation of peptic ulcer? First, there must be environmental factors which account for the changing incidence in this century and the varying incidence in different parts of the world. Secondly, there must be hereditary constitutional factors which help to determine the incidence and site of ulcers. These must include the secretory cell mass of the stomach and the blood groups. Some members of the community may have a special liability to duodenal ulcer by virtue of their specially generous endowment with parietal cells or because of their blood group.

From the pathological viewpoint there is less difficulty in explaining acute than in explaining chronic ulcers. Probably acute gastric lesions—small superficial ulcers—are very common and widely distributed over the stomach and duodenum, and normally heal rapidly. From the frequent presence of mucosal fragments in gastric aspirations such small lesions are known to occur (Hawksley and Cooray, 1948). Such small lesions may be part of the normal life-cycle of the epithelium or could be due to some cytotoxic factor analogous to aphthous ulcers in the mouth. It is also possible that local ischaemia from vascular spasm could cut off adequate supplies of carbon dioxide from actively secreting parietal cells, and this could lead to an intracellular necrotizing concentration of alkalis. Davis (1952) has produced experimental ulcers this way.

The real problem in peptic-ulcer pathology is, why do some ulcers become chronic? This may be due to, the presence of anti-healing factors, which could be either humoral or exogenous. The healing process could be modified by adrenal overactivity from mental or physical stress or by administration of cortisone or corticotrophin. This could operate either on cellular repair mechanisms or by modifying the physical character of mucus as suggested by Hirschowitz, Streeten, Pollard, and Boldt (1955). An impaired mucous barrier might allow cytotoxic factors within the stomach more ready access to the damaged mucosa. It is quite conceivable that anti-healing factors could be present in food and might determine the striking differences in geographical distribution. Tapioca root is the staple diet in Southern India and also in Southern Nigeria, where duodenal ulcers are so prevalent. Could the appreciable amounts of hydrocyanic acid in the root act as an anti-healing factor? Another possible anti-healing influence might arise from vascular constriction. In chronic ulcers the blood supply at the base of the ulcer may become so diminished by vascular occlusion that healing is no longer possible (Key, 1950). An earlier phase might be functional vasoconstriction from tobacco smoking.

Daintree Johnson (1955) believes that stasis in the stomach could be correlated with the development of gastric ulcer. Stasis in a jejunal loop or in the duodenum might also play a part as an anti-healing factor. Possibly the volume of secretion, and especially pooling, of gastric juice may have a greater anti-healing effect than the mere level of acidity. Stasis plus hypersecretion may be a particularly potent combination. In this connexion it is interesting to recall the observation of Zollinger and Ellison (1955), who found an association between the presence of non-insulin-secreting adenoma of the pancreas and sustained hypersecretion leading to stomal ulcer. Another mechanical factor might be

the force of the jet of gastric juice passing through the pylorus and impinging on the duodenal cap, and this in turn could be correlated with nervous tension reflected on gastric motor activity.

Gastric and duodenal ulcers can occur in lower animals but only rarely in the natural state. Natural selection would tend to eliminate animals prone to develop ulceration from unusual environmental factors. In man new personal habits, new foods, new drinks, new methods of cooking and food preparation, and changing feeding habits have come under the guise of civilization. The forces of natural selection have become blunted by medical science, and a disequilibrium now exists between man and his environment, and one of its manifestations is peptic ulcer.

[The second lecture, with a list of references, will appear in our next issue.]

REVIEW OF 464 CASES OF CARCINOMA OF LUNG TREATED BY RESECTION

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In his Lister lecture of 1947 Graham reported the first substantial series of cases of carcinoma of the lung treated by pneumonectomy. Since then numerous papers have recorded the results of individual surgeons or groups of surgeons in different parts of the world.

In Great Britain, Sellors, Cruickshank, and Billimoria (1947) reported a series, followed by Brock (1948), Mason (1949), Taylor and Waterhouse (1950), Price Thomas (1952), Sellors (1955), Bignall and Moon (1955), and Belcher (1956).

At the present moment surgical treatment, where possible, is generally accepted as the most satisfactory treatment for bronchial carcinoma. This involves removal of between a quarter and a half of the respiratory mechanism, and the ability of the patient to withstand the operation depends on the function of the remaining lung tissue and his cardiovascular system. In a heavy industrial and climatically severe region such as Liverpool, inflammatory and degenerative changes in the two systems, especially in the 40 to 60 age group, are likely to be more pronounced than in the districts where sedentary occupations and light industries predominate. That such changes will affect the results of surgery is only too obvious, and it is against this background that we have investigated the results of surgery in the Liverpool Region. As a regional centre, the thoracic unit undertakes most of the surgical treatment of cases in the area apart from the few that gravitate elsewhere. We have based the figures on the known incidence of the disease in this area as revealed by the Cancer Control Organization.

The basis for selection, and the operability, operative mortality, and survival rates vary from author to author, so that a true comparison of results is not readily available. To provide some measure of comparison we have

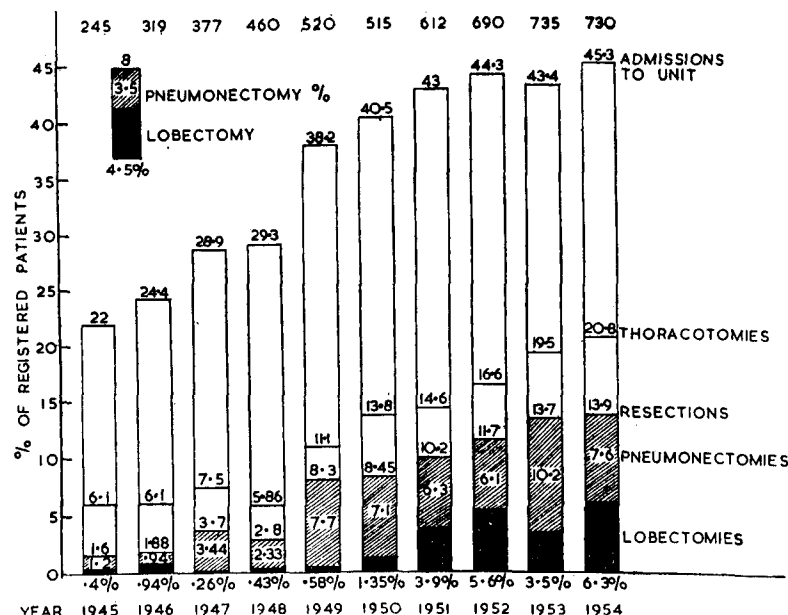


FIG. 1.—Carcinoma patients admitted to unit, thoracotomies performed, and tumours excised, expressed as percentages of patients registered each year by the Cancer Control Organization. (Proportions of patients treated by lobectomy or pneumonectomy represented by black and shaded columns respectively.)

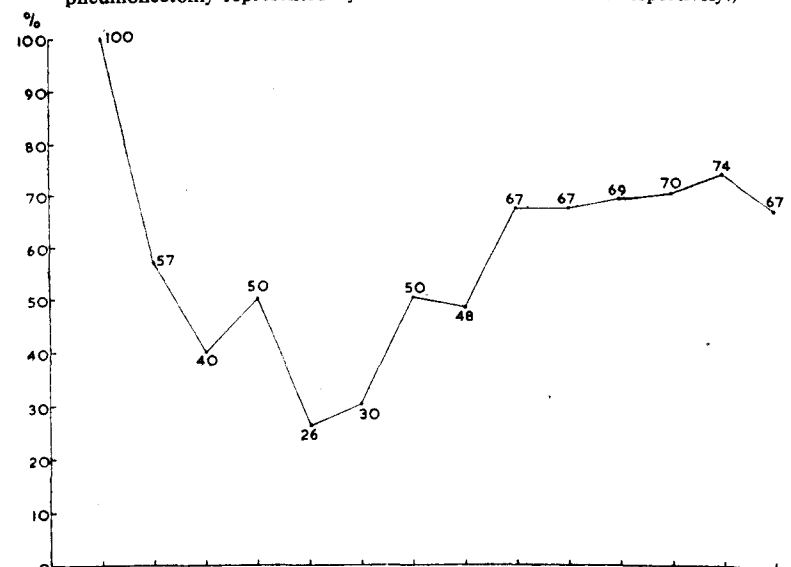


FIG. 2.—Proportion of thoracotomies in which resection was possible for each year from 1941 to 1954.

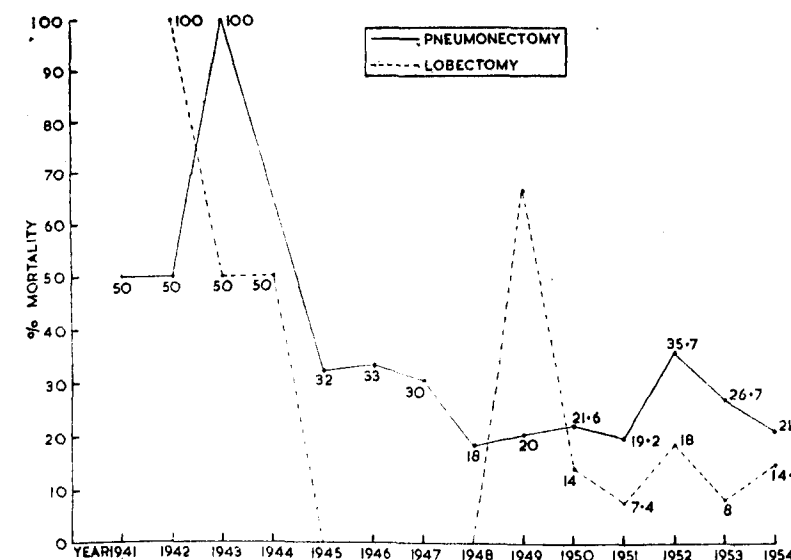


FIG. 3.—Annual operative mortality from pneumonectomy and lobectomy.

adopted the same criteria as Bignall and Moon (1955) and Belcher (1956) for the operative mortality, survival rate, and histological groups.

In December, 1955, we reviewed all the cases of bronchial carcinoma admitted to the Liverpool Thoracic Surgical Unit between 1941 and 1954. Figures are available for the cases registered each year by the Liverpool Cancer Control Organization from 1945 onwards, and these are quoted at the top of Fig. 1. The Organization covers substantially the same region as the Liverpool Thoracic Unit and gives a reliable figure for the known incidence of the disease for the area.

A total of 2,156 patients suffering from bronchial carcinoma were admitted to the unit, of which 7% were women. Of these, 714 were explored (33%) and from 464 (21%) the growths were removed.

Fig. 1 shows the annual percentages of registered patients who were admitted to the unit, were subjected to thoracotomy, and from whom the growth was excised. The relative proportions of lobectomies and pneumonectomies by which the tumour was removed are also shown (calculated to nearest 0.1%).

The proportion of notified cases admitted to the unit increased steadily from 22% in 1945 to 45% in 1954, whilst in the same period the numbers explored rose from 6.1% to 20.8%. Thus the thoracotomy rate increased from an average of 6.4% between 1945 and 1949 to 15% in the period 1950-2 and 20% in 1953-4. This is the natural result of earlier diagnosis, M.M.R. services, and improved clinical facilities, aided more recently by external diagnostic endoscopic clinics at which the obviously inoperable cases were eliminated.

Similarly, the numbers of patients from whom the growths were excised increased from 1.6% in 1945 to 13.9% in later years; there has therefore been approximately a ninefold improvement in the chance of a patient having his tumour removed.

Between 1941 and 1948 the average ratio of operable to inoperable growth was 3:4, but from 1949 onwards this averaged 7:3. Whilst the number of resections has increased from year to year, the relative proportions of pneumonectomies and lobectomies altered considerably, and, whereas pneumonectomy was the more usual operation prior to 1951, that year marked a change of policy, and in subsequent years the numbers of lobectomies increased considerably.

Not only does pneumonectomy carry a higher operative mortality than lobectomy, but the loss of a whole lung deprives the patient of a larger volume of functioning lung tissue, and this may lead to respiratory insufficiency

amounting in some cases to respiratory crippledness. With this in mind, it has been the policy to perform lobectomy in all possible cases, provided the basic criteria for effective removal of the tumours were fulfilled.

The proportion of thoracotomies in which removal of the tumour has been possible is shown in Fig. 2. This had increased since 1945, and though in later years it showed slight variations, during each of the last six years approximately 70% of the growths were removable. No doubt this figure could be improved by rejecting doubtful or borderline cases, but by so doing many patients would be deprived of the benefits of surgery.

Material.—The percentage of patients in quinquennial age groups was: under 45 years, 14.8%; 45-49, 18%; 50-54, 24.5%; 55-59, 23.7%; 60 and over, 19%. Of the 464 patients in whom resection of the tumour was possible, 448 were followed to death or for a minimum of one year.

Operative Mortality

Operative mortality is defined as the number of patients undergoing operation who died of any cause within two months, expressed as a percentage of the whole.

Of the 464 patients undergoing operation, 101 (21.7%) died within two months. Prior to 1948, 31% died, but as the number of operations and experience increased so the mortality fell to 21.5% for the years 1949 to 1954. The respective mortalities for pneumonectomy and lobectomy were 25.9% and 14.7%, showing that the former carried a higher operative risk.

Only 33 women underwent operation, and of these 12% died—a proportion much less than that for men.

Fig. 3 shows the annual variation in operative mortality for pneumonectomies and lobectomies. With the exception of peaks in 1943 and 1952, the mortality for the former declined from 50% in 1942 to 21% in 1954. Lobectomies showed more variation from year to year, but after 1950, when they were performed more often, the mortality became more uniform, with an average of 12.4%.

Comparison with Other Series.—Table I shows the operative mortality recorded by various authors. The mortality in the Liverpool series is strictly comparable only to that of Bignall and Moon, to whose criteria for operative mortality we adhered in calculating the operative deaths. As might be expected, the operative mortality for pneumonectomy has decreased from 53% in Graham's series (Table I) to 11% in Brock and Whytehead's series of "Radical Pneumonectomies," and, although Bignall and Moon reported no deaths from lobectomy, the average mortality for this operation ranges from 4.5 to 9% in the hands of different surgeons.

To determine, if possible, how operative risk could be reduced, we investigated the cause of death in all cases (Table II). The deaths are grouped into "early," occurring within 48 hours of operation, and "late," occurring after 48 hours but within two months, and we found that 42 patients (41.6% of deaths) died within 48 hours.

Accidental or technical difficulties accounted for 12.87% of deaths, coronary thrombosis or congestive failure caused 24.75%, pulmonary embolism and cerebral thrombosis accounted for 2.97% and 2.97% respectively, and a further group due to pulmonary oedema, insufficiency, or infection totalled 31.68%. No fewer than 62.37%, therefore, were due to pulmonary deficiency or vascular lesions of brain, heart, or lungs.

Putting this group into a category of "cardio-pulmonary failure" (C.P.F.), we have in Table III related the proportion of C.P.F. deaths to the total early and late deaths occurring after right and left pneumonectomies and lobectomies.

Whilst the numbers of right and left pneumonectomies were similar, there was a marked difference in the mortality

for the two sides, the right being nearly twice that of the left (33% against 17.3%). The numbers of lobectomies differed somewhat, and the contrast between the two sides was not so pronounced, but, even so, 16.3% of patients who had right lobectomies died, compared with 11.7% of left. When only the C.P.F. deaths are considered the contrast is even greater.

Bignall and Moon also found a higher mortality for right-sided operations (right 12%, left 8%), but thought chance played a part in the difference.

In our series the contrast was more marked, and we believe that the difference is too great for chance to be the only factor.

Table IV shows the proportion of operations and deaths due to pneumonectomy and lobectomy as they are distributed in quinquennial age groups. Deaths after lobectomy increased with age, but deaths after pneumonectomy showed

TABLE I.—Operative Mortality of Other Reported Series

Author	Resection	Mortality Rate
Graham (1947) ..	Pneumonectomy	53%
Rienhoff (1947) ..	"	22.3%
Sellers <i>et al.</i> (1947) ..	"	15%
Brock (1948) ..	"	18%
Mason (1949) ..	"	12.5% (within 1 month)
Taylor and Waterhouse (1950) ..	"	24.3% (within 3 months)
Sellers (1955) ..	Pneumonectomy (364)	24% (1940-8)
	Lobectomy (82)	9% (1948-50)
Brock and Whytehead (1955) ..	Radical pneumonectomy	11%
Bignall and Moon (1955) ..	Pneumonectomy	13% (1950-1)
	Lobectomy	0% (1950-1)
Belcher (1956) ..	Pneumonectomy	4.5%
	Lobectomy	25.9%
	Pneumonectomy	14.7%
	Lobectomy	19.2%
Liverpool (1956) ..	Pneumonectomy	7.4%
	Lobectomy	19.2%
	Total series	19.2%

TABLE II.—Cause of Death in "Early" and "Late" Phases

Cause	Early			Late			Total
	No.	Age Group	Av. Age	No.	Age Group	Av. Age	
D.O.T. ..	4	45-53	50				
Haemorrhage ..	4	44-50	47	2	63-64	63	12.87%
Shock ..	3	48-63	57				
Coronary thrombosis or congestive failure	9	47-66	51	16	51-68	60	24.75%
Pulmonary embolism	2	40-46	43	1		53	2.97%
Cerebral thrombosis	2	50-56	55	1		50	2.97%
Pulmonary oedema or insufficiency infection	10	45-59	55	8	45-60	53	17.82%
Metastasis ..	5	46-61	56	9	45-63	54	13.86%
Saddle embolus (tumour) ..	1		45	7	45-59	48.5	7.92%
Uraemia (prostatic) ..	1		57				0.99%
B.P. fistula ..				4	54-71	62	3.96%
Perf. D. ulcer ..				8	30-61	52.6	7.92%
Pericarditis ..	1		62	1	48-61	52	1.98%
Total ..	42			59			101

TABLE III.—Operative Mortality

Operation	Early		Late		Totals	
	C.P.F.	All	C.P.F.	All	C.P.F.	All
Pneumonectomies:						
Right (151) ..	12.8%	16.5%	11.2%	17.8%	24%	33%
Left (161) ..	4.3%	6.2%	6.2%	11.1%	10.3%	17.3%
Lobectomies:						
Right (85) ..	3.5%	5.8%	8.2%	10.3%	11.7%	16.3%
Left (51) ..	0%	2%	2%	9.8%	2%	11.8%

TABLE IV.—Effect of Age on Operative Mortality

Age Group	Whole Series (464)	Pneumonectomies. Deaths (81)	Lobectomies. Deaths (20)
Under 45 ..	15%	8.6%	0%
45-49 ..	18%	17.2%	10%
50-54 ..	24%	28.4%	20%
55-59 ..	23%	16%	30%
60+ ..	19%	29.6%	40%

considerable variation, being most frequent in the 50-54 and 60+ groups. Only 16% fell into the 55-59 group, and it is significant that this particular age group had the highest number of survivors of the operative phase and the best two-year and five-year survival rates.

Survival Rate

The survival rate has been calculated from the formula:

$$\frac{\text{Actual survival}}{\text{Possible survival}} \times 100$$

The fate of 347 patients who survived the arbitrary two months after operation has been reviewed. At the time of review 204 were known to be dead, and, except in those cases where the patient died in hospital and necropsy was possible, the cause of death was obtained from the practitioner who attended during the terminal illness.

The cause was unknown or unspecified in 15 (7.3%), but of the remainder, 152 (74%) died of recurrence or metastasis. Bronchopleural fistula (or sequelae), coronary disease, and pulmonary insufficiency accounted for 8.8%, 3.8%, and 2.4% respectively.

Malignancy was the cause of death of 76% of those who had lobectomy and of 74% of those who had pneumonectomy, 64% and 60% respectively within two years. The proportion of patients dying of malignant disease increased each month to a peak at 18 months, and, whilst four patients died of metastases five years after their pneumonectomy, no patient died of metastases later than three years after lobectomy. As is shown below, the peak at 18 months corresponds with the time at which nodal involvement began to affect survival rates.

The two-year survival rates for pneumonectomies and lobectomies were similar (44% and 45%), but the five-year rate for pneumonectomies (30%) was much more favourable than that for lobectomies (12.5%). Nevertheless, the lobectomy patients have probably survived in greater comfort.

Of the patients alive and well at the time of the survey, 10 had lived for five years, 9 for six, 3 for eight, 2 for nine, and 1 for ten years after pneumonectomy; a total of 25 out of the first 136 patients operated on since 1941 (100 of these survived operation).

Factors Affecting Survival

Table V shows little difference in the two-year and five-year survival rates for patients treated before and after 1948, so that the year of operation seems to have little effect on survival.

Position of Tumour

The tumours were distributed more or less equally between the right and left lungs (170 and 177), and the two-year survival rates were very similar. The five-year rates, however, were much better for right-sided tumours (34% against 22%). The distribution of individual histological types of tumour was even throughout all lobes and both lungs except the left lower lobe, which had 41% undifferentiated types, some 7% more than the average for both lungs. Nodal involvement occurred in 38% of left-sided tumours compared with only 28% of right-sided lesions. This factor, the higher proportion of undifferentiated tumours in the left lower lobe, and cross-lymphatic spread probably accounted for the poorer five-year rate for left-sided tumours.

The survival rates for individual lobes and their histological types were calculated (Table V, Figs. 4 and 5). The left upper lobe was most often involved and the right middle lobe least often. The latter was involved in only 12 cases, and none lived as long as three years after operation.

Of all lobes, the right lower carried the best prognosis, probably by reason of a slightly higher proportion of squamous tumours (Table VI, Fig. 4), a low rate of nodal

involvement (25%), the earlier incidence of symptoms, and the fact that, except in basal segmental tumours, it has been the practice to perform a middle and lower lobectomy in nearly all lower lobe tumours.

TABLE V.—Survival Rates for Patients Living More than Two Months After Operation Related to Period of Operation, Histological Type, Side, Lobe, Age, Sex, and Extent of Operation

	No.	Survival Rates (%)				
		1 Yr.	2 Yrs.	3 Yrs.	4 Yrs.	5 Yrs.
All patients	347	67	44.6	37	35	28
1941-8	33	70	48	36	36	30
1949-54	314	66	44.1	38	35	25
Squamous	192	71	54	47	43	38
Adenocarcinoma	35	68	31	30	20	—
Undifferentiated	120	57	35	29.3	29.3	19
Right lung	170	62	42	39	35	34
Left "	177	72	46	39	36	22
Right upper lobe	63	58	41	37	30	29
Squamous	34	62	55	56	50	37
Adenocarcinoma	12	64	27	22	14	—
Undifferentiated	17	50	27	27	19	28
Right lower lobe	87	69	53	50	46	38
Squamous	50	69	53	50	46	38
Adenocarcinoma	8	66	33	66	50	—
Undifferentiated	29	58	48	44	46	33
Right middle lobe	12	33	10	—	—	—
Left upper lobe	98	82	52	40	40	21
Squamous	55	90	60	56	50	36
Adenocarcinoma	9	77	27	20	25	9
Undifferentiated	34	69	44	28	31	22
Left lower lobe	74	63	38	28	27	22
Squamous	39	69	45	28	29	33
Adenocarcinoma	5	80	33	50	—	—
Undifferentiated	30	53	31	25	28	12
Men	318	68	45	39	37	29
Women	29	67	38	19	23	25
Pneumonectomy	233	64	45	39	37	29
Lobectomy	114	73	44	36	27	12.5
Age under 45	60 (17%)	66	38	38	30	23
45-49	64 (18.4%)	64	42	37	46	42
50-54	83 (23.9%)	72	50	40	32	25
55-59	86 (24.7%)	71	53	45	48	45
60-64	40 (11.5%)	52	33	25	30	—
65 and over	14 (4%)	60	33	33	14	—

TABLE VI.—Histological Type Related to Period of Operation, Site of Tumour, Sex, Age, Extent of Operation, Nodal Involvement, and Survivors

	Squamous		Undifferentiated		Adenocarcinoma		Total
	No.	%	No.	%	No.	%	
All patients	192	55	120	34	35	10	347
Right lung	95	56	54	32	21	12	170
Left "	97	55	66	37	14	8	177
Right upper lobe	34	55	17	27	11	18	62
" lower "	50	57	29	33	9	10	88
" middle "	5	42	6	50	1	8	12
Left upper lobe	55	56	34	35	9	9	98
" lower "	39	53	30	41	5	7	74
Right main bronchus	6	66	2	33	—	—	8
Left "	3	60	2	40	—	—	5
Men	182	56	105	34	31	10	318
Women	10	35	15	52	4	13	29
Pneumonectomy	130	55	86	37	17	7	233
Lobectomy	62	54	34	30	18	16	114
Age under 45	29	47	28	47	3	5	60
45-49	30	48	26	40	8	12	64
50-54	52	63	20	24	11	13	83
55-59	49	56	27	32	10	12	86
60-64	25	61	14	36	1	2.5	40
65 and over	7	50	5	35	2	14	14
Nodal histology:							
All known cases:							281
Nodes free	117	72	55	57	12	55	184
" involved	46	28	41	43	10	45	97
Two years or more since operation:							136
Nodes free	86	70	41	54	9	53	79
" involved	36	30	35	46	8	47	79
All surviving patients:							95
Nodes free	67	57	22	41	6	43	28
" involved	18	40	8	19	2	20	28

Nodal histology was known in 281 cases and survival time of these was from time of operation to time of survey.

The prognoses for left upper and lower lobe tumours, were similar, and were worse than for right-sided tumours, the reasons for this being a higher rate of nodal involvement (30% left upper, 49% left lower), a longer delay in the appearance of symptoms, and cross-lymphatic spread.

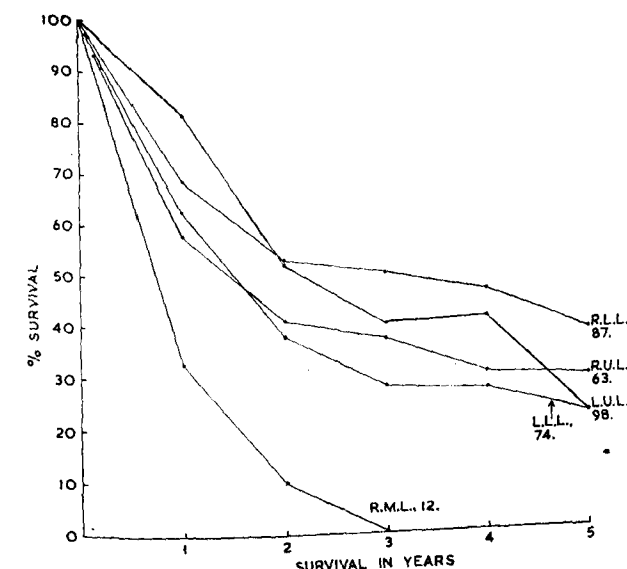


FIG. 4.—Survival rates in upper and lower lobes in both lungs.

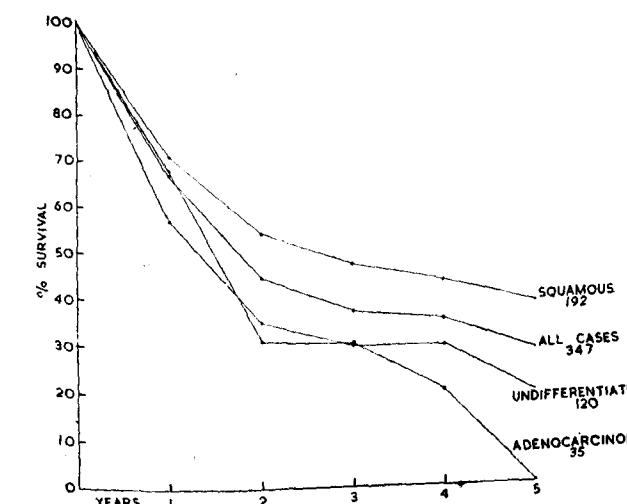


FIG. 5.—Survival rates in the three histological types of tumour.

Age and Sex

The best two- and five-year survival rates were found in the 55-59 quinquennium (53% and 45% respectively), the worst in the over-60 group, 33% of whom survived two years, but none to five years (Table V).

We found that whereas under 50 years of age the distribution of squamous tumours equalled the sum of the undifferentiated and adenocarcinomas—that is, the more malignant types—over this age squamous tumours amounted to 57% of the whole. Nodal involvement by tumour cells occurred in only 29% of patients in the 55-59 group compared with 45% under 45 years and 34% for all other ages. The higher proportion of squamous tumours and the low incidence of nodal involvement probably explains the good survival of the 55-59 group of patients.

In this series 81% of the patients over 60 died of "metastases" compared with 74% for the series as a whole, despite the fact that squamous tumours predominated. It is possible that some of these patients were labelled "metastatic deaths" when in fact death was due to vascular lesions associated with arteriosclerosis.

There were 33 women in the series, four of whom died from the operation. The two- and five-year survival rates were 38% and 25%, compared with 45% and 29% for men (Table V). Adenocarcinomas and undifferentiated carcinomas predominated—65% compared with 44% for men (Table VI)—and though the average age was lower the degree of nodal involvement was much the same. The poorer prognosis would appear to be related to the predominance of the more malignant types of tumour and possible delay in diagnosis, since bronchial carcinoma is less often anticipated in women.

Histological Type of Tumour

All biopsies, tumours, and lymph nodes were examined by the same team of pathologists from 1946 onwards, so that a uniform appraisal of cell types can be expected, and where a "mixed" tumour occurred the predominant cell type dictated the group into which it was placed (F. Whitwell, personal communication).

The histological type of tumour was known in 347 patients who survived the arbitrary two months' operation phase, and the broad classification into squamous, undifferentiated, and adenocarcinomas was adopted.

Table VI shows the distribution of cell types of the tumours in the two lungs, all lobes, main bronchi, type of operation, sex, age groups, nodes, and all survivors.

Squamous tumours occurred in 55% of all cases and behaved consistently in all lobes, with two- and five-year survival rates of 54% and 38% (Tables V and VI). The proportion of squamous tumours was rather lower than in the series recorded by Bignall and Moon, but the survival rate was similar. Nodal involvement occurred in 28% of all squamous tumours.

Undifferentiated tumours occurred in 34% of the patients, compared with 26% in Bignall's series, and, though the overall two-year rate was the same (35%) (Tables V and VI), the five-year rate was considerably less (19% compared with 26%). The prognosis for this type of tumour varied considerably from lobe to lobe, ranging from a two-year rate of 27% in the right upper lobe to 48% in the right lower lobe, with intermediate percentages of 44% and 31% for the left upper and lower lobes. The five-year rate was much better in the right lower and upper lobes (33% and 28%) than in the left (12% and 9%). Nodal involvement occurred in 43% of these tumours.

Adenocarcinomas behaved very differently in this series compared with those recorded by Belcher and by Bignall and Moon. They occurred in 9% of cases (10% of survivors), compared with 13% and 18% respectively. They were commoner in women, more frequently on the right side than the left, and in most cases were associated with hypertrophic pulmonary osteoarthropathy. Nodal involvement occurred in much the same proportion as in undifferentiated types of tumour—namely, 45%. The prognosis compared very unfavourably with the two series mentioned above, 31% surviving two years and 20% for four years; none lived five years (Table V).

Comparing the survival rates of lobectomies in our series, the two-year rate was only 31%, compared with 69% in Belcher's series of lobectomies.

We therefore found that squamous tumours had the best prognosis and adenocarcinomas to be by far the most malignant, both features contrasting strongly with the findings of Belcher and of Bignall and Moon.

Mediastinal and Hilar Nodal Metastases

In this series the involvement of hilar and mediastinal nodes by tumour cells has been investigated from the histological aspect rather than the surgeon's assessment of nodal involvement at operation. With few exceptions, deliberate clearance of mediastinal nodes has been practised since 1947, and most specimens have been examined histologically for evidence of involvement. Full reports were available for 215 specimens removed two years and 53 five years prior

to the time of review. No evidence of metastases was found in 184 cases, and the survival rates for two and five years were 60% and 33% respectively. Metastases occurred in 97 specimens (Table VII), the two- and five-year rates being 26% and 8%.

TABLE VII.—Patients Surviving Two Months After Operation Related to Year and Type of Operation, Histological Type of Tumour, Duration of Symptoms, and Presence of Nodal Metastases

	Pre-1951		1951		1952		1953		1954		
	No.	%	No.	%	No.	%	No.	%	No.	%	
All cases	101	47	54	23	51	23	72	31	69	—	347
2-yr. survivors	47	47	23	43	23	44	31	43	—	—	
Squamous	56	55	25	46	25	50	45	62	41	62	192
Undifferentiated and adenocarcinoma	45	45	29	54	26	50	27	38	28	40	155
Pneumectomy	85	84	30	56	26	51	52	74	40	58	233
Lobectomy	16	16	24	44	25	49	20	26	29	42	114
Average age (years)	50		54		51		51		55		
Av. duration of symptoms (months)	6.3		5.0		4.5		3.7		3.3		
All cases (months)	8.0		4.5		5.0		3.2		3.1		
Squamous											
Undifferentiated and adenocarcinoma											
Known nodal histology	53	52	44	83	46	85	72	100	66	96	281
Nodes free	40	75	31	70	27	59	38	53	48	73	184
Nodes involved	13	25	13	30	19	41	34	47	18	27	97
Survivors, nodes free*	13	29	11	38	14	50	22	60	35	73	95
Survivors, nodes involved	1	8	2	16	4	21	9	26	12	67	28
Squamous, nodes free	23	77	19	79	16	67	28	64	31	76	117
Squamous, nodes involved	7	23	5	21	8	33	16	36	10	24	46
Total squamous	30		24		24		44		41		163
Squamous, two-year survivors:											
Nodes free	15	65	10	53	12	75	18	64	—	—	55
Nodes involved	3	43	1	20	3	38	7	44	—	—	14
Total squamous	18	60	11	46	15	63	25	56	—	—	69
Adenocarcinoma and undifferentiated:											
Nodes free	17	74	12	60	11	50	10	36	17	68	67
Nodes involved	6	26	8	40	11	50	18	64	8	32	51
Undifferentiated only:											
Nodes free	15	71	11	73	10	53	5	26	14	70	55
Nodes involved	6	29	6	27	9	47	14	74	6	30	41

* Survivors in this group taken from time of operation to survey in December, 1955. Percentages corrected for histological type, age, sex, duration of symptoms, and extent of operation related to those with nodal involvement.

The two-year rates are identical with those of Bignall, and, though the five-year rates are lower, they show the same ratio of 4:1 in favour of those without metastases. Since his figures were based on the surgeons' assessment of nodal involvement, it would appear that macroscopic appearances compare closely with histological findings.

After correcting for any of the five other major factors which might affect survival—namely, sex, site, duration of symptoms, extent of operation, and histological type—the two-year rate for patients without evidence of metastases was still 60% and slightly lower at five years (29% compared with 33%). The different survival rates of those without compared with those with metastases is therefore very striking (Table VII).

When the one- and two-year survival rates were compared it became apparent that between these periods the effect of nodal involvement became manifest (Table VII). When no metastases were present the rate fell only from 73% to 60%, whereas in those cases with metastases, the rates fell from 67% to 26%. This corresponds to the period in which the highest number of deaths from metastases occurred—that is, 18 months. The advantage of metastasis-free nodes over involved nodes from two years onwards is approximately 2.5:1 up to four years, and at five years the ratio is better

at 3.7:1 (all figures corrected as before). Whilst nearly all the recorded metastatic deaths occur early, the results of finding no evidence of tumour deposits at operation are even more marked at five years than earlier.

The effect of nodal involvement on the survival rates of the three main histological types is shown in Tables VI and IX. Squamous tumours showed a survival rate (to the maximum period after operation) of 57% if the nodes were free from metastases. Even in the 28% of squamous tumours where nodes were involved, the survival rate was still as high as 40%.

Adenocarcinomas and undifferentiated tumours without nodal involvement had survival rates of just over 40%—that is, no better than squamous tumours already showing involvement. Forty per cent. showed nodal involvement and the survival rate was 20%.

Table VIII shows the relationship between the site of tumour and the state of the hilar nodes. Left lower lobe

TABLE VIII.—Condition of Lymph Nodes Related to Individual Lobes and Year of Operation

Lobe	Nodes	Operations			
		Pre-1953		All	
		No.	%	No.	%
Right upper	Free	26	65	31	65
	Involved	14	35	17	35
" middle	Free	5	71	7	78
	Involved	2	29	2	22
" lower	Free	39	72	53	75
	Involved	15	28	18	25
Main bronchus	Free	1	33	1	33
	Involved	2	67	2	67
Right lung	Free	72	68	92	70
	Involved	33	32	39	30
Left upper	Free	39	63	57	69
	Involved	23	37	26	31
" lower	Free	25	52	32	51
	Involved	23	48	31	49
Main bronchus	Free	—	—	2	40
	Involved	2	100	3	60
Left lung	Free	64	57	91	60
	Involved	48	43	60	40

tumours had nodal involvement in 49% of cases, probably accounting for the left lung showing metastases in 40% compared with 30% in the right side. The right middle and lower lobes had 78% and 75% free from metastases, and the left and right upper lobes occupied intermediate positions. The diminished survival rate for left lower lobes is thus accounted for without taking into consideration the assumption that lymph paths cross over to the right side (Rouvière, 1932).

The proportions of each histological type of tumour showing nodal involvement increased every year up to and including 1953, with the exception of adenocarcinomas. Since their numbers are small and we have found them similar in other respects, they are best considered along with the undifferentiated tumours (Table VII), and this combined group showed the greater increase of nodal involvement. Prior to 1951 the incidence of nodal involvement in the combined group was 26%, compared with 23% for squamous tumours, but in 1953 it increased to 64%, compared with 36% for squamous types. While, therefore, nodal involvement in squamous tumours increased only from 23% to 36%, the combined group actually reached nearly twice this figure.

Why this should happen is not clear; the duration of symptoms was shorter each year, suggesting that the tumours were being operated on at an earlier stage (see below). It is unlikely to be due to keener histological search, since the incidence decreased in all instances in the last year (1954), and although it could have been due to acceptance of patients with greater clinical likelihood of nodal involvement followed by retrenchment in 1954, when results in 1953 were found to be less satisfactory (see above), this is very unlikely. No satisfactory explanation is therefore forthcoming.

Duration of Symptoms Prior to Operation

The expectation of survival did not, as might be first supposed, bear a direct relation to the period for which symptoms had been present at the time of operation.

Like Bignall and Moon (1955), we found the best chance of survival among those with longer histories (over nine months), which had two- and five-year rates of 59% and 33%. Those with histories of less than six months had intermediate rates of 46% and 30%, whilst for those with symptoms of six to nine months the rates were the worst at 36% and 19% respectively (Table IX).

TABLE IX.—Duration of Symptoms Related to Histological Type of Tumour, Condition of Nodes, Two- and Five-year Survivors

	Under 6 Months		6 to 9 Months		Over 9 Months	
	No.	%	No.	%	No.	%
5 years total	54		27		15	
Surviving	16	30	5	19	5	33
2 years total	183		50		27	
Surviving	85	46	18	36	16	59
Nodes free	94	63	19	61	14	64
Nodes involved	56	37	12	39	8	36
Squamous	87	59	12	41	14	67
Adenocarcinoma plus undifferentiated	60	41	17	59	7	33

Nodal involvement remained remarkably constant in relation to the length of history, so that this factor was not in this instance responsible for the influence on survival (Table IX). Contrary to Bignall's finding, however, in our series the percentage of squamous tumours in the groups paralleled the survival rates closely, and the six-to-nine-months group was the only one with more adenocarcinomas and undifferentiated tumours. Also unlike him, as already noted, we found that the effect of duration of symptoms was as great on the five-year rates as on the two-year.

The tumour site had a similar distribution among the under-six-months and six-to-nine-months groups, but with fewer left lower lobe tumours in the over-nine-months group. Hence site has no effect on the two shorter periods, but may have contributed a little to the improved chance of survival in the longest group.

It would appear from our series that the superior survival rates in the patients with long or short histories compared with the intermediate group is mainly due to the inclusion of more patients with squamous tumours (Table IX).

We agree with Bignall that patients coming to operation early stand a better chance of having the tumour removed before metastases have occurred and that those with long histories have slower-growing types of tumour, and we likewise found the incidence of metastases was highest in those with histories of intermediate length.

The average duration of symptoms for patients coming to operation in succeeding years showed a steady reduction (Table VII). In 1953 this was two and a half months, or 40% of the pre-1951 figure, probably due to earlier diagnosis and more expeditious handling on the part of the practitioner, aided by improved thoracic surgical services generally.

Despite the reduction of the duration of symptoms, the two-year survival rate for any given year remained constant around 45% (Table VII), whereas with earlier diagnosis it should have improved. The survival rate has not been affected either by variation in the average age of patients operated on or by the proportions of total and subtotal operations performed (Table VII), since, though the latter varied from year to year, the two-year survival rate is the same for both types of operation (Table V). A practical answer to this is that the proportion of patients with involved nodes increased steadily from 25% pre-1951 to 47% in 1953, but fell again to 27% in 1954. The significance of this cannot be appreciated, as at the time of this review in December, 1955, the two-year survival rate for the patients treated in 1954 could not be calculated.

A similar effect might have resulted from an increased proportion of the more malignant types of tumour, but Table VII shows that, though it fluctuated, the proportion actually fell from 50% in 1952 to 38% in 1953. To offset this, squamous tumours showed more evidence of metastases in 1952 and 1953 with over 30% involvement, compared with just over 20% in 1951 and earlier. In 1954 it was 24%.

It would thus appear that the advantage gained by early operation was offset by the annually increasing frequency of nodal metastases up to 1953.

Extent of Operation

The two-year survival rates after pneumonectomy and lobectomy were practically equal with 45% and 44% respectively. The five-year rates (Table V), however, differed considerably with 29% and 12.5%. Squamous tumours were found equally after both types of operation, but adenocarcinomas slightly more often after lobectomy, at the expense of undifferentiated types. This might be expected, since adenocarcinomas tend to be peripheral and circumscribed (Table VI).

Nodal involvement was found after 39% of pneumonectomies and 27% of lobectomies; and in patients surviving pneumonectomy or lobectomy for two years nodes were found to be involved in 38% and 33% respectively. Of the patients living five years after pneumonectomy, only 25% were found to have nodes involved originally. The survival rates after both operations were similar up to three years, but, later, patients who had undergone pneumonectomy survived better; and, knowing that all those dying of carcinoma after lobectomy did so within three years, we have the impression that some of these might have lived longer with a pneumonectomy if this had been functionally possible.

The ultimate fate after lobectomy and pneumonectomy would seem to depend on the surgeon's appraisal of nodal involvement, especially in lower lobe tumours. There is, of course, a clear difference in operative risk and mortality for the two operations.

Discussion

Apart from purely symptomatic measures, the two main methods of treating bronchial carcinoma are radiotherapy and surgical excision. Bignall (1956) showed that, of 207 patients with and without mediastinal nodes treated by radiotherapy, 29% survived one year and 8% survived two years. Of 463 patients who received no treatment, only 8% survived one year and 6% two years.

We have shown that in the Liverpool Region, of 448 patients treated surgically over a period of 14 years, 53% lived one year and 35% lived two years, notwithstanding the fact that 30% of the survivors of the operation were found to have metastases in mediastinal or hilar lymph nodes. There is little doubt that, at the moment, surgical excision is the method of choice.

We have already shown that the proportion of registered cases treated successfully by surgery increased from 1.6% to 13.9% in 10 years and that the two-year survival rate remains in the region of 44%; therefore, roughly 6.2% of all patients with carcinoma of the lung have a chance of living two years with existing standards of diagnosis and surgical treatment, irrespective of the duration of symptoms.

Belcher (1956) has already emphasized the need for a conservative approach to lung resection in carcinoma cases to preserve adequate lung function, even to the extent of performing palliative lobectomy in cases with poor pulmonary function. The latter type of operation reduced the two-year survival rate from 52% to 33%.

Study of our operative results shows that pneumonectomy is twice as lethal an operation as lobectomy and that on the right side is even more so than that on the left. Robinson *et al.* (1956) found, despite an overall younger age group, that in tuberculous patients 31% died after right pneumonectomy compared with 7% after left pneumonectomy. They noted

that resection on the right side for all types of operation was three times as lethal as on the left side. We felt the marked difference between the two sides was due solely to the relative volumes of the two lungs and to the subsequent effects of mediastinal displacement on the heart and remaining lung after right-sided resection.

Accepting the need for conservative resection, the problem at operation is how little lung can be removed and yet give a hope of a five-year cure?

Provided the anatomical situation of the tumour makes lobectomy a reasonable operation, the decision between performing a total or a subtotal operation must depend on nodal involvement as assessed at the time of operation. The upper lobe tumours present less of a problem than lower lobe lesions in that those with mediastinal nodal involvement have already metastasized and pneumonectomy will be no more radical a procedure than lobectomy. Study of 21 patients who had upper lobectomy and died of metastases showed that with two exceptions all were dead within two years—that is, within the period when nodal metastases usually affect prognosis. There is no reason to believe that these would have survived any longer after pneumonectomy even if they survived the major operation.

Lower lobe tumours are more difficult, especially on the left side, where we found 50% with nodal involvement compared with 25% on the right. Of the patients dying of metastases after lower and middle lobectomies, 22 had tumours in the lower lobes and four in the middle lobe. All the latter died within 12 months, and with two exceptions all those who had lower lobectomies were dead within 23 months. They thus survived about the same length of time as the patients after upper lobectomy. It is conceivable that right pneumonectomy might save a few more patients with lower lobe tumours, but, in view of Rouvière's (1932) work on lymphatic drainage from the left lower lobe, it is doubtful whether left pneumonectomy would have eliminated metastases, particularly if the subcarinal nodes were involved. It would be good fortune if no cancer cells had passed through to the right side by the time the node showed involvement.

We found, despite the reduction in the duration of symptoms, that the two-year survival rate has remained constant, about 45%, and concluded that this was due to increasing nodal involvement, particularly by squamous tumours. The proportion of lobectomies performed since 1951 (except 1953) has been over 40%, and the fact that the two-year rate has remained steady despite an annual increase of nodal involvement suggests that adequate gland removal has been obtained with the less extensive operation in most cases. We feel, therefore, that when the site of tumour and nodal involvement permits of lobectomy this operation is preferable because it preserves lung function and usually provides an adequate removal of the tumour and attendant lymph nodes.

Summary

The fate of 2,156 patients suffering from bronchial carcinoma admitted to the Liverpool Thoracic Surgical Unit has been studied and related to the known cases registered by the Cancer Control Organization.

714 patients were explored and 464 tumours resected; 448 patients were followed to death or survival for a minimum of one year.

347 survived the arbitrary operative phase and 45% and 28% survived for two and five years respectively.

The cause of operative deaths has been analysed and 62.37% found to be due to "cardio-pulmonary failure."

Right-sided operations were more lethal than left, especially for pneumonectomy, and more so when deaths were due to cardio-pulmonary failure.

The quinquennial age group 55 to 59 years made up 24% of all survivors; they had the lowest mortality after

pneumonectomy and had the best two-year and five-year survival rates of 53% and 45% respectively.

Patients with growths in the right lower lobes had the earliest symptoms, the lowest incidence of nodal involvement, and the best five-year survival rate for both squamous and undifferentiated tumours.

Left lower lobe tumours had the highest nodal involvement and the highest proportion of undifferentiated tumours, but the survival rate was similar to the left upper lobe.

Adenocarcinoma appeared to be the most malignant type of tumour, though nodal involvement was no higher than with undifferentiated types.

Despite earlier operation in relation to symptoms, the two-year survival rate has hardly changed, probably owing to the increasing incidence of nodal metastases.

We thank all members of the Liverpool Thoracic Surgical Unit for the use of their case notes; the medical practitioners for their co-operation; Drs. J. S. Fulton and M. A. Stewart, of the Cancer Control Organization, and Mr. F. Ronald Edwards and Dr. O. F. Thomas for their advice and criticism; Mr. G. Wilkins for the preparation of the figures; and Mrs. D. Anthony and Miss J. Peet for undertaking work outside their normal secretarial duties.

REFERENCES

- Beicher, J. R. (1956). *Lancet*, 1, 349.
Bignall, J. R. (1956). *Ibid.*, 1, 876.
— and Moon, A. J. (1955). *Thorax*, 10, 183.
Brock, R. C. (1948). *British Medical Journal*, 2, 737.
— and Whytehead, L. L. (1955). *Brit. J. Surg.*, 43, 8.
Graham, Everts A. (1947). *Ann. Roy. Coll. Surg. Engl.*, 1, 248.
Mason, G. A. (1949). *Lancet*, 2, 587.
Rienhoff, W. F. (1947). *Ann. Surg.*, 125, 541.
Robinson, J. L. Jones, J. C., Meyer, B. W., and Franklin, S. R. (1956). *Amer. Rev. Tuberc.*, 73, 690.
Rouvière, H. (1932). *Anatomie des lymphatiques de l'homme*. Masson, Paris.
Sellers, T. H. (1955). *British Medical Journal*, 1, 445.
Cruikshank, G., and Billimoria, B. R. (1947). *Lancet*, 2, 119.
Taylor, A. B., and Waterhouse, J. A. H. (1950). *Thorax*, 5, 257.
Thomas, C. P. (1952). *Ann. Roy. Coll. Surg. Engl.*, 11, 205.

COMPRESSION OF MEDIAN NERVE IN CARPAL TUNNEL AND ITS RELATION TO ACROPARAESTHESIAE

BY

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The purpose of this paper, which is based on a study of 53 patients with acroparaesthesiae, is to present information concerning the diagnosis, prognosis, and treatment of this condition and to discuss its underlying mechanism.

Schulze (1893) introduced the term "acroparaesthesiae" to describe nocturnal attacks of pain and paraesthesiae that affect the hands of middle-aged women. Wilson (1913) reported the syndrome, often with partial thenar atrophy and objective sensory loss over the digits, in association with cervical rib. Walshe (1945), however, stated that muscular wasting does not occur and the objective sensory loss is exceptional, though when the pain and paraesthesiae are maximal there may be some blunting of cutaneous sensibility over the digits. The most constant feature was, he considered, tenderness over the extensor muscles of the fore-

arm and sometimes over the thenar and adductor muscles of the thumb. He concluded: "... that traction and compression of the lower trunk of the brachial plexus and possibly also of the subclavian artery are the essential mechanical factors underlying most, if perhaps not all, cases of acroparaesthesia in women, that these factors are caused by sagging of the shoulder girdle, and this, in turn, is a natural consequence of an atonic supporting musculature." More recently, Walshe (1951) reaffirmed this contention and discussed the importance of structural and functional abnormalities of the thoracic inlet.

Brain, Wright, and Wilkinson (1947) described the cases of six women, three of whom had acroparaesthesiae, with signs indicative of a lesion affecting the median nerve in the carpal tunnel. At operation they were found to have swelling of the median nerve proximal to the transverse carpal ligament, and in some, where it lay beneath this structure, there was evidence of direct compression of the nerve. Relief of symptoms and improvement of the neurological deficit followed a decompressive operation. McArdle (1951) was the first to suggest that this mechanism was responsible for the production of acroparaesthesiae, and Kremer, Gilliatt, Golding, and Wilson (1953) reported the complete relief of all symptoms in 37 out of 40 cases submitted to surgery; re-exploration of the three who did not obtain benefit showed that the transverse carpal ligament had not been fully divided in two, whilst the last had a cyst attached to the flexor tendons within the carpal tunnel. Gilliatt and Wilson (1953) provided further evidence of a median-nerve lesion in their patients by the study of ischaemic paraesthesiae and sensory fading. Occlusion of the brachial artery was effected by a pneumatic cuff inflated to above arterial pressure. Patients with acroparaesthesiae developed intense tingling in the median distribution within 30 to 60 seconds, and if ischaemia was maintained a number were found to have cutaneous sensory loss in the same territory within 10 minutes.

In spite of this work Ford (1956) writes of acroparaesthesiae: "The fact that there is never any evidence of nerve root damage, even after symptoms have been present for many years, seems to be very strong evidence against the possibility that the symptoms are neurogenic." He preferred to call the condition the "tired arm syndrome," and suggested that it arose from an accumulation of metabolites in fatigued muscle.

Material and Methods

Patients were accepted for the present series who complained of attacks, lasting from minutes to hours, in which they experienced various combinations of pain and paraesthesiae in the digits and palm of one or both hands. Radiation of pain to the forearm and arm was recognized as a variant of the syndrome. Some patients had no objective neurological deficit, others had motor and sensory signs distal to the wrist. The finding of any other neurological abnormality, such as an alteration in the state of the deep tendon reflexes, necessitated rejection from the series.

Fifty-three patients fulfilled these requirements, and between the years 1949 and 1956 inclusive were diagnosed consecutively as suffering from acroparaesthesiae or compression of the median nerve in the carpal tunnel. Of these, 38 attended the department of neurology in the General Infirmary at Leeds, and 15 were seen in private consultant practice by one of us (H.G.).

Details of the treatment and the follow-up are described below. In addition to the routine questioning and exami-

nation, ischaemic sensory tests were carried out on eight patients before treatment and on 43 during the course of the follow-up. A pneumatic cuff was wrapped round the arm and inflated to a pressure of 220 mm. Hg, which was in all instances above arterial pressure. The patient was asked to describe any sensory symptoms affecting the digits or hand that might follow this procedure during the next two minutes. In the greater number the occlusion of the brachial artery was maintained for up to 10 minutes, and sensation over the volar surface of the digits and palm was tested with a pin at two-minute intervals. At the end of this time, if no abnormality was detected, two-point discrimination was tested over the tips of the digits before the cuff was released.

Clinical Features

The number of cases diagnosed in each year is shown in Table I. It can be seen that the annual incidence has steadily increased since 1953. The 53 patients (46 women and 7 men) were between the ages of 18 and 76. In about

TABLE I.—Number of Examples of Acroparaesthesiae Diagnosed Each Year

1949	1950	1951	1952	1953	1954	1955	1956, First Nine Months
1	2	0	2	5	8	18	17

a half of them symptoms began during the fifth and sixth decades, and there was a second, but smaller, peak in the age distribution between the 25th and 30th years. Possible predisposing factors included the following.

Occupational Stress.—Thirty-eight of the women patients, who were either housewives or were engaged in domestic work, related the onset of symptoms to a period of increased activity. Many had noticed improvement after a holiday and had relapsed when they resumed their duties. Tasks which were especially prone to provoke symptoms included heavy lifting, polishing, washing, and knitting. Four men first made complaint after a change of work to a postman, wirewinder, gardener, and pneumatic driller respectively.

Trauma.—In three patients the onset occurred immediately after a fall upon the outstretched hand; one sustained a Colles fracture, one a posterior dislocation of the lower third of the ulna, whilst the last had no bony injury. Another had lacerated her wrist by pushing it through a window.

Arthropathy of Wrist.—Radiographs of the wrist were taken in eight cases and were normal in four. A gross osteoarthritis of the wrist-joints affected three elderly patients, which was most marked on the side of the neurological symptoms; one other had extensive rheumatoid arthritis of the hands.

Pregnancy.—Symptoms came on during pregnancy for the first time in one patient and a relapse ensued in another.

Symptoms

The duration of symptoms was from six weeks to fifteen years. The right hand was first affected in 34 patients, and with one exception all were right-handed persons; in 18 the condition became bilateral within a matter of months. Symptoms began in the left hand in 10 and in five remained unilateral; four patients were left-handed, two sustained an injury to the left wrist, and one held a pneumatic drill in the left hand. In nine both sides were affected simultaneously.

Method of Presentation.—In 45 cases the first intimation that anything was wrong came as a nocturnal attack of either pain, paraesthesiae, or both, referred to the digits and palm. Most often this awakened the patient in the small hours of the morning, and lasted for 10 to 30 minutes. With the passage of time these episodes became more frequent and more severe until there was a more or less continuous background of discomfort throughout the day. In the other eight cases the symptoms began

insidiously and were both persistent and steadily progressive, though punctuated at intervals by diurnal and nocturnal attacks similar to those described.

Pain.—Thirty-six patients complained of pain in the digits and a greater or lesser portion of the adjacent palm. The little finger was involved in only three, all of whom were poor witnesses of fact. In the remainder the distribution was the first four digits (16), the first three digits (13), the first two digits (1), the index and middle fingers (2), and the index, middle, and ring fingers with sparing of the thumb (1). The pain was described as "bursting" or "burning," and it radiated centripetally in 13 to involve the forearm and in six the arm. The seven who had digital paraesthesiae without pain complained of dull ache in the forearm and arm.

Paraesthesiae.—Forty-one patients complained of a disagreeable "pricking" or "tingling" sensation and 22 of "numbness" in the digits. Eight of these did not have digital pain, but when pain and paraesthesiae occurred together the site of reference was, with minor variations, the same and always within the distribution of the median nerve.

Other Complaints.—Ten patients, all of whom had suffered for more than six months, complained of slight weakness of the hand, and three of these had noticed wasting of the thenar eminence. Five others stated that during the height of an attack their fingers turned "white," and another had noticed excessive sweating of the median two-thirds of the hand.

Physical Signs

In eight patients the hands were objectively normal. Careful examination in the remainder revealed a slight-to-moderate neurological deficit, and when symptoms were bilateral there was seldom any major difference between the physical signs on the two sides.

Motor System.—Eighteen patients had wasting of the thenar muscles. Fasciculation was not seen, nor was there any tenderness of muscles of the thenar eminence, forearm, or arm. The scapular muscles were normal and drooping of the shoulder-girdles was not evident. Relative weakness of the abductor pollicis brevis was detected in 36, and opposition of the thumb, as judged by internal rotation of the first digit, seemed to be defective in many.

Sensory System.—A slight alteration of cutaneous sensibility was found in 29; this consisted of relative hypalgesia, hypaesthesia, and impairment of two-point discrimination in 21, while 7 stated that a pin-prick felt abnormally sharp. Delimitation of minimal sensory change over the palm was often difficult owing to the thickness of the skin, but the incidence with which various digits were affected is shown in Table II. It will be seen that in all cases the abnormality was within the cutaneous distribution of the median nerve.

TABLE II.—Frequency and Distribution of Cutaneous Sensory Impairment

Designation of Affected Digit					No. of Patients
1	2	3	4	5	
1	1	1	1	0	3
1	1	1	1	0	18
1	1	1	0	0	6
0	0	1	1	0	2

Special Investigations

Electromyography.—In six patients electrical examination was made of the first dorsal interosseous, thenar, and hypothenar muscles and extensor muscles of the fingers and forearm. In two the findings were normal, in four there were changes indicative of denervation of muscles supplied by the median nerve below the wrist.

Compression of Wrist.—Digital pressure was applied to the volar aspect of the wrist over the transverse carpal ligament in five patients and was maintained for three minutes. This manoeuvre provoked an attack of acroparaesthesiae in three and in two was without effect.

Occlusion of Brachial Artery.—The methods of studying ischaemic paraesthesiae and sensory fading have already been described. Six out of eight patients tested in this way developed intense paraesthesiae, and, of this number, four exhibited cutaneous sensory impairment within the distribution of the median nerve.

Radiographs of Cervical Spine.—Plain radiographs of the cervical spine were taken in six patients, and were normal in five. One was found to have bilateral cervical ribs.

Treatment

Most of the earlier patients were advised to have surgical treatment, and 53 operations were done on 35 patients. One of these had been submitted previously to a two-stage removal of bilateral cervical ribs, from which she had obtained no benefit.

Operative Technique.—Under a general anaesthetic the transverse carpal ligament was exposed through an incision passing along the longitudinal palmar crease at the base of the thumb and up to the transverse crease in front of the wrist to the region of the pisiform bone. This gave a palmar flap large enough to expose the transverse carpal ligament, which was approached through a small longitudinal incision through the palmar fascia in the midline and divided. In some patients the skin incision was extended proximally along the ulnar border of the forearm in order to inspect the median nerve at this site.

Operative Observations.—No abnormality was seen at 29 operations, but at 20 the median nerve was swollen to about twice its normal diameter for between 1 and 3 inches (2.5 and 7.5 cm.) proximal to the transverse carpal ligament; after division of this structure the swelling subsided within a few minutes. In nine of these, and in two where the nerve was not swollen, the median nerve was flattened over that portion of its length where it lay behind and adjacent to the transverse carpal ligament; distal to this ligament the normal convexity of the nerve reappeared (see Figure). In



Compression of the median nerve in the carpal tunnel. The anterior carpal ligament has been divided, showing constriction of the median nerve beneath the ligament with swelling of the nerve proximal to the point of compression. (By kind permission of Sir Reginald Watson-Jones, who performed the operation at the London Hospital. Photographed by R. F. Ruddick.)

eight operations this abnormality persisted, but in three the nerve regained its normal rounded appearance by the end of the procedure. All of these patients had suffered from symptoms for more than six months, many for several years, and all had a moderate neurological deficit. One case requires further description.

Case 1.—In September, 1950, a woman aged 47 had sustained a laceration to the volar surface of the right wrist which had severed some of the flexor tendons and "nicked" the median nerve just above the annular ligament. Primary suture of the tendons and of the nerve was carried out, but in March, 1954,

the wound was re-explored on account of local pain, and a small lateral neuroma of the median nerve was excised. The results of this procedure were initially satisfactory, for power was preserved and the pain relieved, though there was some sensory loss over the territory of the median nerve in the hand. In October she began to have nocturnal attacks of burning pain and paraesthesiae in the median four digits of both hands, but worse on the right side. These became more severe and more frequent until November, 1954, when she was admitted to hospital. Both carpal tunnels were explored; on the left no abnormality was found, on the right silk sutures were removed from the median nerve, which appeared to be otherwise healthy.

Medical Treatment.—Eighteen patients were advised to rest the affected hand as much as possible and to avoid those tasks which were known from experience to provoke symptoms. No other treatment was given.

Results in Surgically Treated Cases

A follow-up of 33 of the 35 patients submitted to surgery had been carried out by one of us (J.P.P.B.) up to the time of writing. The intervals between operation and final assessment were from two months to seven years; 24 were followed up for more than six months, 13 for more than a year. Two patients were followed-up for only three months, and thereafter postal information was obtained from one, and one was untraced. Of the 18 patients who had bilateral operations, 10 obtained complete relief of all symptoms in both hands and three on one hand alone. The latter include one with slight weakness of a hand, one who has persistent aching pain in the forearm and arm, and one who complains of pain in the wrist (Case 1). Three patients, two of whom were elderly valetudinarians, have slight and intermittent tingling of two or more digits on both sides; the case of the third of these follows:

Case 2.—In December, 1955, a woman aged 52 experienced attacks of burning pain, tingling, and numbness affecting the median four digits of both hands which came on at night. In April, 1956, examination showed slight weakness of the abductor pollicis brevis and a minimal hypalgesia over the cutaneous sensory distribution of the median nerve on both sides. Both transverse carpal ligaments were divided and the patient became symptom-free for two months. Thereafter she developed tingling in the ulnar two digits of both hands and difficulty in walking. In September, 1956, examination showed painful restriction of all cervical movements, cutaneous sensory loss in the dermatomes C8-T1 on both sides, and a mild spastic paraplegia. A diagnosis was made of cervical root and cord compression from cervical spondylosis which was demonstrated on plain radiographs.

Of the 17 patients who had a single operation, 11 became symptom-free. The remainder enjoyed a great measure of improvement, but three complained of slight weakness of the hand, two experienced occasional and mild paraesthesiae of two or more digits, and one had pain in the region of the fifth metacarpal which came on after a fall.

With two exceptions, Cases 1 and 2, all were well satisfied with the result, all returned to a normal life, and none had more than minimal symptoms. Indeed, one who did not obtain complete relief of symptoms had returned to his work at the coal-face within seven weeks of an operation on his right wrist.

Before treatment 19 had sensory impairment; 29 had weakness, and of these 10 had wasting of the thenar eminence. After operation sensory loss was found in two and relative weakness in three, two of whom also had some wasting of the thenar eminence. No patient without physical signs before operation developed a neurological deficit after treatment. From the clinical aspect it remains to be said that about half complained of pain and swelling at the site of operation for a few weeks, but this was seldom troublesome and never persistent. Eight experienced aching or tingling in the scar which was precipitated by local pressure or by cold. Cheloid formation did not occur.

Ischaemic paraesthesiae were studied in 29 patients on both sides and the results were normal in 21. Eight, six of whom had been followed up for less than four months, complained of paraesthesiae in the territory of the median

nerve on one side within two minutes. Ischaemic sensory fading was tested in 22 of the above 29 on both limbs, and no abnormality was found in 19; two developed sensory loss in the median territory on the treated hand and one on the untreated hand within 10 minutes.

Results in Medically Treated Cases

A complete and personal follow-up was done on 17 of the 18 patients after intervals of one month to six years; 14 were followed for more than six months and 10 for more than a year. One other was followed for three months only, and since that time has remained untraced. One of the 18 had suffered from increasingly severe nocturnal attacks of acroparaesthesiae for two years and had obtained no benefit from rest; bilateral operations were done at another hospital, and since that time she has been symptom-free; she now has no objective deficit, and ischaemic sensory tests are normal.

Of eight patients who had bilateral symptoms, three have symptomatic relief, but any attempt to return to normal work or household duties results in a relapse, one has improved, and four continue to have nocturnal attacks three or four times a week. Of the nine who had unilateral symptoms, five are symptom-free so long as they avoid tasks which involve flexion and extension of the wrist; three continue to have nocturnal attacks of severe pain and tingling.

Of the eight with an initial sensory deficit, five regained normal sensation, but in three impairment of sensation appeared during the period of observation. Normal muscle bulk was restored in three out of seven who had partial thenar atrophy, but the wasting increased in four. Weakness of the abductor pollicis brevis improved in four out of seven but appeared for the first time in two others.

Ischaemic paraesthesiae were studied in both hands in 14 patients and the results were normal in six; paraesthesiae in the territory of the median nerve appeared in six on both sides and in two on one side within two minutes. Ischaemic sensory fading was studied in 10 of the above 14 patients on both sides; sensation in the territory of the median nerve became impaired in two on both sides and in six on one side within 10 minutes.

None of these patients were able to lead unrestricted lives and seven continued to suffer from frequent nocturnal attacks of pain and paraesthesiae.

Discussion and Conclusions

All the evidence obtained by the present analysis of 53 patients with acroparaesthesiae suggests that the underlying mechanism is compression of the median nerve in the carpal tunnel. The dominant symptoms of pain and paraesthesiae are almost invariably referred to the cutaneous territory of the median nerve, and, though there may be no objective neurological deficit, when such exists it provides additional support for this localization of the lesion. The centripetal radiation of pain is an observed but unexplained fact. When electromyography and ischaemic sensory tests are carried out there is additional support for the contention, and to this must be added the operative findings and the symptomatic relief which follows surgical treatment. For these reasons we cannot agree with Ford (1956) that acroparaesthesiae results from the accumulation of metabolites in fatigued muscle, nor yet with Walshe (1945, 1951) that the condition is determined by structural or functional abnormalities of the thoracic inlet. Indeed, it is notable that the one patient who had bilateral cervical ribs obtained no benefit from their removal, whilst she became free from all symptoms after surgical division of the transverse carpal ligaments.

Garland (1955) has remarked on the predominance of women in all series of median nerve palsy whilst in other peripheral nerve palsies the greater number are men. This may be related to the smaller size of the carpal tunnel in women and to occupational factors. Brain *et al.* (1947)

have shown that pressure within the carpal tunnel is greatest when the wrist is extended, and this posture is especially associated with such household tasks as polishing, knitting, and scrubbing; indeed, it is these activities that provoke symptoms in patients with acroparaesthesiae. The occasional onset or relapse in pregnancy may be aggravated by narrowing of the carpal tunnel by fluid retention. The mechanical nature of the malady is emphasized further by the frequency with which the dominant hand is first affected, and when this does not obtain other factors such as osteoarthropathy of the wrist, trauma, or the nature of employment may be incriminated. These contributory factors are especially common when men are affected.

When surgery is employed it is most inadvisable to adopt the straight longitudinal incision along the midline of the volar aspect of the forearm. This crosses the joint flexure at right angles and pays no attention to the tension lines in skin. Nearly all the patients are women, and it is a surgical solecism to inflict a scar which will in all likelihood produce a cheloid. It is also a cosmetic impropriety to place such a scar in a position which is readily visible. A skin incision has been described which gives an adequate exposure, leaves a featureless scar, and does not in any way interfere with the function of the wrist or hand.

Most often there are no abnormal findings at operation, but in about a third of the cases the median nerve is swollen for a few inches above the transverse carpal ligament and, since this is immediately reversible, is probably determined by oedema. Less frequently there is evidence of direct compression of the median nerve by the transverse carpal ligament, and it is likely that the flattening of the nerve is caused by the duration and extent of the compression.

An analysis of patients treated by surgery shows that there is invariable immediate and dramatic relief of symptoms and that this is maintained; there is then a diminution or disappearance of any pre-existent neurological deficit as judged by clinical examination and the results of ischaemic sensory test. All returned to normal activity. Minor disadvantages include pain and swelling of the volar aspect of the wrist and aching pain provoked by pressure on the scar or by cold. The former does not last for more than a few weeks, but, because it is at times troublesome, it is best to avoid operating on both sides for bilateral symptoms at the same time unless they are very severe. Two separate operations were done on a number of patients and, after the first, symptoms disappeared on the treated side alone. All of these returned of their own accord for the second operation and this seems sufficient answer to those who maintain that the rest enforced by surgery is responsible for the cure.

It must be admitted that rest by itself often gives relief from all symptoms and leads to the disappearance of a pre-existent neurological deficit. However, none who were treated in this way were able to lead unrestricted lives, and some, despite prolonged inactivity, obtained no benefit and developed a progressive objective disability. In addition, ischaemic sensory tests showed a persistent abnormality in the majority. We consider, therefore, that surgery provides the optimum treatment unless the history is short, the symptoms relatively mild, or the patient is able to afford the luxury of prolonged unemployment.

Summary

The clinical features of 53 cases of acroparaesthesiae are described; dominant symptoms consisting of pain and paraesthesiae are almost invariably referred to the territory of the median nerve in the hand, and in the majority there is a slight objective deficit compatible with a median nerve lesion at the wrist.

Electromyography and ischaemic sensory tests lend support for localization of the lesion at the wrist.

The great predominance of female patients may be explained by the smaller size of the carpal tunnel in

women and to occupational factors. In men the onset may be determined by osteoarthropathy of the wrist, trauma, or a change of employment.

Division of the transverse carpal ligament gives immediate and lasting relief of symptoms and improvement of any neurological deficit that may have existed.

In about one-third of the patients there is direct or indirect evidence of compression of the median nerve in the carpal tunnel at operation.

Rest may alone relieve symptoms, but relapse occurs in the majority of patients when they resume a normal life. Some achieve no improvement and develop a progressive neurological deficit.

REFERENCES

- Brain, W. R., Wright, A. D., and Wilkinson, M. (1947). *Lancet*, 1, 277.
Ford, F. R. (1956). *Johns Hopk. Hosp. Bull.*, 98, 464.
Garland, H. (1955). *Univ. Leeds med. J.*, 4, 63.
Gilliat, R. W., and Wilson, T. G. (1953). *Lancet*, 2, 595.
Kremer, M., Gilliat, R. W., Golding, J. S. R., and Wilson, T. G. (1953). *Ibid.*, 2, 590.
McArdle, M. J. (1951). Oral communication to the Association of British Neurologists, October, 1951.
Schulze, F. (1893). *Dtsch. Z. Nervenheilk.*, 3, 300.
Walshe, F. M. R. (1945). *British Medical Journal*, 2, 596.
— (1951). In A. Fielding's *Modern Trends in Neurology*, Chapter 17, p. 542. Butterworth, London.
Wilson, S. A. K. (1913). *Proc. roy. Soc. Med.*, 6, Clin. Sect. 133.

SICKLE-CELL-THALASSAEMIA DISEASE IN SOUTH TURKEY

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When both the genes controlling the formation of normal adult haemoglobin (haemoglobin A) are replaced by alleles responsible for the sickle-cell haemoglobin variant (haemoglobin S), sickle-cell anaemia (S.C.A.) results. If only one A gene is thus replaced, normally no disability results, the AS heterozygote being a symptomless carrier of the sickle-cell trait (S.C.T.) (Neel, 1947, 1949; Beet, 1949; Pauling *et al.*, 1949). The thalassaemia gene is not an allelomorph of those responsible for the formation of haemoglobin A and its variants, but its effect is a suppression of haemoglobin A formation. If an AA homozygote inherits two thalassaemia genes a severe anaemia results—thalassaemia major. If he is heterozygous for the thalassaemia gene the condition is very much less severe or even symptomless—thalassaemia minor (Gatto, 1942; Wintrobe, 1942; Dameshek, 1943; Valentine and Neel, 1944; Chini, 1946; Silvestroni and Bianco, 1946a).

If, however, an AS heterozygote inherits a single thalassaemia gene, suppression of haemoglobin A formation with a subsequent preponderance of haemoglobin S may produce a state which resembles S.C.A. This modified S.C.A. is called sickle-cell-thalassaemia disease (S.C.Th.D.) or microdrepanocytic disease (Silvestroni and Bianco, 1946b, 1952, 1955; Powell *et al.*, 1950; Gatto and Purrazzella, 1951; Wasserman *et al.*, 1952; Sturgeon *et al.*, 1952; Neel *et al.*, 1953; Humble *et al.*, 1954; Singer *et al.*, 1955; Edington and Lehmann, 1955).

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The cells are small and hypochromic, and there are many target cells among them. The resistance towards lysis by hypotonic saline solution is increased (Caminopetros, 1938). Haemoglobin A may be virtually absent, or may be so decreased that it is difficult to establish its presence by the usual electrophoretic techniques.

Foetal haemoglobin (haemoglobin F) is usually present in S.C.Th.D., whereas it is not found in S.C.T. This haemoglobin is under a genetical control which is independent from that of haemoglobin A and its variants, and also from that of thalassaemia. The persistence of haemoglobin F at high concentration beyond the age of 4 months—at which time it has normally disappeared—is a common feature of thalassaemia major, and F is also often found—though at relatively low concentration—in thalassaemia minor (Liquori, 1951; Rich, 1952). When haemoglobin F is demonstrated in an AS heterozygote it usually indicates the inheritance of a thalassaemia gene, and the observation helps towards establishing the diagnosis of S.C.Th.D. Target cells at considerable frequency can be an indication of the presence of the thalassaemia gene. Before they are accepted as such, other conditions associated with target cells must be excluded. The most important are other haemoglobinopathies and severe cirrhosis of the liver. In milder disorders of the liver they may be found occasionally but rarely occur in large numbers, and when they are found in patients with liver disease they coincide with a strikingly increased diameter of the red cells.

We record the occurrence of S.C.Th.D. among the Eti-Turks in Southern Turkey, and in addition report that we have found that the heterozygous possession of a sickling and a thalassaemia gene can express itself either as a severe anaemia closely resembling S.C.A. or as a mild anaemia, or, lastly, that it can fail to give rise to any symptoms. In this latter case it can be discovered accidentally in the course of a survey or when a family of a known S.C.Th.D. patient is studied.

One of us (Aksoy, 1955) found that there was a high sickling incidence in the Eti-Turks, a small Arabic-speaking population enclave near Mersin, in Southern Turkey. We found that in some instances a child suffering from S.C.A. had only one sickling parent. The investigation of such families led to the discovery of the thalassaemia gene among them, and resulted in an alteration of the diagnosis of S.C.A. to one of S.C.Th.D.

Methods

Haemoglobin was determined on a Hellige haemoglobinometer. Reticulocytes and platelets were estimated in a wet preparation, using Dameshek's platelet solution (see Wintrobe, 1951). Osmotic fragility was determined according to Daland and Worthley (see Ham, 1951). The sickle-cell test was performed by incubation of cells with sodium metabisulphite (Daland and Castle, 1948). Foetal haemoglobin was determined according to Singer *et al.* (1951). Target cells were accepted as a possible indication of the presence of the thalassaemia gene only when they were found at considerable frequency, and after the exclusion of other possible causes such as cirrhosis of the liver. Electrophoresis of the haemoglobin was performed on solution freed from stroma by shaking with toluene and subsequent centrifugation. (For details of electrophoretic technique see Lehmann and Smith, 1954.)

Case 1

A 40-year-old housewife, known to be anaemic for several years, was admitted to Mersin State Hospital because of

lassitude and gastric discomfort. Some months prior to admission she tired easily and suffered from moderate osteoarticular pains. She also complained of palpitation on exertion and of irregular fever.

Physical examination revealed a well-developed and well-nourished but pale woman—height 5 ft. 7 in. (170 cm.), weight 11 st. 11½ lb. (75 kg.). The sclerae were subicteric. The spleen was barely palpable, liver not enlarged. A systolic murmur was heard over the apex. Blood pressure was 125/85 mm. Hg. There was no adenopathy. X-ray examination of the skull showed moderate thickening of the diploe and mild trabecular striation on frontal and parietal bones. There were no abnormalities of long bones and hands. The sickling test was positive. The electrophoretic pattern of the haemoglobin was AS; haemoglobin F was absent. The haematological findings are summarized in Tables I and II. The direct and the indirect Coombs test were negative. Features suggesting the presence of a thalassaemia gene were the appearance of the red cells, target cells, and lowered osmotic fragility. A family study revealed thalassaemia minor in one sibling and in one daughter, the husband being normal. It was concluded that this was a mild case of S.C.Th.D.

Details of Family Study (see Fig. 1).—The daughter in whom thalassaemia minor was diagnosed was 17 years old:

TABLE I.—Haematological Data on Five Patients with Sickle-Cell Thalassaemia Disease

	1	2	3	4	5
R.B.C. (10^6 /c.mm.)	2.40	2.50	2.90	2.55	2.55
Haemoglobin (g./per 100 ml.)	7.5	6.7	7.25	7.5	7.8
W.B.C. c.mm.	9,800	16,000	12,700	7,400	19,000
Reticulocytes (%)	15	35	20	10	13.2
Platelets c.mm.	946,000	135,000	160,000	357,000	780,000
Packed cell volume (%)	23	23	28	24	24
M.C.V. (cu. μ)	95	92	96	94	94
M.C.H. (%)	31	27	25	29	31
M.C.H.C. (%)	33	29	26	31	32
Neutrophils (%)	46	54	57	63	66
Band forms (%)	2	7	1	8	10
Metamyelocytes (%)	23	2	8	2	2
Eosinophils (%)	1	—	—	1	—
Basophils (%)	1	7	—	12	4
Monocytes (%)	—	2	—	—	—
Plasma cells (%)	27	27	33	12	18
Lymphocytes (%)	—	—	—	—	—
Nucleated red cells/100 W.B.C.	—	4	3	2	11
Anisocytosis	+++	+++	++	++	++
Poikilocytosis	++	+	±	+	±
Target cells (%)	8.7	18.2	9.6	19	27.8
Sickle cell (%)	—	2.2	—	0.2	0.4
Sickling test	+	+	+	+	+
Foetal haemoglobin (%)	0	1.3	7.8	5.9	1.9
Osmotic fragility (% NaCl)	0.4-0.2	0.42-0.15	0.40-0.20	0.36-0.16	0.38-0.16
Serum bilirubin (mg./100 ml.)	2.3	3.2	2.6	3.6	3.8
van den Bergh reaction	Indirect	Indirect	Indirect	Indirect	Indirect

TABLE II.—Differential Counts of Sternal Marrow Smears in Three Patients with Sickle-Cell Thalassaemia Disease

	Case 1	Case 2	Case 5
Cellularity	+++	+++	+++
M.E. ratio	1:1.4	1:1	1:0.8
Promyelocyte (%)	—	0.5	0.5
Myelocyte (%)	5	10	14
Metamyelocytes (%)	7	10	11
Band form (%)	12	9.5	20
Segm. poly. (%)	7	16.5	6
Eosinophil myel. (%)	2	—	—
band (%)	6	—	—
segm. (%)	1	0.5	—
Lymphocyte (%)	—	2.5	—
Reticulum cell (%)	—	—	—
Plasma cell (%)	1	1	5
Proerythroblast (%)	10	2.5	6
Basophilic normoblast (%)	—	10	3.5
Polychromatic (%)	10	18.5	13
Orthochromatic (%)	20	18.5	15.5
Polychromatic macroblast (%)	9	—	2
Orthochromatic normoblast (%)	10	—	0.5
Mitosis (%)	20	15	10

Hb. 10.9 g./100 ml.; R.B.C., 4,200,000 per c.mm.; 7.4% target cells; P.C.V., 39%; osmotic fragility, 0.4-0.3% NaCl; haemoglobin F absent; fine osteoporosis of parietal and occipital bones.

Case 2

A 12-year-old boy came to the out-patient department of Mersin State Hospital because of lassitude, irregular fever, and malaise. He had a history of infective hepatitis. He developed normally until 2 years of age, when irregular fever, anaemia, and malaise appeared. Malaria was diagnosed, but treatment with quinine, mepacrine, liver extract, and iron gave no relief. Latterly complaints became more severe.

Physical examination revealed a normally developed well-nourished pale boy. The sclerae were subicteric; spleen not palpable; liver enlarged two fingerbreadths below costal margin. Striking frontal bossing was present. X-ray examination of skull showed considerable thickening of diploe and mild striation of frontal, parietal, and occipital bones; there was, however, no "hair-on-end" appearance and the outer table had not disappeared. Long bones showed coarse striation around elbow-joints. The sickling test was positive and the blood smear showed sickle cells. The electrophoretic pattern of the haemoglobin was AS; haemoglobin F was 1.3% (not significant). The haematological findings are summarized in Tables I and II. Features suggesting the presence of a thalassaemia gene were the appearance of the red cells as a whole, 18.2% target cells, and a lowered osmotic fragility. A family study revealed one other sibling with S.C.Th.D. (Case 3) and the presence of the thalassaemia gene in the father, both parents being S.C.T. carriers.

Case 3

A 10-year-old girl, sister of Case 2, was first seen in 1954 suffering from lassitude, irregular fever, malaise, and anaemia. She was treated for malaria. Physical examination revealed a normally developed well-nourished though pale girl. The sclerae were slightly subicteric; spleen three fingerbreadths and liver two fingerbreadths below costal margin. Mild frontal bossing was present. X-ray examination of skull showed moderate thickening of diploe and mild trabecular striation around elbow-joints. The sickling test was positive. The electrophoretic pattern of the haemoglobin was AS; haemoglobin F was 7.8%.

The haematological findings are summarized in Table I. Features suggesting the presence of a thalassaemia gene were the appearance of the red cells as a whole, 9.6% target cells, a lowered osmotic fragility, and the presence of haemoglobin F.

Details of Family Study of Cases 2 and 3 (see Fig. 1).—Both parents and one sibling were AS heterozygotes. All had less than 1% foetal haemoglobin. The appearance of the father's blood film suggested the possession of the thalassaemia gene (8.6% target cells), but there was no anaemia. The thymol turbidity and the gamma-globulin content of the serum were not raised; the pseudocholinesterase was within normal limits. It was concluded that the father was a symptomless heterozygote for the thalassaemia and the sickling gene. The ABO, rhesus, MNS, Lutheran, Kell, and Duffy blood groups of the parents and their three children were determined by Dr. A. E. Mourant and Miss E. W. Ikin at the M.R.C. Blood Group Reference Laboratory; there was no evidence of non-paternity.

Case 4

A 13-year-old girl was brought to the out-patient department of Mersin State Hospital because of palpitation, lassitude, and irregular fever. She had been ill from childhood and there had been bone pains with irregular fever now and then, but there had been no swelling of joints.

Physical examination revealed a normal stature and a somewhat mongoloid facies. The sclerae were subicteric, and there was pallor with a brown-yellow tint to the skin. There were no leg ulcers or adenopathy. The spleen was two fingerbreadths and the liver one fingerbreadth enlarged below the costal margin. Pulse rate was 180 a minute, regular. A systolic murmur was heard over apex and pulmonary artery area. The second pulmonary sound was accentuated. Blood pressure was 110/80 mm. Hg. There were no abnormalities over the lung. X-ray examination of the thorax showed mild left ventricular enlargement, and prominence of the pulmonary artery. E.C.G. showed sinus tachycardia, P-mitrale, left ventricular strain, and heart in vertical position. Frontal bossing was present. X-ray films of the skull revealed thickening of the diploe, mild trabecular striation on parietal bone, and some osteoporosis of frontal bone. The sickle-cell test was positive, and the peripheral blood smear showed some sickled cells. The electrophoretic

pattern of the haemoglobin (Fig. 2) showed most of the haemoglobin to be in the S position (80% as determined by densitometry); there was, however, a "trailing" of haemoglobin extending forward to the haemoglobin A position with a slightly greater density towards the A position than in the intervening area. Foetal haemoglobin was 5.9%. The haematological findings are summarized in Table I.

In this case the differential diagnosis was between S.C.A. and S.C.Th.D., as all the features suggesting the presence of a thalassaemia gene could equally well be found in S.C.A.

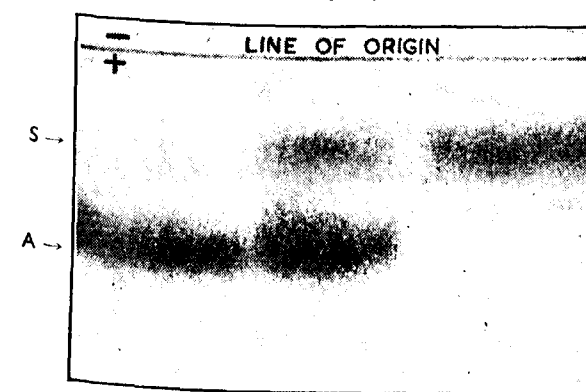


Fig. 2.—Separation of haemoglobin variants by filter-paper electrophoresis. Father, AA. Mother, AS. Daughter (Case 4), sickle-cell-thalassaemia disease.

However, electrophoresis revealed that the amount of non-sickle-cell haemoglobin exceeded the 5.9% haemoglobin F found by chemical estimation, and this suggested the diagnosis of S.C.Th.D. A final proof was brought about by family study, which showed thalassaemia minor in the father (a non-sickler) and in one sibling.

Details of Family Study.—The father, a non-sickler, had thalassaemia minor; Hb, 13.1 g./100 ml.; R.B.C., 4,850,000 per c.mm.; 16.8% target cells; P.C.V. 44%; osmotic fragility, 0.4-0.2% NaCl. X-ray examination of skull showed mild thickening of frontal, parietal, and occipital bones, and striation on parietal bones. The mother was a symptomless sickle-cell-trait carrier. Several siblings had died, one sister at the age of 18 years from anaemia resembling in its features that of Case 4. Two siblings showed no abnormality, but one brother aged 15, a non-sickler, showed evidence of thalassaemia minor (7.8% target cells, osmotic fragility 0.4-0.2% NaCl, mild changes in skull and long bones revealed by x-ray examination).

Case 5

A 23-year-old man was admitted to Mersin State Hospital with dyspnoea, orthopnoea, cough, and abdominal discomfort. He was diagnosed some three years previously in one of the medical clinics of Istanbul University as having sickle-cell anaemia. All his life he had suffered from irregular fever, bone pains, joint swellings, anaemia, and lassitude. The osteoarticular pains were intolerable, and every antirheumatic treatment was ineffective. Three years ago he had leg ulcers which lasted for about one year. Five months before admission his liver became noticeably enlarged and he had dyspnoea. He improved after rest. One week prior to admission he had three to four days' fever, and the yellow discoloration of his sclerae increased; there was abdominal discomfort and cough.

Physical examination revealed an underdeveloped boy rather than man—height 5 ft. 1 in. (154 cm.), weight 7 st. 11 lb. (49.5 kg.)—with a somewhat mongoloid facies. He was pale and icteric. He was orthopnoeic and sat rigidly because of abdominal pain and distension. His temperature was 101.2° F. (38.4° C.). There was a mild inguinal adenopathy, and four scars of leg ulcers were noted. The area of cardiac dullness extended into the lung fields, the pulse rate was 84 a minute and regular, and a moderate friction rub was noted at the left sternal border. Blood pressure was 105/55

mm. Hg. The epigastrium was distended. The spleen was enlarged to two fingerbreadths below the costal margin, and the liver was tender and extended to the iliac crest. X-ray examination of the thorax disclosed an enormous enlargement of the heart; there was no characteristic shape. On screening no pulsations were seen over the heart. X-ray films of the skull showed thickening of the frontal, parietal, and occipital bones and mild striation on the parietal bone. The long bones showed coarse striation around the elbow-joint and the femur; the elbow joint had a "honeycombed" appearance. There was osteoporosis of the pelvis, femur, and tibia.

The sickle-cell test was positive, and the peripheral blood film showed some sickle cells. The electrophoretic pattern of the haemoglobin was AS; the foetal haemoglobin was 1.9% (just significant). The haematological findings are summarized in Tables I and II. Features suggesting the presence of a thalassaemia gene were the appearance of the red cells as a whole, 27.8% target cells, traces of foetal haemoglobin, and a lowered osmotic fragility.

Treatment with ouabain, salicylates, antibiotics, mercurial diuretics, low-sodium diet, and oxygen therapy resulted in prompt improvement. The pyrexia subsided and on the fifth day the friction rub was no longer heard. A mild systolic murmur became audible, and the heart silhouette measured radiographically showed a 3.5 cm. diminution in size. Salicylates and antibiotics were discontinued after two weeks. Treatment with digitalis and mercurial diuretics was continued, and the size of the liver diminished to about four fingerbreadths below the costal margin.

Details of Family Study (see Fig. 1).—As in Cases 2 and 3, both parents were AS heterozygotes. Two of the three siblings investigated were also AS heterozygotes. The father, aged 50, showed no other abnormalities in his blood. The mother, aged 40, however, had numerous target cells (10.5%) in her blood smear. Liver-function tests were not carried out. The serum thymol turbidity was not raised, and there was no obvious evidence of liver disease or of any other condition except thalassaemia which could be responsible for this high incidence of target cells. It was concluded that she was a symptomless heterozygote for both the sickling and the thalassaemia gene.

Discussion

The community of the Eti-Turks is small, and it is remarkable that we should have seen no fewer than five cases of S.C.Th.D. over a period of six months. The Eti-Turks resemble in this respect other communities living around the Mediterranean shore. It is well known that thalassaemia minor by itself may be completely symptomless. This variable effect of one thalassaemia gene is well reflected in the varying severity of the S.C.Th.D. seen in our series. Contrary to the findings of the other writers, none of our five patients had a lowered M.C.V., and the M.C.H.C. was significantly lowered in only two. Nucleated red cells were always present in four, and three showed sickled cells in the peripheral smear. Foetal haemoglobin was absent in two, present in traces in one, and significantly raised in two. All had a lowered osmotic fragility of their red cells—a feature both of S.C.A. and of thalassaemia major—but the conspicuous changes seen in the x-ray films of the skeleton were similar to those seen in thalassaemia major rather than to the milder ones of S.C.A.

In addition to the five patients, two individuals were discovered who were heterozygous for the thalassaemia and sickling genes but did not seem to suffer from S.C.Th.D. This suggests that the same thalassaemia gene does not suppress the haemoglobin A formation equally in different members of a family, and that its penetrance may possibly depend on the particular A gene an individual carries.

Summary

Five cases of sickle-cell-thalassaemia disease were seen in four Eti-Turk families. In addition two individuals were discovered who were heterozygous for the thalassa-

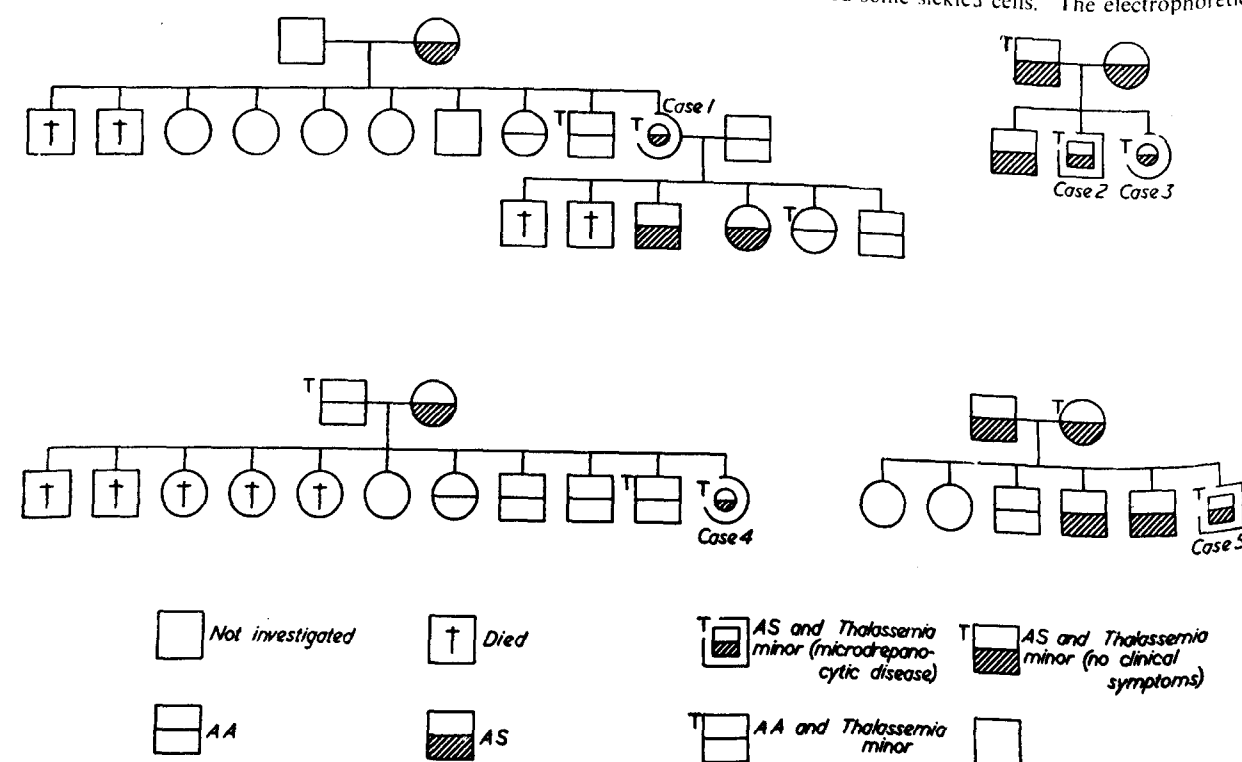


Fig. 1.—Family trees of five patients with sickle-cell-thalassaemia disease.

aemia and sickling genes but were not anaemic. The incidence of the haemoglobinopathy among the Eti-Turks is equalled only in Sicily.

REFERENCES

- Aksoy, M. (1955). *Lancet*, **1**, 589.
Beet, E. A. (1949). *Ann. Eugen. (Lond.)*, **14**, 279.
Caminopetros, J. (1938). *Ann. Med.*, **43**, 27.
Chini, V. (1946). *Gazz. med. ital.*, **105**, 205.
Daland, G. A., and Castle, W. B. (1948). *J. Lab. clin. Med.*, **33**, 1082.
Dameshek, W. (1943). *Amer. J. med. Sci.*, **205**, 643.
Edington, G. M., and Lehmann, H. (1955). *British Medical Journal*, **2**, 1328.
Gatto, L. (1942). *A. ch. ital. Pediatr.*, **9**, 128.
— and Purrazzella, G. (1951). *Pediatrics (Napoli)*, **50**, 789.
Ham, T. H. (1951). *A. Syllabus of Laboratory Examinations in Clinical Diagnosis*. Harvard Univ. Press, Cambridge, Mass.
Humble, J. G., Anderson, I., White, J. C., and Freeman, T. (1954). *J. clin. Path.*, **7**, 201.
Lehmann, H., and Smith, E. B. (1954). *Trans. roy. Soc. trop. Med. Hyg.*, **48**, 12.
Liquori, A. M. (1951). *Nature (Lond.)*, **167**, 950.
Neel, J. V. (1947). *Medicine (Baltimore)*, **26**, 115.
— (1949). *Science*, **110**, 64.
— Itano, H. A., and Lawrence, J. S. (1953). *Blood*, **8**, 434.
Pauline, L., Itano, H. A., Singer, S. J., and Wells, I. C. (1949). *Science*, **110**, 543.
Powell, W. N., Rodarte, J. G., and Neel, J. V. (1950). *Blood*, **5**, 887.
Rich, A. (1952). *Proc. nat. Acad. Sci. (Wash.)*, **38**, 187.
Silvestroni, E., and Bianco, I. (1946a). *Ric. Morf.*, **22**, 217, 271, 325.
— (1946b). *Haematologica*, **29**, 455.
— (1952). *Blood*, **7**, 429.
— (1955). *La Malattia Microdrepanocitica*. Il Pensiero Scientifico, Rome.
Singer, K., Chernoff, A. I., and Singer, L. (1951). *Blood*, **6**, 413.
— Singer, L., and Goldberg, S. R. (1955). *Ibid.*, **10**, 405.
Sturgeon, P., Itano, H. A., and Valentine, W. N. (1952). *Ibid.*, **7**, 350.
Valentine, W. N., and Neel, J. V. (1944). *Arch. int. Med.*, **74**, 185.
Wasserman, C. F., Phelps, V. R., and Hertzog, A. J. (1952). *Pediatrics*, **9**, 286.
Wintrobe, M. M. (1942). *Clinical Hematology*, p. 517. Lea and Febiger, Philadelphia.
— (1951). *Clinical Hematology*. Lea and Febiger, Philadelphia.

A STUDY OF THE SURVIVAL RATE OF CASES OF SICKLE-CELL ANAEMIA

BY

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It is now generally accepted that the phenomenon of the sickling of red cells at reduced oxygen tensions is due to the presence of greater or lesser amounts of an abnormal haemoglobin within the cells. The production of this haemoglobin is controlled by a gene which is allelic to the gene controlling normal haemoglobin production. The heterozygous inheritance of this sickle-cell gene produces the harmless sickle-cell trait, while the homozygote is manifest as sickle-cell anaemia. This anaemia is characterized by haemolysis with intermittent crises and is usually fatal in childhood. This death in childhood of the homozygotes must remove abnormal genes from the population, and the immediate question arises of how, in the face of this recurrent gene loss, the gene frequency can be maintained at the high levels at which it is found in many African tribes.

The answer seems to lie in the interaction of three main factors. Firstly, recurrent mutations must play some part, though it is highly improbable that they could provide the sole replacement of all the genes lost by childhood deaths. Secondly, it is now well established that the heterozygote sickler enjoys some advantage over the normal in respect of falciparum malaria, though the magnitude and exact mechanism of this effect are not yet clear. Thirdly, there is the fact that while most subjects with sickle-cell anaemia die in childhood, some few do survive to adult life and contribute abnormal genes to the next generation. This paper presents some evidence on this third factor as found in a single African tribe in Uganda.

The older literature on the natural history of sickle-cell anaemia has become largely invalidated by the recent discovery of other genetically controlled abnormal haemoglobins and by the description of microdrepanocytic disease. Both this latter disease and the anaemia often resulting from the double inheritance of two abnormal haemoglobins may produce a clinical picture closely similar to sickle-cell anaemia. In East Africa, however, other abnormal haemoglobins have not been found among the African tribes (Jacob, 1955; Roberts and Lehmann, 1955) and thalassaemia has never been detected. The same situation appears to obtain in the Belgian Congo. A high degree of validity can therefore be attached both to clinical reports in children and to simple electrophoretic surveys in adults directed towards defining the survival rate of cases of sickle-cell anaemia in these two areas. Nevertheless, published work has produced somewhat variable estimates of survival rates.

In Kenya, Allison (1954) examined 70 adult sicklers of the Luo tribe by paper electrophoresis and found two cases with the pattern of sickle-cell anaemia. He calculated that these two represented a 35% survival rate to adult life. He later suggested that the survival rate in Africa was more likely to be in the region of 20% on the basis of figures collected from the Musoma tribe of Tanganyika (Allison, 1956). In a survey of the Baamba tribe in Uganda, Lehmann and Raper (1956) found no case showing the electrophoretic pattern of sickle-cell anaemia in a random sample of 478 adults. They conclude "that the survival of sickle-cell homozygotes plays no significant part in the maintenance of the high sickling rate in the Baamba." Workers in the Belgian Congo have expressed the same opinion on the basis of clinical observations in children. The Lambotte-Legrands (1955) state that the great majority of patients die in childhood, and Vandepitte (1955) estimates that only about 1% survive to adult life. It was therefore decided to undertake an electrophoretic survey of adults of the Baganda tribe in an attempt to obtain a more exact figure for the survival rate to reproductive age.

Method

Blood samples were obtained from specimens which had been sent in to the laboratory for routine Kahn tests from the antenatal clinic and from the male V.D. clinic of Mulago Hospital. A few samples were also obtained from mothers bringing their children to the paediatric clinics. Specimens from the Baganda tribe only were examined. In all cases a sickling test was done by the *E. coli* method, and all which were positive were subject to paper electrophoresis by the method already described (Jacob, 1955). An attempt was made to see all cases showing the pattern of sickle-cell anaemia at their next clinic attendance.

Results

Altogether 3,362 specimens were examined, of which 545 were from sicklers and were subjected to electrophoresis. The source of the specimens can be seen from the Table. Cases 291, 316, and 543 of this series of 545 sicklers showed the pattern of sickle-cell anaemia. These samples were all from the antenatal clinic, and further details are as follows.

Sources of Blood Specimens

Source of Blood	Non-sicklers	Sicklers	% Sickling
Antenatal clinic	2,090	396	15.9
Male V.D.	651	126	16.2
Mothers in paediatric clinic ..	76	23	23.2
Total	2,817	545	16.2

Case Reports

Case 291.—A woman aged 18, who had had one abortion and was three months pregnant when seen, gave a history of recurrent fevers throughout childhood which had gradually decreased in severity. The attacks occurred about once a month, and she stated that during them she ached all over, her fingers and toes often swelled, and her eyes often became yellow. She never felt really well between the attacks. It was not possible to obtain a proper family history from her. On examination there was no bossing of the skull, and the spleen was palpable. Her conjunctivae were slightly yellow and the mucous membranes a little pale. There were no joint swellings. The haemoglobin was 8.1 g. per 100 ml. (M.R.C. grey-wedge photometer); red blood cells, 3,400,000 per c.mm.; P.C.V., 32%; white blood cells, 9,400 per c.mm. Stained blood film: the differential white count was within normal limits and the polymorphs showed no shift to the left; the red cells showed some hypochromia and moderate polychromasia; occasional irreversible sickle cells were seen. There were no normoblasts and no malaria parasites. The bilirubin was 2 mg. per 100 ml. Alkali-resistant haemoglobin (Singer *et al.*, 1951), 13.0%. The solubility of haemoglobin was 0.79 g. per litre of 2.24 phosphate buffer (Itano, 1953).

Case 316.—This patient, aged 28, was 34 weeks advanced with her first pregnancy when seen. She did not return to the clinic for the result of her Kahn test, and only clotted blood was available. A film made from the clotted blood showed considerable polychromasia. The bilirubin was 2.8 mg. per 100 ml.; alkali-resistant haemoglobin, 12.0%.

Case 543.—A woman aged 30, who was 28 weeks advanced with her first pregnancy when seen, gave a vague history, but it appeared that she had had recurrent fevers throughout childhood, occurring about once every two months, and accompanied by pains in the limbs and by yellow eyes. She was unable to give any family history. On examination her skull showed slight bossing, her mucous membranes were pale, and the conjunctivae slightly yellow. There were no joint swellings and the spleen was palpable. The haemoglobin was 6.5 g. per 100 ml.; red blood cells, 2,200,000; P.C.V., 24%; white blood cells, 4,300; normoblasts, 15,600 per c.mm. A blood film showed large numbers of normoblasts in varying stages of maturity. There was very marked polychromasia, and irreversible sickle cells were present. The polymorphs showed a shift to the left and occasional myelocytes were seen. The bilirubin was 2.3 mg. per 100 ml.; alkali-resistant haemoglobin, 8.0%. The urine had a considerable excess of urobilinogen. This woman had a stillbirth at home at 36 weeks. She was subsequently admitted to Mulago Hospital with peritonitis. She refused to allow any further blood examinations, and on her death, a few days later, her relatives refused permission for a post-mortem examination.

Discussion

All three women showed the pattern of sickle-cell anaemia on paper electrophoresis and had evidence of a haemolytic process. It could be maintained, however, that they were not true cases of sickle-cell anaemia—in other words, homozygotes for the sickle-cell gene—since it was not possible to prove that they had inherited a single sickle-cell gene from each parent. This proof is theoretically necessary, as both microdrepanocytic disease and sickle-cell haemoglobin D disease produce an electrophoretic haemoglobin pattern on paper indistinguishable from the true case of sickle-cell anaemia. Nevertheless, as in other published reports from East Africa, a high degree of validity can be attached to the diagnosis in the absence of other abnormal haemoglobins and of thalassaemia. Collateral evidence in favour of accepting these as true cases is obtained from the Mulago Hospital records, which show that other young adults with sickle-cell anaemia have been seen in whom the diagnosis has been firmly established by the finding of sickling in both parents.

In order to determine what proportion of the expected number these three cases represent it is assumed that the sickling rate is static. It is further assumed that a system of random mating occurs. It can then be calculated from the sickling rate of 16.2% that this population at birth should have included 22 cases of sickle-cell anaemia. Since only three of these cases were seen in adult life it can be presumed that approximately 86% have died in childhood.

This figure of 14% survival rate lies between the estimates made by Allison (1956), on the one hand, and by Lehmann and Raper (1956) and the workers in the Belgian Congo on the other. The difference might be explained on the basis of the smaller samples of Allison and of Lehmann and Raper; and the Congo workers, relying on clinical diagnosis, might have missed just those mild cases which might be expected to survive to adult life. It seems possible, however, that the different estimates represent a true variation in survival rate. A subject with sickle-cell anaemia may die of the disease *per se* in a crisis, but he may die from many other diseases, such as pneumonia and typhoid, to which he is likely to be less resistant owing to persistent anaemia. The prevalence of these other diseases are therefore likely to affect the survival rate in any one area. The Bwamba forest, in which Lehmann and Raper worked, is certainly more unhealthy than the conditions under which the Baganda live in and around Kampala, and, though accurate vital statistics for these areas are not available, it is certainly clear that the general childhood death rate is by far the higher in the Bwamba forest.

The fact that the heterozygote (sickle-cell trait) is in some degree protected from falciparum malaria has already been referred to. Allison (1956) has stated: "It will be clear that the main factor determining the frequency of the gene in any population is environmental—that is, mortality from falciparum malaria." If the survival rate of the homozygote is truly variable in different areas, and if this variability is due to the relative prevalence of other diseases, then malaria is only one of the many environmental factors concerned in the maintenance of the sickle-cell gene. A study of the maintenance of the sickle-cell gene in any area must include both a study of the childhood mortality from malaria and of the survival rate of the homozygote to reproductive life; only general qualitative inferences may be drawn from such a study, and quantitative inferences are likely to be invalid.

Summary

A study of 3,362 adults of the Baganda tribe has been made. Paper electrophoresis of the haemoglobin solutions revealed three cases of sickle-cell anaemia.

The sickling rate of the whole series was 16.2%, and it is calculated that these three cases of sickle-cell anaemia represent a 14% survival to adult life.

It is suggested that the survival rates of subjects with sickle-cell anaemia may vary in different parts of Africa.

REFERENCES

- Allison, A. C. (1954). *Ann. hum. Genet.*, **19**, 39.
— (1956). *Trans. roy. Soc. trop. Med. Hyg.*, **50**, 185.
Itano, H. A. (1953). *Arch. Biochem. Biophys.*, **47**, 148.
Jacob, G. F. (1955). *British Medical Journal*, **1**, 521.
Lambotte-Legrands, J., and C. (1955). *Ann. Soc. belge Méd. trop.*, **35**, 53.
Lehmann, H., and Raper, A. B. (1956). *British Medical Journal*, **2**, 333.
Roberts, D. F., and Lehmann, H. (1955). *Ibid.*, **1**, 519.
Singer, K., Chernoff, A. I., and Singer, L. (1951). *Blood*, **6**, 413.
Vandepitte, J. M. (1955). *Docum. Med. geogr. trop. (Amst.)*, **7**, 154.

The Central Council for Health Education has produced a pegboard triptych screen display unit for use by local authority health departments. Printed displays in colour are available, with supporting leaflets and posters, for making a compact exhibition of a size to fit an ordinary table. The council hopes also to produce a series of "Make It Yourself" displays on various topics for the triptych screens. Further details and prices will be provided on application to the medical director, Central Council for Health Education, Tavistock House, Tavistock Square, London, W.C.1.

CANCER OF PHARYNX TREATED BY SURGERY

BY

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An assessment of the results obtained in the treatment of patients with cancer by various methods should be made at intervals to determine the benefit the patients derive and to evolve the most satisfactory techniques with our present knowledge of the disease. It is an impossible task, with the available treatments, to save all, but many are enabled to live on for many years with freedom from the disease. Some are treated so that they can live with the disease in comfort for variable periods, and this amelioration is an important object of our work. We must endeavour not to leave a patient any worse off after treatment than he was before it was given. When the results of surgical treatment for cancer are assessed an answer should be sought to these questions: Are distressing symptoms relieved? Are complications caused by the disease, which may be mortal, avoided? What is the length and quality of the patient's life after the operation?

The object of this paper is to present the late results of the surgical treatment of 24 patients with carcinoma of the pharynx who were operated on during 1948 to 1952 and followed up in October, 1956. The interval that had elapsed after operation is adequate for an assessment of results.

The operative techniques used in the treatment of these patients and the earlier results obtained were described in previous papers (Raven, 1952, 1953, 1954).

Carcinoma of Oropharynx

A man aged 62 had an ulcerating carcinoma involving the tonsils, faucial pillars, soft palate, and the base of the left side of the tongue. The left upper deep cervical lymph nodes were enlarged and hard. Operation: partial palato-glosso-pharyngectomy and radical neck lymphatic dissection were performed on July 22, 1949. Histological examination showed a squamous-cell carcinoma of the oropharynx with metastases in cervical lymph nodes. Follow-up, October, 1956: patient has had no recurrence; swallows well; and works regularly (Fig. 1). Survival period, seven years three months.



FIG. 1.—Photograph of patient alive seven years three months after left partial palato-glosso-pharyngectomy and radical dissection of neck lymph nodes for extensive carcinoma of oropharynx and cervical lymph-node metastases. No recurrence.

Carcinoma of Hypopharynx

Case 1.—Woman aged 67 with a carcinoma of the hypopharynx for which a gastrostomy had been performed elsewhere. Operation: laryngo-oesophago-pharyngectomy in two stages. First stage performed on March 28, 1949;

second stage on July 5, 1949. Description of carcinoma: the carcinoma fills the hypopharynx from the cervical oesophagus to the arytenoid cartilages. Histology: a well differentiated squamous-cell carcinoma which had infiltrated widely, including the capsule of the thyroid gland; no lymph-node metastases. Follow-up, October, 1956: patient has had no recurrence and swallows satisfactorily. Survival period, seven years, seven months.

Case 2.—A man aged 67 with a carcinoma of the hypopharynx which had been treated with irradiation elsewhere. Operation: laryngo-pharyngectomy in one stage, performed on October 17, 1950. On December 3, 1951, excision of right cervical lymph nodes. Description of carcinoma: a deep malignant ulcer in the right pyriform fossa. Histology: a squamous-cell carcinoma; metastases in cervical lymph node. In June, 1954, he developed a second primary carcinoma in the posterior third of the tongue which was treated by radiotherapy and diathermy. Follow-up: died May 5, 1956, from carcinoma of the tongue. Survival period, five years seven months.

Case 3.—A man aged 64 with a carcinoma in the hypopharynx which had been treated with irradiation elsewhere. Operation: laryngo-pharyngectomy in multiple stages; acromio-pectoral tubed pedicle grafts were used for the reconstruction of the hypopharynx; first stage performed on December 13, 1950, and the final reconstruction operation on September 10, 1952. Description of carcinoma: in the left pyriform fossa is a malignant ulcer 3.8 by 1.3 cm. whose medial margin reaches the aryepiglottic fold; a nodule of growth 0.7 by 0.4 by 0.2 cm. projects on the posterior surface of the epiglottis at the level of the centre of the ulcer. At the posterior margin of this nodule is a small perforation which communicates with the base of the ulcer in the pyriform fossa. There is a tumour 1 cm. diameter invading the posterior margin of the left sternomastoid muscle. Histology: a squamous-cell carcinoma; tumour in neck—active, keratinizing squamous-cell carcinoma infiltrating dense fibrous tissue and fibrosed muscle. Follow-up, October, 1956: patient has had no recurrence and swallows satisfactorily. Survival period, five years ten months.

Case 4.—A woman aged 61 with a carcinoma in the hypopharynx. Operation: laryngo-oesophago-pharyngectomy in two stages. First stage performed on January 31, 1951, second stage on March 7, 1951. Description of carcinoma: in the anterior wall of the hypopharynx is a malignant ulcer extending from the cervical oesophagus to just below the arytenoids; it invades the oesophago-tracheal septum and bulges into the trachea at the level of the first three rings. Histology: a keratinizing squamous-cell carcinoma; no metastases in the regional lymph nodes. Follow-up, October, 1956: patient has had no recurrence and swallows satisfactorily (Fig. 2). Survival period, five years nine months.

Case 5.—A man aged 62 with a carcinoma in the hypopharynx. On August 24, 1949, an emergency tracheotomy was performed elsewhere. In October, 1949, he was given teloradium therapy, dose 6,500 r in 46 days. The disease was not controlled. Operation: laryngo-oesophago-pharyngectomy in

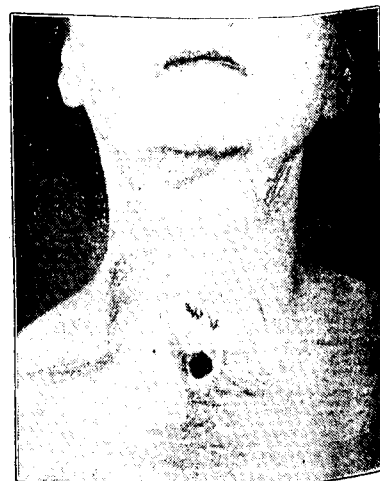


FIG. 2.—Photograph of patient (Case 4) alive five years nine months after laryngo-oesophago-pharyngectomy for carcinoma of hypopharynx. No recurrence.

multiple stages; acromio-pectoral tubed pedicle grafts were used for the reconstruction of the hypopharynx. First stage performed on January 24, 1951; the final reconstruction operation on May 21, 1952. The severe degeneration of the skin of the neck with infection and dermatitis which also affected the anterior chest wall before surgical treatment began, necessitated long intervals between the operations. Description of the carcinoma: a malignant ulcer 3.5 by 2.5 cm. involves the right pyriform fossa and passes on to the posterior pharyngeal wall crossing the midline; it infiltrates into the larynx, forming a malignant ulcer 1 by 0.5 cm. between the true and false vocal cords. Histology: an anaplastic squamous-cell carcinoma; metastases in the cervical lymph nodes. Follow-up, October, 1956: patient has had no recurrence, swallows satisfactorily, and works regularly. Survival period, five years nine months.

Case 6.—A woman aged 60 with a carcinoma in the hypopharynx. Operation: laryngo-oesophago-pharyngectomy in two stages. First stage performed on June 27, 1952, second stage on September 16, 1952. Description of carcinoma: this extends from the arytenoids downwards for 7.2 cm. and encircles the wall of the hypopharynx. It penetrates the posterior wall of the trachea, involving an area 2.2 by 1.1 cm. Histology: a well-differentiated squamous-cell carcinoma; metastases present in the cervical lymph nodes. Follow-up, October 1956: patient has had no recurrence; swallows satisfactorily. Survival period, four years four months.

Case 7.—A woman aged 64 with a carcinoma in the hypopharynx. Operation: laryngo-oesophago-pharyngectomy in two stages. First stage performed on September 30, 1952; second stage on November 25, 1952. Description of carcinoma: an ulcerating tumour 6 by 5 cm. in the hypopharynx, infiltrating as high as the epiglottis. Histology: an anaplastic squamous-cell carcinoma; no metastases in the regional lymph nodes. Follow-up, October, 1956: patient has had no recurrence; swallows satisfactorily. Survival period, four years one month.

Discussion

Carcinoma of Oropharynx—A small number of patients have been treated by partial pharyngectomy and its modifications—partial palato-pharyngectomy, partial glosso-pharyngectomy, and partial palato-glosso-pharyngectomy. More time must elapse before the results can be assessed. The case reported above, in which the patient was well and at work seven years three months later, is an encouragement, for he had an extensive oropharyngeal carcinoma with metastases in the cervical lymph nodes—an unsatisfactory lesion for radiotherapy. Surgical treatment is worthy of consideration for a carcinoma in this site, especially when other methods have not controlled it or cannot offer any lasting benefit, as in this case. Patients who are in this situation have everything to lose and their last months are full of suffering. Before an operation is undertaken it must be established that the carcinoma can be removed radically and a satisfactory pharyngeal reconstruction performed.

Carcinoma of the Hypopharynx—There are 23 patients in the series who were treated surgically three or more years ago. The survival periods are computed from the date of the excisional operation for the carcinoma. Thirteen patients died with cancer from 4 to 33 months later; three died from causes other than cancer; and seven were alive for five years or more; the longest survivor has so far lived seven years seven months.

Clinical Condition of the Patients before Operation—The results should be judged against this dark background. The patients suffered severely from dyspnoea, stridor, and dysphagia; one had a palliative gastrostomy and another a palliative tracheotomy. Some had been pronounced untreatable and were awaiting death with the help of sedatives. Others had received radiotherapy, but the disease was not controlled and they presented difficult problems to solve concerning degenerative and inflamed tissues in the

neck. The carcinomas affected extensive areas of the hypopharynx and often infiltrated the cervical oesophagus, larynx, trachea, and thyroid gland. In 50% of the patients metastases were present in the cervical lymph nodes. The only encouraging feature was the splendid spirit of the patients, their will to fight for life and desire that something should be done to enable them to achieve it. This attitude by patients makes it hard to decide not to carry out a radical operation for certain reasons.

Clinical Condition of Patients After Operation—These surgical procedures do not cause mutilation; the patients have a normal neck except for healed incisions and a tracheostomy. The latter must be a pleasure for those who have struggled with stridor and dyspnoea. They can dress normally and swallow everything, and I have not had a case of fibrous stricture formation at the junction of the skin pharynx and cervical oesophagus or elsewhere. They are taught tracheostomy management, and wear a perforated metal shield over it by day and a tube by night. Speech therapy is given, but they do not speak so well as following laryngectomy, although many make themselves understood. Respiratory infections are not more frequent than in others. They are able to work, live almost normal lives, and are amongst the happiest patients I know, for their present comfort is contrasted with the intense suffering of the past. In addition to giving the patients a chance of permanent benefit, radical surgery affords immediate relief from stridor, dyspnoea, and dysphagia.

Some Facts About the Operation—Every patient is studied as an individual problem, for surgical techniques are available for each condition encountered; these include one-, two-, and multiple-stage operations. The length of stay in hospital varies from three weeks for the one-stage operation to eight or more weeks for the two-stage operation. The plastic reconstruction operations when surgery follows radiotherapy take a long time to complete, for lengthy intervals are necessary between the stages, as seen in the case records cited. When the two-stage operation is done the patient is left with a pharyngostomy and an oesophagostomy after the first operation and is fed through a tube passed through the oesophagostomy into the lower end of the oesophagus. I usually allow an interval of about eight weeks to elapse between the two stages for wound consolidation to occur. Occupational therapy helps the patients to pass the time in hospital between the stages in an interesting way. The risk of these operations is small; there was no operative mortality in this series of patients.

Summary

The late results of the surgical treatment of 24 patients with carcinoma of the pharynx who were operated on during 1948 to 1952 are presented and details are given of eight patients who underwent a radical surgical operation with survival periods of four years one month to seven years seven months. Their clinical condition before and after operation is described and some facts are given regarding the operations. This and subsequent experience in a large series of cases shows there is a place for radical surgery in the treatment of carcinoma of the pharynx, and in some cases when radiotherapy has failed to control the disease, for, in addition to giving patients the chance of permanent benefit, distressing symptoms are relieved at once.

REFERENCES

- Raven R. W. (1952). *British Medical Journal*, 1, 951.
— (1953). *Proc. roy. Soc. Med.*, 46, 770.
— (1954). *Brit. J. Surg.*, 42, 113.

In the first nine months of last year there was an increase of 19% in the number of both men and women student-nurses in mental hospitals; in mental deficiency hospitals the increase was 22% for men students and 24% for women. These figures were given last week at Chelmsford by Mr. J. VAUGHAN-MORGAN, Parliamentary Secretary to the Ministry of Health.

ACUTE AMPHETAMINE POISONING AN ACCOUNT OF 3 CASES

BY

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Amphetamine ("benzedrine") and its derivatives, amphetamine sulphate, dexamphetamine sulphate ("dexedrine"), methylamphetamine, and methylamphetamine hydrochloride ("methedrine") are widely prescribed for a number of ills, and their stimulating effect on the central nervous system is becoming well known to the general public. Although the sale of oral and parenteral preparations is controlled under schedule 4, inhalers containing 325 and 330 mg. of amphetamine base or 250 mg. of methylamphetamine can still be bought without restriction for unauthorized use.* In spite of this ready supply only eight cases of acute poisoning with amphetamine or its compounds have been described in this country. All these drugs appear to have similar effects when taken in excess, and the term "amphetamine poisoning" in this account refers to the clinical picture which can be produced by overdosage with any of the group.

The purpose of this paper is to report three further examples of acute amphetamine poisoning. The case reports illustrate the difficulties which may arise when such patients are admitted to the wards of general hospitals, the necessity for adequate sedation in treatment, and the danger of excessive or improper use of a "benzedrine inhaler."

Case 1

A man of 23 attended the casualty department at 7 a.m. on June 7, 1956, complaining of a cramp-like pain over the praecordium, a tingling sensation over the face, and difficulty in breathing. The symptoms had been present for five hours. He denied having taken any drugs or alcohol. His wife stated that on the previous evening her husband complained of nasal obstruction and a frontal headache. At 11 p.m. he began to use a benzedrine inhaler bought the previous day. This seemed ineffective, and so he warmed the inhaler, at first before the fire and later by partial immersion in hot water. He inhaled constantly until 2 a.m., when he became dizzy and complained of inability to breathe and, soon afterwards, of nausea. Benzedrine inhalations were continued until 4.30 a.m. His symptoms persisted and about 6 a.m. his legs became weak, he had precordial pain, his face began to tingle, and he began to sweat profusely. Now very anxious, he called a neighbour and was brought to hospital.

On examination he was anxious and pale, and was sweating profusely. Breathing was shallow and rapid (40 a minute). His pupils were dilated but reacted to light and accommodation. His pulse was regular, 140 a minute, and his B.P. 200/100 mm. Hg. No other abnormal physical signs were present. Blood glucose on admission was 125 mg. per 100 ml. An electrocardiogram showed regular rhythm with auricular premature beats. The pulse was taken every 15 minutes for the next two and a half hours and varied

*Since this paper was written it is understood that all manufacturers in this country have ceased to make inhalers containing amphetamine derivatives.

between 146 and 100. He was given 3 gr. (0.2 g.) of soluble phenobarbitone intramuscularly and admitted to the ward. On further questioning he gave a clear account of previous illnesses but was confused regarding the day and date. He remained quiet and co-operative during the day. In the ward the pulse rate slowly fell from 120 to 90 and the blood pressure from 170/100 to 130/80 mm. Hg. Breathlessness and other symptoms gradually disappeared.

He was visited by his wife at 7.30 p.m., and at 8 p.m., after she had left, he suddenly developed tachypnoea 50 a minute and tachycardia 160 a minute. He sweated profusely and demanded oxygen. He then insisted he could hear his wife talking and accused the nursing staff of denying him permission to see her. He was given morphine, $\frac{1}{4}$ gr. (0.01 g.), subcutaneously and soluble phenobarbitone, 3 gr. (0.2 g.), intramuscularly. At 8.15 p.m. he demanded more oxygen and attempted to get out of the window. He was restrained with difficulty, but eventually jumped out of bed and for a time several nurses were needed to control him. Paraldehyde, 10 ml., was given intramuscularly and he eventually became quieter. At 1.30 a.m. a further 10 ml. of paraldehyde was given, he fell asleep, and the pulse and blood pressure again fell to normal levels.

Next day he could not remember his confusional episode. Dr. I. S. Kreeger, who then examined him, could find no evidence of psychiatric disturbance. He had been a paratrooper with a good Service record. He was happily married and there was no current stress. His wife recalled that her husband had once before used an inhaler for a cold the previous year; but then he had followed the printed instructions and inhaled only occasionally. After three days the patient was discharged, but later he suffered attacks of hyperventilation. These were becoming infrequent when he last attended the out-patient department four weeks later. The urine passed while he was in hospital was found to contain a total of 36 mg. of amphetamine base, which would correspond with an oral dose of 72-130 mg. of amphetamine (Connell, 1957). The benzedrine inhaler, analysed after the patient's admission to hospital, contained only 60 mg. instead of its original 325 mg.

Case 2

A woman of 32 was admitted to hospital at 8 p.m. on July 21, 1956, having swallowed 50 tablets of dexamphetamine sulphate (200 mg.) 12 hours previously. She denied suicidal intent and stated that she had taken the tablets for slimming, but later she admitted to being very depressed by the proposed adoption of her illegitimate son, 2 months old. The father of the child, of whom the patient was very fond, had suggested the adoption but had refused to marry her.

On admission she was aggressive, suspicious, and restless. Her face was flushed, she was perspiring profusely, and her mouth was dry. Both pupils were widely dilated but reacted to light and accommodation. Her pulse was regular at 120 a minute and her blood pressure 180/90 mm. Hg. After a stomach lavage she was sedated with intramuscular soluble phenobarbitone, 6 gr. (0.4 g.) six-hourly. She slept well during the night, and next morning was quite wide awake and co-operative. Her pulse rate was now 80 and her pupils were of normal size; her B.P. was 90/60 mm. Hg. Recovery was uneventful. The above sedation was continued for three days, when she was interviewed by Dr. E. J. Nuffield, who found no evidence of any specific psychiatric disorder other than mild depression. The urine passed in hospital contained 54.7 mg. of amphetamine sulphate, which would correspond with an oral dose of 109-187 mg. of dexamphetamine sulphate (Connell, 1957).

Case 3

A man of 32 was admitted to hospital on July 11, 1956, at 10 p.m. The previous evening he had drunk 12 pints (6.8 litres) of beer and then spent the night at a coffee stall, where he chewed the contents of one and a half benzedrine inhalers (487.5 mg. of amphetamine). He now felt "on top of the world," and drank a further 5 pints (2.8 litres) of beer

at Covent Garden, starting at 6 a.m. During the day he developed substernal pain and palpitation, and at 2 p.m. attended the Royal Eye Hospital, where he was given 3 gr. (0.2 g.) of soluble phenobarbitone intravenously and transferred to King's College Hospital, arriving at 2.45 p.m. After stomach lavage he refused in-patient treatment and left the hospital.

He returned at 9 p.m., having drunk a further 2 pints (1.1 litres) of beer. He was now anxious and sweating, with dilated pupils which reacted normally to light and accommodation. His pulse was regular at a rate of 108 a minute, and his blood pressure 170/120 mm. Hg. His tendon reflexes were brisk. He was given paraldehyde, 8 ml. intramuscularly, and sodium phenobarbitone 6 gr. (0.4 g.), intramuscularly. The latter was repeated six-hourly. He slept uneventfully through the night. His pulse rate rapidly fell to 70 and his B.P. to normal levels. Next day he was quiet and co-operative and was interviewed by Dr. Nuffield, who found no evidence of psychiatric abnormality beyond a history of chronic alcoholism. He went home after three days, having quite recovered.

Discussion

The side-effects of amphetamine compounds when used therapeutically include dryness of the mouth, restlessness, insomnia, irritability, and anxiety, and are relatively unimportant. With larger doses of 10-30 mg. the cardiovascular system is chiefly affected, causing flushing or pallor, palpitation, labile pulse rate and blood pressure, extrasystoles, heart-block, chest pain, and sometimes collapse (Anderson and Scott, 1936). Prolonged use may on rare occasions cause aplastic anaemia (Davies, 1937), and fatal pancytopenia has been recorded with continued overdosage (Mitchell and Denton, 1950). Death, however, is rare in acute poisoning. Only six cases appear to have been reported, and in three of these the role of amphetamine is uncertain. Harvey *et al.* (1949) thought that amphetamine had contributed to the death of a 35-year-old alcoholic who became jaundiced and died after ingesting alcohol together with the contents of two benzedrine inhalers. Post-mortem examination revealed an alcoholic fatty liver with zonal necrosis. The second patient, a student aged 25, after taking an estimated 10 mg. of amphetamine died suddenly during an examination. At necropsy acute gastric and splanchic dilatation was found. Although he was accustomed to taking amphetamine, his death was partly attributed to the drug (Smith, 1939). Amphetamine was held responsible for the death of a one-year-old child from haemorrhagic gastritis after swallowing 40 mg. of amphetamine together with an unknown quantity of ferrous sulphate tablets (Hertzog *et al.*, 1943).

In animals amphetamine is known to cause cerebral haemorrhage (Ehrich *et al.*, 1939; Ivy and Krasno, 1941), and all three patients in whom acute amphetamine poisoning appeared to be the sole cause of death had cerebral lesions. Pontrelli (1942) described the necropsy findings in a 25-year-old soldier who died after taking 100 mg. of amphetamine. The brain, lungs, and liver were congested, the kidneys showed tubular degeneration, and punctate haemorrhages were present in the pleura and pericardium. Gericke (1945) noted subdural and subarachnoid haemorrhages and petechial haemorrhages in the cerebrum, cerebellum, and pons in a 36-year-old man who had swallowed 120 mg. of amphetamine. Pretorius (1953) found acute internal hydrocephalus in a 3-year-old girl who died after swallowing an estimated 40 mg. of dexamphetamine sulphate. Poteliakhoff and Roughton (1956) have described the occurrence of cerebral haemorrhage with recovery in a man of 42 who dissolved the contents of a benzedrine inhaler in "coca-cola" and drank the mixture.

One common and most alarming result of amphetamine poisoning may be the development of an acute psychosis. Of the eight cases of acute amphetamine poisoning recorded in this country, four had visual or auditory hallucinations (Wallis *et al.*, 1949; Carr, 1954; Patuck, 1956; Shanson,

1956). Another patient was repeatedly admitted to hospital with excitement, confusion, paranoid delusions, and on one occasion depression, each admission being preceded by the ingestion of large quantities of amphetamine (O'Flanagan and Taylor, 1950). Watts (1956) reported the case of a 2-year-old child who swallowed tablets of "edrisal," each containing amphetamine, 2.5 mg., aspirin, 160 mg., and phenacetin, 160 mg. He became very restless and talked all night, at times coherently and at other times "like the wanderings of a lightheaded child." In these cases the amount of amphetamine taken, when known, varied from 55 to 115 mg. One patient extracted the contents of two benzedrine inhalers, but the actual amount ingested was uncertain (O'Flanagan and Taylor, 1950). We estimated that our patient who became psychotic had absorbed 265 mg. of amphetamine.

Acute amphetamine poisoning is commoner than published reports suggest. The severe examples present as an acute mental disturbance and are likely to be seen most often in mental observation wards. Connell (1956) has investigated 42 such cases from the physical and psychiatric aspects in the past two years and has followed the urinary excretion of amphetamine in 10 of these patients. Patients, however, who do not show initial overt mental disturbances at an early stage of the illness may be admitted to general hospitals and the need for heavy sedation may not be appreciated. This may well lead to difficulties and dangers, as shown in Case 1, in which the patient developed an acute psychotic state 12 hours after admission.

Since amphetamine is a barbiturate antagonist (Myerson *et al.*, 1936; Reifstein and Davidoff, 1938), large doses of these sedatives are required in the treatment of amphetamine poisoning, not only to control a psychotic patient but also as a prophylactic measure, since there is good evidence that mental abnormality may thereby be prevented. In the converse problem of barbiturate poisoning treated with large doses of amphetamine, mental complications are rare. None occurred in 14 patients given up to 400 mg. of amphetamine intravenously in eight hours (Freireich and Landsberg, 1946). Riishede (1950) treated 132 cases with total doses of amphetamine up to 4,850 mg., given intramuscularly over 84 hours. Although these amounts far exceeded reported toxic doses of amphetamine, only 5% of patients became confused or euphoric and only 2% developed hallucinations.

In the cases reported here, after adequate sedation Case 1 recovered within a few hours, and the initial restlessness and aggressive attitude in Case 2 quickly disappeared. There was no overt disturbance of a psychotic nature in the third patient, who, possibly wisely, had taken considerable sedation in the form of alcohol before admission.

All three showed an increased tolerance to hypnotic drugs. The first patient slept for only eight hours after injections of 3 gr. (0.2 g.) of sodium phenobarbitone, 20 ml. of paraldehyde, and $\frac{1}{4}$ gr. (0.01 g.) of morphine within five and a half hours. The second and third patients were wide awake after receiving a total of 12 gr. (0.78 g.) of sodium phenobarbitone by injection during the previous 12 hours.

These three further examples bring the total number of cases of acute amphetamine poisoning reported in this country to 11. In seven of these the source of the drug was an amphetamine-containing inhaler. Two examples of inhalational poisoning have previously been described in this country (Carr, 1954; Shanson, 1956), and we could find no evidence that our first patient took the drug in any other way. Memory impairment caused by amphetamine has been noted previously (Waud, 1938), and possibly explains why this patient inhaled almost continuously for five and a half hours when he had previously used an inhaler normally. Impairment of memory was certainly present eight hours after he had started to inhale.

Summary

Three examples of acute amphetamine poisoning are described. Two patients took the drug orally and one by inhalation. One patient became poisoned by chewing

the contents of one and a half benzedrine inhalers, an unorthodox but readily available source of the drug.

One case developed an acute psychosis, a common feature of severe amphetamine intoxication which requires heavy barbiturate sedation both for prophylaxis and for treatment.

We thank Dr. Clifford Hoyle for his guidance and for permission to publish these cases. We are also indebted to Dr. P. H. Connell (Maudsley Hospital) for estimating the amphetamine excretion in two of the cases and for much valuable advice.

REFERENCES

- Anderson, E. W., and Scott, W. C. M. (1936). *Lancet*, 2, 1461.
Carr, R. B. (1954). *British Medical Journal*, 1, 1476.
Connell, P. H. (1956). M.D. Thesis. London.
— (1957). *Biochem. J.*, 65, 7P.
Davies, I. J. (1957). *British Medical Journal*, 2, 615.
Ehrlich, W. E., Lewy, F. H., and Krumbhaar, E. B. (1939). *Amer. J. med. Sci.*, 198, 785.
Freireich, A. W., and Landsberg, J. W. (1946). *J. Amer. med. Ass.*, 131, 661.
Gericke, O. L. (1945). *Ibid.*, 128, 1098.
Harvey, J. K., Todd, C. W., and Howard, J. W. (1949). *Delaware St. med. J.*, 21, 111.
Hertzog, A. J., Karlstrom, A. E., and Bechtel, M. J. (1943). *J. Amer. med. Ass.*, 121, 256.
Ivy, A. C., and Krasno, L. R. (1941). *War Med. (Chicago)*, 1, 15.
Mitchell, H. S., and Denton, R. L. (1950). *Canad. med. Ass. J.*, 62, 594.
Myerson, A., Loman, J., and Dameshek, W. (1936). *Amer. J. med. Sci.*, 192, 560.
O'Flanagan, P. M., and Taylor, R. B. (1950). *J. ment. Sci.*, 96, 1033.
Patuck, D. (1956). *British Medical Journal*, 1, 670.
Pontrelli, E. (1942). *G. Clin. med.*, 23, 847.
Potellakhoff, A., and Roughton, B. C. (1956). *British Medical Journal*, 1, 26.
Pretorius, H. P. J. (1953). *S. Afr. med. J.*, 27, 945.
Reifenstein, E. C., and Davdoff, E. (1938). *Proc. Soc. exp. Biol. (N.Y.)*, 38, 181.
Riishede, J. (1950). *Lancet*, 2, 789.
Shanson, B. (1956). *British Medical Journal*, 1, 576.
Smith, L. C. (1939). *J. Amer. med. Ass.*, 113, 1022.
Wallis, G. G., McHarg, J. F., and Scott, O. C. A. (1949). *British Medical Journal*, 2, 1394.
Watts, C. A. H. (1956). *Ibid.*, 1, 234.
Waud, S. P. (1938). *J. Amer. med. Ass.*, 110, 206.

TRICHOPHYTON RUBRUM INFECTION IN FAMILIES

BY

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Trichophyton rubrum is the fungus most often isolated from patients with mycotic skin diseases attending the Bristol Royal Hospital. Of the 12 species isolated from 204 of these patients seen in the two years since March, 1954, *T. rubrum* was found 43 times.

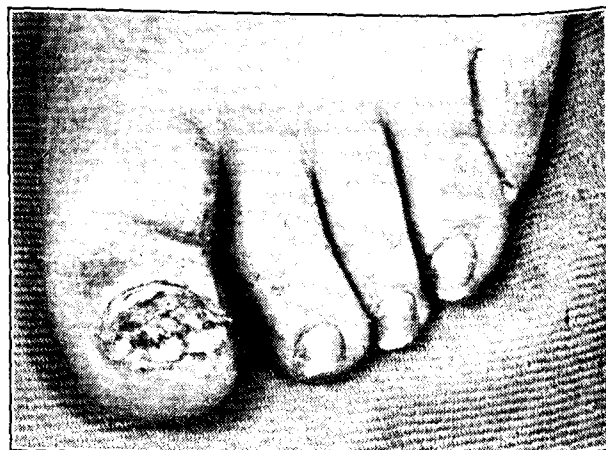
The infection is usually first noticed as a scaling or macerated area between the toes indistinguishable from tinea pedis due to other fungi. *T. rubrum* differs from other dermatophytes, however, in that it is much more likely to attack the nails, when their discoloured, misshapen, and broken appearance (see Fig.) may cause the patient much mental distress; treatment at this stage is very rarely successful. It is surprising, therefore, that the epidemiology and prevention of the disease have been so neglected.

Literature

Baer *et al.* (1955) showed the ease with which infective particles can be shed from active mycotic lesions of the feet. After they had soaked the infected feet of 73 patients in footbaths for 15 minutes they were able to demonstrate the presence of fungi microscopically in the water from 54 of the baths, and to obtain cultures of pathogenic fungi from 13 of these. Despite this evidence, these authors deny the importance of cross-infection in the spread of the disease, on the grounds that numerous attempts, by themselves and others, to isolate pathogenic fungi from

supposedly contaminated floors have been generally unsuccessful. Recently, however, Gentles and Holmes (1956, personal communication), using a new technique, have been able to isolate from the floors of four pit-head bathhouses the species of fungus predominant in the feet of the bathing miners at each pit.

Numerous surveys have been carried out on the incidence of tinea pedis in many types of community, but little effort has been made to trace the spread of any one fungus. Peck *et al.* (1944), on examining the feet of workers in six factories, found only five cases of *T. rubrum* infection, and all these occurred in the same plant. Gentles and Holmes



Trichophyton rubrum infection of the toe-nails.

(1956, personal communication) produce strong evidence that the habitual use of communal baths is an important factor in the spread of tinea pedis in coal-miners. The infection rate with all species of fungi is 31% of miners using baths against 8% of those who do not. They also found that, among bathing miners, the proportion of the two most important pathogens varied from pit to pit: in eight pits *T. mentagrophytes* was the predominant fungus; in one, *T. rubrum*; and in the tenth the two species were present in almost equal numbers. These figures indicate the importance of cross-infection in a community.

On the other hand, Hopkins *et al.* (1947), investigating fungous infection of the feet of soldiers at a military post, found that the various species occurred in approximately the same ratio in most of the groups examined, and concluded that individual susceptibility to an existing latent infection was more important than exposure to cross-infection. However, three of their 26 groups show considerable variation from the predominant species ratio and four others show slight variation. It is possible that the rapid turnover of personnel in military establishments would often allow insufficient time for any one species to become dominant.

Sulzberger *et al.* (1942) attempted to assess the extent of familial and conjugal infections of the feet and groins by sending questionnaires to over 100 American dermatologists. They concluded that among "a sum total probably aggregating hundreds of thousands of patients with fungous infections" of these areas, only four cases of familial infection were proved, and that therefore such infection was of no practical importance. The authors rightly consider that familial infection is not proved unless the fungi are isolated and shown to be culturally similar; yet they include as relevant the replies of 82 dermatologists who did not attempt cultural methods of proof, as well as those of the six who did. Also, no evidence is offered that any of these dermatologists had, as a routine, examined the family contacts of all their ringworm patients, and unless this was done their data can be of little value.

Referring to family infection by *T. rubrum*, Hyman (1953) does not believe that there is any evidence for its existence, while Lewis (1953) thinks it is fairly common, an opinion

which is supported in this country by Gold (1954). Several case reports of familial infections with this fungus have appeared (Hodges, 1921; Lewis and Spoor, 1953).

In view of these conflicting opinions I have tried to determine the incidence of familial *T. rubrum* infections in normal home conditions by a small survey of families living in the Bristol area.

Methods

The 32 patients from whom *T. rubrum* had been isolated and who were living with their families were asked to take part in the survey. As well as households consisting of parents and children, the families included adult brothers and sisters living together, and couples with no children at home. Two families refused to co-operate, five had left the district, and six were found, for various reasons, to be unsuitable subjects. Observations were made on the remaining 19 families comprising the original patients and their 48 contacts. They were visited on prearranged evenings, with the result that it was usual for the whole household to be present at the interview. The survey was undertaken during the winter of 1955-6.

The Interview.—The feet and hands of all persons present were examined and if there were clinical symptoms scrapings were taken. Personal histories were noted and family circumstances and habits discussed.

Laboratory Methods.—The skin scrapings were examined microscopically in 15% potassium hydroxide solution and cultured on Sabouraud's glucose-agar with added penicillin and streptomycin, cultures being obtained from all but one of the microscopically positive specimens but never from those which were negative. When more than one member of a family was infected, the isolates were compared with regard to growth rate and macroscopic and microscopic characters on six agar media (Sabouraud's glucose; Sabouraud's preserve; cornmeal; cornmeal + 1% glucose; asparagine-glucose; and nutrient + 4% glucose) on which they were grown for four weeks at 29° C. Distinct and persistent cultural differences, however slight, were taken to indicate the possibility of different strains which the patients might have contracted from different sources.

Results

The Spread of Infection.—In 9 out of the 19 families more than one person was infected with *T. rubrum*, and within each of these families the isolates were mycologically of the same type. In addition to the communal strain, variant strains of the fungus, occurring in the same lesions, were isolated from two of the families. Of the 48 contacts examined, 13 (27%) were infected, and in 11 of these the infection was first noticed in the feet. The minimum duration of exposure before any of these contacts showed signs of the disease was one year, but one girl was exposed for 15 years before infection was apparent. A much larger survey would be necessary to discover accurately the proportion of children brought up in infected families who ultimately contract the disease; but eight subjects between the ages of 14 and 35 years had been exposed as children, and six of these had proved infections.

Environment and Spread of Infection.—According to the Registrar-General's social classification, 11 of the families belonged to social classes I and II, the disease having spread in six; five were in class III, with a disease spread in two; and three were in classes IV and V, with a disease spread in one. The numbers are small, but they could indicate that *T. rubrum* mycosis is a disease mainly of the professional classes. Alternatively, it is possible that the working classes are less likely to seek medical advice about such a condition. Social class did not influence the incidence of spread, extension of infection having occurred in about half the families in each group. Two of the families were overcrowded, one being spotlessly clean and the other filthy, and together they accounted for 16 of the persons interviewed; yet, in each, only one contact had contracted the disease.

Seven of the original patients could trace their initial infection to residence or active service abroad, and in four others the disease was first noticed while the patient was using swimming-baths regularly or taking an active part in sports. The remaining eight could describe no special circumstances which might have accounted for the onset of their infection.

Effect of Precautions.—Five families had for three years or more taken precautions against spreading the disease—for example, they avoided walking about with bare feet, exchanging footwear, or using a communal bath-mat; and if they shared a bed they wore socks. The infection had not spread in any of these families after the precautions were instituted. It must be noted, however, that two wives who had taken no precautions had not contracted the disease, though they had been exposed to their husband's infections for 30 years.

General Observations on the Infected Persons

In an analysis of all the 32 infected persons seen during the survey (the 19 original patients and the 13 infected contacts) the following points were observed:

1. There was an almost equal sex incidence (17 males to 15 females).
2. Conjugal infection had occurred in 4 out of the 15 couples seen.
3. One child had contracted the disease before he was 5 years old; five first showed evidence of infection between the ages of 5 and 13, and seven persons when they reached 14 years or over.
4. In 27 patients the initial infection was in the feet; of the other five, the hands alone were involved in four, and one child had only a lesion on the face.
5. The nails were infected in 25 persons (78%); in four the finger-nails only had been attacked, in 15 the toe-nails only, and in six both finger- and toe-nails.
6. Three women and four men had had groin infections. Ringworm of the groin in women has seldom been reported in this country, and a description of these cases will be given elsewhere. One woman described ringworm of the axilla and one had an extensive infection of the arms and legs; four cases of ringworm of the face and body were seen.

7. Dermatophytes other than *T. rubrum* were encountered only twice, each time in association with the latter fungus. One man had a severe infection of the feet and toe-nails from which mixed cultures of *T. rubrum* and *Epidermophyton floccosum* were isolated; he had infected his daughter with the former fungus only. One woman had *T. rubrum* on her hands, contracted while treating her son's infection, and *T. interdigitale* on her feet.

8. Twenty-three patients had been referred for specialist advice, but only one while the infection was confined to the toe-webs. Of the remainder, seven consulted a dermatologist when their finger-nails became involved; five each about groin and toe-nail infections; four about face and body lesions; and one about lesions on the hand. Yet in 18 of these infection of the toe-webs had preceded by many years the more widespread symptoms.

Discussion and Conclusions

This survey indicates the importance of cross-infection by *T. rubrum* in the home. In half the families the malady had spread, and 27% of the contacts who were examined were infected. A number of them were unaware of their infection, and this emphasizes the importance of personal examination of such people rather than merely questioning them or their relatives. In fact, these figures are probably an underestimate of the extent of the disease, for in addition to the verified cases many persons interviewed gave descriptions of typical ringworm of the body in the past and mentioned other members of the family who had left home whose toe-nails were "all yellow and thickened."

Marples and Di Menna (1949), Baer *et al.* (1955), Gentles and Holmes (1956, personal communication), and others have noted the long period of exposure before clinical infection of the feet becomes evident: this, as I have reported, has also been my experience. The evidence indicates that some breakdown in personal immunity must precede the onset of clinical disease. If a person is to become infected, this lessening of immunity must coincide with inoculation with a viable fungus. In contradistinction to the hypothesis that patients become infected after recent inoculation from an outside source, Sulzberger *et al.* (1942) and Sulzberger and Baer (1955) believe that most supposedly normal persons are carriers of fungi, and that this is the starting-point of clinical disease when immunity breaks down. Their theory is not supported by the evidence of familial infection in 11 of my 48 contacts, while only one had contracted the disease (due to *T. interdigitale*) from an outside source: a larger proportion of extraneous infections, or at least of mixed infections with two species, would have been expected. The evidence indicates continual exposure of the contacts to cross-infection in the home and a phase of lowered personal resistance which allowed the fungus to produce clinical disease.

The intractability of *T. rubrum* infections to treatment, their disfiguring nature, and the mental distress which often ensues emphasize the importance of attempting to check the spread of the disease. This is especially so in families with young children, as is shown by the infection rate of six out of eight persons over the age of 14 who had been exposed to infection as children. Precautions should be simple and have the object of preventing the shedding of infective particles in places where others may come into contact with them; for instance, avoiding walking about bare-footed, exchanging footwear, or using a communal bath-mat. The sterilization of footwear and floors is impracticable and is not likely to be performed faithfully by the patient.

In half the patients who had been referred to dermatologists the disease had already reached the nails, and was therefore practically incurable. If more patients with tinea pedis were seen by dermatologists before this stage was reached, and if the fungus concerned was identified, infection of the nails and hands might be delayed or prevented. For should *T. rubrum* be found, the patient could be warned to pay greater attention to his condition than is normally accorded to "athlete's foot."

Summary

The epidemiology of *Trichophyton rubrum* infections has been studied in 19 families in whom one member was known to be infected.

The disease had spread in nine of the families, and 13 (27%) of the 48 contacts were infected. The mycological similarity of fungi isolated from members of the same family has been demonstrated.

Six out of eight persons over the age of 14 who had been exposed to infection during childhood had contracted the disease.

Periods of exposure of from 1 to 15 years were noted before clinical signs of disease occurred, and in five families who had taken precautions for three years or more there had been no spread of infection.

The nails had been attacked in 78% of all the infected persons. In most of these the disease had begun in the toe-webs, but specialist advice had not been sought at this early stage.

Cross-infection with *T. rubrum* in families is important, and simple precautions against spreading the disease are suggested.

I thank Dr. R. P. Warin and Dr. C. D. Evans, whose patients, except for one family, were the subjects of this inquiry, for their enthusiastic support throughout; Dr. Catherine J. Maclaren, who

most kindly interviewed one family of her own patients for me; the families, for their very helpful co-operation; and Dr. M. Hewitt for his invaluable guidance in the preparations for, and conduct of, the survey and in the presentation of the results. I am indebted to the University of Bristol Medical Photographic Department for the photograph.

REFERENCES

- Baer, R. L., Rosenthal, S. A., Rogachefsky, H., and Litt, J. Z. (1955). *Amer. J. publ. Hlth.* 45, 784.
Gold, S. C. (1954). *Trans. St. John's Hosp. Derm. Soc.*, 33, 27.
Hodges, R. S. (1921). *Arch. Derm. Syph. (Chicago)*, 4, 1.
Hopkins, J. G., Hillegas, A. B., Ledin, R. B., Rebell, G. C., and Camp, E. (1947). *J. invest. Derm.*, 8, 291.
Hyman, A. B. (1953). *A.M.A. Arch. Derm. Syph.*, 68, 355.
Lewis, G. M. (1953). *Ibid.*, 68, 355.
— and Spoor, H. (1953). *Ibid.*, 68, 354.
Marples, Mary J., and Di Menna, M. E. (1949). *Med. J. Aust.*, 2, 156.
Peck, S. M., Botvinick, L., and Schwartz, L. (1944). *Arch. Derm. Syph. (Chicago)*, 50, 170.
Sulzberger, M. B., and Baer, R. L. (1955). *Year Book of Dermatology and Syphilology*. Year Book Publishers, Chicago.
— and Hecht, R. (1942). *Arch. Derm. Syph. (Chicago)*, 45, 670.

ATHLETE'S FOOT FUNGI ON FLOORS OF COMMUNAL BATHING-PLACES

BY

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During a recent survey of foot ringworm in groups of industrial workers in Great Britain, Gentles and Holmes (1955, 1957) showed that there is spread of infection among users of communal bathhouses. Parasitic fungi were isolated from the floors of some of the bathhouses on a number of occasions (Gentles, 1956). There was some indication that these fungi were not present as saprophytic colonies on the floors, but the evidence was not conclusive (Gentles and Holmes, 1955; Gentles, 1956). Various opinions on the method of spread of infection have been given. Duncan (1949) and J. T. Ingram (1954, personal communication) believed that spread took place by transfer of scales from the feet of the infected to the interdigital clefts of the feet of others. Duncan also believed that the fungi could grow saprophytically on wooden floors, and Riddell (1951) stated that the increase in incidence of the disease amongst users of communal bathing-places was probably due to the lighting up of latent infections rather than to new infections caused by the fungi growing saprophytically on the floors. Peck, Botvinick, and Schwartz (1944) stated that the pH of aged concrete was compatible with growth of the dermatophytes concerned, but they did not show that growth actually took place, and the dermatophytes they isolated from sterilized concrete probably came from infected skin fragments (Gentles, 1956).

Adamson and Annan (1949) isolated *Trichophyton mentagrophytes* from a fragment of skin found on the floor of a bathhouse, and I also made one isolation in this way (Gentles, 1956).

Experiments recently carried out in this laboratory have confirmed that spores of *T. mentagrophytes* can exist for long periods on concrete surfaces and also that this species of dermatophyte can grow on moist crushed asphalt when soap is present. It seems unlikely, however, that the conditions required to enable growth to take place are ever fulfilled in practice. It is customary for floors of most institutions to be thoroughly cleaned at frequent intervals (usually daily) with detergents and disinfectants of various kinds, and these substances almost without exception exert a fungistatic action on

the fungi concerned. In an effort to obtain further information on the question of how infection spreads, the answer to which is important if satisfactory prophylactic measures are to be introduced, it was decided to investigate more fully the condition of shower floors both in the clean state and after they had been used.

Method

The experiment was carried out on two occasions, in May and three weeks later in June, 1956, in the bathhouse of a near-by colliery. The incidence of athlete's foot among those who used the showers at this colliery was estimated in 1953 to be 19% (Gentles and Holmes, 1955; 1957). The sampling of the floor, which is surfaced with asphalt, was carried out with direct samplers (Gentles, 1956). These consist essentially of a velvet pad on a wooden support, and on each of five previous occasions on which they have been used dermatophytes have been successfully isolated. In the laboratory they have proved suitable for location of both fungal spores and skin fragments on asphalt and concrete surfaces.

Three samplers were used on each of the four positions A, B, C, and X (Fig. 1) on the clean floor, and the same number two hours later after some hundred or more men had bathed. Each sampler was applied four times to the part of

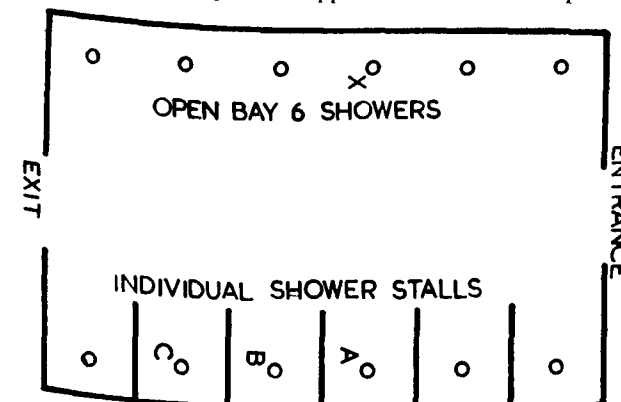


FIG. 1.—Diagram of shower bay in colliery bathhouse, showing the relative positions of the four floor areas A, B, C, and X used in the experiments.

the floor surface immediately below the shower nozzle, the area covered by three samplers on each occasion being just under 1 square foot (929 square cm.). The showers were run for a short period before sampling in order to wet the clean floor, as the samplers are not suitable for use on a dry surface. Three petri dishes containing 4% malt extract agar supplemented with cycloheximide (5 µg./ml.), penicillin (20 units/ml.), and streptomycin (40 units/ml.) were inoculated from each sampler.

The dishes were incubated at 28° C. and examined at frequent intervals.

Results

The cycloheximide inhibited the growth of most of the common saprophytic fungi for a period, and dermatophyte identity of the isolates was in every case confirmed by microscopical examination of a slide mount. Only one species of dermatophyte, *T. mentagrophytes*, was obtained. This species is the common cause of foot ringworm in this country, and is also the predominant species in foot infections at this colliery (Gentles and Holmes, 1955). The isolates were all of the interdigitale variety, and subcultures in no way differed from those usually obtained from foot infections with this species.

The Table shows that dermatophytes were isolated from all four shower positions, but only once were they obtained on both May and June samplings from the same shower.

Results Obtained from Sampling the Floors of Four Shower Stalls on Two Occasions

Date of Sampling (1956)	No. of Colonies of Dermatophyte Obtained							
	Shower A		Shower B		Shower C		Shower X	
	Clean*	After Use	Clean	After Use	Clean	After Use	Clean	After Use
May	0	2	0	0	0	0	0	0
June	0	2	0	22	0	1	0	1
Total	0	4	0	22	0	1	0	1

* Sampling was carried out on the clean floors and also after the showers had been used.

Discussion

It is apparent from these results that the distribution of the fungi on the floors is not the same all the time, as would be the case if the fungi were present as saprophytic colonies. It must be assumed under such circumstances that the spread of infection takes place, as Duncan and Ingram have postulated, by transfer of infected skin fragments. Failure to isolate from the clean floors indicates that cleaning of the floors effectively removes the infective fragments and therefore spread of infection obviously takes place only among those groups who use the showers in periods between cleaning. The efficacy of the cleaning in this bathhouse, which is in no way unusual as regards either method or materials, was clearly evident by comparison of the numbers and variety of saprophytic fungi, yeasts, and bacteria in the petri dishes inoculated from the clean floor and in those inoculated from the floor after use. Two comparable series from a shower before and after use are shown in Fig. 2.

In a previous article (Gentles, 1956) it was stated that the parasitic fungi were probably present on the floors in some quantity. These further isolations from a relatively small

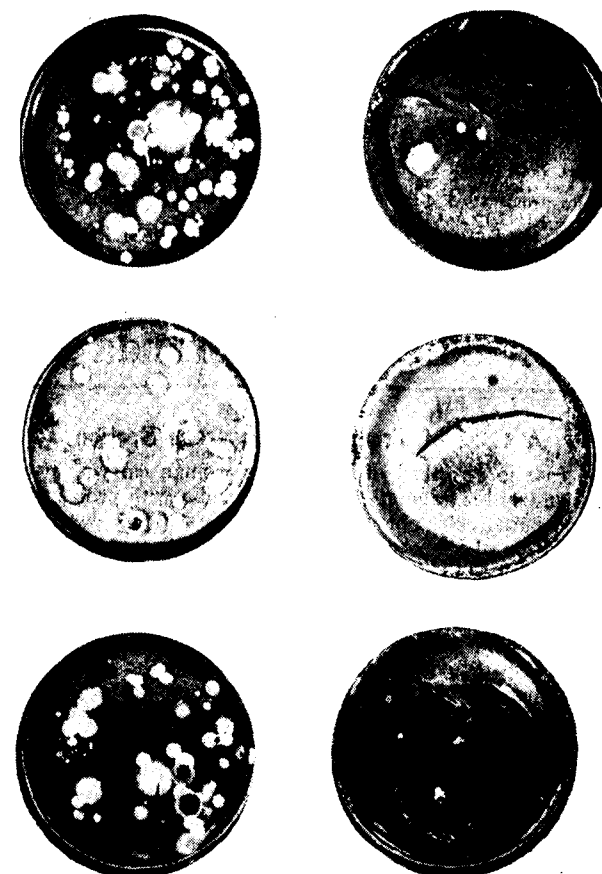


FIG. 2.—Photograph showing on the left the series of three dishes inoculated with a single sampler from the floor of shower A after use, and on the right the dishes inoculated with corresponding sampler used on the clean floor of the same shower. A single colony of *T. mentagrophytes* is present on the lower left petri dish slightly off centre in direction of 5 o'clock.

area confirm this view and show that the failure of many previous attempts was due to deficiencies in the methods used (Peck *et al.*, 1944). The large number of isolates obtained at the June sampling from shower B is probably the result of sampling the shower immediately after it had been used by an infected person. The few colonies usually obtained would seem to indicate that the infected fragments may be washed down the drains shortly after being deposited, as Peck *et al.* suggested, but it is also possible that they are carried away on the feet of subsequent bathers. The risk of skin fragments containing parasitic fungi being picked up on the feet of a person using this particular shower would at any rate be very great.

In view of these findings it seems certain that any measures for control of spread of infection must be taken by the individual, either by the use of aids such as sandals to prevent direct contact with the floors, or by application of some fungicidal preparation after bathing.

Summary

The same four shower stalls of a communal bathhouse were sampled before and after use on two separate occasions. It is clearly shown that the presence of dermatophytes as saprophytic colonies on the floor is extremely unlikely, and that the spread of infection almost certainly takes place by transfer of infected skin fragments. There is also evidence that skin fragments containing viable parasitic fungi are deposited, and are on occasion present on the floors, if even for a comparatively short time, in very large numbers. It is pointed out that measures to control spread must be of a personal nature.

I thank the medical services of the National Coal Board for their co-operation; Professor J. W. Howie and Dr. J. G. Holmes for their advice; Miss C. O. Dawson for much valuable assistance; and Mr. F. Lonsdale and Mr. G. Clark for the photography.

REFERENCES

- Adamson, J. B., and Annan, W. G. (1949). *Brit. J. Phys. Med.*, 12, 34.
Duncan, J. T. (1949). *Trans. roy. Soc. trop. Med. Hyg.*, 42, 207.
Gentles, J. C. (1956). *J. clin. Path.*, 9, 374.
— and Holmes, J. G. (1955). Unpublished reports to the Industrial Epidermophytosis Committee of the Medical Research Council.
— (1957). *Brit. J. Indust. Med.*, 14, 22.
Peck, S. M., Botvinick, L., and Schwartz, L. (1944). *Arch. Derm. Syph. (Chicago)*, 50, 170.
Riddell, R. W. (1951). *Brit. med. Bull.*, 7, 197.

Medical Memoranda

A Case of Traumatic Caesarean Section

The case is described of an African woman carrying twins who suffered a traumatic caesarean section with prolapse of foetal parts. Prompt though primitive surgery was performed by the husband, thereby saving the lives of the mother and one child.

CASE REPORT

A pregnant woman of the Tugen tribe was admitted to Rift Valley Province General Hospital on the evening of November 3, 1954, after a journey of some 40 to 50 miles (64 to 80 km.) on foot and by ambulance. Approximately 24 hours earlier she had fallen forwards on to an iron spike in her garden, and sustained a 4-in. (10-cm.) transverse wound of the abdominal wall with prolapse of what was thought to be a foetal elbow. The husband had roughly sutured the wound with strong thread, and the woman had started on her journey to El Dama Ravine Hospital, from whence she was transferred by ambulance.

On admission the patient's general condition was excellent. The abdominal wound appeared slightly septic, and there was considerable tenderness and guarding over the lower abdomen so that it was difficult to determine details,

although a full-term uterus was palpated and the foetal heart sounded clearly and of normal rate. The patient confirmed that foetal movements were still being felt.

At this time it was thought that the story of prolapse of foetal parts was a mistake, since such an injury was thought to be scarcely compatible with a viable child more than 24 hours later. In consequence operation was deferred for 12 hours, when the thread sutures parted to reveal a foetal hand.

At operation the foetal parts were found to be prolapsing through a transverse wound of the uterus situated 1-2 in. (2.5-5 cm.) above the usually selected site of incision for a lower-segment caesarean section. The uterus was not contracted, though the edges of the wound were everted and bleeding very little; about 1½ to 2 pints (850 to 1,140 ml.) of blood was collected from the paracolic gutters and transfused after straining through gauze into citrate solution.

The dead foetus, with the placenta and membranes, was removed without enlarging the uterine wound, and a further binocular twin, which lay in an intact sac, was similarly delivered and found to be alive.

The uterus was repaired by the method usually adopted after lower-segment caesarean section, and the abdomen was closed without drainage. Apart from some superficial wound infection which responded to chemotherapy, and an anaemia which required treatment, the post-operative course was uneventful. A very satisfied mother was discharged with her small son on the twenty-fifth post-operative day.

COMMENT

This case has a number of features in common with the case of self-inflicted caesarean section described by Sandford (1951).

Hysterectomy was not considered, and indeed it is seldom found necessary to undertake this heroic measure in cases of ruptured uterus, since repair is almost always an easier and less shocking procedure, and very often leaves a uterus capable of further normal function or one in which caesarean section may be undertaken at full term in subsequent pregnancies.

Sufficient confidence in the repair persuaded us that sterilization would also have been an unwarranted procedure. There is adequate supervision by a rural health service in this woman's district to ensure that she will receive satisfactory treatment in the event of further pregnancy.

Regarding the latter paragraph, it is of interest that Dr. Sandford's patient, who also was not sterilized, was returned before term with a further pregnancy, and after an unsuccessful trial labour was delivered of a live child by caesarean section, under my care.

My thanks are due to Dr. D. W. F. Charlton, who assisted in the management of this case.

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REFERENCE

- Sandford, A. R. (1951). *E. Afr. med. J.*, 28, 6.

Recurrent Myxoedema and Goitre Attributed to Potassium Iodide

Myxoedema resulting from the administration of iodine to patients free from thyroid gland disorder is rare. It has been described by Léchelle and Troisier (1950), Bareau (1952), Morgans and Trotter (1953), Herbert and Petrie (1954), and Freed (1954). Acute swelling of the thyroid gland complicating treatment with iodides was reported by Edmunds (1955). Cases in which both myxoedema and goitre developed after iodide administration have been described by Bell (1952), Raben (1953), and Turner and Howard (1956).

The patient whose case is described here had four attacks of myxoedema and goitre in five years, and recovered without treatment. It is believed that potassium iodide was responsible for each episode.

CASE REPORT

The patient, a bricklayer aged 41, has been subject to bronchial asthma from the age of 20. There is no history of any other disease. In September, 1950, he was admitted to hospital complaining that for some three weeks he had been tired, cold, and constipated, and was increasing in weight. His voice had become hoarse, his face puffy; and the swelling of the neck had made fastening his collar difficult. Examination showed a well-built man with the characteristic features of myxoedema. The thyroid gland was uniformly enlarged, smooth, and soft, and the neck measured 16½ in. (41.2 cm.) in circumference. The chest was emphysematous. There were no other abnormal physical findings. The serum cholesterol level was 381 mg. per 100 ml., and the basal metabolic rate (B.M.R.) -20%. He improved rapidly without treatment, and in two weeks had lost 17½ lb. (8 kg.) in weight; his neck circumference had become an inch (2.5 cm.) less, the serum cholesterol level had fallen to 236 mg. per 100 ml., and the B.M.R. had risen to +5%. In three weeks he felt well and his appearance was normal.

In June, 1951, the goitre and symptoms of hypothyroidism recurred during the space of a few weeks, and his appearance again became myxoedematous. Without treatment he recovered completely in two months.

In February, 1952, he was readmitted to hospital with pneumonia and frank myxoedema. The goitre and symptoms of hypothyroidism had begun two or three weeks earlier. Without treatment for his myxoedema he improved rapidly. In three weeks the neck circumference was reduced by 1½ in. (3.1 cm.) and he lost 13 lb. (5.9 kg.) in weight. In two months he was free from symptoms and signs of hypothyroidism.

In March, 1955, he was admitted to hospital with symptoms of severe hypothyroidism, present for about two months. He was sleepy, and had a croaking voice. The features were coarse, with thick lips and puffy eyelids. The skin was cold, dry, and rough. The thyroid gland was uniformly swollen and firm, and the neck measured 17½ in. (44.8 cm.). The serum cholesterol level was 440 mg. per 100 ml. and the B.M.R. was -17%. The electrocardiogram showed small QRS deflections and flat T waves. Without treatment he regained his normal appearance, vigour, and body weight in two months. With recovery his serum cholesterol level fell to 180 mg. per 100 ml. and the B.M.R. increased to +4%; the electrocardiogram became normal, and the neck circumference returned to its normal 14½-15 in. (38-39 cm.).

It was evident that the patient was not suffering from primary hypothyroidism, and inquiry showed that the only chemical agent he had taken was a proprietary medicine containing potassium iodide (potassium iodide, 2½ gr. (0.16 g.); caffeine sodium salicylate, 2½ gr. (0.16 g.); ephedrine, 2½ gr. (26 mg.); extract of coffee B.P.C. to 1 dr. (3.5 ml.). A week had rarely passed without his taking a

little of the mixture, but for several weeks before each attack of myxoedema he had taken five or six doses every day. The symptoms and signs of hypothyroidism had disappeared on each occasion within two months of stopping the medicine. Figs. 1 and 2 show the patient during an attack and between attacks of myxoedema respectively.

A mixture containing all the ingredients of the proprietary medicine except potassium iodide was dispensed, and five or six doses were taken by the patient daily for two months without evidence of hypothyroidism developing.

COMMENT

This case, with the evidence in the literature to which reference has been made, suggests that iodides can cause myxoedema in persons free from previous disorder of the thyroid gland.

Iodide administration is occasionally followed by myxoedema in cases of mild thyrotoxicosis, and in patients subjected to partial thyroidectomy for exophthalmic goitre (Haines, 1928; Thompson and Thompson, 1930; Thompson *et al.*, 1930; and Prodger and Brauns, 1943). A patient with simple goitre in whom iodine administration led to myxoedema was reported by Hurxthal (1945) and by Bell (1952).

It is conceivable that iodides may reduce metabolism by interfering with the secretion or action of thyrotrophic hormone, by increasing the rate of breakdown and excretion of thyroid hormone, by acting directly upon the thyroid gland, or by a combination of these actions. Werner *et al.* (1955) concluded that iodides act upon the thyroid cell, and not by interference with the action of thyrotrophic hormone; and Ansell and Miller (1952) found no evidence of increase in the rate of breakdown and excretion of thyroid hormone in rats fed large doses of iodides. With respect to the effect of iodides on the thyroid gland, it has been found in rats and man that high levels of plasma iodide prevent the transfer of iodine from inorganic to organic combination, and prevent the uptake of iodine by the gland (Wolff and Chaikoff, 1948; Stanley, 1949; Childs *et al.*, 1950; Keating *et al.*, 1950). Ansell and Miller (1952) and Goldsmith and Eisele (1956) suggest that high levels of plasma iodide suppress the release of thyroid hormone from the gland. Fawcett and Kirkwood (1953) believe that excess iodide ions act by forming molecular compounds with elemental iodine in the thyroid gland, and thus make it unavailable for iodinating tyrosine.

Raben (1953) has suggested that the goitre resulting from iodide administration is caused by an excessive secretion of thyrotrophic hormone consequent upon prolonged interference with thyroid hormone formation.

Why myxoedema and goitre should be so rarely caused by these actions of iodine is, at present, a matter for speculation.

I am grateful to Dr. C. E. Davies and Dr. T. Hanley for advice and criticism.

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REFERENCES

- Ansell, G., and Miller, H. (1952). *Lancet*, 2, 5.
Bareau, A. (1952). *Bull. Soc. méd. Hôp. Paris*, 68, 423.
Bell, G. O. (1952). *Trans. Amer. Goiter Ass.*, 28. Thomas, Springfield, Ill.
Childs, D. S., Keating, F. R., Rall, J. E., Williams, M. M. D., and Power, M. H. (1950). *J. clin. Invest.*, 29, 726.
Edmunds, H. T. (1955). *British Medical Journal*, 1, 354.
Fawcett, D. M., and Kirkwood, S. (1953). *J. biol. Chem.*, 204, 787.
Freed, I. (1954). *Lancet*, 1, 572.
Goldsmith, R. E., and Eisele, M. L. (1956). *J. clin. Endocr.*, 16, 130.
Haines, S. F. (1928). *Endocrinology*, 12, 55.
Herbert, E. M., and Petrie, E. (1954). *Lancet*, 1, 108.
Hurxthal, L. M. (1945). *Lahey Clin. Bull.*, 4, 73.
Keating, F. R., Haines, S. F., Power, M. H., and Williams, M. M. D. (1950). *J. clin. Endocr.*, 10, 1425.
Léchelle, P., and Troisier, F. (1950). *Bul. Soc. méd. Hôp. Paris*, 66, 960.
Morgans, M. E., and Trotter, W. R. (1953). *Lancet*, 2, 1335.
Prodger, S., and Brauns, W. H. (1943). *Bull. New Engl. med. Cent.*, 5, 42.
Raben, M. S. (1953). *J. clin. Endocr.*, 13, 812.
Stanley, M. M. (1949). *J. clin. Invest.*, 28, 812.
Thompson, W. O., and Thompson, P. K. (1930). *Endocrinology*, 14, 393.
—, Brailey, A. G., and Cohen, A. C. (1930). *Amer. J. med. Sci.*, 179, 733.
Turner, H. H., and Howard, R. B. (1956). *J. clin. Endocr.*, 16, 141.
Werner, S. C., Spooner, M., and Hamilton, H. (1955). *Ibid.*, 15, 715.
Wolff, J., and Chaikoff, I. L. (1948). *Endocrinology*, 43, 174.



FIG. 1.—Appearance during an attack of myxoedema. FIG. 2.—Appearance between attacks.

Reviews

ORGANIZATION OF MEDICAL RESEARCH

The Support of Medical Research: A Symposium Organized by C.I.O.M.S. Edited by Sir Harold Himsworth and J. F. Delafresnaye. (Pp. 170+xi. 17s. 6d.) Oxford: Blackwell Scientific Publications. 1956.

By honourable tradition research is a function of the universities, but with the increasing realization of the vital importance of scientific knowledge in the present century, and the increasing cost of the machinery of research, it has been found necessary in many countries to supplement the universities' resources for the purpose by establishing central research organizations directly financed by Government. Inquiries by the Council of International Organizations of Medical Sciences (C.I.O.M.S.) in the spring of 1954 showed that no fewer than 30 countries had set up central organizations for medical research, with functions essentially analogous to those of the Medical Research Council in the United Kingdom. It was a happy idea to arrange a meeting between senior officers of these bodies, so that they might compare their problems, determine their common philosophy, and, not least important, get to know each other well. The meeting, which was held in London in October, 1954, under the chairmanship of Sir Harold Himsworth, Secretary of the U.K. Medical Research Council, was attended by representatives of Australia, Belgium, Canada, Eire, India, Israel, the Netherlands, New Zealand, Norway, Sweden, Switzerland, the Union of South Africa, the United Kingdom, the United States, Yugoslavia, and Western Germany; four other countries—Brazil, Japan, Spain, and the U.S.S.R.—had expressed interest in the meeting but were unable to send delegates, and illness unfortunately prevented the representative of France from attending. In preparation for the meeting the delegates of 16 countries had provided detailed memoranda upon their national organizations for medical research, and these are printed as appendices to the report of the symposium.

The report itself is a remarkable document, having been synthesized by Sir Harold Himsworth and Dr. Delafresnaye, with uncommon skill and to the satisfaction of all present, from the verbatim transcripts of the four days' discussions. It shows what a surprising measure of agreement exists, in countries with widely different political systems, in regard to the respective roles of the universities, the central research organization, and special research institutions in the promotion of research and the recruitment and training of investigators. Perhaps its most important conclusion is that, in order to preserve the intellectual climate essential for good research, the central research organization, even when supported wholly or mainly by Government, must be guided in its activities by experienced research scientists, and must itself, like the universities, with which it should be closely integrated, be left free to pursue its scientific aims without political interference.

The book contains much of interest and value for all who are concerned with the advancement of knowledge in medical science and the education of scientific workers. It should be of particular help to the Governments of countries which have not yet set up a research organization but are contemplating doing so; let us hope they will turn to it for guidance in the principles which should govern their work.

F. H. K. GREEN.

HORMONE RESEARCH

Recent Progress in Hormone Research. Proceedings of the Laurentian Hormone Conference, 1955. Edited by Gregory Pincus. Volume XII. (Pp. 453; illustrated. \$10.) New York: Academic Press Inc. London: Academic Books Ltd. 1956.

It is a common complaint that medical literature increases faster than it can be tabulated or digested. There is urgent need for more research into the best methods of recording,

classifying, and disseminating new knowledge. One fairly successful method is by means of the review which surveys the literature on a limited subject. But many reviews fail because they are mere catalogues of collected and relevant papers without critical selection or appraisal. A recent and more successful method is by publishing the proceedings of a symposium. In this way a critical survey of the present state of knowledge is obtained from an expert, and the general conclusions are extended and discussed by other experts. Properly handled, this proves to be an eminently successful method of presenting recent knowledge.

An excellent example of this is the series of Proceedings of the Laurentian Hormone Conferences. Published once a year under the title *Recent Progress in Hormone Research*, this has now firmly established itself as an important reference work in endocrinology. The twelfth volume records the 1955 conference and fully maintains the high standards of both scholarship and editing which we have come to associate with this series. The subjects covered include reviews of thyroid hormone metabolism, and the biogenesis of adrenal medullary amines and of cortical steroids. There are critical studies of the mechanisms of oxidation-reduction of the steroid nucleus and of hormonal glucuronide formation. An extensive survey reviews knowledge of the effect of steroids on cerebral metabolism in man. Present knowledge of the significance and behaviour of aldosterone is concisely and ably reviewed. All the surveys are by leading experts in their fields.

Long surveys are included of the effects of insulin in peptide formation, on human urinary gonadotropin, and on the hormone control of melanin pigmentation. The role of male sex hormone in reproduction is discussed, and so is the mechanism of action of ovarian steroids. Relatively few of the papers are directly clinical, but this volume contains a valuable review of pituitary syndromes in man and a clinical study of testicular hormone production.

All who seek to keep up with the ever-changing concepts of any aspect of endocrinology will find this series of the greatest value. They should be available in every medical library.

C. L. COPE.

TEXTBOOKS OF HISTOLOGY

Lehrbuch der Histologie und der Mikroskopischen Anatomie des Menschen. Established by Philipp Stöhr, carried on by Wilhelm v. Möllendorff, and revised by Kurt Goerttler. Twenty-seventh edition. (Pp. 558+xii; illustrated. D.M.36.) Jena: Gustav Fischer Verlag. 1955.

Histologie und Mikroskopische Anatomie des Menschen. By W. Bargmann. Second edition. (Pp. 796+xvi; illustrated. D.M.69.60.) Stuttgart: Georg Thieme. 1956.

The first of these books is the 27th edition of a famous textbook on the histology and microscopical anatomy of man. Originated by Stöhr, it was continued for many of its appearances under the guidance of von Möllendorff, and for its latest form Professor Goerttler, of Freiburg, is responsible. All systems and tissues are dealt with thoroughly, not only from the point of view of their static composition, but dynamically and from the standpoint of function. That so much can be encompassed in some 550 pages is largely due to the lavish use of illustrations, some in colour; the majority of these are schematic drawings which enable a clear comprehension of the subject to be obtained. Where necessary, however, photomicrographs and drawings of appropriately stained and illuminated preparations are freely employed. Detailed criticism of the enormous amount of material cannot be attempted; its thoroughness indicates its country of origin, and its content is important to a much wider audience than the student population.

To all concerned with normal microscopical anatomy and who do not already know this book it can be confidently recommended on the grounds of its ability to explain the minutiae of its subject and the ease with which the illustrations can be understood. The book is scientifically highly desirable, easily handled owing to its reasonable size, and, possibly what is much more important to its producers, it

is, as a foreword tells us, acceptable as a textbook in the universities and high schools of the German Democratic Republic.

The second of these books, Dr. W. Bargmann's, is the second edition of a textbook on normal human microscopical anatomy and histology. Its resemblance to Goerttler's *Lehrbuch* in subject-matter, layout, and the use of illustrations is remarkable; even the same diagrams are reproduced from the literature in some cases. This may perhaps be traced to the fact that Dr. Bargmann was a pupil of von Möllendorff, presumably at a time when the latter was busy with an earlier edition of the *Lehrbuch der Histologie*.

It is as little possible to criticize minutely *Histologie und Mikroskopische Anatomie des Menschen* as it is the *Lehrbuch der Histologie*. Dr. Bargmann, single-handed, has produced a monumental work of reference for the microscopical anatomist, lavishly illustrated by all convenient methods. That he has made an effort to reduce the size of his book is shown by the condensation of the two earlier parts into one volume in this edition.

These two books are so similar in every way that the questions must inevitably arise of whom they are intended for and whether there is a genuine need for the two. It is easier to answer the second question than the first by noting the regularity with which the *Lehrbuch der Histologie* has presented new editions and that Dr. Bargmann's second edition appears but five years after his first. An audience for the books will be readily found in all those concerned with normal and pathological microscopy of human tissues. In an attempt to compare and contrast these two books and as some sort of aid to a prospective purchaser, it should be noted that Bargmann's book is larger, heavier, and more expensive than Goerttler's. The production of both is of a high order.

I. A. B. CATHIE.

GERIATRICS

Modern Trends in Geriatrics. Edited by William Hobson, B.Sc., M.D., D.P.H. (Pp. 422+vii; illustrated. 72s. 6d.) London: Butterworth and Co. (Publishers) Ltd. 1956.

Many books in geriatrics lose in value because they deal with diseases peculiar to, or of special importance in, old age, but fail to give the essential background for comparison—the changes in mind and body normally associated with ageing. The work under review is free from this fault. The first four chapters dealing with the general problem—the biological and cellular changes, the biochemistry, and the pathology of the elderly—are masterpieces in their execution. A remarkable level of excellence is achieved by the writers of the various contributions which follow. Indeed, it might appear to be invidious to single out any one of them for special praise except that a reviewer is necessarily influenced by his personal interests and experience. The chapters on glycosuria, including the treatment of diabetes mellitus, and those on anaesthesia and therapeutics for the elderly are of outstanding merit.

Each writer has provided a concise, informative, and well-written article in his subject. The result has been the production of a work of exceptional merit which can be read with profit by all medical men even though they may have no special interest in geriatrics.

A. H. DOUTHWAITE.

TEXTBOOK OF MEDICINE

The Principles and Practice of Medicine. A Textbook for Students and Doctors. By Sir Stanley Davidson, B.A., M.D., P.R.C.P.Ed., F.R.C.P.Lond., M.D.Oslo, and the staff of the Department of Medicine, University of Edinburgh, and associated clinical units. Third edition. (Pp. 1,076+viii; illustrated. 35s.) Edinburgh and London: E. and S. Livingstone. 1956.

This textbook has reached its third edition within five years. It is widely used by students preparing for the final examination, and it is easy to see why this is so. The book is essentially practical; its advice on treatment is always lucid

and detailed. It is beautifully printed and light in the hand. It is well planned, and a satisfactory proportion is achieved, not only between the various systems but also in the allotment of space to individual diseases. More than a thousand pages are provided for 35s. For this edition the section on neurology has been rewritten by John Marshall, who has made excellent use of the opportunity. How good also are the sections on haematology (R. H. Girdwood and James Innes), on water and electrolytes (J. S. Robson), and on chronic rheumatic diseases (J. J. R. Duthie). There are sections which could, and probably will, be better done, and the work is not so comprehensive as Cecil's incomparable textbook and the best English texts. It is, however, a more adequate textbook than any of the same size which was available thirty years ago. If these thousand pages contain all the medicine that the final-year student requires to know, are we justified in saying that the medical course demands more of him than he can be reasonably expected to provide?

D. V. HUBBLE.

A TEXTBOOK FOR DIETITIANS

Foundations of Nutrition. By Clara Mae Taylor, Ph.D., and Grace Macleod, Ph.D., and the late Mary Swartz Rose, Ph.D. Fifth edition. (Pp. 620+xi; illustrated. 42s.) New York and London: The Macmillan Company. 1956.

The aim of the fifth edition of this popular book, as of previous editions, has been "to present within a small space some of the fundamental principles of human nutrition, in terms which call for no highly specialized training in those natural sciences upon which the science of nutrition rests." So far as these limitations allow, the whole subject is treated with admirable clarity and facility in 29 chapters which could be grouped under the headings of metabolism, major food components, minerals, vitamins, and dietetics. Little or no chemistry is included, but the reader is given evidence of the reality of vitamins by photographs of their crystals. Moreover, in spite of the human bias of the book, there are only a few illustrations of the effect of nutritional deficiencies in man, which are supplemented by more numerous photographs showing deficiency diseases as produced in experimental animals. In most chapters the history of research is traced back to its early origins, but sometimes the knowledgeable reader may criticize the choice of the most salient references and topics. Thus in dealing with vitamin A no mention is made of the crucial work of H. von Euler on the biological activity of carotene, nor of Wald's classical demonstration that vitamin A is a component of visual purple. To continue in a critical vein, the reader is given no warning on page 235 that the rat's continuously growing incisor teeth, which can be affected by avitaminosis A, are quite different in structure from the molar tooth shown in the adjoining Fig. 62.

Such minor defects, however, will do little to reduce the value of the book to those for whom it is mainly intended. Practical dietitians will receive invaluable help from the numerous pictures showing the amounts of various foods, neatly set out on plates, which provide the same amount of the nutrient under discussion. Expert dietitians have long suggested that the nutrient contents of foodstuffs should not be expressed by weight, nor in international units, but in terms of the standard daily human requirement for the nutrient. This plan has been applied very successfully in this book by expressing nutrient contents as "shares" equal to 1/32 of the daily requirement of a standard man. By comparing the calorie shares of a foodstuff with its shares in other nutrients it is at once apparent where its strengths and weaknesses lie. To quote one example: a portion of wholemeal bread which supplies one share of calories also supplies 1.9 shares of protein, 2.4 of iron, 2.6 of vitamin B₁, and 1.0 of riboflavin. The work concludes with an appendix of 78 pages of tables, new to the present edition, which give, among other data, the contents of numerous foods in calories, protein, iron, calcium, and vitamins A, B, C, and riboflavin.

T. MOORE.

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STRONTIUM-90 IN MAN

Whenever a nuclear weapon is exploded, or atomic energy is released in a reactor, over 200 radioactive isotopes are produced. All these can be harmful to man, but the main villain of the piece appears to be strontium-90. Its notoriety is due to several reasons. First, it has a high yield: one in every twenty fissions results in the production of an atom of strontium-90. Secondly, it is long-lived: its physical half-life is 28 years. Thirdly, it finds its way from the soil into food. Fourthly, it is a bone seeker. And, fifthly, it is retained in the human body for a long time; the biological half-life is about $7\frac{1}{2}$ years. The last two properties lead to the possibility that the β -rays emitted from radiostrontium may produce bone lesions and sarcomas as well as leukaemias.

Although the hazards from the deposition of strontium in bone have long been recognized, too little has been known about its distribution and metabolism to assess the hazards quantitatively. Recent papers¹⁻³ giving results of a world-wide survey of strontium content in man throw some light on the subject. Strontium-90 is an inevitable by-product of nuclear power production, and by the time most of our power requirements have been met from atomic energy there will be an embarrassingly large quantity of strontium-90 to be disposed of; but this does not present a hazard at the moment, since the strontium is not allowed to escape into the open. Even in a full-scale nuclear war strontium-90 would not be the main radiological poison; its damaging action would be small compared with that of the shorter-lived isotopes strontium-89 and iodine-131. It is the relatively small amount of strontium-90 accumulating from test explosions that causes some worry. Furthermore, strontium-90 does not present a genetic hazard, since it emits only β -rays, which do not penetrate to the gonads. It is the somatic hazard, the probability of inducing bone tumours, that is the main concern.

When a nuclear weapon is exploded in the air the radioactive fragments are carried by the upward draught high into the stratosphere. In the case of a

high-altitude explosion—as the next British H-bomb test is supposed to be—there is very little local fall-out, and practically all the radioactivity is taken up into the stratosphere. The rate of descent from there is very low, about 10% per year, and this allows the radioactivity to spread out over the globe, so that when it does come down, mainly with the rain, it is nearly uniformly distributed all over the world. By the time the active material has descended the short-lived radioactive elements have practically all decayed and only the long-lived ones, mainly strontium-90 and caesium-137, are deposited on the ground. Here strontium, being chemically similar to calcium, enters into the soil-plant-animal-human chain of calcium. The first step in the chain, the uptake of strontium by plants, depends on the root depth and on the calcium content of the soil. The latter varies greatly; differences by a factor of 100 are quite common. Since the uptake of strontium by the soil will be the greater the less calcium it contains, the concentration of strontium-90 per gramme of calcium in the soil, and thus the concentration in plants, may vary enormously. There is also a large variation with depth, most of the strontium being deposited in the top 4 in. (10 cm.) of soil. The consumption of vegetable food is one way of introducing strontium-90 into the body. But since most of the calcium in our diet comes from dairy products the next step in the chain, the uptake of strontium by grazing animals, is the most important one. Fortunately there is a large discrimination factor, of about 7, against strontium consumed by the cow appearing in the milk. Furthermore, there is another discrimination factor, of about 8, in going from food to the deposition of strontium in bone, so that the amount of strontium-90 per gramme of calcium in the human bone is very much smaller than that in the soil.

The concentration of strontium-90 is expressed in terms of so-called sunshine units (S.U.), one such unit being one-millionth of a microcurie per gramme of calcium. A recent survey² has shown that the content of strontium-90 in the human skeleton, resulting from all H-bomb tests carried out until the autumn of 1956, will eventually reach a value of about 2 S.U. This is an average value with a very wide spread. The uptake in different bones in the skeleton varies by as much as a factor of 15, the largest concentration being in the vertebrae and sternum, the lowest in the skull. There is also a big variation with age; children aged 0-4 years take up about five times more than adults, and they have also a greater sensitivity to radiations. Finally, there are large variations in individuals of the same age group, probably due to differences in diet.

The main problem is how to assess the hazard from a given amount of strontium-90 in bone. The maximum permissible concentration of strontium-90 is 1,000 S.U., which is 500 times the average amount which will accrue from test explosions. But such a comparison is misleading, since all maximum permissible levels were established for people occupationally exposed to radiations. When whole populations are exposed the maximum level must be greatly reduced. The assessment of this hazard hinges on a fundamental question: how does formation of bone tumours vary with dose? If a threshold dose exists below which tumours are not formed, then the small doses resulting from test explosions are probably harmless. But if there is no threshold, and tumour formation is a linear function of dose, then even the smallest dose will impart a small but finite probability of a bone tumour being formed. The available evidence is meagre, and, moreover, it entails comparison of strontium with radium, since only after exposure to radium has production of bone sarcoma in man actually been observed. There is growing evidence that the relation between the amount of exposure to radiations and the probability of developing long-term effects is of a linear nature. This was the view accepted by the M.R.C. in its report,⁴ which states that "each unit quantity of radiostrontium absorbed by the bone confers a certain probability of bone tumour formation." The consequence of a linear relationship is that every H-bomb test by causing an increase of the content of strontium-90 in bone will increase the frequency of bone lesions. But much more research work will be required before an accurate assessment of the hazard can be made.

ROAD ACCIDENTS

In Great Britain an average of fifteen people die every day as the result of road traffic accidents and 750 are injured. The daily toll of deaths in the United States is 110, and in 1955 four thousand million dollars' worth of property (including vehicles) was damaged in road accidents there.¹ In a recent number of the *Journal of the American Medical Association*, devoted to an A.M.A. symposium on road accidents, a leading article² states: "This is our number 1 public health problem. We are confronted with a massacre without precedent, without good reason, and without a ready solution. The control methods invoked to date are not adequate." The same could be said of road accidents in Great Britain. Almost all countries publish road accident statistics; most have safety committees; yet little attempt has been made outside the

United States to study the causes of these injuries. No country has seriously studied the type of closely co-ordinated, quick-moving hospital organization necessary to tackle the whole problem or to lessen the death rate. The great majority of people who die from these accidents are not killed outright on the road, but die subsequently in hospitals. Road accidents—indeed, injuries in general—present a challenge as yet inadequately answered by both preventive and curative medicine.

A medical committee taking part in a symposium held last year in New York¹ unanimously recommended that "qualifying medical examinations be mandatory prior to the first issuance of a [driver's] license to an individual and that a periodic qualifying medical examination be given prior to each renewal of the license." Independently the J.A.M.A. leading article² states: "The right to drive an automobile must become a sought-after privilege. . . . Some states still regard driver licensing as a source of revenue rather than a means of protecting the welfare of its citizens." Supporting the need for such examinations is the increasing evidence, from America, that the driver is a major factor in road accident causation. Moreover, industrial firms that have instituted a conscientious medical assessment of fitness to drive before employment have reduced their accident rates by as much as 50%.³

Important research on car design and its relationship to injuries of car users, sponsored by the Chrysler Corporation, the Ford Motor Co., and insurance companies, has been carried out over the last few years in the Cornell University Medical College and the Cornell Aeronautical Laboratories.³ Their factual findings on the internal features of conventional American cars likely to cause injuries correspond to those in Britain.⁴⁻⁶ Cornell lists the conventional American design of the instrument panel as responsible for 16% of all injuries, the steering component 14%, the windscreen and frame 13.5%, and the door components 12%. As a result of these findings their Aeronautical Laboratories have built a prototype safety car to lessen these risks. Other research at Cornell, not yet published, shows that some injuries result from the design and location of the hand-brake. An interesting finding from the Cornell research is the frequency in America of "ejection injuries" to the

¹ N.Y. St. J. Med., 1956, 58, 3853.

² J. Amer. med. Ass., 1957, 163, 262.

³ Starks, H. J. H., *Research of Injuries Sustained in Road Accidents*, Road Research Technical Paper, No. 37, 1956, Road Research Laboratories, London.

⁴ Gissane, W., *Practitioner*, 1954, 172, 620.

⁵ Aston, J. N., and Perkins, T. A., *British Medical Journal*, 1954, 2, 200.

⁶ Smillie, I. S., *ibid.*, 1954, 2, 203.

⁷ Moore, J. O., and Turin, B., *A Study of Automobile Doors Opening Under Crash Conditions*, Cornell University Medical Research Department of Public Health and Preventive Medicine, 1954, New York.

⁸ Gissane, W., *Practitioner*, 1955, 175, 450.

¹ Libby, W. F., *Proc. nat. Acad. Sci. (Wash.)*, 1956, 42, 945.

² Kulp, J. L., Eckelmann, W. R., and Schuler, A. R., *Science*, 1957, 125, 219.

³ Booker, D. V., Bryant, F. J., Chamberlain, A. C., Morgan, A., and Spicer, G. S., *Radiostrontium and Radiocaesium Measurements in Biological Materials to December 1956*, Atomic Energy Research Establishment, 1957, London.

⁴ Medical Research Council, *The Hazards to Man of Nuclear and Allied Radiations*, 1956, London.

occupants of cars and their high rates of serious injury and fatality. "In crashes where the velocity of the impact was high, there was a great tendency in frontal impacts for both front doors to open and in lateral impacts for the door opposite the side struck to open. In roll-over accidents, one or both front doors open in 77% of the accidents as compared with 53% in non-roll-over accidents. The resultant ejection of some of the car occupants doubles their risk of serious injury and of death."⁷ Such a high incidence of ejection has not been reported in Britain; that such accidents do occasionally occur here and result in serious injury cannot be doubted. Their much more frequent occurrence in America is probably due to the design of their long straight highways, often tightly packed with cars travelling at high speed; in part they may be due to the large bodies of many American cars. The compact, stoutly constructed, small British cars, with their engine in front, and the absence in this country of high-speed, straight highways, save their users in large measure from this particular hazard. It would be helpful if car manufacturers designed a safer "package" for car occupants. The evidence shows that when the occupant stays in the vehicle after impact he has a much better chance of survival; if he is not thrown violently about against projecting internal fittings, he has an excellent chance of escaping injury altogether.

Our road traffic conditions differ greatly from those of the United States. Here road fatalities in 1956 were shared between pedestrians 42%, motor-cyclists and their passengers 22%, motor-vehicle drivers and car occupants 22%, and pedal-cyclists 12%. In the U.S., where one in every three is said to own a car, the users of cars account for 75% of the total road fatalities and pedestrians for 22%. Yet as the number of motor vehicles on British roads has increased, so have the total injuries (as distinct from fatalities) to their users increased. For 1956 the Ministry of Transport's figures show that the following were killed in road accidents in Great Britain: pedestrians 2,270, pedal-cyclists 650, motor-cyclists 1,250, occupants of other motor-vehicles 1,197; total 5,367. The numbers injured were as follows: pedestrians 61,689, pedal-cyclists 49,169, motor-cyclists 63,883, occupants of other motor vehicles 93,130, horse riders 89; total 267,960.

From the nature of this high-speed machine age, injuries from road accidents will continue into the foreseeable future. Medicine has not yet taken on its full responsibilities in the prevention or treatment of them. The last two decades have witnessed remarkable advances in medical knowledge of the treatment of all types of injury, yet no hospital in this country

has so far been equipped with all the facilities and the staff necessary to meet these treatment requirements in an orderly manner and at the right time. Indeed, most hospitals are at their wits' end to keep pace with the numbers requiring treatment in their old and inadequate buildings. Yet a comparatively small number of hospitals, or self-contained large accident departments, specifically designed with modern, closely co-ordinated equipment, would give medicine a chance to apply its new knowledge and so reduce the present mortality and crippling rate from injuries, and at an economic cost.⁸ Such hospitals should provide reasonable facilities for research teams studying preventive measures to correlate the detailed causes of the accident with the injuries received by the car users, and to include in their study the final result of treatment, the total cost of the accident, and the related cost of hospital treatment and rehabilitation. As the *Journal of the American Medical Association* has stated, this problem remains unsolved. Yet if an all-out attack is mounted at hospitals receiving large numbers of injured it would have purpose and the necessary stimulus to go on until a reasonable solution is reached. But at least one special modern hospital is badly needed to serve as an experimental prototype for future development.

AMPHENONE INHIBITION OF ADRENAL FUNCTION

One of the fascinating features of clinical endocrinology is the stimulus it receives from animal experiments. Amphenone, 1,2-bis-(*p*-aminophenyl)-2-methyl propanone, one of a series of deoxybenzoins, was synthesized by M. J. Allen and A. H. Corwin in 1950.¹ R. Hertz and collaborators^{2,3} were interested in its structural relation to synthetic oestrogens, but noticed that it also produced enlargement of the adrenals (and the thyroid) in the rat, with the deposition of large amounts of inactive lipid material in the cells of the zona fasciculata and the zona reticularis of the adrenal cortex. This was interpreted as being due to inhibition of the synthesis of adrenal steroids, a thesis supported by the abrupt suppression by amphenone of the secretion of 17-hydroxycorticoids after giving A.C.T.H. to the hypophysectomized dog, blood from the adrenal vein being used for corticoid assay.^{3,4}

In contrast to the success they have achieved by hormone-substitution therapy in cases of endocrine deficiency, endocrinologists have been unable to abolish pituitary or adrenal hyperfunction or both, or the function of the normal gland in malignancy, without resort to major surgery. Hertz and colleagues⁵ therefore tried the effect of amphenone in four cases of advanced breast cancer with metastases. They found, as in the rat and dog, that the adrenal corticoids, measured by urinary assay, decreased considerably when the amphenone was

given orally in capsules of 0.125 to 0.5 g. 6-hourly; and that in two fatal cases the adrenals were "extraordinarily enlarged" and full of lipid. Further, the patients did not respond to A.C.T.H. while under the influence of amphenone. In another woman of 35, with carcinoma of the left adrenal with metastases and incomplete Cushing's syndrome, the urinary corticosteroids fell from 24 mg. to 3 mg. a day. In none of the patients was there any appreciable change in the urinary 17-ketosteroids, so that the inhibition of synthesis appears to apply to the adrenal glucocorticoids and not to the adrenal androgens.

Hertz then combined with Thorn and colleagues⁶ to study the effect of amphenone in a woman of 41 with Cushing's syndrome due to an adrenocortical carcinoma. The urinary 17-hydroxycorticoids were reduced by amphenone from 250 mg. a day to 50 mg. or less, but the effect on the raised 17-ketosteroids was much less striking. Accompanying the decrease in 17-hydroxycorticoids was a fall in insulin requirements for the patient's diabetes from 74 units to 13 units and then to nil. The levels of 17-hydroxycorticoids in the plasma showed a remarkable drop of both the free and the conjugated fractions. All this indicates that amphenone specifically interferes with the synthesis in adrenocortical tissue of biologically active 17-hydroxycorticoids from inactive precursors. This is in keeping also with the observations of R. I. Dorfman⁷ that, when added *in vitro* to adrenal slices, amphenone was found to inhibit the production of 17-hydroxycorticoids from suitable precursors.

It next became of theoretical and clinical interest to determine whether amphenone prevents the synthesis of adrenal aldosterone (electrocortin), because this controls electrolyte metabolism, and its secretion is largely independent of pituitary A.C.T.H. A. E. Renold and colleagues⁸ in some metabolic studies at the Peter Bent Brigham Hospital showed that amphenone has this effect. In the first patient, with adrenal hyperplasia, obesity, and diabetes, urinary aldosterone was reduced by amphenone from 20 µg. per 24 hours (normal 1-8) to nil, and a sodium diuresis was noted. The second patient, of great clinical interest, was a 39-year-old nurse, complaining of anasarca for ten years, without evidence of cardiac or renal abnormalities, but with evidence of sodium retention. Urinary aldosterone was greatly raised, being 66-123 µg. per day. Amphenone led to reduction of these values to 8-12 µg. and to a sodium diuresis, with an increase of urinary sodium from 3.0 mEq to 28 mEq. The adrenals were explored and an adenoma secreting aldosterone was found and removed, with restoration of normal biochemical values and clinical cure. Similar investigations into the effect of

aldosterone gave comparable results in a variety of other cases, but no effect was obtained in adrenalectomized patients.

Unfortunately amphenone has toxic side effects. Thus in a series of 24 patients⁹ 18 had drowsiness, 11 gastro-intestinal symptoms (heartburn, nausea, vomiting), 6 morbilliform and pruritic rashes, 6 methaemoglobinemia, and 2 impaired liver function with hepatomegaly in 1. These severe toxic features prevent the therapeutic use of the substance, and its main significance is as a diagnostic tool, including the differentiation of primary and secondary aldosteronism. It is indeed also a spur to search for other substances with similar action but less toxicity. In this connexion it is of interest that Hertz and colleagues⁵ showed that amphenone also inhibits thyroidal ¹³¹I uptake by interfering with the organic binding of iodide, and goitres develop as they do with the thiouracil group of inhibitors of thyroxine synthesis. In nature we find that the synthesis of thyroxine is interfered with at various stages in some forms of genetically determined cretinism; and in genetic virilism, evident at birth or early infancy, there is an apparent inability in the adrenals to convert 17-hydroxyprogesterone to 17-hydroxycorticosterone. Both these defects are usually thought to be due to absence of some chemical link, but it is possible that they are due to the presence of chemical inhibitors. If so, this would give further encouragement to the hope that substances allied to amphenone but without its toxicity will be forthcoming, and, if they are, a new therapeutic era will be opened up.

ATHLETE'S FOOT

According to some American authors¹ expenditure in the United States on the treatment of athlete's foot runs into millions of dollars annually. It is the commonest superficial mycotic disease in Great Britain. What does it cost us?

Two papers published in the *Journal* this week indicate that efforts to control the spread of the disease should be concentrated on communal bathing establishments and the home. For many years athlete's foot has been associated in the lay mind mainly with communal bathing, and this too seems to be the general opinion in the medical profession. The floors and duck-boards in such premises have been suspected as sources of infection owing to their supposed contamination by the exfoliated infective scales of sufferers from athlete's foot. But the many attempts made over the years to isolate by culture pathogenic fungi from presumably contaminated surfaces in bathing premises yielded little positive evidence to support the general belief that

¹ Allen, M. J., and Corwin, A. H., *J. Amer. chem. Soc.*, 1950, **72**, 114.
² Hertz, R., Tullner, W. W., and Allen, M. J., *Proc. Soc. exp. Biol. (N.Y.)*, 1950, **75**, 627.

³ Schrickler, J. A., Dhyse, F. G., and Hallman, L. F., *Recent Progr. Hormone Res.*, 1955, **11**, 119.

⁴ Tullner, W. W., Graff, M. M., and Hertz, R., *Endocrinology*, 1956, **58**, 802.

⁵ Hertz, R., Pittman, J. A., and Graff, M. M., *J. clin. Endocr.*, 1956, **18**, 705.

⁶ Thorn, G. W., Renold, A. E., Goldfien, A., Nelson, D. H., Reddy, W. J., and Hertz, R., *New Engl. J. Med.*, 1956, **254**, 547.

⁷ Dorfman, R. I., 1950, quoted by Hertz, R., *et al.*, *ibid.*, 1956, **254**, 547.

⁸ Renold, A. E., Crabbé, J., Hernandez-Avendano, L., Nelson, D. H., Ross, E. J., Emerson, K., Jr., and Thorn, G. W., *ibid.*, 1957, **256**, 16.

⁹ Ajello, L., and Getz, M. E., *J. invest. Derm.*, 1954, **22**, 17.

² Baer, R. L., Rosenthal, S. A., Rogachefsky, H., and Litt, J. Z., *Amer. J. publ. Hlth.*, 1955, **45**, 784.

³ Sulzberger, M. B., and Baer, R. L., *Year Book of Dermatology and Syphilology*, 1955, Chicago.

⁴ Pillsbury, D. M., Shelley, W. B., and Kligman, A. M., *Dermatology*, 1956, Philadelphia.

⁵ Gentles, J. C., *J. clin. Path.*, 1956, **9**, 374.

⁶ Sulzberger, M. B., Baer, R. L. and Hecht, R., *Arch. Derm. Syph. (Chicago)*, 1942, **45**, 670.

⁷ Ingram, J. T., and Brain, R. T., *Sequeira's Diseases of the Skin*, 1957, London.

infection was spread by infected epithelial debris. These repeated failures were at least in part responsible for causing some American authors^{2,4} to seek other evidence to account for the onset of athlete's foot. Their view seems to be mainly that the pathogenic fungi concerned are present in a dormant state or in a state of low activity in apparently normal skin, and that infection as perceived clinically requires some biochemical alteration of the skin^{2,3} or a "factor X."⁴ These authors rather discount the role of desquamated infective material in the epidemiology of the disease and accordingly regard the customary preventive measures as superfluous. However, recently evidence for the presence of infective materials in shower baths has been accumulating. A few years ago, with the help of cycloheximide in the culture medium to suppress saprophytic moulds, it was possible for some American authors¹ to isolate fungi which cause athlete's foot from shoes and also from the floor of a bathroom, and last year this was accomplished repeatedly by Mr. J. C. Gentles,⁵ who used a special technique for the purpose as well as incorporating cycloheximide in the culture medium. He records some further results in a paper at p. 746 this week. Some American authors,⁶ whose work is cited by Miss Mary P. English in her article at p. 744, state that spread of infection in families is a rare occurrence. Others,⁴ referring to *Trichophyton rubrum* infection, state that "it is important that the patient realize that the disease is relatively harmless and that transmission to others is unlikely to occur; it does not occur in families." In Britain we think otherwise, and the consensus of opinion may be summarized in the following quotation⁷: "The patient should be warned of the risk of infecting others. Going about barefoot at baths and other places may spread infection." There is no doubt also that if more cases of athlete's foot and their contacts in the home were followed up, as Miss English has done, the results would add further evidence that the infection is transferred among members of a family. On the other hand, no amount of evidence of this kind will explain why only a relatively small number of persons exposed to contamination become infected or what are the factors concerned in the onset of clinical manifestations.

As to preventing the spread of infection, bathers with healthy feet should be encouraged to wear shoes or sandals while bathing at communal baths and to wash their feet thoroughly on returning home. Persons affected with athlete's foot should be discouraged from frequenting such premises, and the ways in which infection is spread should be explained to them. In the home an infected member of the family needs practical advice on minimizing the risk of spreading infection to other members of the family. In particular, towels, bath-mats, and other bathroom paraphernalia such as nail-brushes, sponges, face-towels, and soap should be kept apart for his own use. He should not share slippers with others or walk barefooted about the bedroom floor. In bed, and especially in the conjugal bed, he should wear cotton socks, to be washed at frequent intervals after boiling. It is also worth warning him that the infection (chiefly of the *T. rubrum* type) may spread to

other parts of the body, as for instance the hands and the groin, and that in time the nails may be infected, and he should be advised to report immediately to his doctor any spread of this kind and any spread to other members of the family. He will also need explicit directions for the application of the treatment prescribed, because efficient treatment plays an important part in preventing the spread of infection. These may seem to be counsels of perfection, but in this disease half-way measures bring little benefit.

NEW FELLOWS OF ROYAL SOCIETY

Among the 25 new Fellows of the Royal Society elected last week are several medical men, as well as other scientists whose work has advanced medicine. Professor John McMichael, of the Postgraduate Medical School, is elected for "his contributions to medical knowledge, especially on the mechanisms of heart failure." A paper from McMichael and a colleague on this subject appeared three weeks ago in this *Journal*,¹ as did his classical Oliver-Sharpey lectures on the "Dynamics of Heart Failure" in 1952.² One of the pioneers in cardiac catheterization, McMichael was able to obtain data by this procedure about pressure changes in the healthy and diseased heart. He succeeded Sir Francis Fraser at the Postgraduate Medical School in 1946, having been acting director of the department of medicine there during the war. Professor C. L. Oakley, of Leeds University, has carried out a series of investigations into anaerobic bacteria, especially the pathogenic clostridia, doing much to elucidate their antigenic relationships. His researches have had important practical applications in the development of antitoxins. From 1934 to 1953, when he went to Leeds, Oakley worked at the Wellcome Research Laboratories, and during the second world war played a large part in providing prophylactic sera and vaccines for the armed Forces. In 1956 he became editor of the *Journal of Pathology and Bacteriology*. Dr. E. Lester Smith, now senior biochemist at the Glaxo Laboratories, is well known particularly for his work on vitamin B₁₂, or cyanocobalamin. In 1948 he and his colleagues succeeded in isolating it (as did an independent American team) in pure crystalline form. He has continued to study this and related haemopoietic factors, several of these being isolated in his laboratory for the first time.³ Apart from vitamin B₁₂, Lester Smith has been largely concerned with the extraction and development of penicillin.

Professor Saul Adler was educated at Leeds and went to Jerusalem to become head of an institute of microbiology. Later he was appointed one of the first professors at the newly created Hebrew University. His main contribution has been the investigation of leishmaniasis and its manifestations as oriental sore and kala-azar. In 1933 he received the Chalmers Medal of the Royal Society of Hygiene and Tropical Medicine for his work on the transmission of kala-azar by the sandfly and for his demonstration that while blood was sucked flagellates escaped from the infected sandfly into the

¹ McMichael, J., and Shillingford, J. P., *British Medical Journal*, 1957, 1, 537.
² ———, *ibid.*, 1952, 2, 525, 578.
³ Smith, E. L., *ibid.*, 1951, 1, 151.

victim's blood stream. In addition to leishmaniasis Professor Adler has made notable contributions to the pathology of malaria and trypanosomiasis. Professor B. Mendel, of Amsterdam University, made his first contributions to medical science in Germany. In Professor Warburg's Institute he discovered the inhibition of glucolysis by glyceraldehyde—a finding which became subsequently of considerable importance in the unravelling of the steps of the Embden-Meyerhof cycle. He left Germany at the beginning of the Hitler regime and after a time in Holland went to Canada, where he occupied a post at the Banting Institute in Toronto. Here he showed that the cholinesterase of the human and animal blood is not uniform but that there are two groups of enzymes, the true cholinesterases which act on acetylcholine *in vivo*, and the pseudocholinesterases. He has recently shown that the ali-esterase of animal serum can inhibit the growth of virus, plant cells, and tumour cells.

Professor J. F. Danielli's early work on the physical chemistry of membranes was carried out at University College, London; he used monolayers of steroids as his model. In 1938 he went to the Biochemical School in Cambridge as a Beit Memorial Fellow, his main contributions being on blood capillaries; and during the war he was a member of a team concerned with chemical defence. From 1949 he has been professor of zoology at King's College, London. His main interest in recent years has been cytochemistry, but besides his scientific achievements Danielli has been active in the organization of biologists and was one of the principal founders of the Institute of Biology. Other distinguished scientists elected include Professor E. C. Amoroso, of the Royal Veterinary College, London, an authority on the physiology of animal reproduction, and Dr. Charlotte Auerbach, of Edinburgh University, who is investigating the mutations caused by chemical treatment and ionizing radiation.

REACTIONS FROM ORAL PENICILLIN

The admission of two patients within one month to a hospital in Arlington, Virginia, suffering from severe reactions to orally administered penicillin has recently been recorded.¹ Both were women of middle age; one of them was known to have swallowed a capsule of 250 mg. of penicillin V, and the other had in fact taken a 200,000-unit tablet of penicillin G, but this was not at first known, the patient having been rushed to the hospital in coma by the local rescue squad. (It seems from this and several other reports about this type of emergency that Americans have the benefit of rather more than an ordinary ambulance service.) The features of these reactions seem no less alarming and rather more varied than those due to injected penicillin, though the fully developed picture of shock, with unconsciousness, cyanosis, and a steep fall in blood pressure, takes perhaps a few more minutes to develop. In the meantime there are burning sensations in the mouth and eyes, a sense of suffocation and of impending death, and oedema of the lips and eyelids: this is the sign which should suggest the true cause when no history is available. Both patients recovered after treatment with

¹ Maganzini, H. C., *New Engl. J. Med.*, 1957, 258, 52.

adrenaline, antihistamines, and hydrocortisone. In one of them noradrenaline had to be continued for 7½ hours to maintain the blood pressure, a total of 52 mg. being given.

The author also reviews the literature on reactions to penicillin administered by routes other than parenteral injection. These include, apart from oral administration, the local treatment of nasal sinuses, the application of ophthalmic ointment, the use of contaminated syringes, and the performance of a skin sensitivity test. Many such patients can give a history of previous reactions or of allergic manifestation of other kinds, and the single precaution which should never be omitted is to ask about these. It is also necessary always to be prepared to administer the urgent treatment required if shock develops. Accounts of these cases often do not say why the patient took penicillin; when they do the indication sometimes sounds inadequate. Are such reactions most liable to occur in the sort of patient who keeps penicillin tablets at home and takes one occasionally for a trivial reason? It is at any rate necessary to bear in mind that treatment with oral penicillin is not completely free from this risk. It should consequently not be prescribed because of its ease of administration for patients whose condition does not merit the greater trouble of giving an injection.

ANNUAL MEETING AT NEWCASTLE

More doctors from overseas attended the Annual Meeting of the B.M.A. last year than ever before, and no doubt the increasing attraction of the scientific side of the meeting was partly responsible for this encouraging sign of world-wide interest. In the *Supplement* this week we publish the provisional programme of this year's meeting, to be held at Newcastle upon Tyne from July 10 to 19. The Scientific Sections offer a wide choice to visiting members, and it is good to see that the opportunity has been taken to raise the barriers separating some of the specialties: for instance, the Sections of Medicine, Surgery, Cardiology, and Radiology will meet together to discuss arterial embolism. The subjects for the Plenary Sessions have been well chosen and should give family doctors a chance to contribute their own observations. The experiment begun at Brighton of having round-table discussions is to be repeated, and the scientific and pharmaceutical exhibitions will give the visitor plenty to see and think about. An innovation at Newcastle, and one that is certain to be popular, is a series of closed-circuit colour television programmes, sponsored and produced by Smith, Kline, and French Laboratories. These will consist of clinical demonstrations and surgical operations by members of the staffs of the Medical School, King's College, and the Royal Victoria Infirmary, and the transmission will be to the Gymnasium of King's College, where receiving sets will be provided. The programmes have been arranged to take place at times which do not overlap with other meetings. Thanks to the work of those responsible for the arrangements at Newcastle, the Annual Meeting this year offers an unusually diverse programme, and members who are thinking of attending should reserve their hotel accommodation as soon as possible. A list of hotels is given in the provisional programme.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

ABO Blood Groups and Duodenal Ulcer

SIR.—The very important paper by Dr. C. A. Clarke and his colleagues (*Journal*, September 29, 1956, p. 725) established an association between duodenal ulceration and secretion of substances with ABO specificity, ulcers being considerably commoner in non-secretors than in secretors. At the same time they set out to discover whether the associations of duodenal ulceration with group O and with non-secretion observed in the general population also hold within sibships of brothers and sisters. I greatly appreciated several discussions with them during the progress of this interesting work, and they have also kindly given me a copy of the full basic data. Two points have struck me, which I think ought to be made, and after consultation with Dr. Clarke and his colleagues it was agreed that I should put them forward, thereby allowing the Liverpool workers to devote a letter to some new features which they have noted.

The first point is a matter of clarification. It was found that in 112 sibships containing both O's and non-O's the propositus with ulcer who brought the sibship to notice belonged to group O in 59 instances. The expected number on the null hypothesis, that within sibships O's and non-O's are equally likely to develop ulcers, was 54.9095. The difference was only 0.804 times its standard error and so not significant. It was therefore correctly concluded that "the analysis of our sibship data gives no evidence to support the hypothesis that a group O individual is more likely to have a duodenal ulcer than are his A, B, or AB sibs." But neither do the data contradict the hypothesis that the incidence of ulcer in persons of group O relative to non-O's is as high within sibships as it is in the general population.

The previous figures of Clarke *et al.*¹ indicate for the population of Liverpool a relative incidence of ulcer of 1.54 in O's compared to 1 in the other groups. This figure may be applied to the sibship data. Thus, considering sibships containing equal numbers of O's and non-O's, the chance of the propositus being O is put at 0.6063 and of being non-O 0.3937, instead of the 0.5 and 0.5 of the null hypothesis, and similarly for other compositions of segregating sibships. The expected number of O propositi is 65.989. The difference from the observed 59 is 6.989, which is 1.39 times its standard error and so non-significant. In fact, the sibship data do not contradict at the 5% level of significance any figure for relative incidence in O's which does not exceed 1.71. This figure is much higher than 1.38, which is the average for all centres reported up to the present, and considerably higher than 1.57, which is the highest figure at any single centre. The additional information provided by sibships containing more than one ulcer patient gives the same result. It is not possible, therefore, to draw any conclusion.

The second point did not occur to me till after the paper appeared. This is the effect of sex when the sibships contain both men and women. Duodenal ulceration is nearly six times commoner in men than in women. If, therefore, we consider a sibship of two, a man and a woman, one of whom is O and the other not O, then which the propositus with the ulcer will be is overwhelmingly affected by sex and only to a much slighter extent by blood group, even if O's show within sibships the same higher incidence as in the population generally. In the great majority of such sibships it is the man who will have the ulcer, whether he be O or not O. If such sibships are included in the analysis the information they contribute, even if it is unbiased, is largely irrelevant, and the variance is artificially increased.

The correctness of this argument is confirmed by an examination of the data on sibships and secretion. Clarke *et al.* showed 89 sibships segregating for secretion. The observed number of propositi who were non-secretors was 52, the expected number on the hypothesis of equal incidence within sibships being 42.464, the difference being 2.13 times its standard error. Let us now consider only those sibships in which the sibs are all of the same sex as the propositus. Thirty of the 89 sibships are entirely unchanged, as all members were of the same sex. A further 23 can also be used, as the omission of one or more sibs of opposite sex to the propositus still leaves a segregating sibship. In the 53 sibships the observed number of propositi who are non-secretors is 38. The expected number is 24.900. The difference is 13.100 $\pm$ 3.518, or 3.72 times its standard error. Thus the omission of the (largely) irrelevant sibships, and the irrelevant members of some others, has reduced a probability of 1 in 30 to 1 in 5,000, and greatly strengthens the conclusion that the association between ulcer and non-secretion holds within sibships. Turning to the other 36 sibships, those of mixed sex, the expected number of propositi who are non-secretors is 14 against an expectation of 17.583 $\pm$ 2.881, a result entirely incompatible with that given by the sibships all of one sex.

As a further illustration, if we had any doubt that the greater incidence of duodenal ulcer in men held within sibships of brothers and sisters also, exactly the same treatment could be applied as for blood group or secretion. In the 36 sibships of mixed sex the propositus is a man in 30. On the hypothesis that within sibships the risk for the sexes is equal the expected number is 18.083; the difference is 11.917 $\pm$ 2.848, 4.18 times its standard error. If we substitute expectations which we know to be approximately correct for the general population—namely, 0.85 and 0.15 for men and women respectively—the expected number of propositi who are men is 30.086, very close to the number observed.

Applying the same treatment to the sibships segregating for O and non-O, the 112 sibships mentioned above are reduced to 60, the propositus being of group O in 35 instances. The expected number on the null hypothesis of equal incidence is 31.000, and on the hypothesis of a relative incidence of duodenal ulcer in group O of 1.54 is 37.000. The differences of 4.000 and 2.000 are respectively 1.08 and 0.54 times their standard errors. The question of relative incidence within sibships, with its important bearing on whether the association is directly causal or not, is still left open and must await the collection of further data.

It might be asked why we should standardize one factor affecting incidence and ignore others that may also be influential—for example, age. The answer is that with duodenal ulcer the effect of sex is so large that we must take it into account if we are to avoid the risk of being seriously misled. It could easily have happened that the hypothesis of increased incidence in group O within sibships might have been wrongly rejected. Standardization for age might effect some improvement, but in comparison this is likely to be very small. Actually, on the Liverpool data, using all the 293 sibships, the mean age of the propositi is only 0.6 years greater than that of their sibs.

I would suggest, therefore, that in applying to duodenal ulcer the valuable method devised by Dr. C. A. B. Smith, as described by Dr. Clarke and his colleagues, the safe and simple plan is to consider only sibs of the same sex as the propositus. Some information might be recovered from the other segregating sibships, but approximate estimates of sex incidence would have to be introduced, and it seems doubtful whether the trouble would be worth while. It would seem especially undesirable to complicate the analysis by including sibs of opposite sex when there were already sibs of the same sex as the propositus, and so information was being efficiently contributed without them.—I am, etc.,

London, W.C.1.

J. A. FRASER ROBERTS.

REFERENCE

¹ Clarke, C. A., Cowan, W. K., Edwards, J. W., Howel-Evans, A. W., McConnell, R. B., Woodrow, J. C., and Sheppard, P. M., *British Medical Journal*, 1955, 2, 643.

SIR.—In a recent paper (*Journal*, September 29, 1956, p. 725) we showed that, in duodenal ulcer sibships where the unaffected sibs acted as controls, there was no significant association between blood group O and ulcer. Reasons were given for thinking that stratification of the population was an unlikely explanation of this, and a suggestion was put forward that the findings might be due to a maternal factor—that is, a group O woman is more likely than a woman of

other groups to bear children liable to ulcer regardless of the children's own blood group. The other principal finding was that non-secretion of blood group antigens appeared to predispose to ulcer. This was found to hold both within the sibships and in the general population, where a random sample acted as a control (χ^2 using this control has now reached 23.2 $P < 0.001$).

The data have now been extended from 293 to 330 sibships, and some early families where eel serum was used in testing secretor status (and in which, therefore, the results were doubtful) have been excluded. The further analysis of the sibship data seems again to support the view that predisposition to ulcer is dependent not only on the blood group and secretor character of the affected individual but also on the type of sibship to which he belongs. Thus, the families can be divided into four classes: (1) Those in which the sibs are all of the same blood group, but in which there is segregation for secretion. Here there is a significant association between non-secretion and ulcer (Table I). (2) Those in

TABLE I.—Analysis of the Chance of Propositus Being Non-secretor in the Sibships Segregating for Secretion. The Sibships Have Been Considered Separately According to Their Composition With Respect to Group O

Sibs	No. of Sibships	Non-sec. Propositus		d $\pm$ s	P	*P for Comparison of Two Differences
		Observed	Expected			
All group O	23	15	11.43	+3.57 $\pm$ 2.34	0.12	0.91
All not group O	32	19	13.60	+5.40 $\pm$ 2.68	0.05	
Total not segregating for group O	55	34	25.03	+8.97 $\pm$ 3.56	0.02	
Segregating for group O	24	8	11.92	-3.92 $\pm$ 2.38	0.09	0.01

TABLE II.—Analysis of the Chance of Propositus Being Group O in Sibships Segregating for Group O. The Sibships Have Been Considered Separately According to Their Composition With Respect to Secretion

Sibs	No. of Sibships	Non-sec. Propositus		d $\pm$ s	P	*P for Comparison of Two Differences
		Observed	Expected			
All non-sec.	17	6	8.99	-2.99 $\pm$ 2.01	0.13	0.11
All sec.	51	27	24.97	+2.03 $\pm$ 3.48	0.55	
Total not segregating for secretion	68	33	33.95	-0.95 $\pm$ 4.02	0.81	
Segregating for secretion	24	17	11.58	+5.42 $\pm$ 2.35	0.03	0.04

In the tables d is the difference (observed—expected); s the standard error of d; P the significance probability for $\frac{d}{s}$ for a normal distribution; *P is calculated by the method used in Clarke *et al.* (1956).

The comparison of two differences (between expected and observed) per sibship together with the standard error was calculated as follows: let d_1 be the difference between the expected and observed for one set of families, s_1 the standard error, and n_1 the number of sibships, with the corresponding figures for the other set being d_2 , s_2 , and n_2 . Then the difference per sibship will be $(\frac{d_1}{n_1} - \frac{d_2}{n_2})$ and the standard error is $\sqrt{\frac{s_1^2}{n_1^2} + \frac{s_2^2}{n_2^2}}$.

which the sibs segregate both for blood group and secretor status. Here the association which might have been expected from the general population studies is, in fact, found—namely, that blood group O predisposes to ulcer (Table II). (3) Those in which there is segregation for blood group but not for secretor status. In these families there is no detectable effect of the blood group in producing ulcer (Table II). (4) Those in which there is no segregation either for blood group or secretor character. In this class, the most common in the population, the data cannot be analysed by the method we employ (a method necessary to eliminate racial stratification). However, it must be borne in mind that in this type of family there might well be a detectable association between blood group O and duodenal ulcer if a suitable control could be found, but the data are not yet adequate to decide this matter.

If the apparent associations we have discovered are real (and on this more data are clearly required), it is likely that the genetic constitution of the parents not only determines whether or not their offspring segregate but also influences the probability of one or more of them developing an ulcer. The maternal genotype is more likely to be of importance in this respect because of the possibility of an antigen-antibody reaction taking place between mother and foetus (see our data¹ suggesting that immunological reactions may be important in the production of ulcer).

Another possible, but less likely, explanation of the variation within families is that sibs with different blood groups and secretor status might also have different behaviour patterns. This could result in ulcerogenic stresses within a family.

The main conclusion of this further analysis is that both the ABO and secretor loci are playing some part in determining a predisposition to duodenal ulceration and that their effects in this respect are not independent of one another.

We are very grateful to Dr. C. A. B. Smith for his useful comments and invaluable help with the statistical analysis.—We are, etc.,

C. A. CLARKE.
R. B. MCCONNELL.
P. M. SHEPPARD.

REFERENCE

¹ Clarke, C. A., McConnell, R. B., and Sheppard, P. M., *Lancet*, 1957, 1, 212.

Macroglobulinaemia

SIR.—The article on macroglobulinaemia by Drs. Ian R. Mackay and L. I. Taft and Mr. E. F. Wood (*Journal*, March 9, p. 561) has added still three more cases to a literature which is becoming extensive on this interesting subject. They illustrated the symptoms of haemorrhages and weakness secondary to the associated anaemia, though there was no record of any visual symptoms or signs of venous dilatation and haemorrhages in the ocular fundus such as those described by Drs. D. G. Ferriman and A. B. Anderson (*Journal*, August 18, 1956, p. 402), and which were the presenting symptoms in a similar case with which I was recently concerned (shown at the R.S.M. clinical meeting on February 8).

One of the interesting aspects of this disease is the comparatively benign course, for in the cases originally described by Waldenström¹ one had been followed up for seven years and the other for two years without very much change in their general condition, while in the cases reported in this article the first two had symptoms dating back five years, and, in our particular case, three years.

Though the proposition made by the authors regarding mutation as a case for the altered metabolism of the lymphocytoid cells which appear to be the origin of the abnormal globulin is a very interesting one, their suggestion that this occurs "in a malignant lymphoma which is usually, if not always, a lymphocytic lymphosarcoma," would appear to be based on the pathological interpretation of a microscopic appearance that is as yet incompletely described and which does not fit the clinical picture.—I am, etc.,

London, S.E.18.

REFERENCE

¹ Waldenström, J., *Acta med. scand.*, 1944, 117, 216.

Gestation and Sex

SIR.—On the possible association between time of intercourse in the menstrual cycle and sex of child your leading article (*Journal*, February 23, p. 451) is, rightly, worded cautiously. Nevertheless this possibility is not excluded by the evidence to which Dr. H. Binysh refers in his letter (*Journal*, March 16, p. 645). It seems quite impossible to predict the effect on time of conception of restriction of intercourse to a period from the 12th day to the end of the cycle (as in some Jewish families). In women with cycles of 28 days or longer it might increase the frequency of conception from pre-ovulatory matings (by increasing the fre-

quency of intercourse); in women with short cycles it would tend to restrict conception to matings in the post-ovulatory phase. In any case the effect on the sex ratio would have to be very much greater than any hitherto observed in man before it could be established on the offspring of 57 families. There is in fact some evidence that the proportion of male children is raised among Jews.¹ Finally, even if it were true that time of mating had a sharp influence on sex of child, it would not be possible without some very large assumptions to predict the effect on the sex ratio of either (1) restricting intercourse to a considerable part of the cycle, or (2) increasing the frequency of intercourse throughout the cycle. My own guess, and it is little more, is that the effect would not be great.—I am, etc.,

Birmingham, 15.

THOMAS MCKEOWN.

REFERENCE

- ¹ Parkes, A. S., *Biol. Rev.*, 1926, 2, 1.

Leukaemia and Natural Background Radiation

SIR,—It is now well established that ionizing radiations can cause leukaemia in man. The detailed survey carried out recently by the U.K. Medical Research Council¹ of the incidence of leukaemia among patients treated for ankylosing spondylitis with x-rays, as well as the earlier investigations by the U.S. Atomic Bomb Casualty Commission² of the survivors of Hiroshima and Nagasaki during the period 1947–55, have definitely shown that the incidence rate of leukaemia increases with the strength of the radiation dose received. Although the exact relationship between the two is not definitely established, it may not be unreasonable to assume—and there is some recent evidence in support³—that the probability of incidence of leukaemia is directly proportional to the strength of the exposure (at least for low and moderate doses).

In the analysis carried out by the U.K. Medical Research Council, the x-ray dose was estimated in two different ways—first, by calculating the total amount of energy absorbed by the whole body, and, secondly, by calculating the maximum dose of radiation received (at a point in the spinal marrow). The whole-body dose is more relevant in the present discussion.

In the table given below, the figures in the last column are calculated from the corresponding data in columns 1 and 2, which are reproduced from the U.K. Medical Research Council's report. Thus, for instance, the whole-body integral dose of 7.5–14.9 megagram-roentgens (average 11.2) would correspond to a whole-body dose of about 160 roentgens for the "standard man" (mass 70 kilograms). The leukaemia incidence rate for this dose is 4.4 cases per 10,000 men per year (if we exclude the natural rate of 0.3 cases per 10,000 per year). Thus the incidence rate per roentgen per year per million persons comes out to be 2.8.

Whole-body Integral Dose in Megagram-roentgens	Crude Incidence per 10,000 Men per Year	Incidence per Million per Year per Roentgen
0	0.3*	>0.4
<7.5	0.7	2.8
7.5–14.9	4.7	1.8
15.0–22.4	5.1	2.6
22.5–37.4	11.3	3.5
37.5–52.4	22.6	8.0
>52.5	60.2	

* The rate has been estimated from the national vital statistics for all forms of leukaemia excluding lymphatic leukaemia.

It may be seen that the incidence rate of leukaemia is roughly 3 per million per year per roentgen.

An analysis of the Japanese data leads to a figure of roughly 1 per million per year per roentgen. This represents a lower limit to the incidence rate, since the gamma-ray doses have been estimated for a person in the open. Apart from the uncertainty in estimating the dose in this case, the actual radiation dose received by the survivors must have been much less, by a factor of 2 to 3, due

to shielding. Thus the incidence rate is again seen to be very roughly of the order of 3 per million per year per roentgen.

Let us assume that the natural incidence of leukaemia is due entirely to the action of the background radiation (to which everyone is exposed). The average natural death rate due to leukaemia is of the order of 15 per million per year. (In England and Wales the annual death rate from leukaemia was 11 per million in 1920, and 49 per million in 1954; the reason for this increase is not yet clear. The Japanese death rate is about 16 per million per year.) A person receives a whole-body dose of 0.1 to 0.15 roentgen per year from natural background radiation—that is, from the naturally and normally present radioactivity in his own body and the radioactivity and cosmic rays in the environment. This is equal to a dose of 3 to 5 roentgens up to adult life (say, 30 years).

On the assumption that the natural incidence of leukaemia is due entirely to background radiation, the figure of 3 leukaemia cases per million per year per roentgen and a natural radiation dose of 5 roentgens up to adult life would lead to a natural adult incidence rate of 15 per million per year. The close agreement between the incidence rate as calculated above and the observed rate may, no doubt, be partly accidental, but it points to the high plausibility of the assumption that the natural incidence of leukaemia could be due entirely to the background radiation.

Our thanks are due to Professor D. S. Kothari and Dr. M. L. N. Sastri for stimulating discussions.—We are, etc.,

SANTOSH KUMAR MAZUMDAR.
A. NAGARATNAM.

New Delhi.

REFERENCES

- ¹ *The Hazards to Man of Nuclear and Allied Radiations*, 1956. H.M.S.O., London.
² *Pathological Effects of Atomic Radiation*, 1956. National Academy of Sciences, U.S.A.
³ *British Medical Journal*, 1956, 2, 704.

A.C.T.H. in Multiple Sclerosis

SIR,—Three years ago I tried A.C.T.H. on a few selected early cases of disseminated sclerosis (multiple sclerosis) because of my belief that it is a "stress" disease.¹ Patients treated have been maintained on long-acting A.C.T.H. or gel 10–15 units intramuscularly twice or three times a week. This is the calibre of dose I find adequate to keep sarcoidosis patients free of symptoms, and does not usually lead to side-effects. A "no added salt" regimen is advised, together with 1–2 g. of potassium chloride daily. The number of cases is small owing to limited supplies, but the results have been sufficiently encouraging to be worth recording. Unlike most other reported trials of steroids in disseminated sclerosis, treatment has not been started without the prospect of maintaining it, though an exception has been made occasionally. In some cases the results have been really dramatic, and severe disability in bladder control, walking, and co-ordination, though present for some weeks or months, have almost disappeared in a matter of hours. A search of literature shows that Reis, Sahlgren, and Jönsson² first used A.C.T.H. for this disease in 1949. In 1953³ their series totalled 51 patients and 69 courses of treatment; in 68% of the treatments improvement was considerable, and in 48% almost total disappearance of the symptoms of the last attack occurred. The best results were achieved when treatment was given early in an attack, and in young subjects. The number of previous attacks did not seem to have any effect on the response to treatment. T. Fog⁴ recorded improvement in 13 out of 14 patients treated with short courses of A.C.T.H. Glaser and his colleagues⁵ reported an improvement in a third of 33 cases, but said that the improvement was transient, and that regression occurred after stopping treatment. Miller and Gibbons's⁶ experience was that A.C.T.H. in adequate dosage over five days in seven patients had no specific effect on the acute manifestations of disseminated sclerosis, and recently Thygesen and

M. Fog⁷ have produced evidence that cortisone and A.C.T.H. had no effect on the course of the disease in 36 patients over 10 months using relatively heavy dosage.

In two of my ten cases no improvement was obtained and the treatment was stopped. In the rest, partial or complete remissions occurred, and no severe relapses have taken place over a period of one to three years. One patient went on holiday, and ran out of A.C.T.H. and relapsed in a week, but quickly recovered on starting again. In all cases superficial psychotherapy has also been used, and endeavour has been made to give the patients insight into their habit of emotional suppression, and to help them ventilate their problems. At the same time I have tried, where possible, to modify unhappy environments by explanatory interviews with those relatives closely involved, and who are so often unwittingly contributing to the stress situation (it should be noted that Jonez⁸ claims good results from supportive psychotherapy alone). With a disease whose natural course is so variable it is difficult to assess results of treatment, and one does not want to precipitate a rush on A.C.T.H. by doctors anxious to help hopelessly crippled patients. I suggest, however, that it is worth a trial in early cases, or in old cases who have had a relapse, however severe, if the duration of the relapse can still be measured in months. As to whether maintenance therapy with a relatively small dose will protect against severe relapses remains to be seen; if an initial remission has been achieved it seems a logical sequel with parallels in other diseases where steroids are effective.—I am, etc.,

Ipswich.

J. W. PAULLEY.

REFERENCES

- ¹ Paulley, J. W., *Lancet*, 1952, 1, 1305.
² Jönsson, B., von Reis, G., and Sahlgren, E., *Acta psychiat. neurol. scand.*, 1950, suppl. 74.
³ *Ibid.*, 1953, 28, 429.
⁴ Fog, T., *Nord. Med.*, 1951, 46, 1742.
⁵ Glaser, G. H., Merritt, H. H., and Traeger, C. H., *J. Amer. med. Ass.*, 1952, 148, 898.
⁶ Miller, H. G., and Gibbons, J. L., *British Medical Journal*, 1953, 2, 1345.
⁷ Thygesen, P., and Fog, M., *Acta psychiat. neurol. scand.*, 1956, 31, 169.
⁸ Jonez, H. D., *Ann. Allergy*, 1951, 9, 653.

Hospital Confinement

SIR,—Miss Aileen M. Dickins and her obstetric colleagues (*Journal*, March 16, p. 645) have reminded us of the danger of home deliveries for those women whose pregnancies deviate, even slightly, from the normal. It has been truly said that a labour can only be considered normal in retrospect. Until there are more maternity beds in this country there will have to be rigid selection of mothers who can be allowed home delivery. To the list of indications for hospital delivery, I would add *all* primigravidae. The first pregnancy and delivery is as hazardous to the mother and baby as to the woman who has had five or more children.—I am, etc.,

London, W.C.1.

W. C. W. NIXON.

SIR,—There is much to be said for the plea for hospital confinement put forward by your Windsor correspondents (*Journal*, March 16, p. 645), but there is another relevant point of view.

To reduce the very high and still mounting costs of our hospital services, why not encourage many more home confinements of normal multiparae, with the family doctor in charge and with an adequate nursing service? By all means have some standard, such as a D.R.C.O.G., before admitting the younger practitioners to the obstetric panel, but surely the older general practitioners of experience are still capable obstetricians. Confinements in the home need not impose too great a strain on the doctor's time if good antenatal work is done and an experienced and reliable midwife nurse is in attendance.

In pre-N.H.S. days many practitioners owed their establishment in a good practice, and the best type of doctor-patient relationship, to having successfully attended the mothers in their confinements at home. This relationship should be fostered as much as possible, and even now it is fast disappearing in State medicine. In my own area we

have a small maternity hospital where the general practitioners attend their own cases, under supervision of the area consultant obstetrician, and this works reasonably well.—I am, etc.,

Old Kilpatrick,
Dunbartonshire.

WILLIAM GIBSON.

Suxamethonium and Post-operative Muscle Pains

SIR,—I was interested to read the observations of Drs. D. D. B. Morris and C. H. Dunn (*Journal*, February 16, p. 383) on post-operative muscle pains following suxamethonium administration. These pains were, in fact, first described by Dr. T. T. Currie (*Journal*, May 9, 1953, p. 1032) and directly attributed to suxamethonium by Dr. C. Sanger (*Journal*, May 23, 1953, p. 1162).

We have followed up a small series of 50 cases, 25 of which received suxamethonium chloride in doses of 50–150 mg., preceded by 2–3 mg. of decamethonium iodide (C.10), in the hopes of modifying the effects of suxamethonium by the initial depolarizing action of C.10; the other 25 received similar doses of suxamethonium only. All were dental or otolaryngological cases in which no post-operative sedation was needed. They received thiopentone, nitrous oxide and oxygen, and, in some cases, pethidine, in addition to the relaxants used. In the 25 controls 40% (10) developed typical suxamethonium after-pains, 4 of these being severe and generalized. Of those receiving an initial dose of C.10, 24% (6) developed after-pains, and only 1 of these was at all severe. These results did not seem to us to be good enough to merit the routine use of C.10 to reduce muscle pains, but they are comparable with the results obtained using small doses of tubocurarine before the suxamethonium. The necessity of using relaxants of opposing actions is avoided, and C.10 being a shorter-acting drug than tubocurarine, minor degrees of residual paralysis are less likely.

Our findings confirmed that the after-pains bore no definite relation to the initial muscle fasciculations. Eleven of the 15 in the control series who had no after-pains had definite fasciculations, 4 of them markedly so. Of those who developed after-pains, 2 out of the 10 had no observable fasciculations at all.—I am, etc.,

London, S.W.1.

FREDA PRINCE-WHITE.

Noradrenaline in Shock Due to Visceral Perforation

SIR,—In answer to Dr. J. V. I. Young's queries (*Journal*, February 23, p. 463) regarding my article (*Journal*, February 2, p. 261): respirations were at times controlled although not continuously so; the Magill "rebreathing" attachment (Mapleson type A) was used and the gas flows were 8 litres/min. I agree that the Magill attachment is not ideal for use in techniques involving continuously controlled respiration. That some retention of carbon dioxide might, at times, have occurred in the cases described is certainly a possibility.—I am, etc.,

ShIPLEY, Yorks.

D. D. DAVIES.

The Hurt Brain

SIR,—Dr. H. B. Kidd (*Journal*, March 16, p. 645) has misunderstood Dr. E. E. Prebble (*Journal*, February 16, p. 399), who was not criticizing the use of penicillin as such in the treatment of neurosyphilis, but the complacent assumption that a single course of 10 injections or 10 million units automatically guarantees a cure. The proof of the pudding is in the eating, and unless the apparent relief of symptoms, gain in weight, fall in E.S.R., and general improvement in health are supported by improvement in the C.S.F., as shown by repeated examinations, the long-term results may prove disappointing.

It is usually true, as Dr. Kidd's experience shows, that the young acute cases with high C.S.F. cell counts do very well with even moderate amounts ("10 injections") of penicillin, but the long-standing cases require much more prolonged treatment to effect a cure, and when penicillin does not achieve the desired results the clinician should be prepared to fall back upon the old and tried remedies of the pre-

penicillin era. Of these the most outstanding in the treatment of neurosyphilis is not fever therapy but tryparsamide, though scarcely less "dangerous" than malaria. The remarks quoted from J. Purdon Martin¹ that if penicillin fails nothing else will work, and that arsenicals and bismuth are of no value, are contrary to the clinical experience of most older venereologists. In my own experience I have seen cases of neurosyphilis with active C.S.F. formulae fail to respond to repeated, massive, but intermittent courses of penicillin, often persisted in for several years, and yet resolve to the patient administration of tryparsamide.

In the use of penicillin as the treatment of choice, it is very important that it be given at least once daily to maintain a high and continuous tissue fluid level; the temptation to use the longer-acting penicillins at intervals less frequent than once daily has led to very indifferent results in my hands. Given once or twice daily as the sodium or procaine salt in three courses of 10 injections each, with adjuvant treatment in the intervals, penicillin will produce a normal C.S.F. within four months in favourable cases. If it does not, the decision to employ tryparsamide should not be further delayed. No other arsenical (and certainly no trivalent arsenical) should be considered. In view of the dangers of tryparsamide therapy (principally of precipitating an incipient optic atrophy) it should be undertaken in collaboration with a friendly and courageous ophthalmologist.

On the general question of danger, all drugs are potentially dangerous in unskilled hands, and sudden death after penicillin is not unknown. The much more toxic arsenicals require experienced hands, one of the few *raison d'être* for the continued existence of the venereologist; fever therapy carries the greatest risk, and yet in skilled and experienced hands with careful selection of cases very few patients die, as those familiar with the operation of the hypertherm at Newcastle will testify.

Finally, on "authorities," it is inconceivable that Dr. Kidd is not familiar with the authority on his own doorstep in Wakefield, but if this unhappily be so I will gladly supply him with the name privately.—I am, etc.,

Hull.

C. P. HEYWOOD.

REFERENCE

- ¹ Martin, J. P., *Practitioner*, 1956, 176, 142.

SIR,—The letters from Dr. E. E. Prebble (*Journal*, February 16, p. 399) and Dr. Humphry B. Kidd (*Journal*, March 16, p. 645) raise two questions: (1) Is one course of penicillin sufficient to cure neurosyphilis? (2) Is penicillin alone the ideal treatment? As Dr. Prebble suggests, I am sure most, if not all, venereologists would answer the first question with an uncompromising negative. The second question is more difficult, and nearly everyone who treats neurosyphilis has a different view. Personally, I cannot forget the brilliant cures often achieved with tryparsamide before penicillin was available, and feel that this valuable drug should still play a part in treatment.

Neurosyphilis, however, is a chronic disease and we have had penicillin for little more than a decade. Now is not the time for dogmatic statements on treatment. At least another 10 years of careful experiment and assessment of results is needed before an authoritative decision on therapy can be reached.—I am, etc.,

Birmingham, 4.

GERALD H. KNIGHT.

Distinctive Tubes

SIR,—The rapid progress of medical sciences is unavoidably associated with occasional retrograde advances. Correct labelling of the army of new medicamenta for easy identification is as essential as ever. Labels which become detached are a menace. Dr. Frank R. Neubert's suggestion (*Journal*, March 9, p. 588) that oculenta should be dispensed in distinctively coloured tubes is excellent and overdue. This simple method to aid identification was, of course, common practice when differently coloured drop-bottles were used for guttae. But why not be a bit more progressively modern and tint the ointments themselves? Then from the

spreading of the ointment on to the skin around the victim's eye we would at a glance also be able to diagnose the medicamenta to which a new patient has been subjected elsewhere. I cannot, however, allow an old friend of proved merit to be slighted: ung. hyd. ox. flav. is excellent, properly exhibited.—I am, etc.,

Guernsey.

J. E. MARTIN.

Sickling and Malaria

SIR,—Since Allison¹ proposed that the high frequencies of the sickle-cell gene in Africa were to be explained by a relative immunity of the sickle-cell trait carrier to falciparum malaria, much evidence has been brought out both for and against this hypothesis. Although it is generally agreed that such an immunity exists, in many areas it does not seem to be effective enough to account for the high frequencies of the gene. For example, in South-western Nigeria, where the sickle-cell gene attains a frequency of 0.13 (about 26% of the sickle-cell trait), Walters and Bruce-Chwatt² have not been able to find any evidence for this immunity. For the sickle-cell gene to attain a frequency of 0.13 a great deal of differential selection between sicklers and non-sicklers must be occurring. Thus it seems that other factors may well be involved in addition to this immunity of the sickler to falciparum malaria. I should like to propose another mechanism by which falciparum malaria could account for the high frequencies of the sickle-cell gene.

It is a well-known fact that the advanced stages of development of *Plasmodium falciparum* are not seen in the peripheral blood. As the parasite grows, the erythrocyte which contains it adheres to the walls of the blood vessels, usually in the internal organs. Miller, Neel, and Livingstone³ have suggested that under these conditions the cell would be giving up oxygen to both the tissues and the parasite; thus the erythrocytes of a sickle-cell trait carrier with falciparum malaria would have a tendency to sickle in all the organs of the body except the lung, and be more easily phagocytized with consequent interruption of the life cycle. Since Raper⁴ has shown that sicklers do not suffer from cerebral malaria, it seems that, in the brain at least, the parasite cannot multiply as well in sicklers as in non-sicklers. This could then be the basis of the sickler's relative immunity to falciparum malaria. If this were true, the placenta would be another organ in which *P. falciparum* would fail to develop in sicklers.

There have been three studies done on falciparum infections of the placenta, those by Blacklock and Gordon,⁵ Garnham,⁶ and, more recently, Bruce-Chwatt.⁷ Generally these studies indicate that falciparum infections of the placenta are associated with higher abortion, stillbirth, and neonatal death rates. Bruce-Chwatt has also shown that an infected placenta is associated with prematurity and a lower mean birth weight. If falciparum infections of the placenta could not develop to the same extent in sickling mothers, these individuals should have a proportionately higher number of liveborn infants and their offspring a higher survival rate. From a genetic standpoint the important value is the extent to which the sickling mothers contribute to the next generation. I have calculated that in order to maintain 26% of the sickle-cell trait the female sickler would have to contribute to the next generation at a rate that was 1.44 times greater than that of the normal female. This is rather high; however, it should be remembered that only one-half of the sickling mother's offspring will be sicklers, and also that the sickling mothers only produce about one-half of the sickling babies. In addition, the calculation was made on the assumption that this greater contribution to the next generation of sickling females accounted for all of the high frequency of the sickle-cell gene. It seems more probable that the high frequencies are accounted for by a combination of this higher rate and the relative immunity of the sickler to falciparum malaria, and probably other factors.

Data on this problem are rather scarce. Edington⁸ has shown that sickling mothers have a greater fertility rate, and a slightly lower stillbirth rate, and also that their babies have a higher mean birth weight and a higher survival rate.

His figures for the mean birth weight of babies of sickling mothers (3,010 g.) and non-sickling mothers (2,880 g.) are almost identical with Bruce-Chwatt's figures of mean birth weight of babies born of mothers with a non-infected placenta (3,048 g.) and an infected placenta (2,903 g.). Combining Edington's figures for the fertility rate and the offspring survival rate, we find that non-sickling mothers contribute 2.00 offspring to the next generation, while sickling mothers contribute 2.69. The ratio is then 1.34. In the Southern Gold Coast, where this study was done, there is 20% of the sickle-cell trait. To maintain this frequency the ratio only needs to be 1.29. It should be remembered, however, that the offspring survival rate also includes the effects of the relative immunity of the sicklers to falciparum malaria. Although most of the differences quoted here are not statistically significant, the evidence seems to be generally favourable to this hypothesis.

While I was at the Liberian Institute of Tropical Medicine Dr. R. S. Bray and myself attempted to obtain malaria smears from the placentae of sickling mothers. Due to the fact that the sickling rate is only about 7% in this part of Liberia, and also that the majority of the babies are born in the "bush," we were unsuccessful. Since it seems that this mechanism could in some places be as important as the relative immunity of sicklers in maintaining the high frequencies of the sickle-cell gene, I would like to urge that colleagues in areas of high sickling frequencies investigate this aspect of the problem.—I am, etc.,

Ann Arbor, Michigan, U.S.A.

FRANK B. LIVINGSTONE.

REFERENCES

- ¹ Allison, A. C., *British Medical Journal*, 1954, 1, 290.
² Walters, J. H., and Bruce-Chwatt, L. J., *Trans. roy. Soc. trop. Med. Hyg.*, 1956, 50, 511.
³ Miller, M. J., Neel, J. V., and Livingstone, F. B., *ibid.*, 1956, 50, 294.
⁴ Raper, A. B., *British Medical Journal*, 1956, 1, 965.
⁵ Blacklock, D. B., and Gordon, R. M., *Ann. trop. Med. Parasit.*, 1925, 19, 327.
⁶ Garnham, P. C. C., *Trans. roy. Soc. trop. Med. Hyg.*, 1938, 32, 13.
⁷ Bruce-Chwatt, L. J., *Ann. trop. Med. Parasit.*, 1952, 46, 173.
⁸ Edington, G. M., *Trans. roy. Soc. trop. Med. Hyg.*, 1955, 49, 253.

How Many Hospital Beds?

SIR,—May I be allowed to make a very brief reference to your reporter's excellent summary (*Journal*, March 9, p. 579) referring to papers read to the medical section of the Royal Statistical Society at Westminster Hospital on February 26?

While it is true that I referred to the high rising costs of capital building and agreed that there was some measure of agreement on a figure of 6 to 7 acute beds per 1,000 of population, I sought to demonstrate by the use of certain formulae and case-load studies that, even with the information at present available, it should be possible to plan on a basis of as low as 5, or just under 5, beds per 1,000 of population, including maternity departments. Present-day costs being what they are, it is rather important that we should arrive at certain methods of more accurate forecasting. I left out of my reckoning all mental hospital beds, tuberculosis beds, geriatric beds, and certain highly specialized beds only found in the medical teaching centres. It is true that certain of the criteria relating particularly to maternity-bed requirements require re-examination in the light of modern trends, but this factor is not of such material value as to affect to a great extent the basis of calculation so far as our present knowledge goes.

The discussion which followed these papers by Mr. Newell and myself was very stimulating, and it was very encouraging to find that the subject was one of such topical interest.—I am, etc.,

Belfast.

A. T. ELDER.

SIR,—Your report (*Journal*, March 9, p. 579) of the meeting of the medical section of the Royal Statistical Society, in which it was stated that the provision of "bisexual wards" was urged, prompts me to write a few words on this matter. Without reference to outside authorities on the subject we have developed what I understand must be intended by the expression "bisexual wards," and have found it most helpful in the degree of flexibility it offers,

thus in one way, at least, helping to solve the problem of emergency beds in an efficient and non-wasteful manner.

In the General Hospital, West Hartlepool, we have two surgical wards, each consisting of two main wards and a number of side wards which lie geographically between the two main wards and which are used for either sex. One surgical ward has a 12-bedded men's ward, a 7-bedded women's ward, and 6 single-bedded side wards. The other surgical ward has a 14-bedded men's ward, a 12-bedded women's ward, and 6 single-bedded side wards. In this way we can, if necessary, have a minimum of 26 men's beds with a maximum of 31 women's beds, or a maximum of 38 men's beds with a minimum of 19 women's beds. In practice, of course, there are usually only a few beds one way or the other.—I am, etc.,

West Hartlepool.

HUGO GRANT.

Police Evidence Preferred

SIR,—I cannot agree with Dr. Charles L. Worthington (*Journal*, March 16, p. 643) that a policeman is better qualified than a doctor to judge ability to drive a car. The requirements for safe driving are good visual and motor co-ordination together with adequate emotional control. To assess these is the doctor's regular task by techniques with which we are all familiar.

In cases of intoxication disease must be excluded. Agreed. A good clinical examination does this, and establishes unfitness too. A parallel is seen when a doctor certifies that a patient is unfit for his work. The man's employer or workmate cannot be expected to detect a feigned illness, or prevent an ill but willing patient from continuing his efforts; but the doctor's broader knowledge allows him to do these things. And in the case of the driver of a car the doctor is better equipped than ever, for he also is a driver and understands the job.

The alcohol concentration is sometimes unfair because of variations in individual tolerance, and this spoils it from being the complete answer. As doctors we can judge the degree of incoordination, and whether it is due to disease; and as drivers we can assess fitness to drive. But it is not a job for the inexperienced.—I am, etc.,

Paignton.

J. F. BURDON.

Medical Advice in the Lay Press

SIR,—I was most interested to read Dr. M. B. Matthews's letter (*Journal*, March 16, p. 647). Since I have been in practice I have been asked by patients, from time to time and albeit rather apologetically, for some expensive tonic or to "see an ear specialist" (when a simple syringing out of wax was all that was required), or "what about some vitamin tablets, doctor?" etc. On closer questioning they have admitted that these ideas originated from a medical article in the lay press. I have discussed this with a journalist and was told that the press will print what the public wants: and there is, I am sure, little doubt that these articles are widely read. A local chemist told me that he can tell what tonic a well-known Sunday newspaper has advised to its readers by the sale of this commodity in his shop on the Monday. As long as the community is so ill-natured, the press will continue to print these articles. I think that the safeguard is that patients will usually ask their own doctor about it and are quite prepared to accept his advice on the matter.—I am, etc.,

Dalkeith, Midlothian.

H. M. S. NOBLE.

Needle in Rectum

SIR,—One hears about needles disappearing in strange places and emerging from the human body in unexpected places. I think the following case is rather a unique one.

A woman, aged 38 years, brought to the surgery a black needle with cotton threaded in it. She told me that she suffered from constipation and piles. While at work she went to the toilet, and while there felt as if her back was locked and was in great pain. The bowels did not move. The sister at the works looked at the anal region, saying

there was nothing except a piece of cotton, and tried to pull it. The patient screamed, and, thinking the pain was due to piles, the matter rested there. When she got home she thought she would ease the pain by sponging the piles with hot water. Passing her finger into the rectum, she felt the needle lying across and pulled it out. The patient could not explain how long the needle and cotton were there and how they got into the rectum. The only explanation I can think of is that she might have sat on it and it was carried into the rectum by suction.—I am, etc.,
Liverpool, 18.

H. PRATAP.

Bolus Obstruction

SIR.—Further to Dr. John T. Corbett's letter on this subject (*Journal*, March 2, p. 524), it may be of interest to record a very similar case.

In mid-ocean, in October last, a ship's assistant cook, aged 34, reported sick with the classical signs of small-bowel obstruction. Examination revealed a well-healed midline upper abdominal incision which was said to have been "for indigestion in 1953—and I've only half a stomach now"—from which it was concluded that he had undergone a partial gastrectomy. At laparotomy a bolus was discovered firmly impacted in the lower jejunum. This was delivered by enterotomy, and at first baffled investigation, but when dissected at leisure was found to consist of five segments of an orange in one piece. The patient made an uninterrupted recovery but has still to live down this gastronomic reputation amongst his shipmates.—I am, etc.,
London, S.W.1.

LEONARD GOODMAN.

Pavlov's Works

SIR.—In a letter on Pavlov's works (*Journal*, December 22, 1956, p. 1482), Dr. W. Ritchie Russell reviews the choice between modern pseudo-psychology which neglects discipline and that gross materialist conception which posits man as no more than a machine made from cerebro-centric reflex arcs.

Fortunately we need not restrict our choice within such a field. We can go to the ancient stream of common-sense philosophy, which was founded when Aristotle solved the dilemma of Heraclitus and Parmenides by his discovery that corporeal things are constituted from matter and form, which, in man, are body and soul. Man is born with a temperament, rooted in matter ("behaviour patterns" for modern "psychologists"). But repeated acts of the will, a spiritual power, form not only facilitated reflexes but also habits, which are rooted in spirit. These habits are good or bad, virtues or vices. They are imprinted upon the temperament, and so character is formed. Hence, the importance of discipline.

Dr. Russell does well to draw our attention to the attempt of the Russians to found a philosophy on physiology. It is more absurd than the attempt to found a cathedral upon a solitary brick. But the consequences are much more serious. The essential distinction between man and brute is denied; and it becomes quite logical that man should behave like a brute when he is strong and be treated like a brute when he is weak. Let us hope that this be not a "basis for national education." Atheistic materialism is a dangerous playfellow.—I am, etc.,
Sydney, Australia.

VICTOR J. KINSELLA.

Herpes Zoster and Chicken-pox

SIR.—I was interested to read Dr. George Holloway's letter (*Journal*, March 9, p. 583), in which he refers to a case of chicken-pox following herpes in the same household. I had a similar experience last year. The father developed moderately severe herpes ophthalmica on September 19. This subsided, but he was not completely recovered until October 8. On October 4 his son, aged 7 years, developed chicken-pox. The child, suffering from bronchitis, had been confined to the house for the previous three weeks, and, so far as can be ascertained, the father had not been in

contact with chicken-pox. It will be noted that the time intervals between the onset of herpes in the one patient and chicken-pox in the other—18 days in the case recorded by Dr. Holloway, and 15 in this one—approximate nearly to one another. It is invariably the custom to warn parents whose children have chicken-pox of the danger of developing herpes, especially herpes ophthalmica, unless precautionary measures are taken, but hitherto I have not considered it necessary to give any similar warning in cases of herpes.

I am indebted to Dr. J. Durie, in whose practice this case occurred, for his permission to refer to it.—I am, etc.,
Middlesbrough.

H. CRESSWELL PIERCE.

Termination of Pregnancy

SIR.—Dr. James Arkle (*Journal*, March 9, p. 558) represents the ancient Hebrews as allowing therapeutic abortion. Even granted that there were "therapeutic abortionists" during the desert exodus, then they must have been peculiarly incompetent ones, for at the end of their 40 years' pilgrimage, while there were only two men of the original company left, there were still 601,730 Israelite males of 20 years and over. His deductions, whether from the Hebrew text or the Septuagint, appear liberal, to say the least. One might as well discuss the ethics and moral implications of a miscarriage resulting from a present-day car accident.

Not content with this, Dr. Arkle further misrepresents the Christian "laws" on abortion. While referring to various statements by various Christians, it is noteworthy that he does not give a single New Testament reference. Dr. Arkle fails to acknowledge, if not understand, the non-legalistic attitude of true Christianity. The Christian's attitude to this question is not conditioned by one difficult, and maybe irrelevant, Old Testament verse, but rather in the entire context of Biblical teaching. It is not a matter of the "1st Section of the Corpus Juris Canonici (Cap. 9)," but is rather what would have been the attitude of Christ in any given set of circumstances.—I am, etc.,
Cardiff.

D. E. B. POWELL.

Abdominal Hernia Appliance Fitters

SIR.—We would be grateful for the opportunity of bringing to the notice of the medical profession through your *Journal* the scheme for the training and certification of abdominal hernia appliance fitters.

This scheme, sponsored by the Institute of British Surgical Technicians, has been developed for the training of abdominal hernia appliance technicians and subsequent qualification by examination. The chairman of the board of examiners is a surgeon, and the object of the scheme is that the medical profession will be able to have their patients correctly fitted with abdominal hernia appliances and thereby avoid the discomfort and inconvenience often caused by ill-fitting appliances.

A number of courses of training have already been held and others will be arranged at suitable centres throughout the United Kingdom as the scheme increases in scope. There are at present 230 certificated abdominal hernia appliance fitters, the names of whom can readily be supplied to any doctor who is interested. By this means practical assistance will be given to the scheme.—We are, etc.,
HENRY SOUTTAR,
President.

H. GUY DREW,
Chairman.

Institute of British Surgical Technicians.

London, E.C.1.

POINTS FROM LETTERS**Laboratory Requests**

Dr. P. LAZARUS-BARLOW (Hastings) writes: I wonder whether the following two requests recently received in the laboratory here can be beaten. Both were written by medical men of some years' standing: (1) "Mrs. A. Feels sleepy after meals. ? Anaemic. Blood count please." (2) "Mr. B. 33 years. Gets browned off and feels tired in the evenings. Blood count please." What has modern medicine come to?

Obituary

F. W. PRICE, M.D., F.R.C.P.

Dr. F. W. Price, consulting physician to the Royal Northern Hospital and the National Hospital for Diseases of the Heart, died in London on March 19, two days after his 84th birthday. The famous textbook which bears his name ran into eight editions during the thirty years of his editorship.

Frederick William Price was born on March 17, 1873, the son of William Price, of Weston Rhyn, Shropshire. From Ruabon Grammar School he went on to become



a medical student at Edinburgh University, where he graduated M.B., C.M., with honours in medicine, in 1898. After holding the appointment of resident physician at the Edinburgh Royal Infirmary he came down to London as assistant resident medical officer at the Brompton Hospital. Other appointments he held at hospitals in or near London included those of pathologist and registrar at the

City of London Hospital for Diseases of the Chest, physician and honorary pathologist to the Mount Vernon Hospital for Consumption, medical registrar at Westminster Hospital, and physician to out-patients at the Hampstead General and North-west London Hospital. He took the M.R.C.P. of London in 1903 and proceeded to the M.D. in 1908. During these years he established himself in London as a sound physician and built up a large private practice. He was always specially interested in cardiology, an interest which was stimulated by his association with Sir James Mackenzie and Professor A. R. Cushny in pharmacological research. Price himself also carried out original work on the effect of digitalis and other drugs on blood pressure.

In 1912 he was invited to Canada to attend the meeting of the Toronto Academy of Medicine, at which he gave the opening address, and when the British Medical Association held its Annual Meeting at Brighton in 1913 he read a paper on the action of digitalis on the blood pressure in man. Shortly afterwards he was elected to the staff of the National Hospital for Diseases of the Heart as an assistant physician, and in due course he became senior physician and ultimately consulting physician at that hospital and at the Royal Northern. For some years Price examined in medicine for the University of St. Andrews. He was himself a good teacher at the bedside, having a highly developed skill in eliciting the physical signs of cardiac abnormality. In 1915 he was elected a Fellow of the Royal Society of Edinburgh and in 1936 a Fellow of the Royal College of Physicians of London; and in 1947 the honorary degree of M.D. was conferred on him by the Queen's University, Belfast.

Price was the editor of *A Textbook of the Practice of Medicine* from its first edition, published in 1922, to its eighth edition, which appeared in 1951. There were 26 contributors to the work, which set a new fashion, for up to the time of its first appearance most English text-

books had been written by one author. The stress on treatment was found particularly useful by those already in practice. Price himself wrote most of the section on diseases of the heart. To quote from the *Journal's* review of the first edition: "It . . . gives, in a most concise form, a vast amount of valuable information, and the experience of many of the most able London physicians." Price wrote one book himself on diseases of the heart, and he contributed chapters, mainly on cardiological and respiratory disorders, to several textbooks, including Latham and English's *A System of Treatment*.

In 1943 he married Miss Hilda G. Brown, of Bath, and she survives him. A memorial service will be held at All Souls Church, Langham Place, London, on Monday, April 1, at 12.30 p.m.

T. F. C. writes: Frederick Price, known as "Freddie" by many, died last week after a long illness at his home in London. He was an octogenarian leading a life of semi-invalid retirement for many years. When the time came for him to retire from the honorary staff of the National Heart Hospital he drifted away from colleagues and associates. One night during the "blitz" his home in Harley Street was destroyed, and he was found walking in the street in his pyjamas hugging his first love, the manuscript of a new edition of the famous *Textbook of the Practice of Medicine*. He seemed lost and found it difficult to adapt himself to new surroundings.

He married and was happy in his domestic life. He combined a deeply religious nonconformist outlook with a well-defined astuteness. When presiding at a hospital meeting he seemed to be more occupied with tactics than strategy. Shyness was largely responsible for some of his mannerisms and some of his bodily complaints. He did not seem to have many outside interests, and would be content to walk in the evening to his club and read the *Irish Times*. His complaint was always the heavy duties imposed on him as editor of his *opus magnum*, and his life seemed to be centred round the recurring editions; perhaps there was an element of escapism in this concentration through the years. At any rate, the *Textbook* made him a household name in the profession, graduates and undergraduates. It was this *Textbook*, by various authors, and not *Diseases of the Heart* which made his reputation and place in the medical world.

A graduate of Edinburgh University, he made the journey to London and soon came under the influence of Mackenzie, who later had a consulting-room in his house. On Mackenzie's retirement Price occupied the room and his practice increased. He did not harvest new knowledge, but few do. His contribution is a textbook, in many editions, which has been and continues to be generally accepted as a credit to British medicine, and will serve as a worthy memorial to a physician and cardiologist sure of remembrance by friends and others who have benefited by his many years of active life.

T. GRAINGER STEWART, M.D., F.R.C.P.

Dr. T. Grainger Stewart, consulting physician to the National Hospital, Queen Square, London, and consulting neurologist to the West London Hospital, died at Farnborough, near Wantage, Berkshire, on March 18. He was 83.

Thomas Grainger Stewart was born on December 2, 1871, the son of Sir Thomas Grainger Stewart, professor of medicine in the University of Edinburgh from 1876 to 1900. Educated at Edinburgh Academy and the University of Edinburgh, he graduated M.B., Ch.B. in 1900, and was elected a Member of the Royal College of Physicians of Edinburgh in 1902 and of the Royal College of Physicians of London in 1904. He proceeded to the M.D. in 1912, receiving a gold medal for his thesis. After graduation he held the appointment of resident

physician at Edinburgh Royal Infirmary, and then, in 1902 after a period of study abroad, began what was to be a lifelong connexion with the National Hospital in Queen Square. In that year he was appointed junior house-physician to the hospital and thereafter occupied successively the posts of senior house-physician, resident medical officer, medical registrar, assistant pathologist, assistant physician, physician, and, finally, consulting physician. From 1906 to 1909 he was also assistant physician to the Metropolitan Hospital. In the latter year he became assistant physician to the West London Hospital, where he subsequently became neurologist and, in later years, consulting neurologist. Among other appointments he held were those of physician to the Central London Ophthalmic Hospital, honorary neurologist to St. Vincent's Cripples' Home, Pinner, and consulting neurologist to St. James' Hospital, Balham. After the first world war he was consulting neurologist to the Ministry of Pensions. He was elected F.R.C.P. in 1913.

Dr. Grainger Stewart married Lady Frances Playfair, widow of Sir Patrick Playfair, in 1922, and she survives him.

J. P. M. writes: Grainger Stewart was in many ways a typical Scot—reserved, slow of speech, very cautious, very sound in judgment. As a young man he must have been very attractive with his reddish colouring and winning smile. He was appointed to the honorary staff of the National Hospital, Queen Square, at the age of 31. He had already written in association with Gordon Holmes a paper on the symptomatology of cerebellar tumours which was to become a classic, and also (again in association with Holmes) a paper on the connexions of the inferior olive with the cerebellum in man. After his appointment to the honorary staff he wrote in conjunction with Dr. Aldren Turner a textbook of nervous diseases which was published in 1910. Before the first world war he was building up a practice in London, and at hospital showed promise as a teacher. During the war he served as a specialist with the Army at home, and subsequently began an association as consultant with the Ministry of Pensions hospitals, first at Hammersmith and afterwards at Roehampton, which he was to maintain to the end of his days.

In middle life, in the early 1920's, he had a prolonged period of serious illness and was probably never the same man afterwards. He was slower, he had lost some of his keenness, some of his enthusiasm for neurology, some of his *joie de vivre*, and his illness had done great harm to his practice. Thereafter, apart from an occasional lecture, given as a duty, he did no teaching. However, in 1927, he published, in association with Dr. Greenfield and Dr. Blandy, one of the early papers on Schilder's disease (encephalitis peri-axialis), including a case of a variety until then undescribed. A tendency to withdraw from medical society was increased by his oncoming deafness. His physical health eventually recovered fully, and during most of the inter-war years he used to spend the autumn deerstalking in his beloved Scotland—a sport which required physical fitness. In the days when junior physicians had not so many beds under their care as they have now, this gave his junior the welcome charge of his wards for at least two months every year, and some pecuniary reward from looking after his private practice.

With the coming of the second world war Grainger Stewart's activities were necessarily reduced. He spent a good deal of time in London and continued to attend his hospitals—at Queen Square, the West London, Roehampton, and the Eye Hospital in Judd Street—until he reached retiring age in 1942. In committee he always spoke with wisdom and dispassionately, but he lacked vigour and was often short of words—shortcomings of which he was very conscious. For many years he was a valued member of the

board of management of the National Hospital, in the days before the National Health Service.

Brought up in a cultured and academic Edinburgh family, with its strong presbyterian background, Grainger Stewart remained in many ways typical of the society in which he grew up. His standards of conduct were of the highest; he was a loyal and trusted friend; shy and sympathetic, he treated his patients, rich and poor, alike. In the pre-war days, when the hospital was run on more intimate lines than is possible now, he knew not only the residents and nursing staff but every porter and clerk and carpenter and engineer, and was regarded by them all with an instinctive respect and a peculiar affection such as was not accorded to any other member of the honorary staff.

ISAAC JONES, M.D., F.R.C.P.

Dr. Isaac Jones, physician and chief medical officer to the Metropolitan Police and formerly medical tutor at St. Thomas's Hospital, died at St. Thomas's Hospital on March 24, aged 74.

Isaac Jones was born in Australia in 1882 and was a medical student at Melbourne, where he graduated M.B., B.S. in 1909, proceeding to the M.D. with honours three years later. After working as house-surgeon, house-physician, and medical registrar at the Royal Melbourne Hospital, he developed his interest in pathology by taking the post of clinical pathologist to the Royal Melbourne Hospital and the Women's Hospital. For a time he was also resident tutor in medicine, pathology, and physiology at Trinity College, Melbourne. During the first world war he served in the R.A.M.C. with the rank of major and was the author of a special report to the War Office on the control of malaria and dysentery among troops. After demobilization he decided to practise in London and took the M.R.C.P. in 1919. It was at this time that he began his long connexion with St. Thomas's Hospital, where he was appointed deputy director of the clinical medical unit, under Professor Hugh MacLean. In association with his chief and with Dr. Geoffrey Fildes, Isaac Jones published an authoritative paper entitled "Treatment of Gastric and Duodenal Ulcers by Intensive Alkaline Method."

When the staff of the medical unit at St. Thomas's was enlarged in 1928 Isaac Jones became medical tutor, and it was in this post that he continued to serve the medical school at St. Thomas's, retiring after the second world war. He always enjoyed the company of young people and he taught the fundamentals of clinical medicine clearly and entertainingly. Students recognized him for the kindly and genial man he was and held him in special affection for being something of a character. From the time when he ceased to be deputy-director of the medical unit at St. Thomas's in 1928, he served as chief medical officer and consultant physician to the Metropolitan Police, Scotland Yard. In 1947 he gave a memorable lecture to the Medical and Physical Society at St. Thomas's on Scotland Yard and the Metropolitan Police Force. He was always proud to be associated with the Metropolitan Police, and they in their turn were devoted to him.

For many years—from 1937 to his death—Isaac Jones represented the New South Wales and Queensland Branches on the Central Council of the B.M.A., and he also served on a number of the Association's committees, including the Dominions and Overseas Committees. Both inside and outside the profession he had many friends, who will wish to extend their sympathy to his widow and two sons.

G. F. STRONG, M.D., D.Sc., LL.D., F.R.C.P. F.R.C.P.(C.), F.R.A.C.P., F.A.C.P.

Dr. G. F. Strong, clinical professor of medicine at the University of British Columbia, Vancouver, died suddenly in Montreal on February 26 at the age of 60. His many friends in the British Medical Association will recall him as the outgoing President of the Canadian Medical Association at the time of the conjoint Annual Meeting in Toronto in June, 1955.

Born in St. Paul, Minnesota, in 1897, George Frederick Strong—better known to his friends as Fritz Strong—was educated at the University of Minnesota, taking the B.Sc. in 1918 and proceeding to the M.D. in 1921. A year of his graduate training was spent at the Vancouver General Hospital, and this contact with Canada appears to have impelled him to reverse the usual migratory trend, and Canada gained one of its most distinguished medical figures. Appointed to the staff of the Vancouver General Hospital as physician in 1926, Dr. Strong became the leading cardiologist of the west and the prime mover in all good works, locally, nationally, and internationally. The roster of his appointments and offices is long. This able man, whose forceful personality impressed itself on all his contacts, was no office-seeker, but he rose naturally to positions of responsibility and authority. President of the Vancouver Medical Association (1929–30), president of the British Columbia Medical Association (1936–7), president of the Canadian Medical Association (1954–5), president of the American College of Physicians (1955–6), president of the North Pacific Society of Internal Medicine, charter member and first president of the Family Welfare Bureau of Greater Vancouver, president of the Canadian Heart Association, president of the National Heart Foundation of Canada, president of the Greater Vancouver Health League, vice-president of the Western Society for Rehabilitation, director of the Canadian Cancer Society, chairman of the Medical Board of the British Columbia Research Institute—these represent a selection of his many interests. Last year, in the capacity of immediate past-president of the American College of Physicians, he visited Australia and New Zealand to attend the congress at Wellington of the Royal Australasian College of Physicians, before which he read the Arthur E. Mills Memorial Oration, choosing for his subject "The Changing Aspects of Medicine." During the visit he became an honorary Fellow of the College. At the memorable joint Annual Meeting of the British and Canadian Medical Associations in Toronto in 1955, Dr. Strong received the degree of honorary LL.D. of the University of Toronto. In the same year he was elected F.R.C.P.(London).

Dr. Strong took a leading part in the establishment of the Faculty of Medicine at the University of British Columbia. His work and worth were recognized at the founding of the school in 1951 in his appointment as clinical professor of medicine, and it is likely that his contribution to medical education gave him the greatest



satisfaction. He was proceeding to his presidential duties with the National Heart Foundation of Canada when stricken with his fatal illness. Fritz Strong's personal qualities, his energy and drive, his forthright and articulate manner of speaking, will be sadly missed in many organizations, not the least in the Canadian Medical Association, where he contributed so much.

H. E. SIGERIST, M.D., F.R.C.P., LL.D., D.Litt.

Widespread sorrow will be felt by the many friends and admirers of the distinguished historian of medicine, Dr. Henry Sigerist, when they learn of his death, at the age of 65 years, at his home, so pleasantly named Casa Serena, in Pura, Ticino, Switzerland, on March 17.

Born in Paris of Swiss parents, Henry Sigerist was educated at Zurich, and even in early boyhood he was attracted to the study of languages. Before the age of 15 he was familiar with Latin and Greek, and also Arabic, and soon he devoted much attention to Oriental languages, especially to Sanskrit and Chinese. From philology he turned to science and then to medicine, graduating M.D. at Zurich in 1917. Had he specialized in any branch of medicine he would have achieved notable success, but, as he told his audience in the Heath Clark Lectures ("Landmarks in the History of Hygiene"), delivered at the University of London in 1952, "I steadily refused to specialize. My interests were very broad, and I drifted into a field where I could combine all my interests, medical, philological, historical, and sociological. This I did against the advice of my teachers, who tried to impress upon me that the history of medicine was not a career, but a hobby for retired practitioners."

Sigerist commenced his unusual career by assisting Professor Karl Sudhoff, professor of history of medicine in the University of Leipzig, and he succeeded Sudhoff in this chair in 1925. Resigning in 1932, he went to the United States, and at Baltimore he followed Professor W. H. Welch, who had been the first occupant of the chair of medical history at Johns Hopkins University and director of the Institute of the History of Medicine. At that time the librarian of the Institute was Dr. Fielding H. Garrison. Sigerist carried out the duties of his office with characteristic energy and zeal. He founded the *Bulletin of the History of Medicine* in 1933 and by his lectures and writings did much to stimulate interest in an aspect of medicine which has been more fully adopted as a basis of medical education and practice in America than in Britain.

In 1947 Sigerist resigned from his chair at Baltimore and returned to Switzerland in order to devote all his time and energy to the writing of a *History of Medicine*, in eight volumes, which he had planned for many years. He felt that time was passing all too quickly and that if the task was to be completed it must be made a whole-time job. Unfortunately his health was not equal to the self-imposed discipline of this great work, and he was handicapped by a serious illness. Nevertheless he made a wonderful recovery, and it was hoped that he would complete the work as editor, if not as sole author. Unfortunately that hope was not realized. Nevertheless



the name of Henry Sigerist will long be honoured, not only in the annals of medical history but in the whole realm of medicine. Many who never met him will mourn his loss, having been helped and stimulated by his writings, while others who had the great privilege of his friendship will feel the loss more keenly, but will cherish and recall happy memories of his genial presence and his infectious enthusiasm.—D.G.

We are indebted to Dr. E. ASHWORTH UNDERWOOD for the following appreciation:

The death of Henry Sigerist will be a loss to scholarship in general and an irreparable loss to the history of medicine. Although he retired officially 10 years ago from his chair at Baltimore, he had really been working intensively in the writing of a history of medicine on very generous and unusual lines, and only the first volume of this work has so far been published.

Sigerist possessed all the qualities which make a scholar, and he made opportunities to train himself in widely different subjects. After graduating in medicine at Zurich he spent two years as a medical officer in the Swiss Army, where he obtained some clinical and public health experience. At the end of the first world war he decided to make the history of medicine his career, and he therefore spent three years studying that subject under Karl Sudhoff at Leipzig.

At the age of 30 Sigerist was appointed lecturer in the history of medicine at Zurich, and in 1924 he was given the title of professor. In 1923 he published an important work on the existing manuscripts of early mediaeval antidotaries, and also a facsimile edition of the Surgery of Hieronymus Brunschwig. In the next two years he edited a series of editions of early medical texts, and, in collaboration with Professor Charles Singer, a volume of essays in honour of Sudhoff. In 1925 Sudhoff retired and Sigerist followed him in the chair of the history of medicine at Leipzig. During the seven years of his tenure of that chair he edited two journals and wrote many scholarly articles, especially on mediaeval medicine. On the advice of William H. Welch, the founder of the Institute of the History of Medicine at Johns Hopkins University, that university invited Sigerist to be a visiting professor in 1931. He was then asked to succeed Welch as professor, a post which he held from 1932 until his retirement in 1947. On his appointment he began to display his deep interest in medicine in its broader aspect, and especially in the socialization of medical practice and the economics of medicine, for which he became widely known in the United States. He also travelled much abroad, and in 1935 and 1936 he spent the summers in the Soviet Union. These interests found expression in his books *Man and Medicine* (1931), *American Medicine* (1934), and *Socialized Medicine in the Soviet Union* (1937). In 1944 he advised the Government of Saskatchewan on the health services of that Province, and in the same year he was one of a small group of experts who toured India officially to advise regarding the future development of the health services throughout India. The German edition of his work *Great Doctors* was published in 1932.

During his period at Baltimore Sigerist was also intensely active in studying and teaching the history of medicine. Under his leadership various courses were inaugurated, and emphasis was placed on the thorough nature of the preliminary training required. Under him the study became a discipline. He also founded the *Bulletin of the History of Medicine*, which he edited until 1947: this important journal gave him a forum for his own researches and those of his colleagues. Among his best-known books of this period are *Medicine and Human Welfare* (1941), *Civilization and Disease* (1944), and *The University at the Crossroads* (1946), in which he collected some of his important articles on university education and similar subjects.

For many years Sigerist had been determined to write a very large history of medicine, which would place the subject in its relation to general history and to the other forces

and influences which had affected the destiny of mankind. He had been prevented from starting this work by his many activities, and especially by the additional offices which had fallen to him during the war. In the summer of 1947, therefore, he retired from his chair and went to live at Pura in the Italian-speaking part of Switzerland. Yale University appointed him a research associate in the history of medicine, with professorial status. With his splendid library and the assistance afforded him by European institutes he was at first able to make good progress, and the first volume of this very important work was published in 1951. Unforeseen difficulties in connexion with certain sections of the second volume have so far prevented its publication, but my information is that it is now complete. Possibly a third volume may appear as he had planned it; but it seems unlikely that any further volumes will appear actually from his pen. To the best of my knowledge none of the four volumes of his projected work on *The Sociology of Medicine* was ever begun.

Among his many honours were the D.Sc. of the University of London and the Fellowship of the Royal College of Physicians. Lack of space prevents me from giving here personal recollections of a revered friend, whose hospitality will be remembered by many.

ESTHER L. CARLING, M.D.

Dr. Esther Carling died at Ipswich on March 18, aged 86. She was one of the first to develop the open-air treatment of tuberculosis in England, being the founder of the Peppard Sanatorium in Oxfordshire in 1898.

Esther Lillie Carling (née Colebrook) was the daughter of William Colebrook, who was at one time mayor of Reading. She was a medical student at the London School of Medicine for Women, taking the L.S.A. in 1896 and the M.D. of Brussels in the same year. After working in Edinburgh for a time as resident medical officer at the Hospital and Dispensary for Women and Children she returned south to set up in practice not far from Reading at the village of Peppard. Even before this she had been inspired by reports of the open-air treatment of consumption on the Continent, and had made a study tour of Germany and Switzerland to see it in operation. A local doctor knew of her interest, and in 1898 asked her to undertake the treatment of one of his patients. So she obtained accommodation for the patient in a farmhouse in an Oxfordshire village on a spur of the Chiltern Hills, and thus the story of a well-known sanatorium began.

Others soon heard of her work, and unsolicited donations reached the young doctor and enabled her to extend her plans. Kingwood Farm was purchased at Peppard in 1902 and Maitland Sanatorium developed, being named in memory of a patient whose sisters contributed substantially to the project. Several enthusiasts with similar ideas were contemporaries of Dr. Carling, and there was later some friendly rivalry between her and Dr. Jane Walker about which was first in the field with certain features of sanatorium care.

In 1904 she married a family connexion, Henry Carling, an engineer. Together they expanded the sanatorium, providing in one part beds for private patients,



while in other wards patients of small means were received at a charge of 30s. weekly. Children came to the sanatorium from many parts of England.

Under the National Health Insurance Act treatment of tuberculosis became a public responsibility, and, encouraged by John Burns, the president of the Local Government Board, the county councils of Berkshire and Buckinghamshire acquired the sanatorium in 1914. Esther and Henry Carling continued as chief medical officer and superintendent of the Berks and Bucks Joint Sanatorium until 1938, and saw the hospital grow until it could take 180 patients.

From the purchase price paid by the county councils for the sanatorium, the original donations were withdrawn to form a fund named the Maitland Trust. Part of the fund was used to establish and maintain a convalescent home at Barton-on-Sea, where ex-patients who had returned to work could go for a rest. Many years later the home was sold by the trustees and an alternative "Maitland House" acquired at Frinton for female patients. Dr. Carling remained an active trustee of the fund until her death.

A pioneer of vocational therapy and of the employment of ex-patients on the staff of hospitals, Dr. Carling made her mark on sanatorium practice of her time. She published a paper in this *Journal* about the treatment of tuberculosis by artificial pneumothorax as early as 1913, and in the same year she wrote a paper about the management of open-air schools. She was also the author of a book about the Peppard Sanatorium during the forty years she was in charge of it.

A lover of flowers, Dr. Carling was a keen botanist, tramping the Chiltern Hills and the Berkshire Downs in search of the pasque flower and other treasures. A vivid, radiant, petite person (our photograph shows her at the age of 34), she was a frequent correspondent on subjects such as clean milk and nurses' welfare. Her output of personal correspondence was prodigious, and until her last days the letters conveyed to a wide circle of ex-patients and other friends her mental clarity and charm. During the last years increasing deafness and failing health caused her to tilt with spirit at the disadvantages of longevity. She was for some years a justice of the peace, in her youth a suffragette, and later a staunch supporter of Women's Institutes.

She came of a family with strong medical connexions, for she had as first cousins Sir Ernest Rock Carling and Dr. Leonard Colebrook. She was predeceased by her husband and by a son who was a doctor. A daughter and one son survive her.—E. H. S.

Dr. J. F. NICHOLL, a senior cancer clinic associate at Allan Blair Memorial Clinic (Saskatchewan Cancer Commission), Regina, Canada, died after an accident on February 25. He was 39 years of age. John Frederick Nicholl was born at Belfast on November 4, 1917, and was educated at the Methodist College there and at Queen's University, graduating M.B., B.Ch. in 1942. After graduation he held an appointment at the Smithdown Road Hospital and then, for a few months, a part-time post with the Essex county health department. He later studied therapeutic and diagnostic radiology at University College Hospital, London, completing his examinations at the University of London for the Diploma in Medical Radiology in 1946. He then served as senior assistant radiotherapist at St. Thomas's Hospital from 1946 to 1950, after which he went to Canada, where he was chief of radiotherapy and associate in diagnostic radiology at Victoria General Hospital, Halifax, Nova Scotia, from

1950 to 1954. He joined the Allan Blair Memorial Clinic in October, 1954, serving as radiotherapist, but devoting most of his time to the expansion of the radio-isotope laboratory and the development of newer techniques in this field. He was a member of the Canadian Association of Radiologists. He also served on the provincial executive of the Canadian Cancer Society. As an enthusiastic member of the Regina Natural History Society he was well known in ornithological circles. He is survived by his widow, one daughter, and three sons.

Medical Notes in Parliament

SOCIAL SERVICES UNDER CENSURE

The critical motion on the social services which the Opposition have been saving up for some weeks was debated on March 19. It originated in the shilling-an-item prescription charge, and got new impetus from the increased charge for school meals and welfare milk. Dr. EDITH SUMMER-SKILL (Warrington, Lab.), who moved it, declared that in recent Government measures there was an unmistakable trend which, if continued, would seriously weaken the social services. The motion declared that these recent measures placed an undue and increasing burden on those least able to bear it. The only valid test of a social policy, in Dr. Summerskill's view, was how the poorest were faring. Taking first the physical condition of children, she quoted from Dr. Arthur Massey's *Modern Trends in Public Health*—"Between 1935 and 1946 the death rate of children aged 1 to 5 years has been halved; that of deaths in childbirth has been reduced to one-third"; and, while recognizing the part that certain drugs had played, "nevertheless improved nutrition has in the opinion of most played an important role." It took many years for this to be achieved. That was why the Government's policy of reducing or removing the subsidies was such a retrograde step.

Inadequate Milk Consumption

The Inland Revenue revealed that there were two million children in families whose income per head was less than £2 a week, and in one million of them it was less than 30s. The National Food Survey reported that these children had much less than a fair share of the important body-building foods. To withhold cheap food and meals was deliberately to stunt these children's bodies. Milk consumption, which under a Labour Government continued to increase, was now decreasing. An investigation by the Milk Marketing Board had shown that the consumption of milk was inadequate in large families in the lower-income groups.

She demanded from the Minister of Health an unequivocal statement about maternity accommodation in hospitals, and that he should make clear that he approved of maternity accommodation being provided, on health and social grounds. She criticized the refusal to introduce a chiropody service, and the absence of an integrated domiciliary service which could deal at home with thousands of old people now contributing to the overcrowding in hospitals.

It was early yet to say what was happening as a result of the prescription charges imposed on December 1, but it looked as though the warnings then given were justified. The Minister's remarkable statement that he was willing to let chemists examine doctors' certificates, and in the event of being able to prescribe something cheaper be at liberty to do so, would cause harm to the chemist-doctor relationship. The new policy had meant a fall in the number of prescriptions but an increase in costs. It was difficult to understand why the Minister had given the concession to diabetics of obtaining their various items for 1s. but was not prepared to extend it to cancer cases, colostomies, and epileptics. Nothing had been done about the racket in proprietary drugs.

Remarkable Incident

Finally she touched on the grave dispute that had arisen between the Minister of Health and the doctors. The Prime Minister had apparently taken charge, but his attitude, far from improving the situation, had aggravated it. When the Prime Minister saw them in the previous week the doctors came away having been given no further information, and they decided forthwith to prepare a plan for withdrawal from the Service. This was a most remarkable incident, because politically the doctors were 90% Conservative. The Government could not have handled them more clumsily if they had been an implacable Communist bloc. There was no question of the B.M.A. wanting to withdraw the doctors. The Medical Practitioners' Union did not want to withdraw the doctors. The *British Medical Journal* said on March 9: "If politicians say that such an action [withdrawal] is an attempt to wreck the Health Service, who is the wrecker? The Government. The medical profession does not wish to wreck the Health Service." She invited Mr. Butler to take the opportunity of the absence of the Prime Minister to act as mediator in the dispute.

Government Reply

Mr. DENNIS VOSPER, Minister of Health, answered some of these criticisms, but on the doctors' dispute he refused to comment, saying that that would not be in the interests of the doctors or their patients. He was sorry Dr. Summerskill found the intervention of the Prime Minister not helpful. He had intervened because he felt it advisable to set up a Royal Commission to investigate the matter. It was estimated that during the past five years no fewer than 2,000 additional general practitioners had come into the Service. That was a very necessary development.

On the general charge he claimed that over five years of Conservative administration there had been little variation in the proportion of the gross national product expended on the social services. During that period more efficient use had been made of the expenditure. There had been a continuing drop in mortality rates, and a very welcome drop in deaths from children's infectious diseases. On the health of schoolchildren, the report of the Chief Medical Officer of the Ministry for 1954-5 stated: "Only 1.46% were considered to be in poor physical condition in 1955, compared with 2.55% as recently as 1952."

All these improvements had taken place while the Government had been pursuing a policy that recognized that the amount that could be spent on the social services was not unlimited, to eliminate waste and inefficiency, and to ensure that extensions were in the right direction. In hospital building the amount allocated in 1951-2 was £9.5m., in 1956-7 it was £13m., and next year would be £18m. The amount allocated at present for 1958-9 was £20m. (Some Labour ex-Ministers interjected that the £13m. was about equivalent to the £9m. in 1951.) He gave the assurance Dr. Summerskill had asked for about maternity hospitals: there had been no change in policy under the Conservative Government. He also agreed with her that the introduction of a chiropody service would be a welcome improvement, but "when it becomes possible."

On the finance of the Health Service, he repeated the statement of the Chancellor of the Exchequer that the estimated total cost for 1957-8 would be £690m., compared with £450m. in 1949-50. Much of this was due to increases in pay and prices, but there had been an increase in real terms of about 15%. The Health Service Act assumed that the percentage of cost borne by the Exchequer would be 72.4. This year it was 80.2. The Government's intention was to double the Health Service contribution and reduce the Exchequer percentage to 74.1.

Prescribing Levels

Whatever the deterrent effects of charges might be, the number of dental courses and sight tests were increasing to record levels, and prescriptions for 1956-7 were estimated

at 234 millions—the highest ever reached. Last December, compared with December, 1955, there was a fall of 25% in prescriptions, but in January, compared with the previous January, the fall was only 14%. He thought it wrong to suggest that vast savings in the pharmaceutical services could be found in proprietary medicines. Discussions had been proceeding for a vast amount of time with the manufacturers. If the Opposition had postponed their motion for a week or two he might have been able to answer the question more positively. Lastly, on welfare milk and school meals, the Minister would not accept the argument that no change should be made in price or that half-price was unreasonable.

Mr. SOMERVILLE HASTINGS (Barking, Lab.) looked forward to more attention being given to the prevention of illness, and suggested also that "wise spending" could mean savings in the hospital service. He looked upon the slight decline in milk consumption every year since 1951 as a disaster, and regretted the increased charge for welfare milk. Prescription charges were undesirable for many reasons; anything, real or imaginary, that prevented a patient getting advice as soon as possible was wrong, and the increased charge might also operate to divert more people into hospital than would otherwise go there.

Dr. DONALD JOHNSON (Carlisle, Con.) urged the need for a domiciliary psychiatric service.

Dr. J. DICKSON MABON (Greenock, Lab.) was concerned about the lack of social indices which hampered the assessment of values in the services. M.P.s had to find examples in their own constituencies, and in this process he had discovered that in Greenock changes in the price of milk had resulted in substantial changes in the amount of milk consumed in the poorer areas, and the increased charge for school meals had meant that the larger and poorer families had reverted to the dreadful practice of going to school with a sandwich for lunch. But the prescription charge was the most lamentable change in the social services. He had seen in chemists' shops prescription forms (E.C.10) with items obliterated because the customer had asked, "Which is the most important medicine on this?" and the chemist had given advice. If the Minister wished to find economies on the pharmaceutical side of the Service he should look at the American proprietaries. There was a conspiracy by the pharmaceutical firms to get more and more proprietary drugs used in prescriptions. The Medical Research Council should test each new drug and determine its pharmacological value.

Remuneration Claim

Mr. M. LIPTON (Brixton, Lab.) asked the Prime Minister on March 19 what negotiating machinery he was using to settle the interim adjustment of pay for general practitioners. Mr. MACMILLAN replied that it had not yet been decided what should be done by way of an interim adjustment for general practitioners, but, as he had said a week previously, he would make a further statement in due course.

Dr. D. JOHNSON asked the Prime Minister on March 21 from what bodies the Royal Commission would take evidence. Mr. R. A. BUTLER, who replied, said that was a matter for the Commission.

Claims for Damages for Negligence

Mr. D. WEITZMAN (Stoke Newington and Hackney North, Lab.) asked the Minister whether he was aware that claims for damages for negligence against a hospital board, which might well succeed upon their merits, were sometimes met by a defence under the Limitation Act; and upon which principle instructions were given to raise or not to raise this defence. Mr. VOSPER stated: I see no reason to deprive hospital authorities of the protection made available by Parliament to all, and they are normally expected to raise this defence wherever it applies.

Hospital Service Costs

Mr. H. BOARDMAN (Leigh, Lab.) wanted to know the annual cost of the hospital service under the Health Service

from its inception, and the percentage cost of professional and nursing services and administration. Mr. VOSPER gave him the following information on March 21:

Year	On Revenue A/c.	On Capital A/c.	Cost of Professional and Nursing Services as a Percentage of Column 2 (See Note 1)	Estimated Cost of Administration as a Percentage of Total Expenditure (See Note 2)
1948-9 (part year)	£m. 122.7	£m. 5.3	% 40.8*	% 4.4
1949-50	189.3	8.7	46.2*	4.3
1950-1	207.4	8.8	46.5	4.5
1951-2	224.8	9.7	44.8	4.8
1952-3	244.7	9.1	44.3	4.8
1953-4	257.4	8.8	44.0	4.8
1954-5	268.7	11.3	45.1	4.7
1955-6	293.1	11.5	44.6	4.7

* Partly estimated.

Note (1). The cost of professional and nursing services has been taken to be the remuneration of medical, nursing, professional, and technical staff and the cost of drugs, dressings, and medical and surgical appliances and equipment. Part of the general overhead expenses also relates to medical care, but this cannot be separately estimated.

Note (2). The figures for administration are based on the estimated administration expenditure of hospital authorities, including administration expenditure incurred at hospitals, but excluding operational expenses such as the salaries of medical records clerks.

Merit Awards to Consultants

The MINISTER OF HEALTH informed Mr. J. PEYTON (Yeovil, Con.) on March 25 that merit awards were made for professional distinction, and on the basis that 4% of consultants received awards at the rate of £2,500 a year, 10% awards at the rate of £1,500 a year, and 20% awards at the rate of £500 a year. The recommendations were made by the Advisory Committee on Distinction Awards. In view of the basis of the committee's recommendations regional hospital boards were not consulted upon them. Mr. PEYTON thought there was considerable need for wider knowledge about how the committee made its awards. There was considerable uncertainty among consultants and the medical profession. Mr. VOSPER said he knew that some concern had been expressed about this before. The whole basis was that the awards were made on a professional basis.

M.O.H.s and Hospitals

Mr. R. RUSSELL (Wembley, South, Con.) asked if the Minister had yet reached a decision on the recommendation of the Committee of Inquiry into the Cost of the Health Service that the medical officer of health, or one of his staff, should be given an honorary appointment on the medical staff of a hospital; that he should be a member of the medical staff committee; and that he should take charge of outbreaks of infection. Mr. VOSPER stated that after consulting the bodies chiefly interested he had decided not to adopt this recommendation. Hospital authorities had already been advised of the desirability of medical officers of health being members of group hospital medical committees, and of medical officers of health of sanitary districts being members of control of infection committees at hospitals. In his view arrangements of this kind contributed more satisfactorily to the link between the different parts of the Health Service which the Committee had in mind than the formal arrangements proposed.

Country Doctors' Petrol

Sir JOCELYN LUCAS (Portsmouth, South, Con.) wanted to know by how much the increase in tax and price, respectively, of petrol had increased the weekly costs of the average country doctor, more particularly those in hilly counties; and whether they would be reimbursed for the estimated extra cost involved. Mr. VOSPER said that data were not yet available to enable such estimates to be made. When the information came to hand any increase in total practice expenses of general practitioners, including expendi-

ture on petrol, would be met by an equivalent increase in the amount of money paid by the Exchequer into the Central Pool from which their remuneration was provided.

Senior Factories Inspector.—The present Senior Medical Inspector of Factories will be succeeded on September 1 by Dr. Sibyl Horner, a Deputy Senior Medical Inspector.

Homicide Act.—The Homicide Bill, which passed through its stages in the House of Lords without any alteration—as it had done in the Commons—received the Royal Assent by commission on March 21.

Medico-Legal**TRIAL OF DR. J. BODKIN ADAMS**

The trial of Dr. John Bodkin Adams, of Eastbourne, continued before Mr. Justice Devlin at the Old Bailey. Dr. Adams is charged with the murder of a patient, 81-year-old Mrs. Edith Alice Morrell, who died on November 13, 1950. He pleads not guilty.

Sir Reginald Manningham-Buller, Q.C., is appearing for the prosecution with Mr. Melford Stevenson, Q.C., and Mr. Malcolm Morris. Mr. Geoffrey Lawrence, Q.C., is appearing for Dr. Adams with Mr. Edward Clarke and Mr. John Heritage. The Medical Defence Union is acting for Dr. Adams.

The first three witnesses for the prosecution were pharmaceutical chemists who gave evidence on the prescriptions said to have been written for Mrs. Morrell by Dr. Adams. They were followed by the nurses who looked after Mrs. Morrell, the first being Miss Helen Rose Stronach, of Eastbourne.

Nurse Stronach said that Mrs. Morrell was of a neurotic disposition and also very weak indeed. She said that Dr. Adams gave Mrs. Morrell injections with a 1-c.c. syringe when he visited her late in the evenings, though she personally did not see the injections given. Nor did she know what was injected.

Record Books

Cross-examined by Mr. Lawrence, she said that she and other nurses had written down in a book every injection that they gave to Mrs. Morrell and the book would contain everything of significance in the patient's illness—injections, medicines, and the doctor's visits. Mr. Lawrence then produced three exercise books, which proved to be the note-books in which these details were recorded. He asked Nurse Stronach about entries in them. Miss Stronach agreed that her entries showed that Mrs. Morrell was having brandy and "sedormid" and not morphine or any injection from the doctor. She had never recorded the visit of the doctor in the evening when she was on duty.

Mr. Lawrence suggested that Nurse Stronach's memory played her a trick when she said she had never injected anything but morphine. The witness answered: "Yes. It was a long time ago to remember these things." Mr. Lawrence then continued: "Miss Stronach, let us face this. It is another complete trick of your memory to say that on the last day you left Mrs. Morrell was either semi-conscious or rambling—now you see what you wrote at the time—isn't it?" "I have nothing to say." "You have nothing to say?" "No." Mr. Lawrence: "Having refreshed your memory from records made by you and your colleagues at the time, it was obviously quite inaccurate to say that Mrs. Morrell was semiconscious and rambling on the day you left, was it not?" "Well, I have always believed she was so far as my memory was concerned." "Maybe. But having looked at these notes written down six years ago with no memory at all, it is quite clear it was wrong to say she was semiconscious and rambling, or was it not?" "Apparently so."

Sister Annie Helen Mason-Ellis, of Battle, Sussex, was then called. Asked by the Attorney-General whether she first went to nurse Mrs. Morrell she was having injections of any kind, Sister Mason-Ellis said she could not remember. The Attorney-General said there was an entry in one of the books, for July 27, 1950, that Mrs. Morrell had been given an injection in the evening of morphine and heroin. Sister Mason-Ellis said this had been given on the instructions of Dr. Adams. When Dr. Adams visited Mrs. Morrell, she said, the nurses were asked to leave the room. She could not remember ever seeing Dr. Adams give an injection to Mrs. Morrell—"It is too long ago."

Cross-examined by Mr. Lawrence, Sister Mason-Ellis said that right from the start in August, 1949, Mrs. Morrell had been under routine sedation. That had been maintained for months and months and months without alteration. Mrs. Morrell was receiving a standard dose at night of $\frac{1}{4}$ gr. (22 mg.) of heroin and $\frac{1}{4}$ gr. (16 mg.) of morphine. She had some sedative tablets shortly before she had the injection.

On the third day of the trial the judge issued a stern warning to one of the nurses about discussing the trial with the other nurses.

Turning to the afternoon of November 12, 1950, the day before Mrs. Morrell died, Mr. Lawrence asked Sister Mason-Ellis what was the first word she had written in her report for that afternoon. The witness replied that it was "Awake," and she had also written "but quiet." The nurse agreed that the report showed Mrs. Morrell was not in coma.

Cremation Certificate

Evidence about the cremation certificate showed that in answer to the question: "Have you, so far as you are aware, any pecuniary interest in the death of the deceased?" Dr. Adams answered: "Not so far as I am aware." A confirmatory medical certificate signed by a Dr. Fox said he was satisfied that the cause of death was cerebral thrombosis. Mr. Lawrence pointed out that Dr. Adams had put on the cremation certificate the addresses of the three nurses who were attending Mrs. Morrell, so that anyone could ask them any questions about Mrs. Morrell's case if they had wanted to. Dr. H. J. Walker, medical referee at the Downs Crematorium, Brighton, agreed that he would not have authorized the cremation unless he had had the confirmatory certificate from Dr. Fox in addition to the certificate supplied by Dr. Adams.

Nurse Caroline Sylvia Randall, of Eastbourne, then gave evidence. In reply to the Attorney-General she said that Mrs. Morrell was not suffering severe pain. There was stiffness because she was unable to use her limbs at times. On November 7, said Nurse Randall, Mrs. Morrell was getting bigger quantities of heroin, morphine, and "omnophon." Her reports for the next few days recorded the administration of increased quantities of drugs. On the night of November 12-13, the night of Mrs. Morrell's death, the patient was weak, semiconscious, and shaken by spasms. Nurse Randall said that Dr. Adams gave Mrs. Morrell an injection of paraldehyde, 5 c.c. He then refilled the syringe and gave it to Nurse Randall, saying that if the patient was restless Nurse Randall was to give it to her. After the injection Mrs. Morrell was quiet for about an hour, said Nurse Randall, and then the spasms became worse. She thought it was too soon to give the patient another injection, so she tried to get in touch with Dr. Adams by telephone, but he was out. In the end, she gave the patient the other injection. The Attorney-General: "What was the effect?" Mrs. Randall: "She became quiet, and when she became quiet I called Sister Bartlett because I could see that she was passing out."

Mr. Lawrence asked Nurse Randall about a period in September, 1950, when Dr. Adams was away and his partner, Dr. R. V. Harris, was treating Mrs. Morrell. Mr. Lawrence said: "Look at what happened to the injection at night which has been steady in the past for months and months." He read from the record: "Hypo injection morphia gr. $\frac{1}{4}$ and $\frac{1}{4}$. Heroin gr. $\frac{1}{4}$ and $\frac{1}{4}$ given 8.50 p.m. May have

omnophon gr. $\frac{1}{4}$ s.a.s. (if necessary)." Mr. Lawrence: "We have not seen any reference to omnophon before, but it appears here with Dr. Harris, and it is quite plain, isn't it, that on that night the usual injection of morphia and heroin was stepped up in the case of both types of drug?" Nurse Randall: "Yes." Mr. Lawrence said that Dr. Harris had to deal with a state of restlessness in the patient, and he said: "Do you observe that he deals with it by increasing the morphia and increasing the heroin?" Nurse Randall: "Yes." "And introducing omnophon in the night?" "Yes." Nurse Randall agreed that Dr. Harris had continued to use all the same drugs that Dr. Adams had been using, and that when confronted with a spell of restlessness at night he increased the drugs and introduced omnophon.

Nurse's Memory

Questioned about Mrs. Morrell's condition on the last three or four nights, Nurse Randall told the judge that she was not in a coma but was in a sleep like a coma. Mr. Lawrence then referred to the last page of Nurse Randall's notes and said that at 10.30 p.m. she had recorded an injection of 5 c.c. of paraldehyde by Dr. Adams. Nurse Randall agreed. She also agreed that there was no record of any subsequent injection. Mr. Lawrence: "It just is not conceivable, is it, that you would have left out of the record that injection if in fact it was ever given?" "I did give it." "You can't have it both ways. If it is a matter of any importance it would have gone into the book?" "Yes." After further questioning about the paraldehyde, Mr. Lawrence said: "Your memory is not trustworthy, is it?" Nurse Randall: "It appears not to be." Mr. Lawrence: "But the book is quite clear, isn't it?" "Yes."

After further evidence Mr. Justice Devlin intervened to ask the Attorney-General: "Are you going to invite the jury to say that these last two or one—whatever it was—injections in 5 c.c. were given or caused to be given by Dr. Adams with the intention of causing the death of Mrs. Morrell?" The Attorney-General replied: "I do submit that they were given deliberately by Dr. Adams and that they accelerated the death of the patient. But I won't elaborate, my lord. I adhere to that, and my medical evidence will indicate why."

Nurse Brenda Doreen Hughes, of Brixham, Devon (whose surname was Bartlett in 1950), was asked by Mr. Stevenson for the Crown whether she observed any sign of severe pain in the patient. She replied she did not. In the last few days of her life the patient was semiconscious, said Nurse Hughes, and she had twitching spasms. On the last night she remembered that the doctor gave Mrs. Morrell paraldehyde. He then came to the dining-room and prepared an injection which he gave to Sister Randall, but Nurse Hughes could not remember what the injection was. Mr. Lawrence drew attention to an entry in the record book for October 9, "Query stroke." Nurse Hughes agreed that from that time onward Mrs. Morrell was going downhill.

On the sixth day of the trial (March 25) Mr. Lawrence continued the cross-examination of Nurse Hughes. He said that up to 5.30 p.m., November 12, the last day of Mrs. Morrell's life, neither she (Nurse Hughes) nor Nurse Mason-Ellis had recorded anything like a coma. "Indeed you have recorded 'awake,' 'restless,' and 'talkative'?" Nurse Hughes: "Yes."

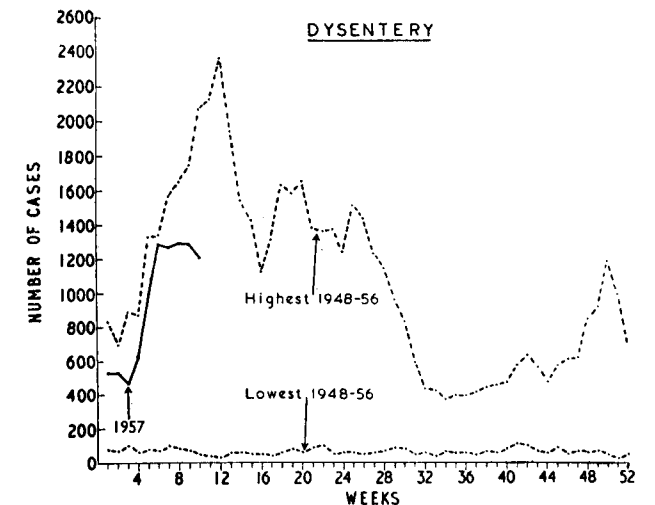
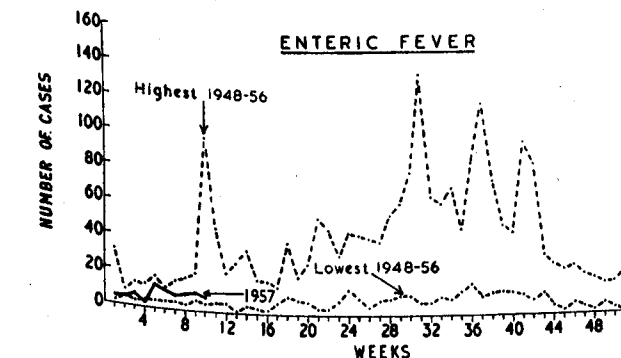
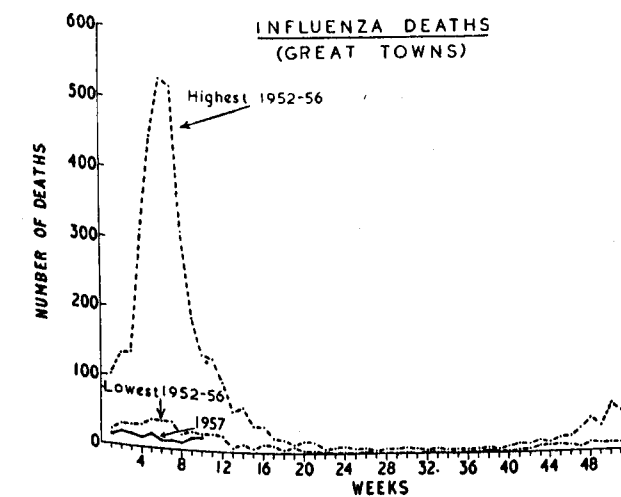
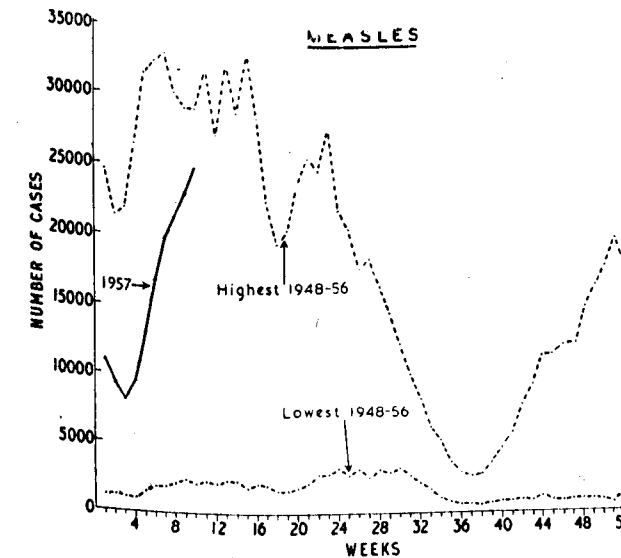
Evidence given by Mr. T. H. E. Price, formerly chauffeur to Mrs. Morrell, showed that after three years' service he had received £1,000 by her will.

Police evidence was given on the arrest of Dr. Adams, and then Mr. Hubert Sogno, solicitor, gave evidence on Mrs. Morrell's wills. This showed that when Mrs. Morrell died Dr. Adams was not a beneficiary under her final will. Dr. Adams got the oak chest and the Rolls-Royce by favour of Mrs. Morrell's son, the residuary legatee, "because it was his mother's last wish." The will also stipulated, as had always been her wish, that her body should be cremated.

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the years 1948-56 (influenza 1952-6) are shown thus -----, the figures for 1957 thus ————. Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The only large variations in the notifications of infectious diseases in England and Wales during the week ending March 9 were rises of 1,777 for measles, from 23,060 to 24,837, and 91 for acute pneumonia, from 664 to 755, and a fall of 77 for dysentery, from 1,291 to 1,214.

The largest increases in the incidence of measles were 448 in Yorkshire West Riding, from 1,688 to 2,136, 349 in London, from 1,876 to 2,225, 326 in Warwickshire, from 700 to 1,026, 205 in Essex, from 1,707 to 1,912, 150 in Surrey, from 1,250 to 1,400, 149 in Southampton County, from 188 to 337, 113 in Middlesex, from 1,233 to 1,346, and 112 in Cheshire, from 800 to 912, the largest decreases were 133 in Lancashire, from 4,084 to 3,951, and 109 in Cumberland, from 570 to 461. The notifications of scarlet fever numbered 837, being 4 more than in the preceding week, and there were no large changes in the local returns. 2,995 cases of whooping-cough were notified, 5 fewer than in the preceding week; the largest variations were decreases of 63 in Lancashire, from 284 to 221, and 45 in Glamorganshire, from 139 to 94, and a rise of 44 in Cumberland, from 42 to 86. 6 cases of diphtheria were notified, being 1 fewer than in the preceding week.

33 cases of acute poliomyelitis were notified, and these were 5 more for paralytic and 2 fewer for non-paralytic cases than in the preceding week. The largest returns were Hertfordshire 6 (Barnet U.D. 6) and Gloucestershire 4 (Bristol C.B. 4).

The largest centres of dysentery were Yorkshire West Riding 235 (York C.B. 49, Sheffield C.B. 37, Leeds C.B. 28, Bradford C.B. 24, Rotherham C.B. 19, Batley M.B. 12, Worsborough U.D. 12), Lancashire 197 (Blackburn C.B. 43, Ashton under Lyne M.B. 31, Urmston U.D. 28, Stretford M.B. 15, Liverpool C.B. 11, Accrington M.B. 11, Blackpool C.B. 10), London 89 (Fulham 17, Wandsworth 14, Hackney 12), Surrey 76 (Surbiton M.B. 33, Esher U.D. 22), Bedfordshire 74 (Luton M.B. 56, Luton R.D. 11), Durham 63 (Blaydon U.D. 21, Gateshead C.B. 10), Northumberland 59 (Blyth M.B. 34, Newcastle upon Tyne C.B. 18), Middlesex 49 (Hayes and Harlington U.D. 24), Kent 47 (Deal M.B. 35), Warwickshire 45 (Coventry C.B. 24, Birmingham C.B. 17), Hertfordshire 44 (Welwyn Garden City U.D. 28, St. Albans R.D. 13), Nottinghamshire 33 (Nottingham C.B. 15), Cheshire 30 (Nantwich R.D. 10), Essex 22, and Carmarthenshire 20.

Week Ending March 16

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 935, whooping-cough 3,180, diphtheria 3, measles 24,825, acute pneumonia 770, acute poliomyelitis 38, dysentery 1,416, paratyphoid fever 4, and typhoid fever 4.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending March 9 (No. 10) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1957					1956				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria	6	1	3	0	2	4	1	0	0	9
Dysentery	1,214	89	359	10		2,071	297	179	12	1
Encephalitis, acute	4	0		0		5	0		0	
Enteric fever:										
Typhoid	1	0	0	0		2	0	0	0	
Paratyphoid	7	1	(8)	0		5	1	1	0	
Food-poisoning	151	26	19	1		189	18		0	
Infective enteritis or diarrhoea under 2 years					8	14			8	4
Measles *	24,837	2,225	550	407	281	2,662	54	148	23	163
Meningococcal infection	24	0	14	1	1	32	0	13	4	
Ophthalmia neonatorum	37	0	8	0		45	3	7	0	
Pneumonia †	206	29	102	10	5	1,153	56	322	29	12
Poliomyelitis, acute:										
Paralytic	26	1		2	0	13	2		1	1
Non-paralytic	7	0				5	1			
Puerperal fever §	206	29	9	1		264	35	8	1	
Scarlet fever	837	54	82	56	18	908	66	75	30	24
Tuberculosis:										
Respiratory	583	72	101	28		696	83	125	22	
Non-respiratory	88	5	17	1		77	8	15	2	
Whooping-cough	2,995	189	328	8	54	1,226	68	133	86	113

DEATHS in Great Towns	1957					1956				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria	1	0	0	0	0	0	0	0	0	1
Dysentery	0	0		0		1	0		0	
Encephalitis, acute		0			0		0			0
Enteric fever	0	0	0	0		1	0	0	0	
Infective enteritis or diarrhoea under 2 years	6	0	0	0	2	7	0	1	0	2
Influenza	19	2	2	1	3	103	6	4	3	2
Measles		1	1	0	0		0	0	0	1
Meningococcal infection		1	0				0	0		
Pneumonia	368	62	29	10	9	590	101	27	26	15
Poliomyelitis, acute	3	0		0	1	1	0		0	0
Scarlet fever		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory	61	8	11	0	5	80	10	10	2	5
Non-respiratory		0	1	0	2		0	2	0	2
Whooping-cough	3	0	0	1	0	1	0	1	0	1
Deaths 0-1 year	249	27	32	5	17	252	40	20	9	22
Deaths (excluding stillbirths)	6,360	919	672	112	236	7,499	1,131	665	183	252
LIVE BIRTHS	8,684	1,212	1,001	221	385	8,638	1,235	1,040	236	487
STILLBIRTHS	221	29	31			212	31	15		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Medical News

Faculty of Anaesthetists.—A "lively and happy gathering," in the words of the Minister of Health, filled the Great Hall of the Royal College of Surgeons for the ninth anniversary dinner of the Faculty of Anaesthetists on March 20. After the Dean of the Faculty, Dr. FRANKIS T. EVANS, had proposed the Loyal Toasts, Mr. DENNIS VOSPER, the Minister of Health, made the main speech of the evening. Remarking that it was not a very propitious time for the Minister of Health and his wife to fall into the company of doctors, Mr. Vosper said that he was not quite so inhuman as editorials in the *B.M.J.* might make his audience think. He regarded his job as a very personal and human one: he believed in the National Health Service, and he and his wife had been N.H.S. patients since 1948. Taken more slowly and easily, the scheme might not have been introduced in the same form as they had it to-day, but it was difficult to take a step back after taking a step forwards. Mr. Vosper paid tribute to the progress made by the anaesthetists in a relatively short time, especially in educational matters: it was good to have attracted so many overseas students to this country. In reply Dr. FRANKIS EVANS said that the research department under the direction of Dr. Ronald Woolmer was assured of a comfortable childhood through the munificence of certain fairy godfathers. The Faculty's next requirement was the endowment of a chair of anaesthesia at the College. Dr. Frankis Evans concluded by paying tribute to Sir James Learmonth's Clover Lecture. The health of the guests was proposed by the Vice-dean of the Faculty, Dr. JOHN GILLIES, and this was acknowledged by Sir EDWIN HERBERT, President of the Law Society. As the skipper of a yacht, he asked the research department to find a sea-sickness cure that did not put the crew into coma.

Bermuda Conference.—The statement issued on March 24 after the talks between President EISENHOWER and Mr. MACMILLAN in Bermuda contains an annexe on nuclear explosions. In the absence of an effective agreement for comprehensive disarmament, states this annexe, "continued nuclear testing is required, certainly for the present." With regard to the dangers from such tests, the annexe continues: "We recognize, however, that there is sincere concern that continued testing may increase world radiation to levels which might be harmful. Studies by independent organizations confirm our belief that this will not happen so long as testing is continued with due restraint." The annexe ends with a declaration, on behalf of both governments, that they will conduct nuclear tests only in such a manner "as will keep world radiation from rising to more than a small fraction of the levels that might be hazardous."

Medicine in Colonial Territories.—Appointments in Her Majesty's Overseas Civil Service and Colonial Research 1955-56, two recent Colonial Office publications, combine to give an informative picture of openings in the colonial territories. Each has a medical section. The first publication is concerned with conditions of service. The Overseas Civil Service does not recruit locally, and differs from its predecessor the former Colonial Service in that the British Government recognizes a special obligation towards its members should the territories in which they work attain self-government. The Government's assurances on this point are set out in detail in the introduction to the handbook. The various branches of the service, the method of selecting candidates, and the financial and other conditions of service are then described. In medicine there are openings for clinicians (including specialists), teachers, administrators, and research workers. The main co-ordinating agency for the last group is the Colonial Medical Research Committee whose chairman is Sir HAROLD HIMSWORTH, F.R.S., secretary of the Medical Research Council in London. An account of this committee's work and the research it is

sponsoring form an important chapter in the annual publication *Colonial Research*. At the end of the year reviewed in the latest volume the Colonial Medical Research Committee was supervising 39 research schemes. Of particular interest is the intensification of work on leprosy and trachoma, the latter in conjunction with the Order of St. John of Jerusalem. Both publications mentioned in this paragraph are issued by Her Majesty's Stationery Office.

British Association of Physical Medicine.—Messrs. Baillière, Tindall and Cox have taken over publication of *Annals of Physical Medicine*, the association's official journal. The journal has been restyled and appears in an enlarged format. Pride of place in the first number in the

new style is given to a picture and description of the association's presidential badge. The badge, which we illustrate by permission of the Goldsmiths Company, is a new one and was used for the first time last October. It bears on its reverse the following dedication: "In memory of the late Lord Horder, first President of the British Association of Physical Medicine, 1943-55. Subscribed by members of the Association." The designer was Mr. A. G. STYLES, and the makers Messrs. Garrard and Co. Being regarded as

a worthy example of contemporary art, the badge was exempted from purchase tax. The symbolism is explained by Dr. P. BAUWENS in his account in *Annals of Physical Medicine*. "The four elements of the ancient philosopher are represented and inconspicuously provide background ornamental motifs. The oval surround bears a wavy design to symbolize water, and a floral decoration the growth from earth, while flames of fire form a foundation for the initials B.A.P.M. which surmount the frame. The fourth element, air, is implied in the deep-blue enamel background to the central theme brought out in relief. This portrays a cripple being raised and supported by two other figures, the one on the dexter side symbolizing medicine, and that on the other side wearing a floral garland to indicate natural resources. The suggestion is the combination of medical knowledge and nature in a common aim for the good of man. In this context the blue of the background may be regarded as standing for truth and light."

Apartheid in Medical Education.—At a meeting this month the South African Medical and Dental Council discussed the position of the Durban Medical School (see *Journal*, March 23, p. 699), and adopted the following resolution:

"That the South African Medical and Dental Council is *inter alia* concerned with the entire pattern of medical education and particularly as far as the acceptance of minimum standards is concerned. It has been brought to the notice of the Council that a new method of control of education is envisaged for the Durban Medical School and that there is a possibility that this may lead to a new pattern which may not be acceptable to the Council for purposes of training of medical practitioners. As a statutory body the Council has grave responsibilities in regard to medical education and feels it incumbent on itself to express the sincere

hope that, in order to obviate unforeseen difficulties which may arise at some future date when the standards are to be considered and the facilities, school, and examinations inspected, the Council respectfully suggest to the Minister of Education and Health to take the necessary steps, prior to enacting the legislation now before Parliament, to have the implications as it affects the responsibilities of the S.A. Medical and Dental Council further investigated and reported upon."

In addition, the Medical and Dental Council appointed a deputation to meet the Minister of Education, Mr. J. H. VILJOEN. The deputation consists of Professor S. F. OOSTHUIZEN, president of the Council, Professor H. W. SNYMAN, dean of the Faculty of Medicine at Pretoria University, Professor VAN ZYL, dean of the Faculty of Medicine at Stellenbosch University, and Professor I. GORDON, dean of the Faculty of Medicine at Natal University—the Durban School.

Glasgow.—At the end of the second week of Glasgow's mass miniature radiography campaign 293,263 persons had had their chests x-rayed. This is claimed as a world record. Last week-end, as a prelude to the campaign's third week, milk distributors delivered one and a half million milk bottles bearing on their caps the words "X-Ray Now." In addition, a "talking aeroplane" has been reminding citizens to go to the radiography centres.

Carlsberg-Wellcome Travelling Research Fellowships.—The Carlsberg Foundation of Copenhagen and the Wellcome Trustees have established two travelling fellowships for Danish and British research workers in fields of science related to human and veterinary medicine. Each year one fellowship will be awarded to a candidate from the United Kingdom for a year's work in Denmark, and one to a Danish candidate for a year's work in Britain. The stipend will range from £800 to £1,200 per annum for whole-time research, and travelling and some incidental expenses will also be provided. The first appointments will be for the academic year beginning this September, and the last date for applications is April 30. Further information may be obtained from the scientific secretary, The Wellcome Trust, 52, Queen Anne Street, London, W.1.

National Institute for Nuclear Research.—The Institute's governing board held its first meeting this month, and discussed its terms of reference. It also appointed a physics committee to investigate proposals and designs for the construction of a large accelerator in Britain. The main object of the new Institute, as stated in Parliament on February 14 by the Financial Secretary to the Treasury, will be "to provide, for common use by universities and others, facilities and equipment which are beyond the scope of individual universities and institutions carrying out research in the nuclear field." The governing board consists of Lord BRIDGES, as chairman, and representatives of universities, the University Grants Committee, the Royal Society, the Atomic Energy Authority, and the Department of Scientific and Industrial Research.

R.C.O.G.—Two Sims-Black travelling professors were appointed at the council meeting on March 23. Mr. J. B. BLAKLEY, director of the obstetrical department at Guy's Hospital, London, is to visit New Zealand and Australia; Professor T. N. A. JEFFCOATE, of Liverpool University, is to visit Canada and the Caribbean area. They will be going next year.

Harveian Tercentenary.—The programme has been revised (see advertisement p. 43) so that speakers at the American Medical Association's annual meeting can take part in it by transatlantic telephone. The session on "Results of Cardiac Surgery" is now to be held on Wednesday afternoon, June 5. Colour television demonstrations will be transmitted from St. Bartholomew's Hospital to the meetings at the Royal College of Surgeons every day except Monday, June 3, between noon and 1 p.m.

Chairman of St. Mary's.—The Minister of Health has appointed Mr. EDGAR E. LAWLEY as chairman of the board of governors of St. Mary's Hospital, Paddington. He

succeeds Mr. ANTHONY DE ROTHSCHILD. Mr. LAWLEY joined the board in 1944; he became deputy chairman in 1948.

Courses for Hospital Administrators.—Leeds University is to run a pilot scheme of study courses for hospital administrators. The university council has accepted a two-year grant, at £8,500 a year, from the Nuffield Provincial Hospitals Trust for this purpose. The department of adult education and extramural studies will be responsible for the courses, which will be "on staff college lines." The courses will be open to senior members of the staffs of hospitals and regional boards.

National Spastics Society.—Dr. C. P. STEVENS has been appointed director of the National Spastics Society. Since the war he has been deputy S.A.M.O. to the South-west Metropolitan Regional Hospital Board and general secretary of the John Lewis partnership.

Dr. Ronald Woolmer, director of the department of anaesthetics in the Royal College of Surgeons, left on March 8 for a three months' tour of medical research centres and departments of anaesthetics in the United States and Canada.

Dr. Brian Stanford, chairman of the medical section of the Royal Photographic Society, has been visiting Holland at the invitation of the Royal Netherlands Scientific Film Association. He lectured in Utrecht, Groningen, Leyden, and The Hague.

COMING EVENTS

Histological Techniques.—Open demonstration by the Association of Medical Microtommists, April 5 from 7 p.m. in the biology laboratory, Guy's Hospital Medical School.

Haemophilia Society.—Annual general meeting, April 7 at 3 p.m., main lecture room, Hospital for Sick Children, Great Ormond Street, London, W.C.1. All interested invited to attend.

Naval Medical Compassionate Fund.—Meeting of subscribers on April 12 at 2.30 p.m., at the Medical Department of the Navy, Queen Anne's Mansions, St. James's Park, London, S.W.1, to elect six directors.

Mental After-Care Association.—Seventy-seventh annual meeting, April 16 at 3 p.m., at the Caxton Hall, London, S.W.1.

Radiological Protection.—Short course at the Atomic Energy Research Establishment, Harwell, April 29 to May 3. Details from the Isotope School, Atomic Energy Research Establishment, Harwell, near Didcot, Berks.

Fourth International Congress of Nutrition.—In Paris, July 26 to August 1, under the auspices of the International Union of Nutritional Sciences. Enrolment early in April to Professor E. TERROINE, Centre National de Coordination des Études et Recherches sur la Nutrition et l'Alimentation, 71, Boulevard Péreire, Paris, 17.

St. John Ambulance Brigade.—Surgeons' Conference at the Cairn Hydro Hotel, Harrogate, May 3 to 5. Details from conference secretary, 8, Grosvenor Crescent, London, S.W.1.

World Health Organization.—Eighth Study Course on the World Health Organization, Geneva, May 6-15. Details from World Federation of United Nations Associations, 1, avenue de la Paix, Geneva, Switzerland.

Second International Congress of Photobiology.—Turin, June 2-8. Details from the secretary-general, Istituto di Fisica dell'Università di Torino, Via Pietro Giuria 1, Corso Massimo d'Azeglio 46, Turin, Italy.

Association of Clinical Pathologists.—Fifty-eighth general meeting at Torquay, April 11-13. Further information from Dr. J. N. CUMINGS, National Hospital for Nervous Diseases, Queen Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, April 1

AUXILIARY ROYAL ARMY MEDICAL CORPS FUNDS (1939).—At 11, Chandos Street, W., 5 p.m., annual general meeting.
MARLBOROUGH DAY HOSPITAL.—8.15 p.m., Dr. F. K. Taylor: Mental Epidemics and Similar Social Phenomena.
● UNITED HOSPITALS CATHOLIC SOCIETY.—At 13, Devonshire Place, W., 6.15 p.m., Dr. C. L. C. Burns: Psychiatry and Psychotherapy.

Tuesday, April 2

GUY'S HOSPITAL MEDICAL SCHOOL: DEPARTMENT OF CHILD HEALTH.—At Physiology Theatre, 5 p.m., Dr. Alexander Nadas (Harvard): Complete Atriculo-Ventricular Block in Children.
ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Lumleian Lecture by Dr. L. C. Hill: Systemic Lupus Erythematosus.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Dr. G. A. D. Gordon: demonstration of neuroradiology.

Wednesday, April 3

FOUNTAIN HOSPITAL.—3.30 p.m., annual general meeting. (Tour of hospital, 2.30 p.m.)
INSTITUTE OF LARYNGOLOGY AND OTOLGY.—5.30 p.m., Dr. H. A. Sissons: Bone Structure and Bone Pathology.
MIDLAND MEDICAL SOCIETY.—At 154, Great Charles Street, Birmingham, 8.15 p.m., Valedictory Address by Professor A. P. Thomson: Medical Education.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Moynihan Lecture by Professor R. M. Jones (Canada): Tumours of the Parotid Gland.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Dr. H. D. Pavie: Study of Certain Aspects of the Relations of Hearing to Noise Exposure (illustrated).
ROYAL SOCIETY OF HEALTH.—2.30 p.m., Dr. W. R. S. Doll: Lung Cancer and Smoking.

Thursday, April 4

FACULTY OF HOMOEOPATHY.—8 p.m., discussion: Treatment of Migraine.
ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Lumleian Lecture by Dr. L. C. Hill: Systemic Lupus Erythematosus.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.30 p.m., Otolaryngology Lecture by Dr. R. D. Hoare: Angiography in Throat, Nose, and Ear Surgery.
ROYAL PHOTOGRAPHIC SOCIETY (MEDICAL GROUP).—7 p.m., Mr. D. J. Bruce: B.A.: How do Films Teach?
ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—4.30 p.m., demonstration and discussion of clinical cases. Dr. H. J. Whiteley: Histologically Invasive yet Self-healing Tumours of Rabbit Skin.
SHEFFIELD UNIVERSITY.—At University Building, Sheffield Royal Infirmary, 5.15 p.m., Dr. B. B. Brodie (Bethesda, U.S.A.): 5-Hydroxytryptamine, Reserpine and the Central Nervous System.

Friday, April 5

INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. E. J. M. Campbell: Respiratory Muscles and the Control of Breathing.
NORTHAMPTON MEDICAL SOCIETY.—8.30 p.m., Dr. R. Wigglesworth: Changing Field in Paediatric Practice.
WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—8.30 p.m., Professor R. Rotblat, D.Sc.: Application of Nuclear Physics to Medicine.

Saturday, April 6

MIDLAND THORACIC SOCIETY.—3 p.m., visit to Prestwood Sanatorium, Stourbridge, for clinical meeting and annual general meeting.
Dr. R. D. T. Cape: Corticotrophin in the Management of Pulmonary Tuberculosis; Dr. J. Aspin: Steroid-treated Pleural Effusion; Dr. A. MacDonald: Occupational Risks in Local Industry.
● SOUTH-EAST METROPOLITAN REGIONAL TUBERCULOSIS SOCIETY.—At Brook General Hospital, Shooters Hill Road, S.E., 10.30 for 11 a.m., Miss L. I. H. Torrance: Female Genital Tuberculosis; Mr. B. B. Milstein: Practical Aspects of Hypothermia.

Sunday, April 7

PADDINGTON GENERAL HOSPITAL.—11 a.m., clinical meeting for general practitioners.
UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.—10.15 a.m., clinical demonstration for general practitioners. Dr. W. N. Goldsmith and Dr. P. J. Hare: Common Affections of the Hand.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Crawford.—On March 21, 1957, at Hillingdon Hospital, Middlesex, to Jeanne, wife of Ian B. Crawford, M.B., B.S., a sister for Belinda and Steven.
Griffiths.—On January 14, 1957, at the Imperial Nursing Home, Cheltenham, Glos, to Elizabeth, wife of Dr. Eric Griffiths, a brother for Lynn Jones.—On February 18, 1957, at 4, Southwood Avenue, Highgate, London, N., to Drs. Alan and Erica Jones, a son—Crispin Howard.
Mac Donagh.—On March 16, 1957, at Cleethorpes Maternity Hospital, to Fay (formerly Cull), M.B., and Fintan Mac Donagh, M.R.C.S., a second daughter.

DEATHS

Armstrong.—On March 15, 1957, at Oakleigh, Stourport-on-Severn, Worcs. Gilbert Roy Angus Armstrong, M.B., Ch.B.
Austen.—On March 10, 1957, at Westcliff-on-Sea, Essex, Alfred Walter Austen, M.R.C.S., L.R.C.P., formerly of Putney, London, S.W., and Cambridge Gardens, London, W., aged 86.
Badeley.—On March 10, 1957, in London, Nancy Marion Badeley, M.R.C.S., L.R.C.P., of 1, Gunterstone Road, London, W., formerly of Loudoun Road, London, N.W.
Barkley.—On March 11, 1957, at The Knoll House, Weybridge, Surrey, Thomas Yuille Barkley, O.B.E., M.B., M.R.C.P.Ed.
Campbell.—On March 13, 1957, at Corbett House, Droitwich, Worcs. Malcolm Campbell, M.B., F.R.C.S.Ed., aged 84.
Devereux.—On March 9, 1957, at Trent Meadows, Puddletown, Dorchester, Robert Meade Daly Devereux, M.B., B.Ch.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Drugs for Tension and Anxiety

Q.—What drugs are most helpful in the management of patients suffering from nervous tension and anxiety states? How should they be given, and what are the dangers?

A.—The newer drugs used in the management of tension states include chlorpromazine, benactyzine, and meprobamate. It is very doubtful whether any of these except the first is more effective than ordinary amylobarbitone, and certainly they are more dangerous. Chlorpromazine may sometimes be used in severe tension states as a synergist to amylobarbitone, and the dosage employed would be of the order of 50 mg. three times a day. Complications include pyrexia in about 10% and jaundice in some 4%, and fatal agranulocytosis.² The toxic effects of meprobamate have been noted recently in this Journal.³

It is therefore seldom necessary to use drugs other than amylobarbitone for the treatment of simple anxiety states, and the failure of this drug is usually due to inadequate doses. During the daytime 1½ gr. (0.1 g.) three times a day will usually be required, and perhaps twice this dose in some cases. A hypnotic may be required in addition. The dose of amylobarbitone required to effect suicide is very large, which is why it is so widely used in routine practice. Also it does not readily produce confusion when alcohol is taken, unlike, for example, quinalbarbitone sodium.

REFERENCES

- ¹ Garmany, G., May, A. R., and Folkson, A., *British Medical Journal*, 1954, 2, 439.
- ² Schick, G., and Virks, J., *New Engl. J. Med.*, 1956, 255, 798.
- ³ *British Medical Journal*, 1956, 2, 1227.

Routine Cord Toilet

Q.—What routine toilet for the umbilical cord is now recommended? I see that one authority has recently suggested the routine use of penicillin cream for this purpose (*British Medical Journal*, September 22, 1956, p. 711), but surely this carries a grave risk of creating penicillin-resistant strains of bacteria?

A.—This question raises two separate problems. The routine use of prophylactic penicillin (or any other antibiotic) in a maternity hospital is certainly open to the serious objection that it will result in a progressive and ultimately serious increase in the proportion of resistant strains amongst the staphylococci which are exposed to it. The same objection applies in the home, although the results will be less immediately apparent. The fact that the correspondence to which the questioner refers is concerned with the occurrence of infection of the neonatal umbilicus and the puerperal genital tract with haemolytic streptococci (which are virtually devoid of this capacity to develop penicillin-resistant strains) does not detract from the importance of this objection. Staphylococci are still the commonest cause of serious infections amongst the newborn, and they will be exposed to the antibiotic, even when they are not the target at which it is aimed. These objections apply with even greater force when the local application of an antibiotic is in question: for it is the distinctive and life-saving property of antibiotics that they can be introduced into the patient's blood stream and tissues, there to destroy or inhibit the growth of sensitive bacteria which have extended their attack beyond the harmless stage of a purely superficial lesion. Where an antiseptic will do, as in any purely superficial lesion, its use is preferable.

Finger-pulp Infections

Q.—Is it sound practice to treat a finger-pulp infection by incision under local analgesia with a ring block of, say, 1% lignocaine without adrenaline?

A.—When a finger-pulp infection requires incision to let out pus it is certainly reasonable to do it under local analgesia induced by ring block at the base of the finger. It is the method of choice in some clinics, and is, of course, convenient if no assistant is available to give an anaesthetic. Lignocaine 1% without adrenaline is a suitable analgesic. Adrenaline is barred for digital-nerve block because its use has been followed by gangrene. It is also superfluous if the finger is made ischaemic with a tourniquet of rubber tubing round its base before the analgesic is injected. The analgesic is injected distal to the tourniquet through a single puncture on the back of the finger. The needle is directed first to one side and then to the other, and about 1 ml. of solution injected on each side. Analgesia distal to the block will be complete in about five minutes. The tourniquet is not removed until the operation is completed. Its removal is followed by reactive hyperaemia and brisk bleeding. It is worth while waiting for this to subside before applying the dressing, which will otherwise become soaked with blood and difficult to remove at the next visit.

Crush Fractures During E.C.T.

Q.—It is often stated that crush vertebral fractures, sustained in the course of electroconvulsive therapy, require no special treatment and never result in physical disability. Crush fractures from other causes, especially if left untreated, are often most disabling. What is the explanation of this difference?

A.—It is quite true that these vertebral fractures produce only a transient disability and often no symptoms at all. Thus Polatin and Linn¹ followed up a series over a period of 10 years and found no orthopaedic or neurological sequelae of any note. Indeed, convulsive therapy had been in use for some years before it was realized that these fractures were taking place at all. Before the introduction of muscle relaxants it was customary to continue treatment if the depression required it, and further damage to the injured vertebra was rare.

Fractures nearly always occur between the fourth and eighth dorsal vertebrae, and the body is injured as a result of longitudinal compression. Injury to the pedicles or the

transverse or spinous processes is practically unknown. The fracture is thus a rather specific one, and it is probably by this fact that the anomaly pointed out by the inquirer is to be explained.

REFERENCE

¹ Polatin, P., and Linn, L., *Amer. J. Psychiat.*, 1949, 105, 825.

Raspberry Leaf Tea

Q.—There is a widespread belief that raspberry leaf tea is beneficial during pregnancy. Has this subject been investigated scientifically, and, if so, with what results?

A.—In 1941 the late Sir Beckwith Whitehouse¹ reported a clinical trial of raspberry leaf extracts, and Burn and Withell² described some of the pharmacological properties of such extracts—while at the present time Mr. J. A. Stallworthy at Oxford is interested in the application of these extracts to obstetrics. Beckett *et al.*³ have studied the active constituents of raspberry leaves. They found that aqueous extracts contained a smooth-muscle stimulant, an anticholinesterase, and a "spasmolytic." The conflicting results of the action of raspberry leaf extracts are due to the presence of antagonistic substances, and these authors maintain that the degree of purification of the extracts will result in a preponderance of either a stimulant or a relaxing effect.

For centuries raspberry leaf tea has been prescribed as a herbal medicine during pregnancy and labour. Among rural communities in the North of England the wise women still prescribe a daily infusion during menstruation to relieve dysmenorrhoea. They also prescribe this tea throughout pregnancy and labour. The older midwives who practise in rural areas claim that such treatment reduces the duration and pain of labour. At present there is no statistical proof to support this, but the subject merits further investigation.

REFERENCES

¹ Whitehouse, B., *British Medical Journal*, 1941, 2, 370.

² Burn, J. H., and Withell, E. R., *Lancet*, 1941, 2, 1.

³ Beckett, A. H., Belthle, F. W., and Fell, K. R., *J. Pharmacol.*, 1954, 6, 785.

Restrictions for Colour-blind Children

Q.—What restrictions are necessary in bringing up colour-blind children? For instance, is there any reason to advise against games with a fast-moving ball such as cricket or squash?

A.—None, as a rule, except that it is obviously no use preparing the child for a job in which normal colour vision is required—e.g., in the Royal Navy or Royal Air Force (except certain branches), as a railway locomotive driver, in certain industries dealing with coloured materials, etc.

Very few people are completely colour blind. The usual abnormality is "defective colour vision," in which confusion arises if the colour stimulus is small or if the differences between various colours are slight. A person suffering from the rare condition of complete colour blindness, to whom the entire world presents a drab grey appearance, has obvious handicaps, but this is very rare indeed.

Differential Diagnosis of Macrocytic Anaemias

Q.—What place have examination of the bone marrow and the therapeutic response to cyanocobalamin in the differential diagnosis of pernicious anaemia from other macrocytic anaemias?

A.—The diagnosis of pernicious anaemia in Britain is usually a simple one, if the clinical and haematological findings and the results of a test meal are typical. Examination of the bone marrow is not necessary in a classical case, but is valuable if there is doubt. In untreated pernicious anaemia a typical megaloblastic picture is present, and this excludes at once a number of macrocytic anaemias where there is a macronormoblastic marrow such as may be found in some cases of acquired haemolytic anaemia and liver disease.

The response to cyanocobalamin (vitamin B₁₂) will be prompt, regular, and complete in pernicious anaemia, unless

there are complicating factors such as hypothyroidism or infection. If the clinical and haematological findings are not typical the possibility of one of the steatorrhoeas should be considered, and these do not usually respond completely to cyanocobalamin. The megaloblastic anaemias of the tropics and of pregnancy are easily excluded on clinical grounds.

NOTES AND COMMENTS

Treatment of Otosclerosis.—Air Vice-Marshal E. D. D. DICKSON, F.R.C.S.Ed., National Institute for the Deaf, 105, Gower Street, London, W.C.1, writes: We appreciate the reference to the National Institute for the Deaf in your reply on the treatment of otosclerosis ("Any Questions?" February 23, p. 473). The Institute has published a booklet (N.I.D. Booklet 493) on *Otosclerosis and the Fenestration Operation*, which is designed for the benefit of the lay public. We shall be glad to supply copies for any readers of the *Journal* or their patients. May I also draw particular attention to the N.I.D. Booklet 481, which sets out a list of companies and their agents whose names are included in the Approved List of the National Institute for the Deaf? These companies and agents have undertaken to observe certain rules of procedure in their dealings with intending purchasers.

The valve-amplifier type of hearing-aid which you mention in your answer is now largely superseded by the transistor type. Although these newer instruments are not necessarily better than the earlier kinds, it will interest patients to know that only a low-tension battery is needed for them; this has a very long life in these instruments and substantially reduces battery-running costs. Use of transistors means that hearing-aids can be further reduced in size and possibly more conveniently worn. The National Institute for the Deaf will at all times be glad to supply any information on this and allied subjects either to doctors or to their patients.

Painless Local Analgesia.—Dr. M. G. GOOD (London, N.W.11) writes: With reference to the query regarding a method of anaesthetizing the skin without injection ("Any Questions?" March 2, p. 536), I should like to recommend a paint recently described. An alcoholic 2% solution of procaine-base may be used for this purpose. Technique: the skin to be anaesthetized is painted first with a 0.1% solution of NaHCO₃, followed by the application of the alcoholic solution; the rapid evaporation of the alcohol favours the penetration of the anaesthetic into the intact skin. After some minutes the skin is less sensitive to pinching, etc.^{1,2}

REFERENCES

¹ Good, M. G., *Indian med. Rec.*, 1956, 76, 85.

² *Z. ges. inn. Med.*, 1956, 11, 1120.

Correction.—In the paper by Mr. T. M. Abbas entitled "Clinical Trial of Glutethimide in Labour" (*Journal*, March 9, p. 563) the headings above the columns of figures in Table III were wrongly printed. The middle column should have been headed "Glutethimide Group" and the right-hand column "Chloral Hydrate Group."

Books of "Any Questions?" and Refresher Course Articles.—The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices include postage. *Any Questions?* Volumes 2 and 3 (8s. each); *Refresher Course for General Practitioners*, Volumes 2 and 3 (26s. 6d. each inland, 26s. overseas); *Clinical Pathology in General Practice* (22s. 3d. inland, 21s. 9d. overseas).

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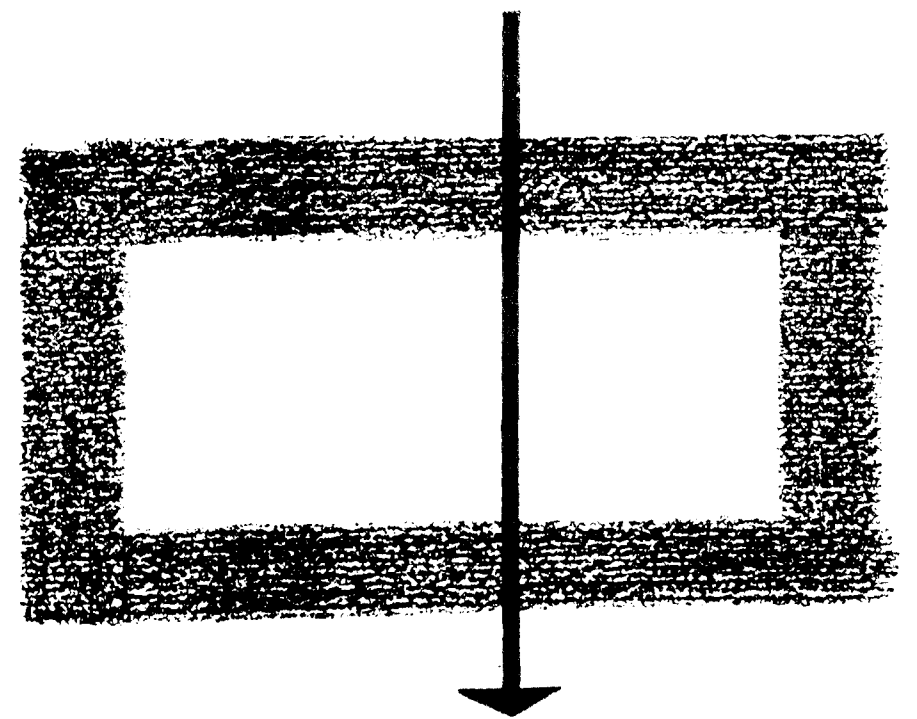
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BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 6 1957

CANCER—A BIOLOGICAL APPROACH

I. THE PROCESSES OF CONTROL

BY

Sir MACFARLANE BURNET, M.D., F.R.S.

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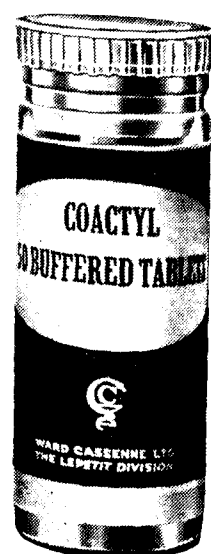
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The understanding and control of cancer is the most urgent problem of medicine to-day. The volume of research on the subject, particularly in America, is vast and heavily biased in two "practical" directions. There is a strong tendency to concentrate on investigations that may provide leads (a) to the elaboration of tests for the early diagnosis of cancer, and (b) to its cure by non-surgical means. This has led perhaps to an undue interest in the biochemical aspects and especially the enzymic activities of tumour cells. Clearly if a chemotherapeutic substance is to be found it will be something which can differentially inhibit some processes by which tumour cells differ from normal cells. Such a bias is both inevitable and desirable, but it should have no influence on any attempts to gain a clear picture of the process in terms of general biological concepts.

Scientists may be divided into three groups. There are those, like myself, who believe that at every stage in scientific development it is necessary to provide the best available generalizations as a guide to effective work, both in the application of knowledge to human needs and in the planning of future research. At the other extreme are those who feel that the only valuable scientific activity is to concentrate on some significant facet of knowledge until the facts are incontrovertible and are expressible in some general statement, preferably mathematical in form, that is acceptable to all competent workers. Then we have available a defined unit of knowledge which can be used *reliably* when the time comes to apply the knowledge in any field where it is required. The great majority of scientists take an intermediate position, usually finding their immediate interest in the detailed study of a chosen field, but interested in learning of the emergence of general pictures in the various wider fields.

The present approach to a discussion of the general problems of cancer springs directly from an interest in the nature of antibody production and the ideas of macromolecular pattern developed in a recent essay (Burnet, 1956). It is necessarily based not on personal work in the field or on a comprehensive knowledge of the original literature, but on recent general treatises and compilations, reference to the original papers being made only when these provide essential contributions to the discussion.

Requirements for any General Theory of Cancer

It will be universally admitted that the essence of the group of phenomena we know as cancer or neoplastic

growth is *growth* of cells free from the normal control exercised by the organism as a whole. Experience of tissue culture suggests that most or all mammalian cells have a capacity for growth when provided with appropriate nutrients. The real problem of cancer is then to understand the processes of control by which normal cells from the fertilized ovum to the end of life are maintained in morphological and functional condition appropriate to the needs of the organism at the time. Perhaps it should be stressed how much more complex and difficult to understand are the processes by which a finger retains its character than what is happening in a carcinoma of the lung. Cancer is a negative condition—a manifestation of the breakdown in one or more aspects of the positive control that welds the cells of the body into a single functioning unit—the organism as a whole.

The failure in cancer is due not to any weakness of the organism but to a change in the character of the cells rendering them in one way or another insusceptible to the normal control.

This statement is self-evident when we consider the phenomena of metastasis and experimental transplantation. When cells from a gastric carcinoma produce metastases in the liver there is nothing to suggest any weakness in the control of liver cells. The secondary nodules are clearly due to cells from the primary tumour. This is even more clearly seen in the case of experimental transplants to animals homozygous with the original host of the tumour. The same two sets of phenomena indicate also that the change in the cells is something handed on from one generation of cells to the next. In the broad sense of the term the change is a genetic one. It is immaterial at the moment whether investigation will in any given case eventually give a more precise label to the genetic change, whether it represents a true somatic mutation, transfer of plasmagones, incorporation of a virus into a "provirus" state, or some new concept yet to be formulated.

Any hypothesis of a general basis for neoplastic growth must be related directly to this function of control—any other type of associated change can only be regarded as secondary. It is therefore from our point of view impossible to accept Warburg's hypothesis that a change from aerobic to anaerobic glycolysis is the essential feature of cancer cells. If cancer is, as indicated above, essentially a negative biological phenomenon like starvation, scurvy, agammaglobulinaemia, or phenyl-pyruvic oligophrenia, the only legitimate way

to discuss its relation to general biology is to use the phenomena of cancer as seen clinically and experimentally to throw light on the nature of normal controls in the organism. Basically this is the theme of the present essay.

Process of Control

It is in line with popular present-day thought to apply concepts from mechanical or electronic control and communication systems to biological phenomena. This has been specially evident in discussions of neural mechanisms, but the general principles would be equally applicable to any other type of biological control. Since there is no evidence of more than very minor influences of nervous action in the control of morphology, this will not be discussed. Forestalling subsequent discussion slightly, we may say that there is very much to suggest that control is a function of the movement of complex molecules carrying patterns equivalent to coded instructions from one part of the organism to another. Further, there is no substantial alternative to such a view; "fields of morphogenesis" may be a necessary provisional concept, but there is no serious suggestion that a physical field in any normal sense is concerned.

Any type of control of a collection of living cells subject to trauma and to variable demands on their function will have to incorporate a number of "components." (1) There will be needed a built-in "plan of action." The whole mechanism must function to favour survival of the individual, and we shall probably be correct in regarding the general plan of action in any developed organism as being to maintain or regain the *status quo*. (2) Information must be provided in some form about the state of the cells in question, particularly as it is relevant to the need of more or less cells or of greater or less functional activity. This is the "feed-back" needed by all mechanisms for any type of homeostatic control. (3) A central control mechanism is needed which will respond to this information by the despatch of appropriate "messengers" to the cells under control. (4) In the cells there must be a reception mechanism to accept instructions so delivered and to induce the appropriate cellular reactions.

This is obviously a generalized statement made to cover such an example as the interaction of pituitary and thyroid, which will be discussed later. Probably all biological control mechanisms need these four components, but one can conceive situations where they may be difficult to recognize. One has in mind the work of Weiss and others on the capacity of cells in appropriate conditions of tissue culture to come together into patterns significantly similar to the structures found in corresponding normal tissues. Here we seem likely to be concerned with something that can be looked on as an interchange of information and instructions between surfaces coming into contact. The third form of control to be discussed, which is referred to rather loosely as "immunological," will probably be found to fit rather clearly into the framework outlined above.

The general hypothesis of control by the interaction of complementary macromolecular patterns has been outlined in what was primarily a discussion of antibody production (Burnet, 1956). This is directly derivative from Ehrlich's hypotheses of lock-and-key action in immunology and chemotherapy. Most of the discussion in *Enzyme, Antigen and Virus* was concerned with protein pattern and the ways in which complementary patterns, not necessarily in the same medium, could arise. It was concluded that for the functioning of such systems there must be means of which (a) patterns can be replicated; (b) patterns can be used as blueprints from which complementary patterns can be fabricated; (c) information encoded in pattern, say on protein or DNA, can be expressed in another medium—for example, RNA or polysaccharide; (d) specific union of pattern and complementary pattern can initiate an appropriate reaction—for example, enzymic breakdown of substrate, liberation of histamine, initiation of oestrus, and the like.

The mammalian body contains a wide variety of differentiated cells which differ greatly in the way they are produced, in their potentialities of multiplication, and in their average life as cellular individuals. At the one extreme we have the erythrocytes and a wide variety of what appear to be highly expendable mesenchymal cells, including lymphocytes, histiocytes, granular leucocytes, and fibroblasts. These are produced in permanent and temporary centres of proliferation, spleen, bone marrow, lymph nodes, and a variety of submucosal collections throughout the body. After a life measurable in days or weeks, these expendable cells are got rid of largely by phagocytosis and intracellular digestion, while another large proportion is shed into the intestinal lumen or liberated on some other mucous membrane.

Next we have the epithelial surfaces of tissues exposed to external or internal environments—skin, and alimentary and respiratory mucous membranes. Here attrition, trauma, and infection are everyday occurrences, and there is a steady replacement of older cells by the reproduction of basal cells or their equivalent. Worn out or damaged cells are shed into the environment. These cells in a sense are always growing, and it is significant that the incidence of cancer in the corresponding situations is high. Carcinoma of the skin, larynx and bronchi, stomach, large intestine, and rectum are all common.

Rather closely related are the organs whose lining is modified sharply in relation to sexual periodicities of menstruation, pregnancy, and lactation. In ovary, uterus, and breast there are hormonally determined changes of cellular proliferation and regression. In the uterus excess cells are shed to the exterior. In the breast the process by which the lactating organ regresses to the quiescent stage probably involves a quiet autolysis of superfluous cells and absorption of their substance into the general pool of amino-acids, nucleotides, and other building blocks.

The endocrine organs have a special part to play in the control of bodily function, and provide equally important examples of the way in which cellular proliferation and function is controlled. In such an organ as the thyroid the amount of specifically functioning cells depends in part at least on the concentration of thyrotropic hormone reaching it from the pituitary. With regression the number of cells diminishes, presumably again by autolysis without the intervention of phagocytic processes. It is likely that similar situations hold for the other endocrine organs.

Most of the major tissues of the body seem to belong to the next class in which the average cell life is long, perhaps indefinitely long, but in which, when demand arises, proliferative and reparative processes take place readily and efficiently. Compensatory hypertrophy of remaining portions of tissue is regular after removal of any considerable proportion, such as one member of a paired organ. Liver, kidney, heart, lungs, and skeletal muscle belong here.

Finally we have the permanent cells of the nervous system which once maturity is reached are not expendable.

This provides a basis for the general consideration of the processes concerned in the development and evolution of cancer. For any given type of cell we have two questions—what are the ways in which control may be lost, and, if one or more such controls are lost, is there any way by which they can be reinstated? Since every cell of the mammalian body is derived from the fertilized ovum, it is reasonable to believe that to some extent all cells are subject to all methods of control, just as all cells have certain common metabolic functions. In practice, however, we find that the effective controls vary greatly from one cell type to another, and it will be convenient to divide them into three major types which can be discussed separately: (1) Hormonal control of cell growth and functional activity of certain organs. (2) Local control (a) by mechanical pressures, tensions, etc., and (b) by mutual interaction of cell surfaces. (3) "Immunological" control associated with the "self-markers" of the body.

Hormonal Control of Growth

It is a striking fact that the most effective chemotherapy of any type of cancer has been the use of oestrogens in prostatic carcinoma. This underlines the significance of hormonal control of growth.

The special quality of hormonal control can perhaps best be seen in the effect on the epidermis of the tadpole of premature exposure to thyroid hormone (Lindeman, 1929). This results in metamorphosis, and as part of the process we find cytolysis and atrophy of epidermal cells on the caudal side of a well-defined line, and proliferative changes on the cranial side. Changing hormone concentrations can in this fashion trigger biologically appropriate changes of different types in various target organs or tissues.

In higher vertebrates the effects are seen largely in endocrine tissues, but there is much to suggest that to some extent all cells are potentially subject to hormonal control. A point that may be of special importance is that control takes the form either of proliferation (and increased functional activity) or cytolysis and atrophy in which the cell substance is quietly broken down and its components are added to the general metabolic pool of the body. They are not "mopped up" by the scavenging cells in the way that most expendable mesenchymal cells are, and they appear to have little or no individual immunological specificity. There is some direct experimental work to support this view. Woodruff and Woodruff (1950), for instance, carried out extensive experiments on the transfer of thyroid tissue from one guinea-pig to the anterior chamber of the eye of another. He found that the tissue became established in the new host if there was a need for it—that is, if the host had been thyroidectomized. The evidence was highly suggestive that in the process by which the foreign tissue became established the stroma of the donor was destroyed and replaced by that of the host, only the specific thyroid cells being genetically still those of the donor.

The general basis of endocrine control has already been briefly discussed, and it has been pointed out how the pituitary control of thyroid function provides one of the most clearly manifested feed-back mechanisms in biological control.

There are a relatively large number of instances where controls of this general type can be distorted by accidental or experimental circumstances to produce hyperplastic or neoplastic growth. Thiouracil and other goitrogenic substances which decrease thyroxine output will induce the formation of thyroid tumours as a result of stimulation by thyrotropic hormone. These tumours are transplantable to other rats (presumably not genetically homozygous) provided the recipients have been rendered thyroxine-deficient either by thyroidectomy or by administration of antithyroid substances (Bielschowsky *et al.*, 1949). A relatively slight change in the situation can give a different picture, involving neoplastic change in the pituitary. Large doses of radio-iodine ^{131}I given to mice will destroy the ability of the thyroid to produce thyroxine, and there is therefore a continuing call for thyrotropic hormone, and the pituitary cells responsible for its production give rise to tumours (Gorbman, 1949). These tumours can be transplanted to mice treated with ^{131}I but not to normal mice. On transfer their autonomy increases and they can eventually be transplanted to untreated mice. Even in this autonomous state, however, they continue to secrete thyrotropic hormone.

Oestrogens will induce testicular tumours in mice by a basically similar mechanism, and, as might be expected, when such tumours are transplanted they will grow to tumours only in recipient mice treated with stilboestrol or other oestrogens.

A different type of experimental artifice to induce endocrine overactivity is to transplant a rat's ovary into the substance of the spleen, the other ovary being removed. A high proportion of such transplanted ovarian tissues give rise to granulosa cell tumours (Biskind and Biskind, 1944). This is

interpreted as resulting from the destruction of oestrogens produced by the ovary during their passage through the liver (in the portal circulation). There is thus a continuous stimulus to pituitary liberation of gonadotrophic hormone without the normal feed-back control. The same type of result is found in mice.

Local Controls

It is quite certain that the actual controls playing on all morphologically significant cells are more numerous and subtle than anything that could be suggested at the present time. All that can be attempted is to outline the simplest mechanisms that might account for some of the more easily recognized features of the phenomena of local repair, regeneration, and growth.

In the first instance there is the response to pressures and tensions which mould skin and skeletal tissues into the form needed by simple mechanical considerations. Even a fairly rapidly growing benign tumour of the subcutaneous tissues allows the skin to keep pace in covering it. There are hosts of similar mechanical controls which play their part in reshaping a functional limb after severe trauma or reconstructive surgery. The detail of the processes by which pressures and tensions lead to modification of growth and shape of cells is outside the field of this discussion, but it will have to be elucidated in full if a complete account of the mechanisms of control is to be provided. Indications of more direct influences associated with the cells themselves can be obtained from a variety of sources. A striking example is to be seen in the classical experiment in which an emulsion of disaggregated sponge cells of two species will come together into aggregates, each composed only of the one species.

Recent work, particularly from Weiss's laboratory, has shown that chick embryo cells, dissociated into single units by treatment with trypsin, can under appropriate conditions of tissue culture give rise to a tissue-like association (Moscona, 1953, 1956). An analysis of the process indicates that the first step is for the cells to become grouped according to kind, aggregating into clusters by a variety of processes which seem to include random encounter, directional migration, and surface interactions. The next process is one of organization within the aggregates and their interaction with clusters of cells of other types to develop the tissue-like appearance.

Essentially similar results are described by Leighton (1951, 1954), who used a type of three-dimensional tissue culture in cellulose sponge for embryonic and tumour cells. In this situation cells developed histological patterns very similar to those of tumours growing in the body. From both types of experiment it is clear that a significant proportion of the control of cellular relations is intrinsic to the cells themselves.

If attention is directed particularly on the mutual interaction of contiguous cells, the simplest working hypothesis is that when two adjacent cells are in their appropriate position in the organism the *status quo* is maintained by an interchange of information—in the form of patterned macromolecules—across the interface. Where a surface is free this particular control must be replaced by something of appropriately different character. If cells are removed by trauma or operatively, the gap will be filled by the proliferation of those adjacent to the gap. If this is a simple reaction, we could deduce from it that, in addition to the disappearance of the adjacent cell, either a failure of that cell to provide information of its existence or an inability of the cell itself to "recognize" the information might lead to the same result—that is, proliferation until in one way or another the remaining controls brought it to a halt.

It would seem that the first requirement for malignant growth is a loss of the control mediated by physiological contact with adjacent cells. The locally invasive character of a cancer, the feature which makes its histological diagnosis possible, is in itself the clearest indication of this. Proliferative reactions in general must eventually be seen against

the background of normal controls, a specially important type being the proliferative response to certain virus infections. This is the basis for the great amount of work and speculation that is associated with the virus theory of cancer, and it is best discussed in relation to that theme.

The various mechanisms which are concerned in embryonic morphogenesis must undoubtedly be relevant, but it would be hopeless for anyone not personally familiar with the field to attempt to draw general principles from their complexities.

One field, however, may be mentioned because it indicates very clearly the concept of control by mutual interactions of cells with which we are primarily concerned. In all vertebrates it appears that cells concerned with pigmentation are derived from a special group of ectodermal cells, the neural crest. At appropriate periods in embryonic life these cells pass to the various sites where melanoblasts will eventually be functionally active.

This migration provides extensive opportunities for experimental study of the process. Weiss and Andres (1952), for instance, injected embryonic cells, including melanoblasts, intravenously in chick embryos of a non-pigmented strain. They found that donor melanoblasts proliferated and produced melanin granules of the sort corresponding to their genotype only in locations in the host where they would normally have produced pigment in a bird of the donor strain.

By appropriate experimental action the normal supply of melanoblasts can be prevented from reaching an area of chick embryo skin. If this skin is now transplanted to replace an area of skin on a normal embryo it is rapidly and freely invaded by adjacent melanoblasts. This does not occur if the graft is of normal skin (Rawles, 1944).

There can be little doubt that migration of the primary melanoblasts is directed by processes involving mutual cell contact and that the sites of their functional proliferation are also determined in this fashion. The extent of their multiplication is also clearly related to processes involving the cell community and not by any self-limitation in their capacity to multiply.

All that need be attempted here is to apply some of the ideas drawn by Weiss from such studies to some aspects of tissue interactions at the immunological level that seem likely to be specially relevant to neoplastic phenomena. In a recent discussion (Burnet, 1956), I have tried to make use of Weiss's concept of complementary interaction between cell surfaces to broaden the idea of immunological "self-markers."

The Immunological Approach

The essence of the self-marker hypothesis (Burnet and Fenner, 1949) is that at a late stage in embryonic life the scavenging cell system of the body (reticulo-endothelial cells, etc.) is conditioned to recognize as self-components certain potentially antigenic constituents of the expendable cells of the body. A variety of foreign potential antigens which by accident or experimental manipulation may be present at the relevant time will also be recognized as self. They will then become part of that class of substances which are incapable of acting as antigens in the conditioned animal.

The observational and experimental basis for this concept is now extensive. The clearest evidence is in regard to tolerance of cells which are antigenically distinct but derived from another individual of the same species. Here complete tolerance can readily be demonstrated from twin studies in cattle, sheep, chickens, and one human case. In all these instances red-cell chimeras have been shown to persist indefinitely. In addition, Anderson *et al.* (1951) showed that non-identical bovine twins (with a common placental circulation during foetal life) were receptive to mutual interchange of skin grafts. Billingham *et al.* (1956) showed experimentally that inoculation of cells from a homozygous strain of mice B into late fetuses of strain A

resulted in tolerance of the grown mice for skin transplants from a B mouse. This tolerance was specific, being confined to skin grafts from strain B.

In all these examples we have the probability that the tolerant condition is associated with the continuing survival of the genetically heterologous cells in the body. Just as accelerated homograft immunity is produced only by experience of living cells, it may also be claimed that immunological tolerance of this type is dependent on the persisting foreign cells which are capable of "mopping up" any antibody that may be produced.

A variety of evidence, however, is strongly against this view. The most cogent experimental result is also due to Medawar's group. If a tolerant white mouse of strain A carrying a healthy black patch of skin of strain B is left untreated, the patch of foreign skin will remain healthy for an indefinite time. If, however, lymph-node cells from a normal A mouse are inoculated into the tolerant mouse they are accepted and can function normally. Within three to four weeks an immune response results in the breakdown and rejection of the black graft. This observation has two very important implications.

In the first place it shows that something has happened to condition the scavenging cells of the tolerant host which does not apply to similar cells reaching the body of the grown mouse. There can be no question of antibody against B cells being produced and absorbed or diverted by persisting B cells from the modifying prenatal injection.

In the second place it is clear that B cells in the tolerant mouse are liberating something which can stimulate unconditioned cells to produce a specific and destructive immune response. Everything suggests that what is liberated is the same antigen as is responsible for homograft immunity. Since purely epithelial skin grafts can provoke homograft immunity there is reasonable certainty that both the conditioning cells and the tolerated graft are contributing amounts of the antigen. In the tolerant animal this antigen is accepted as self—there is no immune response—but if normal lymph node tissue is made available the standard immune response occurs. Medawar *et al.* have found that a labile non-cellular antigen can be extracted from nuclei which will provoke homograft immunity. It seems highly probable that the same antigen, provisionally characterized as a DNA-protein complex, is the one concerned in provoking immunological tolerance.

From the point of view of cellular control in its relation to cancer the important aspect of these results is the indication that cells of many types are constantly liberating "self-markers" into the lymph and blood circulations. A hint of the way in which these markers may act is contained in the finding by Ebert (1954) that, when an animal is grafted with a tissue from a donor treated with an appropriate radio-isotope, labelled molecules "larger than amino-acids" pass selectively to the corresponding organ of the host. At the present time we have no more than hints that these specific agents have a control function, but those hints are insistent, and Green (1954) has built an interesting immunological theory of cancer by elaborating them. This will be discussed in a later section.

II. THE SIGNIFICANCE OF SOMATIC MUTATION

There is every reason to believe that mutation is at least as frequent in somatic cells as in the germ cells. Somatic mutation has been studied particularly in plants, where the phenomena of continuous growth make its effects more readily demonstrated than in the higher animals. In insects body colour mosaics due to somatic mutation at early stages of differentiation are not infrequent. In mammals most of the evidence for somatic mutation comes from studies in tumour pathology.

The essential difference between a mutation occurring in a germ cell and a similar process in a somatic cell depends simply on the extent and distribution of the cells descendant

from that in which the mutation occurred. A germ-cell mutation can potentially influence all the body cells of all those individuals who receive the modified allele in question. A somatic mutation can influence only those body cells which directly descend from the mutant cell. A mutation of any sort in a nerve cell can have no influence on any other cells but itself; a mutation in a cell giving rise to highly expendable descendants may have wider influence. Any mutation is, according to current opinion, an individual event occurring at a limited region of the genetic mechanism of a single cell. The potential effect of the mutation may be almost anything, although the chance of one type of specific damage will be more or less frequent than that of another.

From the practical point of view, however, we have to remember that every tissue is made up of many thousands or millions of cells. A modification of one cell or of any small proportion of the order characteristic of mutation—that is, $1:10^5$ per cell life—will have no detectable effect on the function of the tissue unless one condition is fulfilled. This is that the mutation results in a differential survival advantage for descendants of the mutant cell as compared with the descendants of normal cells. In other words, somatic mutation in higher animals is of no significance whatever unless it results in the loss or change of some quality which frees it in part from the normal control on its capacity to reproduce. Only mutations along the road toward cancer will be of any significance—they will also be almost the only ones detectable even in principle.

From a wide variety of sources it becomes evident that the change from a normal cell to a cancer cell is rarely if ever a single step. This is perhaps equivalent to saying that every normal cell in the body is played on by multiple controls, and that more than one of these controls must be abrogated to allow unrestrained or excessive growth.

There is first the clinical evidence of pre-cancerous changes in organs like breast, prostate, or skin. Benign hyperkeratoses are very common in the human skin. It is usual, too, to find that recurrences are more malignant than the tumour removed and that tumours held temporarily in check by hormonal treatment or irradiation always eventually break away from control. Later we shall mention the interesting relationship between age and incidence of cancer in various organs which points strongly in this direction.

At the experimental level the work of Berenblum and Shubik (1949) on the process of carcinogenesis in mice is relevant. They found that a brief treatment of the skin with a standard carcinogenic hydrocarbon would produce no tumours. If, however, the areas were subsequently treated for a prolonged period with croton oil, itself non-carcinogenic, tumours arose in numbers approximately proportional to the concentration of the carcinogen used. One essential step was induced by the carcinogen, but the so-called co-carcinogenic action of the croton oil was necessary to allow any manifest expression—that is, to induce or provide conditions for the appearance of some further change or changes.

Once a cancer has reached the stage of being transplantable to other individual hosts, the essential changes have taken place and any subsequent changes are, strictly speaking, irrelevant to the problem of the genesis of cancer. Nevertheless many changes do take place in the course of transplantation experiments, and it is logical to believe that, with due reservation, these changes are likely to be of the same general quality as those associated with the change from normal cells to cells recognizable as cancerous.

Perhaps the outstanding recent feature of work on transplantation has been the recognition that all populations of cancer cells are heterogeneous and subject to the processes of mutation and selective survival. There are two main lines of evidence. The first is in regard to the process by which a tumour strain can extend its virulence to other hosts. The second is concerned with the changes observed in response to agents being tested for therapeutic potentialities.

Koprowski's experiments may be mentioned as typical of a number of situations where selective survival of a fraction of a tumour cell population occurs. He tested mice of one strain (ICR) which had been inoculated *in utero* with blood from another strain (C3H) for their susceptibility to an ascites tumour grown in C3H and to which ICR were normally resistant. Tolerance was found to be present, but after a few passages in tolerant hosts the prior manipulation became unnecessary. The ascites tumour strain now grew in all mouse strains tested as well as in ICR and C3H. It appears that tolerance was only partial but allowed sufficient proliferation to let a process of selective survival come into play by which a substrain that had lost further antigenic markers came into dominance.

Almost identical types of result are obtainable by experiments in which tumours are enabled to grow in foreign hosts by making use of some other artifice to weaken the normal immunological resistance. Stewart (1954) used inoculation of newborn mice to adapt a strain of leukaemia to foreign hosts. Earlier Krebs (1943) had adapted a lymphosarcoma by inoculating mice whose resistance had been diminished by x-radiation. In each instance once the strain had been persuaded to grow in the immunologically weakened host it became capable of transplantation to the normal grown animal of the previously resistant genotype.

Hauschka (1953) has elaborated this point of view from his studies of ascites tumours. These often show in association with an extension in range of host a change in the distribution of chromosome numbers in the cells from diploid to heteroploid. He showed that a small fraction of heteroploid cells in a tumour could be concentrated by propagation in a partially incompatible host. In his view loss of transplantation specificity is a result of immunological selection of cell types with least antigenicity amongst the available chromosomal variants. The possibility that the selection is rather for cell types which are unduly resistant to the destructive action of immunological processes must also be considered.

When transplantable tumours are exposed to therapeutic concentrations of radiations or antimetabolites it is the rule to find the eventual appearance of resistant tumour strains. Law (1952), working with mouse leukaemias, found that the tumour cell behaved in a fashion amazingly similar to what is observed in regard to drug fastness in bacteria. It could be shown in classical fashion that resistance was not induced by the agent but that its appearance was due to the selective survival of small numbers of mutants present in the pre-existent population.

A similar situation obtains when pituitary tumours are induced by radiothyroidectomy. Furth (1954) transplanted 13 such tumours, finding that primary passage was possible only in thyroidectomized recipients. On continued transfer, however, most of them became autonomous and capable of growth in normal mice. Here again we have the selection of an appropriate mutant by the conditions in which the population is compelled to grow.

From many directions, therefore, we find support for the working hypothesis that the development of malignancy is the result of a biological process in which successive mutations occur in cells capable of continued proliferation, by which a certain advantage is gained. If cell A mutates to A¹, and A¹ has a slight advantage over A, there will be a gradual conversion of at least some regions from a population of A to one of A¹. If mutation A² is much more likely to occur in A¹ than in A and A² more likely in A² than in the others, then we develop a situation that may be very relevant to the behaviour of spontaneous cancer in men and mice.

There is some reason for guessing that on the average about six controls would need to be abrogated before a cell with the full characteristics of malignancy would emerge. The process is shown in the accompanying Diagram, which represents an epithelial layer derived from constantly proliferating basal cells. While these are normal there is no reason to postulate any deviation from the rule that each

basal cell produces only the pillar of cells reaching from it to the surface, where desquamation occurs. A mutation A^1 may, however, result in a progressively wider column of cells with the character of mutant A^1 developing. When these cells become sufficiently numerous, the possibility of a second mutation becomes steadily greater and eventually new columns of cells lacking two controls will appear. The process will continue indefinitely until perhaps when the sixth type of mutation occurs we have the initiation of a focus of frank cancer. As Armitage and Doll (1954) have pointed out, this is the type of process which would give rise to the very constant and significant mathematical relationship that governs the age incidence of death from cancer in human beings.

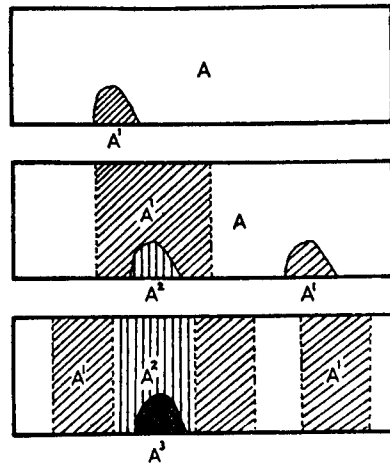


Diagram to illustrate the possible way in which successive mutation to more actively growing cell types could change the constitution of an epithelial cell layer derived from constantly proliferating basal cells (see text).

The frequency of cancer in general and of cancer of most important sites increases rapidly with age, and it is convenient to use a logarithmic scale to show the change in a compact and convenient form. With the usual time scale such a graph shows a gentle concavity downwards. If, however, the age scale is arranged logarithmically so that the intervals 10–20, 20–40, 40–80 have equal value, then the curves fall on straight lines. Exceptions have been discussed by Metcalfe (1955), notably cancer of the prostate, which shows a much steeper slope, and cancer of the ovary, which flattens after the age of 50. Where the incidence of a type of cancer has increased rapidly in the last 50 years, as is the case with bronchial carcinoma, a more complex relation holds. With these exceptions the curves are very uniform in slope and very close approximations to straight lines in America, Britain, and Australia.

The first explanation offered by Fisher and Holloman (1951) was based on the hypothesis that only one mutational step was necessary but that cancer did not develop unless a number of mutated cells found themselves in juxtaposition. If one mutational change occurs in random fashion throughout life and overt malignancy develops only when seven potentially cancerous cells are contiguous, then the observed age incidence would be expected. The interpretation offered by Armitage and Doll (1954), however, appears to be more in line with the clinical and experimental character of malignant change. They suggested that the observed log-log relationship would obtain if for the development of cancer a sequence of six to seven changes in the initiating cell are required. If a cancer cell is the end-result of a series of six or seven successive mutations, then, provided that the probability of the occurrence of each mutation remains constant throughout life and that each mutation is a relatively rare event, the age incidence of cancer would be as observed.

To express the situation in non-mathematical terms we can say that with increasing age more and more patches of cells in expendable tissues are the offspring of cells which have undergone more than one mutation in the line of progression to cancer. Perhaps a very clear indication of this is to look at the skin on the back of the hand of an elderly man and note its mosaic of colour and texture. Cowdry (1955) has treated these changes of skin epidermis with age in some detail, and though he does not specifically state that

he regards the changes as mutational in origin, this is virtually implicit in his summary of the main changes, which include: increased thickness of epidermis in some areas, lessened thickness in others, diminution in hairs, sweat and sebaceous glands, patchy areas of hypo- and hyper-mineralization, occasional marked hypertrophy of single hairs. There are probably invisible mosaics of similar character in many other parts of the ageing body.

There is an interesting clinical implication of the somatic mutation theory of neoplastic change, particularly in the form envisaged by Armitage and Doll. It is a cardinal point of the theory that only if a mutation results in the loss of some structure or function by which general control over growth is exercised will the descendants of the mutated cell become sufficiently numerous to produce clinically or chemically detectable effects. The commonest effects will, of course, be those resulting directly from malignant growth of the cell descendants concerned. There should, however, be occasional opportunities for mutations not themselves leading to or toward malignancy to become manifest because they have occurred in a cell line which has also become malignant.

Macroglobulinaemia (see Mackay, 1956) is a relatively rare condition found in elderly patients in which the blood contains an abnormal globulin of very high molecular weight. It is always associated with a gross replacement of the bone marrow by lymphocyte-like cells which are clearly neoplastic and which in a small proportion of cases give a blood picture hardly distinguishable from chronic lymphatic leukaemia. Whenever the abnormal proteins from different cases of macroglobulinaemia have been compared they have shown sharp individual antigenic differences (Habich, 1953; Kanzow, 1954). Immunologically, and therefore genetically, the appearance of a capacity to produce macroglobulins in excess cannot be directly related to the changes resulting in gross proliferation of the pathological lymphocytes. The only reasonable interpretation is that in each case an independent mutation has occurred in the cell line from which the neoplastic cells have sprung. No other explanation seems capable of covering the facts, notably the rarity of the condition, its age incidence, and the heterogeneous character of the abnormal protein.

Possibility of Directed Mutation

Mutation, whether occurring spontaneously or under the influence of mutagenic radiation, is regarded as a random occurrence, striking any given cell at random (a zero order reaction) and producing mutations of varied type, although for our present purposes only those associated with selective growth are observable. There is now, however, a fairly long list of chemical agents which can be called mutagenic on the basis of experiments on one or other form of organism, *Drosophila* and *Bact. coli* being the favourite test objects. These include a number of carcinogens, mustard gas and nitrogen mustard being the best documented. It is a necessary weakness of experimental work on mutagens that in general only rather gross mutations are recognizable, and, as might be expected, most of the known mutagens are toxic to cells at the stage of division and show a capacity to produce visible abnormalities in the chromosomes. More subtle changes may well be missed by current methods.

The observations and deductions of Bird and Fahmy (1952), who studied changes produced in the salivary chromosomes of *Drosophila*, suggest that carcinogens, like the diepoxybutane they used, may act to produce minor degrees of chromosome damage. They found a high proportion of minor deficiencies in the band pattern of the chromosomes of treated larvae; these varied from defects in staining properties to complete absence of a band. They suggested that the findings were best interpreted as due to chemical damage of the molecular pattern of a gene which prevents its normal replication.

As in every other natural situation, the effect of a mutation is observable only under a limited range of conditions.

If we have a somatic mutagen acting on a mammalian body cell a mutant character can be recognized only under one of two conditions: (1) it may itself provide an opportunity for the cell concerned to produce more descendants than its unmutated congeners; or (2) it is associated either randomly or necessarily with another mutational change allowing selective overgrowth of descendants. Examples of the second class may be found in the variety of rare pathological conditions in which antigenically atypical proteins appear in the serum in association with a variety of neoplastic changes, including myeloma and lymphatic leukaemia.

The problem of the aetiology of cancer or of the mechanism of experimental carcinogenesis may represent essentially a choice between three alternatives. In each it is accepted that the malignant cancer cell is genetically different from the normal cell from which it is derived.

1. Is "mutation" produced by direct damage to chromosomal material altering the genetic code in random fashion? Those mutations which "release" a control against excessive growth will prosper, others will have unobservable results.

2. Are mutations always occurring and the effect of the carcinogen merely to provide, by its combined stimulation of destruction and regeneration, large numbers of cells in which mutations can occur and a specially suitable environment for any cell with a mutation appropriate for differential overgrowth in the special local environment provided by the carcinogen?

3. Does the carcinogen, acting on some key cellular component x , render x non-functional by combining with it, and, by one or other causal mechanism, induce the cell or its descendants to undergo a genetic change by which the component x is no longer produced? One can imagine that a persistent demand for x , owing to its inactivation as soon as it is produced, might in some way lead to damage of the gene controlling the specific pattern of x .

Unfortunately it appears to be extremely difficult to find an experimental choice between the three alternatives, the main difficulty being that by the nature of the material we are precluded from being able to assess what other types of mutations are occurring. The type of experiment which might be expected to throw some light on the matter is that used by Berenblum and Shubik (1949) to demonstrate the co-carcinogenic action of croton oil on mice. Here only a single application of a carcinogenic hydrocarbon is needed to allow the eventual development under prolonged croton oil treatment of foci of neoplasia in numbers approximately proportional to the concentration used of the primary carcinogen. Here it becomes almost impossible to assume that the initiating carcinogen did no more than make use of spontaneously occurring mutations. Somehow or other the primary agent rendered a cell and/or its descendants susceptible to the co-carcinogenic action of the croton oil.

Of the suggestions that have been made to account for the action of carcinogens in producing what is at least an equivalent of somatic mutation, one of the most interesting is Green's (1954) immunological theory of cancer. This makes some use of the self-marker concept of antibody production and immunological tolerance described earlier. Prior to Green's work, immunological ideas were called in, in cancer research, only in discussions of the phenomena of transplantable tumours. It was well known that on first appearance a spontaneous tumour will be transplantable only to mice homozygous with that in which it appeared. After it has been thoroughly adapted to transplantation within the pure strain, it will often be found possible, by one artifice or another, to obtain growth in another strain of mice. Eventually it may be possible to obtain a tumour which is transplantable to and grows freely in any strain of mice.

It is the orthodox opinion, which is backed by a variety of immunological evidence, that the basic reason for failure to grow in a heterologous strain is the immune response of the new host to the foreign marker antigens in the graft.

If these marker antigens are lost the tumour develops a progressively wider range of transplantability. As this change is also associated in general with an increase in the other aspects which measure intensity of malignancy, it is a natural extrapolation to think whether loss of markers is not the primary determinant of malignancy.

Green developed his approach from the finding that certain non-carcinogenic hydrocarbons could render mice non-receptive to transfer of tumours which they would otherwise accept. He believed that a carcinogenic hydrocarbon acted by combining with one of the characteristic antigens of the cell type involved and so producing a new antigenic pattern and provoking an immune response against the modified cells. If a somatic mutation occurred by which a cell lost the marker with which the carcinogen could unite, this would give the cell an advantage, since it would not now be damaged by the immune response. If in addition the loss of the marker represented the loss of one of the points necessary for the organism's control the cell would be on the road to the development of malignancy. On this view the wide variation in the nature of carcinogenic molecules, and the equally wide disparity in the species and tissues susceptible to their action, depends essentially on the accident of specific capacity to combine with the pattern characteristic of a marker molecule.

Observations which may be highly relevant to this hypothesis concern the production of hepatomas in rats by administration of butter yellow and similar azo dyes. Here it has been shown that the dye, or derivatives thereof, is bound firmly to a liver protein which is found in the soluble fraction of homogenates and migrates slowly in electrophoresis. A single type of protein seems to be responsible for holding about 80% of the bound dye. When hepatomas develop they contain no protein-bound dye, and their content of the group of liver proteins concerned is much lower than in normal liver tissue. Dyes of this type have a variety of damaging effects on the liver, and small areas of regenerating cells arise, from some of which hepatomas eventually develop.

The suggestion that a specific protein is lost in the process is strongly supported by the immunological work of Weiler (1956). He showed that hepatoma cells contained very little or no specific liver antigen, and, by using Coons's fluorescent antibody technique, detected a series of changes in livers of rats fed the dye. In the earlier stages islets of cells developed which fluoresced less brightly than the normal liver cells surrounding them when stained with a specific anti-rat-liver serum. We thus have evidence of a series of changes involving the progressive loss of protein capable of binding dye products and, concomitantly, a series of changes in immunological character. As Green points out, these findings recall the fact that carcinogenic hydrocarbons are also bound early to proteins in epithelial cells of treated skin, but the fluorescence which evidences this binding is not seen in developed cancer cells.

It seems unlikely that we are dealing here only with the selection of random mutations. Even with associated damage and destruction with much regeneration of cells the speed of mutation would need to be greatly accelerated to account for the results. The possible interpretations are:

1. Spontaneous undirected mutation in cells rendered highly susceptible to mutation by the agent used.

2. Heightened selection against cells carrying the component with which the carcinogenic agent reacts. The only likely suggestion is Green's, that the action of the carcinogen creates a new (and foreign) antigen which provokes an antibody response. This will thus provide a specific selective agent acting against cells capable of binding the carcinogen. When such a mutation occurs it will have a high probability of giving descendants which will replace or overgrow the normal form.

3. By a mechanism perhaps related to what must be assumed to occur in the process of differentiation during development, specific mutations by loss occur when a functioning entity in the cell is unable to exercise that function. These result in the inhibition or disappearance of the genetic mechanism concerned with that function.

Broadly speaking, the choice is between interpretations 2 and 3, although it must be recognized that these are by no means mutually exclusive. Since 2 is concerned with a specific selective process and 3 with a hypothetical type of induced mutation, the two could well be combined.

Alternative 2, the immunological theory of cancer, has the great advantage of being susceptible to experimental attack along the lines discussed by Green (1954). I have not been able to find any account of experiments in which the action of standard carcinogens was tested in mice treated with x rays and cortisone to eliminate or greatly diminish the antibody response. A strong anticarcinogenic effect under these circumstances might speak strongly for the correctness of Green's hypothesis.

Alternative 3 is virtually what has been suggested by Haddow and others largely on the basis of the work by the Millers, Weiler, etc., on the production of hepatomas in the rat. It is wholly speculative at the present time, the difficulty of establishing it being the familiar biological one of differentiating between spontaneous mutations with selective survival and a direct environmental effect. Past experience should make us lean toward a Darwinian rather than a Lamarckian interpretation, but, on the other hand, we cannot ignore the possible analogies from the process of differentiation.

Differentiation can be legitimately regarded as a process by which the potentialities of a cell are progressively reduced with its taking on of a specialized function. Tissue culture studies indicate that to a considerable extent the differentiated cell is so in virtue of its inheritance. Even in the absence of normal body controls, its descendants differ from the descendants of other types of specialized cells. If this is so the differentiation must also involve the genetic mechanism. Various aspects of this must be "closed down" either by some form of inhibition or by actual irreversible loss of the genetic unit in question. This closing down cannot be of the nature of a random mutation; it is causally determined in the process of development. The sequence of cause and effect is unknown, but speculation would follow the lines adopted by Pollock (1953) in his interesting discussion of the way enzymes may be developed in the process of biochemical ontogeny. An enzyme is built when a substrate for it appears: a gene will be inhibited, destroyed, or lost when its final product ceases to be of functional significance. To convert that teleological statement into mechanism is a task for the future. At the very least it seems to demand that there is a "feed-back" of information from the cytoplasm to every functionally active component of the genetic mechanism. Most cytologists nowadays would probably be willing to allow this.

There may therefore be some justification for going beyond random somatic mutation to account for the high intensity of carcinogenic action of certain chemical agents.

[Parts III and IV, with a list of references, will appear in our next issue.]

The Casualties Union has published a booklet describing its history and work. In 1942 Mr. E. C. CLAXTON, then commandant of the Surrey County Civil Defence Rescue School at Leatherhead, founded the Casualties Union to provide skilled "casualties" for use in Civil Defence training schemes. So that they could play their part with realism these "casualties" were given a medical briefing and a theatrical make-up. The scheme proved so successful that by 1944 the School was turned over wholly to training members of the Allied Armies. When in 1945 Civil Defence was stood down the Casualties Union decided to continue its work, and still provides skilled "casualties" for use in rescue training of all types, first-aid lectures, and rescue competitions. The Union, with a membership of about 1,500, is run on voluntary subscription, and has extended overseas. Inquiries about the Union will be welcomed at its headquarters at 316, Vauxhall Bridge Road, London, S.W.1.

CLINICAL AND SOCIAL PROBLEMS OF PEPTIC ULCER*

BY

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Diagnosis

Establishment of the diagnosis of peptic ulceration can be difficult. The clinical picture may be atypical and there are fallacies about the various investigations.

Clinical Picture

Typically there is epigastric pain associated with food, eased by alkalis and coming on in attacks, but there are many variations. The pain may occur high up in the chest over the sternum, or lower down around the umbilicus or even in the iliac fossae. Sometimes the pain is predominantly in the loin under the costal margin, spreading into the back, simulating a renal pain, especially on the right side. It may be felt only in the back and thought to be muscular in origin—"dyspeptic backache." Apart from the position being unusual, the pain may range from a minimal discomfort to one of considerable severity. It is not uncommon for ulcer pain to come on unrelated to meals, particularly towards the end of the day; relief with alkalis, although the rule, may be lost, particularly with chronic perforation of the ulcer from the stomach or duodenum into the surrounding viscera. Sometimes no pain at all is felt and the ulcer reveals itself by bleeding or perforating. Heartburn, anorexia, periodic nausea, bouts of vomiting, waterbrash, all without pain, may be the only symptoms.

These unusual clinical pictures cause serious difficulties, particularly with patients in whom the radiologist has difficulty in demonstrating an ulcer. This occurs especially in ulcers in the roof of the pyloric antrum and with post-bulbar duodenal ulcer; in such cases a series of negative reports may be recorded before the presence of the ulcer is finally proved, perhaps by clinical complications, gastroscopy, or laparotomy. These patients tend to be diagnosed as having an abdominal neurosis, chronic pancreatitis, or lumbago. They may well develop a secondary neurosis from the uncertainty of their lives and from the failure of their doctors to establish a physical diagnosis. In practice these patients have a consistent story, clear-cut and unembellished by the flights of fancy so common with the true neurotic. The ulcer subject may have pain "like knives sticking in me," which is true, but he will not say he is being "burned alive with wind."

Why do some patients have atypical symptoms? The ulcer with a thick slough may itself be insensitive to pain while pylorospasm is producing oesophageal reflux and heartburn. Enterospasm may occur and the patient may complain of flatulence, trying to bring up wind unsuccessfully, as it may be locked in the splenic flexure of the colon. The ulcer may penetrate surrounding structures, giving rise to parietal pain in the back. A stomal ulcer after partial gastrectomy may become adherent to the diaphragm and chest wall, causing severe

*The second of two Lumleian Lectures delivered to the Royal College of Physicians of London on April 10 and 12, 1956. The first lecture was printed in last week's issue (p. 719).

intractable pain which is possibly diagnosed as intercostal neuritis. Similar pain may be felt in the back, with posterior perforation, and may be diagnosed as rheumatism. Even without parietal extension, pain reference may be bizarre. As the foregut is embryonically a midline organ, the pain reference may be to either side, and left-sided pain may be felt with a duodenal ulcer even when a gastric lesion has been fully excluded. Individuals vary greatly in their threshold to pain—some are very insensitive to parietal pain, others extremely sensitive—and this can be measured with an algometer (Keele, 1954). Lack of pain from viscera may correlate with pain insensitivity as measured in this way, but this is inconsistent and more work is needed on this point.

With any recurrent pain from below the nipples to the iliac crest, in the loin or in the back, one cannot exclude an ulcer because the pain is unrelated to meals or unaffected by alkalis or vomiting, and further investigation is needed. Physical examination, too, may be misleading. Usually there is epigastric tenderness, but this can be entirely absent in the presence of an active ulcer. Further investigation may involve examination of stools for occult blood, barium meal, gastroscopy, and gastric secretory tests.

Investigations

Barium-meal Studies.—With present-day radiology there are still practical difficulties in the demonstration of peptic ulcer, and there is need for the clinician to be more aware of the practical problems of radiology of the alimentary tract. Too often still the radiological report is regarded as final proof. The interpretation of various shadows, deformities, or lack of deformities, must be interpreted in relation to the clinical picture. Some radiologists readily interpret minor mucosal irregularities in terms of peptic ulcer, and others are not so misled. The interests of the patient are best served by maintaining a personal contact between radiologist and clinician who jointly discuss the films.

Considering the physical limitations of the method of investigation with its reliance on shadows and outlines, results are surprisingly accurate in expert hands. Nevertheless, both false-positive and false-negative reports can be made, but these diminish in direct proportion to the contact between clinician and radiologist, and their mutual experience of gastroscopy.

Gastroscopy.—With first-class radiological assistance, the scope for gastroscopy is limited, but it is of help in those cases where there is a discrepancy between the clinical and the radiological picture. Occasionally a chronic gastric ulcer missed by the radiologist may be discovered, and this occurs particularly with ulcers well away from the lesser curve or in the antrum. Sometimes rugal folds may simulate a gastric ulcer on x-ray examination, and the diagnosis can be disproved by gastroscopy. The diagnosis of a gastric diverticulum may be firmly established by direct inspection. The finding of gross mammillation and rugosity of the mucosa may lead to further radiography of the duodenal bulb for duodenal ulceration, or pH studies. Gastroscopy is especially useful in assisting in the diagnosis of bizarre x-ray pictures, when the question of malignancy arises. With present-day technique and adequate premedication, the procedure is extraordinarily well tolerated, and the risk of oesophageal trauma or other hazards is very small. The examination may be done under general anaesthesia if the patient is especially sensitive. Gastroscopy also has a place in defining the cause of bleeding after haematemesis and melaena, particularly in demonstrating acute gastric ulcers which heal quickly.

Gastric Secretory Tests.—Normally gastric secretory tests play a very limited part in the diagnosis of peptic ulcer. Their contribution has been very much overrated in the past, as their fallacies have not been sufficiently appreciated.

As commonly done by the nursing staff, fractional test meals are an almost worthless investigation and do not justify the discomfort to the patient or the time spent by the laboratory staff. If any value is to be given to a report it is essential to know where the tube was in the stomach. In at least one in five tests the tube will curl up in the fundus, where the level of acidity is often substantially lower than in the body of the stomach. This fallacy can be avoided by using a radio-opaque tube and screening the patient at onset to make certain the end of the tube is to the left of the spine and not coiled in the stomach. No test has yet been devised which conclusively separates duodenal ulcer patients from those without ulcers, but duodenal ulcer tends to be associated with hypersecretion, and its demonstration may contribute to the diagnosis in some cases. Alternatively, the finding of achlorhydria would be against the diagnosis. The stimulus of food may be better than histamine. Watkinson and James (1951) found that, by taking the pH of gastric juice aspirated at hourly intervals over the 24 hours, they could demonstrate the presence of acid often for hours in "achlorhydric" patients with gastric ulcer; during this time patients were eating their usual diet.

Stool Examination for Occult Blood.—Examination of the stools for occult blood provides the clinician with an important screening test in the investigation of dyspepsia, a positive reaction needing further investigation and a negative test being reviewed in the light of the patient's history. It is important to realize that negative tests may occur sometimes in the presence of active peptic ulcers. The Gregersen slide technique with benzidine is a simple and reliable test, and, provided the patient is not eating liver or dishes containing animal blood, no dietary restriction is needed.

Special Diagnostic Problems

There are certain recurring problems in diagnosis, and these particularly concern post-bulbar duodenal ulcer, giant gastric or duodenal ulcers, and the distinction between simple and malignant gastric ulcers.

Post-bulbar Duodenal Ulcer

These cases tend to be especially difficult to diagnose, as the duodenal bulb may fill well and distract attention from an ulcer crater which is difficult to see without careful study. Even at laparotomy the ulcer may be missed unless the duodenum is opened. Certain clinical features are to be noted. Pain tends to be in the back, occurs particularly towards the end of the day and at night, and is difficult to relieve. Bleeding is quite common, and episodes of intermittent obstruction with sudden pain and vomiting may occur.

A man aged 52 gave a three-year history of intermittent retrosternal pain going through to the back "like knives." It would occur at any time of the day and night, but particularly at night, sometimes awaking him. He would often vomit, but without relief. The pain would be severe for 20-30 minutes and then ease spontaneously. Alkalis gave little relief, but "liver salts" seemed to help. Two previous x-ray examinations had been reported as normal and a diagnosis of pancreatitis was suspected. Stools were negative for occult blood. When x-rayed again at Central Middlesex Hospital no ulcer was found: the duodenal cap was large and filled well. The examination was repeated and the diagnosis of post-bulbar ulcer was clearly established and confirmed at operation.

A man aged 38 had had a melaena four years previously and later developed severe attacks of vomiting and back pain which lasted several days, recurring six to seven times a year, with complete freedom between them. He had three negative x-ray examinations at different hospitals and was diagnosed as neurotic on two occasions, and as having intestinal obstruction on the third occasion. An emergency laparotomy was performed, but nothing abnormal was found. When he attended Central Middlesex Hospital, a barium-meal examination showed a duodenal ulcer in the second part of the duodenum, so he was admitted for partial gastrectomy. At operation no ulcer was apparent from the external appearances, but a crater was felt in the second part of the duodenum on the posterior wall.

The experience of this group of cases emphasizes the need to look for a post-bulbar duodenal ulcer when there are recurrent persistent symptoms of upper abdominal or back pain, and to be cautious in accepting a negative x-ray report.

Giant Gastric and Duodenal Ulcers

Large simple gastric and duodenal ulcers are not rare; with large gastric ulcers having a diameter of more than 3 cm. radiologically, the probability is much in favour of a simple rather than a malignant lesion. In the admirable series recorded by Jennings and Richardson (1954) only 1 out of 17 proved to be neoplastic. The clinical picture with large ulcers is invariably atypical, and the patient may be thought to have carcinoma of the stomach or of the pancreas. There may be a considerable degree of cachexia, and a depressive state may add to the difficulties of diagnosis. Atypical pain may lead to an initial diagnosis of renal colic, fibrositis, or angina until it is realized that the alimentary tract may be at fault and a barium-meal examination is arranged. A large gastric ulcer with a short history may heal completely and a medical trial is worth while, but the prognosis is poor if there are other associated illnesses.

Large duodenal ulcers also cause diagnostic difficulties, as the size of the ulcer may superficially simulate a normal duodenal cap until close study demonstrates the loss of mucosal pattern and its consistency of size and shape in different films. Oedema around such large duodenal ulcers may cause distortion of the antrum and lead to an initial diagnosis of carcinoma of the stomach.

Distinction Between Simple and Malignant Ulcers

A vital problem in the management of gastric ulcer is the distinction between simple and malignant ulcers. It has been stated frequently, particularly in the United States, that 10% of gastric ulcers are malignant and therefore all must be treated surgically. This bald statement of incidence is probably correct, but makes no allowance for the full use of radiology and gastroscopy in arriving at a diagnosis of a simple or a malignant ulcer. The gastric ulcer which projects clearly from the lesser curve, between the angulus and the cardia, is virtually never malignant. A follow-up study (Avery Jones, 1955a) showed that the chance of missing a malignant ulcer was under 1%.

A small point, but one of considerable interest, is the infrequency of aortic calcification in carcinoma of the stomach as compared with simple gastric ulcer. This was first reported by Elkeles (1949) and confirmed by our observations, although with lesser differences between the two conditions. It is not yet clear whether calcification is less common with carcinoma of the stomach or more common with gastric ulcer.

The distinction between simple and malignant ulcer at laparotomy can be difficult, and errors both ways are not uncommon. It would seem that x-ray films and gastroscopy are much more accurate aids to a correct diagnosis in the early case than inspection and palpation at laparotomy. The mistaking of malignant ulcers for simple ones at the time of acute perforation is referred to below. A wrong diagnosis of malignant ulcer may be made at laparotomy in the presence of a large simple ulcer associated with much inflammatory reaction and lymphatic glandular enlargement. A number of such cases have been seen where the surgeon was so confident of the diagnosis that no biopsy was taken, yet the follow-up has established the diagnosis of a simple ulcer.

There has been much controversy in the past about the risk of malignant degeneration of simple gastric ulcers. The experience at Central Middlesex Hospital would suggest that secondary malignant degeneration is extremely rare in a simple ulcer. With malignant ulcers the lesion has usually been malignant from the onset, but has undergone secondary peptic digestion. Alternatively, a carcinoma may have arisen independently, but adjacent to a simple ulcer. There

is evidence that patients who have had undoubted simple gastric ulcers are, in fact, more liable to develop gastric cancer subsequently.

Treatment

Does dietetic treatment influence the natural history of gastric and duodenal ulcer? The evidence is regrettably slender that real benefit is derived from the traditional dietary regime, and overtreatment can undoubtedly be positively harmful. There is, fortunately, a strong natural tendency to recovery, for which the patient tends to give the credit to his treatment. Martin and Lewis (1949) reviewed a series of 365 patients with gastric or duodenal ulcers 10 years after in-patient treatment and concluded: "It is undeniable that medical treatment relieves the discomfort of most relapses; but from our present evidence we cannot believe that it is any protection against further trouble if this is destined by the ulcer. . . . Those cases which were active persevered with their regimen and also suffered complications, while those who were inactive abandoned treatment and had no trouble." Rae and Allison (1953) reached a similar conclusion from a follow-up group of 63 men with proved peptic ulcer, kept on a careful dietetic regime for 12 months and then reviewed after five years.

Doll, Friedlander, and Pygott (1956) compared an almost normal (fried-free) diet with the standard ulcer regime in patients followed up for a year. In their series there were 64 in-patients with gastric ulcers, 80 out-patients with gastric ulcers, and 50 out-patients with duodenal ulcers. The out-patients were either advised to continue for a year on the standard ulcer diet with which they had previously been treated or were advised to revert to a wholly normal diet. At the end of the year the proportion who had remained free from pain and in whom the ulcer was radiologically healed was practically the same in both groups.

Do other measures besides ordinary dietetic care facilitate the healing of ulcers? In studying the effect of alkalis and milk drip, careful measurements concerning the rate of healing of gastric ulcer have been made with the addition of alkalis to a milk drip in sufficient quantity for the acidity of the gastric contents to be kept above pH 4 throughout the 24 hours. This trial (Doll, Price, Pygott, and Sanderson, 1955) demonstrated, however, that the milk drip produced a greater gain in weight—7 lb. (3.2 kg.) compared with 3 lb. 8 oz. (1.6 kg.)—and the impression was obtained that pain was relieved more rapidly with milk drip than without it, and that therefore it is a useful adjunct to the standard treatment in patients whose pain persists after rest in bed. Similar in-patient therapeutic trials have been made with phenobarbitone, ascorbic acid, and bed rest (Doll and Pygott, 1952), and with "robaden" and cabbage juice (Doll and Pygott, 1954). Two factors only have so far been demonstrated as having a beneficial influence—admission to hospital, which implies bed rest, and stopping smoking.

Our trials on out-patients with duodenal ulcer have not, unfortunately, produced any conclusive evidence of benefit from this treatment. Friedlander (1954) studied five groups of 25 duodenal ulcer subjects on "ribena" syrup, a control syrup, oral hexamethonium, olive oil, and oral methantheline, and followed them up clinically and radiologically for 15 months. Methantheline may have been of use in some cases in the initial relief of pain, but if there was any such effect it did not persist beyond the first nine months. There was otherwise no difference in the symptoms, rate of healing, or frequency of recurrence between the groups great enough to suggest a beneficial effect from any of the treatments. Even if there is no good statistical evidence for the beneficial effect of diet on the healing of ulcers, it cannot be abandoned in the acute stage when the patient is undoubtedly more comfortable on a light diet. Whether the patient is ambulatory or in bed initially, small two-hourly feeds are undoubtedly better tolerated than ordinary-sized meals, and enable him to become symptom-free more quickly. Very soon a reasonably generous basic diet may be given which

will enable the patient to maintain or gain weight. Patients who put on weight usually do well. If a milk drip has been started, it may be continued with the diet for a time in order to increase the calorie intake.

Bed rest is a most valuable measure. It probably means that the position of a gastric ulcer is altered in relation to the gastric juice and perhaps the jet of fluid from the pylorus may no longer impinge on a duodenal ulcer. It must be admitted in individual cases that it may be better for the patient to carry on at work rather than impose the added financial hardship of loss of work. Simple measures should be tried at first, designed to reduce fatigue, to increase regularity of meals, and to reduce or, preferably, stop smoking. If there is troublesome pain, bed rest is, however, necessary.

The next essential is to tackle the anxiety factor, which may seriously aggravate the disease process and retard healing. It is important to establish a good rapport with the patient, and this requires time, privacy, and patience, and on the whole is more easily achieved with a patient having bed rest. Once the patient feels he has a sympathetic independent person who is anxious to help in the capacity of a friend and not as a judge, he may be prepared to unburden the difficulties which too often have caused pent-up emotional stress because there has been no one in whom he could confide. The relief of such emotional tension is in itself of great therapeutic value; so often the patient has got his difficulties out of perspective and they have become much more important than they really are. This is where the independent observer can give valuable help. This approach is equally important with any other chronic illness, such as pulmonary tuberculosis and skin disease.

If there is pain, alkalis should be prescribed between each feed, using first an insoluble alkali, but if this is insufficient a mixture containing sodium bicarbonate may be used temporarily. There is no need to continue frequent alkalis after the symptoms have subsided, and the dose should then be reduced and finally stopped. Initial sedation is often very helpful.

During the past few years there has been a great spate of anticholinergic drugs. Belladonna has had a time-honoured role, and these new preparations have sought to emulate its action but with fewer undesirable side-effects. In general, the therapeutic contribution of these new drugs has not been impressive.

Over-treatment

Can over-treatment of peptic ulcer be harmful? Clinical practice provides many examples of the undesirable effect of overdosage of dietary regimes. A proportion of patients are obsessional in their strict adherence to a medical regime, and three examples are given.

A medical student with a duodenal ulcer was being treated on a very elaborate regime. The failure of the nursing staff to adhere completely to the instructions induced a state of nervous apprehension and annoyance, and his pain persisted. When transferred to another ward the elaborate regime was stopped and he quickly became free from pain.

A hospital doctor with a duodenal ulcer had his meal-times spoilt because his diet was not contrived as perfectly as he would have wished. His symptoms ceased when his diet was stopped and he joined his colleagues in eating the ordinary hospital food.

An out-patient came to the hospital asking for a partial gastrectomy. Inquiry revealed that he had not, in fact, had any pain for five years, but he was now engaged and wished to take his girl friend to a restaurant and have ordinary meals.

It is perhaps the same obsessional nature, coupled with too blind a faith in advisers, which leads to the more serious complications of alkalosis or the milk-alkali syndrome. The risk of excess of soluble alkalis, particularly in the presence of vomiting from pyloric stenosis, is very well known. It is, however, less well recognized that excess of calcium from taking too much milk and alkali over long periods can cause a calcinosis and with it an impairment of renal function (Burnett *et al.*, 1949).

Milk-alkali Syndrome

The first manifestation of the syndrome is usually general malaise with weakness and lethargy. Mental disturbance such as impairment of memory and confusion are common, and psychosis and coma have been reported. All cases so far reported have followed prolonged medical treatment for presumed or proved peptic ulcers, and a not uncommon presentation is that of nausea and vomiting occurring in the absence of pyloric obstruction. Polyuria may be a feature, and generalized severe pruritus has been a major complaint in many cases. An antipathy to milk may develop. Hypercalcaemia is consistently found, usually but not always with an alkalosis, but Burnett *et al.* pointed out that hypophosphataemia is noticeably absent and increased urinary excretion of calcium does not occur. The serum alkaline phosphatase is normal, but a raised blood urea and albuminuria are always present. Metastatic calcification may occur and nephrocalcinosis and nephrolithiasis are common findings. In advanced cases with irreversible renal damage death may occur from uraemia.

It would appear that the syndrome is precipitated by the absorption of base from the ingested milk and alkalis in excess of renal excretion with accumulation of calcium and possible magnesium in the body. Whether this can occur in the presence of previously normal renal function is still undecided. Wilkinson and Jordan (1934) suggested that antecedent renal damage is present in most cases, but Kirsner and Palmer (1942) disagree. It is known that a metabolic alkalosis can lead to renal damage, but not all the reported cases have shown an alkalosis when examined. Hypercalcaemia itself may lead to impairment of renal function, but it is a feature of the 30 cases so far reported that at no stage has an excessive renal excretion of calcium been noted. The importance of the condition lies in the fact that it is iatrogenic and reversible, the latter feature being unfortunately all too rare in chronic renal disease. A reappraisal of patients with peptic ulceration and so-called "chronic nephritis" may perhaps reveal more cases of the milk-alkali syndrome.

Surgical Treatment

Surgical treatment of uncomplicated peptic ulcer will not be discussed in detail. In approximately half the patients with gastric ulcer and a third with duodenal ulcer persistence of symptoms and failure of the ulcer to heal earn the patient surgical treatment. The results, although generally good, do not allow complaisance and must encourage all further medical avenues of research. There is no reason for believing that a simple medical treatment will not one day be found.

Complications

Pyloric Stenosis

Pyloric stenosis is an inaccurate terminology, as so often the obstruction is in the duodenum. Some degree of narrowing is a common occurrence from healing of juxta-pyloric and duodenal ulcers. The presence of narrowing is not necessarily reflected by clinical symptoms of obstruction or radiological evidence of delayed emptying. There can be appreciable narrowing of the pylorus demonstrated at operation in patients in whom no clinical or radiological evidence of retention has been noted. The anatomical lesion may be fully compensated by muscular hypertrophy of the stomach. The development of clinical symptoms of pyloric obstruction is often due to an exacerbation of the ulcer with increased narrowing from oedema and spasm in the presence of an already narrowed lumen.

Failure of this compensation, either from chronic narrowing or from acute or chronic obstruction, leads to evidence of gastric stasis from gastric aspiration or by delayed emptying of the stomach. An evening aspiration of more than 300 ml. or an early morning volume of over 100 ml. suggests obstruction, and so does barium in the stomach six hours after a barium meal. It is necessary to distinguish between gastric stasis and pyloric obstruction.

Gastric stasis may occur apart from pyloric obstruction and be due to hypotonia from potassium depletion, or it may occur in association with migraine. The unexpected finding of a large slow-emptying stomach may sometimes be explained by an attack of migraine coinciding with the barium meal examination.

Pyloric obstruction is most commonly due to peptic ulceration or neoplasm, but acute small marginal erosions may be sufficient to cause distressing symptoms with pain and vomiting (Kinsella, 1951). Other causes include achalasia of the pylorus, hypertrophic pyloric stenosis in adults, a congenital duodenal diaphragm, a polyp of the stomach intermittently prolapsing through the pylorus, a cholecystoduodeno-colic ligament obstructing the first part of the duodenum, the delayed effect of corrosive poisoning, or ferrous sulphate poisoning, which has also caused pyloric stenosis in children.

Pyloric obstruction can be produced by adhesions to an inflamed gall-bladder, without duodenal ulceration being present. Although the symptomatology of pyloric stenosis is usually typical, the presenting clinical picture is sometimes unusual. A number of cases have been sent to hospital as haemorrhages because of the dirty vomitus. Diarrhoea is an occasional initial symptom with pyloric obstruction.

The important recent progress in the management of pyloric stenosis is related to a better understanding of the disturbances in electrolytes. It is well known that in pyloric stenosis there is a deficiency of serum chloride ions with an excess of bicarbonate. In the past this has been attributed to loss of hydrochloric acid by vomiting or gastric aspiration, and the dangers of alkali therapy have been stressed. More recently attention has been focused on potassium depletion as a cause of alkalaemia.

Black and Jepson (1954) have shown by retrospective balance studies that there may be a deficiency of up to 800 mEq of potassium in patients with pyloric stenosis. How this arises is not entirely clear. Some potassium is lost in the gastric juice, but the concentration is much lower than that of sodium and chloride, and vomiting by itself would hardly account for such severe potassium depletion. Deficient dietary intake and renal inability to conserve potassium under the metabolic conditions obtaining in pyloric stenosis are presumably additional important factors.

When potassium is lost from the cells it is replaced by sodium and hydrogen ion, giving an intracellular acidosis. If there is an adequate supply of sodium this process can be continued until one-fifth of the intracellular potassium has been lost without serious disturbance of function. This fraction has been called the muscle labile potassium. In potassium depletion the kidneys excrete a more acid urine than seems appropriate to the serum electrolyte levels, so that in pyloric stenosis with alkalaemia a "paradoxically" acid urine may be found. The paradox is explained by the intracellular acidosis, and overall there may be a greater deficiency of basic rather than acidic ions.

The response of patients with pyloric stenosis and alkalaemia to intravenous sodium therapy is explained in part by the ability of sodium to replace potassium in the cells. The potassium becomes available to the kidneys for excretion as alkali and the alkalaemia is decreased. In the untreated case there is rarely an excess of sodium available to replace the muscle labile potassium. In this way potassium deficiency can impair the renal ability to excrete alkali without gross depletion of the body reserves. Severe potassium depletion of the muscles can occur following prolonged sodium therapy.

Sodium deficiency may be gross in pyloric stenosis; in one of the cases reported by Black and Jepson it amounted to 1,600 mEq. Serum levels and clinical dehydration are probably reliable guides to saline therapy. Potassium depletion is more difficult to assess, and normal serum levels are the rule in the untreated case. It is probably safe to assume there is potassium deficiency whenever there is a raised serum bicarbonate level. In mild cases potassium

by mouth will usually correct the electrolyte deficiency. In more severe cases intravenous normal saline should be given with potassium as soon as it is clear that there is adequate renal function.

Acute Perforated Peptic Ulcer

The mortality from this complication has fallen very considerably since before the second world war. The changing mortality is seen in Table VI. With the introduc-

TABLE VI.—Acute Perforated Peptic Ulcer, 1939-55

Years of Admission	Operated		Not Operated		Total	
	No.	Deaths	No.	Deaths	No.	Deaths
1938-40	106	29 (27.4%)	1	1	107	30 (28.0%)
1941-3	115	20 (17.4%)	8	7	123	27 (22.0%)
1944-6	135	12 (8.9%)	16	16	151	28 (18.5%)
1947-9	168	4 (2.4%)	14	12	182	16 (8.8%)
1950-2	218	9 (4.1%)	12	10	230	19 (8.3%)
1953-5	168	13 (7.7%)	15	13	183	26 (14.2%)
	910	87	66	59	976	146

tion of antibiotics and relaxant anaesthesia the mortality in operative cases fell to 4% in 1952, but this level has not been maintained since and there is still a toll of delayed deaths in the third or later weeks from haemorrhage or sepsis. Forty per cent. of deaths occurred in patients not operated upon. A third of these patients were, in fact, not diagnosed in life, the figures being:

Undiagnosed in life	..	..	24
Too ill for operation	..	..	36
Refused operation	..	..	1
Elective conservative treatment	..	..	5

Those undiagnosed in life presented a variety of clinical pictures—heart failure from cor pulmonale; pneumonia with pleuritic pain; unusual tachycardia after admission for severe haemorrhage. In none had there been any real clinical evidence of an acute perforation such as a sudden episode of pain or collapse, but there was usually a degree of toxæmia out of proportion to the presumptive diagnosis. The therapeutic dividends in this group are small, but it is important to remember this possibility when dealing with a patient whose degree of toxæmia is out of proportion with the presumed illness. No rigidity or tenderness may be present, and an x-ray examination is essential to establish the diagnosis.

Those too ill for operation are patients with peripheral circulatory failure who fail to respond to resuscitation. These are mainly patients with long-delayed admission to hospital. Early diagnosis is unfortunately sometimes prevented by the amazing fortitude of patients.

Operation has been the treatment of choice and medical management used only for patients whose perforations had obviously sealed off or whose general condition for some other reason precluded operation. Following an earlier analysis (Avery Jones and Doll, 1953) emergency partial gastrectomy has been performed particularly when there has been a history of ulcer symptoms for more than two years, and especially for perforated gastric ulcers, as this analysis had revealed that 10% of the assumed simple gastric ulcers at laparotomy were in fact neoplastic. The results since 1949 are shown in Table VII.

TABLE VII

	No.	Deaths	Mortality
Suture	365	18	4.9%
Emergency partial gastrectomy	87	4	4.6%

Hermion Taylor and Warren (1956) have made the practical observation that perforated acute ulcers—that is, those without a history of previous pain—may be treated safely without operation, and report on 47 patients who have recovered without complications. They confirm the value of emergency partial gastrectomy for perforated chronic ulcers.

Haematemesis and Melaena

In my Goulstonian Lectures (Avery Jones, 1947) a survey of 649 admissions for haematemesis and/or melaena was made, and this series has now grown to 2,011 (Table VIII). The frequency of acute ulcers causing haematemesis reported previously has been further confirmed. Of 559

TABLE VIII

Admission for Bleeding from:	No.	%	Deaths
Proved or probable peptic ulcer	1,764		135 (7.7%)
Chronic gastric ulcer	340	17.8	54
Duodenal ulcer	625	32.7	51
Post-operative group (previous gastro-enterostomy or partial gastrectomy)	118	6.2	8
Acute lesion group	559	29.3	14
Hiatus hernia	34	1.8	0
Unclassified (investigations incomplete)	88	4.6	8
Carcinoma ventriculi	39	2.2	14
Portal hypertension	52	2.7	15
Other causes	55	2.7	7
	1,910	100.0%	171 (8.9%)
Bled after Admission for:			
Dyspepsia	29		4
Acute perforation	38		17
General medical or surgical diseases	34		22
	101		43
Series total	2,011		214

patients in the acute-lesion group—that is, those with negative x-ray films—305 have been gastroscopied and 111 acute gastric ulcers demonstrated. In addition some further acute ulcers were discovered at necropsy or from the presence of minimal radiological evidence without previous dyspepsia.

Within this acute lesion group there are other causes of bleeding, such as acute gastritis, drug reactions, and traumatic ulceration from vomiting. Traumatic tearing of the oesophago-cardia junction, the Mallory-Weiss syndrome, is an important recent advance in our knowledge of the cause of haematemesis. It is well known that violent vomiting can cause a rupture of the lower oesophagus, but it is less widely known that the same trauma may cause lesser degrees of longitudinal laceration causing haematemesis (Decker, Zamcheck, and Mallory, 1953).

In the earlier series the patients were mainly treated medically to evaluate the mortality with the help of the then recently introduced drip blood transfusions and the more liberal feeding regime introduced by Meulengracht and developed in this country by Witts. It was, however, clear from the experience with these earlier series that a proportion of patients died whom surgical intervention might have been expected to help. A change in policy was considered necessary and from 1946 operation has been performed, especially on patients with known chronic ulcer whose age was over 40 and who had brisk recurrent bleeding after admission. In addition, patients with a proved or presumed acute ulcer have been operated on if there has been recurrent bleeding on two or three occasions, particularly if there was shock. There was a bias towards operation for cases with persistent pain after admission and for those whose bleeding was obviously rapid and causing marked circulatory collapse. Other factors, such as a shortage of blood of a particular group, might also have favoured surgical treatment.

In considering the problem of surgery for haematemesis and melaena, one is not concerned with the mortality of surgical intervention, for figures for surgical mortality can be very misleading. Some of the patients operated on were obviously appalling risks whose only chance of survival might have come from surgical arrest of bleeding. The proper criterion for success or failure of a surgical policy is whether the overall mortality of all admissions is influenced and also how the patients fare subsequently.

Table IX shows that changing from a medical to a surgical policy has not been accompanied by a decrease in mortality

—if anything, the overall mortality has increased. The extent of emergency surgical intervention is shown in Table X.

The series is not a homogeneous one. The scales have been weighed against the later years as the proportion of patients over 60 has increased (Table XI). There has not, however, been any significant change in the proportion of chronic ulcers. Table IX does not allow for differences in age distribution, but when this is calculated there is still clearly very little change in mortality (Table XII). The differences are not significant, but the mortality has in fact decreased in the last period.

In Tables XIII and XIV the admissions during 1941-6 have been compared with those during 1951-4. In the former period extremely few were operated on; in the later period there was a firm surgical policy towards those with recurrent bleeding after admission, particularly those over 40 years and with probable chronic ulcers. Allowing for the effect of age, it will be seen that there is a definite, although numerically small, reduction in the mortality under

TABLE IX.—Cases Admitted for Bleeding, 1941-54; Proved or Probable Cases of Peptic Ulcer

Year	No. of Cases	No. of Deaths	Mortality Percentage
1941	52	5	5.7
1942	71	2	
1943	92	4	6.6
1944	106	9	
1945	124	8	7.9
1946	118	11	
1947	91	9	7.4
1948	113	6	
1949	136	9	9.5
1950	117	15	
1951	203	13	7.4
1952	188	16	
1953	179	16	7.9
1954	174	12	
Total	1,764	135	

TABLE X.—Extent of Emergency Surgical Intervention, 1947-54

Site	No. of Admissions	No. of Emergency Operations	Percentage of Admissions	No. of Partial Gastrectomies Performed	Deaths
Chronic gastric ulcer	233	44	18.8	43	6
Duodenal ulcer	432	41	9.5	39	14
"Post-operative" group	80	6	7.5	4	3
Acute lesions	373	21	5.6	16	4

TABLE XI.—Proportion of Patients Over 60 Years, 1941-54

Age	1941-6	1947-51	1952-4
Over 60	33%	38%	40%

TABLE XII.—Mortality Rate, 1941-54

	1941-6	1947-50	1951-4
Observed deaths	39	39	57
Expected	38.6	35.58	60.82

TABLE XIII.—Mortality by Age and Period of all Male and Female Cases Admitted for Bleeding (Peptic Ulcer Group)

Age	1941-6			1951-4		
	Admissions	Deaths	Mortality	Admissions	Deaths	Mortality
Under 60	379	13	3.4%	453	9	2.0%
Over 60	184	26	14.1%	291	48	16.5%
Total	563	39		744	57	

TABLE XIV.—Mortality by Age and Period of Male and Female Cases Admitted for Bleeding (Peptic Ulcer Group)

Age	Site	1941-6			1951-4		
		Admissions	Deaths	Mortality %	Admissions	Deaths	Mortality %
Under 60	Chronic gastric ulcer	63	9	14.3	72	4	5.6
	Duodenal ulcer	141	3	2.1	192	2	1.0
	Acute lesions	121	0	0.0	151	1	0.7
	Post-operative group	28	1	3.6	20	2	10.0
Over 60	Chronic gastric ulcer	44	11	25.0	66	14	21.2
	Duodenal ulcer	52	12	23.1	87	19	21.8
	Acute lesions	63	3	4.6	79	5	6.3
	Post-operative group	10	0	0.0	22	2	9.1

60, but over 60 the mortality was correspondingly increased. These results may be interpreted in two ways. It may be said that since the introduction of surgery in a proportion of the more severe cases with continued or recurrent bleeding the overall mortality has not changed significantly, and the same proportion of patients leave hospital as when a policy of energetic transfusion and other medical measures only were used. On the other hand, it may be said that certain groups have significantly benefited from a surgical policy, especially patients under 60 with recurrent bleeding and those patients with a chronic gastric ulcer. It may also be argued that there has, in fact, been some benefit to the group as a whole, as the later years have a higher age distribution and therefore should carry a higher mortality; and, again, the mortality from partial gastrectomy is already included in the overall figure. It must also be remembered that this analysis has covered only proved or probable cases of peptic ulcer and there are other possible causes, although rare ones, for severe gastro-intestinal haemorrhage which may require surgical intervention, as, for example, simple tumours of the stomach or intestine, diverticulitis, vascular lesions, etc.

The unchanged mortality cannot be accepted at once as proving that the surgical policy should be reversed and that one should return to general medical measures in nearly every case. Certain sub-groups of patients have a better prognosis with surgical rather than medical care. The situation has also to be reviewed with reference to the follow-up. There is a responsibility not only for ensuring that the maximum number of patients leave hospital alive, but also that the maximum possible number remain alive and well after a period of years. A follow-up analysis has demonstrated very poor late results in those treated medically as compared with those who had had emergency partial gastrectomy (Avery Jones, 1956). The situation has also to be assessed in relation to the state of the blood bank. During the second world war there were ample supplies of blood available in civilian hospitals, held in reserve against air-raid casualties, but to-day pressure is constantly brought to bear by the pathologists to reduce demands on blood. This naturally encourages a bias towards surgery. There are still some physicians who prefer not to seek surgical assistance, but the balance of evidence is in favour of selective emergency surgery.

Our present policy is to continue a surgical bias knowing that the arrest of bleeding by partial gastrectomy in those patients with severe continued or recurrent bleeding can be undertaken without causing an increase in the overall mortality and that it offers a better outlook for the patient in the future. Our practice is as follows.

In patients with a known history of chronic gastric ulcer there is a strong bias towards a partial gastrectomy at some stage during the admission. In a few patients it may be decided to operate within the first twelve hours even if there is no further bleeding, and this applies particularly to poor-risk patients who might have difficulty in withstanding the strain of a further sharp bleed. If brisk bleeding occurs, or if there is obvious continued bleeding after admission,

then an emergency partial gastrectomy is performed within a few hours and after further blood transfusions have been given. In the remaining cases, careful consideration will be given to the need for an elective operation before leaving the hospital. The general inclination is towards more surgery in this group and at any early phase of admission.

With a known history of duodenal ulcer, the tendency is towards less emergency surgery and more elective operations, but operating immediately if there is severe continued bleeding or severe recurrent bleeding with shock. The same policy holds for those who have had previous operations for duodenal ulcer.

Patients with a history suggestive of chronic peptic ulcer but in whom the site of the crater is uncertain are gastroscopied the same evening or the following morning. Aspirations of gastric juice may be made for pH estimations.

Patients with a short history only—less than two weeks' discomfort—or in whom there has been no previous dyspepsia, are gastroscopied, usually on the next regular gastroscopy session or after a recurrent haemorrhage. If there is bleeding and if shock recurs twice in patients thought to have an acute lesion, the stomach is opened and an attempt made to determine the bleeding-point by digital palpation. The usual procedure then is a partial gastrectomy in men and possibly a submucosal resection of the ulcer in women. If no cause for the bleeding is found, a partial gastrectomy is performed and a further search made of the fundus before the final anastomosis is made.

In patients with evidence of pyloric stenosis an elective operation is planned, if possible after one to two weeks, when the electrolytic balance has been restored.

Patients who have an acute perforation after admission for haemorrhage, or those with simultaneous bleeding and perforation, have an immediate laparotomy, when, if possible, a partial gastrectomy is performed.

Patients admitted with an acute perforated ulcer treated by simple suture who then bleed again after admission have a laparotomy with a view to an emergency partial gastrectomy.

Conclusions

The increase in duodenal ulcer noted previously has continued, although the incidence of gastric ulcer seems to be stationary. Gastric and duodenal ulcers behave differently when analysed statistically in relation to many factors such as blood groups, age, incidence, social class, occupation, and heredity, and it seems probable that they represent independent disease processes.

The cause of gastric and duodenal ulcer remains unknown. Acute erosions and ulcers are common occurrences, and it seems likely that anti-healing factors exist which promote chronicity.

The diagnosis of peptic ulcer, although often simple, may at times prove difficult, and there are important fallacies in relation to radiological and other methods of diagnosis.

The evidence that dietetic treatment influences the healing of gastric and duodenal ulcer is unconvincing. Bed rest and cessation of smoking seem to be beneficial. There are dangers inherent in overtreatment, medical and dietetic.

Better appreciation of the role of potassium depletion has greatly improved the management of pyloric stenosis.

There is still scope for reducing the mortality from acute perforation. A proportion of cases have atypical clinical pictures and may escape detection. There is a role for immediate partial gastrectomy in patients with chronic ulceration, causing perforation.

The introduction of emergency partial gastrectomy for bleeding ulcer has not lowered the overall mortality, but nevertheless there are good reasons for undertaking it in selected cases.

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REFERENCES

- Aird, I. (1955). *Proc. roy. Soc. Med.*, **48**, 139.
 Bentall, H. H., and Roberts, J. A. F. (1953). *British Medical Journal*, **1**, 799.
 Alsted, G. (1953). *The Incidence of Peptic Ulcer in Denmark*. Danish Science Press, Copenhagen.
 Black, D. A. K., and Jepson, R. P. (1954). *Quart. J. Med.*, **23**, 367.
 Burnett, C. H., Commons, R. R., Albright, F., and Howard, J. E. (1949). *New Engl. J. Med.*, **240**, 787.
 Clark, D. H. (1953). *British Medical Journal*, **1**, 1254.
 Clarke, C. A., Cowan, W. K., Edwards, J. W., Howel-Evans, A. W., McConnell, R. B., Woodrow, J. C., and Sheppard, P. M. (1955). *Ibid.*, **2**, 643.
 Edwards, J. W., Haddock, D. R. W., Howel-Evans, A. W., McConnell, R. B., and Sheppard, P. M. (1956). *Ibid.*, **2**, 725.
 Cox, A. J. (1952). *A.M.A. Arch. Path.*, **54**, 407.
 Davies, R. E. (1952). In *Modern Trends in Gastroenterology*, edited by F. Avery Jones, p. 272. Butterworth, London.
 Decker, J. P., Zamcheck, N., and Mallory, G. K. (1953). *New Engl. J. Med.*, **249**, 957.
 Dogra, J. R. (1940). *Indian J. med. Res.*, **28**, 145.
 Doll, R. (1952). In *Modern Trends in Gastroenterology*, edited by F. Avery Jones, p. 361. Butterworth, London.
 — and Buch, J. (1950). *Ann. Eugen. (Camb.)*, **15**, 135.
 Friedlander, P., and Pygott, F. (1956). *Lancet*, **1**, 5.
 Jones, F. A., and Buckatzsch, M. (1951). *Spec. Rep. Ser. med. Res. Coun. (Lond.)*, No. 276.
 — and Kellock, T. D. (1951). *Ann. Eugen. (Camb.)*, **16**, 231.
 Price, A. V., Pygott, F., and Sanderson, P. H. (1956). *Lancet*, **1**, 70.
 — and Pygott, F. (1952). *Ibid.*, **1**, 171.
 — (1954). *Ibid.*, **2**, 1200.
 Elkeles, A. (1949). *Brit. J. Radiol.*, **22**, 280.
 Fisher, R. A. (1930). *The Genetical Theory of Natural Selection*. Oxford.
 Friedlander, P. H. (1954). *Lancet*, **1**, 386.
 Hawksley, J. C., and Coory, G. H. (1948). *J. Path. Bact.*, **60**, 333.
 Hirschowitz, B. I., Streeten, D. H. P., Pollard, H. M., and Boldt, H. A. (1955). *J. Amer. med. Ass.*, **158**, 27.
 Hunt, J. N., and Kay, A. W. (1954). *British Medical Journal*, **2**, 1444.
 Illingworth, C. F. W., Scott, L. D. W., and Jamieson, R. A. (1944). *Ibid.*, **2**, 617, 655.
 Jamieson, R. A. (1955). *Ibid.*, **2**, 222.
 Jennings, D., and Richardson, J. E. (1954). *Lancet*, **2**, 344.
 Johnson, H. D. (1955). *Ibid.*, **1**, 266.
 Jones, F. A. (1947). *British Medical Journal*, **2**, 441, 477.
 — (1955a). *Calif. Med.*, **83**, 201.
 — (1955b). *J. roy. inst. publ. Hlth*, **18**, 64.
 — (1956). *Gastroenterology*, **30**, 166.
 — and Doll, R. (1953). *British Medical Journal*, **1**, 122.
 — and Pollak, H. (1945). *Ibid.*, **1**, 797.
 Kay, A. W. (1953). *Ibid.*, **2**, 77.
 Keele, K. D. (1954). *Lancet*, **1**, 636.
 Kellock, T. D. (1951). *British Medical Journal*, **2**, 1117.
 Key, J. A. (1950). *Ibid.*, **2**, 1464.
 Kinsella, V. J. (1951). *Lancet*, **2**, 18.
 Kirsner, J. B., and Palmer, W. L. (1942). *Arch. Intern. Med.*, **69**, 789.
 — (1952). *Amer. J. Med.*, **13**, 615.
 Knutsen, B., and Selvaag, O. (1947). *Acta med. scand., Suppl.* 196, p. 341.
 Konstam, P. G. (1954). *Lancet*, **2**, 1039.
 Kouwenaar, W. (1930). *Ned. T. Geneesk.*, **74**, 2321.
 Latta, E. M., Cummins, J. F., and Zieve, L. (1956). *A.M.A. Arch. Intern. Med.*, **97**, 576.
 Martin, L., and Lewis, N. (1949). *Lancet*, **2**, 1115.
 Rae, J. W., and Allison, R. S. (1953). *Quart. J. Med.*, **22**, 439.
 Schanke, K. (1946). *Acta chir. scand., Suppl.* 115.
 Taylor, H., and Warren, R. P. (1956). *Lancet*, **1**, 397.
 Tidy, H. (1944). *British Medical Journal*, **1**, 677.
 Tomenius, J. (1955). *Acta med. scand.*, **152**, 391.
 Watkinson, G., and James, A. H. (1951). *Clin. Sci.*, **10**, 255.
 Weber, J. M., and Gregg, L. A. (1955). *Ann. Intern. Med.*, **42**, 1026.
 Wilkinson, S. A., and Jordan, S. M. (1934). *Amer. J. digest. Dis.*, **1**, 509.
 Zollinger, R. M., and Ellison, E. H. (1955). *Ann. Surg.*, **142**, 709.

Three leprosy clinics have been opened in Sokoto Province, Northern Nigeria, by Dr. C. M. Ross, Senior Specialist in Leprosy for the Northern Region. Discharge certificates were recently presented to 23 people in the province who had been examined and found free from leprosy. These are the first discharges in the province, and are an indication of the amount of control which is now being gained over the disease. The Minister of Health for the region has recently announced plans for the building of a leprosy training school at Kaduna to continue the fight against the disease.

RESULTS OF SURGERY IN TREATMENT OF CANCER OF THE LARGE INTESTINE

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In recent years the attitude of surgeons towards cancer of the large bowel has become increasingly more aggressive. Formerly a large proportion of the patients suffering from this disease were regarded as inoperable, and if, as was often the case, the growth lay in the rectum or distal colon they were treated by colostomy alone. Experience has shown, however, that a simple colostomy of this kind seldom afforded any real palliation, and all too often its only effect was to add the inconveniences of an artificial anus to the patient's existing discomforts. Though it overcame any obstructive element it did little to allay the other distressing features of an inoperable growth—the incessant spurious diarrhoea with discharge of slime and blood, the occasional profuse and alarming haemorrhages, the severe sacral or sciatic pain, and the development of fistulae into other organs or externally. This is not surprising, for these symptoms all spring directly from the continued presence of the growth in the bowel and can only be obviated by its removal. It is therefore clearly desirable, where possible in treating cancer of the large bowel, to excise the primary growth for palliative purposes alone quite apart from any question of cure.

Fortunately, despite their well-known predilection to become fixed to adjacent organs or to the pelvic or abdominal walls, carcinomata of the rectum or colon can generally be excised by a really determined operation, comprising, if necessary, resection of implicated adjoining viscera or parietes. Pathological examination of the operating specimens thus secured shows that the binding adhesions often contain no actual growth but are purely inflammatory in character, so that the prognosis is frequently much better than was anticipated at the time of operation, and an excision which was undertaken essentially for palliation sometimes turns out to be curative. Even if the growth should eventually reassert itself the patient may often enjoy two or three years of comfortable and useful life before this occurs. There is thus everything to be said for excision if at all possible, and indeed with almost no other form of malignant disease does really extensive surgery pay such handsome dividends as it does with cancer of the large bowel.

In his pursuit of this more ruthless policy the surgeon is, of course, much assisted by the greatly enhanced safety of surgery since the end of the second world war, due to better blood-transfusion facilities, improved anaesthesia, a clearer understanding of the problem of fluid and electrolyte balance, and the advent of antibiotics for systemic and intestinal use. As a consequence there must now be few patients, even amongst the elderly frail individuals who represent such a large proportion of the sufferers from cancer of the large

bowel, who cannot be made justifiable risks for an excision operation. Thus Allen (1950), of Boston, has recorded a resectability rate of 95%, and an immediate operative mortality of only 2.7% in a series of 195 cases of carcinoma of the colon and rectum treated at the Massachusetts General Hospital; and Naunton Morgan (1955) in this country has reported a resectability rate of 94% and an immediate mortality of only 4.3% in a series of 477 cases of rectal cancer treated at St. Mark's, St. Bartholomew's, and other hospitals.

It is to be presumed that similar trends have characterized the care of cancer of the rectum and colon in the hands of the average general surgeon throughout the country, but we have been unable to discover any extensive published data to support this supposition. It seemed to us that it would be interesting to determine whether the management of cancer of the large bowel has undergone any significant improvement during the past 20 years in a large teaching hospital where the patients suffering from this disease are shared among several general surgical "firms." We have recently attempted to secure such information from the Leeds General Infirmary, where this state of affairs has obtained. For this purpose we have analysed and compared, with special reference to the treatment and mortality, the clinical notes of two groups of cases of carcinoma of the rectum and colon. The first group represented all the patients admitted to the Infirmary with these diseases during the years 1938-43 inclusive, and comprised 485 cases; the second one included all the patients similarly admitted during the years 1947-55 inclusive and totalled 1,159 cases. We believe that the survey of these patients is instructive in another way, for the Leeds General Infirmary, unlike some other teaching hospitals, still functions as the main regional hospital of its area. Its clinical material therefore gives a fairly accurate picture of the relative frequency and common modes of appearance of various diseases. For that reason the opportunity has been taken to elicit from this fairly large combined series of 1,644 cases of cancer of the large bowel certain facts regarding the incidence and manner of presentation of this condition.

Site Incidence of Growths in the Large Bowel

The distribution of the carcinomata in the rectum and colon in the two series and collectively is shown in Table I. It will be seen that there is no essential difference in the incidence in the two periods under review. The frequency

TABLE I.—Distribution of Carcinomata in Various Parts of Large Intestine

Site	Percentage of Growths in Each Site		
	1938-43 Series (485 Cases Analysed)	1947-55 Series (1,159 Cases Analysed)	Combined Series (1,644 Cases Analysed)
Rectum ..	61.5	55.7	57.4
Sigmoid colon ..	21	21.4	21.3
Descending ..	2.9	2.7	2.7
Splenic flexure ..	2.7	3.2	3.0
Transverse colon ..	4.6	4.7	4.7
Hepatic flexure ..	1.0	2.1	1.8
Ascending colon ..	1.6	3.5	2.9
Caecum ..	4.7	6.7	6.1

of growths in different parts of the colon is also very similar to that reported by previous writers, such as Fraser (1938) and Judd (1924), but, unlike the cases referred to by them, the present series includes carcinomata of the rectum and thus reveals the site incidence of malignant disease in the entire large intestine. It will be seen that 57.4% of the growths in the combined series of 1,644 cases lay in the

rectum, and that of the 42.6% of growths in the colon proper exactly half occurred in the sigmoid region. This indicates the enormously increased liability to malignant disease in the distal part of the large bowel, and is important from the diagnostic point of view, for it means that 78.7%, or approximately four-fifths, of the sufferers from bowel cancer have their lesions in a situation which can in most cases be reached directly by the finger or the sigmoidoscope.

The remaining 21.3% of carcinomata in the colon were distributed over the other parts of the large intestine in the following order of frequency: caecum, transverse colon, splenic flexure, ascending and descending colon, and hepatic flexure. But even in the caecum the incidence amounted to only 6.1%.

Sex Incidence

The distribution of the carcinomata at different sites in the two sexes in the combined series is shown in Table II. It will be seen that altogether 907 of the patients were men and

TABLE II.—Relative Numbers of Growths in the Two Sexes at Different Parts of Bowel in Combined Series of 1,644 Cases

Site	No. of Patients with Growths in Each Site	
	Males	Females
Rectum ..	559	385
Sigmoid colon ..	176	174
Descending ..	18	27
Splenic flexure ..	25	25
Transverse colon ..	37	40
Hepatic flexure ..	20	9
Ascending colon ..	24	24
Caecum ..	48	53
All sites ..	907	737

737 women, but that this slight male preponderance is explained entirely by the higher incidence of cancer of the rectum in men than in women—the proportion in this site being 559 men to 385 women. Elsewhere the incidence in the two series was approximately equal.

Mode of Presentation

Broadly speaking, there were three ways in which these 1,644 patients presented at hospital with malignant disease of the large intestine.

As Non-acute Cases at the Out-patient Clinics.—The great majority of the patients were referred to the out-patient clinics or consulting-rooms with an obvious carcinoma of the rectum or colon or with suggestive symptoms requiring further investigation, and were admitted to hospital in due course as non-urgent cases with a view to radical or palliative treatment.

As Emergency Cases with Acute Intestinal Obstruction.—A much smaller proportion of the cases were admitted as emergencies with symptoms of acute intestinal obstruction. Roughly two-thirds of these had had, for some weeks or months prior to the onset of these acute symptoms, other complaints referable to their growth, but their significance had not been appreciated by the patient or his doctor. It was therefore essentially on account of the acute obstruction that the patient was admitted to hospital, and the relief of obstruction was the prime essential in treatment.

As Emergency Cases with General or Localized Peritonitis Due to Perforation of Colon.—A still smaller percentage of the patients were admitted urgently with a local or general peritonitis due to perforation of the colon either through a stercoral ulcer some distance proximal to an obstructing growth, and often in the caecum, or, much more commonly, at the site of the carcinoma itself.

The proportion of patients in these three categories was roughly the same during the two periods under review. Of the combined series of 1,644 cases, 1,239 (75.2%) were admitted as non-urgent cases, 290 (18%) as emergencies with acute intestinal obstruction, and 115 (6.8%) as emergencies with perforation and peritonitis.

Results of Treatment

Our ultimate aim in this survey was to determine the proportion of patients in the two series who were given the benefit of a radical operation and the number who survived this operation. But first of all it is instructive to review the initial management of the cases admitted with acute obstruction or perforation of the bowel and see if, with our better knowledge of fluid and electrolyte balance and the use of antibiotics, there has been any improvement in the results of treatment of these emergencies in recent years.

Cases With Acute Obstruction

Nine of the patients with acute obstruction were virtually moribund on admission and never rallied sufficiently for an operation of any kind to be performed before they died. In 15 other cases the only treatment employed for the obstruction was enemata, which were successful in 14. The remaining patients were subjected to operation, which usually took the form of a decompression or a short circuit, leaving the neoplasm *in situ*, but in a few instances involved a resection of the growth by an intraperitoneal technique with sutured anastomosis, or a Paul-Mikulicz type of operation. The various measures employed in these obstructed cases in the two series and the resulting immediate mortality are listed in Table III.

TABLE III.—Immediate Treatment of Acutely Obstructed Carcinoma of Large Intestine

Forms of Treatment Employed	1938-43		1947-55	
	No. of Cases Treated	No. of Hospital Deaths	No. of Cases Treated	No. of Hospital Deaths
Expectant ..	5	5	4	4
Enemata alone ..	1	0	14	1
Caecostomy ..	24	12	54	24
Ileo-transverse colostomy ..	14	8	68	11
Primary resection: Right hemicolectomy with anastomosis ..	0	0	31	3
Other forms of colectomy { With anastomosis By Paul-Mikulicz method ..	1	0	16	1
Miscellaneous operations ..	0	0	7	2
	10	3	24	6
	4	4	13	2
All forms of treatment	59	32 (54%)	231	54 (23.4%)

It will be seen that the immediate mortality of acutely obstructed carcinomata has declined from 54% during 1938-43 to 23.4% during 1947-55. Some of this improvement may be attributable to the relatively less frequent use, during the latter period, of caecostomy, which appears from this analysis to be a particularly hazardous operation, often followed by fatal sepsis. Another factor which may have been of importance was the better control of fluid and electrolyte balance and the availability of antibiotics during the second period. Incidentally, it is interesting to note that the number of deaths following primary resection—that is, right hemicolectomy, colectomy at other sites with intraperitoneal anastomosis, or Paul-Mikulicz resections—in 58 of these obstructed cases was not as great as might have been feared—being only 12 (20.6%), the majority occurring after operations of the Paul-Mikulicz type.

Cases With Perforation and Peritonitis

Many of these patients were desperately ill on admission and rapidly died; included in this group were most of the 20 patients with a diastatic perforation, usually of the caecum, proximal to an obstructing carcinoma of the left colon. A certain number of the others were treated by laparotomy, suture of the perforation, and the establishment of a proximal colostomy or caecostomy. In a few cases the perforation was exteriorized as a colostomy, or a resection of the perforated growth was performed. The frequency with which these various methods of treatment were used and the immediate results are indicated in

TABLE IV.—Immediate Treatment of Carcinomata of Large Bowel Complicated by Perforation and Peritonitis

	1938-43		1947-55	
	No. of Cases Submitted to it	No. of Hospital Deaths	No. of Cases Submitted to it	No. of Hospital Deaths
Expectant ..	11	11	23	23
Drainage only ..	1	1	1	1
Suture of perforation together with colostomy or caecostomy ..	25	19	32	25
Primary resection (right hemicolectomy or Paul's resection) ..	6	2	16	3
All forms of treatment	43	33 (76.7%)	72	52 (72%)

Table IV. The mortality remained approximately the same in the two groups, being 76.7% during the first and 72% during the second. It will be seen that the best results were obtained by primary resection of the perforation and growth where their relative proximity made this possible.

Cases Proceeding to Radical Excision

Altogether 765 (48.4%) of the 1,644 cases were eventually submitted to radical operation, but there was a considerable difference in the resectability rate during the two periods under review. Thus radical excision was carried out in only 127 (26.2%) of the 485 patients seen during the years 1938-43, but 638 (55%) of the 1,159 patients treated during 1947-55 proceeded to excision of the primary tumour.

Influence of Mode of Presentation of Disease on Ultimate Resectability.—Most of the patients proceeding to resection during both periods under review were derived from the group of cases presenting non-acutely. The proportion of patients eventually achieving resection in the groups with acute obstruction or perforation was much less, partly owing to the smaller size of these groups and partly on account of the rather lower resectability of growths which have been complicated in these ways. Thus of the 1,239 patients presenting non-urgently at the out-patient clinics, 631 (50%) were submitted to resection. By contrast, only 124 (43%) of the 290 cases with acute obstruction and 22 (19%) of the 115 with perforation and peritonitis eventually proceeded to resection.

Influence of Site of Growth on Operability Rate.—If the resectability rate is related to the site of the growth in the two periods under review, as in Table V, the interesting fact

TABLE V.—Influence of Site of Growth on Resectability Rate of Carcinoma of Large Intestine

Site of Growth	1938-43			1947-55		
	No. of Cases Seen with Growths in this Site	No. Deemed Resectable	Resectability Rate	No. of Cases Seen with Growths in this Site	No. Deemed Resectable	Resectability Rate
Rectum ..	298	47	15.7%	646	363	56.2%
Sigmoid ..	102	35	34.3%	248	118	47.5%
Descending colon ..	14	8	57.1%	31	26	83.9%
Splenic flexure ..	13	4	30.8%	37	19	51.4%
Transverse colon ..	22	11	50.0%	55	33	60.0%
Hepatic flexure ..	5	3	60.0%	24	14	58.3%
Ascending colon ..	8	7	87.5%	40	20	50.0%
Caecum ..	23	12	52.2%	78	45	57.7%
All sites	485	127	26.2%	1,159	638	55.0%

emerges that the rise in resectability in the second period is due almost entirely to the more radical management of carcinomata in the rectum and sigmoid colon. In the first period few of these lesions were removed, but during the second an increasing proportion have been subjected to excision each year. For growths elsewhere in the colon, and

especially those on the right side, there has been little change in the resectability rate, which actually has been fairly high throughout.

Influence of Rise in Resectability Rate on Mortality of Radical Operations.—This increase in the proportion of patients proceeding to radical operation in the post-war period would be a very hollow achievement if it were accomplished at the expense of a considerable rise in the operative mortality. In fact, the number of operative deaths following radical operation in the 1938-43 period was 24 out of a total of 127 radical operations, which gives an operative mortality of 18.8%, whilst the number of immediate deaths in the 638 patients proceeding to resection in the 1947-55 period was 71, giving an operative mortality rate of 11.1%. The mortality rate has thus actually fallen despite the increased operability in this latter period, the effect being that a much greater proportion of patients have left the hospital with a chance of cure during 1947-55 than during the 1938-43 period (see Table VI).

TABLE VI.—Proportion of Patients Leaving Hospital Alive After Radical Operation for Carcinoma of Large Bowel

	1938-43	1949-55
No. of patients seen	485	1,159
No. of patients treated by radical operation	127 (26.2%)	638 (55%)
No. of patients leaving hospital alive after radical operation (includes some palliative excisions)	110 (23%)	589 (51%)

Choice of Radical Operation.—The various types of radical operation employed in both these series of cases are listed in Table VII. As would be expected from the increasing resectability of rectal and sigmoid cancer in the latter years revealed in Table V, many more rectal excisions have been performed during the 1947-53 period than in the previous period. In addition, it will be noted that the perineal or sacral type of operation, which was previously in vogue for excision of the rectum, has given way largely to the combined abdomino-perineal excision.

TABLE VII.—Types of Radical Operation Used in Treatment of Carcinoma of Large Intestine

Type of Operation Performed	1938-43		1947-55	
	No. of Times Used	No. of Hospital Deaths	No. of Times Used	No. of Hospital Deaths
Right hemicolectomy with anastomosis	20	4	79	4
Resection of transverse or left colon with anastomosis	24	6	142	12
Resection of transverse or left colon by Paul-Mikulicz method	33	6	62	11
Anterior resection of rectum with anastomosis	0	0	12	1
Abdomino-perineal excision of rectum	4	2	338	40
Perineal excision of rectum	46	4	5	0

Number of Patients Ultimately Cured by Radical Excision.—As nearly half the combined series of 1,644 cases surveyed in this paper were treated in the last five years, and as no reliable follow-up system was in operation during the earlier years, it is clearly impossible to provide any reliable information regarding the percentage of five-year survivors amongst the patients discharged after radical operation. However, Dukes (1944) has estimated that approximately 50% of the survivors from combined excision of the rectum are alive and well five years later, and Rankin and Graham (1950) claim that, of the survivors of radical operations for carcinoma of the colon, between 50 and 60%—depending on the precise site of the growth—live free of recurrence for at least five years. It would be tempting to suppose, therefore, that some 50% of the patients in this series who left hospital after a radical operation will survive for five years or more. It has to be remembered, however, that

included among these resection cases are a number of patients who underwent purely palliative resections in the presence of hepatic metastases or other evidences of irremovable growth. No question of cure arises in these cases, and their inclusion will obviously lower the five-year survivals. It would be too much to hope, therefore, that an overall cure rate of 50% will be achieved, but we reckon that the results should not fall far short of this figure.

Summary and Conclusions

The treatment and operative mortality of carcinoma of the large intestine are compared in two consecutive series of cases admitted to the General Infirmary at Leeds during 1938-43 and 1947-55 respectively.

In the former group of 485 cases the growth was found to be resectable in 26.2%, with an operative mortality of 18.8%. By comparison in the latter group of 1,159 cases resection was performed in 55%, with an operative mortality of 11.1%.

Approximately four-fifths of the growths in both series lay in the rectum or sigmoid, and the improvement in the resectability rate in the second series was due almost entirely to the more radical management of carcinomata in these situations during the latter period. The resectability of carcinoma of other parts of the large intestine remained much the same in the two periods under review.

The reduction in the immediate mortality following radical resection during the second period is attributed mainly to better control of fluid and electrolyte balance and to the use of antibiotics. The improvement in the results of emergency operations for the cases complicated by acute intestinal obstruction may have been due in large measure to these factors also, but was probably referable in part to changes in the choice of operation—namely, to the greater use of transverse colostomy instead of caecostomy for obstructed growths of the left colon. The high mortality of perforation of the colon with resulting peritonitis has remained virtually unchanged, making this still a most lethal complication of cancer of the large intestine.

We are indebted to our surgical colleagues at the Leeds General Infirmary for kind permission to include their patients in this survey, and to Professor E. Grebenik for much helpful criticism from the statistical point of view.

REFERENCES

- Allen, A. W. (1950). *Ann. roy. Coll. Surg. Engl.*, 7, 173.
Dukes, C. E. (1944). *Proc. roy. Soc. Med.*, 37, 131.
Fraser, J. (1938). *Brit. J. Surg.*, 25, 647.
Judd, E. S. (1924). *Sth. med. J.*, 17, 75.
Morgan, C. N. (1955). *J. roy. Coll. Surg. Edinb.*, 1, 112.
Rankin, F. W., and Graham, S. (1950). *Cancer of the Colon and Rectum*. 2nd ed. Thomas, Springfield, Illinois.

Science for Everyman is an annotated book list due to be published by the National Book League early next year. Its production has been made possible by a generous donation from Unilever Ltd. The list, which will comprise some 1,500 titles, is intended for the non-specialist scientist. It will cover many branches of science, including mathematics, physics, chemistry, astronomy and meteorology, geology, oceanology, biology and biochemistry, genetics and evolution, zoology, ornithology, botany and agriculture, technology, and the history of science. The lack of a non-specialist bibliography, and the need for it, became apparent during the preparation of an exhibition of books for last year's meeting of the British Association. The National Book League hopes its list will prove a useful basis on which to build a non-specialist scientific library.

HOMOSEXUALITY: AN ANALYSIS OF 100 MALE CASES SEEN IN PRIVATE PRACTICE

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Amongst the reasons why facts about homosexuality are so hard to come by are: (1) the problem of definition. What are the criteria for homosexuality? Should the emphasis be on preference or performance? How widely should the net be cast? Thus, according to the psycho-analysts, a homosexual component (sometimes conscious but often not) exists in everybody; and if this is correct homosexuality in this sense is universal. (2) The natural reluctance of individuals to admit to a component or preference which is socially condemned or to acts that are illegal and liable to heavy penalty.

But we can probably all agree (a) with the general definition—namely, that homosexual means "having a sexual propensity for members of one's own sex" (O.E.D.); (b) that this propensity varies quantitatively in different individuals and can also vary quantitatively in the same individual during different epochs in life; and (c) that, as in other fields of experience and behaviour, introspection being neither exhaustive nor infallible, the individual may quite genuinely not be fully aware of either the existence or the strength of his motivations or propensities; and of course he can lie about them.

We can probably also agree that "having a sexual propensity for members of one's own sex" can affect behaviour, both in psychosexual and in other spheres, in a variety of ways. Explanations of individual behaviour in these terms range, however, from those based on the recognition of sexual acts consciously motivated by homosexual propensities to others that (to many) are in the nature of queer speculations, unproved and improbable (for example, that all aesthetic appreciation has roots in homosexuality). Between these extremes lies a whole series of more or less legitimate deductions and inferences.

Selection of Cases.—We have tried to short-circuit these difficulties by confining our study to cases in which homosexuality was recorded on the diagnostic summary cards kept by one of us as being either the presenting problem or a major part of the diagnostic formulation. All of these patients were consciously aware of their homosexual propensities and/or had indulged in homosexual acts with others. Cases of inferential or "latent" homosexuality were not included, nor were the cases whose homosexual preference or performance seemed to be an incidental finding of secondary significance from the psychiatric point of view.

Incidence.—From a series of 5,000 cases seen in private practice, the incidence of homosexuality, as outlined above, worked out as 5% of males over the age of 16 and 0.3% (a total of 7 cases) of females over 16.

Of the original 128 male cases, 100 were chosen for further study on the arbitrary basis of adequacy of documentation.

General Findings

The reasons for reference of the 100 cases were:

Criminal charge or executive consequences thereof	30
Worry over homosexual propensities (for example, "Can I change?") as the presenting complaint	25
Various psychiatric problems (for example, depression, excessive drinking) rather than direct worry over homosexuality as the presenting complaint	22
Pressure from friends or relatives	12
Marital difficulties, including impotence	5
Homosexual jealousy or deprivation reactions	2
Executive problems	2
Fear of scandal arising from homosexual acts	2

Age.—The ages of the group ranged from 16 to 69, the mean being 28.2 and the median 33 years. Table I shows the age distribution. In successively higher age groups, the proportion who came because of a criminal charge rose steadily.

TABLE I

Age:	16-25	26-35	36-45	46-55	56-65	66-	Total
Charged	2	11	9	5	1	2	30
Not charged	20	23	18	8	1	0	70
Totals	22	34	27	13	2	2	100

Education and Occupational Status.—The educational and occupational status of the group as a whole was high: 51 had been to public schools, 19 to grammar schools, 13 to secondary schools, and only 10 to elementary schools. Satisfactory information about the education of the remaining 7 is lacking. Of the 100, 41 had been to universities. As regards occupations, using the Registrar-General's coding, the distribution was as follows: (I) professional, 34; (II) intermediate, 24; (III) skilled, 21; (IV) semi-skilled, 1; (V) unskilled, 1; students, 8; not classified, 11; total 100. The most highly represented occupations were: civil servants, 7; doctors, 6; clergymen, 6; school teachers, 6; and 7 worked in jobs connected with stage or radio. There was one window-dresser and one dress designer.

Associated Psychiatric Disorders

Abnormalities of Personality.—It is always difficult to assess or classify these. The best we could do was to group them as follows: sociopathic, 12; inadequate or neurotic, 18; average, 38; good, 26; not classified, 6.

Previous Breakdowns.—In 23 there was a history of nervous trouble in the past which had either received medical treatment or was judged retrospectively as severe enough to have merited this. In addition, 8 had in the past received treatment specifically for homosexuality.

Psychiatric Diagnoses.—The following diagnoses were made at the time of consultation: anxiety state, 6; alcoholism (including 1 paranoid), 4; reactive depression, 2; hysterical reaction, 2; obsessional or phobic, 3; endogenous depression, 2; psychopathic mood-swing, 2; mixed neurotic problem, 2; suspected dementia, 1; post-meningitic personality changes, 1; mental deficiency, 1; total 26.

In all, 43 had either an associated psychiatric syndrome (often minimal) or a neurotic, inadequate, or "sociopathic" personality, or a combination of both. Of the remaining 57, 6 gave a history of psychiatric trouble in the past. Thus in spite of the probability that any group of homosexuals referred to a psychiatrist might be expected to be heavily weighted in the direction of psychiatric abnormality, no fewer than 51% were considered to be free from gross personality disorder, neurosis, or psychosis during their adult lives. Only one was certifiably defective and none certifiably insane. They included a number of important and talented individuals of high integrity, successful, efficient, and respected members of the community. Only two had been on any criminal charge other than homosexuality. Very few showed the traditional "pansy" picture of homo-

sexuals; indeed, only 21 were noted to have at all obvious homosexual personality traits, only one of these being a paedophile.

Psychosexual Experience

Continence.—All but 11 of the 100 cases admitted to one or more homosexual acts with others since adolescence.

Frequency of Acts.—Sufficient information was available in 60 cases who admitted to activity with others to say that, at a very conservative estimate, these 60 persons committed between them 600 and 700 (criminal) acts a year. We have no doubt that the true figure would be much higher. This opinion is based on special inquiry directed to those cases we were able to follow up personally and fortified by data given by other patients, not included in this series. In an ordinary psychiatric assessment, as opposed to a research project, it is often not relevant to inquire into the sexual practices of patients in full detail, whether as regards frequency or type.

Types of Act.—Between practising adults, mutual masturbation was almost universal. Including follow-up information, buggery was noted in 29% and fellatio (and concerning oral-genital activities no special inquiry was usually made at all) was noted in 11%.

For the reasons just given, we are satisfied that the percentages given for buggery and fellatio greatly underestimate the true incidence of such practices. We have little doubt that, although individuals do differ in their preferences, most regularly practising homosexuals indulge at some time or another in all available types of homosexual acts, both actively and passively.

TABLE II.—Comparison of Continent Homosexuals, Known Buggers, and Practising Homosexuals not Noted as Practising Buggery

	Continent		Buggery		Practising, No Known Buggery	
	No.	%	No.	%	No.	%
Age 30 or under	6	54	12	41	24	40
Occupational class I or II	7	64	18	62	33	55
Public school	4	36	16	55	31	51
Charged	—	—	10	34	20	33
Charged more than once	—	—	5	17	11	18
Associated mental disorder or history	4	36	11	38	20	33
Sociopathic	0	0	4	14	8	13
Neurotic or inadequate personality	2	18	4	14	12	20
"Good" personality	3	27	7	24	16	26
"100% homosexual"	2	18	16	55	24	40
6 or more partners admitted	—	—	19	66	11	18
Acts with boys under 16	—	—	3	10	12	20
Totals	11	100	29	100	60	100

Comment.—In respect of the factors tabulated, there was no statistically significant difference between the continent and practising groups.

The Special Legal Position of Buggery.—The law singles out buggery from other homosexual crimes and prescribes a maximum penalty of life imprisonment; whereas for "indecent assault" and acts of gross indecency the maximum penalties are ten years and two years respectively.* Taking a number of criteria (Table II), the only differential point we could find between those known to practise buggery and those in whom buggery was not noted was the apparently higher level of promiscuity, 66% admitting to six partners or more as compared with 18%. (Difference highly significant, $P<0.01$.)

***Medico-legal Note.**—(1) Any act between males anywhere, whether in public or private, is at present a criminal offence if it involves "indecent assault"—that is, contact with or exposure of the private parts with the intent, either admitted or reasonably inferred, of obtaining sexual excitement. (2) "Indecent assault" means in effect (with few exceptions) homosexual behaviour with a partner under 16 years of age, and need not and usually does not contain any ingredient of violence. It very often consists only in gentle fondling.

Paedophilia

We found it possible to divide our series rather sharply into those who were sexually attracted by pre-pubertal boys (paedophiliacs) and those who were not. Seventeen admitted, or showed, paedophile impulses. Of these, twelve were not attracted by adults and only five were attracted at different times in their lives both by pre-pubertal boys and older males; the number of these five who admitted acts with young boys and adults was two. Further, one of these was mentally defective, and in the other impulsive fondling of a young nephew was a transient phase of doubtful significance.

In our series the age of the preferred love object was quite strikingly fixed; apart from the two dubious cases mentioned, there was no evidence in favour of the concept that adult-seeking homosexuals tend, sooner or later in their lives, to prefer young boys (the so-called "rake's progress").

Further analysis of the 17 paedophiliacs in our series showed that they differed from the "adult-seekers" in the following respects: (1) The paedophiliacs came more often because of a charge than for other reasons. (12 out of 17 as compared with 18 out of 83.) ($\chi^2=13.7$; $P<0.01$.) (2) A higher proportion of paedophiliacs were married (7 out of 17 as compared with 12 out of 83.) ($\chi^2=4.96$; $P<0.05$.) (3) They tended to be older than the remainder—for example, 9 out of 17 paedophiliacs were over 41 as compared with 19 out of the other 82 members of the series ($\chi^2=4.9$; $P<0.05$).

Another distinctive feature of paedophiliacs lies in their social isolation from other homosexuals, many (probably the majority) of whom regard the seduction of young boys as abnormal and immoral. Paedophiliacs are seldom members of homosexual coteries; they are obliged to be lone wolves in their sexual pursuits, of which they are often much ashamed. The capacity for self-deception which many paedophiliacs show is possibly a reflection of this shame. For example, in our series a married schoolmaster of 40 who had made a practice for years of inspecting and fondling boys' genitals in the dormitories at night, explained his actions as a means of making sure that the boys were not masturbating—that is, as benevolent supervision. A 69-year-old priest who had been assaulting boys twice weekly for at least a year said, "I must have known it was wrong, but somehow I never thought of it."

According to Kinsey (personal communication) paedophiliacs constitute only a small fraction, not more than 3%, of homosexuals as a whole. In our experience of psychiatric practice, the proportion is somewhat higher, and amongst those criminally charged it is very much higher, in fact misleadingly so.

The Homosexual-heterosexual Scale

Homosexuality is not an "all-or-none" condition. In this series every gradation was found between apparently exclusive, lifelong, "100%" homosexuality, without any conscious capacity for arousal by heterosexual stimuli, and predominant heterosexuality with only transient or minor homosexual inclinations. Kinsey *et al.* (1948) introduced a seven-point rating of homosexuality, with a maximum of 6 points for sexual arousal and activity with other males only, 0 for exclusive heterosexuality, 3 for arousals and acts equally with either sex, and intermediate scores accordingly. The

TABLE III

Original Classification	Approx. Kinsey Equivalent	Number
"100%" homosexual (or nearly so)	5-6	42
Bisexual, predominantly homosexual	4	29
Bisexual, not predominantly homosexual, or transitional homosexuality	1-3	16
Bisexuality not otherwise specified	2-5	3
Homosexual, not classified	—	10

original notes did not use this scale, but in the following classification the very approximate "Kinsey equivalents" are shown in Table III.

Diagnostic Criteria

The fact that the same act may have a totally different psychosexual significance for different individuals was illustrated by the cases of two young men who had both been fined for the same act of gross indecency (mutual masturbation). The doctor of the organization for which they both worked sent them for an opinion on prognosis. One was found to be exclusively homosexual and was judged to have no chance of changing in the direction of heterosexuality; the other was almost entirely heterosexual in his psychic responses, and the incident in his case was considered an isolated and insignificant one. Follow-up confirmed these opinions.

In forming an opinion on the place of a given individual on the homosexual-heterosexual continuum, account was taken of masturbation fantasies and erotic dream content. Friendly but disinterested relations with girls were taken to mean a poorer prognosis, in terms of possible changes in the direction of heterosexuality, than shyness and embarrassment in female company.

Heterosexual Activity

Many homosexuals indulge in intercourse with women out of academic curiosity or in an attempt at self-diagnosis or treatment. For assessment purpose the subjective aspect of heterosexual experience—whether it is enjoyed or desired or not—is more important than what physically takes place.

In our series 19 were at some time married and another 17 had physical heterosexual experience. One 60-year-old man was persuaded by his wife to seek advice for impotence. He had married 25 years previously in the hope of curing his homosexual tendencies, but found that he could achieve orgasm only with the help of homosexual fantasies. He continued to do so, and was physically successful for the first 23 years of his marriage, after which his potency failed. He had six children, but remained homosexual. Sexual intercourse was, in effect, masturbation per vaginam so far as his psychic responses were concerned.

Facultative Homosexuality

Facultative homosexuality is not an entity apart, and the term may be used in respect of almost any bisexual individual. In our series there was clear evidence of facilitation of homosexual acts by environmental factors in 10 cases. One man, for example, avoided the company of women on legal advice while his divorce was pending, and got involved in homosexual activities which led to a criminal charge. Another, also on a charge, had sought consolation in homosexual contacts when economic failures increased the isolation which he felt as a relative dullard in a clever family.

Treatment

Objects.—The objects of treatment can be arbitrarily divided under four main headings: (1) change in direction of the sex urge, (2) greater continence, (3) greater discretion, and (4) better adaptation to the sexual problem and to life in general.

Methods.—As always in psychiatry, treatment consists in a mixture of physical, psychological, social, and environmental measures in varying proportions according to the case.

Recommendations Made.—(a) In-patient care, generally for an associated psychiatric condition such as alcoholism, was advised in 11 cases. (b) Psychotherapy, in the broad sense of further psychiatric interviews of any number or type (including analysis), was recommended in 23 cases. A choice of hospital or private treatment was available. (c) In the remaining 66 cases treatment was limited to discussion at the initial interview, simple counsel, prescription of medi-

cines or environmental adjustments. Psychotherapy in these patients was either not advised or (for example, for geographical reasons) was impracticable.

Legal Reports.—Reports were written to solicitors in 22 cases, but evidence was given in only 9. The discrepancy may be partly due to the fact that reports often contained information and opinions which would have been highly damaging to the defence if revealed in court. For example, in two such reports, the opinion was expressed that prison would be the most appropriate treatment.

Follow-up

Method.—The extent of the follow-up was limited by the need for circumspection. In 95 cases letters were sent to the patient and/or one or more of the following: relatives, family doctors, psychiatrists, other doctors, solicitors, probation officers. Letters to patients generally contained an invitation to attend for personal interview. The response is shown in Table IV.

TABLE IV

Seen personally by one of us	15
Documentary information bearing on sex life	44
Documentary information not bearing on sex life	11
No reply, or useless reply	30

Changes in Orientation.—Of the 59 patients about whom sufficient information was available, 9 (or roughly 1 in 6) reported less intense homosexual feelings, or increased capacity for heterosexual arousal, 3 became more homosexual in preference than when first seen, and no change, even of a minor order, was found in the sexual orientations of the other 47. When a change was found it often amounted only to a slight alteration in the balance of masturbatory fantasies.

Changes in Performance.—Of the above-mentioned 59 patients, 11 showed improved discretion in or control of their persisting homosexual desires. 4 became more active, and another 9 were charged during the follow-up period with homosexual offences.

Changes in Adjustment.—Twenty-three were reported to show improved subjective adjustment or general well-being; this (rather than increasing unhappiness) was the main trend. Three died (one by suicide).

Those Seen Personally.—The 15 who came for interview were a self-selected minority, but they provided more reliable follow-up data than the remainder. Five reported a change towards heterosexuality, 2 were more homosexual in preference, 2 were more discreet, and 3 were more actively practising than before.

Comparison with Original Prognosis.—Of the 59 cases in whom follow-up information was available, the original opinion on the diagnosis and prognosis of the homosexual condition was sufficiently detailed in 52 for the comparison shown in Table V to be made between prediction and

TABLE V

Diagnosis and Prognosis	Total	Changes in Preference		
		Towards Heterosexuality	More Homosexual	No Change
"100%" homosexual—no change of change	24	1	—	23
Predominantly homosexual—little chance of change	14	2	0	12
Bisexual, reasonable chance of change	14	6	3	5

outcome. It will be seen that the original forecast was most often correct in cases of the "100%" type. Adding the first two groups, 3 out of 38 changed towards heterosexuality as compared with 6 out of 14 of the third group. The difference is highly significant ($P<0.01$).

Age and Prognosis.—Changes in preference in the direction of heterosexuality occurred more often in those aged

16 to 25 (6 out of 20) than in those aged 26 or over (3 out of 39). This difference was not, however, statistically significant. Thus, such changes were related more clearly to the degree of bisexuality as originally formulated than to age.

Effects of Psychotherapy.—Twenty-five patients who had psychotherapy of any kind during the follow-up period were compared with a matched group not so treated. The mean duration of follow-up was 4½ years. No difference between the two groups could be discerned as regards change in sexual orientation, discretion, or control. Rather more of the treated patients (12 out of 25 as compared with 8 out of 25) appeared to come to better terms with their problems at a subjective level, but increased overt activity was sometimes noted after treatment. None of these differences was statistically significant. (It is proposed to publish detailed findings separately.)

Some Special Problems

Education.—There were few differences in the histories of ex-public and grammar school boys respectively. Homosexual practices at school age were noted in 12 out of 51 of the former and in 7 out of 19 of the latter; these proportions are not significantly different from each other.

Seduction.—Seduction, or an attempt thereat, by an adult or much older youth was stated to have occurred before the age of 14 in 13 patients and between 14 and 18 years in four other patients. Seduction was reported in 9 out of 30 cases on a criminal charge, and 8 out of 70 who were not, the difference being just significant ($\chi^2=3.90$; $P<0.05$). Comparison of the incidence of a history of seduction in those with impulses directed towards pre-pubertal boys (5 out of 17) and the remainder (12 out of 83) revealed no statistically significant association.

Promiscuity.—Some patients were extremely promiscuous, and great risks were taken in making contacts in public lavatories despite the known observation kept on such places by plain-clothes police. Among reasons given for taking these risks were anatomical proximity and convenience, voyeuristic pleasure ("Penises to me are like tits to the reader of *Vie Parisienne*"), and fantasies of meeting prominent figures ("You never know—X.Y. (a well-known film star) might be standing next to you"). Uriferous odours have an aphrodisiac effect on some. It has been suggested that the illegality of homosexual acts enhances their appeal. We think that some homosexuals do gain vicarious added pleasure by eluding capture. On the other hand, we have found no patient whose enjoyment has been enhanced by detection and punishment—any more than thrill-seeking racing drivers enjoy a crash. It is our impression that homosexuals tend to be more persistently and consciously pre-occupied with sexual thoughts and images than other males.

Blackmail.—Only two patients had a history of being blackmailed in the past. Fear of blackmail was absent in the group as a whole. There was little knowledge of it even at second hand.

Marriage.—Nineteen were, or had been, married. In only eight was marital adjustment apparently satisfactory. A significantly higher proportion of the married (10 out of 19) than of the single men (20 out of 81) came because of a criminal charge ($\chi^2=5.1$; $P<0.05$). The charge concerned boys under 16 in 5 married and 8 single men. Of the 10 married men on a charge, the wives of three were pregnant at the time of the alleged offence.

Criminal Charges.—The criminal charges which brought 30 to the original consultation were: buggery, 2; indecent assault, 12; indecency or gross indecency, 11; importuning, 5. Only one man was charged with acts with adults in private. Adding past history and follow-up findings, in all 36 men were the subject of 54 homosexual charges.

The apparently higher rate of recidivism in those who had been charged before was not significant. Psychiatric findings were negative, in the sense previously used, in 19 out

TABLE VI

	Total	Charged During Follow-up Period
Charged when first seen, and/or previously	33	6
Not charged when first seen, nor previously	67	3
Totals	100	9

of 30 seen because of a criminal charge, and 32 out of 70 of the remainder. There was no significant difference in these proportions. A similar comparison taking into account also past and subsequent charges also failed to reveal any significant difference in the incidence of psychiatric abnormality in those who were charged once or more than once, as compared with the homosexuals who kept out of legal trouble. Two men in the series were at one time or another on other criminal charges (one false pretences, one living on immoral earnings).

Alcohol.—Four of the 100 patients were alcoholic, and another 10 drank excessively. Homosexual acts were allegedly facilitated by alcohol in 12 cases, including 2 of the aforementioned 14. Such facilitation occurred more often (5 out of 13) in those charged more than once than in those charged once only (3 out of 23), and least often (4 out of 64) in the remaining practising homosexuals who were not charged at all during the span of the investigation.

Associated Perversions.—Apart from the various available types of homosexual act the incidence of other known perversions in the series was four. Three men had sado-masochistic fantasies (one involving horses) and one a muscle fetish—that is, he derived erotic satisfaction from the contemplation, *per se*, of well-developed muscles.

Discussion

The literature on homosexuality shows a very wide divergence of opinion on what should be included. The present study was restricted to persons who we believe were homosexual or showed homosexual problems by any criterion. On the other hand, owing mainly to two factors, the group was a highly selected one, and to this extent cannot be regarded as representative of homosexuals as a whole.

The first of these factors was that all cases were referred for a psychiatric opinion, and would therefore be likely to contain a high proportion of the psychiatrically disturbed and criminally charged (these latter having come in the hope of establishing medical reasons for mitigating the rigours of the law).

The second was that all cases were referred for a psychiatric opinion in private, and hence contained a high proportion of the well-to-do. This was reflected in their high educational and social status, and in the relative adequacy with which they were able to verbalize their problems. (By contrast, dull and inarticulate persons are often unable to give more than the crudest account of their psychosexual reactions, and accurate assessment of propensities or the significance of activities is correspondingly difficult.)

The patients were all seen for specific practical reasons, either clinical—for example, "Can I change?"—or legal—for example, "Will he relapse?"—and the case notes were inevitably less complete than in a planned research project. Records differed in scope and emphasis from case to case, and negative findings were not routinely recorded unless considered relevant. Since all cases were seen initially by the same psychiatrist, the personal factor in history-taking was relatively constant. However, it must be remembered that the one psychiatrist may have been uniformly wrong, and—like a stitch dropped in knitting—the resulting omissions and bias may have become increasingly serious and the pattern evolved correspondingly distorted.

In general, the recorded differences between sub-groups in the series found to be significant on test are suggestive,

but not always easy to interpret. Such differences might, for example, arise from the nature of the original sample.

Although sufficient data were not always available for exact classification, we believe that with more information all of these cases could have been placed on a continuum between exclusive heterosexuality and complete homosexuality—that is, somewhere on the seven-point Kinsey scale. We have no doubt that this scale provides the best means of classifying homosexuals. It is unambiguous, descriptive, carries no moral connotation—for example, "invert" or "pervert"—and is not based on dubious theories of aetiology—for example, "congenital" or "acquired." It also carries useful prognostic implications.

Promiscuity is a striking feature of most practising homosexuals. We believe that diversity of acts is the rule, and that there is no medical value in attempting to differentiate those practising buggery from other homosexuals.

The distinction between paedophiliacs and adult seekers is, however, a valid and useful one. The overlap between these groups in our series was so small as not to disturb the hypothesis that the age of the preferred love object is, within limits, a characteristic and fixed attribute of an individual's psychosexual make-up.

Only half the patients showed significant psychiatric abnormality other than their sexual deviation, and such associated abnormalities were often slight. Moreover, many of these abnormalities were explicable as a reaction to the difficulties of being homosexual. Symptomatic homosexuality was rare. If homosexuality is a disease (as has often been suggested), it is in a vast number of cases monosymptomatic, non-progressive, and compatible with subjective well-being and objective efficiency. In our series, both practising and non-practising homosexuals were on the whole successful and valuable members of society, quite unlike the popular conception of such persons as vicious, criminal, effete, or depraved. Only one-fifth were at all obviously "pansy," and we found no reason to regard most of the patients as physically, intellectually, or emotionally immature (unless the basic criterion for "immaturity" is that of being homosexual—a circular argument).

The information recorded was insufficient to throw much useful light upon the controversial issue of psychosexual development; but, so far as they went, our data accorded with the widely expressed view (held by authorities as different as Freud and Kinsey) that the main pattern of psychosexual responses is established not later than puberty. Many of our patients were emphatic that they had felt "different" from others and had in fact been homosexual in their orientation so long as they could remember.

The follow-up gave evidence of a change in the direction of heterosexuality in 9 cases out of 59 (roughly 1 in 6) about whom sufficient information on the sex life was available; but such change sometimes amounted to no more than one or two points on the Kinsey scale. There was no evidence, from our series, that psychotherapy had any obvious effect in any way, on points that could be tested. The original prognosis was substantially correct in those of any age classifiable as Kinsey 5 or 6; changes of preference in either direction were less often successfully predicted in bisexual cases, but prognoses were more often right than wrong. We believe that claims for the cure of homosexuals should be treated with reserve unless the Kinsey rating before and after treatment is clearly stated and relevant evidence adduced. It seldom is.

In a search of the literature—concerning which West (1955) gives many references in his valuable monograph—we have been unable to find studies of a group of homosexuals comparable with our own. Most surveys have been concerned with special problems met with in prison—for example, Henry and Gross, 1938; Apfelberg *et al.*, 1944; Taylor, 1947—or mental hospital practice—for example, Gardner, 1931; Ruskin, 1941; Klein and Horwitz, 1949. The discrepancy in composition between our group and that of Taylor working at H.M. (Remand) Prison at Brixton is

a marked one, particularly in respect of the higher incidence of serious mental abnormality that he found (3% insane and 9% certifiably defective). Selected groups are seen by medicine and the law, and it is probable that the majority of practising homosexuals never reach either.

Summary

The incidence of homosexuality (as defined) was 5% in males over 16 seen in private psychiatric practice. 100 cases were studied retrospectively and so far as possible by follow-up.

In round figures, 9 out of 10 indulged in homosexual acts with others. Many were highly promiscuous and the majority quite active, the practising group committing at a conservative estimate an average of at least 10 (criminal) acts annually each.

There was no evidence that those who admitted to buggery differed from other practising homosexuals in social or economic success, stability or social worth, or that the continent group differed from practising homosexuals in these respects.

Only 49% of cases showed significant psychiatric abnormalities; these were usually minimal.

Paedophiliacs (meaning by this those who were attracted to pre-pubertal boys) were found to constitute a distinct group and only two committed acts with both adult men and pre-pubertal boys. There was no evidence of those preferring adults subsequently seeking boys (the "rake's progress").

In 59 cases where relevant information was obtained in the follow-up, a change towards heterosexual preference was noted in 9, while 3 became more homosexual, and 47 were unchanged. Only 1 of 24 cases originally regarded as "100% homosexual" reported a change in the direction of heterosexuality.

Twenty-five patients treated psychotherapeutically derived no apparent benefit in terms of changed sexual preference or behaviour as compared with 25 (matched) patients not so treated.

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REFERENCES

- Apfelberg, B., Sugar, C., and Pfeffer, A. Z. (1944). *Amer. J. Psychiat.*, 100, 762.
Gardner, G. E. (1931). *Psychoanal. Rev.*, 18, 57.
Henry, G. W., and Gross, A. A. (1938). *Ment. Hyg. (N.Y.)*, 22, 591.
Kinsey, A. C., Pomeroy, W. R., and Martin, C. E. (1948). *Sexual Behaviour in the Human Male*. Philadelphia.
— (1949). *Psychosexual Development in Health and Disease*, edited by P. H. Hoch and J. Zubin. New York.
Klein, H. R., and Horwitz, W. A. (1949). *Amer. J. Psychiat.*, 105, 697.
Ruskin, S. H. (1941). *Ibid.*, 97, 955.
Taylor, F. H. (1947). *British Medical Journal*, 2, 525.
West, D. J. (1955). *Homosexuality*. London.

A small booklet has been written by Dr. J. Gibson, describing the history and work of St. Lawrence's Hospital for mental defectives at Caterham. The hospital was founded in 1870. The booklet, which includes photographs, was set up and printed by patients in the hospital. Originally the hospital was known as Caterham Metropolitan Asylum, and both mental defectives and patients with mental diseases were accommodated. Gradually the buildings were expanded and improved, and they now house about 2,000 patients from the age of 5 upwards, with a nursing staff of 390. For many years the majority of the patients were low-grade mental defectives, but there are now some high-grade mental defectives there also, and so workshops have been built for them. The booklet was produced in the new printing workshop by some of the high-grade mental defectives working under supervision.

PARATHYROID DEFICIENCY
PRESENTING AS EPILEPSY

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Parathyroid deficiency may occasionally present as epilepsy. When this occurs there is almost always evidence also of tetany, latent or overt, though this may be trivial compared with the fits. Moreover, the pattern of the fits may be unusual and suggest the possibility of a reduced serum calcium concentration. Thus the attack may begin or end with carpo-pedal spasm. Occasionally generalized convulsive movements may occur without loss of consciousness and be terrifying to the patient. Sometimes the movements are of a peculiar athetotic variety and resemble the mobile spasm seen in some cases of Kinnier Wilson's disease. This may be linked with the fact that in long-standing cases calcification in the basal ganglia may be demonstrated radiologically—a point of some diagnostic value.

The range and variety of convulsive attacks which may occur has been reviewed by Robinson, Carmichael, and Cumings (1954) in discussing three cases of idiopathic hypoparathyroidism. Such attacks include many varieties of motor epilepsy and some which appear clinically to be petit mal. These authors conclude that the cerebral cortex may participate directly in the increased excitability caused by low serum calcium and readily demonstrated in peripheral nerve.

Diagnostic difficulties may arise, since some patients show an association of papilloedema, fits, and tetany; but Grant (1953) pointed out that the fits and papilloedema may be abolished by the administration of "para-thor-mone," and might thus be the result of electrolyte imbalance and consequent cerebral hydration.

The following case is considered worth recording because in the presence of a focal brain lesion fits occurred only when serum calcium was lowered. The case also illustrates clearly the part played both by the cerebral lesion and by the electrolyte imbalance in determining the pattern of the epileptic attacks.

Case Report

A woman aged 52 had had a partial thyroidectomy for thyrotoxicosis in 1953. Symptoms subsided, but a year later dysphagia developed and progressed. In 1955 a post-cricoid biopsy was performed, and showed grade 3 thyroid carcinoma. On December 22, 1955, Mr. R. G. Macbeth performed a radical thyroidectomy and first-stage pharyngectomy. Extensive local spread was revealed at operation, and deep x-ray therapy was started.

On January 13, 1956, she had what was thought to be a fit, though the onset was not observed, and when first seen she was breathing stertorously, was cyanosed, and was frothing at the mouth. There was no personal or family history of fits, faints, or migraine. She was started on phenobarbitone, 1 gr. (65 mg.) three times a day. On January 14 she had another seizure, in which clonic movements, mainly of the left side, were observed. On the following morning she was found to be weak in the left arm, with some increase in tendon reflexes and an up-going toe on the left side. On January 17 full neurological

examination revealed a slight left spastic hemiparesis, with some reduction of passive movement sense and an extensor plantar response on the same side. There was no papilloedema.

At noon on January 18 she had another fit, which was observed at its onset. It began with carpo-pedal spasm in both hands. The spasm spread over the whole of the left side and consciousness was lost. Clonic movements then occurred, but only on the left side, although there were stertorous breathing, cyanosis, and frothing at the mouth. The movements lasted for about 10 minutes, and consciousness was regained in about 30 minutes. Because of the carpo-pedal spasm at the onset of the attack, and because some myotatic irritability was present, the serum calcium was estimated and found to be 6.2 mg. per 100 ml. Intravenous calcium gluconate was given, and calcium lactate, 10 gr. (0.65 g.) three times a day was combined with para-thor-mone, 25 units four times a day. Forty-eight hours later the serum calcium was 7.3 mg. per 100 ml. and 24 hours after this (January 21) it was 9.4 mg. per 100 ml. On January 24 her treatment was changed from para-thor-mone to dihydrotachysterol, 3 ml. daily by mouth. The phenobarbitone was continued. There were no fits during these six days.

On January 25 she had another left-sided fit, and on January 27 an attack which was witnessed in full. On this occasion the onset was with carpo-pedal spasm, and there was slight risus sardonicus before the spasm, and clonic movements spread to the whole of the left side. The serum calcium, estimated at the end of the attack, was 7.1 mg. per 100 ml. Dihydrotachysterol was increased to 4 ml. daily and extra milk was given in addition to calcium lactate. On January 29 serum calcium was 9.6 mg. per 100 ml. The left hemiparesis was now worse, and by February 4 a virtually complete left spastic hemiplegia, with gross sensory loss, was present. Cerebrospinal fluid was not examined, but skull x-ray films were normal. The electroencephalogram showed a localized slow-wave abnormality in the right parietal region.

It was thought that she probably had a metastasis in the right Rolandic area, but radioactive iodine showed no uptake in this region. On February 3 and 4 there was vomiting and regurgitation through the gastric tube, so that little, if any, of her dihydrotachysterol was retained. On February 6 she had two further focal motor fits in the left arm and leg. The serum calcium at this time was 6.1 mg. per 100 ml. As vomiting had subsided and she was now retaining her medicine, no change in treatment was made. Thereafter she had no further fits, but the hemiplegia and diminishing responsiveness called for a right parietal burr-hole biopsy, which established the presence of a tumour. During the next 10 days she deteriorated steadily, and she died in coma on February 16. Full necropsy was not obtained, but extensive infiltration of growth was seen at the site of operation in the neck, and the regional glands were involved. Histological examination of portions of the brain tumour was carried out, but its appearance was regarded as more that of a primary glioma than of a thyroid secondary, though clinically the latter was more likely.

Comment

This case showed clearly that a low serum calcium was an important factor in precipitating fits. When the serum calcium was maintained at normal or near-normal levels the fits did not occur; when it fell they reappeared. Moreover, the pattern of onset of the attacks, with carpo-pedal spasm, was also determined by the serum calcium level. The local lesion in the right hemisphere, however, appeared to dictate the further course of the fits, in which clonic movements were confined to the left side.

It provides an unusually clear demonstration of two precipitating factors, general and local, combining to produce symptomatic epilepsy. Electrolyte imbalance and local brain lesion can each of themselves produce an epileptic attack. Here a combination of the two seems to have been the necessary stimulus. Even when the cerebral tumour

was present and was probably actively expanding, fits occurred only when the serum calcium fell. It is of further interest that each of the two causal factors contributed recognizable features to the pattern of the attacks.

Summary

A case is described with a focal brain lesion and parathyroid deficiency in which fits of the focal pattern expected from the brain lesion occurred only when the serum calcium was lowered.

Our thanks are due to Mr. R. G. Macbeth and Dr. Frank Ellis for the opportunity of studying this case.

REFERENCES

- Grant, D. K. (1953). *Quart. J. Med.*, 22, 243.
Robinson, P. K., Carmichael, E. A., and Cumings, J. N. (1954). *Ibid.*, 23, 383.

FAILURE OF PENICILLIN TO PREVENT
POST-OPERATIVE CHEST INFECTION

BY

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Penicillin and other antibiotics have been widely used in recent years in an attempt to reduce the incidence of post-operative chest infection. There has, however, been considerable doubt about the efficiency of penicillin in reducing the incidence of these complications when given prophylactically, and many authors have pointed out that they still occur, despite advances in surgery and anaesthesia and the use of antibiotics.

Hasslinger (1956) reports a striking series of 443 patients who underwent partial gastrectomy. Of these, 153 were given prophylactic penicillin. The number of patients with post-operative febrile bronchitis was 23 in the penicillin group and only one in the group who were not given any prophylactic antibiotics. Again, McKittrick and Wheelock (1954) reported on a series of 60 patients submitted to gastrectomy; 36 were given prophylactic antibiotic coverage without any advantage being gained by its use.

This paper describes a clinical investigation undertaken in an attempt to assess the value of penicillin given prophylactically for the prevention of post-operative chest infections.

Methods

For 18 months patients undergoing operations in alternate months were given an injection containing procaine penicillin G, 300,000 units, crystalline penicillin G, 100,000 units, and dibenzylethylenediamine dipenicillin G, 200,000 units, at the same time as the pre-operative injection. Patients operated on in the intervening months received no prophylactic penicillin.

Emergencies were excluded from the series. Most of these emergencies required antibiotics for conditions other than chest infections. All cases requiring gut resection, or considered to need antibiotics by mouth for any reason other than chest complications, were also excluded, as were patients who were given antibiotics post-operatively for threatened or established peritonitis. All other patients were included in the investigation, a careful note being made of their history of bronchitis and their smoking habits.

Physiotherapy was standardized for both groups, being given as a routine before and after operation. Any chest infection which did develop was treated on its merits, antibiotics being prescribed when indicated.

The investigation was essentially a clinical one relying primarily on clinical and not x-ray assessment of the chest condition of the patients. All patients were examined

before operation and daily afterwards for three days. When a severe infection normally warranted a radiograph of the chest it was done, and all cases diagnosed clinically after operation as atelectasis or consolidation were verified by chest films. It was not thought necessary to rely on films to assess the pre-operative chest category in the absence of physical signs.

Estimation of what constitutes a post-operative chest infection is not easy. Following the procedure used by Ellis and Shooter (1952), patients were placed before and after operation into one of the following five categories: group 1, normal; group 2, with cough, but without sputum or physical signs; group 3, with cough and sputum, but without physical signs; group 4, with cough, sputum, and physical signs of infection; or group 5, with a definite pulmonary lesion such as consolidation or collapse.

Patients were regarded as having a post-operative chest infection if, after operation, there were respiratory signs and symptoms that were not present before operation. A change of one step between pre-operative and final post-operative chest grouping was considered to indicate a mild post-operative chest infection, whereas a patient whose post-operative chest category was two or more grades worse was assessed as having a severe post-operative infection.

Results

The particulars of patients included in this investigation are given in Table I, which shows that in respect to the items recorded the two groups were comparable.

TABLE I.—Particulars of Patients in the Investigation

	No. of Patients	No. with History of "Bronchitis"	No. of Smokers	No. of Females	Average Age
Penicillin series	219	21	90	104	42
No penicillin "	221	28	92	106	38

Briefly, the main operative procedures undergone by the patients in the two groups were: (1) hernia operations of all kinds; (2) gall-bladder and common-duct procedures; (3) interval appendicectomies; (4) laparotomies, excluding gut resections; (5) operations on the sympathetic nervous system; (6) thyroidectomies and other general surgical procedures on the head and neck; (7) general surgical procedures on the limbs, such as ligation of varicose veins; (8) minor operations on breast and chest wall; and (9) minor ano-rectal and bladder procedures.

The complete results are given in Table II, which shows the correlation between the pre-operative and post-operative grading. The numbers between the heavy lines are those of patients with a mild (one-stage) post-operative infection, the numbers printed in italics are those with a severe (two stages or more) post-operative infection. It will be seen that an appreciable number of patients in each group had a lower grading after the operation. The results shown in Table II are summarized in Table III. A study of this table shows that the penicillin group did in fact do very slightly better than the control group, but that the difference was exceedingly small, and a statistical test shows that it could have easily occurred by chance.

On further analysis these results were shown to hold good if the comparison was applied separately to smokers and

TABLE II

Pre-operative Grading	Penicillin Group						No-penicillin Group					
	Post-operative Grading						Post-operative Grading					
	1	2	3	4	5	Total	1	2	3	4	5	Total
1	133	12	14	5	5	169	142	18	17	9	2	188
2	8	6	1	3	—	18	5	6	2	—	—	15
3	3	1	7	—	—	11	2	1	8	3	—	14
4	2	—	2	15	2	21	0	—	1	3	—	4
5	—	—	—	—	—	—	—	—	—	—	—	—
Total	146	19	24	23	7	219	149	25	28	17	2	221

non-smokers. It cannot be concluded from these figures that penicillin reduces the risk of post-operative chest infections when given immediately before operation.

TABLE III

	Penicillin	No Penicillin
Severe post-operative chest complications	27	30
Mild post-operative chest	15	23
No change post-operatively	161	159
Post-operative improvement	16	9
Total	219	221

Summary

An attempt has been made to assess the value of penicillin given to prevent post-operative chest infection. Comparing two similar groups, one given penicillin before operation and one not, no evidence has been obtained that penicillin is useful for this purpose.

I am indebted to Dr. R. A. Shooter for advice during this investigation and the preparation of this paper, also to Mr. M. P. Curwen for statistical assistance. I also thank many of the resident surgical staff at the Bridgend General Hospital for their willing co-operation.

REFERENCES

- Ellis, G., and Shooter, R. A. (1952). *Cur. Res. Anesth.*, 31, 430.
Hasslinger, W. M. (1956). *Zbl. Chir.*, 81, 1566.
McKinnick, L. S., and Wheelock, F. C. (1954). *Surg. Gynec. Obstet.*, 99, 376.

PRIMARY AMYLOIDOSIS PRESENTING WITH A CONFUSING CLINICAL PICTURE

BY

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It is well known that primary amyloidosis closely resembles other diseases. It can affect most organs, giving rise to a clinical picture which is often indistinguishable from that produced by a more common disease. When several unrelated organs are affected multiple diagnoses are often made.

The heart by itself or in company with other organs is most commonly involved, such cases usually presenting with congestive heart failure (Eisen, 1946; Lindsay, 1946). The picture may simulate that of failure due to cardiac ischaemia or constrictive pericarditis (Mathews, 1954), but often no obvious cause of failure is found.

Liver disease, often suggestive of cirrhosis, is a frequent mode of presentation. Nephrosis is another common presenting syndrome (Mathews, 1954). The alimentary tract is also a frequent site of infiltration, and a diagnosis of carcinoma may be made in these cases (Koletsky and Stecher, 1939). A sprue-like picture also occurs sometimes (Steinhaus, 1902; Golden, 1945; Adlersberg and Schein, 1947; Schein, 1947; Finley and Adams, 1948). Carcinoma of the lung (Koletsky and Stecher, 1939; Dirkse, 1946) and even of the bladder have been simulated by this disease on occasion. Arthritis and osseous disease have also been reported (Mathews, 1954). Peripheral neuritis is frequently present (De Navasquez and Treble, 1938; Götze and Krücke, 1941; Finley and Adams, 1948), but is often mild and apt to be missed.

The present case is of interest, because it prompted three different diagnoses, besides peripheral neuritis, before the true nature of the disease was established.

Case Report

The patient, a man aged 50, had had no illnesses of note until 1955, apart from a duodenal ulcer for which a gastro-enterostomy had been performed in 1942. In August, 1955, he developed a sensation of food sticking in the epigastrium after meals, with regurgitation of food and anorexia. He was admitted to a hospital, where hepatomegaly was noted. A barium-meal examination revealed a rigid stomach, suggestive of carcinoma. Gastroscopy showed a rigid mucosa and absent pyloric peristalsis. A diagnosis of carcinoma of the stomach was made, but subsequent laparotomy failed to confirm this. Liver biopsy taken at the time was thought to show a pericellular fibrosis. He was sent to a convalescent home in January, 1956, where he developed swelling of his legs with pain and numbness in his left foot and an increase in the size of his abdomen. He attended the out-patient department of the Middlesex Hospital in March, 1956.

On examination he appeared to be wasted, with early clubbing of the fingers, dilated and pulsating neck veins, gross hepatic enlargement, considerable ascites, and oedema of both legs, scrotum, and anterior abdominal wall. The heart appeared to be of normal size, gallop rhythm was not heard, and there were no significant cardiac murmurs. A tentative diagnosis of constrictive pericarditis was made, and he was admitted on March 10.

Investigations.—The venous pressure was 160 mm. of blood, the circulation time (arm-tongue) 30 seconds. The electrocardiogram showed a low-voltage curve with T wave inversion over the left ventricle, suggestive of pericardial change. X-ray examination of the chest showed a slightly enlarged heart, with no pericardial calcification, which pulsed normally on screening. The urine contained a variable quantity of protein from day to day (1–14 g. per litre), but Bence Jones proteose was not present. The haemoglobin was 103% (Haldane) and the white-cell count was normal. The total plasma proteins were 4.5 g. per 100 ml. (albumin 2.1 g., globulin 2.4 g.). The serum bilirubin was 0.6 mg. per 100 ml.; serum alkaline phosphatase 6.2 K-A units per 100 ml.; and serum acid phosphatase 7.2 K-A units per 100 ml. The flocculation tests were all within normal limits. The bromsulphthalein excretion was grossly impaired. The blood urea level was 29 mg. per 100 ml., and the serum cholesterol 260 mg. per 100 ml.

After consideration of these results the diagnosis of constrictive pericarditis was changed to one of severe parenchymal liver disease associated with congestive heart failure of unknown aetiology.

On closer inquiry into the patient's social history, it was found that he had been a wine-waiter for 20 years, and that for some years before the onset of his symptoms his alcohol intake had been excessive and his diet inadequate. This, together with some of the biochemical findings, suggested a diagnosis of portal cirrhosis. The symptoms and signs in the left foot were thought to be those of peripheral neuritis.

The previous liver biopsy was then reviewed and the possibility of amyloid disease was suggested. The section, however, showed so much autolysis that histological diagnosis was uncertain. A Congo-red uptake test was positive, the one-hour sample containing only 30% of the dye in the four-minute sample, with only a trace in the urine. A further liver biopsy by needle confirmed the diagnosis of amyloid disease.

While investigations were being carried out the patient was treated on the usual lines for congestive heart failure, with digitalis and diuretics. This was only moderately successful. Cortisone therapy was contemplated, but the patient died on April 3, before this was begun.

Post-mortem Findings

At necropsy bilateral pleural effusions, gross ascites, and a small pericardial effusion were found. The heart was slightly enlarged and the myocardium was of a waxy consistency.

The coronary vessels were relatively free of atheroma. At the lung bases there was some bronchopneumonic consolidation, but no evidence of tuberculosis or bronchiectasis was found.

The liver was grossly enlarged, weighing 74 oz. (2,100 g.). It was firm and waxy. The cut surface was pink, due to staining with Congo red. The lining of the stomach was also of a very striking pink colour throughout, and so to a lesser extent was the lining of the small intestine. The large intestine did not show any staining with Congo red. The spleen was small but firm and waxy. The kidneys appeared normal macroscopically. None of these organs gave the typical colour with iodine. Thrombosis of the superior mesenteric and left common iliac arteries was also found.

Microscopically the myocardium, liver, spleen, stomach, and small intestine were found to contain a large quantity of amyloid, which did not stain typically with methyl violet. The kidneys were only mildly affected.

Discussion

Wilks (1856) was the first to differentiate primary amyloidosis ("simple lardaceous disease") from the more common secondary variety, originally described by Rokitsky (1842). It was not until 1929 that Lubarsch described the different histological characteristics of primary amyloid.

A search through the literature has revealed 145 previously reported cases. Only 29 of these were diagnosed correctly in life. The reason for the lack of correct diagnosis in the remainder of cases is not far to seek. Probably the most important factor is the close resemblance to more common diseases which primary amyloidosis often shows. The clinical picture thus produced is, however, only rarely absolutely typical, and often several unrelated syndromes are present. Analysis of the literature suggests that primary amyloidosis should be suspected in cases of congestive heart failure of unknown cause and in patients presenting with what appears to be a collection of unrelated conditions, especially if some peripheral nerve involvement is also present. Idiopathic macroglossia often occurs in this disease, and when present is an important physical sign.

It is in the laboratory investigations that the other main difficulty is met. Primary amyloid material has very much less constant staining reactions than the secondary variety (Lubarsch, 1929; Koletsky and Stecher, 1939). It frequently fails to show the staining reactions with Congo red, iodine, and methyl violet. Thus the *in vivo* Congo-red uptake test is negative in over 50% of cases, through failure on the part of the amyloid to take it up (Eisen, 1946; Mathews, 1954), though some authors believe that the liver needs to be affected for this test to be positive (Jackson and Slavin, 1954). If a biopsy of the organs concerned can be done this will usually confirm the diagnosis, but again the absence of typical staining reactions must be borne in mind.

A high serum alkaline phosphatase level is usual in this disease, and is a useful diagnostic aid if other causes for this finding can be excluded (Gutman, 1955). The albumin/globulin ratio is stated to be reversed even in cases with purely cardiac involvement (Jackson and Slavin, 1954).

The aetiology of this disease is very obscure and theories of causation vary greatly, including unrecognized plasmacytomas (Apitz, 1940), non-bacterial hypersensitivity states (Lindsay and Knorp, 1945), and a collagen type of aetiology (Ehrich, 1952).

On the basis of the last theory corticotrophin therapy has been advocated (Jackson and Slavin, 1954). Cortisone has been tried, but without apparent effect (Williams, 1955), and there is some experimental evidence to show that corticotrophin and cortisone in fact increase the production of amyloid in animals with suppurative affections (Peräsalo and Latvalahti, 1954). Thyroid extract seems to have some inhibiting property. Success has been reported in cases of secondary amyloidosis with desiccated liver (Grayzel and Jacobi, 1938), but no attempt to treat the primary disease by this method has so far been recorded.

The congestive heart failure in these cases, if present, is very resistant to digitalis and diuretic therapy.

Summary

The remarkable similarity of the symptoms of primary amyloidosis to those of other conditions is shown by the 145 cases cited from the literature, of which only 29 were diagnosed correctly in life, the remainder being ascribed to a variety of more common diseases. The patient whose case is described above was believed to be the victim of several different conditions before the correct diagnosis was established.

The main diagnostic difficulties are attributable to the extremely variable clinical picture, the close resemblance to other more common diseases, and the frequency of non-specific staining reactions.

I thank Dr. G. D. Hadley for permission to publish this case and for his help in preparing the article. I am indebted to Dr. W. Richardson, of the Bland-Sutton Institute of Pathology, for the post-mortem and histological reports.

REFERENCES

- Adlersberg, D., and Schein, J. (1947). *J. Amer. med. Ass.*, 134, 1459.
Apitz, K. (1940). *Virchows Arch. path. Anat.*, 304, 631.
De Navasquez, S., and Treble, H. A. (1938). *Brain*, 61, 116.
Dirkse, P. R. (1946). *Amer. J. Roentgenol.*, 56, 577.
Ehrich, W. E. (1952). *Amer. Heart J.*, 43, 121.
Eisen, H. N. (1946). *Amer. J. Med.*, 1, 144.
Finley, J. W., jun., and Adams, W. (1948). *Arch. intern. Med.*, 81, 342.
Golden, A. (1945). *Ibid.*, 75, 413.
Götze, W., and Krücke, W. (1941). *Arch. Psychiat. Nervenkr.*, 114, 183.
Grayzel, H. G., and Jacobi, M. (1938). *Ann. intern. Med.*, 12, 39.
Guinan, A. B. (1955). In Cecil and Loeb's *Textbook of Medicine*, 9th ed., p. 719. Philadelphia.
Jackson, A., and Slavin, M. (1954). *Amer. Heart J.*, 47, 839.
Koletsky, S., and Stecher, R. M. (1939). *Arch. Path. (Chicago)*, 27, 267.
Lindsay, S. (1946). *Amer. Heart J.*, 32, 419.
— and Knorp, W. F. (1945). *Arch. Path. (Chicago)*, 39, 315.
Lubarsch, O. (1929). *Virchows Arch. path. Anat.*, 271, 867.
Mathews, W. H. (1954). *Amer. J. med. Sci.*, 228, 317.
Peräsalo, O., and Latvalahti, J. (1954). *Acta path. microbiol. scand.*, 34, 208.
Rokitansky, C. (1842). *Handbuch der Specieellen pathologischen Anatomie*, 3, 311. Vienna.
Schein, J. (1947). *Gastroenterology*, 8, 438.
Steinhaus, F. (1902). *Z. klin. Med.*, 45, 375.
Wilks, S. (1856). *Guy's Hosp. Rep.*, 17, 103.
Williams, J. D. (1955). *Ibid.*, 104, 312.

EPIDEMIC OF MENINGOENCEPHALITIS AND BORNHOLM DISEASE

BY

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AND

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The occurrence of a localized epidemic of meningo-encephalitis and Bornholm disease during the latter part of the summer of 1956 has provided an exceptional opportunity for studying the conditions clinically, tracing the possible sources and spread of infection, and considering the problems of immunity. The study has been purely on clinical grounds; the bacteriological aspect is still being investigated.

The relationship between meningitis and Bornholm disease has been reported on previous occasions (Howard *et al.*, 1943; Finn *et al.*, 1949; Warin *et al.*, 1953), but, except for an outbreak in Sweden, meningeal involvement has been noted in less than 10% of patients in large epidemics. A Swedish group of investigators (Gabinus *et al.*, 1952) have described an outbreak of Bornholm disease with a high incidence of aseptic meningitis associated with Coxsackie virus group B type 3. They

advanced a hypothesis that the virus entering a highly susceptible population affects persons of all ages, with pleurodynia and myalgic symptoms as predominating features, especially amongst older children and adults; on the other hand, in a relatively immune population, where children are primarily affected, aseptic meningitis may be a prominent feature. Our own findings on clinical grounds tend to support this theory.

Present Epidemic

The epidemic occurred within a radius of about 1½ miles (2.4 km.) in the small hamlet of Stretton Grandison (population 550) and Eggleton (population 133), and was centred at the school. The early cases during August and September were of Bornholm disease. This epidemic merged at the end of September into an outbreak of meningoencephalitis, centred largely in Stretton Grandison school. At the end of October encephalitic cases became fewer and Bornholm cases again reappeared.

An interesting feature of the epidemic was that three groups of cases were observed: (1) typical Bornholm disease, (2) typical encephalitis, and (3) a small group of intermediate cases. The Bornholm cases appeared to be related to an epidemic of this disease occurring in the neighbouring Bromyard district.

These cases showed a sudden onset with excruciating abdominal and thoracic pain (Devil's grip), accompanied by great prostration. The thoracic pain was aggravated on respiration, and the patients often feared to move. The infection lasted from two to ten days, and the adults were prone to relapse. The incubation period was two to ten days, often five.

The encephalitic cases appeared to be similar to those occurring in other parts of the country—"Nottingham meningitis." These cases often had a prodromal period of several days of lassitude and anorexia, but perhaps more frequently the onset was sudden, with severe frontal headache, pyrexia, vomiting, neck stiffness, and photophobia. The headache in some cases was paroxysmal and devastating. In a few cases a rash was observed with an erythema of wide distribution or a local macular rash. Sore throat and sore mouth were present in a few cases in the prodromal or acute phase. Coryzal symptoms were also noted in a few instances. Clinically either neck stiffness or a positive Kernig's sign was found. C.S.F. findings in the cases subjected to lumbar puncture showed an increase in lymphocytes.

The intermediate cases occurred in houses where there was already one type of case. In these cases there was headache and vomiting but no photophobia or neck stiffness.

A "Pickles chart" shows that the incidence increased until the end of September and beginning of October, when a peak was reached (Fig. 1). This peak was due to the explosive outbreak at Stretton Grandison school.

Altogether 52 subjects were affected: 27 with meningoencephalitis and 17 with Bornholm disease; 8 were intermediate cases. Of the 52 cases 25 occurred at the school, where there were 47 children (see Table). Of these 25, 15 were meningoencephalitis, 3 intermediate, and 7 Bornholm disease.

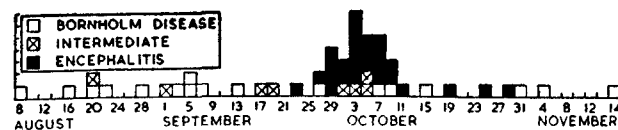


FIG. 1—Incidence of cases (August–November, 1956).

Incidence at School

	Boys	Girls	Total	No. Affected
Juniors	8	11	19	8
Infants	18	10	28	17

The following possible sources of infection have been considered. (1) The neighbouring Bornholm epidemic (with a possible change of type, or mode of action of the virus producing the encephalitic features). (2) Introduction from the influx of "travellers" (hop- and fruit-pickers) which occurred in August. (3) From mice, fleas, lice—but they appear to have played no part. (4) From food and water at the school. The food seems to be beyond suspicion, but is handled by the wife of the latrine attendant. The water has been condemned for three years and is boiled before use. Recently two brothers, young active farm-workers in this area, contracted poliomyelitis simultaneously. From the history it seemed probable that they contracted the disease from contaminated food. Barber (1938) described an epidemic of poliomyelitis in a school where the source of the infection seemed to resemble that of food-poisoning. There does not, however, appear to be any direct evidence of food contamination in the present epidemic.

The spread of infection seems to have been by direct contact, by finger-mouth route. This is supported by the plan of the seating arrangements at the school. The school is a mixed one, with two classes only. The seating arrangement in the infants' class (where there was a larger proportion of cases) is not constant. In the junior class the children adopt a permanent seating arrangement, and all the cases occurred in one section of the room only (Fig. 2).

The children have their meals at the school desks.

Where children seemed to contact a massive infection, as in the school, a large proportion contracted the disease. In the homes the attack rate seemed to depend on susceptibility. It is remarkable that some adult males seemed to be particularly susceptible and developed very severe attacks. This may explain how sporadic cases appear. In one house all five members contracted the infection, but in another of 14 members only one contracted the disease.

In the school the vast majority of cases were of encephalitis, with only a few Bornholm and intermediate cases. Several home contacts of the encephalitic cases developed Bornholm disease. In one family the father and three children had typical encephalitis, and the mother had a very typical Bornholm disease. In another family the mother and one child had Bornholm disease, another had encephalitis, and the father had an intermediate condition.

It is interesting to note that in the neighbouring schools of Yarkhill and Ashperton no cases occurred, although the Stretton Grandison children travel on the same bus as the Ashperton children.

Two children who had a benign encephalitis in 1955 developed Bornholm disease during the epidemic. No children in the school have been vaccinated against poliomyelitis, and so the relationship of this to the development of immunity could not be studied.

The Research Laboratory at Colindale have so far isolated a cytopathogenic agent (not poliomyelitis) from the cerebrospinal fluid or faeces of 10 cases.

Summary

An attack of Bornholm disease and encephalitis is described clinically and an attempt made to link the two conditions on epidemiological grounds. A similar outbreak in Sweden is mentioned for comparison.

We are indebted to the following for help received in studying this epidemic and compiling the data: Dr. J. S. Cookson, Dr. W. Hogg, Dr. A. T. Roden, of the Ministry of Health, and Dr. D. R. Christie.

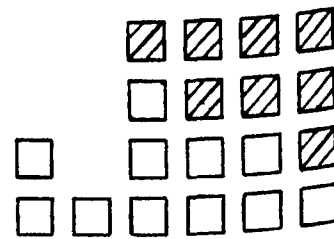


FIG. 2.—Relative positions of pupils in junior class. Shaded areas indicate cases.

REFERENCES

- Barber, G. O. (1938). *British Medical Journal*, 2, 1137.
 Finn, J. J., jun., Weiler, T. H., and Morgan, H. R. (1949). *Arch. intern. Med.*, 83, 305.
 Gahinus, O., Gard, S., Johnsson, T., and Poldre, A. (1952). *Arch. ges. Virusforsch.*, 5, 1.
 Howard, T., Weymüller, C. A., Edson, J., Itner, E., Watson, J., and Cassidy, M. L. (1943). *J. Amer. med. Ass.*, 121, 925.
 Warin, J. F., Davies, J. B. M., Sanders, F. K., and Vizoso, A. D. (1953). *British Medical Journal*, 1, 1345.

Medical Memorandum

Three Cases of Torsion of the Testis

Torsion of the testis is uncommon, and when it has a gradual onset it can easily be mistaken for acute epididymitis. Three new cases are recorded which emphasize the difficulties in early diagnosis described in full by Kennedy (1948) and Walton (1952).

CASE 1

A private soldier aged 19 woke with pain and swelling in the left testicle. Four and a half hours later he was referred for admission as a case of acute epididymitis. On examination he was afebrile and not in severe pain. The left side of the scrotum was swollen, red, oedematous, tender, and faintly ecchymosed round its neck. The skin was not adherent to the testis. Lifting the scrotum made no difference to the pain. Through a shallow hydrocele the epididymis could just be made out, lying anterior to the testis. The cord and opposite testis were normal. Examination per rectum and of the urine showed nothing abnormal.

Operation.—The testicle was delivered through a left inguinal incision. The hydrocele contained blood-stained serous fluid. The testis and epididymis were congested, with petechiae and subserous haemorrhages, and were rotated on a narrow pedicle through 180 degrees. After untwisting the testis the colour gradually returned. The surplus tunica vaginalis was resected, and after the testis was replaced the wound was closed without drainage.

Post-operative prophylactic streptomycin was given for 48 hours. Recovery was uneventful. Six weeks later the testis and epididymis were found to be normal in size, position, and consistence.

CASE 2

A lance-corporal aged 20 had intermittent sharp pain in the left loin whilst lifting heavy crates. Two days later the left testicle began to ache, and the next day it became swollen, and a diagnosis of acute epididymitis was made elsewhere. He was admitted on the following day. On admission he remembered three identical attacks in the last four years, during the first of which his appendix was removed. On examination he was afebrile. There was a red tender oedematous swelling of the left scrotum, the skin of which was not bruised or adherent to the testis. Elevation made the pain worse. The testis was indistinguishable from the epididymis; a tense hydrocele was present, and the cord was swollen and tender. Examination per rectum and of the urine showed nothing abnormal.

Operation.—Through a left inguinal incision an elongated tense purple hydrocele containing serofibrinous fluid was delivered. The testis and epididymis were attached at their upper pole by a rounded pedicle which had been twisted through almost one complete turn. The testis was pale, cyanosed, and black at its inferior pole, and the epididymis was congested and haemorrhagic. The vas deferens made a long loop in the parietal layer of the tunica vaginalis, which therefore could not be resected. When the colour was restored the testis was replaced in the scrotum and sutured to the dartos, and the skin closed without drain-

age. Prophylactic streptomycin was given for two days. Recovery was uneventful. One month later the testicle was normal in size and sensation.

CASE 3

A private soldier aged 21 was admitted complaining of lower abdominal pain and nausea for four days and swelling and pain in the right testicle for two days. Acute epididymitis had been diagnosed and sulphonamides had been given for two days before admission. On admission he was afebrile, and the only abnormal finding elsewhere was a scar, from tuberculous glands in the right side of his neck when he was 8. The left testis was normal. The right side of the scrotum was swollen, oedematous, red, and tender, and the testis and epididymis were indistinguishable in a tense hydrocele which adhered to the skin. Elevation made the pain worse. Examination per rectum and of the urine revealed nothing abnormal.

Operation.—Through a right inguinal incision a black hydrocele containing a haemorrhagic effusion was delivered. The testis had rotated anticlockwise through one and a half turns and was cyanosed and soft, while the epididymis resembled a clot of blood. Twenty minutes after untwisting the testis its colour had scarcely improved, but it was returned to the scrotum, and after dusting with penicillin-sulphathiazole powder the skin was closed without drainage.

Prophylactic streptomycin was given for five days afterwards, and recovery was uneventful. One month later, at a second operation through a small scrotal incision, the left testis was sutured to the areolar tissue of the scrotum. Eight weeks later both testicles were found to be normal in size, consistence, and sensation, and the patient was enjoying normal intercourse with his wife.

COMMENT

In adolescent boys "epididymitis" must be regarded as torsion of the testis or its appendix until proved otherwise (Dix, 1931). It is no less important to find good reason for a diagnosis of epididymitis in older patients, for many cases of torsion give a misleading history, lacking the story of trauma, abdominal pain, and vomiting of classical description (Kennedy, 1948). In early cases the local signs are ambiguous, swelling, redness, oedema, and hydrocele being common to both conditions, and unless seen very early the abnormal relations of the parts are obscured by swelling and pain. Dillon's sign (tethering of the skin in torsion) can occur in either condition, and elevation of the scrotum is of doubtful value, being painful whenever the scrotum is tender. Torsion is equally common on either side (Kennedy, 1948), and fever may occur with either condition.

The only reliable guide is the presence or absence of urinary infection, so a careful examination of the urethra, prostate, vesicles, and urine must be done in each case. If there is still any doubt then one should explore, rather than wait until gangrene of the testis makes itself plain. The different estimates of the survival time of the organ (Walton, 1952; Bailey, 1953) can only be a rough guide, because the tightness of the twist may vary from case to case. It is never safe to wait.

If operation is done in time the testis can be untwisted. A frankly gangrenous testicle is usually removed, but a doubtfully viable organ should, I feel, be restored, for it may recover against every expectation, as did Case 3.

If the underlying anomaly—abnormal mobility of the testis within the tunica vaginalis—is bilateral, the other testicle will be apt to twist. If one is already damaged, or absent, this risk should be explained to the patient and the remaining testicle made secure at a later operation, if he wishes.

J. P. BLANDY, B.M., B.Ch.

REFERENCES

- Bailey, H. (1953). *Emergency Surgery*, 6th ed. Wright, Bristol.
 Dix, V. W. (1931). *Brit. J. Urol.*, 3, 245.
 Kennedy, T. (1948). *Lond. Hosp. Gaz.*, 51, Clinical Supplement, Nov. 1.
 Walton, A. J. (1952). *Lancet*, 2, 211.

Reviews

FREUD CENTENARY ADDRESSES

Sigmund Freud—Four Centenary Addresses. By Ernest Jones, M.D. (Pp. 150. 18s.) New York: Basic Books Inc. London: Tavistock Publications Ltd. 1956.

When the centenary of Freud's birth was celebrated last year it was inevitable that Dr. Ernest Jones should be asked to give a number of commemorative addresses, and this book puts them on record. With his unique knowledge of the man and his work, and immersed as he has been in his great biography of Freud, it would have been easy for Dr. Jones to have restricted himself to aspects of Freud's personality or of psycho-analysis. The addresses, however, present reflections on topics which, though stimulated by the occasion, have a more general appeal. In the first, on "The Nature of Genius," the author reviews the literature and then adds a "modest contribution" on what he suggests is a characteristic feature of the genius as contrasted with the man of great talent—namely, the coexistence of a particular scepticism and a curious credulity. Intellectual gifts of a high order are often combined with scepticism; but it is a credulous streak that seems to assist in the birth of fundamentally new viewpoints, as is neatly illustrated in a comparison between Huxley and Darwin, though, as the author notes, there is a common tendency to ignore the manifestations of this credulity in the biographies of geniuses. (It was this first address, incidentally, which the author delivered so memorably in London, and not the second one as is stated in the book.) The second address deals with "Our Attitude Towards Greatness"; the third, on "Psychiatry Before and After Freud," gives a broad consideration which must be of interest to every psychiatrist. Following these three addresses is the shorter broadcast talk given last May; and finally there is reproduced most of the author's appreciation of Freud written at the time of his death. These addresses, as would be expected from Dr. Jones, are both substantial and well written, and, along with the beautiful production, make this a delightful book.

J. D. SUTHERLAND.

DEMONIACAL POSSESSION

Schizophrenia, 1677. A Psychiatric Study of an Illustrated Autobiographical Record of Demoniactal Possession. By Ida Macalpine, M.D., and Richard A. Hunter, M.D., M.R.C.P., D.P.M. (Pp. 197+ix; illustrated. £6 10s.) London: Willam Dawson and Sons Ltd. 1956.

In 1677 Christoph Haizmann, a Bavarian painter, began to suffer from convulsions and frightening visions, especially "when he had drunk a little too much wine." He confessed that eight years before, after the death of a relative ("ex morte parentis"), he had sold himself to the Devil, and feared now that the Devil would soon claim his due. He went to the Brothers of a Holy Order at Mariazell in Austria and begged them for help. After three days and nights of exorcism he saw the Devil at the altar. Tearing himself from the restraining hands of the priests, he rushed to the spot and returned with a piece of paper, rolled into a ball and torn into four pieces, on which was written his pact with the Devil in 1669. The painter's illness then improved, though a second exorcism was necessary the following year. Afterwards joining a religious order, he wrote the story of his encounters with the Devil and illustrated it with nine paintings.

In 1923 Freud analysed this case of "demoniacal possession," assuming that—as in Schreber's autobiographical account of his "paranoia" which Freud had analysed in 1911—a passive homosexual attachment to the father (or the Devil as a father-substitute) could be discerned here as well. In order to show that Freud had based his views on selected and partially misconceived evidence Dr. Macalpine and her son, Dr. Hunter, had previously published a translation of

Schreber's memoirs. In this volume they present photographic copies and translations of the original manuscript, as well as of the original paintings which recorded the painter's meetings with the Devil. We must be grateful to the authors for having made this material available. It is obvious that the data are so scanty that no kind of dynamic interpretation or diagnostic evaluation can be based on them. It is interesting to learn that Freud had assumed that "ex morte parentis" indicated the death of the father, in spite of its equivocal meaning; and that he had been unaware that, in mediaeval paintings, the Devil was frequently depicted as having conspicuous, or even multiple, breasts. The authors' further claim that concepts of libido and transference are less essential than concepts indicating the patient's disturbed experience of himself is hardly supported by their arguments, which fill the greater part of the book.

F. K. TAYLOR.

NEUROLOGICAL NURSING

Neurological Nursing: A Practical Guide. By John Marshall, M.D., M.R.C.P.Ed., M.R.C.P., D.P.M. (Pp. 166; illustrated. 18s. 6d.) Oxford: Blackwell Scientific Publications. 1956.

Not only does the nursing of neurological patients present a special problem because of the disorders of movement and of sensation to which they may be subject, but so many of the diseases that they have are of such slow progression that their care calls for special skills and attitudes. The investigation of the cause of disease in these patients includes such procedures as injection of air and opaque substances into the cerebrospinal pathways and the use of increasingly complex electronic methods of diagnosis. In all these procedures the active and intelligent co-operation of nurses is essential. In treatment, too, the nurse forms an integral part of the team, whether in prolonged reablement or in the techniques of neurological surgery. The viral diseases, of which poliomyelitis is the striking example, make special demands on the initiative and knowledge of nurses who constantly attend patients in a variety of forms of respirator—patients who may have a tracheotomy or an associated pulmonary disorder.

In the last ten years courses in this specialty of neurological nursing have been carried out in special centres, and this practical textbook will be most valuable both to those who conduct and to those who attend them. There is a good deal in it that the neurological physician takes for granted or has forgotten, but which can make so much difference to his peace of mind as well as to his patients' welfare. In thirteen short chapters Dr. Marshall covers most of the aspects of management of the patient with neurological disease, including his psychological well-being and his social care.

DENIS WILLIAMS.

VASCULAR DISEASES

Diagnosis and Treatment of Vascular Disorders (Angiology). Edited by Saul S. Samuels, A.M., M.D., F.A.C.A., F.A.C.C. (Pp. 621+ix; illustrated. £6 8s.) London: Baillière, Tindall and Cox, Ltd. 1956.

This book by seventeen contributors under the editorship of Dr. Saul S. Samuels deals with disorders of the peripheral vascular system, and on the whole succeeds in giving a clear and up-to-date account of those abnormalities. To British readers it is of interest that four of the contributors are from the Commonwealth (Boyd, Goetz, Ratcliffe, and Rose), and these four have written more than one-third of the book. The chapters by the editor on thromboangiitis obliterans, by Simeone on vascular injuries, and the four chapters by Goetz are all good. Unfortunately, the chapter on angiography is below the standard of the rest of the work. In the first place, too wide a field is covered. To try to include angiocardiology has meant the exclusion of many other techniques, including lymphangiography and the percutaneous techniques of arterial catheterization. And in the second place one gets the impression that this chapter was written several years ago. Perhaps these authors got

off the mark quickly and submitted their sections too long before the other contributors had written theirs. The authors of this chapter also have a different conception of the scope of the book from the editor; in addition to angiocardiology they discuss cerebral arteriography and portal venography, but nowhere else in the book is there a discussion of lesions of these vessels.

In the preface the editor states that he originated the term "angiology" to cover the specialty of vascular medicine and surgery. In my view this is a good term, but it is very difficult to decide upon its scope. Are the diseases of all the blood and lymph vessels in the body to be included? Theoretically yes, but in practice no. The intracranial vessels, for example, are part of neurosurgery, not angiology, although the cervical carotid arteries—not discussed in this book—are, I think, part of angiology. In this book the diseases of the aorta and the blood vessels to the limbs have been discussed, and this must be taken as the editor's conception of angiology—that is, diseases of the peripheral vascular system. As such it is good and should have a wide appeal, and it is recommended.

CHARLES ROB.

ANAESTHESIA IN HEART SURGERY

Anesthesia for Surgery of the Heart. By Kenneth K. Keown, M.D., F.A.C.A. (Pp. 109+xiv; illustrated. 27s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1956.

The author is anaesthetist at the Hahnemann Hospital and the Bailey Thoracic Clinic, and therefore this book was received with keen interest. The preface states that no attempt is made in the book to include a detailed step-by-step description of techniques for anaesthetic management. The reviewer was disappointed to find only a very superficial account of the anaesthetic techniques used. The methods described differ in important details from those used in leading centres in Great Britain. The author reiterates the importance of postponing operation whenever hypotension follows induction of anaesthesia, and repeatedly emphasizes the beneficial effects of inhalation of pure oxygen during anaesthesia for cardiac operations.

The best parts of the book are those describing the pathology of the various cardiac diseases. In each case there is a succinct account of the mechanism of circulatory derangement. There are several notable omissions. Pericardectomy and operations for aortic aneurysm are not mentioned. A section on anaesthesia for diagnostic procedures should have been included, and a description of the management of cardiac arrest would be a valuable addition. It was disappointing to find that hypothermia and cardio-pulmonary by-pass receive only passing mention. The style is often cumbersome, so that the meaning is difficult to follow—for example, "Blood loss from haemorrhage is an excellent example of the needed teamwork for an outcome that will be successful for the patient" (p. 36). Unfortunately there is no index, so that the claim to be a "Ready reference for anesthesiologists" (publishers' note on dust cover) is not substantiated. In view of its small size the price of this book is rather high.

C. F. SCURR.

MEDICAL TREATMENT OF HEART DISEASE

Treatment of Heart Disease: A Clinical Physiologic Approach. By Harry Gross, M.D., F.A.C.P., and Abraham Jezer, M.D. (Pp. 549+x; illustrated. 91s.) Philadelphia and London: W. B. Saunders Company. 1956.

In recent years there have been so many books written on so many aspects of cardiovascular disease that the authors of this one start their preface by posing the question, Why another? Perhaps a critic is in a better position to answer this question than the authors: quite simply one might say because this is probably the best modern book on the medical treatment of heart disease written in the English language. It is remarkably informative, accurate, concise, comprehensive, up to date, and restrained; it is also nicely

written and well produced. The authors have not been able to resist wandering into the neighbouring and inviting fields of pathology, physiology, clinical features, and diagnosis, on the plea that rational treatment commands these excursions, and on the whole such breaks are refreshing. The first chapter, on the pathologic physiology of myocardial insufficiency, condones any subsequent philandering. Appended are a variety of useful diets the ingredients of which are comprehensible to British residents; and 12 pages of appetizing low-sodium recipes left one speculating whether it was Dr. Gross or Dr. Jezer who had the personal interest in these matters.

PAUL WOOD.

VIRUS DISEASES AND THE CARDIO-VASCULAR SYSTEM

Virus Diseases and the Cardiovascular System. A Survey. By Ernest Lyon, M.D. (Pp. 215+viii. \$5.75.) New York and London: Grune and Stratton. 1956.

The author has produced a comprehensive review of his own and other published work on virus diseases, with special reference to the cardiovascular system. The book is arranged in two parts. Part I deals with the general manifestation of virus diseases and with the present concepts of cardiovascular involvement, while the second part covers individual virus diseases in detail. Undue concentration upon the cardiovascular system has been avoided and the whole picture of each disease is presented. There is a useful and full bibliography at the end of each chapter. Unfortunately the style of the text makes it rather difficult to follow, while the inclusion of some illustrations would have added greatly to the value of the work. But the section on the present concepts of cardiovascular involvement in virus disease is worthy of special attention, and the book should be noted by all who are interested in the subject.

J. F. GOODWIN.

Justly renowned for his translations of Chinese literature, Mr. Arthur Waley again puts English readers in his debt by a delightful biography of an eighteenth-century poet, *Yuan Mei* (Allen and Unwin Ltd., 21s.). China, or least the China of its classical literature, was a country where friendship was exalted above the more turbulent passions that have fired many European writers, and contemplation of nature the source of life's deepest pleasures. The feeling in many of the poems that Waley presents here is well evoked in the phrase from one of them: "All my life moonlight and snow are the things I have loved best." That this is a poetic rather than a literal expression of Yuan's impulses is evident from the biographical details that Waley gives us, for the poet, like many another, was rather a libertine. Of special interest to medical men is the glimpses this book gives of the medicine practised in eighteenth-century China. It was by no means primitive, and, though evidently rather different from the medicine of eighteenth-century Europe, it seems to have been no more irrational.

In the John Matheson Shaw Lecture for 1955, delivered at the Royal College of Physicians of Edinburgh, Dr. C. A. H. Watts discusses neuroses in general practice and stresses the need for more accurate definition in surveys of psychiatric cases. He suggests a scheme of classification based on his own experience of these cases. He feels that the average doctor, with the spectre of the chronic hypochondriac in mind, tends as far as possible to avoid the treatment of psychiatric disorders. Dr. Watts also discusses various types of psychotherapy. The lecture has recently been published by the College, at 9, Queen Street, Edinburgh, price 3s. 6d.

The *Hospitals Year Book, 1957*, once again provides an up-to-date and authoritative guide to the hospitals in Great Britain and Northern Ireland, covering all aspects of administration and management. Particulars of blood-transfusion services, Government departments, statutory bodies, local authorities, etc., are included. The editor's annual review of hospital service developments deplores the fact that the Guillebaud Committee's recommendation for increased capital expenditure has not been accepted, pointing out that the need is particularly urgent in the mental hospital field. The *Year Book* is published by the Institute of Hospital Administrators, 75, Portland Place, London, W.1, price 52s. 6d.

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THE FIRST DECISION

Two important decisions were taken by the Council of the B.M.A. last week. It decided not to co-operate with the Royal Commission in present circumstances, thus accepting a recommendation from the G.M.S. Committee, a recommendation that will go also to the special Conference of Local Medical Committees and, from the Council, to the special Representative Meeting, both to take place in about three weeks from now. The interval will give time for reflection, and it is to be hoped that any who doubt the wisdom of the Council's decision will have their doubts dispelled during this interval. To take part in the work of the Royal Commission with its present terms of reference would be to acquiesce in the nullification of the two Spens Reports, to depart from the customary and proper method of negotiating terms and conditions of service with the Ministry of Health or through the Whitley machinery, and to agree that a Royal Commission is a suitable body to determine the remuneration of doctors working in a State medical service. And there is one point that must be made abundantly clear. Our negotiators have been authoritatively informed that the Royal Commission now set up is not a form of arbitration. Arbitration is excluded completely and absolutely. The Royal Commission, presided over by a business man and excluding doctors from its membership, is going to decide what doctors should be paid in the N.H.S. and how this payment should be kept under review. It is true that its recommendations may be rejected, or accepted in part or in whole, by the Government, and—it may be rash to assume—may be accepted or rejected by the profession. We say "rash," because Mr. Macmillan has already set a pattern of behaviour which bodes ill for doctors if they meekly accept it. Having said at one moment that an increase for junior hospital staff should be negotiated through a Whitley committee he then arbitrarily announces in the House of Commons what this increase is to be. This is dictation—the dictation of the employer to his employees. We know that in meetings of the profession registrars have sharply criticized this. But it is a sign of the ill-health of the N.H.S. that they have not—so far—made their protest public, for example, in letters to this *Journal*. They do not wish to prejudice their future in the

hospital service. In these circumstances they will be given the shelter of anonymity if they wish to protest.

We may be sure that the next step Mr. Macmillan will take will be to announce from the floor of the House of Commons that other doctors in the Health Service—excluding, as has been made clear, medical officers of health—will receive as from a certain date a certain percentage increase. Whatever the amount, the profession will find itself in a difficulty. For general practitioners such an addition will go into the Central Pool. For hospital staffs the various salaries paid will be automatically raised. But our colleagues in the public health service, who, if words mean anything, are included in the terms of reference, will get nothing. This is dictation. It is the power of the purse ruthlessly exercised by an all-powerful employer who is adopting autocratic methods that civilized people thought were outmoded. If the medical profession still preserves any sense of dignity, any sense of fair play, any concern for the welfare of future doctors, it will reject these methods with contumely. To co-operate with the Royal Commission under its present terms of reference would be to put expedient before principle. If the terms of reference were altered they would have to be examined afresh, but it is difficult to see how any terms of reference could alter the fact that a Royal Commission is not the proper body to negotiate terms and conditions of service of doctors in a State medical service. The Council of the B.M.A. has given the profession a firm and completely correct lead in refusing co-operation with the Royal Commission, and it is hoped that it will receive from all sections of the profession the unhesitating support this decision deserves.

THE SECOND DECISION

During the past several months dissatisfaction with the present National Health Service has mounted. From the appointed day in July, 1948, it has become progressively obvious that the machinery of the Service badly needs overhauling, and in the meanwhile doctors for the most part have become either rebellious or apathetic and cynical. These attitudes have been more or less concealed by the fact that in spite of all provocation doctors have gone on with their absorbing task of looking after sick people in what is called a Health Service. Their frustrations have been brought to a head, not caused by, the dispute over the present claim for fulfilment of the recommendations of the two Spens Committees. The Council of the B.M.A., which has long been aware of this state of affairs, has now decided to set up a Committee of Inquiry into the N.H.S. as a

whole. This is a courageous and wise move—courageous because the B.M.A. advised the profession in 1948 to enter the N.H.S., wise because the N.H.S. has in many respects fallen short of what even its severe critics thought might come out of it. Even if the Government gave the profession a 24% increase in pay to-morrow, the B.M.A.'s Committee of Inquiry would still go on. It will in effect complete the investigation begun in 1941–2 of the B.M.A. Planning Commission. This Commission, it may be recalled, produced a draft interim report. It produced no final report, but at the time allowed itself to be diverted from this by the publication in 1942 of the Beveridge Report which inaugurated the Welfare State in this country.

It is probably as well that the B.M.A. did not proceed to a final report in and immediately after 1942. The new committee of inquiry into the N.H.S. will now have the great advantage of direct experience of a system of medical care which has with ever-mounting cost been in existence for close on nine years. It will have the advantage of knowing the results of similar—but not identical—schemes in other countries, especially in the Commonwealth and in Europe. The membership of the committee will be widely based, and it will go beyond the Planning Commission set up in the early years of the last war by seeking the co-operation in its work of persons outside the medical profession: it will take the consumer of medical services into close consultation. The B.M.A. thus declares in advance that its intention is not just to recommend modifications to its advantage, not just to pursue selfish aims and objects. If the National Health Service is to evolve into something in which the profession can serve contentedly and from which the public can obtain the real benefits of modern medicine, much hard thought will be necessary. No one denies that there is much that is of value in the present N.H.S. What bedevils it is party politics: witness the stupid attempts of the past eighteen months to make some political capital out of the poliomyelitis vaccine. What we need is the minimum of interference with the individual practitioner of medicine, and the maximum responsibility for the individual hospital in the management of its own affairs. Medicine in its growing enforced subservience to the State machine is in real danger of becoming static, frozen in a series of servile attitudes. Medicine needs to be freed from much that is inhibiting in the present scene if it is once more to become free and dynamic in its responses to challenge. The N.H.S. needs to be subjected to what Mr. Dulles called an "agonizing reappraisal." The opportunity for this reappraisal has now been provided by the B.M.A. Council; and we may be confident it will be grasped eagerly.

VIRUS MENINGITIS AND ENCEPHALOMYELITIS

Infections which simulate poliomyelitis in one form or another have been recognized for a number of years. In Great Britain knowledge of them has grown particularly since the poliomyelitis epidemic of 1947. Usually they have come to be recognized as something distinct either because they fail to conform to the normal pattern of poliomyelitis, whether the major or minor illness, or because of unusual findings in the spinal fluid. G. H. Jennings¹ reported a series of cases of encephalomyelitis seen in North-west London in the summer of 1946 which in his opinion were caused by a neurotropic virus other than poliomyelitis. On the other hand the experience of the 1947 epidemic led others to believe that poliomyelitis was the most likely cause of a brain-stem encephalitis in this country.² The only definite evidence in support of this view was the identification of poliomyelitis infection in two fatal cases of encephalitis during 1947–8 which were reported in this *Journal*.^{3,4} This was ten years ago, when the investigation of virus infections was a complicated business. Fortunately a period of great development lay just ahead which was to have its effect on methods of laboratory diagnosis.

The first step came in 1948 from the small town of Cocksackie on the Hudson River, where G. Dalldorf and G. M. Sickles recovered from the faeces of two children acutely ill with paralytic poliomyelitis a new type of virus which produced disease in suckling mice.⁵ Cocksackie or C viruses were soon recovered from cases of aseptic meningitis, non-paralytic and paralytic poliomyelitis, and from apparently healthy individuals in many parts of the world.⁶ The following year came the important discovery that poliomyelitis virus would grow in tissue culture, and from being one of the most difficult viruses to handle it became one of the easiest. Current methods of virus isolation and antibody estimation provide highly reliable methods of diagnosis.⁷ As the technique of tissue culture developed, it soon became evident that a number of viruses isolated from the alimentary tract were not related antigenically to poliomyelitis, Cocksackie, or to any other known virus, and, being for the most part unrelated to human disease, they were termed "orphan viruses," a name which recently has been changed to the ECHO group of viruses (or enteric cytopathogenic human orphan viruses).^{8,9} Thus there exists a large mixed group of human enteric viruses—poliomyelitis, Cocksackie, ECHO, and probably other viruses as well. The task now is to make use of new techniques to define the exact relationship of these viruses to human disease.¹⁰

Circumstantial evidence has been accumulating in recent years pointing to Coxsackie group B viruses as an important cause of aseptic meningitis. From Rhodesia,¹¹ South Africa,¹² Canada,¹³ and many other parts of the world have come reports of this. In a recent review of 96 cases of aseptic meningitis at the Hospital for Sick Children in Toronto, A. J. Rhodes and A. J. Beale showed that 18 of these could be attributed to Coxsackie B, and in 5 of these cases virus was isolated from the spinal fluid.¹⁴ A close association exists between aseptic meningitis and Bornholm disease. Quite often in outbreaks of Bornholm disease cases are encountered of frank meningitis, particularly in young children, of pleurodynia and myalgia, and of combinations of the two. The view has been advanced in Sweden, and there is much to commend it, that the varied clinical pattern is a reflection of the individual host's reaction to infection with the same infectious agent. This view would serve to explain the character of the epidemic of meningo-encephalitis and Bornholm disease reported by Dr. H. G. Langdale-Smith and colleagues in this week's issue of the *Journal* (p. 805). Although the exact cause of these cases is not yet known, they may have been caused by a Coxsackie virus or, in view of recent observations, by one of the ECHO viruses; the same varied response may be expected in a number of virus infections. The position with Coxsackie A virus is less clear. It has been established as the aetiological agent in herpangina, but only recently has evidence appeared that it has a role in meningo-encephalitis. In a study of meningo-encephalitis in Johannesburg from 1951 to 1954 eleven strains of Coxsackie A (and 20 of Coxsackie B) were isolated from the faeces and in some cases from the spinal fluid as well.¹⁵ In the Toronto series three viruses isolated from the spinal fluid were classified as orphan or ECHO viruses.¹⁴ Other workers have made similar findings. A recent report from the Children's Hospital in Buffalo¹⁶ describes a series of 24 cases (17 children and 7 adults) in a village of 500 inhabitants characterized by an acute onset of fever, headache, and other symptoms suggestive of pre-

paralytic poliomyelitis. The incidence of family infections was high, but no cases of paralysis were encountered. Type ECHO-6 virus was isolated from the faeces of several cases and a specific increase in antibody was detected. The same type of virus was isolated from the spinal fluid of subsequent cases, and it appears that this virus strain was responsible for a number of similar infections in the United States in the summer and autumn of 1955.¹⁷

In Europe similar cases have been encountered. Two reports from Western Germany and one from Switzerland indicate that cases of aseptic meningitis were widespread in the latter half of 1956.¹⁸⁻²⁰ Both clinical and epidemiological features were similar to those observed in the U.S.A. and in Great Britain; in one or two instances meningitis with a rash was observed. Several strains of virus were recovered from the sputum and faeces with properties suggestive of an ECHO virus. In Great Britain outbreaks of aseptic meningitis, often associated with a rash, were reported from widely separated parts of the country in 1955 and 1956. Nottingham,²¹ Lancashire,²² Wensleydale, Sheffield,²³ and many other districts appear to have experienced outbreaks of this kind. Each outbreak had some peculiar feature, but in the main these cases were principally in young children and presented with a sudden onset of fever, headache, nausea, and vomiting. In many a biphasic type of illness was seen. Lymphadenopathy and a rubella-like rash, more often on the face and neck than elsewhere, were seen in some cases. Pleocytosis in the spinal fluid was common, with cell counts ranging from 50 to 2,000. Such high cell counts are not normally associated with poliomyelitis but are occasionally seen in aseptic meningitis caused by mumps or lymphocytic chorio-meningitis viruses. D. A. J. Tyrrell and B. Snell,²⁴ investigating an outbreak at Sheffield in which mouth lesions were also present, recovered several strains of virus in tissue culture of human kidney which subsequently produced lesions in suckling mice suggestive of a Coxsackie A virus. A similar outbreak was observed in East Suffolk in the last few months of 1955, most of the

patients being of primary school age.²⁴ From several of these cases G. P. B. Boissard and his colleagues at Colindale isolated a number of virus strains from faeces, throat washings, and spinal fluid in tissue culture of monkey kidney.²⁵ Tissue-culture fluids produced lesions in suckling-mice, and it seems that these viruses, now identified as type ECHO-9, are related to the Coxsackie-A group. Subsequent tests have shown that their strain is similar to those recovered in Sheffield and in other parts of the country, from a case in Toronto, and from an outbreak of mild meningitis in East London a few years ago.²⁶ Confirmation of the role of ECHO-9 virus in this type of aseptic meningitis comes from Sweden. Also confirmed is the interesting phenomenon, observed in Britain,²⁵ that this virus produces lesions in suckling mice of the Coxsackie-A type only after first being passed in tissue culture.²⁷ A different type of virus, possibly an ECHO, but with properties similar to the agent recovered by F. A. Neva and J. F. Enders from an unusual epidemic exanthem in Boston,²⁷⁻²⁸ was also isolated from a few cases of aseptic meningitis.

These outbreaks of aseptic meningitis have several points in common. Signs of infection of the brain parenchyma are uncommon. Pleocytosis in the spinal fluid is a marked feature and the number of cases with positive virological findings is significant. But in some outbreaks of encephalomyelitis the findings were the reverse, a problem discussed recently at the Section of Epidemiology of the Royal Society of Medicine.

Cases of encephalomyelitis at first thought to be poliomyelitis, until this diagnosis became no longer tenable, were first described in 1949 by Sigurdsson and others²⁹ from Iceland and have since been seen in Australia,³⁰ New York,³¹ Berlin,³² and Great Britain.³¹⁻³³ In the Iceland and Adelaide epidemics many hundreds of young people were affected, and in Britain three outbreaks³³⁻³⁵ have now been seen in hospitals, principally among the nursing-staff. The most recent in the hospitals of the Royal Free Hospital Teaching Group were the most extensive.³⁵⁻³⁶

In a review of the epidemiology of these outbreaks N. Crowley, M. Nelson, and S. Stovin³⁷ have shown that the first cases appeared at the Royal Free Hospital in Gray's Inn Road in July, 1955, and during the course of the next few weeks spread to the other hospitals in the group. Of the population at risk approximately 9% were affected, and it seemed clear that institutional life played an important part in the spread of the disease, in which nurses and resident staff were predominantly affected. Again each outbreak both in this country and abroad has had its own peculiar features, but several points in common emerge from the published reports. Prodromal symptoms were not prominent and were usually insidious

in onset. Low-grade fever and enlargement of the posterior cervical lymph nodes were often seen. Headache, tiredness, and muscle pain were notable features, the last persisting for many months. At a later stage in the cases at the Royal Free Hospital involvement of the reticulo-endothelial system was apparent, with many cases showing tender lymph nodes, liver, and spleen, together with various abnormalities in the lymphocytes in the peripheral blood. Neurological signs were variable, but the main points of difference from poliomyelitis were the signs of muscle weakness without paralysis which continued to develop for several weeks, normal or exaggerated reflexes, and sensory disturbances. Other neurological manifestations encountered were cerebral irritation with photophobia and neck rigidity and considerable emotional disturbance. Ocular and other cranial-nerve palsies and pyramidal signs were seen in many cases.³⁴⁻³⁶ In many instances convalescence has been protracted.³⁵⁻³⁶ In a follow-up of the Iceland cases the more severely affected patients still complained of nervousness, tiredness, and painful muscles six years after infection.³⁸

The pathology of this condition is not known, though the detailed observations on the Royal Free cases suggest that there is widespread systemic involvement.³⁶⁻³⁷ There can be little doubt that in many cases an organic lesion of the brain parenchyma exists. The valuable electromyographic studies, however, indicated that there was no evidence of lower motor neurone degeneration, the picture being one of a myelopathic lesion with the additional abnormality in motor-unit activity. Apart from the Iceland cases,²⁹ in which only a small number were examined and found to show a mild pleocytosis, the spinal fluid has been found to be normal and the virological investigations, many of which have been exhaustive, have been consistently negative.³³⁻³⁶ At present the viral aetiology attributed to this condition rests on the clinical and epidemiological data. The possibility of poliomyelitis, Coxsackie, or ECHO viruses as aetiological agents can be ruled out, but laboratory diagnosis of these infections presupposes that the virus can be recovered from the alimentary tract and, except for poliomyelitis, from the spinal fluid. It is probable that in these atypical cases, and also in encephalitis lethargica, inclusion-body, and related forms of encephalitis, the pathogenesis is different in that virus spreads in a different way and is mainly localized in the central nervous system. For this reason, and because so little is known of the underlying pathological process, all that can be done at present is to exclude known virus infections for which reliable diagnostic tests are available and to make use of improved virus techniques for studying acute and carefully selected cases.

¹ Jennings, G. H., *Lancet*, 1947, 1, 471.

² McAlpine, D., Kremer, M., Buxton, P. H., and Cowan, D. J., *British Medical Journal*, 1947, 2, 1019.

³ Kelleher, W. H., Bratton, A. B., and MacCallum, F. O., *ibid.*, 1949, 2, 213.

⁴ Jennings, G. H., Hamilton-Paterson, J. L., and MacCallum, F. O., *ibid.*, 1949, 2, 210.

⁵ Daildorf, G., and Sickles, G. M., *Science*, 1948, 108, 61.

⁶ *Ann. Rev. Microbiol.*, 1955, 9, 277.

⁷ Enders, J. F., in *Wild Hlth Org. Monograph Ser.*, 1955, no. 26, p. 269, Geneva.

⁸ Committee on ECHO Viruses, *Science*, 1955, 122, 1187.

⁹ Melnick, J. L., *Ann. N.Y. Acad. Sci.*, 1955, 61, 737.

¹⁰ Honig, E. I., Melnick, J. L., Isacson, P., Parr, R., Myers, R. L., and Walton, M., *J. exp. Med.*, 1956, 103, 247.

¹¹ Wilkins, A. J. W., Kotze, D. M., Melvin, J., Gear, J., Prinsloo, F. R., and Kirsch, Z., *S. Afr. med. J.*, 1955, 29, 25.

¹² Gear, J., Measroch, V., and Prinsloo, F. R., *ibid.*, 1956, 30, 806.

¹³ Beale, A. J., Duncan, D., Stackiw, W., Davis, N., Dempster, G., and Rhodes, A. J., *Canad. J. publ. Hlth*, 1956, 47, 179.

¹⁴ Rhodes, A. J., and Beale, A. J., *Ann. N.Y. Acad. Sci.*, 1957, in press.

¹⁵ Bayer, P., and Gear, J., *S. Afr. J. lab. clin. Med.*, 1955, 1, 22.

¹⁶ Karzon, D. T., Barron, A. L., Winkelstein, W., and Cohen, S., *J. Amer. med. Ass.*, 1956, 162, 1298.

¹⁷ Davis, D. C., and Melnick, J. L., *Proc. Soc. exp. Biol. (N.Y.)*, 1956, 82, 839.

¹⁸ Hennessen, W., *Dtsch. med. Wschr.*, 1956, 81, 2088.

¹⁹ Odenthal, H., and Wunder, M., *ibid.*, 1956, 81, 2090.

²⁰ Baumann, von T., Barben, M., Marti, R., Hassler, A., and Krech, U., *Schweiz. med. Wschr.*, 1957, 87, 307.

²¹ Dodd, W., *Lancet*, 1956, 2, 947.

²² Lyle, W. H., *ibid.*, 1956, 2, 1042.

²³ Tyrrell, D. A. J., and Snell, B., *ibid.*, 1956, 2, 1028.

²⁴ Garnett, D. G., Burlingham, A., and Zwanenberg, D. van, *ibid.*, 1957, 1, 500.

²⁵ Boissard, G. P. B., Stokes, L. J., Macrae, A. D., MacCallum, F. O., *ibid.*, 1957, 1, 500.

²⁶ Crawford, T., Macrae, A. D., and O'Reilly, J. N., *Arch. Dis. Childh.*, 1956, 31, 182.

²⁷ Johnson, T., *Lancet*, 1957, 1, 590.

²⁸ Neva, F. A., and Enders, J. F., *J. Immunol.*, 1954, 72, 307.

²⁹ Sigurdsson, B., Sigurjonsson, J., Sigurdsson, J. H., Thorkeisson, J., and Gudmundsson, K. R., *Amer. J. Hyg.*, 1950, 52, 222.

³⁰ Pellew, R. A. A., *Med. J. Aust.*, 1951, 1, 944.

³¹ White, D. N., and Burch, R. B., *Neurology*, 1954, 4, 506.

³² Sumner, D. W., *Lancet*, 1956, 1, 764.

³³ Macrae, A. D., and Galpine, J. F., *ibid.*, 1954, 2, 350.

³⁴ Acheson, E. D., *ibid.*, 1954, 2, 1044.

³⁵ Ramsay, A. M., and O'Sullivan, E., *ibid.*, 1956, 1, 761.

³⁶ Compston, N. D., *British Medical Journal*, 1956, 2, 157.

³⁷ Crowley, N., Nelson, M., and Stovin, S., *J. Hyg.*, 1957, 55, 102.

³⁸ Sigurdsson, B., and Gudmundsson, K. R., *Lancet*, 1956, 1, 766.

PEPTIC ULCERATION AND ACID SECRETION

In his Lumleian Lectures, published in this and last week's *Journal*, Dr. F. Avery Jones undertook a very necessary task—the summing-up of recently acquired knowledge about the prevalence, pathology, and treatment of peptic ulcer. This disorder is so common that by the time men reach the age of 45 to 54 about 1 in 10 has had a peptic ulcer, and for about 1 in 40 there has been serious pain or troublesome complications.¹ At the Central Middlesex Hospital admissions of men and women for acute perforations of the duodenum roughly doubled between 1938 and 1955, and this trend is widespread. To judge from the incidence of acute perforations in Glasgow, it appears that the increase in the prevalence of peptic ulcer is largely the result of an increase in duodenal ulceration.²

Peptic ulcers tend to run in families, patients with gastric ulcer tending to have relatives with gastric ulcer, while patients with duodenal ulcer tend to have relatives with duodenal ulcer.³ Among patients with duodenal ulceration there is an unduly high proportion of them with blood group O. However, when the comparison was made between sibs, the patients with duodenal ulcer were found not to have an increased incidence of blood group O, which suggested that the possession of blood group O is not by itself the important factor.⁴ In last week's *Journal* (p. 758) Dr. J. A. Fraser Roberts⁵ and Dr. C. A. Clarke and his colleagues⁶ at Liverpool discuss these findings in the light of further research.

Peptic ulcer does not occur in patients with Addisonian anaemia, who do not secrete pepsin and acid.⁷ About 80% of patients with peptic ulcer are men, duodenal ulceration being up to six times commoner in men than in women. It is possible that among patients with duodenal ulceration there may be some men with less effective duodenal defences against acid and pepsin than are found in women. If this were so it might be expected that the lowest levels of secretion associated with duodenal ulcer in men would be lower than those found in women with duodenal ulcer. As this is not so,⁸ presumably duodenal resistance is not markedly unequal in men and women with ulceration. Again, it might be thought that the jet of gastric contents playing on the first part of the duodenum could be more vigorous in men than in women, a condition perhaps associated with more rapid gastric emptying in

men. However, studies of emptying with test meals of saline and of water have failed to show any difference between normal men and women.⁹ Curiously enough, it has been found that male patients with duodenal ulcer but no signs of pyloric stenosis empty test meals of saline, glucose solutions,¹⁰ and dilute solutions of acid¹¹ at the same rate as normal men. So far the notion that the increased incidence of duodenal ulcer in men is associated with increased vigour of emptying has not been substantiated.

There remains the possibility that the higher prevalence of duodenal ulceration in men may be associated with increased acidity and peptic activity of the gastric contents. Ewald test-meals (with tea and toast) have shown that men have a higher acidity in their gastric contents after puberty than do women,¹² and it is only after puberty that there is an increased incidence of peptic ulcer in men.¹³ This difference in the secretion of acid is still found when groups of normal men and women are carefully matched, the men secreting about one-and-a-half times as much acid and pepsin as do the women.⁹ If the greater acidity of the gastric contents in men was an important reason for the greater prevalence of ulcer in men, it might be expected that any condition associated with a fall in the acidity of the gastric contents in women would further increase the discrepancy between men and women by reducing the incidence of ulcer in women. It is known from the work of M. B. Strauss and W. B. Castle¹⁴ that gastric acidity falls in pregnancy, and D. H. Clark¹⁵ has reported that many women patients with peptic ulcer have remissions of their disease during pregnancy. Thus the lower acidity of the gastric contents in women as compared with men may at least partly account for the lower prevalence of peptic ulcer in women.

J. N. Hunt^{10, 11} found that under a variety of conditions a group of male patients with duodenal ulcers secreted about twice as much acid as did normal persons, although there were, as would be expected, some patients with duodenal ulceration with subnormal levels of secretion. The mechanism of this hypersecretion of acid has been studied. A. W. Kay,¹⁶ using four times the normal body-weight dose of histamine concurrently with antihistamine to reduce the side-effects, was able to obtain maximum secretion of acid in normal persons and in patients with duodenal ulcer. He found that the power of the parietal cells to secrete acid was about twice normal in patients with duodenal ulcer. This increased secretory power is probably the result of an increased number of parietal cells in the gastric mucosa of patients with duodenal ulcer.¹⁷ There is a further possibility that the hypersecretion found in patients with duodenal ulcer results from derangement of the duodenal mechanism which normally inhibits secretion in response to the acidity of the effluent gastric contents.¹⁸ A recent study shows that this hypothesis can only partly account for the hypersecretion in some patients with duodenal ulceration, for very marked hypersecretion can exist in the presence of an apparently normal inhibitory mechanism. From the facts available at present it would seem reasonable to suppose that in patients with duodenal ulcer the mechanism exciting gastric secretion is normal, but it acts on about twice as many cells as

are found in people without duodenal ulcers.¹⁹ Hence the secretory responses to all stimuli are about doubled. As Avery Jones mentions, there is already some evidence that hypersecretion is familial.

In patients with gastric ulcer the acidity of the gastric contents is often subnormal and cannot by itself be the cause of the ulcer. Avery Jones suggests that anti-healing factors, endogenous or exogenous, may play a part in the progression of an acute ulcer into a chronic one. As R. Doll and F. Pygott^{20, 21} have shown, the healing of ulcers is aided by in-patient treatment and by stopping smoking, and no doubt there are other factors yet to be discovered which help to promote healing. About 22% of the population do not secrete the mucopolysaccharides of ABO blood groups in their saliva, and these people are about 45% more likely to develop duodenal ulcer than are secretors of ABO.⁴ It has been suggested that these substances in some way protect the gastric mucosa.²²

It now seems unlikely that there is a single cause of gastric or duodenal ulcer. It is therefore all the more important that those working on this problem should collect information from as wide a field as possible. The Lumleian Lectures provide many pointers to promising lines of inquiry.

TOTAL SYNTHESIS OF A PENICILLIN

The synthesis of phenoxymethylpenicillin, or penicillin V (Fig. 1), has recently been accomplished by Professor J. C. Sheehan and Dr. K. R. Henery-Logan,¹ of the Massachusetts Institute of Technology. It completes the formal proof of the β -lactam-thiazolidine structure assigned to penicillin in the joint wartime Anglo-American penicillin programme.² In the early stages of this programme the hope was entertained that penicillin would prove capable of synthesis, but improvements in fermentation methods and the intrinsic difficulties of synthesis at the time brought attempts at synthesis to an end without their objective being attained. Though du Vigneaud and his associates³ obtained in minute amount a specimen of synthetic benzylpenicillin, the reaction which they employed did not give unequivocal confirmation of the structure. Sheehan, who was a member of the Merck group during the wartime work, has maintained an interest in the synthetic formation of penicillin and has meanwhile also contributed to the great advances that have taken place

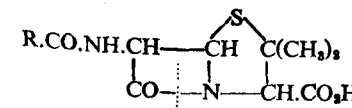


FIG. 1

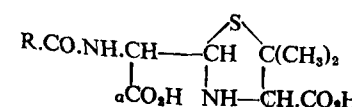


FIG. 2

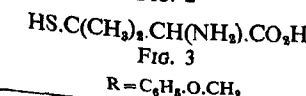
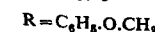


FIG. 3



- ¹ Sheehan, J. C., and Henery-Logan, K. R., *J. Amer. chem. Soc.*, 1957, **79**, 1262.
² Clarke, H. T., Johnson, J. R., and Robinson, Sir Robert (editors), *The Chemistry of Penicillin*, Princeton University Press, 1949.
³ *Chemical and Engineering News*, March 18, 1957, p. 32.

in methods for the synthesis of peptides. It is in the application of one of these newer methods of peptide synthesis that success in the synthesis of penicillin has lain.

Early in the study of penicillin it was found that the penicillins are inactivated by alcohols and alkali and also by amines, such as benzylamine. Inactivation takes place by rupture of the β -lactam ring at the position indicated by the dotted line in Fig. 1 to give the corresponding penicilloic acid (Fig. 2) or a derivative. It is this same Achilles heel in the penicillin molecule that is the site of action of the enzyme penicillinase. Various penicilloic acids were prepared during the war, but the methods then available were too coarse to effect ring-closure between the α -carboxyl group and the imino group of the thiazolidine ring to generate the β -lactam ring of penicillin. The essential merit of Sheehan's latest work is that he has overcome this hitherto insurmountable difficulty by taking the penicilloic acid (Fig. 2) related to phenoxymethylpenicillin and shown that treatment with NN'-dicyclohexylcarbodiimide at 25° C. for 20 minutes in aqueous dioxan yields 10–12% phenoxymethylpenicillin (Fig. 1). Other improvements have been effected in the synthesis of the penicilloic acids, permitting a wide choice for the substituent R, and earlier stages of Sheehan's synthesis give yields of about 80%. The flexibility of the methods that have thus been developed can be gauged by the fact that quantities of 2–5 g. of each of ten new penicillins have been prepared by Sheehan's techniques in the Merck-Sharp and Dohme laboratories for biological study.³

It is too soon to say whether the new methods are likely to have much bearing on practical medicine, and they are unlikely to compete with established fermentation processes for the preparation of known biosynthetic penicillins. But by giving access to new penicillins that have not proved accessible by biosynthesis new light may be thrown on the mode of action of these antibiotics, and new drugs effective against organisms resistant to the present penicillins may appear. The biosynthetic penicillins, now numbering upwards of 30, all incorporate the D-penicillamine moiety (Fig. 3), and it is only with respect to the group R that any variation has so far proved possible biosynthetically. Even then only monosubstituted acetic acids are incorporated into the penicillin molecule as the group R.CO. In addition to carrying through the synthesis of phenoxymethylpenicillin from D-penicillamine, Sheehan and Henery-Logan have also carried out the synthesis from DL-penicillamine, and the resulting racemic phenoxymethylpenicillin was found to have approximately half the antibacterial activity of the penicillin derived from D-penicillamine. This indicates that the enantiomorphous penicillin derived from L-penicillamine must be practically devoid of antibacterial activity. The replacement of D-penicillamine in syntheses of the type used by du Vigneaud and his collaborators² by cysteine and thiothreonine gave mixtures of slight antibacterial activity, and no doubt further developments in that direction will be forthcoming with the aid of the new techniques. The possibility also remains that a form of penicillin insusceptible to hydrolysis by penicillinase may yet emerge.

- ¹ Doll, R., Jones, F. Avery, and Buckatzsch, M., *Special Report Series, Medical Research Council, London*, 1951, No. 276.
² Illingworth, C. F. W., Scott, L. D. W., and Jamieson, R. A., *British Medical Journal*, 1944, **2**, 617, 655.
³ Doll, R., and Kellock, T. D., *Ann. Eugen. (Camb.)*, 1951, **16**, 231.
⁴ Clarke, C. A., et al., *British Medical Journal*, 1956, **2**, 725.
⁵ Fraser Roberts, J. A., *ibid.*, 1957, **1**, 758.
⁶ Clarke, C. A., et al., *ibid.*, 1957, **1**, 758.
⁷ Kahn, J. R., *Amer. J. med. Sci.*, 1937, **194**, 463.
⁸ Ihre, B. J. E., *Acta med. scand.*, 1947, suppl., 196, 322.
⁹ Booth, M., Hunt, J. N., Miles, J. M., and Murray, F. A., *Lancet*, 1957, **1**, 657.
¹⁰ Hunt, J. N., *ibid.*, 1957, **1**, 132.
¹¹ ———, *British Medical Journal*, 1957, **1**, 681.
¹² Vanzant, F. R., Alvarez, W. C., Eusterman, G. B., Dunn, H. L., and Berkson, J., *Arch. Intern. Med.*, 1932, **49**, 345.
¹³ Ivy, A. C., and Martin, C. G., *Gastroenterology*, 1949, **13**, 215.
¹⁴ Strauss, M. B., and Castle, W. B., *Amer. J. med. Sci.*, 1932, **184**, 655.
¹⁵ Clark, D. H., *British Medical Journal*, 1953, **1**, 1254.
¹⁶ Kay, A. W., *ibid.*, 1953, **2**, 77.
¹⁷ Cox, A. J., *A.M.A. Arch. Path.*, 1952, **54**, 407.
¹⁸ Shay, H., *Bull. N.Y. Acad. Med.*, 1944, **20**, 264.
¹⁹ Hunt, J. N., and Kay, A. W., *British Medical Journal*, 1954, **2**, 1444.
²⁰ Doll, R., and Pygott, F., *Lancet*, 1952, **1**, 171.
²¹ ———, *ibid.*, 1954, **2**, 1200.
²² Aird, I., et al., *British Medical Journal*, 1954, **2**, 315.

Reports of Societies

COMMON CONGENITAL ABNORMALITIES AND THEIR MANAGEMENT

The management of the common congenital abnormalities was discussed by four speakers in the Section of General Practice at the Royal Society of Medicine on March 20.

Prevention is Better than Cure

Dr. LINDSEY BATTEN, opening, observed that a wealth of abnormalities could exist in the just-delivered, healthy-seeming babe. A saving clause must be inserted after "Look! You've got a fine boy," and a detailed, purposeful examination follow to find such defects as could be found at this stage. Management at home should include prevention, and to this end he proposed three aetiological classes—"bad seed," "injured embryo," and "pressure group." X-ray trauma was a controllable factor in classes 1 and 2, and the family doctor should stand guard over the ovaries, embryos, and fetuses of his patients against light-hearted radiology, especially in pregnancy. Rubella, innocuous in childhood, was deadly to the developing embryo; every girl-child should have it, and her doctor should do his utmost to make the fact known and to see that she got it. Young wives, if not immune or pregnant, should be warned and advised to acquire immunity by the only means yet known; if exposed and at risk of pregnancy, they should have gamma globulin and contraceptive advice. Actual rubella in early pregnancy called for declaration of the risks to the expectant parents and for a consultation at which termination of pregnancy must inevitably be discussed.

Could anything be done to prevent deformities ascribed to intrauterine compression? The foetus had been described as "moving freely in his bath of liquor amnii." What stopped him in these cases? Did the bath-walls exert too much inward or the bath-water too little outward pressure, or did the sluggish foetus become womb-bound? Prevention might be possible if the answers were known. When defects occurred the doctor must persuade parents not to impute blame, despair, or seek magic cures, but to obtain and act upon sound advice. His responsibility and opportunity were greatest in such impalpable, invisible defects as congenital deafness. Here doctor and mother could effect a diagnosis without apparatus or expert aid, and, since deafness was rarely complete, institute the vital auditory training—the mother, patiently and in faith, speaking words into her infant's ear in the few precious months when the foundations of speech are laid.

Orthopaedic Deformities

Mr. DENIS BROWNE discussed three groups of congenital abnormalities that were often missed, and treatment delayed, on account of failure to examine the parts adequately. With congenital deformities of the hip the results of treatment depended almost entirely on the age treatment was started, he said; the earlier the better. He had diagnosed congenital dislocation at the age of 16 hours, with a perfect result by the time the child was at the walking stage; unfortunately the average age at which patients were being referred for treatment was 2 years. The essential test for early diagnosis of congenital dislocation of the hip was the detection of a limitation of abduction. This required no elaborate techniques and took only a few seconds to carry out. Likewise dysplasia of the acetabulum with failure to develop a good cup could also be diagnosed in this fashion, and likewise early treatment was needed for perfect results. Treatment was simple, and was based on the principles of controlled movements, ensuring that useful and beneficial movement was left unrestricted and preventing useless and harmful movements. Proper scientific splintage was the answer.

No one missed cases of gross deformities of the feet, but two less obvious, though very important, deformities requiring early manipulation were unfortunately very easily missed. These were the varus and the valgus deformities of the metatarsus. Both could be diagnosed at once if one remembered them. Treatment by pressure with adhesive felt on an aluminium splint was eminently successful.

"Idiopathic" scoliosis, like the two metatarsal deformities, was the result of abnormal intrauterine conditions. Here, also, early diagnosis was essential if serious consequences were to be prevented. This condition could easily be spotted by noting that the child always tended to screw round in one direction in the first months of life. Abnormal creases on the concave side of the back confirmed the diagnosis. A splint was shown that reversed the curve of the back without immobilizing the baby. If not corrected before the walking stage, this scoliosis was progressive and most intractable.

Naevi and Ichthyosis

Dr. G. B. MITCHELL-HEGGS discussed some of the common congenital skin abnormalities. About a quarter of all the work of the skin department at a children's hospital was concerned with congenital defects, he said, the two commonest groups being the various types of naevus and ichthyosis.

Each of the three common vascular naevi—the strawberry naevus, the port-wine stain, and the spider naevus—presented a different problem. The strawberry naevus tended to undergo spontaneous resolution around the age of 5–7 years, and therefore it was prudent to wait till then before advising treatment. Some cases needed special treatment. Port-wine stains were very disappointing in their response to therapy on account of their widespread nature. Spider naevi were very easily cured by electrolysis or cautery.

Ichthyosis was an inherited congenital abnormality which rendered its victims liable to eczematous complications. However, a good deal could be done to prevent these ill effects. Bathing in water should be limited as much as possible, and bland oils or vanishing creams used for cleansing purposes in the winter. If water was used it should be "softened" as much as possible; rain water was ideal. Sedatives were valuable when irritation was present. Locally, coal-tar derivatives and the more recent hydrocortisone preparations were indicated to control inflammatory reactions and itching.

Planning of Plastic Surgery

Mr. D. N. MATTHEWS opened his contribution on the role of plastic surgery by stressing the great importance of appreciating and managing the psychological effects of a congenital deformity on the whole family. If parents were to cope satisfactorily with a disabled child, time should not be grudged in explaining to them the scope and plans of any treatment contemplated. Good rapport between consultant, parents, and the family doctor was vital. Besides the technical procedures proposed, the parents and family doctor should be told when was the best time for surgery and the likely length of stay in hospital.

Discussing individual congenital abnormalities, Mr. Matthews said that hare-lip was best treated surgically at around 3 months of age. An associated cleft palate should be left till the age of 15–18 months before being repaired, and any residual soft-tissue deformities till 3–4 years. Deformities of the nasal bones should be left till the age of 12–13 years. The indications for surgical treatment of naevi were haemorrhage, erosion of the skin, growth out of proportion to the growth of the child, or disfigurement. Moles usually required excision and skin graft. The final cosmetic result could not be judged for 18 months. "Bat ears" could be cured only by planned surgery involving some resection of the cartilage. Sticking the ears down to the scalp by adhesive plaster never corrected this abnormality. The best age for treatment was around 4 years. Congenital ptosis should be left until at least 2 years of age, as spontaneous improvement might

occur up till that time. Syndactyly, on the other hand, should not be left too long, otherwise there would be interference with the growing epiphysal ends of the phalanges.

In many instances the operations of circumcision and for tongue-tie were not needed, said Mr. Matthews. But at the same time there were cases in which these minor procedures were essential, and he summarized the indications. Whenever a congenital defect possibly needing surgery was discovered it was wise to refer the child to a consultant at once so that future treatment might be planned and the parents relieved of uncertainty.

ARTERIAL BLOOD PRESSURE

[FROM A SPECIAL CORRESPONDENT]

The co-operative inhabitants of the Vale of Glamorgan and the Rhondda Fach have again been the source of important new information, this time in a non-respiratory field. Dr. W. E. MIALI and Mr. P. D. OLDHAM, of the Medical Research Council's pneumoconiosis research unit, have been studying the arterial blood pressures of samples of the population of these two communities, and Mr. Oldham presented some preliminary results to the Medical Section of the Royal Statistical Society at a meeting held at the Westminster Hospital on March 26.

One purpose of the survey was to confirm the recent findings of Professor G. W. Pickering and his colleagues that blood pressure is a continuously variable attribute depending on age, there being no distinguishable dividing line between normal and abnormal values; and that it is, genetically speaking, a multifactorial attribute rather than one dependent on a single pair of genes. Professor Pickering's analysis was based on hospital out-patients, and to give his results complete generality it was obviously important to see whether or not they applied to a representative sample of the population at large. At the same time the opportunity was taken of studying the relation between blood pressure and occupation, social class, parity, and so on.

The sample consisted of about 600 people, aged 5–80 years, chosen at random from the already card-indexed population of the two valleys; to this were added more than 2,000 of their first-degree relatives, including most of those living within a radius of 25 miles (40 km.). Standard methods were used for measuring the arterial pressure, and the technique of age-correction developed by Professor Pickering and Dr. J. A. Fraser Roberts was also followed.

Surprising Effect of Parity

Apart from the clear confirmation of the earlier findings the most interesting results were those in which the systolic pressure was related to the number of children. Instead of the possibly expected increase of pressure with parity, it was found that the average pressure of the women in the series, after adjustment for age, was about 2.6 mm. Hg lower for each additional child in their family. But what was even more surprising was the fact that almost the identical pattern emerged if the analysis was applied to the men. Mr. Oldham found it hard to explain this discovery: it was presumably related to some environmental factor, possibly diet. The only occupational comparison which yielded anything of interest was that between light and heavy workers. Above the age of 50 the systolic pressure of the light workers was, on the average, about 8 mm. Hg higher than that of the heavy workers, a difference corresponding to about 7 years of age. There were good reasons for supposing that this was not the result of self-selection.

This study is only a beginning. Mr. Oldham concluded his paper by observing that its main value, from a medical point of view, would only become apparent when the sample had been followed up for a number of years. It should then do much to clarify the prognostic value of blood-pressure measurements.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Benactyzine

SIR,—Perhaps I may be permitted to give some further information on the points which Dr. E. H. Hare raises (*Journal*, March 9, p. 582) in discussing our paper on benactyzine (*Journal*, February 9, p. 306).

First, on the question of side-effects and other clues to the identity of the substance which a patient is receiving: The side-effects we noted were not "of such severity that the dosage had to be reduced"; they were in most cases, as we said, "very mild," and we often wondered whether they were not artifacts of our curiosity. We reduced the dose because they might not have been. Depression seemed to us to be a more reliable clue, but, as our paper reports, our impression was mistaken. Probably the clue that is most influential is a marked improvement in symptoms in the absence of any apparent environmental influence. It proved to be equally fallacious. A case may illustrate this point. A miner who had been caught in the haulage and dragged for a considerable distance underground developed a severe anxiety state after the accident, which had been present for 12 months when we saw him. During the test period his symptoms abated in a remarkable manner and his self-confidence returned. Within forty-eight hours of withdrawal of the "drug" he had a complete relapse, and his general practitioner telephoned urgently to ask for details of the drug to which he had previously responded so well. In the meantime we had broken the code and found that his tablets were inert.

The conflicting clues were one impediment to the discovery of the identity of the drug; the other was the "external examiner," who did not know whether or not side-effects had occurred during the test period. As we mentioned, his independent ratings had a correlation of 0.89 with those of the psychiatrist in charge of the case. In those cases whose improvement we thought had probably resulted from "very favourable changes in the patient's life situation," our conclusions were not based on the "bare criterion of 'changed' or 'unchanged,'" as perhaps we should have illustrated in our paper by a case such as the following: A woman of foreign birth, who came to this country as a war bride, developed a severe anxiety state when left alone to support and care for her children after her desertion by her husband, who went abroad. During the test period the husband unexpectedly returned and a reconciliation took place. Her symptoms disappeared. We had to decide what attitude to adopt toward such cases where a powerful influence had unexpectedly intervened compared with which the effect of a symptomatic aid, such as benactyzine, is probably small, and we were interested in assessing the effects of the drug rather than the effect of major changes in the life situation. In a series as small as ours we thought it best to eliminate such an effect rather than "assume" the effects to be eliminated.

We do not, in our paper, "dismiss" the self-controlled trial. For us its advantages were offset by "the disadvantage of providing no information on the course of the malady in comparable patients who do not receive the drug being investigated." We did not deprive ourselves of this advantage of the independent control, since, as our paper states, none of our controls received benactyzine until a fortnight after the test period was over. The considerable degree of improvement shown by controls during the test period is set out in our paper and appears to us to be an important finding.

Your correspondence columns are no place for a lengthy discussion of the literature on the relative merits of global judgments and rating scales, beginning with Galton's con-

clusion in 1879 that "general impressions are never to be trusted." Our paper explains why, rightly or wrongly, we did not employ global judgments. Regarding estimates of probability, we do not share the fairly common medical view that such an estimate is a kind of Wassermann test which suddenly becomes positive when $P=0.05$. There is a 92%–94% chance of the differences we found being the result of the drug. It is therefore at present not unreasonable (to rephrase our previous temperate statement) to attribute them to the drug without being too overconfident about it.

Regarding the comparability of the two groups in all the "factors likely to influence prognosis": unfortunately few, if any, of the factors are known. But the data Dr. Hare requests on the "severity of symptoms" are shown in table II of our paper, where the mean initial symptom scores for control and benactyzine groups are given as 31.6 and 31.4 respectively. The other data he requests, and much more besides, were omitted in the interests of brevity. There were seven men and five women in the control and seven men and seven women in the benactyzine group. The mean age of the groups was 38.3 years and 37.5 years, and the mean duration of symptoms (in months) was 22.0 and 23.7 respectively.

It is not possible to comment on Dr. Hare's finding that the probability of differences being due to chance can be altered by inverting the marking of the rating scale without having details of the procedures he employed, but such a manoeuvre would not affect the estimate of probability obtained by a t test.—I am, etc.,

Leeds, 2.

G. R. HARGREAVES.

Smoking and Lung Cancer

SIR,—The advocacy of non-smoking among school-children who have not begun to smoke is suggested as a precaution against cancer of the lung, and, if the abolition of smoking is desired, this is doubtless the most effectual method.

Islam maintains teetotalism among over 400,000,000 persons (no doubt there are a few offenders) who have not tasted alcohol; to convert such a population who had had access to it would be impossible. This gigantic achievement rests upon a very small basis of two passages in the Koran:

"They will ask thee concerning wine and games of chance. Say, in both is great sin, and advantage also, to men; but their sin is greater than their advantage" (Sura II). "O believers! Surely wine and games of chance, and statues, and the divining arrows, are an abomination of Satan's work! Avoid them, that ye may prosper" (Sura V. Translation by J. M. Rodwell).—I am, etc.,

London, E.C.1.

E. L. KENNAWAY.

Developmental Acro-hypertrophy of Foot

SIR,—Developmental acro-hypertrophy of a foot with horny enlargement of toenails is the best descriptive name for a condition which I once saw many years ago and have since then retained in my mind's eye.

An early-middle-aged male had enlargement of the right foot, especially in length and towards the toes, which showed a kind of gigantism of the toenails, notably that of the big toe. This long nail was of true polished horny appearance, slightly translucent, nothing like the dense, opaque, thickened hyperplastic toenails due to old infection. The case was shown at the Royal Society of Medicine at a clinical demonstration (? dermatological) arranged for French colleagues. No one present had apparently ever seen a similar case, and it was this feeling of being completely baffled that made the picture haunt my imagination. The meeting was, I think, never regularly reported. Now, however, I feel fairly confident that the case was allied to those which in 1918 I termed "haemangiectatic hypertrophy of limbs." It seems fairly certain that there are cases of this class which show no obvious telangiectatic or other enlargement of blood vessels. My name was associated with this condition by

Sir Archibald Gray, and later by some others. P. P. Reichenheim gave an elaborate description of the condition. By far the most complete account of the literature is given by Gerhard Koch in his study entitled: "Zur Klinik, Symptomatologie, Pathogenese und Erbpathologie des Klippel-Trenauney-Weber'schen Syndroms."—I am, etc.,

London, N.W.1.

F. PARKES WEBER.

REFERENCES

- 1 Weber, F. P., *Brit. J. Child. Dis.*, 1918, 15, 13.
- 2 Reichenheim, P. P., *St. Bart's Hosp. J.*, 1943, 4, 53.
- 3 Koch, G., *Acta genet. med. Roma*, 1956, 5, Suppl. 326.

Treatment of Acute Appendicitis

SIR,—In the correspondence about the treatment of acute appendicitis, Mr. R. J. McNeill Love (*Journal*, March 9, p. 585) mentions the teaching of his old chief, Mr. James Sherren, and I think this teaching should be remembered; a personal experience may be of interest.

I was surgeon to the British Legation in Kabul at the time I am recalling, and looking back over 20 years I realize that I had had several attacks of appendicitis but had attributed the trouble to "punkah colic"—that is, a chill from sitting or lying under a punkah in the hot weather in India. When I realized that I was in for the real thing I had to decide what to do; the nearest surgical aid was 200 miles away over a road which in those days took the better part of two days to negotiate, and in addition there would be the usual delays in getting a permit to enter Afghanistan. I did what Mr. McNeill Love mentions—that is, I took to my bed, had nothing but sips of water by mouth, and kept myself under morphine. In due course an abscess formed, but I took a completely detached view of this, thanks to the morphine, and after about a week or 10 days I felt I could drop the morphine and take some nourishment. After three months I went to Simla to have my appendix out, and went through a most uncomfortable and alarming experience. Only the remains of the appendix were found among adhesions which had not yet resolved, and after the operation I suffered from a partial ileus, retention of urine, and an attack of severe urticaria as the result of an injection of anti-gas-gangrene serum, which in those days was given as a prophylactic against peritonitis. I had to have a catheter passed twice and I have seldom experienced so much acute discomfort, to put it mildly, and I do hope that nowadays patients are given some treatment to mitigate the pain of this manoeuvre.

The conservative treatment of acute appendicitis must always be considered under certain circumstances, but I think the doctor in charge probably suffers the most anxiety; if only he could produce the same detachment in himself as in his patient by morphine he would be saved the week or 10 days of acute anxiety which he has to suffer before his patient has weathered the storm.—I am, etc.,

Melrose.

H. H. ELLIOT.

Tetanus Prevention

SIR,—The excellent article on this subject by Drs. H. J. Parish, L. J. M. Laurent, and N. H. Moynihan (*Journal*, March 16, p. 639) could be a timely beginning of the much-needed rationalization of our current national practice of tetanus prevention. Two things they very rightly stress which are not always accepted. First, that the object of a trial dose of antitoxin is to determine any predisposition to general reaction and not to detect any local reaction, the latter having no practical significance. Secondly, that, whenever antitoxin has been given, the patient should be asked to return in 6 to 8 weeks for active immunization with tetanus toxoid. On the other hand, they accept 1,500 international units as being the routine protective dose of antitoxin in a non-immune individual. This is now questioned by many, as was discussed by Dr. Leon S. Kind (*Journal*, March 2, p. 498) when an increase to 10,000 was suggested.

It is regretted that the decision concerning which injuries require tetanus prevention was not regarded as falling within the scope of the article, but the summary, given in footnote, of the criteria of the Birmingham Accident Hospital is most interesting. It is particularly of interest to read this in conjunction with the Registrar-General's Statistical Review for 1954, quoted briefly in the *Journal* (March 9, p. 594), which shows that a large proportion of fatal cases would not have qualified for tetanus protection under the Birmingham criteria. That of course may be the reason why they died of tetanus.

Each year in this country there are many millions of injuries which could produce a case of tetanus. In fact, less than a hundred cases do occur. Many are doubtless prevented by toxoid or antitoxin, but in the process the latter causes much pain and illness and some death. When a case of tetanus does occur the doctor who treated it and did not give antitoxin is open to a charge of negligence. As a result of this it is possible that more injections of antitoxin are given to protect the doctor than are given to protect the patient who has been individually judged to be suffering from a wound meriting the injection of antitoxin, in spite of its danger. In the casualty departments of many hospitals it is a rule that all patients with open wounds are given antitoxin as a "blind routine." This rule may be more for the protection of the staff than of the patients.

I should like to suggest that the Medical Research Council appoint a committee to the task of preparing notes on the prevention of tetanus in injured persons which would include a statement of the types of injuries which require such protection. If such notes were forthcoming from such an authoritative source, practitioners who adhered to them would give protective injections to those patients requiring them; would not be driven by medico-legal considerations to giving them, with all their concomitant risks, to those not requiring them; and would in fact be immune from a charge of negligence if and when tetanus occurred after a minor injury.—I am, etc.,

Cowley, Oxford.

W. A. REYNARD.

SIR,—The notes on prevention of tetanus by Drs. H. J. Parish, L. J. M. Laurent, and N. H. Moynihan (*Journal*, March 16, p. 639) serve a very useful purpose in drawing to light the confused state that exists at the present moment in the prophylaxis against tetanus that is practised in this country. For some months it has been the custom in the casualty department of the Ancoats Hospital to give to those whom we reasonably presume to be in the actively immune state, as defined in the article, a booster of tetanus toxoid. There are something like 8,000 inoculations against tetanus in the year in this department, and about 20% of these are booster doses of tetanus toxoid. This 20% are almost entirely those who have recently served in Her Majesty's Forces, together with some who have been actively immunized in the hospital. It has been the practice to actively immunize all those who suffered any reaction to antitetanus serum and who are reasonably intelligent and understand the distinction between active and passive immunization. They are given a card to state what has been done.

Regrettably, of those requiring tetanus injections many have escaped the routine tetanus toxoid injection given in the Forces by virtue of reserved occupations, and in those groups particularly such people as miners, employees in the engineering industry, and labourers are in real need of active immunization against tetanus. It would seem that it was high time, not only with tetanus toxoid but with all other types of active immunization against disease, the patient himself should possess a record of the injections he has received, and there should be created a universal card giving these details and which could be presented as the occasion arose. In order to achieve universal understanding of prophylaxis against tetanus it seems that there must be also overall agreement in the administration of these sera in the casualty departments throughout the country.—I am, etc.,

Manchester, 4.

DEREK BUNTING.

Rupture of Uterus Involving Bladder

SIR,—My copy of the *Journal* has just come and I was much interested in Dr. M. A. Majekodunmi's report (*Journal*, February 2, p. 270), which reminded me of a near similar case I had a few years ago. Now that I am more experienced in Nigeria and have adjusted myself to the fact that I am usually the last outpost after all the native doctors have done their best and worst, it is a routine for me to examine the bladder extra carefully in all cases of obstructed labours.

My case was a 25-year-old Ishan (Bini) woman brought to the Zuma Memorial Hospital, Irrua, on February 12, 1954, with a history of having been in labour for the past three days. Six hours previously the strong regular pains suddenly ceased and she felt comfortable enough for relatives to be able to carry her for the 12 miles' journey on a push bicycle. On examination she was a small woman, multipara 2—none alive due to difficult labours; pelvic measurements were 8 in., 9 in., and 6½ in. (20 cm., 23 cm., and 16 cm.). She was exhausted, and had a weak, thready pulse; the abdomen was distended with guarding and tenderness. There were no foetal heart sounds, no movements, and the head was wedged in the pelvis. Per vaginam, the os was fully dilated but the vertex was high up and fixed. Because of the previous history, the fixed head, and signs of peritoneal irritation, I suspected ruptured uterus. Later, in the theatre, I found the peritoneal cavity full of bloody fluid; because of the dark and purplish bladder, peritoneal reflection, and the oedema over the area, I smelt the fluid and found it smelling strongly of urine. Further examination revealed a uterus ruptured anteriorly in the lower segment with the baby born to the neck and the head nipping the bladder against the pubis; this portion of the bladder was oedematous and at its posterior aspect it was lacerated. Owing to the shocked condition of the patient both the uterus and bladder were dealt with by débridement and repair; the peritoneal cavity was cleaned out and the abdomen closed. The post-operative period was hectic, but she made it.—I am, etc.,

New York.

XTO G. OKOJIE.

Multiple Sclerosis

SIR,—It is always stimulating to read of a dynamic and positive approach to a difficult problem such as multiple sclerosis, and Dr. Douglas McAlpine's interesting contribution (*Journal*, March 2, p. 475) is such. Nevertheless, it was disappointing that in his remarks on treatment he makes no comment on the considerable value that can be gained from correctly applied physical treatment in selected cases. In mildly affected patients it is not necessary; in severely affected ones it is valueless, except to minimize the development of awkward contractures (and this can be dealt with by a relative); but it is in moderately affected patients that it can make a good deal of difference to function, and in some cases salvage the individual from invalidism. In such cases the time to start is in the convalescent stage, with both physiotherapy and occupational therapy as possible contributors.

Physiotherapy consists in training the patient in a system of progressive co-ordination exercises. Normally, attendance by the patient at the physiotherapy department need not be more than twice weekly, and within three months the immediate maximum improvement will have been achieved; after that only rare visits for follow-up should be required. The success or failure of this programme depends largely on the attitude of the physiotherapist and of the patient. Each visit must be regarded by both as a lesson with the all-important homework to follow daily. I usually give the patient the analogy of somebody who is learning to play the piano, visiting his teacher, but relying on repeated practice to improve the crudity of execution of the piece that he is learning. This principle applies to the rehabilitation of a number of other chronic neurological disorders—e.g., cerebral palsy, hemiplegia, partial paraplegia, etc. Occupational

therapy can also help to improve co-ordination, particularly in the upper extremities, and whenever there is need for assistance with the activities of daily living.

Finally, on the question of telling the patient. In those cases where an active rehabilitation programme is planned, if one is to obtain the intelligent co-operation that is necessary for success the patient has to be told a good deal about his illness, and, if he wants to know its name, he should be told. This may be a shock, but it allays doubt, and he can then be encouraged to face the future with courage and determination. After all, the average expectation of life in this disease is relatively long.—I am, etc.,

Durham.

ANDREW ZINOVIEFF.

Tonsils and Adenoids

SIR,—In the recent correspondence on tonsils and adenoids, the indications for removal of the latter appear to have been completely eclipsed by most complex statistics denigrating the removal of the former. As far as I am concerned, by merely substituting the operation of "A's" for "T's and A's" a sense of realistic proportion will finally be attained.—I am, etc.,

Denton, Lancs.

W. BRAND.

Safety Factor in Car Design

SIR,—Motor vehicle designers are concerned to minimize both the likelihood of accidents and their effects. Both are engineering problems, but towards the solution of the latter the medical profession can contribute extremely valuable help. Given sufficient information as to the causes of injuries, engineers should be able to get some considerable way towards eradicating them. To those concerned with this subject Mr. William Gissane's letter (*Journal*, February 16, p. 399) was of exceptional interest in view of the increasing popularity of miniature cars.

While agreeing with your correspondent that flimsy construction is to be deprecated, one must point out that it is not only to be found in midget vehicles. Further, Dr. Gissane's belief that four wheels are essential for safety is not in accordance with recent experience. It would be possible to name more than one make of three-wheeler that provides just as much protection for the occupants, in the event of a crash, as could be expected from a four-wheeled car of orthodox design—and substantially better protection than some foreign four-wheelers appear likely to afford.—I am, etc.,

Studley, Oxford.

FRANCIS JONES.

Speed Warning Device

SIR,—A speed warning device, such as that mentioned by your correspondent Dr. Allen Glenn (*Journal*, March 23, p. 705), was fitted as standard to some cars pre-war. I had one on a 1937 M.G., and it consisted of a green light on the dashboard which went out when 30 m.p.h. was exceeded. It was undoubtedly effective, but after the first five miles it was switched off and never used again, as by that time I had learned to judge the speed of the car, by ear and "feel," to within a mile an hour or so of the vital thirty. I am quite sure that the "solid core of well-disposed motorists" are all quite capable of the same judgment, and that they are in no need of such a device. Unfortunately, the type of driver in most need of such guidance is the one who is least likely to fit the device, or to heed one should it be fitted as standard. In any case, is not Dr. Glenn confusing safety with legality? There are stretches of road where 40 m.p.h. is safe, though illegal, whereas half that speed is deadly dangerous, though quite legal, in many other built-up areas.

Surely, Sir, money and ingenuity would be much better spent in educating all motorists up to the very high standards set by the police drivers, and in the building of proper roads.—I am, etc.,

Dunstable, Beds.

G. E. PINKERTON.

Police Evidence Preferred

SIR,—Dr. Charles L. Worthington's letter under this heading (*Journal*, March 16, p. 643) puts forward a case for more police evidence and less medical evidence, but, as many people have observed, police evidence in court is not treated with the respect that it deserves and a jury's reactions are very often hostile in an effort to be neutral or impartial. This is only with respect to cases under Section 15 of the Road Transport Act.

Police prefer to use medical evidence because the statement of fact can stand up to counsel's cross-examination and because the borderline case can be dealt with by a police surgeon in a more satisfactory manner. Now, with the advent of the urine alcohol test (which incidentally does not produce its result until some days after the charge is preferred), a stronger case can be made out and the borderline case can also be eliminated by the presence or absence of lateral nystagmus (again a function of the police surgeon). Finally, where the charge may be a serious one involving manslaughter it is only fair to make available every possible evidence including the blood alcohol in addition to the police evidence.—I am, etc.,

Watford, Herts.

CHARLES ROTMAN.

SIR,—A great deal of interest and, I am sure, some harmless amusement has been aroused by the unnerving experience recently of a doctor (*Journal*, March 16, p. 643) who was called by the police to examine a motorist suspected of being "drunk in charge," when, to prove his innocence and sobriety, the detained person started somersaulting "all over the place," as one of the Sunday papers has it.

However, "the shouting and the tumult dies, the sinners and the saints depart," and on cool reflection I wonder if there is not a perfectly simple explanation of this startling performance. In assessing, say, the handwriting of a person suspected of being under the influence, we must always bear in mind the level of literacy expected in that type of person. Surely this will apply also to, say, acrobatic attainment. If the gentleman concerned happened to be a professional dancer or acrobat, he would have been trained in this métier from the toddler stage up, and turning somersaults would come as easily to him as falling off a log would to me—it's just a question of doing what comes naturally. Driving a motor-car is a skill which might well have been acquired much later in life (if at all), and we do know that under the influence of alcohol the most recently acquired skill is the first to be lost, while older-established habits and skills are retained longer.

This case, and all the publicity it has received in the daily press as well as medical and motoring journals, does seem to suggest, as I have felt for a long time, that it would be advisable in all cases to inquire how long the person had been driving, for the shorter their experience the more likely would even a small amount of alcohol be to render them "incapable of having proper control." Had this inquiry been made, and possibly a similar one in this particular instance about his acrobatic prowess, some enlightening answers might have been obtained—and the doctor spared some embarrassment.—I am, etc.,

West Bromwich.

K. E. JOLLES.

Tablet Test for Proteinuria

SIR,—It is a pity that the excellent idea behind the various tablet tests for urinalysis should be discredited by over-enthusiasm. In common with many other G.P.s, I have always carried a 25% solution of salicylsulphonic acid in my bag—previously in a dropper bottle, more recently in a "polythene" squeeze bottle as used for hydrocortisone lotion. The tablet test for proteinuria described by Drs. D. N. Baron and Celia Oakley (*Journal*, March 16, p. 628) appears to offer no serious advantage whatever, and costs more.—I am, etc.,

London, W.11.

J. TUDOR-HART.

The Black Sheep

SIR,—Dr. John D. Kershaw's letter (*Journal*, March 16, p. 645) prompts me to point out that the time and place to educate potential food-handlers, and everyone else, in the importance of food hygiene is at school. Until we have reasonably sanitary conditions in our schools and in our homes—that is, until children can be taught to practise cleanliness during the most impressionable years of their lives—it is futile to hope that any sort of laws can make people clean in later life.—I am, etc.,

Truro.

V. E. WHITMAN.

Domiciliary General Practice

SIR,—It was with interest that I read Dr. R. N. Theakston's article on domiciliary general practice in prevention and treatment of illness (*Journal*, March 23, p. 696), but cannot agree with his practice of leaving perineal and vaginal tears for 24 hours before attempting any repair.

Perineal and vaginal tears are surely best repaired as soon as possible after delivery. In this way there is less time for the introduction of sepsis into the wound, and the patient is spared the nervous anxiety and apprehension which otherwise occur during the hours that elapse before the repair is carried out. After a mother has successfully weathered the experiences of labour she deserves the service of being tidied up completely, without having to anticipate the process of stitching in 24 hours' time. Carried out immediately after delivery, under local infiltration with 1% procaine, the repair is quickly performed, and the freshly damaged tissue is easily sutured.

Dr. Theakston may prefer to "suture the repair in comfort" some 24 hours later, but surely it is more kind, and certainly more scientific, to carry out the repair immediately, allowing the patient to recover sitting in physical and mental comfort.—I am, etc.,

Brompton-on-Swale, Yorkshire.

UGO N. PHILLIPS.

Underfeeding of Babies

SIR,—The second paragraph of Dr. Ian G. Wickes's letter under this title (*Journal*, March 23, p. 702) should be reprinted, framed, and a copy hung in a prominent position in every maternity and paediatric unit. The habit of ascribing the cause of excessive crying to overfeeding is even more widespread than Dr. Wickes suggests, and his remarks might possibly—I use the word advisedly—make some slight impression on the iron prejudices of many senior nurses. My own practice in these cases is to listen in silence to the report, write out on the back of the chart the words "You cannot overfeed a baby" in capitals, and hand it over without comment. I have little illusion about its reception, but regard it as the drop of water which may eventually dent the stone.

Perhaps it is all our own fault in leaving nearly all the care of new babies to nurses. Many practitioners, perhaps the majority, are untrained or uninterested in paediatrics. If so, they should say so and direct the parent elsewhere. The consultant paediatrician is much too senior to be bothered with trivia, and yet these are often the despair of the young mother. So she falls back on the maternity nurse or nanny, who, however expert at the job she was trained for, is given a responsibility beyond her qualifications. This dependence on nurses may go to extreme lengths, and indeed some have extensive paediatric practices, travelling from house to house, advising on every sort of infantile disorder.

Whether this is a desirable state of affairs may be disputed, but many mothers feel that they are entitled to medical rather than nursing advice on their multiple problems, and it is surely the duty of the profession to provide it. Probably the ideal method would be the provision of a great many more "baby doctors," as distinct from consultant paediatricians. It is unreasonable to expect the latter to be concerned with the minutiae of infant life, but it is equally so to leave these unregulated. The "baby

doctor"—a trained paediatrician willing to carry out a sort of general practice amongst infants—is an institution in several Continental countries and the U.S.A., and the few practising here are obviously only partly filling a widespread need.

The work done at infant welfare clinics is generally of a very high order, and covers the bulk of the infant population, but it cannot provide the almost daily supervision in the home which minor ailments often require, and which can only be effectively carried out by the sort of paediatrician I have described above.—I am, etc.,

London, W.1.

ALBERT DAVIS.

Subacute Bacterial Endocarditis

SIR,—In their important contribution Drs. F. G. Hobson and Dr. B. E. Juel-Jensen (*Journal*, December 29, 1956, p. 1501) ask if subacute bacterial endocarditis due to *Str. viridans* ever occurs in an edentulous patient. The following case history may provide an answer.

A water board engineer, aged 59, was admitted to hospital on February 4 this year. He had been edentulous since 1942, when a total extraction had been done "for tooth-ache." Five weeks before his present admission he had complained of pains in his head and back, and his doctor, finding a raised temperature, had ordered him to bed and had treated him for a few days with sulphonamides and later, again for a short period, with penicillin. The fever had initially responded to these treatments but had recurred when the drugs were withdrawn. There was no past history of rheumatism, and the patient denied any tendency to sore throat or to nasal catarrh.

On admission the patient, of moderate build, had evidently lost weight. He had a muddy pallor and was anaemic (Hb 45%). Temperature 101° F. (38.3° C.); pulse regular, 100. The apex beat was displaced towards the anterior axillary line. There was an apical systolic thrill, and a systolic murmur could be heard at the apex and also in the first interspace to the right of the sternum. The spleen was palpable. The urine contained pus cells and red blood cells. Leucocyte count, 6,700/c.mm.; neutrophils, 78%; lymphocytes, 19%; monocytes, 2%; eosinophils, 1%. Within 24 hours of admission three blood cultures were taken and each grew *Str. viridans*. Thereafter the patient was treated with penicillin, 1,000,000 units being given six-hourly. Within four days of treatment he was afebrile, and remained so throughout the six weeks during which he had penicillin, and at the time of writing there is no sign of relapse. On February 13 x-ray screening showed the large left ventricle and calcified valve shadows of aortic stenosis. My colleague, Mr. G. W. Vincent, has seen this patient and the x-rays of his jaws, and confirms that there are no dental remnants.—I am, etc.,

Wolverhampton.

J. V. S. ARLINGHAM DAVIES.

Hospital Confinement

SIR,—The grounds for hospital confinement should be: (1) social—to be investigated by the M.O.H.; (2) medical—to be investigated by the doctor responsible for the patient. Each case should be dealt with on its merits. A general practitioner (especially that now so many have the D.R.C.O.G.) should be in a position to decide if a hospital confinement is necessary at the first booking or if it becomes so later. This would obviate the "blind" categories used as a result of statistics and would lessen the number of normal deliveries blocking beds in hospital.—I am, etc.,

Plymouth.

O. LL. LANDER.

SIR,—Dr. Aileen M. Dickins and her colleagues (*Journal*, March 16, p. 645) ask for views on their remarks on hospital confinements. It is right that hospitals should persuade patients to stay at home. No hospital service could otherwise accommodate all those seeking admission for confinement. It is the duty of the general practitioners to select patients requiring admission, using the criteria that Dr. Dickins *et al.* suggest.

In this area we have found that no patient has been refused immediate admission to hospital either before or during labour, when we have requested it. Alternatively, the patient may be seen at the hospital by the consultant obstetrician, who is always ready to advise. It is very reassuring for a general practitioner to know that he has a first-class hospital obstetric service behind him, and that he can arrange immediate admission without any questions asked until the patient is safely delivered.—We are, etc.,

WILLIAM L. CALNAN,
VICTOR M. BORRELLI.

Chiseldon, Wilts.

Operations for Varicose Veins

SIR,—The leading article on the treatment of varicose veins (*Journal*, March 23, p. 692) makes no mention of their spontaneous cure following thrombophlebitis. A patient of mine was confined to bed for 18 days with acute bronchitis, treated in the first instance with chlortetracycline, and subsequently with "crystamycin" intramuscularly. One week after being allowed up, during which time he made a journey to the local chest clinic for chest x-ray (which was normal), he developed thrombophlebitis in the left internal saphenous vein, the site of extensive varices extending along its whole length from ankle to groin. He was treated with phenylbutazone by mouth, in addition to rest, lead lotion dressings, and crêpe bandaging. The condition subsided, and now, three weeks later, he has, in place of a varicose vein, a solid cord of clot, 18 in. (45.7 cm.) long, which represents a most satisfactory spontaneous cure.—I am, etc.,

London, N.W.10.

K. SANDERS.

Non-venereal Genital Diseases

SIR,—I was interested to read the review of the book on non-venereal genital diseases by Drs. Fritz T. Callomon and John F. Wilson (*Journal*, February 16, p. 388).

I must take it that it is the same Dr. Fritz Callomon whose *Die nichtvenereischen Genitalerkrankungen*² is in my library. The address of Dr. Callomon is given as Dessau-Anhalt, Germany. This will explain the "bias, perhaps determined by a nostalgic devotion to out-of-date German literature" and "the quaintly phrased" English, "almost as though it had been translated too literally from a foreign language," as the reviewer, Dr. Ambrose J. King, puts it.

In conclusion, may I add that the copy of only 189 pages is well bound, its illustrations, just as the paper and print, excellent? It is also perhaps interesting to note that the price of this book was 20 marks, which was of course 20s. *Tempora mutantur!*—I am, etc.,

East London, S. Africa.

NATHAN FINN.

REFERENCES

- Callomon, F. T., and Wilson, J. F., *The Nonvenereal Diseases of the Genitals*, 1956. Blackwell, Oxford.
- *Die nichtvenereischen Genitalerkrankungen*, 1928, 2nd ed. Georg Thieme, Leipzig.

Mild Endogenous Depression

SIR,—Continuing this welcome discussion on endogenous depression, I would like to add a few more comments. I am continually surprised at the prejudice and suspicion with which convulsive therapy is regarded by the vast majority of the medical profession. The only reason and excuse I am able to conjecture to account for this most tragic and lamentable attitude is the unfortunate outcome of cases inadequately treated by this method. In my experience the majority of depressives are made temporarily worse and many will obtain only transient remission from four or five E.C.T.s—the number specified by Dr. Robert Thompson (*Journal*, February 16, p. 401). Having made the diagnosis of depressive illness and embarked upon a course of E.C.T., I would suggest that it is generally advisable to give at least seven treatments and that the therapist must be prepared to give at least 12 treatments if necessary to obtain a full and lasting remission.

Although I fully agree with Dr. C. A. H. Watts (*Journal*, March 2, p. 521) that each case must be fully assessed before treatment, and that a case which from the history would appear likely to remit spontaneously should not be rushed into E.C.T., I do not share his view that E.C.T. is a traumatic operation. To me it would appear that in E.C.T. we have a therapeutic weapon of a stature ranking with that of the organic arsenicals, penicillin, and cortisone. We have also a physiological phenomenon of greater fundamental interest and potentiality than the discovery of cortisone itself. I have never observed clinically any traumatic effect from the use of E.C.T. with relaxants, but I would venture the opinion that, when the medical profession learns to recognize depressive illness, truly traumatic operations will be often avoided. Dental extractions, antrotomies, tonsillectomies, laparotomies, and even craniotomies are done every day in the mistaken belief that one particular organ is diseased when it is only dysfunctioning secondarily to a dysfunction of its autonomic nerve supply.

Finally, I would plead again for the use of E.C.T. in the home. Sensitive, depressed patients are far more readily and pleasantly treated in their own beds, when it is usually unnecessary for them or anyone but a close relative even to know the nature of the treatment being given.—I am, etc.,

Paignton.

R. J. T. WOODLAND.

Popular Delusion

SIR,—During the recent war it was quite common to find men in the Services who firmly believed that "something was put in the food to make them feel less sexual." It was usually thought that this substance was administered either in the tea or the potatoes. I thought that this curious idea had died out, but on questioning a young National Service man recently found that soldiers, at least, still believe in it. However, the theory has been diminished inasmuch as they think that this is done only during the period of training. After this presumably they may run wild.

This belief is strangely similar to the paranoid delusions which many psychotic patients develop, that poison is put in their food. It seems to me that in both cases it is used to explain diminished sexuality from other reasons. Possibly in the psychotics this may be due to a variety of factors, but, in the case of the National Service men, no doubt is caused by anxiety over a new and strange life. This explains the fact that after the initial training the "treatment" seems to stop. It would be interesting to know if others have met this or any similar popular delusions.—I am, etc.,

London, W.1.

CLIFFORD ALLEN.

Wire Brush Surgery

SIR,—May I comment on certain aspects of this method of treatment which is discussed by Dr. J. T. Ingram's very thoughtful review (*Journal*, March 23, p. 688) of the book by Dr. James W. Burks, Jr.,¹ on the subject?

The value of dermabrasion, by wire brushes or by other methods, is widely disputed. Thus Dr. George V. Webster,² in a lecture at Guy's, stated that the effect of dermabrasion depended on the length of the time of the follow-up; the longer the interval after operation, the worse the result. My own view, based on over three years' use of Kurtin's wire brushes and Eller's abrasive wheels, and a longer experience of abrasion by the cruder, now generally abandoned, method of sandpaper, is more optimistic.³ I believe the failures and adverse results which have been widely seen in the States and elsewhere have been largely due to indiscriminate use of the method.

In particular it should be remembered that this technique for the improvement of appearance is only one of a number of techniques which can be used for the same end. The best results can often only be obtained by a combination of abrasion with excision of some lesions, or more often by a general tension of the cheek (as is provided by the standard riedectomy techniques). The question of diagnosis

Obituary

F. C. O. VALENTINE, F.R.C.P.

Dr. F. C. O. Valentine, reader in chemotherapy and consultant bacteriologist to the London Hospital, died there on March 23 at the age of 59.

Frank Cyril Oliphant Valentine was born at Dundee on July 26, 1897, and was educated at Winchester. Before going as a scholar to Magdalene College, Cambridge, he served as an officer in the Royal Field Artillery during the first world war. He qualified M.R.C.S., L.R.C.P. from the London Hospital in 1923, and his early appointments there included house-physician to the medical unit under Professor Arthur Ellis. After this he was admitted to the London M.R.C.P. and became pathology assistant in the Bernhard Baron Institute, before spending six months as travelling fellow to the Rockefeller Institute, where he worked with T. M. Rivers on the growth requirements of *Haemophilus influenzae*.

He returned to the London Hospital to take up the appointment of assistant director of the clinical laboratories under Dr. P. N. Panton. For eleven years from 1926 he worked there in the various branches of clinical pathology. During this time he developed a special interest in haematology and in research on staphylococcal infection, on which, with Panton, he published observations and on the toxins of the organism, in particular the leucocidin. From 1937 to 1939 he was director of the inoculation department in succession to Dr. G. T. Western.

During the last war Valentine held the post of pathologist in the Emergency Medical Service at Claybury, and while there became attracted to problems of chemotherapy. His interest developed with the growth of the subject and was to be the main focus of his further research, clinical work, and teaching. He came back to the London Hospital in 1946 as director of the department of chemotherapy and soon afterwards was made reader in this subject as a member of the staff of the bacteriology department under Professor S. P. (now Sir Samuel) Bedson and with consultant duties in the hospital. As a result Valentine very effectively met the frequent need for practical advice on matters of treatment and the control of infection and was always careful to relate his laboratory findings to the problem of the individual patient. During these years he also played a considerable part in the teaching of medical, dental, and nursing students.

He was elected a Fellow of the Royal College of Physicians in 1952. With R. A. Shooter he wrote the third volume of *Recent Advances in Chemotherapy* (published in 1954): this book provided a short, very useful, and practical account of the subject. He devoted much time to research on antibiotics, and in this he was particularly concerned with the important and variable capacity of different organisms to survive periods of bacteriostasis. Up to the time of his last illness he was energetically studying chemotherapeutic drugs with special reference to their effects in combination.

During Frank Valentine's long association with the London Hospital and its medical school, to which he was deeply attached, he formed many lasting friendships among those who have worked and now work there. His gentle nature, quiet efficiency, and modest

of depth of ingrained dirt, or tattoo pigment, also affects the proper choice of technique. Depth can sometimes only be assessed accurately during the course of planing through the affected area of skin. It not infrequently happens that the whole depth of skin has to be removed. The operator then has to make a decision whether to use a surgical method of closure or to allow healing by marginal ingrowth with a risk of keloid or other formation of gross unsightly scarring. Clearly choice of method and end result will be influenced by training of the operator in use of local flaps and other plastic methods.

It is for these reasons that I would plead that the method be used only under full operating theatre conditions, not in the inadequate arrangements of consulting-rooms. It also seems reasonable to plead that whoever uses this method should be able to supplement it by other plastic techniques, such as riedectomy, when these are necessary for the best standard of result, or when complete abrasion of the lesion or pigment leaves a skin defect.

The use of "freon" and other freezing agents as the anaesthetic also raises important points for debate. Freezing⁴ causes intracellular dermal rupture; and Pomerat and Lewis⁵ have shown by tissue culture methods the added burden that this causes to normal healing. Nor do English patients take well to the freezing of large areas of the face; nor can it be considered really safe for use near the eyes. For these and other reasons I prefer local analgesia; a general anaesthetic is preferable for the most extensive cases.

There are also reasonable matters for debate about almost every aspect of the abrasive techniques at present used; about type of abrasive wheel, about rate of revolutions per minute of the wheel (the faster rates probably cause loading of the wheel more quickly, causing thermal friction to the tissues rather than abrasion), and about the type of post-operative dressing, as well as about the range and scope of method. My own view is that dermabrasion is capable of dramatically successful results in a minority of patients (such as with small superficial angiomas), and can give a very reasonable margin of improvement to many other patients (such as girls with acne scars, provided it is repeated two or three times); but it must also be remembered that it can be harmful and has some special complications of its own. This especially holds if it is not used with technical skill.

While minor areas can be successfully abraded under local analgesia on an out-patient basis, extensive facial operations can, I believe, only be safely done under general anaesthesia in an operating theatre with adequate post-operative nursing as an in-patient for two or three days. If these precautions are not observed, the method is likely to fall into the disrepute in England that prevails for it in many parts of America.—I am, etc.,

London, W.1

PATRICK CLARKSON.

REFERENCES

- Burks, J. W., *Wire Brush Surgery in the Treatment of Certain Cosmetic Defects and Diseases of the Skin*, 1956. Thomas, Illinois.
- Webster, G. V., *Guy's Hosp. Gaz.*, 1956, 70, 379.
- Clarkson, P. W., *Med. Press*, 1949, 221, 17.
- Eller, J. J., and Eller, W. D., *Med. Tms (N.Y.)*, 1956, 84, 158.
- Smith, F., *Plast. reconstr. Surg.*, 1954, 14, 236.
- Pomerat, C. M., and Lewis, R. B., *Tex. Rep. Biol. Med.*, 1953, 11, 333.

Test for Handedness

SIR,—The dominant-eye test for handedness described by Dr. M. Q. Birkbeck (*Journal*, March 23, p. 703) has been found to be less reliable than the following one.

The patient is given a small metal or cardboard ring of about 2 in. (5 cm.) diameter and asked to hold it with both hands. He then raises it quickly and sights a suitable target object with both eyes open. Each eye is then closed in turn, and the one which sees the target through the ring is the dominant eye. One advantage of this test is that it is not influenced by the handedness of the person, as has sometimes been found with the "pointing" test, although as far as I know the evidence for this is entirely empirical.—I am, etc.,

London, W.C.2.

D. A. SHEARD.

manner endeared him to many, by whom he will be keenly missed and long remembered with affection.—
C. F. B.

KATE FRASER, C.B.E., M.D., B.Sc., D.P.H.

Dr. Kate Fraser, a former commissioner of the General Board of Control for Scotland, died at Paisley on March 20 in her eightieth year, after a short illness.

Kate Fraser, whose father, Dr. Donald Fraser, was a distinguished physician in Paisley, went on from Paisley Grammar School to study medicine at Glasgow University and later in Vienna, Paris, and the U.S.A. After taking the B.Sc. (with special distinction in physiology) in 1900, she graduated M.B., Ch.B. in 1903. There-



after she worked for a time as a resident at the Crichton Royal and as a general practitioner, until she was appointed a school medical officer in Govan, where she introduced the use of intelligence tests in schools. In 1913 she published a paper on the use of Binet-Simon tests in determining the suitability of children for admission to special schools. In the same year she took the D.P.H. and proceeded to the M.D.

Dr. Fraser's association with the General Board of Control for Scotland lasted for 33 years; she was the first woman to be appointed a deputy commissioner and later a commissioner and member of the Board. For 21 years as a deputy commissioner she visited patients under guardianship throughout Scotland—in cities, in the country, and in the Highlands and Islands that she loved so well—maintaining a close co-operation with local doctors and local-authority officials. It was during these years that Dr. Fraser attained her unrivalled knowledge and understanding of the social implications of mental handicap and of the importance of the relationship between the handicapped and the community. As a commissioner she organized the ex-Service psychiatric after-care scheme for Scotland. Her determination was largely responsible for the mentally handicapped being included in the provisions of the Disabled Persons Employment Act.

Dr. Fraser was appointed C.B.E. in 1945. She was chairman of the Scottish division of the Royal Medico-psychological Association for three years and was made an honorary member of the Association in 1952.

A colleague writes: Dr. Fraser commanded the respect and affection of all who knew her and of all whose interests touched the field of mental health. Throughout her life, often as a pioneer, she devoted the zeal of the "Fighting Frasers," to whom she was proud to belong, to the service of the mentally ill and handicapped with insight, sympathy, and courage. In spite of her outstanding abilities and achievements she was always absolutely unassuming. Thinking of her, we recall her slight figure, her quick step, her clear and critical mind, her delightful sense of humour and enjoyment of so many things, her kindness and understanding, and her unflinching readiness to give help and encouragement from her own strength of character and ripe experience. She always retained her youthful spirit, and, to her, retirement in 1947 at the age of 69 did not mean rest; indeed, her work in various parts of the mental health

field came to absorb all her time and energy. She devoted herself particularly to the Scottish Association for Mental Health, of which she had been one of the founder members. In August of last year she attended the Conference of the World Federation for Mental Health in Berlin, and only eleven days before her death she was occupied, as chairman of executive, with arrangements for the conference of the Scottish Association for Mental Health to be held at the end of March—a conference which must now take place without her, but not without the continuing inspiration of her work and personality.

Kate Fraser has made a unique contribution to social psychiatry in Scotland; her name will be honoured and her influence will continue for many years to come.

W. S. RUSSELL THOMAS, M.B., B.Chir.

Dr. W. S. Russell Thomas, formerly Member of Parliament for Southampton, died at his home at Warlingham, Surrey, on March 21 at the age of 61.

William Stanley Russell Thomas was born at Talgarth, Breconshire, on February 5, 1896, and was educated at Brecon County School, Christ College, Brecon, Queen's College, Cambridge, and Guy's Hospital. During the first world war he served as a surgeon sub-lieutenant in the R.N.V.R. with the Northern Patrol. Returning to Guy's he qualified in 1919, graduating M.B., B.Chir. in the following year and being awarded the Treasurer's gold medal in clinical medicine. After holding resident appointments at Guy's Hospital and Sheffield Royal Hospital, he worked for a time as assistant medical officer at the West Riding Asylum, Wakefield. He was in general practice at Warlingham from 1922 to 1932 and afterwards in London. While in Surrey he was radiologist to the Caterham Cottage Hospital, and from 1926 to 1932 a member of the Caterham and Warlingham Urban District Council. During these years he read for the Bar and was called by Lincoln's Inn in 1930.

Dr. Russell Thomas stood for Parliament several times as a Liberal. He was unsuccessful at the General Elections in 1931 (Ilford), 1935 (Aberdeen and Kincardineshire Central), and 1936 (Ross and Cromarty). In 1940, standing as a Liberal-National, he was returned unopposed as the Member for Southampton in the vacancy caused by the elevation to the peerage of Sir John Reith. He failed to retain his seat at the 1945 General Election, and was defeated at the polls at Middlesbrough East in 1950 and Brecon and Radnor in 1955. From 1937 to 1945 he was deputy chairman of the London Liberal National Party. He was a member of the Select Committee on Public Petitions from 1942 to 1944, the Select Committee on National Expenditure in 1944, and the British-American Parliamentary Committee from 1942 to 1945. For some years also he was a member of the court of governors of Southampton University College.

Apart from his professional and political duties Dr. Russell Thomas took a keen and abiding interest in the welfare of animals. He became a member of the Royal Society for the Prevention of Cruelty to Animals and of its council in 1943, and was chairman of the society in 1951-2. Since 1944 he had been a vice-president of the National Federation of Property Owners. He married Miss Kathleen M. Bennett in 1922 and she survives him.

R. C. CLARKE, O.B.E., M.B., F.R.C.P.

Dr. R. C. Clarke died at his home at Bristol on March 23. He was 71 years of age. His death after a few days' illness came as a great shock to his wide circle of friends.

Richard Christopher Clarke was born on June 15, 1885, and came of an old Bristol family. From Clifton College he went on to study medicine at University College, Bristol, and at the Middlesex Hospital, qualifying in 1910. In the following year he graduated M.B., Ch.B. at Bristol. After holding several resident appointments at the Bristol Royal Infirmary he was elected assistant physician in 1913. As far back as 1904 he joined the Bristol Rifle Volunteers as a private, and from the first formation of the Territorials he was closely connected with the 4th Gloucesters. He went to France as their M.O. in 1915 and resumed this post after the war. From 1916 to 1919 he was with the 19th Casualty Clearing Station and was one of the first to recognize the new disease of trench fever. Mentioned in dispatches, he was appointed O.B.E. for his services and awarded the Territorial Decoration.

After being demobilized he took the M.R.C.P. in 1920 and returned to his hospital and private practice in Bristol, becoming lecturer in clinical medicine at the university. The diseases of children were his particular interest, and most of his medical writings were on paediatric subjects. Many past students at Bristol retain affectionate memories of "Dickie" Clarke. He was elected F.R.C.P. in 1934.

At the beginning of the second world war he went to the Royal Herbert Hospital, Woolwich, as lieutenant-colonel A.M.S., and in the following year, as full colonel, he formed the No. 2 General Hospital and took it to the Middle East. He was wounded in 1941 and relinquished his commission, under the age limit, in 1942. The loss of his elder son during the war struck him a grievous blow.

Since his retirement from the staff of the Royal Infirmary in 1947 he had devoted to other interests his abounding stores of energy and enthusiasm. Chief among these hobbies was the Clifton Zoo, which owes him an incalculable debt for its present status and ever-increasing popularity. Scarcely a day passed without his paying it a visit, and his fertile brain was constantly hatching new schemes for its development and modernization. He was a vivid personality and to the last his mind remained alert as that of a young man. He was a loyal friend, and his loss will be felt for many a long day. He leaves a widow, one son, and two daughters, one of whom is a doctor.—H. C.

We record with regret the tragic death of Dr. JOHN PULFER on March 26 at the age of 54. He was stabbed to death in his Hendon surgery while seeing a man who was believed to be a patient of his. Johannes Pulfer, who was a native of Hildburghausen in Thuringia, studied medicine at the Universities of Würzburg, Freiburg, Leipzig, and Berlin, graduating in medicine at Würzburg in 1925. The years between 1925 and 1933 he devoted to extensive studies in several fields of medicine, including radiology, bacteriology, and serology. He held several hospital appointments in Berlin, and was on the staff of the Urban Hospital there. During these years he published a number of papers in medical periodicals. In 1933 he became a victim of Nazi oppression and came to England at the end of May. This was the turning-point of his life; he loved Britain and its institutions and traditions to the last day of his life. He took a postgraduate course in Glasgow, obtaining the triple conjoint qualification early in 1935. Later that year he established himself in general practice at Colindale, where he was successful and happy in his work until his untimely and terrible end.

Dr. C. WIESNER writes: Medicine was John Pulfer's true vocation, inspiring him and keeping him deeply interested

during the whole of his professional career. He was a great reader. In spite of a very busy life he found time to keep abreast with the progress and advances of medicine, and he took a great delight in taking medical students to share his surgeries and rounds before their final exams. His keen sense of humour helped many of his patients and was appreciated by all his friends. He was 54 years of age when fate struck him down at work, at the end of a long day, plunging his family, his patients, and his friends alike into the depths of despair and grief, because they could not believe that a light which had shone so brightly could have been extinguished with such cruel suddenness for ever.

J. G. writes: The cruel and tragic death of John Pulfer has been a most grievous blow to many people, not least to his very many patients, to whom he was at all times a good friend and a physician of rare wisdom. It has become almost a commonplace to say that such a man represented general practice at its best, but in John's case this was literal truth. To him his patients always came first, and in the 16 years which have been enriched for me by his friendship I have never known him refuse help to anyone in distress. He brought to his patients not only considerable clinical skill but also a rich and happy personality. He bubbled over with the joy of living and was full of kindness, good humour, and toleration. Despite a very large practice and an immense amount of work, he found time to read of the latest developments in medicine as well as fairly widely in general literature. His enthusiastic praise for such books as *Cry the Beloved Country* by Alan Paton (he must have given dozens of copies of this to friends and relations) shows not only his instinctive recognition of fine literature but also his even more instinctive and fundamental sympathy with the world's unfortunates. Those who knew him and loved him will always be grateful for his friendship. His compassion, courage, and modesty will remain fresh in many hearts. Of no one can it more simply or unaffectedly be said that "in his tongue was the law of kindness."

Mr. C. B. F. Tivy, consulting surgeon to the Plymouth Royal Eye Hospital and consulting ophthalmic surgeon to the Prince of Wales's Hospital, Plymouth, died at his home near Brixham, Devon, on February 27, aged 76. He had patiently endured a long illness. Cecil Brian Forsayeth Tivy was born at Cork on May 3, 1880, and was educated at the old Queen's College there, graduating M.B., B.Ch. from the former Royal University of Ireland in 1903. Four years later he proceeded to the M.Ch. After graduation he held house appointments at the Staffordshire General Infirmary, Sunderland Royal Infirmary, and the Cork Eye, Ear, and Throat Hospital before going into general practice at Brixham in 1908. At the beginning of the first world war he served in the R.N.V.R., and after being invalided out of the Navy in 1915 he joined the R.A.M.C., serving in France, and later in Mesopotamia and Egypt. In 1918 he returned to Brixham, but he had always been interested in eye work, and early in 1919 became a clinical assistant at Moorfields. At the end of that year he joined the late Mr. J. R. Rolston in ophthalmic practice in Plymouth, and was appointed honorary surgeon to the Plymouth Royal Eye Hospital in 1925. He also became consulting ophthalmic surgeon to the Prince of Wales's Hospital and the City Hospital, Plymouth, and to the Royal Albert Hospital, Devonport. He was honorary secretary of the Plymouth Medical Society for some years, and a former president of the South-western Ophthalmological Society. He served as a vice-president of the Section of Ophthalmology when the B.M.A. held its Annual Meeting at Plymouth in 1938. During the second world war he was medical officer to the Yealmpton Home Guard. He retired from hospital work in 1946, but continued in practice until 1948. Mr. Tivy was a great lover of the countryside and country pursuits. He enjoyed shooting most of all, but was an enthusiastic follower of most kinds of sport and a keen golfer. He took a great interest in freemasonry and was a past master of his lodge. He will be sincerely mourned by his former patients not only

for his skill but for his invariable kindness and generosity. To many he became a personal friend. He leaves a widow and two daughters, to whom our sincere sympathy is extended.—P. R. G.

Dr. R. J. WEEDNER died unexpectedly on March 14 at his home at St. Brelade's, Jersey, where he and his wife had settled after he retired from practice at Tynemouth. Some weeks ago, after a visit to his native north country, he was taken ill on returning to London and spent a fortnight in hospital. He had been home about two weeks, apparently fully recovered. Robert Joseph Weedner was born at Newcastle upon Tyne on April 22, 1882, where his father was prominent in business and civic affairs, being an alderman and magistrate, and, in 1912, lord mayor. He received his education at St. Cuthbert's Grammar School in Newcastle, and afterwards at the Institut St. Joseph, La Louvière, in Belgium. At the latter college he and his twin brother Edward, who lives in Newcastle, introduced soccer. His medical education was undertaken at the College of Medicine in the University of Durham, and there he graduated M.B., B.S. in 1906. General practice claimed him, and in 1906 he settled in the borough of Tynemouth, where over the years his practice became a large and representative one. He was interested in surgery, and in 1911 was elected an honorary surgeon to the Tynemouth Victoria Jubilee Infirmary, where he proved himself to be a valuable member of the staff. At the time of his retirement he was chairman of the medical staff. Active in British Medical Association matters, he was chairman of the Tyneside Division from 1938 to 1943. During the first world war he served abroad and was present at the assault on Gallipoli. During the second world war he lost a son in action in Burma, and in 1955 a daughter died after a painful illness. There are two sons and a daughter surviving. Sport was a lifelong interest. As a medical student he played for his college at football, and after his playing days were over kept up a keen interest as a spectator. Tennis and golf he also enjoyed, and the country pursuits of fishing and shooting completed his wide sporting activities.

S. C. S. writes: I knew Dr. R. J. Weedner for over thirty years, both as a colleague in general practice and as a fellow member of the Tynemouth Infirmary staff, and I would like to pay tribute to one who was a worthy member of his profession. With his high integrity and loyalty, he was representative of the very best type of hard-working family doctor. His many friends and patients in the north will mourn his passing, while retaining happy memories, and would wish to extend to Mrs. Weedner and the family their sincere sympathy.

Mr. G. H. CAIGER writes from Durban, Natal: I see from the *Journal* of January 26 (p. 232) that my old friend, E. BARRINGTON BROOKE, has passed on. We first met at Caius, where he entered as a classical scholar during the first world war. After one term, junior medical students were advised to join H.M. Forces. Debarred on medical grounds, Brooke left to relieve a schoolmaster fit for service. Later, when the need for medical men was stressed, he decided to take up medicine, and so, on return from the war, those who survived joined him again. One of the most sociable of men, he was much prized as a friend. Brooke was a lifelong sufferer from asthma and would ask what flowers were in bloom before accepting an invitation for the week-end. We once shared a "long vac." term at the Old Vicarage at Grantchester, where the church clock still stood at 10 to 3 (as in Rupert Brooke's nostalgic war poem). Brooke was on the organizing committee for the International Gerontological Congress held in 1954. Owing no doubt to his modesty, I had not known of his Fellowship of the Royal College of Physicians until I saw his obituary. The memorial service held by his old hospital paid no undeserved tribute, I feel sure, to a classical scholar diverted by war into the realm of medicine, which he served and adorned so faithfully and with that incomparable human touch which was second nature to him.

Medical Notes in Parliament

EDINBURGH HOSPITAL CONTROVERSY

The controversy over the appointment of a consultant physician to a group of hospitals in Edinburgh was brought into the House of Commons on March 25 by one of the local M.P.s, Mr. J. H. HOY (Leith, Lab.). The two hospitals chiefly concerned are the Bruntsfield Hospital for Women and Children and the Elsie Inglis Maternity Hospital, the only two hospitals in Scotland, Mr. Hoy said, where women could be assured of seeing women consultants.

Both were memorial hospitals commemorating two pioneers, Dr. Sophia Jex Blake and Dr. Elsie Inglis, and were established by subscriptions to provide medical care for women by women doctors. The Bruntsfield Hospital started with 17 beds and now had 81, and the Elsie Inglis Hospital was the second largest maternity hospital in Edinburgh, and dealt with about 1,700 cases a year. The consultant physician was about to retire. By a coincidence the consultant physician at two other hospitals in the Southern Group, the Deaconess Church of Scotland Hospital and the Longmore Hospital, was leaving to take up an appointment elsewhere. The South-east Regional Hospital Board had decided to amalgamate the two posts. The decision had aroused a storm of protest. This had been supported by the Edinburgh Medical Committee, the Edinburgh Executive Council, the Medical Women's Federation, various other organizations and public figures, and the consultant and specialist committee of the South-eastern Region, whose reasons were that the volume of work was too great to be done efficiently by one consultant, and the need for at least one woman consultant physician in the region. In spite of this opposition the Secretary of State had upheld the decision of the regional hospital board and supported the paltry excuse that here was an opportunity to combine the two posts and pay a larger salary.

Mr. Hoy summed up his argument with a quotation from a letter by Dr. T. R. R. Todd and others, published in the *Supplement* of February 9 (p. 62), which referred to "a regional hospital board out of touch with medical and lay opinion—underestimating the valuable part played by the smaller hospitals"; and the opinion of Miss Margaret Kidd, Q.C., that "to appoint a man consultant to these hospitals must appear to every honest person an outrageous breach of trust."

Government Reply

Mr. J. NIXON BROWNE, Under Secretary, Scottish Office, did not give the promise of reconsideration for which Mr. Hoy asked. He summarized the Secretary of State's decision, published in the *Supplement* of March 16 (p. 116). It was the duty of the regional board, under the Health Service regulations, to plan the specialist services in its region. The Secretary of State could not intervene in the day-to-day exercise of functions which had been delegated to the board. The health department was frequently consulted by regional boards about their specialist services. The Secretary of State could advise and recommend, and ultimately direct. But to override the decision of a statutory body was a serious matter. The regional board was fully seized of the value of special hospitals for women, and it also knew there was a demand for the services of a woman consultant physician in Edinburgh. But the demand was limited. There were only 19 medical beds in Bruntsfield Hospital (compared with the 1,001 in Edinburgh); the other 62 were still staffed by a woman surgeon and a woman gynaecologist; and all the 68 beds at the Elsie Inglis Hospital were staffed by women. The appointment had not yet been made, and it might still be a woman.

The regional board and the board of management had assessed the services required as five half-days out of 11. The salary would be £1,100 to £1,600. The board concluded that the Bruntsfield and Elsie Inglis post alone would not attract a wide enough range of applicants of satisfactory

quality. They combined it with the Deaconess and Longmore Hospitals, in the same group. The salary for the combined post would be £2,100 to £3,100 on a whole-time basis, or about £1,800 to £2,600 on a maximum part-time basis. It was considered that a post of this broad scope and at this salary would attract, if open to either sex, a consultant of the highest calibre. There was no evidence that regional boards were prejudiced against women consultants. This regional board had asked him to emphasize that should a woman candidate prove herself worthy in open competition she would be appointed to the post with the board's fullest confidence. The Secretary of State's decision was the right one, and the only possible one.

Testing New Drugs

Mr. A. BLENKINSOP (Newcastle-upon-Tyne, East, Lab.) asked the Minister of Health on March 25 whether he would invite the Central Health Services Council to inquire into the advisability of establishing some system of laboratory and hospital testing of new drugs before their use in the Health Service. Mr. D. VOSPER said that a joint committee of the Central and Scottish Health Services Councils already advised on the therapeutic value of new proprietary drugs and preparations, and he thought in present circumstances that was as far as they could go. Mr. BLENKINSOP asked if the Minister did not feel that with the large number of new drugs coming on the market almost every week—some expensive, and some that were challenged medically—it was desirable that there should be some independent test of a more extensive kind than the committee could provide. Mr. VOSPER told him that that was a matter exercising his mind. There were certain proposals under consideration. But Mr. Blenkinsop's proposal had far greater implications than he realized.

The PRESIDENT OF THE BOARD OF TRADE informed Mr. H. WILSON (Huyton, Lab.) on March 28 that imports of drugs, medicines, and medicinal preparations, excluding antibiotics, from the United States were valued at £1.1m. in 1956. These goods were not separately specified in the trade returns for 1951, but imports in that year were estimated to have been of the same order as in 1956.

Tuberculosis Among Immigrants

Mr. T. IREMONGER (Ilford, North, Con.) asked what examination of immigrants into the United Kingdom was made to determine whether they were suffering from tuberculosis or other communicable diseases. Mr. J. K. VAUGHAN-MORGAN, Parliamentary Secretary, replied that any alien immigrant might be subjected to a general medical examination before he was permitted to land. Where tuberculosis was suspected in any person, British or alien, coming to this country the port medical officer notified the medical officer of health of the district to which the person was proceeding, so that he might be brought under observation. The port medical officer had power to examine any person if he had reason to think he was suffering from any other infectious disease, apart from venereal disease. Dr. EDITH SUMMERSKILL (Warrington, Lab.) asked why, if it was considered necessary to x-ray people in factories to diagnose this disease, it was not equally important to x-ray immigrants. Mr. VAUGHAN-MORGAN said it had been explained that to establish a sufficiently thorough health check would involve new restrictions out of all proportion to the danger involved.

Cloistering Emoluments

Mr. JOHN RANKIN (Glasgow, Govan, Lab.) asked the Secretary of State for Scotland on March 26 if he would inquire into the prevalence of the cloistering-emolument system of service in State hospitals in Scotland, and indicate what steps he proposed to take to bring about its termination. Mr. J. NIXON BROWNE, Under Secretary, Scottish Office, said that, if Mr. RANKIN was referring to the fact

that some doctors were required to live in hospital premises where it was necessary that doctors should always be available, the Secretary of State had no evidence of dissatisfaction with this practice. Mr. RANKIN asked if the Minister agreed with the principle that employers had the right to claim emoluments from cloistered staff who were cloistered for the purpose of carrying out their duties. Mr. BROWNE said that was a different question. No responsible group in the hospital service had objected to the present practice. He would look into any case that Mr. Rankin had in mind.

Notification of Burns and Scalds

Dr. DONALD JOHNSON (Carlisle, Con.) suggested that the Minister of Health should introduce legislation to make burns and scalds, causing accidents that needed hospital attention, notifiable by the appropriate authorities. Mr. VAUGHAN-MORGAN said he scarcely thought this would be justified. Dr. JOHNSON asked that at least there should be some arrangement for reliable statistics to be collected. Mr. VAUGHAN-MORGAN said that in some areas medical officers of health were notified, by arrangement with the hospitals. That was being encouraged, and he would welcome a wider extension of it.

Mineral Waters at Bath

Mr. I. PITMAN (Bath, Con.) asked the Minister of Health whether, in view of the anxieties of expectant mothers and others in Bath, he would institute an inquiry into the properties of the mineral waters there. Mr. VAUGHAN-MORGAN, the Parliamentary Secretary, stated that the maternal and infant mortality rates and the number of premature babies born in Bath had all been lower than the national average in most recent years; the stillbirth rate had recently been higher, but in the period since 1936 had more often been below than above the national average. The Minister therefore saw no cause for local anxiety. The content of the mineral waters was known and seemed to have no relation to the matter.

Medical Lists

In reply to a question by Sir KEITH JOSEPH (Leeds, North-east, Con.) on numbers of doctors on medical lists in England and Wales, Mr. VOSPER stated on April 1 that between July, 1952, and July, 1956, the number of doctors increased by 1,908, or 11%, and the number of patients per doctor diminished from 2,436 to 2,272. In 1952 there were 7,596 doctors practising in areas then classified as under-doctored with about 21½ million patients on their lists. By 1956 the areas classified as under-doctored had been so reduced that there were only 3,484 doctors practising in them with about 9½ million patients, a very substantial improvement.

Handicapped Persons' Welfare

Mr. J. K. VAUGHAN-MORGAN, Parliamentary Secretary, Ministry of Health, announced on April 1 that Mr. Edward Evans, M.P., was to be chairman of an advisory committee on the health and welfare of the handicapped. The other members would be (medical members in capitals):

Mr. N. D. Bosworth-Smith, Dr. T. M. CUTHBERT, Alderman Mrs. O. G. Deer, Miss S. T. Hart, Miss G. MacCaul, Alderman E. E. Mile, Sir Cecil Oakes, Alderman Miss May O'Connor, Professor Sir HARRY PLATT, P.R.C.S., Mr. R. G. Richards, Mr. Godfrey Robinson, Alderman R. G. Robinson, Lady Sempill, Professor A. B. SEMPLE, Mr. T. H. Smith, Miss B. H. F. Townsend, S.R.N., Alderman Lieutenant-Commander J. H. Turner, Dr. J. A. L. VAUGHAN-JONES, Mr. H. Willard.

N.H.S. Hospital Staffs.—The number of nurses employed in Health Service hospitals has increased from 125,752 full-time and 23,060 part-time in 1949 to 145,802 and 35,568 respectively in September, 1956. The administrative staff increased from 25,215 in 1949 to 29,664 in 1955.

Medico-Legal

TRIAL OF DR. J. BODKIN ADAMS
EXPERT EVIDENCE

[FROM OUR SPECIAL CORRESPONDENT]

The trial of Dr. John Bodkin Adams, of Eastbourne, continued before Mr. Justice Devlin at the Old Bailey. Dr. Adams is charged with the murder of a patient, 81-year-old Mrs. Edith Alice Morrell, who died on November 13, 1950. He pleads not guilty.

Sir Reginald Manningham-Buller, Q.C., is appearing for the prosecution with Mr. Melford Stevenson, Q.C., and Mr. Malcolm Morris. Mr. Geoffrey Lawrence, Q.C., is appearing for Dr. Adams with Mr. Edward Clarke and Mr. John Heritage. The Medical Defence Union is acting for Dr. Adams.

On the seventh day of the trial (March 27) after evidence had been taken from Superintendent Hannam, of Scotland Yard, and other police witnesses, Dr. Adams's partner, Dr. R. V. Harris, gave evidence. He said he saw Mrs. Morrell on June 12, 1949, and on several occasions in May, 1950. Dr. Adams, he said, usually instructed one to carry on with whatever treatment he had been giving to the patient, and to the best of Dr. Harris's memory he had complied with the instruction. He said he must have increased the morphine and heroin dose on September 12, 1950, because Mrs. Morrell was in an extremely irritable state over Dr. Adams being away. In cross-examination by Mr. Lawrence, Dr. Harris agreed that Dr. Adams was using the morphine and heroin in combination to effect the sedation which was necessary.

Next day Dr. Arthur Henry Douthwaite, of Harley Street, London, was called as the Crown's expert medical witness.

Dr. Douthwaite, described as senior physician to Guy's Hospital, consulting physician to the Royal Hospital and Home for Incurables, honorary consulting physician to the Horsham Hospital, and editor of Hale-White's *Materia Medica*, said he had been in general practice from 1924 until 1928 in Worthing. He described the three common causes of a stroke as (1) haemorrhage of the brain, (2) cerebral thrombosis, and (3) cerebral embolism. Severe cerebral haemorrhage almost always resulted in death within three or four days; cerebral thrombosis patients usually survived and their condition would improve spontaneously over several months. A patient could live for many years after such a complaint.

The Attorney-General then directed the witness's attention to the case of the deceased. He said:

"You have heard the evidence given in this case, and I think you have seen the nurses' reports?"—"Yes."

"What is your conclusion as to the cause of the stroke from which Mrs. Morrell suffered in 1948?"—"In all probability a cerebral thrombosis."

"We have also heard that one effect of the stroke was paralysis of the left side?"—"Yes."

"Is such a stroke followed by any other symptoms?"—"Well, yes, in so far as that naturally the patients, finding themselves unable to move, will naturally be depressed and irritable, lacrimose."

"I want you to indicate quite briefly what is the proper course of treatment for a patient who has suffered a stroke as a result of cerebral thrombosis?"—"Within a few days, as soon as one is able to obtain any co-operation from the patient, when the mind is clear, as it may well be within a few days, one should do one's best to mobilize the patient, encourage movement of the body and indeed encourage her to try to move the paralysed part. Massage, exercises, and so forth."

The witness was then referred to the prescription list, which showed that on July 21, 1948, 40 hypodermic tablets each of heroin and morphine sulphate had been prescribed, the total being 6 2/3 gr. (430 mg.) of each drug.

Attorney-General: "Is there, in your opinion, any justification for injecting morphia and heroin immediately after a

stroke caused by cerebral haemorrhage?"—"No, there is no justification."

"Is it right or wrong to do so?"—"It is wrong. In all circumstances it would be wrong to inject heroin and morphia."

"What about morphia alone?"—"Morphia alone should not be given to someone who has had a stroke unless there was an episode of acute mania; then that would be justified as a single injection."

The witness was then referred to the remainder of the list, which, he agreed, indicated that up to the end of 1949 morphine and heroin had been prescribed for the patient throughout the period.

"What would be the effect of administering morphia and heroin to an old lady who has suffered a stroke? What would be the effect on her rehabilitation?"—"It would greatly interfere with any progress of rehabilitation."

Severe Addiction

Dr. Douthwaite explained that the administrations referred to would inevitably produce severe addiction to both drugs; they would seriously interfere with the patient's prospects of resuming normal life, for they would take away all the co-operation necessary. It was not necessary or generally desirable to use sedation immediately upon a cerebral thrombosis, except that it was reasonable to give something to make sure of sleep at night, but certainly not morphia or heroin. It was not necessary to keep the patient as quiet as possible in the daytime; on the contrary, if the patient were kept very quiet the risk of another stroke was increased because clotting in any artery was more likely to occur when the blood circulated slowly through the patient being kept very quiet. Heroin and morphia would tend to slow the respiration, which might become deeper, and that would result in interference with ventilation of the lungs, possibly leading to collapse and pneumonia—putting it shortly, chest complications. Morphia was also powerfully constipating. Cerebral irritation for a few days after the stroke would result in irritability, but the condition would soon pass off. He would expect a patient of 81 to be suffering from some degree of cerebral arteriosclerosis, however, which was likely to result in irritability, but it would be quite wrong in that case to administer morphia and heroin, because addiction would be rapidly caused and because there were many other safer drugs which were much more effective. In 1950 bromide, barbitone, and lots of the barbiturates had been available. The administration of morphia and heroin together regularly over a short period of time would probably produce drowsiness and sleep to start with, but on recovery from that, on awakening, the patient would feel ill and irritable, possibly sick, and might vomit. The administration of the two, over a period, to a person of 81 who had not suffered a stroke would produce irritability; if irritability were already present due to arteriosclerosis regular injections of the two would worsen the condition.

The patient's normal reaction to the feeling of pleasure referred to was one of dependence on the doctor, who naturally obtained a complete ascendancy over the patient once addiction had occurred.

The Attorney-General: "What legitimate purpose can injections of morphia be daily administered for over a long period?"—"Only for a severe pain which cannot be quelled by drugs which are less dangerous. By 'prolonged periods' I have in mind, as I think you have, sir, several months."

The normal dosage of morphia was 1/4 gr., but the *British Pharmacopoeia* maximum was 1 gr. Nervous insomnia was a strong indication that morphia should not be used, for it would certainly establish addiction in such a case. The normal dose of 1/4 gr. would be given four-hourly in the case of severe pain; it would be given more frequently if the pain were intense, possibly every hour.

"Is morphia a dangerous drug?"—"In the legal sense?"

"Yes."

"Is it a dangerous drug also in the medical sense?"—"It is a dangerous drug in both senses."

"What about heroin?"—"Also in both senses."

"How do they compare?"—"Well, heroin is a stronger drug than morphia, is a more dangerous drug. Its action in many respects is similar to that of morphia, but it differs in some important respects."

"What is the effect of heroin on respiration?"—"It is powerfully depressant. That is the great danger."

"Powerfully depressant?"—"Depressant, yes, of what we call the respiratory centre in the brain."

"When you say 'powerfully depressant' can you give an idea of how it compares with morphia?"—"In that respect?"

"In that respect?"—"Oh, about four times, three or four times more powerful."

"As a depressant of respiration?"—"Yes."

The maximum dosage was 1/4 gr. according to the 1948 B.P. recommendation, said Dr. Douthwaite, seldom given more than once in six hours except in the face of terrible pain. Heroin relieved pain and calmed the patient in consequence. It exercised a slight sedative effect when given to a patient who was not in pain and was not accustomed to the drug, but the drowsy effect was mild and uncertain and disappeared with frequent repetition. Heroin would facilitate sleep by removing pain.

Twitching of Limbs

Twitching of the limbs could be induced by heroin; barbiturates would tend to depress or prevent that if adequately applied. Heroin stimulated the spinal cord much more constantly and violently than morphine, the visible effect being twitchings or convulsions. The natural tolerance of human beings to heroin and morphia varied, but would develop very quickly within a fortnight to three weeks with routine administration. The effect of the 1/4 gr. decreased and lasted for a shorter time once addiction was achieved. If the administration to an addicted patient were stopped the patient became terribly ill, wildly excited, getting pain in the limbs, sweating, sneezing, and possibly collapse—a whole host of what were known as withdrawal symptoms. These became maximal if morphia or heroin were withheld for about two days. Curing an addiction was a very unpleasant process for the patient. Maintaining routine injections of morphia and heroin at the same level for a long period would produce suffering; it would keep the patient in a state of almost constant craving for more drugs and thus ensure that she would be excitable, bad-tempered, impossible to live with.

"Omnopon," which contained 50% morphia, had a similar effect to the latter drug, said Dr. Douthwaite. Paraldehyde was a sedative, the distinguishing features of which were its revolting smell and taste; it also acted as a depressant on the respiratory centre and on the whole of the central nervous system.

The Attorney-General: "But could that properly be used in an endeavour to stop twitchings?"—"Yes."

"But what would be the effect if it was used to stop twitchings if it was superimposed on heavy administrations of heroin alone or heroin and morphia?"—"That would be likely to produce death." It was not of itself a dangerous drug, he said, it would deepen coma or heavy sleep if that existed.

"Is there any justification or legitimate ground, in your view, for administering morphia and heroin together?"—"No."

"What would be the object of giving a routine administration of morphia and heroin? What would be the medical object?"

"The medical object?"

"Can you think of one?"—"There is not one."

Mrs. Morrell, on June 20, 1949, was, in the witness's view, a fully addicted patient.

Keeping Patient Under

The witness was then taken through the remainder of the nurses' reports. After the luncheon adjournment the Attorney-General directed his questions to treatment extending up to the night of November 9-10, 1950:

"I would rather, Dr. Douthwaite, if you would say in your own language what these reports indicate, what the application of this heroin indicates was the basis of the instruction given on November 9 and 10 to give heroin 1 gr. s.o.s."—"It seems to me that the only reason why this was given was in order to keep her under. There was no indication that I can see for the therapeutic administration of heroin on those dates in those quantities."

"When you say 'keep her under' what exactly do you mean by that?"—"Well, to put it in simple language, to keep her thoroughly doped or drugged."

"Now I want you to express your considered opinion as to the effect on this lady of 81, this semi-paralysed lady of 81, of the dosages of heroin given in these last few days, that is to say, from November 8 onwards, allowing for the tolerance which had been acquired to routine injections? What, in your opinion, was the effect of the dosage of heroin given since November 8 as shown by the nurses' reports? Seeing the rise from 2 of morphia and 2 of heroin on the 8th, 2 of morphia and 1 1/2 of heroin on the 9th, and then on November 10 to 4 of heroin and 1 of morphia, then on the next day 3 1/2 and 5 respectively and on the 12th 2 and 3 1/2; looking at those dosages of heroin that she had leading up to the 12th, leading up to the time of her death on the 13th, making all allowances for acquired tolerance, what in your opinion was bound to be the effect of that dosage of heroin as administered to her as shown in the nurses' reports?"—"I believe that it would have produced jerking spasms or convulsions and ultimately death."

"Is there anything in the nurses' records or in the evidence that you have heard to justify this administration of heroin and morphia in November, and particularly on the 10th, 11th, and 12th?"—"No, there is nothing."

"Did you find any evidence of her suffering severe pain since her stroke?"—"No." A condition of severe pain following upon a stroke occurred very rarely, he said, and was known as a thalamic syndrome. There was no indication in the reports of any such complaint.

After referring the witness again to the prescriptions the Attorney-General said:

"I need not take you through the quantities, but you have examined, I think, the entries in particular from No. 81 onwards, have you not? You have seen those ones in November?"—"Yes, the ones in November."

"I think it follows, if those prescriptions in fact exceeded the amount shown in the nurses' reports and the difference was in fact administered to Mrs. Morrell in that period, what effect would that have had on her prospect of life?"—"They would have killed her." He said that the drugs administered on the last day would have been enough to kill the patient.

"We have also heard evidence that one phial of morphia and one phial of heroin or omnopon were left over after her death?"—"Yes."

"Deducting that from the amounts prescribed for her—deducting that—what would have been the effect of administering the balance of the prescriptions?"—"It would still have resulted in death."

"You heard Nurse Randall's evidence as to the symptoms of jerkiness and all that, did you not?"—"Yes, I did."

"Having regard to that dosage of heroin, were they to be expected or not?"—"Yes, they were."

"Is there in your view any other explanation for them?"—"No other explanation is possible in my view."

Cerebral thrombosis in November, 1950, could not have produced the picture created by the nurses' evidence in the last few days, he said. The initial treatment with heroin and morphia was not justified, either the morphia or the heroin, and certainly not the two together. The certain consequence of that treatment was addiction.

"Was there any justification, so far as you can see from the records and the evidence, of continuing such daily treatment from 1948 to November, 1950?"—"No, there was no justification."

"What conclusion do you draw from the dosage administered according to the nurses' reports in the last few days before her death as to the intention with which that dosage must have been prescribed and administered?"—"The only conclusion that I can come to was that the intention was to terminate her life." The injections of paraldehyde on top of the heroin would make the heroin more lethal.

"In the cremation form Dr. Adams, we know, has recorded as the immediate cause of death cerebral thrombosis. Are there any signs in the nurses' reports in your opinion which justify that conclusion?"—"No."

"Supposing there had been any signs of cerebral thrombosis in November, would there then have been any justification for administering those doses of heroin?"—"No, certainly not."

"Can you tell whether a person has died as a result of cerebral thrombosis as a result of an external examination?"—"No, you cannot."

"In your opinion, should heroin be given to old people?"—"No."

"Having considered all the evidence and these documents, can you think—I am sure you will say so if you think so—can

you think of any legitimate reason for the amounts prescribed from November 8 onwards of heroin and morphia?—"No."
"Dealing with the amounts prescribed, were the amounts prescribed on November 8, 9, 10, 11, and 12 sufficient to cause death?"—"Yes."

General Practitioner's Expected Knowledge

On the ninth day of the trial Dr. Douthwaite was recalled, and the Attorney-General continued his examination-in-chief.

Asked to describe the effect of heroin and morphine in conjunction with barbiturates ("allonal" and "sedormid") shown by the night reports to have been administered, the witness said that that would increase the depressant effect of one or the other. Looking back over the period, the degree of drugging, taking into account both the barbiturates and the heroin and morphia, was heavy.

Turning to the question of a general practitioner's expected knowledge of drugs, the Attorney-General said:

"To what extent would knowledge of those matters—that is to say, the nature of heroin and morphia, doses to be administered, the risks of addiction, and the consequences in regard to tolerance, etc., and convulsive spasms at the end—to what extent would those matters be within the knowledge of a general practitioner?"—"He would have the knowledge of all the main occasions, of all the main drugs that are taught to students and repeatedly referred to in the wards in training."

"Would the holder of a diploma in anaesthetics have more or less knowledge in relation to morphia and heroin than an ordinary general practitioner?"—"He would have more. They have to make a special study of drugs of this sort in order to achieve their specialty."

"When you say 'a special study of drugs of this sort' does that include morphia and heroin and the barbitones?"—"Yes, certainly."

Cross-examination of Witness

Mr. Geoffrey Lawrence then opened his cross-examination:

"Dr. Douthwaite, my client, Dr. Adams, in this case, as you know, is charged with the murder of Mrs. Morrell?"—"Yes."

"Before I embark on my cross-examination of what you have said, I want to be quite clear what your proposition to my lord and the jury is in relation to the charge of murder. Have I understood it correctly in this way: that as a doctor and a specialist yourself you are saying that he formed the intention, as you say, 'to terminate her life' on November 8, and carried that intention into effect over the next five days?"—"Yes."

"I think it follows from what you said to my lord yesterday that that murderous intent in your view was present in his mind from and including November 8 onwards to the end?"—"Yes."

"A specialist's profession is a responsible one, no doubt, but I hardly suppose that you have often expressed a graver or more fateful opinion on a matter of medicine than that, have you?"—"No."

"Before going into the witness-box and expressing that view upon oath in this court, have you satisfied yourself that you have had every piece of relevant evidence before you on which to judge?"—"Yes."

"You gave evidence in this case before the magistrates at Eastbourne, did you not?"—"I did."

"For the prosecution?"—"Yes."

"Supporting the charge of murder?"—"Yes."

"At that stage of the matter your knowledge of the medication, the treatment, of Mrs. Morrell began at the beginning of January, 1950, did it not?"—"Yes."

"When you gave evidence at that stage you were entirely in ignorance of what her treatment by Dr. Adams had been before January, 1950, were you not?"—"I was."

"And you gave that evidence at least partly upon the hypothesis that for the last three or four days of her life this lady had been in a continuous coma, did you not?"—"Yes."

"That has turned out on the facts now to be quite wrong?"—"Yes; not a continuous coma."

He agreed that the court had now a complete picture of the patient's treatment. His conclusions, he said, had been based on a medication that began in July, 1948. He had known about the stroke. He had said in conferences that it would be very interesting to know what treatment the patient had had before she had come under the care of Dr. Adams.

Mr. Lawrence: "As a doctor, a Harley Street specialist, who has ended up in that box and said that another doctor formed a murderous intent which he carried into effect on an old lady of 81, have you seriously asked for that information from those who are conducting the matter for the Crown?"—"No. I did not regard it as my duty to ask them to find out facts of that sort. The information and the expression of opinion that I have given is on the facts which have been presented in this court."

"Yes, I dare say, but you are not forgetting for one single moment, are you, the conclusions which you put before the jury yesterday of murder in this man's mind and the execution of murder in the five days at the end of her life?"—"No, I haven't forgotten that for a moment."

Further pressed as to why he had not sought the information, the witness said that in the first place he had been told it was not available; secondly, it would not have materially influenced the answers he had given in respect of the addiction.

Mr. Lawrence: "It would be most important to know, would it not, before damning Dr. Adams's treatment from the start, as you did yesterday, to know what had happened in Cheshire?"—"It would be interesting to know what had happened in Cheshire, yes."

"And so far you do not know what that information is, do you?"—"I do not, no."

Beginning of the Illness

Mr. Lawrence then produced copies of the nurses' notes taken on the case in the Neston Cottage Hospital in Cheshire from the outset of the patient's illness. These would fill the final gap going back to the moment when the stroke had occurred. The reports, starting in June, 1948, indicated hemiplegia, paralysis of the left side, 2 gr. of "luminal" administered. Temperature was 99° F., pulse 72, respirations 18. The witness agreed that luminal was a synthetic barbiturate. The night report for June 26 showed that another 2 gr. of luminal had been given and that the patient had complained of pain in the left arm in the early morning. Special injections and special sleeping tablets had been given on the next two days with very little effect, it being a reasonable inference that the tablets were barbiturates. The day report for June 27 said: "Patient very distressed and complaining of severe pain." Two "veramon" tablets had been given which the patient had been unable to swallow and ½ gr. of morphia had been given at 11.30 a.m., after which the patient had slept. A Dr. Turner had been informed of the position. Morphia, ½ gr., had been given every day for the remaining eight days of the patient's stay in the hospital.

Having put the details of the report to the witness, Mr. Lawrence said: "Now, Dr. Douthwaite, she was in that hospital under the care of a Dr. Turner and apparently with a consultant doctor, Dr. Pemberton, at the early stages?"—"Yes."

"For ten days or thereabouts?"—"Yes."

"With day and night nurses?"—"Yes."

"From those records of that ten days three things at least are clear, are they not: first of all, she was a very ill woman?"—"Yes."

"Secondly, she complained of severe pain?"—"Yes, on June 27."

"And thirdly, that after two nights of attempting to give her sleep and sedation by barbiturates, the doctor at the hospital resorted to morphia?"—"Yes."

"And every night for the rest of her stay in that hospital under those doctors she had morphia?"—"Yes."

The witness pointed out that it was important to remember that the barbiturates had been luminal, but agreed that 2 gr. was a quite good dose. There was some record of the patient having slept after the morphine injections.

Asked about the stroke which the patient had suffered, he confirmed his previous evidence that no doctor should give morphine to a patient with a stroke except if a patient had acute mania. In such a case there should be one single injection. He agreed that, although the doctor in Cheshire had been adopting a course of morphine injections night after night, there had been no suggestion of acute mania or of the rare condition, the thalamic syndrome.

Mr. Lawrence then asked: "Does the field of condemnation that you are spreading from that witness box extend to include Dr. Turner for having given this patient morphia after this stroke?"—"If that was the treatment for the stroke, yes."

"We are left with this, are we not, that three doctors—two other doctors who are not in dock on a charge of murder at all, two doctors in addition to Dr. Adams—gave, and deliberately gave, this particular patient, who had had a stroke, injections of morphia, not a single injection but night after night?"—"Yes, the first being given when pain was reported."

"But you can't shelter behind that, can you?"—"I'm not trying to shelter behind anything."

"Because the morphia goes on night after night, but, as you pointed out just now, there was only one complaint of severe pain?"—"Yes."

He agreed that as a general principle only the man on the spot with the patient in front of him could judge the full and true picture. The general practitioner on the spot had to exercise the best judgment he could.

Mr. Lawrence: "He has not got to be the perfect physician?"—"No."

"—the ideal that is stored up somewhere in Harley Street, has it?"—"No." The patient was not addicted to morphia to any degree on leaving the hospital after having nine daily injections of ½ gr. morphia. It was possible that a person might become addicted in less than a fortnight or three weeks. He agreed that the patient's prognosis at that time in terms of expectation of life might reasonably be six to twelve months.

The witness was then shown the list of prescriptions beginning on July 7, 1948, at the Esperance Nursing Home, Eastbourne, upon her return from Cheshire. They showed that for the next 12 months the patient's treatment had included the administration of tincture of nux vomica, sodium barbitone, syrup, chloroform water, hyperdoric morphia, veramon, a sedative mixture containing morphia, sodium bromide, ammonium bromide, and chloral hydrate; vitamin-B ampoules, pethidine tablets, "allonal" tablets (containing barbiturate with amidopyrine), right up to June 13, 1949, when Dr. Harris had been continuing the prescriptions of morphia and heroin. It was not unreasonable to assume, he agreed, that for some months after the stroke the patient had been suffering pain somewhere.

Making Life Bearable

Heroin, he agreed, had some slight sedative quality, but was notably a pain-killer which left the patient in a state of euphoria. The first object of a general practitioner's treatment for what he could reasonably expect to be the remaining months of Mrs. Morrell's life would be to try to restore her health if possible. The doctor would also try to make life as bearable as possible for the patient. He agreed that, short of a miracle, no doctor in his senses could think that he could restore a woman of 79 or 80 to her pre-stroke health after there had been a brain lesion, as indicated in Mrs. Morrell's case; but making the patient's life as bearable as possible, he said, was a side consideration.

Mr. Lawrence: "Well, you say it is a side consideration, but let us face it, Dr. Douthwaite, not from the consulting room in Harley Street, but let us face it from the angle of the general practitioner in the provincial town."—"Yes, I am quite aware of that."

"Nurses in 1950, after the war, were pretty scarce, were they not?"—"Yes."

"At a time when nurses are not going to put up with an infinity of trouble and difficulty?"—"True."

"If the patient's life is made as bearable as possible for her she is in a condition which enables her to be bearably nursed by them, then that latter factor redounds in favour of the patient, does it not?"—"Yes."

"If she was not up and about in the day-time she would get bedridden too soon?"—"Yes."

"And if she did not get sleep at night she would wear herself out with exhaustion?"—"Yes."

"Exhaustion would lead to collapse, and with an aged woman like that collapse might very well contain the risk of a premature death?"—"Yes."

"Now, whatever you may say about the use of these drugs, morphia and heroin, the fact is this, is it not, recorded in these notebooks: that, broadly speaking, until September, 1950, this woman was being got up and about during the day-time?"—"Yes, I can't remember up to what month that was, but I naturally accept your word."

"So far as sleep was concerned at night, she was having a regular routine injection at 8.30 of ½ gr. morphia and 1/3 gr. heroin, and during that period she was being assisted further to sleep by slight additional doses of barbiturates when necessary?"—"Yes."

"That is the broad picture?"—"Yes, I agree."

He agreed that if there was any clotting after an operation it started usually in a vein rather than the arteries. In extreme cases after strokes such as the patient had had there could be an almost completely or perhaps wholly changed personality manifesting itself in behaviour changes.

Mr. Lawrence: "Do you agree with me now that before you can pass any judgment upon Dr. Adams at any stage of the matter in relation to a murder charge it is necessary to try to see the picture of his treatment of Mrs. Morrell as a whole right from the start?"—"Yes."

"And indeed more than that, to go back, as we have been able to go back, to what happened before he took her over?"—"Yes."

The witness agreed that between June, 1949, and August, 1950, there were indications that efforts were made by Dr. Adams to keep the patient on the move during the daytime and to encourage her to take an interest in outside events.

Withdrawal Symptoms

The witness was then referred to his previous evidence that certain symptoms consistent with withdrawal symptoms had manifested themselves on the occasions when there had been reductions in the drug dosages. Mr. Lawrence said at least one instance of a reduction followed by a good day, and not withdrawal symptoms, had not been referred to.

"It would be perfectly fair to balance that against what you said yesterday in regard to the instances you referred to?"—"Perfectly fair. Let me make it clear. I did not pick out these instances."

"Who did?"—"My attention was drawn to them by the Attorney-General and I agreed; but I had not been through these trying to find evidence to support one way or the other. I had merely studied them. There may be many other instances you can produce like that. I do not doubt it."

"Let me understand this. You and I are agreed, I think, that we ought, in order to try and find out what is the real truth of this case, to look at it as a whole?"—"Yes."

"And not be over-selective and picking out individual bits here and there?"—"Yes."

"But trying to take the big view?"—"Yes."

"Do I understand that it was no part of your expectation when you went into the box yesterday to give evidence that your attention would be drawn to selected instances like this?"—"I had no doubt it would be."

"And you had no doubt what they were to be, had you?"—"That I am not prepared to say."

"You are not prepared to say?"—"That is to say, I was not certain what they would be, but I knew they would choose some."

"But did you realize that it was not fair to pick out those selected instances, that it was not a proper and fair way to put it?"—"I did not think it was my duty to point out whether it was fair or not."

"You agreed yesterday with the expression of opinion that my client intended to kill her and killed her?"—"Yes, I did, and I expressed that view in the last few days of September."

"I suppose you realize that there is a heavy responsibility on any doctor who expresses that view about another?"—"Yes."

"Are you really saying that yesterday you did not think it was part of your duty to correct any false impression which was made by any part of your evidence?"—"If I thought any false impression was to be gained from my evidence, I should have corrected it at once."

"But drawing attention to one or two selected things and ignoring other things was giving a false impression, was it not?"—"Yes, but I realized that you would go through this, or I presumed that was the natural course of events, and that it was for the two counsel on one side and the other to lead me on to express a view on the days when drugs were given, and I thought that was my duty."

"Do you know there is no burden of proving anything in this case, from start to finish, on the defence?"—"No, I did not know that."

"If the result of this little discussion is that I may now disregard altogether that part of your evidence where your attention was drawn to those selected instances, may we pass from it?"—"I am not prepared to say you may disregard it. In so far as instances were drawn to my attention on which I was asked whether they were consistent with withdrawal or increase of drugs, then I meant it."

After the luncheon adjournment Mr. Lawrence continued his cross-examination about addiction and withdrawal symptoms. Dr. Douthwaite said that if a patient was obviously dying it was ridiculous to worry about addiction. If the strong probability was that the patient would not live for more than a month or two, and if the drugs were in fact indicated for that condition, again one need not worry about addiction. If the prognosis was very doubtful as regards time, whether it was a matter of six months or five years, then addiction should be carried in mind the whole time.

The witness agreed that on the second day on which Dr. Adams was carrying out his "murderous" intent the night nurse, on his instructions using her discretion, had given an injection which contained atropine—an antidote to morphia. However, it was an extremely weak antidote and the usual reason for giving it with morphine was to reduce mucus in the throat or lungs.

Last Days of Life

Dr. Douthwaite was recalled on Friday morning, March 29, for the resumption of cross-examination by Mr. Lawrence. Counsel took the witness through an analysis of the treatment given to the patient during the last few days of her life.

Mr. Lawrence: "Now just let us pause there. That has brought us to the night of Friday to the Saturday. If, as I am postulating, the doctor wanted to give as peaceful and helpful nights as possible for this patient at this stage in her illness, he was not doing too badly so far, was he, on those two nights?"

— "He certainly obtained some sleep."

On the Saturday the doctor had varied the treatment from heroin hourly to "Patient may have $\frac{1}{2}$ gr. morphia with $\frac{1}{2}$ gr. heroin hourly if necessary." The subsequent record showed that the patient had not received anything like that dosage in fact. There had been no morning injection, the patient having been asleep when the doctor had called; the $\frac{1}{2}$ and $\frac{1}{2}$ had been given at 1 p.m., another injection in the afternoon; the patient had been quiet until 4.30, then became restless and excited, and had received another $\frac{1}{2}$ and $\frac{1}{2}$ at 4.45. There had been no sleep since 12.30 midday. In the evening the doctor gave 1 gr. each of morphia and heroin. The patient then slept from 7.30 to 10 p.m. At 10.45 Dr. Adams gave $\frac{1}{2}$ gr. heroin and $\frac{1}{2}$ gr. morphia injection, a reduction by half of the previous injection. The nurse gave injections at 1 a.m., 2 a.m., 3.40 a.m., of 1 gr. heroin and $\frac{1}{2}$ gr. morphia, $\frac{1}{2}$ and $\frac{1}{2}$, and 1 gr. heroin respectively, but the nurse had recorded "no sleep." On the last complete day of her life, Sunday, November 12, she received a special injection from the doctor at 11.15 a.m. and slept for two hours, at 2.35 she had $\frac{1}{2}$ gr. hyperdure morphine and $\frac{1}{2}$ gr. heroin from the nurse, the same injection being repeated at 5.25. It seemed from the records that on that last day the drugs were no longer producing sedation and sleep. At 7.30 Dr. Adams had given an intramuscular injection of 2 c.c. paraldehyde with no apparent effects. At 10.30 Dr. Adams injected paraldehyde 5 c.c. The remaining entries were: "11.30, very restless; 12.30, restless and talkative, and very shaky; 12.45, seems a little quieter, appears asleep; respiration 50; 2 a.m., passed away quietly."

Dr. Douthwaite said: "In these last few days, in my view, there was a steady accumulation of morphia and heroin in the body, because this woman—and I think it is common ground—was dying and therefore all the natural functions were depressed. Therefore, the effect of these drugs was slowed down." If Dr. Adams had allowed for that accumulation it would not have been necessary in the last two or three days to keep up more than a minute quantity.

Summarizing his questions, Mr. Lawrence then said: "I am not inviting a Harley-street opinion upon the skill as a doctor of a general practitioner, but after that rehearsal I have put before you—I know what your opinion has been over these last days—I want you to consider this. At least it is a possible alternative view on these reports, is it not, that this general practitioner was following a consistent course with these drugs to produce the results which it was his duty to produce, and that when he found he could not do it on the last day and night he tried to turn to something else?"

— "Yes. He produced what he wanted to produce, or the result that he wanted to produce."

"That is sleep and sedation and the avoidance of restlessness and excitability?"

— "Yes, certainly the avoidance of restlessness, and sleep."

Re-examined by the Attorney-General, Dr. Douthwaite agreed that if the whole or the major part of the heroin and morphine prescribed between November 8 and 12 had been administered to Mrs. Morrell it would have caused death.

The Attorney-General: "Is there any evidence that you have heard in this case, apart from the stroke, to indicate that apart from being an old lady Mrs. Morrell was suffering from any physical degenerative condition?"

— "No."

"Which called for morphia?"

— "No. I think really 'physical degenerative condition' must be interpreted as the degeneration natural to old age, in which case the answer is that morphine should not be given."

Counsel then took the witness through the nurses' records from November 9 to 13 and the witness agreed that the general effect was that the patient had had adequate sleep during that time and that there was no justification for heavy drugging during the day-time. The normal sleeping hours of a bedridden lady of 81 would vary between five and six per night.

Mr. Justice Devlin: "Dr. Douthwaite, how far has this sleep been secured by the increase in the dosage of drugs?"

— "I was wondering the same thing, my lord. I have no doubt that it played a part."

The Attorney-General: "So far, at any rate, is there any shortage of sleep at night time apparent such as would justify procuring drugged sleep at all costs in the daytime?"

— "No, there is not."

The Attorney-General concluded: "Has anything been said in this court, any evidence you have heard, affected your opinion as to the cause of death to Mrs. Morrell?"

— "No."

"To what do you attribute her death?"

— "To drugs, morphia and heroin, possibly assisted by paraldehyde. In the absence of paraldehyde, in my opinion, morphia and heroin administered in the last few days would have killed her."

Judge's Questions

Mr. Justice Devlin then put a number of questions to the witness. He said:

"Dr. Douthwaite, I want your help, and it may be to a quite considerable extent. In due course I expect I shall direct the jury that before they can convict an accused they must be satisfied that he committed an act of murder, and that means, in the circumstances of this case, that he either administered the drugs himself, intending them to kill her, or he gave directions or instructions to the nurses which he hoped and intended, if carried out, would kill the patient, Mrs. Morrell. I should like you, if you would, to help me by directing your general evidence to each of those individual acts. Your evidence covers the period from November 8 to 13 for this purpose, and during that period I think I am right in saying that Dr. Adams paid Mrs. Morrell 17 visits."

— "Yes."

"And on all or most of those occasions he either administered drugs himself or he left directions for the nurses as to what they should do?"

— "Yes, my lord."

"If the case for the Crown is right, then one or more of those acts amounted to murder. I should like to be able, when the time comes, to direct the jury, or assist the jury, by pointing out to them precisely what in relation to each act it is that forces you, as you put it in your own words, to postulate that murder was being committed, or attempted."

The Judge reminded the witness that the first of the 17 visits mentioned had been at 7.40 p.m. on November 7, when $\frac{1}{2}$ gr. morphine and $\frac{1}{2}$ gr. heroin had been given, an increase of $\frac{1}{2}$ gr. of morphine. "Are you forced to postulate murder in relation to that dose?"

— "Not that single dose, my lord."

"Do you mean that you might be forced to postulate it in relation to the doses that come after?"

— "In the first place, the doses which had gone before, and, to be exact, the doses which were not given of morphia, from the 1st to the 5th, when only heroin was given—I think those dates are right—by withdrawing morphia for 5 days in a woman who had been having it regularly, it would have diminished any likelihood of producing a comfortable sleep by virtue of the morphine if the morphine was capable of producing sleep after she had received it for so many months. Furthermore, the tolerance to the morphine, which certainly was acquired, although not a great tolerance because it was not a high dose, would fairly rapidly diminish, and at the end of 5 days, although I am not suggesting the tolerance would have disappeared, it would have been reduced. That was my first point—to draw your lordship's attention to the 8th, at what I regarded as rather a critical date, because that morphine withdrawal was not replaced by any

adequate substitute. In other words, she was deprived of a drug to which she had become accustomed and lost some of her tolerance. Then it was returned, and on the 6th we get a small dose, a $\frac{1}{4}$ of morphine, which would be more effective now because some of the tolerance had been lost. On the 7th it jumps to $\frac{1}{2}$ of morphine from $\frac{1}{4}$, a big jump, and on the 8th it goes to 2. I wondered what was a possible reason for stopping this morphine, and that is why I didn't make up my mind on the probable desire to terminate her life until I saw the substitution was returned on the 6th followed by a rapid increase, together with large doses of heroin. For that I could not find any explanation. Because clearly this was not an attempt, or it seemed to me, this was not an attempt to wean her from her drug addiction on late realization of what was happening. If it had been so, why should not the heroin, which all doctors know is a more dangerous drug, had been reduced first rather than the morphine? Then, to complete the answer to your lordship's question, my conclusions after that were based on the rather rapidly mounting doses of the last few days."

"Are you saying that morphine was deliberately withheld in order that it might be reintroduced?"

— "That is how it appears to me, my lord, because I can see no other reason for it. There was no attempt at substitution."

The witness went on to say that the variation in drugs suggested by defending counsel amounted to variation without substitution.

The Judge: "When you are dealing with another doctor, the very last thing you think of normally is murder?"

— "Yes."

"You explore every other possible hypothesis and reject it and say it cannot be sustained before you come to the conclusion that it is murder?"

— "Yes."

Dr. Douthwaite agreed he had criticized Dr. Adams' treatment as being wrong.

Mr. Justice Devlin: "He embarked on a wrong line of treatment from the very beginning?"

— "In my opinion he did."

"But murder is not suggested as an explanation of that?"

— "No, my lord."

After further questions on the doses of morphine and heroin the Judge then asked about the injection of paraldehyde on the fifteenth visit:

"I think you said at one time that it made her death more certain, if it was not already certain?"

— "Yes, my lord."

"Well, was it in your view certain already?"

— "It was."

"In a matter of days?"

— "Yes, my lord."

"Is it your view, then, that paraldehyde was given to accelerate it?"

— "Yes, my lord."

"And would have that effect?"

— "And would have that effect."

"But again you are forced to draw the conclusion that Dr. Adams gave the paraldehyde because he was tired of waiting for the heroin to take effect, to bring about a quick and immediate result?"

— "Yes, my lord."

"That is the conclusion you draw medically?"

— "Yes, my lord."

"Would 2 c.c. be enough for that purpose?"

— "No, my lord. 2 c.c. is a small dose and I would not be prepared to say that 2 c.c. would make any difference, even though she was heavily drugged, and, in my opinion, suffering from obvious signs at least of heroin poisoning."

"So that medically you cannot find any reason for the 2 c.c. dose?"

— "No, my lord. It occurs to me that it may well be that he tried to mask those conclusions."

"For a quite innocent purpose?"

— "It could be for a quite innocent purpose."

"And it could not have been for a wicked purpose?"

— "2 c.c., no. I do not regard the administration of 2 c.c. as in any way sinister or of any significance."

"But 5 c.c.?"

— "5 c.c., that brings in the probability of a further depression of this respiratory centre which now must have been (if I may use the term) on its last legs."

"Do you find yourself forced to postulate that the 5 c.c. of paraldehyde was given to kill?"

— "Yes, I do, my lord."

"Although 2 c.c. was not given to kill, and could have been given for an innocent purpose?"

— "It could have been given for an innocent purpose."

"But you find yourself forced to exclude the possibility that the 5 c.c. might have been given for an innocent purpose?"

— "I do, my lord."

"Why?"

— "Because it would necessarily—and I think a doctor must know it—have aided or accelerated death from this heroin depression of the respiratory centre. 2 c.c. is too small to produce that effect."

"What about 3 c.c.?"

— "3 c.c., it might. We are getting up to just a level where it is getting dangerous on this picture."

"4 c.c.?"

— "Yes, decidedly dangerous, my lord."

"So if the dose had been 3 c.c. you might well have said that it was for the same innocent purpose as the 2 c.c.?"

— "Yes, I might have, yes."

"And might have been in the circumstances quite the correct thing to do?"

— "No, my lord."

"To stop convulsions?"

— "No. I hope I haven't suggested that if the treatment was just to stop the convulsions that was a suitable thing to do, because the only way . . ."

"No, you have not suggested it. I was putting the question to you. You said it could have been done for an innocent purpose, but you certainly never suggested that it was the right thing to do."

— "Thank you, my lord."

"But it could have been done for an innocent purpose?"

— "It could have been done."

"And 3 c.c. could have been done for an innocent purpose?"

— "Conceivably, yes."

"But 60% more means murder?"

— "Yes."

"Does it matter really, then, in your view, whether the second injection of paraldehyde, about which there has been a lot of dispute, was or was not given?"

— "No, it doesn't affect my view."

The witness said that if there had been a post-mortem on the body the quantities of heroin and morphia in her would have been detected, he believed with reasonably certain accuracy. He preferred not to express an opinion on how long those traces would be detectable; most of it would be detected in a matter of some weeks, but it might be much longer.

After Dr. Douthwaite left the witness-box Mr. Thomas Reid was recalled to produce and explain a graph of the dosages as shown by the nurses' reports on the same basis as graphs to be produced by Dr. Ashby. After he had explained these and been subjected to a limited cross-examination by Mr. Lawrence, the witness withdrew and was replaced by Dr. Michael George Corbett Ashby, who said he practised from 148, Harley Street. His qualifications included M.B., B.Ch., M.R.C.P. He had at one time been medical registrar to Sir Russell Brain, was appointed to consultant status in 1949, since when he had been neurologist to the Whittington Hospital and to five other hospitals in north-west London. His task was to produce certain graphs which he had prepared based on the record of prescriptions.

The Attorney-General put to the witness that it was common ground that morphine and heroin were dangerous drugs. Dr. Ashby assented, but Mr. Lawrence denied that it was common ground.

The Attorney-General: "They are dangerous drugs under the Dangerous Drugs Act, at any rate?"

— "Yes."

"Are you aware of any reason for prescribing morphia and heroin for a patient if they are not intended to be used on that patient?"

— "I can think of no legitimate reason."

Before the court rose Mr. Justice Devlin told Mr. Lawrence that he would consider any application for the recall and further cross-examination of Dr. Douthwaite in view of that witness's last answer to his lordship.

Theory of Murder

On Monday, April 1, Dr. Douthwaite was recalled, at the resumption of the hearing, on the application of Mr. Lawrence, who proceeded to further cross-examination.

He suggested that the witness's "theory of murder" was made up of two limbs—first, that Dr. Adams had withdrawn the morphine on October 31, 1950, for a time in order to reduce to an appreciable degree her tolerance to it; secondly, that, having reduced the tolerance, he had reintroduced morphine on November 6 and thereafter gave increased doses of it in conjunction with heroin in order to bring about a fatal result. Dr. Douthwaite accepted that the two limbs were mutually interdependent. He agreed that, looking at the picture as a whole, there had been an increase of drugs in the last fortnight right up to the time when they had been abandoned and paraldehyde used, but maintained that the picture of such a dosage, even in the case of a patient with inoperable cancer, would have been one suggesting a desire to terminate life.

"It would be quite impossible to say from the picture of the dosage alone that it was a case of murder with intent to kill?"

— "If leading to the death of a patient suffering from pain is precisely the same thing as murder—and that is not for me to

say—I think it would." He agreed it would not be so if the dosage of the last few days were considered isolated from all the previous weeks of drugs accumulating.

"You would not be forced or driven to go into the witness-box and say that the general practitioner who followed that course in that case was a murderer, would you?"—"I would say that faced with a woman in terrible pain he was giving large doses of drugs and those doses of drugs, as set out here, would have caused death."

"You would not say that in those circumstances you were forced to say that that general practitioner was a murderer?"—"No."

The Judge: "Would you say you were forced to conclude he intended to kill?"—"Yes, my lord. Earlier on, when I was asked what my conclusions were from these drugs, I deliberately said my conclusions were that they were given to terminate life. I said that deliberately because I don't know, it's not my business to know, whether that is synonymous with murder. I never introduced the word 'murder' myself, but learned counsel did so, and I take it he meant that was synonymous. In fact I thought he obviously wouldn't deceive me. I was giving that opinion on these drugs administered to an old woman who was not in agonizing pain."

The Judge said he was anxious that there should not be introduced any questions which might be partly questions of law. It might be, as a matter of law, and it might be, as a matter of medical practice, that if a doctor gave drugs knowing that they would shorten life but gave them because they were necessary to relieve pain he was not committing murder.

Mr. Lawrence: "Postulating that this is not a case of extreme pain, or inoperable cancer, but is a case of the terminal stages of senile disintegration with the brain affected by a long-standing arteriosclerotic condition, and postulating that in the last days that patient was suffering acute distress, a lack of sleep, if a doctor were to give the level of drugs indicated in those nurses' reports over the last days, can you imagine that he would be dealing with it in the same way as the general practitioner who was dealing in the same way with the acute pains of the final stages of cancer?"—"No."

"Why not?"—"Because there is a profound difference between the acute pains of inoperable cancer and the terminal pains of arteriosclerosis."

The witness denied that his theory in relation to the withholding of the morphine for five days in the last fortnight of the patient's life was an afterthought, but agreed that it had occurred to him after he had first given evidence at the trial.

Towards the end of his further cross-examination Mr. Lawrence summarized his questions in this form:

"The picture, then, as a whole, is this: a doctor who begins the medication of his patient in a totally wrong way?"—"Yes."

"Due not to any intention to kill but, I suppose, to ignorance or stupidity, or something of that kind?"—"Have I said that? I must start thinking again."

"If you do not want to be asked about it I will not press it."—"Well, I think if I give the answer it will not be helpful to you, and I would rather not be pressed on it in that case."

"Very well then. He starts with a wrong type of medication?"—"Yes."

"It is clear that he goes on with that for years?"—"Yes."

"It is clear—we are all agreed about this—that the woman was in the terminal stages of her life in this last fortnight?"—"Yes."

"Dying anyhow?"—"Dying anyhow?"

"She was dying?"—"Well, she was dying."

Mr. Justice Devlin: "Do you mean she was dying before November 1?"—"Yes, my lord."

Mr. Lawrence: "If what we read in the day report of October 9 is right, where the nurse rang up Dr. Adams and he diagnosed a possible further stroke, if that was in fact another stroke, to some degree, that would certainly bring the final end of her life nearer, would it not?"—"Yes, I think it would." A second stroke would make the prognosis worse.

"The truth of all this matter is this, Dr. Douthwaite, that you first of all gave evidence on one basis to support a charge of murder and then thought of something else after you had started?"—"That is quite likely. In fact, I think it is probable. I had been turning it over in my mind, but at what time it crystallized and became clear I do not know."

"Yes, I think we understand that; but that is your personal view, is it not?"—"Yes."

"You can conceive it quite possible, can you not, that a reasonably minded physician of equal eminence, if I may say so, might by no means find it necessary to postulate an intention

to terminate life on the basis of the same evidence as you have?"—"Certainly. I have always agreed that there would be contra-medical opinion. I am expecting it."

Accumulation of Drugs

After further questions from the Attorney-General the Judge asked Dr. Douthwaite:

"Do I understand this to be right: first, that no single injection given by itself was large enough to drive you to postulate as a medical man that there was an intent to kill by that injection?"—"That is true, yes."

"Secondly, that no instructions that were given to the nurses were such as to drive you to that conclusion, by those instructions alone?"—"I agree, my lord. I mean there were none."

"By those instructions alone Dr. Adams intended to kill?"—"There was no indication that by those instructions alone Dr. Adams intended to kill."

"Whether the intent to kill was formulated first at the end of October or the beginning of November or whether it was formulated first on November 8, it depends on what has been called the accumulation theory?"—"The production of death?"

"Your inference that there was an intent to kill depends on the attribution by you to Dr. Adams of the knowledge that a single drug, not dangerous in itself, would be lethal because of the accumulation of drugs already in the body?"—"Yes, my lord."

"And that is so, as I say, whether one starts with an intent to kill on November 1 or whether it is November 8?"—"Yes, my lord."

"That knowledge and the attribution of that knowledge to Dr. Adams is essential in both cases?"—"Yes, my lord."

By his last answer to Mr. Lawrence, said the witness, he had meant that doctors of skill frequently disagreed and he would be surprised if some eminent doctor did not disagree with him on some points.

"On this particular point, if another doctor were to say he disagreed entirely with your views about accumulation, would that be a genuine skilled view to the contrary?"—"I can only say I would be astonished if he does. I certainly could not agree with him. I really would be astonished if he said that."

A view contrary to his own on the subject of accumulation, due to error, ignorance, or incompetence, could, however, be honestly held by another doctor. But he postulated an intent to kill because he was unable to conceive of a man with Dr. Adams's qualifications and special knowledge of drugs having such ignorance or being ignorant of drugs of that sort. In the case of a general practitioner the patient's death might be due to error, ignorance, or incompetence on the doctor's part, but in the case of a general practitioner with anaesthetist's qualifications such as Dr. Adams had it could not be due to such things.

The Judge: "It must follow, must it not, that if Dr. Adams were to go into the witness-box and say, 'I disagree entirely with this view,' he would be guilty of perjury, would he not?" He would be saying he held a view that in your opinion he could not possibly hold?"—"You have put to me a very difficult point, my lord. If he went into the box and said he did not agree with the opinion I have given..."

"On the accumulation theory?"—"On the accumulation theory, he would then be suggesting that he had not knowledge of it."

"Your answer would be, leaving out perjury, that he could not honestly say that?"—"Yes."

"That is getting near to perjury—he cannot honestly say that?"—"That I believe."

"If any other doctor with Dr. Adams's qualifications goes into the witness-box and says the same, your answer would be the same, would it not—that he could not honestly say that?"—"That would be my answer, yes."

"Then it does not leave any room on this matter of accumulation for any view to the contrary which is based on error, ignorance, or incompetence?"—"No."

He told the judge that if he had seen the patient in October, 1950, he would have expected her to live only for a matter of a few weeks, probably not more than two months.

"If one were to take the lower estimate of that, is Dr. Adams saying to himself, 'She can only live for, let me say, three weeks anyway?' He would be embarking on a course on November 1 that in fact took thirteen days to bring about her death and which probably he would have estimated would take about thirteen days, since he had to withdraw the morphia, reintroduce it, and step it up to overcome the tolerance?"—"He might well have, my lord."

Dr. Douthwaite then left the box.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending March 16 (No. 11) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 100 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1957					1956				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	3	0	1	0	3	7	1	4	0	7
Dysentery	1,416	66	345	7	9	2,133	270	174	13	2
Encephalitis, acute	2	0		0		2	1		0	
Enteric fever: Typhoid	4	1	0	1	1	0	0	1	0	1
Paratyphoid	4	0	0	0		12	0	2(2B)	1	
Food-poisoning	164	20	31	1		117	12		0	
Infective enteritis or diarrhoea under 2 years				10	19				8	5
Measles*	24,825	1832	598	464	339	2,893	56	166	38	184
Meningococcal infection	29	1	17	1		54	6	16	1	2
Ophthalmia neonatorum	37	3	6	1		38	0	5	0	
Pneumonia†	770	54	284	13	13	947	52	228	22	15
Poliomyelitis, acute: Paralytic	23	2		0	4	11	8		1	1
Non-paralytic	15	4				1				
Puerperal fever‡	230	26	10	2		274	37	6	0	1
Scarlet fever	935	74	88	57	18	889	49	89	30	21
Tuberculosis: Respiratory	676	101	99	18		680	84	130	21	
Non-respiratory	89	5	15	5		102	13	13	2	
Whooping-cough	3,180	149	299	10	51	1,329	70	145	72	118

DEATHS in Great Towns	1957					1956				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	1
Dysentery	0	0		0		0	0		0	
Encephalitis, acute	0	0		0		0	0		0	
Enteric fever	0	0	0	0		1	0	0	0	
Infective enteritis or diarrhoea under 2 years	7	1	3	0	3	10	0	0	0	0
Influenza	16	2	2	0	3	70	5	5	4	3
Measles	0	0	0	0		0	0	0	0	
Meningococcal infection	0	1				1	0			
Pneumonia	325	51	29	17	10	419	58	22	25	6
Poliomyelitis, acute	2	0		0		0	0		0	
Scarlet fever	0	0	0	0		0	0	0	0	
Tuberculosis: Respiratory	58	11	8	3	6	86	12	3	2	2
Non-respiratory	1	1	1	0	0	1	3	0	0	
Whooping-cough	2	0	0	0	0	1	0	0	0	0
Deaths 0-1 year	249	32	36	15	13	241	29	28	12	14
Deaths (excluding stillbirths)	6,049	917	619	151	236	6,937	1015	598	161	204
LIVE BIRTHS	8,370	1280	1025	261	384	8,221	1254	983	225	328
STILLBIRTHS	199	22	23			219	23	22		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenza pneumonia.
‡ Includes puerperal pyrexia.

Vital Statistics

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in February was 102, compared with 85 in the previous month and 106 in February, 1956.

The numbers of cases of industrial diseases in the United Kingdom reported during February, 1957, were as follows: lead poisoning 1, epitheliomatous ulceration 6, chrome ulceration 2; total 9. There was one death from epitheliomatous ulceration due to mineral oil.—*Ministry of Labour Gazette*, March, 1957.

Deaths from Accidents

In England and Wales in the month of January 1,280 deaths from accidents were registered. These included 667 home accidents, 385 road accidents, 50 other transport accidents, and 178 other accidents. These figures, and the numbers of deaths in broad age groups, are in a new table, to appear monthly, in the *Registrar-General's Weekly Return*, No. 12.

Infectious Diseases

The largest fluctuations in the notifications of infectious diseases in England and Wales during the week ending March 16 were increases of 202 for dysentery, from 1,214 to 1,416, 185 for whooping-cough, from 2,995 to 3,180, and 98 for scarlet fever, from 837 to 935.

The notifications of measles numbered 24,825, 12 fewer than in the preceding week; the largest variations in the local returns were increases of 276 in Lancashire, from 3,951 to 4,227, 212 in Nottinghamshire, from 306 to 518, 158 in Cumberland, from 461 to 619, 128 in Glamorganshire, from 249 to 377, and 119 in Surrey, from 1,400 to 1,519, and decreases of 393 in London, from 2,225 to 1,832, 268 in Essex, from 1,912 to 1,644, 144 in Durham, from 1,511 to 1,367, 126 in Yorkshire North Riding, from 375 to 249, 119 in Cheshire, from 912 to 793, and 114 in Gloucestershire, from 437 to 323. A small rise in the incidence of scarlet fever occurred in most areas; the largest was 20 in London, from 54 to 74. The largest increases in the notifications of whooping-cough were 54 in Lancashire, from 221 to 275, and 41 in Hertfordshire, from 62 to 103; the largest decrease was 40 in London, from 189 to 149. 3 cases of diphtheria were notified, being 3 fewer than in the preceding week.

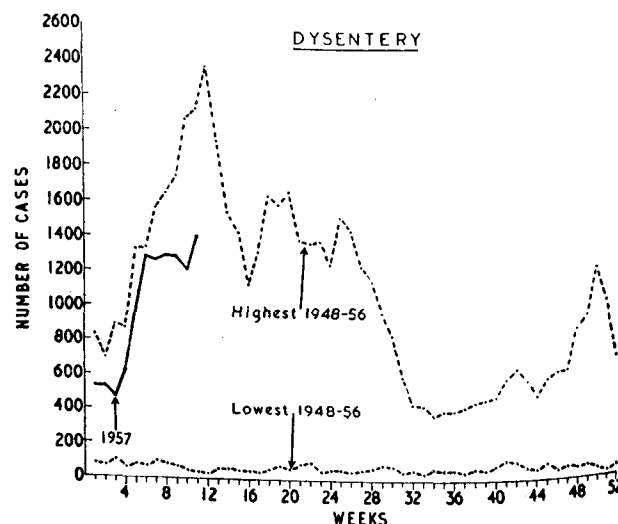
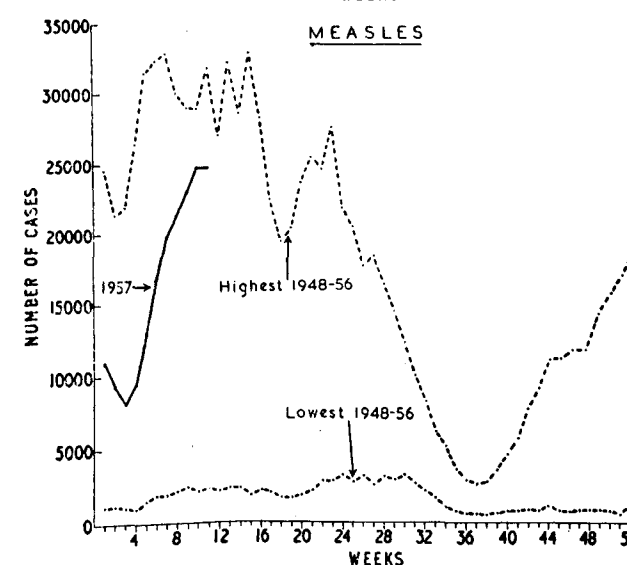
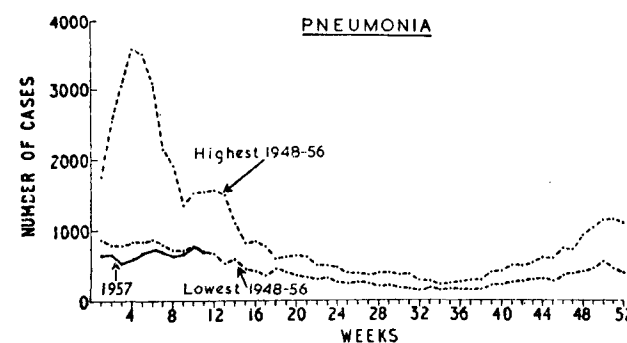
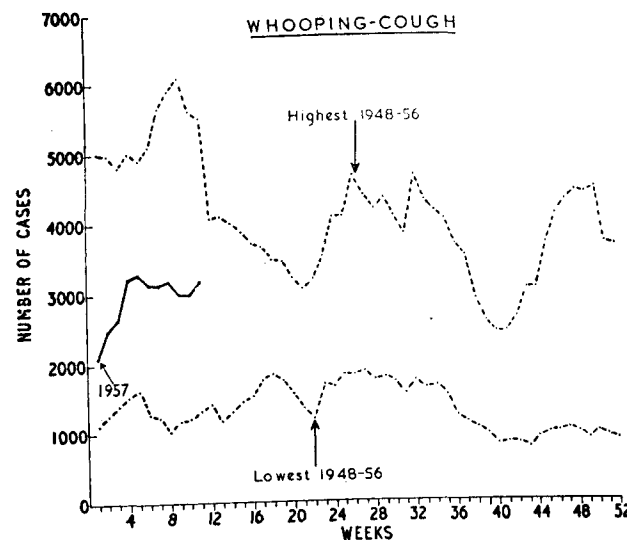
38 cases of acute poliomyelitis were notified, and these were 3 fewer for paralytic and 8 more for non-paralytic cases than in the preceding week. The largest returns were Hertfordshire 9 (Barnet U.D. 5, Stevenage U.D. 2), London 6 (Wandsworth 3, Lewisham 2), and Lancashire 4.

The rise in the number of notifications of dysentery was due to an increased incidence in established outbreaks rather than to new outbreaks; the largest rise was 98 in Yorkshire West Riding. The chief centres of infection during the week were Yorkshire West Riding 333 (Rotherham C.B. 98, Sheffield C.B. 54, York C.B. 40, Leeds C.B. 32, Worsborough U.D. 26, Bradford C.B. 18, Wakefield C.B. 17, Wetherby R.D. 12), Lancashire 170 (Blackburn C.B. 25, Ashton under Lyne M.B. 19, Stretford M.B. 16, Urmston U.D. 15, Liverpool C.B. 15, Kirkham U.D. 10), Surrey 82 (Surrey M.B. 32, Hambledon R.D. 17), Kent 80 (Deal M.B. 59, Chislehurst and Sidcup U.D. 12), Bedfordshire 77 (Luton M.B. 58), Middlesex 71 (Enfield M.B. 30, Hayes and Harlington U.D. 23), London 66 (Islington 13, Hackney 11), Durham 65 (Blaydon U.D. 16, South Shields C.B. 14, Stanley U.D. 11, Gateshead C.B. 10), Warwickshire 59 (Coventry C.B. 29, Birmingham C.B. 19), Hertfordshire 41 (Welwyn Garden City U.D. 38), Nottinghamshire 38 (Basford R.D. 16),

Northumberland 34 (Blyth M.B. 17, Newcastle upon Tyne C.B. 15), Cheshire 30 (Hyde M.B. 9), Berkshire 26 (Reading C.B. 25), Essex 26 (Thurrock U.D. 13), Staffordshire 25, Yorkshire North Riding 23 (Middlesbrough C.B. 23), Carmarthenshire 23 (Llanelli R.D. 14), and Oxfordshire 21.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the years 1948-56 are shown thus -----, the figures for 1957 thus ———. Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Week Ending March 23

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 822, whooping-cough 2,932, diphtheria 3, measles 27,179, acute pneumonia 695, acute poliomyelitis 37, dysentery 1,317, paratyphoid fever 3, and typhoid fever 1.

Universities and Colleges

UNIVERSITY OF OXFORD

Dr. F. G. Hobson has been appointed to the council of St. Luke's Homes, Ltd., for four years from February 18, 1957.

In Congregation on March 2 the following degrees were conferred:

D.M.—M. G. Ellis, M. A. Peyman, Sabine J. Strich.
B.M.—D. H. G. Ogg.

UNIVERSITY OF CAMBRIDGE

Dr. C. C. D. Shute, University Lecturer in Anatomy, has been elected into a Josephine Rebecca Wolf Fellowship at Christ's College.

In Congregation on February 9 the degree of M.B. was conferred on A. C. Fernando (by proxy) and on T. Buchan.

C. H. Kinder, R. B. McGrigor, and C. H. Talbot have been approved at the examination for the degree of M.Chir.

UNIVERSITY OF LONDON

The following have been reappointed representatives of the University on the governing bodies of the institutions indicated in parentheses: Sir Francis Fraser (Board of Management of the London School of Hygiene and Tropical Medicine); Professor A. A. Moncrieff, Professor J. Z. Young, F.R.S., and Mr. R. C. Davenport (Court of Governors of the London School of Hygiene and Tropical Medicine); Professor G. R. Cameron, F.R.S. (Royal Veterinary College).

The following have been recognized as teachers of the University in the subjects indicated in parentheses: *Institute of Psychiatry*, Dr. B. G. C. Ackner and Dr. W. L. L. Rees (*Mental Diseases*); *University College Hospital Medical School*, Dr. W. B. Balderston (*Dental Surgery*); *St. George's Hospital Medical School*, Dr. G. R. F. Hilson (*Pathology*); *Institute of Diseases of the Chest*, Dr. K. F. W. Hinson (*Pathology*); Dr. J. R. May and Dr. R. W. Riddell (*Bacteriology*); *Postgraduate Medical School of London*, Dr. J. P. Payne (*Anaesthetics*), Dr. R. E. Steiner (*Radiology*), and Dr. I. D. P. Wootton (*Pathology (Chemical Pathology)*); *London Hospital Medical College*, Mr. G. C. Tresidder (*Surgery*); *Guy's Hospital Medical School*, Dr. G. R. Webster (*Pathology (Chemical Pathology)*); Dr. G. W. Garland has been granted probationary recognition for two years from November, 1956, as a teacher of obstetrics and gynaecology at St. Thomas's Hospital Medical School.

Medical News

"Food and Health."—World Health Day is celebrated annually on April 7 to commemorate the foundation of the World Health Organization in 1948. This year the theme is "Food and Health," and the Food and Agriculture Organization is joining W.H.O. as co-sponsor. Special messages for the day have been prepared by the two directors-general. Dr. M. G. CANDAU, director-general of W.H.O., writes: "Without enough of the right kinds of food nobody can be healthy. This simple truth holds the explanation of much of the misery from which mankind suffers. A vicious circle has arisen—poor health impairs productive capacity, low production of foodstuffs brings under-nutrition, more sickness, and less productive power. Health means more than simply the absence of disease and infirmity, and enough food does not mean just sufficient to maintain life." Mr. B. R. SEN, director-general of F.A.O., states: "We can legitimately hope that we have seen the last of famine. The existence of reserve stocks of food, modern transport facilities, and experience in famine relief are among the safeguards at our disposal, and any recurrence of famine and its tragic consequences on a large scale would be a disgrace to humanity."

Sir Geoffrey Keynes.—At its recent meeting the Osler Club presented Sir GEOFFREY KEYNES with a drawing of himself on the occasion of his 70th birthday. The Club was fortunate enough to persuade that master-orator Sir GORDON GORDON-TAYLOR to acclaim the new septuagenarian. "As regards yourself," Sir Gordon said in the course of his tribute, "by some alchemy of fate a distinguished surgeon emerges effulgently as the complete man of letters. Nowhere in the history of surgery has such a combination of qualities been mingled in one person at so high a level of excellence."

Library for Birmingham Medical School.—Sketch plans have been approved for the first stage of the medical school library. It will be sited opposite the medical school and will house over 90,000 volumes. Building is expected to start in June. The first stage, which should be completed by the end of 1958, will consist of the lower-ground and ground floors, together with the shell of the first floor. Stage II, consisting of the completion of the first floor and the addition of second and third floors, which will include a large lecture theatre, will be put in hand as soon as funds are available.

Scottish Hospital Endowments Research Trust.—The Trust has issued its first report, covering the period from its constitution on January 12, 1954, until the end of July, 1955 (H.M.S.O., price 1s. 3d. net). The Trust administers some 22% (on an income basis) of the endowments of the former voluntary hospitals in Scotland. Its funds amounted to nearly £2.5m. at the close of the period reviewed, yielding an annual income of £94,000. Under the terms of the Hospital Endowments (Scotland) Act, 1953, these funds are to be used for the support of research "into any matters relating to the causation, prevention, diagnosis, or treatment of illness or mental deficiency or to the development of medical or surgical appliances including hearing-aids." Before making grants the Trustees are required to consult with the Advisory Committee on Medical Research in Scotland. The first report includes a statement on the Trust's policy regarding grants. Its funds should not be considered as relieving universities or hospital boards of their responsibilities for research. The Trustees have decided therefore, as a general principle, to favour applications for support of clinical or experimental investigations only after the completion of any preliminary work. Major pieces of equipment, purchased by the Trust, are to remain Trust property. The report has appendices giving the statutory background of the Trust, conditions applicable to grants, the Trust's financial statement and investment portfolio, and a list of grants already awarded.

Technical Colleges and Radiological Protection.—The MINISTER OF EDUCATION has written to local education authorities advising them on radiological protection in technical colleges. In colleges where radioactive materials are used competent safety officers should be appointed, "hot" laboratories should be kept separate, and proper storage places and mechanical ventilation should be installed where required. There is also advice on the screening of x-ray apparatus. Colleges are asked to inform the Minister before starting instruction or research with a radiation hazard.

Society for Social Medicine.—The society's first annual meeting will be held in Birmingham from September 24 to 26. The meeting will include scientific sessions as well as the usual business meeting. The Society for Social Medicine was formed last December under the chairmanship of Professor W. J. E. JESSOP, professor of social medicine at Trinity College, Dublin. At present the society has 72 members, drawn mainly from doctors and statisticians working in university departments of social medicine. The annual meeting will be limited to members of the society, but any interested medical practitioner may attend the scientific sessions. Further information about the society may be obtained from the hon. secretary, Dr. ALICE STEWART, 8, Keble Road, Oxford.

Lord Cohen in U.S.A.—Lord COHEN OF BIRKENHEAD is paying a short visit to America. In New York he will be the guest of the New York Academy of Medicine, where he will give a dinner address and speak at a luncheon. On April 7 he will address the annual meeting of the American College of Physicians in Boston, and on April 9 will read a paper on "Observations on Carotenaemia." While at this meeting he will be made an honorary Fellow of the College.

London University.—Dr. KATHARINE LLOYD-WILLIAMS, dean of the Royal Free Hospital School of Medicine, has been elected dean of the Faculty of Medicine of the University. She succeeds the late Professor W. G. BARNARD for the remainder of the period 1956-8. Dr. C. F. HARRIS has been reappointed deputy Vice-Chancellor for the academic year 1957-8. The following have been recognized as teachers of the University: Dr. M. A. PARTRIDGE (mental diseases, St. George's Hospital), Dr. J. H. PATERSON (neurology, St. George's Hospital), Mr. J. S. TOMKINSON (obstetrics and gynaecology, Guy's Hospital), Dr. M. SCHACHTER (University College), and Dr. M. L. THOMSON (applied physiology, London School of Hygiene and Tropical Medicine).

"Cantabartians."—The annual dinner of the Cambridge Graduates Club was presided over this year by Sir HENRY DALE, O.M., described during the evening by Dr. GEORGE GRAHAM as "the most distinguished person we have ever had in the club." Sir HENRY said he had not stayed long at Bart's, and had had to miss being house-physician to Dr. Gee when he was offered a George Henry Lewes Studentship. Gee had said to him then that he hoped that some day medicine would become an experimental science. These and other reminiscences of Sir Henry Dale's were much enjoyed by those whom Sir LANDSBOROUGH THOMSON, replying for the guests, described as "Cantabartians."

Faculty of Anaesthetists.—An election of two fellows to the Board of the Faculty of Anaesthetists took place at the Royal College of Surgeons on March 20. Dr. H. J. BRENNAN, director of the department of anaesthetics at the Manchester Royal Infirmary, and Dr. H. H. PINKERTON, consultant in charge of the department of anaesthetics at the Western Infirmary, Glasgow, were elected, each for a period of eight years. Dr. H. C. CHURCHILL-DAVIDSON, of St. Thomas's Hospital, London, was re-elected to the board for a period of four years.

Aberdeen University.—Dr. M. C. MACNAUGHTON has been appointed lecturer in obstetrics and gynaecology. He graduated at Glasgow in 1948.

Leeds University.—Dr. G. J. R. SOUTTER has been appointed lecturer in paediatrics and child health from May 1.

Mass Radiography at Glasgow.—By the end of the third week of the city's campaign 426,525 people had been radiographed. The weekly figures so far have been: first week, 142,000; second week, 151,000; third week, 133,000. The campaign is for five weeks in all.

Decimal Coinage for India.—Banks closed all over India on April 1, according to Reuter, to allow a change to a decimal coinage system. In future the rupee will consist of 100 instead of 192 pice.

Sir Geoffrey Jefferson, F.R.S., emeritus professor of neurosurgery at Yale University, is to receive the university's honorary LL.D. at the Founder's Day celebration on May 15.

Professor J. F. Fulton, Sterling professor of the history of medicine at Yale University, is among those on whom it is proposed to confer the honorary degree of D.Litt. of Oxford University.

Professor A. W. Downie, F.R.S., professor of bacteriology at Liverpool University, is to receive the honorary degree of LL.D. of Aberdeen University at the summer graduation ceremony.

Miss Margaret Fairlie, professor of obstetrics and gynaecology at St. Andrews University from 1940 to 1956, is to receive the honorary degree of LL.D., St. Andrews.

Dr. Mary Crosse, lecturer in child health at Birmingham University, is visiting Turkey and Greece for a month, under the auspices of the British Council.

COMING EVENTS

Recent Trends in Medicinal Chemistry.—Symposium on April 16 at Manchester University arranged jointly by the Chemical Society, Institute of Petroleum, Royal Institute of Chemistry, and Society of Chemical Industry. Apply by April 9 to Dr. M. T. G. Burrows, Murgatroyd's Salt & Chemical Co. Ltd., Elworth, Sandbach, Cheshire.

Wessex Rahere Club.—Spring Dinner at Royal Clarence Hotel, Exeter, on April 27. Details from Mr. A. D. BATEMAN, F.R.C.S., 11, The Circus, Bath.

Leonard Parsons Memorial Lectures.—Professor RUSTIN McINTOSH, of the Babies Hospital, New York, will lecture at the Birmingham Medical School on May 7 and 8 at 4 p.m. His subject will be "Growth and Development."

Harben Lectures.—Professor P. DRINKER, of Harvard, will deliver this year's Harben lectures at 5 p.m. on May 13, 14, and 15 at the Royal Institute of Public Health and Hygiene, 28, Portland Place, London, W.1. His subject will be "Air Pollution and the Public Health."

Dental Implant Society.—Professor T. TALMAGE READ will read a paper on superiosteal dental implants, followed by a film, at the Royal Society of Medicine, May 15, 8 p.m. Medical practitioners are invited. Apply to the hon. secretary, Dental Implant Society of Great Britain, 109, Harley Street, London, W.1.

European Organization for Research on Fluorine and Dental Caries Prevention.—Fourth meeting, Malmö, June 15-17. Details from Professor SYRIST, Royal Dental School, Malmö, Sweden.

NEW ISSUES

Ophthalmic Literature.—The new issue (Vol. 10, No. 3) is now available. It contains a comprehensive selection of abstracts of the literature on ophthalmology and related subjects. Six issues and a volume index each year; annual subscription £4 4s. (or in combination with *British Journal of Ophthalmology*, £7 7s.); single copy 25s.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Abstracts of World Medicine.—Issued in the first week of each month, this journal contains abstracts of important papers selected from the current medical literature of the world. Annual subscription £4 4s., single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Tuesday, April 9

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor H. J. Shaw: Radical Surgery in Cancer of the Extrinsic Larynx and Laryngopharynx.

SOCIETY FOR CULTURAL RELATIONS WITH THE U.S.S.R.—8 p.m., Professor Fedor Syrovatko (Moscow): Soviet Work in the Relief of Pain in Childbirth.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Dr. C. C. Edwards: neurological demonstration.

Wednesday, April 10

●CAMBRIDGE MEDICAL SOCIETY.—At Corpus Christi College, 7.30 for 8 p.m., dinner.

LONDON UNIVERSITY.—At Middlesex Hospital (Clinical Lecture Theatre, First Floor Crosspiece), W., 4 p.m., special university lecture in medicine by Professor R. M. Jones (Toronto): Cancer of the Lung—Certain Considerations in its Diagnosis.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—3.30 p.m., Mr. F. M. Brownlee, A.M.I.H.E.: Hygiene and Public Health in the Municipal Baths Department (illustrated).

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION, PSYCHOTHERAPY AND SOCIAL PSYCHIATRY SECTION.—At 11, Chandos Street, W., 8 p.m., Dr. E. F. Carr: Group Therapy in a Mental Hospital. (Open to members and guests.)

Thursday, April 11

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, W., 8 p.m., Dr. J. Cowie: The Delinquent Girl.

BRITISH INSTITUTE OF RADIOLOGY.—8 p.m., Dr. Macdonald Critchley: Clinical Aspects of Tuberculous Sclerosis; Dr. J. J. Y. Dawson: Tuberculous Sclerosis with Special Reference to Pulmonary Changes; Dr. P. H. Whitaker: Radiological Changes in Tuberculous Sclerosis.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor A. A. Jefferson: Pituitary Chromophobe Adenoma and Rathke Pouch Cysts.

Friday, April 12

BIOCHEMICAL SOCIETY.—At Department of Biochemistry, Oxford University (Friday and Saturday, April 12 and 13), 11 a.m., 361st meeting, jointly with Société Belge de Biochimie—Belgische Vereniging voor Biochemie. BRITISH INSTITUTE OF RADIOLOGY.—3 p.m., meeting of medical members. FACULTY OF RADIOLOGISTS.—At Royal College of Surgeons of England, 5 p.m., Robert Knox Memorial Lecture by Dr. E. Rohan Williams: Multiple Myeloma.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., Dr. I. Friedmann: Advances in Chemotherapy in Ear, Nose, and Throat Diseases.

INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. E. J. M. Campbell: Pulmonary Physiology and Artificial Respiration.

KENT AND CANTERBURY HOSPITAL.—8 p.m., clinical meeting. SOUTHEAST-ON-SEA GENERAL HOSPITAL.—At Out-patients' Hall, 8.30 p.m., Sydney Body Lecture by Sir Hugh Lindsay, LL.D., F.R.S., M.P.: Human Relations in and Around the Health Service.

APPOINTMENTS

CARTER, KENNETH, M.R.C.S., L.R.C.P., Scientific Director, Ames Company, Inc., Elkhart, Indiana, U.S.A.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—T. J. K. Merritt, M.B., B.S., D.P.M., Senior Registrar, Department of Child Psychiatry, Ipswich and East Suffolk Hospital; E. F. Southill, M.B., B.Chir., F.R.C.S., Senior Surgical Registrar, United Norwich Hospitals; Mary M. Berrin, M.B., B.Ch., D.A., Registrar in Child Psychiatry and Mental Deficiency, Little Plumstead Hospital Group; K. J. Millar, M.B., B.S., Surgical Registrar, West Suffolk General Hospital.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Crawford.—On March 22, 1957, to Mary, wife of Dr. W. Cowan Crawford, 58, Pottery Road, Warley, Birmingham, a son—Alan.

Gillespie.—On March 10, 1957, at 2, Cavendish Road, Hull, Yorks, to Dorothy, wife of Ross Gillespie, M.B., Ch.B., a sister for Jean, James, and David.

Norman.—On April 1, 1957, to Dr. Rebe Rainsbury, wife of Dr. L. I. Norman, of 34, Court Road, Eltham, a second daughter.

Shinton.—On March 24, 1957, to Margaret (formerly Hyde), M.B., Ch.B., and Neville Keith Shinton, M.B., M.R.C.P., a second son.

Stephenson.—On March 24, 1957, to Anne (formerly Conley), M.B., B.S., wife of Kenneth D. Stephenson, M.B., B.S., of Stanhope Road, Darlington, Co. Durham, a daughter.

MARRIAGES

Trewby.—Huxley-Williams.—On March 30, 1957, at Hong Kong, Lieutenant-Colonel H. F. Trewby, A.M.I.Mech.E., R.E.M.E., to Rosemary Huxley-Williams, M.R.C.S., L.R.C.P., D.A.

DEATHS

Carmichael.—On March 15, 1957, in hospital, Exeter, Henry Carmichael, M.B., C.M., late of Wandsworth, London, S.W., aged 84.

Hovenden.—On March 14, 1957, at Putney Hospital, Gerald Stanley Hovenden, M.D., of Glebeholme, Barnes, London, S.W., aged 87.

McMahon.—On March 10, 1957, at 31, Church Road, Whitechurch, Cardiff, Glam., Leo Luke McMahon, M.B., B.S.

Stevenson.—On March 11, 1957, at Cambridge, Mabel Geraldine Stevenson, M.D.

Symons.—On March 8, 1957, at Gwendron, Fermanagh, Guernsey, Angelo Nelson Symons, O.B.E., M.R.C.S., L.R.C.P.

Thompson.—On March 6, 1957, in a nursing-home, Frank Stuart Corbett Thompson, O.B.E., M.B., C.M., Lieutenant-Colonel, I.M.S., retired, late of Bengal, aged 84.

Weedner.—On March 14, 1957, at White Gables, St. Brelade, Jersey, Robert Joseph Weedner, M.B., B.S.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Milk on Continental Holiday

Q.—What risk is there of diseases such as tuberculosis and brucellosis from milk and milk products in countries in Western Europe, such as France, Spain, and Italy? Does the risk justify taking any special precautions, especially so far as children are concerned, and, if so, what is advised? Are T.A.B. and B.C.G. inoculations recommended?

A.—In the countries mentioned, and, it may be added, Portugal, Morocco, and Algeria, the incidence of enteric fever is higher—in some much higher—than in Great Britain, and the administration of T.A.B. vaccine is a wise precaution before visiting them, particularly for a stay of some length and in a country district. Cities are safer, because their milk is almost all pasteurized and sanitation generally is under closer control. Brucellosis and tuberculosis are also risks, varying much with locality and difficult to assess. There should be no hesitation at the beginning of any considerable stay, particularly with children, in inquiring about the source of the milk supplied and whether it is pasteurized: if not, and if the quality of the source is doubtful, it may be advisable to have it boiled for the benefit of young children consuming a good deal (the temperature of boiling is quite unnecessarily high, but ignorant people cannot be trusted to do anything less). Whether to immunize with B.C.G. in these circumstances involves the whole question of what should be the scope of this method of vaccination. In Scandinavian countries Mantoux-negative schoolchildren all receive B.C.G. at an early age, and there is much to be said for this, rather as a protection against contact with human disease than against the usually lesser risk of milk-borne infection.

Apomorphine Treatment of Alcoholism

Q.—What are the details of the treatment of alcoholism with apomorphine? How successful is it?

A.—The endemic problem of the compulsive alcoholic and the drug addict is hardly touched on in our medical schools or textbooks. The continual drinker should be treated in a hospital or nursing-home, but those with an intermittent craving may be given oral treatment at home between attacks. Successful treatment makes the patient lose his compulsion to drink, and, unless he returns to taking the alcohol (or drug) he no longer needs, no further treatment will be necessary. Here it is possible to give only a brief outline of the treatment.

Treatment in Hospital.—This should not take more than ten days; six or seven days are generally enough. The dosage should start with apomorphine gr. 1/20 (3.2 mg.) intramuscularly and increase by gr. 1/20 (3.2 mg.) two-hourly, each dose being followed in a few minutes by a drink of 2 oz. (57 ml.) of half-and-half gin or whisky and water (whatever the addiction, even if it is to morphine), until a vomiting dose is reached. The dose of apomorphine is then varied so as to achieve a satisfactory vomit and sleep between injections, which are continued two-hourly for about 48 hours. No food or other drink is given during this stage. During the next 48 hours apomorphine at half the previous highest dose is given three-hourly, the dose being gradually reduced to just below the nauseating level; alcohol is now stopped and food and soft drinks are allowed.

Treatment at Home.—Here the patient is immediately

cut off drink, and apomorphine is given sublingually at a dose just below the nauseating level and is continued two-hourly for two days.

Vitamin Supplements for Babies and Young Children

Q.—What vitamin supplements are advised for a breast-fed baby, and for how long should they be continued?

A.—The standard vitamin supplements given to babies, whether breast- or bottle-fed, are vitamin A 3,000-5,000 units, vitamin D 600-900 units, and vitamin C 25 mg. Breast milk contains just enough of these vitamins to protect the baby only if the mother has been receiving a satisfactory diet and if the baby is taking its feeds well and getting some exposure to sunlight. In Britain one cannot count on enough sunlight to form sufficient vitamin D to give a baby protection from rickets. Hence, if the infant is not taking full feeds, or is ill, it may be deficient in these vitamins.

Apart from the standard supplements noted above, a normal breast-fed baby does not need supplements of other vitamins, unless it is ill, when the addition of the B-group of vitamins is advisable. This applies particularly to prolonged gastrointestinal disturbances.

The absolute need for vitamin supplements once the baby is on a full mixed diet is dependent very much on the quality of the diet and, to a small extent, on the amount of sunshine to which the child's uncovered skin is exposed. But it is generally—and wisely—recommended that children should continue to receive supplements of vitamins A, C, and D until they are 5 years old. The supplements can do no harm, and there is always some risk of at least a vitamin-D deficiency in a rapidly growing child if extra D is not given. It may in fact be wise to continue to give A and D vitamins, at least during winter, until the age of about 12 years. One teaspoonful daily of the Government fortified cod-liver oil is adequate, the dose starting at the age of about 4 weeks with one drop and being doubled every day or two until the full amount is reached. For those babies who will not tolerate this or whose mothers object to the smell and staining properties of cod-liver oil, there are many reliable concentrated preparations. Vitamin C can be given from about the same age in the form of Government concentrated orange juice, or as ascorbic acid pills, fresh orange juice, or rose-hip syrup.

Storage of Inflammable Liquids

Q.—What legal regulations govern the storage of petroleum ether, benzene, toluene, and similar inflammable liquids in chemical laboratories?

A.—Petroleum ether, benzene, and toluene are all "petroleum spirit" within the meaning of the definition for petroleum spirit in the Petroleum (Consolidation) Act, 1928. The provisions of that Act therefore apply to these inflammable liquids. Except in quantities not exceeding three gallons (13.5 litres) and when kept in receptacles not exceeding one pint (570 ml.) in capacity, a licence must be obtained from the local authority for the storage of these petroleum spirits. The local authority may attach to the licence such conditions as they think expedient as regards the safe keeping of the petroleum spirit. The licence may include conditions concerning the nature of the goods with which the petroleum spirit may be kept, for instance.

There are also inflammable liquids with low flash-points which are not petroleum spirit, and the above-mentioned Act does not apply to them. But, if such liquids are kept, the local authority may agree that they should be kept with the petroleum spirit and under the same conditions.

Petroleum spirit intended for use in motor vehicles, motor boats, aircraft, and certain engines may be kept in quantities in excess of three gallons (13.5 litres) under certain specified conditions. This exemption, however, does not apply to the storage of petroleum spirit in chemical laboratories.

Post-coital Pain in Hip

Q.—What are the likely causes of pain in a man's hip and thigh after intercourse? The pain invariably follows intercourse and occurs the next morning—sometimes on getting up and sometimes later—and lasts about three hours before passing off. The patient in question had a non-specific urethritis several years ago. Physical examination is negative.

A.—This pain may be a muscular reaction to some faulty posture during coitus, or it may well be psychological in origin. Clinically and pathologically the spermatic tract must be considered as a single unit consisting of the testes, epididymes, vasa deferentia, ampulla, seminal vesicles, and ejaculatory ducts which empty the seminal fluid into the posterior urethra at the verumontanum during ejaculation. Complete or partial blockage of the spermatic duct from whatever cause may result in spermatic colic which is characterized by sudden, sharp pain at the end of coitus. The close anatomical relationship of the seminal vesicle and ampulla to the corresponding ureter facilitates the spread of inflammatory changes from the former, and this may lead to periureteritis and ureteric colic.

That there is a close association between non-specific urethritis and arthritis is well known, the latter usually occurring when fibrous change takes place in the spermatic tract, and many authors have recorded involvement of the lumbosacral and sacro-iliac joints in this condition.

No Diastolic Reading

Q.—In measuring the blood pressure, sometimes after the systolic reading has been taken the sounds show no alteration right down to a zero reading. Why is this, and how should the diastolic pressure be ascertained in such cases?

A.—There are two conditions in which the Korotkoff sounds may persist right down to the lowest levels. One is aortic incompetence, and the other thyrotoxicosis. Apart from these, nervousness in perfectly healthy people may make the diastolic reading very difficult. This nervousness may not cause the heart rate to increase or the vigour of the contraction to be more pronounced, although there is usually a tendency to thump. This difficulty in taking the diastolic pressure may not persist and the sounds will change if the patient becomes more composed. On another occasion a normal reading may well be found. Usually on very careful auscultation a slight change in the character of the sounds can be detected where the diastolic reading really is. Otherwise, if the sounds go right down to the bottom, then no diastolic reading can be made. The reason for these abnormal diastolic phenomena is not known.

NOTES AND COMMENTS

Alopecia Areata.—Dr. J. T. INGRAM (Leeds) writes: I hope that most dermatologists will disagree with your expert who says that "only local remedies are worth trying in alopecia areata" ("Any Questions?" March 16, p. 658). Alopecia areata is a symptom, not a disease. There is nothing local to treat, and it is probable that all local treatments are worthless. Unless management and treatment are along general lines they are more likely to be harmful than helpful. Fortunately the majority of patients with alopecia areata recover in spite of treatment.

Dr. F. F. HELLIER (Leeds) writes: I cannot disagree too strongly with your expert's opinion that "only local remedies are worth trying in alopecia areata." Local remedies will only make growing hair grow faster and will not directly affect the underlying restraining influence which is arresting hair growth. What this is we do not know, but there is little doubt that in many patients it is associated with nervous stress, anxiety, or shock. It may be that reassurance and a bottle of hair tonic will help the patient's anxiety so that the hair is allowed to grow again, and in this way local treatment may be of value—in a psychological way.

OUR EXPERT replies: I do not question Dr. Hellier's assertion that there is a systemic underlying factor in causing alopecia

areata. However, I agree with Dr. Hellier that we do not know what it is, and we do not, therefore, know how to remove it with treatment. In many patients, it is true, there is associated nervous stress, but in far many more there is none, and the systemic factor remains quite unidentifiable.

Otitis Media Due to Gram-negative Organisms.—Dr. E. N. WHITMAN (Medical Department, Burroughs Wellcome and Co. (U.S.A.) Inc.) writes: This is in regard to the answer to the question on local therapy in otitis media due to Gram-negative organisms ("Any Questions?" December 15, 1956, p. 1441). The only antibiotics mentioned in the answer were chloramphenicol, oxytetracycline, streptomycin, and neomycin. This answer is of concern to me, since I feel that it might possibly be misleading to doctors of limited experience in this field. As you know, much recent work has amply demonstrated that most cases of otitis are caused by Gram-negative organisms, and between 50 and 60% of these are caused by *Pseudomonas aeruginosa*. In addition, it has been repeatedly demonstrated that the most potent antibiotic against this organism is polymyxin B. For that matter, comparing the *in vitro* potency of the antibiotics mentioned in the answer with polymyxin B, the latter emerges far superior. Wright, Potee, and Finland¹ found that almost all strains of *Pseudomonas aeruginosa* were inhibited by 6.3 mcg. or less per ml. of polymyxin B. In comparison the other antibiotics mentioned required the following concentrations in mcg./ml. to inhibit 80-90% of the strains tested: oxytetracycline, 100 mcg./ml.; neomycin, 200 mcg./ml.; streptomycin, 400 mcg./ml.; and chloramphenicol, more than 400 mcg./ml.

So far as clinical work is concerned, Benton² states that "the most frequent organism found in pure culture was *Pseudomonas aeruginosa*" (47 out of 110 cases). He goes on to state that "polymyxin was found to give the quickest and most satisfying results, and it is therefore the drug of choice in cases of gram-negative otitis externa." Branca³ recommends the use of "aerosporin" otic solution: "This preparation contains polymyxin, which is most effective against *Pseudomonas* and gram-negative organisms. It also contains acetic acid, which helps restore the normal pH of the canal."

REFERENCES

1. Wright, S. S., Potee, K. G., and Finland, M., *Amer. J. clin. Path.*, 1954, 24, 1121.
2. Benton, C. D., jun., *Sth med. J. (Bgham, Ala.)*, 1955, 48, 546.
3. Branca, H. E., *A.M.A. Arch. Otolaryng.*, 1956, 63, 459.

OUR EXPERT replies: The original question referred to otitis media, but did not specify whether acute or chronic. Your correspondent, Dr. Whitman, appears to refer to cases of otitis externa, in which I quite agree that polymyxin B gives excellent results. In acute otitis media the infection is predominantly by Gram-positive organisms, and systemic antibiotics are employed. In chronic otitis media Gram-negative organisms are more commonly found, but topical application of antibiotics is often disappointing, and for this reason the application of classical surgical principles of cleanliness and promotion of drainage was given priority.

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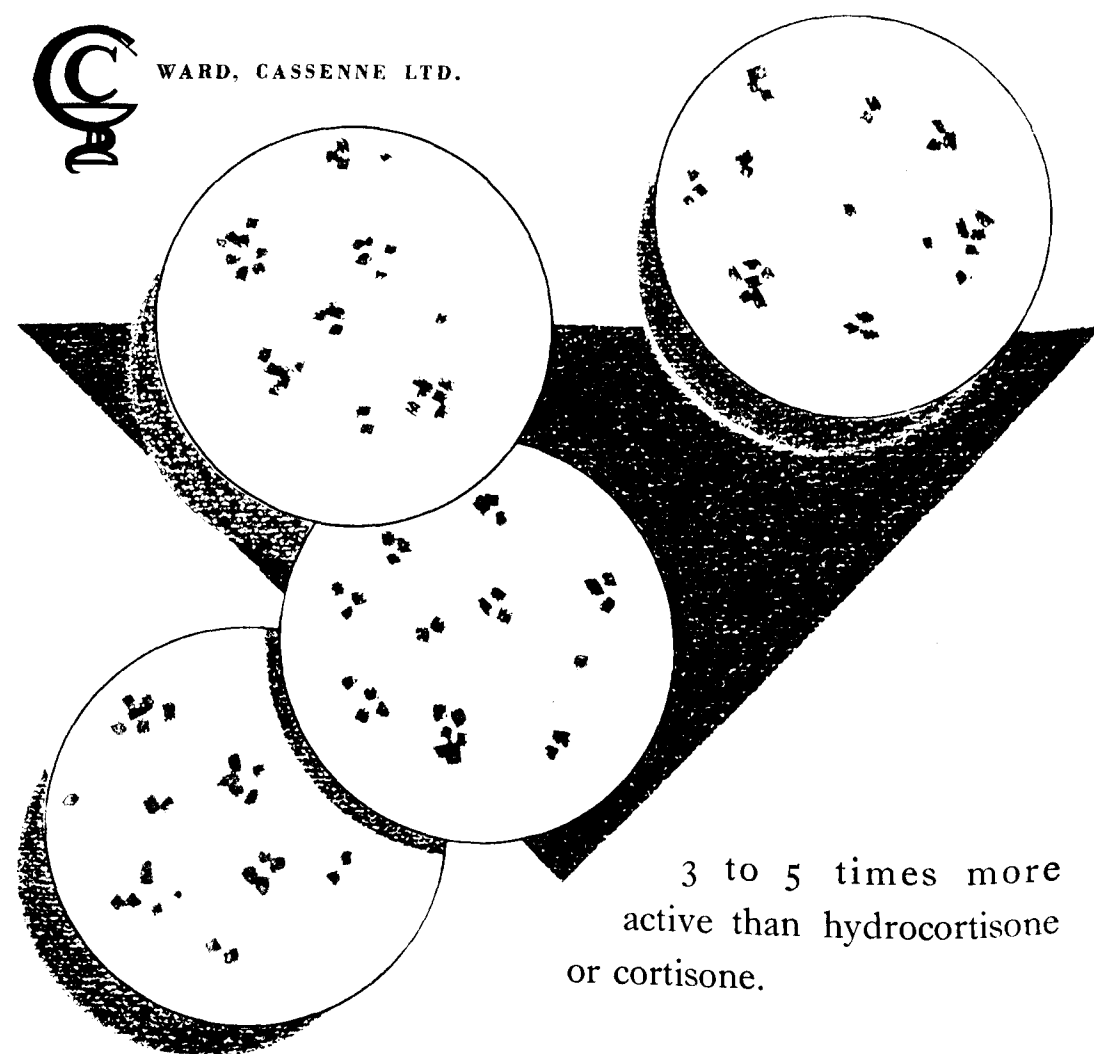
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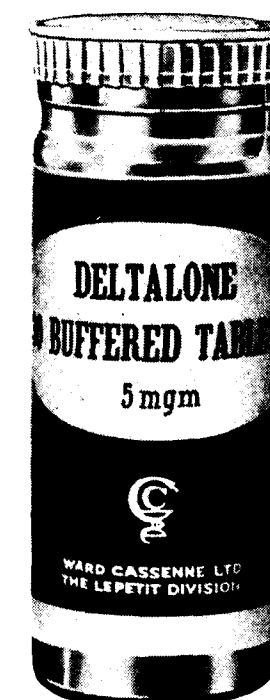
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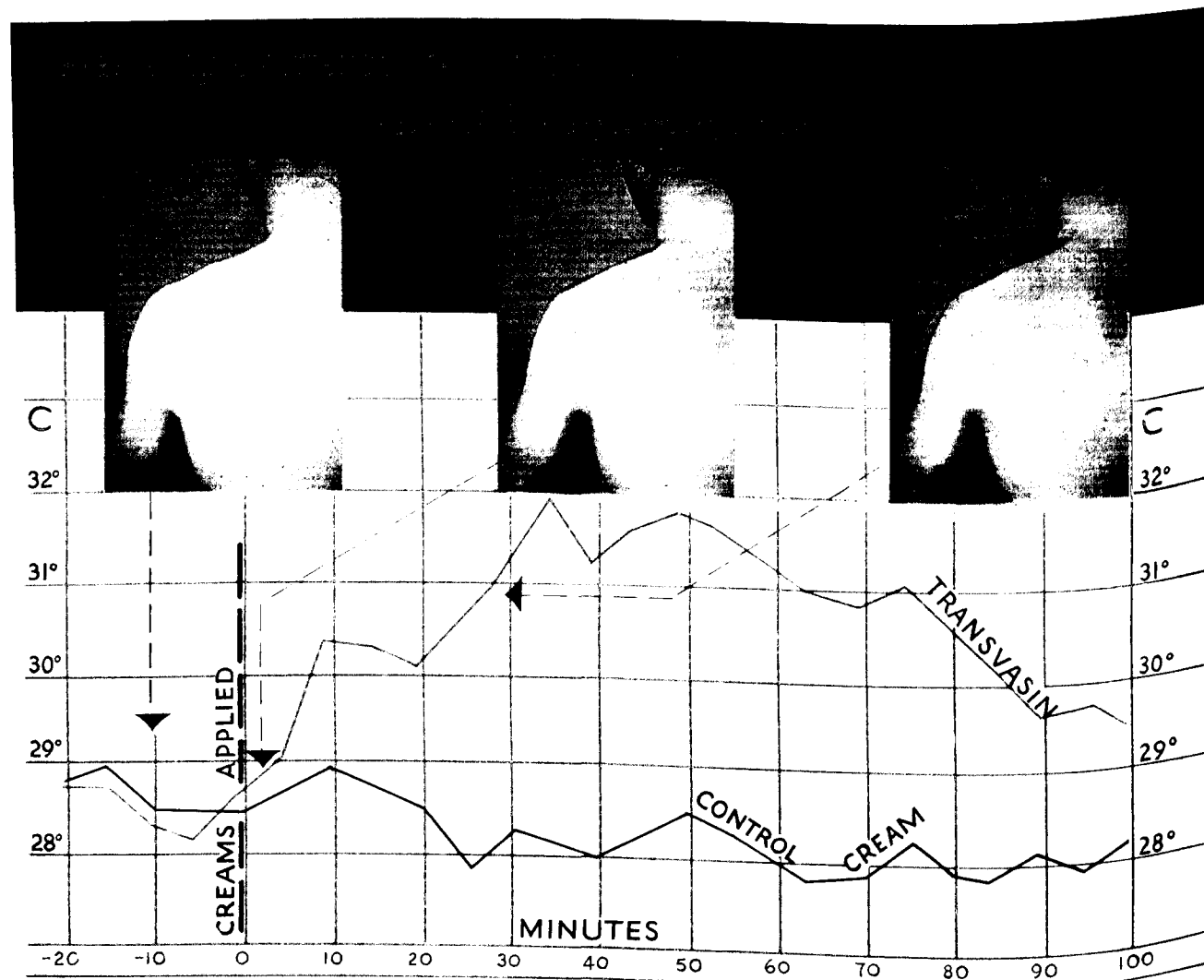
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CANCER—A BIOLOGICAL APPROACH*

III. VIRUSES ASSOCIATED WITH NEOPLASTIC CONDITIONS

BY

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There is still an active body of opinion that would regard cancer as a parasitic disease due to infection of cells by extrinsic viruses. Such an attitude has the great attraction that it suggests straightforward approaches to the prevention of cancer by immunological methods and holds out more hope of an eventual effective chemotherapy. As various writers have pointed out, the claim that some neoplastic processes are due to virus infection is not inconsistent with a recognition of the overriding importance of somatic mutation. Any claim that all cancers are of infective character is unjustified and frankly absurd in the present state of knowledge.

It has never been easy to define a virus, and the recognition of provirus in bacteria, with the convincing evidence that it is intimately built into the host's genetic mechanism, has now made it even more difficult. Any definition must cover the fact that there are two very different systems from each of which by appropriate manipulations a continuing sequence of typical virus infections may be produced. These are respectively the infective particle and the infected host cell.

A virus, in the conventionally understood form of a population of infective virus particles, can be defined as a self-replicating agent or organism smaller than bacteria and capable of multiplication only within living susceptible host cells. It may be desirable to add certain qualifications when we have to discuss demonstrable or hypothetical self-replicating subcellular entities. A virus particle must be shown to carry specific patterns in protein and nucleic acid which are different from those of the host cell and which are not derived genetically from the host species or any species related to it.

At a certain stage of infection, host cells may contain no virus demonstrable by the classic method of breaking up the cell and inoculating the product into other susceptible cells. There is other evidence that at this stage the cells do not contain formed virus particles. Under certain circumstances this phase may be prolonged. Its existence can be recognized either by providing a situation where infective virus particles will develop and be identified by standard methods or by demonstrating specific virus antigen in or liberated from the cells.

In general a virus (in the sense covering both the infective and vegetative phases) can be recognized only if it produces cytopathogenic effects in some type of host. It is by no means necessary, however, that intracellular

production of virus or virus constituents should always be associated with observable cellular changes.

Much of the discussion of a virus theory of cancer has been based on these difficulties of definition. The essential problem, however, is to decide whether the virus theory of cancer provides ideas which will allow (a) more effective generalization as an aid to the understanding of cancer, or (b) effective approaches to prevention or cure that would not be available if other views were held.

The incentive to consider whether all malignant neoplasms are the result of virus infection is derived from the fact that active proliferative lesions may be experimentally produced in birds and mammals by infection with a few typical viruses. The epidemiology of these conditions in nature is consistent with transfer of virus from one host to another by one of the classical methods. There are many other types of neoplasm in which there is no such association with overt virus infection. It is the contention of those supporting the virus theory that in this latter group virus is present, but, because it is normally in the vegetative phase or for other technical reasons, it cannot be observed by conventional techniques.

In this discussion we may deal with the relevant data under four headings: (1) The character of proliferative lesions produced by unequivocal viruses such as fibroma and fowlpox viruses. (2) The significance of the complex of conditions in fowls which includes lymphomatosis and filterable sarcomata. (3) The development of malignant lesions from virus-produced papillomata. (4) The changed susceptibility of proliferating or neoplastic tissue to virus multiplication and damage.

Proliferative Lesions Produced by Virus Infection

It is a commonplace that the gross effect of virus infection in vertebrate tissues is to produce varying degrees and mixtures of cellular proliferation and cellular necrosis. This can be seen in almost diagrammatic form in the lesions produced by different viruses on the chorioallantois. Typical strains of fowlpox give grossly proliferative lesions without necrosis. A neurotropic strain of vaccinia will give a pock with only a thin margin of hyperplastic and proliferating cells and a broad central crater of necrotic material (Beveridge and Burnet, 1946).

Fibroma virus in rabbits may be taken as typical of viruses with predominantly proliferative lesions. Morphologically it is a large pox-type virus; it is presumably spread by biting insects, and is in every sense a thoroughly "typical" virus. The characteristic lesion is composed of healthy-looking fibroblast-like cells and contains much infective virus. Antibody production can be demonstrated,

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*Parts I and II of this paper were printed in last week's issue (p. 779).

and presumably as a result of an immune response the fibromatous lesions regress within a month or two and leave a solid immunity to reinfection. There is no evidence that malignant change ever occurs in the lesions.

This condition poses the general question of how or why a virus induces a cell type to proliferate, in this case almost like a neoplasm. Answers can fall into two categories. The first is to be satisfied with obtaining an accurate range of experimental data on the extent of proliferation produced on different types of tissue by the viruses selected for study and to look for any correlations with other observable qualities of the viruses and cells concerned. The second is to regard the proliferative lesion as a deviation from the normal control of form exercised by the organism as a whole and to use the phenomena in an attempt to understand both the nature of virus action on the cell and the process by which control of the cells' growth is lost during the active phase of the lesion.

In the present discussion we are concerned especially to see in what ways the simple proliferative lesion produced by fibroma virus can provide helpful analogies to what occurs in tumour production. In the fibroma lesion there is no evidence for or against the occurrence of a somatic mutation allowing release of a specific control. We must assume the release of a control, and the simplest hypothesis is that the virus after entering the cell uses, binds, or inactivates a component of the cell which plays an essential part in the process of control. Of the available suggestions the most attractive is to use Weiss's concepts of cellular interactions and to suggest that this type of virus infection results in the cell losing its normal function of maintaining or liberating the markers which convey information of its presence to adjacent cells. These would leave the infected cell representing a (non-existent) gap, which adjacent cells would replicate to fill and in their turn be infected. On this view one could have a mass of cells all "unaware" of the existence of any contiguous cell and therefore proliferating at the maximal rate allowed by nutritional and other still existent controls. An essential feature of this hypothesis is that the same result would appear if the control affected by virus infection were abrogated as a result of a corresponding somatic mutation.

The Shope Papilloma and its Malignant Changes

The naturally occurring virus papillomata of cotton-tail rabbits seem to result from simple transfer of virus from an affected animal to a mildly traumatized area on a susceptible one. The lesions contain infective virus and large amounts of a DNA nucleoprotein, which appears to represent the effective virus. The number of such nucleoprotein particles is, however, enormously larger than the number of minimal infective doses. The lesions are papillomata resulting from proliferation of skin epithelium with various secondary changes. Specific antigen is produced with demonstrable antibody response, and some of the growths regress slowly.

The main interest of this virus in relation to neoplasia depends on two findings: (1) Infection of domestic rabbits gives rise to large papillomatous lesions in which little or no virus can be demonstrated. It has been held that this provides a prototype of the condition present in those cancers where no virus can be isolated. (2) The lesions produced either in cotton-tails or domestic rabbits frequently become carcinomatous, especially if the skin involved has been treated with a chemical carcinogen as well (Rous and Kidd, 1938).

The non-infective character of the lesions in the domestic rabbit would be best interpreted as a stabilized vegetative phase in which specifically patterned virus components are being produced but for one reason or another are not being fabricated into complete infective virus. From analogy with the findings in regard to non-infectious haemagglutinin in influenza virus infections it may be that the essential defect is an unbalanced production of virus protein without equivalent replication of the DNA component. The

point of special importance is that the proliferative character of the lesion, which is as marked in domestic rabbits as in cotton-tails, must depend on the earlier stages of the process of virus replication, since the fabrication and liberation of complete virus particles does not occur. With the proliferation of infected but otherwise undamaged cells, virus patterns in DNA and protein will be distributed to descendant cells and will be enabled to exert in them whatever deviation of control is needed to maintain the proliferative process.

In cotton-tail rabbits many of the growths fail to regress, and about 25% become frankly malignant. With the change to carcinoma, virus can no longer be found in the growths (Syverton *et al.*, 1950). Extensive studies have been made in domestic rabbits of the capacity of the virus to provoke carcinomata in skin areas converted to a pre-cancerous state by treatment with tar. From the history of a transplantable carcinoma V2 produced in this way, it appears that, though no free virus was present, all rabbits bearing the tumour for its first 22 passages developed antibody against papilloma virus. After 46 passages, however, the capacity to produce antibody had disappeared. This tumour was dependent on the existence of vegetative virus, but when the appropriate somatic mutation arose the continuation of virus action became both unnecessary and impossible.

Avian Lymphomatosis and Related Conditions

In domestic fowls, and perhaps in other birds, there is a wide range of neoplastic processes involving mesenchymal cells from which with varying degrees of difficulty non-cellular infectious material can be obtained. The epidemiology of the group is still rather obscure, but everything points to the conclusion that viruses of this complex do spread by one process or another from bird to bird. The viruses concerned are highly labile genetically, and it is perhaps best to regard the most extensively studied types, the Rous sarcoma and Beard's erythromyeloblastosis, as laboratory variants rather remote from natural strains.

It has been known for many years that Rous tumours vary greatly in their filterability. Duran-Reynals (1953) considers that this is largely related to the age of the host. In very young birds haemorrhagic necrotic lesions with much filterable virus is the rule. In old birds slower-growing tumours containing no extractable virus are commonly found. These are just as effective stimulants to antibody formation as are tumours that provide free virus.

Probably the most rewarding way to look at the lymphomatosis viruses of birds is to recognize the different requirements for cell-to-cell transfer if a proliferative process is involved. The standard teaching on the natural history of viruses is that we have a regular alternation of phases. The infective particle, the conventional "virus," is a unit specifically evolved to transfer infection to a new host cell. It is immaterial whether this is another cell of the same host organism or a cell of another individual in which infection is being initiated. Within the susceptible cell we have the vegetative phase, in which replication of all the specifically patterned components needed for infective virus is going on. It has been one of the important recent findings of virology that it is by no means inevitable that initiation of cellular infection must be followed by the production and liberation of a new brood of infectious virus. With highly virulent types, and especially those adapted to specially susceptible laboratory hosts, this condition may be approached.

In nature probably a very large proportion of cells into which virus enters support only a limited phase of the process of replication and produce no infective virus. Under most circumstances this will entail the elimination of the virus concerned, but conditions may be different if the completely infected cell proliferates as a result of some change induced by the infection. The vegetative virus can then progressively infect more and more cells, either descendants or conceivably by some form of cytoplasmic fusion with cells of other lines. If at the end of such an internal spread opportunity arises for the production of a

proportion of infective particles that can reach new individual hosts, there is a clear possibility that the mechanism may have survival value for the virus. As in so many other areas of biology, we find what looks like a degeneration put to biological service and providing a new niche for survival.

The status of the Bittner milk agent in relation to mammary cancer in mice is not yet clear. If it is introduced very early in life it gives rise to mammary cancer at a late stage in mice whose inheritance and endocrine experience are appropriate. There are suggestions that it may arise spontaneously, and there is no doubt that mammary carcinoma can arise in its absence. It is an interesting point, possibly due to an inability of the virus to become implanted unless it enters the body at a stage when immunological tolerance can develop, that no antibodies against the virus have been detected in mice. The general picture one receives is of a virus of very low grade that has found a way of persisting in mouse tissues analogous to that of lymphocytic choriomeningitis virus. As such it has an opportunity to act as an effective link in a chain of abrogated controls leading to the development of mammary cancer.

The other alternative, which is equally applicable to the virus that can transmit leukaemia to mice inoculated on the first day of life (Gross, 1954), is that these mouse agents are not descendants of autonomous viruses, but represent pathologically active subcellular organelles whose pattern has been derived relatively recently from a mouse genetic mechanism. This has been a common speculation for many years, but no one has been able to provide definitive criteria which will establish such an origin.

A point relevant to the lymphoma-leukaemia group of conditions in domestic fowls and laboratory mice is the possibility that there seem to be rather numerous strains in both species in which the overall genetic control of lymphoid cell proliferation is abnormally weak.

Changed Susceptibility of Proliferating Cells to Virus Attack

In recent years the oncolytic action of certain viruses has raised hopes that eventually we may see therapeutic use of viruses which, while lethal for tumour cells, have no action on normal tissues. There are other changes in cell circumstances that may lead to increased susceptibility to virus action, and it is perhaps significant that two of them are associated with diminished control of growth. Virus fibroma lesions in rabbits are infected and rapidly destroyed by some of the encephalitic viruses, including Semliki Forest and MVE, which have no more than trivial action on rabbit tissues generally (Ginder and Friedewald, 1951). Monkey kidney cells *in vivo* do not support multiplication of poliovirus and suffer no damaging effect (Kaplan, 1955). When prepared for tissue culture they represent the medium of choice for growth and recognition of the virus. The HeLa strain of human cancer cells is susceptible to a wide range of viruses, and it is usual to find that transplantable mouse tumours are more susceptible to many viruses than normal mouse tissues.

Koprowski (1955) has introduced an important new point in showing that when an ascites tumour broadens its range of hosts—that is, loses an antigenic individuality marker—it concomitantly develops an increased susceptibility to the cytopathogenic action of several viruses. It may be significant, too, that rapidly growing embryonic tissues where control obviously takes a different form to that of the adult are highly sensitive to virus action. And one may wonder whether in the central nervous system, with its undue susceptibility to many viruses, there may be another clue to this general problem.

When increased susceptibility to viruses becomes evident it is to their necrotic action, not to their effect in increasing proliferation. If simple proliferation is, as we have suggested, due to the relaxation of what might be called proximity control, then it appears that when this control is lost there is no other point at which a number of viruses (of the arthro-

pod-borne group) can be checked once they enter the cell. For reasons that we have discussed in relation to the typical "tumour viruses" the block which tends to be associated with proliferative rather than necrotizing action must lie at a stage just before the completion of virus replication. It is of considerable interest that at the present time there is a strong tendency for virologists to regard the final fabrication of virus as a function of the cell surface. This is particularly well established for influenza virus. In the allantoic cavity the whole process takes place on the free surface of the cell. This is the only surface where there is not a constant proximity to the living surface of other cells. It is too early to make any hints on how a proximity control might also function as a barrier preventing the completion of virus particle production, but it is hard to believe that it will not eventually be found to do so.

Development of Malignant Characters by Cells in Tissue Culture

One of the most decisive arguments against a necessary part being played by viruses in carcinogenesis is derived from the findings that pure cell lines maintained in tissue culture can become malignant. Many examples of this have recently been reported in strains of fibroblasts from mice or rats, but perhaps the most interesting report is that of Earle's group (Sanford *et al.*, 1954). They established a line of fibroblasts from a single cell and from this line developed eight clones which were studied for their capacity to produce sarcomata when inoculated at various stages of culture into mice of the homologous strain. After several passages six of the eight clones had given typical tumours. The most consistently active of these, Line VII, and a strain which had produced no tumours, Line III, were then selected for detailed study. Line VII produced sarcoma in 97% of the mice inoculated, Line III in only 2 out of 146 inoculated. If x-irradiated mice were used, however, over 40% of tumours were obtained from Line III, and these tumours could subsequently be passed in normal mice. The two lines, VII and III, in addition to this difference in transplantability also showed clear differences in cellular morphology. The phenomena are what would be expected on the hypothesis of somatic mutation, but would require a fantastic series of secondary *ad hoc* assumptions to be interpreted as manifestations of virus infection.

Although the evidence can naturally never be complete there is very much to suggest that all, or almost all, of the cell lines derived by virologists from normal human tissues become malignant as they develop facility to grow indefinitely in tissue culture. It is characteristic that at this stage they become susceptible to practically the same range of viruses as HeLa cells and lack any special susceptibility for viruses which naturally infect their cells or origin.

Summary

The general picture emerging from this discussion of the "cancer viruses" is that these represent simply one rather potent means by which what is functionally equivalent to a somatic mutation can be produced. In the well-studied rabbit papilloma there is good evidence that when malignancy is fully established virus cannot grow in the tumour cells. The analogy with azo-dyes and the development of hepatoma is extraordinarily close.

Where a virus produces a proliferative lesion a unique opportunity exists for the development of a situation which probably arises commonly enough in other types of virus infection but cannot be demonstrated. This is the persistence of a "vegetative state" in which production of virus antigen goes on, presumably with replication of the associated nucleic acid more or less in tempo with cellular multiplication, but no production of infective virus. Since in these proliferative lesions infected cells are the progeny of infected cells there is no necessity for the production of infective particles to transfer infection from one cell to another. In all probability any low-grade virus which can

find a cell, either normal or one or more stages on the way to loss of control, in which it can produce proliferative effects will have some or all of the qualities of a cancer virus. Probably all viruses have some capacity to provoke proliferation—the uniform structure of the chorioallantoic lesions speaks for this—but the converse claim that all proliferative processes are due to viruses is quite untenable.

IV. PRACTICAL APPLICATIONS

The only social justification of generalization in science is to provide firmer basis for human action. If the picture of somatic mutation as the basis of malignant disease is correct what are the implications at the practical level? More specifically, does it provide leads regarding research which might eventually allow the development of new techniques for the prevention, diagnosis, or cure of cancer?

Prevention

One of the most heartening developments in medicine has been the recognition that a very large proportion of lung cancer has a definable aetiology and, in principle at least, is preventable. This underlines the potential importance of continued search for aetiological agents of environmental origin. If a somatic mutation cannot be reversed it is of the utmost importance that the conditions under which it is either provoked or given the conditions to allow it to prosper unduly should be understood and counteracted.

Despite continuing assertions that there is as yet no absolute proof of the significance of cigarette smoking, the available evidence suggests that the position in regard to lung cancer is, in fact, relatively clear.

There are two types—one described as adenocarcinoma, which occurs with equal frequency in males and females and for which there is no evidence of environmental influence; the second, comprising squamous-celled and anaplastic carcinomas, is that which is responsible for the recent great increase in lung cancer. This increase is real and is directly related to two environmental factors, cigarette smoking and the degree of urbanization of the environment. A good case can be made for Stocks and Campbell's thesis (1955) that the effective cause of lung cancer is the amount of common carcinogen, 3:4-benzpyrene, in the air inhaled, including of course air inhaled while smoking. In non-smokers there are nine cases of urban lung cancer to one in the country. The ratio diminishes as smoking increases until for heavy cigarette smokers the same high incidence is found in the country as in the town. The preventive approach is therefore quite clear-cut and probably socially impossible to implement. Cigarette smoking needs to be rendered unpopular by every acceptable means, and the greatest attention must be paid to reducing the products of incomplete combustion of fuel that are liberated into the air. It is a good rule that smoke, whether from a factory chimney, a diesel exhaust, or a cigarette, is dangerous and undesirable.

There are a number of other indications of environmental factors being important in the production of cancer, and there may well be some more unpleasant surprises in store for us. There is, for instance, much interest in but no solution of the fact that Indonesians have far less gastric cancer than Europeans or Chinese and much more liver cancer. The suggestion that dietary factors are involved is insistent, but no one has provided a likely answer in any detail.

More immediately important is the part played by ionizing radiation, whether from x rays, from atomic explosions, or from the entry of radioactive material into the body. When dealing with fair-skinned people, one could add the ultra-violet component of sunlight as a penetrating radiation so far as the superficial cells of the body are concerned. The high incidence of relatively mild and tractable skin cancer in regions like Queensland, where there is plenty of sunshine, has been well known for years.

One of the important aspects of the somatic mutation theory of cancer is the way it brings into the same focus the

two important harmful effects of ionizing radiation, carcinogenesis, and genetic damage. Whether acting on the nuclei of germ cells or on the nuclei of the somatic cells of the body, the effect of radiation is the same—random damage to a relatively large assemblage of complex genetic mechanism. It is as if a bullet were fired at random into an automatic telephone exchange. The results would have only a very small relationship to the size or speed of the bullet, but, depending on wholly accidental factors as to where the hit occurred, they might range from no functional effect at all through various types of minor or major malfunction to complete breakdown. As we have discussed, the only type of somatic mutation in man that can be observed is one leading in the direction of cancer. Many other types undoubtedly occur, but there can be no overt evidence of their presence. Germ-cell damage also has only a limited number of ways in which it can be recognized; like damage to somatic cells, it is in general only recognizable when it is of minor degree allowing the production of offspring in whom a specific defect can be recognized. Just as genetic damage may only become manifest in distant generations so somatic damage may have no immediate effect but may lead to the accumulation of a stock of mutant cells all one or more steps nearer to malignant change.

There is no doubt that every type of ionizing radiation has a measurable mutagenic power and that the effect is cumulative—that is, it is just as dangerous to receive 365 units of radiation in 1-unit doses daily over a year as to receive the full dose in a minute. It is impossible, therefore, to say that any dose of radiation is harmless. On the other hand, very high doses are needed to produce malignant change in a large proportion of animals experimentally exposed. Radiologists in the early days were occupationally liable to skin cancer. Now with better protection but much more powerful machines they are still subject to an undue mortality from leukaemia (March, 1950). Large therapeutic doses of x rays, notably for ankylosing spondylitis (M.R.C., 1956), have been shown to be responsible for the development of leukaemia in a significant proportion of cases.

Increasing Exposure to Ionizing Radiation

The only fully established chronic effect of the atom-bomb explosions over Japan was the development of leukaemia in a proportion of the survivors some years later. At the present time leukaemia is the only form of malignant disease other than cancer of the lung that is showing a steady increase. Much thought is being given to the possibility that some, or all, of this increase can be ascribed to increasing exposure to ionizing radiation. There have been two disquieting recent reports. First, that children of mothers who were exposed to diagnostic x rays of the pelvic region during the relevant pregnancy show a much higher incidence of leukaemia and other forms of malignant disease than a control series (Stewart *et al.*, 1956); and, second, that in comparing the history of patients with myelogenous leukaemia with those suffering from chronic lymphatic leukaemia the former group showed a significantly greater amount of exposure to diagnostic x rays (Faber, 1956). These results make it urgent to extend such studies so as to obtain as soon as possible a sound assessment of the danger associated with diagnostic and therapeutic exposures to x rays. It may turn out to be trivial, but equally it may come to be regarded as of sufficient importance to demand revolutionary changes in radiological practice.

Other indications of the carcinogenic activity of ionizing radiation in man can be found in the recently described cases of carcinoma of the thyroid in children treated locally with x rays on the assumption that an enlarged thymus was responsible for symptoms (Clark, 1955). Equally relevant is the classical account (M.R.C., 1956) of the occurrence of bone sarcomata in technicians using radium paint in the manufacture of luminous watch-dials, etc. Extremely minute amounts of radium were involved. Since one of the important products of atomic fission, ⁹⁰Sr, is, like radium,

selectively concentrated in the bones and has a half-life of 28 years, an increasing incidence of bone tumours may be one of the first indications of a dangerous increase in fission by-products.

A full-scale atomic war would have social consequences that would end scientific medicine for generations, and it would be useless to attempt any discussion of its medical sequelae. It is legitimate, however, to consider the implications of the inevitable great increase in the industrial use of nuclear power and the wide distribution of radioactive isotopes which is bound to accompany it. All recent reports stress the problems associated with the large amounts of radioactive waste products that have to be disposed of in the plants for chemical treatment of metal "fuel" that has been used in reactors. So far methods of dealing with such problems seem to have been adequate, and it may be possible to continue to enforce the necessary discipline and control in the future. There is a real risk, however, that as more and more reactors are brought into production all over the world familiarity will result in relaxation of precautions and minor and major accidents increase. Already in Australia we have heard of industrial capsules of cobalt-60 being left for uninstructed adults or children to handle, in one case with the subsequent development of severe lesions.

There is unanimity of authoritative opinion that the global concentration of fission products from test explosions of atomic weapons, plus the limited release of radioactive material from industrial reactors, is at the present time and in the foreseeable future far below the danger level for genetic damage. There is much less evidence about the possible effect of the ⁹⁰Sr, which is selectively concentrated in bone, or ¹³¹I, which, although an isotope of short half-life, may be concentrated sufficiently in the thyroid to produce serious local effects. It would seem highly desirable that careful watch should be kept on the incidence of tumours of bone and of the thyroid during the next decade. These, plus leukaemia, would be the most likely conditions to indicate that the liberation of radioactive material was becoming positively dangerous to health.

From the more general point of view, the last approach to the (partial) prevention of cancer seems likely to be a concentration of research on the mechanism of chemical carcinogenic action. The production of a somatic mutation is in itself unimportant unless conditions are such as to allow an extensive replacement of normal cells by descendants of the mutant type. It may emerge that there are ways by which these conditions can be controlled even if mutation is inevitable. There is, for instance, much to suggest that any form of chronic irritation and inflammation which gives rise to an increased turnover of epithelial cells in one of the vulnerable regions will increase the likelihood of the appearance of malignant change. Appropriate treatment of such conditions may well have an important place in the prevention of cancer.

Diagnosis

The problem of early diagnosis is an extremely difficult one, and if the somatic mutation hypothesis is correct it may, in principle, be even insoluble. Modern studies on the survival time of patients treated in various ways suggest that for many types of cancer the end-result depends on the type of malignant cell and is virtually uninfluenced by the particular form of treatment adopted (Jones, 1956). The only justification for special measures of early diagnosis is a reasonable certainty that the prognosis will be improved by such diagnosis. In view of the universal practice of excising or destroying all small lesions known or suspected to be early cancer, it may be quite impossible ever to make such an assessment. The invariable finding that very early lesions give much better survival rates than more advanced ones is by no means an adequate basis for demonstrating the importance and effectiveness of early diagnosis. If every malignant growth represents the result of a final mutational change occurring in one of numerous cells which have reached by successive mutation the penultimate stage, then

effective treatment may well demand the excision of all these immediately vulnerable cells as well. Where the process of carcinogenesis has been confined to a limited region—clay-pipe cancer of the lip might be taken as a typical example—this may be very readily accomplished. In other situations it may be quite impossible simply because of our inability to recognize cells in the vulnerable state.

One of the academic and perhaps practical problems of the future is to find means of recognizing the extent to which intermediate changes on the road to malignancy have occurred. From the nature of the problem the only hope of recognizing such changes is the histochemical one. Mutations can give rise to general effects only when the mutant type constitutes a significant proportion of the order of 10% or more of the cells of its type in the body. A means must be available by which a much smaller proportion of aberrant cells can be recognized, and histological methods of some sort are the only ones that are at present conceivable.

It is the great virtue of Green's immunological approach that it more than any other theory of cancer provides indications for the direct experimental study of its implications. If the process is to a large extent a loss of serological markers, these changes can in principle be recognized by the use of Coons's (1954) methods with fluorescent antibody as used, for instance, by Weiler (1956) in the study of rat hepatoma. In the field of human pathology, very much might be expected from the production of a series of fluorescent antisera rendered specific by appropriate absorption, against as many organ-specific human antigens as it is practicable to prepare.

Conventional methods of histological examination for the detection of pre-cancerous change will always have their value, but if direct serological indications can be obtained it is most important that they should be elaborated immediately. It is a possibility that such studies would allow concomitant changes to be recognized which would eventually allow the use of simpler histological methods for their detection. The application of fluorescent antibody studies to exfoliated cells might add a further diagnostic criterion to this method of clinical study.

Curative Treatment

If somatic mutation is the key to the understanding of cancer there are grave restrictions to the possibilities of prevention and cure. Nature has only one way of eliminating harmful mutants—by genetic death. Mutation being basically a random process, there is no conceivable way by which a cell can be induced to undergo a specific back-mutation to eliminate the change. Even if in a sense carcinogens act by enforcing a specific mutation by loss, there is still no conceivable way by which the loss of genetic material can be replaced in the cells concerned. Therapy along somatic-genetic lines is therefore unthinkable.

Any therapeutic approach must be indirect and based on some exploitation of a physiological difference between the cancer cell and normal body cells. The chemotherapeutic approach to date has been almost wholly along such lines and suffers from one overwhelming intrinsic disadvantage, which may be put in oversimplified form—namely, that all anti-cancer drugs are also carcinogens. As has been discussed in regard to Law's (1952) work, the situation is analogous to that found with antibiotics and staphylococci. Every effective antibiotic is capable of assisting the emergence of a bacterial pathogen resistant to its action. Once a malignant process is well established, the cell population has become genetically heterogeneous, and though 99% of the cells may be susceptible to some antimetabolite and immediate benefit result, experience to date has confirmed the theoretical prediction that elimination of all cancer cells will be impossible and that sooner or later a new generation of cells resistant to the formerly effective agent will become clinically evident.

A slightly more hopeful approach, which, however, is so dependent on the body's own resources that it has never

been seriously propounded, is the immunological one. It is generally regarded as axiomatic that, since a cancer cell is of the body's own pattern, no effective immunological action against it is possible. In view of recent work, it is, however, conceivable that in many instances there is sufficient antigenic difference to be effective. In terms of the immunological ideas discussed in Part I, cell components, normally non-antigenic, may become so either by modification of antigenic pattern through the action of chemical agents capable of being bound to the component, including perhaps viruses or their products, or by being brought into a new relationship to the scavenging cells of the body. Somatic mutation with malignant or pre-malignant changes might allow either of these conditions to arise. If in terms of Green's theory the loss of self-markers is an important step in the progressive abrogation of control, it may become important to know whether the loss of an antigenic pattern with this effect is or is not associated with the emergence of a new and therefore foreign antigenic pattern. Green's view would be that a carcinogen plus host protein produced a new antigen but that malignancy is associated with the shedding of the new antigen by somatic mutation. Loss of any antigenic pattern may, however, be associated with the emergence of another.

It is by no means inconceivable that small accumulations of tumour cells may develop and because of their possession of new antigenic potentialities provoke an effective immunological reaction, with regression of the tumour and no clinical hint of its existence. It has also been suggested that the result of surgery for cancer may to a large extent be determined by the degree of resistance, presumably immunological in nature, against the tumour cells. Black *et al.* (1954) found a sharp correlation between the degree of lymphocytic infiltration in the tumour removed at operation and the likelihood of "cure" following surgery.

What is to be sought is some means whereby the protective mechanism of the body has its reactivity against minor deviations from self-patterns made more sensitive—the converse of the effect of cortisone in damping down immunological reactivity. One would guess that the desired capacity is determinable only by genetic means, but this is not necessarily so, and from many points of view research along these lines might be particularly valuable for its practical potentialities.

The use of specific antigens for immunization against cancer can be ruled out from the most elementary consideration of the position.

The orthodox treatment of cancer has always been based on a more or less clearly visualized somatic mutation theory. The objective has been first to excise from the body all cells which have taken on the new genetic behaviour, and, if that is impossible, to use any agent known or presumed to have a differentially destructive effect on the malignant cells. When eradication of the malignant cells is impossible there still remain medical and surgical measures which by one or another form of symptomatic relief will do much to make the final stages of disease more tolerable.

Under the circumstances theoretical considerations can have no special significance at the therapeutic level. The most satisfactory application of the very simple principles outlined above will have to be worked out on an empirical basis for each particular type of tumour and every possible opportunity taken to assess the results of treatment objectively. The only satisfactory way is to follow the after-history of treated patients till their death.

To one not directly associated with the surgery of malignant disease it is extraordinarily difficult to gain a clear picture of how much effect modern surgical and irradiation therapy has had on the death rate from cancer. The overall mortality statistics show little or no effect, and some recent analyses (Jones, 1956) of adequately studied series of some of the commoner types of tumour have found it very difficult to show that therapeutic action has greatly modified survival time. On the other hand, there is no doubt that published results of treatment for early cancer of lip, skin,

breast, and cervix uteri show quite gratifying five-year survival percentages.

Perhaps the most pertinent query that is raised by this theoretical discussion is in regard to the use of various forms of ionizing radiation in treatment. Is it or is it not established that radiation influences the survival rate beneficially? There is no doubt that appropriate dosage will cause differential destruction of large numbers of malignant cells. On the other hand, there is also a markedly destructive effect on cells of the lymphocytic series that would mediate any immunological resistance, and there is the carcinogenic effect of irradiation on normal cells. Obviously the practical usefulness of radiation therapy can only be established empirically.

Conclusion

There is little ground for optimism about cancer. Everything suggests that, somatic cells being what they are, the impact of the environment must inexorably lead to an accumulation of mutant cells, some of which will have malignant descendants if life persists long enough. Both the genetic character of the cells exposed and the intensity and type of the mutagenic stimuli from the environment will play a part. At the present time two types of environmental stimuli—the carcinogenic hydrocarbons from incomplete combustion processes and ionizing radiation—are steadily increasing in importance. It may eventually be possible to recognize other specific agents as being responsible for certain types of cancer which have not shown any special change of incidence in recent years. From the very nature of the processes concerned it is difficult to envisage effective means of utilizing such knowledge for the prevention of cancer. We are not likely to ban cigarette smoking and the use of diesel engines on the roads, or to stay the development of nuclear energy, just because these aspects of our mode of living indubitably increase the incidence of cancer.

We must work toward prevention and be prepared not only for failure but for a sharp increase in the incidence of cancer with the further elaboration of modern technology. If so, the medical problem of the future will be very largely to clarify the immense complexities that arise when we try to adopt the orthodox maxim, "Recognize the cancerous lesion as early as possible and excise it."

If what can legitimately be called pre-cancerous lesions are an inevitable development with increasing age it will need the greatest skill and judgment to devise and implement a policy which will provide the "greatest good to the greatest number." On the one hand, there are sound psychological, social, and economic reasons against the use of cancer-detection clinics to carry out relevant periodical examinations of all persons over the age of 40. There is, too, the underlying uncertainty regarding what is the real prognostic significance of borderline lesions—for example, intra-epithelial carcinoma in biopsies of the cervix uteri—and even greater doubts about the ability of any treatment to deal effectively with cancers whose histological character is undubitably malignant. All these points have to be weighed against the desire of all concerned to find and treat malignant growth at the stage at which it can be eradicated.

It would probably be wise to conclude that the diagnosis and treatment of cancer is one of those social problems that must be allowed to develop their own current solution under the various pressures of advancing knowledge, of changing public opinion, and of the

enthusiasm and influence of advocates of this or that approach. A final solution will probably never be possible.

REFERENCES

- Anderson, D., Billingham, R. E., Lampkin, G. H., and Medawar, P. B. (1951). *Heredity*, 5, 379.
- Armitage, P., and Doll, R. (1954). *Brit. J. Cancer*, 8, 1.
- Berenblum, I., and Shubik, P. (1949). *Ibid.*, 3, 109.
- Beveridge, W. I. B., and Burnet, F. M. (1946). *Spec. Rep. Ser. Med. Res. Coun. (Lond.)*, No. 256.
- Bielschowsky, F., Griesbach, W. E., Hall, W. H., Kennedy, T. H., and Purves, H. D. (1949). *Brit. J. Cancer*, 3, 541.
- Billingham, R. E., Brent, L., and Medawar, P. B. (1956). *Phil. Trans. B.* 239, 357.
- Bird, M. J., and Fahmy, O. G. (1952). *Proc. roy. Soc. B.* 140, 556.
- Biskind, M. S., and Biskind, G. S. (1944). *Proc. Soc. exp. Biol. (N.Y.)*, 55, 176.
- Black, M. M., Opler, S. R., and Speer, F. D. (1954). *Surg. Gynec. Obstet.*, 98, 125.
- Burnet, F. M. (1956). *Enzyme Antigen and Virus*. Cambridge Univ. Press.
- and Fenner, F. J. (1949). *Production of Antibodies*. Macmillan, Melbourne.
- Clark, D. E. (1955). *J. Amer. med. Ass.*, 159, 1007.
- Coons, A. H. (1954). *Ann. Rev. Microbiol.*, 8, 333.
- Cowdry, E. V. (1955). *Cancer Cells*. Saunders, Philadelphia.
- Duran Reynals, F. (1953). In *Physiopathology of Cancer*, edited by Homburger and Fishman, p. 298. London.
- Ebert, J. D. (1954). *Proc. Nat. Acad. Sci.*, 40, 337.
- Faber, M. (1956). Cited in *British Medical Journal*, 2, 704.
- Fisher, J. C., and Hollomon, J. H. (1951). *Cancer*, 4, 916.
- Furth, J. (1954). *J. nat. Cancer Inst.*, 15, 687.
- Gander, D. R., and Friedewald, W. F. (1951). *Proc. Soc. exp. Biol. (N.Y.)*, 77, 272.
- Gorbman, A. (1949). *Ibid.*, 71, 237.
- Green, H. N. (1954). *British Medical Journal*, 2, 1374.
- Greenstein, J. P. (1954). *Biochemistry of Cancer*. Academic Press, N.Y.
- Gross, L. (1954). *Proc. Soc. exp. Biol. (N.Y.)*, 86, 734.
- Habich, H. (1953). *Schweiz. med. Wchnr.*, 83, 1253.
- Hauschka, T. S. (1953). *J. nat. Cancer Inst.*, 14, 723.
- Homburger, F., and Fishman, W. H. (editors) (1953). *The Physiopathology of Cancer*. London.
- Jones, H. B. (1956). *Trans. N.Y. Acad. Sci.*, 18, 298.
- Kanzow, U. (1954). *Klin. Wchnr.*, 32, 154.
- Kaplan, A. S. (1955). *Virology*, 1, 377.
- Koprowski, H. (1955). *Nature (Lond.)*, 175, 1087.
- Krebs, C. (1943). *Acta radiol. (Stockh.)*, 24, 190.
- Law, L. W. (1952). *Nature (Lond.)*, 169, 628.
- Leighton, J. (1951). *J. nat. Cancer Inst.*, 12, 545.
- (1954). *Ibid.*, 15, 275.
- Lindeman, V. F. (1929). *Physiol. Zool.*, 2, 255.
- Mackay, I. R. (1956). *Aust. Ann. Med.*, 5, 244.
- March, H. C. (1950). *Amer. J. med. Sci.*, 220, 282.
- Medical Research Council (1956). *The Hazards to Man of Nuclear and Allied Radiations*. H.M.S.O., London.
- Metcalf, D. (1955). *Med. J. Aust.*, 1, 874.
- Moloney, W. C. (1955). *New Engl. J. Med.*, 253, 88.
- Moscona, A. (1953). *Exp. Cell. Res.*, 3, 535.
- Pollock, M. R. (1953). *Proc. Soc. exp. Biol. (N.Y.)*, 92, 410.
- (1956). *Gen. Microbiol. Stages in Enzyme Adaptation*, p. 150. Symp. Soc. Gen. Microbiol. Adaptation in Microorganisms, Cambridge.
- Rawles, M. E. (1944). *Physiol. Zool.*, 17, 167.
- Rous, P., and Kidd, J. G. (1938). *J. exp. Med.*, 67, 399.
- Sanford, K. K., Likely, G. D., and Earle, W. R. (1954). *J. nat. Cancer Inst.*, 15, 215.
- Shope, R. E. (1933). *J. exp. Med.*, 58, 607.
- Stewart, A., Webb, J. G., and Hewitt, D. (1956). *Lancet*, 2, 447.
- Stewart, S. B. (1954). *J. nat. Cancer Inst.*, 14, 1187.
- Stocks, P., and Campbell, J. M. (1955). *British Medical Journal*, 2, 923.
- Syverton, J. T., Wells, E. B., Koonen, J., Dascomb, H. E., and Berry, G. P. (1950). *Cancer Res.*, 10, 474.
- Weller, E. (1956). *Z. Naturforsch.*, 11B, 31.
- Weiss, P. A. (1947). *Yale J. Biol. Med.*, 19, 235.
- and Andres, G. (1952). *J. exp. Zool.*, 121, 449.
- Willier, B. H., Weiss, P. A., and Homburger, V. (1955). *Analysis of Development*, p. 155. Saunders, Philadelphia.
- Woodruff, M. F. A., and Woodruff, H. G. (1950). *Phil. Trans. B.* 234, 559.

At the meeting of the council of the Royal College of Nurses last month final approval was given to a new training scheme which would lead to State registration and the health visitor's certificate. It is being organized by the College with the help of King's College Hospital. A four-year course is envisaged (excluding six months' training for part I midwifery). An introductory term at the Royal College of Nursing would be followed by three years' training at King's College Hospital. Then would come seven months of more specialized training at the College as a health visitor, leading to the health visitor's examination. To ensure continuity and integration of study, one health-visitor tutor at the College would be responsible for the students throughout; during the hospital period she would remain in contact with them in co-operation with the hospital sister-tutors. She would undertake certain lectures at the preliminary training school of the hospital, and also join in the case-study discussions. The scheme is now to be submitted to the Royal Society of Health and the Ministry of Health, with a view to beginning the course in September, 1958.

LONG-TERM RESULTS IN EARLY CASES OF RHEUMATOID ARTHRITIS TREATED WITH EITHER CORTISONE OR ASPIRIN

A THIRD REPORT BY THE JOINT COMMITTEE OF THE MEDICAL RESEARCH COUNCIL AND NUFFIELD FOUNDATION ON CLINICAL TRIALS OF CORTISONE, A.C.T.H., AND OTHER THERAPEUTIC MEASURES IN CHRONIC RHEUMATIC DISEASES*

A comparative study of the value of cortisone and aspirin therapy in early cases of rheumatoid arthritis was started in 1951 by the Joint Committee of the Medical Research Council and Nuffield Foundation on Clinical Trials of Cortisone, A.C.T.H., and Other Therapeutic Measures in Chronic Rheumatic Diseases. The findings during the first and second years of therapy have already been published (Joint Committee, 1954, 1955). Although the therapeutic trial in its original form was not continued after the second year, most of the 61 patients originally taken into the trial have been followed by the physicians at the five participating centres, and a review of the condition of these patients at between three and four years from the start of therapy has provided some interesting information. The patients originally admitted to the trial form a well-defined and homogeneous group of early cases, since only patients with a disease duration of not less than three and not more than nine months were included. In addition the patients had to have a polyarthritis of rheumatoid type affecting at least four joints, with bilateral involvement of hands, feet, ankles, or wrists, and they had to be between 17 and 59 years of age at the time of entry into the trial. The sheep-cell agglutination test was carried out during the first year in 53 of the 61 patients studied and a positive result was recorded at least once in three-quarters of them.

Completeness of Follow-up

The number of patients available for assessment during the three to four years of study is shown in Table I. As previously reported, 3 of the 31 patients allocated to aspirin were lost during the first year of therapy. One woman aged 60 who did well emigrated to New Zealand. A woman aged 53 had a psychological breakdown after three months of therapy and declined to return. And a man aged 48 whose condition was deteriorating felt he was deriving no benefit from the tablets after six months. During the second year there were no losses, but during the third year five patients were lost sight of. In two women aged 45 the disease had been in complete remission throughout most of the second year, and they were untraceable at the

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The results of the trial were analysed by Dr. J. T. Boyd, of the Statistical Research Unit of the Medical Research Council, London School of Hygiene and Tropical Medicine, and the Subcommittee is greatly indebted to him for his work.

three- to four-year follow-up; one had been treated with cortisone, the other with aspirin. One man aged 58 who was receiving cortisone (75 mg. daily) developed haematemesis and melaena, for which gastrectomy was performed at another hospital. After this, cortisone was stopped and

TABLE I.—Number of Patients Available for Assessment and Drugs Actually Taken at Different Stages of the Trial

Drug Taken	Treatment Groups											
	Cortisone				Aspirin				Total			
	Start	1 Yr.	2 Yr.	3-4 Yr.	Start	1 Yr.	2 Yr.	3-4 Yr.	Start	1 Yr.	2 Yr.	3-4 Yr.
Cortisone	30	30	26	12	31	28	20	19	30	30	26	12
Aspirin	—	—	—	—	—	—	—	—	—	—	—	—
Other	—	—	1	2	—	—	4	4	—	—	5	7
None	—	—	3	6	—	—	3	3	—	—	7	9
Total	30	30	30	27	31	28	28	26	61	58	58	53
Not known	—	—	—	3	—	3	3	5	—	3	3	8

the patient was not seen again. A woman aged 60 was found to have a peptic ulcer during the third year of therapy, when on a cortisone dosage of 62.5 mg. daily; cortisone was gradually withdrawn under corticotrophin (A.C.T.H.) cover, but she had a severe flare-up of her arthritis, became seriously disabled, and was transferred to a long-stay hospital. Finally, a woman aged 58 who was receiving aspirin fractured her femur in a car accident, and was admitted to another hospital, where she was also receiving treatment for rheumatoid arthritis and anaemia at the time of the follow-up.

Thus of the eight patients not available for follow-up, two on aspirin and two on cortisone were lost because they did badly or developed serious complications. In one on cortisone and one on aspirin the disease had gone into complete remission during the second year. And two from the aspirin group were lost through unconnected events—namely, emigration and a motor-car accident.

Therapy

At the start of treatment all 61 patients were admitted to hospital for one month, but subsequently they were mainly treated as out-patients, though a small number were readmitted from time to time if the physician-in-charge considered this advisable. Other measures, such as splintage and physiotherapy, were prescribed throughout as indicated.

Details of the dosage of cortisone and aspirin employed in the trial were described in the previous reports. During the first year of therapy both substances were given in 12-week courses, but during the second year treatment was continuous at a dosage determined by the patient's physician, who was asked to employ the minimum dose that would produce maximum functional efficiency and relief of symptoms without producing serious side-effects.

During the third and fourth years treatment was left to the discretion of the physician, though the hope was expressed that, where possible, the patient should be encouraged to continue on the treatment originally allocated at the start of the trial.

The changes in treatment that took place during the period of observation are shown in Table I. At the end of the second year and at the three- to four-year follow-up there were three patients in the aspirin group and five in the cortisone group who were receiving no tablets because their disease was in full remission. One patient in the cortisone group was receiving no tablets of any kind in spite of continuing disease activity. By the end of the second year one patient in the cortisone group and four in the aspirin group were receiving other medicaments, such as tab. codein. co. or phenylbutazone, but by the last follow-up there were nine patients from the original cortisone group who were receiving other treatments, and seven of these were receiving aspirin, one was having phenylbutazone and one tab. codein. co., whereas from the original aspirin group 19 were still receiving aspirin, three phenylbutazone, and one gold.

Thus, of the 53 patients still available for follow-up at three to four years, 27 were originally started on cortisone and 26 on aspirin, but at the last follow-up only 12 were still taking cortisone, whereas 26 were taking aspirin, seven patients having been transferred from cortisone to aspirin, while none had been transferred from aspirin to cortisone. The mean daily dosage during the first and second years was 80 and 75 mg. for cortisone and 4.5 and 4.5 g. for aspirin.

At follow-up the mean daily dosage for those patients receiving the same tablets as at entry into the trial was 66 mg. for cortisone and 3.5 g. for aspirin.

Apart from two patients lost to follow-up through peptic ulceration, only four had their cortisone stopped because of undesirable side-effects. These were mainly not dangerous, consisting of dizziness, hypertension, headaches, dyspepsia, moon-face, etc.* The remaining six who had changed from cortisone to other tablets had done so because they were either deriving little benefit from cortisone or because they had discovered that other tablets were more effective, or for various reasons which were not clear. The small number of patients still on cortisone at the three- to four-year follow-up precludes a comparison between cortisone and aspirin therapy at this stage, but the status of patients originally allocated to the two treatment groups has been compared at three to four years after the start of therapy and the progress of all the patients admitted to the trial has been reviewed.

Assessments

Of the detailed assessments used in the first two years of the trial, some, including tenderness and range of movement in certain specified joints, were not universally recorded thereafter. Comparisons at three to four years have therefore been based upon a clinical statement of progress in general terms, such as functional capacity, disease activity, and remission rate, and also on radiological changes in the hands and feet, and laboratory findings such as sedimentation rate and haemoglobin level.

Results

The general functional capacity of the patients originally allocated to cortisone and aspirin therapy is shown in Table II. The two groups were very similar at the start.

TABLE II.—Number of Patients With Given Functional Capacity at Different Stages of the Trial

Grade	Treatment Groups											
	Cortisone				Aspirin				Total			
	Start	1 Yr.	2 Yr.	3-4 Yr.	Start	1 Yr.	2 Yr.	3-4 Yr.	Start	1 Yr.	2 Yr.	3-4 Yr.
1 Normal and only light work	4	23	21	19	5	23	23	20	9	46	44	39
2 Unemployment but able to do light work	18	5	7	6	18	5	5	6	36	10	12	12
3 Wheel-chair, etc., and bed-ridden	8	2	2	2	6	0	0	0	14	2	2	2
Total	30	30	30	27	29*	28	28	26	59*	58	58	53

* No record was made at the start of treatment for two patients on aspirin; subsequently these two patients appear in Grades 1 and 2.

Both improved considerably by the end of the first year and the position was virtually unchanged during subsequent follow-up. If we consider the eight patients lost sight of, it seems probable that at least two of them would have been in grade 1 or 2—that is, with virtually normal function—and at least two would have been in grade 4 or 5—that is,

*One man aged 43 whose rheumatoid arthritis went into complete remission during the second year of cortisone therapy developed nephritis (Ellis type II) shortly after stopping cortisone. Lupus erythematosus cells were looked for on several occasions with negative results, and after being invalided by his nephritis for most of the third year he eventually recovered.

seriously disabled—while the remaining four might have been in any grade. Thus the results on the whole may not be quite as good as the three- to four-year follow-up suggests. Whether the patients were treated with cortisone or aspirin initially appears to have been immaterial.

The number of patients in whom the disease was recorded as being in complete remission is shown in Table III. It will be seen that the numbers in remission increase

TABLE III.—Numbers of Patients (a) Reported by Physicians as Being in Remission and (b) With Given Clinical Assessment of Activity, at Different Stages of the Trial

Characteristic and Grade	Treatment Groups											
	Cortisone				Aspirin				Total			
	1 Yr.	2 Yr.	3-4 Yr.	1 Yr.	2 Yr.	3-4 Yr.	1 Yr.	2 Yr.	3-4 Yr.	1 Yr.	2 Yr.	3-4 Yr.
In remission	2	4	6	3	4	6	5	8	12	7	12	14
Activity: Inactive	2	4	6	2	4	5	4	8	11	2	4	5
Slightly active	21	20	12	19	16	5	40	39	28	21	19	14
Very active	7	6	9	7	5	5	14	11	14	7	7	7
Total	30	30	27	28	26	26	58	58	53	30	30	27

steadily each year, and if we were to add the two patients lost to follow-up who had been recorded as in remission during the second year the final remission rate would be 14 of the original 61, or 23%. At three to four years the remissions are distributed equally between the cortisone and aspirin groups, and there is clearly nothing to choose between the two treatments in this respect. The total number of patients showing a period of complete remission at some stage was actually 18, but four of them were known to have relapsed by the last follow-up.

A clinical assessment of disease activity based largely upon examination of the joints was also recorded by the physician in charge of the patient; the results are shown in the lower half of Table III. This shows a slight inconsistency in that only 11 patients were stated to have inactive disease at follow-up, but the general picture is the same and there is little to choose between the cortisone and aspirin groups.

The mean haemoglobin levels and sedimentation rates in the two treatment groups at the various assessment times are shown in Table IV. The advantage shown by the cortisone group at the end of the first year's treatment was subsequently lost, and at follow-up the mean haemoglobin in the cortisone group was only 0.5 g.% higher than that of the aspirin group, while the mean sedimentation rate was 8 mm. higher in the cortisone group. The distribution of sedimentation rates at follow-up in the two groups is shown in Table V.

TABLE VI.—X-ray Films of the Hands and Feet. Number of Patients with Given Gradings Amongst Those Who Were X-rayed at Two Years and at Three to Four Years

Grade	Porosis						Erosion					
	Cortisone		Aspirin		Total		Cortisone		Aspirin		Total	
	2 Yr.	3-4 Yr.	2 Yr.	3-4 Yr.	2 Yr.	3-4 Yr.	2 Yr.	3-4 Yr.	2 Yr.	3-4 Yr.	2 Yr.	3-4 Yr.
0 = Nil	9	7	7	5	16	12	7	6	2	1	9	7
1 = Doubtful	4	5	5	4	12	9	4	2	5	4	9	6
2 = Slight	7	7	8	9	16	16	11	9	8	6	19	15
3 = Moderate	4	3	2	2	6	5	3	5	7	6	10	11
4 = Severe	2	4	1	3	3	7	1	1	1	6	2	10
Total	26	26	23	23	49	49	26	26	23	23	49	49
Average grade change	1.35	1.69	1.35	1.74	1.35	1.71	1.50	1.96	2.00	2.52	1.74	2.22
		+0.34		+0.39		+0.36		+0.46		+0.52		+0.48
0 = Nil	12	6	6	5	18	11	9	5	5	3	14	8
1 = Doubtful	1	2	6	4	7	6	2	3	1	2	3	5
2 = Slight	3	8	6	6	9	14	10	9	10	11	20	20
3 = Moderate	4	2	1	3	5	5	1	4	3	2	4	6
4 = Severe	2	4	0	1	2	5	0	1	0	1	0	2
Total	22	22	19	19	41	41	22	22	19	19	41	41
Average grade change	1.23	1.82	1.12	1.53	1.17	1.68	1.14	1.68	1.58	1.79	1.34	1.73
		+0.59		+0.41		+0.51		+0.54		+0.21		+0.39

give a rate of 40% for inactive disease in 84 patients at a mean follow-up period of two and a half years. In this series of 53 patients the proportion of patients in remission at three and a half years was 23%. Detailed comparisons are, however, of doubtful value, since the dividing line between inactive and slightly active disease is difficult to define and the difference between "complete remission" as used in this series and "partial remission" is far from clear and almost certainly not uniformly applied in different centres. In general terms, however, it may be said that in a quarter of the patients in this series the disease went into remission, in a similar proportion of patients the disease remained very active, while in the remaining half the disease remained slightly active. Only a quarter of the patients became seriously disabled. This approximates to the expected results that could be derived from previous follow-up studies (Short and Bauer, 1948; Ragan, 1949; Duthie *et al.*, 1955).

Whether the patients were originally given aspirin or cortisone therapy appears to have been immaterial to the outcome. With the passage of time seven patients were transferred from cortisone to aspirin therapy whereas none were transferred from aspirin to cortisone. Serious complications of therapy were infrequent in this series, but were encountered only in patients on cortisone therapy. Though there is no significant difference between the two treatment groups at follow-up, the changes in therapy do suggest that with the passage of time both patients and physicians have in some cases come to prefer aspirin to cortisone therapy.

Conclusions

Certain conclusions can, we think, justifiably be drawn from this study. Firstly, the introduction of cortisone has not materially affected the prognosis of patients developing rheumatoid arthritis for the first time. Secondly, in early cases there appears to be little difference between the therapeutic effect of aspirin and cortisone, but in the long-term management of the disease, at least during the first four years, medication with aspirin is more often likely to prove satisfactory than medication with cortisone, though there are certainly some patients who feel they derive more relief from cortisone than from aspirin.

REFERENCES

- Duthie, J. J. R., Thompson M., Weir, M. M., and Fletcher, W. B. (1955). *Ann. rheum. Dis.*, 14, 133.
Joint Committee of the Medical Research Council and Nuffield Foundation (1954). *British Medical Journal*, 1, 1223.
— (1955). *Ibid.*, 2, 695.
Kellgren, J. H. (1956). *Ann. rheum. Dis.*, 15, 55.
Ragan, C. (1949). *J. Amer. med. Ass.*, 141, 124.
Short, C. L., and Bauer, W. (1948). *New Engl. J. Med.*, 238, 142.

NOTE ON THE SHEEP-CELL AGGLUTINATION TEST

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Results of the differential sheep-cell agglutination test were finally obtained from all patients except the three lost to the trial in the first six months. The cases admitted at Edinburgh, Sheffield, and Manchester were tested by the method of Ball (1950), the test being regarded as positive if agglutination occurred in a titre of 1:32 or higher when read at 18 hours. The cases admitted at Hammersmith and West London were tested by the original method of Rose *et al.* (1948), in which the test is regarded as positive if the two titres recorded show a ratio of 1:16 or higher. Only single tests were done in six patients, and, of these, four were positive. The remaining 52 patients were tested on several occasions throughout the period of observation. Of the

58 patients tested the results were positive on all occasions in 26, sometimes positive and sometimes negative in 20, and negative only in 12. The distribution of test results in the patients originally allocated to cortisone and aspirin therapy is similar, as shown in Table I. The tests were not

TABLE I.—Results of Differential Agglutination Test in Patients Originally Allocated to Cortisone and Aspirin Therapy

Results of Test	Treatment Groups		
	Cortisone	Aspirin	Total
Positive { Multiple tests ..	11	11	22
Single " ..	2	2	4
Positive and negative " ..	9	11	20
Negative { Multiple tests ..	8	2	10
Single " ..	—	2	2
Total ..	30	28	58

done systematically at set time intervals in all patients, so that no precise statement can be made about the behaviour of the test during the period of observation in the group as a whole, but such information as is available does not suggest that the titre values tend to rise with the passage of time. Indeed, 17 patients showed a steady fall in titre values, whereas only four showed a persistent rise, while in the remaining 31 with repeated tests titres remained unchanged or fluctuated up and down.

The 12 patients in whom only negative tests were recorded are of special interest, since in this small group there were seven remissions and no relapses, so that they account for half of the total remissions at follow-up. There is also some relationship between the sheep-cell test and the development of x-ray changes in the last available films of the hands and feet as shown in Table II, in which the gradings

TABLE II.—Correlation Between X-ray Gradings of Last Available Films and Differential Agglutination Test Results*

X-ray Gradings Porosis + Erosion	Results of Test			Total
	Negative Only	Positive and Negative	Positive Only	
2				
0	3	0	0	3
1	3	0	1	4
1½	0	1	2	3
2	1	5	3	9
2½	4	4	4	12
3	1	3	6	10
3½	0	4	2	6
4	0	2	3	5
	0	1	5	6
Total ..	12	20	26	58

* All patients tested and x-rayed have been included.

for porosis and erosion found in either hands or feet, whichever was the higher, have been added and then divided by 2. It will be seen that six of the seven patients with x-ray gradings of less than 1 had only negative tests, and no patients with only negative tests had an x-ray grading of over 2½, whereas 16 of the 27 patients with x-ray gradings of 2½ and more had persistently positive tests.

In the small series studied in this trial the prognosis of patients giving only negative results in the test was much better than in those giving only positive results, but there appeared to be no difference between those giving only positive results and those giving both positive and negative results in the test. Among the patients in whom the test was always negative there were several with severe widespread polyarthritis and high E.S.R. on entry into the trial, so that the negative tests and good prognosis cannot be entirely explained in terms of trivial disease. Whatever the explanation may be, it is clear that in therapeutic trials in rheumatoid arthritis the sheep-cell test should be performed on several occasions in all patients, and those giving only negative results in this test should be studied separately.

REFERENCES

- Ball, J. (1950). *Lancet*, 2, 520.
Rose, H. M., Ragan, C., Pearce, E., and Lipman, M. O. (1948). *Proc. Soc. exp. Biol. (N.Y.)*, 68, 1.

FOETAL POST-MATURITY AND PROLONGATION OF PREGNANCY

A CRITICAL STUDY OF THE INCIDENCE AND SEQUELAE OF INDUCTION OF LABOUR FOR POST-MATURITY IN BRITISH HOSPITALS, WITH REMARKS THEREON

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In 1922 W. J. Ballantyne and I published a paper entitled "The Problems of Foetal Post-maturity and Prolongation of Pregnancy." The opinions expressed were founded largely on the experience gained by the performance up to that time by one of us (F. J. B.) of over 500 post-mortem examinations of stillbirths and neonatal deaths. We emphasized the absence of any reliable criteria, clinical or pathological, for the diagnosis of post-maturity in the foetus or newborn child, but among our conclusions were the following: (1) the dangers to both mother and child are undoubted: they are chiefly associated with difficulty in the passage of the child; and (2) the treatment is prevention of post-maturity by induction of labour at or soon after the carefully calculated period of full-time gestation.

At that time induction of labour was the method of treating disproportion in Britain, and it was because of the fear of disproportion and difficult labour that we advocated it.

In this paper, which represents a somewhat new approach to the problem, the incidence and sequelae of induction of labour for post-maturity, as revealed in all the hospital annual clinical reports available to me—namely, 32 reports from 20 hospitals—are reviewed.

Incidence of Induction of Labour

Table I shows most of the essential details, and it will be observed that, with one or two exceptions, all the reports are of recent date. Each hospital is designated by a capital letter, and where a number is attached to a letter (for example, A1), it indicates reports of succeeding years from the same hospital.

Only inductions done after the 40th week are included and those in which there are no additional indications for induction, such as toxæmia, disproportion, and so on. Caesarean section rates for all the hospital deliveries are included because a high rate might sometimes compensate for a low induction rate.

It will be evident that there are wide differences in the incidence of induction for post-maturity. In hospital K during the year from July 1, 1949, to June 30, 1950, it was not done once in 4,949 deliveries, whereas in hospitals L and O it was done in 3%, and in hospitals G and A4 in 2.7% and 2.1% respectively. In hospital K, in which there were no inductions for post-maturity, the stillbirth rate was the seventh lowest in the series, and in hospital R, in which induction was done very seldom (0.11%) the stillbirth rate was the third lowest. In neither of these hospitals was the stillbirth rate done for post-maturity. Examination of the stillbirth records of hospital K shows that no stillbirths resulted in women who had gone beyond 40 weeks' gestation, so that no babies were lost through failure to induce. The caesarean section rate in this hospital was 1.8%, the lowest in the entire series.

It will be noted that some hospitals with a low induction rate for post-maturity had a very high perinatal mortality rate. This, however, seems to be due to other causes. Thus in hospital F, with 2,641 deliveries and no inductions for post-maturity, 75% of the patients were "non-white," and

TABLE I.—Essential Details of 596 Surgical Inductions of Labour for Post-maturity from 32 Annual Reports of 20 Hospitals

Hospital	Year	Total Deliveries	No. of Inductions for Post-maturity (Over 40 Weeks)	No. of Primigravidae	Percentage of Inductions for Post-maturity	Stillbirths %	N.N.D. (%)	P.N.M. (%)	Caesarean Section Incidence in All Deliveries
A	1947	1,320	4	3	0.3	2.6	1.6	4.2	4.2
A1	1948	1,257	7	5	0.5	2.7	1.3	4.0	3.9
A2	1949	1,315	15	13	1.1	1.6	1.7	3.3	3.8
A3	1950	1,270	17	7	1.3	0.9	1.7	2.6	5.5
A4	1951	1,285	27	11	2.1	2.3	0.9	3.2	5.4
B1	1951	1,131	9	3	0.8	2.0	0.6	2.6	1.8
B2	1952	1,085	3	3	0.27	2.8	1.2	4.1	2.5
B3	1953	1,906	3	0	0.33	1.7	1.7	3.4	2.3
C	1951	1,099	10	3	0.9	2.2	1.4	3.6	3.4
C1	1952	3,300	12	3	0.3	2.3	1.7	4.0	3.5
D	1951	3,446	33	15	0.95	2.1	1.2	3.3	3.2
D1	1952	6,418	29	5	0.45	2.3	1.8	4.1	3.4
D2	1954	6,838	34	4	0.5	2.2	1.6	3.8	2.6
E	1949	6,838	34	2	0.48	1.8	1.3	3.1	3.6
E1	1950	1,353	14	2	1.03	2.1	0.4	2.5	2.8
F	1949	3,347	63	20	1.8	2.8	1.4	4.2	2.2
F1	1954	2,775	0	0	0	5.0	2.3	7.3	1.9
G	1950	3,363	2	2	0.07	3.3	1.4	4.7	5.9
H	1946-50	3,930	67	?	2.7	2.3	1.4	3.7	3.1
I	1951	1,858	20	0	1.7	2.8	1.6	4.4	3.6
J	1953	3,185	6	?	0.2	2.25	1.7	3.95	5.5
K	1949-50	4,949	0	0	0	1.9	0.8	2.7	2.1
L	1954	808	25	?	3.0	1.8	1.5	3.3	1.8
M	1954	1,417	1	0	0.07	4.6	2.5	6.3	5.8
N	1954	1,932	2	1	0.10	5.8	2.7	7.3	2.18
O	1954	1,027	31	7	3.0	1.4	1.7	8.4	5.4
P	1954	562	1	0	0.2	7.5	7.2	14.7	4.3
Q	1954-5	1,577	2	?	0.12	1.7	1.5	3.2	16.7
R	1955-6	2,594	3	1	0.11	1.6	1.4	3.0	
S	1955-6	1,391	11	6	0.8	2.23	1.86	4.19	
T	1955	1,202	21	?	1.7	1.16	1.25	2.41	2.0

N.N.D. = Neonatal deaths. P.N.M. = Perinatal mortality.

the average antenatal attendance was 3.6 per patient. Of the 96 stillbirths, approximately half were emergencies, and only seven had exceeded 42 weeks' gestation, estimated from the first day of the last period. Particulars of these are as follows.

Case 1.—Emergency, 48 weeks; had been in labour five days with membranes ruptured 48 hours; transverse lie; internal podalic version; breech extraction; ruptured uterus; dead birth.

Case 2.—43 weeks; concealed accidental haemorrhage; weight 8 lb. 4 oz. (3,740 g.); dead born.

Case 3.—44 weeks; spontaneous delivery; foetal heart not heard; dead born: 5 lb. 5 oz. (2,420 g.). No post-mortem examination.

Case 4.—47 weeks; toxæmia; inertia; difficult instrumental delivery; 9 lb. 5 oz. (4,220 g.).

Case 5.—Emergency, 43 weeks; diabetic; arrested shoulders; 9 lb. 3 oz. (4,170 g.).

Case 6.—Emergency, 43 weeks; hysterectomy for intrauterine sepsis; weight of baby unknown.

Case 7.—43 weeks; deep transverse arrest; "failed forceps"; internal podalic version; breech extraction; dead born; 7 lb. 3 oz. (3,260 g.).

Apart from associated conditions, such as disproportion, concealed haemorrhage, diabetes, in only one of these seven (Case 3) could it be said that the foetal death might have been due to post-maturity, but as no post-mortem examination was done the particulars are not sufficient to justify a decision either way.

Hospital N had 2,043 women admitted to its wards in 1954, and of these 1,354 were "coloured" and 689 "natives"; 466 received antisyphilitic treatment, and the average number of attendances at the antenatal clinics was only 3.2 per patient. In hospital P with only one induction for post-maturity, the perinatal mortality was 14.7%. The maternal death rate was 11.7 per 1,000 births, and the average antenatal attendance was only 2.5 per patient.

Though the proportion of white and non-white patients in this hospital is not stated, it is notable that all the seven maternal deaths occurred in "coloured" women. None of the stillbirths were over 40 weeks, and therefore none would have been saved by induction. In hospital M, with only one induction for post-maturity, though again the proportions of white and non-white patients are not stated, all three maternal deaths occurred in non-white women, including two Bantus. The antenatal attendances averaged 4.5 per patient, and none of the stillbirths were over 40 weeks.

It is well known that stillbirth rates are much higher among "non-white" women. Edith Potter (1954) states that in 1950 the perinatal mortality in the United States was 66.7 per 1,000 births amongst non-white women and 39.7 per 1,000 among whites.

It will be evident, therefore, that there is no reason to believe that the high foetal and neonatal mortality in these three hospitals was due to their low induction rates. In fact, all the evidence is against it. Further, in hospital L, where the induction rate for post-maturity was 3%, and the highest in the series, the perinatal mortality was 6.3%—the fifth highest in the 32 reports.

Parity.—Clifford (1954) writes as follows: "In general, post-maturity constitutes no obstetric problem to the multiparous woman. In these women, although the incidence of postmaturity [defined by him as over 300 days from the first day of the last period] is 5%, the foetal and neonatal mortality is no higher than in the full-time infants." Yet in the present series, out of 384 inductions for post-maturity in which parity is stated, 261 (68.0%) were done in multiparae.

Sequelae

Induction-Delivery Interval.—In 24 cases this was over two days. Individual durations in these were as follows (in days): 19, 10, 7 (2 cases), 6, 5 (3 cases), 4½, 4 (5 cases), 3½ (2 cases), 3 (3 cases), 2½ (3 cases) 2½ (2 cases). In many cases the interval was shortened by caesarean section. The time elapsing between artificial rupture of the membranes and the onset of labour is not recorded in any of the reports, most of which were compiled in compliance with the directions for a standard report issued by the Royal College of Obstetricians and Gynaecologists, London, which does not require this particular detail. There can be no doubt, however, that the interval was often long, and that this can be dangerous to the foetus is well known. Gibson (1952), in a review of 843 surgical inductions in Belfast, done during 1946–50, found that intrauterine death occurred in 25% of the cases in which the latent interval exceeded 72 hours after artificial rupture of the membranes, probably from anoxia caused by excessive retraction of the uterus.

Caesarean Section.—In induced cases the caesarean section rate was 6.2%. This may not seem unduly high, but it should be remembered that none of the women who were subjected to it had any abnormality except that they had passed their expected date of delivery, because inductions for post-maturity in which there was an additional indication for termination of pregnancy have been excluded. Some of the caesarean sections, too, were done on young primigravidae, and not infrequently resulted in the birth of a quite small baby. Examples of this are:

1. Primigravida aged 23, supposed to be at the 45th week; induction-delivery interval not stated. Caesarean section for foetal distress; baby weighed 5 lb. 10 oz. (2,550 g.).
2. Primigravida aged 21, 41 weeks. Lower-segment caesarean section; weight 6 lb. 2 oz. (2,780 g.).
3. Primigravida aged 21, 42 weeks. Prolapsed cord, L.S.C.S.; weight 5 lb. 9 oz. (2,525 g.).
4. 1-para aged 22, 42 weeks; L.S.C.S.; weight 6½ lb. (2,950 g.).

The usual indication for caesarean section was uterine inertia or disordered uterine action, causing prolongation of the first stage of labour and foetal distress. The average weight of the babies born by caesarean section was 7½ lb. (3,400 g.), but ranged from 5 lb. 9 oz. to 10 lb. 2 oz. (2,525 to 4,590 g.).

Stillbirths.—There were 10 stillbirths, including 1 craniotomy.

Other Complications.—There were two cases of constriction ring, one of prolapsed cord, three of genital tract infection, including one case of hyperpyrexia in the first stage of labour, and one maternal death.

This patient, aged 42, had had four full-time confinements without any abnormality. The first day of her last period was stated to be April 18, 1955. She was seen 13 times in the antenatal clinic, when her blood pressure and urine were always found to be normal. External version was done for a breech presentation at 32 weeks. Vaginal examination at 40 weeks revealed an "unripe" cervix. Surgical induction, by stripping the membranes, was done at 10 a.m. on February 22, 1956, for "prolonged gestation," 44 weeks and 2 days having elapsed since the first day of her last period. The cervix was rigid, and while dilating it with the finger a slight tear was caused in it. The foetal head was then at the level of the ischial spines, and the patient's condition was good and the foetal heart sounds were regular and clear. Labour began 24 hours after induction and proceeded normally until 29½ hours after induction, when, at four fingerbreadths dilatation, she complained of severe pain in the left side of the chest, became cyanosed, with stertorous breathing, and died in 10 minutes—that is, at 3.25 p.m. on February 23. Post-mortem caesarean section was done, but the baby was dead. It weighed 7 lb. 5 oz. (3,345 g.).

At post-mortem examination of the mother no naked-eye abnormality was found. The following was the report on the microscopical examination: "In some of the small veins are linear refractile pink-staining structures and occasional basophilic amorphous masses. The significance of these is uncertain, but they may be amniotic emboli. The rest of the parenchyma is normal. Similar amorphous material is present in some small blood vessels of the kidneys, suprarenals, and ovaries." The provisional diagnosis of the cause of death was "amniotic embolism." Whether or not the induction contributed in any degree to the death it is not possible to say. The case is simply recorded.

Discussion

Perusal of the recent literature reveals considerable divergence of opinion on the importance of post-maturity as a cause of foetal and neonatal death, and indeed on the question whether it is a clinical entity at all. In the United States of America, D'Esopo and Marchetti (1942) reviewed 1,000 consecutive foetal deaths occurring in the six years 1935–40 at the New York Lying-in Hospital, and the Sloane Hospital for Women, New York, and do not mention post-maturity as a cause. Necropsies were done on 89% of Potter and Adair (1943), in a "clinico-pathological study of perinatal mortality" in the Chicago Lying-in Hospital during the 10 years 1931–41, in which there were 27,321 births, the 10 years 1954 and 1955 there were in the Chicago Lying-in Hospital 6,593 births. The stillbirth rate was 1.5% and the perinatal mortality 2.7%, both of which included all the foetuses and infants weighing 400 g. and over. Dr. two-year perinatal mortality over 2,500 g. was 1%. Dr. Potter, in sending me these figures in 1956, wrote as follows: "I have never found any evidence in our own material that post-maturity contributed to any death. Many years ago we used to deliver occasional babies for supposed post-maturity, but in several years we have had no caesarean sections or inductions performed for that indication. In fact, I have a strong feeling that one of the reasons for our reduction in mortality has been related to the decrease in induction."

Clifford (1954), the well-known Boston paediatrician, on the other hand, believes that it is an important cause of both foetal and neonatal deaths, but only in primigravidae. He states that 1 in 10 post-mature primigravidae (over 300 days) loses her baby, and that of primigravidae over 26 years old 1 in 3 who became post-mature will do so either before or after birth. In multiparae he finds that post-maturity is in

general unimportant, neither the foetal nor the neonatal mortality being any higher than in mature infants.

Among British writers there is a similar though much less sharp difference of opinion. Latto (1951), in 4,653 deliveries in Oxford, found 171 post-matures—that is, 42 weeks or more since the first day of the last period. Among these there were nine stillbirths, and of these only one could, in his opinion, be attributed to post-maturity. In this case the baby was born 15 days after the expected date and weighed 4 lb. 2 oz. (1,900 g.). The placenta was small and infarcted, and weighed 318 g. Latto blamed post-maturity and a small placenta for the stillbirth.

Gladys Hill (1952) (London) reviewed 115 cases of post-maturity (16 days or more over the expected date). She states: "The findings suggest that post-maturity *per se* does not affect adversely the mother, her labour, or her infant." McKiddie (1949) (Aberdeen, Scotland) found that foetal distress in labour occurred twice as often in post-mature cases as in those that were merely mature, but failed to find any correlation between its incidence and the degree of post-maturity. Neither was there any significant difference between the neonatal death rates in post-mature infants and those at term.

Opinion in Britain and elsewhere has been much influenced by the work of Walker and his colleagues (Walker and Turnbull 1953, 1955; Turnbull and Walker, 1955) in Aberdeen; they found that the stillbirth rate increased significantly after the 41st week. Walker put this down to anoxia, as he found that the oxygen supply of the foetus even in a clinically normal pregnancy falls gradually up to the 40th week and rapidly thereafter. At 43 weeks all foetuses have a low oxygen supply, and practically no reserve to meet the stress of labour. The rise in the death rate after the 40th and 41st weeks is due primarily, he says, to a rising incidence of "unexplained deaths"—that is, death *in utero* when there is no clinical abnormality of pregnancy or labour to explain it. Walker (1954) says: "Deaths of this type are common at 40 to 41 weeks, but by 43 weeks, in primigravidae and multigravidae, they are the highest single cause of death . . . by the 42nd and subsequent weeks at least one-third of all deaths are unexplained."

Rathbun (1943), of Boston, however, did not find any higher incidence of unexplained foetal deaths in post-mature cases either before or during labour (Table II).

TABLE II.—Incidence of Unexplained Deaths in Mature and Post-mature Cases Before and During Labour (After Rathbun, 1943)

	Mature		Post-mature	
	No.	%	No.	%
Deaths before labour:				
No cause	12	16.0	5	18.5
Cause apparent	7	9.3	5	18.5
Deaths during labour:				
No cause	7	9.3	3	11.1
Cause apparent	49	65.6	14	51.9

"However," he writes, "failure to appreciate the fact that labour may be more difficult may cost the baby its life, or even the mother hers." Rathbun concludes: "It would seem that post-mature infants are no more inclined to die for no apparent reason than term infants."

Clayton (1953) stressed the frequency of unexplained intrauterine death before the onset of labour when there is no question of post-maturity, and says it is seen nearly as often before the 42nd week as after it.

Even if we assume that there is a higher incidence of unexplained deaths during labour in post-mature cases, it would seem that as they are due to anoxia there may be another explanation of their occurrence than mere post-maturity—namely, the greater size of post-mature babies and consequent longer and more difficult labours. Rathbun found that the mean weight of mature babies of primiparae was 7 lb. 3 oz. (3,260 g.), and of multiparae 7 lb. 10 oz.

(3,460 g.). In post-matures the corresponding figures were 7 lb. 12 oz. and 8 lb. 4 oz. (3,515 and 3,740 g.).

Cope (1956) found that the average birth weight of 1,000 post-mature infants was 8 lb. 2 oz. (3,685 g.), whilst a sample of 200 merely mature infants (confined between the 273rd and 287th days) had an average birth weight of 7 lb. 8 oz. (3,400 g.). These figures are statistically significant.

Karn *et al.* (1951) found that the mean weight of the first-born males at 280 days was 7 lb. 2 oz. (3,230 g.), and increased to 7 lb. 12 oz. (3,515 g.) at 310 days. The mean weight of first-born females was 7 lb. (3,175 g.) at 282 days and 7 lb. 10 oz. (3,460 g.) at 316 days.

Rathbun also found that labour was longer in post-mature women. At term the average duration was 14.9 hours in primiparae and 8.8 hours in multiparae. In post-matures the corresponding times were 18.2 and 10.5 hours.

Walker (1954) found that the incidence of difficult labour in primigravidae rises steadily from the 37th to the 44th week. At the 40th week only 3.1% of all cases have a major degree of difficulty in labour or delivery, but by the 44th week the figure rises to 13.7%. This rise is, he says, "due mainly to an increase in uterine dysfunction of severe degree, but mechanical difficulty also increases, and is made clinically more important by the less efficient contractions." Clifford, Reid, and Worcester (1951) found that the average duration of labour in primigravidae whose babies were alive at the start of labour and yet were stillborn was 34 hours. The average duration of labour in primigravidae whose infants survived was 17 hours.

In passing it may be remarked that this continued growth of the foetus when pregnancy is prolonged after 42 weeks, which must be due to the passage of nutrient materials in solution across the placenta from the maternal to the foetal circulation, is difficult to reconcile with placental insufficiency and its inability to allow the passage of oxygen. It will be recalled that no greater degenerative changes have ever been found in post-mature than in mature placentas (Reynolds, 1937–8; Masters and Clayton, 1940).

As for the occurrence of unexplained intrauterine death before the onset of labour, it is well known to occur not infrequently when there is no question of post-maturity. In 14 of the hospital reports previously cited, I have found 72 unexplained intrauterine deaths before the start of labour, all under 40 weeks' gestation. In 60 of these post-mortem examinations had been done and the cause of death was usually put down as "asphyxia." Of the 72 deaths, 1 was at 28 weeks, 1 at 29 weeks, 5 at 30 weeks, 1 at 31 weeks, 4 at 32 weeks, 6 at 33 weeks, 7 at 34 weeks, 7 at 35 weeks, 7 at 36 weeks, 6 at 37 weeks, 18 at 38 weeks, and 9 at 39 weeks. Possibly they can be explained by the observations of Robinson (1921), professor of anatomy in the University of Edinburgh, who showed that in ferrets, on which his observations were made, a certain percentage of deaths are "normal" and are to be expected. They are not due to environment, or to any abnormality in the mother during pregnancy, because two or three foetuses in a uterine horn may survive and one die. Robinson concluded that the fault lay in the ovum or sperm or both, and that the embryo or foetus died because it was inherently unfitted to survive beyond a certain intrauterine age.

Compensatory Mechanisms in Anoxia

Accepting the findings of Walker and his colleagues that there is a gradual decrease in the oxygen passing from the maternal to the foetal blood, consideration must be given to certain compensatory mechanisms that nature develops to mitigate its harmful consequences to the foetus. These are at least five: (1) The foetal red blood cells and haemoglobin increase in proportion to the fall in the oxygen supply. If the pregnancy is prolonged beyond 40 weeks, foetal haemoglobin still continues to rise (Walker and Turnbull, 1953). (2) The nature of most of the foetal haemoglobin is different from that of the mother; it has a higher affinity for oxygen and so can take up oxygen more easily from the maternal

blood (Barcroft, 1946b). (3) Anoxia increases the amount of carbon dioxide produced by the foetal tissues, and this by raising the acidity of the blood automatically favours the dissociation of oxygen from haemoglobin and its transfer to the foetal organs, the increase in dissociation being in direct proportion to the partial pressure of carbon dioxide in the blood (Fulton, 1955). (4) The foetal arterial blood pressure rises (Barcroft, 1946a). (5) The foetus seems to have greater tolerance of oxygen lack than has the adult. There is evidence that this is due to a partial anaerobic metabolism which requires less oxygen per unit of energy, and that it persists for some time after birth. Its persistence probably accounts for the fact that, whereas the adult animal cannot stand deprivation of oxygen for more than three minutes newborn animals can survive it for times varying from seven minutes (guinea-pigs) to 50 minutes (rats). Many isolated observations suggest that a similar immunity to oxygen lack exists in the newborn infant (Wilson *et al.*, 1948).

That these compensatory mechanisms are often effective even if the stay of the foetus is prolonged long after 43 weeks is shown by the observation that in all the cases of post-maturity allowed in the English courts not one baby was born dead. A well-known example is that of Gaskill v. Gaskill in 1919, in which the baby was born 331 days after the last cohabitation. Adding 14 days—the usual time elapsing between the first day of the last menstrual period and ovulation—the length of gestation, counting from the first day of the last period, was 49 weeks and 2 days. The baby was not weighed at birth, but was said to be unusually large, and labour was prolonged. It was alive and well. A more recent case was that of Wood v. Wood (1947), in which 346 days had elapsed from the date of the last cohabitation. Adding 14 days, we get 51 weeks and 3 days since the first day of the last period. Again the baby was born alive and well.

It is no answer to these examples to say that the decisions of the courts were at fault. Any woman whose character and conduct can withstand scrutiny and cross-examination in, in each case, three of the highest English courts of law must indeed be without reproach.

It is interesting to reflect that if these two women had been cared for in almost any of the hospitals listed in Table I, labour would have been induced at the 41st or 42nd week and no action for divorce would have been brought on account of the unusual prolongation of pregnancy.

Normal Duration of Pregnancy

After deducting all cases in which the date of the beginning of the last menstrual period was doubtful, or whose gestation period counting from that day was greater than 313 days or less than 251 days, Sutton (1945) found that in 2,293 women the average length of gestation was 283 days, and this was the day on which the greatest number of babies were born. Only 5%, however, were born on that day. The term "average" or "mean" implies a "scatter" on either side of the mean. An important question is, "How large can that scatter be before a birth occurring on a day within it becomes premature or post-mature?"

The standard deviation in Sutton's cases is ± 9.3 days (the 10th day), and only 64% of the births took place between the 273rd and the 293rd day, and 36% took place outside these limits. We must certainly, therefore, regard at least these two days as within the normal range. Thus a baby born on the 273rd day is not necessarily premature, nor one born on the 293rd day necessarily post-mature.

These data show that there may be quite considerable variations in different individuals in the length of time that the foetus and placenta (for the placenta is part of the foetus and should therefore mature at the same rate) take to reach maturity. This suggests the possibility, to put it no stronger, that cases of so-called post-maturity are really instances of slow maturation. This conception would explain the well known fact that there are no reliable criteria, clinical or anatomical, of post-maturity in foetus or placenta. Even by x-ray examination of the centres of ossification before or after birth, or actual measurement of the ossific centres at

post-mortem examination, it is impossible to tell the foetal age within one month (Ballantyne and Browne, 1922).

All young women do not reach maturity and puberty at the same age. Clow (1927), in an English public school for girls, found that in 2,600 girls the most usual age of puberty was 13 years (in 34% of cases). The age of onset of menstruation was, however, 16 years in 14.41%, 17 years in 0.35%, and 18 years in 0.17%. Yet all were healthy girls. She concluded that it is not justifiable to regard a case as one of primary amenorrhoea, or to attempt to interfere with the natural course of events, so long as growth in weight and height continue. The Medical Women's Federation of Great Britain (1933) found that in 1,000 women the age of onset of menstruation varied from 9 to 21 years. In approximately 13% menstruation began after 17 years.

Seeing that there are such variations in the length of time taken to reach maturity in healthy girls, why should we expect it to be otherwise in the unborn child? Just as girls may continue to grow until menstruation starts, so we would expect the foetus to continue to grow *in utero*.

Fallacies in Menstrual Data

It is a commonplace that in the inquiry into a case of possible post-maturity a careful scrutiny of the menstrual history is essential, and especially of the possibility that conception may have occurred in a very long menstrual cycle. While the average length of the cycle is 28 days considerable variations from this mean are common. Gunn, Jenkin, and Gunn (1937), in an investigation of menstrual periodicity, found that in 209 apparently healthy women whose menstrual records were reliable the length of the cycle varied by more than 13 days in 30%. In one case the successive periods were 42, 58, 87, 54, 48, 56, and 36 days apart. If conception had occurred in the 87-day cycle the duration of the pregnancy, reckoned from the first day of the last period, would have been 59 days longer than it would have been in a 28-day cycle—that is, 342 days. In other words, the patient would have seemed to be 59 days (8½ weeks) post-mature, whereas, assuming that ovulation occurred 14 days before the next period was due, she was only at term. Such abnormally long intervals can never be entirely excluded, for they may occur in a woman whose cycles have hitherto been no longer than usual. If she were examined early in pregnancy suspicion might be aroused by discrepancy between the size of the uterus and the menstrual dates, though here again there are many well-known pitfalls.

As, however, the average weight of the post-mature child is greater than that of the merely mature child, and as this greater weight must be due to the longer stay of the foetus in the uterus, it is unlikely that conception in a long menstrual cycle accounts for many cases of post-maturity.

Summary

A review of hospital reports shows that there are very large variations in the frequency of induction of labour for post-maturity without any significant differences in the perinatal mortality rates. In certain hospitals the induction rate is 30 times that in others in which induction for post-maturity is done.

In one hospital with approximately 5,000 deliveries in a year it was not done once, yet the stillbirth rate was the seventh lowest in the 32 hospital reports, and the caesarean section rate was 1.8%—the lowest in all the reports. There were no deaths from post-maturity either before or during labour.

The complications occurring in 596 surgical inductions for post-maturity are reviewed. They include long induction-delivery intervals and a high caesarean section rate (6.2%), the sections being usually done for prolonged labour due to disordered or abnormal uterine action.

It is suggested that many cases of so-called post-maturity are really examples of slow maturation of the foetus and placenta, and that as good or better perinatal mortality rates can be got in these cases without induction.

Others may be due to the occurrence of conception in a very long menstrual cycle.

The higher foetal mortality in post-mature as compared with term babies can be adequately explained by the larger size of the infants in the former and the longer duration of labour.

If, because of the larger size of the baby, there is disproportion, the case should be treated by trial of labour. Induction of labour is not the modern treatment for disproportion, at least in primigravidae.

REFERENCES

- Ballantyne, J. W., and Browne, F. J. (1922). *J. Obstet. Gynaec. Brit. Emp.*, 29, 192.
Barcroft, J. (1946a). *Researches on Prenatal Life*. Blackwell Scientific Publ., Oxford.
— (1946b). *Irish J. med. Sci.*, p. 603.
Clayton, S. G. (1953). *Proc. roy. Soc. Med.*, 46, 91.
Clifford, S. H. (1954). *J. Pediatr.*, 44, 1.
— Reid, D. E., and Worcester, Jane (1951). *Amer. J. Dis. Child.*, 82, 232.
Clow, Alice E. S. (1927). *British Medical Journal*, 2, 446.
Cope, L. (1956). M.R.C.O.G. Thesis (unpublished).
D'Esopo, D. A., and Marchetti, A. A. (1942). *Amer. J. Obstet. Gynec.*, 44, 1.
Fulton, J. F. (1955). *Text Book of Physiology*, 17th ed., p. 832. Saunders Philadelphia and London.
Gibson, G. B. (1952). *J. Obstet. Gynaec. Brit. Emp.*, 59, 814.
Gunn, D. L., Jenkin, Penelope M., and Gunn, A. L. (1937). *Ibid.*, 44, 839.
Hill, Gladys (1952). *Ibid.*, 59, 807.
Karo, Mary N., Lana-Brown Helen, Mackenzie, Helen, and Penrose, L. S. (1951). *Ann. Eugen. (Camb.)*, 15, 306.
Latto, L. (1951). *British Medical Journal*, 1, 1364.
McKiddie, J. M. (1949). *J. Obstet. Gynaec. Brit. Emp.*, 56, 386.
Masters, M., and Clayton, S. G. (1940). *Ibid.*, 47, 437.
Medical Women's Federation (1933). *Lancet*, 1, 106.
Potter, Edith L. (1954). *J. Amer. med. Ass.*, 156, 1471.
— and Adair, F. L. (1943). *Amer. J. Obstet. Gynec.*, 45, 1054.
Rathbun, L. S. (1943). *Amer. J. Obstet. Gynec.*, 46, 278.
Reynolds, F. N. (1937-8). *Proc. roy. Soc. Med.*, 31, 781.
Robinson, A. (1921). *Ethin. med. J.*, 26, 137.
Sutton, D. H. (1945). *Med. J. Aust.*, 1, 611.
Turnbull, Elizabeth P. N., and Walker, J. (1955). *Arch. Dis. Child.*, 30, 102.
Walker, J. (1954). *J. Obstet. Gynaec. Brit. Emp.*, 61, 162.
— and Turnbull, Elizabeth P. N. (1953). *Lancet*, 2, 318.
— (1955). *Arch. Dis. Child.*, 30, 111.
Wilson, J. L., Reardon, Helen S., and Murayama, M. (1948). *Pediatrics*, 1, 581.

"The Health of Scotland" was the theme of a speech made last week by Mr. J. NIXON BROWNE, M.P., Joint Parliamentary Under-Secretary of State for Scotland, at the annual conference of the Scottish Branch of the British Red Cross Society. In 1949-50, the first full financial year of the National Health Service, £40m. was spent on the Service in Scotland; in 1956 the figure was £53m. Since 1949 the number of staffed hospital beds had risen from 58,700 to 63,000. Of these about 40% were reserved for mentally ill and mentally defective patients. In 1956 hospital out-patients numbered 7½ million, compared with 5 million in 1949; 4½ million pairs of spectacles had been issued since 1948, and 671,827 sets of false teeth since the charges for them were introduced in 1952. The number of family doctors in the Service had risen from 2,314 in 1949 to 2,603 in 1956, and there had been an encouraging growth of partnerships and group practices. The average number of patients per doctor, however, had fallen from 2,147 to 1,980. One feature in Scottish health statistics which had failed to improve much during the last 25 years was mortality among middle-aged males. The two main reasons for this were deaths from coronary thrombosis and from cancer, particularly lung cancer. The health record of Scotland was in some respects worse than that of England. One possible reason which had been suggested for this was that, according to the National Food Survey in 1954, "the Scots were inclined to indulge in a rather less nutritious diet than the English," eating more carbohydrates and less fruit, fresh vegetables, and meat.

SEDATION OF CHILDREN AS OUT-PATIENTS FOR DENTAL OPERATIONS UNDER GENERAL ANAESTHESIA

TRIAL OF METHYLPENTYNOL, BUTOBARBITONE, AND CHLORPROMAZINE

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Pre-operative sedation for dental out-patients requiring general anaesthesia is not commonly used, but is strongly advocated by Macintosh and Bannister (1952). It may not be necessary in adults, but the assumption that it is of value in the management of young children is widely held. It has been advocated as a method of reducing the emotional disturbances within a child about to undergo what otherwise may be a very frightening experience and as a way of reducing the outward expression of such emotions. It has also been suggested that the prevention of pre-operative terrors would remove the danger of post-operative emotional upsets.

The value of premedication for child in-patients has long been recognized. Basal narcosis has provided a satisfactory answer to the problem, except in the case of operations on the upper respiratory tract (Barnes, 1952). No safe and effective premedication technique has yet been devised for ambulatory children. Methylpentynol, however, has been claimed in both the medical and the lay press to be the ideal agent for this purpose. The statement by the makers of a brand of methylpentynol that their preparation has the "unique property of allaying fear and apprehension within a few minutes of its administration" suggested that its use as a premedicating drug for children should be carefully investigated.

The investigation described here was designed to study the effect of the pre-operative administration of three drugs to child out-patients attending hospital for dental extractions under general anaesthesia.

Conditions of Experiment

In Guy's Hospital two sessions each week are reserved for children between the ages of 2 and 15 years who require dental extractions under general anaesthesia. The children come from all parts of London and the neighbouring counties and from all classes of homes. A few require teeth extracted because of overcrowding of the mouth, but the majority require extractions because extensive caries has made the conservation of the teeth impracticable. A small number of teeth are removed for the immediate relief of pain.

The children are first seen in the dental department. If they need to have teeth extracted, instructions are given that they should be brought, without having had

breakfast, to the out-patient department at 8.30 a.m. on the day of the first convenient session, accompanied by a responsible adult. On arrival the children are given into the care of a nurse. After going to the lavatory, they wait together in a special room away from their parents for their turn to enter the theatre. The house-surgeon takes each child, in order of arrival, into the theatre, seats him in the chair, examines the mouth, and inserts a prop if it is required. The anaesthetist then takes charge of the child and begins induction of anaesthesia.

A senior dental surgeon is responsible for the surgical work. In selected cases, student dressers carry out the treatment under his instruction and supervision. The anaesthetist, in addition to his primary responsibility to the patient, teaches the practice of anaesthetics to student dressers and in suitable cases directs them to administer the anaesthetic under his supervision. Normally there are two surgical dressers and two anaesthetic dressers present in the theatre. With the addition of a nurse and a surgery assistant, this makes a total of nine persons in attendance on the patient.

After the operation the child regains consciousness in the dental chair. He is then handed over to a nurse, who looks after him and takes him to the recovery room. When the child's condition is satisfactory the recovery-room nurse takes him back to his parent, who has been waiting in the reception hall.

Two essential conditions had to be observed in this investigation: firstly, the obvious one that it should in no way cause any harm to the children; and, secondly, that it should not interfere with the normal conduct of the sessions.

Problem of Assessing Effect of Pre-operative Sedation

An essential requirement of any clinical trial is a criterion by which responses to applied measures may be judged (Gaddum, 1954). There is no yardstick readily available by which the effects of pre-operative sedation can be measured. This is probably because the object of this pre-medication is to modify an emotional state which in itself is unobservable. While it is recognized that mental stress can be manifest in bodily changes such as a faster heart rate, a raised blood pressure, a drying of the mouth, or an outbreak of cold sweating, the interpretation of such physical changes in terms of emotions has so far proved impossible. The claims that certain drugs dispel anxiety and apprehension have not therefore been based on objective studies.

An assessment of the degree of anxiety in a patient may be made at an interview. The reliability of the assessment will depend upon the extent to which the subject can communicate his feelings, the length of the interview, and the experience and prejudices of the interviewer. Because so many of the children were of an age at which they were unable adequately to describe their feelings, and since the necessary interviewing time could not be fitted into the normal programme of working of the children's extraction sessions to cover a large number of children, such a technique could not be used here.

Preliminary observations in the theatre revealed that, from the point of view of the anaesthetist and the surgeon, the principal advantage of pre-operative sedation was that it would reduce disturbed behaviour in the patients, thus facilitating the induction and maintenance of anaesthesia. If it is assumed that the patient's lack of co-operation arises from apprehension, then it is fair to judge the effectiveness of the pre-operative sedation by the way in which it influences the behaviour of those receiving it.

Even if the direct relationship between fear and truculence is denied, a harmless drug promoting co-operative behaviour before operations would be of considerable value.

We therefore decided to make an arbitrary scale of behaviour, with calm co-operation at the top, violent obstruction at the bottom, and one intermediate grade. By this scale the behaviour of each child was to be recorded before and after premedication. If the sedation were effective the children at the top of the behaviour scale on arrival would stay there as the time of operation approached. Those who were lower down the scale on arrival might be expected to be upgraded with the passage of time.

Preliminary Trial of Method of Assessment

A preliminary trial of the behaviour-grading procedure was made by one observer (A. C. K.) watching a series of 114 children undergoing dental extractions as described above. The behaviour grading was made at two distinct stages: firstly, immediately the child entered the theatre, and, secondly, when the presentation of the anaesthetic was begun, which is presumably a time of increased stress.

The children who appeared unmoved by the proceedings were graded calm. Those who were overactive or obviously tense, who sobbed, cried, or indulged in delaying tactics, but who yielded readily to suggestion, were put in the disturbed category. Children who refused to co-operate or were actively obstructive were classified as turbulent. The method was found to be practicable, and the results obtained are shown in Fig. 1. It can be seen that with the approach of the anaesthetic some of the calm children became disturbed and some of the disturbed became turbulent.

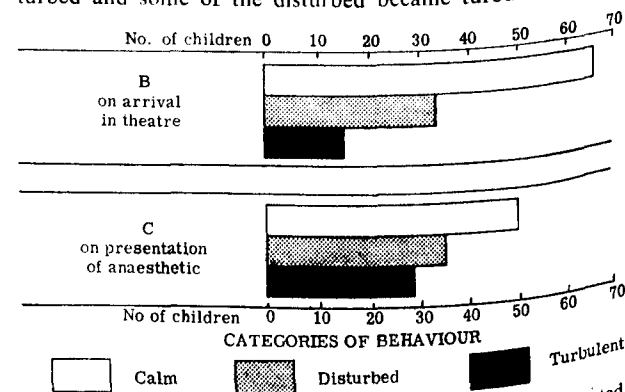


FIG. 1.—Behaviour shown at two stages by 114 unpremedicated children who were about to receive a general anaesthetic.

When two observers (A. C. K. and A. C.) in the theatre made independent assessments of pre-anaesthetic behaviour in terms of the scale, their ratings for each child observed were found to be in close agreement. It was concluded, therefore, that the procedure as outlined was relatively free from personal bias in a clinical assessment of behaviour.

Selection of Drugs

The neurophysiology of apprehension and anxiety is obscure. Rational pharmacology is therefore impossible and drug treatment is largely empirical. If it is assumed that fear is a function of mental activity, then a drug which depresses the central nervous system should logically promote tranquillity.

Methylpentynol.—Those concerned with the clinical investigation of methylpentynol as a hypnotic have observed that "one of the most valuable characteristics of the drug was to produce a state of quiescence accompanied by mental relaxation and a diminution of restlessness." Brookfield (1955), Trotter (1953), Nebel (1953), and Simmons (1954) have claimed good results from methylpentynol given to adults and children prior to dental extractions undertaken with general anaesthesia, and Bourne (1954) has written similarly about his experiences with methylpentynol in obstetrics. Simmons (1954) and Gusterson (1955) were

enthusiastic about the value of this drug before tonsillectomy, but Rendell (1954), Butler (1955), and Rollason (1955) reported otherwise. Because of its alleged clinical virtues and because it appeared to be a very safe drug, it was chosen for use in the present study with children. The dosage adopted—namely, 75 mg. per stone (11.8 mg. per kg.)—was arrived at from the manufacturer's advertised dosage of 250 mg. for a 5–10 years' old child.

Butobarbitone.—This barbiturate is often employed as a pre-operative sedative in dental surgery. For full basal narcosis the accepted standard dosage of a barbiturate such as butobarbitone is 40 mg. per stone (6.3 mg. per kg.). For the sedation of ambulatory patients there is no agreement about dosage. It was arbitrarily assumed, and subsequently confirmed, that 20 mg. per stone (3.1 mg. per kg.) would be a dose which could be given without danger of delaying the patient's recovery and discharge.

Chlorpromazine.—This drug, closely related chemically to the antihistamine promethazine ("phenegan"), is said to be of "unusual interest in psychiatry." In overactive and excitable patients it is said to promote resignation without clouding of consciousness—the so-called "medical leucotomy," and is being widely used in psychiatric practice. Its use as an oral premedicant does not appear to have been studied. In a single dose it has a wide therapeutic ratio and it is unlikely to give rise to those toxic complications encountered with prolonged administration. Its choice in the present investigation seemed, therefore, justified. The dosage, however, had to be arbitrarily adopted, since there was no precedent to serve as a guide. The manufacturers suggested a dosage of 2.5 mg. per stone (0.4 mg. per kg.) as being completely safe, although possibly below an effective level. This amount was given in the pilot trial, and, in view of the lack of evidence that the drug was acting, the dosage was doubled for the full-scale trial.

Design of Clinical Trial

The hospital dispenser prepared four solutions as nearly as possible alike in appearance and taste. One was a placebo and the other three contained the various drugs in such a concentration that the appropriate dose of each could be given by measuring 1 ml. per stone (0.16 ml. per kg.) body weight. Each solution was given a code letter by the dispenser and he alone knew the distribution.

At each session the children were received by one of us (R. G.). A serial number was entered on the patient's record ticket and a note made of the behaviour grading according to the scale described. The child was then weighed and given one of the preparations according to weight. The allocation of the solutions was randomized and the time of administration was recorded together with the other details.

Two observers in the theatre, one a psychologist and one a physiologist, working independently of each other and of the observer in the waiting-room, made two serial classifications of the behaviour of each child according to the scheme described above. Along with their assessments, they noted any particularly interesting events and recorded the type and duration of the anaesthetic. The anaesthetics in this series were either nitrous oxide and oxygen from a standard Walton apparatus or vinyl ether using the Oxford modification of the Goldman inhaler.

In the recovery room a nurse kept a third set of records in which she noted the time when the patient was fit to return to his escort and go home, and the reason for any undue delay in discharge.

Finally, all these records were passed to a secretary who, having obtained the key of the code from the dispenser, transferred all the data to punched cards.

Results of Pilot Study

As a practical test of the design of the trial, a pilot study was carried out. The results are charted in Fig. 2. Examination of this figure suggests that the distribution of

behaviour was identical in the first three "treatments," but that in the fourth, given chlorpromazine, disturbed behaviour was more frequent—possibly because nine of these children were under 6 years of age. The method, having been tested and found satisfactory, was then used on a larger series of patients.

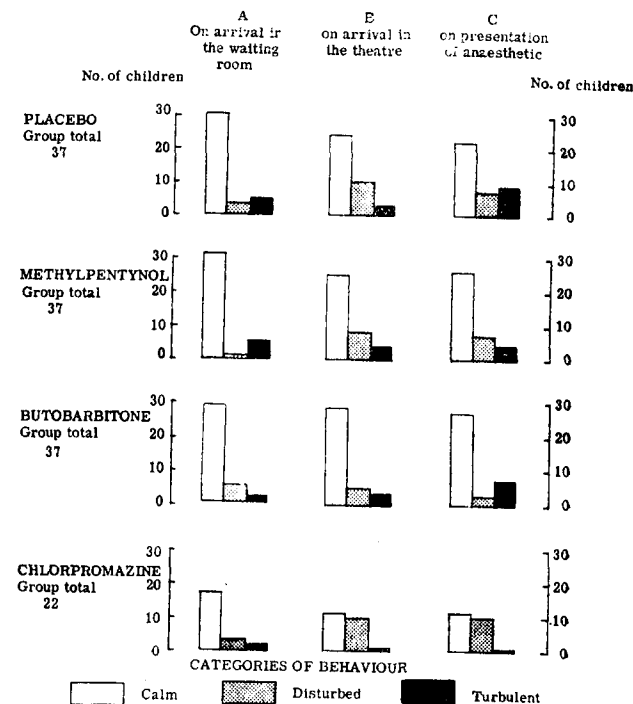


FIG. 2.—Behaviour shown at three stages by 133 children who were about to receive a general anaesthetic. The children are grouped according to their premedication.

Results of Trial

Of the 410 children premedicated and observed as described, 357 were watched by both A. C. K. and E. M. W. in the theatre. Table I shows the distribution of the children among the four treatments and the interval of time between swallowing the solution and entering the theatre. The children for whom this time interval was less than 15 minutes have been excluded from the results.

Table II shows the age distribution of the remaining 338 children according to the treatments they received. In each treatment the age distribution is approximately the same.

TABLE I.—Distribution of Premedication Intervals for 357 Children Arranged in Four Treatment Groups

	Interval in Minutes Between Having Treatment and Entering Theatre						Total
	0-14	15-29	30-44	45-59	60-74	75-89	
Placebo	4	31	34	14	6	2	91
Methylpentynol	7	27	36	10	10	1	91
Butobarbitone	2	27	34	16	8	2	89
Chlorpromazine	6	23	35	16	4	2	86
Total	19	108	139	56	28	7	357

TABLE II.—Distribution of Age by Treatment Groups in Children Who Had Their Premedication more than 15 Minutes Before Entering Theatre

	Age in Years						Total
	2	3	4	5	6	7-13	
Placebo	3	7	13	10	10	44	87
Methylpentynol	5	7	11	10	9	42	84
Butobarbitone	3	8	9	9	12	46	87
Chlorpromazine	4	5	9	6	6	50	80
Total	15	27	42	35	37	182	338

The behaviour gradings for the four groups at the three stages of observation are shown in Fig. 3. No differences between the four treatments are obvious, but the charts may conceal improvements or deteriorations in the behaviour of individual children. In order to study the change of individual behaviour with time, the following method of analysis was used.

Fig. 4 shows the change in behaviour with time of children who were graded "calm" on arrival. Those who were still graded "calm" on entry to the theatre are shown in Fig. 4, a. It can be seen that most of them remained calm

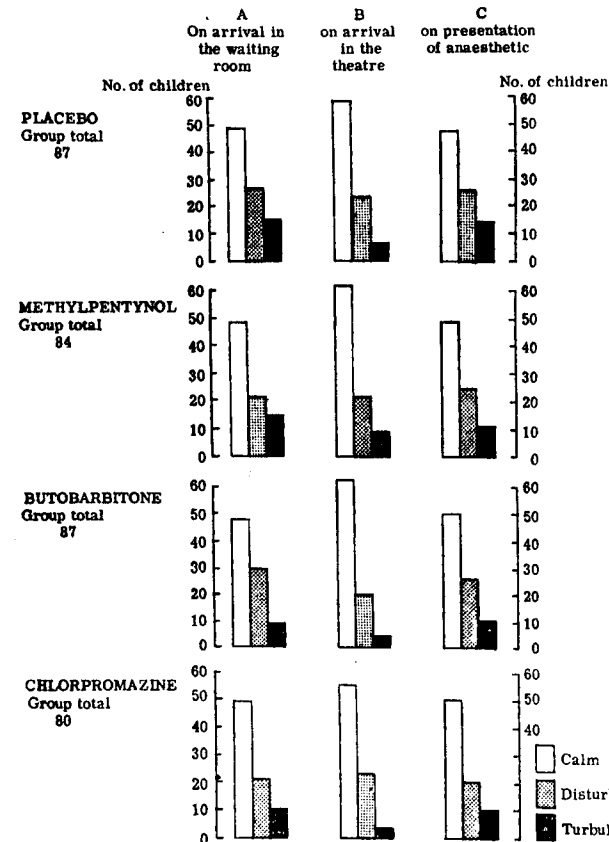


FIG. 3.—Behaviour shown at three stages by 338 children who were about to receive a general anaesthetic. The children are grouped according to their premedication. The distribution of the three types of behaviour was similar in all four groups.

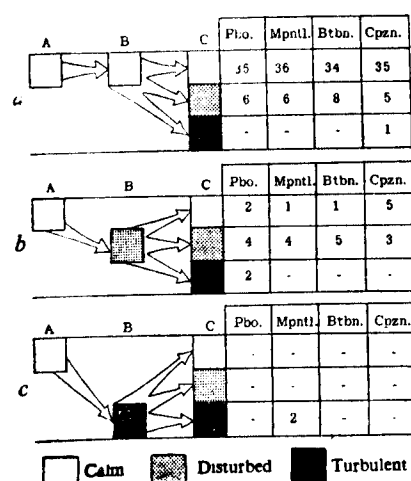


FIG. 4.—Subsequent behaviour of children graded calm on arrival at the waiting-room. A, B, C=times of grading as in Figs. 2 and 5. Pbo.=placebo; Mpn.=methylpentynol; Btbn.=butobarbitone; Cpzn.=chlorpromazine.

on the presentation of the anaesthetic, but about 15% of them showed disturbed behaviour. Fig. 4, b shows that the children who were calm on arrival and disturbed on entering the theatre, sometimes improved, but generally remained in the disturbed category. A marked change from "calm" on arrival to "turbulent" on entry to the theatre was shown by only two children (Fig. 4, c).

When the four treatment groups are compared in this way there is still no suggestion of a difference which might be due to the effect of any particular treatment.

The data for the children who were graded disturbed on arrival in the waiting-room are similarly treated in Fig. 5, a, b, c, whilst the progress of those assessed in the waiting-room as turbulent is followed in Fig. 6, a, b, c.

In each treatment, improvements and deteriorations can be seen to have occurred, but there was no suggestion that any of the three premedication treatments was more effective than the placebo.

It was obvious during the trial that disturbed behaviour was much more frequent in the younger children. In Fig. 7 the data for each treatment group are presented in two sets—one for the children up to and including 6 years of age, and the other for the older ones. Within one group, no significant differences were found, but between the two age groups a marked difference in the distribution of types of behaviour was revealed.

Whereas in the older children roughly two-thirds were graded calm throughout the period of observation, in the younger group only about one-third maintained that standard of behaviour.

Comparison of Findings of Two Independent Observers

Whilst it is reasonable to assume that the design of the trial precluded the possibility of an observer being biased for or against any particular drug, one observer might have made subjective errors so that his results were unreliable. The probability that two independent observers would both repeatedly make the same subjective errors in the conditions of this study is small. If agreement is found between the assessments of two independent observers watching the same event the results can therefore be taken as reasonably reliable.

Table III is an attempt to show the extent of agreement between two such observers. There is close agreement between two observers in grading calm or turbulent children, but two observers in grading the children on entry to the theatre in a higher grade than A.C.K. This tendency, however, was not maintained at the second grading.

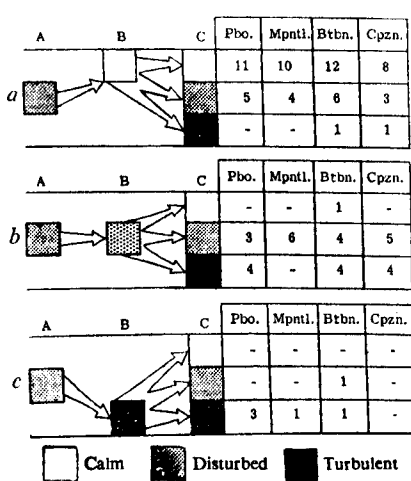


FIG. 5.—Subsequent behaviour of children graded disturbed on arrival at the waiting-room. Explanations as in legend to Fig. 4.

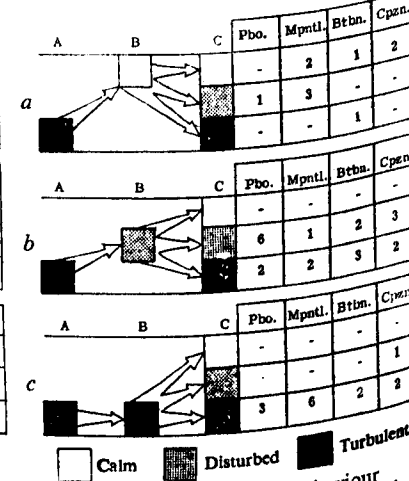


FIG. 6.—Subsequent behaviour of children graded turbulent on arrival at the waiting-room. Explanations as in legend to Fig. 4.

and the differences were small in proportion to the agreements, and varied evenly on either side. Where disagreements occurred they were distributed evenly among the treatment groups.

We do not feel that the disagreements were serious enough to invalidate the method. When the observations of E.M.W. were analysed in the same way as A.C.K.'s in Fig. 3, the distribution of behaviour was the same.

Discussion

The absence of any measurable effect on behaviour in the medicated children may be due to various causes.

Firstly, dosage may be a critical factor. The distributors of methylpentynol recommended in their advisory leaflets that for pre-anaesthetic medication a child of 5 years of age should receive 250 mg. This age group proved almost modal for the children with whom we had to deal and this standard was accordingly taken as a basis. If a child of 5 years weighs, on an average, a little less than 3 stone (19 kg.) (Sutcliffe and Canham, 1950), then the dose adopted was worked out at 75 mg. per stone (11.8 mg. per kg.) of body weight. For butobarbitone no recognized figure was available. 30 to 40 mg. per stone of body weight is employed for full basal narcosis—a state to which it would be dangerous to proceed with ambulant out-patients. 20 mg. per stone (3.1 mg. per kg.) of body weight appeared to be about the largest dose which could be given under these circumstances. The fact that there was no evidence of excessive sleepiness in the children receiving this drug suggests that more might have been given. The problem with a barbiturate of this sort, however, is to settle on a dose which achieves sedation without at the same time impairing co-operation. The danger of restlessness with butobarbitone described by some authorities (Lucas, 1954) served as a further caution against the use of this drug, though fortunately we did not encounter this complication.

For chlorpromazine there was no precedent. The dose of 5 mg. per stone (0.8 mg. per kg.) of body weight was used for the trial proper, at which level no undesirable side-effects were seen.

That the doses used in this trial, particularly of methylpentynol and chlorpromazine, were inadequate is a possible criticism. But other workers (Trotter, 1953) have claimed undoubted success, at least with methylpentynol, at a dosage no greater than that which we followed.

Absorption of the drug must also be taken into account. Data relating to those children who received their medication less than 15 minutes before the induction of anaesthesia were excluded from consideration. As the drugs were all administered in fluid form on an empty stomach, reasonable absorption should have taken place by this time, allowing for the excitement due to the occasion. The manufacturers of methylpentynol have stated, moreover, that 10 to 20 minutes before operation is an adequate interval.

To be examined also are the standards of assessment by which the behaviour was judged. They may not have been sufficiently delicate or precise. Yet by reference to these standards a contrast in behaviour between the various age groups was strikingly demonstrated, while the findings of the two independent observers closely agreed. The criteria were therefore adequate in certain respects, and it is clear that by such yardsticks, whatever changes may have been brought about among the younger children, these were never sufficient to give them the poise of the more mature subjects.

It is clear that, within the conditions of this trial, methylpentynol, butobarbitone, and chlorpromazine could not be distinguished from a placebo by their effect on the behaviour of out-patient children about to undergo general anaesthesia for dental extractions. What, in fact, seems to be much more important than attempted pre-anaesthetic sedation by means of drugs is the age of the children concerned. Those over 6 behave in an almost unexceptionable manner, and for them premedication is almost unnecessary. From observations made in a clinical trial, a value may be ascribed to one or more drugs which, in fact, ought rather to be ascribed to age differences, unless these are carefully taken into account as well.

We would make it clear that our study has been concerned with behaviour—not anxiety. The latter is much more difficult to assess, and we wonder, for reasons already set out in the introduction to this paper, whether other workers are entitled to draw conclusions about anxiety when

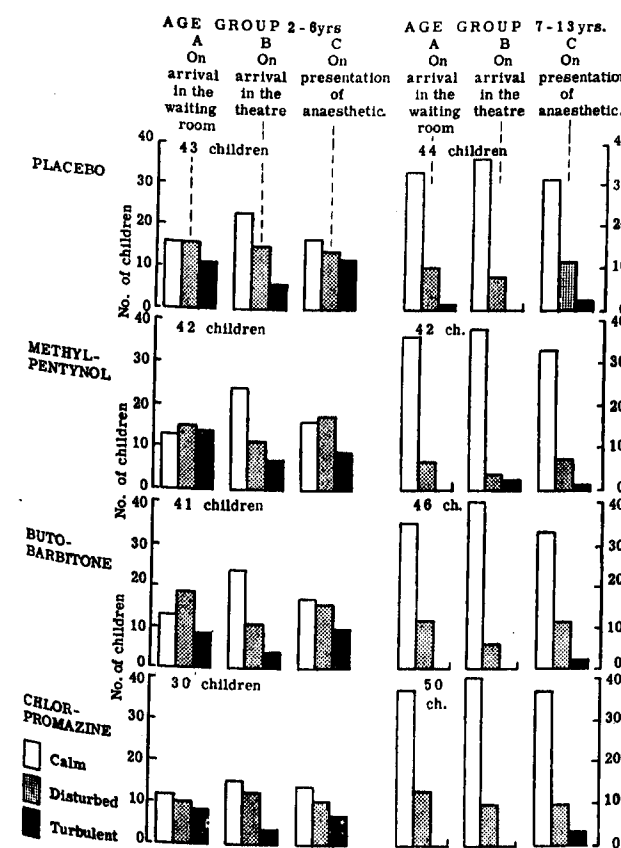


FIG. 7.—Behaviour shown by the younger and the older children before general anaesthesia.

TABLE III.—Comparison of Findings of Two Observers who were Assessing the Behaviour of 390 Children About to be Anaesthetized. The Percentage Occurrence of Agreements and Disagreements Between the Observers are Shown, Taking A.C.K.'s Assessments as the Baseline. Agreements are Shown in BOLD TYPE

A. C. K.'s Observations		How E. M. W. Graded the Same Children		
Grading	No. of Children	Calm %	Disturbed %	Turbulent %
Observations at Child's Entry to the Theatre				
Calm	273	99	1	—
Disturbed	87	29	63	8
Turbulent	30	—	23	77
Observations at Beginning of Presentation of Anaesthetic				
Calm	222	91	9	—
Disturbed	110	13	77	10
Turbulent	58	—	21	79

Recovery Period

Careful attention was paid by the nurse in charge of the recovery room to any unusual behaviour on the part of the patients throughout the trial. There was no evidence that the medication either caused any unusual behaviour or delayed their recovery to a stage when they were fit to leave the hospital.

during a trivial procedure when he had successfully withstood a suprapubic prostatectomy so recently. This patient was premedicated with atropine 1/100 gr. (0.65 mg.). The cyprane inhaler was at no time set beyond the third mark.

Case 6

A healthy man aged 40 was admitted to hospital for block dissection of glands of the right side of the neck. He was premedicated with papaveretum, $\frac{1}{2}$ gr. (22 mg.), and scopolamine, 1/150 gr. (0.43 mg.). Anaesthesia was induced with thiopentone and suxamethonium. The throat was sprayed with lignocaine 4%, a No. 9 plain endotracheal tube passed, and a throat pack inserted. Anaesthesia was maintained with nitrous oxide, oxygen, and trichlorethylene. Following the adoption of a 15–20-degree foot-down tilt and intermittent doses of hexamethonium bromide to a total of 100 mg., the blood systolic pressure was stabilized at a level of 85 mm. Hg. While the dissection proceeded round the subclavian vein a small puncture was made in the vessel, but this was rapidly sealed without entry of air. When dissection had proceeded to the level of the hyoid bone respiration suddenly and dramatically ceased. Carotid pulsation was no longer visible and the apex beat was absent. Immediate artificial ventilation with 100% oxygen in the head-down position was performed and cardiac massage was instituted within $1\frac{1}{2}$ minutes of arrest. The heart was restarted within 30 seconds, and respiration began within a further minute, with restoration of systolic blood pressure to the previous level. The operation was completed under nitrous oxide, oxygen, and intravenous pethidine without further incident. The patient was conscious and rational on termination of the anaesthesia.

The hypotension in this case was never marked and in fact the blood pressure remained at a stable level for 45 minutes, never falling below 80 mm. Hg systolic. The dramatic nature of the collapse is in marked distinction to the usual manner in which death occurs during hypotension (Committee upon Deaths Associated with Anaesthesia 1953). Coronary thrombosis, whether due to the hypotension or occurring as a primary condition, can presumably be excluded by the rapid response of the heart to cardiac massage and the subsequent uneventful recovery. Air embolism is not consistent with the suddenness of the collapse and the equally rapid and complete recovery.

Case 7

A healthy young primigravida aged 30 was admitted to hospital for lower uterine segment caesarean section for contracted pelvis and foetal distress. Premedication was by atropine, 1/100 gr. (0.65 mg.). Anaesthesia was induced with thiopentone and maintained with nitrous oxide, oxygen, and trichlorethylene. After delivery of a live infant the uterus was well retracted and the blood loss was within normal limits. As the abdomen was being closed cardiac arrest occurred. Resuscitation restored a feeble pulse and spontaneous respiration but the patient failed to regain consciousness and died two hours later. Necropsy revealed no cause of death.

Haemorrhage in this case was by no means excessive and up to the time of arrest the patient gave no cause for concern to either surgeon or anaesthetist.

Comment

Cardiac arrest occurring during trichlorethylene anaesthesia is not necessarily cardiac arrest due to trichlorethylene. Before the drug is incriminated certain conditions must be fulfilled. (1) The pattern of arrest must be essentially similar in all cases. (2) Other possible causes of arrest must be absent. (3) The technique of administration of the drug must be beyond reproach, avoiding both anoxia and overdosage.

In each of the cases reported above the clinical picture has been essentially the same, displaying the features originally described by Snow when he first reported primary

cardiac failure under chloroform anaesthesia. Recovery without cardiac massage does not preclude the diagnosis of cardiac arrest in those cases exhibiting the classical features—namely, pallor, apnoea, and absence of pulse and heart sounds. This has recently been demonstrated conclusively by Johnstone (1955) who also showed that resuscitative measures short of cardiac massage may suffice under certain circumstances.

In four of our cases arrest occurred during induction and before surgery had been started. In the remainder the picture is more complicated, but for the reasons given with each report we feel that trichlorethylene was responsible for the arrest which occurred.

In one case trichlorethylene was administered from a cyprane inhaler, a method commonly used both in this country and abroad. In the other cases administration was from the chloroform bottle of the standard Boyle machine, the oxygen varying between 25 and 30% and the minute flow being 7 to 8 litres. Only minimal quantities of trichlorethylene were added, the lever being never more than half-way open and the plunger fully elevated. Enderby (1944) has condemned the use of the chloroform bottle on the Boyle machine for the administration of trichlorethylene. He maintains that even in the minimal position the concentration of trichlorethylene administered is excessive for maintenance of anaesthesia, while anything approaching the maximum concentration is in excess of that required to anaesthetize any patient. Within these limitations, however, the Boyle bottle is still commonly used, and without it the use of trichlorethylene for anaesthesia would virtually cease in this country.

Reassessment of the Place of Trichlorethylene in Modern Anaesthetic Practice

Trichlorethylene, being a powerful analgesic, neither irritant nor explosive, has been widely used in the following circumstances: (1) As a supplement to nitrous oxide and oxygen in the production of light anaesthesia without anoxia. Since after-effects are minimal its popularity became rapidly established in dental, casualty and obstetric practice. (2) To produce the analgesia of Gray's triad (Gray and Rees, 1952) in conjunction with thiopentone, nitrous oxide, and a muscle relaxant. In this respect it is used in lower abdominal surgery and in such operations as herniorrhaphy and haemorrhoidectomy, where some relaxation is desirable but assisted rather than controlled respiration is indicated. (3) As a suitable agent for maintenance of anaesthesia when the explosion hazard is present. (4) As an analgesic vaporized by air.

Hunter (1944) has suggested that the use of trichlorethylene as a routine supplement to nitrous oxide and oxygen should cease. To facilitate the introduction of ether, vinyl ether anaesthetic mixture is just as effective and much safer to the cardiac rhythm. For maintenance of light anaesthesia the trichlorethylene may well be replaced by minimal ether, the increased incidence of post-operative vomiting which may ensue being a small price to pay for the increased safety of the agent used. Since the introduction into anaesthetic practice in this country of intravenous pethidine (Mushin and Rendell-Baker, 1949) this drug has largely supplanted the more toxic volatile anaesthetics, and it may well be that alphaprodine hydrochloride ("nisentil"), at present under investigation, will prove even more satisfactory in this respect.

For dental and casualty anaesthesia Bourne has recently advocated the use of cyclopropane and oxygen; where the explosion hazard is present the oxygen is diluted with nitrous oxide. While this technique has still to stand the test of time the results so far are encouraging. Another suitable alternative for this type of anaesthesia is vinyl ether anaesthetic mixture. In obstetrical anaesthesia the skilful use of ether dispenses with the need for trichlorethylene, and indeed in a recent report Lock and Greiss (1955) condemn its use as an anaesthetic in obstetrics under any circumstances. Similar

considerations apply when reviewing the choice of analgesic agent for use with a relaxant in lower abdominal surgery.

The use of diathermy precludes the employment of any inflammable agent, but once again the introduction of pethidine has reduced the indications for trichlorethylene in this sphere.

The use of trichlorethylene as an analgesic vaporized by air in the apparatus commonly used to date is obviously not without risk. Whether these dangers have been completely overcome by the introduction of thermostatically controlled vaporizers remains to be seen.

Conclusions

Pharmacologically, trichlorethylene bears a strong resemblance to chloroform, and while it is not suggested that the incidence of cardiac arrest is at all comparable it may well be that the occurrence is not so rare. Reported cases are indeed few, but it is possible that this is due to a natural reluctance to publicize mishaps. When cardiac arrest occurs during anaesthesia many possible factors may be implicated. As this is an infrequent occurrence in the clinical experience of any one anaesthetist, and as trichlorethylene is reputedly a safe anaesthetic, it is not surprising that the blame in these cases is apportioned elsewhere and the incident passes unrecorded. This is well seen in Case 6 of our series, where if death had occurred the exclusion of air embolism or coronary thrombosis would have been virtually impossible.

We feel that the place of trichlorethylene in modern anaesthesia is very limited, and in the absence of strong indications for its use other, and safer, agents should be employed. When it is used, however, the possibility of cardiac arrest should be borne in mind and the risk balanced against the advantages to be gained. There is still a place for a safe non-inflammable volatile anaesthetic agent should such be discovered.

Summary

A critical survey of the literature pertaining to cardiac arrest during trichlorethylene anaesthesia is presented. Seven previously unpublished cases are reported. The aetiology of the cardiac arrest in these cases is discussed and the possible role of trichlorethylene is emphasized. The scope of trichlorethylene in modern anaesthetic practice is reassessed and the employment of alternative agents whenever possible is recommended.

We are indebted to Dr. R. W. Cope for making available to us further details of the cases already reported by him. We are grateful to our colleagues whose cases are included in this report, and no less to those whose cases have for various reasons been omitted. Finally, we thank Dr. A. C. Forrester and Dr. D. M. Armstrong for their encouragement in the preparation of this paper.

ADDENDUM.—Since this paper was prepared the Committee upon Deaths Associated with Anaesthesia has produced a further report (*Anaesthesia*, 1956, 11, 194). In this report nine cases of primary cardiac failure are mentioned and a typical case history is given. This type of death accounts for 1.5% of the cases where the anaesthetic is considered to have been responsible for the fatality.

REFERENCES

- Bernstine, M. L. (1954). *A.M.A. Arch. Surg.*, 68, 262.
Committee upon Deaths Associated with Anaesthesia of the Association of Anaesthetists of Great Britain and Ireland (1952). *Anaesthesia*, 7, 200.
(1953). *Ibid.*, 8, 263.
Cope, R. W. (1949). *British Medical Journal*, 1, 454.
de Solderhoff, R. (1949). *Ibid.*, 1, 634.
Enderby, G. H. (1944). *Ibid.*, 2, 300.
Gray, T. C., and Rees, G. J. (1952). *Ibid.*, 2, 891.
Haworth, J., and Duff, A. (1943). *Ibid.*, 1, 381.
Hunter, C. L., and Hadfield, C. F. (1941). *Ibid.*, 1, 924.
Johnstone, M. (1955). *Lancet*, 1, 308.
Lock, F. R., and Greiss, F. C. (1955). *Brit. J. Anaesth.*, 27, 566.
Mushin, W. W., and Rendell-Baker, L. (1949). *Lancet*, 1, 619.
Ostlere, G. (1953). *Trichlorethylene Anaesthesia*. Livingstone, Edinburgh.
Stout, R. J. (1951). *Brit. J. Anaesth.*, 23, 121.

AN OBSCURE CASE OF RUPTURED DIAPHRAGM

BY

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The following case of herniation of the stomach into the left pleural space may be considered rare enough to be placed on record.

Case Report

A man aged 54 was admitted to hospital as an emergency case on April 26, 1956. He was too distressed to give a history; he was gasping for breath, cold sweat was running down his face, and his extremities were blue and cold. It was noted that the heart pulsations were over to the right of the sternum, the trachea was also displaced to the right, the left chest was moving poorly and air entry could not be heard.

The history relevant to this episode is that he had been admitted to hospital as an acute abdominal emergency on September 9, 1954, and a diagnosis of perforation of a diverticulum of the pelvic colon was made. At operation the peritoneum was found to be full of foul-smelling fluid and a large, immovable inflammatory mass was felt in the pelvic region. Left iliac colostomy was performed and the abdomen drained. After a stormy convalescence, complicated by bilateral bronchopneumonia, he left hospital a month later.

On September 5, 1955, he was again admitted and a diagnosis of right-sided subphrenic abscess was made. At operation, after resecting the 12th right rib, foul-smelling pus was evacuated from the anterior superior space beneath the diaphragm and the space was drained for 15 days. He was discharged 21 days after his operation, and he remained at home, reporting to hospital occasionally, until the catastrophe here reported.

Immediately after the present admission a skiagram of his chest showed almost complete collapse of the left lung, with displacement of the mediastinum to the right, apparently due to an extensive hydropneumothorax (Fig. 1). On viewing the skiagram, the Senior Medical Registrar (Dr. D. C. Watson) passed a needle into the chest posteriorly,

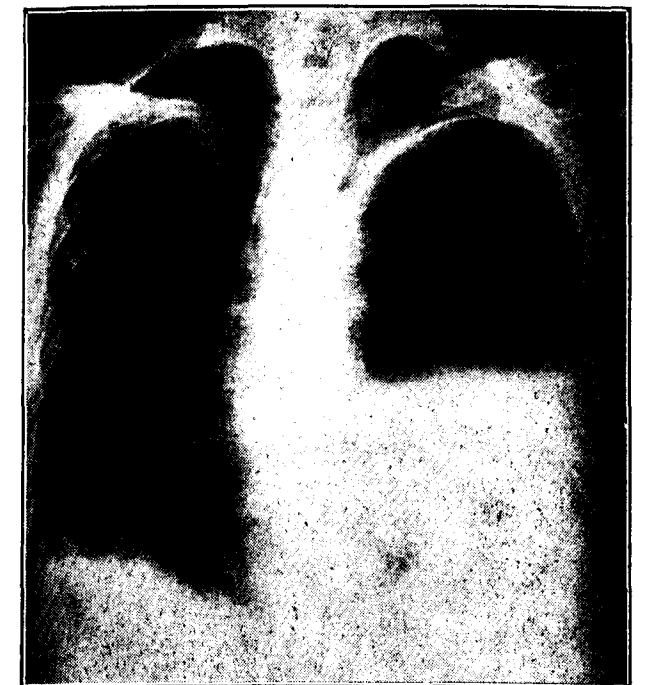


FIG. 1.—Extensive hydropneumothorax with collapse of the lung.

and drew out with great difficulty a small quantity of inspissated pus, but could get no more. When I saw the patient a short time later the picture had not changed except that he was more restless and was grunting with distress. I passed in a long wide-bored needle posteriorly for 2 in. (5 cm.), but no fluid was encountered here.

I then passed a needle anteriorly into the third interspace, above and external to the nipple line, and drew out very easily a syringe of fluid resembling dark beef-tea; this looked like stomach contents, and indeed it was strongly acid to litmus paper. A rubber catheter was inserted in this situation, by means of a trocar and cannula, and attached to a suction apparatus, which aspirated 50 oz. (1,420 ml.) of fluid. At once his condition improved strikingly; a skiagram now showed that the drainage tube was in a large cavity and that the left upper lung had begun to re-expand.

Underwater drainage was continued and a Ryle tube was passed down the oesophagus, being left in for two days while fluids were given by mouth. Nine days later (May 4) he was fit enough to have a barium meal, and this showed that the cavity in which the catheter was lying was the stomach, and that the stomach was within the thoracic cavity (Fig. 2).

On May 9, the catheter being still in the stomach, a barium meal showed that that organ was folded transversely on itself within the thorax, the pylorus and duodenum cap were pointing directly downward, and the stomach was emptying fairly freely into the small bowel.

The patient's general condition now being quite good, it was decided to open the thorax, return the stomach to the abdomen, and repair the diaphragm.

Operation.—On May 11 the chest was opened through the bed of the eighth rib on the left side. The stomach was found to be lying in the pleural cavity, with the fundus and anterior wall pressed up against and adherent to the thoracic wall anteriorly. Posteriorly the stomach was firmly adherent to the lung and to a dense inflammatory mass at the back of the chest wall. Considerable difficulty was found in separating the stomach from this mass, and a little pus was encountered in doing so. The diaphragm consisted merely of a ledge of tissue adherent all round to the stomach. The cardio-oesophageal junction was in its normal position, being held by the crus of the diaphragm. After



FIG. 2.—Barium in stomach showing position of this organ in chest. Draining-tube still in place. Note position of cardio-oesophageal junction.



FIG. 3.—Chest condition five and a half weeks after operation. Anterior-posterior view.

adhesions had been separated, the stomach was pushed down through the large aperture in the diaphragm into the abdominal cavity. The aperture was then drawn together by stay sutures and repaired by means of a tongue of intercostal muscle and by sutures of stainless-steel wire. The chest wound was closed, leaving two drainage-tubes for underwater seal drainage, one anteriorly and one posteriorly.

His post-operative course was smooth and without untoward incidents. A skiagram of the chest taken on May 19 showed that the lung had expanded well but there was some residual inflammatory reaction in the left lower lobe and in the pleura at the base of the pleural cavity. A later skiagram June 27 (Fig. 3) showed satisfactory clearing of the chest with no residual pockets.

Five and a half weeks after repair of his diaphragm the patient left hospital in very good condition.

Discussion

Even with this patient's previous history before us, the true nature of the condition was not at first recognized. On admission he appeared to have a spontaneous pneumothorax.

The first pleural paracentesis passed into a mass of old inflammatory tissue and drew off a very small amount of inspissated pus, suggesting an empyema. The skiagram, however, showed a large space filled with gas and air, with an almost completely collapsed lung, and the clue to the diagnosis was given only after a needle in the third intercostal space drew off the dark fluid described. The surprising feature is that passing a large needle through the chest wall into the stomach did not produce leakage of stomach contents into the pleural cavity.

After drainage of the intrathoracic stomach in this way the lung rapidly expanded, the stomach descended towards the abdomen, and the patient was able to eat and drink without discomfort.

After operation there was very little discharge from the two drainage-tubes, and no loculations of fluid or air were left in the pleural cavity.

The sequence of events leading to rupture of his diaphragm is shown in his history. First, the peritoneal catastrophe of a ruptured diverticulitis, then a subphrenic abscess, which presented on the side opposite to the subsequently

ruptured diaphragm. It is probable that there was a left subphrenic abscess at about the same time and that infection from this site tracked up through the foramen of Blakdale into the chest. This would account for the inflammatory mass at the posterior aspect of the left chest at the site of the first paracentesis and for the subsequent softening, and finally the rupture, of the diaphragm and the sudden passage of the stomach into the chest.

EFFECT OF CHLORPROMAZINE ON RENAL HAEMODYNAMICS AND FUNCTION IN CONGESTIVE HEART FAILURE

PRELIMINARY REPORT

BY

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On the basis of an earlier observation of ours that chlorpromazine ("largactil") has a marked diuretic action in cases of congestive heart failure we investigated 12 cardiac patients and, for comparison, 6 normal persons for the effect of chlorpromazine (25 mg. intravenously) on diuresis, sodium excretion, glomerular filtration (endogenous creatinine clearance), and renal plasma flow (para-aminohippuric acid clearance).

Results

After the intravenous injection of the above dose an immediate increase in diuresis was seen in oedematous cardiac patients, reaching its maximum within about half an hour. The rise averaged two or three times the initial value, and in our 12 cases the average of the maximal diuresis rose to four times as much. Even the lowest values due to chlorpromazine were much higher than those observed in the control periods (Tables I and II).

Sodium excretion varied together with the diuresis, rising upon administration of chlorpromazine in general to more than twice that observed in the control periods. The peak values in some of the experiments reached three times those of the control periods. In the chlorpromazine-treated cases even the lowest sodium excretion was significantly higher than the control values.

The glomerular filtration rate also increased as the result of chlorpromazine, though by no means to the extent seen in diuresis and sodium excretion. In the periods after chlorpromazine administration the glomerular filtration rate was some 20 to 50% higher than the control values, the rise being statistically significant in only the first two periods after administration of the drug. The maximal glomerular filtration rate values in the periods after chlorpromazine were on the average 86% higher than in the controls. The minimal values were 9.5% lower than the control values, and are not statistically significant.

Chlorpromazine produced an average rise of 30% in the renal plasma flow, but this rise, except for the first period after administration, cannot be regarded as statistically significant. The average of maximal values due to chlorpromazine exceeded the controls by 69%, the difference being highly significant. The mean of the lowest values was actually 12% lower than the controls, but from the standpoint of statistical analysis was not substantially different.

Comment

From the above, therefore, it appears that in congestive heart failure chlorpromazine has a pronounced diuretic and

TABLE I.—Results in 12 Cases

Case No.	Diuresis (ml./min.)						Glomerular Filtration						P.A.H. Clearance						Sodium Excretion (mg./min.)					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
1	0.5	0.6	2.3	1.0	1.6	1.2	85	90	152	48	74	51	300	390	620	200	227	180	2.5	3.4	12.0	5.4	8.5	6.1
2	0.9	1.4	1.8	2.7	2.6	3.2	77	86	83	93	74	87	190	280	200	310	250	300	0.8	1.3	1.6	2.2	1.6	2.2
3	0.3	0.4	0.3	0.3	1.0	1.6	74	102	74	44	105	91	—	260	250	173	380	350	0.3	0.3	0.2	0.3	1.5	1.4
4	0.5	0.6	0.5	1.0	0.9	0.9	73	86	51	102	81	88	—	230	149	323	240	180	2.1	3.9	3.3	6.6	6.7	7.5
5	0.4	0.5	0.6	5.9	2.2	3.8	46	49	65	177	55	100	—	—	—	—	133	118	—	2.9	2.6	3.6	2.5	2.0
6	0.7	0.8	1.5	1.6	0.9	0.7	34	35	50	28	23	28	103	162	204	133	118	—	4.4	5.3	9.2	7.7	5.1	—
7	1.3	1.3	2.6	2.2	1.6	—	60	60	130	89	72	—	218	219	390	331	199	—	3.5	4.8	7.8	7.1	5.1	—
8	0.8	0.9	1.5	1.1	1.1	—	60	63	112	74	82	—	—	434	560	462	590	—	1.6	1.6	6.1	7.4	5.7	3.8
9	0.5	0.4	1.6	1.9	1.4	1.0	60	57	160	179	140	86	138	156	493	530	510	264	1.3	1.6	8.8	6.6	6.3	—
10	0.9	1.3	6.5	4.7	4.2	—	113	109	142	85	77	—	272	—	—	280	178	166	—	0.4	0.4	0.9	0.9	1.1
11	0.5	0.4	1.1	0.9	1.1	0.6	68	78	185	148	171	102	183	171	405	352	381	233	0.4	0.4	0.8	0.9	1.1	0.6
12	1.5	1.4	1.0	2.1	6.0	6.0	108	91	48	90	91	91	318	341	112	254	320	286	6.8	6.4	3.6	6.4	7.3	5.5

1 and 2=Control periods. 3, 4, 5, and 6=Periods after administration of chlorpromazine. P.A.H.=Para-aminohippuric acid.

TABLE II.—Effect of Chlorpromazine on Glomerular Filtration Rate, Renal Plasma Flow, and Water and Salt Excretion, Expressed as Percentage of Mean of Control Periods

		1	2	3	4	5	6	Min.	Max.
Diuresis (ml./min.)	Mean	94	106	216	298	260	301	146	396
	S.D.	9.5	9.3	164	95	124	207	82	298
Glomerular filtration rate	Mean	97	103	151	145	122	116	90.5	186
	S.D.	6.2	6.2	73	100	58	38	43	100
P.A.H. clearance	Mean	92	106	138	133	133	112	88	169
	S.D.	9.3	8.8	71	86	83	42	39	73
Sodium excretion (mg./min.)	Mean	92	108	211	213	234	210	141	311
	S.D.	9.6	9.6	136	133	135	129	101	159
				3.852	4.014	4.682	4.067	1.903	6.270
				<0.1	<0.1	<0.1	<0.1	5.0	<0.1

1 and 2=Control periods. 3, 4, 5, and 6=Periods after chlorpromazine administration. Min.=Mean of individual minimal values after chlorpromazine administration. Max.=Mean of the individual maximal values after chlorpromazine administration.

saluretic action. This effect could be explained by alterations of renal haemodynamics—that is, to be due to the rise of renal plasma flow and filtration rate, resulting in the changes of water and salt reabsorption. This possibility is not in the least excluded by the fact that the rise in glomerular filtration and renal plasma flow was much less than that in water and sodium excretion. Against this view, however, stands the fact that the changes in glomerular filtration and plasma flow were not always followed by similar changes in water and sodium excretion. It is to be noted in our experiments that out of 45 post-chlorpromazine clearance periods water excretion rose considerably in 11 cases, and sodium excretion in 7, in spite of a significant fall in glomerular filtration rate and renal plasma flow.

In six normal persons chlorpromazine had no consistent effect on renal function. Diuresis increased in three cases, decreased in two, and in one was unaltered. Glomerular filtration decreased in three cases, and showed no change in the other three. The renal plasma flow diminished in three cases, was unchanged in one, and showed a slight but inconsiderable rise in the other two. Sodium excretion decreased in two cases, and did not alter in three.

Our results will be communicated in detail in the *Acta Medica Academiae Scientiarum Hungaricae*.

PERICARDITIS AND ELECTROCARDIOGRAPHIC CHANGES IN REITER'S SYNDROME

BY

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Physician to M.R.C. Investigation of Non-specific Urethritis

Reiter's syndrome is a condition which has been known for many years, but has been studied in detail only during the last ten to fifteen years. It presents with non-gonococcal urethritis, polyarthritis, conjunctivitis, and sometimes iritis, a characteristic balanitis, or eruption on the skin (keratoderma blennorrhagica), and the syndrome may show all these features or only two or three.

Several authors have described evidence suggesting cardiac involvement in the course of these infections, but, as one would expect with a non-fatal condition most commonly affecting young people, post-mortem evidence is lacking.

Electrocardiographic changes suggesting myocarditis were reported by Gadrat and Morrell (1935), Bang (1940), Candel and Wheelock (1945), Feiring (1946), Paronen (1948), Lövgren and Masreliez (1949), Trier (1950), Shapiro *et al.* (1949), and Weinberger *et al.* (1952). Paronen also recorded seven cases which developed pericarditis with an audible friction rub out of a total of 308 patients suffering from the syndrome. Lever and Crawford (1944) recorded a case of a 35-year-old man who, during the fourth month of a severe attack of Reiter's disease, complained of substernal oppression and whose electrocardiogram showed changes suggestive of recent myocardial infarction. An electrocardiogram earlier in the attack had been normal. He died four days later, but a post-mortem examination was not carried out.

Mayne (1955) described a case of Reiter's syndrome with electrocardiographic changes suggesting pericarditis

which at the time of publication had persisted unaltered over the unusually long period of 15 months. He also recorded a further case of a man aged 30 with Reiter's syndrome who had electrocardiographic changes strongly suggestive of anterior myocardial infarction. Neither of these patients had any symptoms of cardiac disease.

Present Series

In 128 cases of complete Reiter's syndrome, mostly in men between 20 and 35 years of age, clinical evidence of heart disease developed during the attack in only two patients, both of whom suffered from pericarditis. Six patients had complained of transient chest pain, which was thought at the time to be due to connective-tissue involvement. In view of our later experience it is possible that some of these patients may also have had pericarditis.

Electrocardiography now forms a routine part of our investigation of all patients with Reiter's syndrome, and 4 out of 25 cases have shown abnormal tracings. The case histories of these four patients illustrate some of the cardiological abnormalities which may be found in Reiter's syndrome.

Case 1

On admission to hospital a West Indian man aged 38 gave a history of urethral discharge and polyarthritis for a month. His urethral infection had been treated originally by his own doctor with a course of a sulphonamide, but recurred two weeks later, together with terminal haematuria. Many joints of both arms and legs were involved, and there was also pain in the lumbar region and marked plantar fasciitis and swelling of the Achilles tendons. For the first week

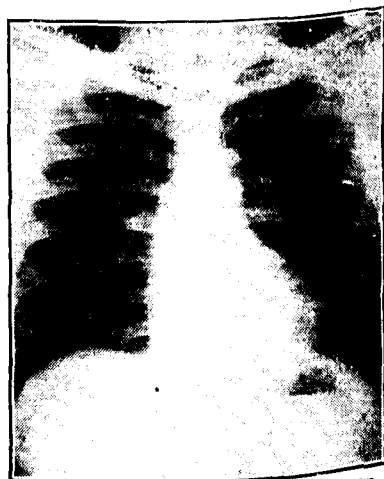


FIG. 1.—Case 1. Heart enlarged. Screening showed this to be of left ventricular origin.

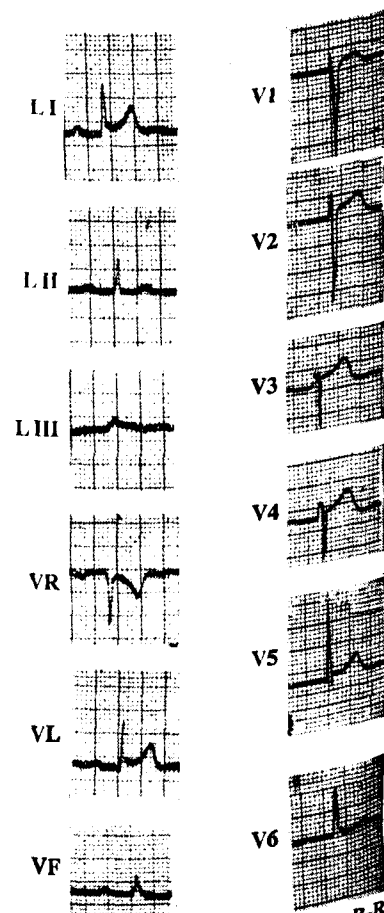


FIG. 2.—Case 1. Prolonged P-R interval of 0.28 second and ST elevation in L I, V I, V II, V III, and V IV.

there was a slight pyrexia of up to 100° F. (37.8° C.). The patient complained of transient central chest pain soon after admission, but on clinical examination no cause for this was detected. Treatment with salicylates and bed rest

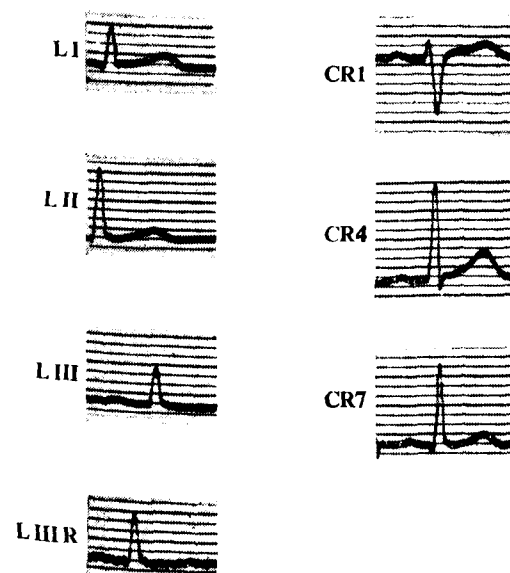


FIG. 3.—Case 2. Elevation of ST segment in L I, L II, and CR leads.

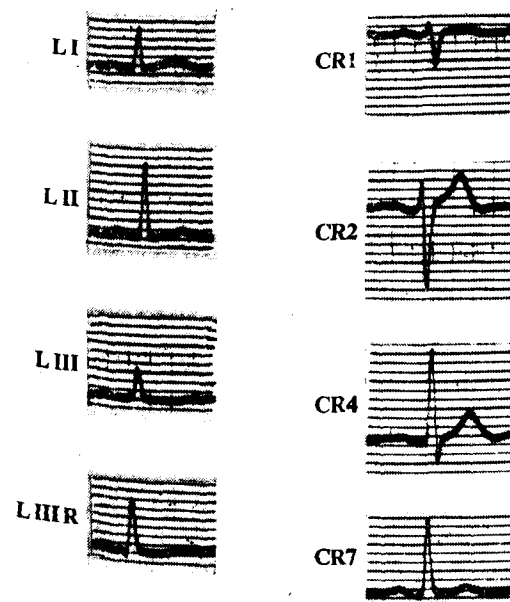


FIG. 4.—Case 2. ST elevation much less marked in L I, CR IV, and CR VII.

did not improve his condition, and fever therapy with intravenous *E. coli* vaccine was tried. After three injections there was considerable symptomatic improvement and he was discharged from hospital.

He had contracted gonorrhoea eight years previously, and this was followed by the development of a urethral stricture. He gave no history of rheumatic fever or previous joint or heart disease. The Wassermann and Kahn reactions were negative and the gonococcal fixation test was strongly positive. The E.S.R. was 80 mm. in one hour, haemoglobin 106%, white blood cells 5,250, with 57% polymorphonuclear leucocytes. A mid-stream specimen of urine showed a few pus cells and was sterile. X-ray examination of the

chest showed the heart to be enlarged, with some prominence in the region of the left ventricle (Fig. 1). The affected joints showed no abnormality. The blood pressure was 150/100.

After leaving hospital he had intermittent pain in various joints and was readmitted with renewed swelling of the same joints as on the first occasion and also of the right elbow. Slight urethral discharge was present, and microscopically showed polymorphonuclear leucocytes and red blood cells but no gonococci. The prostatic secretions contained a considerable excess of polymorphonuclear leucocytes. He developed a mild symptomless bilateral conjunctivitis, which subsided in a few days. A routine electrocardiogram taken on the same day (Fig. 2) showed a prolonged P-R interval of 0.28 second and ST elevation in leads I, VL, V1, V2, V3, and V4. Radiographs of the heart were similar to the previous film, and screening gave no additional information. Nine days later he complained again of central substernal pain, which continued for two days. During this time a pericardial friction rub was heard, but the electrocardiographic tracing showed no change. His joints improved slowly and he was discharged three weeks later. Further electrocardiograms were taken at monthly intervals, but these still showed no change. He was well enough to start work again, and the only abnormality found on clinical examination was minimal stiffness in the knees and several fingers, together with the evidence of chronic prostatic infection.

Case 2

A man aged 24 was admitted to hospital complaining of thick urethral discharge, of soreness of both eyes, and pain in the left heel for one week. He denied sexual intercourse. Polyarthritis developed and affected both knees, ankles, left shoulder, several metacarpophalangeal and proximal interphalangeal joints, and the second, third, and fourth metatarsophalangeal joints of both feet. His illness lasted approximately 14 weeks, and during this time he also suffered two attacks of conjunctivitis and two of iridocyclitis. Lesions of keratoderma blennorrhagica appeared on the palms, soles, genitalia, and limbs.

For the first 14 days he had intermittent pyrexia of up to 100° F. (37.8° C.). For the next six weeks he ran fever of up to 101° F. (38.3° C.) in the evenings, falling to 99.5° F. (37.5° C.) in the mornings. He complained on several occasions of attacks of pain in the chest. Throughout the course of his 14-weeks stay in hospital he showed tachycardia of 95 to 115 beats a minute. No other abnormal physical signs were detected in the cardiovascular system on clinical examination. An electrocardiogram taken 10 weeks after admission showed slight elevation of the ST segment in leads I, II, CR1, CR4, and CR7 (Fig. 3). A tracing taken 10 days later showed much less ST elevation in leads I, CR4, and CR7 (Fig. 4). X-ray examination of the chest showed nothing abnormal. The E.S.R. was 100 mm. in one hour, falling to 40 mm. shortly before discharge.

Case 3

A man aged 33 (a patient of Dr. D. Lewes) had suffered an attack of Reiter's syndrome for some two to three months, the only residual finding being the presence of bilateral calcaneal spurs. Eleven months later he suffered a further attack, this being characterized by joint pains, conjunctivitis, and a transient macular rash. He ran a fever of up to 100° F. (37.8° C.). He also complained of pain in the chest, and on examination was found to have a pericardial friction rub. The electrocardiogram showed ST elevation in leads I, II, V1, and V2 (Fig. 5). The chest x-ray picture was normal.

During the next seven days his fever settled and the pericardial rub disappeared. A further electrocardiogram taken 13 days later (Fig. 6) showed the T wave to be flat in lead II and very low in leads I and III.

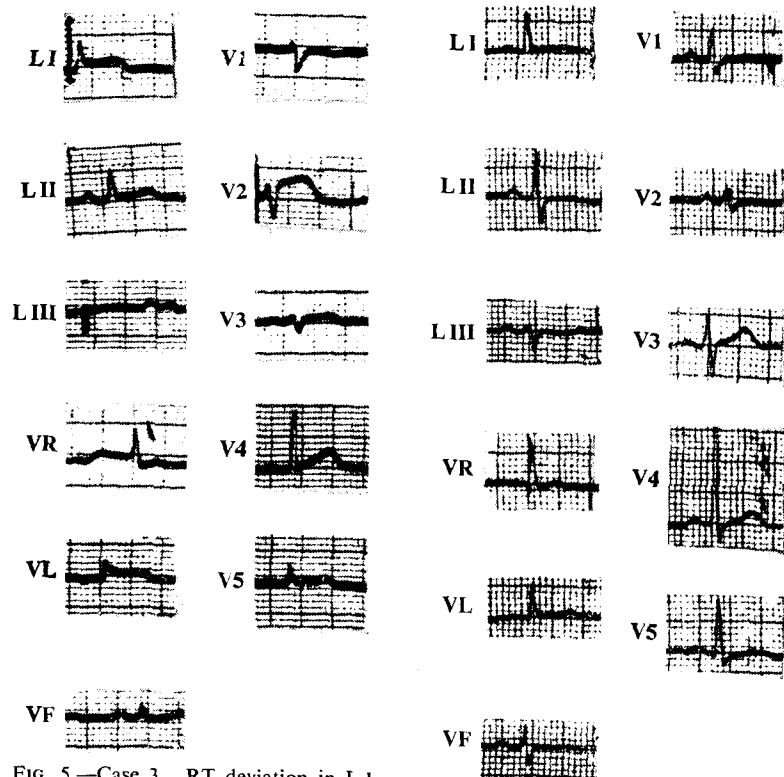


FIG. 5.—Case 3. RT deviation in LI, LII, V1, and V2, with reciprocal ST depression.

Case 4

A 33-year-old man complained of dysuria, frequency, and haematuria 21 days after sexual intercourse. There were no ocular or arthritic symptoms. Shortly after admission he had a rigor and his temperature rose to 102° F. (38.9° C.). There was diffuse tenderness in the hypogastric region, and the urine contained many polymorphonuclear leucocytes and red blood cells. No organisms were seen. Clinical examination of the cardiovascular system showed no abnormality and the x-ray picture of the chest was normal. Three specimens of urine were cultured, but no organisms were grown. An intravenous pyelogram showed no abnormality. On receiving treatment with oxytetracycline he improved rapidly.

An electrocardiogram taken on the fourteenth day of the illness showed the following changes: slight ST elevation

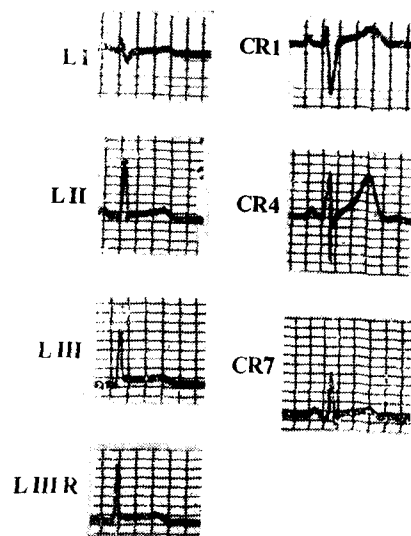


FIG. 7.—Case 4. ST elevation in LII, LIII, LIII R, and CR7. ST depression in LI.

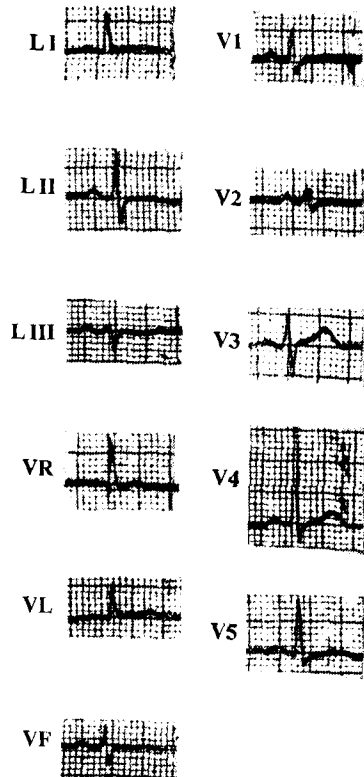


FIG. 6.—Case 3. Tracing normal 13 days later than in Fig. 5.

of electrocardiographic changes in abacterial pyuria has been found in the literature.

In Case 1 the condition was thought to be rheumatoid arthritis at the time of the patient's first discharge from hospital. Arthritis following genital infection and classical rheumatoid arthritis are dissimilar in many respects, but it seems clear that both may cause cardiac involvement. Sokoloff (1953) showed, in a study of 101 post-mortem examinations of patients with rheumatoid arthritis, that pericarditis was a very common finding and that the diagnosis of pericardial disease had rarely been made during the lifetime of the patients. His figures for pericarditis for which no cause other than rheumatoid arthritis could be found were 24.8% of 101 cases, as against 2.2% of 1,154 controls. There are no post-mortem studies of Reiter's syndrome comparable to those in rheumatoid arthritis, but findings in the present series and those described in the literature suggest that low-grade pericardial involvement is not at all uncommon and may be clinically silent.

In view of this evidence there is a good case for employing electrocardiography and careful cardiac assessment as a routine in the investigation of Reiter's syndrome, and attention is also drawn to the possibility that pain in the chest may occasionally be due to pericardial involvement, a fact which is likely to be obscured by the widespread aches and pains which are characteristic of the syndrome. An unusual feature was the persistence of the electrocardiographic changes for six months in Case 1; this tallies with Mayne's experience, for his patient had shown unchanged electrocardiographic tracings for

FIG. 8.—Case 4. S wave in CR1 with ST elevation and inversion of T wave. Slight ST elevation with T wave inversion in LII and LIII. T wave inverted in LIII R and CR7.

in leads II, III, LIII R, and CR7 (Fig. 7). When repeated two weeks later the tracing showed inversion of the T wave in leads II, III, LIII R, and CR7 (Fig. 8). The patient now had no symptoms of any kind, and his urine was normal macroscopically and microscopically.

Discussion

From a study of the present series of patients and the literature it appears that clinically obvious cardiac involvement is uncommon in Reiter's syndrome, but electrocardiographic changes may be more frequent. Most of the previously reported cases have been of this nature, and overt pericarditis with an audible friction rub appears to have been reported only by Paronen (1948).

Case 4 was not characteristic of Reiter's syndrome, but of acute urinary infection of unknown aetiology following sexual exposure. As cultures and microscopy of the urine failed to demonstrate the presence of micro-organisms, it must be classified as a case of abacterial pyuria. Well-marked electrocardiographic changes suggestive of pericarditis developed. It may be that this type of genital infection is caused by the aetiological agent which is responsible for Reiter's syndrome, as suggested by Harkness (1950). Moreover, abacterial pyuria is sometimes closely associated with a typical attack of the syndrome. No reference to the development

at least 15 months up to the time of writing. The remote possibility that constrictive pericarditis may develop later must be borne in mind.

Summary

Three cases of pericardial involvement in Reiter's syndrome are described.

The symptoms of this complication are not always prominent, and for this reason electrocardiography should be a routine procedure in cases of Reiter's syndrome.

A case of abacterial pyuria with pericarditis is also reported.

This work was undertaken as part of the M.R.C. research on non-specific urethritis with a grant-in-aid from the National Institute of Health of the United States Public Health Service Contract No. E652. We thank Dr. C. Young, of St. Mary's Hospital, and Dr. David Lewes, of Bedford General Hospital, for permission to study their patients, and Dr. William Evans, Mr. A. J. King, Dr. G. L. M. McElligott, and Dr. Wallace Brigden for their valuable help.

REFERENCES

- Bang, O. (1940). *British Medical Journal*, 1, 117.
Candel, S., and Wheelock, M. C. (1954). *Ann. Intern. Med.*, 23, 309.
Feiring, W. (1946). *Ibid.*, 25, 498.
Gadrat, J., and Morel, L. (1935). *Bull. Soc. franc. Derm. Syph.*, 42, 1849.
Harkness, A. H. (1950). *Non-Gonococcal Urethritis*. Livingstone, Edinburgh.
Lever, W. F., and Crawford, G. M. (1944). *Arch. Derm. Syph. (Chicago)*, 49, 389.
Lövren, O., and Masreliez, N. (1949). *Nord. Med.*, 42, 1299.
Mayne, G. O. (1955). *Brit. J. vener. Dis.*, 31, 238.
Paronen, I. (1948). *Acta med. scand., Suppl.* 212.
Shapiro, E., Lipkin, M. L., Kahn, J., and Heid, J. B. (1949). *Amer. J. med. Sci.*, 217, 300.
Sokoloff, L. (1953). *Amer. Heart J.*, 45, 635.
Trier, M. (1950). *Acta med. scand.*, 138, Suppl. 239, p. 123.
Weinberger, H. J., Dienes, L., and Bauer, W. (1952). In *American Rheumatism Association's Rheumatic Diseases*, p. 73. Saunders, Philadelphia.

Medical Memorandum

Strangulation of Umbilical Hernia in Children

The infantile type of umbilical hernia is rightly regarded as a benign condition and complications are very rare. A few cases of spontaneous rupture have been reported (MacLean, 1950; Strange, 1956), but strangulation of bowel in such a hernia is even more uncommon. Indeed, Browne (1952) wrote that he was unable to find a record of such an occurrence, and Woods (1953) could find no case in the records of the Bristol hospitals.

I have been able to find only two reports of strangulated umbilical hernia in children. Miller (1932) included one child of 2 years of age in his series of 60 cases of strangulated umbilical hernia seen at the Massachusetts General Hospital from 1911 to 1930; and Crump (1952), in his series of 329 cases of umbilical hernia in American Negro children, mentioned a case of strangulation in a 17-months-old girl.

Two cases of strangulated umbilical hernia have been seen at this hospital during the last six years, and in view of the rarity of the condition a brief report is considered justified.

CASE 1

A boy was admitted to hospital with oedema and albuminuria when he was 2 years old. He was found to be suffering from the nephrotic syndrome. Soon after admission he developed gross ascites, and the presence of a large umbilical hernia was recorded in the case notes. During the next two years numerous abdominal paracenteses were necessary to relieve the distress caused by large accumulations of fluid in the peritoneal cavity. He never showed evidence of renal insufficiency.

When he was 4 years old he was readmitted to hospital with a two-days history of abdominal pain and vomiting.

Examination showed that the umbilical hernia, which had previously been easily reducible, was hard and could no longer be reduced. Apart from some oedema his general condition was good, although he was noticed to have muscular twitchings. As his serum calcium was found to be low he was given intravenous calcium chloride and the twitchings ceased. An intravenous transfusion of glucose water was started pre-operatively.

Under general anaesthesia an incision was made around the protuberant umbilical mass. The underlying tissues were dissected until a loop of bowel was seen which was constricted by a defect in the linea alba. The bowel was congested, but was considered to be viable. The constricting ring was divided, following which there was a gush of fluid from the peritoneal cavity. The child's condition rapidly deteriorated and he died a few minutes later. No cause for the sudden collapse and death was found at necropsy.

CASE 2

A boy, who had been born three months prematurely, was seen as an out-patient when he was 3 months old on account of umbilical and right-sided inguinal hernias. Adhesive strapping was applied to the umbilical hernia, but it is not known how long this was maintained. It was proposed to repair the inguinal hernia when he was older.

Two months later, however, he was admitted to hospital as an emergency because for nine days he had been having attacks of screaming during which he drew up his legs, and his mother noticed that the umbilical swelling had increased in size and had become bluish in colour. The baby had vomited a little and had been constipated.

On examination his general condition was very good and he weighed 12½ lb. (5.8 kg.). There was a large bluish protrusion at the umbilicus which could not be reduced. The inguinal hernia was easily reducible.

An operation was performed at once, and the hernial sac was found to contain a loop of very oedematous but viable bowel and a mass of omentum in which there was a haematoma. The obstruction was relieved and the baby made a rapid recovery.

Two weeks later he was readmitted because the inguinal hernia had become incarcerated. This was successfully relieved by operation.

COMMENT

In Case 1 there was presumably a congenital weakness of the umbilical scar, and raised intra-abdominal pressure, due to the large accumulation of ascitic fluid, resulted in herniation through the scar. The natural tendency for this type of hernia to resolve spontaneously in children (Woods, 1953) would also be unlikely to occur because of the constant increase of pressure in the abdomen. Local distension of the loop of bowel in the hernia, or adhesions due to the many paracenteses, may have been the factors precipitating the strangulation. No cause for the sudden collapse and death of the patient was evident at necropsy, but it may have been due to the sudden release of fluid from the peritoneal cavity.

The umbilical hernia of Case 2 was the usual infantile type, and there appeared to be no factor precipitating the strangulation.

It has been shown that adhesive strapping hastens the resolution of large umbilical hernias (Haworth, 1956), and the fact that strangulation does very rarely occur is perhaps an additional reason for strapping these cases.

Case 1 was admitted under the care of Mr. R. B. Zachary and Case 2 under Mr. W. J. Lytle, to both of whom I am grateful for permission to publish.

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REFERENCES

- Browne, D. (1952). *British Medical Journal*, 2, 1144.
Crump, E. P. (1952). *J. Pediat.*, 40, 214.
Haworth, J. C. (1956). *British Medical Journal*, 1, 1286.
MacLean, A. B. (1950). *Brit. J. Surg.*, 38, 239.
Miller, R. H. (1932). *New Engl. J. Med.*, 206, 389.
Strange, S. L. (1956). *Postgrad. med. J.*, 32, 39.
Woods, G. E. (1953). *Arch. Dis. Childh.*, 28, 450.

Reviews

ENZYME, ANTIGEN, AND VIRUS

Enzyme, Antigen, and Virus: A Study of the Macromolecular Pattern in Action. By F. Macfarlane Burnet, Kt., F.R.S., F.R.C.P. (Pp. 193 + viii. 18s.) London: Cambridge University Press. 1956.

Those who knew that Sir Macfarlane Burnet was preparing a sequel to the monograph *Production of Antibodies*, which he published with Dr. F. Fenner in 1949, have awaited its appearance with the certainty that it would stimulate, and a fair expectation that in places it would irritate, its readers. As the title *Enzyme, Antigen, and Virus* and the subtitle "A Study of Macromolecular Pattern in Action" imply, in this new essay Burnet undertakes a much wider approach to the biosynthesis of specific protein than in his earlier monograph. He first discusses recent work on adaptive enzyme and antibody production in the light of current knowledge of ribose nucleic acid structure and its relationship to protein synthesis. In this light it is possible to put forward a much more definite, though admittedly still speculative, hypothesis about the nature of the protein replicating units in terms of ribose nucleic acid templates—templates whose pattern can, under certain circumstances, in turn be influenced by protein molecules. In many other respects the conclusions of the first monograph still stand, and in fact some, such as the prediction of immunological tolerance, have since been splendidly verified experimentally. After a short digression on the possibility that loss of "self-markers" is the basis of malignancy in cancerous cells, the last chapters deal with virus multiplication. The bacterial viruses containing deoxyribose nucleic acid are set aside as belonging to a class of their own, and not necessarily related to the common theme of this essay. For the growth and reproduction of the influenza virus, however, a detailed hypothesis is constructed capable of accounting for all the main experimental phenomena, including various grades of incompleteness, genetic interactions, and the existence of ribose nucleic acid only in the virus. The interpretation is unorthodox, but very stimulating.

Although there may be several people who might have written an essay on any two of the subjects of this book, it is probably safe to say that only Sir Macfarlane Burnet could have written an essay on all three such as to interest workers on protein synthesis, adaptive enzymes, immunology, and viruses alike.

J. H. HUMPHREY.

TECHNIQUES WITH VIRUSES

Diagnostic Procedures for Virus and Rickettsial Diseases. Second edition. By the Committee on Diagnostic Procedures for Virus and Rickettsial Diseases of the American Public Health Association. (Pp. 578 + xv; illustrated. No price.) New York: American Public Health Association. 1956.

Eight years have passed since the publication of the first edition of this book, which is an indispensable guide to anyone running a virus diagnostic laboratory. In thickness the second edition is nearly twice the first (578 against 347 pages), yet some material has been condensed. There are new chapters on general principles (Lennette), ECHO viruses, tissue culture methods (Melnick), Coxsackie viruses (Dalldorf and Sickles), and miscellaneous virus diseases (Hilleman). Most of the others have been largely rewritten and many appear under new authorship.

Individual experts have been given free rein, and this has the rather unfortunate result that such things as the complement fixation test are described in some detail, but with variations, in several chapters. Melnick's paper on tissue culture techniques will be useful to many readers, though it would appear from the 61 references that the author does not read, or disregards, other than American literature. It is indeed amazing to realize that eight years ago tissue culture played almost no part in diagnostic procedures for

viruses. The adenoviruses (A.P.C.) are considered under "atypical pneumonia": one would think they deserved a chapter of their own. Only the yellow fever chapter remains practically as in the first edition; the important discovery of haemagglutination by this virus is not mentioned.

Obviously many experts will have their favourite methods, and all the authors can do is to describe precisely at least one method which they have found to work. This has been well done, and most authors give attention also to the interpretation of results and the avoidance of pitfalls. Quite apart from its immense value to the laboratory diagnostician, the book will prove a useful source of information and references to all who try to keep abreast of work on the viruses affecting man.

C. H. ANDREWES.

GLAUCOMA

Glaucoma. Transactions of the First Conference, December, 1955, at Princeton, N.J. Edited by Frank W. Newell, M.D. (Pp. 251; illustrated. \$4.50.) New York: Josiah Macy, Jr. Foundation. 1956.

This is an account of a conference held by leading ophthalmologists and medical scientists on the causes of glaucoma. In the words of the chairman, the subject is one which shows "all kinds of unusual and interesting features that are of interest not only to ophthalmologists but to the psychiatrist, to the internist, and to the gynecologist." The discussion is recorded in the form of free questions and answers, and contains many irrelevancies. It is not easy to read. Indeed, the clinical ophthalmologist might search in vain for any clear summary of the latest scientific discoveries, but the research worker should enjoy the finer points of discussion and will appreciate the illustrations of experimental work and the bibliographies. The editors invite criticism of the style of publication, and there is no doubt that the interposition of the headings would enable the reader to follow the trend of the argument more easily, and much of the discussion could be omitted. The text contains a description of the causes of angle-closure glaucoma and of the factors which lead to a blocking of the angle—that is, in the breaking down of a prodromal attack of glaucoma. There appears to be general agreement about the mechanical blocking of the flow of aqueous—by pressure on the root of the iris and by the relative pupillary block. The hydrostatic and osmotic pressure which contribute to the maintenance of intraocular pressure are also discussed, and an extensive account is given of the effects of electrostimulation of the diencephalon—upon blood pressure, cutaneous vessels, and intraocular pressure. The change in resistance to outflow of aqueous which can be caused by the perfusion of some substances such as hyaluronidase in the excised eye, and by the systemic administration in the intact animal or subject, is described in detail, and with particular reference to the nervous and chemical reactions which may occur in the trabeculae of the angular tissue.

D. R. CAMPBELL.

MYOTONIA

Dystrophia Myotonica, Paramyotonia and Myotonia Congenita. By Dr. J. G. Y. De Jong. (Pp. 255; illustrated. Dutch florins 19.50.) Assen: Koninklijke Van Gorcum and Comp. N.V. 1956.

This monograph gives a comprehensive review of the literature concerning myotonia and a detailed account of 43 personal cases of dystrophia myotonica discovered in 11 families, and of 23 of paramyotonia, all occurring in a single family. Translation from the Dutch has probably resulted in loss of clarity, for many of the arguments are difficult to follow, particularly in the section on pathogenesis. The symptomatology of dystrophia myotonica and its endocrine aspects are discussed exhaustively, with a wealth of illustrative detail from the author's own cases, while pathology is also fully considered. In discussing heredity the author rightly stresses the importance of personal examination of whole families, in view of the existence of abortive cases, but fails to mention the important work of Bell on this subject. Throughout, the book is marred by an uncritical repetition of much that has been written before, with little

attempt at clarification and integration; for instance, the brief section on electromyography could do little more than confuse the uninformed reader. Furthermore, it abounds in dogmatic statements based upon impression and personal opinion rather than upon scientifically valid evidence. For example, one reads that "in complete penetration of the gene of dystrophia myotonica, oligophrenia appears." And in considering the vexed question of the relationship between dystrophia myotonica, paramyotonia, and myotonia congenita the author rightly stresses the differences in natural history between the three conditions, but it is difficult to see upon what evidence he bases his categorical assertion that they are entirely different diseases, as his own series includes no cases of myotonia congenita. In a long discussion of pharmacology and treatment it is suggested that growth hormone and insulin may be of value, but this advice appears to rest upon the uncontrolled observation of improvement in a single case. Despite these criticisms one must pay tribute to the author's industry, for the book contains much useful information and will be a valuable source of reference, as most of the important facets of this group of conditions receive detailed consideration.

JOHN N. WALTON.

BRITISH SURGICAL PROGRESS

British Surgical Practice. Surgical Progress, 1956. Under the general editorship of Sir Ernest Rock Carling, LL.D., F.R.C.S., F.R.C.P., F.F.R., and Sir James Paterson Ross, K.C.V.O., M.S., F.R.C.S., F.A.C.S. (Pp. 396 + vii; illustrated. 47s. 6d.) London: Butterworth and Co. Ltd. 1956.

This is the annual supplement to *British Surgical Practice* for the year 1956. As in previous years, the volume consists of original articles, critical surveys, and abstracts. The articles deal with a variety of subjects, the first and longest being an account of spontaneous intracranial haemorrhage by J. M. Potter. Other subjects comprise cancer of the maxilla, atresia of the oesophagus, repair of the cardia, some plastic procedures, distribution of paralysis in poliomyelitis, rectal prolapse, parotitis, traumatic paraplegia, congenital deformities of the thorax, and transplantation of the ureters into the ileum. Of the critical surveys, the most important is that by C. F. Scurr and G. S. W. Organe on hypothermic anaesthesia, in which the advantages and dangers of that procedure are well indicated. The abstracts cover a wide ground and are of varying importance; I wish it might have been possible to include details of the technique used in resection of abdominal aneurysms. Altogether the whole volume will be of great assistance to busy surgeons who are trying to keep up to date with the latest advances.

ZACHARY COPE.

COAGULATION DEFECTS

The Laboratory Diagnosis of Coagulation Defects. By Pietro de Nicola, M.D. (Pp. 240 + xv; illustrated. 57s. 6d.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1956.

This further monograph in the American Lecture Series maintains the high standards of many of its predecessors. It is written by a recognized authority on haemorrhagic disorders and blood coagulation, and he has succeeded in presenting his material in a format suitable not only for the laboratory worker in this field but also for clinicians, physiologists, and pathologists with a less specialized interest. The publication of this book is timely; the number of papers on blood coagulation in recent years is enormous, and each is written in a terminology peculiar to one group of workers. The resulting confusion has in some measure been reduced by this particular account of the subject.

The book contains five chapters, the first on the physiological basis of the laboratory tests, while Chapters II and III deal with the application of these to the diagnosis of haemorrhagic syndromes. Chapter IV enumerates the technical details of each of the tests. Useful diagrams help the reader to follow the description of these technical procedures. On page 63 the term "adsorbed serum" in the account of the thromboplastin generation test should read

"serum". Chapter V summarizes the author's conclusions. The bibliography at the end is good, but a little difficult immediately to follow, being divided into parts, each with a series of numbers, covering individual sections of the book.

A. S. DOUGLAS.

HEALING OF WOUNDS

The Mechanisms of Healing in Human Wounds. By Shattuck W. Hartwell, B.S., M.S., M.D., Ph.D., F.A.C.S., F.I.C.S. (Pp. 166 + xii; illustrated. 34s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1955.

This monograph presents a practising surgeon's mature conclusions on the healing of wounds. Over the past 30 years the author has made numerous experimental and clinical studies of this subject, and these are summarized here in a readable and attractive form. The approach is teleological and qualitative, and though the style is discursive this is not inappropriate in a monograph.

On the basis of extensive histological studies of human wounds in various stages of healing, the author draws attention to the difference between repair of human skin and that of animals (upon which textbook descriptions commonly rely). The dense subcutaneous fatty layer which binds human skin to underlying structures has no counterpart in laboratory animals. To this difference the author ascribes his observation of a type of primary healing peculiar to man (and possibly the pig). This contrasts with "primary healing" in laboratory animals, which is more akin to secondary healing in man. Repair is considered as a cellular activity—the cells of the epidermis having a propensity to migrate so as to cover surfaces. In deeper tissues wandering cells thought to be derived from lymphocytes are responsible for the deposition of collagen. When there is a "space effect" due to dead material, fluid, or air, secondary repair occurs, with increased vascularity, fibrinous exudate, and eventual bridging of the gap by collagen. Filling in of the "space" continues until limited by an epithelial layer. The author reviews the healing of different human tissues and discusses appropriate treatment in the light of the principles he describes. The book does not claim to be exhaustive; chemical factors, for instance, are dismissed in half a page with the robust clinical justification, "The clinical surgeon is not yet in a position to alter them as might be indicated even if he could investigate them." It is also not always clear which statements are based on observation and experiment and which are matters of opinion. Nevertheless, student, surgeon, and research worker will find in this book an infectious enthusiasm for this important subject, and may with profit be led to reflect on the processes which surgery affects and induces.

J. P. BULL.

HEAD INJURIES

Head Injuries and Their Management. By Francis Asbury Echlin, M.D., C.M., M.Sc., Med.Sc.D., F.A.C.S. (Pp. 127 + x; illustrated. 24s.) Philadelphia and Montreal: J. B. Lippincott Company. London: Pitman Medical Publishing Co. Ltd. 1956.

The preface and introduction set out the purpose of this brief monograph. The contents more than justify this purpose in 107 small pages. At first I carried this little book around in my pocket and read it at odd intervals as the author and publishers obviously intended. It deserves much more than such peripatetic attention. Later it won a place by my chair near the fire at home. It is light in the hand, but at intervals should be laid down as one remembers various patients with head injuries of the types it describes so clearly. The book ends with an excellent bibliography covering world literature, and has a good index.

In every way this is a first-class book, short, clear, and concise. The subject is not an easy one to teach or to understand. On this account alone this work can be recommended to teachers, undergraduates, and all in any way responsible for the care of this common group of injuries.

WILLIAM GISSANE.

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"NOTHING WHATEVER ON THIS MATTER OF SPENS"

The consultants and specialists of this country, through their Standing B.M.A. Committee, last week endorsed the Council's recommendation to boycott the Royal Commission in present circumstances. This decision was backed by an overwhelming majority after a careful and thoughtful discussion lasting about three hours, during which the Central Consultants and Specialists Committee was addressed by Sir Russell Brain. The C.C.&S. Committee represents some 20,000 doctors working in the hospital service of this country, and its decision last week means that the Council of the B.M.A., under its chairman Dr. S. Wand, can now go to the Special Representative Meeting in May with the consultants, the general practitioners, and the medical officers of health solidly behind it. The final responsibility for policy rests, of course, with the Representative Body. But unless there is a radical change in the present position the R.B. is unlikely to act otherwise than in full support of the Council's recommendation.

If anyone still has any doubt of the wisdom of this recommendation it should be removed by a reading of the debate in the House of Lords last week. Lord Moran went straight to the heart of the matter by attacking, with cogent argument, the terms of reference of the Royal Commission.

"If the Royal Commission interpret their terms of reference," he said, "so that they are not required to pay regard to what has happened in the past, if they are going to make a fresh start dealing merely with future scales—if, in a word, they are going to ignore these obligations, then I say deliberately that they are wasting their time; they will not allay the discontent among the doctors, nor will they provide a lasting solution of this question of remuneration."

Asking that even at this late hour the terms of reference should be changed, Lord Moran remarked: "I press this matter because, with the present terms of reference, we shall get nowhere." And it is precisely because of this that the B.M.A. Council is

recommending to the Special Representative Meeting that in present circumstances the Association should not co-operate with the Royal Commission. It would be futile to co-operate if "we shall get nowhere": we should end up in Erewhon. It would be stupid, and even dangerous, because we should be attempting to co-operate on terms of reference that had been settled by one side only to the present dispute—the Government, the employer of doctors in the N.H.S. The terms of reference are the Government's terms of reference, and, in Lord Moran's words: "Apparently the findings of this Royal Commission are to be taken seriously only if they are in the Government's favour." The considerations with which the Commission will examine the doctors' case "boil down to a specific comparison with other professions." Lord Moran ended his analysis of this by saying, "It is surely quite wrong." Lord Jowitt and Lord Conesford also both agreed that this wrong could not be made right "by an exchange of letters or anything of that kind." The words of the terms of reference are there for all to read. The profession has been informed with customary curtness that they exclude medical officers of health, although according to the words used they should be included. This arbitrary dismissal of a section of the medical profession is surely in itself enough to convince doctors that they should not—in present circumstances—co-operate with the Royal Commission. To do so would be to betray some of our colleagues.

What kind of defence did the Earl of Home put up for the Government in reply to Lord Moran and other critics? He began by saying that, "It is the first time it [the State] has had to work out a relationship with one of the great skilled professions, and inevitably, I suggest, it must take time. . . ." But the apparent task of the Royal Commission is to work out the relationship of the medical profession, not with the State, but with other professions and with "connected occupations." Lord Home, having said he does not believe it is possible to insulate one profession against the effects of inflation, then goes on to make the following statement: "But, short of the happy day when we achieve a halt to inflation, the best we can do is to try to make as sure as we can that no section of wage earners or salary earners is put at a relative disadvantage with regard to any other section of comparable skill and attainment." This is getting very near to Spens. In the face of the approaching nationalization of—in Lord Home's words—"one of the great skilled professions," the two Spens Committees, in their recommendations, took into account the past financial expectations of doctors, postgraduate training and

qualification, and the desirability of maintaining the proper social and economic status and power to attract suitable recruits. Their specific recommendations were to be adjusted in "direct regard not only to estimates of the change in the value of money but to the increases which have in fact taken place since 1939 in incomes both in the medical and in other professions"—to quote the Consultant Spens Report. It is necessary to go on repeating these recommendations, as, with Lord Moran, we believe they "cannot be thrown upon the dust-heap just because they have subsequently proved inconvenient," though we think Lord Moran is not right in thinking that a section of the medical profession wants to bind the Government in perpetuity to a "literal interpretation of Spens," especially as he interprets this as follows: "That every rise in the cost of living will be met by a rise in the salaries of doctors." The present claim is based on a rise in cost over five years, and even then the Chairman of Council, Dr. Wand, has made it clear that the profession is not insisting on its pound of flesh according to the bond, but is willing—and even anxious—to submit the whole matter to arbitration. Lord Jowitt urged this course in the debate in the House of Lords last week, but, in urging doctors "to stop all this talk of a strike and to accept the principle of arbitration," he seems to have forgotten that it is the profession itself that has ceaselessly been urging this principle. The Government reply in the Lords debate was completely unsatisfactory: at the end of it Lord Moran said, "I go away by the same door by which I came in, with no surety about the awards, and nothing whatever on this matter of Spens." That is why the profession must have nothing to do with the Royal Commission in present circumstances.

WITHDRAWAL FROM SERVICE

Support for withdrawal of general practitioners from the N.H.S. in the absence of a satisfactory settlement of the claim or of arbitration is coming in from all over the country. And the most encouraging support has come from the recommendation of the Hospital Medical Staffs Defence Trust that consultants and S.H.M.O.s should contribute 5% of their hospital remuneration to a special fund for assisting general practitioners in their action. In some divisions, as in the correspondence columns, there has been criticism of the scheme for withdrawing from the N.H.S. No one can pretend to like the idea or to be happy in seeing a skilled and learned profession resorting to this measure in defence of its rights and in pursuit of its just claims. But that it has been forced to consider such a step is the most powerful

indictment there could be of the parlous position in which it finds itself as a nationalized profession controlled in the details of its employment by party politicians. Medicine is, in fact, no longer a free profession. It has sacrificed so much that it seems of little account to sacrifice one of the few things left to it—what is called "dignity." But when a monopoly employer repudiates a contract, refuses to discuss terms, refuses to negotiate, denies us the ultimate resort to arbitration, sets up his own apparatus of determining terms—what possible courses of action are open to the few thousand he employs? Our negotiators presented to the Ministry of Health last year a carefully argued case based upon expert economic and legal advice. All the Minister of Health did was to reject it without even considering it. Words, written and spoken, have simply had no effect upon the profession's masters. Nor have they taken any heed of the criticism and advice they have received in the Press and in the House of Commons and the House of Lords. So the profession has, with the greatest reluctance, been driven to resort to a threat of withdrawal from the N.H.S. on the part of general practitioners. When this present grave and deepening crisis is past it may be hoped that a National Health Service will be evolved that will make this kind of thing highly unlikely. The B.M.A. is not a moment too soon in its decision to set up a wide-ranging inquiry into all aspects of the N.H.S.

PULMONARY ARTERIAL PRESSURE

The blood pressure within the lesser circulation excites increasing attention. The introduction of cardiac catheterization has allowed accurate measurement of vascular pressures within the lung, and disorders of the pulmonary circulation have been extensively studied during the last ten years. The average normal blood pressure in the pulmonary artery is 16/7 mm. Hg, the maximum normal is 30/15 mm. Hg, with reference to the sternal angle,¹ when measured by a cardiac catheter introduced into the pulmonary artery via an arm vein, and connected to a suitable manometer. The pulmonary artery pressure depends upon the output of the right ventricle and the resistance to flow offered by the pulmonary vascular bed. The resistance is normally low, so that the increase in cardiac output on effort is not accompanied by any increase in pressure in the pulmonary circuit.^{2,3} Pulmonary hypertension, by definition, exists when the pulmonary arterial pressure exceeds the maximum normal value (30/15 mm. Hg), and can result from either considerable increases in pulmonary blood flow (as in congenital heart disease with left-

to-right shunt) or from an increase in resistance within the pulmonary vascular bed, or from a combination of both factors.

Pulmonary hypertension resulting from an increase in pulmonary vascular resistance may be due to an increase in left atrial pressure, as in mitral stenosis and left ventricular failure, or to an increase in precapillary or arteriolar resistance due to narrowing of these vessels, which may be organic or functional, or a combination of both. The factors responsible for pulmonary vasoconstriction are imperfectly understood. Evidence from animal experiments,^{4,5} and from clinical studies of the effect of ganglion-blocking agents on the pulmonary circulation,⁶⁻⁸ suggests that such vasoconstriction is neurogenically maintained, though this has been denied.⁹ The pulmonary vascular resistance may be modified by other drugs. A rise in pulmonary arterial pressure due to an increase in resistance can be produced by drugs such as noradrenaline, while tolazoline, aminophylline, and acetylcholine can cause a fall in pressure.¹⁰ Many drugs, especially ganglion-blocking agents, also cause a fall in both systemic and pulmonary resistance. Caution is thus needed in ascribing a reduction in pulmonary resistance to the blocking of a neurogenic mechanism by such drugs, unless the fall in pulmonary resistance is greater than the fall in systemic resistance. Undoubtedly factors of a local nature may also be implicated, especially hypoxia due to a low tension of alveolar oxygen. Pressure in the pulmonary arteries increases after hypoxia, and this hypertension is usually considered to be due to an increase in vascular resistance,^{11,12} though an increase in flow may also be responsible.³ Pulmonary precapillary resistance increases in severe mitral stenosis, in certain types of congenital heart disease (notably patent ductus arteriosus and ventricular septal defect), in chronic pulmonary disease, and when the small vessels are obstructed by thrombo-embolic lesions or neoplastic or other emboli. The condition known

as idiopathic pulmonary hypertension is characterized by a striking increase in arteriolar resistance, leading eventually to failure of the right ventricle. The causes are not fully understood, but in most cases there is intrinsic obstruction of the small pulmonary arteries.¹³⁻¹⁵

Respiration also may influence the pulmonary arterial pressure. Since the pulmonary artery pressure reflects the stroke output of the right ventricle, and since the flow rises in inspiration and falls in expiration, the pulmonary arterial pressure will vary similarly, though during quiet respiration the pressure swing is very small. Respiratory activity may also influence resistance to blood flow through the lungs, for the changes in intra-alveolar pressure during breathing act on the pulmonary capillaries, causing variations in the pulmonary vascular resistance and hence the arterial pressure.¹⁶ Rodbard and colleagues¹⁶ have recently studied the respiratory fluctuations of pulmonary arterial pressure in a number of patients with various cardiovascular disorders. They noted that the swings of pulmonary artery pressure with respiration were increased in patients with pulmonary hypertension due to left ventricular insufficiency, mitral stenosis, or cor pulmonale, but fluctuations were within the normal range (average 5 mm. Hg) in patients with ventricular septal defect and pulmonary hypertension, and in those with pulmonary stenosis. They were unable to explain these differences, but noted that in the group with wide respiratory swings of arterial pressure there was usually pulmonary hypertension and congestion. It is known that the lungs are unduly stiff and the work of breathing is increased in mitral stenosis,^{17,18} and this might exaggerate the normal respiratory swing in pulmonary arterial pressure. Rodbard and colleagues¹⁶ believe that in chronic pulmonary disease the greater resistance to air flow and the reduced lung compliance cause an increase in the respiratory excursions and therefore the fluctuations of arterial pressure. By contrast, no such respiratory anomalies have been noted in pulmonary stenosis or severe pulmonary hypertension with ventricular septal defect, and patients with these disorders were found to have normal respiratory fluctuations of pulmonary arterial pressure. These authors suggest that the assessment of the degree of fluctuation of the pulmonary arterial pressures with respiration might form a useful test for distinguishing cases in which the pulmonary vascular resistance is increased at arteriolar level from those in which it is increased at post-capillary level. However, this is probably an oversimplification of the problem, since in many circumstances both pre- and post-capillary increases in resistance are present, as

frequently occurs in mitral stenosis. This work is valuable in drawing attention to the influence of respiratory factors on the pulmonary arterial pressure in health and disease, but much has still to be learnt before the story of pulmonary hypertension is complete, and all the factors affecting pulmonary resistance are fully understood.

HAZARDS FROM AGRICULTURAL CHEMICALS

The use of pesticides in agriculture increases at this time of year. In May and June the most dangerous pesticides such as parathion and dinitro orthocresol (D.N.O.C.) are dispersed in the greatest quantities. But on a smaller scale many insecticides, herbicides, fungicides, and rodenticides are applied for a much longer season in food stores, glasshouses, or in the open.

The same pest may be successfully attacked by chemicals ranging in their toxicity to man from the very dangerous to the virtually harmless, though factors other than danger to the user must determine the choice of any particular material in agricultural work. As a result of a co-operative effort by many people, including the manufacturers, distributors, and officials of the Ministry of Agriculture, Great Britain has had in recent years a good record in the safe use of the more dangerous pesticides. Before jumping to the conclusion that the regulations controlling the use of these materials are superfluous, it is as well to consider what happens elsewhere. In Germany W. Reinl¹ has assembled records of 28 cases of poisoning by organo-phosphorus insecticides among agricultural workers in 1950-5. These included 1 fatal, 3 severe, 7 moderate, and 17 mild cases of poisoning. An analysis of the symptoms showed that headache, dizziness, weakness, nausea, and vomiting were most frequently seen. Though contraction of the pupil has often been cited as a characteristic sign of poisoning by organo-phosphorus insecticides, it was noted in less than a third of these cases. There is indeed a recent report² of two patients with severe parathion poisoning who had dilatation of the pupils when first seen, and this led to some hesitation in making a diagnosis. Full atropinization saved these cases, and atropine must be given in large doses to all suspected cases of poisoning by organo-phosphorus insecticides. If a mild case responds well to atropine the patient must be kept under observation for 12-24 hours, because a single dose of atropine may be of only temporary benefit. The chemicals that can reverse the inhibition of cholinesterase caused by these compounds are still being studied,³ but specific recommendations for their use have not yet been made.

There is no specific treatment for D.N.O.C. poisoning. Cases are most likely to occur in hot weather when farm labourers are working long hours with weed-killing sprays on cereals. The chlorinated hydrocarbon group

of insecticides continue to be used with complete safety in agriculture. Endrin poisoned people who ate contaminated flour,⁴ and dieldrin when carelessly used has poisoned public health workers.⁵ Despite dramatic signs of poisoning, such as convulsions, no deaths were reported, and the margin of safety is apparently wide. Fluoroacetamide, a slightly less toxic derivative of fluoroacetate, is now on the market for anyone to buy, but it is sold as a very dilute solution containing acetamide, which is an antidote to the poisonous effects of fluoroacetamide in rats.⁶

Antibiotics, including penicillin and streptomycin, have been used for some years in agriculture as supplements to pig and poultry feeds.⁷ More recently sprays containing streptomycin have been applied to a number of different crops in the United States to control plant diseases due to micro-organisms. It seems to be generally accepted that the hazards of handling these antibiotics as agricultural sprays are negligible, and there have been no reports of ill effects among agricultural workers. But since nurses handling antibiotics may become sensitized to them this might be a risk also run by men handling concentrated sprays for crops. Whether or not resistant strains of bacteria can develop in persons coming into only casual contact with antibiotics remains to be seen. If preparations containing antibiotics of the type used in clinical medicine are introduced into agricultural practice in Britain, bacteriologists might look for evidence of any harmful developments.

The doctor with agricultural workers among his patients would do well to ask about possible exposure to toxic chemicals when cases of vague illness are reported to him. It may be helpful to ask to see the pesticide container, for the labels of all reputable brands contain much useful information on the properties of their contents. These pesticide containers are an obvious hazard if left within the reach of children who cannot read the labels.

HYPERGLOBULINAEMIA

Many pathological states are associated with increased levels of serum globulin, and clinicians have long used the erythrocyte sedimentation rate, which is in part dependent upon the globulin level, as an index of organic disease. Certain disorders, such as multiple myeloma, sarcoidosis, kala-azar, and some collagen diseases, may be associated with striking hyperglobulinaemia, but the question remains, How informative is precise measurement of the degree of hyperglobulinaemia as an aid to diagnosis? Using the salting-out technique of C. Cohn and W. Q. Wolfson,¹ which gives results in close agreement with the electrophoretic pattern,² A. R. Feinstein and R. G. Petersdorf³ have correlated in 394 patients the clinical diagnoses with the degree of hyperglobulinaemia. They found that when hyperglobulinaemia exceeded 5 g. per 100 ml. nearly half the patients were suffering from one of the diseases known to be associated with a raised level of serum globulin, and that the chances of the patient

¹ Wood, P., *Diseases of the Heart and Circulation*, 1956, 2nd ed., p. 828, London.

² Hickam, J. B., and Cargill, W. H., *J. clin. Invest.*, 1948, 27, 10.

³ Courmand, A., *Circulation*, 1950, 2, 641.

⁴ Daly, I., de Burgh, Linzell, J. L., Mount, L. E., and Waites, G. M. H., *Quart. J. exp. Physiol.*, 1954, 39, 177.

⁵ — in *Pulmonary Circulation and Respiratory Function. A Symposium*, 1956, p. 1, Dundee.

⁶ Fowler, N. O., Westcott, R. N., Hauenstein, V. D., Scott, R. C., and McGuire, J., *J. clin. Invest.*, 1950, 29, 1387.

⁷ Gilmore, H. R., Kopelman, H., McMichael, J., and Milne, I. G., *Lancet*, 1952, 2, 898.

⁸ Davies, L. G., Goodwin, J. F., and Van Leuven, B. D., *Brit. Heart J.*, 1954, 16, 440.

⁹ Lee, G. de J., Matthews, M. B., and Sharpey-Schafer, E. P., *ibid.*, 1954, 16, 311.

¹⁰ Wood, P., *Diseases of the Heart and Circulation*, 1956, 2nd ed., p. 837, London.

¹¹ Euler, U. S. Von, and Liljestrand, G., *Acta physiol. scand.*, 1946, 12, 301.

¹² Motley, H. L., Courmand, A., Werko, L., Himmelstein, A., and Dresdale, D., *Amer. J. Physiol.*, 1947, 150, 315.

¹³ Shepherd, J. T., Edwards, J. E., Burchell, H. B., Swan, H. J. C., and Wood, E. H., *Brit. Heart J.*, 1957, 19, 70.

¹⁴ Heath, D., Whitaker, W., and Brown, J. W., *ibid.*, 1957, 19, 83.

¹⁵ Evans, W., Short, D. S., and Bedford, D. E., *ibid.*, 1957, 19, 93.

¹⁶ Rodbard, S., Kariv, I., and Heiman, D. F., *Amer. Heart J.*, 1956, 52, 182.

¹⁷ Christie, R. V., *Proc. roy. Soc. Med.*, 1953, 46, 381.

¹⁸ Marshall, R., McIlroy, M. B., and Christie, R. V., *Clin. Sci.*, 1954, 13, 137.

¹ Reinl, W., *Arch. f. Toxikol.*, 1956, 18, 158.

² Dixon, E. M., *J. Amer. med. Ass.*, 1957, 163, 444.

³ Askew, B. M., *Brit. J. Pharmacol.*, 1956, 11, 417.

⁴ Davies, G. M., and Lewis, I., *British Medical Journal*, 1956, 2, 393.

⁵ Blázquez, J., and Biachini, C., *Gac. med. Caracas*, 1956, 63, 1.

⁶ Phillips, M. A., and Worden, A. N., *Lancet*, 1956, 2, 731.

⁷ *British Medical Journal*, 1953, 2, 417.

¹ Cohn, C., and Wolfson, W. Q., *J. Lab. clin. Med.*, 1948, 33, 367.

² Jager, B. V., Schwartz, T. B., Smith, E. L., Nickerson, M., and Brown, D. M., *ibid.*, 1950, 35, 76.

³ Feinstein, A. R., and Petersdorf, R. G., *Ann. intern. Med.*, 1956, 44, 899.

having multiple myeloma, sarcoidosis, or a collagen disease were almost 1 in 2. A moderate degree of hyperglobulinaemia with the level of serum globulin ranging from 4.2 to 5 g. per 100 ml. was attributable to these conditions in only about 1 patient in 10, whereas a third of the patients had liver or neoplastic diseases, and the remainder usually had acute or chronic infections. Lesser degrees of hyperglobulinaemia (3.9 to 4.2 g. per 100 ml.) were found in a wide variety of conditions. Fewer than 1 in 10 had multiple myeloma, sarcoidosis, or a collagen disease, and though all had organic disease more than half had conditions not specifically associated with hyperglobulinaemia. From these findings it can be deduced that, when the diagnosis is not clinically obvious, hyperglobulinaemia exceeding 5 g. per 100 ml. should direct investigations towards confirming the presence or absence of myeloma, sarcoidosis, or one of the collagen diseases. Hyperglobulinaemia of 4.2 to 5 g. per 100 ml. will suggest cancer, liver disease, or infections. Lesser degrees of hyperglobulinaemia give little clue to the best lines of further investigation, and serve only to indicate the existence of organic disease.

POST-MATURITY

It is perplexing to all who practise midwifery that, whereas to some doctors post-maturity poses a difficult and not uncommon problem, others dismiss prolongation of pregnancy as of little or no clinical importance. This division of opinion is reflected in the figures collected by Professor F. J. Browne from 20 hospitals over the last decade, figures which he discusses in an article at p. 851 in this issue. For example, in one hospital in which the total deliveries for 1954 were 1,027, 31 women were induced for uncomplicated post-maturity, while in another hospital there were no such inductions among 4,949 deliveries in 1949-50. The difference was apparently not due to resort to elective caesarean section for post-maturity in the second hospital, for its section rate was less than half that in the first. Indeed, the suspicion arises that the more inductions performed the higher the section rate may be, for 6.2% of all the women induced for simple post-maturity were eventually delivered abdominally.

It seems reasonable to regard the perinatal mortality as a good yardstick by which to measure any adverse effects of prolonged pregnancy, but again opposite conclusions can be drawn from different published reports. In one hospital in Professor Browne's series in which there were no inductions for post-maturity the perinatal mortality was low and there were no stillbirths in pregnancies prolonged beyond 40 weeks; while in the hospital where the induction rate was 3% the total foetal loss was relatively high. Discrepancies might arise partly because conditions in different hospitals are never exactly the same; the logical approach, therefore, would be to compare the results of intervention and non-intervention in a single hospital. This was in fact done

by D. Racker and his colleagues,¹ and their figures showed a lower foetal mortality in the group induced soon after term than in the group allowed to await the spontaneous onset of labour. After discussing the many variables concerned, physiological and clinical, Professor Browne offers certain conclusions. He suggests that many cases of so-called post-maturity are really examples of slow maturation of the foetus and placenta, and that to induce labour in these cases may do nothing to improve the perinatal mortality rate. Others may be due to the occurrence of conception in a very long menstrual cycle; but even when the date of isolated insemination is accurately known the conception-to-delivery interval varies widely—from 235 to 298 days according to E. J. Farris.² Finally, Professor Browne believes that the higher foetal mortality in post-mature babies compared with those born at term can be adequately explained by the larger size of the infants and by the longer average duration of labour in the former group.

The debate continues. And in post-maturity, as in most problems in medicine, the opinion and practice of the individual doctor is likely to be coloured by his personal experiences, and in particular to be influenced by an otherwise unexplained stillbirth or neonatal death, even though such occur also at or before term. For the present, perhaps, an old rule of thumb provides as good a guide to maturity as any: if the cervical canal is taken up and the external os is not closed, the patient is near, at, or after term.

TREATMENT OF PARKINSONISM

The syndrome of Parkinsonism is a challenging problem to the physician. Treatment of this distressing condition began on an empirical basis, and there it still remains. The only real progress has been an increase in the number of drugs available. Solanaceous alkaloids were first given for Parkinsonism so long ago as 1882, but they have never been thoroughly satisfactory because, though they may control the symptoms, their effect is transient, and attempts to extend it by increasing the dose cause severe side effects to appear. The action of many drugs may be prolonged by prescribing them on a form which lengthens the period of absorption from the intestine by several hours, and solanaceous alkaloids have been specially prepared in this way for an investigation into the treatment of Parkinsonism.¹ The preliminary report suggests that this classic treatment may return to favour in modern form.

It has been found that synthetic compounds with anti-acetylcholine and antihistamine activity can favourably influence the Parkinson syndrome. One of the first to be tried was diphenhydramine hydrochloride ("benadryl"). Slight modifications of structure have produced

more powerful analogues, the most active of which has the formula β -dimethylaminoethyl-2-methylbenzhydryl hydrochloride ("disipal"). In the clinic where this compound was investigated disipal is regarded as the best drug with which to begin treatment of new patients.² Ethopropazine hydrochloride ("lysivane") has also been shown to produce beneficial results when given by itself.³ Benzhexol hydrochloride ("artane") is more popular in the U.S.A. than in Britain.⁴⁻⁶ Although it has useful therapeutic properties it has been reported to cause severe mental disturbance.⁷ The activity of caramiphen hydrochloride ("parpanit") has been assessed as equivalent to that of the solanaceous alkaloids,⁸ but some clinicians have found it to be one of the least effective of the drugs commonly prescribed. Phenindamine tartrate ("thephorin") has been said to be the most potent of the antihistamine compounds given for Parkinsonism.¹ Another drug for which good results have been claimed is procyclidine hydrochloride ("kemadrin"),⁹ but it has not achieved any great popularity. A recent addition to the range of drugs has been reported from America. It is a synthetic compound named "cogentin," and has the tropine part of atropine united with the benzhydryl part of diphenhydramine. It is said¹⁰ to have a "prolonged potent anticholinergic, antihistaminic action" and was administered to 302 patients with various forms of Parkinsonism. Of those who began treatment four years ago 57% have experienced benefit with few side effects.

The aetiology of Parkinsonism is still obscure, and any classification provides little more than a convenient nomenclature. Similar presenting symptoms may have different causes requiring different treatment, and it is unlikely that maximal improvement will be obtained through the use of any drug by itself. There is no easy road to success; the only way is to persevere with various combinations of drugs until one is found which gives the individual patient the greatest relief. Frustrating as this approach may appear at times to be, there can be few experiences more rewarding to the physician than to see a patient who was helpless from severe Parkinsonism restored to normal activity.

THE NEW ESTIMATES

Total expenditure on the Health Service in Great Britain is approaching £690m. That figure takes into account payments from all sources, rates as well as taxes, patients' charges as well as the contribution from the national insurance fund. A similar gross figure for 1949-50, the first complete year of the Service, was £450m. But as the Minister of Health explained in the House of Commons recently, this increase of 53% is largely due to the rise in prices, of goods and services, in the intervening period. If prices had remained constant, expenditure on the Health Service would have gone up by only 15% in the last seven years. In other words, the real resources used by the Service have increased by 15%; but, as the country's total resources have expanded even more, the proportion taken by the Service has actually dropped slightly.

It is nevertheless the huge gross total of the Service that has prompted the Government to place more of the cost on to national insurance contributions instead of on to the taxpayer or the patient. At present, the share of the contributions from employer and employees that is credited to the Service is £40m., or approximately one-seventeenth of its cost. In 1949-50 the £40m. represented one-eleventh of the cost, and when the Service was being planned it was estimated that one-fifth of the cost should be met by insurance contributions. As the alternatives for meeting the higher cost are increasing the already onerous burden on the taxpayer and raising charges to patients, the Government has proposed instead to double the amount that will come from the national insurance fund. At £80m. this would meet between an eighth and a ninth of the gross total.

Even so, the amount to be met by the taxpayer would be £510m. A year ago, the taxpayer's bill was estimated at £502m., but supplementary estimates in February raised it to £529m. If, therefore, the proposal to increase the insurance contribution goes through, the taxpayer will be saved nearly £20m. in this financial year. Nearly £1m. of this saving will go to meet the 10% increase in the salaries of junior hospital staffs that came into force on April 1.

Within the Service the estimates¹ are remarkable for the comparative stability shown by the individual items—with the one exception of the hospitals. In fact, the pharmaceutical service actually shows a small fall, from £59.4m. to £57.6m., in its net cost. But this reduction has been achieved only by the expedient of charging patients a shilling for each item on the prescription instead of for each form. This has increased patients' payments for drugs from £8.8m. to £13.4m., and had it not been for this increase the pharmaceutical service would have cost nearly £3m. more.

The rise of nearly £3m. in the dental service can be explained by a bigger demand for treatment. But the increase in the cost of the executive council services as a whole—just over £3m.—is completely dwarfed by the rise in the cost of the hospitals. Some of this, £5.6m., is on capital account and represents the carrying out of the hospitals' building programme. But a sum twice as big is needed for the estimated extra cost of maintaining the hospitals in the new financial year compared with the year just ended. The additional £11m. will bring the total advances to hospital boards for hospital maintenance to £371.5m., or about 54% of the total gross cost, compared with 45% in 1949-50. Presumably this growth in the hospitals' share of Health Service resources is largely inevitable. But it is worth emphasizing, as we have done before, what a large proportion of the hospitals' costs is accounted for by the salaries and wages of staffs other than doctors and nurses. Doctors' salaries are estimated at £39m. in 1957-8 and nurses' at £90m. But all other salaries and wages, excluding the central administrative expenditure of management committees and boards, amount to £108m.

1957-58 Civil Estimates for the Year Ending 31st March, 1958, 1957, H.M.S.O., London.

¹ Racker, D., et al., *Lancet*, 1953, 2, 953.

² Farris, E. J., *Human Ovulation and Fertility*, 1956, London, p. 119.

¹ Gillhespy, R. O., and Ratcliffe, A. H., *Bgham med. Rev.*, 1956, 19, 115.

² ———, *British Medical Journal*, 1955, 2, 352.

³ Palmer, H., and Gallagher, D. J. A., *ibid.*, 1950, 2, 558.

⁴ Bovet, D., and Longo, V. G., *J. Pharmacol.*, 1951, 102, 22.

⁵ Doshay, L. J., and Constable, K., *Neurology*, 1951, 1, 68.

⁶ Effron, A. S., and Schultz, W. M., *Amer. J. med. Sci.*, 1951, 221, 561.

⁷ Porteous, H. B., and Ross, D. N., *British Medical Journal*, 1956, 2, 138.

⁸ Dunham, W. F., and Edwards, C. H., *Lancet*, 1948, 2, 724.

⁹ Montuschi, E., Phillips, J., Prescott, F., and Green, A. F., *ibid.*, 1952, 1, 583.

¹⁰ Doshay, L. J., *J. Amer. med. Ass.*, 1956, 162, 1031.

AGEING AND OLD AGE

SYMPOSIUM AT LIVERPOOL

[FROM A SPECIAL CORRESPONDENT]

An opportunity for people of different disciplines but with a common interest in the problems of ageing to compare their views was afforded by a recent symposium organized by the Department of Studies in Psychological Medicine of Liverpool University. The symposium was held in the University Department of Civic Design on March 23. The joint chairmen were Dr. S. BARTON HALL and Dr. F. HOPKINS, and the speakers included a psychologist, a medical officer of health, and a psychiatrist.

Too Old at 25

The need to regard ageing as a continuous process which starts soon after maturity is reached was stressed by Dr. ALASTAIR HERON (Liverpool), deputy director of the Medical Research Council Group for Research on the Occupational Aspects of Ageing. In the past too much attention had been paid to the end product of the ageing process rather than to the process itself, he said. There was little justification for the view that ageing begins at some arbitrary point such as the age of 65. There were other crucial ages, and some of us had already passed them. Muscular strength would appear to be at its maximum in the late twenties, while some signs of hearing loss were often apparent in the early forties. Similarly deterioration occurred throughout life in visual perception. These physiological changes were paralleled by changes in mental capacity. There was a slow but steady fall in the average score on standardized intelligence tests after the age of 25, while the prolongation of reaction time in the elderly was almost certainly due to differences in the way the ageing individual coped with incoming information. Emotional differences demonstrated on projection tests such as the Rorschach and the thematic apperception test might represent changes in our attitudes and values as we grew older.

Practically all the available data on these mental and physical changes had been obtained by comparing groups of different ages on a single occasion. This, of course, provided no satisfactory evidence on age-changes but only on age-differences, and there was thus a need for intensive longitudinal studies in which the same people were followed throughout life. Such studies did not produce information quickly, and the subjects might well outlive the experimenter. This difficulty could be overcome to some extent by following groups of people of different ages over a period of years. That was what members of the M.R.C. Group at Liverpool were now doing. They were studying the auditory, visual, and intellectual responses of a sample group of volunteers.

Dr. Heron ended his address by referring to the problem of the ageing industrial worker. This was of particular importance nowadays. Physical efficiency was likely to be affected less than mental efficiency, but forms of work where speed was important put a special strain on the elderly. Automation would also pose many problems for the middle-aged worker, as the new electronic devices put a premium on mental rather than manual skills. At present training in industry was "youth-oriented," but training schemes for the middle-aged were also wanted if the latter were to keep up with industrial change.

Services for the Aged in Liverpool

Professor A. B. SEMPLE (Liverpool) discussed the social problems of the elderly as seen in a large city. Isolation, economic difficulties, inadequate diet and housing, and the absence of employment were, in his view, the most important. Physical disability had a particularly bad effect on those who lived alone, as after a time they limited their journeys and eventually did not go out at all. This led them to restrict their diet to milk and bread, commodities usually delivered to the door. In these circumstances home visiting became

very necessary, and in Liverpool they had a friendly visitors service, so that every old person could have a regular visitor if he wanted. This was supplemented by a scheme whereby a friend or neighbour acted as a "signaller," whose job it was to inform the health department if the old person needed help. The domestic-help service also devoted much of its time to the elderly. Here the aim was to get the old person to live as normal a life as possible by taking him shopping and cooking a meal with him in his own home. This was often preferred to having a meal brought to the door by a mobile service.

There was not nearly enough suitable housing for the aged, continued Professor Semple, and, although housing authorities were aware of the problem, they had not yet shown a very realistic approach to it. It was important to restrict accommodation in residential hostels to those who did not need nursing care; if nursing was needed then the proper place was a bed in a hospital for the chronic sick. Lack of mental and physical effort quickened the pace of degeneration, and there was much to be said for a system of employment for the elderly as a health project. Similarly, the value of maintaining outside interests as a preventive against social isolation could not be over-stressed. Such interests were best established in youth or middle age, when enthusiasm was greater and active participation easier.

Importance of Accurate Psychiatric Diagnosis

Professor MARTIN ROTH (Newcastle upon Tyne) spoke on mental disorder in the elderly. This was one of the few forms of mental illness, he said, which we could be reasonably certain had increased in prevalence during the last fifty years. Even so, the increase might well be more apparent than real and due to the greater tendency nowadays to admit to mental hospitals old people who formerly would have survived at home.

It was of primary importance that the diagnosis of mental illness in later life should be accurate. A distinction was usually possible between a gradually developing senile psychosis and an arteriosclerotic psychosis, a condition in which about half the cases showed focal symptoms and signs in addition to dementia. No longer should it be accepted that mental disorder in old people was necessarily always due to arteriosclerotic or degenerative changes. Affective illness in old age had the same good prognosis as it had in young people and responded well to electric convulsion therapy. It was also important to differentiate between delirious states and dementing processes. If the picture was a delirious one then there was generally some specific illness the active treatment of which might decide whether the patient lived or died. A patient who presented as a deluded dement might, for instance, really be suffering from cardiac failure, the treatment of which could ultimately lead to his discharge from hospital. The mortality from delirious states in old age was high, so when there were delirious features a particularly careful search should be made for any specific physical factor which might be treatable.

The electroencephalogram gave some help in differentiating the forms of mental disease in old age. In affective psychosis at all ages the electroencephalogram was essentially normal, while in cases of senile degeneration there might be little change apart from slowing of the alpha rhythm to 6-8 cycles per second. It was in the differential diagnosis of confusion and dementia that the electroencephalogram was most useful, some 40 to 50% of confused cases showing high-voltage, rhythmic, slow waves, predominantly from the frontal region. In arteriosclerotic psychosis such changes were absent in a quiescent phase, but during a phase of acute confusion there might be similar changes, though often with minor asymmetries such as a focal abnormality; or these might develop as the confusion died down.

Unsolved Questions

Dr. R. KEMP (Liverpool), in the discussion, asked whether old people could not be adopted in the same way as children,

but Dr. P. SHAW (Nottingham) said that in Nottingham boarding out had failed to work. It was even more difficult to match old people with a family than it was to match children with foster-parents. They had found in Nottingham that an occupation-centre and day-hospital were of great value, particularly in relieving families of the burden of old people during the day. This had made it possible for many elderly psychiatric cases still to be cared for at home.

Dr. W. E. KERSHAW (Liverpool) said that in most biological systems protected from severe hazards mortality rose with age in such a manner that the logarithm of its rate had a linear relation to time. Because of their concern in tropical medicine with such factors as the fertility of insect vectors, the capacity of a vector to support a parasite, its flight range, and its ability to take repeated blood meals, they had investigated the survival of various physiological functions. All had shown a similar pattern of survival, with the logarithm of the mortality rate linearly related to time. They would like to know more about the relation between failure of physiological functions and death, and data derived from the psychological assessment of the elderly and from the development of psychiatric conditions in old age would probably yield information of value.

Many other points were raised in the discussion. It was generally agreed that some form of residential accommodation half-way between a hostel and a hospital was required for the elderly psychiatric patient, where he could receive nursing care. No one could explain why women live longer than men, although some speakers thought that endocrine factors were responsible. This discrepancy often leads to hostels for the elderly having a preponderance of contented women and a minority of discontented men. Why do some people grow old gracefully and remain mentally alert even in their nineties? This was still a puzzle, and, although many speakers thought that it was a matter of personality and temperament, on the whole the meeting felt that there was much more to it than that. Obviously much more data and research are needed in this field, and more meetings of interested workers as at this successful symposium.

Nova et Vetera

THE GREAT FAMINE

The Great Famine lasted from 1844 to 1850, and was a tragedy for both Ireland and England. This book,* which examines its historical, social, economic, political, and medical aspects, is written by a group of scholars predominantly, if not all, Irish. It is judicious and moderate in tone, singularly impartial, and points out that English handling of the problem was dictated by humanitarian principles and advanced for the time. But it was misdirected by ignorance of Irish conditions and difficulties, and based on economic theories which were quite inapplicable to Ireland. The British Government hesitated and delayed, and 4,000,000 persons were brought to the verge of starvation, while thousands died of famine and fever.

It was not until 1847 that soup kitchens and depots for free food were set up; relief works were a failure and badly administered. Too often the famine-stricken men died at their work. Disastrous too were the wholesale evictions which followed when the famine ceased. Unwilling emigrants were driven out of Ireland, mostly to America, by the hundred thousand, cherishing animosity for the Anglo-Irish land-holding classes and for the government which had done nothing to prevent their expulsion.

The cause of the famine was a fungus disease of the potato due to *Phytophthora infestans*, which appears in the

**The Great Famine: Studies in Irish History, 1845-52*. Edited by R. Dudley Edwards and T. Desmond Williams. (Pp. 517+ xvi; illustrated. 30s.) Dublin: For the Irish Committee of Historical Sciences by Browne and Nolan Ltd. 1956.

form of black spots on the leaves, with, on the under surface, a whitish mould containing the spores. These are conveyed by wind, rain, and insects. The potato was almost the sole food of one-third of the population and a main article of diet of a much greater number.

In Chapter V Sir William MacArthur, with his wonted literary skill and erudition, graphically describes the medical history of the famine. The diseases which followed in its train were typhus, relapsing fever, dysentery, scurvy, and famine dropsy, while in 1848-9 there was an outbreak of imported cholera. Sir William MacArthur considers that nearly a million persons died from famine and its consequences during the whole famine period. He describes the medical organization and arrangements that were made, the provision of fever hospitals, and attempts to limit the spread of infection. But, he adds, in the absence of modern knowledge of louse-borne infection and its prevention "no board of health at that date, even if given dictatorial powers and unlimited funds, could have brought the epidemic to a speedy and dramatic end." Finally he quotes that great Irish physician William Stokes, who said: "We cannot be suddenly wise. Nations as well as individuals must purchase experience, even though the cost be ruinous. And whatever fault we may find with the methods adopted for relief to the sufferers in the famine of 1847, we must applaud the intention, and be grateful for the efforts that were made."

ARTHUR S. MACNULTY.

Reports of Societies

DISORDERS OF THE PANCREAS

DIAGNOSTIC FEATURES

The Section of Medicine of the Royal Society of Medicine discussed the diagnostic features of some pancreatic disorders on March 27. Dr. C. E. BEAUMONT, president of the Section, was in the chair.

Relapsing Pancreatitis

Dr. T. C. HUNT (St. Mary's Hospital) confined his remarks to chronic relapsing pancreatitis, a relatively uncommon disease but one extremely difficult to diagnose. There were several reasons for this difficulty, he said. Chronic pancreatitis probably embraced a number of syndromes with a broad spectrum of symptomatology. It was often associated with—and mistaken for—gall-bladder disease, peptic ulceration, and neurosis. Nor were there any precise diagnostic tests on which the clinician could rely. Relapsing pancreatitis came to light most commonly in the middle forties, though it could occur at the extremes of life. Men and women were equally affected. There was often a long history of recurrent symptoms, of which pain was the most outstanding, before the diagnosis was made. The pain was severe, usually continuous, but it might be spasmodic and difficult to distinguish from colic. In the majority of patients it was situated in the centre of the abdomen and radiated through to the back. It never radiated into the neck or arms, an important point in differentiation from myocardial infarction. A characteristic feature was that sitting up often relieved the pain. Loss of weight and vomiting were common, but, in contrast to peptic ulcer, vomiting did not relieve the pain. Attacks of pain lasting only a few days and failing to respond to alkalis were other useful diagnostic points.

It was not sufficiently realized that chronic pancreatitis might be a cause of gastro-intestinal bleeding, though it was difficult to explain why this should happen. The classical triad of steatorrhoea, glycosuria, and pancreatic calcification was diagnostic, but quite uncommon. Chills, mental and physical fatigue, but excessive alcohol intake might be

precipitating factors, but, although patients tended to avoid fats, there was no evidence that they played any part in causing the disease.

Cancer of the Pancreas

Mr. RODNEY SMITH (St. George's Hospital) spoke about some of the surgical problems in the diagnosis of carcinoma of the pancreas and chronic pancreatitis. The common textbook description of painless jaundice as the presenting symptom of carcinoma was erroneous, he said. In fact pain was very common and occurred as the first symptom as often as jaundice. Those cases in which pain was absent, however, had the best prognosis so far as surgery was concerned. The jaundice was not necessarily progressive, and intermittent relief could result from sloughing of necrotic areas of carcinoma. A distended gall-bladder was not always palpable, so that failure to palpate this organ did not rule out the diagnosis. Radiological examination of the duodenum, with special attention to the mucosal pattern, could sometimes be helpful. In a very few selected patients with obstructive jaundice transhepatic cholangiography, combined if necessary with a barium meal, was of value, though there was a definite risk of leakage of bile into the peritoneal cavity.

Even at operation the diagnosis could be difficult, especially if the tumour was small and eminently suitable for resection. A hard pancreas could be due either to carcinoma or to chronic pancreatitis. It might well be necessary to open the duodenum, and even to perform a transduodenal biopsy of the pancreas, in order to make a definite diagnosis. Biopsy should never be attempted through the pancreas itself because of its unreliability and the risk of producing a fistula. Inspection of the common bile duct could yield valuable information. It was usually dilated, thin, and translucent in neoplasm; often thickened, white, and with adherent peritoneum in chronic pancreatitis.

Chronic Pancreatitis

Chronic pancreatitis, continued Mr. Rodney Smith, could present in many different ways. At one extreme was the patient suffering recurrent acute attacks with pain, fever, leucocytosis, and a raised serum amylase, and at the other the syndrome of chronic pain with calcification of the pancreas. In between were the difficult cases, where the serum amylase was normal and tests of pancreatic function were of no help. Laparotomy was often the only conclusive investigation. The surgeon exploring the abdomen must be prepared to give a definite answer on whether chronic pancreatitis was present, and should make every effort to demonstrate the cause.

In chronic pancreatitis the pancreas was hard and rounded, with adherent peritoneum and peripancreatitis. The biliary system should be explored, and a case could be made out for operative cholangiography and pancreatography. Reflux of bile into the pancreatic duct was common, and Mr. Rodney Smith showed a ciné film demonstrating this by means of diodone injected into the bile duct. Interestingly enough, as he pointed out, the patient experiences pain immediately the dye enters the pancreatic duct. This did not appear to be due to a rise in pressure, since secretin, which increases the pressure in the duct system, caused less pain provided the pancreatic reflux was reduced as a result. Similarly splanchnic block would inhibit pain but had no motor effect on any hypothetical sphincter.

"Mucosis" and Other Pancreatic Disorders of Childhood

Dr. MARTIN BODIAN (Great Ormond Street) reviewed the necropsy material from children dying with diseases of the pancreas. Fibrocystic disease was by far the commonest, but he stressed that the pancreas was only one among a number of organs involved in a widespread disorder of mucus secretion (inherited as a recessive characteristic), which he called "mucosis." For some reason the mucus

was more viscid than normal, and this led to its retention, pseudocyst formation, with subsequent atrophy and necrosis of secretory elements and fibrosis. Ultimately the pancreatic remnant became embedded in a thick layer of fatty tissue. It was important to realize that there was no atresia of the pancreatic duct in this condition. Similar changes occurred throughout the alimentary tract and its adnexa and in the lungs—in fact, in any organ containing mucus-secreting glands. The salivary glands, for example, were involved, though this produced no symptoms. Obstruction of biliary ducts within the liver led to focal biliary fibrosis, and later to more generalized cirrhotic changes. A curious feature, so far unexplained, was that the sweat contained increased amounts of sodium and chloride. Involvement of the lungs was probably the most important single factor, because of the susceptibility to every variety of respiratory infection. The introduction of antibiotics had done much to prolong the life of these children.

By contrast with fibrocystic disease, other pancreatic conditions were uncommon in childhood. Congenital hypoplasia and cystosis might rarely be the cause of symptoms of pancreatic insufficiency. Interstitial pancreatitis could be produced by various factors, of which congenital syphilis was the commonest. Occasional cases were caused by virus infection, vascular disease, and ascending infection of the pancreatic duct associated with gastro-enteritis.

Reflux of Bile

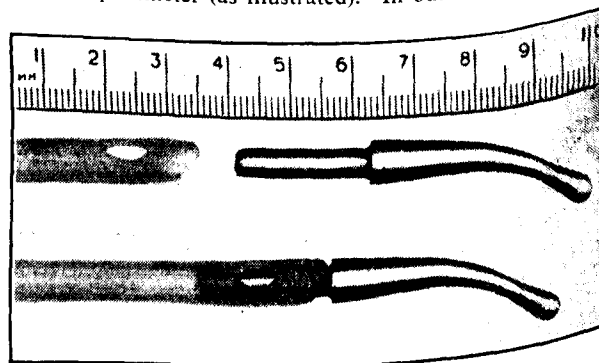
In the discussion which followed it was agreed that reflux of bile into normal pancreatic ducts did not cause trouble, so that chronic pancreatitis must result from the effect of reflux on passages which had already been damaged during the initial attack. Sphincterotomy might relieve symptoms, but if after a suitable interval there was no improvement division of the common bile duct and its insertion into some other part of the small bowel might have to be considered. None of the speakers had much faith in the value of secretin tests or serum amylase estimations in diagnosis; the latter might not rise even in acute pancreatitis.

Preparations and Appliances

METAL CATHETER GUIDE

Mr. J. D. HENNESSY, urological registrar, United Birmingham Hospitals, writes: The whistle-tip type of catheter has now largely replaced all other types of urethral drainage of the bladder following retropubic prostatectomy and other open operations on that organ. It more readily facilitates the removal of any clot formed in the bladder. It is our custom to use a No. 22 or No. 24 Charrière neoplex catheter. On occasion, however, we have found difficulty in passing this catheter beyond the membranous urethra and have had to resort to using a Tieman catheter.

A brass guide shaped like the tip of a Tieman catheter has been made in the hospital workshop and attached to the whistle-tip catheter (as illustrated). In our last thirty retro-



pubic prostatectomies this has been found an excellent method of guiding this catheter into the bladder, the guide then being removed.

A similar fitting could easily be made to suit the funnel-shaped open end of a urethral catheter so as to guide it in a retrograde fashion along the urethra during a suprapubic operation for those who wish to use such a method.

I thank Dr. L. T. Clarke for stimulating thoughts in this direction, Mr. W. H. Biffen for the manufacture of the instrument, and Mr. T. F. Dee for the photograph.

LATHAM TUTOR FOR HOLGER NIELSEN METHOD OF ARTIFICIAL RESPIRATION

Dr. M. A. DOBBIN CRAWFORD, medical officer, Ministry of Supply, writes: Recovery from asphyxia often depends upon the immediate application of artificial respiration, and the efficacy of this treatment rests largely upon the skill of the operator. The recent enthusiastic adoption of the Holger



Nielsen method of artificial respiration has not resulted in its comprehension by the majority of first-aiders; they lack a precise, controlled technique.

A simple apparatus, of great use in training, has been devised to instil control of rhythm, posture, and the weight to be applied. A surface model in wood, of the head, arms, and upper chest, is so made that pressure upon the region of the shoulder-blades is recorded on a dial visible to the operator in a mirror, and the dial is calibrated to indicate the proper weights. The posture of the casualty is correct; the arms lift at the shoulder and are jointed at elbow and wrist. Perfect timing and rhythm can be practised *ad lib.*, without a demer from the casualty, and the proper weight to be leaned upon his back will soon be

appreciated by the attentive student. The Latham tutor has been seen and approved by Dr. K. W. Donald, secretary of the Resuscitation Committee of the Medical Research Council.

This apparatus is readily portable, neatly packed in a light wooden cover. It has been invented by Mr. A. H. Latham, a voluntary and experienced first-aid, who has gained his instructor's certificate and is on the staff of the Ministry of Supply. It is being manufactured by Messrs. Siebe, Gorman and Co. Ltd., Neptune Works, Davis Road, Surbiton, Surrey.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Premature Induction in Haemolytic Disease of Newborn

SIR,—Dr. O. D. Fisher's communication (*Journal*, March 16, p. 615) does no more than confirm that premature induction of labour leads to a reduction in the number of stillbirths but to an increase in neonatal deaths from this cause. His series does not provide a valid comparison between the use of premature induction and spontaneous delivery in the management of Rh iso-immunization. Although clinical assessment was carried out in each case, we are not told the criteria for selection and are left to surmise to what extent induction was determined because of admission to Professor Macafee's unit. If the groups "induced" and "spontaneous" are indeed comparable must one imagine that increased need for exchange transfusion in the induced group was a consequence of induction? It is implied that the more severely affected cases were induced, but we can only guess how this was achieved and how the optimal time for induction was determined. Surprisingly, 28 out of 76 induced cases were delivered after 38 weeks' gestation, but 22 (including 7 of the 12 stillbirths) out of 63 spontaneous cases were delivered before this time. Only 4 out of 17 stillbirths occurred before 36 weeks. This suggests that some early stillbirths were delivered elsewhere, for superficially it would seem that 143 cases represent less than 70% of the number expected in Belfast alone in the five years under discussion.

In a disease so diverse in effect individual cases have little meaning when related to the problem as a whole—e.g., in cases 1 and 2 it is quite likely, having reached 37 weeks' gestation, that the result would have been similar if spontaneous delivery had been allowed. That Dr. Fisher himself found it difficult to decide the optimal time for induction is illustrated by his other case history.

Before embarking on a policy of premature induction one must weigh the probable reduction in the number of stillbirths against the increased neonatal loss. We found that 268 stillbirths occurred in 1,692 cases of haemolytic disease between 1948 and 1956, an incidence of 16%, which corresponds with other estimates.^{1,2} We found, moreover, that 50% of these (taking into account those foetuses dead or hydropic although not delivered) occurred before 35 weeks' gestation, and therefore premature induction at this time can at best provide only half of the answer to this problem. If, e.g., one were to induce 100 immunized Rh-negative mothers at 35 weeks' gestation one might prevent eight stillbirths, for which reward 92 mothers and babies would have been exposed to the risks of premature induction, and, to quote Fisher, the babies exposed to "the hazards of prematurity." It would only require a neonatal death rate similar to that of Fisher (15%) to mean that this had been in vain.

An alternative approach is to reserve premature induction for cases where stillbirth is almost inevitable, but as yet there is no certain method for predicting this. We have found the previous obstetrical history of value, for, although the overall risk of stillbirth is 16%, the risk in a mother developing antibodies for the first time is only 8% and where a previous baby has been mildly affected only 2%. Having analysed 896 cases observed by us in the past four years, we find that 70% of all cases of haemolytic disease fall into this category, and it is doubtful whether premature induction is ever justified in such families. At the other extreme the risk of stillbirth following stillbirth or very severe disease is between 50% and 80%. These account for 10% of all cases of haemolytic disease, and in these we feel that premature induction is justified.⁴ In the remainder,

preceded by disease of sufficient severity to have required treatment, the risk of stillbirth is 20%–27%, and these (20% of all cases) provide food for thought. It is especially in these that a further method of assessment, whether by antibody titrations, tests on liquor amnii, or other method, is needed.

The time at which stillbirth occurs must also be taken into account, and this varies, the chance of the pregnancy reaching 35 weeks satisfactorily being only 30% following multiple stillbirths but 70% for "first affected" stillbirth. The nearer a pregnancy approaches term satisfactorily the less the risk of stillbirth, so that the later induction is delayed the greater its apparent benefit unless early stillbirths are taken into account. Induction at 37 to 38 weeks can possibly prevent 40% of all stillbirths, but less than 30% of those with a bad obstetrical history.

We still require an accurate method of forecasting stillbirth in haemolytic disease, and, having forecast it, a better method than premature induction to forestall it.—We are, etc.,

W. WALKER.
S. MURRAY.
J. RUSSELL.

Newcastle upon Tyne.

REFERENCES

- 1 Walker, W., Murray, S., and Russell, J. K., *J. Obstet. Gynaec. Brit. Emp.*, in press.
- 2 Davies, B. S., Gerrard, J., and Waterhouse, J. A. H., *Arch. Dis. Childh.*, 1953, 28, 466.
- 3 Allen, F. H., jun., Diamond, L. K., and Richardson-Jones, A., *New Engl. J. Med.*, 1954, 251, 453.
- 4 Walker, W., Murray, S., and Russell, J. K., *Lancet*, 1957, 1, 348.

Deformities of the Chest

SIR,—Your annotation on deformities of the chest (*Journal*, March 16, p. 637) comments on the little work which has been done in Britain on this subject. After referring to the suggestion of H. A. Brodtkin^{1,2} that funnel chest and pigeon breast might be due to congenital weakness of the anterior segment of the diaphragm the annotation states: "His arguments, though interesting, are mainly theoretical and proof should be forthcoming before they are accepted. It should be possible to learn something from post-mortem studies. . . ."

In his Hunterian lecture at the Royal College of Surgeons of England, May 17, 1956, Mr. E. F. Chin discussed the surgery of funnel chest and congenital sternal prominence.³ I carried out a histological study of muscle biopsies from the anterior portion of the diaphragm taken by Mr. Chin at operation and compared the findings with biopsies from normal controls in the same age group. The histological picture has done a great deal to confirm Brodtkin's work. In the cases of funnel chest the anterior portion of the diaphragm proved to be grossly deficient in muscle, and the most common change was a marked increase in fibrous tissue. Some cases showed complete replacement of the muscle by fibro-fatty connective tissue. These findings are illustrated in Mr. Chin's paper, and, in our opinion, they fully explain the clinical findings in these cases. I would submit therefore that the congenital defect in the development of the diaphragm suggested by Brodtkin has now been fully proved.—I am, etc.,

Southampton.

REFERENCES

- 1 Brodtkin, H. A., *Pediatrics*, 1949, 3, 286.
- 2 — *Dis. Chest*, 1951, 19, 288.
- 3 Chin, E. F., *Brit. J. Surg.*, 1957, 44, 360.

Chemotherapy in Primary Tuberculosis

SIR,—I was interested to read the comments of Dr. F. J. Bentley (*Journal*, March 9, p. 584) on my recent article on this subject (*Journal*, February 9, p. 324). I am in entire agreement that a major planned trial is called for. As I stated, "The results obtained in the present relatively small series of cases . . . cannot take the place of an adequately controlled large-scale trial."

In recent years treatment of primary tuberculosis in the Indian and Eskimo child has been carried out on a large scale in this country, and it is the general opinion among workers in the field that the clinical course now very closely

resembles that in the white child. In view of this, despite the smallness of the group, and with the reservations mentioned, I feel that it is justifiable to conclude that there is no obvious increase in the natural frequency of segmental lesions as a result of antimicrobial treatment. As Dr. Bentley has reported a 10% incidence of haematogenous complications in children under 2 years of age suffering from a primary infection,¹ it would appear to me unwise to discourage the use of isoniazid in any of this group in view of its excellent reputation in the control of haematogenous spreads unless the results of a controlled trial should show a very real increase in segmental lesions among cases who receive chemotherapy.—I am, etc.,

J. B. RYDER.

Hamilton,
Ontario, Canada.

REFERENCE

- 1 Bentley, F. J., Grzybowski, S., and Benjamin, S., *Tuberculosis in Childhood and Adolescence*, 1954. London.

Neodymium 3-Sulpho-isonicotinate and Blood Coagulation

SIR,—Professor R. B. Hunter and Dr. W. Walker have reported (*Journal*, January 26, p. 227) that they have found haemoglobinaemia in all of four patients who received daily injections of neodymium 3-sulpho-isonicotinate 5 mg./kg. for more than five days. It is not stated, however (as I have heard by personal communication from Dr. Walker), that the haemoglobinaemia was demonstrated only by spectroscopic methods. It may be remembered that the principal bands for neodymium (594–562, 534–498 m μ) are the same as those of oxyhaemoglobin (578 and 542 m μ). It is therefore not possible to show by simple spectroscopy that neodymium will produce haemoglobinaemia. There is also no evidence that it was possible to convert the pigment into reduced haemoglobin, methaemoglobin, and haematin with the corresponding changes in the spectrum.

German authors have seen haemoglobinaemia or haematuria in only some of many thousands of patients, which is similar to the observations following the application of heparin or dicoumaroles, where it is thought that these effects are associated with a greatly prolonged clotting-time rather than being caused by the anticoagulant itself. The proof of a drug-induced haemoglobinaemia is also difficult, because destruction of erythrocytes at venepuncture or on sharp centrifuging of the blood can result in haemolysis.

I believe that it is not justified to draw conclusions from such obviously inadequate experiments and results as regards the clinical application of neodymium sulpho-isonicotinate, a remedy in clinical use for seven years.—I am, etc.,

Hamburg.

E. VINCKE.

Natural Childbirth

SIR,—I have no desire to enter into any controversy regarding the merits and demerits of training programmes for natural childbirth. In my letter (*Journal*, December 29, 1956, p. 1545), I merely wished to add support to Dr. Constance Beynon's¹ contention that it is now time to take stock of the situation regarding the value of these training programmes. I would, however, like to correct certain misunderstandings created in the mind of Dr. J. G. Scott (*Journal*, February 9, p. 343) by my letter.

First, I have a very great respect for Dr. Read's work and consider that he has done us obstetricians a very great service in helping to wean us away from "unnatural childbirth." With most new ideas, however, the pendulum has always a tendency to swing too far due to excess of enthusiasm, and it is necessary to check it before any actual damage is done either to patients or to the nation's purse. Secondly, in more than twenty years of obstetric practice, I have yet to come across an "unsophisticated girl" who has had any education in preparation for labour during pregnancy by a midwife, whether "native" or foreign, excepting those girls who have already been attending antenatal clinics. These girls receive a certain amount of simple but very valuable instruction by the health visitors during

their home visits. On the other hand most "sophisticated" girls have usually read various books as well as articles in magazines on this subject. Thirdly, my experience with women who have already had some training in "natural childbirth" is chiefly limited to those who have had their training in the U.S.A. I can only say that I am glad to know that the pendulum has not yet swung so far in Britain. When it does, Dr. Scott will have experiences similar to mine.

Finally, I would like to suggest to Dr. Scott that in medical science clinical impressions are not enough. A study of the survey of 2,994 parturients by Mr. C. W. F. Burnett² should provide him with considerable food for thought.—I am, etc.,

New Delhi, India.

SITA SEN.

REFERENCES

- 1 Beynon, C. L., *British Medical Journal*, 1955, 1, 475.
- 2 Burnett, C. W. F., *J. Obstet. Gynaec. Brit. Emp.*, 1956, 63, 40.

Termination of Pregnancy

SIR,—The paper by Dr. James Arkle on termination of pregnancy on psychiatric grounds (*Journal*, March 9, 1957, p. 558) contains a number of inaccuracies respecting religious legislation in the matter of abortion. He says that "the ancient Hebrews, too, allowed the operation if the husband agreed," but the text, Exodus, Ch. xxi, v. 22, which he alleges in support does not say this. It refers (whether in the Hebrew or the Septuagint text) to an accidental abortion. In fact, the sacred writings of the Jews contain no other enactment about abortion.

Dr. Arkle is at pains to show that the distinction between a formed and unformed foetus, which eventually appeared in ecclesiastical legislation, was based on the Septuagint version of the Old Testament which embodied this distinction in the translation of the passage of Exodus referred to. He goes on to state that Tertullian's elaboration of this distinction was translated into Latin by St. Jerome. As Tertullian wrote in Latin, this is obviously not the case. The distinction of the formed and unformed foetus was part of current "science" at least from the time of Aristotle (fourth century B.C., some little time before the Septuagint translation was made) onwards. From the beginning, Christian tradition and legislation condemned all direct abortion, irrespective of the point of evolution of the embryo or foetus. When eventually the distinction between a formed and an unformed foetus made its appearance in Canon Law, it was merely to make the penalties less severe in the case of an unformed foetus. When "science" showed that there was no such turning-point in the development of the foetus the distinction disappeared from Canon Law as it has from civil law.—I am, etc.,

London, S.W.17.

M. D. NUNAN.

Treatment of Acute Appendicitis

SIR,—I was much impressed by Mr. Eric Coldrey's method of conservative treatment of acute appendicitis (*Journal*, December 22, 1956, p. 1458). Shortly after reading this article I had occasion to treat two patients suffering from this disease.

A European woman, aged 31, presented classical symptoms and signs. Tenderness was both in the right iliac fossa and pelvis. W.B.C. count was 18,000/c.mm. The patient was not anxious to have the operation, as she was due to go in a short while to the U.K. on home leave. The antibiotics used were penicillin and streptomycin given intravenously by continuous drip—the average daily dose being streptomycin 3 g. and penicillin 3,000,000 units. After four days on this drug the signs and symptoms had almost completely resolved and it was possible to allow the patient to proceed to U.K. with instructions to report without delay to her own hospital where the appendix could be removed in the usual way.

The second patient was a young Arab, aged 17 years, with classical symptoms and signs of acute appendicitis. The presence of diarrhoea suggested a retro-ileal position of the organ. It was decided to try conservative treatment and to follow this by operation at a later date. The treatment used was intramuscular penicillin and streptomycin three-hourly at first. The temperature

did not fall rapidly, and therefore spiramycin by mouth was given instead of penicillin after two days. The symptoms and signs disappeared rather more slowly than in the patient who was given drugs by intravenous drip, and the white count, which was originally 18,000/c.mm., fell more gradually to 9,000/c.mm. At operation, a week after admission to hospital, a grossly thickened appendix was dissected out from the posterior aspect of the mesentery, opposite the terminal ileum. There were numerous recent curtain-like adhesions between the caecum and ileum and the parietal peritoneum, which were separated. The notable feature was the absence of pus. There was very little free fluid in the area. The terminal ileum was thickened and reddened, resembling a regional ileitis. Lymph glands were not enlarged. The post-operative convalescence was uneventful.

Certain conclusions can be drawn from these experiences of mine: (1) The antibiotic treatment of acute appendicitis is a successful method of treatment. (2) Formation of adhesions is a noteworthy feature of such cases, and in the case of a pelvic appendix it is easy to understand how a "frozen pelvis" might arise. (3) When the patient lives in a remote and uncivilized portion of the globe and prefers to have the operation of appendicectomy carried out at a surgical centre in which the patient has confidence, it is possible to tide matters over by using the conservative method of antibiotic treatment.—I am, etc.,

Umm Said, Persian Gulf.

R. T. S. LOUITT.

Cell Excretion in Normal Urine

SIR,—We were interested to read the paper by Drs. B. J. Houghton and M. A. Pears (*Journal*, March 16, p. 622) on cell excretion in normal urine in adults. We would like to draw attention to the method and findings of Masters¹ and Stansfeld and Webb.² In children they determined the number of white cells per c.mm. in random specimens of urine collected without previous preparation. They gave the following normal values:

Percentage and Total Numbers of Specimens of Urine with 10 or Less W.B.C./c.mm.

	Boys	Girls
Masters	100% (70)	92% (50)*
Stansfeld and Webb	98% (1,142)	84% (1,067)

* Catheter specimens.

With this method the rate of urinary excretion need not be determined. The technique is simple and speedy, and we think it is the method of choice in children.—We are, etc.,

M. C. JOSEPH.
P. E. POLANI.

London, S.E.1.

REFERENCES

- 1 Masters, P. L., *Guy's Hosp. Rep.*, 1953, 102, 76.
- 2 Stansfeld, J. M., and Webb, J. K. G., *Arch. Dis. Childh.*, 1953, 28, 386.

Medical Advice in the Lay Press

SIR,—Dr. M. B. Matthews's letter (*Journal*, March 16, p. 647) deserves serious attention. The treatment of medical matters in the lay press has a number of disturbing features. Apart from the one he has mentioned, there is the stream of medical misinformation and ludicrous advice poured out by some Sunday and weekly papers in response to their readers' insistence on knowing how to keep fit. There are the odd pronouncements of our courts of law on questions of aetiology and pathology, which are presented in a way that gives the deliberations of the bench equal authority with scientific observation and experiment. Lastly, and more than offsetting all our propaganda against disease, there are the campaigns of advertisers which create illness in healthy people. At least six of these are constantly before the public, and a new one has been added this week.

The responsibility for this state of affairs rests inescapably with our profession. Circulation of lies and rumours is the inevitable result of public ignorance, and, notwithstanding the work of the British Medical Association and others in the field of popular medical journalism, it is still evident that the ordinary person has difficulty in getting the

information he wants. "My doctor never tells me anything" is the common complaint, nor is pressure of work the only reason for this neglect. We often underrate the patient and doubt his ability to grasp elementary ideas of pathology, and so we withhold explanations which we are sure he will not understand. But experience with non-medical students has suggested that the laity can be taken much further into the complexities of medical thought than has generally been admitted, and that the promotion of our citizens to adult status might be advantageous to both curative and preventive medicine. There seems to be room for more writing on medical topics addressed to the "pelican"-reading classes, and a need also for a monitoring organization that will scour the popular press and issue counterblasts to some of the more dangerous nonsense which is now being printed.—I am, etc.,

Sheffield, 10.

P. E. BROWN.

Poliomyelitis Vaccine

SIR,—Would there be any chance of answers from some official source to the following questions, which must be in the minds of many general practitioners? (1) Is the rate of manufacture of poliomyelitis vaccine really the maximum possible, and are developments being pushed forward with all speed? (2) If the vaccine was only effective up to half the official claim, then in view of the gravity of the problem one would have expected frank progress reports at frequent intervals. Why the long silences and the almost casual references to production difficulties? (3) Why is only one firm in this country at work on the vaccine, and what are the real reasons for this monopoly? Are the profit margins too low to make rapid expansion economic? Is there unwarranted red-tape bedevilling the work of the bacteriologists? Could this responsible firm not do much better if left to itself, as is done with so many vital drugs and vaccines? (4) Is there any real sense of urgency in the mind of the Government at all, or is the general attitude of frustration in connexion with the vaccine a true reflection of the official mind?

There is undoubtedly grave disquiet in many of our minds, and the questions here put forward are genuine ones. I know nothing whatever of what is going on, and my doubts arise solely from past experiences. I think in terms of officially disclosed history relating to shells, tank components, and other military urgencies in peace and war, and wonder whether this vaccine would not flow with far greater fluidity to where it is urgently needed if perchance there was a "former naval person" writing memoranda which demanded to know the full reasons, and at once. There can be many valid reasons for everything done and not done in this connexion, but what exactly are they? We are the people who should say whether they are justifiable reasons or merely officially convenient excuses.—I am, etc.,

St. Ives, Cornwall.

L. P. LOCKHART.

Multiple Sclerosis

SIR,—The publication of Dr. Douglas McAlpine's paper on multiple sclerosis (*Journal*, March 2, p. 475) is greatly to be welcomed for various reasons. It emphasizes the importance of clinical study above all in general practice, where cases of this disease are first encountered. It summarizes most of our existing knowledge, scanty though it admittedly is, and it constitutes an appeal for a fresh outlook.

In 1916 James Dawson¹ published in Edinburgh a monumental contribution to the study of the histology of disseminated sclerosis. Like most pioneers in medical research, Dawson was working entirely alone, without financial backing or endowment. He was of course restricted by the limitations of technique then available. Subject to this reservation, his work remains as an invaluable milestone in the progress towards truth. In 1920 Professor J. Cruickshank² published the result of his studies on Lange's colloidal gold reaction in general paralysis, and considered that the reacting substance resided in the globulin fraction. In

a control series he detected a similar colloidal gold curve in some cases of disseminated sclerosis. In 1921 I published a paper based on the cerebrospinal fluid picture in disseminated sclerosis confirming the high incidence of positive colloidal gold curves in a series of cases and recording progressive modification of such curves during treatment by intravenous "neosalvarsan."

In the years between, much experimental work has been done in this country and in the United States without results of real value. My findings in the cerebrospinal fluid and their modifications under salvarsan therapy led to the following personal contacts. When Dawson of Edinburgh was dying I was determined to ascertain his real opinion. He told me that all his studies on the histological changes convinced him that this disease was based on the activities of a specific infective agent. Subsequently Sir Henry Head very kindly invited me to discuss these matters with him, and we were both agreed that multiple factors must be invoked in any illness. As a result of a direct question I expressed the view that allergy was probably the most important single factor, and I hypothecated an allergic reaction to an unknown infective agent as suggested by Dawson. In explaining the basis of remission, Sir Henry Head advised me strongly never to forget that "the nervous system is 50% overwired."

In 1947 a team of seven research workers published a paper³ on a disease of the nervous system occurring among research workers on swayback in lambs. Of these research workers, four had the misfortune to develop a disease of the central nervous system clinically indistinguishable from disseminated sclerosis. It has always seemed to me personally that this incident has been misinterpreted. The occurrence of four cases of disseminated sclerosis in a team of seven research workers is too high a percentage incidence to be based on a coincidence. It seems equally obvious that they could not have developed a trace-element deficiency. They were personally employed in field and laboratory work under conditions in which they were theoretically exposed to the same infections as those to which sheep are exposed. Should these cases prove ultimately to be identical with true disseminated sclerosis, the whole incident constitutes a most valuable and interesting line for further intensive research which might throw a flood of light on the exact nature of the precise aetiological factors involved.

It appears to me that it is more than time that attention was drawn to the fundamental principles which should govern any line of treatment in medicine. To be justifiable, any treatment should conform to the following criteria: it should be rational, safe, and acceptable to a physician were he himself in the patient's condition. In recent years these principles are often disregarded. Gold, a deadly tissue poison, is still recommended in the treatment of rheumatoid arthritis. The possible development of such grave complications as acute yellow atrophy, agranulocytosis, nephritis, or thrombocytopenic purpura is disregarded. The reader will find a vivid, horrifying, and accurate description of a case in Dr. G. E. Beaumont's *Applied Medicine*.⁴

Cortisone, introduced with world-wide publicity as a cure for rheumatoid arthritis, has failed to cure a single case. Its possible and deadly potential side-effects have been studied and published by Dr. Duthie.⁵ These side-effects have been disregarded and ignored. In the interval there can be few remaining diseases in which cortisone has not been tried, so far without proved success.

The very large group of cases suffering from thyrotoxicosis has for many years been treated with brilliant success following on subtotal thyroidectomy. With adequate preparation and specialized surgical skill such treatment has proved safe and successful. This rational and safe treatment is now in danger of being abandoned for the administration of radioactive isotopes. Potential genetic dangers (to the patient) are disregarded. The possible future development of cancer can be excluded only by the passage of time. In the meantime, myxoedema or occasional deaths are referred to as possible side-effects. Such experimental treatment should,

in the light of our present knowledge, be restricted to animals, if the Home Office were to approve of the experiments in question. As a profession we should return to the attitude of asking ourselves the question, "What is true?" rather than, "What is new?" We should also return to the pursuit of truth within the limits of the Hippocratic Oath.

Finally, I would like to pay tribute to the recent publication on multiple sclerosis by McAlpine, Compston, and Lumsden.⁷ Reviews on monographs at this high level should not be anonymous. This book contains a wealth of information for the future research worker not to be found in any other volume of comparable size.—I am, etc.,

Glasgow, C.3.

D. K. ADAMS.

REFERENCES

- ¹ Dawson, J. W., *Trans. roy. Soc. Edinb.*, 1916, 50, 517.
- ² Cruickshank, J., *Brit. J. exp. Path.*, 1920, 1, 71.
- ³ Adams, D. K., *Lancet*, 1921, 1, 420.
- ⁴ Campbell, A. M. G., Daniel, P., Porter, R. J., Russell, W. R. Smith, H. V., and Innes, J. R. M., *Brain*, 1947, 70, 50.
- ⁵ Beaumont, G. E., *Applied Medicine*, 1950, p. 103. London.
- ⁶ Duthie, J. J. R., *British Medical Journal*, 1952, 1, 341.
- ⁷ McAlpine, D., Compston, N. D., and Lumsden, C. E., *Multiple Sclerosis*, 1955. Livingstone, Edinburgh.

The Hurt Brain

SIR,—I am astonished at Dr. Humphry B. Kidd's implication (*Journal*, March 16, p. 645) that I was advocating treatment of neurosyphilis other than by penicillin (*Journal*, February 16, p. 399), and can only conclude that he has completely misunderstood my comments.

I am satisfied that penicillin is the treatment of choice in neurosyphilis, but am not convinced that the patient can be cured by a total of 10 injections of the antibiotic, as was suggested in the television programme under discussion. The mere reversal of pathological findings in the cerebrospinal fluid does not constitute a complete cure of the disease. All venereologists will agree that it is now no longer justifiable to use a potentially dangerous treatment like induced malaria, except in a few particular types of case. It is surprising that Dr. Kidd should use arsenicals and bismuth at all in these enlightened days. One presumes the arsenical was a pentavalent one with its risk of optic nerve damage, since the trivalent arsenicals, being incapable of reaching the cerebrospinal fluid, have long been known to be useless in neurosyphilis.—I am, etc.,

Liverpool, 3.

E. E. PREBBLE.

SIR,—I wish to protest against the way in which exaggerated statements about the treatment of neurosyphilis have been attributed to me in the correspondence under this heading (*Journal*, March 16, p. 645).

I have written about my experience and that of others with the use of penicillin and have emphasized the need for subsequent supervision and for giving adequate time for clinical recovery. I have never stated that penicillin is the only remedy. I have never stated that if it fails nothing else will work—though, in fact, probably the best remedy then would be more penicillin given under more effective conditions. As regards arsenicals and bismuth, in referring to the absorption of inflammatory products from the brain after penicillin treatment, I wrote: "I know of no evidence that arsenical or bismuth therapy has any effect in hastening absorption or is of any value once the infection has been overcome" (now italicized). I have never made the statement that arsenicals and bismuth were of no value in the treatment of neurosyphilis.

Every treatment of neurosyphilis, and particularly of general paralysis of the insane, at the present time is subject to great limitations; I have tried to analyse the reasons for these, and I would be the last person to suggest that one's obligations to the patient were satisfied by the administration of ten injections of penicillin.—I am, etc.,

London, W.1.

J. PURDON MARTIN.

REFERENCE

- ¹ Martin, J. P., *Practitioner*, 1956, 176, 142.

Prevention of Tetanus

SIR,—I have read with interest the very helpful paper by Drs. H. J. Parish, L. J. M. Laurent, and N. H. Moynihan (*Journal*, March 16, p. 639). This paper, however, does not make clear the best procedure to adopt when immunizing with diphtheria-pertussis-tetanus and T.A.B.T. vaccines.

In the case of the triple vaccine the makers recommend three injections at intervals of one month to six weeks. This would appear to provide immunity to tetanus for six months only, as the third dose would have been given less than six months after the second injection. If this assumption is correct, the best routine for the triple vaccine would appear to be as follows:

Interval:	1st dose	Combined diphtheria-pertussis vaccine
4 weeks	2nd "	Triple vaccine
4 "	3rd "	
6 months	4th "	Tetanus toxoid

This routine would comply with the authors' definition of complete immunity.

If, however, the doses of triple vaccine were given at intervals of four to six weeks, when would the authors advise giving a boosting dose of tetanus toxoid—presuming that the interval of 4–5 years, which would elapse before the diphtheria booster is usually given, is too long for effective protection against tetanus?

Immunization against tetanus combined with T.A.B.T., where only two injections are given, appears to be subject to the same conditions. Is it that the synergistic action of these combined vaccines is such that the disadvantages in the spacing of the third dose of triple vaccine and the absence of a third dose with T.A.B.T. are immaterial, and that full immunity against tetanus is in fact conferred?—I am, etc.,

Portsmouth.

E. D. B. WOLFE.

Visceral Lesions in Herpes Zoster

SIR,—Dr. R. Wyburn-Mason's comprehensive account of the localization of the visceral lesions of herpes zoster (*Journal*, March 23, p. 678) is most instructive. The fact that intestinal involvement usually causes constipation is particularly interesting, since one might expect the inflammatory spasm to have an irritative rather than a "paralytic" effect. The only example of the syndrome which we have recognized did, in fact, have diarrhoea as the dominant symptom. As this is apparently exceptional, we have summarized the history of this patient, who presented as ulcerative colitis.

A woman, aged 64, developed a painful rash on her right thigh in August, 1954. She lost her appetite, and two weeks later began to have diarrhoea and vomiting, accompanied by pain in the left lower abdomen. The vomiting ceased after four days, but she continued to pass five or six watery blood-stained motions daily. On entering hospital a week after the onset of diarrhoea, the patient was feverish—temperature 100° F. (37.8° C.), slightly anaemic, and tender in the left iliac fossa. A herpetic eruption involving the right second lumbar segment was almost healed. No pathogens were grown on stool culture, and sigmoidoscopy on two occasions revealed no abnormality. A barium enema showed left-sided colitis, this part of the colon being contracted, with mucosal irregularity and absent haustration. The diarrhoea continued for four weeks and then ceased abruptly, and the fever settled in six weeks. In the seventh week another barium enema showed that the abnormality was less extensive. The splenic flexure and upper few inches of the descending colon were rigid and narrowed and their contour was slightly irregular. The same localized changes were found when the barium enema was repeated two months later. The patient remained well and has had no further bowel disturbance.

Absence of proctitis and rapid permanent recovery are unusual in acute ulcerative colitis. We therefore suspected that the bowel lesion in this case was a herpetic manifestation, having previously seen cystitis and pleurisy complicate the disease. This interpretation seems to have been correct, since Dr. Wyburn-Mason points out that the portion of the colon which was affected is innervated from the appropriate

(L.2) segment. The transition between the normal and abnormal colon was radiologically very striking, and it appeared to coincide proximally with the territorial limit of the inferior mesenteric artery. The latent interval between the onset of the rash and the diarrhoea presumably indicated, as it does in typhoid fever, the time ulceration took to develop. The fact that this "symptomatic" colitis did not relapse, in spite of radiological evidence of scarring, does not support the suggestion that classical ulcerative colitis originates from a non-specific insult to the colon.—We are, etc.,

London, W.12.

R. E. STEINER.
G. A. MACGREGOR.

Athlete's Foot

SIR,—The two very interesting articles, one by Miss Mary P. English (*Journal*, March 30, p. 744) and the other by Mr. J. C. Gentles (p. 746), as well as your annotation (p. 755) on the same subject, have prompted us to search through our case records for evidence of the spread of tinea pedis in families. Among an approximate total of 352 patients presenting with tinea pedis confirmed by culture we note at least 5 cases of spread of infection due to *T. rubrum*, 2 due to *T. mentagrophytes* var. *interdigitale*, and 2 due to *E. floccosum*. The various relationships of the patients concerned were as follows: husband and wife, father and son, father and daughter, brother and sister, and sister and sister. In one family *T. rubrum* was isolated in culture from the father and his son, whereas *T. mentagrophytes* var. *interdigitale* was cultured from the mother. We also have no doubt that many more such cases of transfer of infection to contacts in families occur than is generally recognized.—We are, etc.,

Leeds.

J. T. INGRAM.
C. J. LA TOUCHE.

Lung Cancer

SIR,—Is it not highly probable that most of the lung cancer to-day is attributable to our modern tarred roads? Forty years ago both were very rare, yet smoking was very common—five cigarettes for a penny. Is tobacco more likely to cause lung cancer to-day than it was then? The same applies to air pollution by chimney smoke. Non-smokers get cancer of the lung. Before we make smoking illegal—as some people would like—and before I resign from the B.M.A. because the *Journal* advertises cigarettes, I would have to be convinced that the very frequent inhalation of tar dust over a number of years was not the most likely cause. In fact, I wonder that any of us who live on and use the main roads escape. I would be very pleased if any of your readers could disprove this, as it is rather alarming.—I am, etc.,

Clent, Worcs.

J. MILLAR SMITH.

Herpes Zoster and Chicken-pox

SIR,—Two cases of herpes zoster in children aged 5 occurring recently in my practice have made Dr. R. M. McGregor's article (*Journal*, January 12, p. 84) and correspondence about zoster very interesting to me. One occurred in a child who had varicella when aged 2 months, the other had a very mild eruption while in hospital for tonsillectomy at 3 years old. The sister of the first case developed a rash indistinguishable from varicella 20 days after the zoster rash appeared, without any other known contact with varicella. Only the second child had pain, and that not severe.

I do not feel confident in putting forward any definite proposition in a disease of such variable severity, but could it be that zoster may affect those people whose immunity to varicella has worn thin, either due to an attack before the age when immunological mechanisms are fully developed, or only after a relatively long lapse of time? This might account for the clinical impression that zoster is commoner with increasing age and explain why it is more frequent in the ages prone to neoplastic disease, and so gave rise to the ground of Dr. McGregor's interesting inquiry.—I am, etc.,

London, S.W.18.

M. J. F. COURTENAY.

Obituary

D. W. G. FARIS, C.B.E., LL.D., M.B., D.P.H.

Dr. Desmond Faris, who was the first dean of the faculty of medicine in the University of Malaya, died at Hove, Sussex, on March 20. He was 55 years of age.

Desmond William George Faris was born on April 30, 1901, and was educated at Epsom College and at the London Hospital, qualifying in 1924 and graduating M.B., B.S. in the following year. Entering the Malayan Medical Service in 1926 as a health officer, he took the D.P.H. a few years later and became chief health officer at Singapore. During the war he was interned by the Japanese in Changi camp, where his efforts to maintain the health of his fellow prisoners were notably successful. He was appointed C.B.E. in 1946. He had been principal of the King Edward VII College of Medicine at Singapore for some time before the founding of the University of Malaya in 1949, and he was appointed the first dean of the faculty of medicine, holding the post until last year. Dr. Faris is survived by his widow and by a son, who is at the London Hospital, and a daughter who is a student of radiotherapy at the Middlesex Hospital.

D. E. C. M. writes: Of those who have served in the Malayan Medical Service and have known and loved that country, none was more devoted than Desmond Faris. Whether as a health officer, as a lecturer in public health, as dean of the faculty of medicine, or as acting vice-principal of the university, whatever he undertook he did with all his might. Nothing showed forth the man more than his willingness to undertake the thankless task of watching over the health of his fellow internees at Changi Prison and Sime Road. Much as he hated it, he undertook duties which demanded unceasing vigilance, endless improvisation, and, most distasteful of all, constant and close contact with our Japanese guards. That we eventually came through that period without experiencing any of the many epidemics which could so easily have been disastrous was in no small measure due to his work and constant endeavour. There can be few who cannot call to mind the picture of him, crowned with an ancient straw hat, bustling about the camp and poking into all sorts of corners at all times of the day.

He took over the duties of dean of the faculty of medicine when the University of Malaya was founded, and in those early formative years gave devoted service. It was no easy task, for there was no well-drilled machinery which merely had to be kept running. Each day brought new problems, for which there were no rules or precedence. To Faris, with his scrupulous regard for detail, his ceaseless questing for the right answer, and his desire to build up an efficient administration, it was a constant source of worry and strain. His latter ill-health was largely due to the pressure under which he worked during this strenuous and difficult time. His work was not in the glamorous light of the public eye, but what he did for the faculty and the university will be of lasting merit. He well deserved the award of the honorary LL.D. which he received at the time of his retirement, and he was proud of such a distinction. He looked forward to his retirement and longed to be again with his family. It is tragic that he should have had so short a time with them. Kipling is not a popular poet in these days, yet how well he described the aspirations and burden of Faris:

"Fill full the mouth of Famine
And bid the sickness cease."

R. H. DALE, M.B., F.R.C.S.Ed.

We much regret to announce that Dr. R. H. Dale, plastic surgeon to the City and St. Paul's Hospitals, Saskatoon, died suddenly on April 3 at Saskatoon, at the early age of 47.

Robert Henry Dale, the third child and only son of Sir Henry and Lady Dale, was born on January 28, 1910. Educated at University College School and Trinity College, Cambridge, he went on to St. Bartholomew's Hospital for his clinical work. He qualified in 1934, and later graduated M.B., B.Chir. Having held the posts of house-surgeon to Sir Girling Ball and house-surgeon to the orthopaedic department at his teaching hospital, he became resident surgical officer at the County Hospital, Lincoln. Having taken the Fellowship of the Royal College of Surgeons of Edinburgh in 1937, he went into a surgical practice at Grantham, where he was elected to the staff of the local hospital. Early in the war his partner, being then unmarried, joined the Army Medical Service, leaving Dr. R. H. Dale, like many others, to take double duty and to deal with air-raid emergencies in Grantham, which had become an important munitions centre. He received, indeed, what might have been a serious injury when a spurt from a thermite incendiary bomb fell upon the dorsum of his foot. When his partner was released he himself joined the Royal Air Force and served for 18 months at Halton, with the rank of squadron leader. He returned to Grantham, where he had built up an increasing surgical connexion as a member of the staff of the Grantham Hospital. He realized, however, that, with the National Health Service impending, there were senior claims to his for consultant appointments there, and, being reluctant to have his activities limited to general practice under the conditions of the National Health Service, he sold his practice early in 1948 and accepted an offer from Sir Archibald McIndoe to become surgical registrar at Queen Victoria Hospital, East Grinstead. During the next few years he gained wide experience of plastic surgery and published a number of papers on the subject, including one in this *Journal* on the treatment of hydrofluoric-acid burns. His paper on electrical accidents in the *British Journal of Plastic Surgery* (1954-5, vol. 7, p. 44) was a very useful and well-illustrated report on an important topic. He remained at the Queen Victoria Hospital till 1953, by which time he was holding a multiple senior registrarship at East Grinstead, the Royal Northern Hospital, and St. Charles's Hospital, Notting Hill. No consulting appointment, however, being available for him, his senior registrarship came to an end in 1953, so that his specialist career with the National Health Service was terminated. He accordingly determined to make another fresh start overseas, and found that there was an opportunity for one with his special experience at Saskatoon, whither he migrated in June, 1953. In less than four years he had built up there, at several hospitals in the city, and especially at the new University Hospital when it was opened in 1955, a practice and a reputation in plastic and traumatic surgery which had extended to a wide district in western Canada. It had, indeed, become excessive in the irresistible pressure of its demands, so as to leave him no adequate reserve for rest and recreation. He had just undertaken a book on the plastic surgery of the hand, in collaboration with Mr. Patrick Clarkson, of London, and had become secretary and treasurer for the current year to the Canadian Association of Plastic Surgeons. His last

letter showed that the hard winter and overwork had made him feel abnormally weary. He was found dead in bed on the morning of April 3, and necropsy revealed a coronary occlusion as the cause.

Dr. Dale leaves a widow and three children, and to them and to his mother and father we extend our deep sympathy in their loss.

Dr. W. E. LINDSAY, formerly dean of the faculty of medicine in the University of Saskatchewan, at Saskatoon, in a letter to Sir Henry Dale, wrote:

"In the comparatively short time that he had been here Robin had made for himself an almost unique place in the affections of his colleagues and friends. To this was added a real respect based on the quality of the work he was doing. He had opened up a field that was new in these parts, so that in addition to our grief for the loss of a friend we realize what it means to the school and the hospital, and indeed to the people generally, who had come to recognize his skill and to depend increasingly on it."

H. S. STANNUS, C.B.E., M.D., Ph.D.
F.R.C.P., D.T.M.&H.

The obituary of Dr. H. S. Stannus was printed in the *Journal* of March 9 (p. 589).

Dr. H. E. MAGEE writes: I first met Dr. H. S. Stannus in 1942 and then began a close association for about seven years, after which we met less frequently. We were not only colleagues working together, but very good friends and more. The news of his death, which I learnt only a few days ago, was a great shock and sorrow to me. Our professional association began with his part-time employment by the Ministry of Health to carry out nutrition surveys in various parts of the country on people of all ages and occupations. It was my business to arrange these surveys and to deal with the reports thereon. I had, therefore, much opportunity of appreciating his great skill as a physician and his scientific precision. The clinical assessment of the nutritional state was in those days, as it still is, a subject of some controversy. Stannus fully realized this and set himself out to contribute of his very best to provide reliable information which the Ministry so much needed in those days. For one thing, he addressed himself with great zeal to the cause of folliculosis, which at that time had been attributed by some to deficiency of vitamin A and by others to deficiency of vitamin C. Stannus designed an ingenious method whereby pictorial records could be made of the degree of the condition. The method made it possible, by means of therapeutic trials, to measure the effects of administration of one vitamin and then of the other. His findings showed that neither vitamin was concerned in the aetiology of the condition. Had the result been otherwise, the question of a ration of one or other vitamin would have had to be considered, especially for adolescents, who were chiefly affected. Towards the end of 1943 there were some complaints about the inadequacy of the rations for miners, and fears were expressed about their health. Stannus spent a week in each of the Notts and Leicestershire coalfields, interviewing and examining the miners as they came off their shifts at all hours of the day and night. I was quite convinced that his presence amongst these men with his pleasant manner and great humanity did much to reassure them about their health. At any rate, there were no further complaints from these two areas.

He was a man of refined and artistic tastes, and it was a great joy to drink his excellent sherry in his pleasant and artistically furnished rooms in Harley Street and then to dine quietly with him in his club near by. He was an excellent and very generous host. After medicine, genealogy was his next love. In the course of his inquiries into his own family tree he was able to unearth authentic records of my own. His explorations took him to Dublin Castle, then to south Co. Antrim, where some branches of the Stannus family had settled about the beginning of the seventeenth

century: one family settled at the neck of the Isthmus of Islandmagee. Stannus discovered at Carrickfergus that a Stannus family had saved a Magee family from the massacre of 1642, whereas, according to tradition, only one male member of the Magee clan survived the massacre. This discovery was a great joy to both of us.

Dr. K. SPERBER died at Accra, Gold Coast (now Ghana), on March 3 at the early age of 46 after a long illness. Born in Czechoslovakia on March 16, 1910, Karel Sperber graduated in medicine at Prague University in 1935, and took the equivalent of the D.P.H. soon afterwards. After two years' service with the Czech forces he became surgical officer to the well-known works hospital of the Bata Shoe Company, where he first showed his marked capabilities for traumatic and obstetrical surgery, which remained his main professional interests. Soon after the German invasion of Czechoslovakia he made an adventurous escape to England, and in 1940 obtained an appointment as a ship surgeon. On his first voyage to the Far East his ship was sunk off the Straits of Malacca and he was taken prisoner. During the following three months he attended 500 Allied survivors on board German prison ships. In the words of official documents, "his only surgical instrument was a pocket knife and his only medicines a few pills supplied by the enemy." Being of Czech nationality the Germans regarded him as a subject of the Reich serving under an enemy flag, and he was a marked man from the day of his capture. This did not prevent him from putting persistent and effective pressure on the authorities of prison camps in Germany to improve the badly lacking medical facilities for 3,600 Allied internees. In the words of a visiting delegate of the Protecting Power, "he did a most excellent job and was of the greatest value for the spirit of the camp." Eventually, however, he was handed over to the Gestapo and was taken first to the horror camp of Auschwitz and later to Buchenwald. His survival, while great numbers were exterminated in these two camps, was a miracle, even for a man of his physical and spiritual toughness. He escaped from Buchenwald in the last weeks of the war and returned to England. After another period as a ship surgeon he joined the Colonial Medical Service, and served from 1950, first in the Seychelles Islands and later in the Gold Coast. A year ago he set up in general practice in Accra, but his untimely death deprived him of the fruits of hard and conscientious work, in which he persisted almost to the day of his death. Dr. Sperber was appointed an honorary O.B.E. in August, 1946, for his outstanding work for Allied seamen, and some two years later he became a naturalized British subject. He was a man of striking appearance, of indomitable spirit, and with a golden sense of humour. He loved the simple good things in life, above all good company and good stories. He was no classical scholar, but he had a favourite and characteristic Latin quotation, remembered from his early school days: *Amicus fidus rarus est*. To his many friends, now dispersed all over the world, this simple truth will be a measure of their loss. He is survived by his wife, Kathleen, whom he married in 1947. With her he found that haven of cloudless happiness for which he had yearned through years of darkness and horrors.—E. P.

Dr. A. E. KILLON died at his home at Slough on March 11. A native of Chester, Alfred Ernest Killon studied medicine at Liverpool University, afterwards qualifying L.A.H. at Dublin in 1920. He had been in practice in Slough for 18 years and had earned the reputation of being a sincere friend to his medical colleagues and patients alike. He was an accomplished pianist and organist, and possessed a wide knowledge of classical literature. He is survived by his widow.

Dr. HARRY D. FINDLAY writes: Dr. A. E. Killon was a modest, unassuming man who never sought the limelight. For that reason, perhaps, he was less well known to some of his colleagues than his merits deserved. Only those of

us who were privileged to visit him in his own happy home knew the facets of his character that made every one of his patients a personal friend. A wise and kindly man, he was skilled in the arts of music and song. He bore a year of suffering without complaint, and faced the last enemy with a courage that was a revelation and an inspiration. To his widow his colleagues, who were also his friends, extend their deep sympathy.

Dr. G. S. HOVENDEN, who was a general practitioner in Barnes for over fifty years, died at Putney Hospital, after a short illness, on March 14. He was 87 years of age. Gerald Stanley Hovenden was born at Norwood on August 27, 1869, and was educated at the Whitgift School. He qualified M.R.C.S., L.R.C.P. from Guy's Hospital in 1894, taking the London degrees of M.B., B.S. in the same year. He proceeded to the M.D. in 1896. In 1900 Dr. George Rodman, his cousin by marriage, who was in practice in Barnes and East Sheen, invited him and his twin brother, the late Dr. Arthur Hovenden, to join him as partners. This they did and remained in the same practice till Dr. Arthur Hovenden's death in 1946 and Dr. Gerald's retirement a few years ago. During the last war, when his brother's health had broken down and his junior partners were called up, he held the practice together with only part-time assistance. His appearance of being unhurried even when he was doing four men's work is still remembered by his patients. He was a member of the British Medical Association for over sixty years and until recently was a very regular attendant at the Divisional meetings. His presidential address to the West London Medico-Chirurgical Society in 1947 was entitled "Fifty Years in General Practice." In a generation when it was still possible for a general practitioner to claim that he was up to the standard of clinical knowledge and experience in practice. He was a skilled anaesthetist with chloroform and ether; he performed many tonsillectomies and adenoidectomies; he was good at dental extractions; he was a particularly good paediatrician (as he had been a clinical assistant at Great Ormond Street); and he had a large midwifery practice. Dr. Rodman was a pioneer radiologist, and in the early days the practice treated a large number of fractures. Dr. Hovenden was the ideal family doctor. His own family was the centre of his life, and through his kindness and understanding of human problems he became the friend and counsellor to several generations of families in his practice. His unsparring devotion to his patients' welfare inspired complete trust, and his gentle, genial manner and obvious enjoyment of his simple pleasures were typical of a man who was contented with his life. He was also intensely interested in the modern developments—both in medicine and in general affairs—which were growing so rapidly around him; he was, for instance, a pioneer motorist. He loved riding, and up to the last war was a familiar figure in Richmond Park, riding with his family. He was a keen walker and dinghy sailor and enjoyed holidays abroad. He was an excellent bridge and chess player; but the pleasure which he enjoyed from reading—in English and French and German—lasted till a few days before his death. He was married twice and had one daughter and three sons; two of his sons are in the medical profession—one carrying on his father's practice and the other a surgeon commander, R.N.

Dr. A. H. PRICE, who for many years was a well-known general practitioner at Reading, died on March 17 at his home at Twyford, Berkshire. He was 64 years of age. Alfred Henry Price was born at Glenbeigh, Co. Kerry, on April 25, 1892, and was educated at St. Columba's College and Trinity College, Dublin, graduating M.B., B.Ch., with first-class honours in medicine, in 1916. He proceeded to the M.D. in 1919 and in the following year took the D.P.H. He was a notable sportsman in his student days, playing cricket and Rugby football for Trinity College and gaining an Irish cap. After graduation he held a resident appointment at the Adelaide Hospital, and then served in the Royal

Navy until 1919, his wartime duties taking him to China, among other places. He acted for a short time as medical officer to the Canton municipal council, later becoming medical officer to the Dimbulla District Planters' Association in Ceylon. In 1928 he returned to England and joined the late Sir Stewart Abram in partnership at Reading. On the death of his partner, Dr. Price carried on the practice alone until 1947, when he was joined by his son, Dr. H. M. Price. For some time Dr. Price was in charge of the physiotherapy department of the Royal Berkshire Hospital, where previously he had been clinical assistant in the ear, nose, and throat department for 13 years. He was medical officer to Reading School and commanding officer and medical officer from 1943 to 1946 of the Reading Sea Cadet Corps. A member of the British Red Cross Society for 17 years, he was for a time assistant county director. From 1942 to 1946 he was honorary secretary of the Reading Division of the British Medical Association. He had also held office as the honorary secretary of the local medical war committee. Always ready to take an active part in the community he served, he was a keen supporter of the British Legion. For many years he was a churchwarden at St. John's Church, Reading.

Medico-Legal

TRIAL OF DR. J. BODKIN ADAMS

EXPERT EVIDENCE CONTINUED

[FROM OUR SPECIAL CORRESPONDENT]

The trial of Dr. John Bodkin Adams, of Eastbourne, continued before Mr. Justice Devlin at the Old Bailey. Dr. Adams is charged with the murder of a patient, 81-year-old Mrs. Edith Alice Morrell, who died on November 13, 1950. He pleads not guilty.

Sir Reginald Manningham-Buller, Q.C., is appearing for the prosecution with Mr. Melford Stevenson, Q.C., and Mr. Malcolm Morris. Mr. Geoffrey Lawrence, Q.C., is appearing for Dr. Adams with Mr. Edward Clarke and Mr. John Heritage. The Medical Defence Union is acting for Dr. Adams.

On the eleventh day of the trial, April 1, Dr. M. G. C. Ashby was recalled to complete his evidence-in-chief. After questioning the witness about graphs illustrating the prescriptions the Attorney-General asked:

"In your opinion, what would be the effect on a woman of 81 years of age if given morphia and heroin in the quantities shown to have been prescribed between November 8 and 12?"—"I don't think it is possible that she could have survived those quantities without being steadily worked up to that dosage; that is to say, a patient receiving those doses when being treated for the pains of cancer would survive them, but they would have been built up several weeks before. They would have been getting perhaps 3 or 4 gr. of each. What led me to a conclusion about an inability to survive was the very sudden rise in the prescriptions as illustrated on the graph. The two situations are entirely different."

"That is taking morphia and heroin together?"—"Yes."—"If she had had the morphia alone what would have been the effect, in your opinion?"—"I don't think she could have stood such a very sudden increase of such an extent, because again the prescriptions as illustrated on the graph show no previous raising of morphia at all really right back to August 18. So there was no preparation for the big dose in respect of acquired tolerance to very high doses, again differing from the usual cancer patient."

The witness said that the same considerations would apply if the patient had had heroin alone; he did not think she could have survived if, instead of having the heroin and morphia alone prescribed, she had the major part of both. He wished to correct a "slight error" in his previous answer: the heroin was not quite the same as the morphia because, according to the prescriptions as illustrated on the graph, there had been a fivefold increase of heroin for the previous six or seven days. With such an increase it would

be possible that she could have survived what was then more than 12 times as much; the dosage had been raised 18 times after only six days, and he did not think it was possible that a woman of 80 could survive that.

He said that every general practitioner would be aware of such facts in relation to morphia, because it was a drug of almost universal use. Not quite the same could be said of heroin, because there must be many family doctors who virtually never used it except perhaps in a linctus. He had never himself used heroin and morphia together in conditions where there was not severe pain, nor had he seen it used by a colleague in such circumstances.

He said that the complaint of severe pain on June 27, 1948, when the patient had been at the Neston Cottage Hospital, Cheshire, was probably due to arthritis. There was no evidence either way of the incidence of a thalamic syndrome. The pain on June 28 was probably dyspeptic from the distension of the stomach or viscera. Brandy frequently gave relief in such circumstances.

The Attorney-General: On every night while she was in that hospital—we do not know on whose instructions—she was given $\frac{1}{2}$ gr. of morphia. Would that, in your opinion, have produced addiction or not?"—"I do not think it is possible to answer that question with a straight 'Yes' or 'No,' for this reason: that if we assume for the moment that addiction is produced after three weeks it is not rational to say that there is no measure of it after nine days; but it would be very slight, and I don't think the addiction would have reached the degree to which the doctors would have to give any attention to gradually weaning. But I don't think it would be right to say that there would not be the beginnings of addiction in a very mild way in an average patient."

Expectation of Life

He was sure none of the doctors concerned would have agreed to Mrs. Morrell's journey back to Eastbourne had they not thought that she had greatly improved and that her transfer would in no way prejudice her further recovery. After morphia had been given for a week to 10 days every doctor would be thinking in terms of how much further it was right or proper to go on with it, because the dangers of addiction would then be steadily mounting—accepting for the moment the arbitrary figure of about three weeks.

In answer to the judge, he said he did not criticize the giving of morphia at the Cheshire nursing-home, because it was recorded that the patient was in severe pain and no doctor would dispute that morphia was one of the drugs that could properly be given to deal with it, although there might perhaps be better choices. The more important consideration was that during those first few days just after a severe stroke the patient's expectation of life was very poor indeed and the doctors would not be thinking in terms of future addiction; their one consideration would be to ease pain without prejudicing the patient's life. There would be an immense change in the prognosis on July 5, the day she was thought fit enough to return to Eastbourne. The prognosis would then be quite good and she could have been expected to have lived for six months to several years.

Asked by the Attorney-General whether there would be any justification on July 9, 1948, having regard to the previous injections, for injecting Mrs. Morrell each evening with hyperdure morphia just to secure sleep, the witness replied: "Taking into consideration that impending addiction was the overriding consideration at that time, morphia would not be the drug of choice; it would be one of the barbiturates, which are the drugs for promoting sleep."

He could think of no justification for adding heroin to the morphine injection on July 21, 1948, and he thought it enormously increased the already present danger of addiction. The patient would have been firmly addicted, but in no sense unweanable, by the time she left the Eastbourne nursing-home in October, 1948. After further questions on weaning treatment and tolerance, the Attorney-General said:

"What would be the effect on the general physical health of an old lady of 80 or 81 if she was submitted to heroin and morphia injections over a long period?"—"Patients' reactions vary to this, but on an average I think it can be said with assur-

ance that it does have a deleterious effect upon health. But in this patient's case I think it is necessary to add that, speaking from memory, for the first two years, or nearly so, the dosage rate was low, and we know from the nurses' books that, at any rate, until the spring of 1950 she was pretty well. So I think, whatever the average results, the deleterious effect upon Mrs. Morrell was relatively slight. I am talking about health, as opposed to being irritable at times."

Dealing with the injections given on November 6 to 12, he said the patient could not have survived that set of doses as a whole because the increase was very sudden over what she had been getting only a few days before. The jerky spasms and twitchings which had been mentioned in evidence were a very rare phenomenon, but his studies in the matter had not permitted any alternative to the conclusion that they were attributable to heroin. They did not sound in any way like epileptic fits. The most likely explanation was the high level of heroin the patient was having at that time. He did not see the justification for the administration of heroin and morphia on such a scale. In the absence of any doctor's notes about the condition of the patient it was very difficult to say whether something which must have been at least easing her passing was justified at the time or not.

Dilemma

He said he was unhappy about the last five days. He had studied the books and records with great attention to the problem as to what was the latest time at which what had been referred to as "the dilemma" could have been resolved, and his own conclusion had not been in agreement with Dr. Douthwaite's that all was lost by November 1.

The Attorney-General: "When do you think the moment came, so far as you can judge, when it was no longer possible to wean her of the addiction which was resulting from this routine administration by Dr. Adams from the time she came out of the nursing-home?"—"I think there was still a faint chance during the first week of November, and as it was a matter of inevitable death or a faint chance, speaking personally—I wasn't there—but from the record there was a chance which I think should properly have been taken. But in the absence of medical records of the case I think it is really quite impossible to say. I may be weeks wrong in this estimate, but my recollection of these books is that within two weeks of death she was bright and talkative—I think I am quoting correctly from memory. Well, I can't believe that a patient could not stand an attempt at weaning, on the basis we read out this afternoon, even at that stage. What was there to be lost?"

"Would it be right, in your opinion, from what you have seen, to describe the immediate cause of death of Mrs. Morrell as cerebral thrombosis?"—"Well, there was no recorded evidence to suggest it was that."

"From what you have seen and heard, what would you say was the cause of her death?"—"I think that is very complicated, the factors causing her death. The immediate factors, of course, would be the combination of what we refer to as terminal natural causes, like terminal pneumonia, which in its turn would have been fairly directly caused by her being kept under for the last few days. Then I think another very important factor—probably a larger factor—was this patient's very heavy pressure of opiate therapy. Thirdly, the patient's age cannot be ignored. I don't for the moment think of anything else. It is not possible without a post-mortem examination to say with any certainty what the actual final closing act is which ended life in the majority of patients."

Dr. Ashby was recalled on Tuesday, April 2, for the resumption of examination-in-chief. After his attention had been drawn to further of the nurses' reports, the witness was asked:

"If you are giving barbiturates and heroin—and we have heard about heroin producing twitching—what would be the effect of the barbiturates on those symptoms which may follow heroin?"—"I should have expected them to have a considerable influence in suppressing those twitchings, just like they suppress the epileptic phenomena, which are not very different."

"So the cessation of the administration of barbiturates would unmask those other symptoms if they were to be unmasked?"—"I should have thought that was to be expected."

The witness was then taken through the remainder of the reports. He said that by November 12 he did not see any

positive evidence of the agonizing discomfort or pain which would justify easing the patient if she was dying anyway.

He said that the patient's history could be divided into three "chapters"; the first started with the stroke and earlier administration of morphia and heroin which he criticized on the grounds that they had made the patient an addict; the second began in the summer of 1950 when it was clear that the pressure of sedation was being further increased: "I don't think she was getting as much morphia and heroin as she needed, and they were in a spiral and a dilemma, but a solution of that dilemma, instead of being desirable, became obligatory, as a disaster could only otherwise result." Chapter 3 was a matter of circumstances and decisions rather than precise dates, and he regarded it as the time when there was virtually no hope of the patient recovering from the effects of the previous circumstances. The Attorney-General then asked:

"Can you see any reason why this lady of her age should have died on November 13 if the heroin and morphia had not been administered to her?"—"I don't think she would have died. I can see no reason from these reports to have expected her to die. She was sitting up in a chair talking quite brightly only a few days before."

He agreed that the books showed no record of the administration of morphia and heroin on October 26 and 27 but only the "special injection" given by Dr. Adams.

Cross-examination of Witness

Mr. Geoffrey Lawrence: "Dr. Ashby, you say that you do not think Mrs. Morrell would have died by November 13, 1950, if she had not been given the drugs mentioned in the nurses' notebooks; is that right?"—"I did say that, yes."

"You would say also, would you not, that if she had not had the drugs mentioned in the nurses' notebooks—and I mean by that going right back over the regular course of sedation, the whole pattern of treatment and medication—it is quite impossible to say that if she had not had that she would have lived as long as November 13?"—"No, I agree one could not. I don't think the earlier treatment had any great influence on the length of her life and she might have died of natural causes earlier. I would accept that fully."

He did not think her life-expectation was materially altered by the earlier therapy, nor was it any protection against sudden death from natural causes, from anything else like another stroke or a heart attack.

Mr. Lawrence: "There are some limits to the powers of divination of a doctor, are there not?"—"Extremely. We are very limited in our powers, particularly of prophecy about life and death."

"That is exactly what I thought. And equally about what causes death?"—"Yes, particularly immediate, rather perhaps unexpected deaths."

"And it is equally unsafe to be dogmatic, is it not, about how long any given person would have lived but for this or but for that?"—"Certainly. I hope I have not been dogmatic about it."

"Life is so full of chances, is it not?"—"It is."

"And the field of medicine, although gradually being explored, has still many uncharted deserts in it, has it not?"—"Certainly."

"Where there are great gaps in knowledge?"—"Yes."

"And particularly in the relationship of cause and effect?"—"I would agree."

"And therefore, in vitally important matters, a careful and wise consultant would hesitate to be dogmatic?"—"Yes. I have tried to hesitate."

"When do you say that Dr. Adams murdered Mrs. Morrell—or don't you say that?"—"I do not think it is for me to say that. I have done my best to guide the court as to what I think would be the results of certain actions and chemicals; I do not really feel in a position to say that on a certain day or even week Dr. Adams decided to murder Mrs. Morrell. I do not feel that is my duty."

"It may not be what you conceive to be your duty; but you cannot say that, can you, on your review of all the evidence in this case—certainly the nurses' notebooks—that on any day or any week he made up his mind to kill Mrs. Morrell?"—"In respect of the books, and if I may bring in the nurses' evidence, I feel that the instruction to keep her under would have almost certain effects and the dosage of 4 gr., 5 gr., and 3½ gr. of heroin combined with morphia would also have brought certain effects, but I am not prepared to say whether they were instructions of a murderous nature."

Mr. Justice Devlin: "I think you are quite right to leave the word 'murder' out of it, but were they instructions which, in

your view, a general practitioner with Dr. Adams's qualifications would have known would accelerate her death?"—"The instruction to keep her under could not fail to have—I should not say 'could not fail,' but would be almost certain to accelerate death."

"And that is a conclusion which a doctor with Dr. Adams's qualifications would have reached?"—"Yes. I think an anaesthetist is particularly conversant with the dangers of a patient being unconscious or semiconscious."

Mr. Lawrence: "Dr. Ashby, if we are going to talk about instruction which, if executed, would be calculated to shorten life it is vitally important, is it not, that we should be accurate about what those instructions were?"—"It is."

"And try to find out for ourselves in what circumstances they were given?"—"Essential."

Mr. Lawrence suggested that the instruction to keep the patient from being restless was not the same as the instruction *simpliciter* to keep the patient under—"I do not think it is quite the same as had the sentence contained only the instruction to keep her under." It was a fair interpretation of Nurse Randall's note, "It was doctor's orders to keep her from getting restless, to keep her under as much as we could at that stage," to say that in it she had really expressed, first, the object and the purpose of the instruction, and, secondly, the means whereby that object or purpose was to be achieved. If that was so, the question of whether or not it was justified must depend upon the patient's situation as seen by the general practitioner.

No Maximum Dose

The witness emphatically agreed that there might well be circumstances in the situation of a patient which justified the doctor putting the comfort of the patient before the longest possible survival date. The man to judge of that was the doctor in charge of the case—there could be nobody else.

After an initial stroke, in an old person with an arterial condition such as that of the deceased, it was by no means uncommon for a second cerebral vascular accident of some kind to occur; in fact such a patient was more likely to die of a second stroke than by heart failure.

The witness said he did not think any doctor embarking on a weaning process after November 1 would have done so with more than a slim expectation of success.

He agreed with counsel that there was no such thing known in the medical profession as the "maximum" dose in respect of the drugs in question, as such.

Mr. Lawrence: "It is extraordinarily difficult, is it not, if not impossible, to talk about fatal doses in the case of the opiate drugs?"—"Yes."

"So much, indeed all, depends upon the condition of the patient who takes the dose?"—"Certainly."

When passing from non-tolerant people to those who had acquired a tolerance, it was even more difficult to say what the level of a fatal dose would be, although the patient's record should give some information about the response to smaller doses.

"Dealing with tolerant persons, have you heard the view expressed by some authorities that it is practically impossible to kill tolerant patients by means of drugs?"—"Yes. It can be very serious from the doctor's point of view. It is well known that in the very bad painful cases we have to be careful not to start these drugs too soon or the point becomes reached where, owing to extreme tolerance, they are ineffective, and there may be nothing else."

"But all up the scale the field is one of great uncertainty, is it not?"—"Yes."

Heroin was a drug which was notable for the production of a feeling of well-being and would be likely to cope with the tendency to outbursts and lack of co-operation with the nurses which the patient evinced upon her return to Eastbourne from Cheshire.

Mr. Lawrence: "If he had given her morphia by night and securing her sleep at night and her co-operation during the day—what he did was to combine them together?"—"He did, yes."

"Is there any synergistic value in combining these two drugs?"—"I was not aware of a strong synergistic action. Dr. Douthwaite is the great expert. I must say I didn't know it was as strong as he suggests."

"If there is any synergism between these two drugs, then the combination of them in one injection would be getting the most out of the ones you were giving to the patient?"—"Given those premises I would accept that conclusion."

"The disadvantages—and I'm not going to dodge it—are the disadvantages of addiction?"—"Yes. I think at that stage the only disadvantage, except for a small measure of possible deleterious effect. But heavy barbiturates also, if they had been necessary, might also have produced a deleterious effect. I don't think it would be fair to say that only morphia and heroin would have that effect."

He agreed that when Dr. Adams came to say on the form what was the immediate cause of death he would have in his mind the initial stroke in Cheshire, the condition of arteriosclerosis, and his own diagnosis on October 9 of a supervening cerebral vascular accident. The isolation of the immediate cause of death was a very difficult matter. In those circumstances the entry might have been quite an honest one. He agreed that a post-mortem examination would not indicate a patient's degree of tolerance to a drug.

Final Cause of Death

Re-examined by the Attorney-General, he agreed that a post-mortem would show whether there was heroin or morphia in a body, and experts could estimate the amount with considerable accuracy soon after death.

The Attorney-General: "Assume for the moment that she had on November 8 and all the subsequent days the morphia and heroin prescribed for her; in your opinion was that morphia and heroin the cause of her death, or was her death due to natural causes?"—"I think that would have been the cause of her death. As I said before, I don't think she could have survived that dosage, but that dosage might well have killed her by an apparently, as it were, natural cause—I hope I have made that clear—such as thrombosis or terminal pneumonia."

The full dosage of the prescriptions would have caused death from direct suppression of the vital centres; the same result would occur if the major part had been given. He did not think she could have survived the level of the injections given on November 10, 11, and 12 with paraldehyde in addition.

After further questions from the Attorney-General, the Judge asked: "Dr. Ashby, in an important answer that you gave to Mr. Lawrence you said that you could not rule out the possibility that the death of Mrs. Morrell was the result of natural causes?"—"Yes."

"And you gave some further answers to the Attorney-General on the subject of cause of death?"—"Yes, my Lord."

"When you said to Mr. Lawrence that you could not rule out the possibility that death was the result of natural causes, did you or did you not mean to say that you could not rule out the possibility that the death of Mrs. Morrell was not caused by drugs administered by Dr. Adams or under his instructions?"—"I am afraid I did not quite understand your full question, my Lord, but I would like to say this, that my answer to Mr. Lawrence, at that moment I thought he was trying to ask me an entirely unbiased opinion on that last page. He said, if my recollection is correct, looking at the last page—and there were six lines—he then asked me about the patient's death and I did feel that on that page there was nothing which prevented me accepting the possibility of some fatal catastrophe like another heart attack or cerebral thrombosis."

"Yes, but I must put my question to you again . . . "—"Would you please?"

" . . . and get you to understand it if I can because it is important. You said you could not rule out the possibility that death was the result of natural causes?"—"Yes."

"And then in answer to the Attorney-General you spoke about natural causes as having a terminal effect, or words to that effect?"—"Yes."

"So that it might be said that death is the result, in the end, of natural causes but those natural causes, or the operation of those natural causes, were themselves produced by the drugs that were administered by Dr. Adams?"—"Certainly, yes."

"And if that were so then it might be said that, looked at in the ordinary, common-sense way, the cause of death was the result of the drugs administered by Dr. Adams?"—"Yes."

"Now, I think you have said that in your view that was the cause of death?"—"Yes."

"But what Mr. Lawrence was asking you to-day was that he was asking you whether you could rule out the alternative possibility; that is to say, can you rule out the possibility that the death of Mrs. Morrell was not caused, in the ordinary, broad sense of the word, by the drugs administered by Dr. Adams?"

"Well, my lord, in so far as the nurses' reports show that her condition was not all that bad, she did seem to die in the end, to judge by these reports, fairly suddenly. I don't think . . ."

"I do not want, if I can avoid it—because I am not anxious to reopen the whole subject—you to answer that in detail, and that is why I began by asking you what you meant by your answer to Mr. Lawrence when you said that you cannot rule out the possibility that death was the result of natural causes. Did you mean simply that you cannot rule out the possibility that at the end natural causes was the terminal thing that brought about her death?"

"Well, with the greatest respect, my lord, I was just going to make it clear when you intervened."

"I am so sorry. Yes?"

"I think I can only say it in this way, that in so far as the reports do not make it completely certain that she was absolutely dying even six hours before, I do not think it is possible absolutely to rule out a sudden catastrophic intervention by some natural cause. It just is not possible to say this woman could not have had another cerebral haemorrhage at 1 o'clock that morning. There is just no evidence to say that that is impossible. I do not think it ever is possible completely to rule out the possibility, in a patient of 81, of sudden death."

"And in your answer to Mr. Lawrence, then, you meant no more than that you are not prepared to rule out the possibility that some cerebral haemorrhage might have intervened and brought about death?"

"Yes, I could not exclude the possibility of that beyond any shadow of doubt."

"Then you went on to say that Dr. Adams could well have thought that cerebral thrombosis was the immediate cause of death. When you said cerebral thrombosis then had you in mind the original cerebral thrombosis or the bare possibility of some intervening cerebral thrombosis?"

"I meant a terminal cerebral thrombosis."

"A further cerebral thrombosis?"

"Yes, my lord."

Cremation Certificate

On the thirteenth day of the trial, April 3, Dr. Francis Edward Camps was called by the Attorney-General to deal with a point raised by the judge. Dr. Camps, who is reader in forensic medicine at the London Hospital and the London Hospital Medical College, said that if a referee refused to give a cremation certificate, having had the forms duly completed and put before him, he could either order a post-mortem himself or, more commonly, notify the coroner, whereby the examination could be carried out under the coroner's auspices. In either event, as a result of that post-mortem examination, his Certificate F, which would be signed by the pathologist or the doctor carrying out the post-mortem, would supersede the B and C certificates, or, in the absence of the coroner, his certificate would cancel out the other two and his certificate was then accepted by the referee. If a person expressed a definite desire to be cremated, he thought it was obligatory for that to be done.

Under cross-examination Dr. Camps said that the medical referee, having examined the forms submitted to him, could order a post-mortem in his own discretion; but this was usually only done in cases of technical difficulty, such as the person not having been seen within the prescribed time before death. If he communicated with the coroner, the latter would undertake an investigation, statements being taken from the various people concerned, and might then order a post-mortem. In cases of cremation now it was always the practice to order a post-mortem because it was the final act. Having assessed the evidence, the coroner then held an inquest if he thought fit, but he was entitled to sign a cremation certificate, after due inquiry, without an inquest if he was satisfied that there was no suspicion or that death had not resulted from an accident, or anything of that sort.

He agreed, in answer to the judge, that some relatives might very much dislike a post-mortem, and the situation could arise (although he had not personally met it) whereby if the doctor had been left a legacy in the will, the relatives might say, "We would much rather that she was buried, and we believe that that would be her own wish rather than a post-mortem being carried out." His own experience had

been that in such cases the medical referee automatically notified the coroner.

Mr. Geoffrey Lawrence then made a submission in law, in the presence of the jury, that there was no case for the defence to answer.

The judge said, without calling on the Attorney-General to reply, that, after careful consideration, he had come to the conclusion that the matter should be determined by the jury and that he would therefore overrule the submission.

Mr. Geoffrey Lawrence explained that the defence had decided, in all the circumstances, not to call the accused.

Expert Evidence for Defence

He then called his medical witness, Dr. John Bishop Harman, of Harley Street, physician to St. Thomas's Hospital, London, to the Royal Marsden Hospital (formerly the Royal Cancer Hospital), and to the St. Helier Hospital, Carshalton.

It was clear that in June, 1948, Mrs. Morrell had had quite a severe stroke, and, Dr. Harman thought, was in a rather difficult mental condition. Her condition was symptomatic of arteriosclerosis. Pain did not usually accompany a stroke. He nevertheless assumed that the morphine had been given for pain. It was occasionally necessary to use morphine as a sedative in restless people who had had strokes. He was not prepared to condemn the use of morphine in such circumstances.

Asked about the use of morphia and heroin in the treatment of the patient when she had returned to Eastbourne in the mid-summer of 1948, he said that when a doctor took over a patient from another doctor, even though he had known her before her stroke and had visited her in Cheshire, the usual thing would be to continue with the treatment, for a time at any rate, that the other doctor had found necessary.

Mr. Lawrence: "So far as heroin is concerned, have you ever known of its use in cases other than cases of severe pain?"

"Oh, I use it for such, yes."

Dealing with further symptoms of a period of confusion after October 9, he said that, without reading too much into the reports, it was clear that the period lasted for a few days after the acute episode at night and then apparently passed off again. That would, of course, be consistent with a stroke, it would be consistent with more drugs having been given, but he saw no evidence of the latter.

The Cheyne-Stokes breathing, reported on the night of October 14-15, was one of the characteristics of a mild heart failure of a certain type which occurred particularly at night. It was not unusual and might occur in elderly persons for no very obvious reason.

Mr. Lawrence: "On the evidence presented in the report, are you able to take a view, as the other doctors took, that there was a point when clearly she was a dying woman?"

"Yes, I agree to the dates suggested, roughly."

"Dr. Douthwaite suggested November 1, and I think Dr. Ashby put the date later—on the 8th or 9th."—Yes. On the 8th it was much more obvious; on the 1st it was not so obvious. I think it is merely a question of how soon you make your diagnosis."

"Now, what do you say about this omission of morphia and omnopon and the concentration on the heroin at this stage? You have heard what Dr. Douthwaite said; what do you say?"

"Well, I entirely disagree with what Dr. Douthwaite has said on that subject. I agree with Dr. Ashby when he said it struck one as of no particular significance."

"Is it or is it not a variation of the drug?"—Yes.

"That is not such a silly question as it sounds, in view of Dr. Douthwaite's answer to me on that point?"—Well, one does speak of a variation sometimes in quantity, sometimes in kind. This was a change."

He agreed with Dr. Ashby that when the point of no return had been reached the first duty of the doctor was to promote the comfort of the patient. The administration of drugs after that point indicated that they were being given to stop her getting excited, to keep her peaceful, and that they were not working effectively. He was not sure why atropine was given, unless it was to stop mucus and trouble in the throat. The only effect of the paraldehyde given on the last day would be sedative.

Mr. Lawrence: "On the evidence of these nursing reports, is that death a morphine death or not, in your opinion?"—No.

"Why do you say that?"—By far the commonest form of morphine death is death in a coma and from respiratory paralysis. Before respiration completely stops it becomes very, very slow; it may be only ten or six times a minute."

"What, then, in short, is the significance in relation to a possible morphine death, of this record of respirations at 50 an hour and a quarter before she died?"—It shows she was not having the usual effect of fatal doses of morphine before she died."

He said that the time from the respirations having been noted at 50 to the time when she died was much too short for her to have died of morphine poisoning, morphine having been taken seven and a half hours before.

The cause of death might have been a coronary thrombosis. He saw no necessity to link her death with the doses of heroin and morphia, although it was possible that it was so linked. Although they were rather large doses of an hypnotic, which in general was a bad thing, it was just as likely that they did her good and that she would have been worse without them. There was no evidence either way.

He had searched world medical literature dating from 1800 to 1956, more than 10,000 references on morphine and allied subjects, for evidence about morphine convulsions, and had found descriptions of only 18 cases, excluding infants, of which one had been due to heroin, the remainder to morphine—4 in women and the rest in men. Many of the reports had been extremely sketchy, merely referring to Chinese coolies having convulsions with unknown doses. Not all the recorded instances, of course, had been available.

The witness described and demonstrated convulsions, and showed the difference between clonic and tonic movement.

Mr. Lawrence: "On the evidence here, what do you say about the death? Was it a death from the convulsive effects of morphine poisoning or not?"—I found it very difficult to discover the relationship between convulsions and death. Only four of my cases are recorded as having died in fact, though they had convulsions. My impression is that when they die with convulsions they die in a convulsion, but my knowledge of the phenomenon is so slight that I would not suggest that this is invariably so.

"At any rate, as Dr. Ashby said, it is a very rare phenomenon?"—Yes.

Fatal Dose

He said that the conception of a fatal dose was really too simple to have any practical value. Morphine and heroin were absolutely outstanding for variability, especially when tolerance was taken into account.

Mr. Lawrence: "Would you have expected the doses indicated in the nurses' notebooks to have had a fatal result on Mrs. Morrell?"—The whole point of morphine doses is that I would not expect anything. It is much too varied and unpredictable. On this dosage I would not say that death could not occur."

He had been surprised to hear hyoscine mentioned as an alternative drug to morphine and heroin. He certainly would not recommend it if there was a danger of respiratory failure.

It was a fairly general rule that morphia and hyoscine were not used together pre-operatively in patients over 60, because that synergistic combination would be likely to depress respiration. He did not think the use of atropine made much difference either way. He, personally, would have turned to paraldehyde if he had had to turn to something. Dr. Douthwaite's description of it as "an old-fashioned and well-established hypnotic" was rather derogatory; it was an old one in continuous use.

Asked to comment on the "sinister" suggestion of the prosecution about the patient's dependence on the doctor for drugs, he said addicts did develop a strongly emotional relationship to people or places from which they got their drugs, but that did not apply in places, such as China, where supplies were easily obtained. There was no evidence that Mrs. Morrell even knew she was dependent on morphine. He saw no evidence of craving for drugs by the patient.

On the fourteenth day of the trial, April 4, Dr. Harman was recalled to give the remainder of his evidence-in-chief. He said that in his opinion there was no reason why heroin should not be given to elderly people. If there was a danger it must be a very small one which was not obvious to a large number of doctors who used the drugs. He agreed with Dr. Ashby that there was nothing sinister in

the withdrawal of the morphine from the treatment at the end of October and the beginning of November, 1950.

There was nothing astonishing in the direction to the nurses to give morphine and heroin S.O.S. He frequently did it himself. He would leave it to the nurses' discretion.

Witness Cross-examined

Cross-examined by the Attorney-General, he said he had been in general practice for one fortnight. Prior to the case he had made no special study of heroin and morphia.

The Attorney-General: "You are a recognized authority, are you not, on a disease known as Q fever?"—I have described cases."

"And Dr. Douthwaite is a recognized authority in relation to heroin and morphia?"—He is."

"When you have to perform a diagnosis, you seek, no doubt, to take into account all relevant facts and symptoms?"—I do."

"It is very important, is it not, that you should not shut your eyes to the obvious or not give certain factors their full weight?"—It is."

"When were you first asked to consider this case?"—About a fortnight before it opened."

"At the magistrates' court?"—No, here."

"When did you start reading books on this subject to prepare for your evidence?"—During that time."

The regulations, with regard to dangerous drugs, were quite strict. It was important that the drugs should not be left lying about. Doctors would not normally prescribe morphia and heroin for a patient without the intention of using them on that patient. He was unwilling to suggest what would have been the effect if nearly all the drugs prescribed between November 8 and 13 had been administered, but he certainly thought she could have survived that dosage.

The Attorney-General: "If she had these prescriptions given to her in that short period, that would not form a topic of medical shop between you and other doctors?"—Yes, those doses would."

"Have you ever heard of any doses like that being prescribed for a lady of 81?"—Yes."

"A dying lady—not dying of cancer—a dying lady?"

"In the case I am thinking of, the lady was not dying at all."

"Have you ever heard of any prescriptions like that being prescribed for a dying lady of 81?"—I have not heard of an exactly comparable case."

"If this lady was, as you say, dying early in November, the administration of this dosage must have killed her, must it not?"—No."

"It would have been a most remarkable thing if she had survived it, would it not?"—It would have been a thing worth talking about to colleagues."

"As a remarkable thing?"—As a remarkable thing."

He did not agree with Dr. Douthwaite's evidence that each one of the prescriptions prescribed on the last days, if administered on those days, was a lethal dose. Dr. Harman said he had only treated two or three addicts and had never attempted to wean one.

The Attorney-General: "Were the addicts you treated morphia or heroin addicts?"—One was a heroin addict, the others morphine addicts."

"One heroin addict is not a very representative pattern, perhaps, on which to base a general opinion, but was that addict excitable?"—Not at all."

"How many years ago was that?"—It was before the war."

"Is that the last case you have seen of heroin addiction?"—Yes."

"Am I right in concluding that most of the views you have expressed about heroin are views you have formed after reading books for the purposes of this case?"—Yes. That is one of the usual ways of gaining knowledge."

He did not consider that, if heroin was given repeatedly, the patient would probably develop a feeling of great gratitude to the doctor who was giving her such wonderful injections.

"Are you really saying that a doctor who succeeds for two years by the use of these drugs in making his patient feel better would not get a sense of gratitude felt by the patient towards him?"—I think she would get a sense of gratitude from all his attention in general."

He saw no reason why an attempt should have been made to wean the patient, because she was getting along very well and the attempt was not necessarily worth it.

increase the amount of money from his practice he had to take more people on his list. With large lists of 4,000 or more it was difficult to give proper service. When people were paid from public funds it was important to have satisfactory arrangements by which their money could be increased. If they did not get paid extra salaries they paid a concealed tax because they did not get enough to enable them to cope with the increasing cost of living. One had to be careful not to insist that one profession alone should be tied to a regular increase when the cost of living went up. He would not suggest that the profession would not wish to be put in a specially privileged position, but they were in the present frame of mind because they felt they had not been given what they were promised.

Lord HADEN-GUEST said that a doctor was not a man who thought primarily about money or the income he would get, although he wanted an adequate income. A doctor had to live a life dedicated to his profession. It was a profession that needed different treatment from others.

Earl JOWITT said that whatever happened he hoped that the doctors would abandon any idea of what was called a strike. He would pray that we might accept far more generally the principle of arbitration rather than a resort to force or pressure to try to win one's end. "By all means let us not try to talk of strikes, it is beneath the dignity of doctors." If there was to be arbitration, however, as he devoutly hoped there would be, it should start on the basis that the doctors were reasonably satisfied with the terms of reference under which the arbitrator was to act.

Government Reply

The EARL OF HOME, Lord President of the Council, said the House would wish that within the limits of reason and possibility justice should be done to the medical profession, because no body of men gave more indispensable service and none had a greater sense of responsibility. He said "within reason and possibility" because there was a background to the doctor's claim from which neither party could escape. The Health Service was a comparatively novel experiment. The State had no inherent virtues as an employer. It was the first time it had had to work out a relationship with one of the great skilled professions. Inevitably it must take time before a satisfactory code could be finally established.

The eight years of the Health Service had run concurrently with a time of intensifying inflation, when the purchasing power of money had declined and the costs of the professions had been raised. The doctors no doubt felt convinced that they had a case for increased remuneration, both actual and in relation to others. But the taxpayers were also bearing record levels of taxation, and they had an unanswerable case for relief. The Government were responsible to both the doctors and the taxpayers, and they had to try to be fair to all.

He emphasized the complex interrelation of these factors because there was one proposition running through this dispute which seemed to him false. It had seemed to be argued that, because the Spens Committees based their recommendations for remuneration on 1939 prices, therefore subsequent settlements must always guarantee the doctors against the extra costs brought about by inflation.

That was not a tenable proposition. So long as inflation persisted it was impossible to insulate one profession against the effects of it, or to guarantee that all professions should advance in their remuneration with proportionate precision. The remedy—and it was the Government's policy—was to stop inflation. That itself required the restraint of wage and salary earners. Short of the happy day when they achieved a halt to inflation, the best they could do was to try to ensure that no section of wage or salary earners was put at a relative disadvantage with regard to any other section of comparable skill and attainment.

The Spens Reports were accepted by the Government of the day, and were expected to provide a basis for the entry of doctors into the Health Service. Mr. Bevan, when Minister of Health, said in 1950 that the Spens principle

had served its original purpose, and could not be regarded as the basis of remuneration for all time. That was true. What in the Government's opinion was needed now, after eight years of the Health Service, was to determine the proper place of the medical profession in relation to other skilled professions, and when that was done to fix the scale of remuneration after authoritative and up-to-date findings by a Royal Commission. The Government believed that the Royal Commission could be the proper instrument. It could take into account all the circumstances that were relevant, and one of the factors clearly relevant was consideration of the Spens Reports. If the doctors wished to put before the Royal Commission their interpretation of the Spens Reports there was no reason why the Commission should not listen to and consider their views on them. Clearly the Royal Commission would take into account rewards for skill in other comparable professions, and equally the special conditions of a doctor's life.

Earl JOWITT, interrupting, said he had been looking at the terms of reference and he did not think that the Earl of Home was right. It depended on the construction of the terms of reference. The Earl of Home should take legal advice after the debate to find out whether he was right in what he said. The Earl of HOME said he had taken the advice of the Minister of Health, and he was advised that what he had said fell within the terms of reference to the Royal Commission.

He mentioned the 10% increase that had been given to junior hospital staff, and the announcement that was to come soon from the Prime Minister in relation to a further interim increase for senior hospital staff and general practitioners. Against the background of the country's financial position, and taking into account the doctor's claim was of such a size that it would affect the incidence of taxation, he suggested that, both from the point of view of the doctor and of the public, this interim assistance to be followed by a Royal Commission was a fair way of dealing with the problem.

The Royal Commission had already held a number of sittings, and the chairman had every intention that the Commission should act with speed. There had been criticisms that there were no doctors or dentists on the Commission, but the Minister thought that they would be more valuable as witnesses. It had also been asked why there was no direction to take into account remuneration in commerce and industry. The Minister thought that would have meant an immensely long inquiry, and there was a large section where conditions were not directly comparable. On the question of merit awards, he understood that the Commission would normally be concerned with the levels of medical and dental remuneration, and not with the methods as such. Whether they would find it necessary to look at merit awards in order to discharge their terms of reference fully would be for them to decide.

It was the Government's hope that they would be able to move away from the atmosphere of distrust, of accusations of bad faith, of trials of strength, and non-cooperation with the Royal Commission and the Health Service. That seemed to all of them out of character in a profession that recognized everywhere for its sense of responsibility. But it was equally true that the community, who were the new employers, should not trade on the tradition of patience and good will of the doctors. There must be give and take; there must be understanding and sympathy on both sides. It was the Government's desire that there should be a rapid, fair, and comprehensive settlement, and they believed that the Royal Commission was the method which would most surely reach these results.

Lord MORAN, in a final comment, expressed at times with some exasperation, said he was profoundly disappointed in the substance of the reply. He had given the Earl of Home notice of two questions, and neither had been answered in a way satisfactory to the doctors. On the question of merit awards he merely said that it was for the Royal Commission to settle. In other words the remuneration of consultants might be torn up by the roots and much done in the last seven years thrown away.

Vital Statistics

Tetanus in Hospital

Investigations into the tetanus outbreak at the North Staffordshire Royal Infirmary, Stoke-on-Trent (*Journal*, March 16, p. 653), have shown that tetanus spores were widespread throughout the operating-theatre block. This was stated by Dr. E. M. Mackay-Scollay, director of the Stafford public health laboratory, at the inquest held last week on two of the patients who died. The jury returned verdicts that death was due to tetanus accidentally contracted following operations. The other three patients have now recovered.

Dr. Mackay-Scollay said the North Staffordshire Infirmary operating-theatre block comprised three theatres and their ancillary departments. He found evidence of the presence of tetanus spores after examining samples of dust, debris, and wall plasters from the floor of the main theatre corridor, various sites in the annexe, in particular the packing-room floor, a naked electric light bulb in the packing room, the sluice-room floor, and the floor, walls, shelves, and partition in the annexe passage. He also found spores among general floor sweepings of the theatre block, in a storage box for rubber gloves, and on a surgeon's glove contained in a sterilization drum. There was no evidence of whether that drum had been through a process of sterilization or not. Negative results had come from his examination of samples of all batches of opened catgut. Asked whether normal hospital sterilization would kill a heavy concentration of tetanus on a surgical glove, he agreed it was very difficult to kill tetanus spores, but said that if the method employed was adequate they would be destroyed.

At the close of the inquest it was announced on behalf of the hospital management committee that the present theatre block at the Infirmary would not be reopened, and that new theatres costing between £40,000 and £50,000 were to be built. This was "because of the unusual and unpredictable cases of infection by tetanus."

Week Ending March 30

The notification of infectious diseases in England and Wales during the week included: scarlet fever 812, whooping-cough 2,849, diphtheria 6, measles 25,185, acute pneumonia 545, acute poliomyelitis 28, dysentery 1,222, paratyphoid fever 3, and typhoid fever 1.

Infectious Diseases

In England and Wales during the week ending March 23 the largest rises in the notifications of infectious diseases were 2,354 for measles, from 24,825 to 27,179, and 134 for food-poisoning, from 164 to 298; the largest falls were 248 for whooping-cough, from 3,180 to 2,932, 113 for scarlet fever, from 935 to 822, 99 for dysentery, from 1,416 to 1,317, and 75 for acute pneumonia, from 770 to 695.

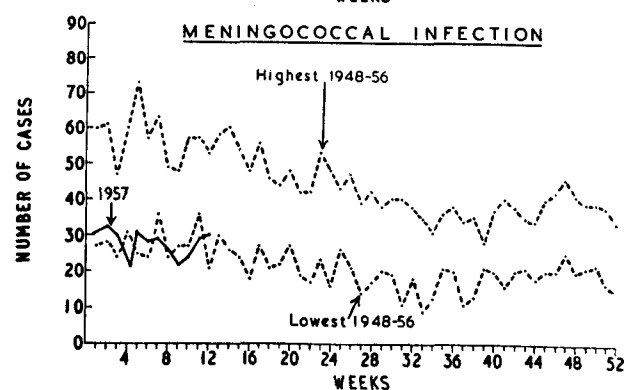
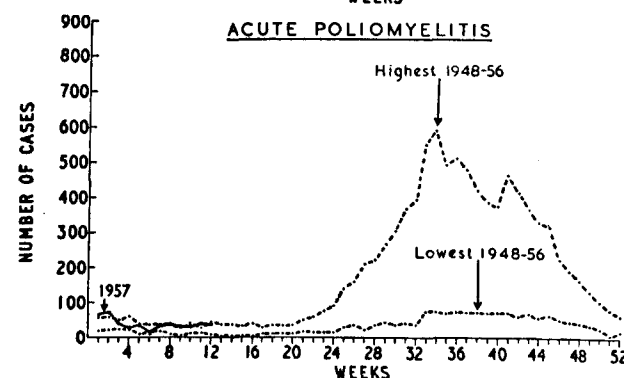
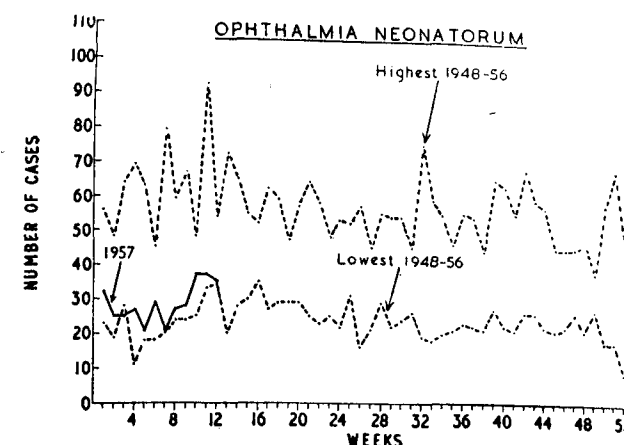
The largest increases in the incidence of measles were 737 in Yorkshire West Riding, from 2,115 to 2,852, 467 in Warwickshire, from 1,099 to 1,566, 402 in Essex, from 1,644 to 2,046, 278 in Middlesex, from 1,298 to 1,576, 272 in Kent, from 795 to 1,067, 202 in London, from 1,832 to 2,034, and the largest decreases were 361 in Lancashire, from 4,227 to 3,866, 204 in Cumberland, from 619 to 415, and 122 in Surrey, from 1,519 to 1,397. The largest declines in the incidence of scarlet fever were 31 in Durham, from 70 to 39, and 24 in London, from 74 to 50. The only large fluctuation in the returns of whooping-cough was a fall of 68 in Warwickshire, from 148 to 80. 3 cases of diphtheria were notified, the same number as in the preceding week.

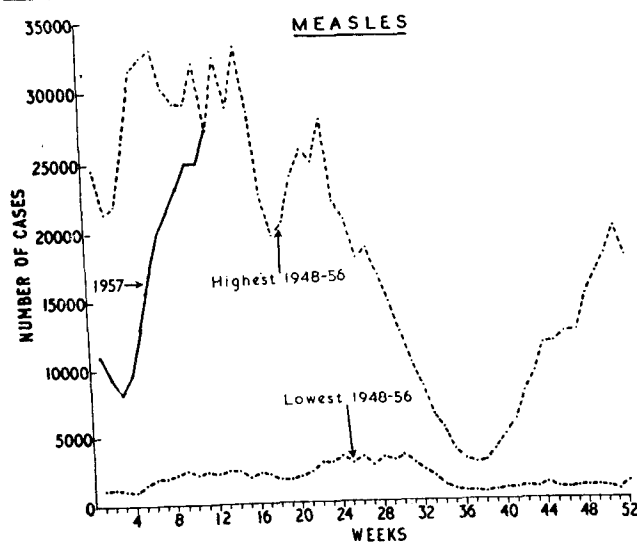
37 cases of acute poliomyelitis were notified, and these were 3 more for paralytic and 4 fewer for non-paralytic cases than in the preceding week. The largest returns were Essex 6 (Brightlingsea U.D. 6), Hertfordshire 5 (Barnet U.D. 2), Surrey 4 (Hambleton R.D. 2).

The largest centres of dysentery were Yorkshire West Riding 282 (Rotherham C.B. 63, Leeds C.B. 40, Bradford C.B. 29, Pontefract M.B. 26, Worsborough U.D. 14, York C.B. 12), Lancashire 150 (Liverpool C.B. 24, Blackburn C.B. 23, Stretford M.B. 21, Ashton under Lyne M.B. 15), Durham 111 (Blaydon U.D. 51, Whickham U.D. 19, Gateshead C.B. 12), Surrey 91 (Surbiton M.B. 32, Chertsey U.D. 25, Esher U.D. 17), London 78 (Wandsworth 40), Cheshire 70 (Hyde M.B. 42), Bedfordshire 57 (Luton M.B. 39, Luton R.D. 17), Middlesex 57 (Hayes and Harlington U.D. 21, Enfield M.B. 16), Nottinghamshire 49 (Basford R.D. 20, Nottingham C.B. 10), Shropshire 33 (Oswestry M.B. 20, Oswestry R.D. 12), Kent 32 (Deal M.B. 27), Warwickshire 31 (Birmingham C.B. 14, Coventry C.B. 11), Essex 30 (Hornchurch U.D. 12), Devonshire 27 (Plymouth C.B. 26), Yorkshire East Riding 25 (Kingston upon Hull C.B. 19), and Oxfordshire 21.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1948-56 are shown thus ----, the figures for 1957 ———. Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





England and Wales in 1956

Provisional figures of deaths from certain causes have been announced for England and Wales in 1956 (Registrar-General's Weekly Return No. 13):

Tuberculosis.—Deaths from respiratory tuberculosis numbered 4,851 (against 5,837 in the previous year), giving a provisional death rate of 109 per million persons. This is a decrease of 17% compared with the previous year. Since 1947 the death rate from respiratory tuberculosis has fallen by more than 75%. The death rate from other forms of tuberculosis was 12 per million persons, compared with 15 for 1955.

Cancer.—The provisional death rate for all forms of cancer for men was 2,274 per million population and for women 1,891. The 1955 figures were 2,252 and 1,873 respectively. The rise in the rate for men includes an increase from 693 to 726 per million population for deaths assigned to cancer of the lung and bronchus. The rate for cancer of the lung and bronchus for women increased from 106 per million in 1955 to 111 in 1956. The male deaths from cancer totalled 48,932, of which 15,615, or nearly 32%, were certified as due to cancer of the lung and bronchus. For women, out of a total of 43,769 deaths from cancer, only 2,570, or less than 6%, were ascribed to this cause.

Maternal Causes.—There were 401 deaths from maternal causes (including abortion) last year. In 1955 the total was 439. The provisional maternal mortality rate (including abortion) per 1,000 live and stillbirths was 0.56, the lowest ever recorded. The previous lowest was 0.64 in 1955.

Eire in 1956

The yearly summary for 1956 in Eire shows that the birth rate was 21.0 per 1,000 population, being 0.2 below the rate for 1955. Infant mortality was 36 per 1,000 registered births; this was the lowest rate ever recorded, being 1 below the preceding lowest level of 1955. The death rate was 11.7 per 1,000 population and was 0.9 below the rate for the preceding year. The death rate per 100,000 from respiratory tuberculosis was 19 and 4 from other forms of tuberculosis; these rates were 5 and 1, respectively, below the rates for 1955. Mortality from respiratory tuberculosis has fallen to one-third and other forms of tuberculosis to one-fifth of the level of 1951. Deaths from infectious diseases included 401 from influenza, 153 from gastro-enteritis (under 2 years), 39 from whooping-cough, 20 from acute poliomyelitis, 20 from measles, and 15 from diphtheria. Deaths from malignant neoplasms numbered 4,566 and were 7 more than in 1955. Of these deaths 48% were due to malignant neoplasms of the digestive system and 12% to the respiratory system.

In the December quarter of 1956 the birth rate was 20.3 per 1,000 population and was 0.8 above the rate for the preceding fourth quarter. The infant mortality rate was 35 per 1,000 registered births, being 1 below the rate for the fourth quarter of 1955; it was the lowest rate for any December quarter. The death rate was 10.9 per 1,000 population and was 0.3 above the rate for the preceding December quarter.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending March 23 (No. 12) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1957					1956				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	3	0	2	0	4	6	2	4	0	4
Dysentery	1,317	78	250	15	2	2,371	339	162	18	1
Encephalitis, acute	4	0				2	0			
Enteric fever:										
Typhoid	1	1	0	0		0	0	1	0	0
Paratyphoid	3	1	0	0		7	4	3(B)	0	
Food-poisoning	298	22	11	2		246	16			
Infective enteritis or diarrhoea under 2 years					13				10	29
Measles *	27,179	2034	550	444	217	2,804	66	204	46	213
Meningococcal infection	30	3	9	2	1	21	2	10	3	1
Ophthalmia neonatorum	35	4	5	0		35	4	8	0	
Pneumonia †	595	52	241	7	8	817	48	232	16	21
Poliomyelitis, acute:										
Paralytic	26	2	1	1	2	9	1	1	0	
Non-paralytic	11	1				3	0			
Puerperal fever ‡	246	49	5	0	1	288	59	9	0	1
Scarlet fever	822	50	59	37	33	982	63	71	32	30
Tuberculosis:										
Respiratory	593	88	97	16		671	89	136	19	1
Non-respiratory	73	6	17	2		90	6	12		
Whooping-cough	2,932	2034	268	10	21	1,416	87	137	87	135

DEATHS in Great Towns	1957					1956				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	1	0	0	0		0	0	0	0	
Encephalitis, acute										
Enteric fever	1	1	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	4	0	2	0	0	8	2	1	0	0
Influenza	21	2	0	0	0	47	4	2	1	1
Measles		1	0	0	0					
Meningococcal infection		0	0				1	0		
Pneumonia	290	38	0	6	8	430	71	28	21	13
Poliomyelitis, acute	3	1			0	2	0			0
Scarlet fever		0	0	0	0		1	0		
Tuberculosis:										
Respiratory	67	9	7	0	3	85	9	16	3	5
Non-respiratory		1	1	0	1		0	1		2
Whooping-cough	0	0	2	0	0	0	0	0	1	0
Deaths 0-1 year	204	24	41	8	12	268	43	35	13	206
Deaths (excluding stillbirths)	5,453	767	613	119	186	6,803	969	665	157	379
LIVE BIRTHS	8,681	1282	1028	222	386	8,681	1318	1027	251	379
STILLBIRTHS	211	22	30			192	26	18		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenza pneumonia.
‡ Includes puerperal pyrexia.

Medical News

Nuffield College of Surgical Sciences.—The opening of the Nuffield College of Surgical Sciences of the Royal College of Surgeons on April 5 was an event of the first importance for surgical education. The new college is the gift of Viscount Nuffield, made through his charitable trust and King Edward's Hospital Fund for London. It consists of a residential college with room for 80 postgraduate teachers, students, and research workers drawn from Commonwealth countries and other parts of the world who will, it was stated, "gather together for periods of intensive study with all the academic amenities and scientific facilities of the Royal College of Surgeons at their disposal." Great store is set by the fact that the students will be able to mix freely with members of the academic staff of the college and with eminent surgeons of every nationality. The project arose from the desire of Viscount Nuffield and Lord Webb-Johnson—both of whom received an ovation—to create an "All Souls of Surgery." Viscount NUFFIELD asked the President, Sir HARRY PLATT, who was supported by the Council of the College, to accept the new college, and Lieutenant-General Lord FREYBERG, V.C., formally opened the building after addressing a large and distinguished gathering. The accommodation is commodious and consists of large bed-sitting rooms, dining-room, and lounge, and the amenities include a squash court and a billiards-room. Residents pay £7 5s. weekly for full board, except luncheon.

Voluntary Health Insurance.—The British United Provident Association celebrated its tenth birthday with a dinner in London on April 2. The association is non-profit-making and exists to provide insurance against heavy medical and nursing expenses for those preferring private treatment. It could report a most satisfactory expansion during its first ten years. Mr. F. E. WEBB, the general manager, said that when the association started the staff numbered 17: to-day it was over 300. Administration then cost about a quarter of the subscribed capital, whereas last year only a little over 10% of the income. The initial membership was 50,000. During the first seven years 250,000 new members joined, and during the last three years another 250,000, figures which, Mr. Webb suggested, seemed to indicate that the more people knew of the nationalized health services the less satisfied they were with them. Only about 3% of existing subscribers dropped out each year, while new subscribers were joining at the rate of 30,000 a year, mainly through the introduction of existing subscribers. The reason why they had been able to make such a success of health insurance was, he thought, because they had been able to pay out such large amounts to their dependants in benefit. That could only be done if the services were administered cheaply, and that they had been able to do. They were a non-profit-making organization; the governors got no payment for their services; the staff was generously treated, but no one else dipped into the pool, and they had no heavy advertising charges. At the dinner the chair was taken by the chairman of the association, Sir ANDREW ROWELL, and Mr. REGINALD MAUDLING, M.P., Paymaster-General, was the principal guest.

Society of Chiropodists.—Sir ZACHARY COPE proposed the health of the society at the annual dinner, held at the Park Lane Hotel on April 4. He said there were three particular things he liked about the society—its name, suggestive of strength and power; its development during the past years; and the excellent leadership it had had. Sir Zachary recalled an occasion during the first world war when he had had to undertake chiropody himself: it was a good thing, he said, that as a surgeon he was accustomed to the sight of blood. Responding to the toast, Mr. J. R. HALL, the president of the society, said that Sir Zachary had done more for medical auxiliaries than anyone else, and before long they hoped to see the fruition of the tremendous work

he had put in as chairman of the Cope Committees—with the "professions supplementary to medicine" based on the same high standards of education, examination, and ethics as those of the medical profession. Proposing the health of the guests, Mr. D. NEALE mentioned in particular the support the society had had from the Royal Colleges, and in an entertaining reply Sir HENRAGE OGILVIE ran through the changing fashions of surgery in fairly recent years: plastic surgery followed the fashion for orthopaedic surgery set by Sir Robert Jones; then came the thoracic surgeons, the cardiologists, the arterial surgeons, and finally, at their heyday now, the surgical biochemists.

Physical Medicine Dinner.—Dr. P. BAUWENS was in the chair when the British Association of Physical Medicine held its annual dinner on April 5. In proposing the health of the association, Sir CECIL WAKELEY said there was no branch of medicine which had not benefited from physical medicine: "We strip the veins. You get rid of the ulcers." After Dr. BAUWENS had replied, the health of the guests was proposed by Group Captain C. J. S. O'MALLEY. He paid a special tribute to Mr. J. Cyril Butterwick, Prime Warden of the Goldsmiths Company, for the help they had given in connexion with the association's presidential badge, made in memory of Lord Horder. In reply Mr. BUTTERWICK said the Goldsmiths Company was deeply interested in rehabilitation. Metalwork and jewellery-making were good outlets in occupational therapy.

University Apartheid Bill Withdrawn.—On technical grounds, Mr. VIJOEN, the South African Minister of Education, Arts, and Science, has withdrawn the Government's Separate University Education Bill. He originally introduced the Bill in the Union parliament on March 11. The Bill's purpose was to enforce apartheid in South African universities. It deprived Natal University of its medical faculty, the Durban Medical School, and placed it together with Fort Hare University College, and other university colleges for "non-whites" which were to be established, under a government department; their teaching staffs were to become civil servants, liable to dismissal for public criticism of the Government. The Bill made it an offence, punishable by fine or imprisonment, to admit non-Europeans to the two existing open universities—Capetown and Witwatersrand—or to admit Europeans to "non-white" colleges. The Government's proposals provoked a storm of criticism from academic and medical circles in South Africa (see this *Journal*, 1957, 1, 532, 699, and 775). It is understood, however, that the reason for the Bill's withdrawal was not in response to the protests it has evoked, but because the parts dealing with the Durban Medical School and Fort Hare would have had to go before a select committee, which is a lengthy process. According to the Capetown correspondent of *The Times*, the South African Government has not shelved the Bill, but intends to introduce a Bill to establish university apartheid this session and to leave the Durban Medical School and Fort Hare University College until later.

Dr. Cuthbert Lockyer, 90.—This Saturday Dr. CUTHBERT LOCKYER, consulting gynaecologist to Charing Cross Hospital, is 90. His colleagues, friends, and pupils will wish to join us in congratulating him. Besides holding consulting appointments at Charing Cross Hospital, the Samaritan Hospital for Women, the Royal Northern Hospital, and the National Hospital, Queen Square, Dr. Lockyer was a foundation fellow and councillor of the Royal College of Obstetricians and Gynaecologists. On his retirement in 1930 he presented his magnificent collection of obstetrical and gynaecological specimens to his old school, Charing Cross Hospital.

Prophylactic Chemotherapy at Cancer Operations.—In New York last month Dr. WARREN H. COLE described his use of a prophylactic "umbrella" of nitrogen mustard in cases of cancer. The nitrogen mustard is given intraperitoneally (and also sometimes intravenously as well) at the time of operation, and intravenously for three days subsequently. The object is to destroy dislodged cancer cells

before they can take root. Dr. Cole, who is immediate past-president of the American College of Surgeons, was speaking at a conference at the New York Academy of Sciences on March 28-30. With colleagues from the University of Illinois College of Medicine he reported to the Southern Surgical Association last December experimental results supporting this approach. At the conference in New York he gave his preliminary findings in 34 patients with cancer of the colon or rectum. Although operation appears to lower resistance to the toxic effects of nitrogen mustard, Dr. Cole was able to conclude that his procedure was safe for such cases provided certain precautions were observed.

Another Medical Visit to Warsaw.—Three British thoracic surgeons, Sir CLEMENT PRICE THOMAS, Mr. ANDREW LOGAN, and Mr. RONALD EDWARDS, visited Warsaw last week. They took part in a meeting of the Thoracic Section of the Society of Polish Surgeons on April 4-6. They were invited by the Polish Ministry of Health, and their visit was arranged through the British Council.

Chair in New York.—Dr. BRIAN MACMAHON has been appointed to a new Chair of Environmental Medicine and Community Health in New York State University. He qualified in medicine from Birmingham Medical School in 1946, and after holding a Rockefeller fellowship at Harvard returned to Birmingham as lecturer in social medicine.

F.R.F.P.S.—The following were admitted fellows of the Royal Faculty of Physicians and Surgeons of Glasgow at a meeting on April 1: G. H. A. Aponso, A. K. Dutta, S. Janardhana, and G. P. McNicol.

Air Travellers' Society.—On March 27 in London Lord BRABAZON OF TARA inaugurated the International Society of Air Travellers and Air Transport Users. Among the society's objects are the maintenance of a register of doctors living near airfields who are ready to treat its members, and the care of children, the disabled, and the infirm at airports. The society's address is 45, Park Lane, London, W.1.

Dr. Macdonald Critchley has been elected a member of the Norwegian Academy of Science and Letters.

COMING EVENTS

Institute of Diseases of the Chest.—Clinical demonstrations by Dr. F. H. YOUNG at the Institute (Brompton Hospital, Fulham Road, London, S.W.3) on Fridays at 5 p.m. from April 26 to July 5. Open to all medical practitioners without fee.

B.B.C. Programmes on Mental Health.—Series of six features, weekly from Wednesday, April 17, in the Home Service. B.B.C. leaflet, "Mind Out of Balance," available, on receipt of stamped envelope (2d.), from B.B.C. Publications (Mental Health), 35, Marylebone High Street, London, W.1.

Polish Medical Association in Exile.—Annual meeting on April 27 and 28, at 14, Collingham Gardens, London, S.W.5. Details from the hon. secretary at the above address.

Heberden Society.—The Heberden Round will be held at the Rheumatic Unit, Northern General Hospital, Ferry Road, Edinburgh, on May 16 from 10 a.m. Members expecting to attend should notify Dr. J. J. R. DUTHIE as soon as possible.

National Association for the Prevention of Tuberculosis.—Symposium on "Chronic Bronchitis," on May 29, at 3.30 p.m., at the Clinical Science Building, York Place, Manchester, 13. Admission by ticket (price 10s.) available from N.A.P.T., Tavistock House North, Tavistock Square, London, W.C.1.

Second International Congress for Social Medicine.—Vienna, May 30 to June 2. Organized by the International Federation for Hygiene and Prophylactic Medicine, the Austrian Scientific Society, and the Austrian Medical Chamber. The theme of the Congress will be "University and Public Health." Details from the secretariat, 10-12, Weiburggasse, Vienna, 1.

NEW ISSUES

Thorax.—The new issue (Vol. 12, No. 1) is now available. The contents include:

- A SELF-CONTAINED, DISPOSABLE OXYGENATOR OF PLASTIC SHEET FOR INTRACARDIAC SURGERY. Vincent L. Gott, Richard A. DeWall, Mathias Panch, M. Nazhi Zuhdi, William Weirich, Richard L. Varco, and C. Walton Lilehel.
- STENOSING NON-CASEATING TUBERCULOSIS (SARCOIDOSIS) OF THE BRONCHI. K. M. Chinn and J. G. Scadding.
- BRONCHIAL INVOLVEMENT IN PULMONARY SARCOIDOSIS. Vatche V. Kaibian.
- COR TRIANGULUM. N. R. Barrett and John B. Hickie.
- THE POSSIBLE ROLE OF SURGERY IN THE TREATMENT OF ANOMALOUS LEFT CORONARY ARTERY. J. Adley, R. E. Horton, and M. G. Wilson.
- AN UNUSUAL CAUSE OF A CONTINUOUS MURMUR SIMULATING PERSISTENT DUCTUS ARTERIOSUS AND ASSOCIATED WITH OTHER CONGENITAL CARDIAC DEFECTS. A. J. Gunning.
- PERCUTANEOUS LEFT VENTRICULAR PUNCTURE IN THE ASSESSMENT OF AORTIC STENOSIS. Peter Fleming and Ronald Gibson.
- THE ANATOMY OF PHRENIC NERVE TERMINATION AND THE MOTOR INNERVATION OF THE DIAPHRAGM. G. S. Müller Botha.
- RESPIRATORY GRANULOMATOSIS WITH POLYARTERITIS NODOSA (WEGENER'S SYNDROME). N. S. Plummer, J. H. Angel, D. B. Shaw, and K. F. W. Hingray.
- REPORT OF A CASE OF PULMONARY TELANGIECTASIA. G. H. Apthorp and D. V. Bates.
- A CASE OF PERITONITIS-PERICARDIAL DIAPHRAGMATIC HERNIA TREATED SURGICALLY. A. El Sherif and S. El Mallah.
- RELAPSES AFTER RESECTION FOR PULMONARY TUBERCULOSIS. A. M. W. Hekking.
- THE RESULTS OF RAISING THE RESPECTABILITY RATE IN OPERATIONS FOR LUNG CARCINOMA. R. Abbey Smith.
- DRILL BIOPSY IN INTRATHORACIC MALIGNANT DISEASE. Robert Morrison and Thomas J. Deeley.
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SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked •. Application should be made first to the institution concerned.

Monday, April 15

SOCIETY FOR GENERAL MICROBIOLOGY.—At Royal Institution, 6 p.m. Third Marjory Stephenson Memorial Lecture by Dr. A. Lwoff (Institut Pasteur): The Notion of Vi-us.

Tuesday, April 16

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Erasmus Wilson Demonstration by Dr. H. G. H. Richards: Parotid Gland Tumours. SOCIETY FOR THE STUDY OF ADDICTION.—At 11, Chandos Street, W. 8 p.m., Dr. D. J. Parr: Alcoholism in General Practice. WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Mr. J. Minton: Ocular Manifestations in Clinical Neurology (Part II).

Wednesday, April 17

HARVEIAN SOCIETY OF LONDON.—8.15 p.m., Dr. Katharine Williams: Nuclear Age: Potentiality and Hazard (illustrated by a film "Calder Hall").

Thursday, April 18

HYPNOTHERAPY GROUP.—At Royal Society of Medicine, 8 p.m., clinical evening. Dr. G. J. Ambrose and Dr. A. Fry: demonstration of cases treated by hypnosis and illustration of the different techniques used. KENT PAEDIATRIC AND CHILD HEALTH SOCIETY.—2.30 for 3 p.m., visit to Vocational Guidance Department, National Institute of Industrial Psychology. NORTH-EAST CLINICAL SOCIETY.—At Prince of Wales's General Hospital, N., 2.30 p.m., clinical meeting.

Sunday, April 21

EDINBURGH CLINICAL CLUB.—At Peel Hospital, 3.15 p.m., meeting with Border Clinical Club.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Steele.—On March 31, 1957, at Kuching General Hospital, Sarawak, to Eileen (formerly Selby-Brown), M.B., B.S., and William O. Steele, B.A., of the Education Office, Simanrang, Sarawak, a son—Jonathan William.

MARRIAGES

O'Donoghue—Hanton.—On March 5, 1957, Hugh O'Donoghue, M.B., D.O., of Herbert Park, Dublin, and 72, Warham Road, Croydon, Surrey, to Miriam Hanton, of John Street, Wexford, Eire.

DEATHS

Aubin.—On March 7, 1957, Emile Dupont Aubin, M.D., of Auckland, New Zealand, aged 87.
Esterman.—On March 7, 1957, Tobias Esterman, M.B., Ch.B., of Highgate, London, N.
Farris.—On March 20, 1957, at 55, Hove Park Road, Hove, Sussex, Desmond William George Farris, C.B.E., M.B., B.S., D.P.H., late of Singapore, Malaya, aged 56.
Hunter.—On March 19, 1957, Stewart Hunter, M.B., F.R.C.S.Ed., M.R.C.P., D.C.H., of Christchurch, New Zealand, aged 54.
Nelson.—On March 16, 1957, at Fauvic Nursing Home, Jersey, Channel Isles, Harry Ross Nelson, M.B., Ch.B., D.P.H., late of Uganda, aged 78.
Price.—On March 17, 1957, at Twyford, Reading, Berks, Alfred Henry Price, M.D., D.P.H.
Small.—On March 18, 1957, at 8, Tollgate Road, Rothbury, Northumberland, John Alexander Small, M.B., Ch.B., aged 80.
Taunton.—On March 18, 1957, at Bailiff's Cottage, Chittenden, Four Elms, Kent, Thomas Joseph Taunton, M.R.C.S., L.R.C.P., of 52, Biddulph Mansions, Elgin Avenue, London, W.

Any Questions ?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Treatment of Menopausal Symptoms after Mastectomy for Cancer

Q.—Is it safe to give hormone therapy for severe menopausal symptoms in a patient who has previously had a radical mastectomy for carcinoma of the breast? The symptoms are predominantly psychological.

A.—There is evidence that the relationship of oestrogen to carcinoma of the breast varies according to whether the disease commences before or after the menopause.¹ In the case in question the growth began before the menopause, so the administration of oestrogen in any form with the idea of controlling menopausal symptoms is contraindicated. Since the symptoms are predominantly psychological it must be asked whether it is reasonably certain that their cause is the climacteric. The association could well be fortuitous, and the opinion of a psychiatrist appears to be indicated before any treatment is planned. If it be concluded that the climacteric is to blame, treatment with sedatives or with drugs which convey euphoria may still be better than endocrine therapy. If it comes to hormones, thyroid might be tried and, failing that, methyl testosterone in a dose of 10 mg. daily sublingually. If the latter has a good effect the patient should be gradually weaned from it after an initial four to six weeks' treatment. The dose of androgen advised is small, so virilizing effects are not likely; they are, however, not impossible.

REFERENCE

¹ Hadfield, G. J., and Holt, J. A. G., *British Medical Journal*, 1956, 2, 972.

Agricultural Fungicides in Medicine

Q.—To what extent have agricultural fungicides proved applicable to mycotic infections in man, in particular compounds such as allylthiohippurate sodium ("ehesal")? Does the relationship of plant and soil fungi to animal fungi make this a practicable possibility, or are there marked differences in their metabolism that preclude this?

A.—There is no known correlation between the effectiveness of fungicides in agricultural practice and their probable therapeutic value in the fungus diseases of man and the lower animals.

Antifungal compounds used in agriculture have provided material for research in the chemotherapy of the mycoses; but, although such compounds have been found fungistatic to pathogenic fungi *in vitro*, in many instances they have been unsuitable for internal administration because of their high toxicity and for external use because of their irritant or sensitizing properties; and when these objections have not applied the compounds have often proved ineffective *in vivo*. As examples among the organic sulphur compounds used as fungicides in agriculture, some of the derivatives of dithiocarbamic acid have been found fungistatic to *Histoplasma capsulatum* at very low concentrations *in vitro*, but they were too toxic to mice for therapeutic tests *in vivo*. A related compound, tetraethylthiuram disulphide (disulfiram), which was found to have a strong, selective, fungistatic action *in vitro* against *H. capsulatum* as compared with other pathogenic fungi, is relatively non-toxic, but proved ineffective for the arrest of histoplasmosis in experimentally infected mice.

So far as their ecology is understood, many pathogenic fungi appear to be "plant and soil fungi" in natural saprophytic life. Adaptation to parasitic life in animal tissues usually entails drastic morphological and physiological changes, so that sensitivity to a drug *in vitro* may be no

criterion of the reaction *in vivo*. One of the few specifics in medical mycology is potassium iodide in the treatment of sporotrichosis; nevertheless, *Sporotrichum schenckii* can vegetate in a culture medium containing 8% of potassium iodide.

Inheritance of Diabetes Mellitus

Q.—What are the chances of diabetes developing in the children of a normal couple where there is an affected grandparent on each side (the paternal grandfather and the maternal grandmother)? There is no other history of diabetes in either family.

A.—A number of large-scale family studies have been made on the inheritance of diabetes mellitus.^{1,2} These have shown that environmental as well as genetic factors must play a part in causing the disease. In addition there is very probably more than one type of diabetes mellitus, differing in age of onset and sensitivity to insulin, with probably different aetiologies.

Any estimate of genetic risks to the relations of men and women with diabetes must be based on empirical findings. Such risks are available for the sibs and children of diabetics, but not for the grandchildren. However, it is improbable that the risk to the children of this couple is more than 10%.

REFERENCES

- ¹ Harris, H., *Ann. Eugen.* 1950, 15, 95.
- ² Steinberg, A. G., and Wilder, R. M., *Amer. J. hum. Genet.*, 1952, 4, 113.

Drug Rashes

Q.—There seem to be only a limited number of forms a drug rash may take. What is the mechanism of such rashes and what principally determines their form in the individual case—composition of the drug, dosage, or the particular patient?

A.—A clear distinction must be drawn between drug rashes which are a manifestation of toxicity and those which are due to the development of allergic sensitivity. Consideration of the effects of arsenic may help to clarify this. Long-continued administration of arsenic may cause the development of hyperkeratosis and pigmentation in the skin. Arsenic is deposited in the skin and hair, but the exact mechanism of its chronic effect is not known. Arsenical salts may also cause an acute toxic erythematous rash which may progress to a generalized exfoliative dermatitis. This has been shown to be due to the poisoning of the pyruvate-oxidase system necessary for the respiratory metabolism of skin and is reversible by dimercaprol (B.A.L.). In addition sensitization of the body to arsenic may occur and the manifestation may be urticarial, vesicular, or exfoliative.

The majority of drug rashes, however, are due to allergic sensitivity. There are two distinct forms of sensitivity reaction—the "immediate" or "anaphylactic" type, and the "delayed" or "tuberculin" type. The mechanism of the former is fairly well understood. In brief, the body responds to the presence of foreign protein by the production of antibodies. After antibodies have been formed and the patient has been thus sensitized subsequent contact with the original protein will result in combination of antigen and antibody which releases histamine and probably other substances giving rise within a few minutes to an urticarial response. In animals anaphylactically sensitized increasing sensitivity may result in an "Arthus reaction" at the site of the skin test. This is a haemorrhagic and necrotizing lesion and similar lesions can occur in humans.

In the "delayed" type of hypersensitivity antibodies have not been demonstrated in the plasma, the local lesion is essentially a proliferative mononuclear response, and hypersensitivity can be transferred only by cells and not by plasma. The response takes the form of erythema, induration, vesiculation, and tissue breakdown.

While these two types of reactions are considered by some workers to be entirely separate, a unifying view has also been put forward that immunization induces all cells of the reticulo-endothelial system to develop a specific reaction-

capacity to antigen, as shown in the infiltration of "delayed" reactions, and further to develop into plasma cells and subsequently produce free antibody as in the immediate reaction. A further point of controversy is whether all the tissues of the body develop "sensitivity" or whether the reaction-capacity is confined to cells of the reticulo-endothelial system. This is still a matter of investigation, although the explanation of "fixed" drug eruptions is dependent upon a clear answer.

Although some of the common sensitizing drugs are—contain—proteins, many are chemicals of varying degrees of complexity which one would not expect to be antigenic. Recent work suggests that these chemicals react with body protein and this complex stimulates the antibody response. When subsequently the simple chemical is brought into contact with the tissues, reactions of the immediate or delayed types or a combination of both occur. While this is certainly a valid explanation for the sensitizing properties of many drugs, it cannot be said to have been proved for them all.

The form of the drug rash is thus determined to a certain extent by the nature of the drug. It is also affected by the dosage, which, however, is related to the degree of individual susceptibility. Proteins tend to elicit an urticarial type of reaction only. Drugs of a chemical nature tend to produce reactions of the delayed type with vesicular lesions, but frequently mixed reactions occur.

Another factor influencing the reactions is the mode of administration. Local application produces initially only a local reaction, but prolonged administration may cause this to become generalized. A generalized reaction may be evenly distributed or localized to particular areas. Local trauma in the form, for example, of friction may determine the site of a secondary eruption or of the appearance of a rash due to ingested drugs. In some drugs—for example, sulphonamides—exposure to sunlight may be the determining factor of the eruption site, and of course there are chemicals which may cause a pure photosensitivity. The excretion of drugs in the sweat gives rise to a diffuse military appearance. The fairly constant appearance of bromide rashes is probably due to the excretion of bromide in the sebum as well as in the sweat.

In general the individual patient does not have a characteristic response to any one drug. Some subjects become more readily sensitized than others. In addition, the ease with which histamine is released from the skin varies. These factors, however, will tend to give quantitative rather than qualitative differences.

Salve for Vesicles

Q.—I once gave a patient who was exasperated by the itching of a routine revaccination vesicle the only analgesic preparation at hand—a sample intended for aural use. It contained an analgesic, an antiseptic, and glycerin, and relieved the itching. I was, however, surprised to see the patient later the same day, and to be told, "It's gone." The vesicle had, in fact, vanished completely. What is the explanation of this action, and would such a preparation act as effectively on the lesions of smallpox, herpes zoster, or chicken-pox?

A.—It is probable that part of the reaction which follows revaccination is an allergic one because of residual antibody to the primary vaccination. Therefore an analgesic or antihistamine preparation might be expected to relieve the itching and some of the inflammatory reaction, including blister-formation. Relief might also be expected in recurrent herpes.

In treating the lesions of smallpox, zoster, or chicken-pox, it has to be remembered that in all cases the virus is present in the skin lesions, and for two or three weeks antibodies are not produced, so that we might regard these lesions as being uncomplicated by an allergic reaction which depends upon the combination of allergen and antibody. It is probably wiser in these cases to use mild drying antiseptic lotions on the skin. This should prevent auto-inocula-

tion from the lesions, and will also control secondary bacterial infection, which often complicates the pock lesions and leads to greater scarring.

Probing the Unconscious

Q.—What are the pros and cons of the various methods used in psychiatry for uncovering unconscious material?

A.—Three methods are commonly used for uncovering unconscious material: (a) hypnosis and other forms of suggestive therapy; (b) narco-analysis; (c) analysis—such as psycho-analysis (Freud) and analytical psychology (Jung).

(a) *Hypnosis and Other Forms of Suggestive Therapy*: Treatment here is mainly in conditions where the removal of the symptom permits the restoration of normal functioning. Suggestion plays a part in every form of psychological treatment. Its mode of action is obscure. The words "only suggestion" give a false impression of the value. It is a quick method and may remove symptoms before they become established. Often, unfortunately, it produces an attitude of dependence in the patient. Patients should be selected for hypnosis by a doctor with psychiatric experience, as this type of therapy has some dangers.¹

(b) *Narco-analysis*, within its range, can help by effecting abreaction of symptoms in neurosis following trauma and repression of emotion. A drawback is that the patient may disown the uncovered material. (a) and (b) are best used by a psychiatrist skilled in the longer method of analysis.²

(c) *Analysis* is a less superficial and also a more co-operative procedure than (a) or (b). The aim is to reveal the meaning and positive value of symptoms. A limitation is that a Freudian or Jungian analysis is time-consuming. The selection of patients (and analyst) is important. Broadly speaking, the Freudian procedure is more efficacious with younger patients and the Jungian with those over, say, 35, but no rigid line can be drawn.³

REFERENCES

- ¹ *British Medical Journal*, 1955, 1, Suppl., 190.
- ² Horsley, J. S., *Narco-analysis*, 1943.
- ³ Stafford-Clark, D., *Psychiatry To-day*, 1950.
- ⁴ Adler, G., *Studies in Analytical Psychology*, 1948. Kegan Paul.

Locks of Grey Hair in a Child

Q.—Locks of grey hair, with about four hairs in each, are beginning to appear in a child of 9 years. Her mother first noticed grey hair in her own case at the age of 20. Can anything be done to arrest this condition?

A.—Locks of white or grey hair may appear in members of certain families soon after birth or during the first or second decades. It is an inherited characteristic transmitted as a dominant direct from generation to generation by males and females alike. An unaffected member of the family does not transmit the defect. Nothing can be done to arrest its appearance.

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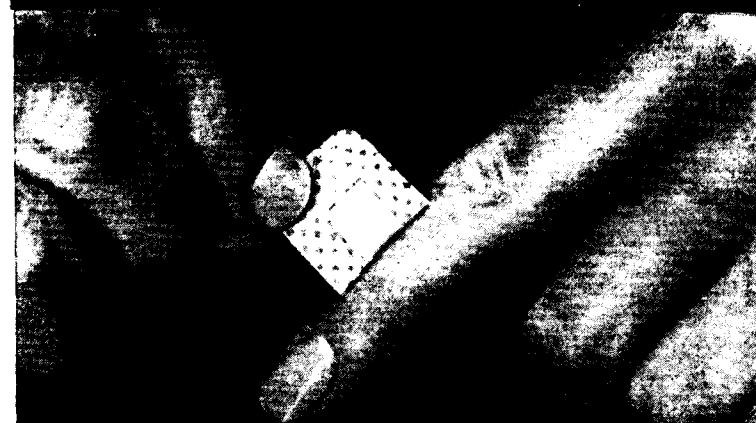
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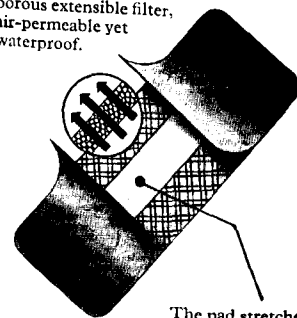


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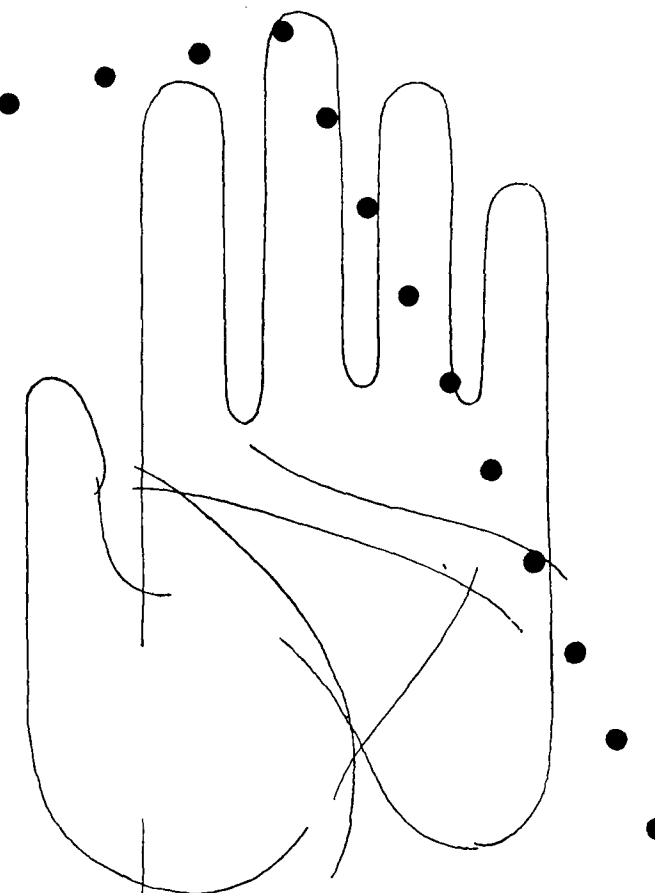
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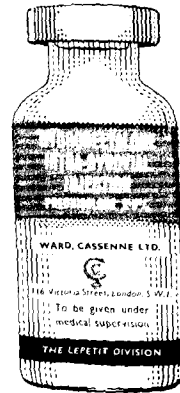
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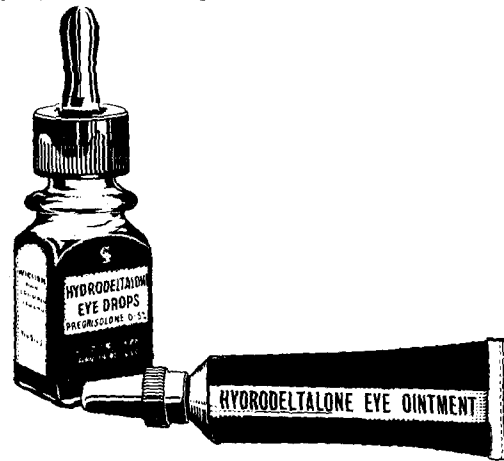
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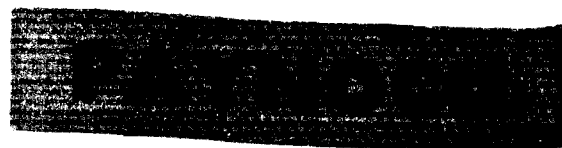
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BY

Sir GEOFFREY JEFFERSON, C.B.E., M.S., F.R.C.P., F.R.C.S., F.R.S.
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A hundred years ago was born a man who would bear one of the most famous names in surgery. What may have been the ambitions of John Callcott and Rosamund Horsley for this third son we cannot know. It is most improbable that they could have seen him as a colossus of scientific medicine. Very likely they thought of him as a future artist of some kind—a painter like his father, already an Associate Royal Academician. Or perhaps he would be like his grandmother's brother, the Sir Augustus Wall Callcott whose landscapes were valued only after those of Constable and Turner and are still known to collectors. Or perhaps, again, he might be a musician like his paternal grandfather, William Horsley, one of England's most famous composers of glees and rounds, the friend of Mendelssohn, who thought highly of these compositions. Victor's father later became a close friend of Felix Mendelssohn. A relation, Lady (Maria) Callcott, was the authoress of *Little Arthur's History of England* (1835), a book so perfectly attuned to the spirit of the times, so edifying, that it was a best seller for more than one generation. It was into this family with its strong artistic associations that the young Victor came.

Antecedents and Social Background

His father was known to the Prince Consort through his designs, one a winning one, for the new Houses of Parliament. Also Miss Scarratt, the Queen's companion, was a close friend of the Horsleys, and this strengthened their slender Palace association. Miss Scarratt had only to come across the announcement in *The Times* of the birth of a son to that family when reading the news to Her Majesty (confined on that same April 14, 1857, the year of the Indian Mutiny, by the

birth of her daughter Beatrice) for there to ensue a discussion from which the names Victor Alexander emerged as those the Queen would like the Horsley boy to have. One year later Horsley senior was commissioned to paint the Princess Beatrice, and Victor was brought to the Palace for the Queen's inspection. Victor

was inspected, as it were, by a host of people afterwards and impressed them by his rather deep-set eyes, wide forehead, his pronounced features, by the energy and alertness of his manner, quickness of decision, and the indefatigability of his frame.

His father before him had been exceptionally gifted and good-looking. The snapshot portrait of John Callcott Horsley which graces his *Recollections of a Royal Academician* (1903) shows a figure at ease in an outsize silk hat, braided cut-away coat and trousers—a figure elegant: one recognizes at once a man economically and socially secure. According to Stephen Paget, Victor's father was friendly, impulsive, hot-tempered, and restless. Like his son after him, he too had a crusade. This was the result of his once-famous address to the Church Congress at



Victor Horsley

[Swaine, London]

Portsmouth in October, 1885, protesting against the use of the nude model, especially when female, in art schools. His address was called "Art Schools and Art Practice in Their Relation to Moral and Religious Life." "Where," he said, "is the justification in God's sight for those who induce women so to ignore their natural modesty and quench their sense of shame as to expose their nakedness to men and thus destroy all that is pure and lovely in their womanhood?" He himself, though greatly dependent on models, had never required them to remove their clothes. This address, *The Times* said, caused a painful sensation. No doubt that was the speaker's intention, but it brought on his head the same sort of criticism, badinage, and hostility

that would come his son's way in due time. There were those who held that John Horsley would have been a better painter if he had been a better anatomist. Amongst his critics was Whistler, as can be read in *The Gentle Art of Making Enemies*. But make no mistake about it, Horsley was a sincere and highly competent painter. It was deep Christian reverence and concern for the welfare of the model that moved the father to protest against the nude.

Religion, by contrast, was not the basis for Victor's crusades, for he was an agnostic, a Huxleyite, but, like his father, a reformer. The motivations of Victor's anti-alcoholic crusade were physiological: alcohol was a toxic substance, a dangerous drug that was too freely available. It was an unpopular thesis, but not for that the less true, especially at that time.

This much has been said about Victor Horsley's parents and forebears because it is necessary, if his work is to be recalled and reappraised, that we should know not only his antecedents but the social background against which he grew to manhood. Social security he evidently had. What he had inherited from his Northumberland artist ancestors might well have been creativeness, inventiveness, and energy. As to this last, we may well be astonished at the great amount of scientific work of quality which Victor Horsley so soon achieved. By the time he was 30 he was well known in Berlin; in another ten years he was a world figure.

Personal Qualities

It seems that Victor Horsley's teachers, and later his fellow students, quickly realized that they were in the company of a person quite exceptionally talented. He learned without effort, he had an exceptional memory, he was skilful with his ambidextrous hands, he had daring, he had energy, he had integrity—in short, he had from early days the qualities of leadership. He shone even in such intelligent company as that group who entered University College Hospital as students with him in 1875—Gotch, Mott, Beavor, Dawson Williams, C. J. Bond. He qualified M.R.C.S. in 1880, M.B., B.S. in 1881, when he was 24, winning the gold medal in surgery with a London University Scholarship. He was elected surgical registrar next year, and took rooms in Gower Street—as Stephen Paget reminds us, in those days the registrar was permitted private practice, though history does not say with what success. However, as Paget charmingly remarked, "Gower Street had been helpful to many young physicians and surgeons of the hospital by making them comfortable till they could make themselves eminent." He was appointed assistant professor of pathology in 1882; in 1883 he was admitted to the F.R.C.S., and the following year was appointed Director of the Brown Institution, where so much of his experimental work was to be done. Horsley became assistant surgeon to University College Hospital in 1885; five years later he was full surgeon, remaining so until he retired from the staff in 1906.

He continued his hospital work at the National Hospital, Queen Square, while he pursued his researches still at University College. He must also conduct his very considerable private practice, operating at what I am told was a singularly comfortable and efficient nursing-home, 9, Mandeville Place. This, in short, is the official story of his life in the barest of outlines, yet the synopsis does mention some things that we still wish to inquire into. What, for instance, was this Brown Institution, and what can have been the pressures or possibly the ambitions that made a man already internationally famous retire from one of London's premier teaching hospitals when he was only 49? He had been elected a Fellow of the Royal Society at the age of 29. By what means had he won the prestige that was so liberally allowed him in the world of science?

It is this story on which I particularly wish to dwell. His researches gradually came to show that the anatomical approach which a surgeon's training is traditionally based must have life breathed into it by physiology. No clinician has ever conducted experimental laboratory research with such energy and without serious interruption over so long a period of years. We shall most admire in him not only his tenacity but his unwillingness to be halted by the technical difficulties that almost all neurophysiological problems present.

The Brown Institution

An excellent short account of the history of this Institution has been given in Stephen Paget's *Life* (1919). The Institution no longer exists, having been destroyed in an air-raid in 1944 at a time when Dr. Twort, famous, like d'Herelle, for the discovery of bacteriophage, was its director—its last. The Institution was built by the University of London, which had accepted a bequest from a Mr. Thomas Brown, of Dublin. The objects were to study and attempt to cure maladies, distempers, and injuries of quadrupeds and birds. The University founded it with these ends in view, but, at the same time, with great wisdom and foresight made it a centre for advanced research in physiology and pathology. The names of its successive superintendents are a sufficient guarantee of the quality of the work done there—Burdon-Sanderson, Greenfield, Roy, Horsley, Sherrington, Rose Bradford, Brodie. Sherrington's own appointment came, as he once told me, like manna from heaven, because the small salary attached as well as the living quarters there allowed him to marry. But there was something more—this Institution was the only place in those days at which recovery experiments could be done on animals of any size, and this had widened Horsley's scope greatly.

It seemed odd to many—it drove anti-vivisectionists to fury—that this institution for the welfare of animals should be used for experiments upon them.

Victor Horsley's tenure of the professor-superintendentship (1884-1900) was signalized with his first experiments on the nervous system, on the thyroid and pituitary glands, on myxoedema and infections in animals, on rabies and hydrophobia. During this period he performed and reported his first group of brain operations at Queen Square (1887) and had recorded with Gowers a world-famous case—the first successful recognition and removal of a spinal-cord tumour (1888).

Early Researches—the Pituitary

The account of Horsley's thyroid researches given by Stephen Paget, which were links in the chain of the cachexia strumipriva and myxoedema stories, is so complete that we may usefully pay attention to something else—the other ductless gland that attracted him, the pituitary. In the paper which he wrote with Handelsmann in 1911, "A preliminary note on experimental investigations of the pituitary body," the following sentence appears concerning partial or complete removal of the gland: "The first to perform such experiments was Horsley in 1886, after whom a series of authors (about 20) repeated the experiments with results which were not uniform." In some investigations the animals succumbed soon after the operation, in others they survived for long periods. Reference was made to the work of Cushing and his collaborators leading to the establishment by them of the experimental condition known as cachexia hypophyseopriva. This clumsy title served a useful purpose by drawing a parallel between the effects of total loss of the pituitary and of the thyroid. Cushing concluded from his own experiments that the pituitary was absolutely and urgently necessary to life, animals dying in a state of lethargy and drowsiness, slow respiration, lowered temperature after three to five days in adult dogs, 10 to 30 in puppies. Horsley criticized this statement and brought in proof three animals—a cat, a dog, and a monkey—which "survived a long time" in spite of proved complete pituitary extirpations.

In 1911, Horsley and Handelsmann reported experiments on 24 animals (20 cats, 21 dogs, and 13 monkeys). Some of the survivors were shown at a meeting of the Physiological Society in March, 1911. The gland had been removed by either the temporal or palatal route, the latter only in the cat. Incidental damage to other intracranial structures was shown in about half the animals by hemiparesis, hemianopia, and, in monkeys, by temporary ipsilateral ophthalmoplegia. This last is a possible disadvantage of the temporal route: third-nerve palsy occurred, as we shall see, sometimes in his human pituitary operations. In 15 animals (2 cats, 9 dogs, and 4 monkeys) the gland was totally removed. In a few others some fragments remained, but, unlike Cushing, Horsley did not include those cases, and thereby missed making some useful observations on chronic hypopituitarism. One of their animals was killed on the 115th day, though in good health; one monkey survived to the 39th day. No important changes were observed in the other organs of the animals that died naturally. They "died of asthenia as animals in captivity do." He did not know that the cause of death might have been adrenal or polyglandular failure. Glycosuria occurred in two out of seven examples where it was specially looked for.

Horsley remarked that he had cut the pituitary stalk in some experiments without causing death. This important paper is sadly lacking in the details that we should like to know, and the figures quoted in one place do not always tally with others elsewhere. Nor is it clear how much of this publication was based on the old work of 1886 or the horizon enlarged by recent experiments. However, the promise was made that Handelsmann would publish all the data in detail, but, so far as can be discovered, he never did. Turning back to the 1886 papers, we find the abstracts of the Brown Institution lectures in the *Lancet* are very bare. Whilst he says that "the cause of myxoedema and cretinism had been shown by Horsley to be due to the loss of the thyroid gland," there is little else exciting except the statement that he had twice successfully removed the pituitary and that the animals had lived five and six months respectively. During life no nervous or other symptoms were noticed. The excitability of the cortex was found to be raised in hypophysectomized animals; and that reminds us that the monograph of the brothers Wenzel (1811) on the association between epilepsy and the pituitary gland was almost the only known "fact" about it 75 years ago.

It was not until 1895 that Oliver and Schäfer discovered the unexpected properties of posterior lobe extracts, and not until 1900 that Benda demonstrated the acidophil adenomatous basis of Marie's acromegaly (1886). What this amounts to, in brief, is that when Horsley was in 1886 experimenting on the pituitary gland he was assisting at the birth of endocrinology, but the endocrines and steroid chemistry lay too far ahead in time for him to be able to see much more clearly what the uses of pituitary were than Claude Bernard had done. Horsley established the fact that the gland could be removed and that rapid death was not necessarily the result. And in this conclusion Horsley has been fully supported by large-scale experimenters. Animals deprived of their pituitaries do not die in a few days; their expectation of life is reduced by about a half. No urgent disaster faces them; Cushing was wrong about that. It will be recalled that P. Bailey and Bremer eventually showed that many of the supposed sequels of the hypophysectomies of Cushing and his school were due to damage to the floor of the third ventricle.

Pituitary Tumours

This may be a convenient place to introduce the subject of Victor Horsley's operations upon pituitary adenomas. It has often been complained that he left no full account (which is true), though he is known to have given lectures about the pituitary and its surgery; for example, Sheffield, 1910. What he may have said is not to be discovered. However, it is now possible to get a sufficiently clear

picture. Four of his cases are given briefly by H. H. Tooth in his report on brain tumours to the 17th International Medical Congress (1913) in London. In 1906, at Toronto, Horsley mentioned 10 pituitaries operated on by him—the cream, however, is contained in Verga's monograph (1911), and I am most grateful to my old friend Dr. Ernest Sachs for directing my attention in this direction. This book from Pavia on the pathology of pituitary tumours contains copies of the notes either at the National Hospital, Queen Square, or from Horsley's private files. Here are to be found the records of 10 patients and references to two more; of these eight recovered and four died. One private case came from South Africa, one from Chicago. With the assistance of Mr. Julien Taylor and Mr. John Hankinson, registrars at Queen Square, who helped in searching through the old notes, some of these cases were found. It is possible, therefore, to reproduce a description of the operative steps from one of these. I referred to this particular case in a former publication (Jefferson, 1955), but at that time it could not be identified.

William Knapp, aged 45, admitted to Queen Square, under Dr. Risien Russell, notes by house-physician, Gordon Holmes, and by clinical clerk, Grainger Stewart. The patient complained of severe pain in the left face and of loss of sight in the left eye, which he was unable to open. Temporal hemianopia was present in the other eye. He had been in hospital before, but was sent home to return if the pain got worse. The first symptom two and a half years previously had been drooping of the left upper lid, which progressed during the next 15 months to closure of that eye. In 1903 he began to suffer from "giddy turns" in which his wife said he had a vacant look—probably minor epilepsy. He began to have pain in the whole left trigeminal area, severe and somewhat paroxysmal, and now upsetting the patient badly. No sensory changes were noted in the left trigeminal distribution. The third nerve was paralysed but the sixth was not. His sight had deteriorated so that he could no longer read. V.A.R. 6/36, V.A.L. nil; bilateral optic atrophy was present.

December 2, 1904.—Operation first stage—Sir Victor Horsley. A large semicircular scalp flap was made from slightly behind the left external orbital process to the base of the mastoid, convex upwards. There was not much bleeding. An area of bone was then removed from the left lateral surface of the skull by trephine, saw, and bone forceps. The dura was found to be tense, but was not incised. The patient stood the operation very well.

December 6, 1904.—Operation, second stage. The flap was turned down and the dura incised and finally cut away where it was exposed. The brain did not bulge to any great extent nor did the convolutions seem flattened. The brain was then slowly lifted up by retractors placed under the temporal lobe, pressure being only slowly exerted so that the brain could mould itself to its altered position. In this way it was soon possible to see into the region of the sella turcica. There was not much haemorrhage, but what there was was controlled by hot irrigation.

An attempt was then made to cut the sensory root of the fifth nerve, but in doing so the superior petrosal sinus was injured and had to be compressed. Attention was next directed to the pituitary body; the dura in the lateral surface of the sella turcica appeared bulged out, and it was then incised by a knife; some tumour mass at once protruded and the greater part of it was then scraped out with a sharp spoon; it came away in small pieces.

A small rhinoscopic mirror was then inserted into the sella turcica so that it might be seen if all the tumour was removed. The small amount of bleeding which followed the operation was easily checked by hot irrigation, and a gauze plug was finally inserted, which reached down to the sella turcica.

(Horsley spoke in 1906 of inserting sometimes this small laryngological mirror into the capsule, and said what an excellent view he got of the second and third nerves, of the crus cerebri, and of the cavernous sinus. With a good headlight he could see the interior of the sella well.)

The patient stood the operation very well. An hour later he was quite bright, said he was quite comfortable, and moved both right and left limbs freely. There was, however, slight paraphasia, the use of wrong words, and occasionally some difficulty in finding words to express himself. He was discharged home on January 12, 1905.

The operation evidently failed to cure this patient's pain, and in March, 1905, we find him back in hospital to be operated upon again, this time for the removal of his left Gasserian ganglion. The notes are very brief.

March 28, 1905.—The previous trephine opening being utilized, Sir Victor Horsley removed the ganglion in the usual way by Krause's method. The fold of the dura covering the ganglion was raised up and incised. The sensory root was drawn from the pons varolii and the ganglion dissected forwards and removed after the nerves had been cut. There was not much haemorrhage. The lids were sewn together at the close of the operation. He lived for eight years.

Horsley's Gasserectomies

This case gives a chance for a brief comment on Horsley's operations for trigeminal neuralgia. Morriston Davies (1907) wrote an admirable paper on the sensory changes in the face as studied in Horsley's 48 cases. By the time of Horsley's death he had probably done more gasserectomies than anyone else, and was well known to share with Krause the reputation of being quite exceptionally expert at it. Observing with what ease apparently, in the case of the patient Knapp, Horsley reversed Krause's method and pulled the sensory root off the pons before he cut the divisions, the reader must wonder why he was not content with the root avulsion alone—why it was left to Spiller to suggest this as not only enough but sufficient. And yet did not Horsley (Horsley, Taylor, and Coleman, 1891) propose and carry this out when he went through the tentorium and cut the nerve in the posterior fossa? The patient, a feeble old lady, died post-operatively. What a pity it was that the case had that end, for otherwise he might have developed a good technique. It must be confessed that without the help of electrocoagulation the transtentorial operation was beyond the resources of Horsley's time as a routine procedure.

Any neurosurgeon reading through the accounts of Horsley's operations to-day will recognize that the operator must have been extremely dextrous. Why—we may repeat a question that has often been asked—why did Horsley use the temporal approach to the pituitary rather than the frontal that everyone used after him? The answer can be guessed fairly accurately. The most important influence must have been his experimental work at the Brown Institution. In the dog and monkey the temporal route is the natural and easiest way in. Familiar with this approach in the animal, it would be natural for him to follow a path that he knew so well. Then there is something else. He had evidently had a nasty experience with the frontal route. It is mentioned in his Toronto Address in Surgery (1906). He said that in 1889 he had been asked to operate on a tumour pressing on the front of the optic chiasma. It proved to be a "cystic adenocarcinoma." In order to get access Horsley tied some of the frontal veins so that he could displace the hemisphere. After the death of the patient some years later it was found that considerable softening of the frontal lobe had occurred. I imagine that a good deal more softening than he knew followed Horsley's elevations of the temporal lobe, but he was careful not to ligate Labbé's vein.

The impression obtained from reading the operation notes reprinted by Verga and from Horsley's own comments on technique is that he was an extraordinarily gentle, skilful, and knowledgeable surgeon. Certainly the testimony of his surgical pupils is that he was unsurpassed. It was the speed of his operating that shocked Cushing, bred in Halsted's school.

Experimental Neurology

Horsley had two main collaborators in his neurological work—Charles Beevor and Richard H. Clarke. Important experimental work was carried out also with his sister's husband, Professor Francis Gotch, with Sir Felix Semon, and with A. E. Schäfer. Some he had done by himself. Eight papers were printed in the *Philosophical Transactions of the Royal Society* between 1886 and 1891. The last of these was the Croonian Lecture presented by himself and Gotch on "The Mammalian Nervous System, its functions, and their localization determined by an electrical method." This paper is 260 folio pages long, and has to do with the

galvanometric pick-up of impulses in the cord and nerves set going by either central or peripheral stimulation. To take one example, stimulation of the motor cortex gave rise to electrical effects chiefly in the opposite half of the spinal cord, a little on the same side. Would it not be a good critical test if the spinal cord was vertically split for two or three inches at its lower end into two halves so that the electrical changes could be more easily kept separate? Very well—it was done and the result confirmed (Fig. 1). Again the sciatic nerve was stimulated and electrical impulses were picked up in the spinal cord and traced by dividing different spinal tracts. The cord itself was stimulated and the resulting discharge followed along it. All this was pioneer work of the first order and a huge undertaking; the results were accurate within the mechanical error of the recording instruments then available. It remains to this day highly important work.

The experiments with Beevor were mainly refinements of the experiments which Ferrier had done on the motor cortex. There is no room for mention of more than three: (1) the exploration of the motor area on the medial surface of the brain; (2) the mapping of the excitable fibres in the crus cerebri and in the internal capsule both in the macaque monkey and in the orang outang; and (3) the plotting of the motor cortex on the latter animal (1890), the first time that a primate had been so investigated.

A description of the furrow formation in the orang is given and the motor points are recorded by a series of 27 photographs—an expensive method, but one leaving no topographical doubt in the reader's mind. Horsley was struck by the similarity of the results of stimulating the orang's brain with what he had already seen in the human being and with what W. W. Keen had reported in his case of cortical excision for epilepsy (1888). With Semon, Horsley sought the cortical motor innervation of the larynx. They went on to explore the floor of the fourth ventricle, a structure that had not been explored electrically previously to 1889, when Horsley had first done this. Sharp closure of the glottis invariably followed stimulation of the calamus scriptorius, but higher up abduction of the vocal cords was the rule (Fig. 2). In parenthesis, no observations on consciousness could be made because the animals were anaesthetized.

As Horsley grew older his experiments, as might be expected, grew in maturity of thought and presentation. We may single out the work he did with Colin Russel, Otto May, and Arthur MacNalty, and with his second great collaborator, Richard Clarke. This work had to do with the cerebellum and brain stem. Moruzzi (1950) has said that the discovery by Horsley and Lowenthal as well as by Sherrington, that stimulation of the anterior median cerebellar cortex inhibited decerebrate rigidity, equalled in its revelation of cerebellar function the discovery of the excitability of the motor cortex.

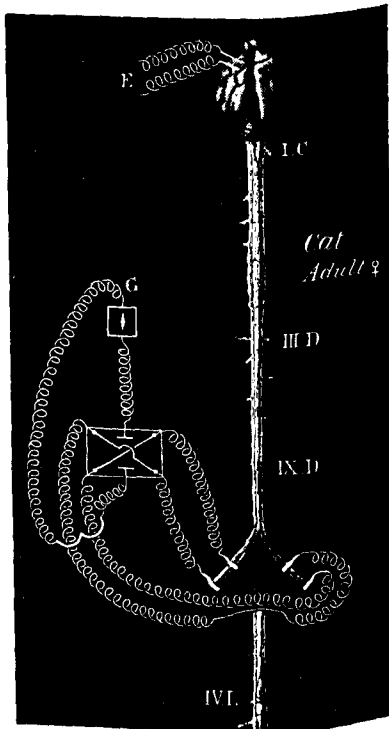


FIG. 1.—From *Philosophical Transactions of the Royal Society*, 1891.

We may pause a moment here to comment on the excellence of the illustrations in Horsley's papers. The photographs are of admirable quality; they were made by him and his groups at U.C.H. or else at his home, 25, Cavendish Square, in the evenings. Also in his papers with May and MacNalty we may well admire the operative dexterity which allowed him to make small cuts into the mid-brain after sliding in above the tentorium or excursions elsewhere with so many survivals.

The cerebellar discovery came about as part of the investigation of the relative significance of the cerebellar cortex and its deep nuclei, and the inquiry whether any efferent

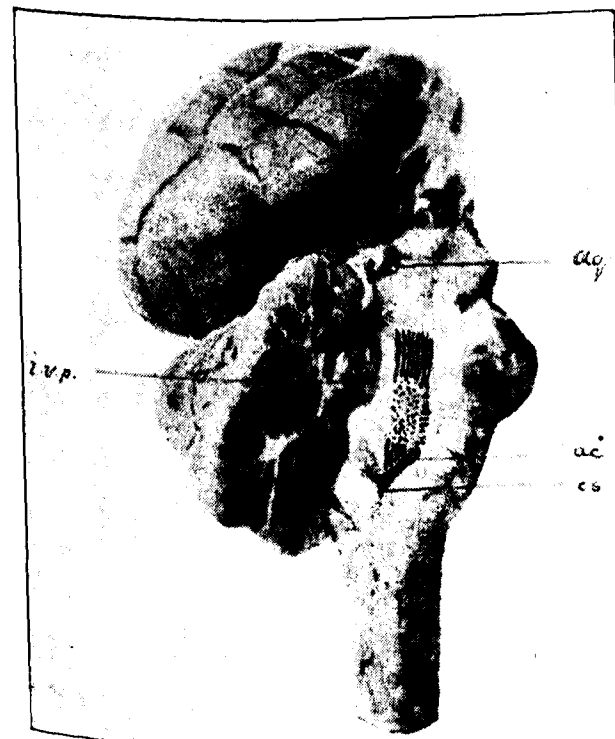


FIG. 2.—Sites on floor of fourth ventricle for movements of the vocal cords. Semon and Horsley. (From *Philosophical Transactions of the Royal Society*, 1890.)

tracts left the cerebellar cortex to enter directly into the spinal cord or brain. Lesions of the cerebellar cortex were traced by Marchi's method; no such fibres were seen. On the other hand, it was difficult to damage the deep cerebellar nuclei in a precise way without injuring the cortex as well. It was to solve this particular technical problem that R. H. Clarke set to work to produce what came to be known as the Horsley-Clarke stereotaxic machine.

Richard Henry Clarke

And here we should say a few words about this remarkable man. Clarke, who was born in 1850 and was therefore the older of the two, had been at Cambridge and taken his M.B. at St. George's Hospital—in his day and later a medical school which received a disproportionately large number of Cambridge men. Clarke must have had private means; he never practised, but was well known as an expert all-round athlete—cricketer, golfer, first-class shot, fox-hunter, and judge of a horse. He may have been a shade hypochondriacal, because he spent, Dr. Sachs tells me, some years in Egypt curing himself of some chest trouble. All who knew him agree about his popularity and say that his gifts as a sportsman were signs of his extraordinary skills married to a first-class intelligence—in short, that he could do anything—so that if anyone could have invented an accurate piece of machinery Clarke would be just that man. He had demonstrated anatomy in Glasgow and physiology at St. George's (1885-7), then worked for many years with Horsley

in the laboratories at University College. It was there that the first square apparatus was finally completed and later a second oval version made.

The stereotaxic instrument is one of the most beautiful tools ever introduced into a physiological laboratory. These instruments were admirably described and illustrated in long papers in 1908 and 1912, and again in the Baltimore (1920) monograph that Clarke finally published with E. E. Henderson from the Laboratory of Pathological Chemistry, University College.

As Clarke said in 1920, without such help it was "impossible to expose the deep ganglia without serious mutilation, haemorrhage, and shock, which not only hinder the attainment of our object but rob it of much of its value when secured." The principles of the instrument are as simple as they are ingenious. Clarke realized that it would be hopeless to base measurements on the shape and external surfaces of the brain and skull. They were too variable. But if one took the equator and meridians as zero planes and measured the brain from inside out much greater accuracy should follow. The sites of deep nuclei and tracts were calibrated by comparison with slices of the brain of cat, dog, and rhesus monkey 2 mm. thick cut in a frame most efficiently designed to ensure complete accuracy. The serial photographs were published in the papers named. Most unfortunately the real results of their electrolytic lesions and deep stimulations were promised but not published. Descriptions of this revolutionary instrument being necessarily very lengthy, they absorbed all the available space.

Something new has, however, recently come to light, for has not Professor Robin Pilcher found in the Department of Surgery at University College Hospital a bound thick folio volume that contains details, including many photographs of the brain, from Horsley and Clarke's cerebellar experiments during 1906? It covers some 70 of the early electrolytic lesions and stimulation of cerebellar cortex and deep nuclei. There is a gap in the dates from May 4 to October 29, 1906, when a rhesus monkey's cerebellum was stimulated. In the right hand at the top of the paper is written in Horsley's hand, "First time of using new instrument and mode of record." It is probable that the new plotting of small squares in the animal's head was under trial before this date. Just now no further comment can be made than to say that most of the stimulations produced movement of the eyes or pupillary changes if they produced anything. One thing might be briefly singled out—stimulations of the posterior longitudinal bundle in the floor of the fourth ventricle. In a cat, on March 29, 1906, they observed twitches of the face and not only conjugate movements of the eyes usually to the same side but, further, sometimes movement of one eye alone and to the same side. This was very new indeed, a refinement on the experiments made with Semon in 1889 and already mentioned.

In Clarke's monograph written after Horsley was dead he permitted himself to make some very unflattering observations on brain surgery. He thought it mutilating and a most unsatisfactory pursuit. If Ferrier's estimate of 7% of cures was the best one could hope for, he would be a strange fellow, Clarke thought, who could call this a triumph of surgery. This acerbity is unhappily a sign of the estrangement that had grown finally between these life-long friends, naturally grieving the friends of both. Clarke had long been the adored friend of the Horsley children. His bearded face, his twinkling blue eyes, his humour, and his ghost stories captivated them. He had for years been the constant companion of the family.

Clarke claimed that really elegant results could be produced by his machine—he hoped that even brain tumours could be cured by electrical means or by the placement of radium. Besides this Clarke thought that it should be possible to relieve pain better than in any other way by coagulation of intracerebral tracts—all these things through a 5-mm. trephine hole. And he was sure that time would show that there were other ways in which the stereo-

taxic instrument could achieve results far in advance of anything then available. Time would show. Allowing for some very pardonable special pleading, Clarke was right and time has vindicated him. His was very real prevision.

Although it is only too clear that Horsley's part in the instrument's actual design was negligible, it was he who had conceived its necessity. It is not too much to say that Clarke would never have thought of stereotaxis had it not been for Victor Horsley's curiosity about the roof nuclei of the cerebellum and his dissatisfaction with the method which he and Clarke had had to use in 1905 and earlier to explore the intrinsic fibres of the cerebellum.

In his flattering but no doubt well-deserved obituary notice on Clarke, Sir G. R. Turner (1926) said, what many must have thought, that this modest man did not receive the credit for his many researches that he deserved. He had left behind a manuscript on the divisions of the cerebellum and their relation to function. It is unpublished still. Time, that proved him right in his foresight of the uses of stereotaxis, has done him much but perhaps not yet enough honour.



Fig. 3.—Photograph of a traumatic epileptic with the coronal sutures and the cerebral fissures drawn on the skull.

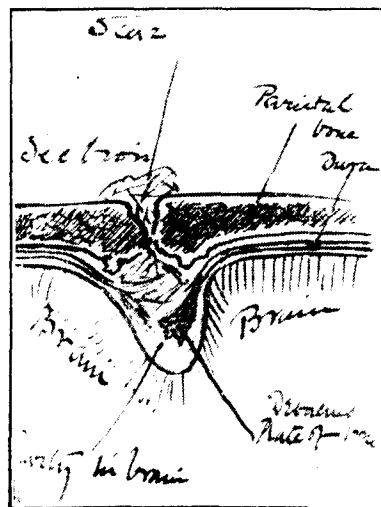


Fig. 4.—Sketch from the operation notes of same case as Fig. 3. Queen Square, 1886.

good marginal sketch from the operation notes shows the state of the traumatic epileptic (Figs. 3 and 4). The tumour from another case in the first series operated upon immediately after the Brighton Meeting, although grossly it looks benign, was proved to have been malignant when the patient succumbed four or five months later.

Victor Horsley as a Neurosurgeon

It should be very plain that no neurological surgeon has ever turned his hand to the practical therapeutics of nervous diseases so well prepared by laboratory experimental work. And none has, as yet, continued, as Horsley did all through his life, to spend so much time in devising and conducting new experiments.

The pleasure felt by Victor Horsley can well be imagined when in August, 1886, he took down to Brighton for the 54th Annual Meeting of the British Medical Association three patients recently operated upon by him. All were examples of Jacksonian epilepsy

Charcot, who was present at Brighton, congratulated Horsley, adding how clearly clinical experience was illuminating the doctrine of cerebral localization as arrived at by animal experiments. Hughlings Jackson, in a characteristically brilliant commentary, ventured that all epilepsies were due to small lesions could they but be found. He said further and most wisely that he felt sure that it was important to cut out more than the lesion "which produced fits by altering the portion of the brain in which it was seated." Horsley had in fact done exactly that. Fortified by his recently acquired familiarity with operations on the animal's brain, he did not hesitate from the first to excise portions of the human cortex. Many surgeons—and in those days remember that all were general surgeons—were encouraged by Horsley's novel human experiments to operate for epilepsy and to report successes after removing trephine disks and bone splinters from old cranial injuries or supposed injuries; they did not often open the dura. Few except W. W. Keen did what Horsley did.

Unfortunately Horsley, except in his famous Linacre Lecture, never reported the later results of his cortical excisions for epilepsy or athetosis. That he made a considerable number is certain. The Surgical Reports of University College Hospital lent me by Professor Pilcher show that in the years 1900-6 30 cases were operated upon—more would be done at Queen Square—yet we do not know how they fared. Horsley published his first 10 brain operations in 1887, and in 1888, with Gowers, the account of the first correct localization and removal of a spinal tumour, the patient recovering from paraplegia. Naturally this case caused a stir. Two major events in combined neurology and surgery had now occurred—the localization and display at operation of both a brain tumour (Hughes Bennett and Rickman Godlee, 1884) and now a spinal.

Brain Surgery

No time shall be lost in discussing the real priority of the first case.

I have already dealt with that matter in a discussion of Macewen's neurological surgery (Jefferson, 1950). It is only fair to allow Macewen to speak again now, taking his words from the discussion on brain surgery at the International Medical Congress (1913). Macewen said: "Mr. President, I believe it was somewhere in the 'seventies when you visited my clinic in the Glasgow Royal Infirmary and asked me three questions—whether I had ever diagnosed a lesion of the brain from the localization of symptoms alone, and, if so, if I had operated upon such a case and had found a lesion in the part where it was expected to be, and, thirdly, if any of those cases so operated upon had recovered, and I was able to answer each of those questions in the affirmative." The logic of this sequence is perfect. It is the story of brain surgery. What was better was that Macewen was perfectly correct in what he said. He proceeded to say that if he were asked what most needed development, it was the physiology of the brain apart from the motor area. How right he was! But in fact it was just these subjects which had been engrossing Victor Horsley in his laboratory for some years, and, latterly, increasingly so. Perhaps it was these preoccupations that prevented Horsley from giving what I imagine was expected of him—a full account of his own experience of brain tumours. Disappointingly, whatever he may have said, the published report is maddeningly brief.

Percy Sargent gave an account of his first 100 cases, with 14.5% recovery in non-comatose patients. Byrom Bramwell spoke of his 225 cases, 42 operated upon, Krause his 154 tumour operations; and von Eiselsberg analysed his 166 cases, including 16 pituitary tumours. He concluded by saying: "Sir Victor Horsley geprägt hat: 'Bei Hirntumoren nicht zu operieren ist inhuman.'" All that Horsley had to say in effect was that it was unnecessary to talk about technique to surgeons—haemorrhage was unimportant, for it was easily controllable, "if it were capillary hot water stopped it, if it were venous then oxygen

stopped it, and if it were arterial the judicious use of chloroform would suffice to lower the blood pressure and so put an end to the haemorrhage." Too simple? Maybe. But it is a physiologist speaking. And, interestingly enough, the modern tendency in neurosurgery is, by means of deliberate hypotension, to return again to the advantage of chloroform anaesthesia without most of its dangers. Horsley, like Macewen, made a demand on the future; what he thought was most needed was a proper understanding of the structure and histological types of brain tumours. That was to be Cushing's main and lifelong preoccupation for which he needed much help, notably, predominantly, from Percival Bailey.

Possibly Victor Horsley at that 1913 Congress thought that Howard H. Tooth's very complete analysis of 500 cases that had come under observation at Queen Square in the years 1902-11 inclusive made it unnecessary for him to make any large communication. Of the cases operated upon—and only half the number were—most had been attended to by Horsley, and the immediate mortality and the survival periods of the patients were recorded. Tooth's was a major work of the first class, and nothing comparable appeared again until W. B. Van Wagenen (1934) and then Hugh Cairns (1935) each analysed the results of the cases of a different single year in Harvey Cushing's service.

The two things which most impress the modern reader when reading through the Queen Square material are: first, the oversimplicity of the pathological diagnosis, and indeed the now patent error of much of it; and, second, the frequency of death from shock after what should have been a highly successful tumour removal. If Horsley had had blood transfusion and blood banks the cases would have had happier endings. Then there was the sad frequency of infection that was a killer. Its incidence was multiplied and became more agonizing still during the first world war. It was 30 years after the date of Tooth's paper that intracranial infection began to come under control. Another failure was the incorrect diagnosis, the mistakes in localization, chiefly in the case of frontal and cerebellar tumours. This difficulty that had serious results was not resolved for many years, and then only by mechanical diagnostic means, not by neurological refinements. Horsley (1906) pointed out the risks of an incorrectly placed attack. Of 79 cases with a correct diagnosis, the post-operative mortality was a little over 8%, but of 16 where the localization was wrong the mortality was 37%. Notwithstanding, many of Horsley's patients were alive and well seven and eight years afterwards.

Horsley had one bee in his bonnet—that papilloedema (Parsons's new name for optic neuritis) always first appeared on the same side as a tumour, and hence had great localizing value. Leslie Paton and Gordon Holmes failed to persuade him of his error. The rest of his work on the nature of papilloedema was first-rate; he was ahead of Hughlings Jackson and Gowers there, having at once accepted the mechanical theory of Manz and made excellent preparations of Schwalbe's sheath and its ampulla. He illustrated his papers with photographs, taken by himself, I suppose, with the German camera that Sir Arthur MacNalty tells us of. One other piece of surgical pathological work should not be overlooked. It was the experiments that he had carried out with Walter Spencer in 1891 on the mode of death in cerebral compression and its prevention. They for the first time used the mercury-filled bag to raise the pressure and noted the same effects on respiration and blood pressure that Harvey Cushing reported in his much more interestingly written paper. Cushing did not refer to the Spencer and Horsley paper in the *Philosophical Transactions of the Royal Society*, which is fully documented, but to a later popular version.

Mention has already been made of Victor Horsley's dexterity; it is impressively evident in the description of his survival experiments on animals. He had stimulated the fifth, seventh, ninth, eleventh, twelfth, and upper third cervical nerves in the monkey; working with Otto May,

it is mentioned that in three cases Horsley had cut the fibres of the hypoglossal nerve off its nucleus by slipping a knife under the tubercle of Rolando parallel with the floor of the fourth ventricle. The animals recovered. Little wonder that Sir William Osler (1919), reviewing the Paget *Life*, said that Horsley was the outstanding surgeon of his generation, that he had acquired a technique hitherto unequalled.

The Man

The work and writings of a man can be properly assessed by anyone whether he has been personally acquainted or not. But to speak of a personality from hearsay is dangerous and almost impertinent. That Victor Horsley was a giant amongst men I have no doubt at all. That he excited admiration and devotion in those who worked with him in their youth can be confirmed because several of them are still alive to testify. Outside his scientific work his reputation was in some directions less secure. Stephen Paget dealt with this with fine discrimination and honesty. Perhaps in his fifties his creativeness was at last on the wane. Stephen Paget quotes him as remarking without complaint that his mind did not "boil with ideas" the way it once did. But that was late. Until then his life had been a fury of research and practice, hospital and private; on top of all were his crusades, first and always the famous anti-alcohol affair, later against treating the suffragettes as criminals, and finally politics, medical and national. He was a Liberal, but nowadays would surely have been a Socialist.

It is not greatly to be wondered at that Harvey Cushing found little to admire and nothing to imitate in this great Englishman. Their lines of interest diverged too far. Horsley's preoccupation was in the intimate structure and physiology of the nervous system. Cushing's was not, it was more practical. Horsley grew up a young man in the company of the great founders of clinical neurology: Hughlings Jackson, David Ferrier, William Gowers, C. K. Mills, Spiller, and Weir Mitchell in America; Sherrington, Gotch, Schäfer were his contemporaries. Horsley could bring to bear operative skills that these men did not have, and so he came actively to explore functions—and that, be it remarked, when 99 out of 100 surgeons thought that anatomy was the only proper study for a practical man. Horsley's eye was on the future. The details of operative surgery Horsley thought important, but not important enough to deserve much publication. Cushing, on the other hand, was much more interested in the immediate present, in technical improvements in a field which was ripe, if mortality was to be reduced and the rate of cure raised, for a change in method. His great gifts were better canalized than Horsley's, but had he been more generous to the older man it would have been more seemly and more just.

Horsley never, it seems, worried overmuch about what people thought of him, nor about the collecting of honours. He had work to do, absorbing work. In 1906 he was in the full flood of his work with Clarke. It was because of this that he gave up his professorship and charge of beds at University College Hospital. He must have found the responsibility of the care of general surgical patients and the routine of student teaching too much an interference with what he really wished to do. Furthermore, the clinical work he really enjoyed was mainly at Queen Square, and he was in great demand as a consultant. In those days a successful London specialist had many long-distance calls. The country was rich, the number of people who could afford to summon the best opinion north, south, east, and west was considerable. Horsley's counsel was often sought on cases which turned out not to be surgical. This was regarded as quite dreadful by some of his medical neurological colleagues. It was, on the other hand, quite all right for them to see surgical cases; that was traditionally correct since Linacre's day, and put the surgeon in his proper place.

There is rarely unanimity as to the shape reforms should take even when their necessity is agreed. This showed up

in his work for the British Medical Association, into the affairs of which he threw himself with his accustomed vigour, and there his professional and scientific reputation gave great weight to his counsels. He was one of the founders of its new constitution, and Chairman of its Representative Body (1903-6). Muirhead Little in his *History of the British Medical Association* (1932) spoke of Horsley's radicalism tempered though it was by a strong belief in constitutional methods. But, he says, "whatever opinions he held, whether on experiments on animals, on total abstinence or medical reform, he held them very strongly, and it was difficult for him to realize that those who differed from him were actuated by as honourable motives as he was himself." Those who differed were ruffians, scoundrels; he did not mince words. The fact that Lloyd George turned to him for advice in drafting his Insurance Act did him great harm in the estimation of the more conservative members of our profession.

In his letters home after he had had time to look around as consulting surgeon to the Army in Mesopotamia, he wrote of the "drunken misdirection of our military affairs," of the "apathy and indifference of the whiskey drinkers." He was, he said, "trying to make the aged and incompetent realize that the British Soldier is a human being" (Paget, 1919, p. 305). Off he went to India to lay the state of medical affairs before the Viceroy, Lord Willingdon, and the Commander-in-Chief, who had already had disturbing reports and were now so impressed that inquiries and reforms were quickly set on foot. Nothing in Horsley's life does him greater credit than the tearing and characteristically unselfish energy of his work for the Army in the field in the last months of his life. It was superb. His disregard, his open contempt even, for bigwigs would have brought only derision had it not been for the force of his personality, his absolute integrity, and the passionate logic of his arguments.

There is a story, now traditional, that Horsley had an almost imbecile belief in the immunity of a total abstainer from heat or disease. It is time that that fable was destroyed. Dr. Anthony Feiling, who was a young medical officer in the hospital to which Horsley was admitted, there to die on July 16, 1916, has kindly given me his impressions of Horsley's last illness. It is true, he says, that he died of heatstroke, but the cause was an infection, probably paratyphoid, though that was never proved. The lack of proof was not very surprising, since their bacteriology was, Dr. Feiling says, by no means reliable. Nor did differentiation become so anywhere, I believe, until some years later. Horsley perhaps did not wear the regulation topee and spinal pad that was so wrongly supposed to prevent sunstroke. But Horsley did not die of sunstroke, but of heatstroke following an infection, the atmospheric temperature near Bagdad in July making body thermostasis difficult even for the young. His opposition to alcohol did not, by the way, prevent him, I am told by Sir Archibald Gray, from permitting his house-surgeons to give alcohol in emergencies to his patients at their discretion. It was a common constituent of the nutrient enema then in such use; Horsley's patients were not exempt.

It was perhaps not always easy to catch enough glimpses of nobility in this man's character. They were often obscured by the mantle of his "extracurricular" activities, in which he roused such passionate devotion or such dislike. Maybe he fished too much in troubled waters, but had he not followed his bent he would have denied his genetic inheritance. Time has shown, annoyingly for his opponents, that the causes to which he devoted his life were good causes—the creation of neurological surgery, the necessity for experiments on animals, temperance if not abstinence, universal women's suffrage, the liberalism of his political opinions, the need for some reforms in our profession, and Government provision of free treatment for the working-man. Such variety suggests a kaleidoscopically colourful personality and makes us feel pale and desiccated beside him. Violent in expression Victor Horsley might at times have been, but he was a fastidious man as well as generous and humorous too.

Well might he say now, "Praise me for virtues, excuse me for my faults, which were never mean."

I wish to acknowledge the help which has been generously given me by many people. My thanks are particularly due to Sir Victor's daughter Pamela (Mrs. Stanley Robinson), to Sir Arthur MacNalty, Dr. Ernest Sachs, Sir Archibald Gray, Professor Robin Pilcher, Mr. Morriston Davies, Dr. Anthony Feiling, Sir Gordon Holmes, Dr. Purdon Martin, Dr. Golla, Dr. Z. Mennell, and to Mr. Julien Taylor and Mr. John Hankinson, of Queen Square, who helped in the search for old case records. Lastly, my debt to Stephen Paget's biography of Sir Victor Horsley is immense.

REFERENCES

- Beevor, C. E., and Horsley, V. (1888). *Phil. Trans. B.*, 179, 205.
Bennett, A. H., and Godlee, R. J. (1884). *Lancet*, 2, 1090.
Cairns, Sir H. (1935). *Yale J. Biol. Med.*, 8, 421.
Clarke, R. H. (1920). "Investigation of the Central Nervous System." *Johns Hopk. Hosp. Rep.*, special volume.
— and Henderson, E. E. (1912). *J. Psychol. Neurol. (Lpz.)*, 18, 391.
Davies, H. Morriston (1907). *Brain*, 30, 219.
Gotch, F., and Horsley, V. (1891). *Phil. Trans. B.*, 182, 267.
Gowers, Sir W. R., and Horsley, V. (1888). *Med.-chir. Trans.*, 71, 379.
Handelsmann and Horsley, Sir V. (1917). *British Medical Journal*, 2, 1150.
Horsley, V. (1886). *Lancet*, 1, 3, 54; 2, 346, 1163.
— (1906). *British Medical Journal*, 2, 411.
— (1908). *Ophthalmoscope*, 6, 658.
— (1909). *British Medical Journal*, 2, 125.
— and Clarke, R. H. (1905). *Brain*, 28, 13.
— (1908). *Ibid.*, 31, 45.
— Taylor, J., and Colman, W. S. (1891). *British Medical Journal*, 2, 1159.
Jefferson, Sir G. (1950). *Sir William MacEwen's Contributions to Neurosurgery*. Glasgow Univ. Press.
— (1955). *The Invasive Adenomas of the Anterior Pituitary*. Liverpool Univ. Press.
Keen, W. W. (1888). *Trans. Amer. surg. Ass.*, 6, 293.
MacEwen, Sir W. (1913). *17th International Congress of Medicine*, Sect. VII, Pt. 2, p. 208. Frowde and Hodder and Stoughton, London.
May, Otto, and Horsley, Sir V. (1910). *Brain*, 33, 175.
Moruzzi, G. (1950). *Problems in Cerebellar Physiology*. Thomas, Springfield, Ill.
Osler, Sir W. (1919). *Oxford Rev.*, 38, 175.
Paget, Stephen (1919). *Sir Victor Horsley: A Study of His Life and Work*. Constable, London.
Sargent, Percy (1913). *17th International Congress of Medicine*, Sect. VII, Pt. 2, p. 212. Frowde and Hodder and Stoughton, London.
Semon, Felix, and Horsley, Sir V. (1890). *Phil. Trans. B.*, 181, 187.
Spencer, W. G., and Horsley, Sir V. (1891). *Ibid.*, 182, 201.
Tooth, H. H. (1913). *17th International Congress of Medicine*, Sect. XI, Neuropathology, p. 161. Frowde and Hodder and Stoughton, London.
Turner, Sir C. R. (1926). *British Medical Journal*, 2, 229.
Verma, G. (1911). *Patologia chirurgicale delle l'ipofisi*. Pavia.
Wagenen, W. P. van (1934). *J. Amer. med. Ass.*, 102, 1454.

SIR VICTOR HORSLEY: HIS LIFE AND WORK*

BY

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Victor Alexander Haden Horsley was born at No. 1, High Row, Kensington, on April 14, 1857. His father was John Callcott Horsley, R.A., a famous artist of his day; his mother Miss Rosamund Haden, sister of Sir Francis Seymour Haden, surgeon and etcher. Horsley's first two names were given him by Queen Victoria, and we note how appropriate they were. Victor, "a conqueror," and he was to conquer in the battle against disease; Alexander, "a helper of men," and he was to be a benefactor of mankind.

Early Days and Education

Horsley was educated at Cranbrook Grammar School, and became a medical student at University College in 1874. In October, 1875, he entered University College Hospital. It was a vintage year, for several of his fellow students achieved distinction in later life. Of these may be mentioned: Francis Gotch, later professor of physiology at Oxford, who married Rosamund Horsley and became Victor's brother-in-law; Sir Frederick Mott, physician and neuropathologist; Sir Dawson Williams.

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Editor of the *British Medical Journal*; Sidney Martin, physician and professor of pathology; C. E. Beevor, the neurologist; Bilton Pollard, surgeon; C. J. Bond, surgeon, of Leicester; and J. E. Hine, afterwards Bishop of Northern Rhodesia. Most of these men remained Horsley's lifelong friends.

At the hospital his chief teachers were: Ringer, Bastian, Russell Reynolds, Gowers, and Wilson Fox in medicine; and John Marshall, Marcus Beck, R. J. Godlee, and A. E. Barker in surgery. Sir Leander Starr Jameson, the future prime minister of Cape Colony, was demonstrator of anatomy and subsequently resident medical officer. Sir Victor told me that Jameson in those early days was somewhat reserved and aloof, but that all the residents in the hospital valued his advice. He worked and read assiduously, and his only relaxation was whist in the evenings. In later years this led on to bridge, which proved a link of friendship between him and his former foe, General Botha.

Very early in Horsley's hospital career his teachers and contemporaries realized that he was a genius and had a brilliant future before him. They admired, too, his forthrightness, his integrity, and his readiness to help others. "He shunned delights and lived laborious days," and already was a vigorous advocate of total abstinence from wine, spirits, and tobacco.

In 1878 Horsley was awarded the Filliter Exhibition in Pathological Anatomy. In November, 1880, he qualified M.R.C.S., and in December became house-surgeon to John Marshall. In 1881 he became M.B. and B.S. London, securing the gold medal in surgery with a university scholarship, and during 1882-4 was surgical registrar to the hospital. He made a series of observations of the action of anaesthetics on his own brain at this time. In November, 1882, he put up his plate at 129, Gower Street, where he shared rooms with his friend and future brother-in-law, Whitelegge, who as Sir Arthur Whitelegge, K.C.B., H.M. Chief Inspector of Factories, was to do so much to advance industrial hygiene and to safeguard the health of the industrial worker. Outstanding events of the year 1883 were that Horsley took his F.R.C.S., became engaged to Miss Eldred Bramwell, a daughter of Sir Frederick Bramwell, the engineer, and made a communication to the Physiological Society, "On four cases of injury of the brain, illustrating the position of the motor centres."

Myxoedema

Horsley was appointed professor-superintendent of the Brown Institution, 149, Wandsworth Road, London, S.W., in 1884, and held the post until 1890. The University of London in 1871 had established this institution as a centre for advanced physiological and pathological research as well as a veterinary hospital for study and treatment of the diseases and injuries of animals. It was the first of its kind and did most important and valuable work in medical research, as will be apparent from the list of its professor-superintendents—Burdon-Sanderson, Greenfield, Roy, Horsley, Sherrington, Rose Bradford, Brodie, and Twort. Its financial resources were meagre, and Horsley repeatedly showed in his annual reports how difficult it was to maintain the institution. To-day research workers aided by endowments, benefactors, and an enlightened Medical Research Council live in better times.

During Horsley's six years of office at the Brown Institution the following researches were done by him:

(1) the localization of function in the brain, and the pathology of epilepsy and of canine chorea. The work on localization is dealt with below. (2) The thyroid gland and myxoedema and cretinism. (3) The protective treatment against rabies.

In 1873 Sir William Gull in a brief paper, "On a cretinoid state supervening in adult life in women," gave the first description of myxoedema. Curling and Fagge had previously noted cases of sporadic cretinism in which the thyroid gland was "atrophied" or even "absent." In 1877 Dr. Ord described further cases and gave the disease the name "myxoedema," for post-mortem evidence showed the thickening of the subcutaneous tissues by excessive formation of a gelatinous or mucinoid substance. The thyroid gland was markedly diminished, but Ord did not appreciate the true significance of this. Endemic cretinism in the Swiss valleys was known to be associated with goitre, but the function of the thyroid gland was unknown.

Reverdin, of Geneva, and Kocher, of Berne, in 1882-3 had been treating goitre by surgical operation (removal of the thyroid gland). In certain of their cases myxoedema had developed. On November 23, 1883, the Clinical Society of London discussed a case of myxoedema, and Sir Felix Semon suggested that cretinism, myxoedema, and "cachexia strumipriva" (Kocher's name for the condition) were allied conditions due to absence or degeneration of the thyroid gland. On December 14 the Clinical Society appointed a committee of investigation. Ord was chairman, W. B. Hadden, honorary secretary, and Horsley one of the members. Horsley, using monkeys, began experimental work on the thyroid with Rickman Godlee in Professor Schäfer's laboratory in October, 1884, continuing it single-handed at the Brown Institution. Removal of the thyroid was followed by muscular tremors and then by symptoms of myxoedema. He was able to record some of these findings in two lectures on the thyroid gland, which he gave at the University of London in December. He extended and continued his experiments in 1885 and 1886. In 1888 the Investigation Committee of the Clinical Society published the Report on Myxoedema. Horsley's report argued for the identity of myxoedema, cretinism, and cachexia strumipriva, and proved that these conditions were due to destruction of the thyroid gland.

As a surgeon Horsley now applied the results which he had obtained in the laboratory. On February 8, 1890, he published in the *British Medical Journal* (p. 287) a "Note on a possible means of arresting the progress of myxoedema, cachexia strumipriva and allied diseases." Schiff and von Eiselsberg had tried transplantation of thyroid gland in thyroidectomized animals. Horsley transplanted the thyroid gland into patients suffering from myxoedema and showed the treatment was specific although not always successful. In 1891 he contributed a critical and historical review of the subject to Virchow's *Festschrift*. In this year came George Murray's hypodermic injection of thyroid gland (*British Medical Journal*, 1891, 2, 796). Murray was also a U.C.H. man and had been Horsley's pupil. In 1892 Hector Mackenzie showed that feeding the patient with fresh thyroid gland was equally beneficial. Stephen Paget observed truly that Horsley founded in this country the modern study of the thyroid gland, and was the first in this country to suggest the rational method of treatment of myxoedema. I may mention here that in 1905 or 1906

Horsley introduced me to Kocher, and I was in the operating theatre of U.C.H. when Horsley performed a thyroidectomy in Kocher's presence, after which Kocher removed the thyroid in a second patient.

Rabies

Horsley had hardly finished his experimental work on the thyroid gland when he was summoned to a fresh field of research. In 1886 the Local Government Board appointed a commission to inquire into Pasteur's method for the treatment of rabies. The members of the commission were Sir James Paget (chairman), Sir Lauder Brunton, Dr. George Fleming, Lord Lister, Sir Richard Quain, Sir Henry Roscoe, and Sir John Burdon-Sanderson, with Horsley as secretary with a remuneration of £50! Horsley was not only the author of the report, but the active investigator and moving spirit of the investigation both in Paris and in London. The Report of the Commission was published in June, 1887, and was presented by Pasteur on July 4 to a meeting of the Académie des Sciences. It states that Horsley's experiments, begun in May, 1886, "entirely confirm M. Pasteur's discovery of a method by which animals may be protected from the infection of rabies. . . . It would be difficult to over-estimate the importance of the discovery whether for its practical utility or for its application in general pathology."

Horsley also investigated a serious outbreak of rabies among the deer in Richmond Park in 1886-7, when no fewer than 264 deer died, and he had some of the animals under observation at the Brown Institution. In 1886 he examined and showed the non-efficacy of the "Buisson bath treatment" for the prevention and cure of hydrophobia.

Rabies was formerly a menace in Great Britain. In 1881 it was responsible for 34 deaths and in 1885 for 60 deaths in England and Wales. As a result of the action taken by the Local Government Board under the presidency of Mr. Walter Long in rigidly enforcing the Muzzling Order of 1896 with the enforcement of a six-months quarantine for any dog introduced into Britain from abroad, human rabies has disappeared from the Registrar-General's statistics. It was Pasteur who suggested this method to Horsley.

In 1886, in recognition of his experimental studies, Victor Horsley had been elected a Fellow of the Royal Society.

The Physiologist

To-day the lessons of neurophysiology and neurology, the anatomy of nerve centres and nerve fibres, the localization of a cerebral tumour or abscess, and the results of cerebral or spinal paralysis are so much a part of medical teaching and practice that it is difficult for us to realize that at the time when Horsley began his experimental work on the subject at University College much of the anatomy and physiology of the brain was unknown territory. More wonderful still, not a few of us are still alive who have walked and talked with the founders of British neurophysiology, "the first who ever burst into that silent sea."

Progress of knowledge of the nervous system has been indissolubly linked with the determination of function in it, since Bell and Magendie discovered the difference of function in the two spinal roots and Flourens delimited the respiratory centre in the bulb.

Broca in 1861, by clinical and post-mortem evidence, localized speech in the third frontal convolution. Hughlings Jackson and Bastian supplied further clinical and pathological evidence of cerebral localization. In 1870 Fritsch and Hitzig, using a weak galvanic current, were able to map out certain centres in the cerebral cortex for movements of the neck, the limbs, and the face. Then in 1873-5 came the original research by Ferrier, which, as Sherrington observed, ranks among the classics of experimental neurology and physiology. Using the faradic current at minimal strength, Ferrier localized many more centres of movement and also of certain acts of perception and

charted them precisely. The suggestion of this work came to Ferrier from that great pioneer in neurological research, Sir James Crichton-Browne, as both Sir David Ferrier and Sir James informed me.

In January, 1884, Horsley began with Professor Schäfer in the physiological department of University College a series of researches upon the brain of the monkey, with a view to testing and, if possible, extending the work of Ferrier and Yeo. This was continued for two and a half years, until July, 1886. For much of the time Horsley was also pursuing allied researches at the Brown Institution with Dr. Charles E. Beevor. It is only possible here to outline the results obtained. In experiments on the external surface Schäfer and Horsley confirmed Ferrier's results and added to them with a finer analysis of certain groups of movements. The work with Beevor was more specialized. Localization was studied in one species of monkey, not only at the level of the surface of the brain but at the level of the nerve fibres passing from the surface of the brain towards the spinal cord. Horsley and Beevor also made an intensive study of localization in the cerebral cortex of the orang-outang.

With Sir Felix Semon, Horsley studied and described the central motor innervation of the larynx. Semon (*Archives of Laryngology*, 1881) had noted that in cases of organic disease involving the motor nerves of the larynx the abductor muscles failed before the adductors; in cases of functional disease the adductors fail before the abductors. Ferrier had discovered the cortical centre for adduction, but Horsley and Semon defined it more exactly at the lower end of the ascending frontal convolution in the monkey. In contradistinction to the monkey and the dog they found abduction well represented in the cat, and also that abduction in all young animals had a much stronger cortical representation than adduction. "Thus, the central motor innervation of the larynx is adjusted not only for phonation, but also for respiration, and adapts itself, in each species of animal, to the change from early life to adult life."

In these localization experiments the area to be studied was mapped out into subdivisions of about 4 mm. square, and a very weak secondary current was employed to obviate the fallacy of diffusion. The investigators used electrodes 2 mm. apart. As in all Horsley's experimental work, the experiments were performed with strict antiseptic precautions. The wound, after being closely stitched, was dressed with antiseptic gauze, and this again overlaid and rendered firmly adherent to the scalp by a layer of thick collodion. All the operations were performed under anaesthesia, either chloroform or ether being used, and usually supplemented by hypodermic injection of one-half to one grain of the acetate of morphine.

These experiments advanced the knowledge of cerebral localization and are memorable. In certain points of anatomical detail regarding the localized areas, and, more especially, regarding the excitability of the post-central convolutions and the existence of intermediate inexcitable zones, these results have been corrected or modified by subsequent work, in particular, by the more exact studies of Sherrington and Grünbaum. Horsley's work marks a great step forward, and his genius and industry made plain paths of research for those who came after him.

In 1890 Horsley and Walter Spencer read a paper to the Royal Society "On the Changes produced in the Circulation and Respiration by Increase of the Intra-cranial Pressure or Tension." In 1891 Horsley and Francis Gotch gave the Croonian Lecture to the Royal Society "On the Mammalian Nervous System, its Functions and their Localisation determined by an Electrical Method." The full text occupies 250 pages of the *Transactions*. Much of the work was done by the brothers-in-law in the physiological laboratory at Oxford. They used a capillary electrometer, and studied the passage of nerve impulses not only between the cortex and the cord but between many other levels of the nervous system.

Horsley's fame was now international, as was shown by the great reception he received at the International Medical Congress in Berlin in August, 1890, when he demonstrated the chief results of his work in cerebral localization. "Dem gehört die Zukunft," "To him belongs the future," said his Teutonic admirers.

In addition, a vast amount of experimental work on the tracts of the spinal cord was carried out by Horsley either alone or in collaboration with other investigators. All his experimental work after 1896 was done in his small laboratory behind the old anatomical theatre at University College. It was a Mecca to neurologists from all parts of the world, who came to see him there and to discuss his findings—for instance, Hughlings Jackson, William Gowers, William Macewen, Harvey Cushing, and L. F. Barker. Any keen resident at U.C.H. or Queen Square was sure of an invitation to the laboratory. As already observed, Sir Victor had many collaborators. I can mention only a few additional names—Risien Russell, Sir Francis Teale, Sir Gordon Holmes, Page May, Donald Armour, Wilfred Harris, Colin K. Russel, Otto May, and Ernest Sachs. Dr. Charles Beevor remained a devoted disciple, and he and I spent many hours side by side at the laboratory bench cutting and examining microscopical sections for Sir Victor.

Work on the Cerebellum

Although Horsley made the whole of the central nervous system his province, in the closing years of his scientific researches he devoted chief attention to work on the cerebellum, principally with R. H. Clarke. With special apparatus, devised by Clarke, they were able to produce a minimal electrolytic lesion of a cerebellar nucleus without involving the cerebral cortex. This was the first use of electrolysis in experimental physiology. Horsley and Clarke concluded that the cerebellar cortex is practically inexcitable, but this has been disproved by subsequent investigation with the use of a stronger electrical current. I remember one experiment in which I slightly increased the strength of the current and detected a cerebellar response, but Horsley attributed this to diffusion of stimulation to the cerebral cortex. I had the privilege of assisting Horsley in his researches from October, 1904, until 1909. The results of certain of these researches were incorporated in a joint paper published in *Brain* in 1909, with the somewhat lengthy title of "Cervico-Spinal-Bulbar and Spino-Cerebellar Tracts and On the Question of Topographical Representation in the Cerebellum."

So far as possible, Sir Victor set aside Thursday afternoons and Saturday mornings for experimental work. He sat at one end of the experimental table, arrayed in a long white coat and wearing a head mirror, which directed reflected light on to the exposed brain of the animal. Opposite him sat the anaesthetist, while I usually wrote notes from Sir Victor's dictation. Apart from these stated hours, at odd moments Sir Victor would appear in the laboratory, often in the early morning, and cut sections for about half an hour. I think the mere mechanical work of using the microtome rested him. At such times he would talk to one on all sorts of subjects, and at intervals whistle tunes out of the Gilbert and Sullivan operas.

At No. 25, Cavendish Square, the large skylighted room at the back of the ground floor was Sir Victor's workshop. It had been built as an anatomical theatre in the days when surgeons held private classes in anatomy, and Horsley said it was taken by R. L. Stevenson for his description of Dr. Jekyll's chemical laboratory in *The Strange Case of Dr. Jekyll and Mr. Hyde*, with which, indeed, it closely corresponded. Here in any spare time Horsley worked with tools, microscope, and camera, dissecting, cutting sections, photographing and developing, making drawings and diagrams. I went with him to purchase an excellent and costly apparatus for photomicrography (Zeiss); and we spent many Sunday afternoons and evenings in the workshop together taking photomicrographs, developing them, and trying the effect of different coloured solutions to act as filters for the light from a strong electric arc. Shelves lined

the walls of the workshop; they were stacked with lecture diagrams, photographs and negatives, lantern slides, trays of microscopical slides, and notes and papers. These last were the result of work which can never be put on record, for the master interpreter is gone. As Wilfred Trotter wrote (*British Journal of Surgery*, October, 1916): "Horsley was always more interested in the carrying out of his researches than in the record of them." He also looked forward to a period of leisure in which to garner up the fruit of past researches, but this was never granted to him.

It has been possible here to mention only the salient facts of Horsley's researches; to describe them fully and to indicate their material contribution to our knowledge of the anatomy, physiology, and pathology of the central nervous system would demand several volumes; furthermore, many of the publications under other names that issued from Horsley's laboratory represent investigations initiated and directed by him. Sir Victor Horsley was remarkable as a practising surgeon in London who maintained interest in pure scientific investigation in days when professional and other duties encroached considerably on his scanty leisure. His amount of scientific output in those precious hours snatched from other work would have amply sufficed for the whole time of many a research professor of physiology. Only a man of Sir Victor's exceptional enthusiasm and energy could have done it.

The Pathologist

Victor Horsley clerked for Dr. H. Charlton Bastian, one of the founders of our present knowledge of the diseases of the central nervous system. In 1880, while still a medical student, he published his first paper in *Brain* with Bastian on "Arrest of development in the left upper limb, in association with an extremely small right ascending parietal convolution." He also made two of the drawings for Bastian's book, *The Brain as an Organ of Mind*, published in 1880. At the same time he was working with F. W. Mott on bacteriology. In 1882 these two great sons of U.C.H. published their results in a paper in the *Journal of Physiology*, entitled: "On the existence of bacteria, or their antecedents in healthy tissues," then a controversial subject. Horsley was early associated with the research work of the Local Government Board, and in 1881 his paper "On Septic Bacteria and their Physiological Relations" appeared as an appendix to the 11th Annual Report of the Board. He wrote the articles on "Bacilli" and "Zyme" in Quain's *Dictionary of Medicine*, and also did work on the transplantation of tumours from man to animals, a subject of much interest to-day.

Thus early distinguished as a pathologist, Horsley was made assistant professor of pathology at University College in 1882, and in 1893 succeeded Bastian as professor. He rearranged the department for research work in pathology and bacteriology, with a subdepartment of pathological chemistry for Dr. Vaughan Harley. Under Horsley's direction the department became a definite and well-known centre for research in experimental pathology. As Dr. Charles Bolton, one of his pupils, observed: "He did not teach from the examination point of view in the very least; but his aim was to give an account of the processes of disease as ascertained by experimental inquiry; and he illustrated all his statements of fact by experiments on every possible occasion." He published excellent reports, and with Rubert Boyce, the assistant professor, he set the high standard of the department which has ever since been maintained. In January, 1893, Horsley and Boyce published in the *British Medical Journal* (p. 111) their "Preliminary Report on Oedema," which showed how complex was the condition—no mere oozing of blood serum into the tissues under mechanical conditions of pressure, but a result of actions and interactions of living tissues.

Owing to increasing pressure of work, in 1896 Horsley resigned the professorship and was succeeded by Dr. Sidney Martin. In the three years in which Horsley had held the chair he had accomplished great things, but it cost him more than it paid him, and the department, to fulfil his

aims, had to be run at a financial loss. He retained his private laboratory at University College under the aegis of the new department of chemical pathology. He was always ready to give advice to his colleagues and research students on pathological problems, and when the Medical School separated from the College a special "Department of Experimental Neurology" was instituted for him, a convention to link him with the College and to enable him to retain his laboratory.

The Surgeon

Horsley was soon known to the medical profession and the world at large as "the brain surgeon," and it was his experimental work on cerebral localization which led to his appointment at the National Hospital, Queen Square. Further, it was the fruit of these researches which he applied to the diagnosis of tumours of the brain and spinal cord, and which enabled him so quickly to evolve his masterly operative technique in cerebral and spinal surgery. He often regretted that the law prohibited students from learning their operative surgery on anaesthetized animals. He naturally saw and operated on many cases of thyroid disease. He did not restrict himself entirely to his special field. He had general surgical cases in his wards at University College Hospital. These he usually handed over to his assistant surgeon, but in private he did general as well as neurosurgery, "to keep my hand in," as he would remark. He was an assistant surgeon to University College Hospital from 1885 to 1893; a "full surgeon" from 1893 to 1900; and a "surgeon in charge of hospital beds" from 1900 to 1906; he then retired and was made a consulting surgeon.

Primitive man trephined. Horsley lectured in 1887 on "Brain-surgery in the Stone Age." Ambroise Paré operated on wounds of the head and laid down rules for their treatment. But the brain could not successfully be touched by the surgeon's scalpel until anaesthetics and antiseptic surgery were discovered and cerebral diagnosis was possible.

William Macewen, of Glasgow, operated on an abscess in the left temporo-sphenoidal lobe in 1881, but it had already infected the lateral ventricle and the patient died. The first successful operation in this country for temporo-sphenoidal abscess was by Arthur Barker, surgeon to University College Hospital, in 1886. The first operation for cerebral tumour in this country was performed by Sir Rickman Godlee, Lister's nephew, in University College Hospital in 1884. The diagnosis had been made by Dr. Hughes Bennett and was confirmed at the operation, the tumour being successfully removed. Lister and Hughlings Jackson were present at the operation. Unfortunately, septic complications occurred from which the patient died. Horsley practised antiseptic surgery and relied on perchloride of mercury rather than carbolic to prevent wound infection. He gave particular care to the anaesthesia of his brain cases. To stop bleeding from the cut edge of the bone he used his antiseptic wax. In operating he was bold and resolute, and his scalpel grazed the springs of life, the recesses of the brain where no other surgeon had dared to explore. At the same time his superb self-confidence never led him into rashness. On the historic occasion, June 9, 1887, when he removed an intradural tumour from the spinal cord (the first operation of its kind), the tumour was small and higher up in the spinal cord than had been diagnosed. Horsley hesitated at first to extend his incision, and did so only at the urgent request of Sir Charles Ballance, who was assisting him. The patient made an excellent recovery and died from another cause twenty years later.

At University College Hospital and at Queen Square Horsley soon had a lengthy list of successful operations for cerebral tumour and Jacksonian epilepsy, ranging from improvement to complete recovery. All the time he was pursuing his researches at the Brown Institution and at University College on the central nervous system, and made many experiments on epilepsy. He also studied "the

accurate use of such lines and angles of measurement as give the relations between the surface of the skull and the surface of the brain, and enable the surgeon to visualize the motor area of the brain in its exact position under the skull" (*International Journal of Medical Sciences*, April, 1887). This had never been done previously, and was a valuable guide for the cerebral surgeon. He found time also for researches in archaeology and anthropology, and lectured on his discoveries in this new field at the Royal Institution and the Anthropological Institute.

Private Practice

Horsley married Miss Bramwell at St. Margaret's, Westminster, on October 4, 1887. They lived at 80, Park Street, Grosvenor Square, where Victor Horsley already had a large and increasing private practice. Not only were head and spinal cases sent to him, or he was asked to see them in consultation all over the United Kingdom, but he often had to diagnose cases of obscure nervous disease, such as myasthenia gravis and progressive muscular atrophy, and to refer them to the neurologist. His name became one to conjure with. He gave equal care to his hospital as to his private patients, and as one of them in Queen Square said: "I do believe if one of us were to die, and Sir Victor got him within half an hour, he could bring him to life again."

From 1892 onwards No. 25, Cavendish Square, was the Horsleys' home. As pressure of work increased with growing fame—he was knighted in 1902—he devoted less time to ward work at his hospital and clinical teaching. This meant increased responsibility for his house-surgeons, but he chose them wisely and trusted them. In my day Sir Archibald Gray and Sir Thomas Lewis, for example, held that coveted post. Another former house-surgeon, Dr. Wigmans, said of Sir Victor: "I never knew one who was more careful to lessen suffering and to avoid causing pain. His dressers were soon taught that the dressings had to be soaked until they came away of themselves; or they got a sharp telling-off. To his patients he was kindness itself; and for those who went to him for advice there was always full and careful help in every way possible."

In private he was assisted by Mr. Rupert Bucknall, assistant surgeon, and later by Wilfred Trotter, already in those days bearing the stamp of greatness. As a rule, Horsley liked to do his first dressings of head wounds himself. Sir Archibald Gray often gave anaesthetics for him in private work.

Because Sir Victor had little time for teaching, some have doubted his ability as a lecturer. In reality he was a great teacher. I well remember his lucid exposition of the diagnosis of cerebral tumours in a clinical lecture he gave in University College Hospital. Writing scientific papers was always a burden to him. His communications were often brief to the extent of curtness. He was an excellent critic of other men's writings. In a paper I drafted for him he struck out five pages of historical introduction, saying truly that if the references alone were given they could be looked up.

His surgery went hand-in-hand with research. In 1893 he made a long series of experiments on the effect of bullet wounds in the brain which showed that the immediate cause of death in such cases is failure of the respiration, not of the heart. In 1906 his address on surgery at the Toronto meeting of the British Medical Association surveyed the whole field of cerebral surgery, and is regarded as one of his most important contributions to the subject.

Horsley had a curious contempt for the surgical technique of which he was so masterly an exponent. He would throw back his head and laugh, saying: "Anyone can be a surgeon; it is only a question of mechanical skill easily acquired." Watching him, for example, removing a cerebellar tumour, how his deft and steady hands refuted this statement. He made up his mind that he would not operate after 60 years of age, which he regarded as the limit of the surgeon's active life.

Sir Victor devoted particular attention to the subject of anaesthesia. He served on a committee of the British Medical Association to study chloroform anaesthesia with Waller, Sherrington, Vernon Harcourt, and Dudley Buxton. Horsley concluded that the percentage of chloroform vapour ought to be exactly controlled, and liked to have the Vernon Harcourt inhaler used in his operations. Other surgeons objected to the time it took to get the patient anaesthetized. I remember once beginning an anaesthetic for Trotter with this inhaler. He pointed to a lint mask and dropping-bottle beside me. "I think this would be a more expeditious method," he observed.

Horsley was a very rapid operator, in contradistinction to Harvey Cushing, who was a most deliberate one. In J. Fulton's *Harvey Cushing* an account is given of Horsley showing Cushing how to operate on the Gasserian ganglion in 1900. "Horsley dashed upstairs, had his patient under ether in five minutes, and was operating fifteen minutes after he entered the house; made a great hole in the woman's skull, pushed up the temporal lobe—blood everywhere—gauze packed into the middle fossa, the ganglion cut, the wound closed, and he was out of the house less than an hour after he had entered it." Such rapidity did not appeal to Cushing, yet Horsley obtained excellent results. Modern methods of cerebral surgery are different, but the successors of Horsley—Harvey Cushing, Hugh Cairns, and Geoffrey Jefferson—have acknowledged their debt to Horsley's pioneer work.

The Medical and Social Reformer

After becoming the greatest of all cranial surgeons, Horsley found himself impelled to sociological and political work in the years preceding the first world war. He strove to serve his profession and womanhood and childhood above all. When the Medical Defence Union was threatened with failure he became its president and threw himself heart and soul into its work. He attended every council and executive meeting, and gave many other hours of his valuable time to its service, making it a bulwark of defence for doctors exposed to attacks from unscrupulous people.

Throughout his professional life Horsley worked hard for the British Medical Association. "He wrote in its Journal, took a chief part in its Annual Meetings, was one of the founders of its new constitution, served on its Council and Committees, was Chairman of its Representative Meetings, and Chairman of the Marylebone Division of its Metropolitan Counties Branch." He strove to make the Association the one great power between the State and the medical profession, a power in which the doctors would be united to defend themselves against injustice, to provide a complete service for the nation, and to obtain proper rates of remuneration for their work. He led the way in forming the policy of the Association in regard to reform of Coroners' Laws and death registration, medical inspection and treatment of schoolchildren, the constitution of a future Ministry of Health, State registration of nurses, and suppression of unqualified practice and quack advertisements. He saw the advantages of the National Insurance Act, that it would give better service for the insured and more favourable conditions for the general practitioner. This excited unjust opposition from those whom he was trying to help. But he took praise and blame with equal serenity, except that he expressed his appreciation of his true friends' sympathy and concern in the bitter attacks made upon him.

Sir Victor served as a direct representative on the General Medical Council from 1897 for nearly ten years, and took an active and useful part in its work.

A campaign in which he was much maligned was his crusade against alcohol. Those were the days when 90% of the injuries admitted on Saturday nights to hospitals might be attributed to drink. Like Benjamin Ward Richardson, it was on scientific grounds that Horsley became a temperance reformer. He was a vice-president of the National Temperance League and president of the British

Medical Temperance Association. As he said in his Lees and Raper Memorial Lecture on "The Effect of Alcohol on the Human Brain," the practical argument for total abstinence is based on the irrefutable proof derived from physiological investigation. In 1907 he and Dr. Mary Sturge published their book, *Alcohol and the Human Body*, which is a great store of medical and scientific evidence on the subject. He gave numerous lectures and addresses in support of temperance, and he attacked the issue of the rum ration in the first world war. He opposed tobacco smoking both on medical and on aesthetic grounds.

Sir Victor gave a number of brotherhood addresses to a non-sectarian group which arose in the Free Churches. Many a Sunday afternoon was devoted to these talks. "There is something of the spirit of Kingsley in them, and of Ruskin," wrote Stephen Paget. They covered a wide field—Christian ethics and unity, public health and sociology.

He was a strong advocate in the cause of female suffrage, and Lady Horsley and he worked hard together to this end. He scathingly criticized the Temporary Discharge of Prisoners Act, the "Cat and Mouse" Act, and denounced the forcible feeding of the militant suffragettes. He foresaw a splendid future for the emancipation of women, but he only saw the Promised Land from afar.

Sir Victor felt so keenly upon these questions of medical and social reform that he desired to enter Parliament as a Liberal in order to extend his service to mankind.

In 1910 he contested the University of London seat and was defeated by his former tutor, Sir Philip Magnus, the Unionist candidate. In June, 1911, he was adopted by the North Islington Liberal and Radical Association; and during 1911-12 did much work in the constituency, as well as speaking on behalf of Liberal candidates elsewhere. From 1910 onwards politics claimed much of his time. In 1912 he resigned his candidature for North Islington, and in January, 1913, was adopted instead by the Liberal Council of the Market Harborough Division. His outspoken views, especially on female suffrage, frightened the Executive Committee, and in November he resigned. Between January, 1914, and May, 1915, he was "approached" on behalf of four constituencies, and, finally, the Huddersfield Liberals were about to adopt him as their candidate.

Many of Horsley's scientific friends regretted his absorption in political warfare when he still had so much to teach mankind in cerebral physiology and other branches of knowledge. They shrank from seeing his motives misjudged, his words misinterpreted, and himself exposed to the hurly-burly of the market-place. His advocacy of National Health Insurance and of female suffrage lost him friends and patients. In those later years his practice fell off, as William Harvey's did when he discovered the circulation of the blood. Horsley made sacrifices of time, leisure, and money for the betterment of mankind. But he could do no other. He was "a bonny fighter" in any cause he believed to be a righteous one. Whether, if elected to Parliament, he would have held high office is doubtful, for he was no trimmer. He detested the *via media*. Compromise was hateful to him, and he always said straight out what he thought. Worthy of Cabinet rank, a government might have been afraid of giving it to him. But he would have made his mark in the Councils of the Nation at Westminster.

The Last Crusade

Sir Victor as a boy had wished to be a soldier, and for many years was a devoted member of the Artists' Corps. He nevertheless hated the wastefulness and folly of war, but when war came in 1914 he put everything aside so that he could render service in the national cause. He had been a captain in the Territorial Force since 1910, and was on the staff of the 3rd London Hospital, where he immediately began work. His great longing was for active service overseas, where there would be scope for his cerebral surgery, and where he could do so much for the sick and wounded. His two sons, Siward and Oswald, were in the Territorials, and afterwards received commissions in the Gordon Highlanders. He besieged the War Office with

appeals for employment, and at length, early in 1915, he was appointed in charge of the Surgical Division of the 21st General Hospital. Pending this hospital's organization, for six weeks he was surgeon to the British Hospital established at Wimereux by Sir Henry and Lady Norman. In May Sir Victor was gazetted Major R.A.M.C.(T.), and on May 20, 1915, he left Southampton with the staff and nursing staff of the 21st General Hospital for Egypt, the hospital being located at Alexandria. Nothing was ready, and, as Horsley wrote: "We shall be frantically busy licking into shape the rotten old barracks which has been handed over to us to convert into a hospital. The Israelites in Egypt were not in it *re* making bricks." On July 14 he was appointed consultant to the Mediterranean Expeditionary Force with the rank of full Colonel, A.M.S. He was in Egypt from June, 1915, to March, 1916. In August, 1915, Lady Horsley joined him, and later their daughter Pamela (Mrs. Stanley Robinson). In October Horsley visited Mudros and Gallipoli, inspected field ambulances and casualty clearing stations, as well as dressing-posts in the trenches and firing-line, and reported on medical conditions. In Egypt, after operating and visiting patients all day, he would work through the hot evenings writing letters and notes of his cases.

There was much public concern about the inefficiency of the medical arrangements in Mesopotamia, and, when Horsley volunteered for the campaign, the authorities were only too glad to have a surgeon of his eminence and standing to report on the matter. He reached Bombay on March 25, 1916, and visited Delhi and Simla: he left Bombay on April 9 and reached Basra on April 16. Here again he worked indefatigably under a hot tropical sun, operating on head injuries, investigating the medical conditions, and collating and preparing notes for his report which he intended to write in India.

Colleagues who worked with Sir Victor at Amara—the late Professor Grey Turner, Sir Zachary Cope, and Dr. Feiling—have told me that he worked too hard for a man of his age in a hot climate. He was frequently urged to curb his extraordinary energy and not to put too severe a strain upon his physical capacity. But to Horsley the work was all, the man nothing.

Sir Victor was working on July 14, when the shade temperature was over 110° F. (43.3° C.), and his last call was on a sick officer whom he knew. On the 15th he became ill and was moved to No. 2 British General Hospital. On July 16 his temperature rose rapidly, he became unconscious, and died of heat-stroke that evening.

Palms were laid on his grave. Later, a cross of white marble was placed over it. He had fought the good fight, he had finished his course, and so Mr. Valiant-for-Truth "passed over and all the trumpets sounded for him on the other side."

I am indebted to the late Mr. Stephen Paget, the author, and to Messrs. Constable and Company, Limited, the publishers, for permission to use certain material in the preparation of this lecture contained in *Sir Victor Horsley: A Study of His Life and Work*, Stephen Paget, London, 1919.

A short pamphlet entitled "The Doctor and his Patients, the Parish Priest and his People" has been published by the Guild of St. Raphael. The Guild consists of clerical and lay members of the Anglican Communion who are anxious to "restore the Ministry of Healing as part of the normal functions of the Church." The pamphlet discusses "the Christian view of Medicine, the Church's Ministry to the Sick, and the practical issues that stem from these considerations." The practical issues include the ways in which doctors and priests can co-operate to provide "a service to the sick which will be truly adequate to all their needs." Three doctors and three priests have jointly written the pamphlet, which is obtainable from the Guild of St. Raphael, 77, Kinnerton Street, London, S.W.1, price 6d., post free.

REMINISCENCES OF AN AMERICAN STUDENT

BY

ERNEST SACHS, M.D., F.A.C.S., F.I.C.S. (Hon.)

It is a great pleasure as well as a very great privilege to have this opportunity to pay tribute to Sir Victor Horsley. Unquestionably he was the father of neurological surgery, for, although sporadic attempts at brain surgery had been made before him, he was the first man to devote himself exclusively to this work.

It is my good fortune to have received my training with him. In 1907 no one in the United States was doing this work. While I was a student at Johns Hopkins, Harvey Cushing was just beginning his first efforts in neurological surgery, but the only place to obtain training was with Sir Victor. I applied to him and was given an opportunity to work in his laboratory in University College. He immediately took me under his wing and very promptly gave me every opportunity to learn his methods and follow his work from every angle. He withheld nothing and gave me most generously of his time. He treated me like a son in his home, and Lady Horsley was equally cordial.

Horsley at Work

I had been trained in surgery under Dr. Halsted at Johns Hopkins and was thoroughly imbued with the methods he taught; therefore it was something of a shock when I first saw Sir Victor operate. He practised antiseptic surgery while I had been trained in aseptic surgery. He worked under a stream of antiseptic solution with which the wound was constantly irrigated by an assistant. His opening of the skull was crude. He always sacrificed his bone flap, but I soon learned that this was unimportant, and that what really counted was his superb knowledge of anatomy and physiology. As soon as the brain was exposed, his handling of the tissues was exquisite and very delicate, and his knowledge of brain anatomy with all its possible variations was outstanding. I recall one occasion when he exposed the occipital lobe and remarked he would make an incision, avoiding Genari's streak. I doubt whether there are many neurosurgeons to-day who know their brain anatomy so thoroughly that they could do that.

Sir Victor spent every afternoon in his laboratory, and the only time I ever knew him to give up that session was when he had an opportunity to deliver an address on the subject of alcohol. He was an uncompromising teetotaler, and I have seen an audience spellbound by his wonderfully well documented discussion of the harmful effects of alcohol. He was convinced of this, and I frequently heard him say that no one could have heat-stroke who did not take alcohol. It is, of course, well known that this conviction of his was responsible for his death from heat-stroke while serving with the troops in the first expedition in Mesopotamia. A medical officer who was with him told me that Sir Victor absolutely refused to wear the helmet or spine pad required of all personnel, and as a result died of a heat-stroke.

Sir Victor was in his element when he was with a group of physiologists. I recall a meeting of the Physiological Society at which were Sherrington, Bayliss, Starling, Page May, and Gotch. Someone brought in a chicken that was ataxic, and Horsley, who with Clarke had just completed his experimental work on the cerebellum, upheld the thesis that the attacks were cerebellar in origin. There was considerable animated discussion and some difference of opinion. What the final outcome was I never learned, but the way Sir Victor stood his ground I shall never forget.

Animal Experiments

Sir Victor was much interested in comparative anatomy and would go to any lengths in order to obtain the brain of some unusual animal. When a walrus died at the Zoological Gardens, the first time in years, he gave up all his consultations that morning in order to take out the brain. When I remarked about this, he said: "If people want me to learn they must be willing to wait." Whenever any of his former students went to the Tropics or Far East he urged them to send him brains of wild animals. One day while I was with him a huge barrel arrived from India. In it, packed in salt, was an elephant's head. One of his former assistants had taken with him on an elephant hunt formaldehyde and injection bottles to inject the carotids after decapitating the animal. The specimen was accompanied by a letter and photographs showing the natives standing around gaping while this performance was going on. Sir Victor got a great thrill from these pictures and immediately took out the brain. In this way he collected a large amount of material and had innumerable photographs of various brains. These he photographed himself in his laboratory in his home in Cavendish Square, but, so far as I have heard, none of this material has ever been worked up or published.

Sir Victor was one of the most prominent vivisectionists at that period; consequently when Parliament was reviewing the laws about vivisection he was one of the important witnesses. A disgruntled former laboratory boy testified before the commission that he had seen Sir Victor pull the heads off living cats. The next day, when Sir Victor appeared in the laboratory, he told the laboratory assistant to bring up a cat, killed it with chloroform, and then told the boy and me to pull at one end of the cat while he pulled at the other. Of course we all knew nothing would happen, but Sir Victor

had to have positive proof before he would testify before the commission. The episode illustrates one of his fundamental characteristics—every statement he made had to be backed up by incontrovertible evidence.

Wide Interests

In the autumn he always rented a place for the shooting rights and went at the shooting as strenuously and enthusiastically as he did everything else. But the first thing he did when he rented a new place was to familiarize himself with the surrounding country. By the time I went down for my Christmas holiday he took me around in his high-powered Daimler, which he loved to drive, and showed me an interesting chancel in one church, a beautiful rose window in another, and a Roman ruin in another place. His interest in art he came by quite naturally, for his father had been a Royal Academician and his uncle was the famous etcher Sir Francis Seymour Haden.

Of Sir Victor's many admirable qualities, not the least was his generosity towards his younger colleagues. Of this I had striking proof. When I had completed the research I had been carrying on in his laboratory, I presented him with the manuscript and, naturally, had put his name and mine on the title-page. He crossed out his name, with the remark: "As long as it is customary, when two men publish a paper, to give credit to the one who is better known, I shall not allow my name to appear." No amount of persuasion could make him change this decision.

As I look back upon the years I spent with Victor Horsley, I feel he gave me the best possible insight into the life of a broadminded, generous scientist of his generation.

He will always be remembered as one of the great figures in medicine.

GLUCOSE TOLERANCE IN PERIODIC PARALYSIS

BY

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Hypokalaemia and muscular paralysis were first associated clinically in patients with familial periodic paralysis (Biernond and Daniels, 1934; Aitken *et al.*, 1937). Although the association has since been observed in several other conditions (Jackson and Oakley, 1955), the identity of the original disease remains distinct. Clinically it is characterized by a familial incidence in at least 80% of cases, by a tendency for the paralytic attacks to begin during sleep, and by the fact that the individuals affected are otherwise healthy (Talbot, 1941). Biochemically it is unique because the hypokalaemia is intermittent and evidence of potassium depletion is lacking (Gass *et al.*, 1948). The pattern of the disease is definite enough for "sporadic" cases without family history to be recognized, and exceptional cases without hypokalaemia are also described (Watson, 1946; Tyler *et al.*, 1951; Ecker, 1953).

The metabolic defect in this disease is not understood, but the response to stimuli which lower the plasma potassium level tends to be exaggerated (Aitken *et al.*, 1937). After the administration of glucose or insulin, for instance, hypokalaemia is often excessive, and paralytic attacks may sometimes be induced in this way to confirm the diagnosis. No undue external loss accompanies the fall in level of the plasma potassium, which is accounted for quantitatively by a transfer of extracellular potassium into the intracellular phase (Danowski *et al.*, 1948). In other words, hypokalaemia is

excessive either because too much potassium leaves the extracellular fluid or because too little returns to it. Which mechanism is operative and why it should occur is uncertain, but fortunately oral potassium controls the symptoms.

A sporadic case of periodic paralysis in which glucose tolerance appeared to be abnormal is described.

Case Report

A 33-year-old engineer complained of attacks of paralysis for 13 years. In the intervals between attacks his health was excellent and he often took part in weight-lifting contests. None of his relatives was similarly affected, nor was there a family history of migraine. The paralysis first occurred in 1943, when he was serving in the Royal Marines. At the end of an evening film show he was unable to rise from his seat because both arms and both legs were weak. All subsequent attacks began between 3 and 7 a.m. In a moderate attack he awoke unable to turn over in bed because his arms were weak and his legs were paralysed but he was able to move his head. Coughing and swallowing became difficult only in the most severe attacks, and speech, breathing, and eye movements were never affected. Micturition was impossible early in an attack, and he was constipated afterwards. Sensation was not disturbed, but his muscles were often painfully stiff next day. Consciousness was never impaired, although he became irritable and apprehensive when paralysed. Nothing was known to precipitate the attacks, but they were sometimes predictable from "a feeling

of stiffness" a few hours beforehand. They could not be "worked off," rarely followed undue exertion, and were unaffected by cold weather or a hot bath.

Most of the attacks were of mild-to-moderate severity, and the patient gradually recovered from them in from four to ten hours. With assistance he was able to eat meals and smoke a cigarette while paralysed, and after a few hours he was able to sit propped up in a chair even though his legs were useless. At first he suffered only three or four attacks a year, but their frequency increased, and in 1955 he had more than a dozen. Shortly before admission he gave up drinking beer (which contains potassium) and instead often ate sweets in the evenings. Attacks then occurred two to three times a week. He had no other complaints apart from infrequent unilateral headaches.

A provisional diagnosis of familial periodic paralysis was made when he was in the Services, but the only treatment he received was psychotherapy. In 1953 his complaint was again thought to be hysterical after brief investigation in hospital. He was later advised to take "Kruschen salts" (potassium 0.12 g. per drachm, or 3%) by a local chemist, but derived no benefit from this.

On examination after admission on March 5, 1956, the patient looked well, his physique was excellent, and no abnormal physical signs were found. The blood pressure was 120/80 mm. Hg, there was no proteinuria or glycosuria, and the specific gravity of the urine was 1016.

Investigations.—Haemoglobin, 15.7 g. per 100 ml.; blood urea, 24 mg. per 100 ml.; blood cholesterol, 200 mg. per 100 ml.; plasma bilirubin, 0.6 mg. per 100 ml.; alkaline phosphatase, 9 units; thymol turbidity, 6 units; zinc sulphate, 1 unit. Plasma electrolytes: potassium, 4.5 mEq/l.; sodium, 146 mEq/l.; bicarbonate, 29.7 mEq/l.; chloride, 90 mEq/l. Urinary steroids: 17-ketosteroids, 19 mg./24 hours; 17-ketogenic steroids, 20 mg./24 hours; aldosterone: normal by chromatographic technique (Dr. Ivor Mills). Radio-iodine excretion test: normal thyroid function. X-ray examination of chest and pituitary fossa: normal. Electrocardiogram: sinus rhythm, normal complexes. Urinary potassium: on a daily intake of 100 mEq of potassium, the urinary excretion was 47 mEq and 53 mEq/24 hours, with a normal diurnal variation. During the first induction of paralysis the excretion fell to 19 mEq/24 hours.

Description of Attacks

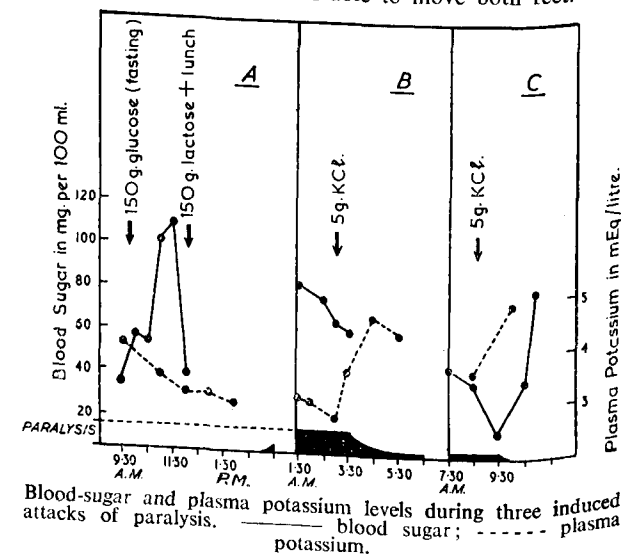
1. When first seen as an out-patient on February 23, 1956, eight hours after the onset of a moderate attack, the patient said that his arms and legs were paralysed. Muscle tone, however, appeared normal, all tendon reflexes were obtained, and with persuasion slight movement of the shoulders occurred. When asked to sit up the patient was unable to do so, although his abdominal muscles were seen to contract and his face flushed with the effort. These findings and the patient's indifference to them suggested a diagnosis of hysteria. This false impression was quickly corrected when the plasma potassium was found to be 2.1 mEq/l., and the E.C.G. showed absent T waves and slight depression of the ST segments.

2. On being told that a balance diet was to start next day, he ate a quantity of fruit and sweets on his second evening in hospital. He awoke next morning (March 7) in a minor attack, during which he was unable to stand up straight or climb stairs. Proximal weakness of all four limbs, most obvious in the hip extensors, was found, although all tendon reflexes were present. The weakness lasted five hours, and three hours after its onset the plasma potassium was 3.7 mEq/l., and the E.C.G. showed slightly decreased amplitude of the T waves.

3. On March 13 the first attempt to induce an attack was made. After a 12-hour fast the patient was given 150 g. of glucose orally at 9 a.m. No weakness developed and he was given 150 g. of lactose with lunch three hours later. At 3.10 p.m. he "felt weak," but the only evidence of this was inability to adduct the extended fingers of the right hand. The plasma potassium fell to 2.9 mEq/l. (see Chart, A), and

the T waves of the E.C.G. became progressively flatter. Weakness of both arms persisted for eight hours, but the tendon reflexes remained brisk.

4. An attack was induced more successfully on March 14. The patient was given 250 g. of lactose with supper at 7.15 p.m. Before going to sleep three hours later he noticed weakness of his left hand and shoulder. At 1.30 a.m. on the 15th he awoke with a partial quadriplegia, affecting his arms more than his legs. Slight movement of his right shoulder was possible and he was still able to move both feet. He



was unable to sit up but could move his head and face normally. His limbs were flail-like and only the ankle-jerks were obtained, although the muscles appeared to retain their tone. The plantar responses were flexor, but the abdominal reflex was present only in the right upper quadrant. The blood pressure was 135/90 mm. Hg. Half an hour later his condition was unchanged and he was given 1 g. of ammonium chloride orally. This was given as a control for his later treatment, because its taste resembles that of potassium chloride. Within the next hour the paralysis of his limbs became complete and the ankle and abdominal reflexes were no longer obtainable. He was therefore given, at 3 a.m., 5 g. of potassium chloride orally. His condition was unaltered 20 minutes later, but after 30 minutes his knee and triceps jerks returned. At 3.35 a.m. he was suddenly able to raise his right elbow from the bed, at 3.50 a.m. he could lift his left leg, at 4.20 a.m. he could move his right foot, and at 4.30 a.m. his left arm suddenly became responsive and stronger than the right one. Although hip extension was weak, he was able to stand unsupported at 5.30 a.m., and two hours later recovery was complete. In this attack the plasma potassium fell to 2.7 mEq/l., and it rapidly rose to normal after the potassium chloride was given (see Chart, B).

5. On March 22 an attempt was made to induce one further attack. The patient was given 300 g. of lactose with supper. On waking next morning his arms were weak and he was unable to move his hands, but his trunk and legs were unaffected. The weakness disappeared in two and a half hours and an E.C.G. showed T waves of normal amplitude. He was then given 150 g. of glucose with breakfast, and, because no weakness followed, a subcutaneous injection of 40 units of soluble insulin was given with lunch three hours later. Again no paralysis occurred, and two hours after the injection the plasma potassium was found to be 3.1 mEq/l. During the night, however, the patient noticed slight weakness of the shoulders and hips, and at 8.30 a.m. next day he was unable to extend the fingers of his right hand. There was demonstrable weakness of hip and elbow extension, but all tendon reflexes were present and the plasma potassium was 3.6 mEq/l. The patient was depressed and irritable and he was noticed to be sweating freely. He was given 5 g. of potassium chloride orally and 45 minutes later he was able

to extend all the fingers of his right hand except the third. His strength recovered fully and he was no longer moody half an hour later. The plasma potassium and blood-sugar changes during recovery are shown (Chart, C).

The Electrocardiogram

Serial E.C.G.s were obtained during the attacks, and the plasma potassium was estimated simultaneously with 22 of them. Flattening, and occasionally disappearance of the T waves with slight ST depression (best seen in Leads II and V5), always accompanied a decrease in the plasma potassium. Although in general the amplitude of the T waves followed the plasma potassium level, there was no exact correspondence between them. The reason for this was apparent in the serial records, which showed that the T-wave changes lagged behind alterations in the plasma potassium level. The time-lag was much shorter than that which often occurs in potassium-depleted subjects (Schwartz *et al.*, 1954), since it lasted only about an hour. A similar delay was observed in the recovery of muscular power after the plasma potassium was restored to normal.

There was no evidence that the E.C.G. was abnormally sensitive to changes in the plasma potassium, whether these were induced by carbohydrate, adrenaline, or insulin. An intravenous injection of 2 units of insulin, for example, produced the same degree of T-wave flattening and ST depression as it did in a control subject, and when the patient was fasting no alteration occurred.

Because hypokalaemia was recognizable from the E.C.G., a half-hourly record of Lead II was made throughout one night in order to discover whether the patient's plasma potassium level decreased significantly during sleep. No change in the T waves was observed, although the patient remained asleep for six hours.

Glucose Tolerance

Various tolerance tests were performed while the patient was on a diet containing 300 g. of carbohydrate, supplemented by the extra amounts used to induce paralysis. The true blood glucose was estimated by the method of King (1951), and the results are shown in the Table in the order in which they were obtained.

In the first test, a delayed rise from a low fasting blood sugar was observed after 150 g. of glucose was given orally. A week later 50 g. of glucose orally produced a "lag" curve; and when this amount was later given intravenously the response was normal. "Hypoglycaemia unresponsiveness" was revealed by a standard intravenous insulin-tolerance test; and when only 2 units of insulin was given intravenously the blood sugar again remained depressed longer than in a control subject. Since neither the intravenous glucose-tolerance test nor a 36-hour fast provoked hypoglycaemia, hyperinsulinism appeared to be excluded.

Two abnormalities are apparent in these results. There was initially a suggestion of increased glucose tolerance, and

there was also prolongation of the response to intravenous insulin. While the difficulty of interpreting tolerance tests is recognized, these findings are thought to be significant because they both independently imply that the storage of glucose was increased. The subsequent tests failed to show an increase in glucose tolerance, but the patient had by then received large amounts of extra carbohydrate and his attacks had become more difficult to induce. Few glucose-tolerance tests are reported in the published cases of periodic paralysis, and it is therefore particularly interesting that an apparent increase in glucose tolerance was also incidentally observed in cases described both by Aitken *et al.* (1937) and by Tyler *et al.* (1951). Their results are included in the Table for comparison. Painter (1955) reported a case with decreased tolerance, but as the patient required large amounts of potassium for several days to restore his plasma level we consider that he was suffering from potassium deficiency and not periodic paralysis. Decreased glucose tolerance is a feature of potassium depletion (Mahler and Stanbury, 1956) as shown by the example in the Table.

The plasma potassium levels observed during the carbohydrate tolerance tests are also shown in the Table. Acute fluctuations in level between estimations were excluded by serial E.C.G.s recorded throughout each test. The results show that in this patient the plasma potassium responded normally both to 50 g. and to 150 g. of glucose. Orally and intravenously, 50 g. failed to induce hypokalaemia, while the depression which followed 150 g. was not significantly greater than was found in the healthy control. It is of interest that the fall in plasma potassium after 150 g. of glucose was more profound in the case of potassium-losing nephritis than in either the patient or the control subject.

Progress

On discharge from hospital the patient was advised to restrict his carbohydrate intake and to take 1 g. of potassium chloride orally every night. Within a fortnight two attacks occurred, both of which were promptly relieved by 5 g. of potassium chloride. He has since remained free from attacks for three months on an unrestricted diet, while taking 2 g. of potassium chloride daily. If the potassium supplement is omitted for only one day attacks are apt to occur after sweets are eaten.

Discussion

The history and the biochemical findings in this case are typical of sporadic periodic paralysis. Hypokalaemic paralyses followed ingestion of carbohydrate, and the attacks were both relieved and prevented by small doses of potassium chloride. Muscle function, the E.C.G., and the plasma potassium were normal between attacks, and there was no evidence of hyperthyroidism, which occasionally precipitates the onset of the disease (Linder, 1955). During induction of an attack the excretion of potassium and creatinine in the urine decreased in the characteristic manner.

Results of Glucose- and Insulin-tolerance Tests

	Blood Sugar in mg. per 100 ml. at:													Comments	
	Fasting	20 mins.	Hours												
			½	1	1½	2	2½	3	3½	4	5	6	7		
Case of Aitken <i>et al.</i> (1937)	66	37	50	84	101	80	73							Increased glucose tolerance	
50 g. glucose orally															" "
Case T. K. B., Tyler <i>et al.</i> (1951)	72		79	88	72	85		68	82					" "	
100 g. glucose orally	(4.7)			(3.6)		(3.7)			(4.0)					" "	
Present case:															
150 g. glucose orally	36		58	55	104	112	41								" "
	(4.0)				(3.4)		(3.1)								" Hypoglycaemia unresponsiveness "
10 units soluble insulin i.v.	90		50	48	56	65		148							" Lag response "
50 g. glucose orally			(3.6)												
50 " " i.v.	98	146	260	77	67	86	77								
	(4.1)	(4.0)	(4.0)		(4.3)		(4.2)							Normal	
Control subject:		246								75	72	80	73		
150 g. glucose orally	61		175	154	74	77	34							" "	
Potassium-losing nephritis:	(4.3)						(3.6)								
150 g. glucose orally	75		128	164	125	144	45	54						Decreased glucose tolerance	
	(4.7)						(3.0)	(3.7)							

Figures in parentheses are plasma potassium in mEq/l.

Chronic potassium depletion was indirectly excluded by finding a normal plasma bicarbonate, no increase in urinary aldosterone, and a diurnal variation in the urinary excretion of potassium, which was itself within the normal range (Evans *et al.*, 1954). The depression of the plasma potassium by moderate doses of glucose was within normal limits, and it was less than that which occurred in a patient with potassium depletion. Large amounts of carbohydrate were required to induce paralysis, and with repeated attempts both the severity of the paralysis and the depression of the plasma potassium diminished. Talbott (1941) and Gass *et al.* (1948) also noted that attacks became more difficult to induce after repeated attempts.

The physical signs which appeared when the patient was paralysed were somewhat misleading. The paralysis was extremely variable in extent and severity, ranging from weakness of one finger to complete quadriplegia. The tendon reflexes were absent when paralysis was severe, but they returned during recovery before voluntary movement was possible. Furthermore, in slighter attacks the reflexes were retained despite widespread weakness. Sporadic periodic paralysis is often confused with hysteria, and in making the correct diagnosis the typical history is more helpful than the physical signs.

Gass *et al.* (1948) failed to establish an exact relationship between the severity of the paralysis and the plasma potassium level. Although the two severe attacks in our patient were associated with considerable hypokalaemia, in one of them the paralysis and the E.C.G. changes persisted for some time after the plasma potassium was restored to normal. Minor paralytic attacks occurred at low normal potassium levels, while levels lower than these were sometimes found when the patient was not paralysed. These findings make the occurrence of exceptional cases without hypokalaemia less remarkable, and, since the actual level of the plasma potassium is thus relatively unimportant, another factor must be responsible for the muscular dysfunction.

The abnormal mobility of potassium in this disease may be due to altered cellular permeability, to an unrecognized deficiency of tissue potassium, or to an increased demand for potassium in carbohydrate metabolism (Gass *et al.*, 1948). Of these alternatives the last-mentioned is perhaps the most likely, since paralysis follows carbohydrate ingestion, and potassium is known to participate in carbohydrate metabolism. Although carbohydrate metabolism is apparently qualitatively normal in this disorder, a quantitative disturbance may exist. The finding of increased glucose tolerance in our case and in those of Aitken *et al.* (1937) and Tyler *et al.* (1951) is thus relevant, since more potassium will be utilized if the normal process of glucose storage is exaggerated. The fact that a steadily falling blood-sugar level was twice found during attacks in our patient is in keeping with this suggestion, particularly since very low values were recorded on the second occasion.

Possibly, then, hypokalaemic paralysis follows ingestion of large quantities of carbohydrate simply because the mechanism for dealing with glucose is over-efficient, at the expense of the available potassium. When a small daily supplement is added to the pool of available potassium undue hypokalaemia is avoided and attacks no longer occur. Gass *et al.* (1948) thought that paralysis occurred because the contractile systems in muscle were deprived of adequate potassium, and this view is supported by the findings of Beccuau *et al.* (1955). These workers showed that attacks of periodic paralysis were relieved by adenosine triphosphate. This substance is the immediate source of energy in muscular contraction, and potassium is essential for its formation (Boyer *et al.*, 1943). The hypokalaemic paralysis may thus be analogous to that which is occasionally seen a few hours after glucose and insulin are given to patients with diabetic ketosis (Nabarro *et al.*, 1952). Admittedly the available potassium is already depleted in the diabetic cases before glucose storage is accelerated, but in attacks of periodic paralysis relative depletion may eventually develop. The fact

that hypokalaemia and paralysis become less easy to induce when large amounts of carbohydrate are repeatedly given suggests that the storage mechanism can become saturated. Conversely, patients are often more susceptible to attacks after exertion, when muscle glycogen is depleted.

Although the evidence on which it rests is scanty, several features of the disease support this theory. Periodic paralysis is relieved by limiting carbohydrate intake, and the potassium needed to prevent attacks is quantitatively related to the carbohydrate in the diet (Ziegler and McQuarrie, 1952). The condition is said to improve after middle age (Talbott, 1941), when a decrease in carbohydrate tolerance commonly occurs (Himsworth and Kerr, 1939). Attacks usually begin in the early morning, and since symptoms also tend to occur at this time in spontaneous hypoglycaemia it would appear that glucose storage is particularly active during the night. Irrespective of the time of day, the attacks are apt to start during sleep (Couston, 1955), when anabolism exceeds catabolism in the inactive muscles. Genetic disorders of carbohydrate metabolism are not unknown, and a similar familial incidence is found in idiopathic infantile hypoglycaemia (McQuarrie, 1954). Hypokalaemic paralyses have not been observed in this condition or in hyperinsulinism, but in the latter disorder (Conn, 1947) and in glycogen-storage disease (Crevel, 1939) muscular weakness occurs.

Zierler and Andres (1956) showed that there is a diurnal variation in potassium exchange between skeletal muscle and the extracellular fluid in normal subjects. Potassium tends to move into muscle during the night, and to leave muscle during the day. During the spontaneous development of a nocturnal attack of periodic paralysis, they observed a similar but much more extensive transfer of potassium into the forearm muscles. They therefore suggested that exaggeration of the normal diurnal variation in potassium exchange, due to unusual permeability of muscle membrane, is a fundamental defect in this disease. In the present case, however, there was no electrocardiographic evidence that hypokalaemia occurred spontaneously during the night, nor was the diurnal variation in urinary potassium excretion exaggerated. Hypokalaemic attacks were always related to carbohydrate ingestion, and only then was the excretion of potassium in the urine considerably reduced.

Since potassium normally moves into cells during glucose assimilation, the increased migration in periodic paralysis is again most simply explained by assuming that glucose assimilation is excessive. Zierler and Andres (1956) detected a disturbance of glucose metabolism in their cases, but no details of it were given in the brief report of their work. Grob *et al.* (1956) showed that after glucose administration the uptake of potassium by the muscles was greater than normal in periodic paralysis. They also found that in this condition insulin produced a migration of potassium into the muscles, which did not occur in normal subjects. In our patient insulin produced an abnormally prolonged depression of the blood sugar.

Many facts thus support the earlier suspicions of Allott and McArdle (1938) that "the activity of a normal mechanism involving hexosephosphate may be excessive in periodic paralysis." Our investigations suggest that the potassium migration, the hypokalaemia, and the paralysis are all secondary effects of overactive glucose storage. The qualitative response of these patients to influences affecting glucose assimilation seems to be normal, but the rate of assimilation, particularly in muscle, is apparently increased.

Summary

A sporadic case of periodic paralysis is described and the features of this condition are outlined.

A glucose-tolerance test in this patient revealed an apparent increase in tolerance, and an intravenous insulin-tolerance test showed "hypoglycaemia unresponsiveness."

The significance of these findings is discussed, and it is suggested that in this disease the rate of glucose storage is excessive following the ingestion of large amounts of carbohydrate.

We thank Dr. C. L. Cope for his interest and advice, and for allowing us to investigate this patient; Dr. M. D. Milne for helpful comment; and Dr. M. E. MacGregor for anticipating the diagnosis by 13 years. We are indebted to Miss Margaret Mathew for performing the biochemical estimations, and to our patient for his willing co-operation.

REFERENCES

- Aitken, R. S., Allott, E. N., Castleden, L. I. M., and Walker, M. (1937). *Clin. Sci.*, 3, 47.
Allott, E. N., and McArdle, B. (1938). *Ibid.*, 3, 229.
Beccuau, M., Velliz, J., Delga, J., and Coirault, R. (1955). *Ann. Méd.*, 56, 437.
Biemond, A., and Daniels, A. P. (1934). *Brain*, 57, 91.
Boyer, P. D., Lardy, H. A., and Phillips, P. H. (1943). *J. biol. Chem.*, 146, 673.
Conn, J. W. (1947). *J. Amer. med. Ass.*, 134, 130.
Couston, T. A. (1955). *Arch. Dis. Childh.*, 30, 193.
Crevel, S. van (1939). *Medicine*, 18, 1.
Danowski, T. S., Elkinton, J. R., Burrows, B. A., and Winkler, A. W. (1948). *J. clin. Invest.*, 27, 65.
Eckert, I. (1953). *J. Pediatr.*, 42, 751.
Evans, B. M., Hughes Jones, N. C., Milne, M. D., and Steiner, S. (1954). *Clin. Sci.*, 13, 305.
Gass, H., Cherkasky, M., and Savitsky, N. (1948). *Medicine (Baltimore)*, 27, 105.
Grob, D., Lilienstein, A., and Johns, R. J. (1956). *J. clin. Invest.*, 35, 708.
Himsworth, H. P., and Kerr, R. B. (1939). *Clin. Sci.*, 4, 153.
Jackson, P. E., and Oakley, C. M. (1955). *British Medical Journal*, 2, 881.
Kins, E. J. (1951). *Microanalysis in Medical Biochemistry*. London.
Linder, M. A. (1955). *Ann. intern. Med.*, 43, 241.
McQuarrie, I. (1954). *Amer. J. Dis. Childh.*, 87, 399.
Mahler, R. F., and Stanbury, S. W. (1956). *Quart. J. Med.*, 25, 21.
Nabarro, J. D. N., Spencer, A. G., and Stowers, J. M. (1952). *Lancet*, 1, 983.
Painter, R. C. (1955). *New Engl. J. Med.*, 252, 213.
Schwartz, W. B., Levine, H. D., and Relman, A. S. (1954). *Amer. J. Med.*, 16, 395.
Talbott, J. H. (1941). *Medicine (Baltimore)*, 20, 85.
Tyler, F. H., Stephens, F. E., Gunn, F. D., and Perkoff, G. T. (1951). *J. clin. Invest.*, 30, 492.
Watson, C. W. (1946). *Yale J. Biol. Med.*, 19, 127.
Zierler, K. L., and McQuarrie, I. (1952). *Metabolism*, 1, 116.
Zierler, K. L., and Andres, R. (1956). *J. clin. Invest.*, 35, 747.

MODIFICATION OF HYPOGLYCAEMIA WITH HEXAMETHONIUM BROMIDE*

BY

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It has been shown by Schachter (1951) that the combination of hexamethonium with insulin results in an augmented hypoglycaemic response, this being attributed to the drug's blocking effect preventing compensatory sympathetic activity in response to the fall of the blood-sugar level. Laurence and Stacey (1951) also observed that the degree of hypoglycaemia produced by a given dose of insulin was greater in the presence of hexamethonium, but that, paradoxically, the ensuing hypoglycaemic symptoms were either reduced or abolished.

In this investigation the effect of the administration of hexamethonium bromide on the response to both large and small doses of insulin is reconsidered, but with particular emphasis as to how far the findings are influenced by alterations in posture.

The reaction to small doses of insulin was assessed by insulin-tolerance tests. Blood-sugar levels were also estimated after injections of large doses of the hormone, but as their values bear no precise relation to the clinical levels of hypoglycaemia (Himwich, 1951a) the response to large doses was therefore determined by attempting to overwhelm the extreme insulin resistance occurring in some schizophrenics during insulin therapy.

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Methods

The insulin-tolerance tests were performed in the manner advocated by Fraser *et al.* (1941), and as the previous diet influences the response to the hormone (Himsworth, 1935) the patients were given at least 300 g. of carbohydrate daily for three days before each of the tests. The blood sugar was estimated by the method of Herbert and Bourne (1930). The reaction of the blood sugar in these tests can be differentiated into two phases: first, the initial decrease of the blood sugar, then the secondary rise which is indicative of the responsiveness to hypoglycaemia. The difference between the fasting and the 30-minute blood-sugar value was adopted as an index of the first function, the mean value of these being determined for the group. As suggested by Fraser and Smith (1941), a measure of the hypoglycaemia responsiveness was obtained from the product of the percentage blood-sugar values at 45, 60, 90, and 120 minutes after the beginning of the test and the time interval of each of these from the previous sample, a quarter of an hour being taken as unity. These products were added together and termed the "hypoglycaemia responsive index" (H.R.I.), the mean value for the H.R.I. being determined for the group.

Patients were therefore subjected first to conventional insulin-tolerance tests; then after the lapse of at least a week they were retested, but in this instance the dose of insulin was supplemented by an intramuscular injection of hexamethonium bromide (25–50 mg.). A variation of this modification was to stand the patient erect after the concomitant injection of insulin and hexamethonium until a vasovagal response with syncope occurred. However, as insulin-tolerance tests were being performed on patients standing erect for approximately 15 minutes after the injection of hexamethonium, it was essential to perform control tests on the same patients who stood erect for a similar period. It is known that the injection of hexamethonium by itself has no significant consistent effect on the fasting blood sugar (Schachter, 1951).

The patients comprising this series were all male schizophrenics, but Hemphill and Reiss (1948) have pointed out that if biochemical investigations are repeated frequently on such patients much day-to-day variation in findings becomes evident. Therefore, as it was intended to compare the results of insulin-tolerance tests repeated at short intervals, it was essential to ensure that sequential tests under standard conditions showed no significant statistical dissimilarity. This was done, and it was seen that although the results of such tests repeated at short intervals on schizophrenics revealed considerable variability, if the mean values of these were assessed for the group the results showed no significant statistical disparity (Marley, 1953a).

No patient was accepted for testing if he was much underweight, if he had been treated within the preceding two months with either electroplexy or deep or modified insulin therapy, or if he had been receiving other drugs regularly within the previous two weeks, as it is known that in such circumstances there are alterations in the fasting blood-sugar levels, in the response to small doses of insulin, or in resting eosinophil counts (Tod, 1937; Gellhorn and Safford, 1948; Henneman *et al.*, 1951; Hunter and Merivale, 1954; Marley, 1955).

A total of 24 patients were given both standard and modified insulin-tolerance tests, each patient serving as his own control for the comparison of sequential tests.

The final part of the investigation comprised the attempted modification of extreme insulin resistance in six male schizophrenics. In three of these cases the patient remained recumbent after the injection of insulin and hexamethonium, whereas the other three patients were stood erect until syncope occurred after the administration of the two substances. In all instances the modified hypoglycaemias were preceded by and separated from the control reaction by a period of at least three rest days. In order that the transitions from one hypoglycaemic level to another could be formulated with precision, a slightly modified form of the classification of

hypoglycaemia proposed by Frostig (1940) was adopted. This includes five phases, the most important being stage 3 hypoglycaemia presenting with loss of consciousness, motor restlessness, clonic twitchings, and torsion spasms; and stage 5 hypoglycaemia, which corresponds to deep coma and is associated with much-reduced or absent corneal reflexes and pin-point pupils without a light reaction. The definition of insulin resistance was arbitrary, and was presumed to be present when no advance beyond a stage 3 hypoglycaemia ensued after the injection of approximately 500 units of insulin.

Eosinophil counts were performed both immediately before the insulin-tolerance tests and during the deep insulin treatments. The initial counts were made at 9 a.m., as the eosinophils tend to become stabilized about this time following the eosinopenia during the early hours of the morning (Rud, 1947). The eosinophils were also counted at 1 p.m., as hypoglycaemia is accompanied by an eosinopenia, which is most marked four hours after stress (Perlmutter and Mufson, 1951). The differences between the 9 a.m. and 1 p.m. counts were calculated, and were termed the mean eosinopenia. Capillary blood was used in eosinophil counting, and both the technique and the phloxine-urea diluent proposed by Manners (1951) were employed, the results being determined from the mean of two pipette counts.

In the attempt to produce syncope the patient would be stood erect immediately after the injection of the insulin and the hexamethonium, and would be supported by two attendants. It was usual for the patient to collapse within 15 minutes, and, following this, frequent estimations of the blood pressure and the pulse rate would be made. In order to record the cardiovascular changes accurately, Grant and Reeve's (1951) classification of circulatory patterns associated with injury was employed. The only patterns seen in the present investigation were the vasovagal and, in one instance, that of warm hypotension. Methylamphetamine hydrochloride was always immediately available for injection as it accelerates recovery after vasovagal collapse (McMichael, 1945).

Modification of Response to Small Doses of Insulin

The mean percentage blood-sugar values for the results of the standard insulin-tolerance tests and those modified with hexamethonium bromide in recumbent patients are depicted in Fig. 1, the other related findings being included in Table I, A and B. It can be seen from these that the combination of small doses of insulin with hexamethonium results in an augmented hypoglycaemic effect but a diminished response to hypoglycaemia with a decline in the mean eosinopenia. On further analysis of these figures it becomes clear that the increased fall in blood sugar after insulin and hexamethonium is statistically significant

($t=5.06$; $P<0.05$), as is the decrease in the mean H.R.I. ($t=3.22$; $P<0.05$) but not the decrease in the mean eosinopenia ($t=1.25$; $P>0.05$).

The results of the comparison of insulin-tolerance tests with those modified by the induction of syncope are considered next, the relevant data being presented in Fig. 2 and Table I, C, and D. It is apparent from these that the induction of syncope with hexamethonium leads to a significantly diminished fall of blood sugar ($t=3.85$; $P<0.05$), a significant increase of the mean H.R.I. ($t=2.28$; $P<0.05$), but an insignificant decrease of the mean eosinopenia ($t=1.17$; $P>0.05$). The assumption of the erect posture in the absence of syncope seems also to modify the test results, inasmuch that the standard deviations were consistently lower in this series (Table I, C) than those obtaining in the other tests.

Marked dilatation of the pupils occurred in the tests modified with hexamethonium, and was presumably due to the effect of the drug rather than to hypoglycaemia. Perspiration also seemed to be reduced by hexamethonium. All patients received their normal breakfasts after the completion of

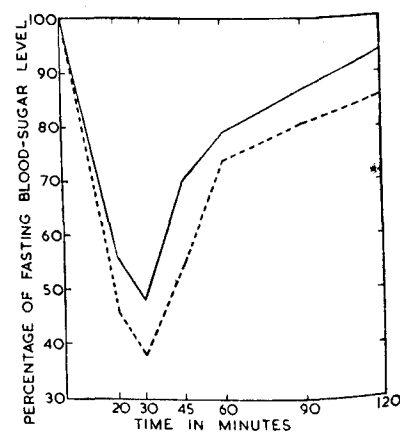


FIG. 1.—Mean percentage blood-sugar levels for standard and modified insulin-tolerance tests in recumbent patients. Continuous line=standard insulin-tolerance tests (12 patients). Interrupted line=Insulin-tolerance tests modified with hexamethonium bromide (12 patients).

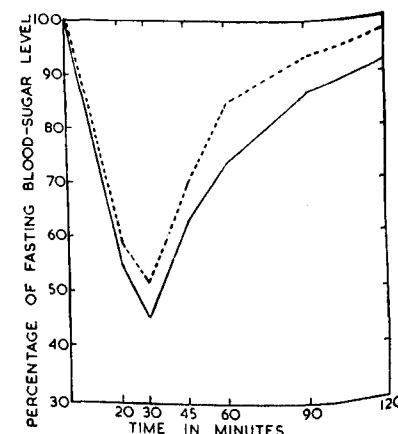


FIG. 2.—Mean percentage blood-sugar levels for standard and modified insulin-tolerance tests in patients temporarily erect. Continuous line=Standard insulin-tolerance tests (12 patients). Interrupted line=Insulin-tolerance tests modified with hexamethonium bromide (12 patients).

TABLE I

		Blood-sugars (percentages of fasting level)						Hypo- glycaemic Effect (%)	H.R.I. (Units)	Eosino- penia (%)	
		Fasting	20 min.	30 min.	45 min.	60 min.	90 min.				120 min.
A. Results of Insulin-tolerance Tests on 12 Recumbent Patients											
Mean	.. ..	100	56.1	47.7	69.9	79.4	87.3	93.9	52.3	511.8	79.8
Range	.. ..	—	40.65	36.59	49.98	62.104	67.116	74.121	41.64	410.674	49.98
Standard deviation	.. ..	—	4.53	7.66	13.53	14.25	15.36	10.69	7.62	72.82	15.27
B. Results of Insulin-tolerance Tests Modified with Hexamethonium (12 Recumbent Patients)											
Mean	.. ..	100	46.1	38.1	54.9	74.2	80.9	85.6	61.9	461.9	68.2
Range	.. ..	—	38.55	25.54	41.78	56.104	59.99	67.103	46.75	358.569	35.98
Standard deviation	.. ..	—	5.47	8.97	10.70	12.34	12.62	11.39	9.15	64.23	20.75
C. Results of Insulin-tolerance Tests on 12 Patients Stood Temporarily Erect											
Mean	.. ..	100	55.2	45.7	62.7	74.2	86.5	92.1	54.3	494.3	83.2
Range	.. ..	—	46.74	36.55	51.76	58.95	77.97	80.108	45.64	460.546	65.95
Standard deviation	.. ..	—	6.70	4.69	8.20	9.00	8.06	7.44	4.57	30.81	7.81
D. Results of Insulin-tolerance Tests Modified with Syncope (12 Patients)											
Mean	.. ..	100	58.6	51.4	70.4	84.8	94.0	98.3	48.6	539.9	79.8
Range	.. ..	—	35.80	40.64	49.100	63.112	67.115	79.110	36.60	417.632	48.97
Standard deviation	.. ..	—	11.10	6.54	14.08	13.75	13.60	11.51	6.52	69.77	15.07

the tests, and even in the case of those who had received hexamethonium with insulin there was no instance of later hypoglycaemic or hypotensive episodes.

Modification of the Response to Large Doses of Insulin

Only a précis of the findings will be presented, as the clinical results of the modification of the reaction to large doses of insulin are presented elsewhere (Marley, 1956).

The administration of hexamethonium bromide to recumbent insulin-resistant schizophrenics receiving deep insulin therapy led to more profound levels of hypoglycaemia than obtained with insulin alone. Thus in three patients doses of respectively 480, 480, and 560 units of insulin given intramuscularly led barely after 210 minutes to the appearance of a stage 3 hypoglycaemia. When the identical doses of insulin were combined in the same patients with 100 mg. of hexamethonium, injected subcutaneously or intramuscularly, a stage 5 hypoglycaemia developed within the same period.

The technique of inducing syncope with hexamethonium early in hypoglycaemia was more successful still. For instance, in another three patients doses of 520, 560, and 640 units of insulin injected intramuscularly failed after 210 minutes to produce even a stage 3 hypoglycaemia, whereas doses of 480, 480, and 520 units in the same patients, but combined with 100–150 mg. of hexamethonium and a syncope induced early in hypoglycaemia, resulted within 150–180 minutes in the emergence of a stage 5 hypoglycaemia.

In both types of modification with hexamethonium the hypoglycaemias differed from the conventional response to insulin in that the customary profuse salivation and perspiration were much reduced and even completely abolished in one patient. Comas tended to develop much more rapidly, and it was noted that the deepest level of hypoglycaemia was accompanied by widely dilated pupils in place of the pin-point pupils that are normally to be anticipated. It was found imperative to terminate the modified hypoglycaemias by the intravenous route, as the stomach appeared not to absorb substances following the combination of insulin with hexamethonium, and even after intravenous interruption the period for complete recovery was longer than that after insulin alone. It was also necessary to keep the patient in bed until the effect of the hexamethonium had worn off, for there was a marked susceptibility to further hypoglycaemic reactions, apparently determined by the assumption of the erect posture.

The blood-sugar levels for both the conventional and the modified hypoglycaemias are shown in Table II, and, although both pursue a very similar pattern, there is a tendency for the blood sugar to fall to lower levels at an earlier stage with the modified than with the orthodox insulin techniques.

In addition, the eosinopenias associated with both types of hypoglycaemia are included in Table III. It can be seen that the decline of the eosinophils in the modified techniques was sometimes greater and sometimes less than in the eosinopenias accompanying the control reactions.

TABLE II.—Reaction to Large Doses of Insulin: Blood-sugar Values (mg. per 100 ml.) for Conventional and Modified Insulin Techniques

Case No.	Conventional Insulin Techniques						Modified Insulin Techniques					
	1	2	3	4	5	6	1	2	3	4	5	6
Insulin (units)	480	480	560	520	560	640	480	480	560	480	480	520
Hexamethonium (mg.)	—	—	—	—	—	—	100	100	100	150	100	100
Posture	R	R	R	R	R	R	R	R	R	S	S	S
Blood sugar:												
7.30 a.m.	75	79	104	75	91	86	71	88	97	79	79	91
8.00 "	67	68	43	57	34	61	56	67	73	45	33	58
8.30 "	58	56	30	31	29	32	43	65	53	27	24	30
9.15 "	52	43	33	25	20	25	27	49	33	22	19	21
10.00 "	47	27	25	23	25	24	16	35	28	21	18	19
10.45 "	42	29	30	17	24	23	25	21	24	18	15	18
Stage of hypoglycaemia	1	2	1	3	2	3	5	5	5	5	5	5

R=Recumbent. S=Syncope induced.

TABLE III.—Reaction to Large Doses of Insulin: Eosinopenias Accompanying Conventional and Modified Insulin Techniques

Case No.	Conventional Insulin Techniques		Eosinopenia %	Modified Insulin Techniques		Eosinopenia %
	9 a.m.	1 p.m.		9 a.m.	1 p.m.	
1	—	—	87	136	—	95
2	137	17	68	320	50	84
3	498	160	94	115	21	82
4	160	11	96	84	12	85
5	79	3	90	108	3	97
6	101	10	—	—	—	—

Cardiovascular Responses Following Combination of Insulin with Hexamethonium

In the erect subject the radial pulse would increase in rate and decrease in volume until syncope occurred. The latter was vasovagal in character and usually brief in duration. In two patients this vasovagal pattern—that is, a systolic blood pressure below 100 mm. Hg, a pulse rate of 70 or fewer beats a minute, cold extremities with pallor of the facies—persisted for longer than 15 minutes. In another instance the brief vasovagal pattern was succeeded by that of warm hypotension, which by definition includes a systolic blood pressure below 100 mm. Hg, a pulse of 90 or more beats a minute, warm extremities, and a face that might be flushed or pale. No irregularity of the pulse was noted after syncope, and the peripheral circulation invariably improved without recourse to methylamphetamine hydrochloride.

Discussion

The finding of an increased hypoglycaemic effect of small doses of insulin following the administration of hexamethonium confirms, but is still merely a restatement of, the conclusions of Laurence and Stacey (1951) and Schachter (1951), although these authors make no mention of the subsequent delayed and reduced recovery from hypoglycaemia as was observed in the tests on recumbent patients. The increased resistance to the hypoglycaemic effect of small doses of insulin following syncope has, so far as is known, not been recorded, and seems reminiscent of the work of Selye and Dosne (1939), who demonstrated that insulin hypoglycaemia may be reduced although not completely abolished by the simultaneous administration of cortin. A similar diminished response to insulin has been recorded after the injection of toxin (Lawrence and Buckley, 1927), during artificial pyrexia (Ohtake, 1939), after short periods of anoxia (Gellhorn and Packer, 1939), and in association with electric shock (Delay and Soulaire, 1944).

It was Engel (1949) who suggested that an increased need for carbohydrate was the first effect of stress, and it is therefore topical that the induction of syncope with hexamethonium results in a significant hyperglycaemia and eosinopenia (Marley, 1953b). Previously, Engel (1945) had stated that the initial rise of blood sugar after stress was due to the hepatic glycogenolysis by adrenaline, and that it was only later that endogenous adrenal cortical hormone secretion

reached levels sufficient to initiate the protein catabolic impulse. Presumably it is the initial and exaggerated adrenaline response that accounts for the diminished hypoglycaemic effect seen in the insulin-tolerance tests modified by syncope. That this is not so paradoxical as it might seem is confirmed by Paton (1954), who mentions that vigorous adrenal medullary discharge can take place in the presence of ganglion block by hexamethonium.

An apparently different result accrued from the combination of hexamethonium with massive doses of insulin, for not only was there an increased depth of clinical hypoglycaemia in recumbent insulin-resistant schizophrenics, but also the induction of syncope with hexamethonium early in hypoglycaemia proved even more effective in overwhelming insulin resistance. Himwich (1951b) described three mechanisms to prevent the complete cessation of brain metabolism during hypoglycaemia. The most valuable of these was the release of hepatic glucose to the blood stream, for it not only acted over a longer period than the other but was quantitatively the most important. It would seem that the induction of syncope with hexamethonium so expedites this second mechanism that even in association with an augmented protein catabolic impulse the stored reserve of carbohydrate is not later available for implementing cerebral metabolism.

Laurence and Stacey (1951) were also at pains to point out that one of the practical applications of their investigation was the recognition of the additional risk incurred by diabetics receiving both insulin and hexamethonium, for such patients were very liable to develop hypoglycaemia in the absence of the usual signs and even to lose consciousness without warning. From the above investigations, this would seem a negligible hazard if the dose of insulin is small; however, in view of the increased sensitivity to insulin following the combination of large doses of the latter with hexamethonium, it is obvious that if large doses of the hormone are required for the satisfactory control of the diabetes, and particularly if the patient has also the tendency to develop hypotensive attacks after the injection of the ganglion-blocking drug, then the risk of hypoglycaemia is considerably augmented. In such an instance, great emphasis should be placed upon restricting the dose of either insulin or hexamethonium and insisting that these patients should remain recumbent until the likelihood of postural hypotension has worn off.

It would be no exaggeration to comment that the assumption of the erect posture in such patients is tantamount to a vastly increased liability to hypoglycaemic episodes further complicated by the fact that they are atypical in presentation. Moreover, while the oral administration of glucose is satisfactory for aborting early and minimal hypoglycaemic symptoms in a patient receiving both hexamethonium and small doses of insulin, once deeper hypoglycaemic levels have appeared, particularly coma, then the administration of sugared water either orally or by stomach tube is both valueless and dangerous. Interruption in this case must be by the intravenous route, a stricture endorsed by the work of Kay and Smith (1950) and Douthwaite and Thorne (1951), who reported that hexamethonium interferes with the motility and secretion of the stomach.

The fall of eosinophils was thought originally to be a specific if indirect index of adrenocortical activation, but this view has now been discarded, as in certain circumstances it proved to be misleading (Bayliss, 1955). Consequently it would be presumptuous to offer any categorical interpretation of the alterations in the values for the eosinophil counts. Speirs and Meyer (1949) had demonstrated that by increasing the amount of stress a greater fall of eosinophils ensued, but the eosinopenia following syncope and insulin was sometimes in excess and sometimes less than that recorded with conventional insulin techniques. The same was found for the combination of small doses of insulin and hexamethonium, although in the latter if the eosinopenia was determined for the group it was found to be diminished in

comparison with the eosinopenia associated with standard insulin-tolerance tests. It is therefore interesting that Gaarenstroom *et al.* (1953) noted that hexamethonium delayed the eosinopenia normally occurring in rats following blood sampling.

The decrease in salivation after hexamethonium is in accord with the experimental findings for animals, as Paton (1951) reported that the parasympathetic ganglion to the salivary glands was the most sensitive of all ganglia to the action of the drug. He also commented on the decrease of perspiration with hexamethonium.

Finally, it is worth alluding to the large values of the standard deviations for the test results, as they are a constant feature of investigations performed on schizophrenics (Hoskins, 1946) and not entirely attributable to the small size of the samples here under scrutiny.

Summary

The combination of small doses of insulin and hexamethonium in recumbent patients results in an augmented hypoglycaemic effect but a decreased response to hypoglycaemia with a decline in the eosinopenia.

The combination of large doses of insulin with hexamethonium in recumbent patients leads to more profound depths of clinical hypoglycaemia.

The combination of small doses of insulin with syncope induced by hexamethonium leads to the appearance of relative insulin resistance associated with an augmented hypoglycaemic response.

In contradistinction, the combination of large doses of insulin with hexamethonium and the induction of syncope early in hypoglycaemia is capable of significantly diminishing resistance to massive doses of this hormone.

The risks incurred by diabetics receiving both insulin and hexamethonium are re-emphasized.

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REFERENCES

- Bayliss, R. I. S. (1955). *British Medical Journal*, **1**, 495.
 Delay, J., and Soulaire, A. (1944). *C.R. Soc. Biol. (Paris)*, **138**, 490.
 Douthwaite, A. H., and Thorne, M. G. (1951). *British Medical Journal*, **1**, 111.
 Engel, F. L. (1945). *J. Mt. Sinai Hosp.*, **12**, 152.
 — (1949). *Endocrinology*, **45**, 170.
 Fraser, R., Albright, F., and Smith, P. H. (1941). *J. clin. Endocr.*, **1**, 297.
 — and Smith, P. H. (1941). *Quart. J. Med.*, **10**, 297.
 Frostig, J. P. (1940). *Amer. J. Psychiat.*, **96**, 1167.
 Gaarenstroom, J. H., Lounerens, B., and Smelik, P. G. (1953). *XIX Int. Physiol. Congr. Montreal*, p. 370.
 Gelhorn, E., and Packer, A. C. (1939). *Proc. Soc. exp. Biol. (N.Y.)*, **41**, 345.
 — and Safford, H. (1948). *Ibid.*, **68**, 74.
 Grant, R. T., and Reeve, E. B. (1951). *Spec. Rep. Ser. med. Res. Coun. (Lond.)*, No. 277, 1st ed., p. 224. H.M.S.O., London.
 Hemphill, R. E., and Reiss, M. (1948). *Proc. roy. Soc. Med.*, **41**, 533.
 Henneman, D. H., Altschule, M. D., and Siegel, E. (1951). *J. appl. Physiol.*, **3**, 411.
 Herbert, F. K., and Bourne, M. C. (1930). *Biochem. J.*, **24**, 299.
 Himsworth, H. P. (1935). *Clin. Sci.*, **2**, 67.
 Himwich, H. E. (1951a). *Brain Metabolism and Cerebral Disorders*, 1st ed., p. 277. Baltimore.
 — (1951b). *Ibid.*, p. 61.
 Hoskins, R. G. (1946). *The Biology of Schizophrenia*, 1st ed., p. 158. New York.
 Hunter, R. A., and Merivale, W. H. H. (1954). *Guy's Hosp. Rep.*, **103**, 375.
 Kay, A. W., and Smith, A. N. (1950). *British Medical Journal*, **1**, 460.
 Laurence, D. R., and Stacey, R. S. (1951). *Lancet*, **2**, 1145.
 Lawrence, R. D., and Buckley, O. B. (1927). *Brit. J. exp. Path.*, **8**, 58.
 McMichael, J. (1945). *Brit. med. Bull.*, **3**, 105.
 Manners, T. (1951). *British Medical Journal*, **1**, 1429.
 Marley, E. (1953a). M.D. Thesis, p. 50. Cambridge.
 — (1953b). *Ibid.*, p. 55.
 — (1955). *J. Neurol. Neurosurg. Psychiat.*, **18**, 280.
 — (1956). *J. ment. Sci.*, **102**, 576.
 Ohtake, I. (1939). *Jap. J. exp. Med.*, **17**, 249.
 Paton, W. D. M. (1951). *British Medical Journal*, **1**, 773.
 — (1954). In *Lectures on the Scientific Basis of Medicine*, **2**, 162. London.
 Perlmutter, M., and Mufson, M. (1951). *J. clin. Endocr.*, **11**, 277.
 Rud, F. (1947). *Acta psychiat. (Kbh.)*, Suppl. 40, p. 353.
 Schachter, M. (1951). *J. Physiol. (Lond.)*, **115**, 206.
 Selye, H., and Dosne, C. (1939). *Proc. Soc. exp. Biol. (N.Y.)*, **42**, 580.
 Speirs, R. S., and Meyer, R. K. (1949). *Endocrinology*, **45**, 403.
 Tod, H. (1937). *Edinb. med. J.*, **44**, 416.

UMBILICAL CORD AS RESERVOIR OF INFECTION IN A MATERNITY HOSPITAL

BY

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Although much work has been done in recent years on *Staph. aureus* infections in maternity hospitals, the problem remains widespread and unsolved. Most hospitals experience outbreaks every few years, and sporadic cases occur at intervals in spite of all precautions. Minor infections such as spots and sticky eyes are a source of anxiety, and the occasional severe ones may cause death or prolonged illness. The fact that *Staph. aureus* is able to acquire resistance to antibiotic drugs means that treatment is likely to become more difficult and uncertain. Greater stress must therefore be laid on prevention.

From the bacteriological point of view there seem to be two aspects of the problem: (1) The ubiquity of *Staph. aureus* in a nursery as judged by the high proportion of positive samples from babies, the bedding, and other articles, and from the atmosphere. No other pathogenic organism is so widely distributed in the environment of a susceptible population. (2) The presence of some strains of increased virulence (Colbeck, 1949; Rountree and Freeman, 1955). At present there is no rapid or straightforward method of detecting virulent strains and excluding their carriers.

The problem which confronts us is therefore mainly one of cross-infection: how and where the staphylococci are maintained and how they spread from one patient to another.

The problem of cross-infection may be attacked from two angles: elimination of the reservoirs where the organisms flourish, and interruption of the routes by which they are spread. This paper is concerned mainly with the first of these points. There are many reservoirs of *Staph. aureus* in a nursery for newborn infants, but the nature of the umbilical cord suggests that it might be a particularly dangerous one. Cut off from its blood supply and separating by a process of dry gangrene, it must be an excellent medium for bacterial multiplication, as Cullen pointed out in 1916. The cord was described by Coventry and Isbister (1951) as an open wound with decreased powers of local resistance. Recent papers by Kwantes and James (1956) and Boissard and Eton (1956) on streptococcal infection support this analogy. The importance of such a wound has long been stressed by workers on hospital cross-infection. It has been shown how the dangers of spread from it may be decreased by the use of no-touch technique in a room supplied with filtered air, and by the protection of the wound with local applications under ample dressings. In contrast with this, it has become the custom recently in many maternity hospitals to do without cord dressings and binders, so that the cord stump is left in direct contact with the baby's clothes and bedding, and freely accessible to its hands. It is also handled every day by nurses who do not wear gloves. It thus seems to be ideally situated not only for the growth of organisms but also for their dissemination into the environment both by contact and by the air.

The umbilical cord has long been recognized as a site from which *Staph. aureus* may readily be recovered

(Cullen, 1916). Forfar *et al.* (1953) swabbed 120 babies at the time of separation of the cord (about the eighth day of life) and found an infection rate of 60%. Edmunds *et al.* (1955) recorded a rate of 40% in 604 infants of the same age. Coventry and Isbister (1951) found 54% of 50 babies to be carrying *Staph. aureus* on the cord by the third to fourth day and remarked on the special dangers of infection of this site. Isbister made further studies in 1951 and 1953. Her interest, however, was mainly clinical. She considered that infection of the cord might result in unsuspected liver damage, which in turn might be responsible for "physiological jaundice" and failure to thrive. The obvious complication of liver abscess and septicaemia is better known but rare.

The purpose of this paper is to draw attention to the cord as one of the main sources of staphylococci and to advance evidence that control of this reservoir more than others might be expected to lead to a diminished risk of virulent staphylococci being spread in a nursery.

Earlier Investigations

The investigations were made in a new maternity hospital, but earlier ones had been made in other maternity hospitals in the district to establish the extent of the problem. In these earlier investigations 74 babies out of 84, aged 4 days (88%), had given positive umbilical swabs in one hospital and 50 out of 59 (85%) in another. Nasal swabs had also been taken in these hospitals in an attempt to find out which was the more important reservoir of infection, nose or cord. In Table I are shown the results of the examination of swabs of cord and nose to determine which site was infected first, and it appears that the cord was almost always infected before or at the same time as the nose. It was rare for the nose alone to be positive.

TABLE I.—Number of Times that the First Positive Swab was Obtained From Nose or Cord

Hospital	Nasal Swab Pos. First	Cord Swab Pos. First	Both Swabs Positive	Total No. of Swabs
A	7	34	19	60
B	6	37	24	67

tion of swabs of cord and nose to determine which site was infected first, and it appears that the cord was almost always infected before or at the same time as the nose. It was rare for the nose alone to be positive.

It was also thought to be of some importance to make a rough comparison of the amount of growth obtained from nasal and cord swabs taken in the first four days of life. Cord swabs proved to give a heavy growth of *Staph. aureus* more often than nasal ones, and the organism was frequently in pure culture. The results are shown in Table II.

TABLE II.—Rough Comparison of Amount of Growth Obtained From Nasal and Cord Swabs Taken on First Four Days of Life

Age (in Days)	No. of Babies Swabbed	Growth from Nose			Growth from Cord		
		Heavy	Mod.	Light	Heavy	Mod.	Light
0	12	—	1	11	1	2	9
1	22	6	1	15	13	6	3
2	17	3	—	14	13	—	4
3-4	5	1	—	4	5	—	—

It was found also that 8 out of 22 babies with a positive nasal swab on the first day of life had become negative on the second. Only 5 out of 37 cord swabs showed a similar loss of the organism, and two of these were overgrown with *Proteus sp.* This suggests that the isolation of *Staph. aureus* from a nasal swab may not necessarily represent the multiplication of organisms there but merely that they have been filtered off from the air.

These preliminary investigations indicated that *Staph. aureus* infection of the umbilicus occurred early and in abundance.

Present Investigations

The investigations were carried out in a maternity hospital which had been opened only a few months previously. In controlled studies the cord stumps were painted with bactericidal dyes to see if this would influence the spread of infection.

The maternity hospital where this investigation was carried out was arranged conveniently on three floors, A, B, and C. There were five small wards and some single rooms for the mothers on each floor, and a nursery, which was divided into several large and small cubicles. The babies were kept in the nurseries during the night, but spent the day with their mothers in the wards. The number of babies varied between about 8 and 21 on each floor, and up to 10 or 12 slept in the same room in the nursery. The nurseries were well ventilated and had windows on three sides, so that much sunshine entered the rooms. They were cleaned with vacuum cleaners and dusted with wet cloths. The junior nursing staff on the different floors were changed every few weeks, but the medical staff and senior nurses remained the same, for the most part, on each floor.

Immediately after delivery the cord of a newborn baby was clamped by the accoucheur, ligated, and cut. The baby was put in a cot and any treatment or cleaning-up considered necessary was carried out with ungloved hands. The cord was inspected frequently to make sure that it was not bleeding; it was sometimes handled or squeezed during this inspection. About six hours after birth it was re-ligated and cut short to about an inch (2.5 cm.); surgical spirit was then applied and the cut end sealed with collodion. If the cord was thick, with an abnormal amount of Wharton's jelly, this was squeezed out before the second ligature was applied. Every day, between 7.30 and 9 a.m., the babies were cleaned, weighed, and bathed (if the cords had separated), and other routine nursing procedures were carried out. Cords were treated with spirit. The nurses' hands were washed with soap and water between the care of each baby and dried on a hand towel.

Bacteriological Technique.—Swabbing was done at the same time each day, just before the midday feed. At this time the babies had not been handled for several hours. Dry swabs were used for the nostrils, but for the skin they were moistened in nutrient broth. Skin swabs were taken from an area about 2 in. (5 cm.) in diameter at the lower end of the sternum. Three 4½-in. (11.5-cm.) settling-plates were put down daily on each floor, one in each of the two busiest nursery cubicles and one in the vestibule. They were not put down until all the babies had been removed from the nursery, so that the finer particles and droplets would be sampled rather than splashes and particles from blankets. There was little activity while the plates were exposed, which was between 9 a.m. and 1 p.m. Agar plates containing 2.5% sheep blood (Marks, 1952) were used both for swabs and settling-plates. They were incubated aerobically at 37° C. overnight and left on the bench for another 24 hours before being read. *Staph. aureus* colonies were identified by their colour and colonial appearance and by the zone of lysis which the majority showed on sheep-blood plates. They were all tested by the slide coagulase test of Cadness-Graves *et al.* (1943) and a tube test was done on all giving a doubtful result. The number of *Staph. aureus* colonies on each settling-plate was recorded. At the time of reading both sets of plates it was not known whether they belonged to the test or to the control group.

Treatment of Umbilical Cords with Triple Dye.*—For the purpose of the investigation, triple dye was applied to the cord of each baby immediately after its birth and every morning until separation took place. It was painted on to the whole of the cord stump and about an inch (2.5 cm.) of the surrounding skin. It appeared to be fixed to the tissues quickly, for it stained the clothes very little and did not spread to the rest of the baby's skin.

*Brilliant green 2.29 g., proflavine hemisulphate 1.14 g., crystal violet 2.29 g., water 1,000 ml.

Results of Triple-dye Treatment of Cords of all Babies on One Floor

(a) Between January 25 and April 14, 1956, triple dye was painted on the cords of all the babies born on floor A, while those on floor B were left untreated. A fortnight was allowed to pass before the investigations began so that there would be time for any effect to become apparent. The investigations were as follows: (1) Nasal and skin swabs were taken from all babies on both floors when they were 4 days old. (2) Settling-plates were put down in the nursery on both floors. The number of *Staph. aureus* colonies on the three plates was recorded. The results are shown in Table III.

TABLE III.—Treatment of Umbilical Cords with Triple Dye

Swabs	Treatment of Cord	No. of Babies	No. of Swabs Positive	Difference	Standard Error
Nasal	Dye (floor A)	91	46 (50.5%)	24.2%	6.95
	No dye (.. B)	91	68 (74.7%)		
Skin	Dye (.. A)	91	32 (35.2%)	25.2%	7.61
	No dye (.. B)	91	55 (60.4%)		

Average Number of *Staph. aureus* Colonies on Three Settling-plates

Treatment of Cord	No. of Days	Average Count	Difference	Standard Error
Dye (floor A) ..	62	4.77	4.93	1.14
No dye (.. B) ..	62	9.70		

(b) Between April 14 and June 1 this procedure was reversed, babies on floor B being treated and those on floor A being used as controls. A fortnight was again allowed before investigations began. These were exactly the same as before. The results are shown in Table IV.

TABLE IV.—Treatment of Umbilical Cords with Triple Dye

Swabs	Treatment of Cord	No. of Babies	No. of Swabs Positive	Difference	Standard Error
Nasal	Dye (floor B)	54	19 (35.2%)	36.2%	9.16
	No dye (.. A)	49	35 (71.4%)		
Skin	Dye (.. B)	54	17 (31.5%)	39.9%	9.03
	No dye (.. A)	49	35 (71.4%)		

Average Number of *Staph. aureus* Colonies on Three Settling-plates

Treatment of Cord	No. of Days	Average Count	Difference	Standard Error
Dye (floor B) ..	34	3.41	1.82	0.81
No dye (.. A) ..	34	5.23		

When the cords of all babies on floor A were treated with the dye, both the nasal and the skin infection rates were reduced by a significant amount when compared with those on the control floor. This difference may have been due to variations in nursing technique or to the presence of heavy nasal carriers on one floor and not on the other. However, this seems unlikely, because when the dye was introduced on floor B, and discontinued on floor A, after only a fortnight's interval, both infection rates fell on floor B and rose significantly higher on floor A. The number of colonies on settling-plates showed a similar distribution. Thus it appeared that treatment of all babies' cords on one floor was associated with a lower infection rate of nose and skin and with reduced contamination of the air.

Results of Triple-dye Treatment of Cords of Alternate Babies

Over this period a second type of investigation was being carried out on floor C. The cord of every second baby born in this unit was painted with the dye, but treated and untreated infants were kept in the same nursery and handled by the same staff, so that, apart from the dye on the cord, all conditions were similar for both groups. Swabs were taken from each treated baby when it was 4 days old and from an untreated one of the same age, which acted as a

control. The techniques used were the same as before, but settling-plates were not put down. This floor also contains the premature unit, so special precautions were used here which were not employed on the other floors, such as the wearing of masks and the application of chlorhexidine ("hibitane") cream after washing the hands. Premature babies were not included in the investigation. The results are shown in Table V.

TABLE V.—Treatment of Umbilical Cords with Triple Dye on Floor C

Swabs	Treatment of Cord	No. of Babies	No. of Swabs Positive	Difference	Standard Error
Nasal	Dye	50	20 (40.0%)	—	—
	No dye	49	19 (38.8%)		
Skin	Dye	50	10 (20.0%)	33.1%	9.1
	No dye	49	26 (53.1%)		

This investigation was carried out in order to eliminate the effect on the infection rate of nursing techniques and nasal carriers. The results, however, showed an unexpected pattern. While the skin swabs of treated babies gave a significantly lower infection rate than those of the control group, the nasal infection rates were the same. The babies on this floor all breathed the same air, so this finding suggests that, though organisms may spread from the cord on to the skin, nasal infection comes mainly from the air. The nasal infection rate in both groups was lower than usual; it is possible that the treatment of the cords of half the babies in this unit had decreased the level of airborne contamination, which was reflected in the number of organisms inhaled by the babies. The additional precautions mentioned before may also have contributed to this reduction.

Discussion

These results leave little doubt that the umbilical cord acts as a reservoir from which *Staph. aureus* may be spread. The importance of this depends on how far the second aspect of cross-infection may be brought under control—the transfer of organisms from one patient to another.

There are many ways in which this occurs in a maternity hospital, and the problem has been discussed in numerous papers. Most workers agree that the medical and nursing staffs are the chief source of the organisms (Parker and Kennedy, 1949; Forfar *et al.*, 1953; Rountree *et al.*, 1956). Once the organism has been introduced into the nursery, however, the spread seems to be mainly from one baby to another. Some workers stress the airborne route in this (Wallace and Duguid, 1952), while others consider that contact infection plays the greater part (Allison and Hobbs, 1947; Blaikley, 1952). In old-fashioned hospitals with poor ventilation and little sunlight the airborne route probably plays a large part in the spread of infection. It can be reduced considerably by methods such as treatment of blankets, oiling of floors, spacing of beds, etc. Even when all these procedures are carried out, however, organisms will still reach the air as long as infected patients are present. A limit is soon reached at which no further measures could be applied, in a place such as a nursery, without severe disorganization of the routine work. Clarke *et al.* (1954), for example, have shown that when applied alone these measures reduced the total numbers of organisms in the air in a surgical ward, but did not affect the cross-infection rate.

Contact infection is equally difficult to eliminate entirely, although it seems that better precautions could be taken than are in use at the moment. It does not seem to be appreciated, for instance, in many maternity hospitals, that soap and water will not remove staphylococci from the skin, although this is made clear by Colebrook (1930), Colebrook and Maxted (1933), and a Medical Research Council Memorandum (1941). Some findings which I obtained in the course of another investigation may illustrate this point. (1) A visit was paid to the nurseries while the morning routine of

changing and cleaning the babies was going on. The hands of 11 nurses were swabbed before and after they were washed in the usual way. Six were positive for *Staph. aureus* on both occasions, one acquired the organism and one lost it. The staphylococci isolated were of the phage-type endemic at the time, not the nurses' nasal strains. (2) Swabs were taken from door-handles of cubicles and hand-towels in the nurseries over a period of several months; 49% of 147 door-handles were positive for *Staph. aureus* and 47% of 53 towels. (Eight per cent. salt-broth enrichment was used for these swabs.) (3) The average time which a nurse was able to spare for hand-washing between the handling of each baby was 15 seconds.

Price (1938) found that, while hands were never completely sterilized by washing with soap and water, two minutes was the average time taken for the removal of "transient" organisms. Colebrook and Maxted (1933) reported that staphylococci could still be recovered from the hands after they had been washed for as long as five minutes. In order to limit this degree of hand contamination various skin disinfectants may be used, but many are not suitable for prolonged use. Chlorhexidine cream has not this disadvantage, and has been shown by Murray and Calman (1953, 1956) to be effective against *Staph. aureus* in laboratory tests. Colebrook (1955) suggested that gloves which could be disinfected on the hands might be used with advantage. It would certainly seem reasonable for nurses to wear gloves when handling the cord stump or when looking after babies with clinical infections.

It thus appears that at present the control of cross-infection by blocking routes of transfer is still imperfect. This makes it doubly important to eliminate, so far as is possible, the chief reservoirs of pathogenic organisms. It is necessary to distinguish between places where *Staph. aureus* can often be obtained, such as the air and fomites, and places where it actually multiplies. It will always be present because of the high nasal carrier rate; we must concentrate on reducing its numbers rather than attempt to banish it entirely from nurseries.

The main reservoirs are generally considered to be: (a) Any open lesion, whether in mothers, staff, or babies. These cases should be isolated. (b) The nostrils and skin of adult carriers. The work of Gould (1955) and Rountree *et al.* (1956) suggests that the use of nasal ointments containing antibiotics such as neomycin, gramicidin, and bacitracin may help to prevent the introduction and spread of organisms from this source. It would not be possible to use these continuously, however. (c) The babies themselves form the remaining reservoir of infection as well as its main target. After the first few days of life, *Staph. aureus* can usually be isolated from the nose, mouth, eyes, cord stump, faeces, and the skin as a whole. Of these, the cord is not only the site from which spread is most likely to occur, but it is also the easiest to treat. It would be difficult to eliminate *Staph. aureus* from the other sites without using antibiotic drugs, which is not to be recommended as a routine. Local treatment of the cord, on the other hand, appears to be effective and free from side-effects or complications. Whether cord dressings should be reintroduced instead of or as well as this procedure is a question that might well bear investigation.

This work was carried out during an inter-epidemic period, when there was very little *Staph. aureus* infection in the hospital. Where a large population of staphylococci has been allowed to accumulate, treatment of the cord by itself would probably make little difference to the cross-infection rate. All the known methods of control must be applied simultaneously if any impression is to be made on the prevalence of the organism. These may be summarized as follows: avoidance of overcrowding, isolation of cases, precautions against contact and airborne spread, and removal, if possible, of dangerous carriers. The purpose of this study has been merely to point out the similarity between the cord and an open wound, and to indicate how the danger of this as a source of infection may be reduced.

Summary

A study is described of the part played by the umbilical cord of the newborn infant as a source of infection in a maternity hospital.

The cords of one group of babies were treated with triple dye. Nasal and skin swabs were compared with those of an untreated group in another unit and counts made of *Staph. aureus* colonies on settling-plates put down in the two nurseries. After a fortnight, treatment was introduced into the unit which had previously acted as a control, and similar investigations were carried out.

There was a significant difference between the treated and untreated groups in respect of both the nasal and skin swabs and the numbers of *Staph. aureus* colonies isolated from settling plates.

In a second investigation, treated and untreated babies were kept together in the same nursery. Skin swabs again showed a significant difference, but the nasal infection rates were the same in both groups.

The practical value of these findings is discussed in relation to the prevention of cross-infection among newborn infants.

This work was done while I was working at the Public Health Laboratory, Cardiff, and I would like to thank Professor A. S. Duncan, Professor A. G. Watkins, and the matron and staff of Cardiff Maternity Hospital for their co-operation. I am also grateful to Professor Scott Thomson and Dr. G. S. Wilson for their help with the presentation of this paper.

REFERENCES

- Allison, V. D., and Hobbs, B. C. (1947). *British Medical Journal*, 2, 1.
 Blaikley, J. B. (1952). *Proc. roy. Soc. Med.*, 45, 98.
 Boissard, J. M., and Eton, B. (1956). *British Medical Journal*, 2, 574.
 Cadness-Graves, B., Williams, R., Harper, G. J., and Miles, A. A. (1943). *Lancet*, 1, 736.
 Clarke, S. K. R., Dalgleish, P. G., Parry, E. W., and Gillespie, W. A. (1954). *Ibid.*, 2, 211.
 Colbeck, J. C. (1949). *Canad. med. Ass. J.*, 61, 557.
 Colebrook, L. (1930). *Ministry of Health Interim Report on Maternal Mortality and Morbidity*, p. 122. London.
 — (1955). *Lancet*, 2, 885.
 — and Maxted, W. R. (1933). *J. Obstet. Gynaec. Brit. Emp.*, 40, 966.
 Coventry, K. J., and Isbister, C. (1951). *Med. J. Aust.*, 2, 394.
 Cullen, T. S. (1916). *Embryology, Anatomy, and Diseases of the Umbilicus*. Saunders, Philadelphia and London.
 Edmunds, P. N., Elias-Jones, T. F., Forfar, J. O., and Balf, C. L. (1955). *British Medical Journal*, 1, 990.
 Forfar, J. O., Balf, C. L., Elias-Jones, T. F., and Edmunds, P. N. (1953). *Ibid.*, 2, 170.
 Gould, J. C. (1955). *J. Hyg. (Lond.)*, 53, 379.
 Isbister, C. (1951). *Med. J. Aust.*, 2, 386.
 — (1953). *Ibid.*, 2, 576.
 Kwantes, W., and James, J. R. E. (1956). *British Medical Journal*, 2, 576.
 Marks, J. (1952). *J. Path. Bact.*, 64, 175.
 Medical Research Council (1941). *War Memorandum*, No. 6. London.
 Murray, J., and Calman, R. M. (1955). *British Medical Journal*, 1, 81.
 — (1956). *Ibid.*, 2, 200.
 Parker, M. T., and Kennedy, J. (1949). *J. Hyg. (Lond.)*, 47, 213.
 Price, P. B. (1938). *J. Infect. Dis.*, 63, 301.
 Rountree, P. M., and Freeman, B. M. (1955). *Med. J. Aust.*, 2, 157.
 Heseltine, M., Rheuben, J., and Shearman, R. P. (1956). *Ibid.*, 1, 528.
 Wallace, A. T., and Duguid, J. P. (1952). *Edinb. med. J.*, 59, 200.

In 1955 the British Council for Rehabilitation set up a working party to investigate "the gastric problem" in industry. The working party has now reported. Its chairman was Dr. F. AVERY JONES, and among its members were two professors of industrial health, six industrial medical officers, a physician, a psychiatrist, and a medical statistician. The report is very short (6 pages) and intended for lay readers. The principal conclusions are that gastric and duodenal ulcer are common among men to-day; that those prone to ulcer must avoid undue fatigue, anxiety, and irregular meals; and that both management and worker can help to reduce the problem. The report, entitled "Gastric and Duodenal Ulcer: A Modern Industrial Problem," can be obtained for 1s. 6d. from the British Council for Rehabilitation, Tavistock House (South), Tavistock Square, London, W.C.1.

BARBITURATE ANTAGONISTS TO SHORTEN DROWSINESS AFTER SEDATED B.M.R. DETERMINATIONS

BY

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The reliability of determinations of the basal metabolic rate depends largely on the certainty of the patients being basal during the test. It has been shown that preliminary sedation to the point of sleep can ensure this in nervous patients (Bartels, 1949; Fraser and Nordin, 1955). This technique, however, may leave the patient drowsy and confused for a variable and sometimes prolonged period after the test. We have therefore conducted the clinical trial reported below to assess whether the drowsy period can be shortened with barbiturate antagonists.

Two substances, bemegride (β -ethyl- β -methylglutaramide; "megimide") and amiphenazole (2:4-diamino-5-phenylthiazole hydrochloride; "daptazole") have been advocated for the treatment of coma due to barbiturate overdosage (Shulman *et al.*, 1955). Bemegride is a specific barbiturate antagonist, while amiphenazole has a similar weaker action but also acts as a nervous and respiratory stimulant (Shaw *et al.*, 1954). It seemed likely that these drugs might also shorten the period of drowsiness and confusion following smaller doses of barbiturates.

Method

The trial was arranged on a series of 10 patients whose sedated B.M.R. was being determined in hospital on each of two successive days. After the B.M.R. determination on one day they received the antagonist bemegride, the other day being used as a control. On both days the rate of awakening was carefully assessed so that any consistent difference between rates of waking on the two days could be determined and perhaps attributed to the antagonist drug.

Drug Dosage.—On each day the patient was sedated with three oral doses of 200 mg. (3 gr.) of sodium amylbarbitone ("sodium amytal") at 7, 8, and 9 a.m. Subsequently, at 10.30 and 11 a.m. on one day, he or she received two oral doses of the antagonist bemegride (each of 150 mg. in a 0.5% solution), while on the other, or control day, he or she received two apparently similar doses containing only saline. In the case of four patients the observer also was unaware which was the control day.

Assessment of Wakening.—From 10.30 a.m. the patient's drowsiness was assessed at half-hourly intervals until fully awake, using the following criteria:

Appearance	Speech	Gait
Asleep 3	Incoherent 3	Gross impairment 4
Drowsy 2	Slurred 2	Moderate " 3
Normal 1	Normal 1	Slight " 2
		Normal 1

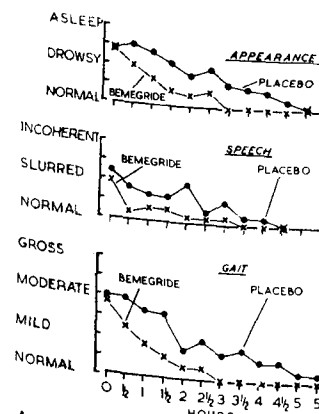
Occasionally, observations on a control day were not followed through until the patient was completely awake.

These patients have been graded as fully awake half an hour after the last observation, an assumption which would tend to weigh against any waking effect of bemegride.

We are at present testing by similar means whether the addition of amiphenazole to the present regime will influence the rapidity or degree of wakening. The results of this investigation are not yet complete.

Results

Time of Wakening.—In the accompanying Chart the average state of drowsiness at half-hourly intervals on all control days is compared with that on all bemegride days (10 control days, 13 bemegride days, 10 patients). This shows that on the control day normal speech was usually regained at 4½ hours, normal appearance at 5 hours, and normal gait at 6 hours, while after bemegride the corresponding times were much shorter: 3½, 3, and 3 hours respectively. The trial was planned so that the initial status of each patient should be as near the same as possible on each day. The



Average time in hours to reach normality on control days and bemegride days (13 patients).

mean initial values are seen to be very nearly equivalent, so that the more rapid waking after bemegride appears to be due to this drug.

Speed of Awakening After Bemegride Compared With Control Day

Cases*	Initial Status on Bemegride Day	Difference between Control Day and Bemegride Day (in Minutes) until Fully Awake as Judged by:		
		Appearance	Speech	Gait
1 (a)	Deeper	-120	120	120
1 (b)	"	-130	210	210
2 (a)	"	90	60	90
2 (b)†	Equivalent	30	60	30
3 (a)†	"	90	30	60
4†	"	300	0	390
5†	"	30	-150	90
6	"	300	300	300
7 (a)	Lighter	150	150	120
7 (b)	"	210	120	90
8 (a)	"	210	120	120
8 (b)	"	90	180	180
2 (c)	"	0	-90	120
	Mean	135	111	192
	Standard deviation	35.1	31.7	27.8

* Numbers indicate patients tested. Letters in parentheses show where the same patient was tested on more than one occasion.
 † Blind assessments (observer unaware of which day was the control).
 Negative values record instances in which the patient took longer to reach normality on bemegride day than on control day.

The consistency with which this effect was observed is shown in the Table. Each patient's results are recorded separately, and the shortening of the time to reach normality after bemegride compared with the control day is shown for each of the three criteria. Any instances of lengthening of values. The patients have also been grouped according to their initial status—whether it was judged slightly deeper, equivalent, or slightly lighter than on the control day. This grouping does not seem to have influenced the shortening of waking-time observed, confirming that this effect was not merely a reflection of differing initial drowsiness. On nine of the bemegride days waking was more rapid by all criteria. On the other four days waking was judged slower by only one criterion and never by that of gait, the most precise assessment of all three. These apparent exceptions therefore probably reflect merely the crudeness of the assessments.

It should also be noted that the four patients tested "blind" show as much evidence of bemegride effect as the others.

The average shortening in waking-time attributable to bemegride is 135 minutes for appearance, 111 minutes for speech, and 192 minutes for gait. This acceleration in waking-time is clearly significant when the mean values for all these differences in waking-time are considered; for each criterion alone, $P < 0.01$ by t test.

Toxic Reactions

Of the 10 patients who were closely observed, two became nauseated. This was the only toxic effect, and occurred after the second dose of bemegride in both instances. Under normal circumstances the second dose would probably have been withheld from one of these patients, since he was already sufficiently awake after the first dose. That this would have lessened the incidence of toxicity is shown by a consideration of the toxic effects observed in a further 45 patients who were not so closely observed, and from whom the second dose was sometimes withheld if the patient was reasonably awake after the first. In this group, two patients became agitated, four were nauseated, and two developed a skin rash.

Mental.—During the early period of the trial one nervous thyrotoxic patient became confused and agitated after the standard dose of bemegride. The significance of this effect was misinterpreted and a further dose given, with worsening of her excitement. A second patient, with myxoedema, became agitated after the two doses of 150 mg. In both instances the excitement was controlled by sodium amylbarbitone, 200 mg. by mouth, and subsequent sedated B.M.R.s followed by smaller doses of bemegride were performed without incident.

Gastro-intestinal.—Three patients complained of nausea and one actually vomited after the two standard doses of bemegride. One further patient complained of slight nausea after the first dose but did not vomit. Single doses repeated on subsequent days on the first three patients were unaccompanied by gastro-intestinal upset.

Skin.—Two patients developed a diffuse irritating erythematous rash on the trunk and limbs within 48 hours of bemegride administration. In both instances the rash was controlled by antihistamines and disappeared within 48 hours. The cause of the eruptions remains uncertain, as both bemegride and sodium amylbarbitone had been given in each case.

We conclude that the overall incidence of possible side-effects is 15% and that this figure may be much lower if the second dose of bemegride is withheld in all instances where the patient appears sufficiently awake after the first 150 mg.

Discussion

Previous workers have used bemegride in the treatment of barbiturate overdosage (Shulman *et al.*, 1955; Montuschi and Wickenden, 1955; Holten, 1955; Perinpanayagam *et al.*, 1955). From their findings it seemed likely that the drug would shorten the waking-time after barbiturate anaesthesia. Bentel *et al.* (1956) have recorded their results in a series of 108 patients in whom bemegride was used to terminate thiopentone anaesthesia. The drug was given by intravenous injection in doses usually of 25 and 50 mg. All patients were awake five to nine minutes after the injection, and side-effects were noted only after doses subsequently believed to have been excessive. Harris (1955) reported a similar series of 73 patients with no side-effects. Unfortunately there were no controls in either of these trials.

It could not be inferred from the results in barbiturate coma or anaesthesia that bemegride would also shorten the drowsiness following smaller doses of barbiturate. Our results give clear evidence of the effectiveness of oral bemegride in shortening the drowsiness and confusion following moderate barbiturate sedation. It can be seen that sedation adequate for B.M.R. tests may be followed by four to six hours of drowsiness and mild confusion which can be

shortened by an average of two to three hours by the use of bemegride. We have gained support for these observations in another series of 20 patients without control observation and in a further 25 patients who were not so closely observed.

The dosage used in the present series was standardized for purposes of comparison, and in the great majority this proved to be satisfactory. In practice, it should suffice to give one dose and follow it with a second only if the patient is still drowsy (and not nauseated) half an hour later. Only very occasional patients have shown slight agitation or nausea after the first dose of 150 mg. and only 5 out of 55 have shown these toxic effects after the two doses used. As nausea or vomiting is likely to be one of the earliest toxic effects, there is advantage in giving the drug orally. There was no evidence that thyrotoxicosis or myxoedema predisposed to toxic reactions.

On the basis of the above findings, we can now recommend oral bemegride as a practical and safe means of shortening the period of drowsiness which follows barbiturate sedation. One oral dose of 150 mg. in 0.5% solution should be given, and be followed by a second in 30 minutes only if the patient is then still drowsy and not nauseated. In this series barbiturates had been given in order to carry out sleeping B.M.R. estimations. There are many other diagnostic and therapeutic techniques, however, which require sedation and have therefore usually necessitated admission to hospital. If such barbiturate sedation is terminated by bemegride these procedures can be simplified, and may then even be performed in the out-patients department.

Summary

A series of 13 patients sedated with barbiturates for the purpose of B.M.R. determinations were studied to evaluate the action of a barbiturate antagonist, bemegride. A two- to three-hour shortening of the drowsy period was noted after bemegride compared with a placebo.

Bemegride was given in two oral doses of 150 mg. in 0.5% solution at an interval of half an hour. Toxic reactions were few and related mainly to the second dose.

Bemegride appears to have considerable value in facilitating the performance of therapeutic and diagnostic procedures which need barbiturate sedation.

We thank the nursing staff of Hammersmith Hospital who co-operated in this trial; also Dr. Edmund Alcock, medical officer, A. & G. Nicholas Ltd., for generous supplies of megimide.

REFERENCES

- Bartels, E. C. (1949). *J. clin. Endocr.*, **9**, 1190.
Bentel, H., Barlow M. B., and Ginsberg, H. (1956). *Med. Proc.*, **2**, 198.
Fraser, R., and Nordin, B. E. C. (1955). *Lancet*, **1**, 532.
Harris, T. A. B. (1955). *Ibid.*, **1**, 181.
Holten, C. (1955). *Ibid.*, **2**, 619.
Montuschi, E., and Wickenden, P. D. (1955). *Ibid.*, **1**, 622.
Perinpanavagam, M. S., Nicholls, G., and Osmond, J. D. (1955). *British Medical Journal*, **2**, 912.
Shaw, F. H., Simon, S. E., Cass, N., Shulman, A., Anstee, J. R., and Nelson, E. R. (1954). *Nature (Lond.)*, **174**, 402.
Shulman, A., Shaw, F. H., Cass, N. M., and Whyte, H. M. (1955). *British Medical Journal*, **1**, 1238.

The British Council for the Welfare of Spastics has published a pamphlet containing four addresses on cerebral palsy. They were given at a conference for doctors in Birmingham last October, under Professor J. M. SMELLIE's chairmanship. Professor R. S. ILLINGWORTH discusses the "Early Diagnosis of Cerebral Palsy"; Dr. FRANCES BRAID "The Aetiology of Cerebral Palsy"; Dr. H. M. COHEN "Cerebral Palsy and the School Health Service"; and Mr. A. INNES, F.R.C.S., "The Management of Cerebral Palsy." The pamphlet (pp. 40) may be obtained from the council at 13, Suffolk Street, Haymarket, London, S.W.1, price 3s. 6d. (post free).

FATAL DUODENAL PERFORATION DURING PREDNISONE THERAPY

BY

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Prednisone, or Δ^4 -dehydrocortisone, is regarded as superior to cortisone both because of its greater potency and because, within the normal range of therapeutic doses, it has less sodium-retaining effect with little tendency to produce oedema. Bollet *et al.* (1955), however, reported the development of symptomless duodenal ulcers, identified radiologically, in 3 of 18 patients receiving prednisone or prednisolone (Δ^4 -dehydro-hydrocortisone) for rheumatoid arthritis.

The following report concerns the development during prednisone therapy of a symptomless duodenal ulcer which remained unsuspected until perforation and peritonitis were revealed at necropsy.

Case Report

A man aged 61 was first admitted to hospital on April 20, 1956, complaining of bilateral rib pain and a purpuric rash. On May 5 a diagnosis of multiple myeloma was made by sternal marrow examination, and was confirmed biochemically and radiologically. There was no history of digestive upset. Treatment was with urethane for 25 days and cortisone for 8 days. On June 14 prednisone, 5 mg. three times a day, was substituted for cortisone, while urethane therapy was continued. He was discharged from hospital somewhat improved five weeks later, and continued to receive these drugs at home. On August 14 he was readmitted complaining of vague abdominal pain, constipation, and dyspnoea, of one week's duration. By this time, he had received a total of 920 mg. of prednisone. He was pale, with a recurrence of the purpuric rash which had been observed intermittently for the past year, and there was evidence of considerable weight loss since his last admission. The abdomen was soft and was not distended. Tenderness was not elicited in any area, nor was there any guarding or rigidity. Bowel sounds were heard. The rectum was full of soft faeces, but there was no tenderness. Pulse rate 80 per minute; blood pressure 95/50 mm. Hg. He became comatose shortly after admission, and died four hours later.

Post-mortem examination showed that death had been due to generalized peritonitis following perforation of a duodenal ulcer. The peritonitis was maximal in the upper abdomen and right iliac fossa, and there was a frankly purulent exudate between liver and diaphragm. The ulcer, which measured 3 by 0.6 cm., was situated vertically on the posterior wall of the duodenum, immediately beyond the pyloric sphincter. Histologically, it was a peptic ulcer of acute type which, except at the site of perforation, was almost confined to the mucosa and submucosa, with a minimal degree of fibrosis and virtually no involvement of the muscle coat. The probable duration of the ulcer was two to four weeks. The remaining positive findings were those of multiple myeloma.

Discussion

While there have been reports of dyspepsia developing during prednisone or prednisolone therapy (Bunim *et al.*, 1955; Margolis *et al.*, 1955; Fisher, 1956), a more striking finding was that of Bollet *et al.* (1955), who observed radiological evidence of duodenal ulceration, without corresponding symptoms, in three previously ulcer-free patients on

prednisone and prednisolone therapy. In all three cases radiological evidence of healing followed the institution of routine ulcer treatment, without the need for discontinuing the drug. In contrast, in two patients treated by Hart *et al.* (1955) dyspepsia improved when prednisone was substituted for cortisone.

The case recorded here is a further example of symptomless duodenal ulcer developing during prednisone therapy. Although the patient experienced some abdominal pain during the seven days before his death, this was not localized and was never severe, and at no time were either the symptoms or the clinical findings suggestive of perforation. In the absence of symptoms and of radiological evidence it is not possible to state accurately the date of onset of the ulcer, but the histological appearances leave no doubt that its duration was substantially less than that of the prednisone therapy.

There have been several reports of massive haematemesis (Pechet, cited by Bollet *et al.*, 1955; Bickel, 1955) and of intestinal haemorrhage (Muller, 1955) occurring during prednisone therapy. Pickert (1956) recorded a case similar to ours in which perforation of a symptomless duodenal ulcer, histologically acute, was the cause of death. Fentress *et al.* (1956) and Hess and Macpherson (1957) described cases of perforation, which were not symptomless, complicating treatment with prednisone and prednisolone respectively.

It is clear that symptomless perforation must be added to symptomless ulceration as one of the possible complications of prednisone therapy.

It would seem advisable to carry out frequent examinations of the stools for occult blood, as well as repeated barium-meal examinations where possible, during prednisone therapy. Antacids probably have some prophylactic value. Estimation of plasma and urine pepsinogen levels (Hirschowitz, 1955; Hirschowitz *et al.*, 1956) might become a practicable method for detecting the onset of peptic ulceration. The occurrence of epigastric pain, however mild, should be regarded as a danger signal.

Summary

A case of fatal perforation of a duodenal ulcer following two months' prednisone therapy for multiple myeloma is recorded. The ulcer was histologically of acute type, and was probably of two to four weeks' duration. It was virtually symptomless, and the subsequent perforation and peritonitis were attended by a minimum of symptoms and a total absence of physical signs.

We wish to thank Dr. J. S. Parkinson for permission to publish this case.

REFERENCES

- Bickel, G. (1955). *Schweiz. med. Wschr.*, **85**, 859.
Bollet, A. J., Black, R., and Bunim, J. J. (1955). *J. Amer. med. Ass.*, **158**, 459.
Bunim, J. J., Pechet, M. M., and Bollet, A. J. (1955). *Ibid.*, **157**, 311.
Fentress, V., Firschild, P., and Reveno, W. S. (1956). *New Engl. J. Med.*, **254**, 657.
Fisher, M. (1956). *Lancet*, **2**, 18.
Hart, F. D., Clark, C. J. M., and Golding, J. R. (1955). *Ibid.*, **2**, 998.
Hess, E. V., and Macpherson, M. E. (1957). *British Medical Journal*, **1**, 271.
Hirschowitz, B. I. (1955). *J. Lab. clin. Med.*, **46**, 568.
—, Streeter, D. H. P., London, J. A., and Pollard, H. M. (1956). *Lancet*, **2**, 1081.
Margolis, H. M., Barr, J. H., Jun., Stolzer, B. L., Eisenbeis, C. H., Jun., and Martz, E. W., Jun. (1955). *J. Amer. med. Ass.*, **158**, 454.
Muller, A. F. (1955). *Schweiz. med. Wschr.*, **85**, 1001.
Pickert, H. (1956). *Arzt. Wschr.*, **11**, 328.

The British Epilepsy Association gave a preview of its film "People Apart" at the Royal College of Surgeons this month. The film tells the public "the facts" about epilepsy. It was made by Guy Brenton, who won an "Oscar" for the best documentary film of 1955. The main actors are epileptics; there are no professionals. "People Apart" (35 mm. or 16 mm., 35 minutes, with sound) may be hired by private associations from the British Epilepsy Association, 136, George Street, London, W.1. (Hiring fee £2.)

Medical Memoranda

Intussusception and Acute Appendicitis

The association of acute intussusception with acute appendicitis in infancy and childhood is not a common one. The age incidence of the two conditions differs, intussusception being uncommon over 2 years and acute appendicitis uncommon under 2. In a small personal series of 12 consecutive operations for acute intussusception during the past year, only one infant was aged over 2 years; in a series of 75 operations for acute appendicitis during the same period, only one child was under 2.

Thompson (1955) records a case of caeco-colic intussusception complicating perforated appendicitis in an infant of 20 months, and gives reasons why the intussusception probably followed the appendicitis. He refers to a similar case of Lipin and Miller (1948): a man of 21 in whom acute appendicitis was complicated by intussusception.

The reverse sequence—acute appendicitis following intussusception—seems particularly uncommon. The following case is thought of sufficient interest to be recorded.

CASE REPORT

A healthy girl of 5 was admitted to hospital as an emergency case on March 13, 1955. The history was of attacks of colicky central abdominal pain and vomiting for the previous 36 hours. There had been no rectal bleeding. Examination showed her general condition to be satisfactory: she was neither shocked nor pyrexial. There was no tenderness or any other physical signs on abdominal examination.

She was kept under observation. Twelve hours later she developed another attack of severe abdominal colic and vomiting. Abdominal examination then revealed some central distension and a palpable mass in the right lumbar area. During this period her highest temperature was 99° F. (37.2° C.). The urine contained no pus cells on microscopy. A white cell count showed 28,000 per c.mm. (80% polymorphs). It was decided to operate. A diagnosis of intussusception was considered, but the leucocytosis was not explained.

A right paramedian incision was made and an intussusception found with its apex half-way up the ascending colon. This was reduced without difficulty and the gut was perfectly viable. The appendix appeared very slightly swollen, but did not seem acutely inflamed. In view of the leucocytosis, appendectomy was performed. After completion of the operation the appendix was opened and found to contain frank pus. Mucosal ulceration was present, and it was felt that perforation would soon have followed. Histological examination confirmed the acute inflammatory process. The patient made an uninterrupted recovery without antibiotics, and was discharged on the twelfth post-operative day.

It is thought likely that the first event occurring here was the intussusception. The acute appendicitis probably followed when the base of the appendix was drawn up by the intussusceptum, precipitated by the appendix becoming obstructed by the neck of the intussusciptum. The following features confirm this view: (1) the absence of pyrexia and abdominal tenderness, due to the inflamed appendix being buried in the intussusception; (2) the first physical signs noted were those of abdominal distension and a mass; and (3) the intussusception was of the common ileo-caecal type starting just proximal to the ileo-caecal valve.

COMMENT

After reduction of an intussusception the appendix is often seen to remain blue and even show incipient gangrene after the gut wall has returned to normal. For this reason,

in the series of 12 intussusceptions referred to above, appendicectomy was performed in five cases, with no deleterious effects on post-operative recovery. No reference has been found to intussusception precipitating acute appendicitis by obstructing the lumen of the appendix. In view of the outwardly innocuous appearance of the appendix in the case described, it is felt justified to urge appendicectomy in intussusception if the appendix shows the slightest abnormality. This should apply especially to children over the age of 2. Gross (1953) states that "mere engorgement and swelling of an appendix is not a sufficient indication for appendicectomy. . . . The cautious operator will not remove the appendix unless it is gangrenous and its vessels thrombosed." A plea is entered to modify this attitude.

I should like to thank Mr. A. Gourevitch for permission to publish this case.

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REFERENCES

- Gross, R. E. (1953). *The Surgery of Infancy and Childhood*, p. 290. Saunders, Philadelphia.
Lipin, R. J., and Miller, J. M. (1948). *Postgrad. Med.*, 3, 283.
Thompson, B. A. (1955). *British Medical Journal*, 1, 952.

Fatal Agranulocytosis During Treatment with Amodiaquine

Amongst the drugs more recently introduced both chloroquine and amodiaquine ("camoquin") have established a good reputation for safety in the treatment of malaria. In this disease, however, they are usually given in short courses. The extension of their use over long periods to treat chronic diseases such as lupus erythematosus and other skin diseases in which photosensitivity is an important factor introduces new hazards.

In the treatment of malaria, side-effects which have been reported include mild and transient headache, visual disturbances, gastro-intestinal upsets, and pruritus. After prolonged medication for suppressive purposes dermatitis, bleaching of the hair, and diminution of T waves in some or all leads of the E.C.G. have been reported (Goodman and Gilman, 1955). Side-effects are reversible on withdrawal of the drugs and only rarely become serious enough to contraindicate their use in this disorder.

In a recent review of the treatment with these drugs in lupus erythematosus (Dubois, 1956) two more potentially serious side-effects have been recorded—namely, thrombocytopenia and severe leucopenia—the former being encountered once and the latter three times in treating a series of 42 patients with chloroquine. In this series neither of these effects was encountered in treating 31 patients with amodiaquine. However, as these drugs are so closely allied chemically the following case of fatal agranulocytosis following treatment with amodiaquine seems worth reporting.

CASE HISTORY

A married woman aged 53 was admitted to hospital on September 26, 1956. Ten days previously she developed a sore throat and was presumed to have a quinsy. Three months earlier she had a rash on her face and forehead which appeared to be made worse by exposure to sunlight, and for this reason she was given amodiaquine. In all she received one tablet (200 mg.) of amodiaquine daily for nearly eight weeks, from July 24 to September 16. With the onset of the sore throat on September 16 the amodiaquine was stopped and "distaquaine penicillin," 300,000 units, was given systemically daily for three days and subsequently by mouth. The temperature, which was initially 102° F. (38.9° C.), never responded to treatment, and just before admission she became irrational, was unable to open her mouth, and was thought to have some neck rigidity. The presence of meningitis was suspected.

On admission she was obviously very ill, jaundiced, and toxæmic. Temperature was 99.8° F. (37.7° C.). With much difficulty the mouth was opened and a sloughing ulcer surrounded by a zone of erythema was detected on the right tonsil. The left tonsil was also inflamed. There was marked fetor of the breath. Neither the cervical lymph nodes nor the spleen were palpably enlarged. The other systems shared no significant abnormality.

Investigations.—September 26: Hb, 90% (13.3 g./100 ml.); C.I., 0.95; red count, 4,760,000 per c.mm.; white cells, 3,500 per c.mm. (lymphocytes 100%); E.S.R., 48 mm.; P.C.V., 40%; M.C.H. 28 µg.; M.C.V. 84 cubic microns; M.C.H.C., 33.2%. September 27: Direct bilirubin, 1.2 g./100 ml.; indirect bilirubin, 1 g./100 ml.; total bilirubin, 2.2 g./100 ml.; alkaline phosphatase, 22.3 K.A. units; thymol turbidity, 1 unit; zinc sulphate turbidity, 1.5 units; total protein, 5.15 g./100 ml. (albumin 3.6 g., globulin 1.55 g.); albumin:globulin ratio 2.38:1. Widal reaction negative in all dilutions of patient's serum against the following: *Salmonella paratyphi B* O and H, *Salmonella typhi* O and H, *Brucella abortus*, *Brucella melitensis*, and non-specific *Salmonella* H. Urine: reaction acid; albumin trace; sugar nil. Microscopical examination—light deposit of amorphous urates only. No growth on culture. A negative test for quinine derivatives. White count 600 per c.mm. September 28: Sternal marrow showed a very marked hypoplasia of the granular series; the red blood cells showed some anisocytosis and polychromasia; erythropoiesis did not appear to be much affected; myeloid-erythroid ratio 1:4. Right tonsil: culture—large number of Gram-positive cocci seen. Left tonsil: culture—several epithelial cells and a number of Vincent's organisms present. A few colonies of *Staph. albus* and *Str. viridans* were grown. White cells, 450 per c.mm. (lymphocytes 99%, large monos. 1%). September 29: Paul-Bunnell, unabsorbed weak positive at 1:20, absorbed weak positive at 1:10. White cells, 350 per c.mm.

The patient was given one million units of soluble penicillin six-hourly from the time of admission, and in addition tab. prednisone, 10 mg. four times a day. The following day she was also given pyridoxine, 200 mg. daily. This was later changed to 50 mg. twice daily intravenously and 100 mg. daily orally. The patient failed to respond to therapy; the temperature remained elevated and the white count low throughout. She went steadily downhill and eventually died on September 30 at 6.50 a.m.

Post-mortem Findings.—At necropsy the outstanding abnormal findings were as follows. The brain showed some congestion and much oedema, but the central nervous system was otherwise normal. The fauces and tonsils were ulcerated and there was slight erosion of the lower end of the oesophagus. The large bowel as far as the splenic flexure was thickened owing to oedema. The lungs were congested. Small haemorrhagic areas resembling infarcts were visible. Both lower lobes were dark and oedematous, but there was no pneumonic consolidation. The pericardial sac contained 1½ oz. (45 ml.) of clear icteric fluid. The heart was dilated and the cut surface of the myocardium revealed diffuse fine fibrosis. The kidneys were of normal size, but early arteriosclerotic changes were visible. The liver was enlarged and had a nutmeg appearance. The spleen was about double normal size. The lymph nodes in the porta hepatis and mesentery were enlarged. The bone marrow appeared normal.

I am grateful to Dr. F. Macdonald, of Parke, Davis and Co. Ltd., for drawing my attention to the relevant literature, and to my colleague, Dr. R. A. Garson, who carried out the special investigations.

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REFERENCES

- Dubois, E. L. (1956). *Ann. Intern. Med.*, 45, 163.
Goodman, L. S., and Gilman, A. (1955). *The Pharmacological Basis of Therapeutics*. New York.

Reviews

DERMATOLOGY

Dermatology. By Donald M. Pillsbury, M.A., D.Sc., M.D., Walter B. Shelley, M.D., Ph.D., and Albert M. Kligman, M.D., Ph.D. (Pp. 1,331+xix; illustrated. £7.) Philadelphia and London: W. B. Saunders Company. 1956.

This is an exciting book, and one of the most important on dermatology that has yet been produced. Had it not been so heavy, I should certainly have taken it to bed to read, or to church in anticipation of a dull sermon. Each one of the many eminent dermatologists working in the University Hospital at Philadelphia is an authority in some other discipline, as physiology, mycology, pharmacology, or art. It was thus inevitable that an important textbook should come out of this institute, and it is most welcome. It is of great interest to dermatologists, but is of importance to the medical student, the family doctor, and the physician, and perhaps chiefly to those who determine the balance of the curriculum in the medical school. Too often, as the authors remark, the skin is regarded as a veil which obscures the proper study of deeper organs instead of the guide which it should be.

The first portion of the work emphasizes the significance of normal function in the skin, and each chapter is ably summarized at the end. This is beautifully done and makes attractive reading. For the rest the authors have ventured on a new approach. There is first an important chapter on taking the medical history, and this section is expanded into a consideration of paediatric, gastric, and tropical problems. Similar space is then devoted to clinical examination of the patient and develops into a consideration of regional dermatology. There are many points of fundamental importance here for all practitioners. It may sound banal to stress the need for examination of the whole patient in a good light, yet often this is neglected even in high circles, with resulting errors in diagnosis. These sections are well conceived, though they sometimes fall a little short of their promise, as in those entitled "Distribution of patterns as an aid to diagnosis" and "Basic pathologic patterns." Great opportunities seem here to have been neglected. Other sections sometimes deteriorate into a catalogue of diseases or unimportant details which cause unprofitable duplication. It would seem better generally, when dealing with broad principles, to keep to this approach and to leave detail for the later clinical sections. A valuable section on therapy might be expanded on the general side, so much more important than local treatment, yet so commonly neglected. Attention here is chiefly directed to steroid hormonal therapy, which is a little out of proportion. The authors' views on radiotherapy will not receive general dermatological approval, although they are, in my opinion, unquestionably sound and essentially wise: Radiotherapy, though not without value, has taken too large a place in the treatment of skin disease. It has dangers, and is a measure that will surely be abandoned before many years are past. But steroid hormonal therapy is also dangerous.

Most of the remainder of the work is devoted to clinical dermatology with avoidance of elaborate and unnecessary terminology. There are few references to the literature, which is wise, for it is the authors' views that are of interest, and the allocation of priorities in description of disease or in the accidental discovery of useful therapeutic measures is not important. The clinical descriptions of disease are good and make easy reading, and the illustrations, all black-and-white, are generally excellent. I should feel that, to be in line with the general purport of the book, more space might be devoted to general and constitutional factors in aetiology—for example, in psoriasis—and treatment is too brief. Some diseases, though not common, are sufficiently important to merit more attention, as parapsoriasis and pityriasis rubra pilaris.

The pattern of the book makes some repetition inevitable, which is no great disadvantage, though it calls for careful editorial scrutiny. Contact dermatitis and the patch-test, for instance, figure extensively under allergy, under dermatitis and eczema, and under industrial dermatoses. The sections on fungous diseases, parasitology, hereditary diseases and psychodermatoses, lymphoma, and most of the field of eczematous dermatoses are very good. The section on tumours is good, but is not simplified by including such affections as sebaceous cysts, urticaria pigmentosa, milium, and naevi generally. There is a tendency to base generalizations on American experience and forget the rest of the world. It is not true in Britain that sycosis barbae is more common in the bearded, or that erythema nodosum is seen with rheumatic fever and is rare in tuberculosis.

These are small criticisms beside the major concept of this work, which is well set out in the preface. We shall look forward to further editions. The editors could usefully do some pruning, for there is a tendency to be a little prolix and there are a few illustrations and diagrams which are of no value. Though we must approve the editors' "inability to maintain an attitude of consistent solemnity throughout," the work is, it seems to me, of too high an order to contain the comic-strip cartoon.

J. T. INGRAM.

ANKYLOSING SPONDYLITIS

Ankylosing Spondylitis. Clinical Considerations—Roentgenology—Pathologic Anatomy—Treatment. By J. Forestier, M.D., F.A.C.R., F. Jacqueline, M.D., and J. Rotes-Querol, M.D. Translated by A. U. Desjardins, M.S., M.D., F.A.C.P., F.A.C.R. (Pp. 374+xviii; illustrated. 81s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1956.

This well-produced monograph on ankylosing spondylitis is a welcome addition to high-class rheumatological literature. It is perhaps rather expensive, but it is very well produced. In America, where it is published, the general view is that ankylosing spondylitis and rheumatoid arthritis are merely variants of the same disease. It is possible that this volume may change opinion on this matter. It starts with a brief historical account of the disease, which points out, rightly, that Bechterew's eponymous connexion with this disease is unmerited. In further chapters incidence, diagnosis, spinal and paraspinal symptoms, involvement of the peripheral joints and organs, laboratory examinations, and differential diagnosis are all well dealt with, as is the subject of treatment, in which the authors differ from current practice in this country, mainly in their use of gold and copper salts, thorium X, and amidopyrine. Their orthopaedic approach is in line with our own.

The authors write of their personal experience with a group of 400 cases, and their description of the early symptoms is particularly useful, as these have been understressed in previous works. Early diagnosis is all-important in ankylosing spondylitis. They state rightly that iritis is commoner in this disease than in rheumatoid arthritis, but are wrong in their belief that this is contrary to English opinion. Their account of the x-ray changes to be found at various stages of the disease is clear and detailed, and the plates are well reproduced. The syndrome of ankylosis in the spine of old people, which they regard as a specific entity, is of special interest. The place of radiotherapy and of the steroid hormones in treatment is fully discussed. It is their opinion that the latter should be reserved for severe cases which have failed to respond to normal routine methods—an opinion which finds general acceptance in this country. It is surprising, however, that they do not mention the use of local intra-articular injections of hydrocortisone in the control of active peripheral joint lesions. There is a comprehensive and useful list of 270 references. This book should be read not only by rheumatologists, but by all general physicians who have, or should have, any interest in this disease.

W. S. C. COPENMAN.

LIVER DISEASES

Diseases of the Liver. Edited by Leon Schiff, M.D., Ph.D. Foreword by Cecil J. Watson, M.D., Ph.D. (Pp. 738+xix; illustrated. £5 10s.) London: Pitman Medical Publishing Co. Ltd. 1956.

This textbook contains 26 chapters written by 28 different authors. Most of the writers are American, but Britain is represented by N. F. MacLagan, W. B. Matthews, and Sheila Sherlock. It is a heavy book with 735 large pages printed in double columns, but it is not unpleasant to read, as the type is large, legible, and pleasingly spaced and there are numerous illustrations. It does not pretend to be encyclopaedic, though the chapters are well documented with references; it is rather a primer of current knowledge about the common diseases of the liver. It begins with accounts of the anatomy, physiology, biochemistry, and experimental pathology of the liver. There are then descriptions of liver-function tests and needle biopsy of the liver, and discussions of jaundice, portal hypertension, and hepatic coma. Ascites is not given a chapter to itself, but is discussed rather briefly in the chapter on cirrhosis. The various forms of hepatitis and cirrhosis are fully described. Infections, parasites, and tumours of the liver all receive attention, and there is a chapter on amyloidosis. Zuelzer has an excellent chapter on liver diseases in infancy and childhood, but there does not seem to be any mention of veno-occlusive disease in infancy or of Chiari's syndrome. Macfarlane Burnet's stimulating ideas on subacute hepatitis as an autoimmune disease due to failure of the self-recognition mechanism probably appeared too recently for inclusion. There is a long final chapter dealing with diseases of the gall-bladder and extrahepatic bile ducts. This is a book one can commend to the average postgraduate student, though more serious workers will probably find it lacking in brilliance.

L. J. WITTS.

A DOCTOR OF MANY PARTS

One Doctor in His Time. By Bethel Solomons, M.D., F.R.C.P.I., F.R.C.O.G., M.R.I.A. (Pp. 224; illustrated. 18s.) London: Christopher Johnson. 1956.

"One doctor in his time" (Solomons) "... plays many parts" (Shakespeare). Many doctors have proved this point, but none better than Dr. Bethel Solomons, who, in his time, has appeared in so many roles and in so many acts. In this one he rightly plays the lead in rapidly shifting scenes, and does so with buoyancy backed by an excellent memory for people and places. He creates for readers a vivid picture of the man himself. We see him at school, at Trinity College, and in practice in Dublin. We see him as the Master of the Rotunda (not to be mistaken for one of the Irish hunts); as a lecturer in the U.S.A.; as President of the Royal College of Physicians of Ireland; as a member of the Irish Rugby Football team and later as one of the Irish selectors. We see him at the bridge table, on the ski slopes, and in the hunting field—which he first invaded at the age of 46 years. We see him on the stage at the Abbey Theatre, and fraternizing with writers, actors, and artists of all kinds. We see him in his own home as a gracious host, and in many other homes as an entertaining guest. Last, but not least, we see him as an obstetrician and gynaecologist who, expecting—no doubt rightly—that his autobiography will appeal to lay as well as medical circles, indulges in asides to give popular advice on sundry medical matters. There is a forthrightness about this book which allows even frank mention of Jewry (Orthodox and Liberal) and anti-Semitism. It is pervaded by the atmosphere of old-time Dublin into which creeps for a few moments a galaxy of great people chosen from many spheres of life. Some readers may think that there are too many small parts and that these are too small—little more than a "walk on" in many cases. The named cast, given in the form of an index, is approximately 300. Mention of so many will have a special appeal for those who are familiar with Dublin and its folk. Those less intimately

associated may find themselves wishing that the author had done more than whet the appetite about certain people and events, even if this had meant the exclusion of others.

T. N. A. JEFFCOATE.

AN AMERICAN VOLUNTARY HOSPITAL

Hunterdon Medical Center: The Story of One Approach to Rural Medical Care. By Ray E. Trussell. (Pp. 237+xxii; illustrated. 30s.) Cambridge, Massachusetts: Harvard University Press for The Commonwealth Fund. London: Oxford University Press. 1956.

Hunterdon, a county in the State of New Jersey with 43,000 inhabitants, had no hospital, and this book tells the story of the provision of a hospital service. The hospital has several interesting and unusual features. It is closely connected with New York University-Bellevue Medical Center; the Hunterdon hospital junior staff appointments are included in the Bellevue rotating internships, and the directors of the various services in the local hospital have part-time teaching responsibilities in the Bellevue Medical Center. The hospital provides routine medical examinations and various public-health services in addition to the customary in-patient and clinical facilities. The patients are in the care of their general practitioner, but are under the control of the director of the appropriate service, who must approve the treatment of patients, which is routinely conducted by the interns. The specialists, of whom there are twelve, are whole-time and pool their fees, so that the salary of the paediatrician is equal to that of the surgeon. The initial capital outlay worked out at 50 dollars per head of the community and was raised by subscription. The fees, which are thought to be high by some of the rural patients, are fixed at the "Blue Shield" rates (which are not stated), and can therefore be fully covered by the "Blue Shield" hospital insurance. The indigent are treated free, and the cost of their treatment is borne by the community. The standard of hospital care provided in Hunterdon is comparable with that which can be purchased by the wealthy in this country; indeed, the payment of the "Blue Shield" hospital insurance would be beyond the capacity of the average British family budget.

It will be readily seen that there are some features of the scheme, such as the submission of the general practitioner to consultant control and the conflict of the group consultant with the private specialist outside, which must raise problems—administrative, ethical, and personal. Such experiments in the provision of hospital services in the United States and Canada will continue to be watched with great interest by all engaged in the National Health Service here.

D. V. HUBBLE.

SKELETAL ROENTGENOLOGY

Borderlands of the Normal and Early Pathologic in Skeletal Roentgenology. By Alban Köhler. Tenth edition by E. A. Zimmer. English translation arranged and edited by James T. Case, M.D., D.M.R.E. (Pp. 723+xiv; illustrated. \$24.50.) New York and London: Grune and Stratton Inc. 1956.

This English translation of the tenth German edition of Köhler's famous work will be welcomed by all who are interested in the detail of skeletal structure. It has been brought fully up to date by Zimmer, of Berne, and is a goldmine of accurate information. It is superbly produced, and the elaborate plates and diagrams are described so clearly that one is apt to forget the vast labour that must have gone to their production. An immense bibliography is included for those who are engaged in research. We would express our gratitude to the translator who has brought this great work within the reach of all of us, and we would hope that it will soon be available in every library where it can be consulted by surgeons as well as by radiologists, for to both it furnishes a work of reference unique in its value and importance.

HENRY SOUTTAR.

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MELANOCYTE-STIMULATING HORMONE
AND CORTICOTROPHIN

Melanocyte-stimulating hormone (M.S.H.) is one of the names given to a substance found in the pars intermedia of the pituitary gland. It was recognized as a hormone over thirty years ago as a result of the work of W. J. Atwell¹ and of L. T. Hogben and F. R. Winton² on the ability of pituitary extracts to cause darkening of the skin in certain amphibia, particularly the frog. The darkening of the frog's skin in dark surroundings and its paling in light surroundings are largely controlled by the secretion of M.S.H. The blackening of the skin appears to be due to a dispersion of the melanin in the melanocytes³ under the influence of the hormone. Other names given to M.S.H. are intermedin, melanophore-expanding hormone, and melanin-dispersing hormone. Although various types of action in influencing metabolic activity have been ascribed to M.S.H. from time to time, it has long been uncertain what part this substance plays in mammalian and human economy. The hormone is certainly present in the pituitary glands of species in which no simple activity of the type observable in the frog can be shown. There is now good evidence that in man and animals skin melanin can be formed in the cytoplasm of melanocytes⁴ and that extracts of pituitary tissue rich in M.S.H. activity can bring about an increase in the quantity of melanin in amphibian and human skin.⁵⁻⁷

For some time now the possibility has been considered that the darkening of the skin in Addison's disease might be due, perhaps in part, to the action of M.S.H. In 1952 S. Johnsson and B. Högborg⁸

showed that the blood of patients with Addison's disease is abnormally rich in M.S.H. activity. Their blood would be expected also to be rich in corticotrophin (A.C.T.H.) because of the low concentration of corticosteroids in the blood.⁹ A high level of M.S.H. activity is also found in the blood of patients with Cushing's syndrome, of those subjected to stress, and of pregnant women, where again a high concentration of corticotrophin in the blood is to be expected.¹⁰ In view of these observations, together with the fact that the most highly purified preparations of corticotrophin available possessed M.S.H. activity, the suggestion put forward in 1952 by S. Johnsson and B. Högborg⁸ and by F. G. Sulman¹¹ that M.S.H. and corticotrophin might be identical commanded some attention. Since, however, corticotrophic activity is destroyed by treatment with hot dilute alkali under conditions in which M.S.H. activity may be retained and prolonged,¹²⁻¹³ the two activities cannot be ascribed to the same chemical structure. This is not in itself evidence that the two structures are in different molecules; but evidence that the two activities do indeed reside mainly in different molecules was provided by the comparative ease of almost complete separation of corticotrophic and M.S.H. activities.¹²⁻¹⁴ Johnsson and Högborg¹⁴ accepted this evidence against their former suggestion of identity, while F. G. Sulman¹⁵ modified his hypothesis, proposing instead that M.S.H. is one "factor" in "the A.C.T.H. complex." This relationship was not closely defined, but suggested simultaneous secretion and perhaps also loose combination of two molecules. Such a suggestion is perhaps unexpected in view of the 100-fold difference in the ratio of corticotrophic and M.S.H. activities¹² between pituitary anterior lobes, which are rich in corticotrophin, and intermediate and posterior lobes, which are rich in M.S.H.¹⁶ An even clearer difference in the ratio of activities between concentrates from anterior and posterior lobes was found by F. W. Landgrebe and C. J. O. R. Morris.¹⁷

The fact that the two types of activity remain together during much of the process of purification

- ¹ Atwell, W. J., *Science*, 1919, **49**, 48.
- ² Hogben, L. T., and Winton, F. R., *Proc. R. Soc. B*, 1922, **93**, 318.
- ³ Fitzpatrick, T. B., and Lerner, A. B., have recently put forward a systematic nomenclature for pigment cells in *Science*, 1953, **117**, 640.
- ⁴ Lorincz, A. L., in *Physiology and Biochemistry of the Skin*, 1954, ed. Rothman, S., University of Chicago Press, p. 515.
- ⁵ Frieden, I. J., and Bozler, J. M., *Proc. Soc. exp. Biol.*, N.Y., 1951, **77**, 35.
- ⁶ Karkun, J. N., and Mukerji, B., *Indian J. med. Res.*, 1953, **41**, 467.
- ⁷ Lerner, A. B., Shizume, K., and Bunding, L., *J. clin. Endocrinol.*, 1954, **14**, 1463.
- ⁸ Johnsson, S., and Högborg, B., *Nature, Lond.*, 1952, **169**, 286.
- ⁹ Sydnor, K. L., et al., *J. clin. Endocrinol.*, 1953, **13**, 891.
- ¹⁰ Johnsson, S., and Högborg, B., *Acta endocr. (Kbh.)*, 1953, **13**, 325.
- ¹¹ Sulman, F. G., *Nature, Lond.*, 1952, **169**, 588.
- ¹² Reinhardt, W. O., et al., *Proc. Soc. exp. Biol.*, N.Y., 1952, **80**, 439.
- ¹³ Morris, C. J. O. R., *Lancet*, 1952, **1**, 1210.
- ¹⁴ Raben, M. S., Rosenberg, I. N., and Astwood, E. B., *Fed. Proc.*, 1952, **11**, 126.
- ¹⁵ Sulman, F. G., *J. Endocrinol.*, 1952, **8**, 275.
- ¹⁶ Zondek, B., and Krohn, H., *Klin. Wschr.*, 1932, **11**, 849.
- ¹⁷ Cited by Landgrebe, F. W., Ketterer, B., and Waring, H., in *The Hormones*, vol. 3, 1955, ed. Pincus, G., and Thimann, K. V., New York, p. 389.
- ¹⁸ Thing, E., *Acta endocr. (Kbh.)*, 1954, **16**, 160.
- ¹⁹ Lerner, A. B., and Lee, T. H., *J. Amer. chem. Soc.*, 1955, **77**, 1066.
- ²⁰ Porath, J., et al., *Biochim. biophys. Acta*, 1955, **17**, 598.
- ²¹ Benfey, B. J., and Purvis, J. L., *J. Amer. chem. Soc.*, 1955, **77**, 5167.
- ²² Landgrebe, F. W., and Mitchell, G. M., *Quart. J. exp. Physiol.*, 1954, **39**, 11.
- ²³ Lee, T. H., and Lerner, A. B., *J. biol. Chem.*, 1956, **221**, 943.
- ²⁴ Geschwind, I. I., Li, C. H., and Barnaf, L., *J. Amer. chem. Soc.*, 1956, **78**, 4494.
- ²⁵ Dixon, H. B. F., *Biochim. biophys. Acta*, 1956, **19**, 392.
- ²⁶ Dedman, M. L., Farmer, T. H., and Morris, C. J. O. R., *Biochem. J.*, 1955, **59**, xii.
- ²⁷ Winter, C. A., Brink, N. G., and Folkers, K., *Proc. Soc. exp. Biol.*, N.Y., 1953, **82**, 365.
- ²⁸ Bell, P. H., *J. Amer. chem. Soc.*, 1954, **76**, 5565.
- ²⁹ White, W. F., and Landmann, W. A., *ibid.*, 1955, **77**, 1711.
- ³⁰ Li, C. H., et al., *Nature, Lond.*, 1955, **176**, 687.
- ³¹ Harris, J. I., and Roos, P., *ibid.*, 1956, **178**, 90.
- ³² Dixon, H. B. F., *Biochem. J.*, 1956, **62**, 25P.
- ³³ Brown, H., Sanger, F., and Kitai, R., *ibid.*, 1955, **60**, 556.
- ³⁴ Popenoe, E. A., Lawler, H. C., and du Vigneaud, V., *J. Amer. chem. Soc.*, 1952, **74**, 3713.
- ³⁵ Shizume, K., and Lerner, A. B., *J. clin. Endocrinol.*, 1954, **14**, 1491.
- ³⁶ Forgács, P., *Acta endocr. (Kbh.)*, 1956, **23**, 1.
- ³⁷ Geschwind, I. I., Li, C. H., and Barnaf, L., *J. Amer. Chem. Soc.*, 1957, **79**, 1003.

of corticotrophin¹⁸ can now be attributed to chemical similarities in the structures of M.S.H. and corticotrophin. These similarities became clear once the hormones had been isolated. In 1955 A. B. Lerner and T. H. Lee,¹⁹ J. O. Porath *et al.*,²⁰ and B. J. Benfey and J. L. Purvis²¹ all independently isolated apparently pure melanocyte-stimulating substances from the pituitary glands of pigs. All these workers used oxycellulose adsorption, which F. W. Landgrebe and G. M. Mitchell²² had first applied to the purification of M.S.H. T. H. Lee and A. B. Lerner²³ have since suggested that there exist two types of the hormone in pig pituitary glands, the α and the β types. Their β type appears to be identical with that isolated in 1955 by the other workers cited, and also with that isolated by I. I. Geschwind, C. H. Li, and L. Barnafi²⁴ in 1956. These purified preparations of M.S.H. appear to be lacking in detectable corticotrophic activity where they have been tested. Nevertheless corticotrophin does possess some melanocyte-stimulating activity—about 1/150 of that of purified M.S.H., according to F. W. Landgrebe (cited by H. B. F. Dixon²⁵). Dixon inactivated corticotrophin by treatment with hydrogen peroxide and subsequently partially reactivated it by treatment with sulphhydryl substances according to the method of M. L. Dedman, T. H. Farmer, and C. J. O. R. Morris.²⁶ In the mixture resulting from the partial reactivation the corticotrophic and M.S.H. activities could not be mutually separated under the conditions of the experiment, although the unregenerated inactive substance was separated from the reactivated material and was devoid of both activities. In other words, chemical alteration, followed by regeneration, of corticotrophin went hand in hand with the loss and recovery of both its corticotrophic and melanocyte-stimulating activities: this might be considered as evidence that both activities can be ascribed to the same molecule. That the M.S.H. activity of corticotrophin was an intrinsic property of the molecules and not due to contamination with M.S.H. itself had already been suggested by C. A. Winter *et al.*²⁷ and by P. H. Bell,²⁸ on the basis of the constancy of the small amount of melanocyte-stimulating activity still possessed by rigorously purified corticotrophin. This residual M.S.H. activity is much less than that to be found in the preparations of corticotrophin now generally available for clinical use, and this suggests that these preparations are significantly contaminated with M.S.H.

The possession of M.S.H. activity by both M.S.H. and corticotrophin might be expected to reflect a similarity in the order of amino-acid residues in their molecules. This similarity was revealed when their

structures were elucidated. The structure of corticotrophin was first determined by P. H. Bell and his colleagues.²⁸ Comparable findings were independently published by W. F. White and W. A. Landmann,²⁹ while C. H. Li and his colleagues³⁰ also found a similar structure. It is a peptide containing 39 amino-acids in a single chain. Recently J. I. Harris and P. Roos³¹ have completely elucidated the chemical structure of one type of M.S.H., that which corresponds with the β -M.S.H. of T. H. Lee and A. B. Lerner.²³ Harris and Roos find their M.S.H. to be a peptide of 18 amino-acids in a single chain, a sequence of seven amino-acid residues being common to their structure for M.S.H. and that of corticotrophin. In this way a chemical basis for the intrinsic M.S.H. activity of corticotrophin has almost certainly been revealed. Subsequently I. I. Geschwind, C. H. Li, and L. Barnafi²⁴ have come to similar conclusions about the structure of the M.S.H. which they have isolated.

H. B. F. Dixon³² has found that mild treatment of corticotrophin with periodate destroys the corticotrophic activity of the substance without discharging its small melanocyte-stimulating action. Under the conditions in which it was used periodate would be expected to attack only the amino-acid residue of serine at the end of the peptide chain of corticotrophin, and to leave unchanged the sequence of seven amino-acids common to β -M.S.H. and to corticotrophin. This evidence therefore strengthens the likelihood that this sequence is responsible for the M.S.H. activity of corticotrophin. There is the possibility that with M.S.H., as with corticotrophin,³⁰ insulin,³³ and vasopressin,³⁴ species differences in the chemical structure of a peptide hormone may exist.³⁷

Many problems remain. Why is the blood of patients with Addison's disease rich in both M.S.H. and corticotrophin? Why does treatment with cortisone appear to lower the concentration in the blood of both these hormones?³⁵ Why does such treatment nevertheless alter to different extents the amounts of these hormones found in the pituitary gland?³⁶ Investigation of the control of the secretion of corticotrophin and M.S.H. may disclose clinical, and perhaps evolutionary, relationships of these two hormones that are at present only vague possibilities. Certainly the investigations of the biochemists have opened up entrancing new fields of study. The growing inter-action of the clinical and biochemical aspects of this subject may be reflected in the notable contributions made by the dermatologist A. B. Lerner^{7 19 23 35} to the fundamental biochemistry of M.S.H. and of melanogenesis.

SIR VICTOR HORSLEY

The three opening articles in this week's issue of the *Journal* pay tribute to the centenary of the birth of Sir Victor Horsley. His is a name which will endure as the pioneer of neurosurgery, even though he was in point of fact not the first surgeon to remove a brain tumour. Horsley's physiological researches and his work upon the surgery of the brain and spinal cord broke fresh ground in a unique fashion. His early career was spent in the propitious intellectual atmosphere of University College, London, for he studied in close contact with such inspiring teachers as Bastian, Russell Reynolds, and William Gowers. In his Centenary Lecture, delivered last week in B.M.A. House, Sir Geoffrey Jefferson has painted a vivid picture of Horsley, his background, his career, and his place in the medical pantheon. Sir Arthur MacNalty, who had the great advantage of having known Horsley personally and having worked with him, has been able to give us a fascinating glimpse behind the scenes. He reminds us that Horsley was an artist of no mean ability: while still a young demonstrator of anatomy at University College Hospital he executed the drawing which has since become so familiar to all students, showing the morphological relationships of the spinous processes, the vertebral bodies, and the segments of the spinal cord.

Horsley will also be remembered as being the first surgeon ever to operate successfully upon a case of spinal tumour. In 1887 an Army officer aged 43, suffering from a spastic weakness of both legs, came under the medical care of William Gowers. The clinical diagnosis of spinal tumour was made. Already Gowers had toyed with the notion that such a type of lesion was surely one which would lend itself to successful surgery. Accordingly, with the moral support of his old chief, Sir William Jenner, Gowers invited his young surgical colleague Horsley, then 30 years of age, to see the patient and to operate. This was performed in the surgical theatre at the National Hospital, Queen Square, on June 9, 1887, in the presence of Gowers, Edmunds, and Percy Kidd. Dr. White was the anaesthetist on that great occasion, and Mr. Steadman and Mr. (afterwards Sir) Charles Ballance acted as surgical assistants. A tumour, which proved to be a fibromyxoma, was found attached to the 4th thoracic root on the left side of the spinal cord, and was removed successfully. In less than six months the patient was walking, and a year later he was back at full duty.

Inevitably there was somewhat of a clash of personalities between Horsley and that other neuro-surgical pioneer, Harvey Cushing. The latter first

visited Horsley in 1900, Cushing then being 31 years of age. But having seen Horsley at work, Cushing shied: he behaved rather like Walter Pater, who shrank from reading Stevenson or Kipling lest their stronger style might infect his own. Cushing felt that the refinements of neurological surgery could not be learned from Horsley, and he went elsewhere. None the less, in later years he maintained a friendly correspondence, and he even sent one of his pupils, Ernest Sachs, to work with Horsley. That this was a successful visit can be judged from Dr. Sachs's reminiscences (p. 916).

Horsley was a man of strong personality, overbearing perhaps, and impatient of criticism. His active mind and abundant energy could not be contained merely by his professional techniques. For the last twenty-five years of his life the B.M.A. was one of his main interests, and he left his mark on the history of the Association, for he was largely responsible for the reform of its constitutional machinery fifty-six years ago. He filled nearly every important office in the Association except those of President and Chairman of Council. His public activities went well beyond the boundaries of medicine, and as a politician and propagandist he became familiar to his contemporaries, even to the verge of unpopularity, by reason of his enthusiastic sponsorship of such causes as women's suffrage, teetotalism, and liberalism. As Sir Geoffrey Jefferson puts it, "Maybe he fished too much in troubled waters." But as a doctor he had all the admired virtues: in a tribute written at the time of his death, Wilfred Trotter wrote: "In dealing with his patients Horsley consistently showed a deep and tender humanity very much at variance with the picture of him which it is to be supposed the public allowed itself sometimes to draw." Horsley's great drive finally became canalized along patriotic lines. Despite his years, he volunteered for wartime service. He served in the Army at first in a ludicrously low rank, and died in 1916 on active service in the Mesopotamian desert.

RETIREMENT AND EMPLOYMENT

A recent Bill amending the national insurance provisions enables pensioners under 70 (65 for women) who have retired to return to work and become eligible for increases in the weekly pension they will eventually draw. It is thus a valuable incentive to older persons to resume working. But we know relatively little about the ways in which the newly retired adjust to their new conditions or about their willingness or otherwise to return to work if it is available. A careful study made by I. M. Richardson¹ is an interesting addition to our

knowledge of the subject. It was based on an examination of a sample of 244 retired men between the ages of 65 and 75. Its aims were to examine the reasons given for retirement and the use made of it, with special reference to possibilities of re-employment.

Two previous surveys, one made in 1950 by G. Thomas and B. Osborne² for the Social Survey, the other made by the Ministry of National Insurance in 1953,³ had already established that ill-health and the enforcement of a fixed retirement age by the employer are the main reasons given by workers for their retirement. Richardson's survey confirmed these findings, action by employers being a common reason at 65 but relatively unimportant over the age of 70, when ill-health predominated. He points out, however, that the significance of compulsory retirement at 65 may be exaggerated, since it is not known how many of the men affected would have retired in any event for some other reason, such as disability; hence the effectiveness of relaxing the age restriction to working life imposed by some employers cannot be estimated. Moreover, while Richardson accepts ill-health and action by the employer as the most commonly recurring factors in determining a man's time of retirement, he emphasizes that for the majority of the men interviewed it was a combination of factors that finally decided the question. For example, in a minority of cases at any rate it was evident that family opinions and circumstances had strongly influenced the individual's decision, and future studies might well pay attention to the role of the family here.

Richardson next considers the possibilities of re-employment when a man has once retired. Fitness for work is obviously a major factor, and as a result of an attempt to grade his subjects on this basis he reaches the tentative conclusion that more than 50% had a disability of occupational significance. The three leading causes of disablement discovered (cardiovascular disease, arthritis, and chronic bronchitis) all impose restrictions on mobility. If these conclusions can be regarded as generally valid, they would point to serious limitations on the size of the pool of retired workers from which new recruits to industry might be drawn. But if a man is to return to work after retirement he must not only be fit but also sufficiently keen to make the effort required to start again. As the result of careful investigation Richardson discovered that only 54% of the wholly retired men in his sample were "content" with their position, and about one-third said that they wanted to resume work. Not many of these had actually tried to find it, however, and he concludes, "it may well be that, at and soon after the time of retiring, there is a more active interest in opportunities for work, but as time passes the retired man's enthusiasm seems to wane." So it would appear essential to avoid any long interval

between retiring from one job and finding another. Once the routine of retirement is established, it is difficult to break.

In the final section of his study Richardson investigates some of the characteristics of the life of a retired person. He emphasizes the importance of the learning period when new habits are formed, a new daily routine established, new attitudes acquired, and suggests that in Great Britain we have thought little about the different ways in which help and encouragement might be given to men and women to use their retirement constructively. Finally, he also gives some consideration to the complex theme of family relationships during these years. Here the conclusions he draws are generally optimistic. Like the National Assistance Board in its study made in 1954 of a group much more likely to be dependent (men and women over 80 in receipt of assistance),⁴ he repudiates the tendency to regard all old people as problems: "the truth is that the majority live largely independent lives and only a minority present one or other kind of serious problem." This is worth emphasizing, as is the support he gives to the finding of several other investigations that in most cases old people are in close touch with their relatives and "family duty" is well done. Nevertheless, the socio-medical problems of old people needing the support of family and friends but either lacking it or rejecting it are sometimes serious and difficult, while the strains imposed by the older generation on the younger can be considerable. As Richardson points out in his concluding paragraph, "the complex dynamics of inter-generation relationships are only beginning to be understood," and the answers to many questions must await the outcome of further research.

DRUG COSTS

A scheme for regulating the prices of proprietary drugs was announced by the Minister of Health last week. The Association of British Pharmaceutical Industry has been working on it and arguing points with the Ministry for the last two and a half years. Stating that the Government has accepted the scheme in principle, the Minister said he hoped it would begin operating in the next two months. It covers over 4,000 products and has three main provisions which enable manufacturers to regulate maximum prices voluntarily. They are given in our Parliamentary report at page 955. When the scheme begins, existing prices will be brought down if necessary, but not brought up, to the levels determined by its provisions.

The background to all this is a rumbling barrage of Parliamentary questions to successive Ministers of Health ever since the Health Service began. The thought has often occurred to M.P.s of divers political creeds that the cost of the Health Service could easily be cut if doctors included a smaller proportion of

¹ *British Medical Journal*, 1953, 2, 925.

² *Ibid.*, 1956, 2, 1552.

³ Bagnall, H. H., and Stock, F. G., *Pharm. J.*, 1956, 177, 441.

proprietary preparations in their prescriptions. The figures show that this idea has not made much headway in the medical profession, and there are several good reasons why it has not. One is that many proprietary preparations have no so-called official equivalent, because the pharmaceutical industry, by virtue of its research, has introduced most of the potent new drugs. Another is that, among those drugs which have an official equivalent, there are many whose equivalence is more apparent in official circles than in the doctor's surgery. Again, a considerable number of the proprietaries are cheaper than their official equivalents,¹ while among those which are not only a few can be found whose price seems to call for criticism. Consequently, as might be expected, the estimated saving under the new scheme is small—about £750,000 a year on a drug bill of over £50m. Nor is the need for drastic saving particularly evident. Between 1949 and 1956 the cost of prescribing in general practice, after allowing for the increase in the cost of living (or inflation), rose by 17%.² This figure might well be attributed to the introduction of new and more efficacious drugs, resulting in lives saved and earlier return to health and work.

A recent analysis of barbiturate tablets carried out by H. H. Bagnall and F. G. Stock³ provides some evidence of why the doctor's judgment in sometimes preferring a proprietary to its equivalent is sounder than the politician's. They took 343 samples of barbiturate tablets; these comprised 11 samples of various proprietary tablets and 332 samples of 14 different types of barbiturate supplied by the manufacturers as conforming to B.P. specifications. The 343 samples included the products of 36 manufacturers plus a few of uncertain origin. Tests to see whether the tablets were up to B.P. requirements revealed some striking discrepancies. All of the proprietary tablets were found to be correct. Of the 332 non-proprietary samples 79 were found to be incorrect. Differences between the firms were notable; four firms, for instance, had been the manufacturers of 83 correct samples, whereas 42 incorrect samples were found out of 67 made by two firms. Disintegration tests showed times ranging from 1 minute up to the indefinite: some tablets had not softened after a week's immersion in water. Shelf life, or speed of deterioration on storage, was found to differ greatly, and the authors suggest that "a very good case could be made out for requiring all drugs to be labelled with their dates of manufacture." Another possibility is that all drugs as supplied to the patient should be labelled with the manufacturer's name. Experience has shown time and again that the named product, whatever it may be, is more to be relied on than the unnamed; the manufacturer who takes care to maintain quality puts his name on his products. In the old days, when pills and mixtures were dispensed on the premises, the patient often had a shrewd idea of which chemist in his town did the job best, and chose accordingly. By contrast, it is not so easy for doctor or patient to discriminate between the boxes of anonymous tablets handed over the counter nowadays. However that may be, good prescribing will always be economical prescribing, and

doctors will no doubt continue to rely more on their own informed judgment than on the judgment of parties whose chief aim is either to promote sales or to restrict them.

INTRA-ARTERIAL OXYGEN

In 1934 W. H. Chase¹ noted a curious thing about the behaviour of blood vessels after intra-arterial injection of gases when he reported seeing the vessels of the rabbit's mesentery dilate after air embolism. M. Villaret and R. Chachera² further observed that, whereas solid emboli always provoked vasoconstriction, air bubbles never did—on the contrary, dilatation often ensued. Lately, F. Duff and his colleagues³ have examined the physiology of this response in detail in the healthy human forearm. They injected a few millilitres of various gases into the brachial artery and found that the blood flow through the forearm increased some three or four times, irrespective of the gas used and despite an initial slight fall in flow when the bubbles first entered and blocked some of the smaller vessels. The most remarkable feature of the response was its persistence; normal flows were not regained for 48 hours or more. Duff and his colleagues are inclined to believe that the gas emboli inflict some injury on the tissues, a product of which (not histamine) causes the vessels of the part to dilate. The nervous system was found not to be concerned in the response.

Such long-lasting dilatation might well be of therapeutic worth, and in France and Germany numbers of patients with arterial disease of the limbs have been so treated. A. Lemaire, J. Loeper, and E. Housset⁴ in Paris were the pioneers, and in 1953 reported 58 cases. From Germany, M. Ratschow⁵ and W. Fey and W. Boxberg⁶ between them reported over 200 cases in 1956. They used repeated injections into the femoral artery of oxygen gas in volumes of 40 to 100 ml. or more. In the arm much smaller volumes were used. Complications have been few. The chief danger is that bubbles may be carried proximally and find their way into viscera, including the brain; a death has been reported from cerebral air embolism. Slow injection and insistence upon the patient lying flat for three-quarters of an hour after injection prevent such mishaps. Generalized urticarial reactions and severe pain associated with intense vasoconstriction in the treated limb are also occasionally encountered. A spastic phase, during which the skin becomes white and the pulses disappear, is the normal initial response of the limb to the injection; noises due to the gas bubbles may be heard with the stethoscope. This is soon succeeded by a hyperaemic phase, and the skin temperature remains raised for the next day or two. Of the patients treated, those with the milder forms of arterial obstruction obtained most benefit. In Fey's series three-quarters of the patients with

¹ Chase, W. H., *Surg. Gynec. Obstet.*, 1934, 59, 569.

² Villaret, M., and Chachera, R., *Les Embolies Cérébrales*, 1939, Paris.

³ Duff, F., Greenfield, A. D. M., and Whelan, R. F., *Clin. Sci.*, 1954, 13, 365.

⁴ Lemaire, A., Loeper, J., and Housset, E., *Presse méd.*, 1953, 61, 1439.

⁵ Ratschow, M., *Angiology*, 1956, 7, 61.

⁶ Fey, W., and Boxberg, W., *Dtsch. med. Wschr.*, 1956, 81, 2031.

⁷ Marshall, R. J., and Whelan, R. F., *British Medical Journal*, 1956, 2, 1448.

¹ Richardson, I. M., Retirement: a socio-medical study of 244 men. *Scottish Medical Journal*, Vol. 1, No. 12, December, 1956, pp. 381-391.

² Thomas, G., and Osborne, B., *Older People and their Employment*, Social Survey Report No. 150, Central Office of Information, 1950.

³ *British Medical Journal*, 1954, 2, 1406.

⁴ Report of the National Assistance Board for the Year ended December 31st, 1954, Cmd. 9530, pp. 16-20. H.M.S.O.

exercise pain alone improved their walking distance, whereas of patients in whom necrosis was present only about one-quarter benefited. Indeed, if tissue damage is the mode of action of gas therapy, great caution is necessary in treating patients with tissues already anaemic. In a recent report published in this *Journal* R. J. Marshall and R. F. Whelan⁷ described the encouraging results they obtained with intra-arterial oxygen in the treatment of 18 patients with peripheral vascular disease (Raynaud's phenomenon, intermittent claudication, and ischaemic necrosis of feet). These authors believe that, rightly applied, it is a safe method of treatment, but warn against its use in patients with very low resting blood flows or in those with recent occlusion of a major vessel.

Generally speaking, chemical vasodilators have proved disappointing in treating occlusive arterial disease. Perhaps the mechanical effects of gas bubbles have something better to offer.

HUMAN TUMOUR TRANSPLANTS IN ANIMALS

Great efforts have been made in Britain and the U.S.A. to find a suitable testing-ground for chemotherapeutic substances believed to have a selective effect on cancer cells. The pioneer work on the transplantation of human tumours was carried out by M. T. Carrell and H. Burrows¹ in 1913: they showed that such tumours could be transplanted and grown in animal hosts. From then on little interest was taken in the technique until 1938, when Dr. H. S. N. Greene,² of Yale, published his results on transplantation of human tumours into the anterior chamber of the guinea-pig's eye and the rabbit's brain. Prompted by the idea that this might prove a useful technique for studying the efficacy and action of anti-cancer substances, Dr. Helene Toolan,³ of the Sloan-Kettering Institute in New York, devised her method of injecting a finely minced suspension of tumour below the skin of the abdominal wall in rats or of implanting a tiny fragment or suspension of tumour into the cheek pouch of the hamster. Transplants of this sort will not take in a normal animal, since the host's tissue reaction overwhelms the implant, which is very vulnerable, being without a blood supply or protecting stroma. For this stage of vulnerability to be overcome and for the tumour to be put in a position to survive and grow, the host reaction has to be modified by first treating the animal either with x rays to the total body or with cortisone injections, or with a combination of the two. Tumours growing in this way and used for chemotherapeutic trials can be easily palpated and measured with callipers, and change in their size thus assessed.

The advantages of the method were obvious, but its critics said that a human tumour treated in this way lost its human character and became an animal tumour. One way to refute this criticism would be to show that one of these tumours after passage through animals

could again be grown in the original host—but to find such a host would require very exceptional circumstances. By an extraordinary chance this test was able to be performed. A patient named Mrs. Fernandez was admitted to the Memorial Centre with cancer of the cervix which was pronounced inoperable. A piece of the tumour was taken for biopsy and part of this was taken for transplantation into an animal. The implant was successful. On hearing this, the patient, in spite of knowing her hopeless prognosis, took an intelligent interest in the animal experiments and indeed seemed to derive some consolation from it. From questioning the staff and reading of this sort of work in the lay press she realized that the final test ought to be reimplantation of the tumour, now growing in rats. At her suggestion and with her consent this was done: a piece of tumour was implanted below the skin of her forearm. That the implant took was proved when the nodule was excised and examined microscopically. Dr. C. P. Rhoads reported this unique experiment in his recent Imperial Cancer Research Fund lecture at the Royal College of Surgeons. Through the courage of the patient who offered herself for this experiment, the important biological fact has been established that a human tumour grown in animals retains its human character. Her example has been followed by the prisoners in Ohio gaol who volunteered to have living cancer cells implanted below their skin.⁴ In these experiments the tumour implants failed to grow, showing that the normal host was able to destroy the cancerous implant.⁵ This work marks another stage in the study of tumour-host relationships and of the problems of cancer growth and spread.

"PUBLIC HEALTH"

Public Health, the journal of the Society of Medical Officers of Health, was first published in 1888, and ever since it has kept members informed of the activities of the society and published work of interest to those working in the preventive medical services. Eighteen months ago the familiar utilitarian buff cover gave way to a more dignified design of black on green, and at the same time the paper was improved and a larger type-face used. It now turns out that these improvements were only a foretaste of better things to come, for this month *Public Health* appears in a completely new and much more readable form, with a single-column page, larger type, and a lay-out more in line with other monthly medical periodicals. No doubt the new publishers of the journal, Baillière, Tindall and Cox Ltd., are responsible for some of these agreeable changes, but the editors are also to be congratulated on the contents of the first number of this new volume. As a former editor of *Public Health* wrote not long ago: "The editor of a journal which is the official organ of a learned society must, we believe, always bear in the forefront of his mind that the journal he edits is the only regular link between its sponsoring body and many of the members."¹ *Public Health* in its new guise should do much to strengthen this link between the society and its members.

¹ *Publ. Hlth*, 1955, 48, 183.

¹ Carrell, M. T., and Burrows, H., *J. Amer. med. Ass.*, 1910, 60, 1732.

² Greene, H. S. N., *Science*, 1938, 88, 357.

³ Toolan, H. W., *Cancer Res.*, 1954, 14, 660.

⁴ See *British Medical Journal*, 1956, 1, 762.

⁵ Southam, C. M., Moore, A. E., and Rhoads, C. P., *Science*, 1957, 125, 158.

PSYCHOLOGY AND MEDICINE

BRITISH PSYCHOLOGICAL SOCIETY

[FROM A SPECIAL CORRESPONDENT]

The annual conference of the British Psychological Society was held at St. Andrews University from March 28 to April 2. A large number of the papers were of medical interest and some of them are summarized below.

Rehabilitation of Chronic Schizophrenics

Dr. N. O'CONNOR, Ph.D., an M.R.C. research psychologist, gave the first of the clinical papers. His subject was the rehabilitation of chronic schizophrenics. The magnitude of this problem will be realized from the fact that the best estimates reckon chronic schizophrenics as comprising 70% of all chronic mental patients. In mental hospitals there is increasing emphasis on the social and occupational treatment of chronic schizophrenics, not only as a means of preventing their further deterioration, but also to prepare even those severely affected for return to life outside. Although, over the years, enthusiasts have obtained good results from such rehabilitation, the factors that initiate and maintain improvement are still largely unknown. Dr. O'Connor's paper dealt with a study of chronic schizophrenics given a simple industrial task. Their performance was found to be very low, but they improved with practice and eventually achieved 85% of the level reached by a control group of normal subjects. Whereas most schizophrenics improved in a manner similar to normal subjects, a group of paranoid schizophrenics showed a type of improvement quite unlike the others. Instead of an initial rapid improvement, slowing down as it reached the maximum, these patients improved steadily and continuously to their maximum. On theoretical grounds it was suggested that this pattern of improvement was due to some difference in their motivation related to their particular psychological make-up. Their training might therefore require a rather special technique. A paper by Dr. ANNE BROADHURST, Ph.D. (Springfield Hospital, Tooting), on the mental functioning of chronic schizophrenics showed that, after practice tests for mental speed, they actually improved more rapidly than normal subjects, even though their final level was below normal. Ordinarily schizophrenics show abnormally slow mental functioning.

A Biological Approach to Child Development

From the medical point of view the most interesting part of the meeting was the symposium on child development. The symposium was opened by Dr. JOHN BOWLBY (Tavistock Clinic, London), who gave a simple account of ethology and its clinical implications. He defined ethology as the "study of species-specific behaviour-patterns." A central problem for both clinical and social psychology was, he said, the nature and development of the child's relationships with other people. Psycho-analytic theory was concerned with human instincts, their development, organization, and conflict, and these, it was held, were the determinants of human behaviour. Unfortunately, although clinical reports were voluminous, records of systematic observations were few, experimental methods were conspicuously absent, and hypotheses were often so framed that they were not susceptible of testing. It was here that the example of the ethologists, with their descriptive and experimental studies of the development of social behaviour, family relationships, and conflict and defence mechanisms in lower organisms, was able to offer a scientifically rigorous method of approach.

The pioneer of this approach was Darwin. In his chapter on instinct in the *Origin of Species* he noted that each species was endowed with as specific a repertoire of inherited behaviour-patterns as it had specific anatomical structure. Modern ethologists had identified a number of the specific stimuli—"sign stimuli"—that elicited these patterns of behaviour; they were often fairly simple visual or auditory

signals to which the organism was innately sensitive. Where these behaviour-patterns mediated social behaviour, much light had been thrown on the nature of social interaction. The concept of sign-stimuli able to release or suppress social behaviour—"social releasers" or "social suppressors," as they were called—would, Dr. Bowlby believed, prove valuable in the study of social relationships in man. Of course, internal conditions, such as hormone levels and the degree of maturation of the central nervous system, also played an important part in initiating and terminating behaviour. In the growing individual, species-specific behaviour-patterns often underwent critical phases of development, when certain of their characteristics were established either permanently or nearly so. These critical phases usually occurred very early in the life cycle, and during them were determined not only whether a particular response appeared at all, but also its form and intensity and the particular stimuli which activated or terminated it. It was essentially in these critical phases that modification of behaviour by learning occurred. In the animal kingdom conflicting impulses were a commonplace, and the outcome of such conflicts was very varied and sometimes as maladaptive as in man. Much could probably be learnt from studying the ways in which such conflicts were regulated in animals. He thought that here too critical phases would be found, and this might well provide a key to understanding the origin of neuroses.

An example of the ethological approach to clinical problems was the work on the social behaviour of babies. There was little doubt that a baby's smile acted as a social releaser: one of its functions was surely to evoke maternal behaviour in the mother. Although the earlier workers had discovered that the sign-stimulus for the baby's smile was the human face—or a representation of it equipped with two "eyes"—they had not recognized this smiling as an innate response. As the infant grew older a more complex stimulus was needed to evoke its smile. The fact that this behaviour was influenced by learning did not contradict the view that the response was originally innate. Crying, sucking, and smiling were, he suspected, some of our many "built-in" motor patterns, representing Nature's insurance against leaving everything in man to the hazard of learning. In this context it was relevant to recall Freud's belief of over forty years ago that, for a further understanding of instinct, psychology would have to look to biology. The biologically rooted science of ethology, said Dr. Bowlby in conclusion, would probably enable them to recast the psycho-analytic theory of instinct.

Other Theories of Child Development

Dr. C. B. HINDLEY (Institute of Education and Child Health, London) gave an account of the contribution of "associative learning" theories to the problems of child development. On the basis of the inherited tendencies of the infant, the various learning principles, including classical conditioning, trial-and-error learning, and the acquisition of secondary drives, could explain the formation and development of later characteristic modes of behaviour. In infants, conditioning had been found in the second week and was quite strong by six weeks. The first phase of learning was discriminative and abstractive, and restriction of perceptual experience had been found to be more damaging than restriction of motor experience. Work on chimpanzees, continued Dr. Hindley, had shown that critical periods were not as important as in the lower animals. The theory that reduction of anxiety acted as a reinforcement had already proved useful in clinical medicine, and the finding that enuretics had often had an exceptionally frustrating habit-training was a good example of the ability of frustration to "fix" behaviour. However, provided allowance was made for maturation, there was no essential contradiction between ethological and learning theories.

Dr. CECILY DE MONCHAUX, Ph.D. (University College, London), discussed the contribution of psycho-analysis. The original psycho-analytic formulations about child development had been based on the analysis of adult patients, she

said. But later they had been confirmed by studying children. While observation of adults in regressive states had led to deductions about children's unconscious fantasies, it had required the analysis of children to reveal the details of the defence mechanisms which were used to deal with these fantasies at different stages of development.

Dr. E. J. ANTHONY (Institute of Psychiatry, London) then gave a historical account of the development of Piaget's system, and contrasted it with the Freudian system.

First Social Relationship

Mr. J. A. AMBROSE (Tavistock Clinic, London) then described, from an ethological standpoint, a preliminary study forming part of a wide programme of research on the processes underlying the development of the infant's attachment to its mother—its first permanent social relationship. The study concerned the variations of the smiling response of babies to the stimulus of the sight of a motionless, unsmiling human face. The "smiling time," defined as the number of seconds a baby smiled in a total period of 30 seconds' exposure to the stimulus, was found to diminish rapidly from a maximum, but could be revived by moving, speaking, or smiling at the baby, or by removing the stimulus for a short period. If a constant stimulus was repeated intermittently the smiling response waned. This waning curve differed from infant to infant and was sensitive to a variety of external and internal conditions affecting the baby. However, smiling was only part of a baby's response. It engaged in a good deal of other forms of activity which Mr. Ambrose described and discussed.

Mr. T. MOORE (Institute of Education and Child Health, London) gave an account of a study of the sleeping habits of babies in their first year of life. At three weeks an infant slept for some 14 out of the 24 hours, and only slowly during the course of its first year did its sleeping tend to occur wholly at night. At the end of this year 10% of the babies he studied had never slept regularly through the night for four consecutive weeks, and half of those who had settled relapsed to waking at night later. Among the factors associated with this failure to settle at night were neonatal asphyxia, male sex, feeding difficulties, insufficient nursing, and inconsistent handling at night.

Separation from Home

Dr. C. M. HEINICKE, Ph.D. (Tavistock Institute, London), described a carefully designed clinical investigation on the effects of temporary separation from the home and a stay in a residential nursery on children, aged 15-30 months. A control group matched in all respects except for the absence from home were similarly studied. This work confirmed the damaging effect of separation from the home.

Dr. T. R. LEE, Ph.D. (St. Andrews University), had obtained assessments of the social and emotional adjustment of 883 infants attending 57 village schools from their teachers. He found greater maladjustment in those who went to schools far from home. Of possible explanations for this (including fatigue), the only one which satisfied the data was a situation where the child felt its mother to be inaccessible.

Mrs. KELLMER PRINGLE, Ph.D. (Birmingham University), reported that children who had been admitted to institutions early in life and had lost contact with their families, when tested at the ages of 8, 11, and 14 for range of vocabulary and intelligence, obtained lower scores than those admitted later and with persisting home contacts.

Other Medical Contributions

Mr. P. H. GLOW (University College, London) described the effect of a hallucinogen—lysergic acid—on the behaviour of rats. His experiments had shown that its effect was related to its concentration in the brain and was due to its action on the afferent system, not the motor system.

Dr. M. HAMILTON (Leeds University) gave an account of the application of psychometric methods to the assessment

of the symptoms of anxiety neurosis. Patients were assessed on 13 variables (symptoms), using a five-point scale, and simultaneous assessment by two psychiatrists showed that the method was more reliable than most psychological tests of personality. The method of factor-analysis had been used to study the relations between the variables, and it was shown that these could be ascribed to two independent factors, one accounting for "psychic" symptoms, and the other for somatic symptoms. German psychiatrists, he pointed out, classified the latter group as a distinct syndrome of "autonomic dysfunction."

Professor H. J. EYSENCK (Institute of Psychiatry, London) gave an account of a recent work in which excitatory drugs such as amphetamine and caffeine and sedatives such as amylobarbitone sodium were used to alter cerebral functioning. Previous work has shown the importance of excitation and inhibition on the personality. This paper was concerned with the effects of these drugs on the development of visual after-images.

No account of this meeting would be complete without some reference to Dr. E. B. STRAUSS's presidential address on "The Anatomy of Treachery." He gave a literary and sparkling address in which sound judgment of character, wisdom, and clinical acumen were nicely mingled. It made a fitting climax to a stimulating meeting.

Reports of Societies

MANCHESTER MEDICAL SOCIETY

"Perinatal Pneumonia" and "Hormones and Adrenalectomy in Metastatic Breast Carcinoma" were discussed recently by the Sections of Pathology and Surgery respectively of the Manchester Medical Society.

Perinatal Pneumonia

The discussion on perinatal pneumonia was opened by Dr. F. A. LANGLEY, senior lecturer in special pathology. In the years 1950, 1952, and 1954 they had found pneumonia *post mortem* in 10% of stillborn foetuses, in 25% of babies dying on the first day, in 33% of those dying on the second day, and thereafter in diminishing proportion. The still-born foetuses and infants dying under three days were on average larger than a control group of foetuses and infants dying without evidence of pneumonia, and birth injury and severe dystocia were commoner among them. Particularly striking was the high incidence of pneumonia in infants whose amniotic membranes had been ruptured more than 48 hours, although the duration of labour by itself seemed to play no part. Of stillborn foetuses whose placentas were available for examination, all the ones with pneumonia showed inflammation of the foetal surface of the placenta.

A clinical trial was carried out in 1955 in which women in labour with pyrexia, foetal tachycardia of 160 or more, or offensive liquor were separated into two groups. One group was treated with streptomycin and oxytetracycline, while the other received no antibiotic therapy. Five cases of pneumonia were found *post mortem* in the untreated and none in the treated group. In each case of pneumonia there was evidence that maternal infection had been present for 48 hours or more. And again a close correlation was found between the length of time the membranes had been ruptured and the occurrence of pneumonia.

Dr. R. F. JENNISON, lecturer in clinical pathology, said he had made bacteriological studies during the last two years of 330 lungs from infants dying in the perinatal period. He had isolated bacteria from 128. The commonest organisms were *Bact. coli* (15%), *Strep. faecalis* (9%), and non-haemolytic streptococci (6%). Of the 39 lungs showing pneumonia, 21 had given positive cultures, six of these being of *Bact. coli*.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Strontium-90 in Man

SIR,—Strontium-90 is now frequently being discussed all over the world, and your leading article (*Journal*, March 30, p. 752) will no doubt be quoted in lay fora as an expression of the best medical opinion of this country. It is important that some of the weaknesses of this, in most ways excellent, short summary of the situation should be noted.

"The main problem is how to assess the hazard from a given amount of strontium-90 in bone." Most would agree with this quotation.

Permissible Body Burden for the Occupationally Exposed.—This has been given by the International Commission on Radiological Protection and the Medical Research Council's Committee on Protection against Ionizing Radiation as 1 μ c of strontium-90 or approximately 1,000 S.U. (strontium units, μ c per gramme of calcium), and was derived as follows. From industrial experience in the luminizing industry it was considered that the minimum toxic body burden of radium—a chemical analogue of calcium and strontium—was 1 μ c. Early results with experimental rodents in Chicago had indicated that the toxic dose of strontium-89 relative to radium was about 10:1. Strontium-90 and its daughter yttrium-90 liberate per disintegration about twice the energy of strontium-89. Therefore the ratio of strontium-90 to radium should be about 5:1 as administered; but radium decays in the body to radon, a gas, much of which escapes in expired air, more in the case of recently deposited radium than from long-standing depots, and more in the case of experimental rodents than man. In terms of body burden of effective radioactive material in human bone it was fair to allow a factor of 2 for this, bringing the ratio strontium-90:radium=10:1. The calculated, minimum toxic permanent body burden for strontium-90 is thus 10 μ c. Allowing a safety factor of 10 a maximum permissible body burden of 1 μ c was derived.

The following uncertainties are relevant. (1) Industrial radium used in the luminizing industry was a mixture containing variable amounts of mesothorium and other radioactive elements, too short-lived for their contribution to the observed toxic manifestations to be assessed at the time when the body burdens of luminizers were estimated. However, a few subjects who had received injections of relatively pure radium for medical (sic) reasons have been discovered: in them the minimum toxic body burden appears so far to be about 3 μ c as compared with recent estimates of about half a microcurie of "radium" in ex-luminizers. The minimum toxic body burden of radium cannot therefore be indicated with precision. (2) The ratio of toxic doses of radium and strontium-89 was derived from injected animals. After more chronic administration these radioactive materials may be expected to be more widely distributed in bone. (3) The comparative metabolism of radium and strontium may differ significantly in man from the rodent because of different size and bone structure.

Permissible Body Burden in General Population.—In spite of the uncertainties the maximum permissible body burden for strontium-90 remains one of the best authenticated for strontium-90 for occupational purposes. However, because of the uncertainties it is not justifiable to use this figure as a yardstick when one is considering a general population as Libby² and Kulp *et al.*³ have done. Your leading article and the Medical Research Council⁴ have given the most cogent reason—the presence in a general population of foetal, neonatal, and adolescent subjects who have greater avidity for and greater sensitivity to radioactive strontium. On the other hand, with the homeopathic doses they receive daily the young will distribute strontium much more uniformly in bone than will the adult. How much this latter offsets the former is unknown.

A comparison of the bacteria isolated from the infants' lungs with those from their mother's vaginas during a controlled trial in 1955 had shown a similar distribution of pathogenic organisms. The number of pathogens increased with the length of time the membranes had been ruptured and also with the duration of maternal pyrexia. All the infants with pneumonia in this series had been born of mothers with a pyrexia of 99.4° F. (37.4° C.) or more for at least 48 hours and whose membranes had been ruptured for 36 hours or more. No cases occurred in mothers without pyrexia or who had been given antibiotics as soon as pyrexia developed. It appeared, therefore, that the majority of cases of perinatal pneumonia were caused by bacteria from the vagina, and were associated with a maternal reaction manifested by pyrexia.

Bilateral Adrenalectomy and Oophorectomy for Breast Cancer

Mr. A. F. ROBINSON (Burnley General Hospital) opened the discussion on "Hormones and Adrenalectomy in Metastatic Breast Carcinoma." Bilateral adrenalectomy and oophorectomy (or orchidectomy) could help control disseminated breast cancer only if the tumour was hormone-dependent, he said. To eliminate all oestrogenic hormones both adrenals and ovaries had to be removed, unless a hypophysectomy was done instead; a previous x-ray sterilization or menopause did not remove the need for oophorectomy. Operation was recommended if the disseminated cancer was active and advancing and simpler treatments had failed. Cases had to be selected with care. Those whom it was thought would not stand operation, those whose arms were grossly swollen, those over about 70, those with much hepatic or mediastinal metastasis, and those with irreversible vital damage, should be excluded. At operation accessory adrenals must be looked for and removed.

After the critical first six hours there was usually little cause for anxiety. In general more cortisone was the remedy for most ills at any stage after operation, and difficulty in cortisone management usually meant failure of response in the cancer. Postural hypotension was an indication for deoxycortone in the follow-up period. Response in the successful cases had been dramatic, bone pain often being relieved by the morning after operation. In 43 cases there had been 5 deaths associated with the operation, and 18 out of the 38 survivors had been greatly helped.

Dr. MARY COLE (Christie Hospital) gave more details of the operative results. Of the 43 patients 19 had been operated upon at least 12 months ago; of these, nine showed a measurable response, seven being still alive, three being well at 18, 17, and 13 months respectively. Including those operated upon six months ago, there were 38 cases; 19 had shown a response and 10 were still in remission after periods between 6 and 18 months.

At most sites there was some improvement, but bone metastases responded more consistently than others. Many of the patients had had a trial of hormones pre-operatively, and of 18 patients who responded to adrenalectomy nine had previously shown a response to hormones; of 14 who did not respond to adrenalectomy two only had shown a previous response to hormones.

Dr. Cole then compared these results with those from other methods of treatment. X-ray castration had resulted in improvement of the metastases in 21.5% of 79 pre-menopausal women, she said. Some 20% of 142 pre-menopausal women receiving testosterone propionate responded, but there was a gradual diminishing response in the older age-groups. Of 258 patients treated with stilboestrol the best response—19.2%—was obtained in those at least 10 years past their menopause, while of the pre-menopausal patients only 5% responded. In spite of the lower remission rate with hormones compared with combined oophorectomy and adrenalectomy, she made a plea for a trial of the appropriate hormone before operation—the final palliative measure—was considered. Some patients, she said, might have a remission with hormones, and subsequently again after adrenalectomy and oophorectomy.

This matter of distribution of strontium is worthy of stress. The values given by Kulp *et al.*⁹ for strontium-90 in human skeletons were not those directly measured but figures "normalized" for unevenness of distribution in different bones. Now, unless I am in error, the factor for normalization was derived from the single administration of strontium-85 to adults in the terminal phase of killing diseases. An ill adult patient, probably bed-ridden, given a single dose of a radioactive marker and dying 3 to 125 days later, is no criterion for the metabolism of a daily ingested calcium analogue, and to use this criterion to "normalize" observed data, particularly from children, is, to say the least, unscientific. In fact field studies on domestic animals⁵ indicate that gross radioactivity from strontium-90 is fairly uniformly distributed throughout the bones. Moreover, the analysis of stable strontium in human bones from subjects of all ages shows a similar uniformity.⁶ Strontium is a normal though apparently non-essential metabolite, and radioactive strontium will follow the same pathways.

Radioactive strontium-90, now universally distributed over the surface of the world, should be considered in comparison with the naturally occurring radium found in all bone, human and animal. Calculations of acceptable risks for a population from body-burdens of radioactive strontium are best made therefore using natural radium contamination as the criterion. This approach is being pursued with vigour.

Dose-response Relationship.—Meanwhile, "How does formation of bone tumours vary with dose?" Is there a relationship between natural radioactivity of bone and natural incidence of bone sarcoma? Though this has been carefully looked for, the only conclusion is that the evidence is too scanty.

Is there "growing evidence that the relation between the amount of exposure to radiations and the probability of developing long-term effects is of a linear nature"? In so far that formerly there was none at all, while recently a linear relationship has been suggested between dose to a point in the spinal marrow and the incidence of leukaemia in irradiated spondylitics (Appendix B*), this statement is true.⁷ But radiation-induced leukaemia is an odd thing. It has a much shorter latency than other radiation-induced malignant states. Some would even yet argue that it is not a malignant condition. In the experimentally induced lymphoma of the mouse the relation between total dose and fractionation of the dose is most complex and certainly not simply linear.⁷

It would be unwise therefore to use leukaemia as a model for all radiation-induced malignancies and as a justification of the thesis of somatic mutation as the cause of cancer. It is wrong, moreover, to attribute to the M.R.C. report⁴ opinions which it did not express. The statement, "Each unit quantity of radiostromium absorbed by bone confers a certain probability of bone tumour formation," was not in the report but one of its signed appendices. Furthermore, the statement would suggest a linear relationship only if each unit quantity conferred the same probability.

In point of fact, the quantitative evidence of the carcinogenic properties of radiostromium, and there is not much of it, suggests that the relationship is not linear and that there is some form of threshold, or effective latent period.⁸ Therefore your conclusion, "The consequence of a linear relationship is that every H-bomb test by causing an increase of the content of strontium-90 in bone will increase the frequency of bone lesions," is as yet without foundation. The correct conclusion in the present state of scientific knowledge is that a linear relationship sets the limit and indicates the worst possible conditions, so that it would be prudent to go easy until the real facts are ascertained.

Strontium in Animal Metabolism.—*Pari passu*, it is right and proper that investigations be made on the uptake of both natural radium and the now universal strontium-90. Your leading article notes that we derive most of our calcium and strontium from milk and certain of its products. A safety factor of about 7—the cow—is built into this route by which we ingest strontium-90. Your leading article

quotes a second safety factor of about 8 in going from food to the deposition of strontium in human bone. The combination 7×8 would indeed be impressive, but is unfortunately an overstatement. Sowden and Stith⁶ find the strontium content of human bones to be, in round figures, 100 p.p.m. of ash, of which about 40% will be calcium. The strontium:calcium ratio is thus about 1:4,000. In a general diet one can derive from the data of Harrison *et al.*¹⁰ that strontium:calcium is about 1:500. Here is the factor 8, but this includes the factor for the cow in so far as milk and its products are part of the diet of the average adult. Moreover, Harrison *et al.* calculate that the discrimination against strontium in favour of calcium by the human gut gives a factor of about 2. Unpublished observations from the same source suggest that the human bone absorbs calcium and strontium from the blood without discrimination. The best figure at the moment for the human safety factor is thus only 2. It is likely to be rather higher for alkaline earths of vegetable origin than for those derived from milk, since lactose and some amino-acids cause reduction in the factor of discrimination.¹¹

Strontium in Soil and Plant.—Your leading article infers that all the strontium-90 in plants is derived from the soil. But the leaf of the plant is a very good surface for the adhesion of small particles of "fall-out" and for the absorption of strontium as well as other mineral ions.^{12,13} Thus the present contamination may be much more related to the rate of fall-out than to integrated total "fall-out."—I am, etc.,

Didcot, Berks.

J. F. LOUTIT.

REFERENCES

- Looney, W. B., Hasterlik, R. J., Bruce, A. M., and Skirmont, E. *Amer. J. Roentgenol.*, 1955, 73, 1006.
- Libby, W. F., *Proc. nat. Acad. Sci. (Wash.)*, 1956, 42, 945.
- Kulp, J. L., Eckelmann, W. R., and Schult, A. R., *Science*, 1957, 125, 219.
- Medical Research Council, *The Hazards to Man of Nuclear and Allied Radiations*, 1956, London.
- Cox, G. W., and Morgan, A., personal communication.
- Sowden, E. M., and Stith, S. R., A.E.R.E. MRC/R.2030, 1956.
- Mole, R. H., in *Progress in Radiobiology*, 1956, edited by J. S. Mitchell, B. E. Holmes, and C. L. Smith. Oliver and Boyd.
- Finkel, M. P., *Radiology*, 1956, 67, 665.
- Brues, A. M., *J. clin. Invest.*, 1949, 28, 1286.
- Harrison, G. E., Raymond, W. H. A., and Tretheway, H. C., *Clin. Sci.*, 1955, 14, 681.
- Wasserman, R. H., Comar, C. L., and Nold, M. M., *J. Nutr.*, 1956, 59, 371.
- Tukey, H. B., and Wittwer, S. H., in *Progress in Nuclear Energy VI: Biological Sciences*, 1956, Pergamon Press.
- Russell, R. S., Squire, H. M., and Martin, R. P., A.E.R.E./S.P.A.R. 3, 1955.

SIR,—Your leading article (*Journal*, March 30, p. 752) states that strontium-90 does not present genetic hazards since it emits only β -rays which do not penetrate to the gonads. In view of the great importance of this subject at the present time, it would be interesting to know whether this statement is based on experimental evidence or merely on supposition. If the latter, then it is difficult to accept the argument without further investigation. It may be that the writer assumed that all the available strontium-90 is deposited in the bone and therefore is unlikely to affect the gonads. However, even on this assumption the β -particles can traverse distances of up to about a centimetre in soft tissues¹: when the testes are in the inguinal canal, they must be less than one centimetre distant from bone at some stage in their journey. This may also apply to the ovaries during development.

A second possibility which may not be excluded is the effect of any strontium-90 prior to its deposition in the bone or after subsequent mobilization. If there is any similarity between the effect of strontium and lead it may be that strontium does in fact have an effect on the soft tissues in general. Lead is well known to have a special affinity for bone, but its main impact is on soft tissues, such as the nervous system and the gut. Until, therefore, these possibilities have been excluded by experiments of suitable length in mammals, such a statement as that in your leading article may convey a false sense of security.—I am, etc.,

London, S.W.17.

BRIAN H. KIRMAN.

REFERENCE

- Medical Research Council, *The Hazards to Man of Nuclear and Allied Radiations*, 1956, p. 5. London.

Carcinoma of Oesophagus Associated with Tylosis

SIR,—Keratosi palmaris et plantaris (tylosis) has hitherto been considered a rather trivial disability, of interest chiefly to geneticists on account of its classical method of inheritance as a mendelian dominant. However, that the skin condition can sometimes have a sinister association is shown by a study of two tylotic Liverpool families, where, on no less than 16 occasions, patients with the skin abnormality have also developed cancer of the oesophagus. In one family there were 10 such cases in three generations, and in the other six in two generations.

The following points are relevant: (1) The association was first discovered in family S, but family C had been reported previously on account of the familial incidence of the carcinoma.¹ On reinvestigation the affected members of this family were also found to have been tylotic. It is possible that the two families are related, but definite proof of this is so far not forthcoming. (2) There were no cases of carcinoma of the oesophagus occurring in the non-tylotic members of either family, and there was no excess of cancer of other sites in these individuals. (3) It is important when investigating for tylosis to examine both the hands and feet of patients, as not infrequently in our families the lesion is only on the soles. (4) In the two families the average age at death of those who developed the carcinoma was 45 years, and males and females were equally affected. (5) The site of the growth was in the lower third of the oesophagus in 10 cases, in the mid-third in three, and in three cases the site was not known. (6) Of the tylotics investigated in these families, 30% developed carcinoma of the oesophagus. (7) The average age of onset of the tylosis was about 14 years—this is later than is usually described. (8) In two patients in whom the growth was removed the skin condition markedly improved after operation.

In a large survey of carcinoma of the oesophagus made in Denmark² it was firmly concluded that inherited factors played no part in the aetiology of this type of growth. The association, therefore, between tylosis and oesophageal cancer in our two families seems of particular interest, and as far as we know has not been described before. Pedigrees and full details of the families will be published later, but in the meantime we should be very interested to know if anyone has observed a similar association. We are also interested to find out the causes of death in patients who have been known to have tylosis.—We are, etc.,

C. A. CLARKE.

A. W. HOWEL-EVANS.

R. B. MCCONNELL.

Liverpool, 1.

REFERENCES

- Clarke, C. A., and McConnell, R. B., *British Medical Journal*, 1954, 2, 1137.
- Mosbech, J. N. S., and Videbaek, A., *J. nat. Cancer Inst.*, 1955, 15, 1665.

Living with a Colostomy

SIR,—Your leading article (*Journal*, February 2, p. 274) and subsequent letters in the *Journal* quite rightly focus the attention of a new generation of doctors on the need of being informed about the management and care of a colostomy and of being competent to pass on this information in simple terms to their patients.

I think the impression has unfortunately been given that a colostomy needs either a washout or "drugs" to make it work efficiently. It is my contention that the success of a colostomy depends on how well it has been made. If it has been ill-fashioned, no method of management, no combination of drugs, diet, or bulk-forming substance will make it work efficiently. It should be possible to pass the adult male index finger covered with a lubricated finger-cot into a colostomy and through the layers of the abdominal wall without discomfort to the patient. If the colostomy is too tight this digitation will cause the patient pain.

The only concern to a patient who has to have a permanent colostomy is that, if it has to be, then it should be

efficient. The majority of permanent colostomies are an essential step in the treatment of cancer of the rectum, where a surgeon's attention is naturally focused on removing the growth and the fashioning of the colostomy is often left till the end of the operation, when the surgeon is tired and when complications arising during the operation may make it necessary to fashion it hurriedly without the care and attention it deserves.

Because of this, I have recommended that the colostomy stoma should be fashioned as the first step of an excision of the rectum before making the laparotomy incision. The advantages of this sequence are: (1) The colostomy is made when the surgeon is fresh. (2) Sufficient time can be spent on its detailed construction. (3) The stoma through the abdominal wall is made with the layers in anatomical superimposition. (4) If complications arise during the operation the colostomy has already been fashioned and need not be left to a hurried last-minute stab incision through the abdominal parietes. I have found that the best colostomies are those where a disk of abdominal wall 3 cm. in diameter (the size of a penny) is "trephined" through the outer third of the left rectus muscle just below the level of the umbilicus.¹

In conclusion, an unsatisfactory colostomy nearly always means that it has been badly made, or has become stenosed. A well-fashioned colostomy will act, usually twice a day, according to food intake and the physiological responses of the colon, without having to resort to medicines or washouts.—I am, etc.,

London, W.1.

HENRY R. THOMPSON.

REFERENCE

- Mainiot, R., *Management of Abdominal Operations*, 1957, Vol. 2, p. 1209. H. K. Lewis, London.

SIR,—I would like to refer to one point in your excellent leader on living with a colostomy (*Journal*, February 2, p. 274). The instructions which are given to a patient on the aftercare of his disability are usually adequate, but, as you rightly say, it is when the patients go home that they often run into difficulties. Many patients are elderly and in the early days at least will rely for help from their relatives, who have not received any instructions on the subject. How much better it would be if all hospitals issued to their patients a written guide on the day-to-day management of a colostomy. I am sure the lives of these people and their relatives would be made much easier. In this connexion, I would refer your readers to a most valuable little handbook, *The Home Management of a Colostomy* (published by Harker Stagg Ltd.), which is available free to doctors and hospitals for issue to their patients. I have used it with considerable success in my practice in the East End of London.—I am, etc.,

London, E.3.

D. JENKINS.

Continuous Suxamethonium Infusion

SIR,—With due respect to Dr. C. Langton Hewer's vast experience, I beg to disagree with his reference to continuous suxamethonium (*Journal*, January 5, p. 45).

I have been fortunate in administering over 400 continuous suxamethonium anaesthetics with only one case of post-operative apnoea lasting 25 minutes with no ill-effects. This happened at the beginning of the series and it was my fault. Thereafter much the same rules were rigidly adhered to as prescribed by Drs. Godfrey Herington and E. James (*Journal*, January 26, p. 227). To exclude the possibility of overloading the patient with fluids, the concentration of the drip was increased to 1,500 mg. per 500 ml. of saline and the rate reduced to an absolute minimum by a "fine adjustment" screw, so that the patient was allowed to breathe spontaneously at intervals. Using a simple "rubber tubing-glass canula" modification¹ 500 ml. of suxamethonium solution was used for three or four successive cases on the list.—I am, etc.,

Adelaide, S. Australia

R. C. OLIVA.

REFERENCE

- Oliva, R. C., *Brit. J. Anaesth.*, 1956, 28, 338.

Inflammation

SIR,—Professor L. P. Garrod wrote a very interesting critical review of my book¹ (*Journal*, September 1, 1956, p. 518). There are, however, several points in this review which I think need some clarification.

Whenever attempts have been made to isolate leukotaxine by the methods which we described, its isolation has been confirmed from practically everywhere, starting from Cullumbine and Rydon² in England in 1946, and more recently by a number of Japanese investigators, notably Kimeo Yasuhira.³ In regard to Professor Garrod's comment, "whether substances produced by the chemical treatment of body fluids exist as such in nature and exert naturally the effects produced by the isolated substance," let me point out that in all our studies we have always used the untreated exudate as a base level. If a biological factor is found to be present in this body fluid which has biological effects, only then is chemical extraction begun. This has been repeatedly emphasized. In the concluding chapter on page 403 of *Biochemical Mechanisms in Inflammation* the statement is made: "These factors are first shown to exist in the whole exudate. Subsequently, biochemical analysis reveals these factors as further purified biochemical units." In regard to Miles's work, I have originally sent Dr. Miles some of our leukotaxine, and he himself states that his factor is not leukotaxine. I quote from my own footnote on page 51: "It appears to be neither leukotaxine nor histamine."

In regard to the comment concerning figure 78 on page 236, I think that the point is well taken, but this is a false impression, and it is essentially the artist's fault. The injections are always made immediately after taking the basal temperature. On that particular figure the artist should have had two arrows, because the arrow refers really to the time following the necrosin injection, and that was started later. At any rate, for the information of the reader, the local temperature prior to pyrexin injection was just over 104° F. (40° C.); and very soon after its injection it began rising until a peak of 107° F. (41.7° C.) was reached. Such experiments have been repeatedly confirmed. Nevertheless, I am to take the blame for this oversight, for I should have noticed it when the chart was returned to me by the artist.

In regard to the heterologous reaction, as a control, in all experiments we also use the blood serum and the fractions extracted from it from the same type of animal as is employed in the extraction of the factors from exudates. In this way it is shown that the effect is not referable to heterologous proteins, since the blood serum fails to give the same reactions as the exudate. Although this is not stated in the book as such, the blood serum controls are mentioned in several places in it.

I value considerably Professor Garrod's survey of my book, and it is only in the spirit of truth that I am calling attention to the aforementioned factual information.—I am, etc.,

Philadelphia, U.S.A.

REFERENCES

- Menkin, V., *Biochemical Mechanisms in Inflammation*, 1956. C. Thomas, Springfield, Ill.
- Cullumbine, H., and Rydon, H. N., *Brit. J. exp. Path.*, 1946, 27, 33.
- Yasuhira, K., *Acta path. jap.*, 1951, 1, 7.

Toxic Effects of Meprobamate

SIR,—In your annotation (*Journal*, November 24, 1956, p. 1227) you state that Friedman and Marmelzat¹ say that one 400-mg. tablet of meprobamate may produce skin lesions in less than four hours.

A dentist, aged 36, took his first and only 400-mg. tablet of meprobamate at 4 p.m. Around 8 p.m. he felt he was on the point of fainting, with general malaise and chills. The skin of the area of the pelvic girdle began to itch severely. He went to sleep. When he awoke next morning at 6.30 a.m. there was massive purpura with discrete and confluent lesions over the skin from mid-thigh to lower third of trunk, sharply demarcated from the normal skin, below and above. A full blood count was normal, platelets

normal in number and normal in morphology, as seen by routine stains; bleeding time, coagulation time, normal. The rash disappeared in four days without any treatment other than reassurance. It was neither feasible nor desirable to subject this patient to a further test dose of meprobamate.

This patient resembles case 2 and case 6 of Friedman and Marmelzat.—I am, etc.,

Jerusalem.

ELI DAVIS.

REFERENCE

- Friedman, H. T., and Marmelzat, W. L., *J. Amer. med. Ass.*, 1956, 162, 628.

Acute Amphetamine Poisoning

SIR,—I was interested in a paper by Drs. R. Greenwood and R. S. Peachey (*Journal*, March 30, p. 742). A review of the literature reveals the very variable response of different individuals to overdosage with both dexamphetamine and its isomer DL-amphetamine. Symptoms may vary from mild excitability to acute psychotic states or even death. In a case cited by Ehrlich *et al.*,¹ a 27-year-old mechanic took 20 g. of amphetamine over a two-day period and, though he developed an acute paranoid state, he made an uneventful recovery following treatment with barbiturates. At the other extreme is the case of L. C. Smith,² quoted by Drs. Greenwood and Peachey, who died after taking 10 mg. of DL-amphetamine. The case described by Hertzog *et al.*,³ and mentioned by Drs. Greenwood and Peachey in their paper, cannot be accepted as having died from amphetamine overdose, as the symptoms and post-mortem findings were those of poisoning due to ferrous sulphate which Hertzog regarded as non-toxic.

The following case history illustrates the very mild symptoms that may occur following the ingestion of a fairly large dose of dexamphetamine.

An unmarried woman, age 20 years, who had had a baby two months earlier, became depressed and swallowed 42 15-mg. dexamphetamine "spansule" capsules (630 mg.). She was admitted to hospital nine hours later. On admission, she was mildly excited but she was easily calmed by reassurance. Her pulse rate was 110 per minute and B.P. 120/85 mm. Hg. She was given 1½ oz. (42.5 g.) of magnesium sulphate by mouth and phenobarbitone sodium 0.2 g. intramuscularly. Three hours later she complained of difficulty in sleeping and she was given sodium amytal 0.2 g. by mouth at 1 a.m. She slept well and the following morning she was quite calm and none the worse for her experience. The patient's first bowel action after taking the capsules was 13½ hours after admission. The whole 170 g. of semi-solid faeces was examined but only one dexamphetamine pellet was found. There are approximately 19,000 pellets in 42 15-mg. spansules, which suggests that she probably absorbed most, if not all, of the ingested drug.

It is possible that the absence of severe symptoms was partly due to the form in which the drug was taken. The construction of spansule capsules is ingenious. The dexamphetamine is divided between a large number of pellets contained in the capsules. About one-third of the active ingredient is incorporated into uncoated pellets which disintegrate as soon as the capsule dissolves. The remainder of the pellets are protected by digestible coatings of various thicknesses and they disintegrate constantly over a period of about eight hours.—I am, etc.,

Llwynypia, Rhondda.

M. S. PATHY.

REFERENCES

- Ehrlich, W. E., Lewy, F. H., and Krumbhaar, E. B., *Amer. J. med. Sci.*, 1939, 198, 785.
- Smith, L. C., *J. Amer. med. Ass.*, 1939, 113, 1022.
- Hertzog, A. J., Karlstrom, A. E., and Bechtel, M. J., *ibid.*, 1943, 121, 256.

Termination of Pregnancy

SIR,—May I draw attention to a number of inaccuracies in the article by Dr. James Arkle entitled "Termination of Pregnancy on Psychiatric Grounds" (*Journal*, March 9, p. 558)? Your contributor states that "the Christian opposition [to abortion] is based to some extent on a mis-translation of the abstract laws of the ancients." This is simply not true. The Christian attitude has always been determined by the principle that the child, though yet unborn, is a human being to the same degree and by the same title as its mother. As such it has an inalienable right to

life, a right which it receives immediately from God. The commandment "Thou shalt not kill" therefore holds good for the foetus as for all human beings (for a clear statement of Catholic teaching on this and related matters see the Papal Allocution to the Congress of the Catholic Union of Midwives).

The Hebrew text of Exodus, ch. xxi, v. 22, is interpreted by your contributor as referring to the deliberate procuring of an abortion. This is, in fact, a misinterpretation. The passage means: if two men are quarrelling, and one should happen to strike a pregnant woman (even by accident), so that a miscarriage results, two kinds of penalty are applied. If the woman lives, the guilty one must pay a fine, as shall be determined by the woman's husband. If, however, she dies, the punishment shall be inflicted in accordance with the principle "An eye for an eye." There is therefore no question of an operation for the purpose of deliberately terminating a pregnancy, nor is there any mention of the husband's agreeing to the operation. The last sentence translated by your contributor, "He shall pay for the miscarriage," is based on an amended Hebrew text. The probable meaning of the Hebrew text as it stands is: "And he shall pay it [the fine] before the judges." For almost exact parallels in Assyrian law, *The Assyrian Laws*¹ could be usefully consulted.

It is interesting to note that, whatever St. Jerome thought about the time of the infusion of the human soul into the foetus, he translated Exodus, ch. xxi, v. 22, correctly, avoiding the error of the Greek translators. He would therefore have understood that it was irrelevant to refer to this passage in a discussion of therapeutic abortion.—I am, etc.,

Dublin.

DERMOT J. RYAN.

Professor of Semitic Languages,
University College.

REFERENCES

- Papal Allocution to the Congress of the Catholic Union of Midwives, October 29, 1951, Catholic Truth Society, London.
- Driver, G. R., and Niles, J. C., *The Assyrian Laws*, 1935, p. 106. Oxford University Press.

Hospital Confinement

SIR,—There is much to be said in favour of Professor W. C. W. Nixon's plea (*Journal*, March 30, p. 761) for hospital delivery of all primigravidae. But why stop there? Despite the lip service often paid towards the benefits, psychological and otherwise, of domiciliary midwifery, the only important consideration, surely, is that it is so much safer to have a baby in hospital than in the home; consequently, a majority of intelligent women will request hospital booking. If anyone may be said to enjoy a "right" under the Welfare State, then surely the pregnant woman has a right to demand the safest and best possible conditions for the birth of her baby. In my opinion, these conditions are only fulfilled in the modern maternity hospital or good nursing-home. Incidentally, it would be interesting to know how many doctors' wives are confined at home.

However, having had the baby, the sooner the normal parturient rejoins her family the better for all. Most patients are ready to leave hospital by their fourth or fifth post-partum day, and I have seen no harm result from such early discharge. If British obstetricians adopted the practice of their colleagues in America and Canada, and encouraged early ambulation and early discharge from hospital, there would be ample beds for all who desired them. It should not be difficult, by co-operation between hospital staff and family doctor, to arrange adequate puerperal attention on an out-patient basis.—I am, etc.,

Pinner, Middlesex.

J. P. O'DWYER.

Underfeeding of Babies

SIR,—I cannot agree with Dr. Ian G. Wickes (*Journal*, March 23, p. 702) and Mr. Albert Davis (*Journal*, April 6, p. 821) that all babies should be given as much milk as they can take. A baby who does not feel completely secure is likely to "want" more than it needs at any one feed, and if the doctor is relying on the baby to regurgitate what it is

unable to assimilate there is a risk of overtaxing the baby's digestive capacity, especially with artificial feeding. As in adults, one badly assimilated meal may be more difficult to recover from than hard manual labour.¹ Surely the inguinal hernia in Dr. Wickes's case is more likely to be the result than the cause of perpetual crying?—I am, etc.,

Enfield, Middlesex.

C. M. SMALL.

REFERENCE

- Emerson, W. R. P., *The Diagnosis of Health*, 1930. New York.

SIR,—I support Dr. Ian G. Wickes's views (*Journal*, March 23, p. 702) on the error and the evil of the over-feeding diagnosis. Like Mr. Albert Davis (*Journal*, April 6, p. 821), I teach that "you cannot overfeed a baby" (and usually the next baby to be seen in the clinic is the one overfed baby encountered every term).

I write, however, to disagree with Mr. Davis on two important matters. We do not want "baby doctors" in England. They bring many disadvantages. The proper solution is the training of family doctors who really know about normal babies. The second matter is the curious belief, not unique to Mr. Davis, that the consultant paediatrician is "too senior to bother about trivia." Many of us continue to work in infant welfare clinics to prevent ourselves from any chance of losing touch with "trivia," because we know that so many symptoms in infancy and childhood grow out of "trivia." In other words, every detail of management that influences the happiness and the healthy development and the family relationship of the new individual is of real importance. Put another way, for the paediatrician there are no such things as "trivia."—I am, etc.,

London, W.1.

ALFRED WHITE FRANKLIN.

SIR,—In addition to Mr. Albert Davis's timely suggestion (*Journal*, April 6, p. 821) that a "baby doctor" should be available to all mothers who are in despair over "trivia," might it also be suggested that the paediatricians who would instruct these doctors would also undertake to teach the nurses who, in the present scheme of things, cannot avoid advising on infant feeding? Thus, contradictory advice, so confusing for young mothers, would be less likely.

But why should senior nurses be cried down, in print or otherwise, so often and so severely by paediatricians when the paediatric professor is himself ultimately responsible for the training of these women? If doctors who hold teaching posts and who lecture on infant feeding not only to medical students but also to nurses do not give suitable and adequate instruction this surely suggests that they themselves have received inadequate or poor teaching in this field of child welfare is long overdue.—I am, etc.,

London, E.C.4.

ELIZABETH MORRISON.

Medical Ethics in Wartime

SIR,—It is of interest to read in your issue of February 16 (p. 397) that the World Medical Association's suggested "Code of Medical Ethics in Wartime" is now being submitted to national medical associations for their approval and support. The protection of civilian doctors in time of war would undoubtedly be strengthened by the universal adoption of such a code.

The changing character of warfare is changing the character of the problems of the protection of medical personnel. The Commonwealth Official Medical Historians' Liaison Committee has been considering this subject for some time in the light of experience of the working of the Geneva Convention during the second world war, and a joint memorandum is to be prepared on the subject. The historians are in a unique position to appraise the working of the Convention and to put forward suggestions concerning possible revisions.

New problems have arisen which indicate the need for bringing the provisions of the Geneva Convention up to date and, in view of the total nature of modern war, of extending them to embrace the whole field of medical ser-

vice in time of war, both military and civilian. The initiative of the World Medical Association and that of the Commonwealth Official Medical Historians' Liaison Committee may contribute greatly to this end.—I am, etc.,

W. FRANKLIN MELLOR,

London, W.1.

Secretary,
United Kingdom Official Medical History of the War
and of the Commonwealth Liaison Committee.

Massive Hypertrophy of the Breasts

SIR.—A 23-year-old Yoruba woman was admitted to the General Hospital, Abeokuta, in December, 1956, on account of increasing disability due to the huge size of her breasts (Fig. 1).

She was a primigravida in the 8th month of pregnancy, and the hypertrophy had started three years previously. There was no milk in the breasts. Owing to interference



FIG. 1

FIG. 2

with her movements and with respiration it was decided to amputate the breasts straight away and not wait for the birth of the child. The breasts were removed one at a time with an interval of three weeks between the operations. She gave birth to a stillborn child five days after the first operation. Split-skin grafts were used to cover small areas left bare by the amputations. Each breast weighed more than 15 lb. (6.8 kg.). The second photograph shows her appearance before her discharge from hospital (Fig. 2).

My thanks are due to the acting Director of Medical Services, Western Region of Nigeria, for permission to publish this note.—I am, etc.,

Abeokuta, W. Nigeria.

R. O. PARNIS.

The Hurt Brain

SIR.—As one who has been interested in the treatment of neurosyphilis in mental hospitals during the past twenty years, and who has had the opportunity of discussing the subject with many mental hospital psychiatrists interested in penicillin treatment of such cases over the past eleven years, I can assure Dr. E. E. Prebble (*Journal*, February 16, p. 399) that mental hospital psychiatrists do not accept the statement that syphilis of the brain could now be cured with ten injections of penicillin as stated in the television programme "The Hurt Mind." During the past ten years I have been treating patients with neurosyphilis by aqueous solutions of intramuscular penicillin alone, and have seen excellent results.

Early in my investigations two courses of treatment were prescribed, the second course to be given one month after the first.¹ In two patients who had improved clinically as well as serologically but died from other causes histological examination of the brain revealed inflammatory changes which were definitely less intense than in the average untreated general paretic.² This suggested that treatment by penicillin alone is capable of influencing the pathological progress of general paresis. Further research into the subject led me finally to advocate a scheme of dosage for the treatment of parenchymatous neurosyphilis—namely, first day, 20,000 units three-hourly for eight

doses; second day, 50,000 units three-hourly for eight doses; third day, 100,000 units three-hourly for eight doses; and fourth to tenth days, 500,000 units four-hourly for forty-two doses.³ I have used this scheme of treatment ever since with remarkable success, and many patients have been cured. The relative safety of penicillin and the shorter periods of time required to administer the penicillin are, in my opinion, definite advantages over the older methods of treatment of general paralysis of the insane.—I am, etc.,

R. H. F. SMITH.

Colchester.

REFERENCES

- 1 Smith, R. H. F., *Lancet*, 1947, 1, 665.
- 2 — and Ve de M. rais, *J. ment. Sci.*, 1948, 94, 70.
- 3 — *ibid.*, 1951, 97, 340.

Bilirubin

SIR.—In your annotation on bilirubin (*Journal*, February 16, p. 393) you state that direct reacting bilirubin has been shown to be a complex with glucuronic acid. It might be of interest to your readers to know that in 1905 P. J. Cammidge,¹ then of St. Bartholomew's Hospital, recorded that when bile was present in the urine glucuronic acid was also present in excess in those subjects whose jaundice was due to obstruction of the biliary passages.—I am, etc.,

B. P. BILLINGTON.

Sydney, Australia.

REFERENCE

- 1 Cammidge, P. J., *Treatment*, 1905, 9, 649.

Bolus Obstruction

SIR.—Three cases of post-gastrectomy bolus obstruction have been described in the recent correspondence (Dr. B. N. Colabawalla, *Journal*, February 23, p. 465; Dr. J. T. Corbett, March 2, p. 524; Dr. L. Goodman, March 30, p. 764). We have had a similar case in a man, aged 63, who had had a partial gastrectomy several years before and developed acute intestinal obstruction two days after eating an orange. He insisted that he had eaten it in single segments, but at operation the obstructing bolus, which was removed from the ileum two feet (61 cm.) from the ileo-caecal valve, was found to consist of half an orange. He was edentulous, and in spite of this obstructive accident still persists in eating without dentures.

It seems that orange is a poorly digested article; it was also the obstructive agent in two of the three post-gastrectomy cases quoted above, and it has been described as causing obturation obstruction in the normal gastrointestinal tract.¹ As Dr. Corbett suggests, the post-gastrectomy patient should be warned about adequate mastication and, we should add, proper fragmentation of oranges, especially in the edentulous.—We are, etc.,

IRENE S. CADE.

G. QVIST.

London, W.1.

REFERENCE

- 1 Aird, I., *Companion in Surgical Studies*, 1957, 2nd ed., p. 811. Livingstone, Edinburgh.

Hydrocortisone in Sunburn

SIR.—With the impending advent (we hope) of the sunny season, I should like to record my very satisfactory experiences with hydrocortisone 1% (usually in the form of the lotion) in the treatment of severe sunburn. In several cases, especially of people with fair complexions who require only relatively small doses of sunlight to redden and "burn" their skin badly, I found that one or possibly two applications of the lotion at, say, four-hourly intervals were sufficient dramatically to relieve the pain and almost visibly to reduce the rapidly progressive erythema which otherwise would have resulted by next day in an acute "solar dermatitis," and its concomitant general malaise. I found this treatment equally useful in the crews of open cars, where, I believe, the moving air stream enhances the effect of ultraviolet light.

One patient presented herself at my surgery on her return from her seaside holiday, by which time her legs in particular were seriously affected by extensive oedema of the skin, blistering, and weeping. The pain was wellnigh unbearable. I treated her with hydrocortisone lotion, and she also improved at a rate I had never before witnessed—or, indeed, considered possible.

In retrospect, I began to wonder about the rationale (I must confess it was experimental inquisitiveness which caused me to hand the first patient a sample bottle of the lotion I had with me), and it occurred to me that it was quite reasonable, for the complaint is due to an acute inflammatory reaction of the skin and hydrocortisone is probably the best anti-inflammatory agent in our armamentarium. This could be one instance of a theory working out in actual practice.

It seems quite clear that the cost of this preparation precludes its routine use as a sunburn lotion (my next experiment, if an opportunity should present itself, will be to see whether application of the lotion before exposure will help to prevent or at least delay the onset of symptoms), but I consider its use well justified in selected severe cases, where it will save untold suffering.—I am, etc.,

K. E. JOLLES.

West Bromwich.

Police Evidence Preferred

SIR.—While agreeing with Dr. Charles Worthington's statement (*Journal*, March 16, p. 643) that the purpose of medical examination of persons accused of driving while under the influence of drink should be to exclude illness, accident, or infirmity which might be mistaken for alcoholism or contribute to its effects, not everyone would agree that the medical witness should be allowed to confine his evidence to such matters.

The doctor's examination often reveals signs of a cerebellar lesion which if transient is likely to be toxic in origin. Toxic substances causing cerebellar impairment are alcohol and phenytoin. Surely it is the doctor's duty to report such a finding and state "consistent with . . ." The rest of the evidence and the final decision as to "whether he is under the influence of drink or drugs to such an extent as to be incapable of having proper control of a motor vehicle" may not seem to be in the doctor's province. In view of the 15 people a day who die on the roads and the 750 who are injured, I would submit that any evidence of neurological dysfunction resulting from toxicity should be equated with being incapable of having proper control. The emergencies that arise demanding a high level of performance from a sober driver seem far too frequent to me (not only when I am driving) to permit tolerance of any degree of neurological impairment; especially as the mental attitude of the driver is at times more dangerous than his lack of physical skill.—I am, etc.,

St. Albans.

RUSSELL BARTON.

Safety Factor in Car Design

SIR.—There is one respect in which a three-wheel car is more dangerous than a small four-wheel car, and that is the danger of overturning. Six months ago I witnessed one of the small three-wheel cars completing a perfect somersault. The driver was a teenager and he was fortunate in having his car hood up. Just as it is essential for motor-bicycle drivers to wear helmets, it is presumably essential for drivers in small cars to be similarly protected when the car hood is down. Most of the three-wheel cars have these rather flimsy car hoods and obviously appeal to teenagers on fine days. In the U.S.A. an increasing proportion of schoolchildren drive their own cars to school, so that the problem of car parking makes small cars popular with the authorities. This problem, of course, does not yet exist in this country, where bicycles are used and take up little room. However, it must be reckoned with in years to come.—I am, etc.,

Wolverhampton.

GARETH R. DAVIES.

Rectal Foreign Body

SIR.—Dr. H. Pratap's interesting letter (*Journal*, March 30, p. 763) prompts me to record another unsuspected rectal foreign body. A Dutch engineer who had been referred to me originally because of a residual urethritis complained at a subsequent attendance of a sudden attack of severe pain in the anal region when passing a motion earlier that

day. The pain had gradually lessened, but discomfort still persisted. Suspecting an anal fissure, I cautiously introduced a well-lubricated finger into the rectum. Immediately beyond the anal sphincter it came in contact with an elongated object with its long axis at right angles to the anal canal. I was able to extract it without difficulty and identified it as a fish bone. Its wickedly sharp point was intact and it measured just over 1½ in. (3.8 cm.) in length. The patient recalled eating a fish meal two days previously. One can only marvel at its uneventful passage through the alimentary canal prior to its being held up at the exit.—I am, etc.,

Liverpool, 3.

C. D. ALERGANT.

Material of Early Contraceptive Sheaths

SIR.—As an Australian, I have been brought up to believe that by far the most important product to be obtained from the sheep is wool. I was therefore interested to read in Professor Julian Huxley's letter (*Journal*, March 9, p. 581) of the earlier use of the caecum of this animal for contraceptive sheaths, as shown by Professor J. Z. Young's examination.

I felt it might be of interest to know that in this atomic age the same use is still being made of this portion of the sheep's gut, in the U.S., if not elsewhere. In the eleventh edition of the *Physician's Desk Reference*,¹ under the manufacturer's name, prophylactics are described which "are produced from the caecum of the lamb." The influence of the twentieth century is seen, however, when one reads further down the column that they are supplied not only dry, "to be moistened before use," but also "pre-moistened, each in a plastic capsule."—I am, etc.,

Boston, Mass., U.S.A.

C. A. RIGG.

REFERENCE

- 1 *Physician's Desk Reference*, 1957, 11th ed. Medical Economics, Inc., Oradell, N.J.

Sherrington Centenary

SIR.—This is the centenary year of the birth of Sir Charles Scott Sherrington, O.M., a founder and main architect of the physiology of the nervous system. The Royal Society of Medicine, wishing to pay tribute to his life and work, proposes to raise a fund towards a Sherrington Lecture, for the furtherance of knowledge on the nervous system, to be delivered from time to time in the Society's rooms in London.

It is felt that many will wish to contribute: both those who were his friends, pupils, and colleagues, and those, more numerous, who, as patients, doctors, and scientists, have benefited indirectly from his work. We wish to take this opportunity to commend the endeavour of the Royal Society of Medicine to establish this memorial to a great pioneer in scientific medicine.

Donations should be made payable to the Secretary, The Royal Society of Medicine, 1, Wimpole Street, London, W.1, and cheques crossed "Sherrington Memorial."—We are, etc.,

RUSSELL BRAIN,

President, Royal College of Physicians.

LINDOR BROWN,

Foreign Secretary, Physiological Society.

JOHN FULTON,

Stirling Professor of the History of Medicine, Yale University.

W. R. HENDERSON,

President, Society of British Neurological Surgeons.

CYRIL HINSHELWOOD,

President of the Royal Society.

E. G. T. LIDDELL,

Waynflete Professor of Physiology, University of Oxford.

D. W. C. NORTHFIELD,

President, Section of Neurology, Royal Society of Medicine.

CLEMENT PRICE THOMAS,

President, Royal Society of Medicine.

CHARLES SYMONDS,

President, Association of British Neurologists.

FRANCIS WALSH,

Chairman, Sherrington Memorial Committee.

Royal Society of Medicine.

London, W.1.

Obituary

G. R. MATHER CORDINER, C.V.O., M.B., D.M.R.E.

Dr. G. R. Mather Cordiner, honorary radiologist to St. George's Hospital, died suddenly at his home in London on April 8. He was 58 years of age.

George Ritchie Mather Cordiner was born at Dundee on July 28, 1898, and was educated at Harris Academy and at Dundee University College, graduating M.B., Ch.B. from St. Andrew's University in 1922. Coming south shortly afterwards he held the appointment of house-surgeon at Gravesend Hospital, and then practised for a time in North London. In 1924 he obtained the Cambridge D.M.R.E., and three years later gave up general practice in order to specialize as a radiologist. He quickly made a name for himself in his specialty and at one time or another was on the staff of numerous hospitals in the London area, including the Middlesex Hospital, the Evelina Hospital for Children, the Royal Northern Hospital, the Victoria Cottage Hospital, Barnet, St. Paul's Hospital, the Hospital for Tropical Diseases, and Oldchurch Hospital, Romford. His connexion with St. George's Hospital began in 1935, with his appointment as assistant radiologist, and in 1937 he became consultant radiologist. He was a lecturer in radiology at the medical school at St. George's and also at the London School of Hygiene and Tropical Medicine. Most of his published work was on the radiology of the stomach and duodenum, and when he was elected president of the Hunterian Society in 1948 he chose as the subject for his presidential address, "The Role of Radiology in Relation to the Peptic Ulcer Problem." In 1951 Dr. Mather Cordiner was called in to join the medical advisers who were attending King George VI prior to his operation for resection of lung, and he signed a number of the official bulletins. In the Birthday Honours of the same year he was appointed C.V.O. for his services. He leaves a widow and one son and one daughter.

We are indebted to Dr. J. W. D. BULL for the following appreciation: George Cordiner's sudden death at the relatively early age of 58 will come as a great shock to all those who knew him. In his earlier years he was honorary radiologist to several hospitals, but with increasing commitments was forced to give up active work in them all, save St. George's. Until the end he offered his services free at this hospital, never joining the Health Service, which he disliked intensely. Cordiner will be best remembered for his work on the radiology of the gastro-intestinal tract. Some twenty-five years ago he went to study under Berg in Germany, who had followed the work of Åkerlund, of Stockholm, on gastro-intestinal radiology, with special reference to the compression technique of the duodenal cap. Generally speaking, in most countries at that time the radiological diagnosis of peptic ulcer was crude and haphazard. Cordiner immediately saw the great value of Åkerlund and Berg's work and applied it scrupulously in this country.

His rise to fame was meteoric. Physicians, surgeons, and general practitioners who consulted him were astonished to see duodenal ulcers, time after time, demonstrated on the x-ray films. Prior to this they were often compelled to guess at diagnosis from the results of test meals, occult-blood tests, and the doubtful value of what was seen or not seen on the x-ray fluorescent screen. As a result, Cordiner's opinion was sought by doctors up and down the country and he rapidly developed a large practice. Throughout his professional career the alimentary tract was his main interest. His ability to demonstrate minimal lesions continued to astonish his colleagues. Sceptical surgeons after being bullied—for

it was necessary—to open the abdomen, frequently had to eat their words. Sometimes, indeed, they thought they were right until humbled by the histologist's evidence which supported Cordiner's diagnosis.

In recent years overwork told on him and he was seen at scientific meetings less and less. He seldom contributed papers and had never been interested in medical politics. His practice of medicine was essentially personal, and very many patients and doctors will feel his loss an irreparable void.

He was devoted to his family, was an excellent host, and cherished the beautiful things he had in his house. His knowledge of old furniture and old clocks was considerable and was his chief hobby. For his widow, son, and daughter, all will feel the deepest sympathy in their loss.

A. E. MORTIMER WOOLF, M.B., F.R.C.S.

Mr. A. E. Mortimer Woolf, consulting surgeon to Queen Mary's Hospital for the East End and emeritus surgeon to Lord Mayor Treloar Orthopaedic Hospital, Alton, died at his home at Loughton, Essex, on April 6, aged 72.

Albert Edward Mortimer Woolf was born in London on October 3, 1884, and educated at Clifton College and Emmanuel College, Cambridge. He went on to the London Hospital, qualifying in 1908, taking the F.R.C.S. in 1909, and graduating M.B., B.Chir. a year or two later. At the London he was house-surgeon, house-physician, and receiving-room officer. During the first world war he served in the R.A.M.C. with the British Expeditionary Force in France, and later in Mesopotamia, India, and Serbia. After the war he was appointed demonstrator in anatomy at King's College and set to work to help students from many hospitals. His first honorary appointment was to the staff of Queen Mary's Hospital for the East End, and later he became senior surgeon there. Among other hospitals he served were the East Ham Memorial Hospital, the Forest Hospital, Buckhurst Hill, the Epping and District Cottage Hospital, St. Margaret's Hospital, Epping, and Lord Mayor Treloar's Home, Alton. He was always ready to help nurses, and for many years he gave lectures to the nurses in training at Queen Mary's Hospital. Apart from his very active professional life, Mr. Mortimer Woolf retained his connexion with the family business of Yeatman and Co. Ltd., Watford, of which he had been chairman for the past 20 years.

C. P. G. W. writes: The death of Mr. Mortimer Woolf removes from the medical profession a well-known personality who will be missed by a wide circle of his friends. He was a great disciple of John Hunter and was largely responsible for the rejuvenation of the Hunterian Society. He more than trebled the membership of the society and insisted that it should continue as a medical society in the City of London. He served as its honorary secretary and librarian for many years and was president on two occasions, delivering the Hunterian Oration in 1931 on "Some Personalities of the Hunterian Epoch." Up to the time of his death he acted as editor of the society's *Transactions*.

Woolf was a general surgeon in the real meaning of the term, and he published many articles on a variety of surgi-



DONALD WATSON, M.B., F.R.C.S.

Mr. Donald Watson, consultant surgeon at the Royal Eye and Ear Hospital, Bradford, died at his home at Bradford on March 28. He was 69 years of age.

Donald Watson was born on July 7, 1887, in the North Island, New Zealand, and received his early education there. Leaving college, he first entered the Civil Service, but, finding the atmosphere stultifying to a rugged and robust individualist, he embarked on a career in medicine and was trained in the Edinburgh medical school, graduating M.B., Ch.B. in 1911. He served as a medical officer in India and the East during the first world war. Returning to Edinburgh, he became assistant to the late Sir Harold Stiles, whose teaching had a profound influence upon him, and much of his undoubted success as a laryngologist he attributed to his basic training in general surgery. Becoming a Fellow of the Royal College of Surgeons of England in 1920, Watson was appointed to the honorary staff at the Royal Eye and Ear Hospital in Bradford in 1922, and this hospital he served most devotedly until his retirement in 1952. His fame spread widely, and he came to be recognized as one of the outstanding surgeons in the North of England.

Always an enthusiastic member of the British Medical Association, Donald Watson was chairman of the Bradford Division for three periods between 1939 and 1947 and its treasurer for many years. An original member of the Leeds Regional Hospital Board, he was appointed chairman of the medical services committee and represented the regional board on the board of governors of the United Leeds Hospitals, honours which he earned by the recognition from both lay and professional colleagues of his absolute integrity of purpose. Among the numerous other offices he held were the first chairmanship of the Group of Otolaryngologists of the B.M.A., chairmanship of the Leeds regional consultants' committee, and the presidency of the North of England Otolaryngological Society. Perhaps the appointment which gave him most pleasure was the election to the chair of the Section of Otolaryngology of the Royal Society of Medicine. Always a doughty champion of consultants not associated with teaching schools, he was specially gratified by this appreciation of his status by his fellow otologists, for he regarded it not only as a personal tribute but as a recognition of the value of the work done in the non-teaching hospitals. When the B.M.A. held its Annual Meeting at Bradford in 1924 he acted as one of the honorary secretaries of the Section of Laryngology and Otolaryngology, and at Cambridge in 1948 he served as a vice-president of the Section of Otorhinolaryngology.

Donald Watson was a man of very wide interests, and whatever he was doing, whether in the hospital, in the committee room, or in the countryside, he really did it with all his considerable might, and neither at work nor at play did he ever allow matters to drift. It is a measure of the affectionate regard in which he was held that he numbered among his closest friends those with whose opinions he did not always agree. Like many of his fellow countrymen he excelled at games and field sports. A fine shot, a first-class golfer, and in later years a keen fisherman, he brought to each a boyish enthusiasm which made him such a delightful companion. His passing still further reduces the ranks of the great characters in medicine who, nurtured in different conditions, have contributed so much to the upholding of our great traditions in present-day circumstances. He is survived by his wife and his daughter, to whom the deep sympathy of his many friends is extended.—F. E. C.-W.

C. E. SCOTT, M.B., F.R.C.S.Ed.

Dr. C. E. Scott died at Edinburgh on April 3, after some months of illness, at the age of 61. He was the senior practising otolaryngologist in Edinburgh, and at the time of his death was surgeon in charge of the ear, nose, and

cal subjects. But he had time for his many hobbies. He was a keen and able golfer, a well-travelled man who knew the surgical clinics in Europe and America. He was also a keen musician, and many of his friends have happy memories of some of the musical evenings spent at his house in Harley Street. Mortimer Woolf will be greatly missed, for he was a genuine, happy character. He was upright in all his actions and incapable of any mean one. He leaves a widow and two daughters, to whom we extend our deep sympathy.

Sir RATANJI DALAL, C.I.E., M.R.C.P.

Sir Ratanji Dalal, who had a distinguished career in public health in India, died at his home at Belgaum in the Bombay Presidency on April 6. He was 88 years of age.

Born at Broach, Bombay, on July 27, 1868, Ratanji Dinshaw Dalal was educated at high schools in Broach and Bombay and then received his medical training at the Grant Medical College, Bombay, qualifying L.M.&S. at the University of Bombay in 1894. He continued his medical studies at University College, London, and at St. Bartholomew's Hospital, taking the M.R.C.S., L.R.C.P. in 1895. For two years he was resident medical officer to the Finsbury Dispensary, being the first Indian doctor to hold a public appointment in England. In 1897 he was assigned by the India Office for plague duty in India, and quickly distinguished himself by his efficient and outstanding work.

In 1905 his report on the saving of life among the employees of the Empress Mills in Nagpur, Central Provinces, resulting from the use of anti-plague vaccine was published by the Bombay Government and distributed widely for the information of employers of labour and the public generally in India. From 1904-6 he conducted some important investigations at the Bombay Bacteriological Laboratory on anti-plague vaccine. For three years (1908-11) he carried out research on methods of preventing plague, and in 1909 was the first to introduce in India the use of barium carbonate as a rat poison. This proved an effective measure and helped to save innumerable lives. During the famine of the early 'twenties in the Bijapur district he selected sites for famine relief camps and so organized and supervised the sanitary arrangements and vaccination work that no cases of cholera or other epidemic disease occurred in the camps, although cholera was prevalent outside. As director of the Vaccine Institute, Belgaum, from 1923 to 1925 Sir Ratanji carried out many important changes in the manufacture of vaccine lymph. He was the author of a *Manual of Vaccination*, published in 1930 by the Bombay Government. On his retirement from Government service in 1925 Sir Ratanji worked for the Red Cross and lectured on public health subjects.

From 1930 to 1945 he was a member of the Indian Central Legislative Assembly, and he bore much of the burden of the debate on the Indian Medical Council Bill. During the second world war he raised funds for defence loans and war gifts and also recruited officers for the Indian Army.

Sir Ratanji was the first Indian to be awarded the diploma of Membership of the Royal College of Physicians of London without examination. This was in 1931, just after the publication of his *Manual of Vaccination*. In 1916 he took the D.P.H. of the English Royal Colleges. He was knighted in 1942. Previously he had, in 1923, received the Kaisar-i-Hind medal for public service in India, in 1935 King George V's Silver Jubilee medal (awarded to him both by the Government of Bombay and the Government of India for distinguished services), the Companionship of the Order of the Indian Empire in 1936, and in 1937 King George VI's Coronation Medal "for unimpeachable loyalty to the British Government." Among the various governing bodies of which he was a member were the British Empire Leprosy Relief Association (Indian Council), the Lady Hardinge Medical College and Hospital, Delhi, the Countess of Dufferin's Fund, and the Pasteur Institute, Kasauli.

throat department of the Royal Hospital for Sick Children and of the Northern Group of Hospitals in Edinburgh.

Charles Ernest Scott was born on November 3, 1895, and was educated at Selkirk High School and Fochabers Academy. His medical studies at Edinburgh University were interrupted by service in the Royal Navy during the first world war, and he graduated M.B., Ch.B. in 1921. After holding resident posts at Edinburgh Royal Infirmary, and quickly deciding upon the line which he would follow, he obtained the appointment of senior clinical assistant and university clinical tutor to Dr. J. D. Lithgow's unit in the infirmary. During this period he passed the examination for the Fellowship of the Royal College of Surgeons of Edinburgh in 1926, and when an appointment fell vacant in the Royal Hospital for Sick Children in Edinburgh he became assistant surgeon to Dr. Douglas Guthrie. Dr. Scott held other local appointments, being assistant surgeon to Leith General Hospital, and quickly took a prominent position among the specialists in his chosen subject. Apart from his work within the city he had the responsibility for the ear, nose, and throat services in his native Border country, and he will be greatly missed in the Border towns.

Dr. Scott was known to a very wide circle of friends as a man of great ability and a surgeon of the first rank. His quiet and modest manner covered and to some extent concealed the fact that he possessed one of the most skilful and dexterous pair of hands in his profession, and his many patients will greatly miss his gentleness and his kind and considerate ways. He took a keen interest in his profession, and outside his normal work acted as secretary of the Scottish Otolaryngological Society from 1933 to 1946, except for the year (1935) in which he was president of the society. Curling was a favourite pastime and he was at his best when enthusiastically skipping one of the Edinburgh medical rinks. In his younger days, following Border traditions, he took a keen interest in athletic pursuits, in particular Rugby football, at which he proved himself an excellent full-back. A lovable, unassuming man, he will be sadly missed from the medical scene in Edinburgh. For many years a widower, he is survived by a son, to whom the sympathy of his friends is extended.—I. S. H.

FLORENCE M. S. THOMAS, M.B., Ch.B.

Dr. Florence M. S. Thomas died at her home at Canford Cliffs, Bournemouth, on March 3, at the age of 77.

I. C. H. writes: Florence Margaret Sarah Price was born at Carmarthen on December 30, 1879. Her life was intensely medical. She was brought up in the atmosphere of a large general practice; her father, Dr. Rees Price, combined ability with immense enthusiasm for his profession, giving to it his best energies, both his sons, and his daughter. His desire, one gathered, was that his daughter should remain, like her great Victorian namesake, dedicated and single: this was, most happily, unfulfilled. Nevertheless, her marriage was far from being a loss to medicine, for after marrying a doctor she continued to work as one; both her sons are doctors and her daughter is a doctor's wife. She graduated in 1904 with the M.B., Ch.B. of Edinburgh, where she spent the first half of her student life, completing the course at Birmingham. In those days, when the "lady medical" had not been so thoroughly accepted, she vanquished all prejudice with her complete modesty, despite a personal charm which was irresistible to both sexes and all ages, and an ability which took her through the medical course without a failure and at maximum speed. Moreover, during much of this time she kept watch, by parental injunction, over the studies of her elder brother—a charming youth, but ill-armed against the distractions of life—coaxing, helping, and scolding him as required, for all of which, when qualified, he was duly grateful.

After taking her degree she became a house-physician at the Swansea General and Eye Hospital, where she met the rising young oculist, Frank Thomas, whom she married.

As his practice grew she helped him more and more with his hospital work, and after several years of this experience was appointed consulting ophthalmic surgeon to the Port Talbot Hospital. It was a marriage full of happiness. Frank Thomas was a jewel among men, both as an oculist and in his warm humanity, and his wife gave to both an ideal reinforcement. She knew just how to distribute energy between her home and her profession. The nursery years of their four children were indeed privileged. Near the end of a life, long, useful, and happy, the deepest sorrow fell upon her. Frank Thomas, who had worked in failing health till the end of the war, retired and left Swansea for Canford Cliffs, where both his son and son-in-law were in practice. In 1949 he died. The loss was overwhelming, though the nearness of her children much helped her. Soon her own health began to fail. She bore many troubles most bravely, including the rigours of an operation for glaucoma. Then, last August, her younger daughter died suddenly. The shock to her intense maternal feeling, with a seriously impaired heart, might have been immediately fatal but for her other children: through them she again found some happiness before the end, with heart failure, sudden and painless.

Her personality was unique, with a charm difficult to convey in words. Her voice was a delight, soft, musical, and very characteristic. It was always a pleasure to look at her; she had a neat, small figure, a face vividly expressing her essential beauty, and we have never known so much of a fascinating girl carried on into the seventies. Her outstanding quality was a sincerity that fairly shone. Her intense human sympathy never willingly stopped at words; she always longed to help, and when possible she did. Her patients adored her. She had a wonderful sense of humour and a superb gift of entertaining narrative. A beautiful and rare spirit has taken flight. We grieve with her devoted children for all they have lost, and humbly share their thankfulness for all she has given.

L. L. McMAHON, M.B.

Dr. L. L. McMahon, of Whitchurch, Glamorgan, died at his home there on March 10 at the age of 68. Leo Luke McMahon was born on October 31, 1888, and studied medicine at the University of Melbourne, where he graduated M.B., B.S. in 1915. After the first world war he came to Britain and settled in general practice at Whitchurch, where he remained until his death.

C. W. S. writes: Dr. L. L. McMahon was one of the large army of general practitioners who shun the limelight, do their duty, and leave behind them a sweet-smelling memory. "Mac" was always a joy to his patients and friends—solid, four-square, uncompromising, and kindly. Uprightness and common sense were the twin poles of his being, and in his last long illness his courage was amazing. He made no concession to the enemy, worked to the last day, and died, as he wished, in harness. For the lighter side of life, golf was his passion: unorthodox in style, he was a dangerous opponent because he never recognized defeat. He leaves a widow and one son, who is a medical student.

R. E. H. PARTINGTON, M.R.C.S., L.R.C.P.

Dr. Robert Edward Heap Partington, who practised in Sheffield, died suddenly on March 10 at the age of 51. He had an unusual career, for before beginning the study of medicine at Sheffield in 1938 he served for seventeen years in the Merchant Navy and the Royal Naval Reserve. When the second world war began in 1939 he rejoined the Royal Navy and was actively engaged throughout most of the war, taking part in the North African landings and in convoy work across the Atlantic and to and from Murmansk. For his services he was awarded the Reserve Decoration and promoted to the rank of commander. Sent home in 1944 to finish his

medical studies at Sheffield University, he qualified M.R.C.S., L.R.C.P. in 1949.

After a year's resident work at the Royal Hospital, Sheffield, he started in practice at Beighton as partner to Dr. L. A. de Dombal. He combined mature judgment and powers of leadership with an up-to-date medical knowledge, and his patients came to rely on him and to love him. They will miss him as a counsellor as well as a doctor. He was a staunch and active churchman all his life, and for the past two years had been lay reader at Eckington church. He leaves a widow and one son, aged 5 years.

T. Y. BARKLEY, O.B.E., M.B., M.R.C.P.Ed.

Dr. T. Y. Barkley died at his home at Weybridge, Surrey, on March 11 at the age of 65.

Born on December 28, 1891, Thomas Yuille Barkley was a Scot, and studied medicine at Edinburgh University, where he graduated M.B., Ch.B. in 1915. He qualified for the Annandale Gold Medal, which was not awarded during the first world war. He at once joined the R.A.M.C., serving in France, Salonika, and the Balkans. He attained the rank of lieutenant-colonel and commanded a casualty clearing station. Mentioned in dispatches on three occasions, he was appointed O.B.E. in 1919 for his distinguished services. The war over, in 1919 he went into general practice at Weybridge, and carried on there until his death nearly 38 years later. He devoted his life to his practice, and worked so hard in the service of his patients that he had little time for other interests. Apart from his annual holiday, he rarely went "off duty," and latterly, when he had painful warnings of serious cardiac trouble, refused to retire from work. His clinical judgment was exceptional, and his ready sympathy and understanding of their problems made him a much-loved friend of his patients, as well as their trusted medical adviser. It was typical of the man that in 1931, despite a busy and successful practice, Dr. Barkley made time, by working in the early hours of the morning, to read for the M.R.C.P. of Edinburgh, obtaining this diploma at the first attempt. When the National Health Service was instituted in 1948 Dr. Barkley did not enter it, but continued in private practice as strenuously as ever. He leaves a widow, a son, and a daughter, his elder son having been killed when flying a bomber in 1944. At a memorial service at Weybridge, St. Mary's Church, Otland, was filled almost to capacity. There could have been no more sure sign of the love and esteem in which Tom Barkley was held. Truly he was "an helper of many," and he will be sadly missed by the many of whom he was physician, friend, and counsellor.—S. S. B. and R. G. H.

J. G. STEBBING, M.B.

Dr. J. G. Stebbing died at the Royal Marsden Hospital on March 23 at the age of 32. For the past three or four years he had been in practice in Bermondsey.

John Garvin Stebbing was the younger son of the late Mr. G. F. Stebbing, who was a surgeon at Lambeth Hospital and a well-known pioneer in radiotherapy. After leaving Dulwich College he went on to Guy's Hospital, graduating M.B., B.S. in 1947. He had a fine record as a student, and after graduation was house-surgeon to Sir Russell Brock. Thereafter he worked for a time as junior lecturer in physiology, and then became assistant director of research in the department of surgery. He had unusual gifts, inheriting much from his remarkable father, and he continued to work in his practice in Bermondsey, though suffering from a disease he knew was incurable. Since 1955 he had been a member of council of the Medical Protection Society, of which his father had been chairman. His death at such an early age is a great loss to the profession. He leaves a wife and daughter.

Sir RUSSELL BROCK writes: Dr. J. G. Stebbing's early death marks the end of a courageous although short professional life. A routine radiograph before entering the Services at

the end of his house appointments disclosed a serious lesion. In spite of this knowledge, his cheerfulness was unimpaired and he embarked on a busy life as a general practitioner in one of the poorer districts of London and rapidly established a position as an able and sympathetic doctor. He did not allow repeated relapses to interfere with his work and efficiency. One can have nothing but admiration for a professional life carried on so doggedly and successfully under such a grave handicap. The fine spirit with which he faced his final illness was characteristic of his nature.

FREDERIC DURAN-JORDA, M.D.

Dr. Frederic Duran-Jorda, pathologist at Booth Hall Children's Hospital, Manchester, died on March 30 in the Manchester Royal Infirmary, at the age of 52.

Frederic Duran-Jorda, a Catalan by birth, graduated M.D. from the University of Barcelona in 1928. He decided to specialize in pathology, and in 1934 was appointed clinical pathologist to the public health department of his home town. With the outbreak of the Spanish Civil War he organized the blood transfusion service of the Republican Army, using, for the first time on a large scale, the civilian population as donors. In 1937 he officially took up the post as chief of the service. In this capacity he obtained the highest medical award of the Catalan Government, and was invited to various European countries to lecture and advise on the organization of national blood transfusion services. The British Red Cross Society helped him to come to England in 1939. After a short stay in London he decided to work as a technician in the clinical laboratory of Ancoats Hospital, Manchester, where, after his admission to the British Medical Register, he was soon appointed first as assistant pathologist and then as pathologist. In 1950 he became director of the department of pathology at Booth Hall Children's Hospital and Monsall Hospital, Manchester.

A. H. writes: Duran-Jorda loved his work, and, as with so many medical men, it was the purpose and hobby in his life. A wide range of problems attracted his interest, and he approached them with originality of method and conception. In spite of an unusual liveliness, he would pursue with infinite patience and energy the most intricate details of any problem that engaged his fertile mind. Partly as a result of his training, but also due to an innate ability, he had become a master of laboratory technique. This was particularly evident in his histological studies of the gastric and intestinal mucosa, the Bellini ducts, and pulmonary hyaline membrane in the newborn. His paper on the histopathology of the semi-squamous epithelial layer in the colon was awarded the first prize and a certificate of merit by the American Gastro-enterological Association in 1947, as well as a first prize of the Institute of Catalan Medical Studies in Barcelona. He had his own ideas on blood formation, ideas not generally accepted, but which he supported by a number of fascinating investigations, not only in man but also in different animal species. Another subject which had attracted him early in his medical career and to which he returned quite recently was parasitology. A study on the relationship of *Oxyuris vermicularis* to appendicitis in children is in the press. During the past two years he introduced a new and promising treatment for scalds and burns in children.

Duran-Jorda was a man of striking good looks but modest and gentle. Although he had decided views on most subjects he was exceedingly tolerant and respected the opinions of others. In his kindness he would always willingly offer help where help was needed and took a fatherly interest in all his subordinates and assistants. They responded with an affection bordering on devotion. For some time he had been fully aware of his incurable illness, but he continued bravely with his daily duties and his research work until the final phase of his disease, hoping that fate would grant enough time to complete some of the tasks he had set himself. All his colleagues were his friends, but he had many outside the professional circle, and all will extend their deep-felt sympathy to his widow and his two children.

Medico-Legal

ACQUITTAL OF DR. J. BODKIN ADAMS

JUDGE'S SUMMING-UP

The jury found Dr. John Bodkin Adams not guilty of the murder of Mrs. Morrell, who died at Eastbourne on November 13, 1950. They reached their verdict in 44 minutes on April 9, the seventeenth day of the longest murder trial recorded in Great Britain. In his summing-up the Judge referred to "a most curious situation, perhaps unique in these courts," that the act of murder had to be proved by expert evidence; and again: "the medical evidence is the essential part of the case, and perhaps the crucial part."

Sir Reginald Manningham-Buller, Q.C., appeared for the prosecution with Mr. Melford Stevenson, Q.C., and Mr. Malcolm Morris. Mr. Geoffrey Lawrence, Q.C., appeared for Dr. Adams with Mr. Edward Clarke and Mr. John Heritage. The Medical Defence Union instructed Messrs. Hempsons, solicitors, to act for Dr. Adams.

Mr. Justice Devlin began his summing-up on April 8 by defining murder as "an act, or a series of acts, done by the prisoner which were intended to kill and did in fact kill." It did not matter for this purpose that the patient's death was inevitable and her days were numbered. If her life was cut short by weeks or months it was just as much murder as if it was cut short by years.

"You have heard a good deal of discussion during the evidence about the circumstances in which doctors might be justified in administering drugs which would shorten life. Cases of severe pain were suggested and also cases of helpless misery. The law knows of no special defence of this category. But that does not mean that a doctor who is aiding the sick and dying has to calculate in minutes or even hours, perhaps not in days or weeks, the effects on a patient's life of the medicines which he will administer."

"If the first purpose of medicine—the restoration of health—can no longer be achieved, there is still much for the doctor to do, and he is entitled to do all that is proper and necessary to relieve pain and suffering even if the measures he takes may incidentally shorten life. There are cases in hospital where a doctor prolongs or shortens life by hours or perhaps even longer. The doctor who decides to administer the drug or not is not thinking in terms of hours or months of life. He could not do the job if he were. If, for example, a doctor has done something or omitted to do something and death occurs, say on the 11th or 12th or on the Monday instead of the Tuesday, no one with common sense would say the doctor caused the death. They would say the cause of death was the injury or whatever it was that brought her to hospital. It remains a fact and remains the law that no doctor, nor any man, has the right to deliberately cut off life. I say it to you so there can be no mistake."

Proper Treatment

Counsel for the defence was saying, said the judge, that the treatment given by Dr. Adams was designed to promote comfort, and if it was the right and proper treatment the fact (if it was) that it shortened life did not convict him of murder.

He directed the jury that as a matter of law there was no evidence on which they could conclude that any drugs were administered to Mrs. Morrell over and above the injections recorded in the nurses' books.

He then digressed to comment on the public hearing in the magistrate's court: "I would like to say this—I say it with the approval and authority of the Lord Chief Justice—I think it would have been wiser in this case if those preliminary proceedings before the magistrates had been held in private; because, when you have a case of this character which arouses widespread discussion, it is inevitable reports should appear in the press. And, as I reminded you at the beginning of this case, the proceedings before the preliminary magistrates were quite different from the proceedings that emerged in this court. They should be read by the public consequently and by members of the public who might be asked to serve on the jury." He did not criticize the magistrates, who had a difficult decision to make, nor did he

make any criticism of the general rule that except for good and special reasons criminal processes should be conducted in open court.

After telling the jury that the burden of proof was on the prosecution, the judge said that they had to decide between the medical opinions as they would in getting conflicting medical opinions over a relative who was ill. They had to make up their mind which was most likely to be right. Referring to Mr. Lawrence's advice that Dr. Adams should not go into the witness-box, the judge said: "It would be utterly wrong if you were to regard Dr. Adams's silence as contributing in any way towards proof of guilt. It does not, and it cannot. The prisoner who goes into the witness-box goes there for his own benefit and his own defence." Turning to Mrs. Morrell's will, the judge pointed out that what Dr. Adams got was the oak chest and silver valued at £276, which compared with £300 to the night nurse and £1,000 to the chauffeur. The jury might bear in mind that the usual mark of undue influence was that the influencer was able to extract something which he ought not to have got.

"When you find that the bequest, so far from being something in the opinion of the relatives that Dr. Adams ought not to have got, Mr. Morrell thinks it fair to add something to that which his mother had bequeathed, it may help you to decide whether this was really a case of undue influence exercised by Dr. Adams."

Discussing the discrepancies between the amounts of drugs prescribed and the amounts shown in the nurses' note-books as administered, the judge said it seemed clear that the special injections could not possibly account for the difference between them. Was there a channel, he asked, down which drugs which were prescribed were improperly disappearing? The jury might think or suspect that someone was dealing dishonestly with them, and that that someone must either be Dr. Adams or one of the nurses.

"If you were ever to get so far in your investigations as to begin to wonder which of the people is most likely you will, in fairness to Dr. Adams, bear in mind that two of the nurses have told lies about this matter in the witness-box. One of them lied about where the drugs were kept locked up—that was Nurse Stronach—and one of the others, either Nurse Mason-Ellis or Nurse Randall, lied about the conversation in the train in which Nurse Randall is alleged to have said: 'Don't say that, or you will get me into trouble.'"

The prosecution had to satisfy the jury that death was not due to natural causes. "It is a most curious situation, perhaps unique in these courts, that the act of murder has to be proved by expert evidence," and of the doctors' evidence he commented: "Men of science cannot always give precise, clear, and unqualified answers, particularly if they are dealing with an illness which occurred years ago at which they were not present."

Question of Intent

The court adjourned, and on its resumption the following day, April 9, the judge said the medical evidence was the essential part of the case, and perhaps the crucial part. The jury were entitled to accept the evidence of Dr. Douthwaite and not to attach much to the contrary opinions of Dr. Harman, and they were entitled to say that Dr. Ashby's real conclusion was that the drugging was an unjustified act in the medical sense which accelerated death. That was the issue on this point which they had to determine. If they decided certain points in favour of the prosecution, then they would have to deal with the question of intent. Intent was something that existed in a man's mind. Apart from his own evidence it could only be proved by inferences that were drawn from his own acts, but his own evidence must be welcome. People did not normally intend things unless they were going to benefit from them. Therefore the jury must examine what was the motive in this case. Mr. Lawrence had said that the suggestion that the doctor had anticipated Mrs. Morrell's death by a few days or few weeks for a chest of silver valued at £270 was ludicrous.

"'Ludicrous' is a strong word. But it is a strong point, and it is a point which requires an answer. I listened carefully to the Attorney-General to see what the answer was. I didn't hear the answer."

The judge said a further point for the jury to consider was the false filling up of the cremation form. "I say 'false' advisedly, for it is a matter for you. But it seems to me that it is false." The answer which Dr. Adams had given on the form—"Not so far as I am aware"—had to be set side by side with the answer given to Superintendent Hannam, and that answer made it plain that he knew, or thought, he was going to get the oak chest and the car.

As to the nurses' note-books, the judge said that the Attorney-General in his address had asked where they had come from, and in whose interest it was to keep them. While the judge would not say that there was a mystery about it, it was something which one would have liked to have known the answer to.

Finally, the judge said there were three points that the jury would have to consider. The Crown must satisfy them that Mrs. Morrell did not die of natural causes; that, from the medical evidence, the act of killing was something that was capable of being murder; and that the act was committed by the accused with the intent to murder. "Not infrequently I have heard the case presented by the prosecution that seems to me to be manifestly strong, and sometimes I have felt it my duty to tell the jury so. I do not feel I should hesitate to tell you here the case for the defence seemed to be manifestly a strong one, and you must not find for the Crown until you have weighed and subjected and ruled out all the evidence and the arguments put before you on behalf of the defence. It is always the same question—is the case for the Crown strong enough to carry conviction to your mind? It is your question and you have to answer it."

Medical Notes in Parliament

Protection in Atomic Plant

Mr. SOMERVILLE HASTINGS (Barking, Lab.) asked the Prime Minister on April 9 whether, in view of the danger resulting from accidents, malicious or otherwise, in connexion with the processes in which nuclear energy was applied, he would institute an inquiry into the best first-aid treatment, and arrange that such information was made available wherever it might be required.

Mr. H. MACMILLAN replied that the Atomic Energy Authority took the most exhaustive precautions against accidents, and there were extensive measures for detecting radioactivity in all laboratories and plants where radioactive or toxic material was used. Emergency arrangements to deal with accidents which might occur were tested regularly in exercises designed to cover every foreseeable contingency. A draft code of regulations covering the protection of workers in factories against ionizing radiations was in preparation. A code of practice for the protection of workers in hospitals in the Health Service was also being published. He was satisfied that there was no need for the inquiry suggested.

Mr. HASTINGS thought that, as the results of heavy and even fatal doses of ionizing radiation were not at once apparent, it was especially important that in every area where such accidents could occur there should be a definite statement, easily read by all who might be affected, about danger involved and what should be done. Mr. MACMILLAN said he appreciated the anxiety of Mr. Hastings, but he thought the Authority were taking every possible precaution. In the laboratories and plants everything was done to ensure that high standards of protection against absorption of radiation were general, and continuously observed. Personal records of radiation received during occupational exposure were kept for all persons whose work exposed them to such radiation.

Dr. EDITH SUMMERSKILL (Warrington, Lab.) suggested that as the greatest authorities agreed that there were aspects that were obscure, this was the time to institute an inquiry. What were the objections? Mr. MACMILLAN replied that

he would certainly consider an inquiry if he thought it would help the work of the Authority in its care of those it employed. But he was satisfied that everything possible was being done, and he did not think an inquiry would help its work; it might even at present impede it. If at any time he felt an outside inquiry by experts not available to the Authority would be valuable he would discuss it with the Authority and consider whether it would be useful.

Proprietary Preparations Agreement

Mr. R. RUSSELL (Wembley, South, Con.) asked the Minister of Health for a statement regarding his negotiations about the price of proprietary preparations. Mr. D. VOSPER, replying on April 8, said the Government had accepted in principle a scheme proposed by the Association of British Pharmaceutical Industry, and modified in the course of discussions with the Health Ministers, for regulating the prices of certain proprietary pharmaceutical products. The scheme provided a method of establishing reasonable maximum prices for most of these products.* There would also be cases where firms negotiated prices directly with the Departments. The Government's acceptance of the scheme was subject to the completion of some points of detail and to the working out of suitable administrative machinery, but he hoped it could be brought into operation within the next two months. The scheme would be on trial, and subject to review. He was grateful to the industry for the co-operation they had shown throughout these negotiations.

Information Refused

Mr. N. DODDS (Erith and Crayford, Lab.) asked on April 8 what intelligence quotient examination had recently been given to Miss Mary Betteridge, a patient at St. Margaret's Mental Hospital, Birmingham; who supervised the examination; and with what result. Mr. J. K. VAUGHAN-MORGAN, the Parliamentary Secretary, replied: I do not think it would be right to give this information, which is confidential.

Expenditure on Vaccinations

Mr. S. P. VIANI (Willesden, West, Lab.) asked the Secretary of State for Scotland what payments had been made, either out of the rates or from Exchequer funds, to cover the cost of vaccination against smallpox since the operation of the Health Service Act in July, 1948; how payments were made for inoculating against diphtheria, whooping-cough, and for any other inoculations; what was the total amount of payments for the materials used in these inoculations; and how much had been paid out of State funds for carrying out these inoculations or for supplying local authorities with a record of the inoculations performed. Mr. J. S. MACLAY stated on April 5 that vaccinations and inoculations carried out by general practitioners in the Health Service were covered by their remuneration from capitation fees, etc. In addition they received 5s. from the local health authority for each record submitted. No special fee was paid for

*The scheme contains three main provisions which enable manufacturers to regulate their prices voluntarily:

(a) Under the first, the price in the U.K. will not exceed that which the product commands in adequate volume in overseas markets in face of international competition.

(b) The second, which applies when a product is not exported in significant quantity, provides that if an identical non-proprietary standard drug is available in the U.K. the price of the proprietary shall not exceed the price of the standard drug.

(c) If it is impossible to apply either of these two provisions, a maximum price may be determined by using a detailed formula comprising (i) an ingredient allowance based on recognized trade prices and (ii) processing and packaging allowances according to a schedule covering different types of product.

The prices determined by the three formulae will be maximum prices. Immediate effect will be given to price reductions that result from the application of the scheme. On the other hand, if in any case the permitted maximum under the appropriate formula is higher than the existing price, the existing price will not be increased on that account. The scheme also provides that in special cases, and where a manufacturer prefers this course, a fair and reasonable price may instead be negotiated with the Health Departments.

vaccinations and inoculations carried out by medical practitioners employed full-time by local health authorities; those employed part-time were paid on a sessional basis. The gross expenditure incurred by local health authorities in Scotland in respect of vaccinations and inoculations carried out under the Health Service from July, 1948, to the end of March, 1957, was £598,000, half of which fell on the Exchequer and half on the rates. This expenditure was in respect of record fees, staff costs, and materials not supplied centrally. In addition, during the same period the Scottish Office incurred expenditure for vaccines and other immunizing materials issued free to local health authorities amounting to £111,000. Separate figures in respect of the different vaccines were not available. Nor was the cost of vaccines dispensed by chemists on the prescriptions of general medical practitioners separately recorded.

Doctors' Lists of Patients

Mr. D. VOSPER told Mr. SOMERVILLE HASTINGS on April 12 that in July, 1956, the number of general practitioners with lists of between 2,500 and 3,500 patients was 5,385; the number with lists between 1,500 and 2,500 was 5,218; and the number with lists of 1,500 or under was 5,500, of which about 540 had lists of 500 or under.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

Dr. B. Towers has been reappointed a University Demonstrator in the Department of Anatomy with tenure from April 1, 1957, for two years. Dr. R. T. Sims has been appointed a University Demonstrator in the Department of Anatomy and Dr. J. G. Cruickshank a University Demonstrator in the Department of Pathology, both with tenure from April 1, 1957, for three years.

In Congregation on February 23 the degree of M.B. was conferred (by proxy) on R. H. Lavelle.

In Congregation on March 9 the following degrees were conferred:

M.B.—C. C. Gunn (by proxy).
M.D.—J. R. Seale, T. M. D. Gimlette, J. O. Robinson, K. E. Halnan, H. B. L. Williams, A. S. Herington,
M.Chir.—C. H. Kinder (by proxy).

D. S. H. W. Nicol, M.D., formerly Scholar of Christ's College, has been elected into the Josephine Rebecca Wolf Fellowship at the College for research in biochemistry.

UNIVERSITY OF DUBLIN

SCHOOL OF PHYSIC, TRINITY COLLEGE

At a recent examination the following medical practitioners were awarded the Diploma in Gynaecology and Obstetrics:

N. K. Allahbadia, B. H. Marten, S. Madan, S. Khosla, S. K. Ghosh, P. J. Kaur, S. Froman.

UNIVERSITY OF LONDON

Dr. A. J. M. Rees has been elected and Dr. A. Talbot Rogers re-elected to membership of the Standing Committee of Convocation, as the representatives of Medicine.

The William Julius Mickle Fellowship for 1956-7 has been awarded to Elfrida L. G. Hilton, M.B., F.R.C.S., F.F.R., in respect of her work on the care and cure of cancer.

The degree of M.D. was awarded by the Senate to D. Rowley on February 27.

UNIVERSITY OF LEEDS

The following candidates have been approved at the examinations indicated:

M.D.—Mary McMillan (with distinction).
M.B., Ch.B.—C. D. Holdsworth, *P. H. Smith, *Brenda Thiede, J. S. W. Brierley, Dorothy C. Campbell, J. H. Chippendale, H. M. Chung, J. E. Cox, N. Cross, A. Darnborough, Eileen M. Gillespie, P. Goodwin, L. L. Hemis, P. H. Holmes, D. Jarratt, D. T. Jones, Vera E. Lawton, J. W. Lewis, M. Mahloudji, J. W. A. Moxon, D. T. Price, B. E. Roberts, Audrey Sarfas, Margaret Sawyer, Marion Sherman, J. N. Smith, R. I. Swires, R. J. Taylor, D. L. Thiede, F. E. Tomlinson, Barbara F. Turner, R. W. Turner, B. Whitaker, Dorothy M. Wootton.

DIPLOMA IN PUBLIC HEALTH.—E. W. G. Birch, †C. Burns, G. Cust, J. A. G. Graham, J. Harkness, M. E. O'Neill, J. Pemberton, †W. Turner, J. A. G. Watson, Marianne H. Witt.

*With second-class honours. †With distinction.

UNIVERSITY OF SHEFFIELD

At a meeting of the University Council held on March 15 Dr. I. B. Sneddon was appointed part-time Lecturer in Dermatology.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College held on February 14, with Sir Harry Platt, President, in the chair, Sir Henry Dale was admitted as a member of the Court of Patrons.

The Hallett Prize was awarded to Darrel Felix Weinman, of Ceylon, on the result of the Primary Fellowship examination held recently in that country.

Diplomas of Fellowship in the Faculty of Anaesthetists were granted to the following successful candidates:

J. K. Trotter, T. R. Bomonji, H. M. C. Corfield, P. Dinmore, A. Thorogood, Morag J. R. Bastable, June E. Brett, J. B. Montgomery, J. D. Holdsworth, D. I. Chisholm, C. Moss, R. H. Bolton, Wendy A. Clark, M. Rosen, F. Wilson, A. R. Boutros, T. D. W. Davies, W. J. Glover, R. P. Holmes, R. T. Pettigrew, H. G. Saunders, K. B. Holloway, J. Moore, R. G. Waterhouse, I. E. Purkis.

The diploma of M.R.C.S. was granted to J. R. Anthony and to the 84 other successful candidates whose names were printed in the report of the meeting of the Royal College of Physicians of London in the *Journal* of March 2 (p. 530) as recipients of the diploma of L.R.C.P.

Diplomas in Public Health and in Industrial Health were granted, jointly with the Royal College of Physicians of London, to the successful candidates whose names were printed in the report of the meeting of the Royal College of Physicians of London in the *Journal* of March 2 (p. 530).

A Diploma in Child Health was granted to U. S. Ellis and a Diploma in Radiodiagnosis to B. W. A. Leeming, both jointly with the Royal College of Physicians of London.

At a meeting of the Council of the College held on March 14, with Sir Harry Platt, President, in the chair, the Hallett Prize was awarded to Dr. S. K. Nair, of Agra, and the Macloghlin Scholarship to F. R. Jackaman, of Queen Elizabeth's School, Barnet.

The death of Dr. Everts A. Graham, an Honorary Fellow of the College, was reported.

Vital Statistics

Marriages in 1955

In England and Wales in 1955 the most popular age for men to marry was 23 and for women 21. In 14 marriages both bride and groom were aged over 85, and in 48 both were aged 16. Of the 28,016 men aged under 21 who married, 3 were widowers and 7 divorced; while, of the 108,464 women under 21 who married, 21 were widows and 27 divorced. In response to the income-tax laws, the most favoured month for marriage was again March, when 60,532 took place; May had the fewest number, with 16,474. The downward trend in divorces continued, there being 26,262 as compared with 58,444 in 1947, the post-war peak. About 500-600 annulments a year have been granted in the 1950's.—*Registrar-General's Statistical Review of England and Wales for the Year 1955*, Part 2, Tables, Civil (H.M.S.O., 7s. 6d.).

Week Ending April 6

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 878, whooping-cough 2,768, diphtheria 9, measles 25,280, acute pneumonia 466, acute poliomyelitis 37, dysentery 1,051, paratyphoid fever 3, and typhoid fever 2.

Infectious Diseases in First Quarter

Notifications of infectious diseases in England and Wales during the first quarter of this year were in general below the average of the preceding first quarters. The exceptions were acute poliomyelitis and whooping-cough. The number of notifications of acute poliomyelitis was the highest ever recorded for a first quarter, the previous highest figure was 512 in 1950. The incidence of whooping-cough, though relatively high, has been exceeded in earlier March quarters. Notifications of dysentery were below the level of the two preceding March quarters, but the incidence is still very high. Diphtheria notifications were the lowest ever recorded for any first quarter; the average number per week was 4.5, compared with 1,611 in the first quarter of 1938. The incidence of acute pneumonia was very low, and the number of deaths from influenza in the great towns was the lowest for many years.

Returns of the great towns suggest that the infant mortality rate for the whole country will be the lowest ever recorded for a March quarter and the general death rate will be the lowest for recent first quarters.

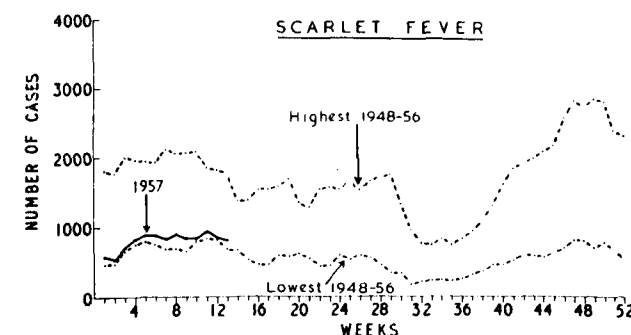
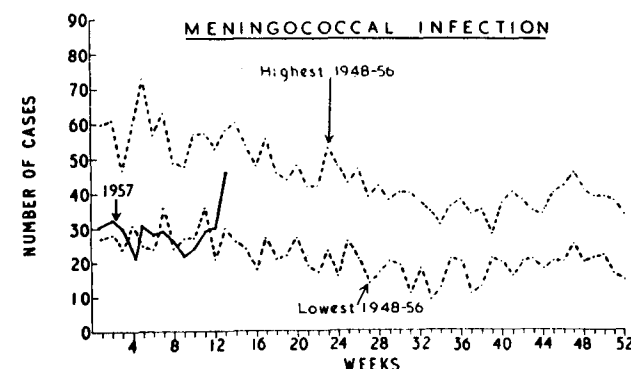
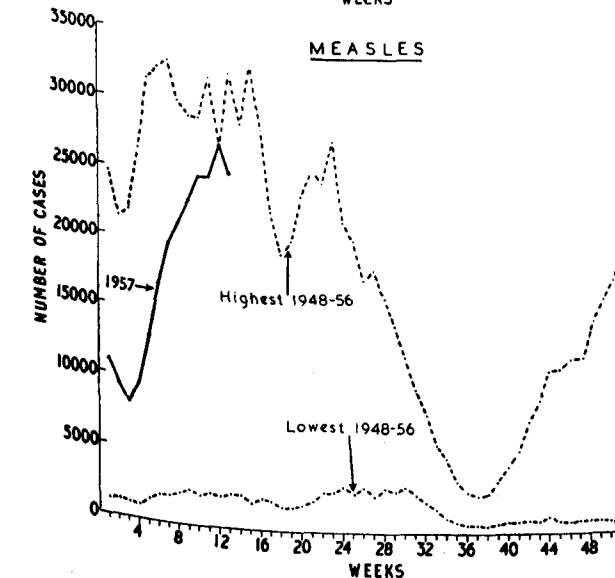
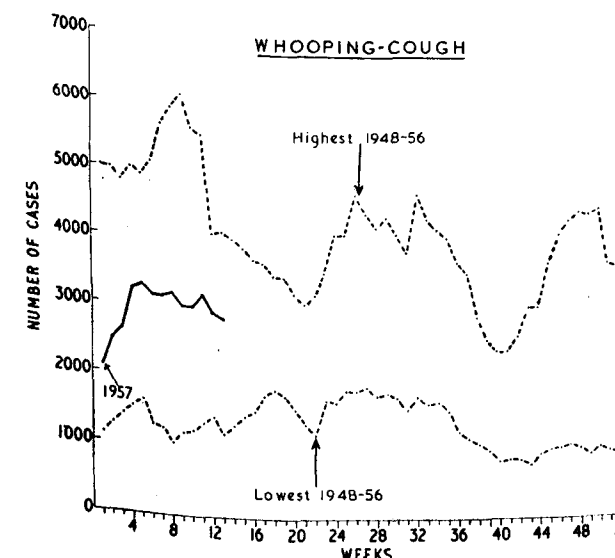
The uncorrected notifications for the first quarters of the past five years are:

England and Wales	1953	1954	1955	1956	1957
Scarlet fever	20,550	15,868	9,121	11,400	10,315
Whooping-cough	34,207	28,985	25,020	16,870	38,251
Measles	350,836	23,340	251,486	35,164	233,826
Acute poliomyelitis	345	332	208	366	516
Diphtheria	264	246	173	89	59
Meningococcal infections	595	515	499	436	385
Dysentery	4,449	10,808	14,551	19,297	13,594
Acute pneumonia	20,005	10,507	13,430	12,905	8,491
Enteric fevers	123	244	113	98	94
Great Towns: Deaths from influenza	2,995	398	1,181	921	204
All deaths	97,150	85,783	95,780	95,191	77,292

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1948-56 are shown thus ———, the figures for 1957 ———.

Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

Infectious diseases were less prevalent in England and Wales during the week ending March 30. The falls in the notifications included 1,994 for measles, from 27,179 to 25,185, 150 for acute pneumonia, from 695 to 545, 95 for dysentery, from 1,317 to 1,222, 88 for food-poisoning, from 298 to 210, and 83 for whooping-cough, from 2,932 to 2,849.

The largest falls in the incidence of measles were 614 in Essex, from 2,046 to 1,432, 402 in Lancashire, from 3,866 to 3,464, 310 in London, from 2,034 to 1,724, 242 in Middlesex, from 1,576 to 1,334, 214 in Yorkshire West Riding, from 2,852 to 2,638, and 210 in Northumberland, from 879 to 669; the largest rises were 162 in Nottinghamshire, from 443 to 605, 105 in Durham, from 1,488 to 1,593, and 92 in Lincolnshire, from 450 to 542. The notifications of scarlet fever numbered 812, being 10 fewer than in the preceding week, and there were no large fluctuations in the local trends. The largest variation in the trends of whooping-cough was a rise of 55 in Kent, from 173 to 228. 6 cases of diphtheria, 3 more than in the preceding week, were notified, and 2 of these cases were from Plymouth C.B.

28 cases of acute poliomyelitis were notified during the week, and these were 8 fewer for paralytic and 1 fewer for non-paralytic cases than in the preceding week. The largest returns were Sussex 3 (Brighton C.B. 3), Middlesex 3 (Ealing M.B. 2), Gloucestershire 3 (Bristol C.B. 2), and Essex 3.

The largest centres of dysentery were Yorkshire West Riding 301 (Leeds C.B. 72, Rotherham R.D. 57, Rotherham C.B. 53, Bradford C.B. 30, Sheffield C.B. 21, York C.B. 15), Lancashire 167 (Blackburn C.B. 25, Liverpool C.B. 24, Ashton under Lyne M.B. 19, Blackpool C.B. 16, Stretford M.B. 11), Durham 95 (Blaydon U.D. 26, Gateshead C.B. 20, South Shields C.B. 15, Whickham M.B. 15, Boldon U.D. 10), Cheshire 83 (Hyde M.B. 32, Stalybridge M.B. 24, Dukinfield M.B. 12), London 71 (Wandsworth 20), Kent 53 (Deal M.B. 44), Surrey 50 (Surrey M.B. 15, Esher U.D. 12), Nottinghamshire 44 (Mansfield M.B. 11, Basford R.D. 11), Bedfordshire 36 (Luton M.B. 25), Devonshire 29 (Plymouth C.B. 29), Middlesex 28 (Hayes and Harlington U.D. 11), Staffordshire 27 (West Bromwich C.B. 24), Shropshire 25 (Oswestry R.D. 16), Hertfordshire 20 (Welwyn Garden City U.D. 15), Northumberland 20 (Newcastle upon Tyne C.B. 12), Essex 20 (Romford M.B. 10), and Yorkshire East Riding 20.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending March 30 (No. 13) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included). London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria	6	1	5	0	4	6	0	5	0	5
Dysentery	1,222	71	230	12	10	1,948	409	104	11	
Encephalitis, acute	1	0		0		2	0		0	
Enteric fever:										
Typhoid	1	1	0	0		2	0	0	0	
Paratyphoid	3	0	6(B)	0	3(B)	3	0	0	0	
Food-poisoning	210	33	37	0		145	17		0	
Infective enteritis or diarrhoea under 2 years					12				10	8
Measles *	25,185	1724	439	470	281	2,666	76	207	33	165
Meningococcal infection	46	3	15	1	2	30	2	6	0	2
Ophthalmia neonatorum	36	2	6	0		28	4	3	0	
Pneumonia †	545	42	241	4	17	560	32	198	15	5
Poliomyelitis, acute:										
Paralytic	18	0		0	3	11	3	2	0	0
Non-paralytic	10	1				3	0			
Puerperal fever §	240	58	15	1		180	36	4	0	
Scarlet fever	812	64	87	45	17	686	49	70	37	17
Tuberculosis:										
Respiratory	683	88	176	14		551	72	120	19	
Non-respiratory	79	13	20	4		75	5	21	2	
Whooping-cough	2,849	149	279	7	64	1,179	60	126	58	65

DEATHS in Great Towns	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	1	0		0		0			0	
Encephalitis, acute		0			0		0			0
Enteric fever	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	3	0	0	1	0	7	0	1	0	0
Influenza	9	0	1	0	1	27	2	2	2	4
Measles		1	1	0	0		0	0	0	0
Meningococcal infection		0	1				0	0		
Pneumonia	269	43	19	8	8	356	61	18	19	5
Poliomyelitis, acute	3	0		1	0	1	1		0	0
Scarlet fever		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory	47	6	9	1	4	68	8	13	0	2
Non-respiratory		1	0	0	1		1	1	0	0
Whooping-cough	3	0	0	0	0	0	0	0	0	0
Deaths 0-1 year	206	21	40	4	13	208	29	29	11	4
Deaths (excluding stillbirths)	5,308	727	557	104	164	5,904	801	607	153	171
LIVE BIRTHS	8,634	1,237	1,074	232	398	7,457	1,137	952	161	246
STILLBIRTHS	228	27	27			218	23	24		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenza pneumonia.
§ Includes puerperal pyrexia.

Medical News

Chalmers Medal.—The council of the Royal Society of Tropical Medicine and Hygiene has awarded the 1957 Chalmers medal to Dr. A. J. HADDOW. The award is made every two years to a worker under 45 for research of outstanding merit in tropical medicine or hygiene. Dr. Haddow is director of the Virus Research Institute at Entebbe, Uganda, and his work on the entomology of yellow fever in East Africa is cited as particularly meritorious. Not only did it solve the initial problem of the transmission of sylvan yellow fever there, but it exposed "fundamental problems in mosquito behaviour." The presentation is expected to be made at the society's annual general meeting in June.

Australian Doctors on Visit to China.—A party of 20 Australian doctors left Sydney on April 8 for a month's lecture tour of China. They had been invited by the Chinese Medical Association. The party is led by Dr. LEONARD COX, president of the Australian Association of Neurologists, and among its members are the deans of the faculties of medicine at the Universities of Sydney and Melbourne, Professor E. FORD and Professor S. SUNDERLAND, and the chairman of the Australian Red Cross Society, Sir PETER MACCALLUM. They are to visit Peking, Shanghai, Canton, and Hankow, according to Radio Australia.

National Association for Mental Health.—The annual conference was held at Church House, Westminster, on April 11 and 12. The general theme was "The Maladjusted Child," and the Underwood Committee's report on the subject was taken as the basis for discussion. The conference debated the causes of maladjustment and the factors that predispose to it, and considered practicable measures in prevention and management. Among the medical speakers were Dr. KENNETH SODDY, Dr. JOHN BOWLBY, and Dr. MILDRED CREAK. The conference was opened by the Lord Chancellor, VISCOUNT KILMUIR.

Association of Occupational Therapists.—The association celebrated its 21st anniversary with a reception at the Goldsmiths' Hall in London on April 12. There is a particularly close link between the association and the Goldsmiths' Company, which has supported them for many years. When the association was originally formed there were only a few occupational therapists practising in England; now there are nearly 1,800 full members of the association and seven recognized training schools—in London, Oxford, Liverpool, Chertsey, Derby, Exeter, and Northampton. The association conducts its own examinations and awards a diploma which at present is the sole qualification in this specialty available in England. With the Scottish Association of Occupational Therapists the English association works closely in a joint council, through which both countries are represented on the World Federation of Occupational Therapists. The World Federation was formed at a meeting in Liverpool in 1952.

Polio Vaccine from Britain.—Distribution in the Federation of Rhodesia and Nyasaland of 38,000 doses of British re-processed polio vaccine was completed last month. The vaccine arrived there on March 23. A further 20,000 doses were expected to arrive on March 30. This is stated in the official *Newsletter* of the Federal Information Department, dated April 6, which adds that an order for an additional 40,000 doses has been placed "with the United Kingdom manufacturer" by the Federal Ministry of Health. The Federation has also received 5,900 doses from the Poliomyelitis Research Foundation in South Africa. This gave rise to questions in the South African Senate, as the Union Government was then making arrangements to import 300,000 doses of polio vaccine from the United States (*South African Medical Journal*, March 2, p. 204).

COMING EVENTS

Association of Clinical Biochemists.—Southern regional meeting at St. Bartholomew's Hospital, London, E.C.1, on May 11 at 2 p.m. Four papers on chemical toxicology will be read.

Indian Medical Service Dinner Club.—Annual dinner at the East India and Sports Club, St. James's Square, London, S.W.1, June 7, at 7 p.m. Details from the hon. secretary, I.M.S. Dinner Club, Medical Board Room, Commonwealth Relations Office, Matthew Parker Street, London, S.W.1.

National Association for Maternal and Child Welfare.—Annual conference, June 26-28, at Church House, Westminster, London, S.W.1.

International Poliomyelitis Conference.—Fourth conference, organized by the International Poliomyelitis Congress, in Geneva, July 8-12. Details from the secretariat of the conference, Hôtel du Rhône, Geneva, Switzerland. Early registration is advised.

Institute of Social Psychiatry.—Course in Group and Social Psychotherapy, July 22-29, at Moor Park College, Farnham, Surrey. Details from Institute of Social Psychiatry, 9, Fellows Road, London, N.W.3.

Control of Chemical Additives in Food.—A joint meeting of the U.S. Food Law Institute, the division of food, drug, and cosmetic law of the American Bar Association, and (from Britain) the food group of the Society of Chemical Industry, the Society for Analytical Chemistry, and the Association of Public Analysts, will be held at the Royal Institution, 21, Albemarle Street, London, W.1, on July 26, 10 a.m.-4.30 p.m. The conference is open to the public, free of charge.

NEW ISSUES

British Journal of Pharmacology and Chemotherapy.—The new issue (Vol. 12, No. 1) is now available. The contents include:

THE ACTION OF TRIETHYLENEMELAMINE ON THE FERTILITY OF MALE RATS. Marion Bock and H. Jackson.
EFFECTS OF RESERPINE ON BLOOD-PRESSURE RESPONSES EVOKED FROM THE HYPOTHALAMUS. B. K. Anand, S. Dua, and C. L. Malhoira.
PHARMACOLOGICAL EFFECTS PRODUCED BY INTRACEREBRAL INJECTION OF DRUGS IN THE CONSCIOUS MOUSE. T. J. Haley and W. G. McCormick.
THE INHIBITORY ACTION OF SOME ANTIMALARIAL DRUGS AND RELATED COMPOUNDS ON THE HEXOKINASE OF YEAST AND OF PLASMODIUM BEPHELI. Dorothy M. Fraser and W. O. Kermack.
THE EFFECT OF ESERINE AND NEOSTIGMINE ON THE BLOOD PRESSURE OF CONSCIOUS RATS. M. Medaković and V. Varadić.
THE INHIBITION BY SODIUM SALICYLATE OF OEDEMA OF THE HIND-PAW OF THE RAT INDUCED BY 5-HYDROXYTRYPTAMINE. E. Kelemen.
SOME ASPECTS OF THE PHARMACOLOGY OF AN HOMOLOGOUS SERIES OF CHOLINE ESTERS OF FATTY ACIDS. R. Schneider and A. R. Timms.
HISTAMINE RELEASE INHIBITION IN VITRO AND ANTIAPHYLACTIC EFFECTS IN VIVO OF SOME CHEMICAL COMPOUNDS. F. C. McIntire, R. K. Richards, and L. W. Roth.
EXPERIMENTS WITH THE TRYpanocidal COMPOUND "528" IN WEST AFRICA. R. L. Chardler.
PHARMACOLOGICAL ACTIONS OF PURE MUSCARINE CHLORIDE. P. J. Fraser.
THE ASSAY OF ANTI-ACETYLCHOLINE AGENTS FOR ANTAGONISM OF PILO-CARPINE-INDUCED SALIVATION IN RABBITS. D. M. Brown and R. M. Quinton.
THE RELEASE OF CATECHOL AMINES FROM ISOLATED CHROMAFFIN GRANULES. N. R. Eade.
THE ANTIVIRAL ACTION OF THREO-β-PHENYLSELINE. Lois Dickinson and Mildred J. Thompson.
THE INFLUENCE OF POTASSIUM CONCENTRATION ON THE ACTION OF QUINIDINE AND OF SOME ANTIMALARIAL SUBSTANCES ON CARDIAC MUSCLE. A. K. Atmizac.
THE ACTION OF MORPHINE ON THE SUPERIOR CERVICAL GANGLION AND ON THE NIGHTMARE MEMBRANE OF THE CAT. U. Trendelenburg.
THE TRANSMITTER RELEASED BY STIMULATION OF THE BRONCHIAL SYMPATHETIC NERVES OF CATS. Mary F. Lockett.
ANALOGIC ACTIVITY OF DIPIPANONE HYDROCHLORIDE IN STUDENT VOLUNTEERS. D. A. Cahal.
SEASONAL VARIATIONS IN THE RESPONSE OF RATS TO THE ANTIDIURETIC HORMONE. H. Heller, G. Herdan, and S. M. A. Zaidi.
THE EFFECT OF ETHER AND PENTOBARBITONE SODIUM ON GASTROINTESTINAL FUNCTION IN THE INTACT RAT. P. C. Reynell and G. H. Spray.
LOCAL EFFECTS AND MECHANISM OF ABSORPTION OF IRON PREPARATIONS ADMINISTERED INTRAMUSCULARLY. C. R. Beresford, L. Golberg, and J. P. Smith.
INHIBITION BY MORPHINE OF THE RELEASE OF ACETYLCHOLINE FROM THE INTESTINE OF THE GUINEA-PIG. W. Schaumann.
THE ACTION OF MORPHINE AND RELATED SUBSTANCES ON CONTRACTION AND ACETYLCHOLINE OUTPUT OF COAXIALLY STIMULATED GUINEA-PIG ILEUM. W. D. M. Paton.
SOME PHARMACOLOGICAL ACTIONS OF CHOLINE 2:6-XYLyl ETHER BROMIDE. G. L. Willey.

Issued quarterly; annual subscription £4 4s.; single copy 25s.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Recruitment of Nurses and Midwives.—From May 1 the Ministry of Health and the Department of Health for Scotland are to take over from the Ministry of Labour and National Service the general oversight of the recruitment of nurses and midwives. In view of this change the national advisory council concerned will be reconstituted and henceforth advise the Health Ministers instead of the Ministry of Labour. The nursing appointments service of the Ministry of Labour will continue, however. It has 166 local offices which assist those wishing to train, or obtain employment, as nurses, midwives, or nursing assistants or auxiliaries.

Central Midwives Board.—Mr. ARNOLD WALKER and Professor ALAN MONCRIEFF were re-elected respectively chairman and deputy chairman of the Board at a meeting on April 4.

Apartheid in Medicine.—On April 8 the South African Government introduced its revised Bill to enforce university apartheid; the Durban Medical School is expected to be dealt with later (see this *Journal*, April 13, p. 899). The South African Government has also been concerned with the principle of apartheid in nursing and blood transfusion practice. According to a *Reuter* dispatch, the Government has decided not to enforce apartheid for blood transfusions. Mr. J. H. VILJOEN, the Minister of Health, told the House of Assembly recently that the blood transfusion regulations requiring the race of the donor to be shown clearly on each bottle would not in any way prohibit the use of blood interracially. Last September the South African Medical and Dental Council accepted a recommendation that blood for transfusion should be so labelled. Dr. M. SHAPIRO, director of the Blood Transfusion Service, who was present, declared at the time: "It is tragic that there should be discrimination in South Africa between the blood of whites and non-whites." But, while the South African Government has now decided against apartheid in blood transfusion, it is pressing forward with measures to ensure racial segregation in the bodies which control nursing in South Africa. Notice of a Bill aimed at debarring non-European nurses from the Nursing Council and the South African Nursing Association was given in the Speech from the Throne at the opening of the new session of the South African Parliament in Capetown in January.

Collegium Internationale Allergologicum.—The Collegium's third annual meeting was held on March 28 in London, and the following officers and council were elected for 1957-8: *president*: Dr. D. Harley (London); *vice-president*, Dr. J. Duchaine (Brussels); *hon. secretary*, Dr. P. Kallós (Helsingborg); *treasurer and executive secretary*, Dr. A. Cerletti (Basle); *members of council*: Dr. R. R. A. Coombs (Cambridge), Professor H. A. E. van Dishoeck (Leyden), Dr. W. Feldberg (London), Professor W. Hansen (Lübeck), Dr. R. Hoigné (Berne), Professor C. Jimenez-Diaz (Madrid), Dr. W. Kaufman (Bridgeport, U.S.A.), and Professor H. R. Olivier (Paris).

Professor A. C. Frazer, professor of pharmacology at Birmingham University, has been appointed a member of the W.H.O. expert panel on food. The appointment is for five years. Professor Frazer is also president of the British Food Manufacturing Industries Research Association, a Government-sponsored organization concerned with problems of food processing and preservation.

Sir Geoffrey Jefferson, F.R.S.—A proposal to confer the honorary degree of D.Sc. on Sir GEOFFREY JEFFERSON, emeritus professor of neurosurgery at Manchester University, will be considered in Congregation at Cambridge on May 4.

Professor J. M. Robson, professor of pharmacology at Guy's Hospital, London, has arrived in Australia on a lecture tour. He is visiting Sydney, Brisbane, Canberra, and Melbourne.

British Journal of Ophthalmology.—The new issue (Vol. 41, No. 4) is now available. The contents include:

THE FELLOW EYE IN ACUTE CLOSED-ANGLE GLAUCOMA. W. E. S. Bain.
DARK-ROOM TEST AND ITS MECHANISM. Wallace S. Foulds.
CHRONIC CLOSED-ANGLE GLAUCOMA. Wallace S. Foulds and Calbert I. Phillips.

NATURAL HISTORY OF ONCHOCERCIASIS. F. H. Budden.
CAVERNOUS SINUS THROMBOPHLEBITIS. P. J. Taylor.
OXYPHENONIUM AS AN ATROPINE SUBSTITUTE IN OPHTHALMOLOGY. M. J. Roper-Hall.

ACCIDENTAL VACCINIA. Charles Taylor.
SYNCHETIC LID RETRACTION. N. S. Jain.

CORRESPONDENCE.
BOOK REVIEWS.

NOTES.
OBITUARY.

Issued monthly; annual subscription £4 4s.; single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

British Heart Journal.—The new issue (Vol. 19, No. 2) is now available. The contents include:

THE SYNDROME OF THE SUSPENDED HEART. By William Evans and H. G. Lloyd-Thomas.

EPILEPSY AND MITRAL STENOSIS. By C. G. Baker and T. R. L. Finnegan.

OBSCURE CARDIOPATHY. By Byron Evans.

DIFFUSE ENDOMYOCARDIAL SCLEROSIS. By J. B. Lynch and J. Watt.

FIBRO-ELASTOSIS OF THE HEART IN ADOLESCENCE. By W. H. R. Auld and H. Watson.

ENDOCARDIAL FIBRO-ELASTOSIS WITH GENERALIZED LYMPHADENOPATHY, OEDEMA, AND RASH. N. M. Gibbs, J. C. Haworth, and John Rendle-Short.

THE AORTA AND PULMONARY ARTERIES IN FALLOT'S TETRALOGY. By J. Norman Pattinson and Richard W. Emanuel.

DILATATION OF THE AORTA DUE TO GRANULOMATOUS (GIANT-CELL) AORTITIS. By J. V. O. Reid.

THE ANATOMICAL APPEARANCE OF RHEUMATIC TRICUSPID VALVE DISEASE. By Arthur Hollman.

PULMONARY ARTERIAL PRESSURE AFTER PRISCOLINE IN MITRAL STENOSIS. By K. Braun, G. Izak, and S. Z. Rosenberg.

HAEMODYNAMIC STUDIES DURING AURICULAR FIBRILLATION AND AFTER RESTORATION OF SINUS RHYTHM. By Ole Jacob Broch and Otar Müller.

PROGNOSIS OF CORONARY HEART DISEASE IN MEDICAL PRACTITIONERS. By J. N. Morris and J. A. Heady.

SEPTAL INFARCTION WITH RECOVERY OF THE ELECTROCARDIOGRAM. By D. Gordon Abrahams.

ELECTROCARDIOGRAPHIC CHANGES DURING PRESSURE BREATHING. By R. J. Shephard.

COMPLETE HEART BLOCK IN AN EXPERIENCED PILOT. By Francis A. L. Mathewson and Fred H. Harvie.

PRÆCORDIAL BALLISTOCARDIOGRAPHY. By Patrick Mounsey.

INFLUENCE OF ACETYLCHOLINE ON PULMONARY ARTERIAL PRESSURE. By P. Harris.

THE EFFECT OF ACETYLCHOLINE ON PULMONARY VASCULAR RESISTANCE AND LEFT ATRIAL PRESSURE IN MITRAL STENOSIS. By Paul Wood, E. M. Besterman, M. K. Towers, and M. B. McIlroy.

CASE REPORTS

BALL-VALVE MITRAL OBSTRUCTION BY A SARCOMA OF A PULMONARY VEIN. By A. A. R. Cumming and A. J. Shillitoe.

KAPOST'S HAEMANGIOSARCOMA OF THE HEART. By Michael Gelfand.

REPETITIVE PAROXYSMAL VENTRICULAR TACHYCARDIA WITH FUSION BEATS. By Ruston Jal Vakil.

DUPPLICATION OF THE MITRAL VALVE. By E. D. Wigle.

INCREASED CARDIAC OUTPUT CAUSED BY SECONDARY HYPERNEPHROMA. By Geoffrey Bourne.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Wednesday, April 24

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—8 p.m., Dr. J. A. Harrington and Dr. K. W. Cross, Ph.D.: Survey of Chronic Patients in a Mental Hospital and its Implications. Discussions to be opened by The Hon. W. S. Maclay.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. J. G. Scadding: Clinical Significance of Tuberculin Tests.

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—8.30 p.m., Dr. G. F. Abercrombie: College of General Practitioners.

MIDLAND CENTRE FOR NEUROSURGERY, Holly Lane, Smethwick, near Birmingham.—8 p.m., Dr. J. N. Cumings: Biochemical Abnormalities in Hepatolenticular Degeneration.

SCOTTISH EASTERN ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At Adam House, Chambers Street, Edinburgh, 8.30 p.m., Dr. Joy Patrick: Demonology.

Thursday, April 25

HILL END HOSPITAL MEDICAL SOCIETY, St. Albans.—8.45 p.m., Sir Francis Walshe, F.R.S.: Traumatic Neuroses.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.30 p.m., Sir Archibald McIndoe: Scope of Plastic Surgery.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnold Demonstration by Dr. B. D. Wyke: Surgical Considerations of the Temporal Lobes.

ROYAL NORTHERN HOSPITAL.—2.45 p.m., Mr. A. E. Roche: Some Genito-urinary Problems.

Friday, April 26

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. F. H. Young: clinical demonstration.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., Mr. G. H. Howells: Sinusitis.

Saturday, April 27

KENT PEDIATRIC AND CHILD HEALTH SOCIETY.—At Royal Star Hotel, Maidstone, 3 p.m., annual general meeting.

APPOINTMENTS

HOSPITAL FOR SICK CHILDREN, Great Ormond Street, London, W.C.—C. V. Peterson, M.B., B.S., F.R.C.S.Ed., Resident House-surgeon; N. J. O'Doherty, M.D., M.R.C.P., M.R.C.P.I., Resident House-physician.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End Road, London, N.W.8.—A. Giordani, M.R.C.S., L.R.C.P., D.M.R.D., Honorary Assistant Radiologist; J. R. Cooper, M.R.C.S., L.R.C.P., L.D.S., Honorary Dental Surgeon.

LIVERPOOL REGIONAL HOSPITAL BOARD.—A. C. Barry, M.B., Ch.B., D.P.M., Assistant Psychiatrist at Sefton Mental Hospital; M. J. Cosgrave, M.B., Ch.B., D.P.M., Assistant Psychiatrist at Deva Hospital; R. Fairhurst, M.B., Ch.B., B.D.S., Consultant Dental Surgeon to Birkenhead Group; G. W. Bamber, M.D., F.R.C.P., Consultant Dermatologist to Bootle Hospital and the Liverpool Radium Institute.

MANCHESTER REGIONAL HOSPITAL BOARD.—E. L. Trickey, M.B., B.S., F.R.C.S., Consultant Traumatic and Orthopaedic Surgeon, Ashton, Hyde, and Glossop Hospitals; G. T. Johnson, M.D., F.F.A.R.C.S., M.R.C.O.G., Consultant Obstetrician/Gynaecologist, West Manchester Hospitals; E. Sherrah-Davies, M.B., B.Chir., F.R.C.S., D.M.R.T., Whole-time Assistant Radiographer, Christie Hospital and Holt Radium Institute, Manchester; L. G. G. Jones, M.R.C.P.Ed., M.R.C.S., L.R.C.P., Whole-time Assistant Venerologist, Manchester Area.

NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD.—Joan Martinez, M.B., Ch.B., D.A., Consultant Anaesthetist, Highlands General Hospital; K. R. Dempster, M.B., B.S., Consultant Morbid Anatomist, King Edward VII Hospital, Windsor; R. T. D. Emond, M.B., Ch.B., M.R.C.P., D.T.M.&H., Consultant in Infectious Diseases, and Physician Superintendent, Coppetts Wood Hospital; E. K. Gardner, M.B., B.Chir., F.R.C.S., F.F.A.R.C.S., Consultant Anaesthetist, Barnet Group of Hospitals; F. H. Edwards, M.R.C.S., L.R.C.P., D.P.M., Consultant Psychiatrist, Portman Clinic; P. J. F. Walsh, M.B., B.S., D.P.M., Assistant Psychiatrist (S.H.M.O.), St. Bernard's Hospital; W. O. Heffernan, L.R.C.P.&S.I., D.P.M., Assistant Psychiatrist (S.H.M.O.), Hill End Hospital; C. O. Kennedy, M.B., Ch.B., M.F.Hom., and L. R. Twentyman, M.B., B.Chir., M.F.Hom., Senior Hospital Medical Officers, Royal London Homoeopathic Hospital.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—R. A. J. Baily, M.B., B.Chir., F.R.C.S., Consultant Orthopaedic Surgeon to Weston-super-Mare Group of Hospitals; S. S. Knappe, M.D., Deputy Medical Superintendent, Sandhill Park Hospital, Bishops Lydeard; A. K. Banerjee, M.B., B.S., F.R.C.S., F.R.C.S.Ed., Surgical Registrar at Southmead Hospital, Bristol; S. D. Bulos, M.D., F.R.C.S.Ed., Registrar in Orthopaedic and Traumatic Surgery in Exeter Clinical Area; M. F. Bethell, M.D., D.P.M., Consultant Psychiatrist and Deputy Medical Superintendent at Tonic Vale Hospital, near Taunton; E. W. Moore, M.B., Ch.B., M.R.C.P.Ed., D.P.H., D.M.R.D., Consultant Radiologist to Bath Clinical Area.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

May.—On March 8, 1957, at Prince Albert, Saskatchewan, Canada, to Jean, wife of Malcolm J. May, M.B.E., M.B., F.R.C.S., a brother for Martin—Nigel Malcolm.

Rohatgi.—On April 3, 1957, at Queen Charlotte's Maternity Hospital, London, W., to Malti, D.R.C.O.G., wife of J. N. Rohatgi, M.S., F.R.C.S., a daughter—Nira.

DEATHS

Billinghurst.—On March 22, 1957, at 24, Fairway, Merron, Guildford, Surrey, Walter Brinsmead Billinghurst, M.B., B.Ch.

Cooper.—On March 22, 1957, in London, Henry Cremer Cooper, M.R.C.S., L.R.C.P., L.D.S., aged 85.

Craig.—On April 1, 1957, at Bognor Regis, Sussex, William James Forsyth Craig, L.R.C.P.&S.Ed., L.R.F.P.S., of 137, Wheelwright Road, Erdington, Birmingham, Warwick.

Duran-Jorda.—On March 30, 1957, at the Manchester Royal Infirmary, Frederick Duran-Jorda, M.D., of Broughton House, 139, Marsland Road, Sale, Cheshire, aged 51.

Hanson.—On March 24, 1957, at 11, Egerton Gardens, London, S.W., David Cochrane Hanson, M.C., M.B., Ch.B.

Hudson.—On March 21, 1957, at Ashford Hospital, Kent, Bernard Hudson, M.D., M.R.C.P., of Castleton Oak Cottage, Biddenden, Kent.

Johnston.—On March 26, 1957, at Rothesay, Clyde Road, St. Leonards-on-Sea, Sussex, Robert Macfie Johnston, M.B., aged 85.

Jones.—On March 24, 1957, at St. Thomas's Hospital, London, S.E., Isaac Eastwood Jones, M.D., F.R.C.P., aged 74.

Kidd.—On March 29, 1957, at the London Hospital, Beatrice Mary Kidd, M.B., of Brooklands, Blackheath Park, London, S.E., aged 80.

O'Donnell.—On March 29, 1957, at The Avenue, Stone, Staffs, James Roderick O'Donnell, M.B., B.Ch.

Oster.—On March 25, 1957, at Capetown, South Africa, Robert Douglas Oster, M.B., Ch.B., formerly of Edinburgh.

Quinn.—On March 25, 1957, at Cork, Francis B. Quinn, M.B., B.Ch., Surgeon Captain, R.N., retired, of Thornton Hall, Jersey, Channel Islands.

Read.—On March 24, 1957, at Addenbrooke's Hospital, Cambridge, Harold William Read, T.D., M.R.C.S., L.R.C.P., of Long Sutton, Lincs.

Relf.—On March 25, 1957, Herbert John Relf, M.R.C.S., L.R.C.P., L.D.S., of 6a, Fairfield Road, East Croydon, Surrey, aged 84.

Scott.—On April 3, 1957, in a nursing-home, Edinburgh, Charles Ernest Scott, M.B., F.R.C.S.Ed., of 33, Palmerston Place, Edinburgh.

Stebbing.—On March 23, 1957, John Garvin Stebbing, M.B., B.S., of 1, Liskeard Gardens, Blackheath, London, S.E., aged 32.

Turner.—On March 28, 1957, at his home, Oundle, Peterborough, Northants, Bernard Roworth Turner, M.B., B.Chir., aged 85.

Watson.—On March 28, 1957, at 3, Park Drive, Heaton, Bradford, Yorks, Donald Watson, M.B., F.R.C.S., aged 69.

Watts.—On March 24, 1957, at Hampton Dene, Hereford, Hilbre Hamilton Watts, M.B., Ch.B., aged 41.

Weir.—On March 20, 1957, at 4, Little Anglesey Road, Alverstoke, Hants, Hamish McDonald Weir, M.B., Ch.B., formerly of The Moorings, Lee-on-Solent, Hants.

Wilson.—On March 23, 1957, at his home, Redvales House, Bury, Lancs, William Webster Watt Wilson, M.B., Ch.B., aged 78.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Underwriting Substandard Lives

Q.—Dr. K. Shirley Smith in his presidential address to the Assurance Medical Society mentioned the existence of special "pools" for those with coronary disease, diabetes mellitus, or hypertension. What steps must a person with one of these conditions take in order to obtain life cover by inclusion in one of these pools?

A.—The formation of special "pools" to deal with conditions such as coronary disease, diabetes mellitus, and hypertension has in recent years become a feature in the handling of difficult life assurance cases. These pools are administered by a Re-assurance Company which will undertake the whole or part of a life assurance risk submitted by any one of the ordinary Life Assurance Societies. It does not follow that all such Societies make use of the special pools, but their services are available to any Life Office which seeks their aid.

So far as a sufferer from one of these conditions is concerned the normal procedure is for him to make a proposal for life assurance to the Society of his choice, which will arrange all the necessary details and undertake a medical examination. The Society will then indicate to the applicant whether it can, of itself, offer life assurance at all, and, if so, on what terms. On the other hand, it may decline the proposal outright. In the latter case the applicant may then ask the Society to submit his proposal to the special pool for consideration, and this it will do on the applicant's behalf. Equally it is open to the individual to say from the outset that he would like his proposal to be considered not only by the Life Assurance Society but by the special pool concerned, so that he can see which of the two offers the better terms and place his assurance accordingly.

REFERENCE

¹ British Medical Journal, 1957, 1, 513.

Gynaecomastia as an Industrial Hazard

Q.—A young man who has worked for a number of years on the production of stilboestrol has recently complained of pain and tenderness of his breasts. The pain has become less since transferring to a different job two weeks ago. (1) Is this a recognized hazard of those working with oestrogens, and, if so, what is the portal of entry of the oestrogen to the body? (2) What is the prognosis after cessation of exposure? (3) If acquired as a result of a man's occupation, does the condition attract compensation, and what powers exist to compel an employer to take adequate precautions to eliminate this hazard?

A.—(1) The occurrence of mammary hyperplasia among those working with oestrogens is a hazard which is recognized at least by endocrinologists and those interested in industrial medicine. Fitzsimons¹ reported 20 cases of gynaecomastia among 38 men engaged in the manufacture of stilboestrol and dienoestrol. The portals of entry are probably through the skin and, if the worker does not wash his hands before meals, by the mouth. The lungs are an important portal of entry for the dust of oestrogens, and in fact precautions in the factories handling these substances are directed towards keeping the dust out of the atmosphere and avoiding their contact with the skin. The condition usually subsides gradually after cessation of exposure.

(2) Gynaecomastia as a result of an excessive dose of stilboestrol is not included in the list of prescribed diseases under the Industrial Injuries Act. In certain circumstances diseases

would be due to an overdose of sex hormones might be accepted as being due to "injury by accident," but each case is considered on its merits. There are no factory regulations covering the manufacture and handling of oestrogens, but Section 47 of the Factories Act requires the removal of "any dust or fume or other impurity of such character and to such extent as it is likely to be injurious or offensive to the persons employed, or any substantial quantity of dust of any kind. All practical measures shall be taken to protect the persons employed against inhalation of the dust or fume or other impurity and to prevent its accumulation in any workroom, and in particular, where the nature of the process makes it practicable, exhaust appliances shall be provided and maintained, as near as possible to the point of origin of the dust or fume or other impurity, so as to prevent its entering the air of any workroom." In practice the work with oestrogens is usually done under exhaust ventilation in enclosed cabinets, and the workers are provided with overalls, gloves, head-coverings, and dust respirators. They also undergo periodic medical examination. All these measures, however, are voluntary except the exhaust ventilation.

REFERENCE

¹ Fitzsimons, M. P., *Brit. J. Indust. Med.*, 1944, 1, 235.

Antivenin for Adder Bites

Q.—Should antivenin always be given for adder bites in Britain? If so, how soon must it be given and in what dosage, and where may it be obtained?

A.—The adder or common viper (*Vipera berus*) is the only species of poisonous snake indigenous to Great Britain. Fatalities following its bite are rare, though small children may be severely affected. A tourniquet should at once be applied well above the bite, which is almost invariably on an extremity, and it should be loosened for 5 to 10 seconds every 10 to 15 minutes. The encouragement of bleeding may also help.

Specific venom antiserum, or antivenin, is highly effective and should always be administered if it can be obtained before the expected recession of symptoms commences. Dosage is dependent on the potency of the preparation, and should be in accordance with the instructions on the leaflet provided by the manufacturer. The dosage for children should never be less than the adult dose. It is always safer to give a larger dose to young children because of the smaller blood volume. Antivenin is not manufactured in Great Britain, but can be obtained by application to certain hospitals and other centres (for a list see *Monthly Bull. Minist. Hlth (London)*, 1955, 14, 70). Before giving serum, ideally one should make sure by means of a "trial dose" that the patient is not sensitive to it; but in practice, owing to the emergency, it is unusual to delay the main dose for a sensitivity test.

Apart from the special measures recommended above—namely, a tourniquet and antivenin—the treatment of the shock should be on general lines.

BCM: A New Nitrogen Mustard

Q.—A recent report from Budapest¹ records the clinical trial of a nitrogen mustard compound called BCM (1,6-bis (β-chlorethyl-amino-1, 6-desoxy-D-mannitol) dichloride). Is anything further known about the value of this compound?

A.—There are four other references to BCM in the literature. A paper by Vargha² briefly describes its preparation. Kellner, Németh, and Sellei³ report on its biological, haematological, and tumour-inhibiting activity. In a much more detailed paper Kellner and Németh⁴ report their studies of the tumour-inhibiting effects of several nitrogen-mustard-carbohydrate combinations and have established that BCM surpassed HN2 (methyl dichloroethylamine) in its tumour-inhibiting and haematological effects. The substance is less

toxic and has a wider range of clinical use than HN2. Animal experiments show that BCM has an inhibiting effect on metastases, so that it could be used prophylactically in surgery. The authors in this paper recommend that clinical tests be carried out not only in blood dyscrasias but also in carcinomas and sarcomas. There is also the original Hungarian publication.²

REFERENCES

- ¹ Sella, C., Eckhardt, S., Hartai, F., and Dumbovich, B., *Lancet*, 1956, 1, 785.
- ² Vargha, L., *Naturwissenschaften*, 1955, 42, 582.
- ³ Kellner, B., Németh, L., and Sella, C., *ibid.*, 1955, 42, 582.
- ⁴ ———, *Z. Krebsforsch.*, 1956, 61, 165.
- ⁵ ———, Sella, C., and Vargha, L., *Orvosi Hetilap*, 1956, 97, 999.

Susceptibility to Belladonna

Q.—What accounts for the great differences between species in their susceptibility to belladonna poisoning? I understand hens and rabbits can eat the leaves and berries with apparent impunity. Why can children stand relatively much greater doses of belladonna than adults?

A.—The question contains two statements both of which are generally accepted as true, but both are open to doubt. According to Willberg¹ the lethal dose of atropine per kg. for a rat or a hen (750 mg./kg.) is four times as great as the lethal dose for a cat or finch. Hedgehogs, guinea-pigs, mice, rabbits, ducks, dogs, pigeons, and crows are intermediate. The range of doses is not very great. The lethal dose for man is not accurately known, but it is probably much less than in any of the species tested by Willberg. Unna *et al.*² studied the effect of atropine on salivary secretion in children under 12 and found little or no variation with age: the effective doses were proportional to body weight and comparable to those effective in adults.

Differences in susceptibility depend, in part at least, on differences in the rates of elimination of the alkaloids. Some rabbits possess an enzyme which hydrolyses both atropine and hyoscyne; the presence of the enzyme is controlled by genetic factors. Rabbits fed on belladonna acquire tolerance, and several generations have been reared on a diet consisting exclusively of belladonna, hyoscyamus, and stramonium.³ This tolerance is also due to more rapid elimination, and the story, which appears in some textbooks, about a whole family, plus cat and dog, being killed by eating the flesh of resistant rabbits is most improbable.

REFERENCES

- ¹ Willberg, M. A., *Biochem. Z.*, 1914, 66, 389.
- ² Unna, K. R., Glasier, K., Lipton, E., and Patterson, P. R., *Pediatrics*, 1950, 6, 197.
- ³ Heckel, E., *C.R. Acad. Sci. (Paris)*, 1875, 80, 1608.

Sleep Paralysis

Q.—What is the nature of sleep paralysis, and how is it explained?

A.—Brief and infrequent episodes of sleep paralysis can occur in normal people. The subject finds that he is lying in bed and, although awake, cannot move or speak. In its full clinical form the symptom may be associated with hallucinations, either visual or more often auditory, which may be pleasant or unpleasant. Attacks of cataplexy in the day, and even at times narcolepsy, may occur in these patients. The syndrome of sleep paralysis, hallucinosis, and cataplexy was described by L'Hermite.¹ The condition is not related to epilepsy or psychosis, but many sufferers are neurotic subjects. There is little evidence that the condition is the result of damage or disease of the brain, but appears to be a functional disturbance of the sleep-waking mechanism. The condition, which occurs usually in young adults, tends to improve spontaneously with time, and often responds to a simple barbiturate hypnotic and reassurance that the condition is not a mental illness. Psychotherapy may have some place in the treatment of these patients.

REFERENCE

- ¹ L'Hermite, J., and Tournay, A., *Rev. neurol. (Paris)*, 1927, 1, 751.

Premedication for Hypnosis

Q.—Is there any drug which is useful in preparing a patient for hypnotic suggestion?

A.—It is not usual to prepare a patient for hypnosis by giving him a drug in advance. In the relatively few instances when hypnotic suggestion is at all useful, it is a technique to be employed deliberately and without haste. The difficulty about giving any drug in advance would be that the patient might sleep.

It has of course been customary for many years to use the injection of a sedating drug instead of hypnosis, and this technique is called narcoanalysis. The drug employed is usually thiopentone or amylbarbitone, which in either case must be injected slowly, the object being to produce a state of maximum suggestibility short of sleep.

Aetiology and Prevention of Coronary Thrombosis

Q.—What is definitely known about the aetiology of coronary thrombosis? Has there been a genuine increase in its frequency, and how far can this be blamed on "modern life"? What precautions, in dietary or other habits, may a professional man reasonably adopt in order to reduce his chances of developing the disease?

A.—In a great proportion of cases, atheroma of the coronary arteries underlies coronary thrombosis. The aetiology of coronary thrombosis is thus in large measure the aetiology of atheroma. The consensus of opinion is that this disease of the arteries is connected with derangements of fat and cholesterol metabolism. A familial influence in causing coronary disease in younger men has been proved. Sex and age incidence point also to involution of sexual organs as a contributory circumstance. There has unquestionably been an increasing incidence of coronary heart disease. While nothing is definitely known as to the influence of factors under the heading "modern life," mental and physical stress, frustration of ambition, and exceptional fatigue and high responsibility have been regarded as contributing to this disease. However, most authorities agree that a sedentary life with little exercise and over-indulgence in rich foods is a more likely basis of coronary thrombosis than a physically strenuous habit of life coupled with a simple moderate diet.

The precautions that a professional man may reasonably adopt to minimize his chance of coronary disease may be adduced as follows: (i) maintenance of the habit of walking and/or golf or other outdoor sport; (ii) avoidance of putting on weight; (iii) avoiding, as far as possible, rush and hurry; (iv) keeping to strict moderation in animal fats and rich foods in general in the diet; (v) observing a reasonable moderation in the use of tobacco and alcohol.

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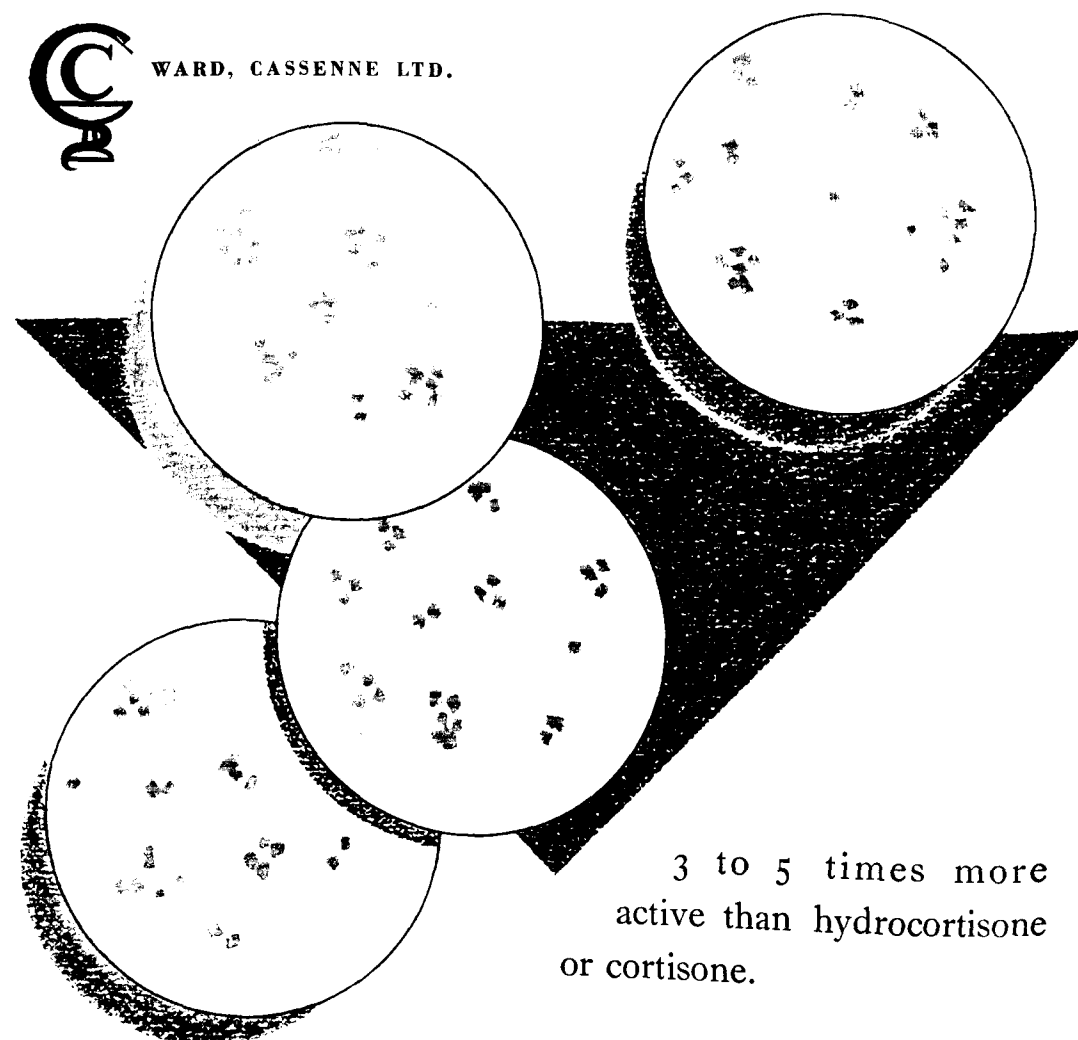
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BRITISH MEDICAL JOURNAL

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LATENT INFECTIONS WITH VIRUSES AND RICKETTSIAE*

BY

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[WITH SPECIAL PLATE]

The laboratory diagnosis of virus diseases is to-day somewhat complicated by the embarrassing number of new agents which have been isolated through increasing use of human and monkey cells in tissue culture. One of the principal problems is to establish a causal connexion between these new viruses and particular clinical syndromes. A number are still unattached and continue to deserve the name "orphan virus" originally used by Melnick (1955).

Some of the newly discovered viruses are clearly transient visitors, whether or not they are associated with disease. Certain types, however, appear to persist as latent infections in the tonsils and adenoids (Rowe *et al.*, 1953). Latent infection raises special problems, not only in its relationship to illness, but also in the mechanism by which obligate intracellular organisms can survive for long periods in one host. A review of this topic should not be limited to latent virus infections of man, however, because there is much to be learnt from similar conditions of animals, birds, and even bacteria.

In this paper "latent infection" will be used to mean the persistence of a virus or rickettsia in the tissues for long periods, during most of which there is no obvious manifestation of disease. This will not be taken to include the incubation period even when it is long, as, for example, in infective hepatitis.

Our knowledge of latent viral and rickettsial infections of man is, of course, limited by our inability to search the tissues for the hidden organism. We are dependent upon the reappearance of virus in the blood or vesicle fluid or in some other situation where it can be isolated and detected by laboratory methods, or where its presence can be deduced through secondary infection of contacts. An inevitably different approach has, however, revealed the presence of latent viruses in the tissues of wild and laboratory-bred animals.

Latent Infections of Animals

Attempts to isolate the causative organism from suspected virus diseases of man often involves inoculation of experimental animals by various routes with a number of so-called "blind" passages of tissue suspension from one group of inoculated animals to the next. After one or more such passages the animals may sicken

*The Lock Lecture delivered before the Royal Faculty of Physicians and Surgeons, Glasgow, November 14, 1956.

and a filterable agent be obtained from the tissues which will cause reproducible disease in other animals of the same species. A great many organisms isolated in this way have turned out to be viruses lying dormant in the stock animals, which are activated by passage of tissue suspensions. Sometimes salt solutions or other simple diluents will activate these viruses, rather like the non-specific stimuli which activate herpes simplex in man. These latent infections of laboratory animals naturally add to the difficulties of virus research. Eaton (1950), in his attempts to isolate the causative agent of primary atypical pneumonia by intranasal inoculation of cotton-rats and hamsters, identified three different latent viruses in the lungs alone of his stock animals. A number of latent virus infections have also been found in the lungs of mice and guinea-pigs. Such infections are not confined to the respiratory tract, however. There is, for example, spontaneous encephalomyelitis of mice, sometimes called mouse poliomyelitis, and originally investigated by Theiler (1937).

Mouse Encephalomyelitis

Theiler's virus is almost universally present in the intestinal wall of laboratory mice between the first and sixth months of life and sometimes longer; in fact it is difficult to obtain for experimental work a line of mice which are free of the virus. Infection apparently occurs through exposure of the baby mice to faecal contamination, and not *in utero* or through the milk. When carrying Theiler's virus the mice are healthy, and it may be regarded for the most part as a harmless commensal infection, but occasionally the virus invades the central nervous system and produces a paralytic disease.

Lymphocytic Choriomeningitis

Another condition of mice which has considerable bearing on our problem is lymphocytic choriomeningitis, which, of course, can occasionally spread to man. Traub (1939) at the Rockefeller Institute studied a stock of mice in which this virus was originally absent but gradually became established naturally over several years. At the end of the period of study all the mice, including the newborn, carried the virus in large numbers in their tissues and, except for an occasional illness in young animals, remained perfectly healthy. Infection was transmitted to the young *in utero* and persisted throughout life. Of special interest was the complete absence of antibody development in animals infected with the virus *in utero*, although antibodies appeared in the usual way after infection of older virus-free mice from another stock. It was suggested by Burnet

and Fenner (1949) that this was due to failure to recognize as antigenically foreign substances previously present in foetal life. The work of Billingham *et al.* (1953) with skin grafts in mice has led to the full confirmation of this important principle of "immune tolerance."

The adaptation of lymphocytic choriomeningitis virus to the mouse is the most complete that has been identified. The discovery depended, however, on the availability of other stock mice which were free of this virus and susceptible to infection. If such an agent was universally present in mice, and if no other host were susceptible, it might never be detected even if it occasionally produced obvious disease.

Latent infections are not confined to small rodents. The virus of swine influenza, whose complicated life history would surprise even the students of parasitic worms, was shown by Shope (1941) to lie dormant in a lungworm in the pig tissues, and it is only activated by a stimulus such as a superadded bacterial infection with *Haemophilus influenzae*. Monkeys are known to suffer from their own variety of herpes which persists in the same way as human herpes, while the recent large-scale use of monkey cells for growth of poliomyelitis virus has yielded a number of other viruses from the tissues of apparently healthy animals.

Rickettsial Infection

Rickettsiae, which resemble viruses in their intracellular habitat, characteristically persist in their natural or laboratory hosts long after the original infection. When rats or mice are inoculated with typhus rickettsiae the organisms can be re-isolated from the brain for periods up to at least a year despite the presence of antibody.

Rickettsia burneti, the causal agent of Q fever, also remains alive in the tissues of animals for long periods after the initial acute infection, and this has considerable bearing on the natural history of Q fever. Unlike other rickettsiae, this organism is maintained in large domestic animals such as cows and sheep. Its spread between these animals and to man depends not on ticks or other arthropods, but upon massive excretion at parturition in the placenta and birth fluids, and then in the milk. Animals are susceptible to infection at any time whether pregnant or not, but after a short generalized infection the organism becomes quiescent. Although it can be isolated from the spleen and kidneys, no transmission occurs. This latent state continues perhaps for years, until the animal becomes pregnant. Towards the end of pregnancy the infection is activated and the rickettsiae multiply in enormous numbers in the placenta until at parturition they are shed and are potentially able to infect other animals and occasionally man.

Psittacosis

This virus also persists as a latent infection in a great variety of wild and caged birds in a rather similar way: shedding of virus in the excreta occurs at certain periods of physiological stress, and particularly at nesting time, thus causing infection of the young birds. Some of these die, but the survivors develop latent infection and the cycle is continued. Many of the latent viruses in the lungs of laboratory animals, which have been mentioned above, also belong to the psittacosis group.

The Tumour Viruses

It is not the purpose of this paper to consider the part played by viruses in the aetiology of tumours. In certain neoplasms of mice, however, a virus-like agent clearly plays some part in a fashion which implies long-continued latent infection. In strains of mice with a high incidence of cancer of the breast the milk factor, or Bittner factor, is transmitted to the offspring by suckling and carries with it the predisposition to develop cancer of the breast in middle life. The agent is filterable and particulate, and present in the breast and other tissues as well as the milk from mice of the high-cancer strain before the age at which cancer normally develops. It has many of the characteristic properties of viruses, but like lymphocytic choriomeningitis

it remains quiescent in the cells of the mouse throughout most of its life, in the meanwhile infecting its offspring.

According to Gross (1952), mouse leukaemia is transmitted in a similar fashion. He found that leukaemia could be transmitted to a strain of mice which was free of the disease, by inoculating filtrates of tumours from high-leukaemic strains. As with the milk factor, transmission was possible only in the first few days of life. Thereafter the mice developed normally, but by the end of a year about half developed leukaemia. The leukaemic factor was subsequently found at all ages in other tissues of healthy mice from the high-leukaemic strain, and it is thought to be continuously transmitted from generation to generation, possibly *in utero*.

This work on animals suggests that there are a large number of viruses which lie dormant in the tissues, perhaps gaining entry when the animal is very young and persisting throughout its life. In some circumstances the balance between host and parasite is upset, cells are damaged, and clinical manifestations may result, perhaps long after the initial infection. It should, however, be noted that, purely on clinical grounds, there would be little to suggest that such an illness was due to an infectious agent.

Latent Infections of Man

When a patient recovers from a virus disease such as measles or smallpox the virus disappears from the tissues. It has admittedly been suggested that the subsequent life-long immunity implies continued survival of the virus, but there is as yet no clinical, epidemiological, or experimental evidence to support this hypothesis. In other conditions such as poliomyelitis the cells of the alimentary tract support the virus for several weeks, but prolonged carriage has not been reported.

Herpes Simplex

The only common disease of man which is generally acknowledged to be due to life-long persistence of a virus is, of course, herpes simplex. The vesicular eruption or cold sore which appears on the lips or nostrils during acute fevers is one of the most familiar of the minor nuisances of medicine. Many individuals are subject to recurrent attacks throughout their life, and these develop in response to non-specific stimuli such as sunburn, fever, or trauma, and not through exposure to another source of herpes virus. There is no doubt that the virus is present during each of these recurrent attacks, because it can invariably be isolated in the early stages by inoculation of vesicle fluid into some susceptible tissue such as that of the rabbit cornea or chick embryo. Individuals who are prone to repeated herpes have specific antibody in their blood between attacks, which neutralizes the virus in laboratory tests, and probably prevents wide extension of the lesions; but the antibodies do not seem able to prevent either the life-long persistence of the virus or the onset of the attack. Paradoxically, the individuals who do not have herpes are the ones without herpes antibody.

This is only one aspect of this disease, however. With increased facilities for virus isolation it has become clear that in infants and children, and occasionally young adults, several entirely different illnesses are caused by the same herpes virus. The most common is herpetic stomatitis, a mild vesicular eruption of the oral mucous membrane with fever and constitutional disturbance. More severe, but rarer, examples are eczema herpeticum, a type of Kaposi's varicelliform eruption, and meningoencephalitis due to herpes virus. These conditions as such do not recur, and they follow the more usual pattern of an acute infectious disease. They affect individuals who have no antibodies initially but who develop them during the attack, and it is often possible to show that infection was exogenous through contact with another patient suffering from herpes.

Burnet and Williams (1939) suggested that these infections in childhood constituted the primary attacks due to first exposure to herpes virus, but that the virus established

itself permanently in the cells in some latent form, causing the usual recurrent manifestation in later life. It was supposed that the virus remained within the cells, dividing with them, normally causing no damage, and unexposed to antibody. This comfortable symbiosis was presumably upset by a number of non-specific stimuli which led to cell breakdown with the release of a large number of virus particles.

This idea of the natural history of herpes, which was later more fully developed by Burnet (1946), is now widely accepted, but a good many unsolved problems remain. Where, for example, does the latent virus reside? The recurrent attack is most often in a place contaminated by saliva, and herpes virus is known to be present in the saliva of carriers, both between and during attacks. Furthermore, Stalder and Zurukzoglu (1936) have shown that areas of facial skin subject to recurrent herpes no longer develop the disease if transplanted to another part of the body. This suggests that the virus persists in some other cells, perhaps those of the buccal mucous membrane at the site of the primary attack, passing in the saliva or nasal secretion to the site of the recurrent attack. If this were the sole explanation, however, it would imply some rather curious dribbling habits. The recurrent attack usually occurs in roughly the same place every time, and this is not the only place likely to be contaminated with saliva. It is therefore necessary to postulate that one particular area of skin is sensitive to reinfection. This brings us back to the other idea that the virus lies dormant at the site of the recurrent attack and is activated by saliva. Others favour the central nervous system, dorsal root ganglia, or cutaneous nerve endings as the permanent home of the virus, but there is little supporting evidence.

Herpes virus from humans does not cause a similar recurrent infection which can be studied in animals, although Good and Campbell (1948) showed that rabbits given an anaphylactic shock long after recovery from an acute herpetic infection may die of herpes encephalitis. Perhaps investigation of natural monkey herpes might give a further lead in the study of human herpes.

Brill-Zinsser Disease

There are other, less familiar but well established forms of long-continued infection, and a notable example is Brill-Zinsser disease. This is a sporadic form of typhus which occurs principally in the Eastern United States, but it has also been recently reported in Britain (Hawksley and Stokes, 1950; Steel and Lawy, 1956). For many years it was assumed that it was contracted locally, but it was difficult to explain why it was chiefly confined to Jewish immigrants to the U.S.A. from South-Eastern Europe. It was then shown that the rickettsia from patients with Brill's disease was not of the endemic variety present in the United States but was of the classical epidemic type from Eastern Europe, and Zinsser (1934), after a prolonged study, was forced to the conclusion that the disease was a recrudescence of epidemic typhus contracted in the typhus foci of South-Eastern Europe. Some of the patients had not visited Europe for many years, and the rickettsia can presumably persist in the tissues throughout this period even in the presence of antibody. Price (1955) has recently confirmed this by isolating the organism from the lymph nodes of healthy individuals who have previously had typhus. These observations are of wide importance because they also explain how the epidemic typhus rickettsia can survive in the intervals between typhus epidemics in Eastern Europe and Asia.

Other pathogenic rickettsiae can sometimes persist in man. Smadel *et al.* (1952) isolated *R. tsutsugamushi* from the lymph nodes of a patient one year after scrub typhus which had been treated with chloramphenicol. Q fever can be a long-continued relapsing illness, and Huebner has found *R. burneti* in the blood and urine one year after an attack (see Marmion *et al.*, 1953). Psittacosis virus has been isolated from the same patient over a period of eight years by Meyer and Eddie (1951).

Herpes virus, pathogenic rickettsiae, and the psittacosis virus grow well in a variety of laboratory animals and eggs, and so are relatively easy to isolate and identify. We come now, however, to other viruses which are apparently host-specific and able to grow only in man. These are, of course, much more difficult to study, and depend upon the use of volunteers or, alternatively, cultures of human cells *in vitro*.

Serum Hepatitis

One virus which has been discovered unintentionally by using man himself as an experimental animal is, of course, the virus of serum hepatitis. It is now known that a proportion of apparently healthy adults carry in their blood a virus capable of causing hepatitis in non-carriers. Transmission occurs by parenteral inoculation alone during blood transfusion or from inoculation of blood products such as serum or plasma. The large outbreaks which occurred during the last war were due to human serum used as a preservative in yellow-fever vaccine. The amount of virus in the blood of carriers must be quite appreciable, because transmission may occur with minute amounts of blood such as that contaminating the needle of an imperfectly sterilized syringe, and large pools of serum and plasma can be infected from one contributor to the pool. Potentially the virus might be transmitted by blood-sucking insects simply by contamination of the proboscis, although there is no evidence that this in fact occurs. Little is known about serum hepatitis virus because it has been studied only by inoculation of human volunteers, and the substantial mortality rate does not exactly encourage this means of investigation. Attempts to use human cells in culture from liver or elsewhere have not been successful. In recent months Richtsel *et al.* (1956) have described a strain of human cells apparently susceptible to a similar virus, that causing infectious hepatitis, but it is not yet known if serum hepatitis will also infect these cells.

It is difficult to see how the virus gains access naturally, and it has even been claimed that this is an example of spontaneous generation from the cells of the carrier. The account of hepatitis in newborn infants by Dible *et al.* (1954), however, suggests the possibility that transfer may normally occur from mother to child *in utero* with consequent development of immune tolerance—that is, loss of ability to develop antibodies to the virus. This might then lead to a permanent latent infection, persisting for life, in the same way as lymphocytic choriomeningitis in mice, and, like the latter, detectable only by inoculation of susceptible non-carriers.

Serum hepatitis may not be the only latent virus which manifests itself in this way by parenteral inoculation. Beutler and Dern (1955), when working on the survival time of transfused red cells, discovered that the blood of one healthy donor produced an acute feverish illness in nearly all recipients about 12 days after inoculation. The agent causing this illness was filterable and could be transmitted from these recipients to others during the acute stage and up to at least nine weeks later, causing similar symptoms. The fever, lasting about a week, was accompanied by headache and muscle pain, sometimes with nausea and vomiting or respiratory symptoms, and 6 patients out of 38 developed arthritis one to five weeks after the end of the acute illness. The agent producing this disease was present in the blood of the donor in repeated tests over a 13-month period, during which he remained perfectly well. The authors point out that this rather mild illness could easily be missed after the usual transfusion of a single recipient from a donor who was a carrier.

The Adenoviruses

The development of tissue-culture methods for the study of viruses, stimulated by Weller *et al.* (1949) in their work on poliomyelitis, showed the great potential advantages in the use of human and monkey cells growing *in vitro*. This has not unnaturally led to the uncovering of new viruses previously undetected through lack of pathogenicity for laboratory animals and eggs. These viruses are in roughly

two groups: (1) a heterogeneous collection from faecal specimens mostly isolated during attempted isolation of poliomyelitis virus; and (2) a single family of related viruses largely from the upper respiratory tract and eye, now known as the adenoviruses or A.P.C. viruses (adenoido-pharyngo-conjunctival viruses). Rowe *et al.* (1953) isolated the first of these agents when growing cultures of tonsils and adenoids removed at operation. They found that epithelial cells from these tissues grew well for about two weeks, but degeneration then appeared in some of the cultures. A virus could be isolated from the degenerating cells, which would then cause similar changes in the remaining adenoid cultures which had remained normal, as well as in certain other cultures of human epithelium, such as the HeLa strain of carcinoma cells. The virus could not so easily be obtained from swabs or even ground suspensions of adenoids, although it regularly became unmasked after growth of the cells in culture. This could perhaps be due to the elimination of antibody or other inhibitory substances originally present in the extracellular fluid.

Since then at least 14 closely related viruses have been isolated, some from adenoids removed at operation and some from patients with acute respiratory disease, while two members of the same group have been found in monkey and chimpanzee tissues respectively (Rowe and Huebner, 1956).

Some members of this group of viruses—notably Types 3 and 4, 7 and 8—cause acute diseases such as pneumonia, pharyngitis accompanied by conjunctivitis, and other upper respiratory syndromes in patients of all ages. It is not known if these viruses persist after the initial infection. Certain other adenoviruses, however—Types 1, 2, and 5—are found only in association with febrile respiratory illnesses in young children, but they are present in the majority of adenoids removed at operation from both children and adults, and antibodies against one or other type are also present in the blood of nearly all adults. This suggests that widespread infection with these types occurs at an early age and is associated with the typical hyperplasia of tonsils and adenoids seen in young children. Despite the development of antibodies after first infection, the virus apparently persists, perhaps indefinitely, in the lymphoid tissue.

This resembles latent herpes except that adenovirus may be more widespread. The latent herpes virus, however, at intervals damages the cells and gives rise to disease. The similarly latent adenovirus would have practical importance only if there was also some clinical manifestation of its presence after the initial infection. There may be a number of unexplained illnesses due to recrudescence of latent viruses in lymphoid tissue. It is tempting, for example, to suspect some of the recurrent spontaneous afflictions of the throat and nose, especially in children, and lymphoid hyperplasia caused by a virus of this sort might even initiate attacks of acute appendicitis.

Proof of a causal connexion is not likely to be an easy matter, however. If such illnesses were accompanied by release of virus from damaged cells the virus would probably not be detectable in practice through immediate neutralization by antibody already present. In recurrent herpes the virus conveniently presents itself in an easily recognized superficial vesicle from which it can be isolated before antibody filters in as well. Apart from the difficulty of sampling the lymphoid tissue sufficiently early in an illness, neutralization of adenovirus is likely to be much more rapid in what is the probable site of antibody production.

Demonstration of a rise in serum antibody after the illness might be suggestive, but there is little alteration after recurrent herpes. Perhaps it would be possible to show an increase in viral antigen (even if infectivity was neutralized) by injecting exudates, or tissue suspensions where available, into rabbits, and comparing the antibody rise with that resulting from injections of control material; but the variability of antibody response in different rabbits might be prohibitive. Nevertheless, a fresh approach of some sort will be needed to study this type of aetiological relationship.

Mechanism of Latent Infection

Having considered some examples of latent viral and rickettsial infection in man and animals, it would now be appropriate to discuss the mechanism by which these parasites can survive so successfully in their hosts. This review is confined to the viruses and rickettsiae, but bacteria and even larger parasites can persist for long periods as well. Most of these organisms live on an internal surface of the host, however, and they avoid the immunological problems involved by prolonged sojourn inside the tissue. Furthermore, most of the larger organisms, even inside the tissues, retain their morphological identity, whereas some viruses probably develop a much more intimate relationship with the cells of the host.

Once a virus or rickettsia has gained access to the susceptible cells initially, one may suppose the following requirements if it is to establish a persistent latent infection: (1) the virus must produce no damage to the cells, or at least the rate of damage must be less than the rate of production of new cells; (2) it must have some mechanism for getting from cell to cell, particularly if the cell concerned has a short life; and (3) it must not be affected by the immunity mechanism of the host.

It is admittedly possible to imagine an equilibrium with a low-grade immunity, in which a small proportion of virus released is always left unneutralized and is thus able to infect a small number of new cells and so on. One could hardly expect such a system to remain stable for long, however, without some sort of over-all control mechanism. Our consideration of some examples of latent infections indeed suggests that there may be more than one way in which viruses persist. After all, there are certain infections, such as lymphocytic choriomeningitis in mice and possibly serum hepatitis in man, in which antibody never develops and virus can pass unhampered throughout the body. On the other hand, herpes virus is presumably maintained in cells which are surrounded by antibody.

It would be convenient, at the risk of oversimplification, to consider three main groups of persistent viruses, which probably have different mechanisms for survival.

1. *No Development of Antibody.*—In lymphocytic choriomeningitis of mice, mouse mammary cancer, mouse leukaemia, and possibly serum hepatitis of man, infection occurs *in utero* or within the first few days of life. Antibodies probably never develop against these viruses even though they persist for life. This is presumably due to the phenomenon of immune tolerance. Lymphocytic choriomeningitis virus, and probably the agent of mouse leukaemia, are widely scattered in various tissues and present in high concentration, while it is also probable that serum hepatitis virus is plentiful at least in the blood of human carriers. The only limitation to the growth of these viruses is the supply of susceptible cells. Since a large number of cells are infected, one would assume that these are not damaged during virus multiplication. This immediately leads to difficulty in explaining why serum hepatitis virus causes necrosis of liver cells when transmitted to non-carriers. Perhaps the liver damage in non-carriers is connected with a normal immune reaction to the virus. This might help to explain the very long incubation period, allowing for growth of the virus and development of immunity before onset of clinical manifestations.

Theiler's virus may fall into this first group, but, since infection of young mice is sometimes delayed for two or three weeks, the immune tolerance is not complete and latent infection generally persists for only about six months, after which antibody appears and the virus is eliminated.

2. *Antibody Present but Ineffective.*—In persistent infection of man and animals, or of birds, with rickettsiae or viruses of the psittacosis group, antibody to the organism is normally present, and can be detected by various *in vitro* methods such as agglutination or complement fixation. These antibodies will neutralize the toxic effects of the organisms

and prevent fever or other clinical signs of infection in animals, but it is difficult to show any effect on the actual growth of the organisms. For example, *R. burneti* grows just as effectively in eggs in the presence of high-titre immune serum as with normal serum. Growth of smaller viruses is probably neutralized because antibody prevents their entry into the cells. Perhaps the large viruses and rickettsiae have a different method of entry and one which is not blocked by antibody. Some grow in phagocytic cells, and here the opsonic action of antibody might actually help. Anyway, it seems likely that the long persistence of these organisms in the tissues of naturally infected individuals is connected with a similar failure of antibody to prevent multiplication and dissemination.

Several of us at Cambridge have investigated this phenomenon with *R. burneti*, the causal agent of Q fever. Dr. Fiset and I have found that organisms freshly isolated from animals, either in the acute stage or after long persistence, fail to react in certain *in vitro* tests even with their homologous antibody (Stoker and Fiset, 1956). This was subsequently found to be due to a polysaccharide of low antigenicity on the surface of the naturally occurring rickettsiae which prevents the main protein antigen of the organism from combining with its antibody (Fiset, unpublished). It was suggested that the surface layer allowed *R. burneti* to survive in the host in the presence of this antibody. An *in vivo* neutralization test developed by our colleagues Abinanti and Marmion (1956) added some confirmation, but there is not yet sufficient evidence to conclude that this phenomenon is entirely responsible for long persistence under natural conditions.

Morgan's (1956) studies with psittacosis suggest that, with this virus at least, other factors may also be involved. Thus the psittacosis virus remains latent in chick cells cultured on deficient medium, but multiplies normally when the cells are given certain amino-acids. Studies of this sort with other latent viruses and rickettsiae are now needed.

3. *Antibody Present and Effective, but No Contact with Virus.*—In the third group of latent infections, which includes herpes and the adenoviruses, antibody is also present in the circulating blood of the host. Unlike the rickettsiae and psittacosis group, however, growth of the virus can easily be neutralized by antibody. When herpes virus or adenoviruses are mixed with antibody in laboratory tests and brought into contact with susceptible cells they are prevented from entering the cells and multiplying. This seems to imply that under natural conditions the latent virus, once established, can pass from cell to cell without exposure to antibody. How could this take place?

If there is no damage to the cells during virus growth there would, presumably, be no inflammatory reaction with exudate of plasma protein, including antibody globulin, in the extracellular fluid. Thus a virus such as herpes could pass from cell to cell quite freely, provided it remained outside the blood stream, particularly where the cells are closely packed as in the basal layer of epithelium. In lymphoid tissue, where the adenoviruses persist, however, antibody may be in much closer contact with the infected cells.

An alternative is passage from cell to cell along cytoplasmic connexions. Black and Melnick (1955) observed that when sheets of monkey cells in culture are infected with B virus, the monkey herpes, spread was at first confined to cells adjacent to the initial focus of infection and was not affected by antibody in the medium. With human herpes virus growing in human carcinoma cells (HeLa strain) a similar focal spread is observed. Under ordinary experimental conditions the cells release virus into the surrounding medium, secondary foci appear, and the lesions soon become confluent, with the development of giant cells (Special Plate, Figs. 1 and 2). If antiserum is added to the medium a few hours after first infection the change does not become confluent. The primary foci continue to enlarge, however (Plate, Fig. 3), suggesting that the virus is passing to contiguous cells without coming into contact with antibody.

One of the most striking changes is the development of a web of cytoplasmic connexions between cells, but these are most easily seen in unneutralized cultures in the neighbourhood of giant cells (Plate, Fig. 2), and are not visible between the tightly packed cells of the foci which develop in the presence of antiserum. My colleague Dr. Ross, who has stained herpes-infected cells with fluorescent antibody by the technique devised by Coons and Kaplan (1950), has found some fluorescence in these cytoplasmic extrusions, but it is not certain if this is due to the presence of the infective virus particles themselves.

An alternative would be the transfer of the virus to the descendants of the originally infected cells at mitosis. This is unlikely in the cultures of carcinoma cells, because we have found that they stop multiplying immediately they are infected, but we must seriously consider this possibility under natural conditions, where absence of histological change in the quiescent phase implies a lack of damage to be expected if cell division were proceeding normally. It is perhaps noteworthy that herpes and adenovirus are the only two animal viruses for which there is unequivocal evidence of multiplication in the nucleus. If such viruses could divide at the same rate as the host cell, the progeny might pass with the chromosomes to the nuclei of the daughter cells and might almost be considered cell constituents. It is in the latent virus infections of bacteria, however, that this type of relationship has been most fully investigated, largely following the work of Lwoff and Gutmann (1950).

Lysogenic Strains of Bacteria

When two closely related strains of bacteria—for example, two strains of staphylococci—are grown together, one strain may grow normally but cause lysis of the bacteria in the other strain. The apparently normal strain is called lysogenic, and the property is due to the presence of latent virus in each bacterium. The virus does no damage to the bacterial host, and divides with it so that the strain is permanently infected but its physiological functions are unimpaired. A small proportion of the cells release virus, which has no effect on the remainder of the infected bacteria, but which will cause lysis of other susceptible strains of bacteria not already carrying the latent infection. These uninfected strains which undergo lysis can therefore act as indicators of virus from the apparently normal carrier strain. Provided one can find a suitable indicator, it is now possible to show latent virus infection in a large number of strains of various bacterial species.

This symbiotic relationship between the virus and bacterial cell can be upset by certain physical stimuli and chemical agents. If a lysogenic strain is irradiated with ultraviolet light, for example, all the bacteria undergo lysis and release large amounts of virus. One is immediately reminded of the transformation of latent into active herpes by sunlight and other apparently non-specific stimuli.

State of the Latent Virus

It is well to remember that the mature virus particle, as shown in electronmicrographs of purified virus suspensions, is probably only one stage in the life cycle, allowing transport to and penetration of the virus into new cells. The work of Hershey and Chase (1952) on bacteriophage has led to the conclusion that the characteristic tadpole-shaped particle does not enter the bacterial cell, but acts as a sort of syringe to introduce nucleic acid, which is apparently the organizer of new virus and which carries its genetic characters. Work on human and animal viruses, and especially influenza virus, also suggests that the virus particle, after penetration of the cell, is broken down into its constitutive genetic elements, or, at least, completely altered into a vegetative state during multiplication.

If in some latent infections the virus lies permanently within the cell and its descendants, it may consist solely of the genetic material of the virus dividing in time with the hereditary constituents of the parent cell. It is in this form, called prophage, that the virus persists in lysogenic bacteria.

This adds to the problem, because if latent animal viruses exist in this state they would not be detected by ordinary isolation procedures, because virus material would not be in a form which could infect new cells. Some inducing agent would be needed which would upset the equilibrium and allow the virus to mature to a fully infectious form, as in the induction of lysogenic bacteria by ultra-violet light. There is no clear evidence at present, however, that latent virus infection of human or animal cells resembles that of bacterial cells. Further progress awaits a suitable model of latent infection in tissue culture which could be studied by the quantitative techniques which have been so fruitful with lysogenic bacteria.

A more or less undetectable latent virus which persists indefinitely without damaging the cell in the ordinary sense may anyway seem rather an academic nicety. Absence of recognizable histological change, however, does not mean that the continued presence of viral material in a cell will not alter some of its functions. For example, the tumour viruses change the potentiality of the cells they infect without necessarily causing necrosis. Latent virus infection of a bacterium may confer entirely new characters, such as the development of flagella or toxin production, on the otherwise normal host. We have yet to see whether viruses may cause long-standing alterations of cell function in man.

Conclusion

We have now indulged in a good deal of speculation and have come some way from practical medical problems, but, judging by the numbers of latent viruses found in animals, our own tissues may harbour more unobtrusive guests than we imagine. For the survival of a virus or any other parasite it is, of course, the most satisfactory arrangement. No damage to the house—no trouble with the landlord.

When symbiosis is complete, especially if early infection leads to immune tolerance, we may expect few medical problems. These will arise only when artificial procedures, like blood transfusion, carry the virus to someone who has escaped early infection. Nevertheless, this risk will call for great care if virus vaccines are ever made from human cell cultures, which are more likely than blood to carry these hidden agents.

With other infections, like herpes and Brill's disease, the balance may occasionally be upset with a sudden acceleration of virus production and cell damage, causing illness in the carrier. Some sporadic afflictions of tonsils and adenoids, or even other lymphoid tissue, may eventually prove to be due to recrudescences of infection with adenoviruses. Such conditions lack many of the usual attributes of an infectious disease, and their recognition as latent virus infections will involve subtle problems for the virologist as well as the clinician. It is to be hoped that investigation of the more fundamental problems of the mechanism of latency, as outlined, may ultimately be of practical value in the elucidation of these diseases.

REFERENCES

- Abinanti, F. R., and Marmion, B. P. (1956). Awaiting publication.
Beutler, E., and Dorn, R. J. (1955). *J. Amer. med. Ass.*, 159, 989.
Billingham R. E., Brent, L., and Medawar, P. B. (1953). *Nature (Lond.)*, 172, 603.
Black, F. L., and Melnick J. L. (1955). *J. Immunol.*, 74, 236.
Burnet, F. M. (1945). *Virus as Organism*. Harvard University Press, Cambridge, Mass.
— and Fenner, F. (1949). *Production of Antibodies*, 2nd ed. Melbourne.
— and Williams, S. W. (1939). *Med. J. Aust.*, 1, 637.
Coons, A. H., and Kaplan, M. H. (1950). *J. exp. Med.*, 91, 1.
Dible, J. H., Hunt, W. E., Fugh, V. W., Steingold, L., and Wood, J. H. F. (1954). *J. Path. Bact.*, 67, 195.
Eaton, M. D. (1950). In Doerr, R., and Hallauer, C., *Handbuch der Virusforschung*, Suppl. II, p. 87. Vienna.
Fiset, P. Unpublished data.
Good, R. A., and Campbell, B. (1948). *Proc. Soc. exp. Biol. (N.Y.)*, 68, 82.
Gross, L. (1952). *Ann. N.Y. Acad. Sci.*, 54, 1184.
Hawksley, J. C., and Stokes, E. J. (1950). *Lancet*, 2, 97.

- Hershey, A. D., and Chase, M. (1952). *J. gen. Physiol.*, 36, 39.
Lwoff, A., and Gutmann, A. (1950). *Ann. Inst. Pasteur*, 78, 711.
Marmion, B. P., Stoker, M. G. P., McCoy, J. H., Malloch, R. A., and Moore, B. (1953). *Lancet*, 1, 503.
Melnick, J. L. (1955). *Ann. N.Y. Acad. Sci.*, 61, 754.
Meyer, K. F., and Eddie, B. (1951). *J. Infect. Dis.*, 88, 109.
Morgan, H. R. (1956). *J. exp. Med.*, 103, 37.
Price, W. H. (1955). *J. Bact.*, 69, 106.
Rightsel, W. A., Keltch, R. A., Tekusham, F. M., and McLean, I. W., jun. (1956). *Science*, 124, 226.
Rowe, W. P., and Huebner, R. J. (1956). *Amer. J. trop. Med. Hyg.*, 5, 453.
— Gilmore, L. K., Parrott, R. H., and Ward, T. G. (1953). *Proc. Soc. exp. Biol. (N.Y.)*, 84, 570.
Shope, R. E. (1941). *J. exp. Med.*, 74, 49.
Smadel, J. E., Ley, H. L., jun., Diercks, F. H., and Cameron, J. A. P. (1952). *Amer. J. Hyg.*, 56, 294.
Stalder, W., and Zurukzoglu, St. (1936). *Zbl. Bakt., I. Abt. Orig.*, 136, 94.
Steel, M., and Lawy, H. S. (1956). *Lancet*, 2, 174.
Stoker, M. G. P., and Fiset, P. (1956). *Canad. J. Microbiol.*, 2, 310.
Theiler, M. (1937). *J. exp. Med.*, 65, 705.
Traub, E. (1939). *Ibid.*, 69, 801.
Weller, T. H., Robbins, F. C., and Enders, J. F. (1949). *Proc. Soc. exp. Biol. (N.Y.)*, 72, 153.
Zinsser, H. (1934). *Amer. J. Hyg.*, 20, 513.

ADULT HYPERTROPHY OF THE PYLORUS

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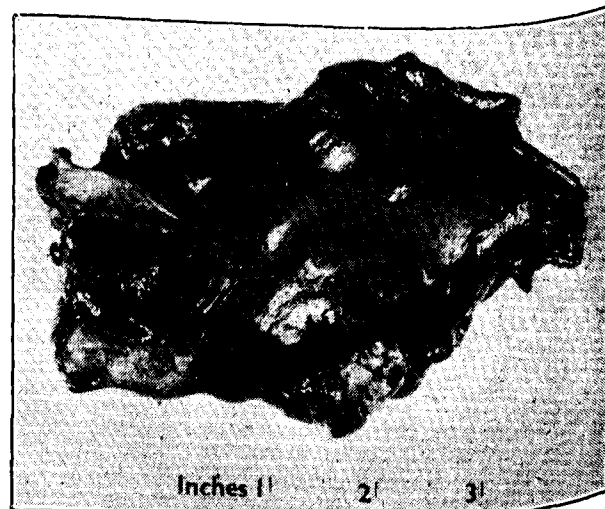
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[WITH SPECIAL PLATE]

Pyloric hypertrophy in adults has in the past ten years been found 25 times during laparotomy at St. James's Hospital. Fewer than 200 cases have been recorded in the literature since the condition was first described by Cruveilhier over 100 years ago, and many of these were discovered only at necropsy. Horwitz *et al.* (1929) found that the normal thickness of the pyloric muscle varied from 3.8 mm. to 8.5 mm.; in all our cases it has been 1 cm. or more (see photograph). Furthermore, in all cases the hypertrophy was mainly confined to the circular muscle.

Only once has a confident pre-operative diagnosis of the condition been made, but increasing experience has enabled us to form a strong suspicion of its existence from the radiographs after a barium meal in a few



Resected stomach from Case 6, showing incised thickened pylorus (1.3 cm.).

other cases. The majority of patients have had co-existent duodenal or gastric ulcers, and it is the symptoms of these which have brought them under our care.

Treatment has therefore been directed to cure of the ulcer. The accompanying table summarizes the findings in these cases.

History

In no case were we able to obtain a clear-cut history of vomiting in infancy suggestive of congenital pyloric stenosis. One or two patients stated that in childhood they had suffered from bilious attacks with vomiting, and one gave a history of migraine with vomiting dating back to childhood. It may be significant that in this case the migraine has been

Table Showing Details of 25 Cases of Adult Hypertrophy of the Pylorus Admitted for Treatment of Peptic Ulcer

Case No.	Age at Onset (Years)	Age at Operation (Years)	History of Congenital Pyloric Stenosis	Ulcer Dyspepsia	Vomiting	X-ray Findings		Gastroscopic Findings	Procedure	Operative Findings	Remarks
						Original	Retrospect				
1	50	58	Nil	+	+	Prepyloric ulcer	—	—	Pyloroplasty	Pyloric hypertrophy	
2	46	48	"	+	—	Duodenal ulcer with retention	Same as original	Inconclusive	Billroth-I gastrectomy	Pyloric hypertrophy; mucosal stenosis; gastric ulcer	No external evidence of ulceration at operation
3	19	28	"	+	+	Duodenal ulcer	Poorly filled, irregular cap	—	Polya-type gastrectomy	Pyloric hypertrophy; duodenal ulcer	
4	46	50	"	+	+	" "	Narrowing of canal; bulbar impression	—	Billroth-I gastrectomy	Pyloric hypertrophy; gastric and duodenal ulcers	No external evidence of ulceration at operation
5	24	49	"	+ with haemorrhage	—	Normal	Slight bulbar impression	Normal	" "	Pyloric hypertrophy; duodenal ulcer	
6	38	53	"	+	—	—	—	Gastric ulcer	" "	Non-rotation of gut; pyloric hypertrophy; 2 gastric ulcers	
7	30?	53	"	+	—	Gastric ulcer with retention	—	—	Polya-type gastrectomy	Pyloric hypertrophy; gastric ulcer	
8	39	43	"	+	—	Hyperperistalsis	—	Gastric ulcer	" "	" "	
9	39	48	"	+	++	Duodenal ulcer	—	—	" "	Pyloric hypertrophy; high gastric ulcer	
10	55	60	"	+	Self-induced	Gastric ulcer; duodenitis	—	Gastric ulcer	Billroth-I gastrectomy	" "	
11	32	42	"	+	++	Duodenal ulcer; prestenotic diverticula	—	—	Polya-type gastrectomy	Pyloric hypertrophy; duodenal ulcer	Specimen R.C.S. No external evidence of ulceration at operation
12	27	42	"	+	+	—	—	Gastric ulcer	Billroth-I gastrectomy	Pyloric hypertrophy; gastric ulcer; mucosa prolapse	
13	28	28	"	Vague	—	Pyloric ulcer with retention	—	—	Pyloroplasty	Pyloric hypertrophy	
14	?	59	"	+ with haemorrhage	+	Elongated canal; duodenal ulcer with retention; ?pyloric hypertrophy	Elongation and narrowing of canal; proximal and distal impressions; pyloric hypertrophy	Blood-clot on narrowed antrum	Billroth-I gastrectomy	Pyloric hypertrophy; gastric ulcer	No external evidence of ulceration at operation. Hypertrophy diagnosed pre-operatively
15	42	47	"	+	—	Duodenal ulcer with retention	—	—	Polya-type gastrectomy	Pyloric hypertrophy; mucosal prolapse	
16	40	40	"	—	+	Normal	Bulbar impression; elongation and narrowing of canal	—	Ramstedt operation	Pyloric hypertrophy	Laparotomy performed for recurrent intestinal obstruction due to bands
17	20	70	"	+	—	Duodenal ulcer with retention	Elongated pylorus; deformity of cap; retention	—	Gastro-enterostomy	" "	
18	66	68	"	+	+	Elongation and narrowing of canal surrounding tumour; proximal and distal impressions; pyloric hypertrophy	Same as original	—	Billroth-I gastrectomy	Pyloric hypertrophy; pyloric ulcer	Hypertrophy diagnosed pre-operatively. Radiologist reported palpable tumour during screening
19	34	54	"	+	+	Duodenal ulcer with retention	—	—	Polya-type gastrectomy	Pyloric hypertrophy; gastric ulcer	
20	37	47	"	+	+	Duodenal ulcer with retention	—	—	Pyloroplasty	Pyloric hypertrophy; mucosal stenosis	Relief of symptoms
21	20	50	"	Not typical	+	Small deformed bulb	Peaking of pylorus; very small cap	—	" "	" "	
22	68	70	"	Atypical	—	Duodenal ulcer	Same as original	Small scar; gastric ulcer	Billroth-I gastrectomy	Pyloric hypertrophy; duodenal ulcer	
23	20	43	"	—	—	Duodenal ulcer; 24-hour retention	" "	—	" "	Pyloric hypertrophy; gastric ulcer; mucosal stenosis	
24	19	40	"	—	—	Deformity of cap	" "	Gastric scar	Polya-type gastrectomy	Pyloric hypertrophy; gastric ulcer	
25	28	35	"	—	—	Duodenal ulcer with retention	" "	—	" "	Pyloric hypertrophy; duodenal and gastric ulcers	
			"	—	—	Duodenal ulcer with retention	" "	—	Pyloroplasty; cholecystectomy	Pyloric hypertrophy; gallstones	Patient a pure negro

cured, at least temporarily, by partial gastrectomy. In 15 of the 25 cases vomiting was a prominent symptom, and it was profuse in four, two of which had a duodenal ulcer and two a gastric ulcer. In 18 cases concomitant peptic ulcers were confirmed at operation, and all but one of these presented with ulcer-type dyspepsia. It is interesting that five of the remaining seven cases also gave typical ulcer histories. In another case the condition was an incidental finding at an emergency operation for obstruction due to bands; and the last case had a history of vague discomfort, waterbrash, and a sensation of choking. In short, ulcer-type dyspepsia was the main feature whether or not the presence of an ulcer was confirmed, and vomiting was frequently a symptom.

If there is an aetiological connexion between peptic ulceration and adult hypertrophy of the pylorus, it might be expected that the site of the ulcer would be fairly constant, but this does not appear to be so, since in 11 cases it was gastric, in four duodenal, in two both gastric and duodenal, and in the other pyloric.

We have been unable to discover any symptom or group of symptoms which would help in establishing a confident diagnosis. A history of profuse vomiting for many years associated with an atypical history of ulcer dyspepsia, without gross gastric retention, might lead one to suspect the condition.

Physical Signs

Here again no diagnostic facts have been elicited. Epigastric tenderness has been a constant sign in cases with or without ulcer. A tumour has never been felt on clinical examination, but in Case 18 the radiologist felt a pyloric tumour during screening. In seven cases a succussion splash was noted, and in these a large gastric residue was apparent on x-ray examination. Four of them had a gastric ulcer, and in three the hypertrophy was the only finding. Curiously, none of the cases associated with a duodenal ulcer had a splash or showed gross gastric retention on x-ray examination.

Radiological Findings

The x-ray findings are reported in two ways: as original reports and as reports in retrospect. Two cases were not examined radiologically, the diagnosis of gastric ulcer being made in each case by gastroscopy. In nine cases a retrospective examination of the radiographs has not been possible.

Although duodenal ulcer was found at operation in only six cases, a pyloric or duodenal ulcer was reported in 17. The reports on the remainder are in summary as follows: no lesion seen, 2; hyperperistalsis, 1; gastric ulcer with retention, 1; gastric ulcer with duodenitis, 1; probable adult hypertrophy of pylorus, 1. Thus the diagnosis was suggested with confidence in one case only, though in another two it was mentioned as a possibility.

Retrospective examination of the barium-meal radiographs has been interesting. In the two cases in which it was reported that the condition might be present it is now obvious that the report could have been given with confidence (see Special Plate, Figs. 1 and 2). In seven cases no reason could be found to modify the original report. Two of these had a duodenal or pyloric ulcer, three others a gastric ulcer with gross mucosal stenosis and in which no cap could be demonstrated, and one both gastric and duodenal ulcers. In five other cases revised reports were as follows:

Case 4.—There is narrowing of the pyloric canal with a slight duodenal bulbar impression; the canal is not elongated. Operative findings: gastric ulcer and duodenal ulcer with hypertrophy.

Case 5.—The canal is normal but there is a slight duodenal bulbar impression. Operative findings: duodenal ulcer and hypertrophy.

Case 16.—There is elongation and narrowing of the pyloric canal with a duodenal bulbar impression. Operative findings: pyloric hypertrophy only.

Case 17.—There is elongation but no narrowing of the pylorus with a deformity of the duodenal cap. Operative finding: pyloric hypertrophy only.

Case 20.—There is slight peaking of the pylorus with a very small cap.

Gastroscopy

This was performed in eight cases. Results in two were inconclusive and in one normal; five had gastric ulceration or scarring. In only one was narrowing of the pylorus noted, but blood-clot in the antrum prevented close examination of the mucosa.

Operative Findings

In all cases at laparotomy the diagnosis was reasonably obvious. In an early case, to exclude the possibility of carcinoma, a small incision was made in the pylorus. This manoeuvre removes all doubt. The white, regular, glistening muscle cannot be confused with the grey, irregular infiltrative type of carcinoma. The serosa is normal, and the submucosa loose and lax and easily defined. At the same time a small piece can be taken for microscopical examination (Tanner, 1950).

In 11 cases there was no evidence of a concomitant lesion of the stomach or duodenum on thorough inspection and palpation. In five of these a gastrectomy was performed, and the excised specimen revealed scarring or shallow ulceration in either stomach or duodenum in all but one case. In four cases a Heineke-Mikulicz pyloroplasty was performed, in one a Ramstedt operation, and in one a gastro-jejunostomy. The last patient was a man aged over 70; his general condition was not good and the operation was carried out under local analgesia. In the 14 cases where a peptic ulcer was found a suitable gastrectomy was performed to cure this.

The state of the pyloric mucosa excited interest in five cases, three of which had such a degree of mucosal stenosis that only a moderate-sized probe could be passed; two of the three also had a gastric ulcer, but in the third no ulcer was found. The other two cases presented small protrusions through the pylorus into the duodenum, about 2.3 mm. in diameter. In both instances these were thought to be polypi, but section showed normal musculo-mucosal tissue. The exact nature of this is doubtful, but we think it is an abnormal form of mucosal prolapse due to the hypertrophied pyloric muscle preventing normal reduction. The cause of mucosal stenosis is obscure, but we feel that it must be inflammatory in origin, possibly from an acute pyloric or duodenal ulcer. It may be due to some degenerative change secondary to mucosal prolapse.

An associated congenital lesion was found in Case 6—namely, non-rotation of the gut. This patient had a gastric ulcer and was subjected to a Billroth-I gastrectomy.

There were no deaths in the series, and post-operative convalescence was uneventful in all cases. Two of the earlier ones have not been contacted recently, but the remainder are all known to have satisfactory relief of their symptoms.

Discussion

Various theories concerning the aetiology of pyloric hypertrophy in adults have been advanced, of which the most probable is that it is a persistence of the infantile form. Considering the amount that has been written on the immediate results of treatment of congenital hypertrophic pyloric stenosis, there is remarkably little information on the ultimate fate of the tumour. In careful follow-up studies of babies treated medically Runström (1939) has shown that the condition tends to resolve slowly and an abnormality may be detected for many years.

There seems to be fairly general agreement that a Ramstedt operation is followed by complete disappearance of the tumour (Wollstein, 1922). The very few "failures" have all required a second operation within a few days or weeks of the first, and have usually been attributed to

incomplete division of the circular muscle fibres. In no case, so far as we have been able to ascertain, has the tumour been shown to have persisted for more than a few weeks after this type of operation. Two patients at St. James' Hospital who had Ramstedt's operation in infancy have undergone laparotomy in adult life, one for gastric ulcer and the other for recurrent appendicitis. In both the pylorus felt normal and there appeared to be no persistence of the hypertrophy.

If the infant is treated by gastro-jejunostomy the tumour frequently remains unaltered (Holt, 1917), even well into adult life (Donovan, 1946; Walters, 1946; Armitage and Rhind, 1951; and others). Indeed, the cases recorded suggest that the tumour nearly always does persist after gastro-jejunostomy, though this may be an erroneous impression, as the absence of a tumour at a subsequent operation may be overlooked or not regarded as worthy of record. Be this as it may, it is difficult to imagine why a short-circuiting operation will lead to persistence of the tumour while other forms of treatment will cause its disappearance. We agree with McCann and Dean (1950) that the tumour will persist in a proportion of medically treated or subclinical cases and will be discovered only at necropsy, at operation for some other condition, or when some additional mechanical or inflammatory factor leads to increased stenosis with the production of symptoms.

The frequent finding of a peptic ulcer in association with the condition indicates that there may be some relationship between the two. It has been postulated that stasis is conducive to peptic ulceration: several papers have drawn attention to the incidence of duodenal ulceration in duodenal ileus, and recently Johnson (1955) has suggested that gastric ulceration may follow pyloric stenosis. The hypertrophy, then, may explain the gastric ulcers, but would not account for the duodenal ulcers.

Kirklin and Harris (1933), reviewing the literature and describing 81 cases seen at the Mayo Clinic, list the following radiographic appearances which may be aids to diagnosis: (1) lengthening of the pyloric canal (normal does not exceed 1 cm.); (2) a narrowing of the pyloric canal, though this is variable; (3) a narrow crevice or a longer depression about the mid-point of the lower edge of the canal; and (4) concavity in the base of the duodenal bulb—that is, a duodenal bulbar impression. They considered that the only definite pathognomonic feature was the last of these. While it is of interest, and occasionally of importance, to make a pre-operative diagnosis, we would emphasize that all filling defects in the region of the pyloric canal in adults should be regarded as neoplastic until proved at operation to be benign.

It has been stated (Morley, 1949) that it is difficult to distinguish this condition from a carcinoma of the pylorus, but we have found that, when it has been met with once and diagnosed at operation, recognition of the innocent nature of the tumour is relatively easy. If in doubt, a small incision with diathermy into the tumour will render the diagnosis more obvious, as the glistening, bulging cut surface of the muscle is quite characteristic and in no way resembles the cut surface of an infiltrative type of neoplasm.

Having identified the lesion, we have dealt with it along the following lines: (1) If a peptic ulcer is present a gastrectomy is performed. The presence of hypertrophy is no contraindication to the Billroth-I type of reconstruction, as the duodenum is never involved in the hypertrophy. (2) If there is no obvious ulcer on examination of the serosal surfaces of stomach and duodenum and after careful palpation, we consider the history, and where there is a good clinical history suggestive of peptic ulcer we perform a Billroth-I gastrectomy, since on occasions ulcers have been found only after examination of the resected specimen. (3) If the clinical history is atypical and the diagnosis has been mainly based on radiological findings, we advise a pyloro-duodenotomy, biopsy, and resuture transversely to make a Heineke-Mikulicz pyloroplasty. This is most likely to prove satisfactory where there is coexistent mucosal stenosis (Tanner, 1950).

It is very inviting where no other lesion is found to perform a Ramstedt operation, and this was done in Case 16. The result so far has been most gratifying, but as the patient had no gastric symptoms before laparotomy for intestinal obstruction it is hardly a fair test.

In conclusion we would like to add that since we started to make a particular study of this condition in 1953 we have identified it with greater frequency than we had done before, and are sure that it is a far more common condition than is generally realized.

Summary

In the past ten years 25 cases of pyloric hypertrophy in adults have been seen during laparotomy at St. James' Hospital. In no case was a confident diagnosis of the condition made before operation, though in three cases the radiologist had suggested this possibility. All but two cases presented with symptoms suggesting peptic ulceration, and a peptic ulcer was in fact found in 18.

The radiological findings are reviewed and the aetiology is discussed. Where an ulcer is found or there is a history suggesting peptic ulcer a Billroth-I partial gastrectomy is advocated as the best form of treatment. In other cases, after exclusion of gastric carcinoma by biopsy, a lesser operation may suffice.

We acknowledge with thanks the kind co-operation of Mr. Norman Tanner in allowing us to use his cases. Our thanks are also due to Dr. R. V. Quilliam for his helpful suggestion with the radiographs.

REFERENCES

- Armitage, G., and Rhind, J. A. (1951). *Brit. J. Surg.*, **39**, 39.
Donovan, E. J. (1946). *Ann. Surg.*, **124**, 708.
Holt, L. E. (1917). *J. Amer. med. Ass.*, **68**, 1517.
Horwitz, A., Alvarez, W. C., and Ascanio, H. (1929). *Ann. Surg.*, **89**, 521.
Johnson, H. D. (1955). *Lancet*, **1**, 266.
Kirklin, B. R., and Harris, M. T. (1933). *Amer. J. Roentgenol.*, **29**, 437.
McCann, J. C., and Dean, M. A. (1950). *Surg. Gynec. Obstet.*, **90**, 535.
Morley, J. (1949). *Proc. roy. Soc. Med.*, **42**, 659.
Runström, G. (1939). *Acta paediat. (Uppsala)*, **26**, 383.
Tanner, N. C. (1950). *Medical Annual*, p. 312. Wright, Bristol.
Walters, W. (1946). *J. Amer. med. Ass.*, **131**, 1269.
Wollstein, M. (1922). *Amer. J. Dis. Child.*, **23**, 511.

LOCAL ANALGESIA AND KIELLAND'S FORCEPS

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[WITH SPECIAL PLATE]

The dangers of general anaesthesia in operative obstetrics have been repeatedly emphasized in recent years (Jeffcoate, 1953; Parker, 1954, 1956). Forceps delivery is by far the commonest operation performed, and is probably the most dangerous from an anaesthetic point of view. To avoid this risk some have advocated a return to operating with the patient in the lateral position, while others have advised the use of local analgesia wherever possible. Up to the present it has, however, been the general experience and opinion (Parker, 1956) that pudendal block and local infiltration of the perineum is applicable only to about 60% of all forceps deliveries—that is, those in which the head is at the outlet and favourably rotated.

This paper describes the methods and presents the results of an attempt to extend beyond this limit the use

of local analgesia for forceps delivery. The work was carried out at Mill Road Maternity Hospital, Liverpool, during the 12 months April 1, 1955, to March 31, 1956. Lignocaine (1%) up to a maximum of 50 ml. was the agent used, by a technique similar to that described by Gate and Dutton (1955).

Over-all Results

During the year in question 3,553 babies were born in the hospital, and 410 of these (11.5%) were delivered by forceps. Of these operations, 94% were successfully conducted under local analgesia. The operations consisted of 266 outlet forceps without rotation of the head and 144 cavity forceps with rotation of the head. The proportion of primigravidae to multigravidae in the forceps series was 7:1, whereas for all deliveries it was 10:13. The mortality was as follows:

Maternal.—One mother died, but death was in no way related to the operation. She had extensive bronchiectasis and contracted pneumonia shortly before the onset of labour. The foetus died from asphyxia early in the first stage, and an easy low forceps delivery was performed under local analgesia when the head reached the perineum. The patient died 36 hours later from cardiac failure secondary to the lung condition. (Table I, Case 7.)

Foetal.—Table I shows the foetal loss with forceps delivery. Nine babies were stillborn, and two died in the neonatal period from gross malformations. Of the still-

TABLE I.—Foetal Loss Associated with Forceps Delivery

Case No.	Indications for Use of Forceps	Necropsy Findings	Remarks
OUTLET FORCEPS (264 cases under local analgesia)			
1	Foetal distress	Fresh stillbirth; asphyxia	Severe foetal distress before operation
2	Delay	Macerated stillbirth	Admitted to hospital with foetal death in utero
3	"	"	"
4	"	Fresh stillbirth; asphyxia	Foetal death in first stage; cause unknown
5	"	"	"
6	"	"	Foetal death early in first stage; post-mature
7	Maternal chest condition	"	Maternal death (see above). Baby died at start of labour
CAVITY ARRESTS: KIELLAND'S FORCEPS ROTATION AND DELIVERY (125 cases under local analgesia)			
8	Delay with dead foetus	Macerated stillbirth	"
9	Cardiac disease	Neonatal death: oesophageal atresia	"
FORCEPS UNDER GENERAL ANAESTHESIA (21 cases)			
10	Delay	Neonatal death: bilateral hydro-nephrosis	"
11	Eclampsia	Fresh stillbirth; asphyxia	"Flying squad" case; baby dead on admission

born babies, 4 (Cases 3, 4, 8, and 11) died *in utero* before the onset of labour and 3 (Cases 5, 6, and 7) during the first stage of labour. If the grossly malformed babies and those which died *in utero* before operation are excluded there were two stillbirths, a mortality of 0.5%. In both these cases an easy low forceps operation was carried out because of foetal distress, and necropsy showed asphyxial changes only. There were no foetal deaths from intracranial injury. That these results were not obtained by an over-ready resort to caesarean section in cases of potential difficulty is shown by the caesarean section rate of only 2.8%, despite the fact that the hospital serves a poor-class area where contracted pelvis, even rachitic in origin, is still prevalent.

Rotation of the Foetal Head

The need to rotate the foetal head is generally regarded as the largest single factor calling for general anaesthesia. Local analgesia is said to be unsuitable for these cases

because: (a) it does not permit the introduction of the whole hand into the vagina and the slight disimpaction of the head usually necessary for manual rotation; (b) it does not allow free abdominal manipulation of the trunk; and (c) it does not produce the uterine relaxation thought to be necessary to allow rotation of the foetal trunk with the head (Kerr and Moir, 1949).

In planning our work it seemed that the use of Kielland's forceps for head rotation offered a possible answer to the first difficulty. The second and third arguments appeared to be based on a belief that general anaesthesia is needed to produce sufficient uterine relaxation for trunk rotation, this having been handed down through generations of textbooks without its truth ever being seriously questioned. It was decided to investigate this by studying the behaviour of the foetal trunk radiologically during the course of rotation of the head by means of Kielland's forceps under local analgesia, 14 cases, in all of which a persistent posterior or transverse position of the head called for operative intervention, being so examined. In each case rotation of the head was easily achieved and was accompanied by rotation of the trunk without any abdominal manipulation whatever, and before traction was applied. (Special Plate, Figs. 1 and 2.)

This finding was clearly of importance. It led to the abandonment of manual rotation in favour of the routine use of Kielland's forceps for head rotation, and an immediate extension of the scope of local analgesia.

Kielland's Forceps

The techniques for the use of Kielland's forceps have been fully described by Parry Jones (1952) and Donald (1955), but certain points in their use under local analgesia deserve comment.

The successful application of the blades of the forceps under local analgesia demands extreme gentleness and the most careful attention to details of technique. For applying the anterior blade in cases of transverse arrest the classical method seemed unsuited for use without general anaesthesia; thus either the wandering or the direct method was employed, depending on the operator's preference.

Parry Jones has stated that the use of the direct method is limited to those cases in which the head is arrested at a low level in the pelvis, but we have found that by careful attention to the patient's position it can be employed in nearly all cases of transverse arrest at ischial-spine level. To do this the patient is placed in the lithotomy position on an operating-table or suitable hard bed, with the convexity of her sacrum resting on the edge and her buttocks overhanging slightly (Fig. A). Providing her buttocks are well clear of the end of the table, the handle of the forceps can be depressed beyond the vertical, and this allows the direct introduction of the anterior blade between the palmar surface of two fingers inserted anteriorly and the foetal head (Special Plate, Fig. 3).



FIG. A.—Patient in lithotomy position on operating table for direct application of anterior blade of Kielland's forceps. If position is achieved by lowering a folding leaf at foot of table this should be removed, to allow depression of handle of blade beyond the vertical.

It is next necessary to emphasize that for success with local analgesia it is essential that all manipulations be performed *between* contractions. This applies to application of the blades, rotation of the head, and also traction. This is contrary to the general recommendation that traction should be restricted to the period of uterine contraction, but it is necessary because, since the analgesia does not relieve the contraction pain, the patient is bound to be disturbed and may become uncooperative. By applying traction only between pains it is possible, in a large proportion of cases, to deliver the child without the mother realizing it has been born.

Among the 144 cases in which Kielland's forceps were used for rotation there was no case of urinary fistula, third-degree tear, or other maternal injury (Table II). This can

TABLE II.—Morbidity with Forceps Operation (Including Four "Trial of Forceps" Cases which Came to Caesarean Section)

Morbidity	Local Analgesia		General Anaesthesia	
	Forceps (Simpson's or Wrigley's) without Rotation (264 Cases)	Kielland's Forceps (125 Cases)	Trial of Forceps (11 Cases)	Other G.A. (14 Cases)
A. Maternal:				
Notifiable pyrexia	16	8	1	2
Post-partum haemorrhage	7	3	2	2
Secondary post-partum haemorrhage	3	Nil	Nil	Nil
Transient haematuria	2	2	"	"
Third-degree tear	2	Nil	"	"
Perineal breakdown	3	1	"	"
B. Foetal:				
Cephalhaematoma	2	1	"	1
Cerebral irritation	2	Nil	"	"
Facial paresis (all transient)	2	2	"	Nil
Fractured clavicle	1	Nil	1	"

be attributed to the conduct of the majority of the operations (125) under local analgesia, with resultant gentleness and delicacy in the handling of the instrument. There was no attributable foetal loss in the group, and this aspect is discussed later. The effectiveness of local analgesia for the Kielland's operation is shown in Table III. There was only one case in which local analgesia had to be abandoned in favour of general anaesthesia. Inhalation analgesia ("trilene" or gas-and-air) was administered only if the patient complained of discomfort.

TABLE III.—Effectiveness of Local Analgesia for Kielland's Rotation and Delivery

	No. of Cases
Very effective; patient undisturbed	105 (83%)
Satisfactory except for slight discomfort at some stage for which gas-and-air or trilene was given	20 (16%)
Unsatisfactory or impossible to inject	1 (1%)

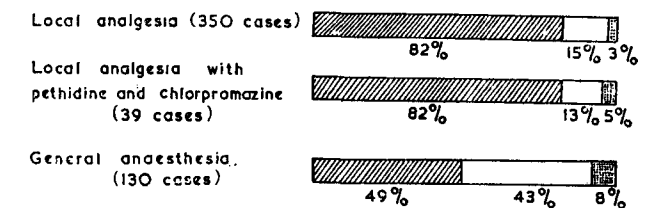
While it is realized that the assessment of comfort is individual and open to question, we are convinced that none of the patients experienced any distress comparable to that associated with the passage of a stomach tube in the second stage of labour, which is usually regarded as an essential preliminary to any general anaesthetic in the circumstances.

Supplementary Sedation

Cases where the patient is apprehensive and uncooperative or where discomfort is experienced during injection of the analgesic present a special problem. In the earlier part of the investigation general anaesthesia had to be resorted to for two simple low forceps deliveries on this account, and following this we tested the effect of an intravenous injection of a mixture of pethidine hydrochloride, 100 mg., and chlorpromazine ("largactil"), 12.5 mg., diluted with 10 ml. of normal saline solution. The purpose of the small quantity of chlorpromazine is to counteract the emetic effect which the rapid injection of pethidine usually produces, but it also potentiates the sedative action. This combination of drugs proved so effective that nervousness and lack

of maternal co-operation ceased to be regarded as contra-indications to local analgesia. In fact, it is probable that a considerable number of forceps operations could be performed under this injection alone.

The question obviously arises as to the effect of these drugs on the foetus. Judging from the small number of cases in which we used them, they do not have a significant respiratory depressant effect. In reaching this conclusion we assessed the results against those obtained when local analgesia was used alone, and when general anaesthesia was used for a comparable series of forceps operations in 1951. (See Graph 1.)



Legend:
 [Hatched bar] Cried or established regular respiration within 1 minute
 [White bar] Apnoea for 1-5 minutes (asphyxia livida)
 [Dotted bar] Apnoea for over 5 minutes (asphyxia pallida)

GRAPH 1.—Incidence of apnoea neonatorum. The last group is of comparable cases of forceps delivery conducted under general anaesthesia in the same practice during 1951.

Contraindications to Local Analgesia

Although the use of local analgesia was widely extended, there remained a small group of cases (amounting to only 6% in our series) where general anaesthesia seemed necessary or advisable. The factors calling for general anaesthesia were as follows.

1. **Unsatisfactory Local Analgesia** (3 cases).—In two of these cases, occurring early in our series, lack of maternal co-operation prevented injection of the local analgesic. In the light of our subsequent experience with supplementary pethidine and chlorpromazine injection it seems likely that general anaesthesia could have been avoided in these cases.

2. **"Dangerous Uterine Contractions"** (3 cases).—In these cases strong uterine contractions were hazardous to mother or baby. Two were cases of deep transverse arrest in patients with previous caesarean section scars, while the third was a case of prolapsed cord.

3. **"Complicated Forceps"** (7 cases).—This group included mento-lateral and posterior face presentations (2 cases), forceps application before full dilatation of the cervix (4 cases), and gross foetal abdominal distension (1 case).

4. **Eclampsia** (1 case).

5. **"Trial of Forceps"** (11 cases).—The indications for this procedure were second-stage arrest in the pelvic cavity with (a) the biparietal diameter not completely down to the ischial spines; (b) so little room at the level of the arrest that application of the forceps blades seemed likely to be extremely difficult; or (c) evidence of marked outlet contraction. Of the 11 cases in this category, four came to caesarean section. No foetal loss occurred, and the only foetal morbidity was a fractured clavicle in a case where shoulder dystocia was encountered.

Management of General Anaesthesia Cases

Our policy was to conduct in the operating theatre these few cases requiring general anaesthesia. Parker advocated this and stressed its anaesthetic benefits. The electric suction apparatus and all the other equipment of the anaesthetist are always readily available, while the fact that the patient is on an operating-table facilitates laryngeal intubation and ensures that the Trendelenburg position can be easily obtained. In our experience it also presents certain advantages to the obstetrician. The ability to proceed immediately to caesarean section is essential in the "trial of forceps" cases,

and also in cases of face and brow presentation in which the best results can be obtained only if attempts at vaginal delivery can be abandoned when the difficulties prove greater than anticipated (Morris, 1953).



FIG. B.—Operator seated on 6-in. (15-cm.) stool and with operating-table slightly elevated, allowing traction in true axis of pelvis.

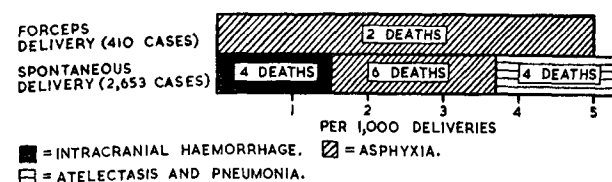
Local Analgesia, Kielland's Forceps and the Foetus

The principal aim of our policy was to combat the maternal anaesthetic hazard, but in its actual operation it appeared to be beneficial to the foetus as well. Graph 2 gives the corrected results for all forceps deliveries during the 12 months' operation of the policy, compared with those of the previous five years, similarly corrected. Graph 3 shows the foetal mortality of the forceps series compared with that for spontaneous cephalic delivery in the same year, 1955-6, similarly corrected. The striking thing is that four foetal deaths attributable to cerebral trauma occurred in the spontaneous group, while there were no such deaths in the forceps group. The use of local analgesia was probably the most important factor in achieving these improved foetal results. A parallel might be drawn between the increased safety of delivery with forceps, particularly Kiel-

YEAR	FORCEPS INCIDENCE	FOETAL MORTALITY (CORRECTED) PER 1,000 FORCEPS BIRTHS
1950-4	8.4%	11
1955-6	11.5%	22

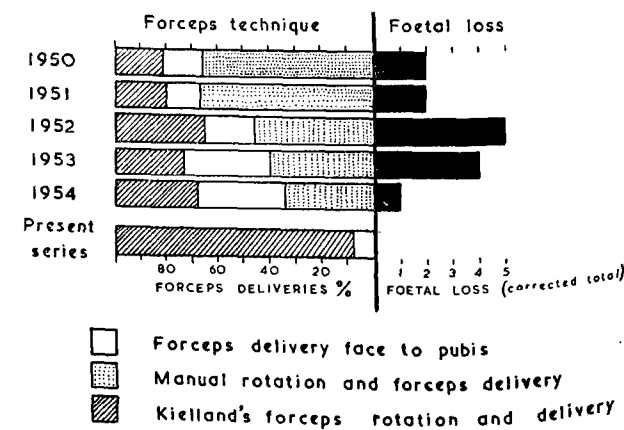
□ = DEATHS DUE TO CEREBRAL TRAUMA
■ = DEATHS DUE TO ASPHYXIA, ETC.

GRAPH 2.—Comparison of forceps delivery incidences and foetal results in 1950-4 and present series. Figures for foetal mortality are corrected in each case for: macerated foetuses; babies weighing under 4 lb. (1.814 kg.); gross foetal abnormalities; severe erythroblastosis foetalis; and foetal deaths in labour before delivery was embarked upon.



GRAPH 3.—Comparison of foetal mortality for forceps and spontaneous deliveries in cephalic presentations. The same correcting factors applied as in Graph 2.

land's, under local analgesia, and the safety of external version without anaesthesia compared with version performed under a general anaesthetic. The other possible factor was the replacement of manual rotation by Kielland's forceps rotation (see Graph 4). Assessment of this would clearly involve a complex discussion of the merits of the manual method versus the forceps method of rotating the head. Brief mention will be made, however, of several aspects of the controversy on which we have new evidence to offer.



GRAPH 4.—Foetal loss in relation to forceps technique in cases of malposition of occiput. The same correcting factors applied as in Graphs 2 and 3.

First, the traction force with Kielland's forceps is applied directly to the base of the skull and there is a negligible amount of biparietal pressure. That this is so is clearly seen in Fig. 4 of the Special Plate. In this case the head was so extended in the pelvic cavity that the brow was presenting. Kielland's forceps were applied (Fig. 4a) and simple downward traction exerted. When this reached 60 lb. (27.22 kg.), flexion of the head to a vertex occurred (Fig. 4b) followed by easy delivery. The site of the forceps force was marked by bruising of the pinnae, which lay on the mastoid regions. This finding has been confirmed in another similar case, and it is clear that such movement could not occur if there was any appreciable biparietal pressure. This freedom of movement of the foetal head within the blades, which is not widely recognized, may also account, in part at least, for the diminished traction force said to be needed with Kielland's forceps as compared with the orthodox axis-traction instrument. Kielland (1916) was so convinced of this that he stated categorically that measurement of it was unnecessary!

However, to try to obtain accurate measurements of the force employed, a pair of Kielland's forceps were adapted so that a dynamometer fitted into two slotted pins on the distal shoulders. The lower bar of the dynamometer is elliptical, and can be attached by opening and then closing the handles slightly after the blades have been applied and any asynclitism corrected (Fig. C). Graph 5 shows the results obtained in 55 cases. The range of the traction forces was 15-75 lb. (6.8-34 kg.)—the majority of the readings being between 35-50 lb. (15.9-22.7 kg.). Baxter (1946), who measured the traction force with axis-traction forceps, gives 70 lb. (31.8 kg.) as the critical force beyond which cerebral damage is likely to be sustained, but he does not report a large series. In the "trial of forceps" cases in our series, not more than moderate traction (35-50 lb. or 15.9-22.7 kg.) was employed.

Another factor affording a mechanical advantage with Kielland's forceps is the lack of upward displacement of the head during rotation, which is well shown in Fig. 2 of the Special Plate. In this case it can be seen that once the occiput has been rotated to the anterior position the head is practically delivering itself. This is a common clinical experience.

Summary

It has been found possible to extend the scope of local analgesia to 94% of all forceps deliveries. This has been achieved by the routine use of Kielland's forceps for rotation of the head, and the supplementary injection of a mixture of pethidine and chlorpromazine in certain cases. In addition to the great reduction in the maternal anaesthetic hazard, this policy has produced an improvement in foetal results. The possible factors concerned in this are discussed. It seems likely that the most important fact is that the great majority of the

operations were performed under local analgesia. This, incidentally, leads to gentleness and accurateness while precluding the use of excessive force.

We are grateful to Mr. C. H. Walsh and Professor T. N. A. Jeffcoate for the opportunity to perform this work and also for their encouragement and advice; and to Professor Jeffcoate we are further indebted for constructive criticism and help in the preparation of this paper. Our thanks are also due to Mr. W. Jennings and his colleagues for the radiographic work, and to Messrs. Kidd, Greenough, and Lee for the photographs and tables. Mr. Price, of Alexander and Fowler, Liverpool, constructed the dynamometer attachment on the Kielland's forceps.

REFERENCES

- Baxter, J. (1946). *J. Obstet. Gynaec. Brit. Emp.*, 53, 42.
Donald, I. (1955). *Practical Obstetric Problems*. Lloyd-Luke, London.
Gate, J. M., and Dutton, W. A. W. (1955). *British Medical Journal*, 2, 99.
Jeffcoate, T. N. A. (1953). *Ibid.*, 2, 951.
Jones, E. Parry (1952). *Kielland's Forceps*. Butterworth, London.
Kerr, J. M. M., and Moir, J. C. (1949). *Operative Obstetrics*. Baillière, Tindall and Cox, London.
Kielland, C. (1916). *Mschr. Geburtsh. Gynäk.*, 43, 48.
Morris, N. (1953). *J. Obstet. Gynaec. Brit. Emp.*, 60, 44.
Parker, R. B. (1954). *British Medical Journal*, 2, 65.
— (1956). *Ibid.*, 2, 16.

DIFFERENTIAL DIAGNOSIS OF ANKYLOSING SPONDYLITIS

BY

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[WITH SPECIAL PLATE]

The last 25 years have seen two notable advances in the management of ankylosing spondylitis—namely, the use of deep x-ray therapy, and recognition of the importance of active movement in preventing loss of motion in the spine and limbs. Both the beneficial effects of x rays (Smyth, Freyberg, and Lampe, 1941; Hilton, 1943; McWhirter, 1945; Hart *et al.*, 1949) and the extensive loss of mobility which commonly results from prolonged immobilization (Swaim, 1939) appear to be relatively specific features of ankylosing spondylitis (Smyth, Freyberg, and Peck, 1941; Desmarais, 1953; Sharp and Easson, 1954). Serious complications of x-ray treatment of spondylitis are rare, but the possibilities of aplastic anaemia (Goodman, 1956; Sharp and Easson, 1954) and perhaps leukaemia (Brown and Abbott, 1955) resulting from such treatment make it very desirable that patients who are unlikely to benefit should not be treated with x rays. From the practical point of view it is therefore important, before advising treatment, to establish the diagnosis as certainly as possible in a patient in whom ankylosing spondylitis is suspected.

"Atypical" Spondylitis

The excellent accounts of Polley and Slocumb (1947), Mowbray *et al.* (1949), and particularly Hart *et al.* (1949) and Hart (1955), render a further detailed description of the clinical and radiographic features of classical ankylosing spondylitis superfluous; the emphasis placed by these authors on the significance of such symptoms as recurrent "lumbago," "sciatica," or "fibrositis," particularly when they occur in young men, are aggravated by immobility, or are associated with diminished chest expansion or iritis, and on the importance in diagnosis of radiographic changes in the sacro-iliac joints (Special Plate, Fig. 1a), has led to more frequent diagnosis at a stage where treatment is likely to be effective.

In a study of 530 patients attending a special clinic for investigation and treatment of spondylitis it was found that

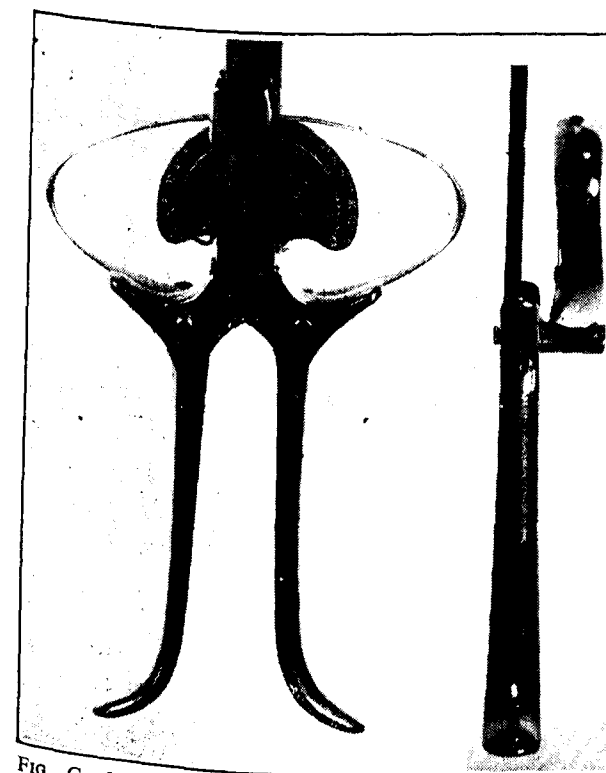
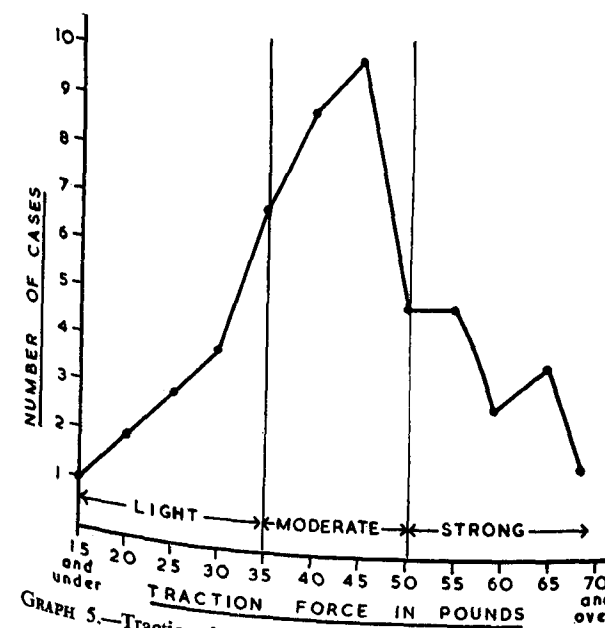


FIG. C.—Views of Kielland's forceps showing dynamometer fitted to pins on posterior aspect of distal shoulders.



GRAPH 5.—Traction force as measured by dynamometer in 55 deliveries with Kielland's forceps.

the majority conformed to the classical picture of ankylosing spondylitis, but that about one in five presented unusual clinical or radiographic features; these patients were labelled "atypical" spondylitis, although most of them had bilateral radiological changes in the sacro-iliac joints. Analysis of the results of x-ray treatment in these patients (Sharp and Easson, 1954) showed that those with straightforward ankylosing spondylitis were mostly much improved, while the majority of the "atypical" cases were unimproved. This suggested that "atypical" spondylitis might in part be due to other spinal conditions simulating ankylosing spondylitis but unresponsive to x rays. Some of the "atypical" spondylitis had features suggesting rheumatoid arthritis, such as involvement of the hands and feet and of tendons, and gave positive reactions to the differential sheep-cell agglutination test (D.A.T.) (Ball, 1950); others had valvular heart lesions, and from their histories it appeared that the spinal changes had followed recurrent attacks of rheumatic fever. In some patients the spinal changes were associated with psoriasis, and they also usually had involvement of the hands and feet but negative D.A.T. results; and in still others the onset of the illness seemed to be clearly related to an attack of urethritis or of dysentery, so that the possibility of Reiter's disease came into the picture.

We therefore investigated other patients who had attended the centre with rheumatoid arthritis, rheumatic fever, psoriasis and arthritis, or Reiter's disease with the object of assessing the extent and nature of the spinal involvement in these conditions and the features which might help to distinguish these forms of spondylitis from typical ankylosing spondylitis.

Rheumatoid Arthritis

The frequency and the pattern of spinal involvement in rheumatoid arthritis were obtained from a study of a random selection of 100 patients who attended the centre with rheumatoid arthritis over a two-year period; the proportion of males to females proved to be almost exactly one to two. Other adult patients selected because of marked spinal disease and the 36 who had attended with juvenile rheumatoid arthritis—that is, starting at or below the age of 15—since the centre was established were also studied.

Involvement of the spine was rarely a prominent feature of the disease picture, but evidence of spinal involvement in the rheumatoid process was found in exactly half of the randomly selected patients and was slightly commoner in males. In contrast to ankylosing spondylitis, the cervical region was much the commonest site affected, being involved in four-fifths of those with spinal involvement, whereas the dorsal and lumbar regions were involved in less than one-third. In over half the patients with spinal involvement the cervical region only was affected; involvement of the cervical region alone was never observed in ankylosing spondylitis.

Painful limitation of neck movement was the commonest symptom, and the main pain was often referred over the "shoulders" but rarely down the outer border of the upper arm, where the pain from subdeltoid bursitis, which was also commonly present in these patients, was referred on movement of the shoulder, particularly through the "painful arc" in abduction. Pain from the lower spine was usually less severe than that from the cervical region.

Severe deformity of the spine was unusual, but often there was decrease in lumbar lordosis and increase in dorsal kyphosis, as illustrated in the accompanying photograph of a woman of 46 with severe rheumatoid arthritis of 13 years' duration. This patient was chosen as an example as she also had subcutaneous nodules over several lower dorsal and lumbar spinous processes, the elbows, and occipital region, such nodules over spinous processes being a source of considerable discomfort in several bed-fast patients.

Although in exceptional cases the spine had been rendered completely rigid, there was usually only moderate restriction of movement of an affected region of the spine; the chest expansion was rarely reduced. In some of the most severe,

although often relatively painless, forms of cervical-spine involvement, abnormal mobility and cervical kyphosis had developed but neurological complications were uncommon.

Radiographic Changes.—Abnormalities of the sacro-iliac joints occurred not uncommonly in patients with severe and extensive rheumatoid disease. Occasionally the joints were fused, but in the earlier stages erosions of the joint surfaces were usually smaller than in ankylosing spondylitis and the fluffy juxta-articular bone sclerosis was absent (Special Plate, Fig. 1b). Moreover, extensive spinal involvement often occurred in patients whose sacro-iliac joints appeared normal.

Radiographic changes in the spine were often absent in patients with clinical spinal involvement, and when present were most easily demonstrable in the cervical region (Plate, Figs. 2b and 3b). They were characterized by narrowing of the intervertebral disks, often with relatively little osteophytosis of the vertebral bodies, and by erosion, narrowing, and sometimes ankylosis of the apophyseal joints. The vertebral plates adjacent to the narrowed disks often appeared irregular, and occasionally faint ossification was visible within the disk spaces; subluxation of vertebrae, usually forward, was not uncommon in severe cases.

In children the spine was rather more frequently involved than in adults, particularly in the dorsal and lumbar regions. The process appeared to be similar to that in adults, apart from a greater tendency to bony ankylosis of apophyseal joints and to complete disappearance of the margins of the disks and fusion of the rims of adjacent vertebral bodies. Arrest or slowing of vertebral growth was common when the disease had started in early childhood (Plate, Fig. 2c).

Rheumatoid arthritis of the spine was therefore distinguished from ankylosing spondylitis by the predominant involvement of the cervical region and retention of normal chest expansion; by frequent involvement of the sacro-iliac joints, without radiographic abnormalities of those joints, which in any case rarely resembled those in ankylosing spondylitis; by a strong tendency to narrowing of multiple disk spaces and not infrequent cervical subluxation; and by the absence, even in advanced cases, of the "bambooning" and of "squaring" of vertebral bodies (Rolleston, 1947) commonly seen in ankylosing spondylitis (Plate, Figs. 2a and 3a).

Treatment.—The wearing of a padded cardboard collar for some weeks or months was usually most effective in relieving symptoms from the cervical spine. In patients with unstable cervical subluxation more effective support was supplied by means of a plastic or leather collar, and even in some of these it was found that the support could be discarded after some months without recurrence of symptoms; surgical spinal fusion was rarely required. Symptoms from the lower spine usually responded well to bed rest and analgesics of the aspirin type.

Rheumatic Fever

It has been known for many years that permanent joint changes may result from rheumatic fever (Jaccoud, 1867;



Female aged 46 with severe rheumatoid arthritis involving the spine, showing spinal deformity and subcutaneous nodules over several spinous processes and other bony prominences.

Bywaters, 1950), but Thomas (1955) was the first to call attention to the frequency of spinal involvement in this form of arthritis.

The condition is rare, and only ten males and nine females suffering from this form of arthritis have been seen at the centre in a period during which over 2,000 patients have attended with rheumatoid arthritis; 5 of the 19 had been referred to the spondylitis clinic. Ten of these patients were reported previously by Thomas (1955). All the patients were adults with valvular heart lesions, and they gave a characteristic history of repeated attacks of severe and prolonged rheumatic fever, usually following throat infections and starting in childhood and continuing into adult life. Almost all of them had developed ligamentous laxity, abnormal mobility, and sometimes effusions in the limb joints, notably the hands, where ulnar deviation of the fingers was common; the deformity was usually correctible, but in very advanced stages was permanent. One-third of the patients had nodules on tendons, sometimes of considerable size.

The spine had been involved in one or more rheumatic attacks in almost all the patients, but, in contrast to the findings in the limbs, two-thirds of them had residual limitation of spinal movement, particularly of the lower spine; occasionally the whole spine was rigid. None of them had severe spinal deformity and the chest expansion was usually normal. In one man the residual changes were confined to the sacro-iliac joints and spine, and in another to the sacro-iliac joints only.

The D.A.T. was negative in the 16 patients tested and there was an almost complete absence of bony erosions on radiographs of the limb joints—a further point of difference from rheumatoid arthritis. The sacro-iliac joints were radiographically abnormal in over half the patients, and occasionally the appearances were indistinguishable from those of ankylosing spondylitis (Plate, Fig. 1c), but the advanced spinal changes were distinctive (Plate, Figs. 2d and 3c). These comprised antero-posterior narrowing of some vertebral bodies, narrowing of multiple disks without vertebral osteophytosis, bony ankylosis of apophyseal joints, and, when the disease had started in childhood, hypoplasia of the vertebrae.

Differentiation of this condition from ankylosing spondylitis with coincident rheumatic heart disease rested, first, on the characteristic history, particularly the precipitation of the attacks of rheumatic fever by throat infections; secondly, on the presence in the greater number of them of the peripheral joint changes and in some cases large tendon nodules, the latter being very rare in our patients with ankylosing spondylitis; and, finally, on the characteristic radiographic changes in the spine in advanced cases.

Treatment.—Almost all of these patients derived great symptomatic relief from calcium aspirin in a dosage of 60 gr. (4 g.) or so daily; three of them received x-ray therapy, but since none was much improved we no longer prescribe x-ray therapy for these patients. In their long-term management, prevention or prompt treatment of streptococcal infections would appear to be indicated with the object of preventing recurrences of rheumatic activity, and progression of the heart lesions which form an important part of their disability.

Reiter's Disease

The main features of this syndrome, which is of unknown but probably infective aetiology, are non-specific urethritis, arthritis, and inflammatory eye lesions, most commonly conjunctivitis but sometimes iritis (Paronen, 1948; Zewi, 1947). In this country the infection is usually of venereal origin (Harkness, 1950), but a probably identical condition may follow dysentery (Reiter, 1916; Fiessinger and Leroy, 1916; Paronen, 1948). Other less constant features of the syndrome are skin rashes, of which the most characteristic is keratoderma blennorrhagica, although this may be indistinguishable from pustular psoriasis (Auckland, 1951). Stomatitis, cystitis, and haematuria (Piora, 1953) are occasional features.

The three main features of the disease had all been present during the illness of the 20 patients, all males, in whom this diagnosis had been made at the centre; three-quarters had started with a urethral discharge. In 14 of the cases three, and in the remainder two, of the main features had occurred simultaneously, usually at the onset, and keratoderma blennorrhagica had also been present in two. Relapses of the eye inflammation and arthritis were common, sometimes after remissions of up to ten years' duration; the urethritis recurred less frequently.

The arthritis involved the joints of the feet or ankles in all the patients, and almost half of them had tender heels, but the hands were involved in only one-third. Occasionally the feet showed a rather characteristic deformity with dorsal dislocation and outward deviation of the extended toes, first described in this condition by Launois (1899). The knees were involved in three-quarters and the spine was affected almost as frequently, particularly the lumbar region, which was involved in half the patients. One-fifth of the patients had developed gross restriction of spinal movement, particularly in the dorsal and lumbar regions, with little deformity but usually with reduced chest expansion.

In patients with advanced spinal changes both the clinical picture and the x-ray appearances of the spine were often difficult or impossible to distinguish from those of advanced ankylosing spondylitis. The sacro-iliac joints were radiographically abnormal in almost half of all the patients, and were always abnormal, and sometimes fused, when there were extensive spinal changes (Plate, Fig. 1d). There was a striking tendency to proliferation of new bone at any affected site. In the pelvis and spine this was evident in the form of bony proliferation around the acetabula and femoral heads, much new bone formation on the margins of the pelvis, and heavy bony bridging of the intervertebral spaces, usually through ossification of spinal ligaments, but sometimes also of the disk margins (Plate, Figs. 2e and 3d).

The diagnosis of Reiter's disease is suggested by the characteristic history, the involvement of the feet—which are involved in less than one-fifth of our patients with ankylosing spondylitis—and the radiographic evidence of much ligamentous ossification.

Treatment.—The acute phase of the arthritis subsided in most cases following bed rest, analgesic and in some cases artificial fever therapy, and plaster splintage when indicated. The duration of the acute attacks varied from a few weeks to many months, and residual anatomical changes were the rule in severe or relapsing cases. In one case in which both wrists and two others in which both feet were involved with about equal severity x-ray therapy was given to one side and, unknown to the patient, "mock" therapy to the other side. In each case both the treated and "mock" treated lesions were improved at the completion of the course, and there was no evidence of any greater improvement on the treated side.

Psoriasis and Arthritis

The incidence of psoriasis in patients with polyarthritis is said to be unduly high (Dawson and Tyson, 1938; Bauer *et al.*, 1941). Most authorities maintain that the arthritis is rheumatoid arthritis, perhaps modified in some cases by the presence of psoriasis; but others, such as Sherman (1952), consider that it is a distinct entity.

Evidence of psoriasis was found in 34 males and 32 females referred to the centre with a polyarthritis; 11 of them had been referred to the spondylitis clinic. In 58 cases the rash was present at the time of examination, in 29 the nails being involved; six gave a history of psoriasis which had cleared up apart from persistent nail changes in two; and in the remaining two the psoriasis was confined to the nails.

The hands or feet, usually both, were almost invariably involved in the arthritis, and in over one-third of the cases the distal interphalangeal joints of the fingers were affected. The proximal limb joints were also involved in two-thirds of the patients. Only four, however, had subcutaneous nodules, and 12 others involvement of tendons. The D.A.T.

was positive in only 11 (28%) of the 39 patients tested, whereas in the random series of 100 rheumatoid patients mentioned earlier, subcutaneous nodules were present in 23 and tendon lesions in 56, and 24 (73%) of the 33 patients tested gave positive D.A.T. results. These findings suggested that the majority were not suffering from straightforward rheumatoid arthritis.

Painful limitation of spinal movement was present in three-quarters of the patients; the three spinal regions were involved with equal frequency, and in over one-third the whole spine was affected and was virtually rigid in four, only one of whom had been referred to the spondylitis clinic.

Radiographically, the sacro-iliac joints were often normal in patients with clinical spinal involvement. Except that cervical subluxation was not observed, the changes in the spine combined the other features observed in rheumatoid arthritis with a strong tendency to ossification of spinal ligaments. In the limb joints and particularly in the feet, the arthritis was often of a very destructive type, but a tendency to proliferation of new bone, less striking than in Reiter's disease, was also evident.

Ankylosing spondylitis merited serious consideration in the diagnosis of very few of these patients. Extensive spinal involvement was almost invariably associated with florid and widespread arthritis in the limbs and atypical radiographic changes in the sacro-iliac joints and spine. The differentiation from Reiter's disease was sometimes more difficult, and only made in some cases through the absence of the ocular and genito-urinary features.

Treatment.—The best results appeared to have been obtained from management along the same lines as for rheumatoid arthritis. Only 2 of the 11 patients treated by x rays appeared to derive worthwhile benefit; one patient died from aplastic anaemia five years after treatment.

Review of the "Atypical Spondylitis" Group

On reviewing the atypical group seen in the spondylitis clinic in the light of these findings it was found that approximately half of the atypical cases could be fitted into these categories. A few had radiographic appearances in the spine of "senile ankylosing hyperostosis" (Forestier and Rotes-Querol, 1950) (Plate, Fig. 3e) associated with bony enlargement of multiple limb joints. There were two members of a family, who have been described elsewhere (Sharp, 1954), who suffered from a heredo-familial form of spondylitis associated with extensive calcinosis of joint structures and blood vessels in the limbs. In some of the remainder the spinal changes appeared to be due to osteoarthritis or degenerative disease, and there were a few patients probably suffering from ankylosing spondylitis in whom the picture was complicated by such conditions as metabolic or Paget's disease of bone. In addition there was a small number of cases in which the diagnosis still remained obscure.

Discussion

The findings in this study suggest that bilateral sacro-iliac joint changes as seen radiographically cannot be accepted as certain evidence of ankylosing spondylitis or as a definite indication that deep x-ray therapy is likely to be beneficial. If a patient has symptoms and signs suggesting ankylosing spondylitis, the possibility of other diseases of the spine should be borne in mind, and the following features should be specially looked for: (1) evidence of rheumatoid arthritis, such as predominant involvement of the cervical region, widespread polyarthritis affecting particularly the distal joints of the limbs, subcutaneous and large tendon nodules, or a positive result in the differential sheep-cell agglutination test; (2) evidence of rheumatic fever, such as a valvular heart lesion and a history of recurrent acute rheumatism; (3) evidence of Reiter's disease, such as a history of urethritis or dysentery, conjunctivitis, or keratoderma; and (4) evidence of psoriasis. If any of these features are present the patient is probably not suffering from ankylosing spondylitis and is unlikely to derive much

benefit from deep x-ray therapy. Furthermore, bed rest and immobilization may be indicated instead of the active mobilization which is so necessary in the management of typical ankylosing spondylitis.

Summary

In approximately one-fifth of the patients attending a special spondylitis clinic the clinical picture differed in various ways from that of classical ankylosing spondylitis, although most of them had bilateral radiographic changes in the sacro-iliac joints. Some of them had psoriasis, and others had features suggesting rheumatoid arthritis, recurrent rheumatic fever, or Reiter's disease with spinal involvement.

A study of these conditions in other patients revealed certain features by which they can usually be distinguished from ankylosing spondylitis.

On review, many of the atypical cases from the spondylitis clinic appeared to fit into the above categories, suggesting that bilateral sacro-iliac joint changes cannot be accepted as certain evidence of ankylosing spondylitis. Some others had radiographic changes of "senile ankylosing hyperostosis," and two had a heredo-familial form of spondylitis associated with calcinosis of limb joints and blood vessels. A few cases remain undiagnosed.

The differential diagnosis of ankylosing spondylitis appears important, since patients with these other forms of spondylitis do not usually appear to benefit from deep x-ray therapy, and they may be helped by bed rest and immobilization rather than by encouragement of active movement as in the management of ankylosing spondylitis.

I am indebted to Professor J. H. Kellgren for much advice and assistance; to Dr. J. Ball, who performed the sheep-cell differential agglutination tests; and to Dr. Robert Ollerenshaw and his staff for the illustrations. I am grateful to Dr. A. E. Thomas and the editor of the *Annals of the Rheumatic Diseases* for permission to reproduce Figs. 2d and 3c (Special Plate).

The spondylitis clinic is conducted in collaboration with the Christie Hospital and Holt Radium Institute, and Dr. Ralston Paterson provided facilities for, and Dr. E. C. Easson supervised, the x-ray treatment of these patients.

REFERENCES

- Auckland, G. (1951). *Brit. J. vener. Dis.*, 27, 143.
 Ball, J. (1950). *Lancet*, 2, 520.
 Bauer, W., Bennet, G. A., and Zeller, J. W. (1941). *Trans. Amer. Ass. Phys.*, 56, 349.
 Brown, W. M. C., and Abbott, J. D. (1955). *Lancet*, 1, 1283.
 Bywaters, E. G. L. (1950). *Brit. Heart J.*, 12, 101.
 Dawson, M. H., and Tyson, T. L. (1938). *Trans. Amer. Ass. Phys.*, 53, 303.
 Desmarais, M. H. L. (1953). *Ann. rheum. Dis.*, 11, 97.
 Flessinger, W., and Leroy, E. (1916). *Bull. Soc. méd. Hôp. Paris*, 40, 2030.
 Forestier, J., and Rotes-Querol, J. (1950). *Ann. rheum. Dis.*, 9, 321.
 Goodman, G. (1956). *J. Fac. Radiol. (Lond.)*, 7, 167.
 Harkness, A. H. (1950). *Non-gonococcal Urethritis*, p. 99. Livingstone, Edinburgh.
 Hart, F. D., Robinson, K. C., Allchin, F. M., and MacLagan, N. F. (1949). *Quart. J. Med.*, 18, 217.
 Hart, F. D. (1955). *Ann. rheum. Dis.*, 14, 77.
 Hilton, G. (1943). *Proc. roy. Soc. Med.*, 36, 608.
 Jaccoud, S. (1867). *Leçons de Clinique Médicale faites à l'Hôpital de la Charité*, p. 598. Paris.
 Launois, P. E. (1899). *Bull. Soc. méd. Hôp. Paris*, 16, 736.
 McWhirter, R. (1945). *Brit. J. Radiol.*, 18, 302.
 Mowbray, R., Latner, A. L., and Middlemiss, J. H. (1949). *Quart. J. Med.*, 18, 187.
 Paronen, I. (1948). *Acta med. scand.*, Suppl. 212.
 Piore, J. (1953). *Ibid.*, 144, 284.
 Polley, H. F., and Stocumb, C. H. (1947). *Ann. Intern. Med.*, 26, 240.
 Reiter, H. (1916). *Dtsch. med. Wschr.*, 42, 1535.
 Rolleston, G. L. (1947). *Brit. J. Radiol.*, 20, 288.
 Sharp, J. (1954). *Ann. rheum. Dis.*, 13, 15.
 — and Easson, E. C. (1954). *British Medical Journal*, 1, 619.
 Sherman, M. A. (1952). *J. Bone Jt Surg.*, 34A, 831.
 Smyth, C. J., Freyberg, R. H., and Lampe, I. (1941). *J. Amer. med. Ass.*, 117, 826.
 — and Peck, W. S. (1941). *Ibid.*, 116, 1995.
 Swaim, L. T. (1939). *J. Bone Jt Surg.*, 21, 983.
 Thomas, A. E. (1955). *Ann. rheum. Dis.*, 14, 259.
 Zewi, M. (1947). *Acta ophthal. (Kbh.)*, 25, 47.

M. G. P. STOKER: LATENT INFECTIONS WITH VIRUSES AND RICKETTSIAE



FIG. 1.—Culture of uninfected human carcinoma cells (strain HeLa). All preparations $\times 320$, stained haematoxylin.

FIG. 2.—Cytopathic change five days after infection with herpes virus. Note giant cell and cytoplasmic processes between cells.

FIG. 3.—Cytopathic change five days after infection with herpes virus; herpes antibody added to medium two hours after virus. Focal distribution of affected cells surrounded by apparently normal cells.

A. M. DESMOND AND B. F. SWYNNERTON: ADULT HYPERTROPHY OF PYLORUS

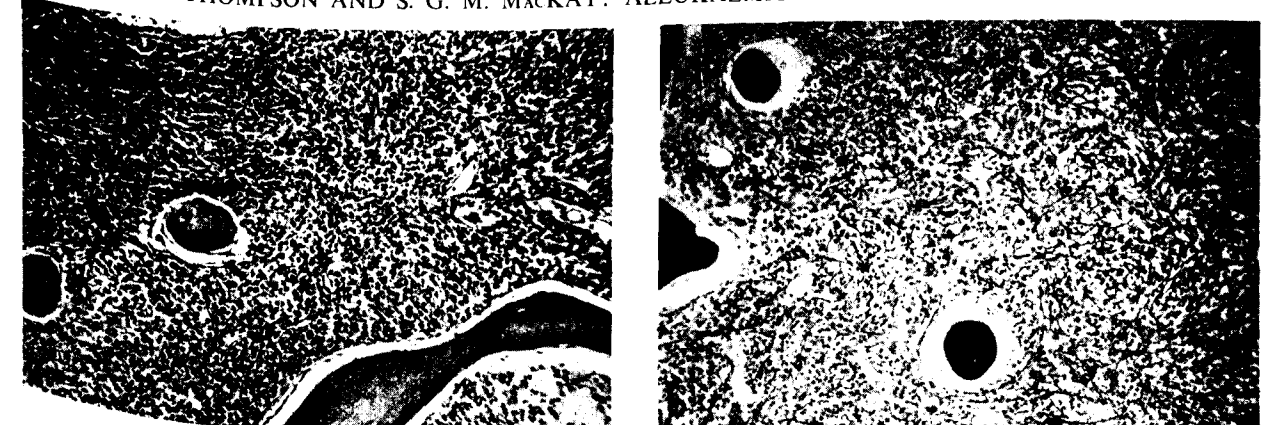


FIG. 1.—Elongation and narrowing of pyloric canal with surrounding soft-tissue shadow and duodenal bulbar impression. (Case 18.)



FIG. 2.—Elongation and narrowing of pyloric canal with proximal and distal impressions. Photomicrograph of tumour. ($\times 5$.) (Case 14.)

R. B. THOMPSON AND S. G. M. MACKAY: ALEUKAEMIC MYELOBLASTIC LEUKAEMIA



Sections of ribs to demonstrate (a) fibroblastic proliferation; (b) reticulin fibrils. ($\times 225$.)

J. S. SCOTT AND R. L. GADD: LOCAL ANALGESIA AND KIELLAND'S FORCEPS

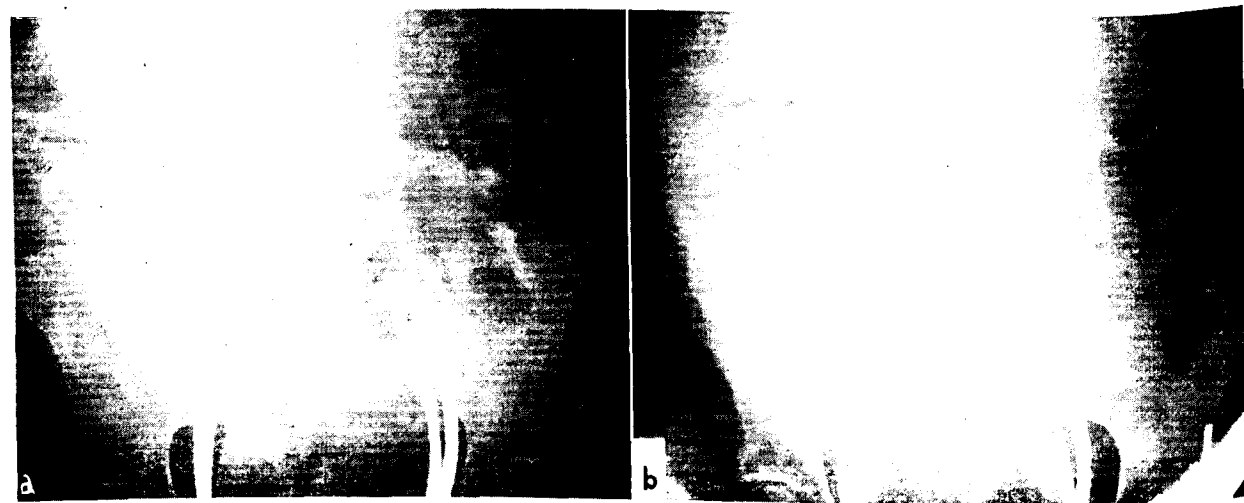


FIG. 1

FIG. 1.—Rotation of head through 180 degrees from right occipito-posterior (a) to left occipito-anterior position (b) by Kielland's forceps under local analgesia has been accompanied by complete rotation of spine. Patient was a primigravida and baby weighed 11 lb. (4.994 kg.).

FIG. 2.—Spine has rotated to anterior position with occiput, without traction or abdominal manipulation. Mechanical advantage obtained by rotation without displacement also demonstrated. (a) Forceps applied; (b) after rotation.

FIG. 3.—Direct application of anterior Kielland's blade between palmar surface of fingers and head, which is arrested in transverse position.

FIG. 4.—Brow presentation (a) which has become flexed to a vertex (b) during traction with Kielland's forceps.

(All illustrations from films taken during forceps delivery, under technical difficulties. Where necessary relevant skeletal features are outlined.)

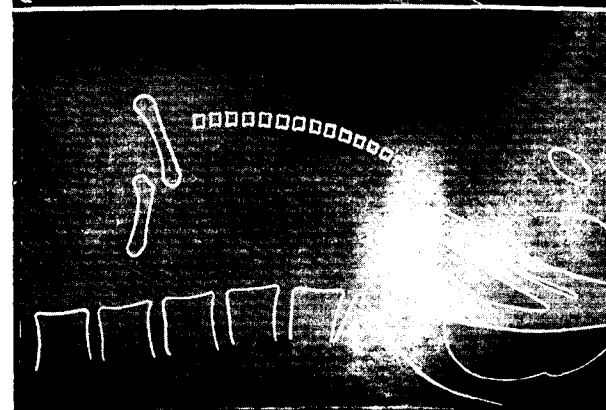
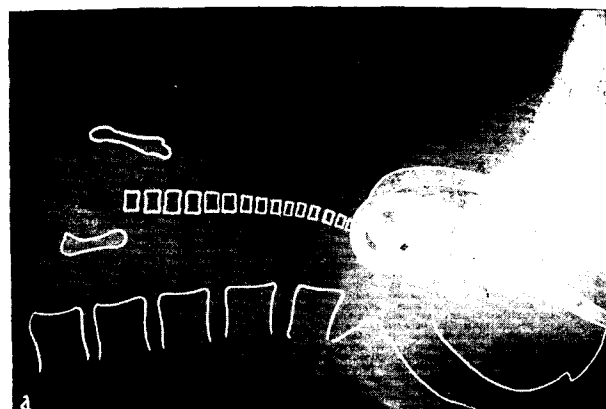


FIG. 2

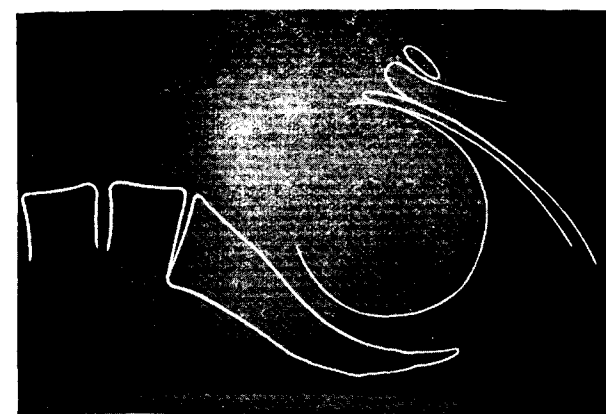


FIG. 3

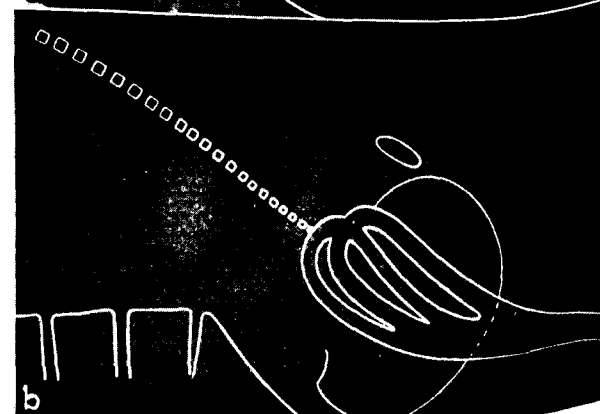
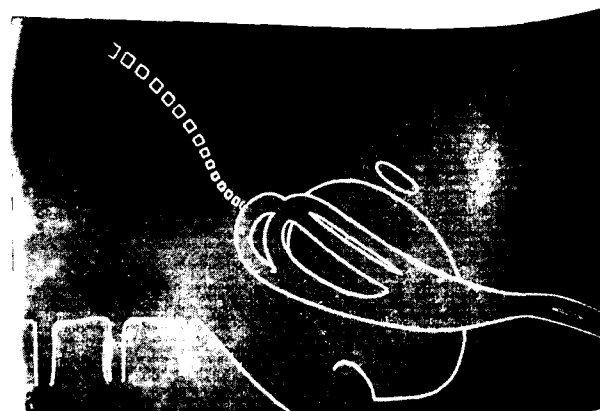


FIG. 4

J. SHARP: ANKYLOSING SPONDYLITIS

C. S. DARKE ET AL.: PULMONARY
ASPERGILLOSIS

FIG. 1.—Antero-posterior views of left sacro-iliac joints. a. Male aged 24 with typical ankylosing spondylitis, showing large erosions of joint surfaces and fluffy juxta-articular bone sclerosis. b. Female aged 42 with severe rheumatoid arthritis, showing erosions of lower parts of joints with slight sclerosis of adjacent ilium. c. Male aged 35, following recurrent rheumatic fever since age of 9, showing erosions of joint surfaces, slight juxta-articular bone sclerosis, and partial fusion. d. Male aged 34 with Reiter's disease, showing erosions of joint surfaces and juxta-articular bone sclerosis. Appearances in c and d are indistinguishable from those in ankylosing spondylitis.



Aspergillus fumigatus, showing characteristic fruiting body. (x525.)

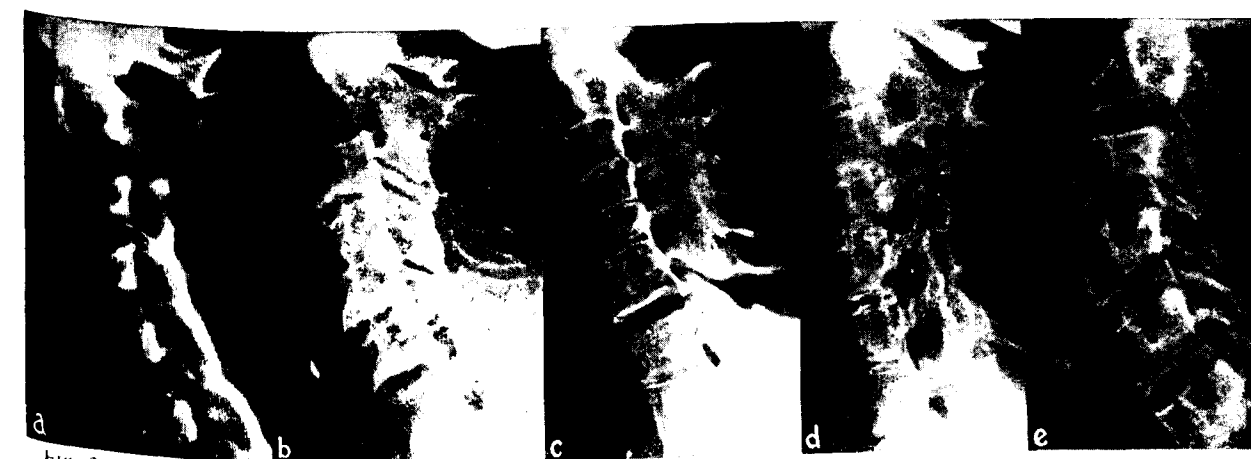


FIG. 2.—Lateral radiographs of cervical spine. a. Male aged 45 with advanced typical ankylosing spondylitis, showing ossification of margins of disks with retention of normal central disk spaces, "squaring" of vertebral bodies, and bony ankylosis of some apophyseal joints. b. Female aged 63 with severe rheumatoid arthritis, showing narrowing of multiple disk spaces with irregularity of adjacent vertebral plates and erosions and ankylosis of apophyseal joints. c. Female aged 24 whose rheumatoid arthritis started at age of 2, showing hypoplasia of vertebrae, gross narrowing of disk spaces, fusion of margins of adjacent vertebral bodies, and bony ankylosis of apophyseal joints. d. Same patient as Fig. 1c, showing hypoplasia of lower vertebrae, narrowing and ossification of disks, and bony ankylosis of apophyseal joints. e. Male aged 44 with Reiter's disease, showing ossification of both anterior longitudinal ligament and disk margins.

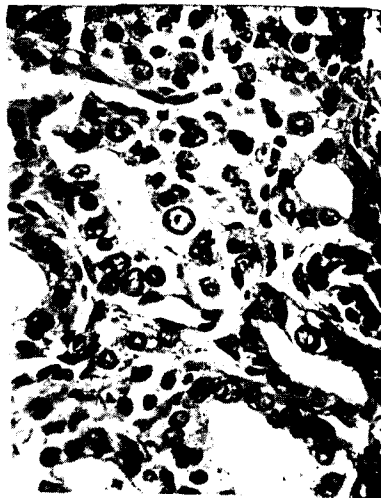


FIG. 3.—Lateral radiographs of lumbar spine. a. Male aged 52 with typical ankylosing spondylitis, showing osteoporosis, ossification of disk margins, "squaring" of vertebral bodies, and bony ankylosis of apophyseal joints. b. Patient illustrated in text. Appearances normal. Radiographs of cervical spine revealed bambooing of multiple disk spaces. c. Same patient as Figs. 1c and 2d, showing slight antero-posterior narrowing of vertebral bodies, narrowing of multiple disk spaces without osteophytosis, and small infarctions in upper two vertebrae surrounded by sclerosed bone. d. Same patient as Fig. 2e, showing massive new bone formation on anterior aspects of vertebral bodies and posterior articular processes.

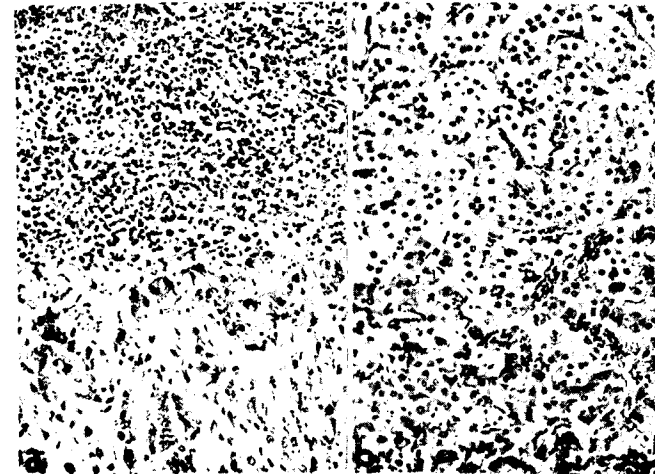
I. D. RILEY AND G. SCLARE: THYROID DISORDERS IN NEWBORN



FIG. 1.—Case 2: Showing enlargement of thyroid.

FIG. 2.—Case 2: Showing uniformly cuboidal lining cells with marked variation in size of their nuclei. (H. and E. $\times 400$.)FIG. 3.—Case 2: Showing unusually prominent stroma. (Masson's trichrome. $\times 55$.)

R. G. WELCH: ADDISON'S DISEASE

Sections of adrenal (a) from patient and (b) from healthy child of same age. ($\times 120$.)

S. COPE: FIBROSARCOMA OF AURICLE

Photomicrograph of section of tumour. ($\times 300$.)

M. ELLIS AND P. WINSTON: CAROTID-BODY TUMOUR



FIG. 1.—Tomograph of larynx, September 24, 1954. Left vocal cord relaxed.

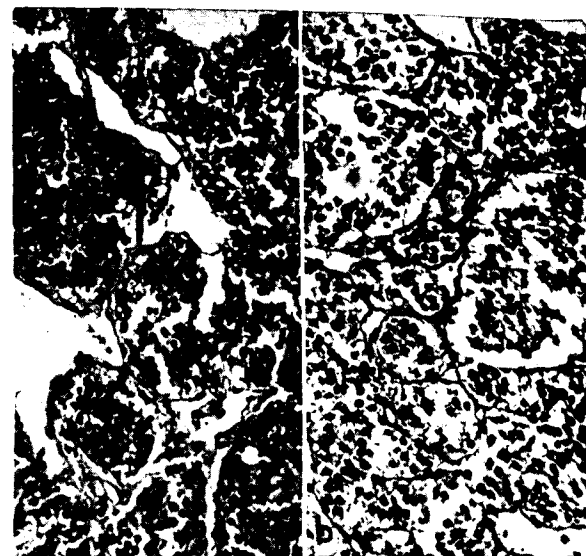
FIG. 2.—Photomicrographs of sections of tumour. (a, $\times 174$; b, $\times 190$.)

FIG. 3.—Tomograph of larynx, September 14, 1956. Left vocal cord unchanged.

THYROID DISORDERS IN THE NEWBORN

BY

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[WITH SPECIAL PLATE]

Disturbances of thyroid function in the newborn have been recorded at three periods in the history of thyroid disorder. The first cases were described before the discovery of the value of iodine prophylaxis in endemic areas, the second after its employment, and the third following the introduction of thiouracil. Three cases of this third type are described in the present paper.

Case 1

Male born normally at term on June 27, 1955. The mother, aged 28, was a primigravida and had had thyroidectomy for thyrotoxicosis in 1946. She was treated with 200 mg. of thiouracil daily for a recurrence in the same year. On January 5, 1955, she was not fully controlled on 100 mg. daily, and was admitted from March 31 to April 10 for stabilization. She was receiving 100 mg. daily at the time of her admission on June 9, and this was continued up to term.

The infant weighed 5 lb. 1 oz. (2.296 kg.) at birth. Nothing abnormal was detected, there being no goitre. On the eighth day, when there was very slight thyroid enlargement, he was noticed to be sweating profusely and to have developed a sweat rash. He was irritable, his conjunctivae were suffused, and there was no increase in weight for the first 13 days. He was pale and his skin was hot to the touch, but his appetite was good. The irritability increased and the temperature showed an intermittent fluctuation between 97° and 100° F. (36.1° and 37.8° C.). Lugol's iodine, 5 minims (0.06 ml.) twice a day, was given with phenobarbitone, $\frac{1}{4}$ gr. (8 mg.) twice daily, and the weight then rose steadily. He was sent home on the twenty-sixth day weighing 6 lb. 3 oz. (2.807 kg.).

Case 2

Male born six weeks prematurely on December 16, 1954. The mother, aged 34, a primigravida, had been treated for thyrotoxicosis with methyl thiouracil, 100 mg. daily, and laevothyroxine, 0.1 mg. daily. Seven days before delivery, in spite of a tachycardia of 90 per minute, it was decided not to increase the thiouracil for fear of the effect on the foetus.

The infant weighed 4 lb. 4 oz. (1.927 kg.), and was cold and cyanosed with visible enlargement of the thyroid (Special Plate, Fig. 1). Next day the blood urea was 30 mg. and the blood cholesterol 104 mg. per 100 ml. By December 24 there was a tachycardia and the skin was moist and clammy. The baby was tremulous and hyperactive and had an irregular fever, mainly from 97° to 99° F. (36.1°–37.2° C.), but reaching 102° F. (38.9° C.) on one occasion. Cyanotic attacks developed with diminished air entry in the right lung, thought to be due to aspirated feeds. A week later, although no weight had been gained, he was no longer hyperactive and the thyroid was a little smaller, but he regained the hyperactivity and became very thin. The blood cholesterol on January 8, 1955, was 124 mg. per 100 ml. Lugol's iodine, 5 minims (0.3 ml.) three times a day, was

started on January 21, but death occurred next day, when the infant's weight was 4 lb. 1½ oz. (1.856 kg.).

Necropsy showed the thyroid to be uniformly enlarged and to weigh 10 g. (see photograph). The gland was firm and its cut surface of fleshy appearance.

Histology.—Although the interval between death and necropsy was 60 hours, autolytic changes were inconspicuous. The thyroid follicles varied little in appearance from one part of the gland to another. They were small, of irregular outline, and had a scanty colloid content which, in a very few instances, showed a solitary central vacuole. The lining cells were uniformly cuboidal, but there was marked variation in the size of their nuclei (Special Plate, Fig. 2). The stroma was unusually prominent (Special Plate, Fig. 3).



The uniformly enlarged thyroid found at necropsy in Case 2, compared with a normal gland.

Case 3

Male born normally at term on June 26, 1944. The mother, aged 29, a primigravida, developed thyrotoxicosis during pregnancy and was treated with 200 mg. of thiouracil five times a day from April 27, 1944, reduced to three times daily on May 25 and to twice a day on May 30. For three weeks before delivery thiouracil was discontinued.

The infant weighed 6 lb. 1½ oz. (2.764 kg.) at birth. There was visible enlargement of the right lobe of the thyroid at this time, and it was remarked that the baby was "hypothyroid" in appearance. Tube feeding was employed, but frequent vomiting occurred, and on July 3 loose stools began to be passed. Death ensued on July 9.

Necropsy showed the body to be emaciated, with loss of nearly all subcutaneous and body fat. Histologically the thyroid was devoid of colloid, and the follicles were partially or totally occupied by desquamated epithelial cells. Nuclear variation of the type seen in Case 2 was not present.

Discussion

Endemic goitre in the newborn was first described by Fodere in 1796, and since that time many cases have been reported. In 1935 the condition was present in 50% of all newborn babies in Switzerland and accounted for 10% of the neonatal mortality in Freiburg im Breisgau (Aschoff, cited by Parmelee *et al.*, 1940). It is probable that both heredity and iodine deficiency are factors in the production of the condition, as it has become less common since prophylaxis with iodine came into use. Sporadic cases have also been reported with some frequency, and the clinical picture is similar. The mother usually, but not always, has a simple goitre, and the infant, as a rule, a nodular goitre. This may be so large as to cause death from respiratory obstruction (Peterson, 1911; Williamson, 1933; Mitchell and Struthers, 1933; Davies, 1943; Kunstadter, 1948; Seligman and Pescovitz, 1950; Schiffrin and Hurwitt, 1951; Jones, 1951).

Thyrotoxicosis in the newborn was first described by White (1912); he had suspected the condition to be present before birth in the foetus of a thyrotoxic mother. Such cases are rare (Margetts, 1950). Goitre in the offspring of mothers who have received iodine either for goitre (Vérel, 1949; Skinner, 1924) or for some other condition (Parmelee *et al.*, 1940) has been reported. These goitres were transitory and diffuse rather than nodular.

Since the introduction of thiouracil it has been found that mothers treated with this drug may give birth to babies with goitres (Hubble, 1956). The babies may be otherwise normal or show signs of either myxoedema or hyperthyroidism. The condition usually subsides in a few weeks without treatment, but subsequent myxoedema has been reported (Elphinstone, 1953; Morris, 1953) and death has been known to ensue (Keynes, 1952). Such a goitre has been found in a six-months foetus at necropsy (Davis and Forbes, 1945), and it has also been seen in twins (Saye *et al.*, 1952). The goitre is usually diffuse, and on section hyperplasia with absence of colloid is seen. It is noteworthy that the histological appearances in our Case 2 are comparable in many ways with those seen in adult thyrotoxicosis, whereas many previous reports described hyperplasia of a type that commonly occurs in the normal newborn infant (Sclaire, 1956). A raised level of protein-bound iodine was found by Bongiovanni *et al.* (1956). There does not appear to be any relation between the type of lesion in the mother and that in the child. Normal or goitrous mothers may give birth to normal or goitrous infants, and signs of toxicity may be present or absent in either (Eaton, 1945; Fischer, 1951; Salm, 1954; Koerner, 1954; Scarizza, 1954).

Investigations related to the problem include the discovery that the serum iodine level rises during pregnancy (Man *et al.*, 1951; Cooke and Man, 1956) and that the foetal thyroid has a greater affinity for iodine than that of the adult. It has also been shown that maternal thyrotropic hormone cannot pass the placenta (Nikitovitch and Knobil, 1955), but that thyroid hormone and thiouracil can do so (Freiesleben and Kjerulf-Jensen, 1947; Frisk and Josefsson, 1947). From these facts it would appear that thiouracil acts by depressing foetal thyroxine formation, thus inducing production of foetal thyrotropic hormone which in a few days leads to thyrotoxicosis. It is, however, probable that a hereditary factor also operates, and this might explain instances of identical disorders in mother and child.

The most important clinical question is to what extent the mother's thyrotoxicosis may be controlled without producing damage to the foetal thyroid. This is probably best answered by maintaining the protein-bound iodine above the normal level, and by substituting iodine for the thiouracil some weeks before delivery (Keynes, 1952); but the evidence for the value of this manoeuvre is not conclusive, as the third case of the present series would suggest. Certainly if the condition of the mother demands thiouracil, the drug should not be discontinued.

Two of the three cases described here ended fatally, which suggests that the danger to the infant is substantial. Despite its failure in Case 2, iodine is probably the best drug to administer to the infant. Studies of the radioactive iodine uptake would help to elucidate the condition, but the danger at such an age renders the method inadvisable.

Summary

Three cases of goitre in the newborn are reported. In all three cases the mother had during pregnancy received treatment with thiouracil for thyrotoxicosis. Two of the infants died. The post-mortem appearances are described and illustrated.

The aetiology is discussed, and the question of treatment is reviewed in the light of cases described previously.

REFERENCES

- Bongiovanni, A. M., Eberlein, W. R., Thomas, P. Z., and Anderson, W. B. (1956). *J. clin. Endocr.*, 16, 146.
Cooke, R. E., and Man, E. B. (1956). *Pediatrics*, 17, 617.
Davies, J. R. (1943). *J. Pediatr.*, 22, 570.
Davis, L. J., and Forbes, W. (1945). *Lancet*, 2, 740.
Eaton, J. C. (1945). *Ibid.*, 1, 171.
Elphinstone, N. (1953). *Ibid.*, 1, 1281.
Fischer, P. M. S. (1951). *S. Afr. med. J.*, 25, 217.
Fodere, F. E. (1956). *Ueber den Kropf und den Cretinismus*. C. F. Himburg, Berlin.
Freiesleben, E., and Kjerulf-Jensen, K. (1947). *J. clin. Endocr.*, 7, 47.
Frisk, A. R., and Josefsson, E. (1947). *Acta med. scand.*, Suppl. 196, 85.
Hubble, D. (1956). *British Medical Journal*, 1, 875.

- Jones, D. B. (1951). *Amer. J. Path.*, 27, 85.
Keynes, G. (1952). *J. Obstet. Gynaec. Brit. Emp.*, 59, 173.
Kunstadter, R. H. (1948). *J. Pediatr.*, 32, 711.
Koerner, K. A. (1954). *Ibid.*, 45, 464.
Man, E. B., Heinemann, M., Johnson, C. E., Leary, D. C., and Peters, J. P. (1951). *J. clin. Invest.*, 30, 137.
Margetts, B. M. (1950). *Proc. roy. Soc. Med.*, 43, 615.
Mitchell, D. S., and Struthers, R. R. (1933). *Canad. med. Ass. J.*, 28, 27.
Morris, D. (1953). *Lancet*, 1, 1284.
Nikitovitch, M., and Knobil, E. (1955). *J. clin. Endocr.*, 15, 837 (abstract).
Parmelee, A. H., Allen, E., Stein, I. F., and Buxbaum, H. (1940). *Amer. J. Obstet. Gynec.*, 40, 145.
Peterson, E. W. (1911). *Arch. Pediatr.*, 28, 142.
Salm, R. (1954). *J. Obstet. Gynaec. Brit. Emp.*, 61, 831.
Saye, E. B., Watt, C. H., Foushee, J. C., and Palmer, J. I. (1952). *J. Amer. med. Ass.*, 149, 1399.
Scarizza, P. M. (1954). *Minerva pediat. (Torino)*, 6, 433.
Schiffrin, N., and Hurwitz, E. S. (1951). *J. Pediatr.*, 39, 597.
Sclaire, G. (1956). *Scottish med. J.*, 1, 251.
Seligman, B., and Pescovitz, H. (1950). *N.Y. State J. Med.*, 50, 1845.
Skinner, H. H. (1924). *J. Amer. med. Ass.*, 82, 1190.
Vérel, D. (1949). *British Medical Journal*, 1, 892.
White, C. (1912). *J. Obstet. Gynaec. (Lithuania)*, 21, 231.
Williamson, G. R. (1933). *J. Pediatr.*, 2, 458.

ADDISON'S DISEASE IN A NINE-YEAR-OLD GIRL

BY

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[WITH SPECIAL PLATE]

The purpose of this paper is to record a further example of Addison's disease in a child—a very rare occurrence—and to draw attention yet again to the great change in the nature of the usual underlying pathological process that has taken place in the past ten years, coincident with, and probably resulting from, the high degree of control of tuberculosis now achieved.

Report of Case

The patient was a girl aged 9½ years, the second of four children, the parents and the other children all being healthy. A few weeks after a mild attack of mumps she gradually became listless, felt weak, and lost her appetite. There were frontal headaches, especially on waking, and occasional epigastric pains. Giddiness on standing, stiffness and aching of the limbs, vomiting, and occasional double vision followed in a month or so with loss of weight. After four months, too weak even to get out of bed, she was admitted to hospital. She was ill, pale, and thin, but the only other findings were a slight evening pyrexia and a rapid sleeping pulse rate (about 110 per minute). B.P. 100/60 mm. Hg; E.S.R. 7 mm. in one hour; Hb 102%; W.B.C. 8,900 per c.mm. (lymphocytes 65%, monocytes 2.5%, neutrophil polymorphs 25%, and eosinophil polymorphs 6.5%). Mantoux 1:1,000 negative. Chest radiograph clear (a small heart shadow). Cerebrospinal fluid normal except for a chloride value of 670 mg. per 100 ml.

An intracranial tumour was considered and the patient was transferred to St. Thomas's Hospital. At this time a general increase in pigmentation was noticed, including a pigmented spot on the lip. She was very miserable, and lay curled up in her bed, moaning quietly. She drank fluids, but refused nearly all solids (in retrospect, the only foods she enjoyed throughout her illness were salty), and vomited daily. B.P. 105/80 mm. Hg. The electroencephalograph (E.E.G.) was abnormal; there were theta waves at 7 c.p.s. and fast activity at 20 c.p.s., seen in leads from all areas, but the record was dominated by asymmetrical irregular high-voltage (150–200 μ V) slow waves at 2–3 c.p.s., of greatest amplitude in leads from the left cerebral hemisphere, and of lower frequency posteriorly. The E.S.R. was now 32 mm. in one hour.

The pigmentation increased rapidly over the next few days, and Addison's disease was considered. The day before

she died her blood pressure was 100/70 mm. Hg. Three hours after this was taken she collapsed and became pulseless. The plasma electrolyte values (in mEq per litre) were: sodium 119, potassium 5, chloride 94, and bicarbonate 24; blood sugar 80 mg. per 100 ml.; P.C.V. 44 c.cm. per 100 ml. She was given glucose saline containing hydrocortisone and noradrenaline intravenously and deoxycortone acetate (D.C.A.) and cortisone intramuscularly, but despite the administration of 120 mg. hydrocortisone, 100 mg. cortisone, 3 mg. D.C.A., and nearly 5 mg. noradrenaline in the next 23 hours the blood pressure never rose above 70/40 mm. Hg and she never became conscious. Three hours before death the plasma electrolyte values (in mEq per litre) were: sodium 124, potassium 5.2, chloride 100, bicarbonate 18; the P.C.V. was now 32 c.cm. per 100 ml. and the blood sugar 158 mg. per 100 ml.

Necropsy (Dr. H. Spencer) showed leaflike adrenals (30×10×1 mm.) each weighing about 0.75 g., which on cutting had no recognizable cortex. Histologically they showed adrenal atrophy (see Special Plate). No inclusion bodies could be seen. Apart from two small areas of perivascular lymphocytic cuffing on the outer part of the lentiform nucleus of the brain and chromatolytic changes in a few nerve cells of the pons and medulla, there were no other histological or anatomical changes of note.

Comment

This history of increasing weakness and loss of energy, of vomiting, loss of appetite, and wasting, and the development

of pigmentation, is characteristic of the condition which, untreated, progresses to a fatal crisis, precipitated perhaps by infection, trauma, surgery, or drugs such as morphine or the barbiturates, to which these patients are particularly sensitive. An increased liking for salt is often found—it occurred in 13 of the cases quoted in the accompanying table. The blood pressure may, as here, remain normal until the onset of the crisis. Lymphocytosis and eosinophilia, reflecting perhaps the low secretion of glucosteroids, are noted occasionally. The E.E.G. record showing diffuse high-voltage slow activity waves is typical.

Discussion

Jaudon (1946) found reports in the world literature of 62 proved cases of Addison's disease in children under 15 years, all but 13 of them being over 10 years. The underlying condition was tuberculosis in 53, atrophy in five, and "not demonstrated" in one, whilst in three the symptoms complicated hyperplasia of the androgen-secreting cells of the foetal cortex—mixed adrenal disease, a relatively more common condition best considered apart. Since then reports of a further 29 cases of uncomplicated Addison's disease have appeared, 22 in boys. The details are shown in the table.

Thus, including this present case, adrenal atrophy was the cause in 11 (55%) of the 20 proved cases, hypoplasia in four, and tuberculosis in only two (10%). In the 10 cases where the aetiology was less certain, only one had definite evidence of tuberculosis. Talbot *et al.* (1952) found tuber-

Summary of 29 Cases of Addison's Disease in Children Reported since 1946

	Sex	Age at Onset	Length of Illness	Pathology	Associated Conditions	Comments
Sikl (1948)	M	3 weeks	2 weeks	Hypoplasia (P.M.)		Treated from 7 months
Geppert, Spencer, and Richmond (1950)	M	Birth	20 months	" "		
Deamer and Silver (1950)	M	" "	10 "	" "		Survives. "Treated" from 18 months
Moore and Cermak (1950)	M	Few months	4 years +	Probably hypoplasia		Treated with D.C.A.
Provenzano (1950)	M	2 weeks	7 months	Adrenal cysts (P.M.)		Responded to A.C.T.H. at first
Garraban, Sampayo, and Di Pietro (1952)	M	Birth	24 days	Hypoplasia (P.M.)		
O'Donnell (1950)	M	16 months	5 months	Atrophy (P.M.)		
White and Sutton (1950)	M	20 "	7 "	" "		
Mautner (1954)	F	2½ years	2 days	Fibrosis and calcification (P.M.)		Negro child. Septicaemia aged 1 month; normal then until crisis precipitated by otitis media
Russell and Potter (1951)	M	4½ "	12 hours	Calcification, cause not known (P.M.)	Internal hydrocephalus	Mentally and physically retarded. Sudden death in crisis precipitated by mild illness
Bickel and Stamm (1948)	F	7 "	7 months	Atrophy (P.M.)	Followed severe impetigo	Pigmented scar aged 4 months after vague febrile illness at 2 months. Retarded growth. Crisis at 9 years. Survives on treatment
Beasman (1948)	M	5 "	3 "	" "		Presented as hypoglycaemia
Burdick, Warthen, Cassidy, and Welsh (1950)	M	5½ "	6 "	" "		Sister has thrush and Addison's disease
Craig, Schiff, and Boone (1955)	M	6½ "	3 "	" "	Monilia; 7 hypoparathyroidism; pneumonia, empyema	Brother with monilia, coeliac disease, and hypoparathyroidism
Leonard (1946)	F	10 "	2 years	" "	Monilia at 2½ years; 7 coeliac disease at 4½ years; hypoparathyroidism at 6 years	No parathyroids found at necropsy
Broch (1946)	F	10½ "	18 months	" "	Monilia at 3½ years; 7 hypoparathyroidism from 5½ years	
Laplane and Fritel (1948)	M	14 "	6 "	" "		Pigmentation only for 18 months and then fatal crisis
Correa and Piers (1952)	F	12 "	18 "	Tuberculosis (P.M.)		
Mouriquand, Dechavanne, and Laugel (1951)	F	11½ "	4 "	" "	Heart failure	After 4 months' treatment developed faintly positive Mantoux reaction, shortly before death. No other evidence of tuberculosis
Demirag (1947)	M	13 "	9 "	Unknown; probably non-tuberculous		
Mathiesius (1947)	M	11 "	2 years +	Unknown; no evidence of tuberculous infection	Chronic malaria	
Briggs, Goodwin, and Wilson (1951)	M	8 "	3 "	" "		Presented at age 10 with 3-year history of illness. Stunted growth
Patzrowa (1953)	M	12 "	6 months +	Unknown; probably atrophy, possibly tuberculosis		One year later 17-year-old brother died in 5 weeks of adrenal atrophy. Calcified abdominal glands
Papadatos and Klein (1954)	M	10 "	" "	Unknown; no evidence of tuberculosis	Hypoparathyroidism at 5½ years	
Bernheim and François (1953)	F	12 "	3 "	Unknown; no evidence of tuberculous infection		
Stanton, Jones, and Marble (1954)	M	10 "	2 years +	Probably tuberculosis	Diabetes mellitus at 2½ years	Aetiology not considered at all by authors

culosis to be a factor in only one of nine cases known to them. In so far, therefore, as can be judged from the evidence of published case reports, tuberculosis has now been displaced from its position as the commonest cause of Addison's disease in childhood, and atrophy must account for at least half the cases of this condition. A similar trend has been seen in adults in recent years. In adults atrophy is more common in the female, yet in these recently reported cases in children the reverse is true, a fact Jaudon (1946) also noted.

As to the cause of adrenal atrophy (adrenocortical contraction) nothing definite is known. The histological picture is clear-cut (Guttman, 1930): the parenchymal cells degenerate and disappear, shrinking away from the undamaged reticulum framework, which in time collapses, leaving no trace of the columnar zonal pattern. Both cortex and, to a lesser extent, medulla are infiltrated with lymphocytes, and there is usually no cicatricial or productive fibrosis. The condition has occurred in members of the same family—definitely in one case (Craig *et al.*, 1955), probably in two more (Briggs *et al.*, 1951; Smith and Higgins, 1952). It can be associated with disorder in other endocrine glands. Of these 11 proved examples of adrenal atrophy, clinical hypoparathyroidism was present in two and strongly suspected in two more. In two of the surviving cases where atrophy was suspected there is a further example with associated hypoparathyroidism and one with diabetes mellitus, the 47th example in the literature (Stanton *et al.*, 1954). In adults Addison's disease, particularly (but not always) when due to adrenal atrophy, has been found in association with both hypothyroidism and hyperthyroidism (Sorkin, 1949). Changes in the pituitary are found in Addison's disease from all causes, being secondary to the adrenal hypofunction. The adrenal changes in hypopituitarism are quite distinct from those of adrenocortical contraction (Crooke and Russell, 1935).

In the particular instance reported here the onset after mumps is of interest when one considers the effect of the mumps virus on testis, ovary, and pancreas. No inclusion bodies, however, can be seen on microscopy. The only other suggestions that this selective destruction of parenchymal cells might be viral in origin are from Weiner (1936), who found intranuclear inclusions in a case of atrophy in a middle-aged woman, and Friedman (1948) and others, who have noted a resemblance between the changes in this condition and those of certain liver diseases, particularly hepatitis—allowing for the different natures of the organ—and that there was some correlation in the rise in incidence of both conditions as seen at the United States Army Institute of Pathology. Yet, on the whole, it seems more likely that the relationship in time between the mumps and the onset of the child's final illness is only a coincidence.

Summary

A fatal case of Addison's disease due to atrophy of the adrenals in a girl of 9 years is reported. The picture of progressive weakness and listlessness, of vomiting and anorexia, and the development of pigmentation is typical of the condition. Until the onset of crisis her blood pressure was normal.

The recent literature on Addison's disease in children is reviewed. In the past ten years more than one-half of the cases reported with a known pathology have been due to atrophy of the adrenals (adrenocortical contraction) and only one-tenth to tuberculosis—a great change from the findings in a previous review of this subject. Over one-third of the cases showed evidence of a craving or increased liking for salt.

I wish to thank Dr. J. Forest Smith and Dr. John Anderson for permission to publish details of this case admitted under their care; Dr. H. Spencer and Dr. J. D. Pollitt for permission to quote from their reports; and my colleagues who gave their help and advice.

- REFERENCES
- Bernheim, M., and François, R. (1953). *Pédiatrie*, 42, 357.
 Bessman, S. P. (1948). *Clin. Proc. Child. Hosp. (Wash.)*, 5, 173.
 Bickel, H., and Stamm, O. (1948). *Helv. paediat. Acta*, 3, 53.
 Briggs, J. N., Goodwin, J. F., and Wilson, A. (1951). *British Medical Journal*, 1, 115.
 Broch, O. J. (1946). *Acta med. scand.*, 125, 371.
 Burdick, W. F., Warthen, R. O., Cassidy, J. E., and Welsh, W. W. (1950). *Amer. J. Dis. Child.*, 80, 975.
 Correa, O., and Piers, A. (1952). *Rev. chil. Pediatr.*, 23, 110.
 Craig, J. M., Schiff, L. H., and Boone, J. E. (1955). *Amer. J. Dis. Child.*, 89, 669.
 Crooke, A. C., and Russell, D. S. (1935). *J. Path. Bact.*, 40, 255.
 Deamer, W. C., and Silver, H. K. (1950). *J. Pediatr.*, 37, 490.
 Demirag, B. (1947). *Ann. paediat. (Basel)*, 169, 65.
 Friedman, N. B. (1948). *Endocrinology*, 42, 181.
 Garrahan, J. P., Sampayo, R. R. L., and Di Pietro, A. (1952). *Arch. argent. Pediatr.*, 37, 220.
 Geppert, L. J., Spencer, W. A., and Richmond, A. M. (1950). *J. Pediatr.*, 37, 1.
 Guttman, P. H. (1930). *Arch. Path. (Chicago)*, 10, 742, 895.
 Jaudon, J. C. (1946). *J. Pediatr.*, 28, 737.
 Laplane, R., and Fritel, D. (1948). *Arch. franc. Pédiat.*, 5, 282.
 Leonard, M. F. (1946). *J. clin. Endocr.*, 6, 493.
 Mathesius, V. J. (1947). *Pediat. Listy*, 2, 160.
 Mautner, H. (1954). *Ann. paediat. (Basel)*, 58, 354.
 Moore, F. P., and Cermak, E. G. (1950). *J. Pediatr.*, 36, 91.
 Mouriquand, G., Dechavanne, D., and Laugel, J. (1951). *Pédiatrie*, 40, 67.
 O'Donnell, W. M. (1950). *Arch. intern. Med.*, 86, 266.
 Papadatos, C., and Klein, R. (1954). *J. clin. Endocr.*, 14, 653.
 Patzerowa, T. (1953). *Pediat. pol.*, 28, 416.
 Provenzano, R. W. (1950). *New Engl. J. Med.*, 242, 87.
 Russell, A., and Potter, C. T. (1951). *Proc. roy. Soc. Med.*, 44, 957.
 Sikl, H. (1948). *J. Path. Bact.*, 60, 323.
 Smith, T. W., and Higgins, A. R. (1952). *Milit. Surg.*, 110, 180.
 Sorkin, S. Z. (1949). *Medicine*, 28, 371.
 Stanton, E. R., Jones, H. W., and Marble, A. (1954). *Arch. intern. Med.*, 93, 911.
 Talbot, N. B., Sobel, E. H., McArthur, J. W., and Crawford, J. D. (1952). *Functional Endocrinology from Birth through Adolescence*, p. 195. Harvard Univ. Press, Cambridge, Mass.
 Weiner, H. A. (1936). *Amer. J. Path.*, 12, 411.
 White, F. P., and Sutton, L. E. (1950). *J. Pediatr.*, 37, 778.

AN UNUSUAL CASE OF CAROTID-BODY TUMOUR

BY

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[WITH SPECIAL PLATE]

Aberrant parasympathetic nervous tissue often occurs near the great vessels of the neck. From this tissue a tumour called non-chromaffin paraganglioma may arise, sometimes near the bifurcation of the common carotid artery, where it is known as a carotid-body tumour, or occasionally near the exit from the skull of the internal jugular vein, where it is given the name of glomus jugulare tumour. These tumours are characteristically extremely vascular, and the carotid-body tumour is, in addition, closely attached to one or other of the carotid vessels by vascular connexions as well as adhesions, often simulating an aneurysmal dilatation. Excision of such a tumour may be impossible without also resecting a length of the adherent vessels.

As the tumour increases in size, pressure on neighbouring structures may occur, particularly the vagus and hypoglossal nerves and the sympathetic nerve trunk. The internal jugular vein is more often pushed aside than invaded. Harrington *et al.* (1941) state that 40–50% of carotid-body tumours become malignant, but Lahey and Warren (1947) consider this estimate is much too high. Metastases to cervical lymph nodes may occur, and very occasionally distant metastases.

The interesting and unusual features of the case now recorded are the extent of invasion and destruction of the internal jugular vein together with pressure atrophy of the vagus nerve, without any close relationship or adherence to the carotid vessels.

Case Report

A married woman aged 37 had two years previously, possibly following an attack of influenza, noticed a swelling develop in the left side of her neck. There were no other symptoms. She attended a local hospital, where in May, 1953, an enlarged lymph node was removed. Histological

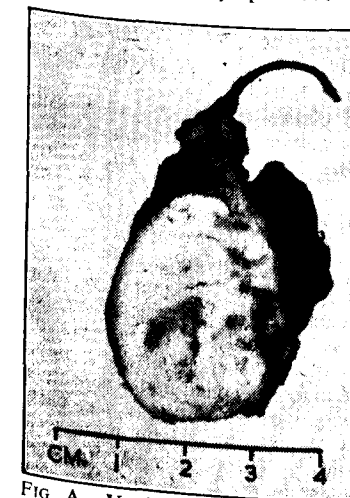


FIG. A.—Vertical section of tumour.

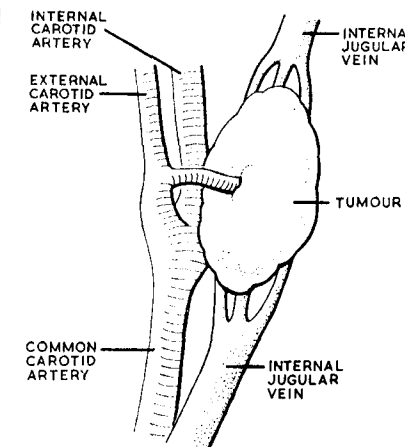


FIG. B.—Diagram showing anatomical relations of tumour.

examination showed sinus catarrh, and there was no evidence of granulomatous or malignant disease. At the same time nothing abnormal was found in the upper respiratory tract. Within two weeks the swelling recurred under the scar, and the patient thinks that her voice became husky at about the same time.

She first attended the Royal National Throat, Nose and Ear Hospital on September 24, 1954. Her voice was then weak and very slightly hoarse. Under a puckered scar 3 cm. long and running obliquely in the left side of the neck at the level of the upper border of the thyroid cartilage was a swelling about the size of a large walnut. It was smooth, firm, and painless on palpation, and not pulsatile, although it transmitted pulsation. There was no bruit. The lump was partly overlapped by the anterior margin of the left sternomastoid muscle, and was mobile laterally but not in a vertical plane. There were no other palpable swellings in the neck. The tonsils were healthy, and the remainder of the upper respiratory tract was normal except for the left vocal cord, which was completely paralysed and was situated close to the mid-line at a lower level than the right vocal cord. Tomograms of the larynx showed the relaxed condition of the left vocal cord (Special Plate, Fig. 1), but no other abnormality. A radiograph of the chest was normal. A very slight secondary anaemia and also a slight rise in the erythrocyte sedimentation rate were present, but neither was considered significant. Bronchoscopy and oesophagoscopy revealed nothing abnormal.

An exploratory operation was performed on November 1, 1954. The swelling was found in the anterior triangle, partly covered by the sternomastoid muscle, which was adherent to it. A smooth, pale grey swelling was then clearly defined lateral to the bifurcation of the common carotid artery and very slightly adherent to it and to the external carotid artery. The mass was ovoid in shape, and measured 5 by 3 cm., with its long axis in the vertical plane (Fig. A). There was a communicating vessel between the tumour and the external carotid artery. The striking feature, however, was the absence of a definite internal jugular vein. This was replaced by several small vessels

which entered and left the tumour, as shown diagrammatically in Fig. B, but this position was not disclosed until after considerable dissection. The vagus nerve was not identified. The artery of supply and all the venous connexions were ligated and divided and the tumour removed. A small lymph node adherent to it was also excised. The wound healed soundly, convalescence was uneventful, and the patient left hospital ten days later. The histological report (Dr. I. Friedmann) was: "A large gland-like tumour. Sections show a well-encapsulated vascular tumour consisting of groups of epithelial cells with poorly defined boundaries closely associated with the vascular spaces and stroma (Special Plate, Fig. 2). The growth belongs to the paragangliomata, and in view of its site is a so-called carotid-body tumour." The lymph node contained no evidence of neoplasm or tuberculosis.

There has been no sign of recurrence of the growth (April, 1957), though the vocal cord has remained paralysed (Plate, Fig. 3).

Comment

The paragangliomata associated with the great vessels of the neck differ markedly in their characteristics and natural history, depending on their site. In the middle of the neck the tumour is usually well defined and encapsulated and adherent to the carotid arteries; higher in the neck it is more diffuse and related to the internal jugular vein and jugular bulb. In the case described above a half-way position has been observed in which the tumour was situated in the middle of the neck and encapsulated, although related almost entirely to the internal jugular vein.

There seems to be no reason why it should not sometimes assume this character, but curiously enough no previous record has been found in the literature. The absence of the usual dense adherence to the carotid vessels facilitated excision, but the close connexion with the internal jugular vein leading to its disruption as an entity was probably responsible for the early onset of pressure on the vagus nerve and paralysis of the vocal cord.

Summary

A case of carotid-body tumour is described in which there was extensive invasion and destruction of the internal jugular vein but no close relationship or adherence of the tumour to the carotid vessels. The left vocal cord was completely paralysed. After surgical removal of the tumour there has been no recurrence, but the left vocal cord remains paralysed.

Our thanks are due to Mr. D. J. Connolly, of the Institute of Laryngology, for the preparation of the illustrations.

REFERENCES

- Harrington, S. W., Clagett, O. T., and Dockerty, M. B. (1941). *Ann. Surg.*, 114, 520.
 Lahey, F. H., and Warren, K. W. (1947). *Surg. Gynec. Obstet.*, 85, 281.

The smoking habits of English schoolboys were discussed at a recent meeting of the Royal Society of Health. Mr. RONALD W. RAVEN, F.R.C.S., had analysed material collected by the Marie Curie Memorial Foundation from the heads of 141 schools. "The problem is a serious one," he said, "and the habit is widespread in secondary and grammar schools. The habit starts as early as 8 years and a few of these boys tend to become regular smokers. In some primary schools smoking is a difficult problem with the 9- and 10-year-old group, but the more 'inveterate addicts' are in the 13- and 15-age group. The percentage of regular boy smokers is increasing; one headmaster found that at 14 and over half the boys are confirmed smokers."

PULMONARY ASPERGILLOSIS

REPORT OF A CASE

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[WITH SPECIAL PLATE]

A century has elapsed since Virchow (1856) first reported the post-mortem findings of pulmonary aspergillosis, and many cases of this disease have subsequently been described. While pulmonary aspergillosis as a primary infection remains a rare and mainly occupational disease, its occurrence as a fatal complication of bacterial infections of the lung treated with antibiotics has become important with the increasing use of these agents for the treatment of pulmonary diseases. Fatal cases have recently been described by Abbott *et al.* (1952) and by Rankin (1953), although in the latter instance agranulocytosis and a monilial infection were also present. The object of this report is to describe another case of aspergillosis which proved fatal, and to suggest that it is an example of secondary rather than primary infection.

Case History

A male road worker aged 63 was admitted to hospital on the 18th day of a respiratory infection. The illness began acutely with fever, cough, and left pleuritic pain, and initial treatment was with sulphonamides. There was some response, but later a relapse set in with increasing breathlessness and right-sided pleurisy. A routine chest radiograph taken two years previously during investigation for schizophrenia showed calcified tuberculous lesions, moderate emphysema, and pleural thickening at the base of the right lung.

Clinical examination now indicated bronchopneumonia with a severe bilateral pleurisy, and a radiograph showed mottled opacities in the right lower lobe and base of the right upper lobe. Culture of the sputum, which was mucoid, yielded a heavy growth of *Streptococcus viridans* and a scanty growth of *Neisseria catarrhalis*. Pneumococcus Type XXVII was isolated by mouse inoculation. Blood culture was sterile.

Tetracycline, 0.5 g. six-hourly for 4 days and then 0.25 g. six-hourly for 8 days, was given. Despite this therapy the temperature ranged from 97.6 to 102° F. (36.4 to 38.9° C.) for the next 14 days. The general response was poor and quite unlike that expected in the ordinary case of pneumococcal infection. A chest radiograph taken eight days after admission showed the appearance of bronchopneumonia throughout the whole of the right lung with excavation in the upper lobe. Weakness, delirium, and a flushed facies developed, and 14 days after admission the sputum, which had remained essentially mucoid, became russet-brown and later black in colour. A further radiograph at this time showed progressive bronchopneumonic consolidation in the right lung with spread to the left upper lobe. Chloramphenicol, 2 g. followed by 0.5 g. six-hourly, was given by mouth for the next three days, and finally one intramuscular injection of 200 mg. of pentamidine as

well as potassium iodide by mouth. Mental confusion and early heart failure developed shortly before the patient's death 19 days after admission and on the 37th day of the disease.

A leucocyte count showed a polymorphonuclear leucocytosis rising in 20 days from 12,000 to 29,000 per c.mm. A radiograph taken on the day before death showed extension of the disease to the whole of both lungs with multiple abscess formation, particularly in the upper lobes. Culture of the sputum at intervals showed little change in the bacteriological flora, which throughout remained sensitive to tetracycline and chloramphenicol. No acid-alcohol-fast bacilli were found on several examinations. Complement-fixing antibodies to influenza virus A and B, to the psittacosis-LGV group of viruses, and to *Rickettsia burneti* were not detected. Cold agglutinins and agglutinins against *Streptococcus M.G.* were not found.

In view of the lack of clinical response, and unusual radiological course, and the colour of the sputum, a secondary fungus infection of the lung was suspected. Direct examination of the sputum for yeast or mycelial fragments was consistently negative, but a specimen taken two days before death yielded, after 48 hours, a growth of a fungus which was identified as *Aspergillus fumigatus*.

Post-mortem Examination.—Positive findings were confined to the respiratory system. The larynx, trachea, and main bronchi showed congestion only. There were old pleural adhesions on the anterior surface of both upper lobes. Both lungs showed extensive pneumonic consolidation with a scattered cystic appearance. This was particularly marked in the left lower lobe, where there were small, ragged abscess cavities. Thrombosis of the small pulmonary arteries was evident in the left lung. Wet preparations of scrapings from the abscesses revealed the fruiting heads of an *Aspergillus*. Cultures taken under sterile precautions from the main bronchi and from two separate lung lesions yielded a heavy growth of a mould of the genus *Aspergillus*, which was kindly identified for us as *A. fumigatus* by Dr. Jacqueline Walker, of the Mycological Reference Laboratory. A scanty growth of this mould was also obtained from the spleen.

In the lungs the general histological picture was that of a resolving pneumonia with abscess formation. In the left upper lobe there was an acute inflammatory exudate, mainly cellular, but fibrinous in some places. Other areas showed similar pneumonic changes with abscesses but with evidence of some resolution. Most of the abscesses were lined by a layer of fungal mycelia about 10 μ thick, and in one cavity the characteristic fruiting bodies of *A. fumigatus* were found (see Special Plate). The bronchial mucosa was mainly intact, and the bronchioles contained pus but no fungal mycelium.

Discussion

Although death was due to a diffuse bacterial pneumonia and pulmonary arterial thrombosis, there was histological evidence that resolution of the pneumonia had begun. Antibiotic therapy had, however, failed to limit the spread of pneumonia, and was complicated by the growth of a fungus which had invaded necrotic areas in both lungs. The eradication of a fungus infection in these circumstances is difficult, although in this instance specific therapy was employed only terminally.

In cases of pulmonary aspergillosis, iodides in full doses and neoarsphenamine have been used (Conant *et al.*, 1954), although they were found by Hinson *et al.* (1952) to be of no value in two of their cases. The latter authors state that *A. fumigatus* was inhibited *in vitro* by "M. and B. 938" (4:4'-diamidinodiphenylamine dihydrochloride) in a concentration of 1 in 100,000. This substance was used by them in one case with equivocal results, and unpleasant hypotensive symptoms followed intravenous injection.

In the present case the strain of *A. fumigatus* was found to be resistant to the commonly used antibiotics and also to

BRONCHO-PULMONARY ASPERGILLOSIS

REPORT OF A CASE

BY

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Fungal infections of the lungs were first described in a variety of animals early in the nineteenth century, birds and horses being the commonest victims. The credit for the first account of this infection in human beings is given to Hughes Bennett (1842), but some doubt exists as to the validity of his description of the infecting fungus. The earliest definite identification of the aspergillus came from Sluyter (1847). Since that date the world literature on this subject has grown progressively, but contributions from this country have been sparse.

In 1952, however, broncho-pulmonary aspergillosis was admirably reviewed in this country by Hinson *et al.* In their paper eight new cases were reported, the mycology and literature considered exhaustively, and reference was made to both medical and surgical treatments for the condition. Resection measures were applied where the infection was confined to a lobe or a lung. In the medical management of more general disease "M. and B. 938" (4:4'-diamidinodiphenylamine dihydrochloride) was used both as an inhalant and an intravenous medication.

The case now described is of interest in that (1) it arose in a man working in close proximity to a cotton-mill; (2) the initial diagnosis was that of possible lung cancer; and (3) the correct diagnosis became obvious when *Aspergillus fumigatus* was grown on pure culture from aspiration material obtained at bronchoscopy. This led to the intravenous use of hydroxystilbamidine with considerable and sustained improvement in the clinical and radiological pictures.

Case History

The patient, a man of 62 years, had worked from the age of 26 onwards as a brass-dresser in a foundry. For many years before this present illness developed the premises adjacent to his place of employment had been used as a cotton-mill. His position while working exposed him to heavy clouds of cotton dust which emanated from the mill. Bronchitic afflictions, according to him, were common amongst his co-workers.

In August, 1955, he sustained a back injury when a heavy beam fell on him from a moderate height. No skeletal damage resulted, but he dates his symptoms of cough and sputum production from this event. In the next few weeks the cough became increasingly troublesome and was accompanied by progressive exertional dyspnoea. The coughing was so severe that vomiting occurred on several occasions. The sputum was copious and mucopurulent, but never blood-stained. Lassitude was marked, but there was neither chest pain nor undue weight loss. These symptoms led to radiological examination of the chest with the discovery of an excavated lesion in the left lung, and his admission to the Thoracic Unit, Mearns Kirk Hospital, on November 29, 1955.

Clinical examination showed a pale, thin, lethargic man, with slight finger clubbing, but no cyanosis or dyspnoea at

isoniazid and *p*-aminosalicylic acid. In carrying out the sensitivity tests there was no evidence that the growth of the mould was stimulated *in vitro* by low concentrations of the antibiotics.

Active research is at present being carried on in many centres to develop fungistatic agents, and certain information is now available on the new antifungal antibiotic nystatin, which has been used in certain fungus infections, particularly intestinal moniliasis (Newcomer *et al.*, 1954-5). With the possibility of similar agents becoming available for the treatment of fungal infections, it is clear that an aspergillus infection should be considered in every case where a respiratory infection fails to respond to antibiotics, particularly if lung destruction is present. In such cases special attention should be paid to examination of the sputum for moulds both by direct means and especially by culture. In direct wet preparations the mature conidiophores of *A. fumigatus* have a pale-brown colour, and their resistance to 4% caustic soda permits the use of this substance to digest the sputum and so facilitate their recognition. Mycelial fragments may also be detected by the periodic-acid-Schiff reaction, which is invaluable for the detection of fungi in paraffin-wax sections of sputum or tissue, although we have had no experience of its use in direct wet preparations.

The strain isolated from this case produced an abundant growth on blood agar after 48 hours' incubation at 37° C. When there is heavy bacterial contamination of the sputum, penicillin and streptomycin may be added to the medium to inhibit other organisms (Conant *et al.*, 1954). The fungus is identified by its colonial appearance and its microscopical morphology. For the latter purpose a portion of the growth may be mounted in a drop of lactophenol cotton blue, or, to obtain better preparations, agar block culture should be used.

Although there is no evidence that the antibiotics caused the patient's death, it seems likely that they favoured the saprophytic development of a fungus which led finally to direct invasion of the tissues and death.

Summary

A case of pulmonary aspergillosis complicating a diffuse bacterial pneumonia is described. Although there is no evidence that antibiotic treatment caused the patient's death, it seems likely that the antibiotics favoured the saprophytic development of a fungus which finally directly invaded the tissues and led to a fatal outcome.

Methods of investigating and treating similar cases are put forward.

We would like to thank Mr. C. A. Lambourne for technical assistance and photography.

REFERENCES

- Abbott, J. D., Fernando, H. V. J., Gurling, K., and Meade, B. W. (1952). *British Medical Journal*, 1, 523.
Conant, N. F., Smith, D. T., Baker, R. D., Callaway, J. L., and Martin, D. S. (1954). *Manual of Clinical Mycology*, 2nd ed. Saunders, Philadelphia.
Hinson, K. F. W., Moon, A. J., and Plummer, N. S. (1952). *Thorax*, 7, 317.
Newcomer, V. D., Wright, E. T., and Sternberg, T. H. (1954-5). *Antibiotics Annual*, p. 686. New York.
Rankin, N. E. (1953). *British Medical Journal*, 1, 918.
Virchow, R. (1856). *Virchows Arch. path. Anat.*, 9, 557.

Minerva Nucleare, a new addition to the group of medical journals published by Edizione Minerva Medica, Turin, is a bi-monthly devoted to nuclear biology and medicine. It is the official organ of the Società di Biologia e Medicina Nucleare. Annual subscription is 4,000 lire, and the journal is obtainable from 83, Corso Bramante, Turin.

rest. A chest radiograph revealed a large abscess cavity with a fluid level occupying the greater part of the left lower lobe, and scattered infiltrative changes throughout the remainder of both lungs. The two possibilities of neoplasm with abscess formation and of tuberculosis were considered, and bronchoscopy under local analgesia was performed. There were copious purulent secretions, and the mucosa of the left main bronchus was severely congested. A random mucosal biopsy from the origin of the apex of the left lower lobe bronchus showed only severe non-specific inflammatory change.

A diagnosis of pyogenic lung abscess was made, and tetracycline therapy was instituted without improvement. Serial cultural examinations of the sputum failed to reveal tubercle bacilli; instead *A. fumigatus* was grown in almost pure culture. This finding being insufficient to establish a diagnosis of aspergillosis, bronchoscopy was repeated on January 3, 1956, with aspiration of bronchial secretions. The specimen was reported on as follows: "One fungus only was present, and on microscopic examination it was identified as an *Aspergillus* species. Careful examination of the microscopic characteristics and of the colonies on Czapek's solution of agar were carried out. The form and measurements of the smooth conidiophores and flask-shaped vesicles with the single series of crowded sterigmata conformed to those given by Thom and Raper (1945) for *A. fumigatus* Fresenius. The colonies were of the velvety strain described by the authors, at first white, becoming dark green to almost black with age, and with the reverse, which was at first colourless, becoming pale brown in two to three weeks."

Intravenous hydroxystilbamidine therapy was thereupon instituted, and two ten-day courses of 0.15 g. daily were administered, with a seven-day rest between courses. Progressive clinical and radiological improvement resulted. Oral nystatin therapy in a dosage of 500,000 units thrice daily followed the second course of hydroxystilbamidine and was continued for eight weeks. During this time albuminuria was noted, and a mid-stream specimen contained numerous pus cells and red blood cells, with only a very light growth of neisseriae on culture. No yeast-like structures were discovered, and no further renal investigations were undertaken.

The patient was discharged from hospital on March 3, 1956, much improved. He continued to report at intervals for out-patient supervision. At his last attendance on August 30 x-ray examination showed further clearing and the abscess cavity had almost totally disappeared. There was corresponding reduction of the infiltrative changes. His general condition, however, had deteriorated in the previous two months, and he complained of lassitude, some weight loss, and frequency of micturition. One month later he died at home after a rapid terminal illness in which urinary symptoms with incontinence and lower limb oedema were prominent. No post-mortem examination was carried out.

Discussion

Isolation of *A. fumigatus* from the sputum is of quite frequent occurrence. In the past such a finding has been the basis of a diagnosis of broncho-pulmonary aspergillosis in some cases, but, as Hinson *et al.* (1952) pointed out, such diagnoses are tenuous. These authors indicated more rigorous diagnostic criteria, the corner-stone of which was histological examination of the diseased tissue, which they were able to carry out in all three of their cases. In our case such examination was impossible, as necropsy was not performed, and resection treatment was not feasible in the earlier part of the illness. Instead the sputum findings were confirmed by cultural isolation from bronchial secretions of a solitary fungus identified as *A. fumigatus* Fresenius. In addition the response to hydroxystilbamidine therapy, although temporary, was gratifying, and seemed to support the diagnosis. The patient showed progressive radiological improvement over the space of nine months. Riddell (1956) mentions the efficacy of inhalations of nystatin, brilliant

green, or hydroxystilbamidine in *A. fumigatus* infections, but his paper was not published until after the death of our patient.

Aspergillosis may be a primary infection, or, probably more frequently, it may involve tissues already damaged by disease—for example, bronchiectasis, bronchial carcinoma, or tuberculosis. In the present case the initial diagnosis rested between a tuberculous excavation, and a lung abscess either of primary type or secondary to lung neoplasm. Serial bacteriological culture ruled out the former, while bronchoscopy coupled with the progressive nine-month period of radiological improvement excluded the latter. This infection was therefore felt to be primary in origin. Marshall and Perry (1952) described three types of primary involvement: (1) acute tracheo-bronchitis or (2) bronchopneumonia, both of which are rare; and (3) a chronic process simulating either tuberculosis or neoplasm. The third category would appear to cover our case.

An interesting feature of the case, and one which must remain a matter of conjecture, is the possibility of a secondary renal involvement by the fungus, presumably due to haematogenous spread, which has been reported in the literature. Death resulted in circumstances which suggested renal failure, although previous examination of the urine while the patient was in hospital failed to reveal the fungus. Presumably, too, if renal involvement had been present it would appear that the stilbamidine therapy had been ineffective.

A final point concerns the occupational history and requires little stressing. The disease occurs predominantly in those handling infected grain, flour, etc. (Norris and Landis, 1920; Davidson, 1948). Heppleston and Gloyne (1949) mentioned its occurrence in coal-miners.

Summary

A case of primary broncho-pulmonary aspergillosis which ended fatally despite a temporary favourable response to hydroxystilbamidine and nystatin therapy is described. Death occurred in circumstances suggesting renal failure, though *Aspergillus fumigatus* had not been isolated from the urine.

We acknowledge with pleasure the assistance afforded us by Mr. R. S. Barclay, thoracic surgeon, in whose ward the patient was treated. We are indebted for the careful bacteriological investigations to Dr. L. G. Bruce, consultant bacteriologist, and also Mr. J. C. Gentles, medical mycologist, at the Western Infirmary, Glasgow.

REFERENCES

- Bennett, J. H. (1942). *Trans. roy. Soc. Edinb.*, 15, 277.
Davidson, M. (1948). *A Practical Manual of Diseases of the Chest*, p. 478. Oxford Univ. Press, London.
Heppleston, A. G., and Gloyne, S. R. (1949). *Thorax*, 4, 168.
Hinson, K. F. W., Moon, A. J., and Plummer, N. S. (1952). *Ibid.*, 7, 317.
Marshall, G., and Perry, K. M. A. (1952). *Diseases of the Chest*, 1, 175. Butterworth, London.
Norris, G. W., and Landis, H. R. M. (1920). *Diseases of the Chest*, p. 400. Saunders, Philadelphia.
Rénon, L. (1897). *Étude sur l'Aspergilliose chez les Animaux et chez l'Homme*. Masson, Paris.
Riddell, R. W. (1956). *British Medical Journal*, 2, 783.
Sluyter, F. T. (1847). *Inaug. Diss.*, Berlin, p. 14. Cit. Rénon (1897).
Thom, C., and Raper, K. B. (1945). *A Manual of the Aspergilli*. Williams and Wilkins, Baltimore.

Milk can now be frozen and stored for at least a year without deterioration, it is claimed. A method of doing this has been developed by the National Institute for Research in Dairying, with financial support from the National Research Development Corporation, and is discussed in the corporation's annual report published last month (H.M.S.O., price 1s. net). Pasteurized milk is treated with ultrasonic waves, poured into polythene bags, and quickly frozen in a brine bath. The report mentions "the commercial possibilities of frozen milk, which include the provision of fresh milk for passengers throughout long sea-voyages, storage of milk during times of over-production, and shipment to countries where good-quality fresh milk is unobtainable." The corporation, to whom the patent rights have been transferred, has licensed two British firms, who expect to go into production shortly.

FIBROSARCOMA OF RIGHT AURICLE

BY

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[WITH SPECIAL PLATE]

The following case of cardiac tumour is reported as showing a clinical picture which, although unusual, should not be impossible of recognition. If this case had been diagnosed during life surgical intervention might have had a successful outcome, and for this reason it is proposed to describe the case in some detail.

Case Report

The patient, a woman aged 40, was admitted to hospital on March 1, 1956. In September, 1954, she had been in hospital suffering from biliary colic, for which cholecystectomy was performed. The gall-bladder was thickened and fibrosed and contained several gall-stones. Subsequently she had remained in good health until the end of 1955, when she became listless and tired. In January, 1956, she complained of generalized aches and pains in the limbs, and, although she was afebrile, mild influenza was diagnosed and she was confined to bed. On January 10 severe pain in the right hypochondrium and epigastrium associated with nausea developed. During that day she had three further such bouts, but findings on physical examination were negative apart from the suspicion of slight jaundice. Four days later she was still suffering from bouts of pain and nausea, and diarrhoea and severe weakness had also developed. There were no abnormal signs in any of the major systems. In particular the heart sounds were normal, there was no tachycardia or arrhythmia, and the blood pressure was 100/80 mm. Hg. A surgical opinion was that there was no acute abdominal condition requiring emergency treatment. An electrocardiogram was normal, as also was a radiograph of the dorso-lumbar spine.

Nausea with vomiting and diarrhoea persisted, together with pain in the right hypochondrium. In addition the patient had two alarming attacks in which she almost collapsed, complaining of feeling cold and faint and a sense of impending death. Examination was again negative apart from slight, but now definite, jaundice, and on the advice of the surgeon the patient was transferred to hospital. On admission she was afebrile and in good general condition. There was no anaemia, wasting, or dehydration, but moderate jaundice was present. Examination of the abdomen was negative. Blood pressure 130/90 mm. Hg; pulse regular; heart sounds normal and no murmurs heard. Lung fields clear and no abnormality detected elsewhere. Results of blood examination: haemoglobin 89%; mean corpuscular (increase due to a polymorphonuclear leucocytosis). Non-protein nitrogen, 30 mg. per 100 ml. Stools normal. Urine contained bile but no other abnormal substances. Serum bilirubin, 5 mg. per 100 ml. Thymol turbidity, 2 units; serum flocculation and zinc sulphate flocculation, negative. Serum alkaline phosphatase, 9 units; serum proteins, 6.6 g. per 100 ml. On the following day examination by screen x-ray of the chest and a barium meal showed normal results. The abdominal pain and jaundice persisted, oedema of the ankles developed, and albumin appeared in the urine. There was no fever, but a repeat white blood count showed a leucocytosis of 19,000 per c.mm.

I first saw the patient on March 7. At this time her general condition was reasonably good. There was moderate jaundice, with now an extensive oedema of the legs, abdomen, and back as far as the lumbar region. The liver was enlarged to about three fingerbreadths below the costal margin, soft, tender, and with overlying muscular rigidity. There was no engorgement of the jugular veins, and the

lung bases were clear. The blood pressure was 125/85 mm. Hg, and the heart appeared normal in all respects. Oedema, albuminuria, and leucocytosis with no congestive signs above the diaphragm indicated a thrombosis of the inferior vena cava. The cause of this was in some doubt. In view of the previous gall-stones, the present pain, jaundice, and tenderness in the right hypochondrium, the liver appeared to be the primary site of disease. It was postulated that there had been a recurrent stone with subsequent infection and the development of hepatic-vein thrombosis spreading back to involve the inferior vena cava. This somewhat tortuous mechanism seemed to cover all the facts better than a primary hepatic-vein thrombosis. Further investigation showed: serum albumin 3.4 g., serum globulin 3.1 g. per 100 ml.; Wassermann reaction negative; blood coagulation time normal; non-protein nitrogen, 65 mg. per 100 ml.; blood culture negative; in the urine a large quantity of albumin, a few epithelial cells, and hyaline casts.

During the next few days the patient's condition deteriorated. The jaundice fluctuated and she had repeated attacks of pain with profuse sweating and a feeling of weakness; nausea was troublesome, though vomiting was only occasional. The rigidity and tenderness in the right hypochondrium were constant, the liver was unchanged in size and consistency, and there was some ascites. The oedema was gross and the patient complained of cramp-like pains in the legs, thought to be due to accumulation of fluid. The temperature was subnormal. Blood pressure, pulse, heart, and lungs were normal. The leucocyte count was still 20,000 per c.mm. and liver-function tests gave normal results.

On March 17 small purpuric spots were seen on the lips, palate, and diffusely over the skin. A harsh to-and-fro murmur was heard over the praecordium, and though its curious quality was noted it was presumed to be a pericardial rub. There were several points against the diagnosis of hepato-renal failure, but even so a more satisfactory explanation of these various signs was not forthcoming.

Over the next 48 hours the patient's condition deteriorated further, and she died in coma on March 20.

Post-mortem Examination

At necropsy the relevant findings were as follows.

A number of dilated veins were present at the lower end of the oesophagus.

The lungs showed gross congestion and oedema. There were several pulmonary infarcts; these were of recent origin and due to the presence of masses of thrombus in the major and minor branches of the pulmonary artery. The thrombi appeared to be embolic in nature.

There were numerous petechiae on the surface of the heart, and about 2 oz. (57 ml.) of straw-coloured fluid was



Photograph of the tumour.

found in the pericardium. The right auricle and ventricle were distended by a large, rounded, somewhat gelatinous tumour arising from the upper part of the medial wall of the auricle (see photograph). The tumour measured about 2½ by 1½ in. (6.4 by 3.8 cm.) and passed through the tricuspid valve into the right ventricle. Over the surface of the tricuspid valve and endocardium of the auricle was an area of roughening on which were numerous fibrin vegetations, apparently caused by friction between the tumour surface and the endocardium. The aorta, great vessels, and coronary arteries were normal.

A considerable quantity of slightly turbid yellow fluid was present in the abdomen.

The liver was enlarged and showed gross changes of chronic venous congestion. There was no thrombus in any of the hepatic veins. The inferior vena cava was obliterated by a fairly recently formed thrombus. This appeared to have originated at a point near the orifices of the hepatic veins, and it extended throughout the entire length of the inferior vena cava and iliac veins. The thrombus passed across the openings of the hepatic and renal veins, but did not extend into them. The portal and splenic veins contained no thrombus. No indication of the cause or origin of this thrombus other than venous stasis due to back pressure by the tumour could be detected.

Histology of the Tumour (see Special Plate)

A cellular tumour, the cells being spindle in type and showing pleomorphism and an occasional mitosis. No infiltration of surrounding tissues was noted in the sections examined. Special staining methods revealed no evidence of cross-striations to suggest a myomatous origin, but did reveal a moderate amount of intracellular collagen. The tumour therefore appeared to be of fibroblastic origin, and was considered by the pathologist to be most probably a low-grade sarcoma.

Discussion

In a review of tumours of the heart Prichard (1951) states that such tumours are rarely diagnosed before necropsy, largely because there is little knowledge of their natural history. The total number of sarcomata Prichard was able to find in the literature was 113, of which the majority were infiltrative or sessile, but some 20% were polypoidal. Whorton (1949), who also analysed the types of cardiac tumour, classified 41 as "spindle-cell neoplasms" of the type described in the present case. Hurst and Cooper (1955) state that primary sarcomata occur most frequently in the right auricle and right ventricle—a point also noted by Prichard. Of Yater's (1931) series of 48 sarcomata, 18 were in the right auricle—an extension of Mandelstamm's (1923) series of 11 primary malignant tumours in this site out of a total of 26.

There are several types of clinical picture arising from tumour of the right auricle. In a discussion of myxoma Bahnson and Newman (1953) mention four possible syndromes: (a) obstruction or regurgitation at the auriculo-ventricular valve, varying with time and the position of the patient; (b) syncope and reactional tachycardia with positional changes; (c) dyspnoea; and (d) a syndrome resembling subacute bacterial endocarditis. Weller (1940) emphasizes the symptoms of respiratory involvement and also describes two cases with superior vena caval block. Hurst and Cooper mention that inferior vena caval obstruction may be the presenting feature. Whorton also notes this and quotes four cases from the literature. In one of these (Raw, 1898), although the fibrosarcoma had infiltrated directly into the inferior vena cava causing thrombosis of the upper third, the clinical picture was rather that of dyspnoea due to haemorrhagic pleural effusion.

In the present case the original two episodes of collapse may well have been due to temporary impaction of the tumour in the A.V. ring. Subsequently intermittent obstruction of the inferior vena cava occurred, giving rise to acute hepatic congestion and pain. Eventually, as a result of this repeated obstruction, thrombosis of the inferior vena cava

occurred, producing oedema, albuminuria, and enlargement of the liver. The next stage would appear to have been impaction of the tumour in the tricuspid orifice, when the harsh to-and-fro murmur was discovered, the patient dying within three days. The fact that the liver was soft and tender in the presence of slight jaundice, normal liver-function tests, and the absence of fever might have suggested that it became congested only when the signs of inferior vena caval obstruction were noted. An acute obstruction as anatomically high as this should then lead to consideration of a tumour of the right auricle as a possible cause, particularly as collapse with a sense of impending death is so frequently a symptom of an intra-auricular mass.

In the present case, although the tumour is regarded as a fibrosarcoma, the polypoidal appearance and the absence of infiltration suggest that, if it had been diagnosed, surgical removal might have been feasible.

Summary

A case of fibrosarcoma of the right auricle in which the tumour gave rise to the clinical picture of acute obstruction of the inferior vena cava is described.

The relevant points in the literature are briefly reviewed.

It is suggested that this type of case, if diagnosed, may be amenable to surgical treatment.

I should like to thank Dr. Monica Hurst for her detailed notes on the patient's progress before entering hospital. The pathological reports were prepared by Dr. Charles St. Hill, and the slides by Mr. Elliot, senior laboratory technician. I am also grateful to Mr. R. Doyle and Dr. R. W. Brookfield for permission to publish this case.

REFERENCES

- Bahnson, H. T., and Newman, E. V. (1953). *Bull. Johns Hopk. Hosp.*, 93, 150.
Hurst, J. W., and Cooper, H. R. (1955). *Amer. Heart J.*, 50, 782.
Mandelstamm, M. (1923). *Virchows Arch. path. Anat.*, 245, 43.
Prichard, R. W. (1951). *Arch. Path. (Chicago)*, 51, 98.
Raw, N. (1898). *British Medical Journal*, 2, 1335.
Weller, G. L. (1940). *Ann. Intern. Med.*, 14, 314.
Whorton, C. M. (1949). *Cancer (N.Y.)*, 2, 245.
Yater, M. W. (1931). *Arch. Intern. Med.*, 48, 627.

ALEUKAEMIC MYELOBLASTIC LEUKAEMIA

EFFECT OF CORTISONE THERAPY

BY

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[WITH SPECIAL PLATE]

That cortisone may have an adverse effect on at least some cases of myeloblastic leukaemia is not generally accepted; the course of the illness described in this paper, however, provides evidence that such therapy may sometimes be disastrous. The case is also of interest in that it supports the suggestion that certain cases of "aleukaemic myelosis" and "myeloproliferative syndrome" bear a close relationship to frank myeloid leukaemia.

Case Report

The patient was a woman aged 51 years. Her initial complaints of lethargy, exhaustion, and shortness of breath for one month had by the time of her first clinical examination become extreme. Increasing pallor had been observed

for the same period; there was also loss of appetite and a fall in weight by over 8 lb. (3.629 kg.). Apart from increased frequency and amount of menstrual loss over the previous year there had been no history of bleeding. From childhood until the age of 32 she had been treated from time to time with iron preparations. Two years before the present illness she had probably suffered from methaemoglobinemia following sulphonamide therapy; at this time her blood count was normal. This was the only history of exposure to any potentially toxic substance. The patient's mother was known to have received regular treatment following a clinical diagnosis of pernicious anaemia. Physical examination revealed marked pallor without any hint of icterus. The liver, spleen, and lymph nodes were not enlarged; there were no skin lesions, no purpura, and no sternal tenderness. There were occasional spikes of fever up to 100° F. (37.8° C.).

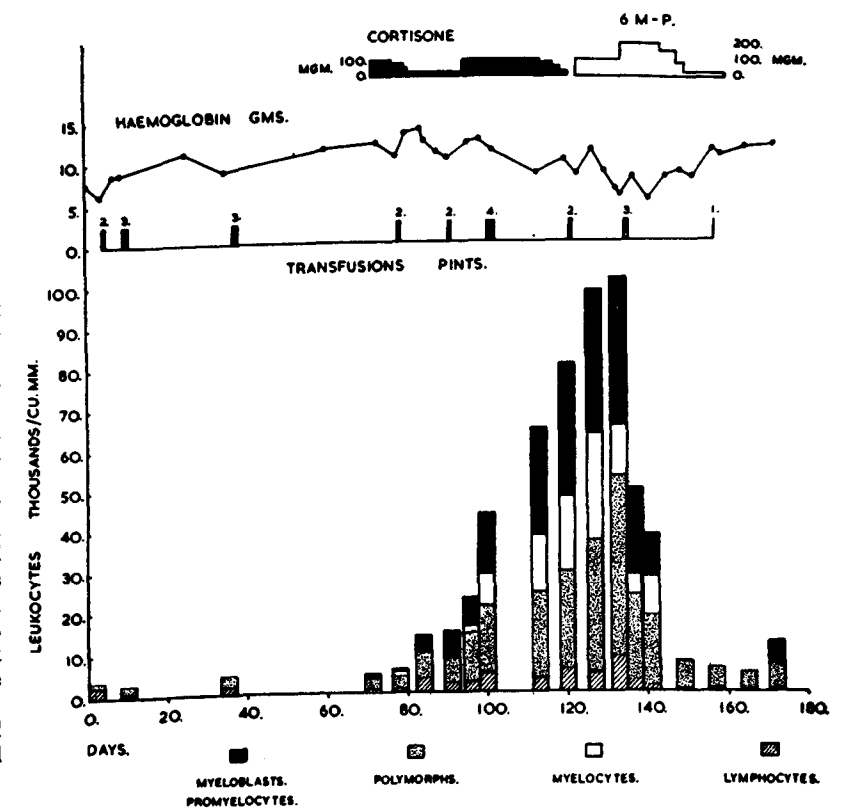
The initial blood count showed: R.B.C. 2,890,000 per c.mm.; haemoglobin 7.6 g. per 100 ml. (51%); P.C.V. 22 c.cm. per 100 ml.; M.C.V. 76 c.μ; M.C.H. 26.0 μg.; M.C.H.C. 34.6%. The reticulocyte count averaged 0.4%. The white cell count averaged 3,000 per c.mm.; initial differential counts were neutrophil polymorphs 60%, lymphocytes 37%, monocytes 2.5%, and plasma cells 0.5%. Platelets appeared scanty on smears and counts averaged 80,000 per c.mm.; no abnormal forms were seen. Bilirubin was less than 0.1 mg., iron 152 μg., and urea 47 mg. per 100 ml. of serum. Alkaline phosphatase was 7.8 units (Jenner and Kay). There was histamine-fast achlorhydria. Radiological appearances of chest and upper gastro-intestinal tract were normal. A very small amount of marrow was aspirated with difficulty from one iliac crest; the specimen was too poor for detailed differential counting, but erythropoiesis was clearly normoblastic and no abnormal cells were found. A rib biopsy showed normal bone; the marrow spaces, however, were largely filled by proliferating fibroblasts (Special Plate, a) and scattered among these were normal marrow cells, with a predominance of the granulocytic series; there were many reticulin fibrils (Special Plate, b). Repeated differential counts were made on the peripheral blood during the first ten weeks of observation. Occasional primitive myeloid cells were found and, more rarely still, normoblasts (see Graph). These findings were not considered surprising, in view of the fibrosis of the bone marrow. During this period the haemoglobin level was maintained by transfusion; the clinical picture did not change.

Because of the clinical findings and the diffuse fibroblastic proliferation in the marrow, together with a pancytopenia, treatment with cortisone was discussed. It was felt that such therapy might raise the haematological values and produce clinical improvement as well as possibly checking the fibroblastic proliferation. The possibility that the disorder might be related to myeloid leukaemia, and so might be made worse by cortisone therapy, was thought to be remote, and treatment was started on the 72nd day of observation. At first the effect was gratifying; the patient's clinical condition improved and she felt stronger than for some weeks. Within eight days a remarkable outpouring of primitive myeloid cells began, however, and the cortisone dosage was reduced. The initial clinical improvement was not maintained on this reduced dosage, however, and the patient began to complain of weakness and severe pain in the limbs. After much discussion the dosage of cortisone was raised, and there followed a return of well-being and disappearance of the limb pain. An even more remarkable rise in total white cell count then occurred with an increase in

production of primitive myeloid cells; indeed, the peripheral blood picture became frankly leukaemic. The spleen became palpable for the first time, the tip reaching two to three fingerbreadths below the costal margin. Cortisone was then withdrawn and a course of 6-mercaptopurine was given with a very satisfactory haematological response. The total white cell count fell and the leukaemic cells almost disappeared. Transfusion was required less frequently; indeed, the haemoglobin level began to rise spontaneously. Clinical improvement was not so satisfactory, and after a period of intense weakness the patient died suddenly on the 175th day of observation. Unfortunately, necropsy was not performed.

Discussion

There seems no doubt that the patient was suffering from an unusual variant of myeloid leukaemia. This type of case has been well discussed in recent years by Heller *et al.* (1947), Merskey (1949), Dameshek (1951), Hutt *et al.* (1953), and Black-Schaffer and Stoddard (1953). These authors have stressed the close relationships which these cases have to chronic myeloid leukaemia on the one hand and polycythaemia on the other. It has been suggested that proliferation of marrow cells is the common factor which in some cases leads to the production of excessive granulocytes and in others to excessive erythrocyte formation. Either condition may be accompanied by a thrombocytosis and by fibrosis of the marrow, or the latter may be the predominant feature. The true nature of the underlying process in cases showing mainly myelofibrosis is usually very difficult to determine. The course of the case here described would certainly support the contention that some at least of these cases are very closely allied to myeloid leukaemia. This concept of myelofibrosis excludes, of course, those cases secondary to granulomatous deposits in tuberculosis, sarcoid, and Hodgkin's disease, secondary to carcinomatous deposits, and resulting from various chemical and physical agents. The case described here differed from most published cases of "myeloproliferative disorder" or "aleukaemic myelosis" in having no splenomegaly until the terminal leukaemic phase. A similar case (Case 2) was recorded in the series reported by Hutt *et al.*



Graph showing haematological findings and treatment.

(1953); here, however, the fibrosis was more pronounced and there was no leukaemic phase comparable to that seen in the present instance.

We have been unable to find a record of any similar case treated with steroids. Gray and Taylor (1953) have, however, reported a patient with an acute systemic reticuloendotheliosis who developed a frank monocytic leukaemia while on A.C.T.H. therapy. That steroid therapy might be harmful in at least some cases of acute myeloblastic leukaemia, in contrast to the remarkable though temporary remissions often obtained in lymphoblastic leukaemia, has been suggested by several authors (Rosenthal *et al.*, 1951; Fessas *et al.*, 1954; Björkman, 1956). Very recently Joseph and Levin (1956) have described a very interesting case of monocytic leukaemia in which cortisone made the leukaemia worse. One of us (R. B. T.) has further unpublished evidence pointing to the same conclusion. On the other hand, steroid therapy is recommended for both lymphoblastic and myeloblastic leukaemias by Scott (1955), and by Hayhoe and Whitby (1955), although it is clear that the responses in myeloblastic leukaemia are poorer. It seems likely, therefore, that not all myeloblastic cases show acceleration of the leukaemic process under the influence of steroids. At present there is no method of distinguishing one type of case from the other except by clinical trial of steroids. It is, admittedly, often difficult to distinguish acute lymphoblastic from acute granulocytic leukaemia. With care, however, such a distinction is usually possible with the exception of occasional very acute cases showing no evidence of differentiation. In these a diagnosis of stem-cell leukaemia must be made; most of them seem to react as lymphoblastic leukaemia. In view of the disastrous effect of steroids in the case described above it does seem important to make as accurate a diagnosis of the type of leukaemia as possible and to bear in mind the possibility that an adverse effect may be obtained in the myeloblastic type.

Summary

An unusual case of aleukaemic myeloid leukaemia with fibroblastic proliferation in the marrow is presented which, on treatment with cortisone, became frankly leukaemic and ended fatally in spite of a haematological remission with 6-mercaptopurine therapy.

Acknowledgments are due to the Departments of Pathology and of Photography, King's College, Newcastle upon Tyne, for sections and photographs respectively.

REFERENCES

- Björkman, S. E. (1956). *Acta haemat. (Basel)*, 15, 175.
Black-Schaffer, B., and Stoddard, L. D. (1953). *Amer. J. Path.*, 29, 413.
Dameshek, W. (1951). *Blood*, 6, 372.
Fessas, P., Wintrobe, M. M., Thompson, R. B., and Cartwright, G. E. (1954). *A.M.A. Arch. intern. Med.*, 94, 384.
Gray, J. D., and Taylor, S. (1953). *Cancer*, 6, 333.
Hayhoe, F. G. J., and Whitby, L. (1955). *Brit. J. Haematol.*, 1, 1.
Heller, E. L., Lewisohn, M. G., and Palin, W. E. (1947). *Amer. J. Path.*, 23, 327.
Hutt, M. S. R., Pinniger, J. L., and Wetherley-Mein, G. (1953). *Blood*, 8, 295.
Joseph, M. C., and Levin, S. E. (1956). *British Medical Journal*, 1, 1328.
Merskey, C. (1949). *Arch. intern. Med.*, 84, 277.
Rosenthal, M. C., Saunders, R. H., Schwartz, L. J., Zannos, L., Santiago, E. P., and Dameshek, W. (1951). *Blood*, 6, 804.
Scott, R. B. (1955). *British Medical Journal*, 2, 75.

The Central Council for Health Education has published a report of a conference held on January 24 at B.M.A. House on the "Education of the Public regarding Cancer." The report (price 1s.) includes sections on "Prevention and Treatment of Cancer," "Problems of Cancer Education," and "Cancer Education in Practice." Other recent publications of the Central Council for Health Education include "Look Inside," an illustrated leaflet for children on the care of teeth (price 2s. 6d. per dozen); "Safe Storage," a guide to food storage without refrigeration (price 2s. per dozen); "Poliomyelitis" (price 1s. per dozen); "Weaning and Mixed Feeding" (price 6s. per dozen). These publications may be obtained from the Central Council for Health Education, Tavistock House North, Tavistock Square, London, W.C.1.

BLEEDING HAEMANGIOMATOUS HAMARTOMA OF THE SMALL BOWEL

BY

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[WITH SPECIAL PLATE]

Haemangioma of the gastro-intestinal tract is a very uncommon condition, rarely diagnosed without laparotomy. Like Guy and Cooper (1950), we believe that this warrants the reporting of all cases. The case we now describe is instructive in that the diagnosis was not suspected before operation, and the result of exploratory laparotomy and excision of the lesion was dramatically favourable.

Case Report

A man aged 46 was admitted to hospital in the early hours of April 29, 1955. On the previous evening, while driving his car, he suddenly felt faint and had a desire to defaecate. He managed to drive home—a few miles—and then passed a stool mixed with bright red blood. Six days previously he had had a brief spell of nausea, vomiting, and diarrhoea which he attributed to something he had eaten, but he had felt perfectly well on the day of onset of the rectal bleeding. He had always been a healthy man, though five years previously there had been a little rectal bleeding, said to be due to haemorrhoids. There had been no weight loss and no dyspepsia.

On admission he was not shocked, though his own doctor had found him to be in a state of shock about an hour before. Abdominal and rectal examination revealed no abnormality except the presence of fresh blood in the rectum. Next morning he was passing dark fluid blood; his haemoglobin was 74%. There was no evidence of any abnormal bleeding tendency.

Over the next seven days three attacks of melaena associated with shock occurred, and on each occasion blood transfusion was required. During this week the haemoglobin level was never above 60% in spite of the infusion of a total of 6 pints (3.4 l.) of whole blood and 2½ pints (1.4 l.) of packed red cells. On May 2, after the second attack of bleeding, he was seen by one of us (A. F. R.), and it was decided that any further bleeding would necessitate urgent operation. Thereafter his progress was observed jointly by the medical and surgical units concerned. Operation was finally performed on May 6 after the third attack of bleeding, which, like the others, led to a rapid deterioration in the patient's general condition. At no time had there been abdominal tenderness or any sign of a local lesion in the abdomen, and a definite pre-operative diagnosis was not made. The following possibilities were considered (in order of likelihood): ulcerated Meckel's diverticulum; proximal colonic neoplasm; duodenal ulceration.

Exploration through a right paramedian incision centred opposite the umbilicus revealed distension of the lowest 6 ft. (180 cm.) of the ileum and of most of the proximal colon by an accumulation of blood. Just below the upper limit of the distended length of ileum there was a dimpling of the antimesenteric border with an underlying hard,

APRIL 27, 1957

HAEMANGIOMA OF SMALL BOWEL

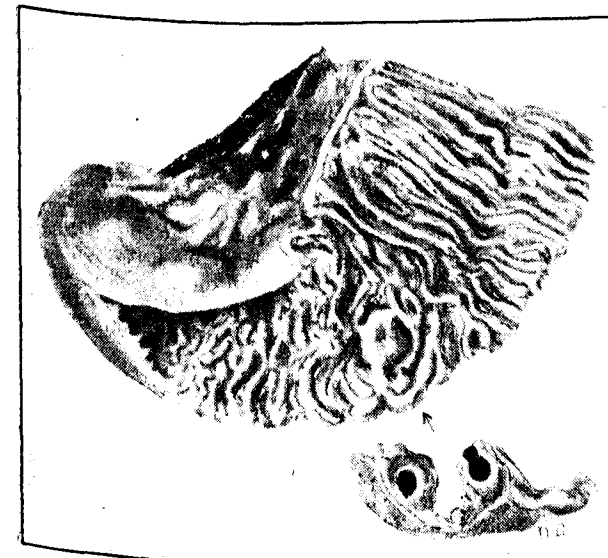
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globular, intramural nodule about ½ in. (1 cm.) in diameter (see accompanying drawing). The stomach, duodenum, and jejunum appeared normal, and no Meckel's diverticulum was found; the nodule was therefore judged to be the source of the bleeding. Accordingly a generous resection of over 8 in. (20 cm.) of ileum and its mesentery was carried out, being planned to allow for possible malignancy. Repair was effected by end-to-end anastomosis.

There was no more bleeding after the operation and the patient went home on the 15th post-operative day after an uneventful convalescence. He was seen again four weeks later, when he felt in normal health and showed no evidence of anaemia.

Pathological Report

The specimen consists of a loop of ileum 20 cm. long, together with part of its mesentery. On the mucosal surface, on the antimesenteric border, is a firm, blue, sessile polyp 1 cm. in diameter, at the apex of which is a cup-shaped depression 3 mm. in diameter. The cut surface shows the bulk of the polyp to consist of a blood clot surrounded by grey tissue, the whole covered by mucosa except at the apex, where the clot protrudes through the central depression (see Fig.). The muscularis is intact deep to the lesion.



Drawing of tumour. Note central depressed area.

Microscopically, in the submucosa there is a large, solitary, saccular vascular dilatation which has ruptured through the surface mucosa; its wall consists of smooth muscle and fibrous tissue with a small amount of elastic tissue externally; its lumen is plugged with recent thrombus. In serial sections the dilatation appears to arise from the artery to the right (see Special Plate). The vascularity of the submucosa around the lesion is no greater than that seen elsewhere in the specimen.

The lesion is clearly a vascular hamartoma; there is no evidence of a progressive neoplasm.

Discussion

Life-saving emergency operations often have to be performed to stop bleeding from duodenal and gastric ulcers. Operations for bleeding Meckel's diverticulum and bleeding oesophageal varices are also familiar, but operations for bleeding haemangiomas of the intestine must be rare, either in emergency or otherwise.

Haemangiomas may be found either in the small or the large bowel, the former being the commoner site. According to Raiford (1932) they form only 0.3% of all gastrointestinal tumours and 3.4% of tumours of the small bowel themselves rarities. They are almost always benign, there

being only two recorded instances of malignancy, both affecting the small bowel. Brown (1924) and Kaijser (1936) consider and classify the intestinal haemangiomas in detail, and Hansen (1948) gives a most useful review of the 85 cases he found described in the literature between 1860 and 1948. His figures show that in the small bowel the tumours are often multiple, though single lesions as in the case here described, generally cavernous and polypoid in nature, are found in about 40% of cases.

The clinical presentation may take one of the following forms: (1) chronic haemorrhage, causing an unexplained anaemia with occult blood in the stools; (2) acute haemorrhage, as in this instance; (3) obstruction, acute or chronic, and sometimes the result of intussusception; (4) inflammation of the lesion itself, simulating appendicitis. In presentations (3) and (4) laparotomy is likely to be carried out without delay and the nature of the lesion soon discovered. But in (1) the diagnosis is often not made until the anaemia has been unsuccessfully treated medically for many years. In (2) the diagnosis of haemangioma will seldom be made. Even if it is considered, the alternatives of duodenal or Meckel's diverticulum ulceration are certain to appear much more likely sources of haemorrhage. This could even apply at laparotomy, much as in an operation reported by Smith *et al.* (1944) in which a radiologically detected duodenal ulcer was thought to be the source of bleeding; in actual fact the bleeding arose in an undiscovered leiomyosarcoma of the jejunum.

Associated angiomatous lesions in the skin and visible mucous membranes may suggest the diagnosis to the clinician, as in the cases reported by Rickham (1952) and by Heycock and Dickinson (1951). This association emphasizes the fact that the vascular lesions are developmental anomalies and not true neoplasms. In the present case there were no visible lesions.

In these days there is no need to stress the value of surgical treatment in cases of recurrent acute gastrointestinal haemorrhage. In reporting this case we hope to show that the diagnosis haemangioma should be considered before operation and that a search should be made for haemangiomas at the time of operation, even in the presence of an obvious peptic ulcer. This search is even more necessary before embarking on the usual empirical gastrectomy in those cases where no peptic ulcer is found.

The surgeon should not have a difficult task at operation unless the lesions are multiple. Bentley (reported by Heycock and Dickinson) in a two-stage operation, had to make 23 separate mural incisions and resect 5 cm. of bowel in a patient with 30 haemangiomas of the small bowel. The more usual difficulty will be one of diagnosis.

Summary

A case of acute intestinal bleeding in which an urgent operation became necessary because the bleeding persisted in spite of repeated blood transfusion and other medical treatment is reported. Owing to the absence of any significant previous history and any abnormality on abdominal examination, no precise diagnosis could be made pre-operatively, although duodenal ulceration, ulceration in a Meckel's diverticulum, and colonic neoplasm were thought to be likely causes. The source of the bleeding proved to be an angiomatous lesion in the ileum, and resection of a short segment of ileum led to complete cure.

The literature is reviewed and the various syndromes produced by angiomata of the intestine are discussed. It is suggested that this type of lesion should be considered as a possible diagnosis in cases of chronic anaemia with occult blood in the stools as well as in cases of acute intestinal haemorrhage. It is also pointed out that if these latter come to operation it is as well to

bear in mind the possibility of angioma even when a peptic ulcer is actually found at laparotomy, and especially when no such ulcer can be found.

We are grateful to Dr. C. S. D. Don and to Mr. R. L. Holt for permission to publish this case. Miss D. Davidson, Medical Artist, Manchester Royal Infirmary, kindly provided the drawing of the specimen.

REFERENCES

- Brown, A. J. (1924). *Surg. Gynec. Obstet.*, 39, 191.
Guy, C. C., and Cooper, H. F. (1950). *Surgery*, 27, 293.
Hansen, P. S. (1948). *Amer. J. clin. Path.*, 18, 14.
Heycock, J. B., and Dickinson, P. H. (1951). *British Medical Journal*, 1, 620.
Kalliser, R. (1936). *Arch. klin. Chir.*, 187, 351.
Raiford, T. S. (1932). *Arch. Surg. (Chicago)*, 25, 122, 321.
Rickham, P. P. (1952). *Brit. J. Surg.*, 39, 462.
Smith, L. A., Good, C. A., and Gray, H. K. (1944). *Proc. Mayo Clin.*, 19, 117.

Medical Memorandum

Death following Injection of Paraffin into the Breast

Up to 20 years ago in Hong Kong it was considered indecent for Chinese women to have even a suggestion of a figure, and it was common for them to wear tight clothing to flatten their busts. But the advance of modern ideas, particularly through the medium of Western films, has changed this attitude. One method of improving the figure is the injection of liquid paraffin into the mammary glands, based on the use of such injections into the tissues in plastic operations, such as for the correction of nasal deformity. This has been practised indiscriminately, in some cases causing severe pain and leading to infection and sloughing.

In the following case the injection of paraffin into the breast for cosmetic reasons resulted in death from fatty embolism in the brain and lungs.

CASE REPORT

A Chinese woman aged 32, the mother of four children, who had been in poor health for some time, had arranged with a nurse to have a total of eleven injections of paraffin into her breasts to improve her appearance. She received the first three injections into the right breast at 3 p.m. on May 5, 1954. During and soon after the injections she experienced extreme pain and discomfort. Four hours later she felt giddy and faint and complained of severe headache. Her husband applied some Chinese medicinal oil to her face, forehead, and temples, and this seemed to relieve her. By 10.30 that evening she appeared to be asleep. About midnight she cried out, apparently in great pain, and this continued at intervals throughout the night. Early next morning her condition was worse, and a doctor was called in. He found her semicomatose and restless, with closed eyes; she was afebrile, but had a pulse rate of 100 per minute, regular but weak. Pupils were slightly dilated and reacted to light, more sluggishly on the left. Knee-jerks were exaggerated, but there was no neck rigidity or paralysis of extremities. Nothing significant was found in heart and lungs. There was no sweating. After prescribing for her he left.

As her condition did not improve another doctor was summoned at about 12.30 p.m. She was still semicomatose and with dilated pupils, but her right breast had become swollen and tender. Immediate removal to hospital for observation and treatment was advised.

By midnight the patient's condition had not improved despite energetic care, and a third practitioner was called in in consultation. She was then unconscious, with a temperature of 102° F. (38.9° C.) and incontinence of urine and faeces. The pupils were dilated and reflexes still present. The right breast was hot to the touch and swollen, and three puncture marks were noted. A diagnosis of cerebral paraffin embolism was suspected; ice packs were applied and nikethamide and nicotinic acid injections prescribed.

The patient was transferred next day to Queen Mary Hospital under the care of Professor A. J. S. McFadzean.

She was still unconscious, but her temperature had fallen to 100.5° F. (38° C.). She reacted to painful stimuli, and both pupils were small and reacted sluggishly to light. On auscultation there was diminished air entry with rales over both bases. Her condition progressively deteriorated and the coma deepened in spite of treatment, and she died 24 hours after admission. Necropsy was performed 20 hours later.

Post-mortem Findings.—The lips and nail-beds were cyanotic. The right breast was swollen and had three puncture marks, at 2, 5, and 9 o'clock, each about 5 in. (12.7 cm.) from the nipple. On reflecting the breast from the surface of the pectoralis major muscle about 10 ml. of clear oily fluid exuded from the under surface of the mammary gland. Incisions into the breast just under the puncture marks, and particularly in the lower medial quadrant, revealed globules of clear oil, which exuded from the yellow, semi-solid fatty tissue. A small haematoma mixed with oily fluid was present in the gland under the puncture mark at 9 o'clock. In the heart a thick layer of fat was visible under the visceral pericardium. The myocardium was soft and flabby. Petechiae were present on the endocardial lining and papillary muscle of the left ventricle and on the left interventricular septum. The bronchi contained frothy sanguineous fluid. The lungs were red and soft, with numerous petechiae on the surface. The cut surface was intensely congested. On squeezing the lung, frothy fluid mixed with oil globules exuded. Section of the kidney revealed a pale cortex and a slightly redder medulla. In the brain nothing abnormal was found in the basal arteries and soft meninges, but the cortical vessels were congested. The cut surface showed numerous minute petechiae spread over the white matter of the cerebrum.

Staining frozen sections prepared from brain and lung tissues with Sudan III resulted in red droplets appearing in the capillaries. These were considered by Professor P. C. Hou to be droplets of neutral fat, on the basis of an experiment in which he stained with Sudan III a mixture of liquid paraffin with human (neutral) fat, the fat droplets taking the stain but not the paraffin droplets.

DISCUSSION

When adipose tissues are lacerated, fat globules may enter ruptured venules and veins at the site of injury and be carried to the lungs. Most of the globules which reach the lungs are held up initially in the small arterioles, but by a process of moulding many of them ultimately pass through the pulmonary capillaries into the systemic circulation, in which they are carried to all tissues of the body and become lodged in the arterioles of such organs as the brain and kidneys.

The way in which fat globules enter lacerated or ruptured veins has not yet been established. In the case here described a blood vessel was ruptured, resulting in haematoma; in addition the high force needed to inject the liquid paraffin into the breast caused some displacement of the patient's own fat globules into the blood stream.

In cases of bone fracture it has been claimed that haematoma formation and inflammatory reaction at the site of fracture create a positive pressure in the marrow cavity which forces damaged fat cells into the veins. It has also been claimed that there is a negative pressure in the marrow cavity and that this has the effect of "sucking" damaged fat cells into the veins.

It is of interest that at the inquest on this patient the jury returned a unanimous verdict of manslaughter, and a warrant for the arrest of the nurse was issued by the magistrate sitting as coroner.

I am grateful to Professors A. J. S. McFadzean and P. C. Hou, of the University of Hong Kong, for their help; to the Honourable Director of Medical Services, Hong Kong, for permission to publish this report; and to the Commissioner of Police, Hong Kong, for access to his files.

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Reviews

FORENSIC MEDICINE

Practical Forensic Medicine. By Francis E. Camps, M.D., and W. B. Purchase, C.B.E., M.C., M.B., D.P.H. Foreword by H. Edmund Davies, LL.B., B.C.L. (Pp. 541; illustrated. 75s.) London: Hutchinson's Medical Publications Ltd. 1956.

This book represents the active collaboration of a medical practitioner and a barrister who is also one of H.M. coroners. Since they are both highly experienced, practical men, it is to be expected that something good would result from their co-operation. The reader will not be disappointed. The first occasion, I think, on which such a combination occurred was in 1823 when Paris and Fonblanque wrote a three-volume treatise on medical jurisprudence. That work was rightly acclaimed as an elaborate and scholarly production. Since that date, although lawyers have contributed to several publications, there have been few if any examples of close co-operation between the two professions of law and medicine in the preparation of a textbook.

This book by Camps and Purchase makes excellent reading, although the space allotted to different subjects is very uneven. The article on identification, for example, which is very good, takes up about an eighth of the book excluding toxicology, whereas the sections dealing with the medico-legal necropsy, the examination of blood, semen, hairs, fibres, etc., are much too brief. Similarly, in a most informative article on the barbiturates, with a wealth of interesting cases, there is little if any advice about the treatment of a case of poisoning due to a barbiturate, and no instructions about how to wash out the stomach. The absence of an index is a defect which should be remedied in the next edition. The book is excellently printed and bound and is a credit to the publishers. It should be in the library of all those interested in forensic medicine. Its usefulness to the general practitioner in an out-of-the-way place and who is not likely to have more than one book on the subject is not so clear.

SYDNEY SMITH.

SCIENCE AND CRIME

The Scientific Investigation of Crime. By L. C. Nickolls, M.Sc., A.R.C.S., D.I.C., F.R.I.C. (Pp. 398 + xiii; illustrated. 50s.) London: Butterworth and Co. (Publishers) Ltd. 1956.

The author of this book is the director of the forensic police laboratory at New Scotland Yard and has drawn on a vast experience of forensic work to produce a book which is informative, instructive, and eminently readable.

"Contact traces" is an expression frequently used to indicate the trail which a criminal may leave on his surroundings, or which the surroundings may leave on the criminal. The most obvious example of a contact trace is a fingerprint. There are, of course, many others such as blood, semen, dust of botanical or mechanical origin, and marks made on or by instruments and weapons. In this book the author describes first the lay-out of an up-to-date police laboratory, with an enumeration of the more important apparatus necessary for the identification of contact traces. This chapter will be of great interest to any laboratory worker, irrespective of his specialty. There follows a chapter on the type of material which is likely to be available at the scene of a crime and a description of the various methods of recovery of such evidence, with practical advice on storage and transport. The following chapters deal in detail with the identification of soils, paint, wood fragments, body fluids, and a host of other materials. Further information of a highly technical character is given on such subjects as the restoration of obliterated marks and impressions and the deciphering of damaged and altered documents. A chapter on alcohol determination in blood and urine gives the precise details of the modern methods of such analysis, and in the final chapter

on toxicology the author wisely confines himself to a discussion of the broad principles entailed in the identification of common poisons.

The book is particularly well illustrated with a wealth of photographs and many simple but informative diagrams. In some cases the captions are not sufficiently clear to readers who are not constantly practising forensic science, and recourse to the text is necessary for clarification. The price of 50s. places this book somewhere between an ordinary textbook and a reference book, which is probably its proper place. The author would, I am sure, be the last person to describe his work as a medical textbook. It will, however, be of great value to members of this profession who are obliged to carry out forensic investigations because of the absence of local forensic science laboratories. And, without belittling the book in any way, the numerous amateur detectives in the medical profession will find it most absorbing reading.

DONALD TEARE.

MENTAL DEFICIENCY

A Textbook of Mental Deficiency. First compiled by the late A. F. Tredgold, M.D., F.R.C.P., F.R.S. Ed. Ninth edition by R. F. Tredgold, M.D., D.P.M., and K. Soddy, M.D., D.P.M. (Pp. 480 + xv; illustrated. 40s.) London: Baillière, Tindall and Cox. 1956.

It is sometimes overlooked that mental deficiency is a field in which a number of major advances have been made in recent years and in which current views have undergone a great deal of revision, especially those concerned with aetiology and the social aspects of backwardness and defect. Recognition of several new syndromes with a simple genetic determination and of a number of new pre- and post-natal noxae which can disturb the maturation of the nervous system has bitten deep into the formerly large group of "simple amentia," and theories such as those of blastophoria and neuropathic taint have become obsolete in the face of increased evidence of inheritance through single and multiple unitary traits. When A. F. Tredgold's textbook was published in 1908, it documented the accumulated experience of a very original observer, and for many years it was rightly considered the best introduction to the subject. Many of Tredgold's views have stood the test of time, but by the seventh edition the text was beginning to fall behind, some of the case reports and illustrations were not representative of the defective as now seen, and notable new research was not recorded. In the present edition, while much of the original form has been retained the whole text has been revised and the results of new work incorporated without overloading.

The presentation of the subject at the outset is clear and systematic. There is sometimes an unnecessary tendency to preserve the form laid down by the original author, especially in classification, and to ensure that he is still given personal credit for ideas which are by now common property, but with this the reader will readily sympathize. The sections on the pathology and chemistry of defect rather lag behind the rest, and R. F. Tredgold's original drawings of neurones will surely have to be left out or replaced by modern photographs in the next edition, as will a few of the older illustrations. The chemistry of the defective brain is discussed in less than half a page, and the discussion of cerebral function generally lays an almost exclusive stress on the cortex, which is out of keeping with the present interest in basal structures. In spite of this, the more striking new work on neurones, blood vessels, and fibre-systems in defect receives adequate mention. A valuable feature is the attention given to environmental factors and to the special characteristics of the defective psyche in conditions of maladjustment. In a long chapter on disorders of relationship formation the frame of reference and classification are of psycho-analytic origin, but, if the relevance of this may be disputed, the case histories carry conviction and illustrate well the total approach to the defective which is essential if the best use is to be had from his meagre wit. One will be sorry to lose the detailed

description of J. H. Pullen, the "genius" of Earlswood Asylum, but this must be positively his last appearance.

Teachers of psychiatry whose hesitation to recommend "Tredgold" to beginners in the field of mental deficiency has increased with the last few editions will be much reassured by the radical revision which has been undertaken, and it is probable that this venerable text will now take a new lease of life and add itself to the few exceptions to the usual rule that "they never come back."

ALEXANDER KENNEDY.

PROGRESS IN HAEMATOLOGY

Progress in Hematology. Volume I, 1956. Edited by Leandro M. Tocantins, M.D., with 27 contributors. (Pp. 336+ix; illustrated. \$9.75.) New York and London: Grune and Stratton, 1956.

In his editorial introduction to this first volume of *Progress in Hematology* Tocantins refers to the remarkable expansion of investigations and knowledge that has taken place during the last 20 years in haematology, and explains that the intention of this publication is to provide a periodical survey of the existing position in fields where substantial advances have been made. The frequency of future volumes in the series will depend on the response to the first and on the number and state of advance of current topics as they develop.

The standard of the 16 contributions making up this work is high, and together they undoubtedly go a long way towards achieving the editor's expressed intention. No haematologist who wishes to maintain a broad acquaintance with work in the many subdivisions of his subject would fail to welcome this book and to look forward to future volumes. The articles which offer critical reviews of fairly broad subjects are particularly valuable. "Abnormal Hemoglobins" (39 pages, 211 references) by Zuelzer, Neel, and Robinson, "Chemotherapy of Human Leukemia" (20 pages, 146 references) by Burchenal and Ellison, and "The Biochemistry and Enzymatic Activities of Leukocytes in Health and Disease" (15 pages, 66 references) by Valentine, exemplify this excellent aspect of the work. Valuable though they are, all these articles suffer from the inevitable disadvantage that the processes of publication in book form, however fast, render each review to some extent outdated by the time it appears. The same criticism applies to several otherwise admirable reviews of more restricted fields, such as Ungley and Thompson's "Gastric Intrinsic Factor and Vitamin B₁₂ Interrelationships" (15 pages, 127 references), Brown and Moore's "Parenterally Administered Iron in the Treatment of Hypochromic Anemia" (18 pages, 158 references), and Strumia's "Life Span of Erythrocytes and their Post-transfusion Survival" (14 pages, 42 references). In general all these review articles give satisfactory summaries of the position in the latter half of 1955.

Apart from one or two articles of very restricted range which might more appropriately have been published in some current haematological journal, the surveys presented here emphasize the rapid growth of haematology and endorse the need for the kind of periodical review envisaged in this projected series.

F. G. J. HAYHOE.

IN HONOUR OF NISSEN

Chirurgische Indikationen. Dedicated to Rudolf Nissen. (Pp. 299+xii; illustrated. D.M.42.) Stuttgart: Georg Thieme Verlag, 1956.

This birthday offering to Professor Nissen from more than fifty of the leading surgeons of the world, his friends and colleagues, is a worthy recognition of what surgery owes to one whose career must have been unique. A pupil of Sauerbruch both at Munich and Berlin, he was sent by him to Constantinople, there to create the first great surgical school in Turkey. In 1940 he was called to New York, and after twelve years of brilliant work he was called four years ago to the professorship of surgery at Basle. In every field

of surgery he excelled, and as a teacher he was equally at home in German, French, or English.

These contributions in his honour come from the chiefs of great surgical centres all over the world; they are throughout of a very high order, and each of them represents some special interest of its author. We can mention only a few, but all are worthy of close study. Professor Jentzer, of Geneva, gives in French his wide experience of indications for operation in many different fields. Papper, of New York, discusses anaesthesia in the aged. Bing, of Alabama, describes the contribution of physiology to the surgery of the heart, and Bayer, of Düsseldorf, the surgical treatment of stenosis of the cardiac valves, while Mason, of Newcastle, discusses mitral valvotomy in pregnancy. Brunner, of Zurich, writes on the surgery of bronchiectasis, Welch, of New York, on splenectomy, and Bergmann, of New York, on prosthetic replacement of the femoral head. These few notes will at least show the range covered by these contributions from the leaders of surgery all over the world, but they can give no idea of the wealth of material here collected. This book should be made available to every surgeon in the country and every surgical library should possess it. We would all like to share in the honour so well paid to Professor Nissen.

HENRY SOUTTAR.

BONE STRUCTURE AND METABOLISM

Ciba Foundation Symposium on Bone Structure and Metabolism. Editors for the Ciba Foundation: G. E. W. Wolstenholme, O.B.E., M.A., M.B., B.Ch., and Cecilia M. O'Connor, B.Sc. (Pp. 299+xii; illustrated. 45s.) London: J. and A. Churchill Ltd., 1956.

Since its inauguration in 1949 the Ciba Foundation has arranged a series of symposia on various subjects of medical interest, and at each of these a number of selected research workers have been able to meet informally in order to exchange ideas and information on a particular subject. In July, 1955, such a symposium was devoted to bone structure and metabolism and was attended by about 25 distinguished workers from Europe and North America. The present volume, edited by Dr. Wolstenholme and Miss O'Connor of the Ciba Foundation, is designed to bring the substance of the meeting to the attention of a wider audience. It takes the form of a series of papers, together with a more or less verbatim account of the informal discussion that followed each contribution. The book makes an interesting introduction to the considerable amount of very active research that is at present being carried out in the field of bone biology. Important topics discussed include chemical studies of bone salt and bone mucopolysaccharides, studies of isotope uptake and localization in bone and cartilage, the bearing of microradiographic and electron-microscopic techniques on the investigation of bone structure, the action and fate of vitamin D in the experimental animal, and the part played by vascular factors in bone pathology. From a clinical viewpoint, the symposium is notable for its discussions on the relations between parathyroid function and bone, "vitamin-D-resistant rickets," and the rare disease "hypophosphatasia." No outstanding synthesis of knowledge emerges from the discussions, but the book gives us an idea of the way skeletal research is developing, and lets us see something of the techniques it employs and the problems it encounters.

H. A. SISSONS.

The Approach to Mental Health, by Dr. David T. MacLay, has the great virtue of being written with exceptional clarity. Intended for the educated lay reader, the book offers a review of how the mind normally works; the emphasis is on the healthy mind, but the author aptly illustrates the normal by brief case-histories of the pathological. Though he introduces the reader to the work of the psycho-analysts and their allies, he pays his respects also to McDougall. The book is written with some delicacy; indeed, the discussion of sexual desires and their fulfilment, normal and abnormal, comes under "Social Aspects of Psychology." Not only the adult layman but the adolescent might find that this book suits his needs. It is published by Thorsons Publishers Ltd. for 12s. 6d.

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A CHANGING PICTURE

Two events in particular claimed the attention of the Council and the G.M.S. Committee when they met last week. The Central Consultants and Specialists Committee decided on April 10 to support the decision of the G.M.S. Committee, of the Public Health Committee, and of the B.M.A. Council not in present circumstances to co-operate with the Royal Commission. Immediately following this there was an exchange of letters between the chairman of the Joint Consultants Committee and the Prime Minister. Sir Russell Brain's next move was to summon a special meeting of the Comitia of the Royal College of Physicians of London four days before his successor was elected. After hearing the letters exchanged between the Prime Minister and the President of the College this poorly attended assembly thereupon decided to co-operate with the Royal Commission, thus departing from the recommendation of the four other bodies mentioned above, which represent the consultants and specialists, the general practitioners, and the medical officers of health of Britain. The next event, which likewise came as no surprise, was this announcement in the House of Commons by the Prime Minister on April 16: "The Government have now decided to increase the basic remuneration of senior hospital medical and dental staff, including consultants and specialists, and all dentists engaged in general dental service by 5% from May 1 next, and from the same date to add 5% to the aggregate net remuneration of general practitioners—that is, remuneration after the deduction of practice expenses. We propose to consult representatives of the profession as to the best method of distributing this sum between individual practitioners." This particular figure had been round the whispering galleries for some time, and had been mentioned in several newspapers a few days before Mr. Macmillan informed the medical profession of his arbitrary decision in the House of Commons, without any previous consultation with representatives of a profession which, in accordance with a covenant it had entered into with the Government of 1946 and 1948, submitted over a year ago a claim for increased pay. As the cost of living had gone up by 24% since the previous adjustment was made in the remunera-

tion of general practitioners, the claim was for an increase of 24%. In the face of the Government's No! under the present and the recent Ministers of Health, Dr. S. Wand, chairman of the B.M.A. Council—and in this capacity the key professional figure in the present dispute—has made it quite plain that the profession is willing, even anxious, that the present claim should go to arbitration, the results of which would be accepted. But Mr. Macmillan refuses this just as he denies to the profession the use of the customary avenues of direct discussion, negotiation, and, if necessary, arbitration. On behalf of the Government he dictates to doctors working in the health service an important part of their terms of employment, brushing aside all the customary conventions, not to mention courtesies, in this kind of human transaction.

The B.M.A. Council and the G.M.S. Committee had emergency meetings last week to discuss the significance of these events. The attitude of these two important bodies to the exchange of letters between Mr. Macmillan and the Chairman of the Joint Consultants Committee reflected that of the debaters in the House of Lords when it recently discussed this matter. Once the Government has got into the position of having to explain by means of letters what the terms of reference of a Royal Commission mean, it has really got to the point of admitting that the terms should be revised. It appears not to be impossible to have second thoughts about the terms of reference of a Royal Commission, and surely it would be much better to do this, and more dignified, than to pursue a course utterly distasteful to one side in the present dispute—unless, of course, the Government wants such a course. But in any event a Royal Commission is not the right body to settle a dispute over terms of service. In a letter to *The Times* the Chairman of Council, Dr. Wand, recently reiterated the profession's wish to get round the table, through its own representatives, with representatives of the Government, with the Minister of Health and his Department. This is a matter of principle. That is why the G.M.S. Committee last week passed a resolution against accepting the 5% award arbitrarily made last week by Mr. Macmillan, without any prior consultation whatsoever with the medical profession. The Committee is recommending to the Conference of Local Medical Committees that the amount of the award be put into a suspense account.

In the meantime support grows in meetings of the profession for the plan of withdrawal of general practitioners from the National Health Service. The C.C. and S. Committee of the B.M.A. have heartened their colleagues in general practice by their recommendation that consultants and specialists should give

them financial support in the coming struggle, a struggle which the Government could bring to an end to-morrow if it decided to negotiate a settlement or submit the claim to arbitration. In a letter to *The Times* last Saturday a group of doctors implied that the matter has shifted from the crude question of being paid the rate for the job to a question of principle. It is good that more doctors are beginning to realize this, but it has been a question of principle from the very beginning—the principle of contract, though that contract cannot be legally enforceable at law. It appears to us to be essential to stand unshakably firm by principle, and to avoid the quicksands of expediency. In the House of Lords a fortnight ago Lord Moran, in an able if bitter speech—and understandably bitter—seemed to hint that the B.M.A. regarded the two Spens Reports as a professional sacred cow. But he knows as well as anyone that the profession entered the N.H.S. in 1948 largely because it felt that the two Spens Reports gave it a guarantee of its future status in a state medical service. If the Government invited the medical profession to discuss with it an alternative formula—and discuss it on an equal basis and on agreed terms—surely it would meet with a favourable response. And what could be simpler or more reasonable? When the Conference and the Representative Body come to discuss the question of co-operating or not with the Royal Commission they will no doubt bear in mind Lord Moran's warning that the findings of the Royal Commission will be "taken seriously only if they are in the Government's favour."

MATERNAL AND FOETAL THYROID

The foetal thyroid accumulates radioactive iodine from the twelfth to the fourteenth week of gestation.^{1,2} After that time the thyroid is assumed to be capable of synthesizing thyroxine and of supplying the needs of the foetus. The infants of hypothyroid mothers are not cretinous at birth; this suggests that the infant is not dependent on the provision of maternal thyroxine. Nor does maternal thyroxine reach the foetus in sufficient concentration to prevent hypothyroidism occurring in the athyroid foetus, as judged by the retarded skeletal development of some cretins diagnosed during the first few weeks of life. It has sometimes been assumed that the presence of maternal thyroxine is responsible for the fact that cretinism is not obvious in the newborn infant, but a progressive failure of the infant's thyroid remnant provides an equally acceptable explanation. Placental passage of ¹³¹I-labelled thyroxine has, however, been proved to occur.³ Passage was slow, and 169 hours had passed

before the concentration in the foetal serum had reached 49% of that in the maternal serum.

E. B. Man⁴ has recently reported that the thyroxine-like iodine (butanol-extractable iodine) in the serum of pregnant women rises to 7.0 $\gamma\%$ (normal 3 $\gamma\%$ to 7 $\gamma\%$) at the tenth week of pregnancy and stays at this level, or above, until term. Pregnant women with B.E.I. levels below these normals frequently abort or bear infants with various abnormalities. Man concluded from these facts that this "hypothyroidism" in the mother produces disease in the foetus and that such women should be treated with thyroid in their pregnancy. Clinical maternal hypothyroidism has not yet been shown to produce disease in the child, and S. Ingbar,²¹ in the discussion that followed her paper, put a very different construction on these facts by stating that the serum protein in the plasma of pregnant women has an increased capacity to bind thyroxine. Moreover, by giving 30 mg. of stilboestrol daily to a variety of non-pregnant subjects, Ingbar found that the thyroxine-binding capacity was enhanced.

If the maternal thyroxine passed the placenta in any quantity it would prevent not only the development of the foetal thyroid but also the production of the thyrotropic hormone (T.S.H.) by the foetal pituitary. If the T.S.H.-thyroid mechanism is established in the foetus, the placental passage of either T.S.H. or the thyroid hormone would interfere with its full development and function. Even if such a passage does not normally occur, it might take place in disease in which, for example, an excess of either T.S.H. or thyroxine is circulating in the maternal blood. It has been shown^{5,6} that the highest levels of T.S.H. are found in hypothyroidism, and though the birth of children to hypothyroid women is by no means uncommon (assessed, it is true, by retrospective history-taking) only one baby with an abnormal thyroid condition (hyperthyroidism) has so far been reported as born to a hypothyroid mother.⁷ These clinical facts

- ¹ Chapman, E. M., Corner, G. W. Jr., Robinson, D., and Evans, R. D., *J. clin. Endocr.*, 1948, **8**, 717.
- ² Hodges, R. E., Evans, T. C., Bradbury, J. T., and Keettel, W. C., *ibid.*, 1955, **16**, 661.
- ³ Grumbach, M. M., and Werner, S. C., *ibid.*, 1956, **18**, 1392.
- ⁴ Man, E. B., *Thyroid and Iodine Metabolism*, 20th Ross Pediatric Research Conference, 1957, p. 55, Columbus, Ohio.
- ⁵ D'Angelo, S. A., Paschikis, K. E., Gordon, A. S., and Cantarow, A., *J. clin. Endocr.*, 1951, **11**, 1237.
- ⁶ Gilliland, I. C., and Strudwick, J. I., *British Medical Journal*, 1956, **1**, 378.
- ⁷ Koerner, K. A., *J. Pediatr.*, 1954, **45**, 464.
- ⁸ Nikitovitch, M., and Knobil, E., *J. clin. Endocr.*, 1955, **15**, 837.
- ⁹ White, C., *J. Obstet. Gynaec. Brit. Emp.*, 1912, **21**, 231.
- ¹⁰ Keynes, G., *ibid.*, 1952, **59**, 173.
- ¹¹ Margetts, B. M., *Proc. roy. Soc. Med.*, 1950, **43**, 615.
- ¹² Fischer, P. M. S., *S. Afr. med. J.*, 1951, **25**, 217.
- ¹³ Skelton, M. O., and Gans, B., *Arch. Dis. Childh.*, 1955, **30**, 460.
- ¹⁴ Bongiovanni, A. M., Eberlein, W. R., Thomas, P. Z., and Anderson, W. B., *J. clin. Endocr.*, 1956, **16**, 146.
- ¹⁵ Lewis, I. C., and Macgregor, A. G., *Lancet*, 1957, **1**, 14.
- ¹⁶ Morris, O., *ibid.*, 1953, **1**, 1284.
- ¹⁷ Verel, D., *British Medical Journal*, 1949, **1**, 892.
- ¹⁸ Talbot, N. B., Sobel, E. H., McArthur, J. W., and Crawford, J. D., *Functional Endocrinology from Birth through Adolescence*, 1952, p. 44, Cambridge, Mass.
- ¹⁹ Astwood, E. B., and Solomon, D. H., *The Thyroid*, ed. by S. C. Werner, 1955, p. 55, New York.
- ²⁰ Goldsmith, R. E., and Eisele, M. L., *J. clin. Endocr.*, 1956, **18**, 130.
- ²¹ Ingbar, S., *Thyroid and Iodine Metabolism*, 20th Ross Pediatric Research Conference, 1957, Columbus, Ohio.

speak strongly against the passage of T.S.H. across the placenta, and they are supported by experimental evidence, for thyroidectomy in the pregnant rat does not cause hyperplasia of the foetal thyroid.⁸

Thyrotoxicosis has been described in infants born of thyrotoxic mothers.⁹⁻¹⁵ Some of these authors have taken this as evidence that T.S.H. has passed the placenta in excess and stimulated the foetal thyroid to the production of thyrotoxicosis in the infant. This might be accepted as a possible explanation, despite the evidence already cited that this is unlikely to be a normal mechanism, if it were not for the fact that the levels of T.S.H. circulating in thyrotoxicosis are either undetectable or low by the histological methods of assay used.^{5,6} However, I. C. Lewis and A. G. Macgregor¹⁵ point out that in the reported cases of congenital hyperthyroidism exophthalmos has been present (not in all¹⁴), and in their case and in those of M. O. Skelton and B. Gans¹³ severe exophthalmos was present in the mother. Sir Geoffrey Keynes¹⁰ has recorded a remarkable case in which a woman developed exophthalmos after thyroidectomy and subsequently became pregnant. Her baby was born without thyrotoxicosis but with exophthalmos and with lid retraction, which persisted for one year. Patients with exophthalmos have been shown to have a high level of circulating T.S.H.,^{5,6} but before conclusions are drawn about the passage of T.S.H. across the placenta it is well to remember that the pathogenesis of both thyrotoxicosis and exophthalmos is still the subject of much debate and speculation.

When antithyroid drugs have been given for maternal thyrotoxicosis, goitres in the baby have been described and the baby's thyroid condition has been reported as toxic,¹⁴ hypothyroid,¹⁶ and euthyroid.¹⁷ Three further cases are reported in the *Journal* this week (p. 979) by Drs. I. D. Riley and G. Sclare. Propylthiouracil given to the pregnant rat⁸ leads to hyperplasia of the foetal thyroid, and in the human cases it is usually assumed that the goitrogen passes across the placenta and inhibits the synthesis of thyroxine by the foetal thyroid. This results in increased production of thyrotrophin, with thyroid hyperplasia; after birth, when thiouracil no longer reaches the baby, a phase of neonatal hyperthyroidism may occur. The birth of goitrous babies to mothers who have been treated with antithyroid drugs emphasizes the need for care in the treatment of thyrotoxicosis in the pregnant woman. Keynes¹⁰ reported twenty-one successful cases of subtotal thyroidectomy in pregnancy, with only one stillbirth, and recommends that the operation should be done between the third and the seventh month of gestation.

Most physicians and obstetricians will prefer to give antithyroid drugs for thyrotoxicosis in the pregnant woman, and, if hypothyroidism is carefully avoided and if the drug is stopped three to four weeks before delivery, no harm to the infant thyroid should ensue. It is reasonable to treat thyrotoxicosis in the infant with both iodine and thiouracil¹⁵ (or neomercazone); occasionally severe respiratory obstruction by a large thyroid may require subtotal thyroidectomy.¹⁴

Where goitre is endemic, deficiency of iodine (possibly associated with genetic and other unexplained environmental causes) will produce neonatal goitre. In areas where goitre is not endemic, a neonatal goitre may be associated with the administration of iodine or iodide to the mother.¹⁸ This action of iodine is unexplained; it may be due to an inhibition of hormone synthesis¹⁹ or to an interference with T.S.H. activity in the thyroid gland and a consequent slow discharge of thyroxine.²⁰ Though much uncertainty still surrounds the exact pathogenesis of these hazards to the foetal thyroid, we can say that both neonatal goitre and thyrotoxicosis (but not cretinism) may be preventable.

SURGERY OF CORONARY ARTERY DISEASE

In the year that has elapsed since the surgical treatment of coronary artery disease was discussed in these columns¹ a few operations have been performed in Great Britain and experience in the U.S.A. has continued to enlarge. In particular, C. S. Beck, of Cleveland, Ohio, has carried out thousands of experimental operations during more than two decades, and recently many operations on human patients. With B. L. Brofman he has reported² 100 consecutive cases with no operative mortality. These authors point out that theoretically there are two ways of increasing the blood supply to an area of myocardium in which it is deficient owing to arterial disease—firstly by adding to the total blood flow to the heart, and secondly by altering the distribution of that flow within the heart muscle. Many operations aimed at increasing the entering flow may in fact have no such effect, but nevertheless be successful by acting in the second way. This was the result of the difficult operation of anastomosis of the aorta to the coronary sinus, now abandoned; the reversed flow of arterial blood lasted only a few weeks, but by then inter-coronary anastomoses had developed, with benefit that lasted much longer. T. M. Zoll and colleagues³ investigated the frequency of naturally occurring anastomoses between terminal branches of the coronary arteries, and found they are present in fewer than one in ten healthy hearts; when coronary arteries are narrowed to less

¹ *British Medical Journal*, 1956, **1**, 503.

² Beck, C. S., and Brofman, B. L., *Ann. intern. Med.*, 1956, **45**, 975.

³ Zoll, T. M., Wessler, S., and Schlesinger, M. J., *Circulation*, 1951, **4**, 797.

⁴ Battezzati, M., Tagliaferro, A., and De Marchi, G., *Minerva med. (Torino)*, 1955, **46**, 1178.

than one-quarter the normal diameter, the incidence is increased to more than one in two; and, when total occlusion occurs as a chronic process with survival, intercoronary anastomoses are always found. If these anastomoses can be artificially produced or increased, the likelihood of survival with further progress of coronary disease is enhanced. This is the aim of Beck's present operation. It consists in four manœuvres: abrasion of the lining pericardium and epicardium to cause inflammation; instillation of powdered asbestos to maintain it and stimulate the formation of vessels; application of mediastinal fat as a graft, for the same purpose; and partial ligation of the coronary sinus, since this, like the other measures, has been shown to cause the formation of intercoronary anastomoses and to protect the experimental animal against the effects of coronary ligation. The present indications accepted for the operation are coronary insufficiency and angina pectoris, and one or more infarcts; but it is advised that at least six months should have elapsed since the last infarct. Congestive heart failure, marked enlargement of the heart, and rapidly progressive symptoms are contraindications.

This operation, like present-day medical treatment, does nothing to restore the lumen of the obstructed coronary artery. Though anticoagulant therapy may perhaps prevent the spread of thrombus, it too has no effect on the causative intimal lesion. Attempts have been made, even as an emergency operation, to evacuate clot and cholesterol deposits and so restore the coronary lumen; but, since even in large arteries like the femoral such disobliteration operations are not at all reliable, success can seldom be expected in the appreciably smaller coronary vessels. As the occluded segment of artery is often limited, its replacement by a graft is an attractive conception. When with the aid of the mechanical pump-oxygenator more experience has been gained in operations on the dry, arrested heart, this will no doubt become practicable. At present technical difficulties seem insuperable. Meanwhile an emergency operation may be of value in another way. Death from coronary thrombosis is often due to cardiac arrest from ventricular fibrillation, occurring in a heart which is well able to continue beating adequately if this disorder of function can be reversed. As in cardiac arrest occurring during surgical operations, normal beat can often be restored by prompt massage of the heart. If aid is at hand, and the condition recognized within two minutes, lives could be and have been¹ saved in this way. The only instrument required is a knife.

A simple operation which perhaps merits further trial has been reported from Italy.⁴ This consists in bilateral ligation of the internal mammary artery in the second intercostal space, a little below the origin of the pericardiophrenic branch, so that the total blood flow is directed into this artery. There are normally anastomotic vessels between pericardium and myocardium at the root of the aorta, and it is said that these are greatly increased by this ligation. The hazard is relatively small and the operation has been safely done very soon after infarction—when an increased blood supply is most especially needed.

INTESTINAL LIPODYSTROPHY

In 1907 G. H. Whipple, then an instructor in pathology at Johns Hopkins University, wrote an account of "a hitherto undescribed disease characterized anatomically by deposits of fat and fatty acids in the intestinal and mesenteric lymphatic tissues."¹ The subject of his report was a 36-year-old physician who had suffered for five years from attacks of arthritis, loss of weight and strength, cough and, later, diarrhoea, with the passage of three or four bulky stools a day containing an excess of fat. He was diagnosed clinically as suffering from sarcoma or Hodgkin's disease of the mesenteric glands and was therefore explored surgically. At operation the mesenteric glands were very much enlarged and hard; a diagnosis of mesenteric tuberculosis was made and the abdomen was closed. The patient was reasonably well for two days but then developed dyspnoea which became extreme and terminated suddenly in death. At the post-mortem examination Whipple found the villi of the small intestine swollen, the submucosa thickened, and the mesenteric glands enormously enlarged by deposits of neutral fats and fatty acids. Both in the mucosa and in the mesenteric glands he found numbers of large mononuclear cells surrounding the fatty deposits. He proposed the name intestinal lipodystrophy for the disorder, which is often called Whipple's disease.

Though a rare disease, intestinal lipodystrophy has always aroused the interest of gastro-enterologists, and in 1956 Chun-I. Wang, H. D. Janowitz, and D. Adlersberg² reported the 55th published case-history. The great interest of their case is the response shown to corticosteroid therapy. The diagnosis had been made beyond all reasonable doubt by intestinal biopsy at laparotomy in 1951, when an ileo-transverse colostomy was carried out because the terminal ileum bore some suspicious evidence of regional ileitis. After the operation the diarrhoea increased and the patient was then treated with oral cortisone for four months with marked improvement, both symptomatically and as shown by tests of intestinal absorption. The patient relapsed one week after stopping this treatment. Soon afterwards she was treated with corticotrophin gel for 6½ months, also with good results, but again she relapsed soon after treatment ceased. She was then given hydrocortisone (free alcohol) by mouth for five months with both subjective and objective improvement. Thereafter she did not relapse during a follow-up period of twenty months.

Wang and his colleagues are not alone in having used corticoids in this disease, and they summarize the results of this form of treatment in six previously published cases as well as in their own. Several of the patients responded initially to cortisone or corticotrophin, although relapse, either after stopping treatment or even during it, was liable to occur. So far as can be deduced from the very small number of cases treated, hydrocortisone (free alcohol) by mouth may be the most effective

¹ Whipple, G. H., *Bull. Johns Hopk. Hosp.*, 1907, 18, 382.
² Wang, C.-I., Janowitz, H. D., and Adlersberg, D., *Gastroenterology*, 1956, 30, 475.
³ Hendrix, J. P., Black-Schaffer, B., Withers, R. W., and Handler, P., *A.M.A. Arch. Intern. Med.*, 1950, 85, 91.
⁴ Plummer, K., Russi, S., Harris, W. H., Jr., and Caravati, C. M., *ibid.*, 1950, 86, 280.
⁵ Russo, F. R., *ibid.*, 1952, 89, 600.

treatment, and intramuscular corticotrophin probably gives better results than oral cortisone. Wang and his colleagues recommend in addition a high-protein, low-fat diet with restriction of sodium intake and added potassium.

With the finding that Whipple's disease is sometimes amenable to treatment, its early recognition becomes important. Its clinical features have been well reviewed during recent years.³⁻⁵ The disease occurs chiefly in middle-aged men, and is characterized by polyarthritis, dyspepsia, cough, loss of weight, diarrhoea, and steatorrhoea. Brown pigmentation of the skin, resembling that of Addison's disease, is not uncommon. Death always used to occur between one and five years from the onset of symptoms. As the diagnosis cannot be made on clinical grounds, laparotomy should be advised when the disease is suspected so that biopsy specimens can be taken of the intestinal mucosa and of the mesenteric lymph nodes for microscopical study. How necessary this is for correct diagnosis can be seen from the fact that J. P. Hendrix and his colleagues,³ when reporting four cases in 1950, had made the diagnosis in one of them by mesenteric lymph-node biopsy, and they believed that this was the first reported case to be diagnosed during life.

DANGERS OF STRONTIUM-90

Recent discussion on the hazards of releasing nuclear energy has centred about the dispersing of radioactive strontium into the environment. As was said in these columns recently⁴: "The main problem is how to assess the hazard from a given amount of strontium-90 in bone." The issue may be narrowed by considering whether there is such a thing as a safe dose of strontium-90 in the human body, with the corollary that every addition to this threshold dose increases the risk of malignant disease developing. An important contribution to the debate from a committee of the Atomic Scientists' Association is reported at p. 1003 of the *Journal* this week, and its short answer is that the evidence is as yet inconclusive.

The fundamental difficulty, says the report, is that the relationship between damage produced and amount of radiation is not known. If there is a threshold dose below which cancer cannot be induced, "then it can reasonably be inferred that the small amount of strontium-90 which will accumulate in bone from the current H-bomb tests would not result in any harm." But if a linear relationship exists between amount of strontium-90 in the body and risk of developing a bone tumour, and if various other assumptions detailed by the committee are made, then "the number of bone sarcomas from one nominal high-yield nuclear test may amount to 20,000 all over the world." The type of test referred to is the one carried out with an H-bomb at Bikini in 1954 and with a fission-yield equivalent of 20 megatons. Whether or not such a linear relationship exists has not yet been determined. If it does, the consequence

of it is that "every H-bomb test by causing an increase of the content of strontium-90 in bone will increase the frequency of bone lesions."⁴ Some evidence^{5,6} that the relationship may be of a different kind was referred to in this *Journal* last week by J. F. Loutit,⁷ whose views command great respect. He wrote: "In point of fact, the quantitative evidence of the carcinogenic properties of radiostrontium, and there is not much of it, suggests that the relationship is not linear and that there is some form of threshold, or effective latent period." The research being carried out to elucidate these issues is unlikely to provide clear-cut conclusions for some time. Meanwhile, the situation is well summed up in these words of Loutit's: "The correct conclusion in the present state of scientific knowledge is that a linear relationship sets the limit and indicates the worst possible conditions, so that it would be prudent to go easy until the real facts are ascertained."

ANIMAL EXPERIMENTS AND PROTECTION FROM DISEASE

The Research Defence Society generally chooses for the annual lecture commemorating its founder, the late Sir Stephen Paget, a speaker guaranteed to carry the battle into the opponents' territory. In the twenty-fourth lecture (1955) Sir Henry Dale, with the vigour still characteristic of this stimulating octogenarian, had given a devastating exposition of the untold suffering among men and women and children, to say nothing of domestic animals and pets, that the anti-vivisectionists would have inflicted if they had had their way.¹ Last year the twenty-fifth Memorial Lecture was delivered by Professor A. A. Miles, director of the Lister Institute of Preventive Medicine. His title, "Resistance to Infection—the Experimental Approach," suggested that he was going to be philosophical rather than polemical: none the less he had many shrewd hits at those who wish to prohibit the use of animals in the laboratory. He made a scrupulously careful analysis of what animal experiments cannot and—far more important—of what they can in fact help to achieve. He dwelt at some length, after a historical introduction ranging from Galen to Koch, on the dual concepts of host susceptibility (or lack of resistance) and virulence of the invading organism, showing that the resulting intensity of an illness or infection is due to the joint, and ever-changing, operation of both factors together. He explained further how the late Professor W. W. C. Topley's studies of epidemiology in laboratory groups of mice had thrown fresh light on this joint action, revealing, for example, what might be expected from bringing a new group of uninfected animals into a colony in which an epidemic is already under way. One of the unexpected results—that this might even cause a waning infection to flare up again—has immediately practical applications in the domain of human health. Professor Miles also carefully expounded just how little the experimental method had so far been able to tell us of the complex relationship between nutrition and infection and of the even more complex one between heredity

¹ See report in *British Medical Journal*, 1955, 2, 1266.
² Miles, A. A., *Conquest*, 1957, 45, 2.

⁴ *British Medical Journal*, 1957, 1, 752.
⁵ Finkel, M. P., *Radiology*, 1956, 67, 665.
⁶ Bruce, A. M., *J. clin. Invest.*, 1949, 28, 1286.
⁷ Loutit, J. F., *British Medical Journal*, 1957, 1, 943.

and resistance to disease. Opponents of the experimental method no doubt will be eager to cite this in their propaganda and will ignore Professor Miles's demonstration that without it we should to-day not merely know even less of these important relationships than we do, but should almost certainly be pursuing will-o'-the-wisps through the gloomy quagmires of what he calls "notional biology."

Professor Miles dealt in some detail with the major line of attack on animal experiments—an attack relying for the most part on the argument that they are unnecessary or irrelevant or unjustifiable. And he distinguished all three of these from what is often confused with them—namely, the attack for so-called ethical reasons. This can only be met, according to Professor Miles, by our recognizing "a clear-cut hierarchy in the animal kingdom" that causes us to "conceive our first duty to be to man." On this point, moreover, he neatly turned the tables on the critics of animal experiments. "The contention," he said, "that what happens in an animal is irrelevant to what happens in man can be made only by insisting on the differences between one animal and another; and ignoring the similarities. To do so is to deny on biological grounds the very kinship that is invoked to forbid the use of animals altogether."

Professor Miles is far from advocating the indiscriminate or extravagant use of animals in the laboratory. Indeed, he cited as one of the "beautiful" features about Topley's experiments that their planning and analysis permitted the maximum certainty of result to be got with the minimum number of mice; he also said that "the respect we accord to the living animal . . . is a very real thing to most of us. . . . We acknowledge it in any consideration of animal experiment not only by avoiding the brutal, but by doing our best to avoid the unnecessary." The whole lecture is an admirable example of honest philosophical thinking clearly expressed, and will give in the reading, now that it has been published* by the Research Defence Society, even more food for thought, and incidental pleasure, than it did in the hearing.

EMMETROPIA

The problem of the refraction of the eye has excited the interest of the physicist and physiologist since the early part of the seventeenth century, and in more recent years the ophthalmologist has added his attention to the subject. While a mass of detail has emerged from these studies, there is still no complete understanding of the factors which contribute to the development of the emmetropic eye or of the deviations from normality which lead to the state of ametropia. Until the beginning of the present century only the variations in the axial length of the eye were considered, a normal axial length being associated with emmetropia, a decreased length with myopia, and an increased length with hypermetropia. In 1913 this simple philosophy was upset by

A. Steiger,³ who showed that in emmetropia the axial length could vary widely, and he found also much variation in corneal dioptric power. Steiger concluded that the different forms of ametropia seen in clinical practice are the result of a free association of these two variable components, axial length and corneal dioptric power. This conclusion was proved to be untenable by E. Tron,⁴ who obtained a correlation rather than a random association between these two components.

Now in a Medical Research Council report⁵ Professor A. Sorsby and colleagues have shown that axial length and corneal dioptric power are correlated when the refractive error is less than ± 4.00 D, so that a subnormal axial length tends to be correlated with an increased corneal dioptric power, and vice versa. In this way emmetropia is the result of perfect correlation, and minor degrees of ametropia follow a slight failure in this correlation. On the other hand, high degrees of ametropia (more than ± 4.00 D) are the result of anomalous components with values falling outside the range of normal variations, and axial length is without doubt the main determining factor. Fewer than 5% of eyes fall into the category of high ametropia. The two other components which contribute to the total refraction of the eye are the depth of the anterior chamber and the lens dioptric power, but these play a less significant part in the production of ametropia. It is likely that in the normal eye the correlation between axial length and corneal dioptric power is a simple and self-regulating process whereby, during any increase in the axial length of the eyeball, the cornea, which is part of a sphere, naturally becomes less curved. The retina may act as the organizer of the refractive components of the eye in the process tending towards emmetropization.

PRESIDENT OF THE ROYAL COLLEGE OF PHYSICIANS

Dr. Robert Platt, Professor of Medicine in the University of Manchester, was elected last week President of the Royal College of Physicians of London. Professor Platt was educated at Sheffield University, where he took his M.D., and was physician to the Royal Infirmary in Sheffield before moving to Manchester in 1945. He is widely known as an authority on renal disease. His writings on medical education and other aspects of medicine, thoughtful and penetrating in their analysis, have commanded the deep respect of his professional colleagues. Since 1948 he has been an editor of the *Quarterly Journal of Medicine*. Professor Platt's election as President of the Royal College of Physicians will be welcomed on these and on many other grounds. Coming from the provinces he breaks what has been almost a London monopoly of one of the high offices in the world of medicine. He carries his learning and his culture without ostentation, and his approach to the position and problems of his new office will, we may be sure, be refreshingly direct. Apart from his medical appointments, Professor Platt is on the Council of the Royal Manchester College of Music and is Chairman of the Manchester Chamber Concerts Society: he is himself a 'cellist of no mean distinction.

ASTHMA AND HAY FEVER

SYMPOSIUM FOR G.P.s

[FROM A SPECIAL CORRESPONDENT]

A symposium on allergy and the respiratory tract was held at the Institute of Diseases of the Chest, London, on April 9. It was designed specially for the general practitioner.

Management of Asthma

Dr. J. L. LIVINGSTONE began by defining asthma as a clinical syndrome marked by periodic dyspnoea with wheezing, mainly expiratory, associated with temporary narrowing of the smaller bronchi and bronchioles throughout the lungs. In long-standing cases the wheezing might become permanent. Asthma was a common condition, affecting at least 1% of our population, or around 750,000 persons in England and Wales, he said. Although it was generally accepted as a relatively benign though trying condition, this was not strictly so, for 3,000 individuals were certified each year as dying from "asthma," and even this was probably an underestimate.

What was the prognosis? It was very difficult to dogmatize, as the course depended on so many interrelated factors. In a 20-year follow-up of almost 500 children under 13 years of age Rackemann and Edwards had found that 70% either were "cured" or were almost completely unaffected by asthma, so long as they avoided allergens; that 25% were still suffering from asthma, 11% of these being severely affected; and that 1% had died. There was therefore a natural tendency towards a spontaneous "cure" during adolescence.

In discussing therapy and management it was well to have some simple system of classification. Dr. Livingstone suggested the following as practical: allergic asthma, with mucoid sputum; infective asthma, with purulent sputum; mixed asthma, a combination of the two preceding groups; psychological asthma; drug sensitivity, especially to aspirin; asthma due to nasal causes; and a miscellaneous group such as that associated with menses, exertion, and foods. Treatment must always be a serious matter and not just a question of prescribing antispasmodics. The main features in any plan of management should include: (i) early and accurate diagnosis of the type of asthma, as already defined, and the application of appropriate therapy; (ii) a "hardening regime" including fresh air, cold baths, and general toughening up, especially in children—this regime was based on the good results when children entered boarding schools and youths joined the Forces; (iii) avoidance of allergens, especially in bedrooms, where attention to pillows and mattresses would yield rewards, as would removal of dust; (iv) physiotherapy, which had twofold psychological and functional benefits; (v) treatment of nasal defects; (vi) treatment of any infection with appropriate antibacterial measures; and (vii) hyposensitization.

Hormone Therapy in Asthma

Dr. HOWARD NICHOLSON spoke on the use of the corticosteroids in the control of asthma, basing many of his comments on the results of the recent Medical Research Council trial.* In status asthmaticus a good proportion of patients would respond to the simpler well-established treatment with adrenaline and aminophylline, he said. The more potent and more dangerous corticosteroids should be reserved for those more severely affected who did not respond to the simpler remedies after 24 hours of energetic treatment. This applied more particularly to the first attack of status asthmaticus. However, discretion must be used in each case, and in a very severely ill patient who was in danger of his life corticosteroids were indicated at once.

Cortisone or one of its delta derivatives were the oral preparations most often used. Dr. Nicholson expressed a preference for prednisone. The dosage recommended for cortisone was 350 mg. on the first day, 200 mg. on the second, followed by a reduction of 25 mg. over each suc-

*Lancet, 1956, 2, 798, 803.

ceeding day for the next 8-10 days. The dosage for prednisone was one-fifth of that for cortisone.

In the infective group, with a purulent sputum, the infection should be energetically treated with antibiotics such as the tetracyclines or penicillin and streptomycin if catapnoes were to be avoided.

In chronic asthma the corticosteroids were much more disappointing, in the vast majority the condition relapsing when the drug was discontinued. They did have their place, however, in a small group of cases who were very severely incapacitated, and in these patients the drug had to be continued more or less permanently in a dosage of 75 mg. daily for cortisone or 15 mg. for prednisone. It must be strongly emphasized that this was a potentially dangerous therapy which should be reserved for the very severe and intractable case, properly selected and with a full appreciation of the risks involved.

Hay Fever

Mr. P. F. MILLING spoke as an E.N.T. surgeon on the differential diagnosis of hay fever. The signs and symptoms of hay fever were common to a number of other conditions. Even the everyday coryza had to be remembered when examining a new case. Vasomotor rhinitis was a confusing group of cases with almost identical clinical features but without the characteristic seasonal patterns. Allergic rhinitis was a more definite group in which a history of association of symptoms with contact with dust or animals was obtainable. With the increasing use of hypotensive drugs it was becoming more common to see patients with stuffy noses and sneezing attacks as a direct effect of these drugs. Nasal polypi and infected sinuses which might result as complications from any of the already mentioned conditions could also produce symptoms of "hay fever."

In the treatment of hay fever prophylactic therapy with antihistamines was not usually successful, and it was better to wait till symptoms appeared before using these drugs.

Assessment of the Allergic Factor

The allergist's views were presented by Dr. J. PEPYS, who stated that the incidence of allergic disorders had been calculated to be 10% in those countries where studies had been made. This high incidence made it all the more necessary to approach the problem in a proper scientific fashion.

The diagnosis of allergy must be based on a careful history and examination. The pale boggy appearance of the nasal mucosa together with the presence of eosinophil cells in the nasal secretions was typical. Itching of the nose was common, and in children particularly the vigorous rubbing of the nose, the "allergic salute," was a very frequent sign. Repeated episodes of "bronchitis," "pneumonia," and "colds" should be regarded with suspicion, since they could all be part of the allergic clinical manifestations. These incidents could be all the more confusing because of associated pyrexia, which, whilst its cause was not clear, might nevertheless disappear on control of allergic factors.

Classification of respiratory allergic disorders was difficult. The simplest method was to group cases as extrinsic or intrinsic. The extrinsic group presented a long history of skin and other allergic manifestations, often starting in infancy with eczema. External allergens could be found, and the prognosis for this group was good. The intrinsic group started symptoms later in life; the prognosis was poor, and, except for their frequent and remarkable sensitivity to aspirin, other allergens were seldom identified.

Management was based on identification of the causal allergen, and the removal of the patient from the cause from the patient. If this was not possible, the course of desensitization should be considered. Identification of the cause should be based on a careful history. It was essential to ask the questions as to possible specific causes. Were there seasonal variations? Allergy to tree pollens produced symptoms early in the year, grass pollens produced symptoms towards the end of June,

and in the autumn moulds were often responsible for allergic reactions. Were symptoms related to house dust? Here one had to ask specifically about the effects of sweeping and dusting in the home. Were the attacks nocturnal? If so, then they might be related to the dust in, or the composition of, the mattress and pillows. Were there associations with animals, foods, or drugs? All these possibilities had to be explored, and a careful history was much more valuable than any of the ancillary tests. Skin tests were very difficult to assess, and, unless they were carefully executed with reliable materials and the results carefully interpreted by an expert, they were apt to be misleading. A positive skin-reaction did not necessarily imply that the test allergen was, in fact, the real cause of the clinical disorder. Skin tests could, however, be most useful in confirming allergic sensitivity to moulds and grass, flower, or tree pollens.

Control of Allergy

Environmental control—i.e., the removal of allergens—was based on long experience of the results of identification of allergens, continued Dr. Pepys. A common approach to such patients, modified by individual findings, included advice on the removal of animals; the changing of mattresses or pillows or providing suitable plastic covers for them; and the control of house dust by vacuum cleaning, damp dusting, and the wearing of masks when dusting.

Desensitization was indicated only if control by other means was not possible. It consisted of carefully graduated courses of injections which might have to be continued for many years. It was a nice point to decide whether the trouble involved was worth while.

The corticosteroids had a very small place in the treatment of the common respiratory allergic disorders. They were useful, however, in the very severe seasonal asthmas, and in these they could be used prophylactically during the season.

Dr. Pepys stressed the very real dangers of "nasal addiction," with severe aggravation of rhinitis, caused by the use of some of the currently popular nasal drops—"fenox" and "privine" being, in his view, the worst offenders.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM

[FROM A SPECIAL CORRESPONDENT]

The 77th annual congress of the Ophthalmological Society of the United Kingdom was held at the Royal Society of Medicine from April 11 to 13, under the presidency of Mr. J. J. HEALY. A record number of members and their guests attended and a wide variety of papers were read.

The Bowman Lecture was delivered by Sir STEWART DUKE-ELDER on "The Aetiology of Simple Glaucoma." This lecture is the highest honour the Society can bestow, and this year's exposition was outstandingly interesting and informative.

Diabetic Retinopathy

The principal discussion was on the eye changes in diabetes. Professor G. I. SCOTT, of Edinburgh, opened it by referring to the difficult problem of the aetiology of diabetic retinopathy. The evidence about this was still inconclusive, he said, but he could confirm that the retinopathy occurred in the absence of general hypertension or local retinal arteriosclerosis, and that its development depended primarily on the duration, not the severity, of the diabetes. He also drew attention to the two different types of retinitis proliferans that characterize its later stage, one being the typical product of vitreous haemorrhage and the other manifesting itself by the gradual development of vascular loops which often result in a retinal detachment. Although the tendency to diabetes can be inherited, there seems to be no genetic predisposition to the retinopathy, and Professor Scott quoted a personal case in which it occurred in diabetes following

a pancreatic lesion. He also mentioned an unusual family who regularly developed an optic atrophy in association with their diabetes, but not a retinopathy. Capillary fragility also failed to account for diabetic retinopathy, but the retinopathy was always accompanied by a disturbance of carbohydrate metabolism of the diabetic type. Was the retinopathy commoner in the well-controlled type of diabetic, he asked in conclusion, and did it show any altered frequency in those with a high renal threshold? These were questions he was now in the process of investigating.

Relationship to Glomerulosclerosis

Dr. NORMAN ASHTON, director of pathology at the Institute of Ophthalmology, London, then discussed the relationship between diabetic retinopathy and glomerulosclerosis as seen in man and in experimental animals. In a post-mortem series of 203 diabetic patients he had found retinopathy in 67.4% and glomerulosclerosis in 36.9%. His main conclusions from this study were: (a) that retinopathy precedes glomerulosclerosis, and in its early stages may exist without the renal lesion; (b) that diabetic glomerulosclerosis, on the other hand, is always associated with retinopathy; and (c) that, although practically all stages of the two lesions can coexist, severe retinopathy is almost always associated with glomerulosclerosis, the proportion of cases with severe glomerulosclerosis increasing with the severity of the retinopathy. The close relationship between the incidence of the two lesions suggested a common cause, which was further borne out by their histological similarity. Indeed, a hypothesis could be advanced which explained their histogenesis on the same basis—namely, the seepage of lipoproteins and mucopolysaccharides from the circulation through foci of capillary degeneration. However, as Volk had recently pointed out, this comparison between the two lesions in terms of histogenesis was not completely acceptable, for there were several points difficult to explain, and the relationship between the two lesions might not in fact be as close as previously supposed.

On the experimental side, no worker had yet succeeded in reproducing a retinopathy which could be accepted as analogous to that seen in human diabetes, although isolated components of the retinopathy had been produced by a variety of experimental procedures. In contrast, lesions resembling diabetic glomerulosclerosis had been repeatedly demonstrated experimentally, the most noteworthy results being those of Becker and his colleagues, who had obtained such glomerular lesions in 96% of rabbits deficient in vitamin B₁₂ treated with cortisone. There was considerable evidence to show that these lesions might be due to lipaemia, for cortisone was known to induce lipaemia in rabbits, and the lesions could be prevented by the simultaneous administration of heparin and reproduced by other forms of experimental hyperlipaemia. However, Cook had shown that fat emboli alone were insufficient to produce characteristic retinal and renal lesions, but in man it seemed possible that a complex macromolecular substance consisting of fat, protein, and mucopolysaccharide, by impeding or obstructing the capillary circulation or by forming intramural deposits, might give rise to the various manifestations of diabetic micro-angiopathy.

Clinical Factors

Finally, Dr. J. D. N. NABARRO (London) gave a general assessment of the picture from the physician's point of view, discussing the incidence of diabetic retinopathy and its possible relation to a relative increase in adrenal cortical activity. After reviewing the two groups, insulin-deficient and insulin-resistant diabetics, he concluded that the clinical evidence pointed to "prolonged sustained hyperglycaemia, or something closely related to it, as the cause of the retinitis." Discussing the management of the insulin-resistant group, he felt that the principal concern should be in controlling their obesity. He also mentioned the danger of carbutamide (BZ 55) in promoting the risk of retinal damage.

Subsequently he had tried tolbutamide, which was slightly different chemically and not a true sulphonamide, and here the results had been satisfactory with negligible side-effects. However, prolonged trial of these new drugs would be necessary before they could be recommended for widespread use, and even then they would be suitable for only a small proportion of cases. More radical measures included hypophysectomy, which carried a considerable mortality and whose effects although generally favourable were difficult to assess.

STRONTIUM HAZARD FROM NUCLEAR EXPLOSIONS

STATEMENT BY ATOMIC SCIENTISTS' ASSOCIATION

If there is no threshold dose with strontium-90 below which malignant bone tumours do not occur, then some 50,000 such cases may result from the radioactive strontium already liberated into the atmosphere from nuclear explosions. In addition there would probably be a number of cases of leukaemia. This admittedly rough estimate is given in a statement by the radiation hazards committee* of the Atomic Scientists' Association. The statement was published on April 16. The committee thinks it quite possible that for strontium-90 no threshold does exist.

The Atomic Scientists' Association was founded in 1946, mainly by scientists who had taken part in the wartime atomic energy projects. One of its principal aims is to keep the public informed about the effects of the release of atomic energy on human welfare. Its president is Professor H. S. W. MASSEY, F.R.S., Quain professor of physics, University College, London; there are 20 vice-presidents, all save one fellows of the Royal Society, and including among their number Sir JOHN COCKROFT; Professor J. ROTBLAT is executive vice-president.

The statement begins by recording that the association's council had earlier appointed a committee to study radiation hazards "and to follow up the implications of last year's report of the Medical Research Council† in the light of more recent information." In view of the present concern about the H-bomb tests, continues the statement, the council asked the committee to prepare a public statement on its current assessment of the hazard from radioactive strontium.

Committee's Statement

"When," says the committee, "an H-bomb is exploded at a high altitude, and in an area in which there are no inhabitants—as is said to be the case with the forthcoming British tests—there is very little likelihood of immediate injury to people, or of substantial local contamination of the oceans, even if a large amount of radioactivity is produced in the explosion. This radioactivity would be taken up into the upper regions of the atmosphere from where it would spread all over the globe and gradually descend to the ground over a period of some years. By that time only the long-lived radioactive products of the bomb would remain, and it is with the possible effects of these that we are concerned.

"If H-bomb tests continue at the present rate, the dose of radiation to the reproductive organs, which may cause damage to future generations, has been estimated in the M.R.C. report to be of the order of 1% of that resulting from the natural level of radiations. Of greater import, however, is the damage which may result to the present generation, mainly from one radioactive substance—strontium-90. This substance enters into our food, chiefly in vegetables and dairy products, and it accumulates in the human body in the bones, where it remains for a long time.

*Membership of Radiation Hazards Committee: Professor J. Rotblat (chairman), Dr. J. W. Boag, Professor A. Haddow, Dr. W. M. Levitt, Dr. Patricia J. Lindop, Mr. S. B. Osborn, Professor L. S. Penrose, F.R.S., Professor P. A. Sheppard, Dr. G. Simon, and Dr. A. J. Salmon.
†The Hazards to Man of Nuclear and Allied Radiations. Cmd. 9780, 1956. H.M.S.O., London.

Depending on the assumptions made about the distribution of strontium in bone, we calculate (see appendix) that by the year 1970 the radiation dose to bone from all the tests carried out up to the autumn of 1956 will range from 9% to 45% of the dose received from all natural sources, including the radium which is normally present in bone.

"It is known that radioactive substances concentrated in the bone may give rise to bone cancers and other damage, and that the irradiation of bone marrow may result in leukaemia, a type of cancer of the blood. The induction of bone cancers by the action of strontium-90 in the bone has been demonstrated in animals; in human beings the same effect has been observed with radium, which in some ways behaves like strontium. In all these cases, however, the amounts of radioactivity present in the bone were far greater than those that are likely to accrue from H-bomb tests. The question then arises how to apply these findings to very small doses. There is here a fundamental difficulty, in that the relationship between the damage produced and the amount of radiation is not known. If this relationship is such that there exists a threshold dose below which cancer cannot be induced, then it can reasonably be inferred that the small amount of strontium-90 which will accumulate in bone from the current H-bomb tests would not result in any harm. If, however, the number of additional bone tumours resulting from radiation is directly proportional to the dose, then even a very small dose will give rise to a small but definite probability of bone cancer. This means that in a very large population a certain number of people would contract this disease as the result of their having a small amount of strontium-90 in their bones."

Evidence on a Threshold Inconclusive

"The evidence is as yet inconclusive. Some animal experiments have been interpreted as indicating the existence of a threshold dose. On the other hand, in man the occurrence of leukaemia caused by radiation suggests a simple proportional relationship. Unfortunately the question cannot be settled by experiment in a short period of time, nor is there strong guidance from theory. There is one theory of the origin of cancer (that it is due to somatic point mutation) which implies a proportional relationship. Where the effects of strontium-90 are concerned the authorities in the M.R.C. report appear to be inclined towards the proportional hypothesis, for they state: 'On the whole the experiments seem in favour of a proportionality between the frequency of tumours produced in a given length of time and the amount of radioactive material in the body even at low dose levels.'

"If the proportional relationship is accepted, it is then possible to make a rough estimate of the number of bone cancers which may result from a given H-bomb test. The calculations given in the appendix show that an H-bomb of the type tested at Bikini in 1954, if exploded high in the atmosphere, may eventually produce bone cancers in 1,000 people for every million tons of T.N.T. of equivalent explosive power. (It has been stated that bombs hitherto exploded were equivalent, in aggregate, to 50 million tons, in so far as their strontium-90 fall-out is concerned.) These thousand casualties would be spread all over the world and occur in the course of several decades. A somewhat larger number of people might suffer other bone changes, possibly without manifesting any clinical symptoms. There is also the probability of a number of cases of leukaemia resulting, but we have not enough data to estimate this number. At the same time it should be pointed out that these casualties, although large in absolute number, represent only a fraction of those due to the natural level of radioactivity; there would be no way of distinguishing one from the other.

"If other types of nuclear weapons were exploded, the number of casualties would vary in direct relation to the amount of fission products released into the upper atmosphere.

"In giving these estimates it must be emphasized again that, apart from the considerable margin of error due to lack of adequate data, they are based on the as yet unproved hypothesis of a proportional relationship applying to very

small doses. From this point of view they represent the most pessimistic approach. On the other hand, if this hypothesis is correct, then the figures may be an underestimate of the damage, since they do not allow for the radiation dose in children before or after birth. Children are known to take up much larger quantities of strontium than adults, and the likelihood of producing radiation damage in them is probably much greater for the same amount of radiation.

APPENDIX

"Estimate of Strontium-90 Hazard Based on an Assumed Linear Relationship between Bone Tumour Formation and Dose"

"1. The measurements of the ^{90}Sr content in human bone in this country, carried out by workers of the U.K.A.E.A.,¹ show that by the beginning of 1956 the average amount in all age groups from 10 years upwards was about 0.2 S.U.* (1 S.U. = 10^{-12} curies of ^{90}Sr per gramme of calcium).

"2. If this figure is applied to the data of the world survey of strontium-90 made by the Lamont group,² we conclude that the ^{90}Sr concentration resulting from all the tests carried out up to the autumn of 1956 will in 1970 amount to about 4 S.U. This value is in agreement with the estimate of 4-10 S.U. made by Libby³ for the U.S.A.

"3. The total fission yield from the tests carried out up to the autumn of 1956 is estimated² to be equivalent to 50 megatons. For one nominal high-yield weapon (as defined in the Indian Government's document⁴: 20 megatons with high fission yield) exploded high in the atmosphere, one may therefore expect a concentration in bone of 1.6 S.U.

"4. From Hasterlik's survey⁵ of bone sarcoma in people with a radium burden, we estimate that 0.1 microcurie of radium yields about 0.5% probability of bone sarcoma. (A factor of 2 has been allowed for the possible admixture of mesothorium with the radium.)

"5. Since 0.1 microcurie of radium is accepted⁶ to be equivalent to 1,000 S.U., applying this probability value to the population of the whole world (2.5×10^9 people) we obtain that the number of bone sarcomas from one nominal high-yield nuclear test may amount to 20,000 all over the world ($2.5 \times 10^9 \times 0.5 \times 10^{-2} \times 1.6 \times 10^{-3}$).

"6. The radium normally contained in the body and the external radiation from natural sources deliver to the bone a dose equivalent to 45 S.U., or 9 S.U. if one allows for the non-uniform concentration of strontium in bone (Spiers⁷). This means that the dose rate from strontium in bone will amount to 4/45 or 4/9 of that due to the natural background.

REFERENCES

1. Bryant, R. J., Chamberlain, A. C., Morgan, A., and Spicer, G. S., A.E.R.E. HP/R 2056, 1956.
2. Kulp, J. L., Eckelmann, W. R., and Schulert, A. R., *Science*, 1957, **125**, 219.
3. Libby, W. F., *Proc. Nat. Acad. Sci. (Wash.)*, 1956, **42**, 945.
4. *Nuclear Explosions*, Government of India, 1956.
5. Hasterlik, R. J., Geneva Conference, Vol. 11, p. 149.
6. Recommendations of International Commission on Radiological Protection, *Brit. J. Radiol.*, 1955, Suppl. 6.
7. Spiers, F. W., *Brit. J. Radiol.*, 1956, **29**, 409."

IMPERIAL CANCER RESEARCH FUND

The Imperial Cancer Research Fund held its annual meeting at the Royal College of Surgeons on April 15, under the chairmanship of Sir CECIL WAKELEY, chairman of the Fund's council. Besides presenting the Fund's 54th report, Sir Cecil Wakeley announced that it was hoped to begin demolition work in the autumn on Nos. 44 and 45, Lincoln's Inn Fields, on the opposite flank of the R.C.S. to the Nuffield College, in preparation for the Fund's new laboratories and offices. Mr. A. DICKSON WRIGHT, the honorary treasurer, said that the cost of the new laboratories was estimated at about £1m. They were planned to be up in about two years' time.

Progress in Research

The report for 1955-6 is introduced by a general outline of the chief problems in cancer research to-day and an

*S.U. is an abbreviation of "sunshine" or "strontium unit." "Sunshine unit" is more usual in the United States, "strontium unit" in Britain.

account of some of the ways in which they are being attacked. Then follow the directors' reports of research at the Central Laboratories at Mill Hill (Dr. JAMES CRAIGIE, F.R.S.) and at the Clinico-Pathological Research Unit at 48, Lincoln's Inn Fields (Professor GEOFFREY HADFIELD). Dr. Craigie's report records the retirement of Dr. A. M. BEGG, who discovered the first filterable fowl endothelioma, and of Mr. H. G. CRABTREE, who worked on tumour metabolism. Both joined the Fund in 1922.

Dr. CRAIGIE reviews nine years' experience of preserving tumours frozen. Over 60 experimental tumours are now stored at -79°C , and even after five or more years those tested have shown no significant progressive loss of viability. So far also there has been no observable change in the character of tumours so preserved. Freezing, among other advantages, is a far more economical way of maintaining a tumour than by serial transplantation. It costs rather less than £2 a year to keep a tumour in this way, and Dr. Craigie now meets most requests for experimental material from this frozen tumour bank. Other work being carried out at the Mill Hill laboratories includes *in vitro* studies of tumour cells in hanging-drop preparations. Here it appears that the carbon-dioxide concentration in the cell's atmosphere is a "critical factor" in deciding whether a cell rounds off or puts out cytoplasmic processes. Other related studies have concerned the "adhesiveness" of tumour cells which is thought to have a bearing on their ability to infiltrate and metastasize. Prolonged stilboestrol treatment of guinea-pigs has resulted in an apparent acceleration of the normal ageing process and also in changes in renal function similar to those seen in aldosteronism in man.

Clinico-pathological Research Unit

Professor HADFIELD, in his report, says that the obstacles in investigating human cancer on a strictly scientific basis are proving on the whole more easily surmountable than might be expected. Preparations are being made for a study of the heterologous transplantation of human tumours, and one of his staff has gone to New York to study the methods developed at the Sloan-Kettering Institute. On the biochemical side, hormone excretion in patients with cancers of the breast and prostate has been further investigated.

The question of possible differences between clinical (or active) and latent (or unsuspected) prostatic cancer has been investigated in various ways. In histologically proved prostatic cancer death without gross metastases (biological latency of the tumour) was common among the older patients, and the presence or absence of metastases bore no direct relation to the duration of the disease. A follow-up of 200 patients with clinically benign prostatic enlargement, now in its fourth year, has produced 19 with undoubted histological cancer, though none had died of the disease. Pointing out that presumably many of these patients have biologically latent cancers, Dr. L. M. FRANKS comments: "It is obvious that the morphology of a prostatic tumour is an unreliable guide to its biological behaviour. Other methods for assessing tumour activity are essential."

Work on the relationship between pituitary function and breast cancer has been continued. One of the reasons why some workers have been unable to confirm the reliability of the mouse-breast test for mammatrophic hormone in the urine is said to be the finding that the response to prolactin is a remarkably uncommon strain characteristic; only two out of 37 strains of laboratory mice exhibited it.

Dr. J. BAMFORTH reports on exfoliative cytology. "Judged by clinical standards," he says, it is "of immense service" in the early diagnosis of cancer of the cervix; in clinically recognizable prostatic cancer "the cytological characters of the smear are unmistakable," but in preclinical disease no firm claim for it can yet be made; in suspected lung cancer "cytological examination of the sputum by an experienced observer is an essential diagnostic measure."

Research on lung cancer by Dr. G. J. CUNNINGHAM is summarized as leading to the conclusion that pulmonary fibrosis, as in bronchiectasis, does not directly predispose to the development of primary bronchial carcinoma.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Post-maturity

SIR,—In your annotation on the subject of post-maturity (*Journal*, April 13, p. 876), you end with Greenhill's dangerous assertion that "if the cervical canal is taken up and the external os is not closed, the patient is near, at, or after term." The implied corollary is that, if the cervix is *not* taken up, term has not been reached. While in the normal case the taking up of the cervix (which is a sign that labour is soon to begin) occurs more or less simultaneously with maturation of the foetus, it is wrong to assume that this happy coincidence is true in every case. A premature labour, say at 32 weeks, is preceded by the taking up of the cervix, and, on the other hand, in a prolonged pregnancy the foetus may die in utero because its growing demands exceed the diminishing ability of the dying placenta to supply it, while the cervix remains long and closed because the uterus is not yet ready for action. No, Sir, it is not enough to depend on the state of the cervix to decide whether term has been reached. The calculation of the duration of pregnancy requires careful assessment of a number of details—the menstrual history, comparison of the size of the uterus in early pregnancy with the estimated duration, the time when movements are first felt, the girth in late pregnancy, the clinical assessment of the size of the foetal head, the x-ray appearances of the foetus and its ossification centres, and last, and probably least, the state of the cervix. A *laissez faire* attitude is probably better than ill-considered, brash interference, but careful clinical assessment of every detail is surely better than either.—I am, etc.,

London, S.W.3.

J. C. MCCLURE BROWNE.

Delayed Emptying of Gastric Stump

SIR,—I have followed with considerable interest the correspondence initiated by Mr. R. B. Welbourn (*Journal*, November 17, 1956, p. 1172) concerning delayed emptying of the gastric stump soon after gastrectomy. It has often been pointed out that operation usually reveals no apparent mechanical fault. Laparotomy therefore is better avoided, and in most cases gastric aspiration eventually results in resolution of the apparent obstruction. However, such obstruction may last, as Mr. Welbourn writes, for a matter of weeks, and, although gastric aspiration can be continued throughout this period, the problem soon arises as to the best way to maintain nutrition. The intravenous route has considerable limitations if an attempt is made to carry it on for a long period, and the sooner one can revert to alimentary feeding the better. The answer to this problem was given several years ago by Abbott and Rawson,¹ who described their double lumen tube, and by Einhorn,² who described a similar tube. Mr. Welbourn speculates as to the possibility of using such a tube, having not apparently heard of it before, and Mr. Maurice Lee (*Journal*, December 8, 1956, p. 1364) has devised such a tube, apparently not knowing of the work of Abbott, Rawson, and Einhorn. Although I have been using Abbott-Rawson intubation as a routine in all gastrectomies for many years, I was recently surprised to find that only a very small percentage of Australian surgeons use it.

Our routine in gastrectomy is as follows. The tube is introduced via the nares into the stomach shortly before operation, and at operation the end of the tube is placed into the efferent loop so that the gastric suction holes lie in the stomach. Printed instructions to nurses divide the post-operative treatment while the tube is in position into two phases. On return to the ward after operation, to

prevent the lumen of the tube from becoming blocked, the jejunal feeding portion of the tube is connected to a slow 5% dextrose drip. Hourly syringe suction is applied to the gastric suction portion. In the patient behaving normally, never more than a few centimetres are withdrawn at a time. Continuous suction never works satisfactorily. If it does it usually means that trouble is developing. With syringe suction any abnormal change in the behaviour of the aspirate very early becomes apparent. Suction is continued without oral intake until bile appears in the aspirate 12 to 48 hours after operation. This is taken to indicate that the usual temporary post-operative paralytic ileus is subsiding. Aspirations are continued for a few hours after bile appears to allow for the transition from the early irregular contractions of the small bowel to the stage of normal peristalsis. This is the end of the first phase, which is the time when it is decided that the bowel movements have recovered to such a degree that it becomes wise to introduce food into the small bowel. The gastric aspiration is continued, but the continuous jejunal drip is replaced by the hourly injection of 1 oz. of a suitable protein hydrolysate. This is followed by the injection of the gastric aspirate, which, if removed as it collects, consists of normal duodenal content, which should be conserved. This feeding is continued with increasing quantities for a couple of days until it becomes clear that the jejunum is tolerating the feedings. The tube is then removed and oral feeding commenced.

Two obstructive phenomena may occur in the early post-operative period—namely, obstruction to emptying of the stomach, and intestinal obstruction at a lower level. These are readily diagnosed at a very early stage. Normally the gastric aspirate by syringe every hour is only a matter of a few cubic centimetres. If it is found that the quantity gradually increases, though perhaps irregularly, and commences to come away very easily with syringe suction, then one of these obstructions is developing. The jejunal drip is stopped, and syringe suction is applied to the jejunal portion of the tube. If only a few cubic centimetres of fluid are withdrawn with difficulty, the fluid appearing to be only that which has been introduced to clear the lumen of the tube, then the obstruction is at the efferent stomach. If, however, there is an increase in the quantity of fluid that can be aspirated from the jejunal feeding tube, and this fluid comes away readily, and in volume, and appears to be similar to that withdrawn through the gastric suction, then the obstruction is in the small bowel.

With stomal obstruction, syringe suction is replaced by continuous suction. If the fluid is aspirated as secreted, it is normal duodenal content, and should be returned to the alimentary canal. With a double lumen tube this can readily be done by placing the gastric aspirate in a suitable container, and running it through a simple filter into the jejunal portion of the double lumen tube. To this can be added a continuous drip of high-protein fluid. It is sometimes found that sufficient fluid can be given by the jejunal feeding tube to allow of intravenous fluids being discontinued. I have had such a case enjoy perfect comfort for 14 days. At the end of this period the block resolved, this being shown by rapid fall in the amount of fluid that could be aspirated from the stomach. When this occurs the management of the Abbott-Rawson tube reverts to that of the second phase of normal management, and progress is uneventful. One does not have to worry with prolonged intravenous feeding, and does not have to discard the many pints of aspirated normal duodenal content which otherwise could only be given through a feeding jejunostomy. With small-bowel obstruction continuous suction is applied to whichever of the two lumens runs the easier, and this suction is continued until the obstruction resolves, which it usually does. This is again indicated by a rapid fall in the amount of aspirate coincident with relief of distension and pain and perhaps passage of flatus. The management again reverts to the normal management.

Concerning Mr. Welbourn's case report, I would like to state that oral intake is not allowed while suction is being carried out, except as a trial at the stage when one feels that the patient may tolerate a change from suction to oral feeding. As Mr. Lee advocates, some years ago we did start drip feeding into the jejunal feeding tube immediately after operation, but found that, if such were done into a small bowel in a state of the so-called "physiological ileus," it was often not tolerated, causing regurgitation and vomiting.

We therefore stopped this in favour of using the appearance of bile in the aspirate as an indication of the probability that the introduction of food was likely to be tolerated.—I am, etc.,

Geelong,
Victoria, Australia.

CHARLES GALE.

REFERENCES

- ¹ Abbott, W. O., and Rawson, A. J., *J. Amer. med. Ass.*, 1937, **108**, 1873.
- ² Einhorn, M., *Surg. Gynec. Obstet.*, 1941, **72**, 48.

Strontium-90 in Man

SIR,—Your leading article (*Journal*, March 30, p. 752), relating to the dangers of strontium-90 absorption in man, apparently overlooks the special case of the marine habitat, which, since so many nuclear tests are carried out at sea, can hardly be regarded as insignificant.

It is, I believe, true that certain species of zoo-plankton concentrate strontium specifically. Since these organisms constitute the staple diet of larger marine forms used for human food, it is probable that sea-borne strontium would reach the human organism, and, in fish-eating communities washed by streams passing near to nuclear testing-grounds, could constitute a very real danger. Furthermore, while on land the spread of strontium-90 is uniform, the tendency for plankton organisms to concentrate in areas of suitable physical properties for maximum growth could produce, under suitable conditions, concentrations of strontium-90 considerably higher than the average level, with correspondingly higher levels in fish grazing in these areas.

While we are perhaps fortunate in England, in being a considerable distance from the nuclear testing-grounds, there are others who are less fortunate and whose shores are washed by ocean streams carried over immense distances.—I am, etc.,

London, N.8.

GORDON HYDE.

Benactyzine

SIR,—The paper by Professor G. R. Hargreaves and Drs. M. Hamilton and J. M. Roberts (*Journal*, February 9, p. 306) and the subsequent correspondence between Dr. E. H. Hare (*Journal*, March 9, p. 582) and Professor Hargreaves (*Journal*, April 6, p. 817) emphasize the importance of properly conducted "blind" investigations of the efficacy of therapeutic drugs "in order to circumvent the capacity for unwitting self-deception which both psychiatrists and their patients display"—as the authors of the original paper had put it. Alas, it seems that even the best intentions are not proof against the craft and ingenuity of unwitting self-deception. The investigation by Hargreaves and his colleagues shows an example of self-deception which is so marked as to be highly significant statistically.

It is debatable whether "blind" trials are possible at all in the case of a drug that does not remove symptoms and merely causes characteristic effects which reduce the distress occasioned by the patients' symptoms. Benactyzine produces (? in most cases) "a feeling of calmness, and sometimes a sense of detachment," as the original authors have reported. In more than half their cases (8 out of 14) there were complaints of dizziness and "muddled thinking." Obviously any psychiatrist worth his salt is likely to detect the characteristic effects of such a drug. He certainly may be expected to see through the transparent "blind" of such a trial, and to guess, with a success-rate far above chance, whether a patient received the drug or inert tablet.

Hargreaves and his colleagues removed six patients from their investigation because of changes in the patients' life situation. The patients were removed before the authors knew the coding employed for the dispensation of the tablets. Nevertheless this procedure violates the canons of statistical experimentation. Dr. Hare rightly pointed out that, had the patients not been removed, there would have been hardly any difference between the improvement scores in the control and the benactyzine patients. It is this removal of six patients from the investigation that betrays the working of unwitting self-deception. The exclusion of every one of these patients favoured a positive outcome of the trial. How often could

this have happened by chance? If we assume that in each case there had been an equal chance that the exclusion of a patient either increased or reduced the difference between the control and the benactyzine group, then the answer is: only once in 64 chance guesses could it have happened that the difference between the two groups was invariably increased. It is like the chance of throwing six heads in spinning a coin. P therefore is 0.016, which is of much higher significance than any of the P-values reported in the original paper. It supplies statistical evidence that the investigators had fallen victims to the wiles of unwitting self-deception which they had been trying so hard to circumvent.—I am etc.,

London, S.E.5.

F. K. TAYLOR.

Defective Colour Vision

SIR,—People are often unaware of defective colour vision irrespective of their general intelligence and education. Occasionally the effects are damaging to their careers. Defective colour vision is common in men, the frequency being about 8%, and less common in women, being about 0.44%.

A case in point, a youth of 18 years, had worked satisfactorily in an industrial chemical laboratory on work which he could and did carry out satisfactorily for over a year. His further training, at a technical school, necessitated titrations using colorimetric methods. After a year he developed an anxiety neurosis due to difficulty in his school work owing to his colour defective vision, and after a further six months of effort he resigned his post.

A review of the effects of defective colour vision in industry was made in 1946 by the Colour Group of the Physical Society. They stated: "We have no doubt of the urgency of instituting tests of the colour vision of schoolchildren, especially boys. . . . They recommended that school tests should be carried out at 13 years by a confusion chart method—for example, Ishihara—and that pre-vocational tests should also be carried out. The use of a simple short method such as Ishihara charts can be made with little instruction by a nurse or other intelligent adult. By this means those with grossly defective colour vision will all be found and most of those with marked colour defects. Yet, 11 years after the Physical Society's report, only a minority of schoolchildren have colour vision tests.

The young man referred to above wasted about two years of his life in training for a task for which he was unsuitable through his colour defect. If he had completed the training period he could undoubtedly have taken some sort of post in a large laboratory, but promotion, which would be dependent on further training and the ability to move from task to task to gain general experience, would have been greatly hampered. The waste of time in training, bitter disappointment of cherished ambitions of would-be chemists, aircrew, seamen, railwaymen, etc., and the even more serious damage to people's careers later can be avoided by a school examination of colour vision.—I am, etc.,

Gerrards Cross, Bucks.

ROBERT PIPER.

REFERENCES

- ¹ Gray, R. C., *Nature (Lond.)*, 1944, **153**, 657.
- ² *Effects of Defective Colour Vision in Industry*, 1946. Physical Society. London.

Underfeeding of Babies

SIR,—In the second paragraph of Mr. Albert Davis's letter on this subject (*Journal*, April 6, p. 821) he refers to the "extensive paediatric practices" of some nurses. I would like to go one stage further in commenting on what I might call "risks the baby runs in being kept healthy."

No one would dispute the fact that infant welfare clinics and health visitors have done a lot towards education in baby-care and are a very big factor in the lowering infantile mortality. But now I feel there is a risk of going too far. Just as it is possible to overtreat peptic ulcers—as we read in the same copy of the *Journal* (p. 786)—so I am sure it is possible to overcare for babies. Let me give you three instances: (1) Weighing: Many mothers of newborn babies

are literally slaves to the scales. If baby does not put on his regulation 6 oz. (170 g.) per week, they rush round to the doctor to find out the cause. As I see it, weighing is largely unnecessary. If the baby is contented, taking his feeds, and there are no symptoms of trouble—e.g., vomiting or diarrhoea—and there is no apparent organic trouble, surely everything is fine. If he is breast-fed he is getting enough; and the amount of milk to be given to a bottle-fed baby should anyway be calculated on his expected weight, as opposed to his real weight (and even then one should not stick strictly to the 2½ oz. per lb. (156 ml. per kg.) body-weight per day). As far as I see it, the only point in weighing a healthy baby is to see if a breast-fed one is being underfed—and even then the only method is to test-feed for 24 hours. (2) Foreskins: How many cases of circumcision arise because someone in infancy has been bitten by the stretching bug, so that the foreskin develops into an inelastic scar? Let us recognize the physiologically tight foreskin of the neonate, and leave it well alone. It will then rarely need circumcision. (3) Umbilical herniae: In infancy we know these to be very common, and we also know that a very high percentage are "cured" spontaneously. Why not leave them alone? Strapping (especially with pennies) only becomes unhygienic, and if anything upsets the muscular balance of the abdominal wall it is the strapping that is usually carried out in clinics.

Let me hasten to repeat that in principle I have every admiration for the infant welfare service. But, if the members of it are not careful, their meddlesomeness may undo much of the good they are doing.—I am etc.,

Ramsgate.

W. G. BENSON.

SIR,—It is well that Mr. Albert Davis (*Journal*, April 6, p. 821) has moved us from the perennial, albeit important, topic of overfeeding into the realm of the role of the paediatrician; and how apposite that this should come from an obstetrician.

His concept of the consultant paediatrician as "much too senior to be bothered with trivia" approaches the core of the doctor-patient relationship. Paediatric practice has changed considerably in recent years and now includes not only diagnosis, treatment, and aftercare of the ill child but also the newer practice of preventive child health, starting with the neonates and seeing them through infancy and childhood to puberty. In so much of this work successful management of "trivia" may often prevent more serious and complicated events. The experienced paediatrician will see these in their right perspective and by his reinforcement of the mother's natural potentials will often enable her to feel able to deal with them herself or to know where to turn to for help.

We do not need a new brand of doctor to do this work but an improvement in those involved in child care. The paediatrician, through his contact with parents, health visitors, clinic doctors, and, above all, the general practitioners, can do so much by example and by helping in the better understanding of the everyday yet very real problems of motherhood and child management.—I am, etc.,

London, W.1.

DAVID MORRIS.

SIR,—"Carry oi out but don't bend oi," said the yokel at the feast when he had filled himself up with cider. The yokel was wise, because he knew that the capacity of the human stomach is limited. The truth of this must be remembered when discussing the question of overfeeding babies. While I agree entirely with Dr. Ian G. Wickes (*Journal*, March 23, p. 702) and Mr. A. Davis (*Journal*, April 6, p. 821) when they tell us that it is not possible to overfeed a baby, I am equally convinced that it is possible to overfill its stomach at any one time.

Overfilling produces stretching of the gastric muscle, which responds in the usual way with vigorous contraction. This will result either in regurgitation of the surplus, or, by stimulating intestinal peristalsis, the passage of loose stools. Either of these results, though quite harmless to the baby,

will, if the true explanation is not forthcoming, cause anxiety and lead to the giving of unwise advice, which in turn may produce untoward results.

In my view, much of the trouble caused by overfilling can be traced to the practice of insisting that babies' feeds be diluted with water—a practice based on the false notion that babies may be "upset" by the relatively thick curd of raw cow's milk. The dilute feed fills the baby's stomach but it does not satisfy its hunger; indeed, the attendant regurgitation may cause the loss of much-needed food. The baby cries for more food; the feed is increased and becomes even more bulky; so that a vicious circle is established of overfilling, regurgitation, hunger, overfilling. The remedy is to increase the calories without increasing the volume, first by giving undiluted milk, and secondly, if necessary, by adding an extra scoop of dried milk to the feed without the addition of any extra water. In breast-feeding, when babies can easily overfill themselves if allowed to feed too long (more than ten minutes a side), the remedy is to shorten the time of the feeds and increase their number in the day. It is water that is the curse of the hungry bottle-fed baby, and infancy therefore is perhaps the only time in our life when the right advice is, "Take less water with it."—I am, etc.,

London, S.E.26.

JOHN BURKINSHAW.

Mild Endogenous Depression

SIR,—If I may be permitted, Dr. R. J. T. Woodland's very interesting letter (*Journal*, April 6, p. 822) has prompted me to some further thought on this subject.

I accept Dr. Woodland's criticism of my "four or five E.C.T.s" (*Journal*, February 16, p. 401). I did not intend the latter to be taken quite too literally, but still I agree it could be misleading, and that in many cases it would be most unwise to stop at either of these figures. Ideally, I used to aim at giving two E.C.T.s after all symptoms of depression, sleeplessness, and tearfulness had vanished—that is, from the day the patient attended stating he felt "fully recovered." To stop while there is any suggestion of any one of the above symptoms remaining is usually, in my opinion, to court disappointment. On the other hand, in some cases mental confusion (going beyond the memory defects, which may be ignored) sets in early, and here I think one must hold off for a time and then again review the position. To continue with E.C.T. in the face of confusion only of course increases the confusion, and may lead to panic and a complete refusal to have further treatment.

But my main reason in wishing to re-enter this correspondence is to question the accuracy of the term "endogenous." The latter term suggests that this depression is largely innate or constitutional, which, in my experience, is quite rare. I think it is now fully appreciated that depression in the vast majority of cases simply means an exhaustion of "nature's bank" of nervous energy, due it may be to just the daily wear and tear of life, or in exceptional cases to exceptional causes—acute stress, shock, bereavement, etc. (in the latter cases I do not think there is anything to be gained by coining another term "reactive"; nor, in my opinion, does the diagnosis "reactive" alter in any way the treatment called for). Therefore I think the term "anxiety neurosis" is at once more elastic and all-embracing than "endogenous depression" and is to be preferred to it, provided we do not confuse it with hysterical states, which in my opinion, for the sake of clarity, we should call "anxiety hysteria" and not "anxiety state."—I am, etc.,

Northampton.

ROBERT THOMPSON.

Popular Delusion

SIR,—Rumours of the kind described by Dr. Clifford Allen (*Journal*, April 6, p. 822) are quite common, especially in times of war. Marie Bonaparte described some of them in her *Myths of War* (London: Imago Publishing Co., 1947). Her study is revealing and amusing.—I am etc.,

London, N.W.8.

W. HOFFER.

Road Accidents

SIR,—In your leading article (*Journal*, March 30, p. 753) on the above subject you refer to the American Medical Association symposium recently published, which advocates qualifying medical examinations and re-examinations for drivers; "safety cars," so built as to lessen the risk of damage from collision; and also various other devices to reduce the toll of the roads. But, as far as I can gather from your comments, no mention is made of intoxication as a major factor in accidents, both in the U.S.A. and in this country.

In my opinion, drinking drivers and pedestrians are responsible for 50% of those road fatalities occurring after 10 p.m. and for 10% of all road deaths in this country. I formed this conclusion after reviewing the police reports of all the fatal road accidents in Leicester, Leicestershire, and Rutland for the three years 1953 to 1955. These caused 254 deaths. In a letter in your *Journal* (March 17, 1956, p. 631) I concluded, "If we regard Leicestershire as a fair sample of the country as a whole, there would appear to be over 500 deaths annually in Great Britain due to drinking drivers or pedestrians." Dr. Maurice V. Stack (*Journal*, June 23, 1956, p. 1485) appealed to police surgeons or other interested persons to produce evidence refuting the above figures and conclusions, but none have appeared. Quite recently I have seen the reports of two more groups of fatal road accidents in different parts of the country, and both of these groups confirm my conclusions. In the hundreds of road deaths investigated, in not one instance was the driver involved charged with being "drunk" or "under the influence." I am told that these reports will be published later.

If my views are correct, over 500 deaths annually in Great Britain (and perhaps 25,000 injuries) result from intoxication. It is obvious that very few convictions can be obtained by our present methods of examination. It is surely time for this country to legalize some objective test, in the same way as a speed limit is legalized. Measurement of the alcohol in the urine or blood provides such an objective test, which has been used for many years both in Europe and America. As far as I am aware, no country or state has discarded this test when once adopted. Bad drivers or careless pedestrians are responsible for most accidents, and a very moderate degree of intoxication will convert a careful into a careless and therefore a dangerous driver.—I am, etc.,

Leicester.

N. I. SPRIGGS.

Lung Cancer

SIR,—Your correspondent, Dr. J. Millar Smith (*Journal*, April 13, p. 886), has answered his own question about a possible connexion between road tar and lung cancer. He says: "In fact, I wonder that any of us who live on and use the main roads escape." There is no evidence that road-users, such as traffic police, lorry drivers, and housewives, are particularly subject to lung cancer. There is ample evidence that smokers, especially town-dwelling ones, are. Even the urban factor may be largely accounted for by the fact that the change from pipe to cigarette smoking began in the towns.—I am, etc.,

Garboldisham, Norfolk.

ROBERT McCURDY.

REFERENCE

¹ Stocks, P., and Campbell, J. M., *British Medical Journal*, 1955, 2, 923.

Tetanus Prevention

SIR,—In view of the sometimes severe and occasionally fatal reactions to antitetanic serum (A.T.S.), it now seems quite unjustified to plan any long-term prevention of tetanus by A.T.S. rather than by active immunization with tetanus toxoid (T.T.). The latter has the double advantage of preventing or modifying the disease if infection is incurred and of allowing rapid mobilization of natural antitoxin (without the hazards of a serum reaction) by a booster dose of T.T. in circumstances of special risk.

The immune population will decrease when National Service ends. In the long run the growing practice of triple inoculation (diphtheria, tetanus, pertussis) for infants will build it up: meanwhile the gap could be bridged by active immunization offered by the school medical services, by casualty departments, and perhaps by industrial medical officers, who may meet a population at special risk. For such a policy to bear full fruit, as Dr. Derek Bunting (*Journal*, April 6, p. 819) points out, some accessible record of immunization state will be important.—I am, etc.,

Oxford.

C. W. M. WHITTY.

Budgerigars in Wards

SIR,—In recent years the keeping of budgerigars has become increasingly prevalent. Recently I have noticed their appearance in several general wards of one of the hospitals which I attend, and also in the infirmary ward of a mental hospital. While my personal view is that these birds, which may be carriers of psittacosis, are undesirable in acute wards of general hospitals, I should value the opinion of any of your readers concerning the advisability or otherwise of banning such pets from wards.—I am, etc.,

London, W.1.

N. A. THORNE.

Hungarian Refugees

SIR,—In the report of the proceedings of Council published in your issue of April 6 a statement by Dr. H. D. Chalke (*Supplement*, p. 155) is quoted which implies that many Hungarian refugees, among whom the prevalence of tuberculosis is unduly high, are working in mines all over the country in close contact with other workers, without having been submitted to any x-ray examination. This implication is incorrect. All Hungarian refugees brought into this country for work in the coal mines have been x-rayed—the majority by the National Coal Board's x-ray units and the remainder by mass x-ray units of the regional hospital boards. All cases of active and potentially active tuberculosis revealed by these examinations have been referred to chest physicians for treatment or observation.—I am, etc.,

London, S.W.1.

JOHN ROGAN,
Chief Medical Officer,
National Coal Board.

Sir Victor Horsley

SIR,—In your leading article in honour of Sir Victor Horsley (*Journal*, April 20, p. 937) you refer to the first successful operation for removal of a spinal tumour and mention that Mr. Steadman and Mr. (afterwards Sir Charles) Ballance assisted Horsley at the operation. I still have a letter, however, which Sir Charles wrote to me on July 6, 1934, not long before he died, in which he states, "I alone helped at the operation. Neither Horsley nor I were in favour of many hands in the operation field." He goes on to say, "The spinal cord was exposed too low down. The physicians, bar Ferrier, opposed any further exposure. I was teaching anatomy at that time and urged Horsley to expose the cord higher up. I was probably the only one present who was familiar with the relations of the vertebrae to the spinal roots. Well, Horsley agreed, exposed the cord higher up—the tumour was exposed and shelled out like a sweet [sic] pea."

The tumour, as you correctly remark, was called a fibromyoma. It became specimen 5063-1 in the museum of the Royal College of Surgeons, but cannot be re-examined, as it was, unfortunately, destroyed by the high explosive bomb which fell on the College on May 10, 1941. We shall therefore never know its precise nature, but from the fact that it was adherent to the fourth thoracic nerve root on the left side, where it had been a cause of intense pain of root type below the patient's scapula, and because it was partly cystic and partly solid, there must be a strong presumption that it was in reality a neurinoma and to-day would have been so classified.—I am, etc.,

Cardiff.

LAMBERT ROGERS.

Obituary

H. F. HOLLIS, M.B.

Dr. H. F. Hollis, a well-known general practitioner in Leeds and a former member of the General Medical Services Committee, died at his home at Headingley on April 13 after an illness borne with great patience and fortitude. He was 68 years of age.

Henry Fielden Hollis was born on May 27, 1888, and studied medicine at Glasgow University, where he graduated M.B., Ch.B. in 1917. He then served with the R.A.M.C. in the Middle East and East Africa for the remainder of the first world war. Returning to Leeds, he went into partnership with the late Dr. J. J. Anning in the Beeston district, where he built up a large and busy practice. He soon devoted himself to the duties of the local medical and panel committee and became its honorary secretary in 1933, continuing after 1948 as honorary secretary to the Leeds Local Medical Committee—an office he carried out with energy and zeal. Always ready and willing to assist his colleagues in their problems, he had their good will, friendship, and implicit confidence. There are few who did not benefit from his sound and helpful advice, gained from his many years of experience and close attention to the intricate details of the work. He retired from the secretaryship at the end of 1956 because of illness. His colleagues on the Leeds Local Medical Committee gave him an illuminated scroll inscribed with their names and a message of thanks for his unfailing courtesy and signal help during the 24 years he had served them, and presented him with a personal gift. A dinner was arranged, but unfortunately he was not well enough to attend the function. Dr. Hollis was also a member of the Leeds Executive Council from its inception in 1948.

A stalwart supporter of the British Medical Association, he served on the old Insurance Acts Committee and on its successor, the General Medical Services Committee, for many strenuous years, from 1943 to 1956, and he represented his Division at the Annual Representative Meeting from 1942 to 1956. He was also chairman of the Leeds Division in 1949–50.

Dr. Hollis was very interested in the St. John Ambulance Association and was corps surgeon for Leeds, and did very good work for the brigade. For his services he was appointed an officer of the Venerable Order of St. John of Jerusalem. He was medical officer to the Leeds United football club for 30 years. He held many other appointments, including the chairmanship of a local recruitment board, and he was a medical referee to the Leeds corporation. He leaves a widow, one son, and two daughters.

J. E. R. writes: Harry Hollis was a delightful man to work with, and his quiet efficiency and sustained interest in everything he undertook made him an ideal confidant. He had a charm of manner and a tactful approach which did much to help in solving the many problems which were put to him. His hobbies, when he had time to indulge them, were fishing and golf. He will be greatly missed by his many friends and numerous patients, who have lost a very capable, considerate, and conscientious doctor.

P. B. ROBINSON, M.B., D.P.H., D.T.M.

Dr. P. B. Robinson, formerly director of medical services in Northern Rhodesia, died at Lusaka, Northern Rhodesia, on March 20. He was 56 years of age.

Philip Bernard Robinson was born in Dublin in 1901 and was educated at Trinity College there, graduating M.B., B.Ch. from the University of Dublin in 1925. He obtained the Liverpool D.T.M. in 1929 and the Dublin D.P.H. seven years later. Soon after graduation he joined the Colonial Medical Service as a medical officer and went out to Northern Rhodesia. He served in that territory throughout his colonial career, with the exception of eighteen months during which he was deputy director of medical services in

Uganda. He served first at Solwezi, now no longer a station with a medical officer, and later in many other parts of Northern Rhodesia in various medical capacities. Finally he returned from Uganda in March, 1947, to replace his old chief, Dr. J. F. C. Haslam, as director of medical services. This position he held until he went on leave pending retirement on December 31, 1955. For some years he was an ex-officio member of the legislative council of Northern Rhodesia until the director of medical services ceased to be appointed to that body. He leaves a widow, one son, now a medical student at Dublin University, and two daughters. The sympathies of many people in Northern Rhodesia go to them in their loss.

W. C. B. H. writes: During his long service in Northern Rhodesia, "Barney" Robinson became well known to many people of all races and will be affectionately remembered by numerous members of the public as well as by the officers who served with him. Possessed of an unusually acute brain, he gained a very high reputation as a clinician and as a surgeon during his earlier days in the Colonial Medical Service. Later he devoted himself to administration and was equally successful in this sphere, guiding the Northern Rhodesia health services skilfully through an era of great expansion. In the two years preceding his retirement he played an important part in the difficult task of fusing three separate health services into one after the federation of the three territories of Southern and Northern Rhodesia and Nyasaland. In his dealings with his staff he was always kindly and scrupulously fair, although it was typical of him that he often did his best to conceal this under a gruff outer manner. Similarly his many acts of generosity were always, if possible, concealed.

S. G. JAMES, M.D., M.R.C.P., D.P.M.

Dr. S. G. James, medical superintendent of Broadmoor Institution, died on April 11 after a long illness. He was 53 years of age.

Stanley George James was born at Sydney, Australia, on October 4, 1903. After graduating M.B., Ch.M. from the University of Sydney in 1926, he held the appointments of house-physician, house-surgeon, and medical registrar at his teaching hospital, and in 1929 came to England. His first appointment in London was that of senior house-physician at the West End Hospital for Nervous Diseases, and he then became assistant medical officer at Friern Hospital. He was elected a Member of the Royal College of Physicians of London in 1931, obtained the D.P.M. of the English Royal Colleges in 1934, and proceeded to the M.D. in 1939. From 1935 to 1939 he was deputy medical superintendent at Rampton Hospital and from 1939 to 1952 medical superintendent at Moss Side Hospital, Maghull.

A colleague writes: Dr. James was appointed medical superintendent at Broadmoor in 1952. With his long service in State institutions, he brought the benefits of this experience to Broadmoor. His first interest, naturally, was the care of his patients, but in addition he was indefatigable in his efforts to improve conditions for members of the staff. He had a brilliant mind, and his contributions to clinical discussions and demonstrations in the post-mortem room were most inspiring. He was able to talk authoritatively and comprehensively about many subjects, particularly gardening, electronics, and carpentry, and his workshop was the envy of every visitor. He gave invaluable directions when the new handicraft centre at Broadmoor was equipped. He read widely, and especially was a great lover of the works of Charles Dickens and Gilbert and Sullivan. His early days at Broadmoor were so full of promise, and during the short time he was there he achieved so much, that it seems grievous he should have died so soon, but very many of us, both patients and staff, are comforted by gratitude for what he has done for us. Our heartfelt sympathy goes out to his widow, formerly Miss Winifred Boshier, who had been the matron at Broadmoor and who tended him unsparingly in his illness.

GEORGE MITCHELL, M.D., D.P.H.

Dr. George Mitchell died suddenly on April 6 at the age of 81, and his passing leaves a distinct gap in the medical life of Wolverhampton, where for so many years he had occupied a niche all his own.

Born on October 18, 1875, George Mitchell was a graduate of Aberdeen University, where he qualified in 1903, and proceeded to the M.D., with highest honours, in 1905, attaining the D.P.H. in the interim. After a period in general practice he entered the public health service, and after working for two years as chief school medical officer in Aberdeenshire, he became, in 1912, assistant medical officer of health and tuberculosis officer to the County Borough of Rochdale. From 1914 to 1919 he saw service in the first world war with the R.A.M.C.

In 1919 he went to Wolverhampton to take charge of the venereal diseases services for the district, with headquarters at what is now the Royal Hospital, Wolverhampton, and he held this post for 32 years until his retirement in 1951. During this period he developed such an interest in diseases of the skin that in recognition of his clinical abilities in this field a special department of dermatology was created and he became the first dermatologist to the hospital. He was chairman of the South Staffordshire Division of the British Medical Association in 1932-3. A mere catalogue of the details of his career would entirely fail to explain the peculiar regard in which he was held by all his colleagues in hospital and by the practitioners of the district. To an extent quite peculiar to himself, his personality evoked a mixture of the deepest affection and respect—respect for his intellectual abilities and intellectual honesty, two qualities by no means always synonymous, and respect for his clinical judgment and integrity of life, qualities which to many of us seemed to typify the granite of his native country but which by themselves could nevertheless suggest a personality essentially cold. By contrast it was his warmth and sense of humour which seemed to enlarge and almost transfigure his mental equipment, so that in the course of time he became a central figure beloved by all. He had anticipated his ending, which he met with the cheerful stoicism so characteristic of him. The passing of George Mitchell leaves those privileged to know him well with a great sense of loss. He will not be soon forgotten.—J. H. S.

THORVALD MADSEN, C.B.E., M.D.

Dr. Thorvald Madsen, the distinguished Danish microbiologist, died suddenly at St. Heddinge, East Zealand, on April 15 in his 88th year.

Thorvald Johannes Marius Madsen was born at Frederiksberg on February 18, 1870, and studied medicine at Copenhagen University, where he graduated in 1893. During the next few years he held a teaching post in the bacteriological laboratory of the university and studied abroad, working for a time at the Pasteur Institute in Paris and with Ehrlich at Frankfurt. In 1902 he was appointed director of the State Serum Laboratory at Copenhagen, a post he retained until his retirement in 1940. He was one of the most prominent medical scientists who worked for the League of Nations, and was president of its Health Committee from 1921 to 1940. He presided over the first meeting of the Commission on Biological Standardization in London in 1921 and remained president of the commission until 1940. As part of his work for the League he organized measures to control the many epidemics in east and south-east Europe which were an aftermath of the first world war.

Madsen published many works on immunology and immunochemistry and edited the *Communications de l'Institut Sérothérapique de l'Etat Danois* from 1906 to 1940. His scientific work gained him an international reputation and many awards, including the Buchanan Medal of the Royal Society in 1932 "for his theoretical and practical work in immunity, especially in relation to diphtheria antitoxin,"

the Swedish Pasteur Medal, the Grand Cross of the Order of the Dannebrog, and the Légion d'Honneur. He was created an honorary C.B.E. in 1921. An honorary fellow of the Pathological Society of Great Britain and Ireland, he held honorary doctorates of Glasgow, Frankfurt, Upsala, Riga, and Oslo. Even after retirement Madsen maintained his interest in humanitarian and scientific work. He headed the Unicef mission to Italy from 1947 to 1950, and was president of the Fourth International Congress on Microbiology held at Copenhagen in 1947.

Medical Notes in Parliament

INTERIM ADVANCE

The PRIME MINISTER announced on April 16 a 5% increase in the basic remuneration of senior hospital medical and dental staff, including consultants and specialists, and for all dentists engaged in the general dental service, and a corresponding addition of 5% to the aggregate net remuneration of general practitioners (that is, remuneration after deduction of practice expenses). It will operate from May 1. The increase will cost £4,900,000, divided as follows: senior medical staffs, about £1,200,000; general medical practitioners, £2,500,000; general dental practitioners, £1,200,000. To this should be added the 10% interim increase for junior hospital staff, amounting to £900,000.

The text of Mr. Macmillan's statement was as follows:

Before the Royal Commission was appointed I explained that its appointment did not preclude an interim adjustment in advance of and without prejudice to its recommendations. An adjustment was made in the remuneration of junior hospital staff, both medical and dental, at the beginning of this month, when their remuneration was increased by 10%. In announcing this increase I said that we were considering what should be done by way of an interim adjustment for the other doctors and dentists covered by the Commission's terms of reference.

The Government have now decided to increase the basic remuneration of senior hospital medical and dental staff including consultants and specialists and all dentists engaged in general dental services by 5% from May 1 next, and from the same date to add 5% to the aggregate net remuneration of general practitioners—that is, remuneration after the deduction of practice expenses. We propose to consult representatives of the profession as to the best method of distributing this sum between individual practitioners.

In the meantime, the Royal Commission have been asked to regard their work as a matter of urgency and have in fact already, I understand, held six meetings. I hope that the letters I have exchanged with the then President of the Royal College of Physicians, together with the statement issued by the chairman of the Royal Commission, will reassure those who have expressed their concern about the terms of reference.

I hope now that all concerned will turn their thoughts to the task of working out a satisfactory basis for future remuneration, and for keeping it under review.

Dr. EDITH SUMMERSKILL (Warrington, Lab.) asked these questions: What was the basis used to arrive at this award? Why has this decision been made in an arbitrary fashion, without negotiation with the doctors? Why has the decision been made without any consideration of the findings of the Royal Commission? Will the distribution from the central pool be similar to that made in 1952? Mr. MACMILLAN: It was always stated by the Government that they intended to make an interim award while the Commission was sitting. The 10% was given to the junior staff, and now 5% is given to the general body. The reason this procedure is adopted is that the present dispute is on a matter of the interpretation of the Spens Reports. Therefore there could not be any agreed basis for negotiation in the ordinary way. The object of the Commission, which is really an independent body, is to find and recommend what should be the basis of remuneration both now and in the future. As to the method of calculation, I do not know whether it is similar to that in 1952. In the case of the 10%, it is as I have already stated. In the case of the 5%, it is by adding to the aggregate net remuneration. Then we propose to

consult the doctors' organization on the best method of distributing this money.

Mrs. LENA JEGER (Holborn and St. Pancras, South, Lab.) asked the Prime Minister to give a better explanation. Was he saying that he thought up 10% in his sleep one night, and that on another night he thought up 5%? What was the arithmetic behind a suggestion that provides the same increase for highly paid consultants as for the humbler and overworked general practitioner? Mr. MACMILLAN: As I have explained, we appointed a Royal Commission because there is a disagreement on what should be the whole basis for calculating remuneration both now and in the future. I hope that this independent body, with terms of reference which I have explained to be very wide, will reach that basis. Meanwhile, since the Commission must take a considerable time—a substantial time—to make its report, it was thought right to make this advance. I hope and believe that it will be regarded on the whole as equitable and reasonable.

Mr. A. WOODBURN (Clackmannan and East Stirling, Lab.) asked what steps were to be taken to see that fairness was done to the assistants. In some parts of the country a lot of empire-building was going on among doctors and assistants. The public would like to know that the assistants were to get proper treatment under these arrangements. Mr. MACMILLAN: No doubt the Minister of Health will take the point into account in consultation with the doctors' representatives on the methods of distribution. We shall certainly take account of the point.

Collective Bargaining Machinery

Mr. M. LIPTON (Brixton, Lab.) asked how the Prime Minister expected employers and workers to accept the principle of collective bargaining if he ignored it in dealing with the doctors' increment. Was he aware that this contempt for established machinery was regarded as a grave injustice by the medical profession? Mr. MACMILLAN: I do not think that is really quite fair. It is a prerequisite of any arbitration that there should be common agreement on what the arbitration has to be about. The difficulty here is disagreement about the interpretation of the Spens Reports. The most practical way—I think there is general opinion in the country supporting this—is to get the most independent body we can, and I think we have in the Royal Commission a very good independent body, to try to reach an agreed basis from which in future these adjustments can be made without difficulty.

Dr. D. JOHNSON (Carlisle, Con.) asked the Prime Minister, or the Minister of Health, to press on the medical organization the necessity of bearing in mind in distributing the 5% that there was serious concern at the differences in remuneration among various practitioners within the same service, and that this should be given serious attention in the distribution of the extra sum. Mr. MACMILLAN suggested that no doubt Dr. Johnson would, if necessary, communicate with the Minister of Health.

Mr. A. BLENKINSOP (Newcastle upon Tyne, East, Lab.) asked whether the Prime Minister could assure him that at last the Minister of Health would have real power to carry out negotiations, and that he would not only take account of the position of assistants but also of doctors with smaller lists, and would try to get a constructive settlement that would help to reduce the large lists of the richer practitioners. Mr. MACMILLAN: It is not a question of negotiation but of consultation, and of how this interim award had better be distributed and applied. When we get the Royal Commission's report I hope we shall have a permanent solution of how the whole Service will work in the future.

Speed of Commission

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.): As an important factor will be the speed at which the Royal Commission reports, can we have an assurance that its deliberations will not take more than eight or nine months from now? Mr. MACMILLAN: I have asked the Royal

Commission to do its work speedily. I have every confidence in the chairman and the members. The Commission has already had six meetings, and I hope that every possible assistance will be given to the Commission to conclude its task speedily.

Mr. J. RAMSDEN (Harrogate, Con.): In view of the business-like way in which the Commission is proceeding, as shown by the fact that it has already met six times, has the Prime Minister some hope that the doctors will, in these changed circumstances, modify their attitude towards the Commission? Will he make it clear, once and for all, that it will be within the competence of the Commission to have regard to the general relevance of the Spens Reports in its consideration of the matter? Mr. MACMILLAN: All these points about the competence of the Commission were cleared in the exchange of letters which took place, and which I think has been generally regarded as wise and satisfactory. I very much hope that everyone concerned will now turn his labours to the work of creating a satisfactory basis for the future remuneration and management of the Service.

Mr. F. LEE (Newton, Lab.) said now that the Prime Minister had pointed out that before they could have a successful arbitration it was necessary to have some sort of offer about which to arbitrate, would he make sure that a copy of his statement went to the shipbuilding and engineering employers? Mr. MACMILLAN: I did not say that we had to have some kind of offer, but some kind of basis. In this case, there was one interpretation which the doctors made and which the Government felt they could not accept. Therefore it was far better to have an independent body to deal with the matter.

Royal Commission's Inquiries

Mrs. LENA JEGER asked the Prime Minister on the same day when the Royal Commission on the remuneration of doctors and dentists started work, and from whom evidence had so far been taken.

Mr. MACMILLAN told her that he was informed that the Royal Commission held its first meeting on March 13, the day after he announced its appointment, and that it had already held six meetings. He understood that it had not yet received any formal evidence, but had held preliminary and informal discussions with representatives of the consultants, the dental profession, the Bar, architects, chartered surveyors, accountants, and different branches of the engineering profession. Representatives of the consultants and the dentists made it clear at that stage that their presence did not commit their organizations to giving evidence.

COMPENSATION FOR LOSS OF GOODWILL

The subject of compensation for loss of the right to sell goodwill of medical practices was discussed in the House of Commons on April 18. Mr. RONALD BELL (South Buckinghamshire, Con.) complained of a decision that had been given on an application for compensation by a doctor constituent of his. Normally, he said, a doctor received compensation when he retired for the right to sell his practice, which was lost under the National Health Service Act. There were, however, provisions providing for earlier payment of compensation. Paragraph 262 in the *Handbook for General Medical Practitioners* stated: "... where doctors have onerous loans outstanding which were raised for the purchase of their practices, or where an elderly doctor or one whose health is failing finds it necessary to take a partner in order to prevent the complete disintegration of his practice," early payment might be made.

His constituent suffered two attacks of virus pneumonia in June and October last year. He obtained the services of a locum tenens. As a result of the second attack the doctor became permanently unable to carry on his medical practice alone, giving the whole of his time to it, and an arrangement was made that the locum should remain with him in partnership. As a consequence certain expenses for residential and surgery accommodation were incurred, and the doctor made

an application to the Ministry of Health last December in respect of these. The application was unsuccessful because, it was stated, (1) from 1950 to 1956 his list had increased progressively from 1,400 to 2,450 patients (approximately), and (2) he had described himself as being actively engaged in the practice.

The first reason, Mr. Bell argued, was not relevant to the damage caused to the practice by the doctor's two illnesses last year. As for the second, it could easily happen that a medical practitioner became unable to carry an unlimited liability. He had asked the Ministry in what sort of circumstances an early payment of compensation under para. 262 might be made. The reply he had received was this:

"Para. 262 . . . owes its origin to discussions held in 1953 with the B.M.A., who were subsequently informed that the Department was willing to consider sympathetically advance payments of compensation to 'individual cases of hardship where an elderly doctor or one whose health is failing finds it necessary to take a partner in order to prevent the complete disintegration of his practice' . . ."; and: "As was expected, however, extremely few applications on these grounds had been received, and none has been sufficiently strong to justify an advance payment." The letter also stated: "Before regarding a payment as justified, we expect factual evidence that the practice was rapidly declining due to the ill-health . . . of the doctor."

That meant, said Mr. Bell, that in order to save the ship one must sink it first. Money would not be paid in advance of retirement until a doctor could prove that his practice had already undergone a rapid decline due to his ill-health. Therefore, if he had available a suitable locum who would prevent any disastrous consequences to the practice through his illness, and used the locum, he disintegrated himself to claim under para. 262. The Ministry's letter continued: "We would not consider a payment to be justified, however, if it appeared that the doctor could reasonably carry on the practice alone, albeit a reduced practice with a correspondingly reduced income."

To interpret para. 262 in this way, Mr. Bell argued, was not a fulfilment of the undertaking given in writing to the B.M.A. in 1953 that "the Minister will sympathetically consider any individual case of a doctor who through ill-health has to take in a partner to prevent the complete disintegration of his practice." It was misleading if practitioners were to be subsequently told that what it really meant was that only if their practice had got well on the way to disintegration they might have a case. It was also wrong on its merits. If a practitioner was fortunate enough to be able to take immediate action to prevent disintegration of his practice, he should not thereby in any way prejudice his right to apply under para. 262.

Government Reply

Mr. J. K. VAUGHAN-MORGAN, Parliamentary Secretary, Ministry of Health, said that in Section 36 (3) of the National Health Service Act, 1946, which stated that compensation should not be paid until the retirement or earlier death of the doctor concerned, a proviso was inserted "except in such circumstances as may be prescribed" to meet the circumstances of those doctors who had outstanding onerous loans for the purchase of the goodwill of the practice. The total number of claims for England and Wales was about 15,000, of which over 11,000 were outstanding. The total amount so far paid out was £21m., including £8m. in advance payments made on grounds of hardship. The Department had been generous in its interpretation of the provision. As a result of representations made by the profession in 1953 it was agreed to extend the proviso to make advances of compensation where a doctor found it necessary to take a partner in order to prevent the complete disintegration of his practice. There was some knowledge on the side of the Department that there would not be many such cases; the agreement was made so that machinery should be ready to alleviate cases of hardship that might arise. No claims had in fact been paid out under this proviso. No case had so

far been found to justify payment under this heading. There had been only three applications in the course of four years. No complaints had been received from the profession of any dissatisfaction with these decisions. It was obvious that individuals might feel it, but there had been no widespread feeling that there had been a failure to do justice.

It should be remembered that, as compensation was made for the loss of the right to sell the goodwill, the real test for any advance payments under the proviso was whether, in the days before the Health Service, a doctor would have sold his goodwill to meet expenditure that was now alleged to involve hardship. He would obviously have done so only in very exceptional circumstances, as he would be parting with his means of livelihood. It followed that the Department could not use this proviso to make advances to enable doctors to buy houses or cars or to equip their surgeries. To meet those needs other means were available, which did not concern the Ministry of Health. No fewer than nearly 1,400 doctors had borrowed money on the security of the compensation ultimately payable to them, and the amount involved was £4,500,000.

In the particular case cited by Mr. Bell the doctor gave in December five different reasons for immediate compensation. The first was that age and ill-health had compelled him to take a partner to prevent the complete disintegration of his practice. The four others were the need to buy a house for his partner, at a cost of £3,750; the need to adapt and equip surgery premises costing between £600 and £1,000; the inability to meet these costs because he had only 2,400 Health Service patients, and his share had been halved by the introduction of a partner; and lack of capital. The Department could not accept any of those reasons except the first: a doctor could not obviously have sold his goodwill to buy a house or equip a surgery. As for the disintegration of the practice, this was not the first claim made on grounds of ill-health. The doctor made a claim in 1951, when the number of his patients was 1,583. By July, 1956, just before he again made a claim, they had risen to 2,381; and on January 1, 1957, just after he made the new claim, the number had risen to 2,424. During the past quarter there had been a further increase to 2,489. This was on the doctor's own list and not his partner's. Whatever these figures showed they could not be interpreted as complete disintegration; nor did they support the contention that his illness would result in a permanent decrease in his capacity for work. The doctor's application to receive extra payment on the notional-list basis had been rejected by the executive council on the ground that the arrangement he had made with another doctor was not a bona-fide partnership, and that the other doctor might be considered to be engaged more in the capacity of assistant than partner; he had his own list.

He added that he would consider the criticisms of the wording used in the *Handbook*, and see whether any better wording could be found, though he doubted it. Before any changes were made the Department would in any case have to consult representatives of the profession.

Poliomyelitis Vaccine

Mr. WEDGWOOD BENN (Bristol, South-East, Lab.) asked the Minister of Health whether supplies of the anti-polio vaccine would be available in sufficient quantities to immunize all those children in the recommended age groups, and what percentage of this maximum potential demand could be met this year; and what plans he had for providing 100% coverage. Mr. VAUGHAN-MORGAN stated on April 18 that good progress was now being made with vaccination against poliomyelitis, and it was the Minister's aim to increase the coverage as rapidly as possible. There would, however, be no relaxation of the safety precautions applied to the vaccine, and he therefore did not think he would be justified in trying to make precise estimates of future progress.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending April 6 (No. 14) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	9	1	2	0	2	4	0	8	0	10
Dysentery ..	1,051	36	252	11	4	1,336	204	221	11	2
Encephalitis, acute	4	1		0		0	0		0	
Enteric fever: Typhoid	2	0	0	0		2	1	3	0	2
Paratyphoid ..	3	0	4 (B)	0	1 (B)	3	0	1 (B)	0	
Food-poisoning ..	204	32	44	0		153	24		0	
Infective enteritis or diarrhoea under 2 years ..				10	16				9	25
Measles* ..	25,280	2007	308	354	277	3,317	75	263	54	235
Meningococcal infection ..	29	2	13	1		40	3	17	0	
Ophthalmia neonatorum ..	32	1	4	0		39	1	6	0	
Pneumonia † ..	466	25	212	6	2	697	47	218	4	4
Poliomyelitis, acute: Paralytic	17	2		0	2	8	0		0	2
Non-paralytic ..	20	2		0		2	0		0	
Puerperal fever § ..	204	33	15	1		258	53	11	2	
Scarlet fever ..	878	68	84	52	24	681	48	89	25	23
Tuberculosis: Respiratory	583	76	274	24		561	60	111	3	
Non-respiratory ..	65	8	17	2		77	5	12	1	
Whooping-cough ..	2,768	137	263	7	67	1,346	86	155	89	90

DEATHS In Great Towns	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	1	0	0	0	0	1
Dysentery ..	0	0		0		1	0		1	
Encephalitis, acute		1			0		0			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	2	0	0	0	0	8	0	1	0	0
Influenza ..	3	1	1	0	1	26	1	3	1	1
Measles ..		1	0	0	0		0	0	0	0
Meningococcal infection ..		0	0				0	0		
Pneumonia ..	261	37	0	21	13	290	54	16	10	3
Poliomyelitis, acute	0	0			0	0	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory	41	7	8	2	3	56	7	12	3	6
Non-respiratory ..		0	0	0	1		1	1	0	1
Whooping-cough ..	1	0	0	0	0	1	0	0	0	0
Deaths 0-1 year ..	216	24	29	6	23	224	23	44	9	14
Deaths (excluding stillbirths) ..	5,199	708	603	107	174	5,687	801	627	132	152
LIVE BIRTHS ..	8,842	1,264	1,086	233	369	8,649	1,182	1,130	212	428
STILLBIRTHS ..	253	37	30			217	22	27		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenza pneumonia.
§ Includes puerperal pyrexia.

Vital Statistics

GLASGOW X-RAY CAMPAIGN

During March 11 to April 12 nearly three-quarters of a million people in Glasgow had chest radiographs taken. Preliminary figures show that 1,600 active cases of tuberculosis were found, or 0.22% of the 710,838 people x-rayed. These figures were given on April 18 by Dr. A. K. BOWMAN, senior administrative medical officer of the Western Regional Hospital Board. A further 5,069 cases (0.7%) were still doubtful, and in 1,405 cases (0.19%) the disease appeared to be healed, but further observation was considered necessary. A total of 8,074 cases of pulmonary tuberculosis have thus so far been found which require further observation or treatment. We are indebted to Dr. W. A. HORNE, Medical Officer of Health of Glasgow, for the following account of the measures which made this campaign such a striking success.

When the Glasgow campaign ended more than 700,000 persons over 14 years of age had been radiographed. Several world records were broken, and on the last day, Friday, April 12, 46,077 persons were examined. The campaign has been most successful and will be the turning-point in the control of tuberculosis in Glasgow. During the five weeks 30 mass miniature x-ray units were open to the public, mainly in the afternoon and evening, but on the last day all the units opened at 10 a.m. and continued in action until the queues were exhausted. Seven additional units were set aside for the examination of members of the public recalled for a large film. Of the 37 units, 10 were Scottish, 21 English, four from the Army, one from the R.A.F., and one from the National Coal Board.

Initial planning started some eighteen months ago, when consideration was given to exact timing, the number of x-ray units required, the dispersal of the units in sites most suitable and attractive to the public, and important technical and other factors to be taken into account in the organization of the campaign, which was mounted jointly by the Corporation of Glasgow, the Department of Health for Scotland, and the Western Regional Hospital Board.

Publicity was regarded as vital and had to be inspired, sustained, and thorough, with nothing left to chance. Expert advice was essential, and this was found in a publicity committee on which were represented the press, the cinema, and the B.B.C. Valuable assistance was given by the Scottish Information Office, which supplied an expert press officer whose help was continuously available. Excellent support was obtained from the press in the initial stages, both before and during the campaign. Three short films were prepared, two by N.A.P.T., and with the co-operation of the owners and managers these were shown in all the Glasgow cinemas.

Adding spice and forming important publicity material was the scheme of prizes, which were of two types—six large and numerous small prizes. One of the large prizes was presented each week, and the most valuable, an A.35 motor-car donated by the Glasgow Austin agents, at the end of the campaign. The small prizes were distributed by "x-ray men" to members of the public, who wore the distinctive badge showing that they had been radiographed. Various other novel publicity methods were developed and used. Ideas bubbled up and when approved by the publicity committee were immediately developed. Two campaign songs were written and have proved intriguing and popular. The services of the writers, composers, and musicians were given free.

The defects of publicity were revealed by short public surveys carried out by a department of the university, and the material was adjusted to remedy the defects shown. Special attention was paid to the doubts and anxieties that were expressed, and particularly to the need to encourage parents of young children and older people to be radiographed.

The second major factor was community participation. Above all, the campaign was non-denominational and non-

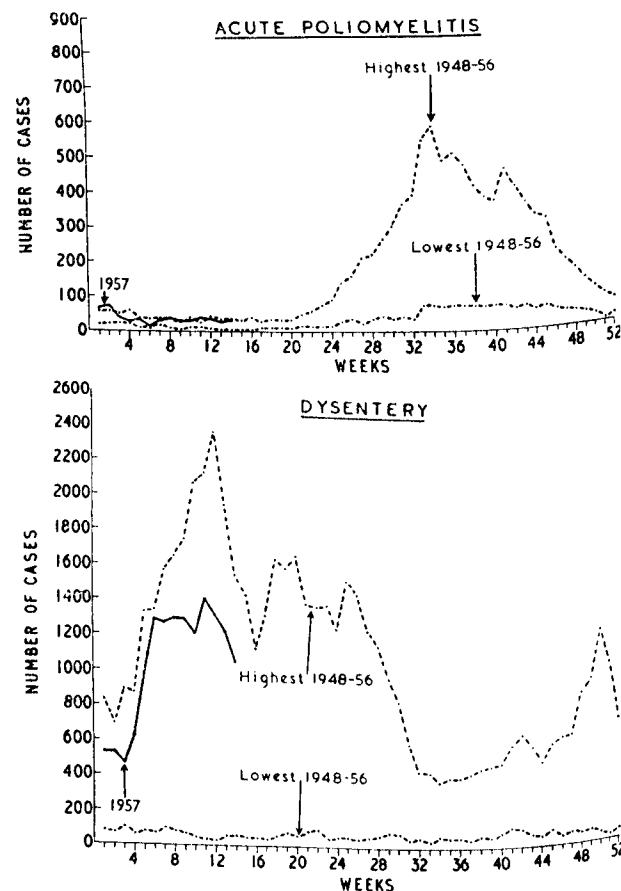
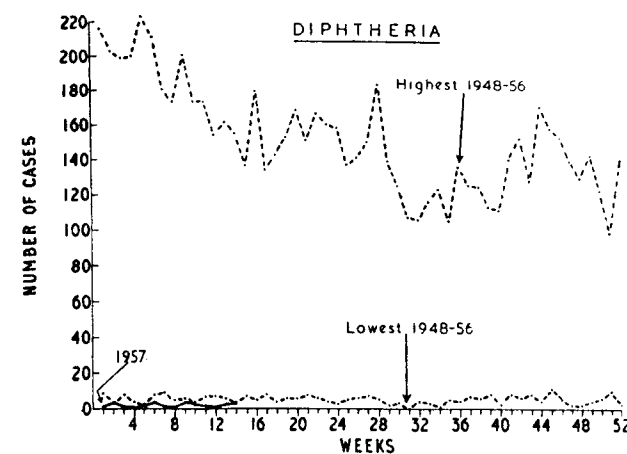
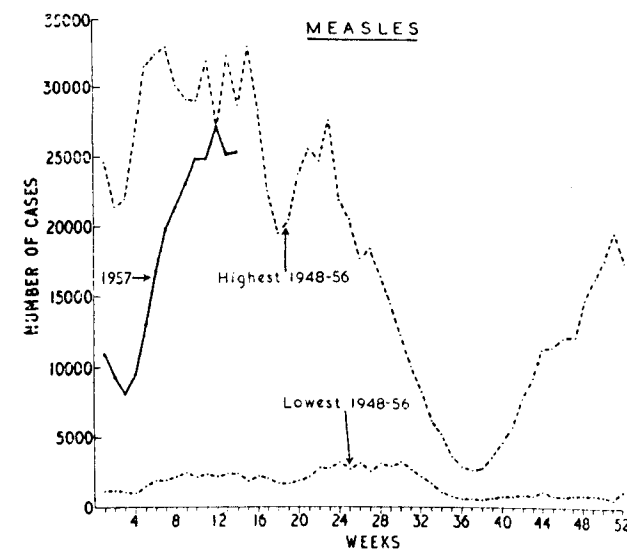
political. Assistance was invited and willingly given by all denominations, and members of the Churches played a very important part. Some 12,000 voluntary workers were enrolled, divided into 49 ward groups, each with ward headquarters, chairman and secretary, and executive committee. These ward groups not only spread information about the campaign but also carried out house-to-house visiting and ascertained the attitude of the householders, and followed up that information by subsequent visits. The ward groups provided hostesses for the x-ray units, and these hostesses have proved to be an important factor in the successful working of the centres.

Every member of the Corporation and every group or association in the city, religious, political, social, industrial, and commercial, were behind the campaign and gave wholehearted support. Community participation was in fact universal. The campaign, of course, could not have been successful without the enthusiasm of the staffs of the x-ray units coming to Glasgow and their departmental, administrative, and organizing staffs.

The campaign began and ended with a religious service in the Cathedral and in St. Andrew's Church. To the citizens of Glasgow it was in the nature of a crusade, and their response has been a reward and a tribute to the organizers.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1948-56 are shown thus -----, the figures for 1957 ————. Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The largest variations in the notifications of infectious diseases in England and Wales during the week ending April 6 were increases of 95 for measles, from 25,185 to 25,280, 66 for scarlet fever, from 812 to 878, and decreases of 171 for dysentery, from 1,222 to 1,051, 81 for whooping-cough, from 2,849 to 2,768, and 79 for acute pneumonia, from 545 to 466.

37 cases of acute poliomyelitis were notified during the week, and these cases were 1 fewer for paralytic and 10 more for non-paralytic cases than in the preceding week. The largest returns were Essex 12 (Brightlingsea U.D. 10), Sussex 6 (Brighton C.B. 5), London 4.

Generally the incidence of measles continued to decline in the north and rise in the south of the country. In the north-west and northern regions the number of notifications fell by 999, from 6,947 to 5,948, and in London and the south-east region they rose by 483, from 4,787 to 5,270. The London boroughs with the largest increases in the number of notifications of measles were Greenwich 64, from 59 to 123, Hammersmith 45, from 26 to 71, Wandsworth 50, from 159 to 209. Other towns with large increases were Birmingham C.B. 200, from 640 to 840; Cardiff C.B. 169, from 226 to 395; Havant and Waterloo U.D. 102, from 72 to 174, and Chatham M.B. 78, from 147 to 225.

Only small variations were recorded in the returns of scarlet fever. The largest fluctuations in the trends of whooping-cough were decreases of 43 in Shropshire, from 73 to 30; 38 in Norfolk, from 110 to 72; 34 in Kent, from 228 to 194; and increases of 44 in Essex, from 146 to 190; and 37 in Cheshire, from 48 to 85. 9 cases of diphtheria were notified, being 3 more than in the preceding week; 2 of these cases were notified in Birmingham C.B.

The largest centres of dysentery were Yorkshire West Riding 245 (Bradford C.B. 54, Leeds C.B. 46, Rotherham R.D. 38, Sheffield C.B. 18, Rotherham C.B. 17, Huddersfield C.B. 15), Lancashire 123 (Blackburn C.B. 26, Stretford M.B. 18, Liverpool C.B. 14), Cheshire 58 (Hyde M.B. 25,

Stalybridge M.B. 22), Durham 56 (Whickham U.D. 23, Gateshead C.B. 12, Blaydon U.D. 10), Warwickshire 49 (Birmingham C.B. 34, Coventry C.B. 11), Nottinghamshire 43 (Nottingham C.B. 14, Carlton U.D. 11), Middlesex 41 (Hayes and Harlington U.D. 11, Ealing M.B. 10), Northumberland 38 (Longbenton U.D. 22), London 36 (scattered through 14 boroughs), Southampton County 35 (Southampton C.B. 13, Basingstoke M.B. 10), Essex 34 (East Ham C.B. 18), Bedfordshire 30 (Luton M.B. 22), Norfolk 22, Surrey 21, and Oxfordshire 21 (Bullington R.D. 14).

Medical News

Benefactions by the Wellcome Trust.—The Wellcome Trustees announce the following benefactions: (1) £95,000 to Birmingham University as a contribution to the cost of building an extension to the clinical research block at the Queen Elizabeth Hospital. The extension will substantially increase the research accommodation for the university departments of medicine and surgery. (2) Up to £11,000 to the Middlesex Hospital Medical School for the cost of providing an extension to the Institute of Clinical Research in Hanson Street. (3) £10,000 to the Christian Medical College Hospital, Vellore, South India, for the cost of setting up a metabolic research unit and maintaining it for five years. The unit is to be used in the first instance for a study of fat metabolism in relation to tropical sprue. The Trustees have also agreed to purchase the following items of special equipment for indefinite loan to research centres: a nuclear magnetic resonance spectrometer (costing approximately £17,000), for the department of chemistry, University College, London; and a photo-electric spectropolarimeter (costing approximately £3,600), for the department of biochemistry, Postgraduate Medical School of London.

Association of British Pharmaceutical Industry.—The scheme for regulating prices of proprietary drugs was referred to by speakers at the annual dinner of the Association of the British Pharmaceutical Industry, held last week at the Savoy Hotel. Mr. C. M. HILL, president of the association, said that the industry would do its best to ensure that the scheme worked satisfactorily, and he hoped that the agreement reached between the Ministry and the association would put an end to the exaggerated stories about the excessive cost of proprietary drugs. The industry had been built up on the good will of the medical and pharmaceutical profession. "Reputable firms," Mr. Hill continued, "do not overstate claims for their products." Finally Mr. Hill paid tribute to the work of Mr. W. K. FITCH, who would shortly be retiring from the editorship of the *Pharmaceutical Journal*. Mr. DENNIS VOSPER, Minister of Health, speaking in reply, congratulated the industry on voluntarily putting forward a scheme for price control and for the co-operation which had been shown during the discussions with the Ministry. Referring to criticisms of some of the publicity methods of which he had heard rumours, Mr. Vosper said that the consumers' point of view should be borne in mind, and he hoped that the industry would keep this sort of practices within reasonable control.

U.N. Committee on Atomic Radiation.—Starting on April 8, the General Assembly's committee on atomic radiation began a private 10-day session in Geneva. One of the items on the committee's agenda was the measurement of radioactive fall-out, especially strontium-90. Among the delegates to the 15-member committee were Dr. E. A. WATKINSON (Canada), who was elected vice-chairman; Dr. E. E. POCHIN, director of the M.R.C. department of clinical research at U.C.H. Medical School, London (United Kingdom); Mr. D. J. STEVENS (Australia); Mr. V. R. KHANOLKAR (India); and Dr. SHIELDS WARREN (United States). The committee also includes delegates from the U.S.S.R. and Japan.

Scope of Mass Radiography.—The Joint Tuberculosis Council has issued the following statement on the use of mass radiography in industry and general practice:

"The council, at its meeting on March 1, considered a report by its radiological committee and strongly supported the views expressed in this report—namely, that much more extensive use should be made of mass radiography; and that in industry both employers and employees should—in their own interest—arrange for pre-employment x-rays; and that, for the protection of the public, annual x-rays should be required of staff employed on public transport and in the catering trades. It also recommends that the present mass x-ray service should be improved by providing miniature x-ray units in all chest clinics for the examination of persons referred by general practitioners, and by others who wish to have a chest x-ray. The extension of the miniature x-ray service in this way would make chest x-ray easily available to everyone, and pre-employment x-rays could be provided either by the chest clinic service or by private arrangement with industry."

The Joint Tuberculosis Council comprises representatives of the British Tuberculosis Association, the Society of Medical Officers of Health, the B.M.A., N.A.P.T., the Society of Thoracic Surgeons, the Faculty of Radiologists, and other bodies and individuals interested in the prevention and treatment of tuberculosis.

Royal College of Surgeons.—Two benefactors of the College were honoured at the council meeting on April 11. Sir ARTHUR SIMS, the New Zealand industrialist, was admitted to the honorary fellowship, and, with Mr. EDWARD LUMLEY, to the Court of Patrons. Jacksonian prizes for 1956 were awarded to Mr. A. H. HUNT (St. Bartholomew's Hospital, London) and Mr. J. A. MACCREIDIE (Belfast) for their essays on portal hypertension; Mr. R. E. HORTON (Bristol) received a certificate of honourable mention. The subject for the 1958 Jacksonian prize will be an essay on "Factors Which Influence the Genesis and Progression of the Disease." The Hallet prize was presented to Dr. S. K. NAIR (Agra University). The title of Bland-Sutton lecturer in anatomy at the College. The following were elected fellows without examination, being practitioners of at least 20 years' standing: Mr. G. F. Burnell (Truro), Professor P. K. Chamugam (Colombo), Mr. R. F. Guymer (London School of Hygiene and Tropical Medicine), Mr. G. G. Lyttle (Belfast), Surgeon Vice-Admiral R. C. May (medical director-general, Royal Navy), and Colonel J. M. Shah (Karachi).

Alan Newton Prize.—The council of the Royal Australasian College of Surgeons has awarded the 1956 Alan Newton prize to Mr. L. I. PARTON, F.R.C.S., a urologist at Auckland, New Zealand. Mr. G. R. DAVIDSON, F.R.C.S.Ed., of Ballarat, Victoria, *proxime accessit*. The subject for the next prize will be an essay, not exceeding 75,000 words, on "The Surgery of Malformations of the Heart and Great Vessels." Candidates must hold one of the following qualifications: F.R.A.C.S., F.R.C.S.(Eng.), F.R.C.S.I., F.R.C.S.Ed., or F.R.F.P.S. (in surgery). The prize is biennial, and entries must be in the hands of the secretary of the Royal Australasian College of Surgeons (Spring Street, Melbourne, C.1) by December 1, 1958. Further details about the prize may be obtained from the College.

Russia and W.H.O.—The Russian government has informed the World Health Organization that it will resume active membership as from the current year. The U.S.S.R. became a member State in March, 1948, but discontinued active participation in February, 1949.

Glasgow University.—Among those on whom the Senatus Academicus has decided to bestow honorary degrees on Commemoration Day (June 19) are: Brigadier J. S. K. BOYD, F.R.S., formerly director of the Wellcome Laboratories of Tropical Medicine, and Sir JAMES PATERSON ROSS, professor of surgery in the University of London. Both are to receive the honorary degree of Doctor of Laws.

University College of the West Indies.—Dr. ROBERT MITCHELL, an assistant pathologist in Glasgow, has been

appointed lecturer in anatomy. Before turning to medicine Dr. Mitchell practised for a number of years as a veterinary surgeon. In 1944 he graduated M.B., Ch.B. at Glasgow University, later holding university appointments there as demonstrator in anatomy and lecturer in histology and embryology. He is expected to take up his appointment in Jamaica in June.

Psychiatrist Appointed Vice-chairman of L.C.C.—Dr. L. F. BROWNE was appointed vice-chairman of the London County Council at the annual meeting on April 16. Dr. Browne is a consulting psychiatrist and deputy chairman of the Tavistock Institute of Human Relations. He is also a J.P. for the County of London, and has been an alderman of the L.C.C. since 1949.

Sir Philip Manson-Bahr has been awarded the 1955 Emile Brumpt prize by the Faculty of Medicine and the Institute of Tropical Medicine of Paris. He will lecture on May 22 before the Société de Pathologie Exotique at the Institut Pasteur on the "History of the School of Tropical Medicine in London."

Dr. W. Lane-Petter, director of the Laboratory Animals' Bureau of the Medical Research Council, has been appointed by the Privy Council to the council of the Pharmaceutical Society. He succeeds Dr. J. A. GILES, who has retired.

Dr. Hilda Roberts, honorary research assistant at the Institute of Obstetrics and Gynaecology, London, is leaving England shortly to become director of obstetric anaesthesia at Women's College Hospital, Toronto. She was the guest of honour at a party at the House of Commons on April 11, when Mr. J. BIGGS-DAVISON, M.P., and Mr. E. L. MALLALIEU, Q.C., M.P., entertained members of the committee of the National Birthday Trust Fund. For the past two years Dr. Roberts has been the Trust's research fellow in obstetric analgesia.

COMING EVENTS

Medical Art Society.—Fifteenth annual exhibition at Walker's Galleries, 118, New Bond Street, London, W.1, April 26 to May 11.

Glasgow Medical Exhibition.—April 29 to May 3 (daily 11 a.m. to 6.30 p.m.), at McLellan Galleries, Sauchiehall Street, Glasgow. Professor S. ALSTEAD will open the exhibition at 11.30 a.m. on April 29.

Institute of Hospital Administrators.—Annual conference at Torre Abbey Mansion House, Torquay, May 2-4. Details from the Institute, 75, Portland Place, London, W.1.

Radio.—"The Falling Sickness": A documentary programme about epilepsy, produced with the co-operation of the British Epilepsy Association, at 7.45 p.m., May 3, in the Home Service.

N.A.P.T. Dedication Services.—Annual services of dedication for doctors and nurses, Sunday, May 5, at 3.30 p.m. at St. Martin-in-the-Fields, Trafalgar Square; and Corpus Christi, Maiden Lane, Strand. Similar services in Scotland on May 5, at Wellington Church, Glasgow; St. Aloysius, Glasgow; and Beechgrove Church, Aberdeen.

Institute of Dermatology.—May 7-28, semi-permanent exhibition on "Diseases of the Nails."

British Society for Immunology.—Spring meeting May 10 and 11, Westminster Medical School, Horseferry Road, London, S.W.1. Further details from Dr. R. G. WHITE, Department of Bacteriology, London Hospital, London, E.1.

London Medical Orchestral Society.—May 18, at 8 p.m. at Royal College of Surgeons, in aid of the Imperial Cancer Research Fund. Works by Beethoven, Schubert, and Schumann, soloist Liza Fuchsova. Tickets (5s., 7s. 6d., 10s.) from the hon. secretary, 6, Oxford Court, Queen's Drive, London, W.3, or at the door.

Symposium on Anaesthesia.—Arranged by the societies for anaesthesia of Germany, Switzerland, and Austria, July 13-15, at Palais Auersperg, 1, Auerspergstrasse, Vienna, 8.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, April 29

● HUNTERIAN SOCIETY.—At Talbot Restaurant, E.C., 7 for 7.30 p.m., annual general (dinner) meeting. Mr. C. R. Rudolf: Hunteriana Part IV.
● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—3 p.m., Dr. Sheila G. Ransom: Preparation for Childbirth.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. W. Somerville: Diagnosis and Treatment of Atrial Septal Defect.

Tuesday, April 30

FOUNTAIN HOSPITAL.—5.30 p.m., Dr. D. A. Pond and Dr. B. H. Kirman: Mental Retardation and Epilepsy.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Erasmus Wilson Demonstration by Dr. J. B. Walter: Some Histological Aspects of Early Cancer.
ROYAL STATISTICAL SOCIETY: MEDICAL SECTION.—At Keene Lecture Theatre, 2nd Floor, Westminster Medical School, 5.30 p.m., Mr. R. G. Carpenter: Studying the Ravages of Time.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Dr. B. G. Parsons-Smith: neurological demonstration.

Wednesday, May 1

ASSURANCE MEDICAL SOCIETY.—At 11, Chandos Street, W., 5 p.m., Dr. A. H. Douthwaite: Some Danagers of Therapeutics.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Pathogenesis of Ringworm Infections.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Sir Russell Brock: Present Position of the Surgery of Pulmonary Stenosis.
● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—4.30 p.m., Mr. Aleck Bourne: Vaginal Discharge.
LONDON UNIVERSITY.—At Senate House, 5.30 p.m., special university lecture in psychology by Dr. Else Frenkel-Brunswick (California): Logical Analysis of Psychoanalytic Concepts.
SOCIETY FOR ANALYTICAL CHEMISTRY: BIOLOGICAL METHODS GROUP.—At Chemical Society, Burlington House, W., 7 p.m., Dr. J. M. Ross: Antibiotics and the Public Health; Dr. N. J. Berridge, Ph.D.: Determination of Antibiotics in Milk with Special Reference to Penicillin; Dr. J. H. Taylor, Ph.D.: Determination of Antibiotic Research in the Tissues and Body Fluids of Animals.

Thursday, May 2

FACULTY OF HOMOEOPATHY.—8 p.m., Dr. James Connor: Homoeopathy and Obstetrics.
HONYMAN GILLESPIE LECTURE.—At Anatomy Theatre, University New Buildings, Edinburgh, 5 p.m., Dr. W. Sircus: Recurrent Aphthous Ulceration of the Mouth.
NUFFIELD ORTHOPAEDIC CENTRE.—At Wingfield-Morris Orthopaedic Hospital, 8.30 p.m., Professor J. Trueta: Bone Growth and Endochondral Ossification: An Experimental Study.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Erasmus Wilson Demonstration by Dr. F. C. Chesterman: Transplantation of Human Tumours and Normal Tissues to Laboratory Animals. 5.30 p.m., Otolaryngology Lecture by Professor G. Dohleman: Physiology of the Cupula of the Ampulla in Relation to Vertigo.
ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION: CHILD PSYCHIATRY SECTION.—At Bristol Royal Hospital for Sick Children, 5.30 p.m., Dr. Gaynor Lacey: Young Children with Recurrent Abdominal Pains.
ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—5 p.m., Dr. A. G. McD. Weddell: Some Recent Investigations into Leprosy.

Friday, May 3

● INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. B. F. Russell: clinical demonstration.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. F. H. Young: clinical demonstration.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—10 a.m., Professor W. A. Mackay: Post-operative Complications.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Professor W. C. W. Nixon: Prolonged Labour.

Sunday, May 5

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—10.30 a.m., clinical meeting.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Bickford.—On April 7, 1957, to Elizabeth, wife of Dr. C. A. Bickford, a son.

DEATHS

Copping.—On April 9, 1957, at Highlands, Midham Green, Woolhampton, Berks, Walter Valentine Copping, C.I.E., D.S.O., M.D., F.R.C.S.I., Major-General, I.M.S., retired.
Griffiths.—On March 31, 1957, at Rondebosch, South Africa, Henry Meredith Griffiths, F.R.C.S.Ed.
Groarke.—On April 9, 1957, Patrick Groarke, L.R.C.P.&S.Ed., L.R.F.P.S., at Dagenham, Essex.
Heanley.—On April 10, 1957, at Chy-Henley, Bigsby's Corner, Saxmundham, Suffolk, Katharine Heanley, L.M.S.S.A., late of East Ham, London, E., aged 87.
James.—On April 11, 1957, at his home, Stanley George James, M.D., Ch.M., M.R.C.P., of Broadmoor, Crowthorne, Berks, late of Sydney, Australia.
Lampough.—On April 7, 1957, Charles Lampough, M.D., of Alverstoke, Hants, aged 84.
Mitchell.—On April 6, 1957, at Royal Hospital, Wolverhampton, George Mitchell, M.D., D.P.H.
Singer.—On April 9, 1957, Ernest Oscar Adolph Singer, M.B., M.R.C.P., Colonel, R.A.M.C., retired.
Thompson.—On April 5, 1957, John Douglas Thompson, M.B., B.Ch., D.Phys.Med., of 355, Stag Lane, Edgware.
Walker.—On April 3, 1957, Cuthbert Ferguson Walker, M.D., D.P.H., of Grange-over-Sands, Lancs, aged 81.
Wilson.—On April 4, 1957, at Arngask, 71, Abbotswood Gardens, Ilford, Essex, James Leitch Wilson, M.B., Ch.B., D.P.M., aged 75.

Any Questions ?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Arterial Changes in Hypertension

Q.—Have there been any recent advances in our knowledge of the causes of arterial degeneration in hypertension or of the factors immediately responsible for the rupture of a vessel in this condition ?

A.—There has been no notable advance in knowledge of this subject. The degenerations concerned are of two kinds: (a) atheroma, which affects mainly the large- and medium-sized arteries, and (b) hyaline arteriolar sclerosis, which affects the smaller vessels of various organs—e.g., spleen, kidneys, pancreas, adrenals, etc.

Atheroma, although not essentially dependent on hypertension, tends to be accentuated in that condition, and consequently its common sequelae such as thrombosis (coronary arteries) and rupture (intracerebral arteries) are more frequent in hypertensives than in others. The high pulse pressure which obtains in hypertension is doubtless the factor immediately responsible for the rupture of arteries which are already atheromatous.

Hyaline arteriolar sclerosis, on the other hand, is a specific feature of hypertension,¹ but its nature is obscure. The orthodox view is that it represents a physico-chemical alteration of the smooth muscle of the arterioles,² but the suggestion has also been made that the hyaline substance is a deposit of haematogenous origin in the blood vessels.³

REFERENCES

- 1 Smith, J. P., *J. Path. Bact.*, 1956, 72, 643.
- 2 Montgomery, P. O., and Muirhead, E. E., *Amer. J. Path.*, 1954, 30, 521.
- 3 Duguid, J. B., and Anderson, G. S., *J. Path. Bact.*, 1952, 64, 519.

Breast-feeding Difficulties and Complementary Feeds

Q.—If, owing to a mechanical difficulty such as retracted nipples, a baby fails to gain weight satisfactorily, is it better to take him off the breast completely or to use complementary feeds? How should complementary feeds be managed, and what decides how much should be given on each occasion?

A.—If the mechanical difficulty is severe, breast-feeding is usually unsuccessful. However, initially it is almost always worth giving breast-feeding a trial, as it is often surprising how, despite severely retracted nipples, satisfactory breast-feeding can be established; it is only by trial that the doubt can be settled. At the outset it is wise to ascertain the mother's own views, as the success of breast-feeding in these cases will often depend on her enthusiasm.

A plan is to offer the baby an artificial feed after the breast feeds (complementary) rather than substituting an artificial feed for a whole breast feed (supplementary). When the infant has taken what he can from each breast (do not allow him more than five to seven minutes on each side), he should be offered a full bottle of half-cream milk, made up with equal measures of powder and ounces of water, and added sugar if the manufacturers have not included it. The amount offered should be as much as the baby wants, which means he should be fed until he is satisfied. The best evidence that he is having sufficient is a gain of an ounce (28 g.) a day—or at least 5 oz. (140 g.) a week—and a contented infant.

If after trial it is evident that about less than half the total feed is being contributed by the breasts at each feed, it is usually not worth while continuing with breast-feeding. To establish this point, test feeds can be done, but should be delayed until complementary feeds have been given for several days, as test feeds often worry the mother.

Incidence of Allergy to Milk

Q.—Are there any statistics showing the incidence of allergy to milk among children?

A.—Vaughan and Black¹ review the literature on the frequency of allergy to milk, and report that, from replies to a query from the Bureau of Health and Public Instruction of the American Medical Association, Cooke estimated the incidence of sensitization to milk in all children as about 0.3% to 0.4%; Rachemann as less than 0.01%. Loveless,² from a poll of 191 specialists in paediatrics or allergy, found that 1.5% of 245,000 patients were considered allergic to milk by clinical standards. Collins-Williams³ found an incidence of allergy to milk of 0.3% in 3,000 infants and children seen by him as a general paediatrician, cases referred on account of suspected or definite allergic illnesses being purposely excluded.

REFERENCES

- 1 Vaughan, W. T., and Black, J. H., *Practice of Allergy*, 3rd ed., 1954, Kimpton.
- 2 Loveless, M. H., *J. Allergy*, 1950, 21, 489.
- 3 Collins-Williams, C., *J. Pediatr.*, 1956, 48, 39.

Enuresis in Children

Q.—A healthy girl of 9 often wets her bed at night. She is second in a family of five children, of whom four are boys. Her disposition is happy and her parents understanding and encouraging. Sedatives, fluid restriction, ignoring the wet nights and praising her for the occasional dry night have all been tried over a long period, but without any improvement. What does your expert suggest now?

A.—It is questionable whether anyone can call himself an expert on this problem. From the wording of the query it seems that this 9-year-old girl is periodically dry at night, which tends to make any organic cause of the bed-wetting less likely. Spina bifida is occasionally responsible for enuresis and therefore needs exclusion as a cause. Spina bifida occulta is, of course, common, and therefore its mere radiological demonstration in an enuretic does not mean that there is any causal connexion. A renal abnormality is unlikely in a healthy girl who is dry during the day and even, at times, at night.

It is thought that a physiological aberration of the control and excretion of the body fluid may account for some cases of nocturnal enuresis, leading to increased output of urine at night. In such cases pituitrin, administered as snuff ("disipidin," 100 mg. on going to bed), has been claimed to be of value and is perhaps worth trying in persistent enuresis.

Some degree of emotional disturbance is likely to occur as a result of enuresis in most children after the age of infancy, and there is little doubt that the condition has a psychological basis in a large number of cases, if not the majority. It is sometimes possible, however, especially if the parents are understanding, to obtain improvement or even a cure by physical means. If this girl sleeps very deeply it may be possible to lighten sleep by giving amphetamine, 5-20 mg., in the evening; this may help the child to become sufficiently wakeful to respond to a full bladder and to get out of bed to empty it. Nocturnal enuresis is sometimes accompanied by some degree of frequency during the day, so that the bladder becomes accustomed to frequent emptying. A small dose of phenobarbitone ($\frac{1}{4}$ to $\frac{1}{2}$ gr.—16 to 32 mg.) in the morning may be helpful if this is the case. At the same time the child should be encouraged to hold her urine during the day for increasingly long periods with the idea of conditioning the bladder to retain larger quantities without discomfort. The ability to do this adds

to the child's confidence, and this, together with the increase in capacity of the bladder, may lead to cessation of the nocturnal enuresis.

An electric bell, which rings when the circuit is closed as a result of urine wetting a pad in the child's bed, is recommended by some as an effective way of producing a conditioned reflex which inhibits micturition.¹ It seems rather a crude type of therapy, but it may be worth trying, especially in children over the age of about 9.

It is very possible that even a happy child such as this, and with understanding parents, has an underlying emotional disturbance which may be responsible for the enuresis. It is, for instance, sometimes as difficult for a girl to be the only one in a family of boys as it is to be the only boy in a family of girls. Advice from a skilled child psychiatrist might certainly help the parents to gain enough insight into their daughter's difficulties to bring about a cure, or perhaps active psychological treatment might be required. It is worth noting that a recent survey of a large number of families showed that enuresis had cleared up soonest among the children of those parents who said that they had made no effort to treat or control the habit.

REFERENCE

Davidson, J. Romanes, and Douglass, E., *British Medical Journal*, 1950, 1, 1345.

Toxicity of Detergents

Q.—What toxic effects may be expected from the ingestion of cetrimide or any similar cationic detergent?

A.—There is a single report of a woman who swallowed a mouthful of whisky and an undiluted cationic detergent mixed in error. She collapsed and died in a few hours, but nothing striking was seen at necropsy.

Several types of detergent have been incorporated in the diet of laboratory animals and fed to them for periods up to two years. In concentrations greatly in excess of anything that could be found in human food and drink from utensils washed in dilute detergent solutions, these substances did not upset the animals receiving them. These detergents react with and precipitate proteins in solution, so small quantities taken by mouth will not be absorbed unchanged from the alimentary tract.

Indications for Antirabic Vaccine

Q.—Should antirabic vaccine be given at once to persons bitten by a possibly rabid animal? If it has been possible to keep the animal under observation, is it safe to defer vaccination until a definite diagnosis of the animal's condition can be established?

A.—Not everyone who has been bitten by a rabid animal should be given a course of rabies vaccine, for the course itself is not free from the risk of dangerous complications, including demyelinating lesions of the central nervous system.

It is generally considered that persons, even though they have been bitten, should not be given a course of vaccination if the skin of the body, including the face and mouth, is unbroken; if tooth wounds have been made through clothing which has remained unbroken; or if the wounds were inflicted more than seven days prior to the development of signs of the disease in the animal. If the animal remains normal for seven or more days after inflicting wounds, treatment which may have been begun can be discontinued. There is only a very small possibility of being infected from an animal which survives this period, although it is desirable to confine it for a full 10 days. On the other hand, nervous complications may develop if a person receives 10 antirabic vaccinations; they are less likely to do so after only seven.

Vaccination is also unnecessary if exposure has been limited to handling an animal or objects contaminated with its saliva, or if wounds known to have been more than 24 hours old or to have been covered by an unbroken crust have been licked by a rabid animal. Mosquito bites, no matter how recently inflicted, may be ignored.

The decision whether to start treatment or not after a person has been bitten and the animal caught and confined will depend upon the foregoing considerations, in addition to the behaviour and clinical condition of the animal. If it appears probable that the bite has been received from a rabid animal, it is recommended that vaccinations be commenced but that they should be discontinued if the animal survives seven days.

Oesophageal Changes in Raynaud's Disease

Q.—What is the significance and pathology of the oesophageal changes sometimes encountered in cases of Raynaud's disease and revealed by a barium swallow? Do they cause any symptoms requiring treatment?

A.—Oesophageal changes occur only in those patients with Raynaud's phenomenon due to scleroderma. In these cases the pathological changes are due to swelling of the collagen in muscle bundles in either digital arteries or the oesophagus. The muscle may ultimately atrophy so that a mere immobile tube remains.

Oesophageal symptoms occur in cases where the changes are advanced. The lower reaches of the oesophagus are more commonly affected, and the symptoms may resemble those of achalasia where the cardia is affected, of hiatus hernia and short oesophagus where longitudinal contraction has occurred, or of benign fibrous stricture where there has been a circumferential contraction. In other cases there is a mere postural dysphagia, the patient being able to swallow in the erect but not in the horizontal position. The changes seen in the barium swallow in general may also resemble the conditions mimicked by the symptoms.

The symptoms require treatment according to their severity. Benign stricture needs to be treated by dilatation or in advanced cases by surgery. Further details about the condition may be found in a paper by Bourne.¹

REFERENCE

¹ Bourne, W. A., *Lancet*, 1949, 1, 392.

Cerebral Cortex Biopsy

Q.—Is cerebral cortex biopsy a recognized diagnostic procedure, and, if so, what are the indications for it?

A.—I know of no study of biopsy of the cerebral cortex. This may be due to the fact that little useful information could usually be obtained from the examination of small fragments of cortex, while on the other hand the removal of large strips of grey matter, even from silent areas, would be followed by a real risk of post-traumatic epilepsy. Theoretically the procedure could be of value in the confirmation of the clinical diagnosis of such conditions as are associated with loss of cortical neurones or glial overgrowths.

Correction.—The words "Road Transport Act" in Dr. Charles Rotman's letter (*Journal*, April 6, p. 820) should have read "Road Traffic Act."

Books of "Any Questions?" and Refresher Course Articles.—The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices include postage. *Any Questions?*, Volumes 2 and 3 (8s. each); *Refresher Course for General Practitioners*, Volumes 2 and 3 (26s. 6d. each inland, 26s. overseas); *Clinical Pathology in General Practice* (22s. 3d. inland, 21s. 9d. overseas).

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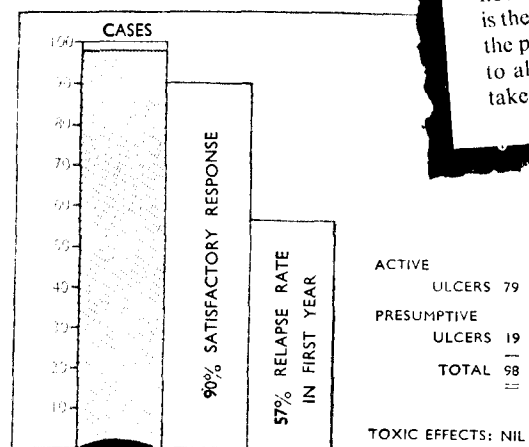
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TABLE II

Group	Active Ulcers	Presumptive Ulcers	Totals
A	63 (79.6%)	17 (89.0%)	80 (81.7%)
B	8 (10.2%)	1 (5.5%)	9 (9.2%)
C	6 (7.6%)	1 (5.5%)	7 (7.1%)
D	2 (2.5%)	0 (—)	2 (2.0%)
TOTALS	79 (100%)	19 (100%)	98 (100%)

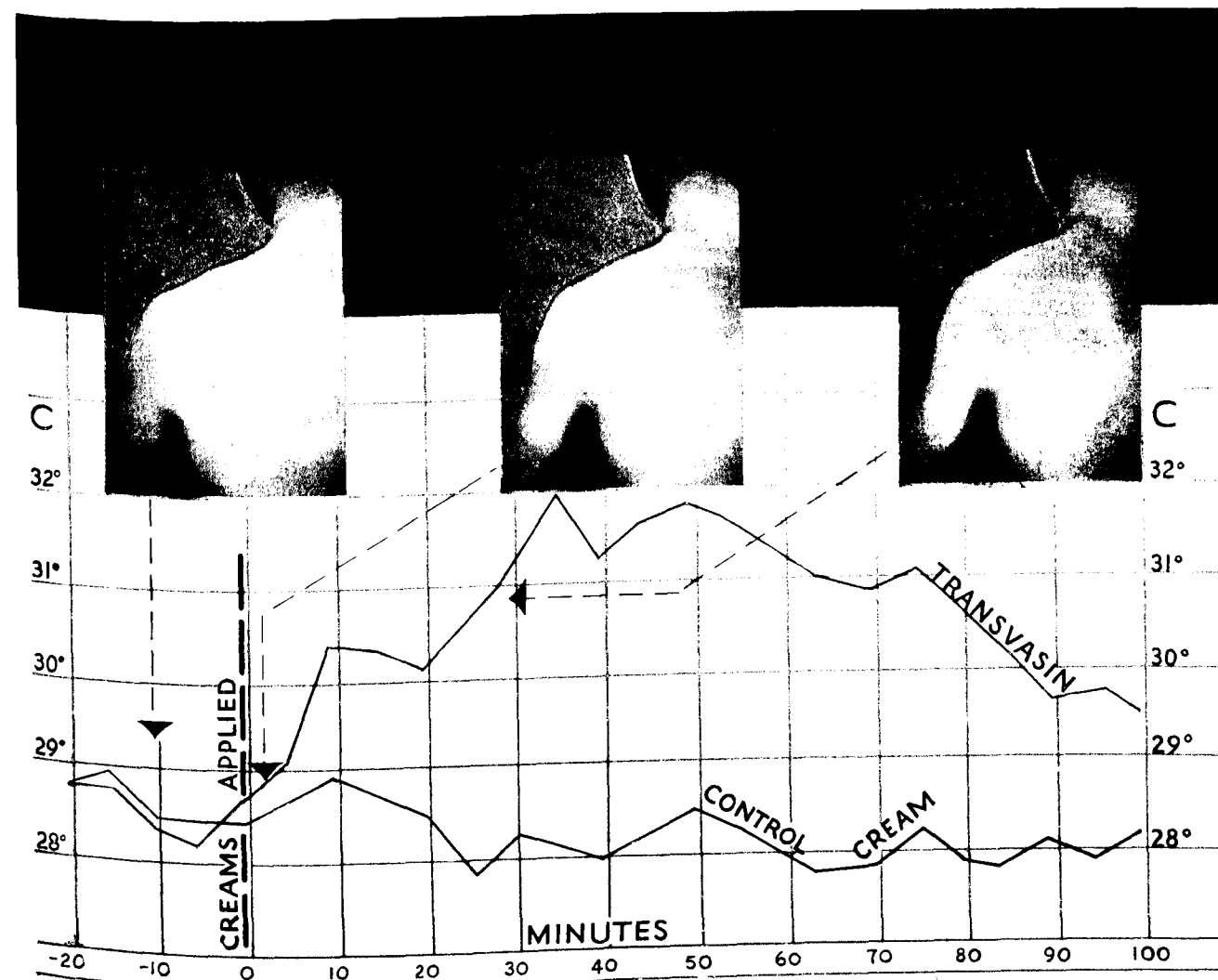
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BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 4 1957

SURGICAL TREATMENT OF AORTIC STENOSIS

BY

Sir RUSSELL BROCK, M.S., F.R.C.S.

Thoracic Surgeon to Guy's Hospital; Surgeon to the Brompton Hospital

The surgical treatment of aortic stenosis has received little attention in the literature of this country, in spite of numerous articles from the United States. Logan and Turner (1954) reported on seven patients treated by operation, and Marquis and Logan (1955) described six cases of congenital aortic stenosis treated by operation, but were unenthusiastic about their results. More recently Baker and Campbell (1956) have presented the results in 16 of their patients operated upon at Guy's Hospital.

This article gives my views and experiences in operating on 120 cases of aortic stenosis; it necessarily touches on the clinical features of this disease, but is intended primarily as a surgical essay.

Historical

The history of the surgical treatment of aortic stenosis is inevitably short. It is usually stated that the first operation was done in 1913 by Tuffier, who attempted to dilate the stenosis by invaginating the aortic wall with his finger. This can scarcely be accepted as a serious contribution.

My own interest in valvotomy focused upon the aortic valve soon after the war, when, in common with a number of surgeons throughout the world, I was engaged in seeking ways to develop direct operations upon the heart valves as the next obvious and long-overdue surgical development.

Souttar (1925) had pointed the way to a simple technique to deal with mitral stenosis, but it proved difficult in 1946 to persuade cardiologists that herein lay a promising (and as it turned out, brilliant) therapeutic future; there was too much inborn reluctance to touch the heart. However, it seemed that aortic stenosis offered to the surgeon a route which avoided direct interference with the heart and therefore was less likely to evoke the superstition. The important fact seemed to be that the aortic valve could be approached with relative simplicity from above. The anatomical basis of the arterial route to the aortic valve and to the pulmonary valve has been described elsewhere (Brock, 1950); it suffices to say that an instrument introduced into the innominate artery either via its subclavian or common carotid branch, or directly into its trunk, can be passed straight down to the aortic valve cusps.

During 1946 I designed an operating cardioscope, or combined valvoscope and valvotome, and was able to use it on a case of aortic stenosis on March 27, 1947. The right subclavian artery was exposed through a small

incision in the neck, and the cardioscope was passed without difficulty to the aortic valve; a good view was obtained of the irregular calcified masses which distorted the diseased valve. It was realized that an attempt to cut this calcified valve semi-blindly with the small knife attached to the instrument was unlikely to be successful enough to justify the risk involved. The instrument was withdrawn; the patient suffered no harm nor derived any benefit.

About this time also Smithy (Smithy and Parker, 1947) was grappling with the problem until his own untimely death from the disease itself. Bailey *et al.* (1952) next reported that the technique of passing a cutting valvotome through the ventricular wall and then using an expanding dilator to split the valve open, although so satisfactory in pulmonary valve stenosis, was liable to cause severe regurgitation if used on the aortic valve. They suggested that instead of preliminary use of a valvotome the stenosis should be relieved by means of a powerful expanding dilator, and to this end designed a three-bladed one, based on the two-bladed dilator already used with success on pulmonary stenosis (Brock and Campbell, 1950). There is no doubt that Bailey's recommendation of the basic use of an expanding dilator was sound. In ordinary calcified aortic valvar stenosis the architecture of the fused cusps is so distorted that the blind use of a cutting instrument is dangerous and ineffective; dangerous because it is easy to miss the valve lumen and perforate the aortic wall or the tissue of a cusp; ineffective because it may encounter only calcified tissue it cannot cut. A properly designed expanding dilator finds its way through the valve lumen with less danger and can disrupt the fused cusps. When the valve is not calcified, as in children or young adults, there can still be a place for the preliminary use of a cutting valvotome before the valve is cautiously split open with a dilator, unless of course open valvotomy is used.

Bailey was soon able to report a large experience with this type of transventricular valvotomy (Bailey *et al.*, 1954), but after operating on some 65 patients he rejected the transventricular route for a transaortic one (Uricchio *et al.*, 1955; Bailey *et al.*, 1956). Harken (1955) has also accepted the aortic route to the valve, and, indeed, has stated dogmatically that it is the only route that should even be considered. A number of other American writers have also made the same recommendation, among them Fell (1955) and Likoff *et al.* (1955). In Great Britain, Logan has used the transventricular route (Logan and Turner, 1954).

After my initial case of retrograde approach to the valve in 1947 I used this route in two more patients. Instead of a small neck incision the upper part of the sternum was split and the innominate artery itself used for the passage of instruments. My experience with it was so bad that I abandoned it in 1952, with reluctance, for the transventricular route. After some initial troubles this route has proved so satisfactory for general use that I have continued to use it for most cases up to date. I cannot agree with the arguments put forward for the superiority of the transaortic route over the transventricular; the matter is discussed more fully below.

The use of the blind method in valvotomy, whatever the route, has much against it. Although one can feel content that in relieving aortic stenosis by dilatation something is being achieved where nothing was being done before, it is not possible to be really satisfied with it. Especially is this so in children or young adults in whom the valve is not calcified. Here it would seem essential for good surgery to achieve as near a perfect result as possible with the least chance of causing regurgitation. There is only one way to achieve this in a high proportion of cases, and that is by open direct-vision valvotomy. This is, of course, in keeping with the present inexorable trend of cardiac surgical technique, towards open-vision operating.

Open aortic valvotomy has been inevitable, and it is interesting and significant that the step was undertaken by two or three surgeons about the same time. My own first open aortic valvotomy was done on January 26, 1956 (Brock, 1956), and I have since done six cases. Lewis *et al.* (1956) have reported three cases of open aortic valvotomy under hypothermia, the first being operated upon on December 2, 1955. Lillehei *et al.* (1956) report a single case of open aortic valvotomy for calcified aortic stenosis using a complete by-pass and retrograde coronary perfusion; this operation was done on January 31, 1956, and since then Lillehei has done several more. In the discussion following Lewis's communication Swan mentions having used open aortic valvotomy twice (presumably under hypothermia) and Bailey also twice, using a pump oxygenator. It is as yet rather early to assess the true value of open aortic valvotomy, but it is certainly the most promising and logical method of treatment so far available.

Assessment of the results of closed valvotomy is easier and will be presented later.

Therapeutic Problem of Aortic Stenosis

As with many other heart diseases, there has been much loose and immature thought about aortic stenosis. Typical is the attitude that it is a relatively benign condition based on the observation that patients are encountered in the 50's or 60's with a short history. From this it is argued that all patients can live to 50 or 60! The same attitude was seen a few years ago with mitral stenosis: one patient aged 60 or even 70 can be so prominent in a clinician's mind that he may fix his attentions on him and conclude that any sufferer from valve stenosis can live so long. The countless thousands suffering grave or total disability or dying

Age Groups of 78 Patients With Aortic Stenosis

1-9	10-19	20-29	30-39	40-49	50-59	60-69
4	7	5	15	25	20	2

before 45 are ignored. The accompanying Table gives the age groups of the patients in my series; it should be realized that each and every one was referred for treatment because of severe symptoms. It is seen that 56 patients were below the age of 50 years and 31 below 40.

Aortic stenosis is a surgical disease and each case should be considered as possibly needing surgery; not, as is now usual, being accorded regular observation until some sinister or subterminal symptoms appear. This statement is bound to provoke protest and so must be justified. For this it is imperative to realize that one of the basic functions of the surgeon is to relieve obstruction to a hollow viscus or duct—a function which has become elaborated chiefly since the advent of modern surgery. The relief of obstruction to the oesophagus, the pylorus, the intestine, the urinary or biliary apparatus is accepted, without question, as a surgical matter. Happily, in recent years this acceptance is extending to the mitral valve and the pulmonary outflow tract, but its significance in relation to the aortic outflow is less appreciated. Neglect of, or a *laissez faire* attitude towards, chronic or subacute obstruction of the bladder or colon would be considered professional incompetence or neglect, and yet chronic or subacute obstruction of the left ventricle is still viewed with complacency.

The left ventricle is the most important muscular structure in the body; it is possible to live, and live well, without a bladder or a colon, but not without a left ventricle. To some it may seem wrong to think of the colon, the bladder, and the heart in the same terms. The heart still carries with it the atmosphere of nobility and an exalted place in the human economy which is exemplified in its being credited with the seat of the emotions. Noble it is in the same way as that other friend of man, the horse. The left ventricle in particular is the willing horse; it will go on, week after week, month after month, year after year, doing its job manfully under the severest burden and will make but little complaint. When it does at last begin to complain, when symptoms are insistent and can no longer be ignored, it is dangerously near its end. It will live but a few months or a year or two once the features of failure have appeared; it is liable to stop suddenly, just as the horse may go on until it drops down dead. Even at the late stage of impending failure it may be restored to many years of useful work if its burden is relieved, if the aortic stenosis is corrected. It behoves us to recognize and respect left ventricular obstruction and to relieve it much earlier than is now done.

It is, of course, realized that until very recently there was no safe or satisfactory surgical treatment for aortic stenosis, and thus nothing was to be gained by reference to a surgeon. The object of this article is to try to show that surgery now offers a great deal to the sufferer from aortic stenosis, but that to do his best the surgeon should be consulted before signs of chronic invalidism and impending death have appeared; that only in this way can good results be obtained and confidence be engendered.

Clinical Assessment

This brings us to another fact that has to be discussed—the need for a more scientific assessment of the clinical state of the patient than is generally used. The physician may defend his policy and practice of not referring his patients for surgical intervention because he has concluded that their disability or disease does not warrant it; that the aortic stenosis is not severe enough. Without doubt there are many cases in which this is the correct and proper decision. The point to be made is that in most cases this decision is empiric; it is in the nature of a "hunch"; a clinical hunch that may be right, and may be totally wrong. In such a responsible matter more than clinical sense is needed, for to-day methods are available to help towards a more precise assessment.

The simplest, and unfortunately the most ingenuous, assessment used is the patient's symptoms. There is, for instance, the astonishing statement in an important textbook (Lewis, 1933), "there are no symptoms of aortic stenosis." The most that can be said of this is that it is presumably meant to be subtle and it merely succeeds in being sinister. If the patient says he is not troubled or is conscious of only slight restriction on exertion, this is usually accepted as ruling out the need for operation. Clearly this may be so,

but we do not receive long training to become doctors, and longer still to become specialists, to apply a simple rule of thumb that could be applied by a layman. It is our duty to assess the situation in each patient so that he can be given sound and sober advice. This may well be reassurance and observation, but we must be able to recognize when the circumstances are not satisfactory even though they may appear to be so superficially. The left ventricle, in this matter, is its own worst enemy; it will go on doing its job with but little outward protest until it can continue no longer without grave complaint. What we need is to be able to assess the burden the left ventricle is carrying even though it carries this burden without noticeable complaint.

The first step in this is clinical assessment. Others have written of this—for example, Matthews *et al.* (1955) and Baker and Campbell (1956)—and so only a few comments are needed here, and it is best to start at the end. When the heart has grossly failed the patient may be too late for surgery and certainly too late for more than moderate amelioration. Yet how often is this the very time that the patient is first directed to the surgeon even though he may have been regularly observed for years. It is like guarding closely the sufferer from chronic prostatic obstruction until his bladder is up to his umbilicus, his urinary tract infected, and his kidneys barely functioning, and only then referring him for operation. Features of right-sided heart failure are usually features of inoperability, not indications for operation; established right-sided failure indicates a virtually totally inoperable state. Much the same applies to left-sided failure. The condition unrelieved or unrelievable by routine medical treatment indicates that the time for useful surgery has passed. It is useless to appeal that only an operation gives the patient a chance of survival; this is not surgery, it is the prostitution of surgery. Surgery is a valuable tool which should be used properly and with respect; it becomes damaged and blunted if misused. The bad results of surgery repeatedly invoked in such cases promote lack of confidence, impair morale, and hold up progress.

If left-sided failure has occurred but has responded satisfactorily to treatment, especially if it was precipitated by an acute infection or some such episode, then successful operation may still be possible. The same applies to the early features of left ventricular failure, such as a tendency to nocturnal dyspnoea; it is still not too late to save these patients. It must, however, be realized that these are not so much indications for operation as indications that if operation is not undertaken as an urgency it will be too late.

Angina pectoris is often considered as a contraindication to operation; this is not so. It should be regarded as a *cri du cœur* for relief. Anginal symptoms are usually completely relieved by a successful valvotomy.

Dyspnoea at night is a grave feature; dyspnoea on exertion is often brushed aside. This should not be so; it should always, however slight, be accepted as a significant symptom until full assessment has shown it not to be. Although it is a very difficult feature to assess, and though it may prove unimportant, nevertheless, if genuine, it indicates that under the conditions in which it occurs the heart is unable to do its work properly, its ability is limited, it is failing in its task. In other words, dyspnoea can be an important feature, an important warning of the need for help.

Except in emotion or on physical effort we are unconscious of the heart's action. In a patient with aortic stenosis simple awareness of the heart's action may be a feature that should lead to complete and critical assessment of the burden the left ventricle is carrying. Especially is this so in the child or young adult, in whom the left ventricle has a remarkable power of compensation for the demands placed upon it; a power that we should recognize, respect, and seek to relieve from burden rather than take advantage of to the extent of abuse.

How can this assessment be made in the absence of the obvious clinical stigmata of failure? Simple enlargement

of the ventricle may be only reasonable compensation. If considerable it indicates a considerable burden; in the absence of regurgitation much enlargement suggests a degree of actual failure. The electrocardiogram is indispensable in assessment, especially if over a period of observation it shows deterioration. The clinical examination of the pulse is also invaluable, particularly when extended by the more critical analysis of an arterial pulse tracing.

In many cases it is quite easy from the above findings to decide that operation is desirable or essential. In others more critical assessment is needed.

More Critical Assessment

Right-heart catheterization by itself can give little direct help; it may demonstrate a low cardiac output and poor response to exercise. The "pulmonary capillary venous pressure" may also indicate or confirm evidence of left ventricular limitation or failure. The information obtained is likely to be more useful if combined with a knowledge of the pressure in the left ventricle and aorta. This may be obtained by direct left atrial puncture according to the technique of Björk *et al.* (1953), but we have found that, although a left atrial pressure record can be secured, it is, disappointingly, frequently impossible to manipulate a catheter into the left ventricle in cases of aortic stenosis; it is much easier when the left atrium is dilated as in mitral valve disease. Moreover, left atrial puncture may be very distressing to the patient, and, if he is ill with aortic stenosis, may be frankly dangerous. However, we have been able to obtain valuable information in this way by simultaneous recording of the left ventricular pressure and the brachial or femoral artery pressure, thus obtaining the gradient across the valve.

In view of the uncertainty and drawbacks to left atrial puncture we have been using direct left ventricular puncture with greater satisfaction. This method is quick and simple, and so far has proved safe (Brock, Milstein, and Ross, 1956). It has been invaluable in deciding for or against operation in difficult cases. Thus, although clinical and other features may indicate the probable need for operation, direct left ventricular puncture has shown unequivocally a trivial gradient across the aortic valve; conversely, it has demonstrated in not dissimilar cases a very high left ventricular pressure and a very high gradient, indicating the urgent need for operation. In the 90 cases in which we have used this method it has been incomparably less disturbing than left atrial puncture; there has been no morbidity and no mortality. A more detailed report on the analysis of the information obtained from left ventricular puncture is given by Fleming and Gibson (1957), and I need not anticipate their observations.

Figs. 1 and 2 show the type of pressure record and information obtainable from the direct left ventricular puncture combined with a brachial artery pressure tracing. Fig. 2 illustrates that a direct left ventricular pressure record may exclude significant aortic stenosis.

The only time the gradient may be deceptively high is if significant regurgitation coexists; it should be possible to recognize such substantial regurgitation by other methods.

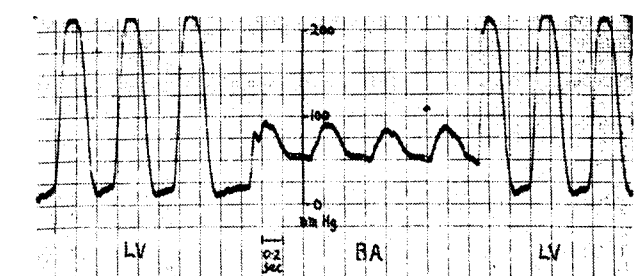


FIG. 1.—Left ventricular and brachial artery pressure records showing an aortic systolic gradient of 120 mm. Hg, thus demonstrating severe aortic stenosis. Left ventricular pressure recorded by direct percutaneous puncture of ventricle.

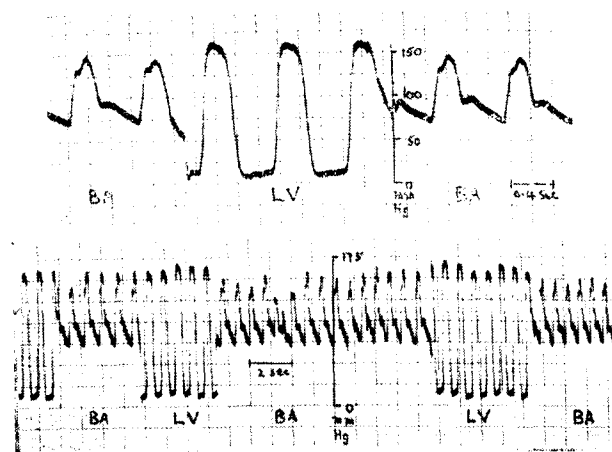


FIG. 2.—Brachial artery and left ventricular pressure records showing an aortic systolic gradient varying from 5 to 15 mm. Hg, thus excluding significant aortic stenosis. Left ventricular pressure recorded by direct percutaneous puncture of ventricle.

Usually the pulse pressure is too wide for dominant aortic stenosis and the actual gradient is rarely as high as 100 mm. Hg and more usually nearer 50 mm. Hg. Incidentally there is a tendency to be too ready to reject a patient for aortic valvotomy because of the presence of some regurgitation; a small amount may be quite unimportant and should not turn one away from relieving the dominant stenosis; in these cases study of the aortic gradient may be especially helpful. Valvotomy may even relieve the regurgitation as well as the stenosis if it restores greater mobility to the cusps.

In a short communication to the British Cardiac Society in 1954 I indicated the difficulty of diagnosing significant aortic stenosis from the physical signs alone in all cases; in particular the mere presence of a systolic thrill and murmur may be misleading. This was illustrated by pressure records taken at operation for aortic coarctation in a boy who had been diagnosed as also having dangerous aortic stenosis. It can be seen (Fig. 3) that there was no gradient across the valve. In another patient, observed for several years by a skilled cardiologist who requested operation as a result of his clinical observations and his knowledge of the patient's progress, pressures taken across the aortic valve at thoracotomy also showed no gradient. (Today this information would have been obtained by direct

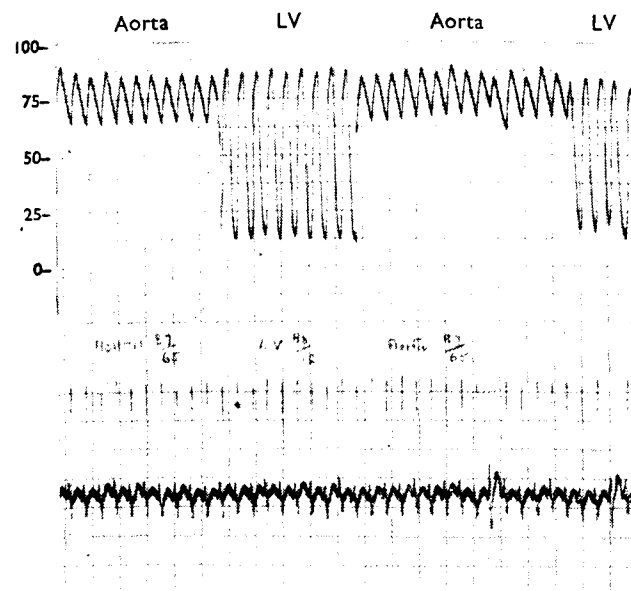


FIG. 3.—Pressure records of aorta and left ventricle taken at thoracotomy; there is no gradient and no significant aortic stenosis.

left ventricular puncture.) These two cases emphasized that it is not enough to accept even a skilled clinical assessment in all cases and indicate that the surgeon must check the pressures across the valve at operation, if these have not been done before. Operation results and experiences in patients in whom this has not been routinely done may be, in my submission, valueless; they are certainly incomplete.

The ability to do percutaneous left ventricular puncture and simultaneous brachial artery or aortic records of pressure allows us to obtain this precise and valuable information as a part of routine pre-operative assessment.

So far we have found a reasonably close correlation between the pressures recorded before operation and those taken at operation. This is in direct disagreement with the statements made by others that observations at operation are unreliable (Matthews *et al.*, 1955; Bailey *et al.*, 1956).

Matthews *et al.* (1955) also state that it should not be necessary to know the gradient across the valve to assess the severity of the stenosis, and that, apart from the figures being unreliable, the requisite information can be obtained by other means. They give no figures to support this, nor disclose any experience obtained from cases studied before and at operation. In my experience it is not possible to obtain sufficient precise information on these cases without left as well as right-heart catheterization. It is difficult to imagine any pre-operative clinical assessment of cases much superior to that which I am privileged to enjoy from my very able cardiological colleagues, and yet we have found that the final essential information has on several occasions come only from left ventricular puncture with or without right-heart catheterization. This has enabled us to assess the severity of the lesion and thus has greatly helped the difficult task of advising operation in an anxious case, even though there was already a strong clinical indication for operation. Also it has enabled us, unequivocally, to rule out or postpone operation in others in whom operation had seemed indicated.

At present large numbers of patients with aortic stenosis are being observed at cardiac clinics throughout the world by virtually rule-of-thumb methods. Especially is this so with children. Their aortic stenosis may be mild and unimportant; it may be severe. With present practice there is little chance of the more severe cases being selected for operative relief until they begin to show signs of grave failure, by which time it may be too late.

If these patients are to be selected for operation at the proper time, when their left ventricle needs relief from its burden and before advanced secondary changes have occurred, this cannot be done by clinical "guessing," however shrewd this may be and however hard it is to accept that it often is guessing. If proper progress is to be made in the surgery of aortic stenosis then the approach to and management of these cases have got to be reorganized. Especially must this be so in children and young adults, for it is in them that the best results will be achieved before the valve has become so severely calcified that it cannot be made even remotely normal. Nadas and Ongley (1956), of Boston, reported a careful and complete study, including left- and right-heart catheterization, they had undertaken in a series of children with aortic stenosis. They realized the need for this after observing five sudden deaths in five years. Their findings revealed the need for urgent surgery in almost all their patients.

Clearly it would be unreasonable to expect patients with aortic stenosis to have been put forward for operation, or even necessarily critically examined with a view to operation, until quite recently. The surgery of aortic stenosis had not justified itself; the mortality was high and the results were poor. Clinicians have, quite properly, been hesitant and unconvinced. One of the objects of this article is to try to show that there is now every justification for confidence in advising patients to consider surgery and to undergo it if found to be suitable for operation.

Morbid Anatomy of Aortic Stenosis

The outstanding feature in aortic stenosis is the frequency with which the valve cusps are deformed by calcified deposits. On this rock-like substance the surgeon's efforts may founder, for he is often at the mercy of the anatomical accident of the disposition of these masses; what he can do to help may be decided largely by them. In extreme cases the whole valve and ring may be so calcified that little or nothing can be achieved; in others the commissures, or at any rate part of them, may be sufficiently free from calcium to allow a satisfactory result. The least favourable type is the bicuspid valve in which it may be impossible materially to increase the valve lumen without rupturing part of the cusps and thus causing severe regurgitation. In such a valve the cusp margins are straight lines, rigid and fixed; they are not curved like bucket-handles and so possessed of the power of swinging wide open as is the case when a stenosed but prominent valve cone is cut transversely by valvotomy.

Clearly it is desirable, whenever possible, to operate before calcification has developed. Unfortunately, only too often extensive calcification is already present when the patient first comes for advice. In my series in only one patient over the age of 30 was the valve not calcified; she was 32. Once calcification is present it has to be accepted and the efficacy of surgery is inevitably limited; cure, as such, is impossible. This is, however, no reason why operation should be rejected. Theory may be against it; practice proves it can give satisfactory results, as will be shown. At the very least the clock can be turned back several years, even though considerable stenosis remains; the patient may gain a larger valve orifice than, in fact, he has had for the greater part of his life.

The non-calcified valve has been studied at open operation in six cases; in five there were three fused cusps, in one the valve was bicuspid. The cusps were much more thickened and swollen than is seen in the stenosed pulmonary valve, the commissures in particular being swollen and difficult to define on their ventricular aspect. This may well be due to the higher pressures involved.

The patient who had a bicuspid valvar stenosis also had a severe subvalvar stenosis. This condition was also found as an isolated lesion in four other patients, and the five cases have been fully reported elsewhere (Brock and Fleming, 1956). It must suffice to state here that the pre-operative differentiation between valvar and subvalvar stenosis is difficult; the various clinical and semi-clinical differential features put forward are valueless. In four cases the diagnosis was made at operation by a withdrawal pressure record taken with a catheter passed into the aorta through the left ventricle. In the fifth case a withdrawal pressure record failed to show the subvalvar stenosis which was disclosed by open operation on a supposed valvar stenosis. It is our policy to make a withdrawal pressure record whenever there is any doubt about the lesion being valvar, especially in the absence of calcification. The possibility of the stenosis being subvalvar must be borne in mind and every effort made at a precise differentiation.

When the aortic stenosis is associated with mitral stenosis severe calcification is less frequent and consequently valvotomy offers more in isolated aortic stenosis. In 34 cases of combined aortic and mitral stenosis calcification was absent in 20 and was not severe in most of the others.

Surgical Technique

As already stated, the transventricular approach is preferred, except for open valvotomy. The heart is exposed by the standard left antero-lateral thoracotomy through the bed of the fifth rib, which is used for mitral valvotomy also. Although the skin incision extends backwards only some 2 inches (5 cm.) beyond the inferior angle of the scapula, the rib bed is opened for its whole length. This gives an excellent exposure and spares the big shoulder muscles. Occasionally, when the left ventricle is very large, it is

better to divide the sixth costal cartilage as well, and occasionally it may be more convenient to use the sixth rib bed.

Once the chest is opened the next step is dissection of the aortic branches to the head and neck and the passage of snares for their later control; it is essential to do this to help guard against calcified emboli. It is best to secure the vessels early in case emergency valvotomy is needed should the heart show distress.

The aorta is next palpated and the character of this thrill and pulsation is noted. The state of the valve and the valve ring is examined, especially for calcification. Pressures are then taken in the aorta and left ventricle by simultaneous needle puncture; in this way the gradient is assessed or confirmed. A catheter withdrawal tracing is not now used as a routine, because the manipulations of introducing it may be disturbing and may even produce ventricular fibrillation; it is used when there is a possibility of a subvalvar stenosis.

A favourable site on the left ventricle is selected for entry; this should be towards the apex and in a region as free as possible from coronary branches. A local anaesthetic solution is not injected into the myocardium; it does no good and may do harm. Formerly a heavy linen thread purse-string stitch was used and held in a Rumel tourniquet, but it was found that the strong pull that an assistant can exert may cause partial ischaemic atrophy within the constricted area. A light 00 silk stitch is now preferred, held by a short piece of soft rubber tubing; this is effective and not harmful. Sometimes no stitch at all is used.

Through a small incision a probe is inserted to feel the way into the ventricle; this is followed by a 0.4-cm. bougie. Neither of these instruments goes high enough to engage the valve lest calcium emboli are detached. The snares are now tightened on the aortic branches and the valve dilatation is done without loss of time. The 0.4-cm. bougie is advanced to the valve, and palpation will quickly give some idea of the size, shape, and disposition of the stoma. This is quickly followed by the 0.7-cm. bougie, and then the expanding dilator is introduced and opened in two or three directions. All these movements must be fully controlled. If there is any doubt at all of the true position of an instrument it should be withdrawn and a fresh start made. To push or to use force may be disastrous. Only rarely is the orifice so small that a bougie is really gripped tight, and then the advancing force must be steady and controlled; all movements of the instrument should be checked and guided by fingers placed outside the aorta. As the instruments are changed the assistant applies light pressure, if needed, to the purse-string tourniquet.

An observer calls out the duration of the time of occlusion of the head and neck vessels; first at 45 seconds, then at 60 seconds, and thereafter every 10 seconds. It is usually possible to complete the valve dilatation in 50-70 seconds (Fig. 4). A pause of some 5-10 heart beats is allowed to disperse any free calcium, and the snares are then loosened. Haemorrhage is usually slight and is controlled by finger pressure in addition to light tightening of the tourniquet.

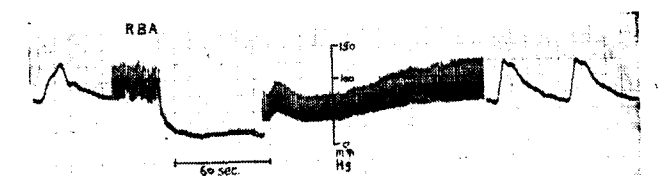


FIG. 4.—A continuous brachial artery pressure record taken before, during, and after aortic valvotomy. Three features are demonstrated. (1) The fall in blood pressure to almost zero marks the duration of occlusion of the aortic branches to the head and neck to prevent calcium emboli; it lasts some 65 seconds, and during this time the valvotomy was completed. (2) The blood pressure rapidly returns to the pre-valvotomy level. (3) On the left and the right are slow tracings to show the form of the pulse wave. Before valvotomy the slow upstroke shows a classical anacrotic notch; after valvotomy the upstroke is steep and has no notch.

If bleeding is heavy a swab can be held over the wound. At this stage it is better to wait quietly a few minutes to let the heart settle down; this will always lessen the bleeding and may allow it to stop altogether. Palpation of the aorta will usually reveal changes in the thrill, pulsation, and pressure to indicate the degree of improvement. When the heart's action is steady the improvement can be checked by taking pressures across the valve once more by needle puncture. If these are satisfactory it only remains to close the small wound in the ventricle with two or three stitches. If the gradient is still high further instrumentation is needed.

It is necessary to take great care in tying the stitches. If the muscle is at all friable and they are tied too tightly they will cut out, and control may then be difficult; the sutures should be bedded down just so much and no more. Much has been written about uncontrollable haemorrhage and unsuturable wounds, but these have never been so in any of the cases in this series. It may be that the use of a large, heavy type of expanding dilator is responsible for severe damage to the myocardium. The simple two-bladed dilator of the type used for pulmonary stenosis and opening to 3.5 cm. is less than 1 cm. in diameter. It has given no

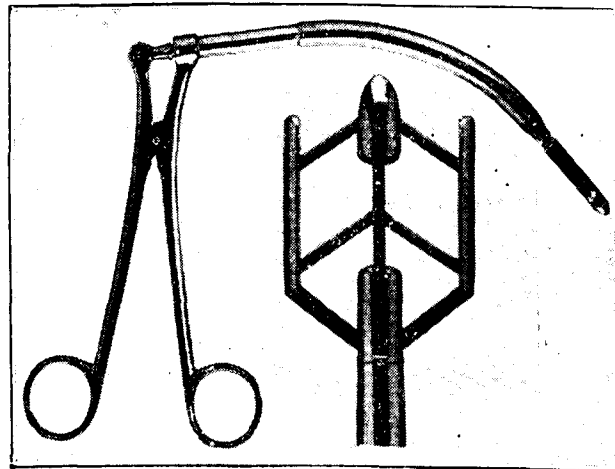


FIG. 5.—Two-bladed expanding dilator.

trouble and is very powerful and effective (Fig. 5). The suggestion that a three-bladed expanding dilator can open the three commissures is unconvincing.

The heart may show distress during the early manipulations, and ventricular fibrillation may even begin. In these circumstances it is best to proceed at once to complete the valvotomy and then begin resuscitation.

If fibrillation begins during the valve dilatation this can be completed and then massage and defibrillation carried out. Several patients have made a perfectly normal recovery even after going through a period of many minutes of ventricular fibrillation (Milstein and Brock, 1954).

When aortic and mitral stenosis coexist the heart is exposed in the same way. In most cases the mitral stenosis is the more important lesion and is dealt with first; pressures are always taken across both valves to try to elucidate this. If the aortic stenosis should be the more important it is naturally treated first. After the mitral valvotomy the aortic gradient is again checked before the aortic valve is dealt with according to the technique already described, except that the aortic branches would not be snared in the absence of calcification. Aortic valvotomy is usually well tolerated in these cases because the left ventricle has, as it were, been protected by the mitral stenosis.

The technique for open aortic valvotomy is, of course, quite different. The chest is opened by the standard transverse, transsternal incision through the bed of the right third and left fourth or fifth rib. Pressure estimations are done as usual and then venovenous cooling is instituted accord-

ing to the technique described elsewhere (Brock and Ross, 1955; Brock, 1956), the temperature being lowered to about 29° C.

After interruption of the circulation by clamping the superior and inferior venae cavae the aorta is opened to expose the valve for visual valvotomy; little more than five minutes is needed to complete this. The incision in the aorta is closed with a clamp and can then be sutured at leisure after the circulation has been re-established.

Pressure Records

A certain amount has been said about pressure records across the aortic valve, but this is a convenient moment at which to elaborate certain features.

The criticism has already been mentioned that pressure records taken at operation are unreliable, although these statements are rarely supported by actual figures.

Pressure recordings have been made at operation on all the cases of aortic stenosis in this series and on at least another 50 cases in which it has been necessary to assess the gradient critically (usually when mitral stenosis coexists). Over a period of years, and from this not inconsiderable

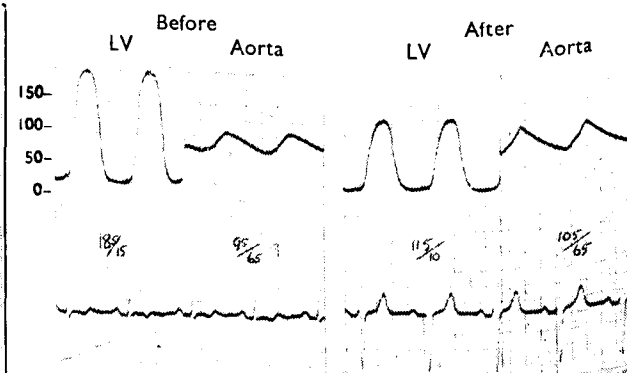


FIG. 6.—Pressure records from left ventricle and aorta taken at operation before and after aortic valvotomy. The pre-operative gradient of 90 mm. Hg has been reduced to 10 mm. Hg; the systemic pressure has actually risen 10 mm. Hg. The form of the aortic pulse tracing has improved.

number of cases, the impression has been formed that these observations cannot be dismissed as unreliable or misleading. It is obvious that the conditions at operation may be different from those existing at other times, and proper allowance can be made for this. Thus the heart's action may be poor, the systemic pressure low, and the gradient correspondingly reduced. Clearly this must be taken into account after the manipulations of aortic valvotomy, when the ventricular pressure might be lower from the insult the heart has received. It is not difficult to recognize this state and either wait until the condition has improved or just note that the observations are not fully reliable under the conditions pertaining.

It has already been stated that our experience with direct left ventricular puncture has shown that pressure records made before operation can be exactly confirmed at operation. Furthermore, far from the heart being embarrassed by valvotomy, its action is often immediately and strikingly improved so that an even higher systemic pressure is recorded (Fig. 6). If this is so, or the systemic pressure is at any rate not lowered, it can be inferred that the drop in left ventricular pressure is the expression of relief of stenosis and not ventricular failure. Thus typical records are:

	Before valvotomy	After valvotomy
Aorta	100/56 mm. Hg	100/50 mm. Hg
Left ventricle	260/40 mm. Hg	140/40 mm. Hg

The aortic and brachial artery tracings will also usually confirm the efficacy of the procedure (Figs. 4 and 7).

If pressure records made at operation are to be rejected as unreliable it would be good to know what other method

of assessment is to take their place. Even with open aortic valvotomy there is the problem of secondary subvalvar stenosis.

The pressure gradient in isolated aortic stenosis coming to operation is usually much higher than in aortic stenosis combined with mitral stenosis. Thus the usual gradient is

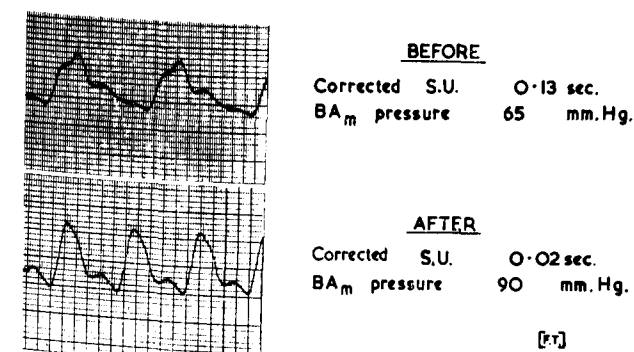


FIG. 7.—Brachial artery tracings taken before and after aortic valvotomy to show conversion from a grossly anacrotic to an almost normal tracing.

about 100 mm. Hg—for example, aorta 100 mm. Hg, left ventricle 200 mm. Hg. In severe cases the left ventricular pressure may be nearly 300 mm. Hg. In one patient it was found to be 325 mm. Hg when measured by direct left ventricular puncture; the brachial artery pressure was 115 mm. Hg.

It is difficult to lay down any firm rule for a figure below which one would probably not advise operation in pure aortic stenosis; 50 mm. Hg suggests itself, especially if this were a figure arrived at by left ventricular puncture before operation. If found at operation full weight would have to be given to the evidence of any general circulatory depression, particularly an unduly low aortic pressure. Normally, also, all the other clinical features would have to be taken into account, including cardiac output.

It is expecting too much to be able to obliterate the gradient completely in a case of severe calcified aortic stenosis. Occasionally this can be nearly achieved, as is shown by Fig. 6, in which there has been a reduction from 90 mm. Hg to 10 mm. Hg. Fig. 8 also shows almost complete obliteration of the gradient.

Often one must be content with a residual gradient of 30–50 mm. Hg. Occasionally it is not possible to achieve any satisfactory reduction of the gradient. In such cases, however, it would be wrong to assume always that there has been no specific relief of the actual valve stenosis. For instance, in a recent case the pressures before aortic valvotomy were: aorta, 100 mm. Hg; left ventricle, 200 mm. Hg; gradient, 100 mm. Hg.

The valve orifice was felt to split well and the dilator could be opened freely. In spite of this the pressures were: aorta, 80 mm. Hg; left ventricle, 150 mm. Hg; gradient, 70 mm. Hg. The dilator was again passed, and it was confirmed that the valve opened easily and widely; it seems certain that residual valve stenosis was slight.

The probable explanation lies in the appearance of a secondary subvalvar muscular obstruction due to gross left ventricular hypertrophy analogous to what has been fully described as occurring in the right ventricle in certain cases of pulmonary valvar stenosis (Brock, 1956). A catheter withdrawal record seemed to give support to this. It can be reasonably expected, if this is the explanation, that improvement may accompany diminution in the gross muscular hypertrophy.

The value of pressure records made before, during, and after operation may be judged from the following notes of a case.

A youth aged 16 had congenital aortic stenosis; the electrocardiogram showed severe left ventricular strain pattern. Right heart catheterization and direct left ventricular puncture gave the following data. Cardiac output: At rest, 5 litres; during exercise, 7.1 litres; during L.V. puncture, 6.3 litres. Pressures: Brachial artery—at rest, 110/60 mm. Hg; during L.V. puncture, 95/60 mm. Hg; left ventricle, 177/17 mm. Hg; systolic pressure gradient, 82 mm. Hg. Estimated aortic valve area, 0.8 square cm.

When the heart was exposed at operation the pressure records were: aorta, 69/52 mm. Hg; left ventricle, 136/15 mm. Hg—systolic gradient, 67 mm. Hg.

After venovenous cooling to 29.5° C. the aorta was opened to expose a stenosed valve cone with a central aperture about 0.4–0.5 cm. in diameter; the three fused commissures were cut accurately and a finger was passed into the left ventricle.

Pressure records were again taken when the temperature was 32° C. These showed: aorta, 60/42 mm. Hg; left ventricle, 73/11 mm. Hg; systolic gradient, 13 mm. Hg.

Investigations were repeated six months after operation with the following findings; figures at the pre-operative catheterization are given in parentheses. Cardiac output: At rest, 16.7 litres (5 litres); during L.V. puncture, 10.6 litres (6.3 litres). Pressures: Brachial artery—during L.V. puncture, 115/67 mm. Hg (95/60 mm. Hg); left ventricle, 135/12 mm. Hg (177/17 mm. Hg); systolic gradient, 20 mm. Hg (82 mm. Hg). Estimated aortic valve area, 2.32 square cm. (0.8 square cm.).

The brachial artery pressure pulse was now normal instead of being grossly anacrotic.

It should be noted that in addition to proof of the effectiveness of the open aortic valvotomy in improving the cardiac output and converting the pressure gradient across the valve, there is very close agreement between the pre-operation records and the pre-valvotomy records at operation; also between the post-valvotomy records at operation and those made six months after operation.

When mitral stenosis exists with aortic stenosis the gradient is usually much less than in pure aortic stenosis. My first combined aortic and mitral valvotomy was done in January, 1953, but for at least three years before this the practice was made of taking pressure records across the aortic valve in cases of mitral stenosis with features of aortic stenosis and trying to obtain some information by a post-operative follow-up. As a result of this experience it is felt that a gradient of only 25–30 mm. Hg is an indication for aortic valvotomy when there is a coexistent mitral stenosis, and of course associated with clinical features of aortic stenosis. This is based on a follow-up of patients in whom the gradient was as small as this and who seemed to have a degree of disability due to unrelieved aortic stenosis. There have, of course, been patients in whom a gradient of 25 mm. Hg was found who have shown no signs of disability. Two patients in whom the gradient was 50 mm. Hg and 70 mm. Hg were left with their aortic stenosis untouched, and both had to have secondary aortic valvotomy; both then obtained complete relief. There can be no doubt that a gradient of 50 mm. Hg in a patient with combined stenosis must not be left unrelieved.

In the presence of significant mitral stenosis the gradient must inevitably be smaller because of the diminished filling of the left ventricle and hence the restricted output. As a corollary, relief of the mitral stenosis will improve the filling and the output, and hence the gradient across the aortic valve stenosis will increase.

In these combined cases it is much easier to obliterate the pressure gradient completely (Fig. 9).

The aortic valve manipulations are so well tolerated in these patients that in any doubtful case it is now thought preferable to introduce a bougie and try to gauge the size

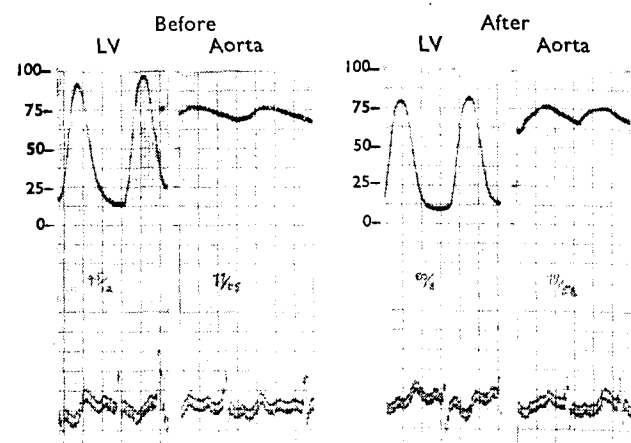


FIG. 9.—Pressure records from left ventricle and aorta in a case of combined aortic and mitral stenosis before and after combined aortic and mitral valvotomy. The small pre-valvotomy gradient of 18 mm. Hg has been reduced to 3 mm. Hg.

of the valve orifice, or even to insert an expanding dilator to try to assess this more closely, and, if need be, open it widely and split the valve.

There were three deaths among the 34 cases of combined aortic and mitral valvotomy, but in all three death was due to the mitral stenosis and not to the aortic valvotomy.

Results

The greater tolerance of aortic valvotomy when combined with mitral valvotomy makes it desirable to separate this group from pure aortic stenosis.

As stated above, combined aortic and mitral valvotomy was done in 34 patients with three deaths. In 12 patients the clinical result was excellent or good; it is in this group of combined aortic and mitral valvotomy that some of the very best results can be obtained. In only seven patients was the result classed as fair and in only one as poor.

Four patients have since died; in these the initial result had been judged as good in one, fair in one, poor in two.

In two cases aortic stenosis was associated with coarctation of the aorta, both lesions being severe.

There remain 84 cases of isolated aortic stenosis; from these should be deducted the first, 1947, case in which no valvotomy was done; 83 remain. Among these are five cases of subvalvar stenosis, and it would appear better not to consider them with the pure valvar stenosis group; 78 cases remain for consideration.

Among these 78, there occurred 14 deaths due to the operation—an overall mortality of 18%. It must, however, be pointed out that five of these deaths occurred in the first eight patients, all of whom were very bad risks; four were over the age of 50, one over 60; some were in advanced right- or left-sided failure.

This early experience was so disturbing that operations on aortic stenosis were nearly abandoned, but after consideration it was decided that it was wrong to select such desperate cases; thereafter the results improved vastly. It must not be supposed that only mild cases were chosen; it was simply that moribund patients were rejected.

If, for the moment, these first eight cases are excluded we find the mortality is 9 in 70 (12.8%). Actually there have been only three deaths in the last 48 cases of pure aortic stenosis; and in one of these the patient had been in left-sided failure and had grossly impaired lung function; one was a case of open aortic valvotomy under hypo-

thermia; the third patient died 10 days after operation from a heavy wound infection resistant to antibiotics. Included in these 48 are four cases of open aortic valvotomy.

In the last 63 cases of aortic valvotomy, including those with mitral stenosis, there have been only four deaths; all except one were very bad risks.

In an average-risk patient with isolated aortic stenosis the mortality from operation should be low; it is only when features of advanced secondary changes are present that the mortality rises. This means that in certain types of case the risk of operation may lie between 25 and 50%; for average cases the risk is probably no more than 5%.

Baker and Campbell (1956) made a detailed clinical survey of the results of the first 16 patients operated on at Guy's Hospital. How gravely ill were the patients in this series is seen by the fact that six died and in only five was the result good; even among these five one died after 18 months. Baker and Campbell, indicating how these patients were chosen for operation at a late stage of their disease, reveal that 9 of the 16 had left ventricular failure and three had progressed to right-sided failure as well; all had electrocardiographic signs of severe left ventricular strain. In this larger series of 78 cases 21 had left ventricular failure and a further 11 had progressed to right-sided failure as well; 68 had electrocardiographic features of severe left ventricular strain.

The clinical result in the 64 survivors in this series of 78 can be presented simply as follows:

Died since	..	..	..	..	..	9
Still alive	..	..	..	..	..	55
Excellent result	..	..	..	..	12	42
Good result	..	..	..	..	30	
Fair result	..	..	..	..	13	

The nine patients who have died since require more detailed analysis. In these the result had been classed as

Excellent	1	(died 13 months later of lung cancer)
Good	1	(died 6 months)
Fair	4	(died 2 years, 20 months, 15 months, 3 months)
Poor	3	(died 1 year, 9 months, 4 months)

Post-operative Aortic Regurgitation

A criticism of blind aortic valve dilatation has been that it is followed by a high incidence of severe regurgitation. In this series some degree of regurgitation was produced in 14 patients and was largely responsible for the death of four of these. In the others it varied from mild to moderate in degree, the result being classed as good in five and fair in five. To balance this, pre-operative regurgitation has been lessened or completely relieved in several patients. Regurgitation is a hazard, but only a small one, and certainly not large enough to weigh against operation.

Transventricular or Transaortic Approach?

The transaortic route for valvotomy is the one now most generally advocated, chiefly as a result of the strong recommendation of American surgeons. Unquestionably this must be the correct route for open aortic valvotomy, but we are concerned now with the "blind" procedure. For this I have been unable to accept that the transventricular route is inferior. These claims must now be examined.

As mentioned earlier, I first used a supravalar approach nearly 10 years ago; in two later cases the aorta was exposed by splitting the upper part of the sternum and instruments were inserted through the innominate artery. The results were so poor that this route was abandoned for the transventricular; this has since been used exclusively without reverting to the transaortic approach (except for open surgery).

The unfavourable features claimed for the transventricular route have not been manifest. These have been stated to be: undesirable interference with the left ventricle, liability to ventricular fibrillation, excessive or uncontrollable haemorrhage, inability to suture the ventricle, inability to do a satisfactory valvotomy, and higher mortality.

No one will question that it is better to avoid direct interference with the left ventricle if this can be avoided. However, one of the chief reasons why I abandoned the supravalar approach was that it did not seem to protect the ventricle, seeing that ventricular fibrillation occurred in two cases, proving immediately fatal in one; the second patient died a few hours later. It is true that these were bad risks and just the type in which incision in the left ventricle would have been badly tolerated; the point is that collapse was not avoided by sparing the ventricle. From reports and records this is also the experience of others. Among the 109 cases in which the ventricle has been transversed (75 cases of pure aortic stenosis; 34 cases with combined mitral stenosis) ventricular fibrillation due to this occurred in nine. Four of these patients died at operation or soon afterwards; the remaining five were successfully converted to normal rhythm. Of the nine deaths apart from these, in none can the incision in the ventricle be directly blamed.

Ventricular fibrillation occurred in two out of three supravalar cases in this series and in 9 out of 109 transventricular cases. In four of these, ventricular fibrillation began before the ventricle was incised, and was, in fact, a token of the serious heart condition. One great advantage of the transventricular route then becomes apparent in that the heart can be quickly massaged, immediate valvotomy can be done, and electric defibrillation achieved without delay. The transaortic operation can be a long and much more complicated procedure, a fact against using it in a very poor risk case in which a rapid, effective valvotomy is needed. There is no evidence that ventricular fibrillation is a more serious menace in the transventricular operation. Whether ventricular fibrillation occurs or not can be determined by the way the ventricle is handled: the utmost gentleness must be used; the slightest extra stimulation may precipitate distress or disaster. In addition to the surgeon, the assistants also carry a great responsibility, especially in regard to care in use of a sucker within the pericardium. This can easily cause ventricular tachycardia and fibrillation.

Although haemorrhage is claimed to be a danger in the transventricular procedure it would appear unlikely that the transaortic approach is itself free from the dangers of uncontrolled or severe bleeding, and, indeed, this is borne out from reports. Inability to control haemorrhage from the left ventricle has never occurred in this series. In a few cases with a huge left ventricle haemorrhage has been excessive, but no more. Perhaps this difference in experience lies in the use of a smaller, kinder instrument which inflicts little or no damage on the muscle; a large instrument can be very traumatic. In this also may lie the cause of the greater incidence of ventricular fibrillation complained of, and perhaps also the other objection of inability to close the wound.

Inability to suture safely has not been met with in any of our cases. When the disease is not grossly advanced there is no difficulty at all in muscle suture. When the ventricle is big and unhealthy the muscle may hold stitches badly and great care must be taken in tying sutures.

Deaths have certainly been reported from trouble with closure of the aortic incision in the supravalar approach; these include delayed rupture and haemorrhage and also aneurysm formation. On balance there seems little to favour the aorta over the ventricle as safer tissue for suture.

It is maintained that operation from above allows better relief of the stenosis from ability to use the finger as well as instruments. Blind transventricular dilatation is a rather crude and surgically unsatisfactory technique, but I am unconvinced that any better result can be achieved with the finger from above. Certainly the finger can feel the lesion, but the severe and vicarious calcification of the valve tissue prevents effective digital splitting; the pathological anatomy is in no way comparable to that of mitral stenosis, in which the finger can be so effective. It may well be that in occasional cases rather more can be done than from below, but

too rarely to form a significant argument in favour of a blind approach from above. A severely calcified valve is hopelessly unfavourable by any method.

The proponents of the supravalar approach state that the mortality is lower in their cases.

Thus Likoff *et al.* (1955) mention a mortality of 28% in 79 patients with the transventricular route and, following this, a mortality of 10% in 50 cases of the transaortic operation.

Bailey *et al.* (1956) state that since March, 1950, they have operated on 287 patients, and their mortality figures are: transventricular, 68 cases, 19 deaths (28%); combined mitral and aortic, 87 cases, 16 deaths (18.4%); transaortic, 47 cases, 7 deaths (14.7%). In my own small series the comparable figures are: transventricular, 76 cases, 12 deaths (16%); combined mitral and aortic, 34 cases, 3 deaths (9%); Transaortic, 3 cases, 2 deaths (66%).

It should, however, be noted that the cases in the three groups of Bailey *et al.* total 202, leaving 85 cases unaccounted for in their total series. It is difficult from their report to know which cases have been excluded, although by inference it is a convenient number of the earlier ones who were operated on in an earlier technical phase. If this is so it is difficult to know how exactly to appraise the results. In my own series, if the first seven cases in which technique and selection of cases was less mature are omitted the results are: transventricular 69 cases, 9 deaths (13%).

Direct comparison of mortality figures between different and relatively small series of cases is patently weak and unsatisfactory. The above comparison does, however, show that the mortality of the transventricular operation is not essentially greater than that of the transaortic.

My experience and practice is not presented as a plea for the transventricular operation; it is merely intended to show that there are no overwhelming advantages in favour of the transaortic approach such as have been claimed.

In actual fact neither blind method can carry any strong claim, because the basic morbid anatomical changes in the valve favour neither.

The answer to obtaining better technical results in aortic valvotomy must lie in the development of open direct-vision surgery. This has already been begun, and it will soon be possible to report on a large enough number of cases to enable a fair assessment of its value to be made. At present this must be awaited, and many surgeons may still prefer to continue to use the palliative procedure of transventricular dilatation of calcified aortic stenosis rather than to submit such patients routinely to the unassessed hazards of open valvotomy under hypothermia or with total heart-lung by-pass.

Summary

The historical development of the surgery of aortic stenosis is presented and also the principles governing the need for operation. It is pointed out that aortic stenosis is fundamentally a state of obstruction of the left ventricle and the same principles should be followed in its management as are already well established in obstruction of other hollow muscular viscera, such as the colon, stomach, or bladder.

Surgery can now offer sufficient relief with a relatively low mortality (10-15%) to make it thoroughly justifiable to refer patients for operation.

The importance of critical clinical assessment is emphasized, aided by the more objective methods of right and left heart catheterization. Percutaneous puncture of the left ventricle is a simple, safe, and quick way of determining the pressure gradient across the valve.

The various operative approaches are discussed. For calcified aortic stenosis the transventricular route is preferred. For non-calcified cases, open aortic valvotomy under direct vision and with hypothermia is used.

Operation was done in 130 cases, 34 being examples of combined mitral and aortic stenosis.

The mortality of operation need be no more than 10-15%. A good result was obtained in about 70% of survivors. The mortality will always be high if operation is deferred until features of heart failure have appeared.

The patients included in this study were almost all operated on in collaboration with Drs. Maurice Campbell, Paul Wood, Charles Baker, and Ronald Gibson; I am indebted to them all. I am also grateful for the invaluable help of various colleagues in the investigations before, during, and after operation. Fig. 8 is from records made by Dr. P. Fleming, and Figs. 1, 2, 3, 4, 6, and 9 are from records made by Dr. R. Gibson. I am grateful to Dr. Lawson McDonald for the arterial pulse tracing in Fig. 7.

REFERENCES

- Bailey, C. P., Bolton, H. E., Jamison, W. L., and Nichols, H. T. (1954). *Circulation*, 9, 22.
 — Nichols, H. T., Jamison, W. L., and Litwak, R. C. (1956). *J. thorac. Surg.*, 31, 375.
 — Ramirez, H. P. R., and Larzelere, H. B. (1952). *J. Amer. med. Ass.*, 150, 1647.
 Baker, C. G., and Campbell, M. (1956). *Lancet*, 1, 171.
 Björk, V. O., Malmström, G., and Uggla, L. G. (1953). *Ann. Surg.*, 138, 718.
 Brock, R. C. (1950). *Guy's Hosp. Rep.*, 99, 236.
 — (1956). *Proc. roy. Soc. Med.*, 49, 347.
 — and Campbell, M. (1950). *Brit. Heart J.*, 12, 377.
 — and Fleming, P. R. (1956). *Guy's Hosp. Rep.*, 105, 391.
 — Milstein, B. B., and Ross, D. N. (1956). *Thorax*, 11, 163.
 — and Ross, D. N. (1955). *Guy's Hosp. Rep.*, 104, 99.
 Fell, E. H. (1955). In *International Symposium on Cardiovascular Surgery*, Detroit, p. 318. Philadelphia.
 Fleming, P. R., and Gibson, R. V. (1957). *Thorax*, 12, 37.
 Harken, D. E. (1955). In *International Symposium on Cardiovascular Surgery*, Detroit, p. 315. Philadelphia.
 Lewis, F. J., Shumway, N. E., Niaz, S. A., and Benjamin, R. B. (1956). *J. thorac. Surg.*, 32, 481.
 Lewis, T. (1933). *Diseases of the Heart*. London.
 Likoff, W., Berkowitz, D., Denton, C., Goldberg, H., and Reale, A. (1955). *J. Amer. med. Ass.*, 157, 1367.
 Lillehei, C. W., DeWall, R. A., Gott, V. L., and Varco, R. L. (1956). *Dis. Chest*, 30, 123.
 Logan, A., and Turner, R. (1954). *Lancet*, 1, 1091.
 Marquis, R. M., and Logan, A. (1955). *Brit. Heart J.*, 17, 373.
 Matthews, M. B., Medd, W. E., and Gorling, R. (1955). *British Medical Journal*, 2, 759.
 Milstein, B. B., and Brock, R. C. (1954). *Guy's Hosp. Rep.*, 103, 213.
 Nadas, A., and Ongley, D. A. (1956). Second European Cardiology Congress, Stockholm.
 Smithy, H. G., and Parker, E. F. (1947). *Surg. Gynec. Obstet.*, 84, 625.
 Souttar, H. S. (1925). *British Medical Journal*, 2, 603.
 Tuffier, T. (1913). *Trans. Int. Congr. Med.* (London, 1914), sect. vii, surgery, pt. 2, p. 249.
 Uricchio, J. F., Litwak, R., and Bailey, C. P. (1955). *Circulation*, 12, 785.

MENTAL PERFORMANCE IN CHRONIC ANOXIA*

BY

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No one has ever had the opportunity to observe the unalloyed effects of prolonged severe oxygen deficiency in man. In physical illness there are always impurities present: in anaemia, the cause of the anaemia; in pulmonary disease, the toxic effects of the causative organism or of the secondary invaders; even in cardiac disease, such confusing factors as the presence of cerebral arteriosclerosis. At great altitudes the complicating factors are numerous. The most important is probably the psychological make-up of the climber. A full discussion of the problem would lead the inquirer into such private fields as his subject's reason for going to the mountains at all. The Walter Mitty complex, so well described by that excellent psychologist James Thurber, is probably the common thread which runs through all our tangled motives for being mountaineers, but in many of us some of the motives are less worthy of

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respect, and in consequence psychological breakdowns may occur and may have effects upon the other members of a party which may wrongly be ascribed to what on Everest in 1933 was vulgarly described as "alt."

Such considerations urge caution in attacking the question of the mental effects of chronic anoxia along the usual anecdotal lines. A description of the manic behaviour of A on Everest or the depressive interlude experienced by B on Kangchenjunga must be sceptically examined for possible psychological, as opposed to physiological, causes. Unfortunately the very proper loyalty which censors the reports of every returning mountaineer makes it impossible to obtain a sufficiently detailed description of the mental atmosphere of the party as a whole or the pattern of behaviour of individual members.

Confused though the problem is by psychological considerations and by such additional complications as wind and weather, nutrition, and technical mountaineering difficulties, we are not entirely without guidance in our search for essentials. We can look for the common factors in the conditions of chronic anoxia due to physical disease and chronic anoxia due to altitude. Bearing in mind that the clinical picture is modified by different impurities, we may justifiably assume as a working hypothesis that common factors are the result of chronic anoxia pure and simple. We can administer a further test by studying acute anoxia, whether it be anoxic, anaemic, stagnant, or histotoxic. Broadly speaking, a chronic condition produces signs and symptoms similar to those of an acute condition, modified by their being milder, more prolonged, and in consequence admixed with the syndrome produced by the adaptive reactions of the body, which, in the acute condition, have not had the necessary time to develop.

Chronic Anoxia

It is convenient first briefly to consider the effects upon the mind of chronic anoxia studied at moderate altitudes in health and at sea-level in other forms of anoxic anoxia (as in pulmonary disease); in anaemic anoxia (as in pernicious or Addisonian anaemia); and in stagnant anoxia (as in cardiac failure).

Perhaps the most reliable information bearing on our present purpose is that which has been obtained by the observation of man during prolonged residence at moderate altitudes. When I was in Darjeeling, which lies at about 7,000 feet (2,130 metres), I found a fairly general impression that those who stayed there for a year or more without a break at lower levels, often became somewhat irritable, and I have heard the same story from doctors practising in Johannesburg, which lies at a similar level. If we go twice as high, to 14,000 feet (4,270 metres), we have the observations of Barcroft (1925) at Cerro de Pasco. Mental tests disclosed nothing; and Barcroft wrote:

"Yet I am not prepared to admit that our mental capacity was the same at Cerro as it is here. All the party will agree, I believe, that the reason why the mental tests failed to reveal the difference was because our mental disability was of too subtle a character to be revealed by somewhat simple tests than because the fitness of our minds was unimpaired. It is possible to force oneself to do good work even though the test measures the quality of work done; but were it ideal it would also measure the degree of concentration brought to bear upon the task." [One is reminded of the interesting experiment conducted many years ago by some young gentlemen of a famous medical school, who by constant practice trained themselves to perform perfectly, even in a state of severe alcoholic intoxication, all the tests employed by the police for drunkenness.] "Apart from the actual processes of addition, subtraction, etc., there seemed to be an unwonted difficulty in stating a sum at Cerro if it were not of a quite simple character. The Van Slyke method of gas analysis

demands the application of some rather complicated tables of correction to the gas volumes as actually measured. These corrections loomed large at Cerro altogether out of proportion to their real difficulty. . . ."

Barcroft's observations on the inability of mental tests to show mental deterioration at 14,000 feet (4,270 metres) were confirmed by Hingston (1924) at 21,000 feet (6,400 metres). No deterioration in actual performance was demonstrable. Yet such a deterioration exists. I well remember the difference in effort needed to take samples of alveolar air at Base Camp on Everest (17,000 feet—5,180 metres) and at Camp V (25,600 feet—7,800 metres). At Base Camp it was an almost automatic process performed in a few seconds. At Camp V it needed a conscious effort of concentration.

Turning to other causes of chronic anoxic anoxia, one finds a dearth of recorded observations and there is equal silence on the subject of mental performance in chronic anaemic anoxia, though Thomas Addison himself noted personality changes in some of his patients.

In stagnant anoxia, such as that due to chronic congestive cardiac failure, observations on the mental processes have been numerous and have been correlated with the arterio-venous oxygen difference. The subject has been reviewed by Himwich (1951). Neuroses are common in cardiac failure, especially confusion, delusions of persecution, and exacerbation of previous anxiety states. It is difficult for the hospital doctor (by whom the majority of such observations are recorded) to assess such changes. He cannot compare the present mental state of his patient with the past. In general practice such observations are easy but have never been recorded. My own impression is that in the chronic anoxia of cardiac failure and advanced pulmonary disease one sees an accentuation of a previous mental abnormality rather than the creation of a new one. The man one has known for years as a well-balanced, placid, good-tempered, co-operative patient retains these characteristics in a state of chronic anoxia due to illness. One feels that one of the effects of the illness is to strip the veneer off a man and expose the quality of his mind naked to the world. I think that the same thing happens in alcoholic intoxication and in the chronic anoxia of great altitudes. The effects on the mind of a decrease in the A-V oxygen ratio are superimposed on individual characteristic patterns of behaviour.

Acute Anoxia

In acute anoxia we can study a relatively pure process, unaffected by the protective reactions of the body. This may be done at great altitudes in balloon ascents or in low-pressure chambers, and during carbon monoxide poisoning. Moreover, as there is good reason to believe that what we observe in acute anoxia is in fact the result of diminished cerebral metabolism, we may study its effects by analogy and in good experimental conditions, during myxoedema or hypoglycaemia, whether spontaneous, accidental (as in diabetics after an overdose of insulin), or purposeful (during the treatment by means of insulin of various mental abnormalities).

Haldane's description of acute anoxic anoxia is well known (Haldane and Priestley, 1935). It is worthy of fuller quotation than space will allow. He draws attention to several effects which are observable during chronic anoxia—the dulling of the senses and intellect, the loss of memory and of sane judgment, and the tendency to uncontrolled emotional outbursts. He comments on the likeness which exists between the effects of anoxaemia and of alcohol, a similarity stressed also by Barcroft and by Hingston. Yet these effects are demonstrated very unevenly. An extreme example of mental and physical control was that of Coxwell, who with Glaisher ascended in 1862 in a balloon to 29,000 feet (8,840 metres). Glaisher was by this time unconscious, but Coxwell was still able to clamber into the rigging to free a tangled rope and thus to save his own and Glaisher's life—an interesting fact in view of recent arguments about the necessity of oxygen apparatus on Everest.

More recently McFarland (1938) has described the results of acute exposure of human beings to low oxygen pressures. No change is observed below about 12,000 feet (3,660 metres), when the memory for recent events becomes slightly impaired. At about 14,000 feet (4,270 metres) changes in mood may be observed, differing from one individual to another, and there may be lassitude or euphoria. At 18,000 feet (5,490 metres) sensory perception is decreased, the field of attention is narrowed, irrational behaviour may be manifest, and judgment is impaired. Above 20,000 feet (6,100 metres) reaction times are slowed, awareness of the passage of time becomes inaccurate, and explosive emotional outbursts may occur.

The study of carbon monoxide poisoning and, more especially, of hypoglycaemia has given us much information about the processes involved. As the schizophrenic patient sinks into coma under the influence of insulin, his physical signs denote a steady deterioration of cerebral control from the cortex downwards and it is possible to watch the patient's bodily control dropping in phylogenetic stages from the cortex, via the diencephalon and the upper medulla to the lower medullary region. During recovery the development of the brain is recapitulated. Each area of the brain during the process called by Hughlings Jackson "dissolution" uses, as hypoglycaemia advances, a steadily decreasing amount of oxygen, and when the oxygen needs of each part of the brain are separately examined it is found that the higher the part of the brain examined the higher are its demands. It follows that the more voracious parts are the first to succumb. A relatively mild deficiency affects only the newer parts of the brain, and at the other end of the scale a very severe deficiency is needed to bring to a final end the function of the medulla.

In mild acute anoxia and the chronic anoxia of great altitudes this process stops at the first stage, the abolition in part of cortical control. Rarely indeed does the mountaineer evince the sham rage of the decorticated cat, but he may often come very near to doing so. There is reason to believe that the stratifications of the brain as a whole are reflected in the laminations of the highest centres. An analogy with the effects of alcohol in excess is not strictly sound, because although alcohol reduces brain metabolism very much as do anoxia and hypoglycaemia, it has probably another and separate activity. Nevertheless Barcroft's evidence, which I can support from my personal observations, strongly suggests that the analogy is a useful one. Within the cortex, it is the higher control which is first lost, the inhibitions imposed by recent training preceding in their exit those more deeply embedded in childhood. A similar though cruder sequence is seen during the slow induction of anaesthesia by barbituric acid derivatives. One sees first euphoria, then loss of inhibitions, ineptitude in obeying commands, loss of mental concentration, and finally loss of consciousness.

Great Altitudes

We must now turn to a consideration of the more complex phenomena of mental processes in man in the special circumstances of high mountains, and attempt to recognize changes in performance which reflect the changes of acute anoxia and of the milder and less complicated circumstances of chronic anoxia in human illness. The common factors may, *ex hypothesi*, be accepted as due to severe chronic anoxia and not to meteorological or strictly psychological causes. The earliest observations are those of Hingston (1924).

"High altitudes affect the operations of the mind. One member was confident of a dulling of the will power, a diminution in the strength of purpose, with less and less desire to reach the summit the farther he made the ascent. Somervell describes a lack of observance at and above 25,000 ft. (7,620 metres). Bruce records an enfeeblement of memory. He found an effort in recalling previous events. Above 23,000 ft. (7,010 metres) his ideas became increasingly inaccurate. It was necessary for him to record them immediately, as otherwise they would become forgotten or distorted. I think everyone experienced some mental

lassitude. Though the mind was clear, yet there was a disinclination for effort. It was far more pleasant to sit about than to do a job of work that required thought. . . . Though mental work is a burden at high altitudes, yet with an effort it can be done. One physiologist has said that sustained mental work is out of the question at anything over 10,000 ft. (3,050 metres). We certainly could not agree with this. Those who have read Norton's despatches to *The Times*, especially one dictated at Camp III, when he was burdened with anxiety and partially blind, will admit that this effort from 21,000 ft. (6,400 metres) was not a bad intellectual performance. The main effect of altitude is a mental laziness which determination can overcome."

Personal Observations

May I turn now to a few sketchy observations of my own? It is well that I recorded them at the time. It may in itself be significant that when I read my diary again after an interval of 20 years I found that I had completely forgotten a lot of what had happened under my eyes on the upper part of Everest, though the incidents below about 20,000 feet (6,100 metres) still seemed fresh in my mind.

Only one member of the expedition was seriously affected at Base Camp (17,000 feet—5,180 metres). Mental lassitude assailed him so severely that he gradually withdrew himself from the day-to-day work of the camp. He ceased to take any interest in the job which had been assigned to him, and his work was gradually taken over by other people without any protest or resistance. He ultimately improved and succeeded in reaching the North Col, but he never pulled his weight in the Expedition again. No one else showed any change in mental performance below the North Col (23,000 feet—7,010 metres), when several people began to complain of nightmares. Two members became argumentative, over-critical, and, if opposed, surly. One of these made a gradual recovery, but the other, after an ascent to 25,000 feet (7,620 metres), became extremely ill-tempered and suffered from the delusion that he was severely frost-bitten. In fact, he was not frost-bitten at all, but he spent several days at Base Camp refusing to leave his tent.

A curious case which I am inclined to ascribe to other causes than pure chronic anoxia was that of a member who acquitted himself well up to the North Col, the highest point planned for him. On his return to lower levels he developed a severe paranoid psychosis from which he did not recover until a few days before his return to Darjeeling. I think that here anoxia was only a contributory factor. He was a man whose physical and mental fitness were below the level demanded but who from a sense of duty had driven himself to breaking-point.

Apart from these examples, no mental changes were observed except in those who climbed above 27,000 feet (8,230 metres). All of these had "waking dreams" which took the form of terrifying nightmares except in the case of Frank Smythe, who recorded his impressions in his book *Camp 6*. He was convinced, when climbing alone, and of course without oxygen equipment, at about 28,000 feet (8,530 metres), that he had with him a friendly companion, to whom at one point he offered a sandwich. He also had visual hallucinations, seeing above the ridge of the mountains some curious dark bodies which came to be known as "Frank's pulsating teapots." Yet his judgment otherwise was quite unimpaired. At 28,100 feet (8,565 metres), with the summit less than 1,000 feet (305 metres) above him, he was able soberly to consider the pros and cons of continuing, weighing his feeling of physical fitness and the early hour against the bad condition of the snow, and coming to the unwelcome conclusion that he must return. Smythe never suffered from the irritability which occasionally appeared in all the rest of us who went high. It seemed that chronic anoxia increased his placidity. At low altitudes a little inclined to take offence, at great ones he emanated serenity and an infectious happiness.

Indeed, those who reached the highest points were, it seemed, less affected by ill-temper, perhaps because even ill-temper requires a certain level of oxygen tension to develop. They may by this time have reached a condition

of fatuous good-temper. This was certainly true of one of us, who after his return from the higher reaches was confused, somewhat aphasic, and disinclined to talk, preferring to sit in silence, benignly contemplating his surroundings. The failure of memory which has so often been described affected us very unequally. One man was very conscious of this at the time. He said his mental capacity was 25% of normal. He forgot that his job was the exploration of the Second Step, though this had been his much-discussed assignment for weeks. Happily his companion remembered.

Another effect of high altitudes which can be recognized as an effect of oxygen deficiency rather than of psychological and mental stress is a dulling of the special senses, for this occurs very noticeably in acute oxygen deficiency. This was first observed by Paul Bert (1943) and confirmed by Haldane and others (1919). The dulling is not as a rule observed: it is the return of brightness to light and colour, and of loudness to sound, which strikes one when the oxygen supply is increased. I wrote of this when returning from the summit of Kamet (25,447 feet—7,756 metres), in 1931 (Greene, 1932).

"In the neighbourhood of our old Camp One the snow began to fall less thickly, and far ahead we could see the end of the East Kamet Valley, and the dark and snow-streaked rock peaks lying above Base Camp. It was at this point—at about, I suppose, 16,500 feet (5,030 metres)—that a change came over my feelings. Haldane has written how, in his experiments on the effects of low air-pressure, he sat in his steel chamber with the pressure gradually rising towards the normal: and how, at a certain level, the electric light glowed suddenly more brightly. At first he thought that the current had been increased, but later he came to realize that the change was in himself and not in the current. For me, shut in no steel chamber, but walking slowly down the East Kamet Glacier, depressed by wind and weather and painful feet, the whole aspect of life as suddenly changed. I began once more to appreciate the pleasures of the senses. The snow was whiter and more scintillating. When, little by little, patches of sky began to show between the banks of cloud, they seemed a brighter blue than the skies of Kamet. One began to hear and to smell more acutely. It is clear that not only are one's senses dulled by lack of oxygen, so that the light in the steel chamber becomes dull and the Himalayan sky less blue, but that all one's mental processes suffer a like fate. Especially, at great heights one does not gloat over one's pleasures. One loses, as Goethe has put it, 'the capacity to submit to impressions; to be delighted, touched, and exalted.' But now this capacity was suddenly restored."

Conclusions

It is now possible to sift the observations of Everest doctors on the mental performances of their parties and to trace their similarity with those observed during anoxia in other circumstances. The following facts emerge.

1. Chronic anoxia affects different people very differently, both quantitatively and qualitatively. Some men are remarkably resistant, showing within the limits of the "experiment" little change at all. Those who show definite changes are affected very much as they are by alcoholic intoxication, the protective skins of their essential mental make-up being stripped off onion-fashion, the more recently acquired inhibitions being the first to go.

2. Memory is seriously affected, though to different degrees in different individuals.

3. The capacity accurately to perform mental tasks is affected. Tests hitherto performed have been too simple to show this, but more concentration has been needed in their performance at great altitudes, and harder tests might be employed in future.

4. Emotional instability may be severe. This usually takes the form of irritability. The tearfulness described by Barcroft does not occur in other descriptions than his and is probably the result of mental fatigue rather than of anoxia. Conversely, many travellers' tales of strange behaviour at great altitudes should be discounted because of a lack of similarity to mental changes occurring in acute anoxia and in chronic anoxia due to other causes.

May I end by quoting with sympathy the words of Mosso (1898)? "It is my wish to find some man with a hole in

his skull who would have been willing to come with me on the Monte Rosa Expedition, but I was not successful in my search. Some other physiologist will, I hope, be luckier."

REFERENCES

- Barcroft, J. (1925). *The Respiratory Function of the Blood*, Part I. Cambridge.
Bert, P. (1943). *Barometric Pressure*. Columbus, Ohio.
Greene, R. (1932). In *Smythe's Kamet Conquered*. London.
Haldane, J. S., Kellas, A. M., and Kennaway, E. L. (1919). *J. Physiol. (Lond.)*, 53, 183.
— and Priestley, J. G. (1935). *Respiration*, p. 200. Oxford.
Himwich, H. E. (1951). *Brain Metabolism and Cerebral Disorders*. Baltimore.
Hingston, R. W. G. (1924). *Geogr. J.*, 65, 4.
McFarland, R. A. (1938). Dept. of Comm., Bureau of Air Comm., Report No. 13.
Mosso, A. (1898). *Life of Man in the High Alps*. Translated from second Italian edition. London.

PRODUCTION OF FIBRILLATION IN ISOLATED ATRIA OF RABBIT HEART

BY

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The atria of the hearts of small animals can be dissected from other tissue and suspended in a bath containing some modification of Ringer's solution, and in this bath they maintain their rhythmic contractions. A few observations have been made of the production of arrhythmias in such preparations. Dawes and Vane (1951) studied the guinea-pig atria at 37° C., stimulating them electrically at a rate slightly greater than the spontaneous rate. They observed that if a test-pulse was thrown in just outside the absolute refractory period, the atria often responded by repetitive discharges at a frequency much greater than the normal rate of beat. These discharges continued for periods up to one hour. DiPalma and Masciatello (1951) made similar observations in cat atria at 29° C., though the repetitive discharge was of shorter duration. West, Turner, and Loomis (1954), in the course of studies on excitability and conduction time, noted the occurrence of arrhythmias when the interval between two stimuli was near the absolute refractory period; these lasted from a few seconds to several minutes, and they said that the arrhythmias occurred regularly in the presence of acetylcholine.

Burn, Vaughan Williams, and Walker (1955) observed that during the infusion of acetylcholine into the heart-lung preparation of the dog stimulation of the right atrium resulted in fibrillation, which persisted when stimulation ceased. The fibrillation continued so long as acetylcholine was infused, and could be terminated at will by stopping the infusion or by injecting atropine. In a later paper

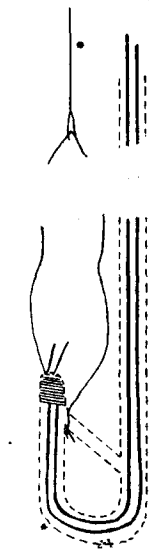


FIG. 1.—Broken lines show a glass tube, through which a pair of shielded and insulated wires run, terminating in platinum electrodes. The two limbs of the U are joined by a solid piece of glass, sloping as shown, to which the lower ends of the atria are attached. The electrodes pierce the atria.

Burn, Gunning, and Walker (1956) showed that the fibrillation was also stopped by a slow infusion of KCl.

We now describe the production of fibrillation in the isolated atria of the rabbit by stimulation in the presence of acetylcholine.

Method

Rabbits weighing 2–3 kg. were used. They were stunned by a blow on the head, and the hearts were removed and placed in Ringer's solution of the following composition: NaCl, 9 g.; KCl, 0.4 g.; CaCl₂, 0.24 g.; NaHCO₃, 0.5 g.; dextrose, 2 g.; distilled water, 1 litre. The atria were dissected free from fat and other tissue, attached to an electrode (see Fig. 1) designed by Mr. O. B. Saxby, of this department, and suspended in a bath of the solution described which was aerated with oxygen and maintained at 30–31° C. A mechanical record was taken on a kymograph. The atria were stimulated by square wave pulses of 0.75 msec. duration and of 6–10 volts strength. Surface electrograms were recorded from the stimulating electrodes on a Cossor machine (model 1314).

Production of Arrhythmia

In the initial experiments, atria, suspended in the bath, were stimulated at frequencies varying from 200 to 1,200 a minute for different periods. In all preparations the normal rhythm returned immediately on cessation of stimulation. Low concentrations of acetylcholine had very little effect on the sequence of events. With concentrations greater than 3×10^{-4} g. per ml. repetitive charges of brief duration, from 2 to 5 seconds, were occasionally observed after stopping the stimulation, but persistent arrhythmia was not seen.

In further experiments the concentration of KCl in the solution was reduced to one-quarter (100 mg. per litre). Stimulation still failed to produce arrhythmia in the presence of low concentrations of acetylcholine, but, when the concentration was greater than 3×10^{-4} g. per ml. and the frequency of stimulation was greater than 600 a minute, arrhythmia then persisted, as demonstrated in Fig. 2, which shows the electrogram record.

The electrogram in $\frac{1}{4}$ K solution is shown after stimulation in (c) and on addition of acetylcholine in (d). Stimulation in the presence of acetylcholine then caused fibrillation as in (e), continuing six minutes later as in (f). When the acetylcholine was removed by changing the bath fluid a normal rhythm returned as in (g).

Once the procedure which has been described was followed, flutter or

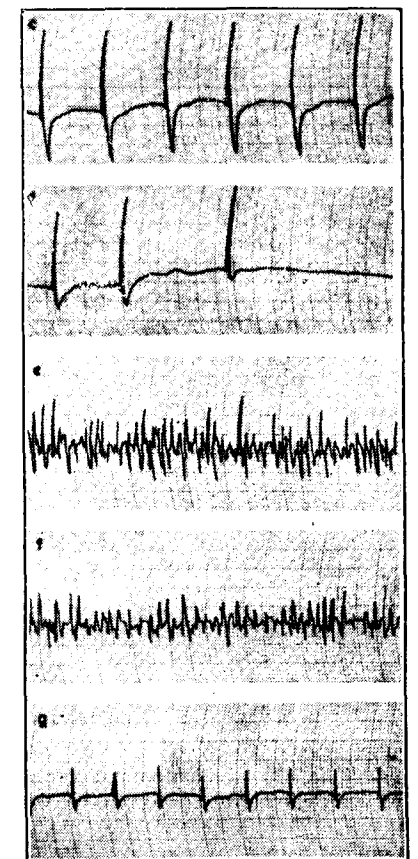


FIG. 2.—(c) E.C.G. in $\frac{1}{4}$ K solution after stimulation; (d) beats arrested by addition of acetylcholine; (e) fibrillation one minute after stimulation in presence of acetylcholine; (f) six minutes later; (g) after washing out acetylcholine.

fibrillation was observed in all atria tested. Flutter was observed in 43%, fibrillation in 40%, and a mixture of flutter and fibrillation in the rest. In one preparation fibrillation was observed for 45 minutes and was then terminated by removing the acetylcholine from the bath (see Fig. 3). Flutter or fibrillation was produced with regularity in either the right or the left atrium.

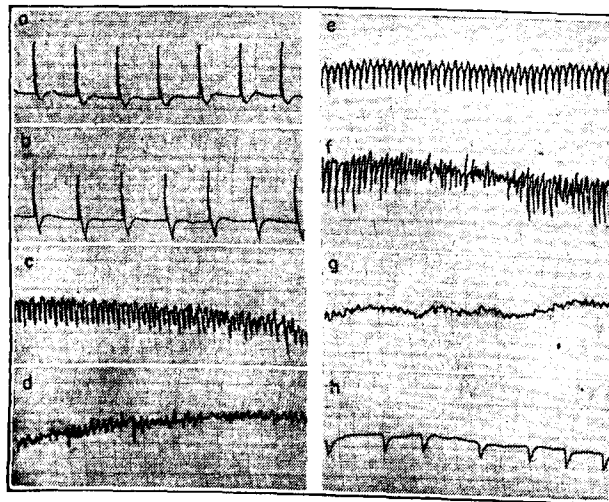


FIG. 3.—(a) E.C.G. in normal solution; (b) after changing to $\frac{1}{2}$ K solution; (c) one minute after stimulating in presence of acetylcholine 6×10^{-4} g. per ml.; (d) four minutes later; (e) 20 minutes later; (f) 35 minutes later; (g) 45 minutes later; (h) after removing acetylcholine.

Stimulus Frequency

The effect of stimulus frequency on the initiation of atrial fibrillation was carefully examined. The results are summarized in Fig. 4. Acetylcholine was added in a concentration of 3×10^{-4} g. per ml. in all trials, and atria were counted as fibrillating when the fibrillation persisted for three minutes after stimulation stopped. A low frequency was used first, and at the end of one minute's stimulation the stimulus was turned off for 10 seconds to see if an arrhythmia was persisting; if not, the frequency was increased and the stimulation continued. Fig. 4 shows that the commonest threshold frequency was between 500 and 600 a minute.

FIG. 4.—Effect of stimulus frequency on the initiation of fibrillation in isolated atria. Solution containing $\frac{1}{2}$ K, acetylcholine 3×10^{-4} g. per ml. On the abscissa is shown the rate of stimulation per minute. On the ordinate is the percentage of preparations in which fibrillation was produced. From 10 to 45 atria were used for each point.

Action of Atropine and Quinidine

Observations were made to test the effect of atropine and quinidine. By stimulation at 1,200 a minute in the presence of acetylcholine (3×10^{-4} g. per ml.) fibrillation was produced, and was observed for five minutes. It was then terminated by washing out the acetylcholine. Fifteen minutes later the fibrillation was induced again, and one minute after stimulation ceased atropine or quinidine was added to the bath. When atropine was added, fibrillation stopped within 30 seconds (see Fig. 5). When quinidine was added, fibrillation stopped after one to two minutes.

Discussion

The production of fibrillation in the isolated atria of the rabbit depends on three factors: the presence of a low concentration of potassium in the bath fluid, the presence of a high concentration of acetylcholine, and electrical stimulation at a high rate for a short period.

When the atria contract sodium enters the cells, and then, in order that they may become excitable once more, potassium leaves the cells. This potassium must then be replaced within the atrial cells by metabolic processes which occur in the pores of the cell membrane. If the external concentration of potassium is low the replacement of potassium within the cells becomes very difficult, and it is probably for this reason that the low potassium concentration favours fibrillation.

The presence of a high concentration of acetylcholine makes the cell membrane much more permeable to potassium (Harris and Hutter, 1956) and it greatly shortens the refractory period. Under normal conditions, when a contraction occurs there is a long interval (0.15 second) before excitability is restored and the fibres become re-excitable. In the presence of acetylcholine this interval is shortened, perhaps to 0.01 second (Hoffman and Suckling, 1953). If now stimulation is applied at a high rate (700 a minute) some of the fibres are probably unable to keep in phase, and some contract later than others. If these others have recovered their excitability very quickly (in the presence of acetylcholine) they may be stimulated by the ones contracting a little later. Thus fibrillation begins, and is perhaps a condition in which each fibre in contracting stimulates its neighbours. This process may go on indefinitely, until indeed the acetylcholine is removed and the time required for each fibre to recover excitability again becomes much longer.

The fibrillation process may, however, be related to a high net loss of potassium, for when the external potassium concentration is raised fibrillation is arrested (Burn, Gunning, and Walker, 1956).

Summary

Fibrillation can be produced in the isolated atria of the rabbit heart, using rabbits from 2–3 kg., by stimulation at frequencies from 500 to 800 a minute in the presence of acetylcholine (3 to 8×10^{-4} g. per ml.). The bath fluid should contain not more than 100 mg. of KCl per litre. The fibrillation continues after the

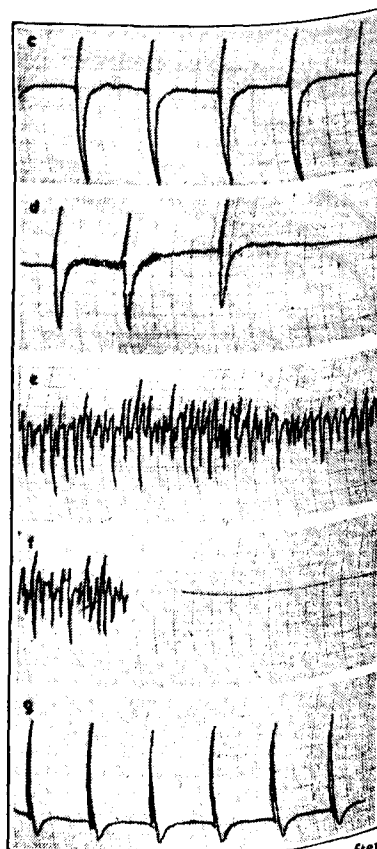


FIG. 5.—(c) E.C.G. in $\frac{1}{2}$ K solution after stimulation; (d) effect of adding acetylcholine 8×10^{-4} g. per ml.; (e) 30 seconds after stimulation stopped; (f) arrest of fibrillation by atropine (1×10^{-4} g. per ml.); (g) normal rhythm two minutes later.

stimulation stops. It can be arrested by removing acetylcholine from the bath or by adding atropine or quinidine.

REFERENCES

- Burn, J. H., Gunning, A. J., and Walker, J. M. (1956). *Circulat. Res.*, 4, 288.
—, Vaughan Williams, E. M., and Walker, J. M. (1955). *J. Physiol. (Lond.)*, 128, 277.
Dawes, G. S., and Vane, J. R. (1951). *Ibid.*, 112, 28P.
DiPalma, J. R., and Mascarello, A. V. (1951). *Amer. J. Physiol.*, 164, 589.
Harris, E. J., and Hutter, O. F. (1956). *J. Physiol. (Lond.)*, 133, 58P.
Hoffman, B. F., and Suckling, E. E. (1953). *Amer. J. Physiol.*, 173, 312.
West, T. C., Turner, L. D., and Loomis, T. A. (1954). *J. Pharmacol.*, 111, 475.

POLIOMYELITIS ANTIBODY STUDIES IN A GROUP OF LONDON CHILDREN

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In any virus disease in which subclinical infection takes place the distinction between those who have acquired natural immunity, and therefore have less pressing need for immunization, and those who are still susceptible is difficult. In this respect poliomyelitis stands in marked contrast to measles. It is known that recovery from paralytic poliomyelitis is followed by a prolonged state of immunity in that second attacks of paralysis are rarely encountered, but immunity also develops after non-paralytic and subclinical infection. It has now been clearly established that active immunity in all forms of poliomyelitis infection is closely associated with the presence of circulating antibody; moreover, the incidence of antibody in relation to different age groups has proved to be a reliable guide to the overall immune status of a population.

In the past, serological tests to determine this information were based almost exclusively on the incidence of type 2 antibody, as only one strain (Lansing, type 2 strain) could be handled with any convenience in the laboratory. Since the introduction of tissue-culture methods it is possible to examine sera for antibodies to all three types of poliomyelitis virus and thus gain an overall picture of the pattern of immunity, not only throughout the world but in different sections of a population. From the evidence so accumulated it is now apparent that the incidence of infection with each of the three types is much higher than would be assumed from the incidence of clinical disease, and varies greatly from one part of the world to another (Gear, 1955). For instance, 80% of children in Cairo have by the age of 3 years acquired antibodies to all three virus types. At the same time the evidence of clinical disease is low. In contrast, in an urban population in the United States the same figure of 80% is not reached until the 30–40 age group (Paul, 1955).

The present investigation was undertaken as a preliminary to the introduction of immunization with

poliomyelitis vaccine in the United Kingdom. The purpose of the study was first to determine the incidence of poliomyelitis antibodies (and therefore the inapparent infection rate amongst healthy children); and, secondly, to form some idea of the age at which natural infection begins to take place in such a group. A further purpose was to determine whether the complement-fixation test could be used as a screening test for evidence of past infection.

Materials and Methods

The Study Group.—Ninety children were included in the study during the period March–October, 1955. They were children who had been admitted to the Victoria Hospital for Children with minor medical or surgical complaints. There were approximately equal numbers in each yearly age group from 12 months to 10 years. In no case was there a history of contact with a known clinical case of poliomyelitis, nor of a febrile illness with signs of meningeal involvement. The majority of the children came from the Boroughs of Battersea, Chelsea, and Fulham and, except for three who had been abroad for a short time, had lived nowhere else. The socio-economic background of these children was assessed from the occupation of the father, the intelligence of the parents, and the care given to the child before admission, and was graded as poor, average, or good. The distribution of children from poor, average, and good homes was uniform throughout the age groups.

Sera.—A single specimen of blood was collected from each child. After separation from the clot, sera were divided into two parts; one part for neutralization tests was stored at -65° C., the other for complement-fixation tests at 4° C.

Virus Strains.—The following strains were used both for complement-fixation and for neutralization tests: Mahoney (type 1), MEF-1 (type 2), Saukett (type 3).

Complement-fixation Test.—In order to economize in material the "drop method" on "perspex" sheets was employed as described for use with poliomyelitis viruses by Svedmyr, Enders, and Holloway (1953) and by Le Bouvier (1953).

Antigens.—These were prepared from monkey-kidney tissue culture and HeLa-cell cultures inoculated with each virus type. The fluids were harvested when cellular degeneration was complete. In the early stages of this investigation complement-fixing antigens were heated to destroy infectivity, but when it became clear that heating resulted in a loss of specificity, subsequent tests were carried out with untreated antigens, special precautions being taken to avoid risk of infection to those carrying out the tests. After inactivation serial twofold dilutions of serum were made in Ca-Mg saline; 4 units of antigen and 2, $2\frac{1}{2}$, and 3 units of complement were used in each test. Fixation was allowed to proceed overnight in the refrigerator. The end-point was taken as the highest dilution of serum producing 50% fixation of antigen with $2\frac{1}{2}$ units of complement.

Neutralization Test.—Preliminary tests were made with the HeLa-cell tissue culture method described by Syverton, Scherer, and Elwood (1954), but, as the results in our hands were at times variable, it was decided to carry out all subsequent tests in monolayer cultures of monkey-kidney epithelium grown in synthetic medium 199 containing 2% horse serum (Youngner, 1954). Monkey-kidney culture tubes prepared seven to eight days previously were examined before use to ensure that sheets of monolayer cells were present. The growth medium was replaced by fresh synthetic medium 199 without horse serum.

Virus.—Types 1, 2, and 3 poliomyelitis viruses from monkey-kidney tissue cultures were diluted so as to contain 100 tissue-culture infective doses previously determined by titration.

Serum Dilutions.—After inactivation serial dilutions of serum were made in medium 199. Screening tests were carried out at $1/4$, $1/64$, and $1/256$; and final tests, if

permanent teeth; deciduous teeth do not present such a great difficulty, there being less trauma involved in the extractions. It is our belief that, unless there be special circumstances, deciduous teeth should be left to shed themselves in the normal manner.

Antibiotic Therapy.—As a result of the teeth being neglected, sepsis at the site of extraction was frequently present. To combat the additional risk of bleeding which might result from socket infection all the patients were given oral antibiotic therapy for five days, starting on the day of operation. Initially, parenteral penicillin was administered, but this resulted in troublesome haematoma at the site of intramuscular injection and was discontinued.

Anaesthesia.—In a small number of the earlier operations of the series anaesthesia was regional by inferior dental injections; the great majority of the operations were undertaken with local or infiltration anaesthesia, and this was eventually adopted as the method of choice. Regional anaesthesia by inferior dental injection carries the risk of haematoma in the neck and of permanent damage to the nerve by haemorrhage. Haemophiliacs not infrequently suffer peripheral nerve damage as a consequence of haemorrhage. Endotracheal intubation during general anaesthesia is potentially dangerous by virtue of the possible development of laryngeal haemorrhage or haematoma.

Acrylic Resin Protective Splint

For each patient a protective dental splint was prepared before the operation and inserted immediately after removal of the teeth. The splint was constructed in the following manner: an impression of the upper and lower teeth was taken with one of the alginate impression materials such as "zelex," and models from this were poured in stone-hard plaster. From the models the tooth or teeth to be extracted were removed and over this area a layer of dental wax was fitted. Another alginate impression was taken from the first model and a second model cast in stone. The models were then set up on an articulator with the aid of a wax bite. Upon the second model a layer of wax was placed, trimmed to the exact requirements of the splint, and then processed in clear acrylic resin.

The reason for the first layer of wax over the tooth socket was to allow sufficient space between the acrylic splint and the socket for insertion of black gutta-percha. From experience it was found that this gutta-percha was tolerated by the soft tissues in the region of the wound much better than the hard acrylic. At the same time there was a close seal. Fig. 1 illustrates a splint with the gutta-percha in position. When significant bleeding occurred there was no hesitation in removing the splint for reapplication of local haemostatic measures; the splint was then reinserted. Where insignificant bleeding occurred the splint was left in position for 10-14 days before removal; at the end of that time there was generally a healed socket when the splint was removed. In a few of the earlier operations, as indicated in Table I, no splint was used.

The purpose of the splint was to protect the soft friable clot in the socket from trauma by food or from disturbance

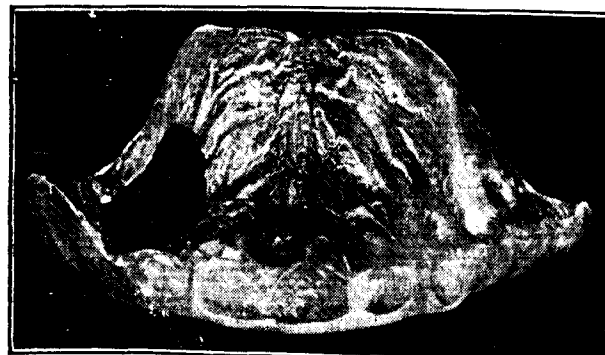


FIG. 1.—An acrylic resin dental splint with black gutta-percha inserted in the splint opposite the extraction site.

by the tongue; a less important role of the dental splint was to hold haemostatic dressings in position. The splint was not used for the purpose of exerting pressure on the socket. Such pressure may be dangerous in consequence of haemorrhage occurring into tissue; such a haematoma in the neck can be large enough to block the airway. Qvist, Endicott, and Mitchell (1942) report a case of fatal asphyxia following dental extraction in a haemophiliac where the obstruction to the airway was due to massive haemorrhagic infiltration of the floor of the mouth. Pressure on a socket also causes its enlargement and increases the area for potential haemorrhage. It is essential that the splint be made skilfully; a badly fitting splint is worse than no splint at all. The splint must fit accurately on the remaining teeth and remain firmly *in situ*; a loose splint causes disturbance of the poorly formed clot in the socket. It must not cause pressure on the gingival margin at any part, as such trauma will certainly result in an additional site for haemorrhage. The application of the black gutta-percha to the splint at the area of the wound was found to be of great value in preventing injury of the gum by the splint. The splint enables the patient to take a soft pulped diet and he can be ambulatory in the ward. The use of protective splints has also been favourably reported by White and Mallett (1949) and Matheson (1949).

Local Haemostatic Treatment

This consisted of an adsorbable dressing such as "calgitex" or gelatin sponge with bovine thrombin or Russell viper venom.

The application of local haemostatic agents to the tooth sockets was of very limited value. No surface application of haemostatic agents can be considered highly successful in haemophilic bleeding. To be of value a haemostatic requires to be carried to the site of bleeding by the patient's own circulation. Thrombin, for example, when applied to a socket will produce a surface layer of fibrin from the blood filling a socket, but this does not prevent bleeding occurring from the freely flowing vessels in the base of the wound.

Suturing of the gum is used in the control of haemorrhage following tooth extraction in normal persons. It is, however, contraindicated in haemophilia, as it provides an additional site for bleeding and may encourage haemorrhage into the adjacent tissue spaces rather than externally.

Replacement Therapy

Therapy with blood or blood products was used in an attempt to supply the coagulation components missing in these patients. In the earlier extractions of the series, bank blood was tried, but, later, fresh frozen plasma was used. Fresh frozen plasma was eventually adopted as the routine form of replacement therapy for deficiency of antihemophilic globulin. In one patient a large amount of the dried plasma fraction (Cohn I) containing antihemophilic globulin was given. In a few of the later extractions further plasma was administered 48 hours after the initial infusion, the third day being the time of highest incidence of haemorrhage.

In four patients the administration of plasma subsequent to the first occasion caused urticarial reactions. These were treated with a single dose of 100 mg. of oral cortisone and 50 mg. of promethazine hydrochloride. Any further administration of plasma was preceded by cortisone and promethazine hydrochloride one hour before giving the plasma. This appeared to prevent recurrence of the urticaria.

As already stated patients with haemophilia lack antihemophilic globulin and those with Christmas disease the Christmas factor. The only available therapeutic agents are contained in human plasma or derived therefrom by fractionation.

The life of antihemophilic globulin in blood stored at 4° C.—that is, in bank blood—is very short; after three to

four days only trace amounts are usually present. If plasma is collected fresh and immediately frozen to -20° C., at which temperature it is stored, there is very good preservation of the antihemophilic globulin. This fresh frozen plasma was used in many of the patients included in this investigation (Table I). Apart from the difficulties of preservation of the antihemophilic globulin there is the problem of the large amounts required in the management of the patients to maintain haemostatic levels over prolonged periods. The intravenous administration of 2 pints (1,140 ml.) of fresh plasma to a haemophiliac causes a rise in antihemophilic globulin content from nil to 5-10% of that present in normal plasma. More than half of this has disappeared by 12 hours and only trace amounts are present at 24 hours. The difficulties of the problem can readily be appreciated. Cohn's plasma fraction I, containing antihemophilic globulin, is available as a lyophil dried preparation in ampoules. In the transfusion services of this

region each ampoule is derived from 75 ml. of plasma. Even with full recovery of antihemophilic globulin in the ampoules, 10 or more would be needed to give the equivalent of 2 pints (1,140 ml.) of plasma.

In one patient the dried antihemophilic fraction from 15 pints (8.5 litres) of blood was given as a pre-operative measure, with satisfactory response. It is believed that at the present time the best available therapeutic agent is fresh frozen plasma and that this must be used in large quantities, such as 2 pints (1,140 ml.) at a time (A. S. Douglas, 1956, unpublished observations). Moss (1955) also reports on the value of fresh frozen plasma in the management of bleeding tooth sockets in haemophilia.

There should be no reliance on bank blood as a source of antihemophilic globulin unless it has been collected within a few hours of administration. The Christmas factor, on the other hand, is well preserved not only in fresh frozen plasma but also in bank blood.

TABLE I.—Details of 32 Dental Operations

Case No.	Disease	No. of Teeth Extracted	Details of Teeth Extracted	Antibiotic	Local Treatment	Anaesthesia	Transfusions		Haemoglobin Values (%)		Days Before Bleeding Ceased	Days Before Sockets Well Healed
							Before	After	Before	Lowest After		
1	Haemophilia	1	6	C	NoS; C+T; Sut.	R	2B	4B	92	80	7	14
		3	6/67	P	NoS; C; Sut.	R+I	—	7B	98	68	6	15
		2	46	P+C	NoS; G+T; Sut.	I	IB	2B	98	90	6	14
2	Haemophilia	1	6	C	NoS	I	IB	3B	90	84	6	16
		1	7	C	NoS	I	IB	5B; 1FFP	90	58	14	23
		4	21 | 12	—	NoS	I	1FFP	6B; 4FFP	105	68	10	16
3	Haemophilia	1	6	—	S; G+T	I	—	—	95	89	6	14
		1	6	—	S; G+T	I	—	—	100	86	7	12
		1	6	A	S; G+T	I	2FFP	—	105	102	5	10
		3	876	A	S; G+T	I	2FFP	1B; 1FFP	104	62	6	16
		2	12	A	S; G+T	I	2FFP	—	100	99	3	9
4	Haemophilia	1	1	A	S; G+T	I	2FFP	—	103	94	4	10
		3	678	A	S; G+T	I	2FFP	—	96	96	5	10
		2	76	A	S; G+T	I	2FFP	—	100	75	9	13
		2	45	A	S; G+T	I	2FFP	—	75	75	3	11
5	Christmas disease	1	6	A	S; G+T	I	1½FFP	—	74	64	6	13
		1	6	A	S; C+T	I	1½FFP	—	65	62	3	13
		2	66	A	S; C+T	I	2FFP	—	76	68	No Bl.	15
		2	75	—	S; G+T+RVV	I	2FFP	—	105	80	6	13
6	Haemophilia	2	84	—	S; G+T	I	2FFP	—	101	80	6	9
		3	578	—	S; G+T	I	2FFP	—	85	69	6	10
		2	13	—	S; G+T	I	2FFP	2FFP	99	76	6	10
7	Haemophilia	1	4	A	S; C+T	I	AHG	—	101	99	No Bl.	11
		2	67	A	S; C+T	I	2FFP	—	99	95	2	12
		1	6	A	S; C+T	I	2FFP	1½FFP	110	92	11	17
8	Haemophilia	1	6	A	S; C+T	I	1FFP	—	97	97	6	9
		1	6	A	S; C+T	I	1FFP	1FFP	102	88	14	17
		2	56	A	S; C+T	I	1½FFP	1FFP	95	93	7	11
9	Haemophilia	1	6	A	S; C+T	I	1½FFP	1FFP	86	83	No Bl.	12
		2	66	A	S; C+T	I	1½FFP	1½FFP	86	54	17	20
10	Haemophilia	3	256	—	NoS	I	—	2FFP	118	84	9	21
		2	6	A	S; G+T	I	2FFP	—	92	92	3	12

Antibiotic
C = Chloramphenicol
P = Parenteral penicillin
A = Chlorotetracycline
* Oral antibiotics caused vomiting.

Local treatment
S = Splint
NoS = No splint
C = Calgitex
G = Gelatin sponge
T = Thrombin
RVV = Russell viper venom
Sut = Suturing

Anaesthesia
R = Regional
I = Infiltration

Transfusions
Figures express amounts in pints
B = Blood
FFP = Fresh frozen plasma
After = At times from first to eleventh day after extraction
AHG = Antihemophilic globulin fraction from 15 pints (8.5 litres) of blood

Time in days before bleeding ceased
No Bl. = No bleeding.

Haemorrhage

In Fig. 2 is shown the incidence of haemorrhage, subsequent to the 32 dental operations. Even when the bleeding was minimal in extent, possibly only the staining of saliva over a short period, haemorrhage was recorded as

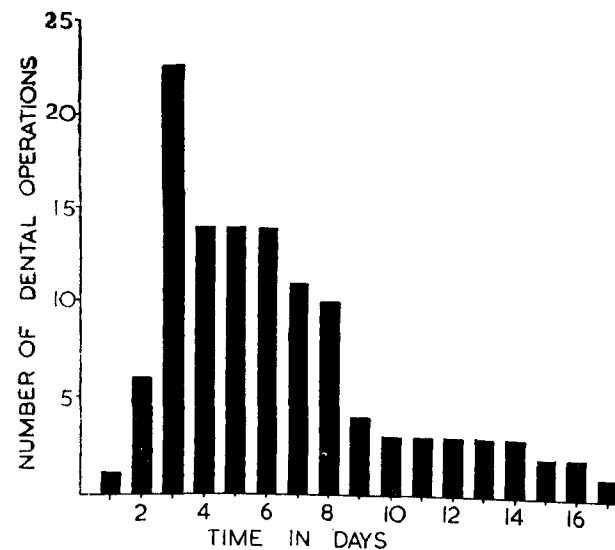


FIG. 2—Histogram showing the incidence of haemorrhage during the days subsequent to the extraction. Abscissa—time in days after extraction of the teeth. Ordinate—number of dental operations.

having occurred on that particular day. Comparison with the fall in haemoglobin level as recorded in Table I will show that bleeding was often minimal in its extent. Bleeding was rare on the first day but very common on the third day—that is, 48 hours after extraction. There was some bleeding at this time in 23 out of the 32 operations. Haemorrhage was common up to the eighth day after extraction, but unusual after that time. In one patient bleeding stopped only at the seventeenth day. The relative immunity from haemorrhage during the first 36-48 hours following extraction may be explained by the replacement therapy given just before the operation or as a result of the thromboplastic activity of the damaged tissue at the extraction site.

Blood Loss.—In an attempt to estimate the blood loss, haemoglobin levels were assayed daily, and the lowest value recorded in the post-operative period was used as an approximate indication of the extent of the haemorrhage. The mean fall in haemoglobin over all the extractions was 7% per tooth removed. As would be expected, the loss of haemoglobin was proportional to the number of teeth removed at each operation (Table II). The numbers

TABLE II

Operation	Mean Fall of Haemoglobin per Operation
One tooth extracted	10%
Two teeth	13%
Three	25%
Four	37%

involved in each group are small, but the figures probably give some indication of the anticipated loss of blood from these extractions.

Blood Transfusion

Matched blood was held for each patient for a period of 10-14 days from the time of extraction. Haemophiliacs are often the recipients of multiple transfusions, and there is the danger of haemolytic transfusion reactions unless sensitive compatibility tests are employed. In case there should be a bleeding emergency, therefore, cross-matched blood was reserved for each patient. Two of the patients were

rhesus-negative and had anti-D antibodies in consequence of previous transfusion.

As haemophilic patients often require transfusion throughout their lives there is the consequent risk of development of immune antibodies. With the adoption of the measures described, transfusion after dental extraction was very rarely required. This benefits the patient in so far as the opportunity for development of immune antibodies is reduced.

Duration of In-patient Management

In-patient treatment varied from 9 to 23 days, with an average of 13 days per dental operation. It will be appreciated that where a complete clearance of teeth was required this involved a protracted stay in hospital. It was our policy to carry out a small number of operations, possibly two, on one hospital admission and discharge the patient for subsequent readmission. The morale of these patients is remarkably good, considering the life of chronic invalidism which they have to suffer. Nevertheless it is of benefit to them not to make their stay in hospital too protracted on any one admission.

Discussion

These experiences in dental extraction of haemophilic patients failed to provide a complete answer to the problems of management. We are satisfied, however, that the adoption of the measures described is successful in limiting haemorrhage. Such haemorrhage as occurs will not be severe enough to endanger life.

The first eight observations in the series may be regarded as pilot studies. As a consequence of these the measures finally adopted may be summarized as follows: (a) extraction of not more than two teeth at one time; (b) construction of an acrylic resin protective splint, with gutta-percha lining at the site of extraction; (c) administration of 2 pints (1,140 ml.) of fresh frozen plasma just before the extractions; and (d) oral antibiotic therapy.

During the eight pilot observations a total of 22 pints (12.5 litres) of blood was required for replacement of blood loss due to the extractions. In the subsequent 24 dental operations only 1 pint (570 ml.) of blood was used. It is tempting to assume that this striking difference was due to the measures adopted.

The observations in the last case form an interesting comparison. The first operation was performed without any of the above measures; in particular there was no splint and no previous administration of plasma. Bleeding continued for nine days and the haemoglobin fell by 24%. Two weeks later further extractions were done with the preparation of upper and lower jaw splints and the previous administration of plasma. The only bleeding consisted of some staining of saliva on the third day and there was no fall in the haemoglobin level.

The ideal answer to the problems of management of tooth extraction in these patients is the administration of adequate amounts of antihemophilic globulin or the Christmas factor over a sufficient period of time. The maintenance of haemostatic levels of these factors over the period of 10-14 days required for the complete healing of the socket is not a practical possibility at the present time.

Summary

The results of 32 dental operations for tooth extraction in patients with haemophilia or Christmas disease are reported. The commonest time for haemorrhage was the third day after extraction, but in one case this was still occurring as late as 17 days after the extractions. It was inadvisable to extract more than two teeth at a time; where possible, two adjacent teeth were removed. An acrylic resin protective dental splint was used to protect the operation site subsequent to extraction. Black gutta-percha was inserted in the splint opposite the extraction site. Replacement therapy consisted of 2 pints

(1,140 ml.) of fresh frozen plasma immediately before extraction and on the occurrence of bleeding, provided this was severe enough. Oral antibiotic therapy was used for five days from the time of extraction.

We thank Professor L. J. Davis and Professor J. Aitchison for advice and interest in this work. We acknowledge also the helpful co-operation of Dr. J. Wallace, director of the Glasgow and West of Scotland Blood Transfusion Service, and Dr. D. Ellis, of the Edinburgh and South-east Scotland Blood Transfusion Service. The work in the University Department of Medicine, Royal Infirmary, Glasgow, was in part financed by grants from the Advisory Committee on Medical Research for Scotland and from the Medical Research Council.

REFERENCES

- Biggs, R., Douglas, A. S., Macfarlane, R. G., Dacie, J. V., Pitney, W. R., Merskey, C., and O'Brien, J. R. (1952). *British Medical Journal*, 2, 1378.
Matheson, W. S. (1949). *Brit. dent. J.*, 87, 312.
Moss, R. L. (1955). *Oral Surg.*, 8, 27.
Qvist, G., Endicott, C. L., and Mitchell, J. H. (1942). *Brit. dent. J.*, 73, 178.
White, P. H., and Mallett, S. P. (1949). *J. oral Surg.*, 7, 237.

CHRISTMAS DISEASE IN A WOMAN

BY

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In the majority of affected families the inheritance of Christmas disease is of the same sex-linked recessive pattern as true haemophilia, resulting in the transmission of the disease to males by apparently healthy females. In a small number of instances, however, heterozygous females have been found to be mildly affected, suggesting that the Christmas disease gene may be less completely recessive than that responsible for haemophilia. The case is presented here of a young woman with Christmas disease of the same order of severity as her affected male relatives.

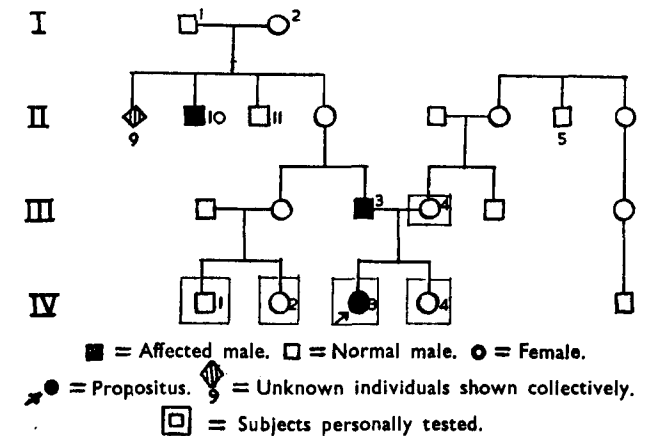
Case History

A single woman aged 22 was investigated because of a history of prolonged bleeding following tooth extractions. She had had teeth extracted on several occasions since the age of 6, and each time had bled from the tooth socket intermittently for 7 to 14 days. It had always proved possible to control the bleeding eventually by plugging, and she had never had a blood transfusion. No abnormal bleeding occurred at the spontaneous shedding of the primary dentitions. Two teeth have been extracted since the diagnosis of Christmas disease was made, and on this occasion bleeding was successfully controlled by packing the tooth sockets with an absorbable dressing soaked in thrombin. With this treatment bleeding stopped within 24 hours, but started again three days after the extraction, necessitating repacking, which resulted in permanent haemostasis.

The patient has had no other haemorrhagic symptoms. She has never had any other operations or serious injuries, and does not bruise excessively from minor traumata. Superficial cuts soon stop bleeding, and menstruation is normal. She has never had haemarthroses, epistaxes, purpura, or haematuria. At the age of 17 she swallowed a small open safety-pin without ill-effect.

Family History.—The patient's family tree is shown in the diagram. Her paternal great-grandparents, I 1 and I 2, are said to have been first cousins. Her father, III 3, suffered from prolonged and excessive bleeding after tooth extraction

on several occasions, but had no other haemorrhagic symptoms. He had never had any other operations or serious injuries. He was accepted for military service and was killed at Anzio in 1944. One of his mother's five brothers (II 10), now deceased, is known to have bled excessively after tooth extraction, but another (II 11) has never had any haemorrhagic symptoms. It has unfortunately proved impossible to trace the remaining members of the patient's paternal grandmother's family. There is no history of abnormal bleeding in any other known relatives of either sex on the patient's father's side, nor in any member of her mother's family.



Laboratory Investigations.—The results of tests of the patient's haemostatic mechanism are shown in Table I. It will be seen that these were all within normal limits.

A thromboplastin generation test was performed by the method of Biggs and Douglas (1953), using a suspension of normal platelets with various combinations of serum and Al(OH)₃-adsorbed plasma. All sera were obtained from blood shaken with glass beads until coagulation occurred, and then incubated at 37° C. for two hours. The sera were

TABLE I.—Results of Routine Laboratory Tests on Patient's Blood

Test	Patient	Normal Control Range
Whole-blood clotting-time (Lee and White) (minutes)	7½-10	5-10
One-stage prothrombin time (Quick) (seconds)	17.3	17.2-18.6
Proconvertin (Owren) (%)	80	70-120
Prothrombin consumption index (Merskey) (%)	18	Less than 40
Bleeding-time (Ivy) (minutes)	3	3-7
Platelet count (per c.mm.)	353,000	200,000-500,000

TABLE II.—Results of a Thromboplastin Generation Test. The Same Normal Platelet Suspension and M/40 CaCl₂ were Used Throughout

Al(OH) ₃ -adsorbed Plasma (1/5)	Serum (1/10)	Shortest Second Stage Clotting-time (sec.)	Final Thromboplastin Concentration (%)
Normal	Normal	10	100
Normal	Normal	13½	65
Normal	Normal	10	100
Normal	50% Patient	9½	108
Normal	50% Normal		
Haemophilic	Normal	25	17
10% Normal		14	52
90% Haemophilic			
10% Patient		11	83
90% Haemophilic			
Normal	Christmas disease	23½	19
Normal	10% Normal	12½	65
Normal	90% Christmas disease		
Normal	10% Patient	21	24
Normal	90% Christmas disease		

diluted 1 in 10 (vol./vol.) in 0.85% saline, and stored at -20°C . until required. The results in Table II show that the patient has a serum deficiency, and that her serum is incapable of correcting that of a patient with Christmas disease. Her $\text{Al}(\text{OH})_3$ -adsorbed plasma corrected that of a haemophilic subject better than did that of the normal control, and her own serum was corrected by an equal volume of normal serum, showing that the defect was not due to the presence of an inhibitor of thromboplastin generation. It was concluded that she had a true deficiency of Christmas factor. No PTA-deficient blood (Rosenthal *et al.*, 1953) was available for matching experiments, but the failure of mutual correction of Christmas disease and patient's serum is taken to exclude the diagnosis of PTA deficiency in this case.

On another occasion the Christmas factor content of the patient's serum was determined by measuring its ability to correct the defect of Christmas disease serum in the thromboplastin generation test. Serial dilutions of normal serum in Christmas disease serum were tested, all the other reagents being kept constant, and the concentrations of normal serum were plotted against the corresponding shortest second-stage clotting-times, to obtain a Christmas factor dilution curve. A 10% dilution of the patient's serum in Christmas disease serum was then tested in the same way. By interpolation on the dilution curve, it was found that the patient's serum contained approximately 8% of Christmas factor relative to the control. This method of assay has given results between 0 and 20% of normal in males with Christmas disease investigated in this laboratory. Serum from the most severely affected of these was used as the diluent in the present case.

Christmas factor and proconvertin (factor VII) assays have also been carried out on the serum of the patient's mother, sister, and two first cousins. None of these have any haemorrhagic tendency, and all have had teeth extracted without excessive bleeding. It was found that none had significant deficiency of either factor (Table III), though the amount of each factor in the sister's blood was slightly less than in the other members of the family.

TABLE III.—Christmas Factor and Proconvertin (Factor VII) in the Patient's Relatives

Relationship to Patient	Christmas Factor (%)	Proconvertin (%)
Mother (III 4)	80	100
Sister (IV 4)	65	70
Cousin (IV 1)	90	96
" (IV 2)	90	96

Discussion

The laboratory investigations show that the patient suffers from a Christmas factor deficiency, and her history suggests that it is a congenital one. It is unfortunate that no affected relatives were available for testing, but the family history strongly suggests that her father and great-uncle suffered from the same condition. A unifying though somewhat unusual feature was the limitation of symptoms in each affected member of the family to bleeding after tooth extraction. It may be that this merely indicates the occurrence of a mild degree of the disorder in three people who all escaped serious injury.

There are two genetically possible explanations for the occurrence of Christmas disease in the daughter of an affected male. Unless the patient is homozygous for the Christmas disease gene, it is necessary to postulate that the gene is not completely recessive.

There is no evidence in the present case for the first of these alternatives. Although the silent transmission of the gene to the patient's mother through several generations of carriers cannot be excluded with certainty, the fact that none of her eight known male relatives were affected makes such an explanation extremely unlikely. Still more so is the possibility that the patient has received a second Christmas disease gene as the result of a mutation occurring in the ovum which gave rise to her.

It is therefore reasonable to assume that the occurrence of Christmas disease in this patient represents the effect of an incompletely recessive gene. Some degree of expression of the Christmas disease gene in heterozygotes has already been reported by Biggs *et al.* (1952), Biggs and Macfarlane (1954), Brinkhous *et al.* (1954), Rosenthal and Sanders (1954), and Ramot *et al.* (1955). Graham *et al.* (1953) have observed a similar phenomenon in a large family with a mild form of haemophilia. In most of these cases the heterozygotes have been symptomless, the abnormality being detectable only by laboratory tests; in the remainder the heterozygous females appear to have had milder symptoms than their affected male relatives. The present case differs from these in that the patient's disability is apparently very similar in degree to that experienced by her father and great-uncle. While it must be admitted that such an assessment, based on second-hand evidence, is necessarily inexact, the observation that the patient's serum contains less than 10% of the normal amount of Christmas factor also suggests that the degree of deficiency is of the same order as in her male relatives, whose disability was slight.

It is of interest that the patient's sister, who must also be assumed to be a heterozygote but who has no history of abnormal bleeding, has a slightly reduced amount of Christmas factor in her serum. This finding is consistent with the view that the Christmas disease gene is incompletely recessive in this family; the difference in degree of the defect between the patient and her sister may be taken as evidence of the variable expressivity of the gene, the expression apparently being almost complete in the patient's case.

Summary

The case of a young woman with Christmas disease is reported, in which the presenting symptom was prolonged haemorrhage following tooth extraction.

Her serum was found to contain approximately 8% of the normal amount of Christmas factor.

The family history suggested that the patient's father and his uncle suffered from Christmas disease of a similar degree of severity.

The genetic implication of these observations is that the gene for Christmas disease may be intermediate rather than completely recessive.

I am indebted to the patient and her family for their co-operation, and to Dr. Rosemary Biggs and Dr. C. O. Carter for helpful discussion.

ADDENDUM.—Since this paper was written, the patient has undergone bilateral intranasal anastomies with diathermy to the inferior turbinates. Following this operation, she bled intermittently from the nose for a fortnight. At the end of this time, when her haemoglobin had fallen to 7.7 g. per 100 ml., she was transfused with three pints (1.7 l.) of fresh blood, which successfully controlled the bleeding. This is of some interest as the only recorded instance of bleeding in this family other than after tooth extraction, and supports the view that the patient's disability is comparable in degree with that of her affected male relatives.

REFERENCES

- Biggs, R., and Douglas, A. S. (1953). *J. clin. Path.*, 6, 23.
 — Macfarlane, R. G., Dacie, J. V., Pitney, W. R., Merskey, C., and O'Brien, J. R. (1952). *British Medical Journal*, 2, 1378.
 — and Macfarlane, R. G. (1954). Personal communication to W. R. Pitney and J. V. Dacie, *Brit. med. Bull.*, 1955, 11, 11.
 Brinkhous, K. M., Langdell, R. D., Penick, G. D., Graham, J. B., and Wagner, R. H. (1954). *J. Amer. med. Ass.*, 154, 481.
 Graham, J. B., McLendon, W. W., and Brinkhous, K. M. (1953). *Amer. J. med. Sci.*, 225, 46.
 Ramot, B., Angelopoulos, B., and Singer, K. (1955). *J. Lab. clin. Med.*, 46, 80.
 Rosenthal, M. C., and Sanders, M. (1954). *Amer. J. Med.*, 16, 153.
 Rosenthal, R. L., Dreskin, O. H., and Rosenthal, N. (1953). *Proc. Soc. exp. Biol. (N.Y.)*, 82, 171.

IMPROVED L.E. CELL TEST USING FINGER-PRICK BLOOD

BY

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The L.E. cell is recognized as a neutrophil polymorphonuclear leucocyte whose nuclear lobes are compressed to the periphery of the cell by the inclusion of homogeneous material which stains a reddish purple with the usual blood stains. There is much evidence in favour of the inclusion material being nuclear in origin. Occasionally cells are found in which an ingested cell can still be recognized; these cells are "tart" cells and must not be confused with L.E. cells, in which the ingested material has lost all its nuclear structure.

The production of L.E. cells from bone marrow or blood of patients suffering from systemic lupus erythematosus (S.L.E.) would appear to be essential for a complete diagnosis. Many methods have been devised for producing L.E. cells from venous blood, amongst which the one devised by Marten and Blackburn (1953) and used by us for some time has been found reliable. It often happens that L.E. cells are detected only after several specimens of blood have been examined, and these repeated venepunctures become very tiresome for patient and physician. The processing of venous blood specimens and the microscopical examination of the final blood smears are also time-consuming.

A method in which capillary blood could be used would solve some of these problems, and in fact L.E. cells have been found in finger-prick blood preparations by several workers (Eppes and Ludovic, 1951; Rohn and Bond, 1952; Chomet *et al.*, 1953; Rosenfeld *et al.*, 1954; Sickley *et al.*, 1955); but these have been chance findings or have involved techniques which could not be adapted for routine use.

Snapper and Nathan (1955a, 1955b) have devised a more practical method which requires only one drop of blood from an S.L.E. patient, and it is based on the recognition that three essential factors are involved in L.E. cell formation: (1) plasma or serum from an S.L.E. patient; (2) nucleoprotein from nuclei of damaged cells, which form the "substrate"; and (3) active phagocytic polymorphonuclears. They recommend that the substrate be prepared from a drop of normal blood incubated for an hour in a moist-chamber at 37°C . The blood clot which forms is removed, and it is then found that large numbers of leucocytes, particularly polymorphonuclears, are left on the air-dried slide. The test proper is then carried out by making a hanging-drop preparation of the patient's blood so that the drop of blood just touches the substrate on the slide. This hanging-drop preparation is then incubated in a moist-chamber at 37°C . for one hour. During this period the L.E. factor in the patient's serum acts on the nucleoprotein of the dead leucocytes in the substrate to form an

intermediate product. The latter undergoes phagocytosis by the live polymorphonuclears migrating from the small drop of blood which clots. After incubation the clot is removed and the material on the slide stained with the usual blood stains. The small area on the slide is quickly identified and easily examined microscopically in a very short time.

In our hands the use of leucocytes from normal blood, which is strongly recommended by these workers, has not proved as reliable as a substrate which we describe below prepared from chronic lymphatic leukaemia blood. Details of this method are given and the results, with illustrations, discussed.

Methods

Preparation of Substrate Suspension.—Fifteen millilitres of venous blood from a chronic lymphatic leukaemia patient (white-cell count over 75,000 per c.mm.) is placed in a sterile 1-oz. (28-ml.) screw-capped bottle containing two partially opened steel-wire paper-clips. The bottle is slowly inverted intermittently until the formation of fibrin occurs, and then shaken rapidly for another five minutes. Complete defibrination occurs within 15 minutes of taking the blood, the fibrin becoming attached to the paper-clips. The blood is decanted into a sterile 6 by $\frac{1}{2}$ in. (15 by 1.3 cm.) test-tube, plugged or covered and then inclined at an angle of 60° degrees in a 37°C . water-bath until the red blood cells have sedimented about one-third of the way down. This usually takes one hour, but may take up to three hours. The opalescent supernatant and a buffy layer containing the bulk of the lymphocytes and a small proportion of red blood cells (about 5%) are pipetted off into a 3 by $\frac{1}{2}$ in. (7.5 by 1.3 cm.) test-tube. The cell suspension is mixed gently and a white-cell count carried out. If the white-cell count is below 200,000 per c.mm. the suspension is centrifuged for five minutes at 2,500 r.p.m. and then some of the supernatant removed to give the correct cell count of 200,000 per c.mm. If the count is much above 200,000 per c.mm. dilution can be made with the patient's serum, obtained by centrifuging the blood remaining in the 6 by $\frac{1}{2}$ in. (15 by 1.3 cm.) test-tube.

Preparation of Substrate Slide.—New 3 by 1 in. (7.5 by 2.5 cm.) microscope slides are used, rinsed in hot water and wiped dry. A small drop of the substrate suspension, about 1 to 2 mm. in diameter, is placed at the centre of the slide. With a narrow smooth-ended glass rod the drop is spread out to cover a circular area 12 to 15 mm. in diameter, which takes only a short time to dry at room temperature.

Storage of Substrate Slides.—A large stock of many hundreds of dried substrate slides prepared in the above manner are stored in closely packed cardboard boxes in a laboratory bench drawer at room temperature. The temperature varies between 17° and 20°C . Storage in the refrigerator or at temperatures much above the usual room temperatures causes deterioration.

Finger-prick Blood Technique.—A $\frac{1}{4}$ in. (2.2 cm.) square cover-glass (No. 2 thickness) is divided in half. The two pieces are positioned on opposite sides of the dried substrate area of a substrate slide placed in a Petri dish, the bottom of which contains a well-moistened perfectly flat filter-paper. A drop of blood from a finger-prick is allowed to touch the centre of a $\frac{1}{4}$ by $\frac{1}{4}$ in. (3.2 by 2.2 cm.) cover-glass (No. 1 thickness) so that a drop of blood 4 mm. in diameter is obtained. This cover-glass is now lowered on to the slide and the drop of blood positioned on the periphery of the substrate area. The drop of blood on the No. 1 cover-glass just touches the substrate because of the pieces of No. 2 cover-glass, which are thick enough to prevent obliteration of the drop by capillary action. The Petri dish is now covered with its lid and transferred to a 37°C . incubator for one hour only. The slide with its cover-glass preparation is then gently removed from the Petri dish and any moisture on the under side of the slide wiped off. The large cover-

glass is now slid off. If the clot sticks to the slide it can easily be released with the corner of the cover-glass and then slid to the edge of the slide and removed. The slide is rapidly dried by waving it in the air. Our preparations are stained as for blood with Jenner-Giemsa stains.

Test for L.E. Factor in Serum.—A drop of the serum is placed in a small watch-glass. Two drops of blood from a healthy group O subject are added and quickly mixed. A

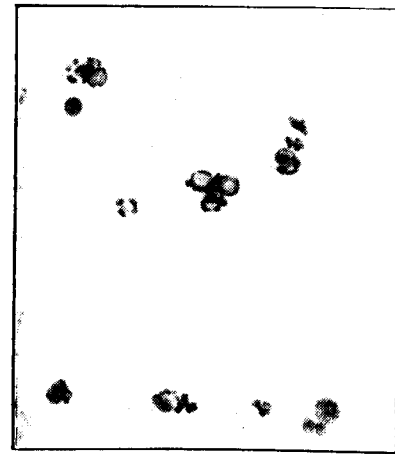


FIG. 1.—Low-power appearance of a positive stained preparation. ($\times 300$.)



FIG. 2.—High-power appearance. ($\times 500$.)

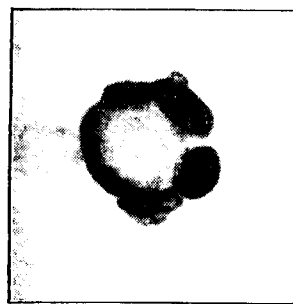


FIG. 3.—Appearance with oil-immersion objective. ($\times 950$.)

The substrates were tested with finger-prick blood from patients who were suffering from S.L.E. and who showed L.E. cells in venous blood preparations made by the Marten and Blackburn (1953) method, henceforth referred to as the venous blood method. The results were as follows:

Normal Blood Leucocytes Substrate.—Variable results were obtained even with substrate preparations less than 10 days old. In several cases no L.E. cells could be found with the finger-prick blood method although moderate numbers were being found by the venous blood method.

Chronic Myeloid and Acute Leukaemia Substrate.—False-negative results were obtained as with normal blood leuco-

cytes substrate. There was also difficulty in assessing which was the reaction area and which the substrate area.

Chronic Lymphatic Leukaemia Substrate.—L.E. cells were found with the finger-prick blood method in every case where they had been found by the venous blood method. In some cases a more conclusive picture was obtained with this substrate and finger-prick blood than by the venous blood method. Substrates up to three months old still gave reliable results.

Results of the Finger-prick L.E. Test

Normal Subjects.—Of 50 normal subjects, 75% showed an occasional "tart" cell. In two normal subjects an occasional cell morphologically indistinguishable from the L.E. cell was found. The cells were not always found on repeating the tests with a substrate slide made either from the same or from different lymphatic leukaemia blood. This was quite different from the cases of S.L.E., where L.E. cells in moderate or large numbers were consistently found on repeated examinations. In the Table we have denoted this as "positive."

Results of L.E. Cell Tests in 10 Patients who were Clinically Cases of Systemic Lupus Erythematosus

Patient	Age	Sex	L.E. Cell Test	
			Venous Blood	Finger-prick Blood
1	51	M	Positive	Positive
2	64	M	Negative*	"
3	46	M	Positive	"
4	42	F	Positive	"
5	30	F	Not done†	"
6	41	F	Positive	"
7	11	M	"	"
8	21	M	"	"
9	24	F	"	"
10	41	F	"	"

* Only tart cells found. † Patient refused venepuncture.

Systemic Lupus Erythematosus.—A total of 10 "positive" cases have been seen in the past year. Eight of these showed numerous L.E. cells by the finger-prick and venous blood methods. The other two showed moderate numbers of L.E. cells only by the finger-prick method (see Table). One of these latter patients had refused a venepuncture. Following treatment with cortisone the patients have all improved clinically and the number of L.E. cells in finger-prick and venous blood preparations has diminished.

Patients Suffering from Other Diseases.—Scanty L.E. cells have been found in only one or two cases of rheumatoid arthritis, but were not found consistently on repeat examinations.

Discussion

Harvey *et al.* (1954) have noted that in systemic lupus erythematosus L.E. cells are not found constantly, and repeated testing is necessary. L.E. cells were originally found in bone-marrow preparations (Hargraves *et al.*, 1948), but venous blood preparations were later shown to give reliable results (Hargraves, 1949; Sundberg and Lick, 1949).

Eppes and Ludovic (1951) found only one L.E. cell in peripheral blood smears taken from numerous patients, and Chomet *et al.* (1953) found L.E. cells in the peripheral blood smears of a patient three days before death. They put forward the theory that the L.E. factor was then at its peak concentration, but were uncertain that the L.E. cell was an *in vivo* phenomenon, since a peripheral blood smear could be regarded as a post-vital artefact. Rohn and Bond (1952) actually observed L.E. cell formation in a cover-glass preparation of a drop of blood stained with supravital stains. This method, while of great interest from the point of view of L.E. cell formation, would appear to be unsuitable for routine use. From their observations they concluded that the polymorphonuclears and not lymphocytes underwent autolysis, and the product was then ingested by active polymorphonuclears to produce L.E. cells. This is an opposite

view to the one put forward by Moyer and Fisher (1950), who gave experimental evidence that the lymphocyte was the autolysed cell involved and that the best results were obtained with lymphocytes whose cell walls were first damaged. Moyer and Fisher concluded that three factors were necessary for L.E. cell formation: (1) L.E. plasma or serum factor; (2) nucleoprotein from damaged lymphocytes (substrate); and (3) active neutrophils.

Zimmer and Hargraves (1952) compared various methods for producing L.E. cells and decided that methods in which clotted blood was used gave the best results. The method of Marten and Blackburn (1953) is such a method; we have used it for the past two years and found it satisfactory.

Thus it became feasible that the peripheral or finger-prick clotted-blood methods might be developed if factors 2 and 3 previously mentioned could be obtained in an adequate concentration. Snapper and Nathan (1955a, 1955b) have devised an ingenious method for doing this. The nucleoprotein factor, or substrate, is obtained by incubating a drop of blood for an hour at 37° C. in a moist-chamber. An outpouring of neutrophils occurs, and these cells remain on the slide after the blood clot is removed. The air-dried neutrophils act as substrate. A drop of the patient's blood is now incubated in the same area as the substrate. If the patient is suffering from S.L.E., then the L.E. factor in the serum causes an autolysis of the dead neutrophils and the product is phagocytosed by the fresh neutrophils which migrate from the patient's blood clot. Snapper and Nathan mention that cells other than neutrophils can be used as substrate—for example, leukaemic blood cells or tissue cells from Hodgkin's disease or carcinoma.

We have confirmed these authors' observations but find their method for producing substrate slides rather difficult. The preparations were stable for only 10 days, and we have not been able to find L.E. cells by their method when undoubtedly positive results were found by the venous blood method. However, with the use of lymphocytes from chronic lymphatic leukaemia, which are regularly available in a large teaching hospital, much more reliable substrate slides, which were stable for several months, were obtained. The results compared well with the venous blood method. The fact that lymphocytes give such good results would seem to confirm the conclusions of Moyer and Fisher (1950) concerning the mechanism of L.E. cell formation.

The high proportion of false-negative results obtained when leucocytes from normal blood are used as substrate may be due to the small proportion of lymphocytes that are to be found in the substrate area. Polymorphonuclears will always be found there, and one is not certain whether they were derived from the patient's drop of blood. When lymphocytes from blood of patients with chronic lymphatic leukaemia are used as substrate there is little doubt about the source of the polymorphonuclears seen. There appears to be an optimum concentration of lymphocytes required for the test, and to achieve this we recommend placing the patient's drop of blood on to the periphery of the lymphocyte substrate area. The test should always be done in duplicate or triplicate.

Substrates prepared from the buffy coats of normal blood and leukaemias other than chronic lymphatic leukaemia have often given poor results. Kurnick *et al.* (1953) have discussed the probability of an L.E. cell phenomenon inhibitor, and it is possible we are dealing with such an inhibitor when failures occur. It is worth noting that the polymorphonuclear is the cell which can produce this inhibition.

Recently a method has been reported for producing L.E. cells from finger blood in which the digit is first constricted for 20 minutes and tight enough to produce cyanosis (Sickley *et al.*, 1955). This procedure appeared to be rather upsetting to the patient and not reliable, as a high proportion of false negatives were obtained by these workers. Since in S.L.E. Raynaud's phenomenon can occur, the procedure might lead to gangrene.

Fifteen millilitres of blood from one patient with chronic lymphatic leukaemia provides many hundreds of substrate slides, which can be stored for future use by a group of hospitals. The slides are stable at room temperature for three months and in some cases even six months after preparation. It is possible that the temperature of storage is a deciding factor on the stability, and this is being investigated further. With a reliable and stable substrate slide the L.E. cell test is now very simple to perform, and the finger-prick method should soon find its place in many laboratories.

In 10 S.L.E. patients tested repeatedly by us, moderate numbers or numerous L.E. cells were always found by the finger-prick blood method, using various substrates from lymphatic leukaemia blood. This occurred prior to and during treatment. Following the initiation of treatment with cortisone, symptoms were soon relieved, but in most cases a much longer time elapsed before the L.E. cells in the test diminished.

The finding of an occasional cell resembling the L.E. cell in some normal subjects and in few cases of rheumatoid arthritis requires explanation. Fortunately the finding differs from that in S.L.E., where L.E. cells are found in large numbers by the finger-prick blood method. The dried lymphatic leukaemia serum which remains on the lymphocytes of the substrate may have L.E.-cell-forming properties in minimal amount. Another hypothesis is that minimal amounts of L.E. cell factor are occasionally found in human plasma.

Summary

A method for producing L.E. cells from finger-prick blood is described in which the substrate recommended is obtained from lymphocytes of cases of chronic lymphatic leukaemia.

The method compares favourably with a reliable venous blood method, and has the added advantage of simplicity and ease of microscopical examination.

The substrate slides prepared from lymphocytes appear to be stable for at least three months.

In patients suffering from systemic lupus erythematosus numerous L.E. cells are found consistently by the finger-prick method prior to and during treatment.

In some normal subjects, and in a few cases of rheumatoid arthritis, an occasional cell resembling the L.E. cell may be found, but the finding is not consistent.

We wish to thank the patients who willingly donated blood both for substrate preparation and the tests; the physicians of the Manchester Royal Infirmary for their co-operation; Dr. J. F. Wilkinson and Dr. M. C. G. Israels, of the department of haematology, for their advice; Miss Margaret Kenwright, of the department of clinical pathology, for technical assistance; and Mr. Brian Figg, of the department of obstetrics and gynaecology, who took the microphotographs.

REFERENCES

- Chomet, B., Kirshen, M. M., Schaefer, G., and Mudrik, P. (1953). *Blood*, 8, 1107.
- Eppes, W., and Ludovic, E. (1951). *Ibid.*, 6, 466.
- Hargraves, M. M. (1949). *Proc. Mayo Clin.*, 24, 234.
- , Richmond, H., and Morton, R. (1948). *Ibid.*, 23, 25.
- Harvey, A. McG., Shulman, L. E., Tumulty, P. A., Conley, C. L., and Schoenrich, E. H. (1954). *Medicine (Baltimore)*, 33, 291.
- Kurnick, N. B., Schwartz, L. I., Pariser, S., and Lee, S. L. (1953). *J. clin. Invest.*, 32, 193.
- Marten, R. H., and Blackburn, E. K. (1953). *J. clin. Path.*, 6, 89.
- Moyer, J. B., and Fisher, G. S. (1950). *Amer. J. clin. Path.*, 20, 1011.
- Rohn, R. J., and Bond, W. H. (1952). *Amer. J. Med.*, 12, 422.
- Rosenfeld, S., Swiller, A. I., and Morrison, M. (1954). *J. Amer. med. Ass.*, 155, 568.
- Sickley, J. F., Friedman, I. A., Feldhake, C., and Schwartz, S. O. (1955). *J. Lab. clin. Med.*, 46, 624.
- Snapper, I., and Nathan, D. J. (1955a). *J. invest. Derm.*, 24, 473.
- , (1955b). *Blood*, 10, 718.
- Sundberg, R. D., and Lick, N. B. (1949). *J. invest. Derm.*, 12, 83.
- Zimmer, F. E., and Hargraves, M. M. (1952). *Proc. Mayo Clin.*, 27, 419, 424.

PEMPHIGUS NEONATORUM CAUSED BY STAPHYLOCOCCUS AUREUS TYPE 71

BY

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Recent work has shown that most of the staphylococci isolated from the lesions of impetigo contagiosa are of a type uncommon in other situations, and are defined by their susceptibility to the typing phage 71 (Spittlehouse, 1955; Parker *et al.*, 1955; Barrow, 1955).

In this paper we describe a small epidemic of pemphigus neonatorum caused by staphylococci of the same phage-pattern. The outbreak took place during the course of a general investigation of staphylococcal cross-infection in the nursery wards of a maternity hospital. During the outbreak, and for four months before it, cultures for staphylococci were made from all cases of neonatal skin sepsis and from various other sources described below. As a result it was possible to trace the staphylococcus subsequently responsible for the pemphigus from its introduction by a nasal carrier and during its dissemination in the hospital.

All the staphylococci referred to in this paper were coagulase-positive.

Bacteriological Methods.—Swabs were moistened with saline before use. Settle-plates were exposed for two hours. Cultures from blankets and garments were made by the sweep-plate technique (Williams, quoted by Blowers and Wallace, 1955). Coagulase-positive staphylococci were isolated and investigated as described elsewhere (Alder *et al.*, 1955), except that the phages 71 and 80 were added to the set of typing phages (Williams and Rippon, 1952), making 21 in all.

General Investigation of Staphylococcal Cross-infection

There was one nursery on each of the three floors of the hospital, that on the first floor being occupied by premature infants. The investigation was carried out on the second and third floors, which on the average contained 25 and 18 cots respectively.

The study began on September 18, 1955—that is, 18 weeks before the first case of pemphigus. This study is still being carried on, but only the results obtained in the period up to February 3, 1956, are given in detail, because the outbreak came to an end then. During the 20 weeks, 385 babies were accommodated in the two nurseries. The noses of 227 of the babies were swabbed repeatedly until they yielded *Staph. aureus*. By the fourth day 67.1% were positive. Swabs taken from normal skin on the back of the neck, the umbilical region, and the groin often yielded *Staph. aureus*; 75% of those from the umbilical region were positive on the second day of life.

Nasal and hand swabs were taken once a week from the nurses on day duty in the nurseries, except for those who happened to be off duty at the time of swabbing. Also,

staphylococci isolated from the noses and hands of nurses before joining the hospital were kindly sent to us from the Department of Preventive Medicine, University of Bristol. Nasal swabs were taken from 85 mothers on admission to the hospital. Two settle-plates were exposed three times a week in each nursery. From November 15 cultures were taken from the babies' garments and bedclothes. The practice of the hospital was to send all articles to the laundry as soon as they were used. Babies' garments and bedclothes from both floors were washed together (the woollens at a lower temperature than the non-woollen goods), but were kept separate from other laundry. Cultures were made from 144 cot blankets, 62 woollen vests and jackets, and several cotton articles. All of these had been freshly laundered except for a few of the blankets. Many of the woollens yielded heavy growths of bacteria, which often included staphylococci. The non-woollen articles, which had been more strongly heated, yielded very scanty growths and no staphylococci.

From all these sources 874 coagulase-positive staphylococci were isolated, 551 of them being penicillin-resistant. In addition, 13 pustular lesions of babies' skins and 17 cases of neonatal conjunctivitis yielded coagulase-positive staphylococci. The staphylococcal cross-infection on the two floors was about equal in amount, as judged by bacteriological and clinical observations. The clinical infections were mild, and were very few in comparison with the numbers of staphylococci which were isolated. Except for the cases of pemphigus described below, they consisted entirely of conjunctivitis and of skin pustules, which were usually small and trivial.

We hope to report in a later paper our observations on the staphylococcal cross-infection as a whole.

Cases of Pemphigus

There were nine cases, none of which was seriously affected (Table I). The first was a baby on floor 3 who developed the disease on January 23, 1956. There were

TABLE I.—Cases of Pemphigus Neonatorum

Case	Date of Onset	Day of Life	Floor	Site of Bullae	Phage-types of Staphylococci
1	23/1/56	10	3	Scalp, finger, eyelid, chin	<i>Staph. aureus</i> type 71
2	24/1/56	7	3	Fingers, cheek, chin	" " " 71
3	24/1/56	10	3	Umbilicus, leg	" " " type
4	25/1/56	9	3	3 fingers	"54/75/77" <i>Staph. aureus</i> type 71
5	25/1/56	8	3	Thigh	<i>Staph. aureus</i> type 71
6	27/1/56	8	2	Fingers and forearm	Not cultured
7	30/1/56	12	3	Umbilicus	" " " 52A*
8	3/2/56	7	3	"	" " " type
9	3/2/56	6	3	"	"6/7/54/70+" Not cultured

* See text for possible explanation of failure to isolate *Staph. aureus* type 71 from these cases.

seven more cases on floor 3, and one on floor 2. The latter (Case 6) had been delivered by caesarean section in the operating theatre on floor 3, and his first garments had been provided by the nursery on that floor.

Swabs from the bullae of seven of the cases were cultured, and all gave profuse growths of *Staph. aureus*. Four of them, including the first two cases, yielded penicillin-resistant staphylococci lysed by phage 71 but by no other dilute phage. They were lysed by other group II phages at 1,000 × R.T.D., and thus were the same as the "normal 71" strains of Parker *et al.* (1955). From three others, type 71 staphylococci were not isolated. These negative results may have been due to failure to examine the cultures thoroughly enough. By mistake, the plates were discarded after one colony from each plate had been picked for typing. All three cultures from which we failed to isolate type 71 staphylococci were from already ruptured bullae near the umbilicus. Staphylococci of various phage patterns were

often present in large numbers on normal skin in this area, and cultures of ruptured bullae would no doubt often contain more than one strain.

Staphylococci of type 71 had not been identified previously in the hospital. However, a number of the cultures which had been isolated from various sources since late November, 1955, had not then been typed. Completion of this work revealed that one nurse, Nurse C, who joined the staff on November 30, 1955, was a persistent heavy nasal carrier of type 71 penicillin-resistant staphylococci, and that similar staphylococci had been isolated subsequently from a variety of sources, chiefly on floor 3 (Table II). All these strains

TABLE II.—Sources and Dates of Isolation of Penicillin-resistant *Staph. aureus*, Phage-type 71

Date	Floor	Site
30/11/55	3	Nurse C's nose
14/12/55	2	Settle-plate
6/1/56	3	Nurse C's nose
6/1/56	3	" " hands
13/1/56	3	" " nose
17/1/56	3	Used blanket
17/1/56	3	Freshly laundered vest
17/1/56	3	A baby's normal skin, near umbilicus
18/1/56	3	Settle-plate
19/1/56	3	A baby's normal skin (groin)
20/1/56	3	Two freshly laundered woollen garments
20/1/56	3	Settle-plate
20/1/56	2	A nurse's hand
23/1/56	2	A baby's normal skin (neck)
23/1/56	3	Pemphigus lesions of scalp, finger and chin (Case 1)
23/1/56	3	Two settle-plates
24/1/56	3	Pemphigus lesions of finger and chin (Case 2)
24/1/56	3	Freshly laundered woollen garment
26/1/56	3	Pemphigus lesions on finger (Case 4)
27/1/56	2	Pemphigus lesions, fingers and forearm (Case 6)
27/1/56	2	Used blanket

were resistant to penicillin but sensitive to streptomycin, chloramphenicol, and oxytetracycline. They inhibited the growth of corynebacteria (Parker *et al.*, 1955) and were egg-yolk negative (Gillespie and Alder, 1952).

Subsequent inquiry revealed that Nurse C had had impetigo three years previously. She had worked only in the nursery of floor 3 since her arrival, and had been in close contact with the first case. This baby had been separated from his mother for some days on account of her past history of tuberculosis, and Nurse C had been given special duties with him. Nurse C left the hospital, for personal reasons, on January 30, 1956, seven days after the outbreak of pemphigus began.

The steps taken to stop the outbreak consisted in isolation and barrier nursing of the cases and treating them with intramuscular streptomycin and local antiseptics, isolating the contacts, and autoclaving all garments and bedding of the cases and contacts and of their mothers. Most of the blankets and garments on floor 3 and many on floor 2 were thus sterilized. Admissions to floor 3 were stopped until all cases and contacts had been discharged. As an emergency measure, nose swabs were taken from all members of the nursing, domestic, physiotherapy, and resident medical staff, and from all mothers and babies in the hospital. Hand swabs were taken from some nurses, and umbilical swabs from some babies. Of the 165 swabs thus taken, 62 yielded *Staph. aureus*, but the epidemic strain was not isolated.

There were no more cases of pemphigus until March 15, 1956, when a baby on floor 3 developed a small bulla on the scalp which yielded a penicillin-sensitive type 71 staphylococcus. This may have been a variant of the epidemic strain. There have been no cases during the subsequent five months, but the epidemic strain has been isolated occasionally from other sources—a nurse's nose, a nurse's hand, a baby's nose, a baby's eye, a settle plate, and two blankets.

Since the beginning of April, all babies' garments and blankets have been disinfected by means of cetyl trimethylamine bromide ("cirrasol OD") (Blowers and Wallace, 1955).

Discussion

In several outbreaks of pemphigus neonatorum typing by sera or phages has shown the causative organisms to be particular epidemic strains of *Staph. aureus* (Elliott *et al.*, 1941; Hobbs, 1944; Allison and Hobbs, 1947; Williams *et al.*, 1947; Parker and Kennedy, 1949; Rowntree *et al.*, 1956). Our findings again illustrate the specific nature of the infection and show that it is sometimes caused by type 71 staphylococci, which in older people causes staphylococcal impetigo. The nurse who brought the organism into the hospital may have been carrying it in her nose since her own attack of impetigo three years before. A persistent nasal carrier may harbour the same strain for several years (Gould and McKillop, 1954).

The dissemination of the type 71 strain on floor 3, after Nurse C's arrival, illustrates the importance of nasal carriers in contributing staphylococci to the environment. Nevertheless, it is likely that the first case of pemphigus resulted from direct infection by Nurse C, possibly via her hands. The rapidity with which the subsequent cases followed showed that most of them were caused by cross-infection from the first case; the organisms were probably transferred by contact by members of the staff.

The transfer of organisms to floor 2, where they were found on a few occasions, may have taken place through the laundry. Case 6 may have been infected in this way.

Our experience before the outbreak of pemphigus illustrates the well-known fact that clinical staphylococcal infections are often few and mild even when there is a great deal of "bacteriological" cross-infection in a hospital (Rountree and Barbour, 1950; Barber *et al.*, 1953; Clarke *et al.*, 1954). But the introduction of more virulent strains, or the presence of patients with lowered resistance or with wounds which expose susceptible tissues, may at any time result in serious infections. Therefore it is important to reduce staphylococcal cross-infection so far as is possible, irrespective of its clinical results at any particular time.

When an outbreak of infection is caused by a particular epidemic strain, special precautions should be taken to limit its spread. Bedclothes should be disinfected after use if this is not already being done. The oiling of blankets, which merely suppresses dust, is not enough (Clarke *et al.*, 1954). A hand cream containing a disinfectant such as chlorhexidine ("hibitane") (Murray and Calman, 1955) may be used by nurses. Affected patients should if possible be isolated and nursed by a separate staff. Nasal carriers of the epidemic strain should be detected and treated if possible. We have recently had encouraging results in a preliminary trial of "graneodin" ointment in the treatment of nasal carriers. This ointment contains gramicidin and neomycin. Its application to the nostrils four times a day for a week or two has usually cured the carrier state. E. S. Duthie (personal communication) has also had encouraging results in a more extensive trial of this method. Rountree *et al.* (1956) have reported success in controlling neonatal staphylococcal infection by treating the noses of the staff with an ointment containing bacitracin and neomycin.

Summary

An outbreak of pemphigus neonatorum in a maternity hospital followed the introduction by a nasal carrier of *Staph. aureus* phage type 71.

For four months before the outbreak started an investigation of staphylococcal cross-infection had been conducted in the hospital, and this investigation was continued during the outbreak. It was therefore possible to detect the epidemic strain during the period which elapsed between its introduction into the hospital and the outbreak of pemphigus.

We thank the consultant clinical staff of the Bristol Maternity Hospital for permission to carry out this investigation, and the matron and nursing staff for their co-operation.

REFERENCES

- Alder, V. G., Gillespie, W. A., and Thompson, Margaret E. M. (1955). *J. Path. Bact.*, 70, 503.
- Allison, V. D., and Hobbs, Betty C. (1947). *British Medical Journal*, 2, 1.
- Barber, Mary, Wilson, B. D. R., Rippon, Joan E., and Williams, R. E. O. (1953). *J. Obstet. Gynaec. Brit. Emp.*, 60, 476.
- Barrow, G. I. (1955). *J. Hyg. (Lond.)*, 53, 495.
- Blowers, R., and Wallace, K. R. (1955). *Lancet*, 1, 1250.
- Clarke, Suzanne K. R., Dalgleish, P. G., Parry, E. W., and Gillespie, W. A. (1954). *Lancet*, 2, 211.
- Elliott, S. D., Gillespie, E. H., and Holland, E. (1941). *Ibid.*, 1, 169.
- Gillespie, W. A., and Alder, V. G. (1952). *J. Path. Bact.*, 64, 187.
- Gould, J. C., and McKillop, Elizabeth J. (1954). *J. Hyg. (Lond.)*, 52, 304.
- Hobbs, Betty C. (1944). *Monthly Bull. Minist. Hlth (Lond.)*, 3, 11.
- Murray, J., and Calman, R. M. (1955). *British Medical Journal*, 1, 81.
- Parker, M. T., and Kennedy, J. (1949). *J. Hyg. (Lond.)*, 47, 213.
- Tomlinson, A. J. H., and Williams, R. E. O. (1955). *Ibid.*, 53, 458.
- Rountree, Phyllis M., and Barbour, R. G. H. (1950). *Med. J. Aust.*, 1, 525.
- Heseltine, M., Rheuben, J., and Shearman, R. P. (1956). *Ibid.*, 1, 528.
- Spittlehouse, K. E. (1955). *Lancet*, 2, 378.
- Williams, G. C., Sims-Roberts, Carol, and Cook, G. T. (1947). *Monthly Bull. Minist. Hlth (Lond.)*, 6, 13.
- Williams, R. E. O., and Rippon, Joan E. (1952). *J. Hyg. (Lond.)*, 50, 320.

Medical Memoranda

Fatal Thrombocytopenic Purpura Due to Quinidine

Moodie (1950) reported the first case of thrombocytopenic purpura due to quinidine in this country and reviewed five others. Since then 22 further cases have been described, all of which recovered completely. We wish to report a fatal case.

CASE REPORT

A foundry manager aged 40 had no serious illnesses until the onset of angina pectoris in September, 1955. He was away from work for four weeks following myocardial infarction in April, 1956, and was admitted to hospital on July 17 with a fresh antero-septal infarct. He was treated with heparin for 24 hours after admission and phenindione ("dindevan") for six weeks, until September 1, when he left hospital. The prothrombin index was maintained around 40, without bleeding episodes or purpura.

On his fifth day in hospital he developed paroxysmal ventricular tachycardia, for which he was given procaine amide ("pronestyl"). Because of recurrent paroxysms a total of 68 g. of procaine amide was given over the next 20 days. His leucocyte count fell from 9,700 to 3,700 per c.mm., as frequently occurs with this drug, and later returned to the normal level. When the paroxysms started he was given a test dose of quinidine followed by 5 gr. (0.32 g.) six-hourly for six days, and 10 gr. (0.65 g.) six-hourly for 37 days until he left hospital.

He was sent home on a maintenance dose of quinidine, 5 gr. (0.32 g.) three times a day. After 16 days—when he had taken a total of 1,840 gr. (119 g.)—he noticed spots on his legs, and haematuria developed two days later. We saw him on the twentieth day, stopped the drug, and readmitted him to hospital (September 21). He then had severe purpura on the face and limbs, some spots on the trunk, and macroscopic haematuria. There were no retinal haemorrhages and the spleen was not palpable. The blood pressure was 130/80.

Blood examination showed: haemoglobin, 95% (14 g./100 ml.); W.B.C., 7,500 per c.mm., with a normal differential count; platelets 56,000 per c.mm.

At 3.20 a.m. the next day he woke with dysarthria and weakness of the right arm and the right side of the face. At 5 a.m. he lost consciousness, had a severe epistaxis at 6 a.m., and died one and a half hours later.

Necropsy.—Small submucous haemorrhages were found in many viscera and in the muscles and connective tissue throughout the body, and large haemorrhages occurred in both renal pelves and in the left cerebral hemisphere. The spleen was enlarged (370 g.) and very soft. There was severe coronary atheroma with old and recent myocardial

infarction. The bone marrow appeared normal on microscopy, and megakaryocytes were numerous, but details of their morphology could not be studied in the material available.

COMMENT

The subject of quinidine purpura has been reviewed by Bolton and Dameshek (1956).

Sex and Age.—Of the 29 recorded cases only 5, including this one, were in men. This is parallel with the incidence of idiopathic thrombocytopenic purpura, which is said to be "almost wholly confined to women when the first symptoms appear in adults" (Castle, 1955). There have been no reported cases of quinidine purpura in children; most patients have been over 55 years and a few were over 70 (Collins, 1950; Lipson, 1952; Aakesson, 1952). Since quinidine is more often employed in young patients it seems that elderly women are most liable to the hazard.

Sensitizing Dose.—Purpura may occur at any stage in quinidine therapy, and in this case it appeared after eight weeks' treatment and a total dosage of 1,840 gr. (119 g.). Some patients have become sensitive after only a few days and a total dose of less than 50 gr. (3.2 g.) (Larimer, 1949; Moodie, 1950). Others have taken several hundred grains over one or two months before developing purpura for the first time. Bigelow and Desforges (1952) had a patient who had taken quinidine daily for two years before purpura appeared. In patients who have previously had quinidine purpura a test dose of 3–6 gr. (0.2–0.4 g.) has rapidly produced severe thrombocytopenia in almost all recorded cases. One exception developed fever and a rash. A patient (Norcross, 1950) who had three purpuric episodes in seven years nearly died in coma with convulsions after 9 gr. (0.6 g.); and a later test dose of 3 mg. reduced the platelets to 33,500 per c.mm. Moodie (1950) describes an unsuccessful attempt at desensitization. It thus appears that quinidine is absolutely contraindicated in patients who have had quinidine purpura.

Pathogenesis.—Platelet antibodies, defective maturation of the megakaryocytes, and capillary damage have all been implicated in the production of quinidine purpura. The extreme thrombocytopenia occurring within a few hours of a test dose of quinidine (Nussbaum and Shulman, 1952; Larson, 1953) implies destruction or removal of circulating platelets, apart from any action on the bone marrow, the usual platelet life being two to seven days. As in purpura due to "sedormid" (Ackroyd, 1949), the patient probably forms antibodies to a drug-platelet complex. The serum of these patients agglutinates normal platelets in the presence of quinidine (Bigelow and Desforges, 1952), and agglutination is followed by lysis if complement is also present (Ackroyd, 1949; Bolton and Dameshek, 1956). In essential thrombocytopenia the marrow usually contains a normal proportion of megakaryocytes, though there may be a preponderance of abnormal or immature forms, of which the appearances suggest depressed platelet formation. This latter picture is described by Hirsch and Dameshek (1950) and Phelps (1951) in cases of quinidine purpura. Marrow obtained at necropsy in the present case contained a normal proportion of megakaryocytes, but their morphological details could not be discerned. Bleeding is not simply related to the severity of thrombocytopenia, and capillary dysfunction is equally important. Ackroyd (1949) demonstrated that in susceptible patients patch tests with sedormid produce local haemorrhage and capillary fragility without thrombocytopenia. However, a patch test with quinidine was negative in Larson's (1953) case, and Bolton and Dameshek (1956) were unable to detect capillary antibodies in their cases.

Prognosis.—In 28 published cases purpura subsided within a few days of stopping the quinidine, and the platelets were normal in one or two weeks. The platelets may continue to fall for two days (Phelps, 1951). The fatal outcome in this case cannot be attributed solely to his taking quinidine for four days after the appearance of petechiae, since many other patients did this without serious consequences. One

other fatal case of purpura was mentioned at a discussion on quinidine therapy (Gold, 1954), but details are not available. Although spontaneous recovery is the rule, it is by no means certain or predictable. In view of the action of cortisone and corticotrophin in suppressing antigen-antibody reactions, there are good grounds for the early use of these drugs in all cases of drug purpura.

CONCLUSIONS

A test dose of quinidine, however small, is contraindicated in patients who have had purpura due to quinidine. Drug purpura should be treated with cortisone or corticotrophin, since the condition is potentially fatal and antigen-antibody reactions appear to be involved.

We are grateful to Dr. R. L. Mackay for permission to report this case and to Dr. A. G. Marshall for the necropsy findings.

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REFERENCES

- Aakesson, S. (1952). *Cardiologia (Basel)*, 21, 762.
- Ackroyd, J. F. (1949). *Clin. Sci.*, 7, 249.
- Bigelow, F. S., and Desforges, J. F. (1952). *Amer. J. med. Sci.*, 224, 274.
- Bolton, F. G., and Dameshek, W. (1956). *Blood*, 11, 527.
- Castle, W. B. (1955). In Cecil and Loeb's *Textbook of Medicine*, 9th ed., p. 1200. Philadelphia.
- Collins, D. C. (1950). *Circulation*, 2, 438.
- Gold, H. (1954). *Amer. J. Med.*, 17, 398.
- Hirsch, E. O., and Dameshek, W. (1950). *Ibid.*, 9, 828.
- Larimer, R. C. (1949). *Canad. med. Ass. J.*, 60, 508.
- Larson, R. K. (1953). *Blood*, 8, 16.
- Lipson, L. (1952). *N.Y. St. J. Med.*, 52, 586.
- Moodie, G. (1950). *British Medical Journal*, 2, 553.
- Norcross, J. W. (1950). *New Engl. J. Med.*, 242, 53.
- Nussbaum, H. E., and Shulman, M. W. (1952). *Ann. Intern. Med.*, 37, 190.
- Phelps, J. E. (1951). *J. Mo. med. Ass.*, 48, 905.

Rheumatoid Arthritis of the Larynx

A male clerk aged 61 had developed rheumatoid arthritis 30 years previously and had received various treatments during this period, leaving him with marked deformity of hands, wrists, and elbows, and rheumatoid nodules over the latter. For some years he had had a productive cough, and chest x-ray changes were known to be compatible with some bilateral basal bronchiectasis. For three months he had noticed increasing dyspnoea on exertion and huskiness of his voice; severe dyspnoea and wheezing had supervened for two days before I was asked to see him at his home as a case of "asthma." He had marked inspiratory and moderate expiratory stridor; laryngeal obstruction was diagnosed and he was admitted to hospital at once.

Laryngoscopy and bronchoscopy were performed under local analgesia by Mr. Mearns Milne. The vocal cords showed some whitish nodules on both vocal processes and a very narrow glottic aperture. The bronchial tree contained a large quantity of infected sputum but was otherwise normal. Tracheostomy was performed with great relief to the patient's condition. Biopsy of one of the vocal nodules showed a vascular fibrous core covered by somewhat hyperplastic squamous epithelium; no significant inflammatory reaction was present. Indirect laryngoscopy was later performed by Mr. Douglas Fairman, who reported that the vocal cords showed slight abduction on inspiration so as to produce a very small glottic chink, and they adducted on phonation. He confirmed the presence of nodules on the vocal processes of the arytenoids and the upper surface of the left vocal cord, and he suggested that the laryngeal condition was produced by an ankylosing arthritis of the crico-arytenoid joints.

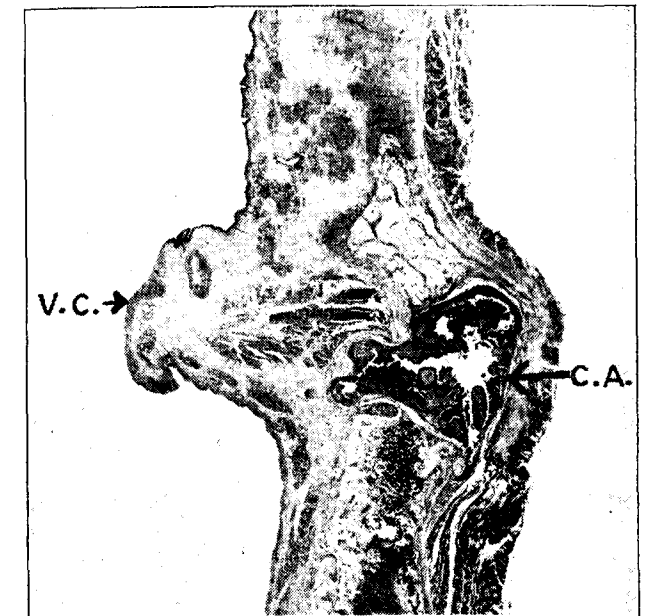
The patient was thereafter treated by physiotherapy for his bronchial infection, together with catheter suction through his tracheostomy tube, which was later changed to a permanent type. Constant difficulty in expectoration persisted,

however, and four months after admission he developed an acute respiratory infection with extensive consolidation in both lower lobes. This failed to respond to treatment, including antibiotics, and he died.

Necropsy by Dr. R. J. Sandry confirmed the cause of death as bilateral basal bronchopneumonia; some bronchiectasis was present in both lower lobes, but no "rheumatoid" changes were found in the lungs. The laryngeal appearances previously seen were confirmed, and histological section showed, as suspected, changes in the crico-arytenoid joints characteristic of rheumatoid arthritis (see illustration).

COMMENT

This same condition seemed very probable in a patient who recently died at home, with no necropsy. When seen at the age of 83 she gave a 35-year history of rheumatoid arthritis, with which she was completely crippled. Some degree of laryngeal stridor and dyspnoea at rest had been



Longitudinal section of larynx (x4). V.C.=vocal cord. C.A.=crico-arytenoid joint showing villous synovial proliferation.

noted progressively for over three years, and her voice had become more husky and deep in tone, rather similar to that in myxoedema, of which in her case there was no evidence. Her general condition and neck posture made even indirect laryngoscopy impossible, so that the laryngeal diagnosis remained unproved.

While crico-arytenoid arthritis has been recorded by laryngologists (Ellis, 1951; de Vido and Ancetti, 1952) it is a rare and scarcely recognized condition in general medical practice. Hart and Mackenzie (1955) encountered laryngeal stridor requiring tracheostomy in a man with chronic rheumatoid arthritis. They considered that abductor palsy was the cause but could not account for this except possibly on a basis of previous deep x-ray therapy for thyrotoxicosis. Histologically they reported diffuse fibrosis in the region of the vocal cords, but did not specifically refer to the crico-arytenoid joints. It seems likely that, in their case also, arthritis of these joints was present as an explanation of the findings.

If laryngeal stridor occurs in a case of rheumatoid arthritis, it is suggested that the most likely cause is involvement of the crico-arytenoid joints by the disease process.

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REFERENCES

- de Vido, G., and Ancetti, A. (1952). *Minerva otorinolaryng. (Torino)*, 2, 479.
- Ellis, M. (1951). *British Encyclopaedia of Medical Practice*, 2nd ed., 7, 629. London.
- Hart, F. D., and Mackenzie, D. H. (1955). *British Medical Journal*, 2, 890.

Reviews

CELL FUNCTION

New Pathways in Cellular Pathology. By Gordon Roy Cameron, M.B., D.Sc.(Melb.), F.R.C.P., F.R.S. (Pp. 90+ vii; illustrated. 16s.) London: Edward Arnold (Publishers) Ltd. 1956.

This slim volume of 88 pages and eight short chapters is an expansion into a monograph of two lectures given by the author, one in Leeds in 1954, the other in Dublin in the following year. The book serves as an excellent and remarkably stimulating introduction to the author's authoritative treatise on the pathology of the cell. He is the leader of a group of scientific optimists who found themselves "dissatisfied and often discouraged by the morphological outlook on cellular pathology" and "turned to recent biochemical and biophysical techniques" which they hoped "might illuminate" some of their difficulties. They have been "encouraged to go on with increasing hope." The following are some of the modern techniques they have used: (1) The study of cell respiration in organ and tissue homogenates and in organ slices; (2) differential centrifugation of the disrupted cell at speeds reaching several hundred thousand times gravity; (3) investigation of the enzymatic potencies of each cell constituent—for example, the mitochondria, in which more than 20 enzyme systems have already been identified; (4) electron photomicrography of excessively thin slices of cells at a magnification exceeding 90,000 diameters; (5) autoradiography.

These new techniques ruthlessly reduce conventional morphology to the molecular level and produce valid evidence about cell function. For example, each of the millions of leaf-like laminae which can be seen crossing the long axis of the suitably magnified mitochondria have the same size as a molecule of succinoxidase, an enzyme which occurs exclusively in these organelles.

The author warns us that the application of these new disciplines to pathology is fraught with disappointments "which will daunt the courage of the most intrepid voyager," but "it would be wrong to despair even though discovery often means one step forward and two steps backward." In spite of this he is able to describe with uncanny accuracy and precision the intracellular biochemical lesions which many injuries produce, to account for functional cellular failure, and to locate this at the cell membrane or in a particular cell organelle. The effect on cell function of poisons such as thioacetamide, carbon tetrachloride, fluoracetic acid, *o*-dinitroresol, *Clostridium welchii* toxin, and lewisite are pin-pointed at the molecular level, and infinitely more satisfying reasons than simple morphological change are adduced for the manifestation of copper deficiency in cattle, vitamin-B₁₂ deficiency, cloudy swelling, hydropic degeneration, fatty degeneration, calcification, and proteinuria.

Professor Cameron's book is a challenge to the complacent attitude of the conventional pathologist. He appeals for recruits to this new scientific discipline in these words: "My one purpose is to talk to you about the way we are working and thinking in the hope that you, too, may share the excitement of exploring new pathways in cellular pathology," and "if I can entice the reader to set his imagination to work in designing this new world, then I shall have succeeded in my task."

GEOFFREY HADFIELD.

BACTERIOLOGY AND IMMUNITY

An Outline of Bacteriology and Immunity. By Ronald Hare, M.D. (Pp. 418+ix; illustrated. 35s.) London, New York, Toronto: Longmans, Green and Co. 1956.

It is refreshing to find a textbook of bacteriology written on really original lines. Professor Hare has reduced the descriptive part of his book to a minimum—all the cocci and bacilli are herded together in only four chapters occupying 73 pages—in order to concentrate on the general aspects

of his subject. Six chapters are given to immunity, and they include fuller and clearer explanations of many phenomena than are to be found in most other books; there are numerous graphs of antibody responses and illustrations of various antigen-antibody reactions. Another favoured subject is what may be called hygiene, with a very full discussion of how micro-organisms are disseminated by cases or carriers, including original observations by the author. This section includes an exceptionally full list of animal sources of infection, and an interesting original compilation of data in graphic form showing variations in the duration of infectivity after attacks of six diseases. The usual chapters on morphology and cultivation treat viruses equally with bacteria in the text and much more generously in illustration. There are also chapters on bacterial metabolism, on disinfection (is it not rather sweeping to condemn alcohol as "too weak to be of practical value"?), and on chemotherapy. The nomenclature is ultra-modern, including the adoption of *Bordetella*; we are not told how to pronounce this name; nor in denying the entitlement of the organism of whooping-cough to be called *Haemophilus* is it mentioned that the medium best suited to its growth contains much more blood than any other in regular use. There are many very beautiful illustrations, and (as seems to happen even in the best books) a few unrecognizable ones, such as those on pages 317 and 347. The footnote references to important papers are a useful feature.

The book will be deservedly popular among students who are learning the subject as they need to know it for the intelligent practice of medicine. For those so fortunate as to do rather more bench work, or for anyone using it as a practical guide in diagnostic proceedings, the scanty references to technique and rather meagre descriptions of individual species may be a drawback. If the descriptive section were expanded and included some of the material from Chapter XI on methods of immunization, it could also give a clearer picture of the kinds of disease for which each organism is responsible, and reflect a little of the drama of early work on such subjects as anthrax, rabies, and plague.

L. P. GARROD.

CEREBRAL ORGANIZATION

The Organization of the Cerebral Cortex. By D. A. Sholl. (Pp. 125+xvi; illustrated. 18s.) London: Methuen and Co. Ltd. 1956.

All whose studies are concerned with the organization of the cerebral cortex should make a point of reading this book, for it contains compelling evidence that they should think in terms of a model based on the concept of probability and discuss their observations in statistical terms. Readers not conversant with the technical language of neurology, or those without any scientific training, may find the early chapters a little heavy going, but they should not allow this to deter them from finishing the book, for the meaning is never obscured by the technical terms employed. The use of such terms in a book of this scope and length is necessary if only to persuade specialists that they cannot afford to ignore its message.

The author has attempted to present a unified view of some of the recent work on the organization of the cerebral cortex which has been carried out by anatomists, clinicians, physiologists, and psychologists in order to correlate the results of these various disciplines. His own work has led him to adopt a statistical approach to the problems, and the book is written from this point of view. The account which he gives is necessarily incomplete, and he admits that future research may show that some of the interpretations which he has made are unjustified. Even if this proves to be the case, it is unlikely to affect the conclusions at which he arrives.

Dr. Sholl is to be congratulated on having written this book. He has approached a most difficult subject with commendable caution and modesty. The account which he gives is judicious and entirely free from special pleading. It offers no easy solution; on the contrary, he shows that none is

TEXTBOOK OF MEDICINE

Internal Medicine: A Physiologic and Clinical Approach to Disease. By Robert P. McCombs, B.S., M.D., F.A.C.P. (Pp. 706+xxi; illustrated. 75s.) Chicago: The Year Book Publishers Inc. London: Interscience Publishers Ltd. 1956.

This short textbook by the professor of medicine at Tufts University, Boston, is divided into 12 chapters dealing respectively with the heart, hypertension and vascular disorders, the kidney, body fluids and electrolytes, endocrinology, infectious diseases, the lung, allergy, gastro-enterology, the blood, rheumatic disorders, and metabolic disorders. Thus neurology, psychiatry, electrocardiology, and dermatology have been deliberately omitted. Each chapter gives an excellent summary of the relevant applied physiology, followed by brief but accurate and well-balanced accounts of the commoner diseases. At the end of each section there is a short list of useful references (all save one or two, it need hardly be added, to American work). Salt and water metabolism and endocrinology are particularly well done; by contrast, the gastro-enterology section is perhaps a little disappointing. The approach is essentially practical throughout, so that discussion of controversial or purely theoretical matters has been avoided and laboratory diagnostic procedures have not been over-stressed at the expense of clinical methods.

The emphasis being, commendably, on the common and important things, there is an absence of detail which, together with a rather sketchy index, limits the value of the book as a work of reference. It is clearly intended to be read as an introduction to medicine, or for revision, and for these purposes it is admirable. It can be strongly recommended to anyone seeking a concise account of the fundamentals of internal medicine to-day.

J. C. HOUSTON.

ESSENTIALS OF SURGERY

A Short Practice of Surgery. By Hamilton Bailey, F.R.C.S., F.A.C.S., F.I.C.S., F.R.S.E., and R. J. McNeill Love, M.S., F.R.C.S., F.A.C.S., F.I.C.S., with chapters by John Charnley, F.R.C.S., William P. Cleland, M.R.C.P., F.R.C.S., and Geoffrey Knight, F.R.C.S., and pathological illustrations by L. C. D. Hermitte, M.B., Ch.B. Tenth edition. (Pp. 1,126+ viii; illustrated. 84s.) London: H. K. Lewis and Co. Ltd. 1956.

The facts that this well-known textbook has reached a tenth edition and that 80,000 copies have been sold within the last 25 years are sufficient testimony that it presents an adequate account of the essentials of modern surgery. Surgery is now so vast a subject that even a "short practice" needs over 1,000 pages to contain it; and reading through several sections of this book convinces one that the authors have needed considerable skill to condense necessary knowledge into small compass.

The surgery of three specialties has in this edition been described by specialists. Mr. William Cleland, Mr. John Charnley, and Mr. Geoffrey Knight deal respectively with thoracic surgery, orthopaedic surgery, and neurosurgery, and in each instance the rewritten section is excellent. The style of writing is clear and there are even traces of humour and mild satire. On page 764 we are told of the only known pathological evidence of the existence of a weaker sex, while on page 930 the advice is given to administer the latest fashionable drug for vasospasm. The description of intra- and extra-capsular fractures of the neck of the femur on page 958 shows how radiological is displacing clinical diagnosis. The parts written by Mr. Hamilton Bailey and Mr. McNeill Love maintain their high standard of excellence.

No review of this book would be complete without a tribute to the publishers and printers for the excellent production. Paper and typography are good, and both plain and coloured illustrations are well placed and excellently reproduced. This edition certainly gives as succinct and up-to-date an account of modern surgery as is possible in these days of rapid progress.

ZACHARY COPE.

IMMUNOLOGY

Fundamentals of Immunology. By William C. Boyd. Third edition. (Pp. 776+xiv; illustrated. \$10.) London and New York: Interscience Publishers Inc. 1956.

This is a well-produced and readable work. As the title implies, it deals with the fundamentals of immunology and gives an excellent account and appraisal of the facts and theories relating to immunology, antibodies, antigens, blood groups, antigen-antibody reactions, and hypersensitivity as well as autoimmunization. There is also a most helpful chapter on the practical use of immunity and hypersensitivity, but the final chapter on laboratory and clinical technique leaves much to be desired and deserves much more than the space (118 pages) allotted to it. At the end of each chapter a well-selected list of references is given which should be useful to those readers who wish to consult original papers. The main difficulty of the reviewer is to decide for whom the book is written. It is certainly not suitable for the majority of undergraduate medical students in this country. For example, few have the time to contemplate the mathematical arguments concerning antigen-antibody reactions (pp. 336-45), and most of them would be intimidated by the equation at the top of page 344. This volume could be used as a book of reference, but would probably have a greater appeal to those students taking a science degree in bacteriology or those qualified practitioners who are in the early stages of a clinical bacteriological career.

I. N. ORPWOOD PRICE.

METABOLIC REGULATION

La Régulation des Processus Métaboliques dans l'Organisme. By Théophile Cohn. (Pp. 681. No price.) Paris: Presses Universitaires de France. 1956.

This is a colossal work, probably representing the labour of many years, in some 700 large pages, all of which I do not pretend to have read. The author is a director of research in Paris and has set out to co-ordinate our knowledge of the total regulation of the metabolic processes of the body, and fulfils this task as well as possible in such a widespread field. He divides his book into three sections. The first deals in detail with the metabolism of carbohydrate, proteins, and fats; the second with the transformation of metabolites and their combustion; the third with total metabolic co-ordination. Detailed biochemistry is avoided throughout and most emphasis laid on the endocrine system and the fundamental animal experiments from which knowledge grew. The relation of these to human disease is briefly but adequately mentioned, and in all sections historical aspects are interestingly included. The bibliography is enormous, including some 1,700 references, and the spelling of non-French names is unusually accurate. The only error noted is that Banting and Best discovered insulin in 1921, not 1923, and it seems strange that Banting's name does not appear in the references.

This book is a fine intellectual study on which the author is to be congratulated. But inevitably there is this tragedy with such books in that they are always out of date, at least for specialists, before they are published. The latest references are 1952, since when new knowledge and ideas make the work already behind the times.

R. D. LAWRENCE.

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FOURTH SYMPOSIUM ON ANTIBIOTICS

A symposium on antibiotics in Washington seems now to be a regular annual event, and the report¹ of the fourth of these meetings, held in October last, is again larger than its forerunners. It consists of 1,134 pages and contains 154 papers and apparently verbatim reports of three panel discussions. The grain in these contributions is mixed with a high proportion of chaff, and not only are no major discoveries reported but the number of papers containing really significant and hitherto unreported material is small. Nevertheless this unwieldy volume has much value in reflecting trends of thought, particularly in the United States. The problem which evidently most exercised the minds of participants was that of antibiotic-resistant infections and measures for their prevention. So far as this concerns cross-infection in hospitals, it is refreshing to read a spirited contribution to a panel discussion by Pulaski, demanding as rigid an application of aseptic principles in wards as in operating theatres and specifying features of a safer wound-dressing technique. It is mentioned here that 70% of the antibiotics used in surgical services are given prophylactically, and that proof of the efficacy of many such procedures is lacking. Unfortunately there appears to have been little discussion of the more questionable of these uses: the only specific example in the programme was entitled "Antibiotics in Intestinal Antisepsis." In this connexion speakers seem to have been agreed that antibiotic preparation before colonic surgery is valuable, and that the sulphonamides are outmoded for this purpose. Although methods in great variety were advocated, neomycin was the favourite stand-by, usually given, after mechanical cleansing of the bowel, for only one day before operation and usually combined with another antibiotic such as erythromycin or bacitracin, which has an action particularly on the Gram-positive flora.

Many of the communications were concerned, explicitly or implicitly, with another aspect of the

problem of bacterial resistance—that is, the advisability of using pairs of antibiotics in the hope of delaying the emergence of resistance. Studies of several new combinations of this kind were reported, notably the mixture of tetracycline and oleandomycin known as "sigmamycin," and the chairman, Dr. Henry Welch, went so far in his introductory remarks as to divide the history of antibiotic therapy into three eras—"narrow spectrum," "broad spectrum," and "combinations." This elevation of a selling point to the status of a major advance in therapeutics has provoked a vigorous rejoinder from Maxwell Finland and eighteen other internationally known physicians² in the U.S.A., who conclude by saying that they conceive it the duty of clinical investigators and authors "to protect the medical profession and the public against the abuse of preliminary scientific information and against the improper and premature exploitation of conclusions based on inadequate data." A full-scale debate on this important question of principle would have been interesting, and never took place, but it is quite evident that leading medical authorities in the United States dislike fixed commercial combinations, and would prefer to prescribe mixtures in the proportions they deem desirable for such individual patients as they think require them. It was repeatedly emphasized that combinations do not have the advantage claimed unless the organism is sensitive to both components. The only study reported of which the object was to determine whether combinations delay the clinical acquisition of resistance was made by M. H. Lepper and his colleagues at the Municipal Contagious Disease Hospital, Chicago: novobiocin and spiramycin were the drugs used, and the conclusion was that combined treatment delayed the appearance of resistant strains by about two months only.

Another panel discussion and many other papers were concerned with the use of antibiotics as food preservatives. Statistics of food production and wastage in the United States show how huge the possible savings might be if food could be effectively and safely preserved by this means. It seems that only the tetracyclines are suitable for the preservation of flesh foods. So far only the treatment of poultry is permitted, and assays of chicken meat so treated show that the residue of antibiotic is destroyed by cooking. This does not appear to be true of fish when baked or fried, and should the preservation of fish be permitted it will have to be asked whether the human consumption of food containing small but detectable amounts of tetracycline antibiotics has any serious disadvantages. Does exposure to such low concentrations evoke bacterial resistance to higher

ones? It is surprising that apparently none of the numerous workers who have devoted so much energy to this subject should have tried to settle this fundamental question. Vegetables and fruit are also in this picture, and there is even the tentative suggestion that an antibiotic might be added to milk, but this only in areas affected by kwashiorkor and innocent of refrigerators. One speaker declared that it "will be necessary to engineer and integrate the use of the antibiotic compounds into production lines" and envisaged the successive treatment of foods by antibiotics, vacuum packing with an antioxidant, microwave heating to inactivate enzymes, radiation to produce surface sterilization—possibly with the addition of chemicals to reduce consequent flavour changes—and finally low-temperature storage. It seems superfluous to add: "Such a procedure would produce foods and food products certainly different from those that we are accustomed to to-day. . . ."

Other papers read at the symposium dealt with new antibiotics, new forms of old antibiotics and some less familiar uses for them, and methods of sensitivity-testing with their results. Comparatively new antibiotics about which there is further but largely repetitive information are vancomycin, oleandomycin, and novobiocin. One paper reports favourably on the treatment of urinary-tract infections with novobiocin, although the concentrations attained in the urine were in some cases lower than those in the blood: so little of this antibiotic is excreted by the kidney that its choice for this purpose seems strange. A series of six papers on synnematin B, now known to be a form of penicillin, deals exclusively with laboratory studies: it is not clear whether further clinical application of this antibiotic is contemplated. Workers in the American antibiotic industry are continuing to unearth far more new antibiotics than all the rest of the world put together, and two among the actually new antibiotics described at the symposium appear more interesting than the rest: amphotericin has some action in the systemic mycoses, and ristocetin has a wide range of antibacterial action, embracing among other species the tubercle bacillus. The origins of ristocetin are agreeably colourful: the species forming it is named *Nocardia lurida*, and the soil sample from which this was isolated came from the Garden of the Gods, Colorado. Although ristocetin can be given only intravenously, it has been used by M. J. Romansky and his colleagues for the treatment of 16 patients, including cases of pneumonia and one of bacterial endocarditis, with satisfactory results. Among miscellaneous items of information, it is interesting to read that the delicious perfume of the balsam poplar has a powerful action on tubercle bacilli.

AUTHORITY AND TREATMENT

Juvenile courts were legally established in Great Britain just under fifty years ago. It is generally agreed that in most respects they have worked well, but the development of child psychiatry on the one hand and, on the other, the growth of special social services for children under the Children Act (after the Curtis Report) have led to many suggestions for reform. The departmental committee recently set up by the Home Secretary, with Viscount Ingleby as chairman, will doubtless be considering such new ideas. Its terms of reference fall into two parts, the one concerned with the legal side—powers, procedure, available methods of disposal and so forth in the juvenile courts—the other with preventive action by the child-care authorities for children neglected in their own homes. The report^{1 2} by the joint committee of the British Medical Association and the Magistrates' Association made valuable recommendations in this second topic. It is of interest also to note that the Ingleby Committee is asked to look at the working of the law in relation to "the prevention of cruelty to, and exposure to moral and physical danger of, juveniles."

In all the evidence that the new committee will receive, as Dr. Eileen Younghusband points out in a special number of the *British Journal of Delinquency*,³ there will unfortunately be none by the children themselves. In their anxiety to see that what they do is in the interests of the welfare of the child before them, many magistrates are facing the dilemma that the children and adolescents fail to appreciate (or even listen to) their words of helpful advice, while at the same time this sort of approach may weaken the value of the awe and prestige which the majesty of the law is held to confer. The comments of some intelligent teenagers would be helpful but do not seem to have been recorded. The confusion is especially apparent for children brought to the court as in need of care or protection or even as "beyond control." The need for the family and child-welfare services advocated by Dr. Younghusband is then paramount, yet the whole setting of the court system is not far removed from that used in the trial of adult criminals. It is perhaps a preoccupation with this aspect of the work of the juvenile courts that has led certain reformers to question the attribution of guilt, leading to such an antithesis as "sickness or sin," which was the title of a provocative article⁴ last year by Professor Barbara Wootton, herself an experienced juvenile-

¹ Joint Committee of B.M.A. and Magistrates' Association, *Cruelty to and Neglect of Children*, 1956, B.M.A.
² *British Medical Journal*, 1956, 1, 1286.
³ Younghusband, E., *Brit. J. Delinqu.*, 1957, 7, 181.
⁴ Wootton, Barbara, *Twentieth Century*, May, 1956.
⁵ Cavenagh, W. E., *Brit. J. Delinqu.*, 1957, 7, 196.

¹ *Antibiotics Annual 1956-57*, edited by H. Welch and F. Marti-Ibanez, 1957, New York.

² *Antibiot. Med.*, 1957, 4, 17.

court magistrate. The same theme is seen in the phrase "clinic or court?" And it must be admitted that with certain behaviour problems it is often a matter of chance whether or not a child is sent to a child-guidance centre or brought before the courts. Dr. Younghusband describes the difficulties by posing the two aspects: the law assumes that the law-breaker could have refrained from breaking it "and is therefore guilty of an offence; while medical treatment . . . is based upon an attempt to understand causation and to prescribe appropriate treatment." Her comment is that this is "the new wine which is proving so heady in the juvenile courts." One weakness is that, whereas in London the panel of magistrates for juvenile courts is specially chosen and is thus essentially composed of people with an interest in children, outside this area the method of appointment to the Bench restricts it to those already on the Bench for adult courts. In consequence magistrates may be deplorably ignorant of modern work on the emotional development of children and their personal difficulties in a faulty family setting.

Perhaps an even more dangerous feature of the new doctrine is that whereas something in the nature of child welfare committees, as in Sweden, may be admirable for sorting out a child's problems, when it comes to removing the child from his parents there must be some legal sanction. Mrs. W. E. Cavenagh,⁵ also a contributor to the *British Journal of Delinquency* symposium, quotes the Lord Chief Justice as saying last year: "No persons of any age are to be confined in institutions merely because doctors and officials think it would be good for them." Even, then, if the welfare of the child after careful investigation on judicial lines points strongly to the need for institutional care, public (and legal) opinion would probably always insist that this can be achieved only by the processes of the law. The difficulty here is that a relatively minor offence may reveal a deplorable family situation crying out for at any rate temporary removal of the child offender to different surroundings to give him a chance in life, while a more serious lapse, when the child has reliable parents prepared to take responsibility for the future, may well be dealt with by a period of probation. Superficially, and certainly to the parents in the former instance, there is here something which looks grossly unjust.

This is one of the problems which the Ingleby Committee will have to consider, and indeed throughout its deliberations the twin functions of the present-day juvenile court—authority and treatment—will be ever before them. As Dr. Younghusband remarks, it is the probation officers who now reconcile these two functions and seek by good case-work to "help the offender and his parents to come to terms with each

other and with society." Public opinion, with medical approval, has been moving away from physical punishment for the juvenile offender, whether by birch or restraint on freedom. There is just a danger that sentimentality may be creeping in heavily disguised as ill-digested psychological knowledge. To correct this there is room for more medical practitioners, interested and experienced in children's troubles, to sit on the Bench in the juvenile courts to-day.

SURGERY OF AORTIC STENOSIS

Several hundred operations for aortic stenosis have now been performed, nearly all during the past five years. C. P. Bailey of Philadelphia in 1956 with several colleagues¹ published a report on 287 operations, and in the opening pages of this issue Sir Russell Brock describes his experiences, based on 108 operations, and gives an encompassing review of what is known of this lesion. Surgery, the only treatment which can alter a stenotic aortic valve, should now at least be considered in all cases, certainly if there is evidence of deterioration. Sir Russell Brock makes a strong plea for operation before the left ventricle is damaged, and his arguments demand attention. He rightly stresses that obstruction to the outlet of the left ventricle, the most important muscular organ in the body, should be relieved as urgently as obstruction to the exit from any other hollow viscus, such as the bladder, the colon, or the biliary system. As in these fields of surgery, good results cannot be expected if obstruction has been long-standing and its effects profound and perhaps nearly fatal.

Aortic stenosis is usually a sequel to rheumatic fever. Rarely it is a congenital lesion, when hypoplasia of the base of the aorta, an associated sub-valvar stenosis, and post-stenotic dilatation of the ascending aorta are often present. Arteriosclerosis may sometimes cause aortic stenosis, usually with associated regurgitation. As in disease of the mitral valve, rheumatic aortic stenosis may also be accompanied by regurgitation. The abnormality of the valve is due to the organization of vegetations and fibrin deposits on cusps; scar tissue thickens the lunules and obliterates the commissures, asymmetrically and centripetally; and late contraction further narrows the lumen or, by preventing approximation of the cusps, allows reflux. I. K. R. McMillan² has clearly shown the inefficient action of the diseased

¹ Bailey, C. P., Bolton, H. E., Nichols, H. T., Jamison, W. L., and Litwak, R. S., *J. thorac. Surg.*, 1956, 31, 375.
² McMillan, I. K. R., *Brit. Heart J.*, 1955, 17, 1.
³ Brock, R. C., Milstein, B. B., and Ross, D. N., *Thorax*, 1956, 11, 163.
⁴ Uricchio, J. F., Litwak, R., Denton, C., Goldberg, H., and Likoff, W., *Ann. Intern. Med.*, 1956, 44, 844.
⁵ Lewis, F. J., Sumway, N. E., Niazi, S. A., and Benjamin, R. B., *J. thorac. Surg.*, 1956, 32, 481.

valve by post-mortem cinephotography. Calcification eventually occurs in nearly all cases, especially at the commissures near the ring; it hampers the surgeon's efforts and adds to the dangers by providing a source of emboli, but does not inevitably preclude a good result. Aortic stenosis is about five times less common than mitral stenosis, but both valves are often diseased. Some reduction of the valve lumen can be tolerated without ill effects, probably to one-quarter or less of the normal, but beyond this the left ventricle hypertrophies and eventually fails. If there is aortic regurgitation the ventricle also dilates. The systolic blood pressure is low and the pulse pressure small, and the flow in the coronary arteries is impaired.

The clinical course of aortic stenosis typically begins with a latent period without serious symptoms or disability, which may last for many years; then symptoms appear and are fairly soon followed by heart failure and death. Relief by medical treatment is seldom long lasting. In contrast to mitral stenosis, in which the course is usually a gradual decline with periods of satisfactory but gradually lessening response to medical treatment, the patient's decline in aortic stenosis is relatively abrupt and inexorable, seldom lasting more than two years from the first evidence of heart failure. It follows that surgical treatment should seldom be delayed if it is to be effective. The earliest symptoms are often tiredness and dyspnoea on exertion: palpitations, or simply awareness of the heart's action, may be significant. Fainting or dizziness usually points to inadequate aortic flow, as does angina, which may be felt as a tightness of the throat or as chest pain. Such patients may die suddenly, presumably from ventricular fibrillation following myocardial anoxia. Angina, especially in older patients, may be due to independent disease of the coronary arteries, and its significance should be cautiously assessed. Nocturnal dyspnoea and orthopnoea are serious symptoms of left ventricular failure. A short harsh basal systolic murmur, best heard in the right second interspace, is the most constant physical sign. It sometimes radiates towards the apex, is usually transmitted to the carotid arteries, and, if intense, is palpable as a thrill. A long, blowing, early diastolic murmur, replacing the second sound, is a sign of aortic regurgitation. The classical plateau pulse and small pulse-pressure are not always present, and blood-pressure readings may be within normal limits. The electrocardiogram may show left ventricular strain or preponderance. The pulse is usually regular; atrial fibrillation suggests an associated mitral lesion. There may be evidence of left ventricular enlargement—the most important radiological sign. A boot-shaped heart suggests aortic

incompetence. Calcifications is best seen by fluoroscopy. An associated mitral stenosis, present in about one-third of patients coming to operation, means a less serious prognosis. The left ventricle is less likely to enlarge, though the left atrium and the right ventricle do so. Operative correction of stenosis of one valve may unmask a relatively silent lesion of the other, so if necessary both should be dealt with at the same time. Occasionally a third lesion, tricuspid stenosis, is also present.

Pressure measurements can give useful information, particularly in cases complicated by other valve lesions, or with regurgitation or misleading symptoms. The most useful finding is a pressure gradient across the aortic valve: this can be shown by catheterization of the left side of the heart. The catheter can be introduced into the left atrium either by direct puncture through the chest wall or through the wall of a bronchus via a bronchoscope. But the procedure carries a definite risk, and it is not always possible to manipulate the catheter into the ventricle and aorta. Direct puncture of the left ventricle through the anterior chest wall is feasible and not dangerous³; simultaneous puncture of the brachial artery gives an accurate approximation to the aortic pressure and so will show the gradient. The measurements may also be made at operation. Sir Russell Brock advises that in general a gradient of 50 mm. Hg or over is an indication for operation.

The surgical approach to the aortic valve may be from below through the wall of the left ventricle, or from above through the aorta. Sir Russell Brock prefers the former route. The heart is approached by left lateral thoracotomy. Temporary occlusion of the innominate and carotid arteries reduces the risk of cerebral embolism. Through a tiny incision in the ventricle, controlled by a purse-string stitch, probes and an expanding dilator can be introduced and guided to the valve. The dilator is expanded in various directions. The effectiveness of the dilatation can be checked by pressure measurements. The ventricular wound is usually sutured without great difficulty, though care is necessary to avoid stitches cutting through, and serious haemorrhage is seldom a problem. The risk of ventricular fibrillation is a greater one, but it can often be treated successfully by carrying out the valvotomy if this has not been done, and by cardiac massage and electric shock. Bailey now prefers the approach from above, though in many hands this route is probably more dangerous. It has not been established that it carries any less risk of ventricular fibrillation.⁴ A right or mid-line anterior thoracotomy is used. An artificial pouch of pericardium or of plastic material is sutured to the side of the aorta: this allows the introduction of the surgeon's

finger and of instruments, in the same way as the natural auricular appendage does to the mitral valve. Palpation of the valve carries a slight advantage, and sometimes digital pressure alone causes sufficient rupture, but this is seldom as effective as it is for the mitral valve.

These techniques are both blind. More recently, through the aortic approach, open operations with direct inspection of the valve and accurate division of the three commissures have been performed, with the help of hypothermia⁵ or a pump-oxygenator. These methods are very promising, but the techniques carry their own additional hazards. The grossly distorted, heavily calcified valve so often the end result of aortic stenosis cannot be restored to normal by any manoeuvre; but the incomplete enlargement that can be obtained by transventricular dilatation often greatly improves the prognosis. Perhaps eventually it may prove possible to incorporate an efficient artificial or grafted valve into the patient's heart. Further experience will enable indications for operation to be more clearly defined, and as in congenital heart disease assessment by elaborate investigation may prove less often necessary. Operation now appears to be indicated in cases of predominant aortic stenosis when there is inadequate left ventricular outflow. Contraindications include heart failure not responding to treatment, active rheumatism, and bacterial endocarditis. Good results are less likely in older patients and when there is extensive calcification or great cardiac enlargement. In favourable cases the present operative mortality appears to be about 5%.

RESISTANCE TO CORTICOTROPHIN

Though cortisone and corticotrophin seem to act in the same manner, both raising the level of hydrocortisone in the body fluids, many clinicians consider that corticotrophin is the more potent therapeutic agent of the two. Possibly, therefore, the adrenal cortex produces some additional unknown steroid of therapeutic importance. This may be mainly why corticotrophin maintains its considerable popularity as a drug in spite of the inconveniences of its administration; but many physicians have encountered wide variations in the clinical effects it produces. There are several reasons for this. First, the therapeutic effects of corticotrophin are mediated entirely through the adrenal cortex, and the responsiveness of this organ varies considerably even in healthy individuals. Secondly, its rate of absorption into the blood stream is known to modify its effect. Thirdly, there is a possibility that the corticotrophin may decompose in the muscle at the injection site. That this could occur was shown by A. E. Renold and colleagues,¹ who found that eight of 100 patients developed frank resistance to corticotrophin given intramuscularly, though all continued to give an entirely normal response

to the same preparation given intravenously. Fourthly, corticotrophin is a protein obtainable only by extraction of mammalian pituitary glands, and because of the difficulties of manufacture and of assay the resultant product is apt to vary considerably in potency. All these variables make the task of obtaining a repeatable therapeutic effect a matter largely of trial and error.

P. H. Forsham² noted the development of sensitivity to impure preparations, though he found none when using purer products. A careful study of the development of such resistance to injected corticotrophin has been recently made by H. F. West.³ In a series of 51 patients treated with corticotrophin for periods of up to three years, 42 (80%) acquired resistance to one or more preparations. This resistance was revealed by a failure to maintain a sufficiently high output of ketogenic steroids or of 17-hydroxycorticoids as well as by the failure to maintain clinical improvement. The development of resistance to one preparation was often associated with continued sensitivity to another, though resistance to the second preparation might develop if its administration was continued. Thirteen patients became insensitive to two preparations and seven to three different preparations of corticotrophin. Local allergic reactions developed in 17 patients of the series, consisting in an area of induration at the injection site 3-4 cm. across, but the development of this local sensitivity seemed to be independent of the development of resistance to corticotrophin. Patients showing local allergy might remain sensitive, and those who had developed resistance did not necessarily show local allergy. In the subjects who developed resistance to corticotrophin there was no suggestion of adrenal exhaustion, and the possibility of deterioration of the preparation during storage was effectively excluded. The resistance developed was usually a species resistance, for sensitivity to corticotrophin from another animal source usually persisted. In no case was there evidence of a non-specific resistance to all corticotrophins, and sensitivity to endogenous corticotrophin remained unimpaired. In most of the cases in this series no distinction was made between local and general inactivation, but in the two cases tested resistance was not overcome by using the intravenous route. Two patients who had become resistant to both pork and beef corticotrophin showed a satisfactory response to a highly purified sample of corticotrophin A.⁴ West considers that there is less risk of developing resistance from highly purified corticotrophins.

There is clearly great need for an extended trial of a preparation of greater and more constant purity than many of the commercial products at present available. Corticotrophin is a drug of such potency and value that it deserves stricter pharmaceutical control than it has had in the past. On May 1 preparations of corticotrophin were brought under the control of the Therapeutic Substances Act, 1956.

¹ Renold, A. E., Jenkins, D., Forsham, P. H., and Thorn, G. W., *J. clin. Endocr.*, 1952, 12, 763.

² Forsham, P. H., *Ciba Foundation Colloquia on Endocrinology*, 1955, 8, 319, London.

³ West, H. F., *Ann. rheum. Dis.*, 1956, 15, 124.

⁴ Dixon, H. B. F., and Stack-Dunne, M. P., *Biochem. J.*, 1955, 61, 483.

REPLACEMENT THERAPY FOR THE HAEMOPHILIAC

The aim of treatment in the management of the haemophiliac is to correct the haemostatic defect by supplying antihæmophilic globulin in an effective amount. The missing component is present in normal human plasma, and thus the therapeutic problem might seem to be a simple one. But in practice the supply of adequate amounts of antihæmophilic globulin to the haemophiliac is extremely difficult. The survival *in vivo* of antihæmophilic globulin once administered is very short, probably about 6 to 12 hours. To raise the level of antihæmophilic globulin in a haemophiliac to about a tenth of the level in the normal person requires the rapid administration of approximately a litre of fresh plasma; and to maintain even this limited objective would mean that a litre of plasma, or its content of antihæmophilic globulin, would have to be given every six to twelve hours. It is not even certain what concentration of antihæmophilic globulin in the recipient's blood represents a haemostatic level; this probably varies with the task demanded of it. For example, for the control of hæmaturia in these patients 10% of antihæmophilic globulin might be sufficient, though quite inadequate for the control of hæmorrhage from a surgical wound.

The difficulty in providing antihæmophilic globulin for the haemophiliac patient lies not only in the large amounts required to stop bleeding but also in the lability of this component of normal plasma when stored. In bank blood the survival of antihæmophilic globulin is very variable: it may lessen in quantity by as much as 50% in a matter of twenty-four hours under the standard conditions of storage in a refrigerator at 4° C. If the plasma is separated from the red cells and maintained frozen at -20° C—the so-called fresh-frozen plasma—survival of antihæmophilic globulin is much improved. At present such fresh-frozen plasma supplied by many transfusion services is the best readily available preparation for the treatment of the haemophiliac in an emergency. It has to be used in large quantities, such as a litre of plasma every 6 to 12 hours. Elsewhere in this issue (p. 1035) Mr. J. A. Orr and Dr. A. S. Douglas, reporting on the management of dental extractions in patients with hæmophilia and Christmas disease, describe their method of using fresh-frozen plasma. The large volumes which are necessary, though in general well tolerated, carry some risk of circulatory overloading. Concentrated preparations of antihæmophilic globulin would therefore prove a great advance in the management of these patients. R. G. Macfarlane and his colleagues^{1,2} in Oxford have prepared concentrated preparations of antihæmophilic globulin from bovine and pig blood. In animal blood the concentration of the factor is often very much higher than in human blood. R. A. Kekwick and P. Wolf³ have recently reported the preparation of very concentrated antihæmophilic globulin from human blood. Though obviously the human preparations of antihæmophilic globulin have

advantages over those obtained from animal sources, particularly in relation to antigenicity, it seems unlikely that enough of the material can be obtained from human plasma to treat the hæmophilic population of the whole country. Another potentially rich source of antihæmophilic globulin is tissue, and F. Nour-Eldin and J. F. Wilkinson⁴ have prepared it from brain. It is to be hoped that in the foreseeable future the long-term management of hæmophilic patients will be made simpler by the readier availability of suitable preparations of antihæmophilic globulin.

HARVEY TERCENTENARY CONGRESS

Like many another stroke of genius, William Harvey's discovery of the circulation of the blood was not at first generally accepted. The new idea was difficult to relate to the anatomy and physiology then current, and its use in clinical medicine seemed slight, even negligible.¹ The beam of light shone so far out that it left on either side great areas of darkness, which only succeeding centuries were to see gradually illuminated. But to *De Motu Cordis* may be traced the beginnings of modern cardiology, until recently the province of physicians, though it is symptomatic of the times that half the papers reviewing "the present knowledge of the circulation" at the Harveian Tercentenary Congress in June are by surgeons. The programme includes a discussion on cardiac surgery to be held jointly, by transatlantic telephone, with participants in the American Medical Association's annual meeting in New York. These will include Drs. A. Blalock, M. De Bakey, and G. Burch.

The main theme of the congress, which is timed to commemorate Harvey's death on June 3, 1657, is to review the store of knowledge which has accumulated since Harvey's momentous observations and deductions. It is therefore appropriate that the opening session should be devoted to a historical review of studies of the circulation from the seventeenth to the twentieth century. Other symposia are concerned with pulmonary, coronary, cerebral, splanchnic, peripheral, and foetal circulations. One session, devoted to the results of cardiac surgery, will define the experience of Great Britain, France, Sweden, and the U.S.A. in the tremendous advances achieved in the last two decades. At the close of the scientific meetings in London the congress will be transferred to Harvey's birthplace, Folkestone, where more personal and biographical aspects of his life will be discussed under the chairmanship of Sir Geoffrey Keynes. The organizing committee is composed of representatives of the Royal Society, Medical Research Council, Royal College of Physicians, British Cardiac Society, Physiological Society, Society of Thoracic Surgeons, Thoracic Society, and the Harveian Society of London, while the main meetings are to be held at the Royal College of Surgeons in London. The variety of interests thus brought together gives some indication of the influence that Harvey's work has had on medicine. Full details of the congress may be obtained from the organizing secretary, Mrs. E. M. Fraser, 11, Chandos Street, London, W.1.

¹ Guthrie, D., *British Medical Journal*, 1957, 1, 575.

¹ Macfarlane, R. G., Biggs, R., and Bidwell, E., *Lancet*, 1954, 1, 1316.

² Bidwell, E., *Brit. J. Haematol.*, 1955, 35, 386.

³ Kekwick, R. A., and Wolf, P., *Lancet*, 1957, 1, 647.

⁴ Nour-Eldin, F., and Wilkinson, J. F., *Brit. J. Haematol.*, 1956, 2, 433.

ALKYLATING AGENTS IN CANCER

CLINICAL USEFULNESS AND MODE OF ACTION

[FROM A SPECIAL CORRESPONDENT]

The Section of Biology of the New York Academy of Sciences sponsored an international conference on the comparative clinical and biological effects of alkylating agents in New York recently. It ran from March 28 to March 30. The organizing committee, under the chairmanship of Dr. LEON H. SCHMIDT, included among its members Professor F. BERGEL and Professor ALEXANDER HADDOW from Britain. Some fifty papers were read, including twenty by invited delegates from Canada, Britain, Western Germany, Hungary, and Japan, and a paper had been received from the U.S.S.R.

Mode of Action

Dr. C. C. PRICE (University of Pennsylvania) and Dr. W. C. J. ROSS (Chester Beatty Research Institute, the Royal Cancer Hospital, London) opened the proceedings with descriptions of the fundamental mechanisms of alkylation and the *in vitro* reactions of alkylating agents. An alkylating agent could be defined as one which under certain conditions possesses one (monofunctional) or more (polyfunctional) centres capable of reacting with electron-rich groups in biological systems. At the Chester Beatty Research Institute it had been found that agents which readily alkylated ionized acid groups, particularly phosphate, were more powerful inhibitors of tumour growth than those especially reactive towards amino-groups and sulphhydryl groups. Materials rich in nucleic acids were highly susceptible to alkylating agents. Dr. K. A. STACEY (Chester Beatty Research Institute) had shown that nitrogen mustards, epoxides, and esters of methanesulphonic acid would esterify the primary phosphate groups of deoxyribosenucleic acid *in vitro*, and of deoxyribosenucleic acid in the form of nucleoprotein obtained from herring sperm heads. Chlorambucil reacted only with the deoxyribosenucleic acid of intact nucleoprotein. By contrast Dr. J. J. ROBERTS (Chester Beatty Research Institute), who had studied ¹⁴C-labelled chloroethylmethanesulphonate (C.B. 1506) *in vivo*, said that a high proportion of the drug had alkylated thiol groups, and suggested that this might be an integral part of the growth-inhibiting mechanism of these agents. If so, nucleic acids would play little part in the reaction, since they are entirely devoid of thiol groups.

Dr. CHARLOTTE AUERBACH, F.R.S. (Institute of Animal Genetics, Edinburgh), on the other hand, thought it hazardous to try to relate the mutagenicity of alkylating agents to their chemical properties. She did not think they had any specific qualities distinguishing them from other mutagens. Spermatids were more sensitive to alkylating agents than spermatogonia, but only the latter synthesized deoxyribosenucleic acid. Nor could mutagenic ability be related to alkylation of thiol groups.

Professor P. C. KOLLER (Chester Beatty Research Institute) described the various types of cytological damage observed after the administration of drugs, and thought the alkylating agents produced certain characteristic types of injury.

Pharmacology and Toxicology

Dr. C. C. STOCK (Sloan-Kettering Institute for Cancer Research, New York) said that many alkylating agents had been shown to have tumour-inhibitory activity in both experimental animals and man. Some investigators felt that most of what could be expected had already been achieved with this type of agent; others thought further exploration was still worth while. This would repeatedly raise the question of whether the new compounds were sufficiently superior to those already available to warrant clinical trial.

Dr. S. S. STERNBERG (Sloan-Kettering Institute for Cancer Research) described the pharmacological and toxic effects of the different classes of alkylating agent. When median

lethal or supra-lethal doses were used the same basic effects were observed with all types of agent—namely, convulsions, paralysis, and a variety of cholinergic effects. Anorexia, vomiting, diarrhoea, and leucopenia occurred, and there was gross destruction of lymphoid tissue, bone marrow, and intestinal mucosa. In man, the similarities of the effects of alkylating agents to those produced by ionizing radiations were less than in animals, but intra-arterial nitrogen mustard had caused epilation and erythema similar to that resulting from irradiation. Dr. L. A. ELSON (Chester Beatty Research Institute), using relatively small single doses of alkylating agents in rats, had found them to be only partially radiomimetic in their effects on the blood picture. All nitrogen-mustard analogues tested produced one pattern of response, whereas busulphan analogues brought about a different but equally characteristic pattern. Simultaneous administration of a nitrogen mustard and busulphan closely simulated the complete haematological effects of radiation.

Dr. P. K. SMITH (George Washington University, Washington, D.C.) described his studies on the distribution and metabolism of isotope-labelled sulphur mustard, nitrogen mustard, triethylenephosphoramide, tretamine (T.E.M.; triethylene melamine), and busulphan in mice, rats, and man. These compounds disappeared rapidly from the blood, they did not localize selectively in tumours, and only in the case of busulphan was any unaltered substance detected in the urine.

Nitrogen Mustard and Tretamine

Dr. D. A. KARNOFSKY (Sloan-Kettering Institute for Cancer Research) summarized the clinical results obtained with nitrogen mustard, which had been in use now for 15 years. It was the most widely used alkylating agent, and related drugs should be compared with it in terms of route of administration, immediate and delayed toxicity, spectrum of therapeutic action in neoplastic diseases, and activity in patients who had failed to respond to nitrogen mustard. Its chief application was in the later stages of Hodgkin's disease. Improvement lasting from one week to one year or more (average six to eight weeks) could be expected in 80 to 90% of patients and repeated responses could sometimes be obtained. Occasionally it was necessary to push treatment until severe leucopenia occurred before the patient remitted, and in one case repeated treatment for seven months was necessary to achieve remission. Nitrogen mustard did not prolong life in most cases but conferred real clinical benefit. Its role in the treatment of other lymphomas and in other forms of malignancy was less easy to evaluate. In bronchial carcinoma absorption of pleural effusions, relief of superior vena caval obstruction, and other objective effects had occurred in some 40% of cases, but benefit rarely exceeded eight weeks.

Dr. H. D. DIAMOND (Memorial Center for Cancer and Allied Diseases, New York), discussing the indications for using nitrogen mustard or tretamine (T.E.M.; triethylene melamine) in malignant lymphomas emphasized their value in relieving the symptoms of superior vena caval obstruction and of compression paraplegia. Full doses of nitrogen mustard should be followed immediately by x-ray therapy. Nitrogen mustard should also be used in the acute, toxic, highly febrile syndrome and in cases with recurrent pulmonary lesions (where it was necessary to differentiate between radiation fibrosis and active disease). Nitrogen mustard was also of value in treating the "homme rouge" type of mycosis fungoides.

Dr. A. S. WEISBERGER (Western Reserve University, Cleveland, Ohio) described the results of direct instillation of nitrogen mustard into serous cavities in 88 patients with malignant effusions. The results were as good as or better than those obtained with radioactive colloidal gold, and he preferred nitrogen mustard on the grounds of its availability, ease of administration, inexpensiveness, and lack of radiation hazard. Dr. W. H. COLE (University of Illinois College of Medicine, Chicago) described the intraperitoneal use of nitrogen mustard in man at the time of resection of

the colon and rectum for carcinoma.* The rationale for this procedure was the finding that the number of "takes" of the Walker rat carcinoma injected into the portal vein was reduced if nitrogen mustard was injected simultaneously. There was a slight increase in bleeding tendency during and after the operation and paralytic ileus was more common, but with proper precautions the method was considered safe.

Dr. R. W. RUNDLES (Duke University School of Medicine, Durham, N. Carolina) summarized his results with tetramine (T.E.M.; triethylene melamine) in 54 cases of chronic lymphocytic leukaemia. Tetramine was a most effective agent in controlling the disease, but the range of sensitivity to the drug was very great and he thought it would be replaced by chlorambucil. Tretamine had also proved useful in about half of the patients with widespread ovarian carcinomas and in a few with undifferentiated metastatic carcinoma.

Chlorambucil

Dr. L. G. ISRAELS (University of Manitoba, Winnipeg) described the results obtained with chlorambucil (C.B. 1348) in the treatment of 107 patients with malignant lymphoma during the past four years. Excellent remissions were obtained in 3 of 35 patients with Hodgkin's disease, 9 of 12 with follicular lymphoma, 12 of 27 with chronic lymphocytic leukaemia, and 7 of 20 with lymphocytic lymphoma. Some benefit (less than six months) was obtained in a further 21 cases of Hodgkin's disease, 3 of follicular lymphoma, 9 of chronic lymphocytic leukaemia, and 5 of lymphocytic lymphoma. Transient benefit occurred in 8 of 13 cases of reticulosarcoma. Chlorambucil was well tolerated and was less toxic to haemopoietic tissue than other cytotoxic agents in common use. It was probably the treatment of choice in follicular lymphoma, chronic lymphocytic leukaemia, and lymphocytic lymphoma, but nitrogen mustard was to be preferred in the treatment of Hodgkin's disease.

Dr. C. A. DOAN (Ohio State University College of Medicine) had treated 100 patients with chlorambucil in the past two and a half years. Twenty-two of 47 patients with Hodgkin's disease had obtained remissions lasting four months or more, one had a second remission, and one a third. Twelve of 18 patients with chronic lymphocytic leukaemia benefited, 5 having previously failed to respond to radioactive phosphorus or x-ray therapy. Six of eight patients with lymphosarcoma responded well. Dr. J. E. ULTMANN (Columbia University College of Physicians and Surgeons, New York) had found chlorambucil of particular value in cases of chronic lymphocytic leukaemia with moderate thrombocytopenia but without clinical haemorrhagic manifestations. In Hodgkin's disease the results were less encouraging, only two of eight patients having responded. Dr. B. E. HALL (Stanford University School of Medicine, California) had treated 120 patients with chlorambucil. Significant benefit was conferred on 7 of 21 patients with Hodgkin's disease, 2 of 6 with lymphosarcoma, 6 of 8 with chronic lymphocytic leukaemia, and on the only patient with follicular lymphoma. Occasional patients with undifferentiated carcinoma metastases responded. Drs. Doan, Ultmann, and Hall had not found chlorambucil to be of value in myelomatosis, and the bone marrow in this condition was easily depressed by the drug. Dr. K. B. OLSON (Albany Medical College, New York), however, described one patient, in remission after eight months, who had experienced marked relief of pain and some improvement in bone-marrow findings. Dr. S. L. GUMPERT (New York University Bellevue Medical Center) described benefit in one case of ovarian carcinoma.

Busulphan

Dr. D. A. G. GALTON (Chester Beatty Research Institute) described the clinical effects of busulphan ("myleran"). Its chief role was in the treatment of chronic granulocytic leukaemia. When the leucocyte count had risen quickly after a course of treatment continuous therapy had been

*See also *British Medical Journal*, April 13, p. 899.

of value and had been given for periods of 8 to 45 months in 25 cases. Dimethylmyleran at half the dosage of busulphan had been equally effective.

Dr. F. H. BETHELL (Simpson Memorial Institute for Medical Research, Ann Arbor, Michigan) had used busulphan or tretamine in 54 cases of chronic granulocytic leukaemia and preferred continuous therapy to intermittent courses of treatment. Both drugs were equally useful and were superior to intermittent courses of irradiation. There was cross-resistance to these drugs.

Dr. W. DAMESHEK (New England Medical Center, Boston) said he had been particularly impressed with the regularity and reproducibility of response to busulphan in chronic granulocytic leukaemia. The best remissions were in patients whose leucocyte counts were brought to slightly leucopenic levels (between 5,000 and 6,000 per cubic mm.). He had also found the drug useful in four of eight patients with myeloid metaplasia who obtained symptomatic relief, reduction in splenomegaly, and a rise in haemoglobin.

Dr. M. P. SYKES (Sloan-Kettering Institute for Cancer Research) had used busulphan in 21 cases of malignant lymphoma and had given short courses with large doses. Six patients responded in some degree, but in only two were the remissions lasting; one was a case of very chronic lymphocytic leukaemia, the other of lymphoma. A comparative study, under similar conditions, with busulphan as well as other alkylating agents would be necessary to establish any quantitative differences in their therapeutic activity and response at various levels of haematological depression. Dr. R. D. SULLIVAN (Veterans Administration Hospital, Manhattan) had treated 18 patients with bronchial carcinoma, using dosage schedules comparable in bone-marrow depressing activity to those employed with nitrogen mustard. Six showed objective evidence of tumour regression lasting 2 to 12 weeks, and the results were considered to parallel those obtained with nitrogen mustard. Dr. H. R. BIERMAN (City of Hope Medical Center, Duarte, California) had injected dimethylmyleran in warm alcohol intravenously in the human subject. Depression of the neutrophil count began three hours later. The bone marrow showed abnormal myeloid and erythroid precursors. Single intravenous doses of dimethylmyleran had led to improvement in one of three cases of acute leukaemia refractory to other forms of therapy.

Thio-TEPA and R.48

Dr. J. C. WRIGHT (New York University Bellevue Medical Center) reviewed 93 cases of carcinoma, sarcoma, and miscellaneous tumours in which triethylenethiophosphoramide (thio-TEPA) had been given. Some 30% of patients had derived benefit; the only side-effect was bone-marrow depression. Dr. J. E. ULTMANN (Columbia University College of Physicians and Surgeons, New York) had treated 100 patients with various malignant neoplasms. In malignant lymphomas remissions were usually short-lived, but in 27 cases of disseminated ovarian carcinoma significant objective improvement was observed and the mean survival was 13 months compared with 3 months in untreated patients. Severe haemopoietic depression occurred in 43 instances with clinical manifestations in 17 patients. This limited the usefulness of thio-TEPA. Dr. K. B. OLSON (Albany Medical College, New York) had used thio-TEPA in 42 cases of advanced malignant disease. In general the results were inferior to those obtained with nitrogen mustard and the effects on the bone marrow were often serious. Dr. H. SHAY (Fels Research Institute, Temple University Medical Center, Philadelphia) felt that the doses employed by the previous speakers were too large and that thio-TEPA had proved very effective in the management of chronic granulocytic leukaemia and in advanced mammary and ovarian carcinoma. Improvement and unquestionable prolongation of life had been secured in occasional cases of advanced gastro-intestinal carcinoma.

Dr. JEANNE BATEMAN (Garfield Memorial Hospital, Washington, D.C.) had used thio-TEPA in 486 patients. Main-

tenance therapy from 2 weeks to 3 years (average 5½ months) had been given. Oral, intravenous, intrapleural, intrapericardial, intraperitoneal routes, and direct injections into tumours had been employed. Palliation had been achieved in a high percentage of cases of advanced mammary, ovarian, uterine, and other tumours, and in some tumours of the central nervous system. Dr. L. K. ALPERT (George Washington University Cancer Clinic, Washington, D.C.) had obtained significant though limited improvement in metastatic mammary and ovarian carcinoma. Eleven of 16 patients with bone involvement from mammary carcinoma experienced temporary relief of pain and 3 of 5 patients with serous effusions obtained prolonged relief. Five of 13 patients with ovarian carcinoma had a prolonged objective regression of abdominal disease. Dr. L. A. LEONE (Medical College of Virginia, Richmond) felt that systemic administration of thio-TEPA was of extremely limited value, but intracavitary injections might be helpful in the management of malignant serous effusions.

Dr. O. H. WARWICK (Toronto General Hospital) had treated 88 patients with malignant lymphoma, leukaemia, and myeloma with 2-naphthylamine mustard (C.B. 1048; R. 48). The drug had proved useful in about half of the 36 cases of lymphosarcoma and chronic lymphocytic leukaemia, but was of little value in other conditions. Dr. A. ROTTINO (St. Vincent's Hospital, New York) had obtained remissions in 5 of 22 cases of Hodgkin's disease treated with R. 48, and partial remissions occurred in another 12. Five patients refractory to chlorambucil responded well to R. 48.

Summing Up and Verdict

The final session of the conference was devoted to summing up. Dr. P. ALEXANDER (Chester Beatty Research Institute) felt that most of the available evidence supported the view that the main biological consequences of exposure to alkylating agents resulted from damage to deoxyribonucleic acid (D.N.A.) through alkylation of its exposed phosphate groups. The fact that D.N.A. was apparently so resistant to ionizing radiations could now be explained. Dr. STACEY had found that post-treatment with urea revealed considerable damage to single chains of D.N.A. As long as the twin helices of D.N.A. were bound together, multiple single breaks of either chain induced by radiation would remain hidden. Urea split the twin helix lengthwise by disrupting the hydrogen bonding, and the damaged single chains then fell into fragments.

Professor F. BERGEL (Chester Beatty Research Institute) surveyed the whole field of chemical synthesis of alkylating agents, and pointed out that there was still considerable scope for attempting to achieve selectivity of action by modifying the carrier group of the alkylating agent. This might offer the possibility of designing agents to be transported selectively to different tissues or tumours. Professor A. HADDOW (Chester Beatty Research Institute) felt that no compelling evidence had been presented to suggest that alkylating agents had any special chemotherapeutic properties that distinguished them from other classes of compounds. He doubted whether they would have any ultimate or permanent place in the chemotherapy of malignant disease.

Dr. GELLHORN, summing up, said the several compounds discussed had all been claimed to produce some degree of benefit in a variety of malignant conditions but that it was not easy to say what factors made one drug more desirable than another. Such differences as had been demonstrated were probably not qualitative but were similar to those which would lead to the choice of one of a number of preparations of, say, digitalis. The alkylating agents had a definite place in the treatment of Hodgkin's disease, lymphomas, and leukaemias; their efficacy in mammary carcinoma required further classification but might be important. In carcinoma of the bronchus the effects were always transient and there was no good reason to advocate their use as a routine.

MEDICAL ART SOCIETY'S EXHIBITION

The fifteenth annual exhibition of the Medical Art Society is now showing at Walker's Galleries, New Bond Street, London, where it will remain until May 11. We are indebted to Mr. MERVYN LEVY, A.R.C.A., M.R.S.L., for the following notes on the outstanding exhibits.

Critical Appreciation

The two most notable exhibitors this year are J. S. Tomkinson and Audrey Hanson. The one for his compelling vitality, the other for her haunting loveliness. One excites and stirs, the other enchants and lulls. Yet both artists are concerned with springs of elemental energy; Mr. Tomkinson with a young child—Miss Hanson with the sea. In both one feels the urgency of the idea, the triumphant moment of conception from which the paintings have burst in due time as naturally as at birth. There is rather more evidence of the birth pang in Mr. Tomkinson's studies of "Claudia Asleep" and "Claudia," but there may well be some purely physiological reason why women painters so often, it seems to me, manipulate the medium of expression with such a direct and unimpeded fluency. The Claudia pictures, quite small—as indeed is Miss Hanson's "March Sea"—are painted with the knife-edge of nervous gusto. The painter has used a considerable distortion of both form and colour, particularly in "Claudia Asleep," in order to present a sort of "lemon-juice essence" of this subject. It is as though at any moment Claudia might awaken with a crotchety squawk. So great is the dramatic tension in this little picture that one finds oneself on tiptoe for fear the peace of the gallery should be shattered like glass by the brick of an infant's screech. But that of course is the precise nature of the dramatic tension which any haggard father might feel looking down in awe and fear at some capricious infant tyrant taking a momentary refresher.

Miss Hanson's "March Sea" moves one in quite a different way. It is painted in an exquisite filigree style. A silver breaker rolls in with a muffled roar across two overlapping sheets of ghost-grey water that have raced ahead to kiss the cold sands. It is not any particular sea, but all the oceans of the world mingling in the mind and heart of the spectator; all the seas of poetry and imagination curiously blended in this one little picture so miraculously gentle, yet so strong. It is the sea of dreams that we carry with us everywhere—it is not the sea at Blackpool or Bournemouth—but the sea of Shelley and Byron, of Poe and Flecker. It is the true aesthetic ocean, half real, half dream, washing and sounding, in every cove of the heart.

Some Notable Pictures

Nowhere is the presence of "significant form" more genuinely evident than in P. Tuttnauer's "The Pond, Regent's Park." Here the orchestration of colour, shape, and line has been contrived with a superb duality; the subject and its abstract potential have been cunningly blended by a painter of outstanding quality and vision. I also commend with enthusiasm the brilliantly executed sky in A. M. Rackow's "Château Gaillard, Seine"; the devotion, tenderness, and subtle aerial perspective of A. B. Hewlett's crumbling "Italian Stronghold"; Josephine Roth's fine characterization in her portraits "Mrs. Knight" and "The Twisted Smile"; the pure light which suffuses both Bruno Lux's "Orchard" and Humphrey Neame's "Old Farm House"; John Crosley's really damp "Thaw—Berkshire Downs"; Edith Whetnall's watercolour, "Pepe's House," executed with superb clarity and a minimum of the standard tricks of the water-colour trade; and, lastly, G. Konstom's plaster head of Alfred Wolmark, glinting with good humour.

All in all, this is a tremendously interesting and many-faceted exhibition by one of the most progressive and mature art societies in the country.

AUTOMATION AND INDUSTRIAL HEALTH

[FROM A SPECIAL CORRESPONDENT]

There is now some experience of automatic processes in industry. The Ergonomics Research Society therefore chose as the theme for its recent symposium at Bristol a consideration of the "Changing Demands of Modern Work and Control." The question of automation's effects on the industrial worker was one of the major topics discussed, and some of the papers on the likely medical and social consequences are here summarized. The symposium was held at Bristol University from April 8 to 11, and Sir PHILIP MORRIS, Vice-Chancellor of the University, presided at the opening session.

Revolution in Working Conditions

Appropriately enough, the first paper looked forward to the age of automation. Mr. J. CHRIS JONES (Metropolitan-Vickers Electrical Co.) attempted in general terms to foresee the effects of such future industrial changes on the structure of working life. He predicted a change in the role of the worker as radical as that when the crafts became mechanized. The individual worker would evolve, he thought, into a sort of mental craftsman, with almost a free-lance status. The home and the factory would tend to come together again as in the heyday of the crafts. Periods of "on call" work might become typical of automation, and the brain worker might spend much of his time at home, being mainly needed only in the event of an emergency such as a stoppage. Pollution of the environment could be avoided and zoning of industrial and residential districts would no longer be necessary. Canteens for workers, health and welfare departments, rest rooms, etc., might prove to have been only a temporary expedient, characteristic of the "past age" of mechanization.

If Mr. Chris Jones's paper gave promise of the fruits of automation, Dr. G. C. BURGER (medical director, N. V. Philips Gloeilampenfabrieken, Eindhoven, Holland) made it abundantly clear that automation also brought new problems and responsibilities. Ergonomics and industrial health work should go hand in hand, he said, if the goal of using human beings to the best of their powers was to be achieved. Medical men must be included in the ergonomics research team.

While the introduction of automation would lead, he believed, to an increase in wealth and to generally better health, there would also be an inevitable, if paradoxical, rise in sickness and absenteeism in industry, due to the anxiety and uncertainty engendered by the changing demands. Meeting so much rationalization in the factory would make the worker hanker for irrationalism and foster an unpreparedness to accept the inevitable. These were probably the most important effects automation would have on the worker. However, the physical consequences of automation might prove equally serious. Long periods of muscular inactivity, with greater responsibility and mental stress, might lead to an increase in degenerative vascular disease. Coupled with this was the fact that increases in wealth were often accompanied by over-consumption of food and a preference for sedentary "canned recreation" such as watching television. Dr. Burger's picture was of a costly human machine, only moderately extended. It would be necessary to compensate this lack of physical activity at work by greater leisure activity.

That this might become a serious problem was instanced by Mr. K. F. H. MURRELL (University of Bristol), who said that the high incidence of coronary disease in the U.S.A. was causing grave concern there, especially as it was higher in the groups with greater responsibility.

Easing the Transition

Continuing, Dr. BURGER urged the need to study the worker-job relationship. The job must be tailored to the

worker and vice versa, and here a combined physiological and medical approach was important. There were also special problems to be considered, such as that of the worker with well-developed muscles but limited brain-power who might be asked to do light work at high speeds. Social, mental, and political tensions might result from too little physical and too much mental stress. Machines would dictate the speed of work, and the resulting mental stresses called for intensive study by ergonomists. The demands on the worker were not so much in terms of muscle power but in ability to deal intelligently with "information." Thus the ergonomists should direct their attention not to calories and beats per minute, but to "bits" per second, cybernetics, and information theory.

An automatic factory, said Dr. Burger, must also be safe. To this end the industrial physician and the designer should co-operate with the ergonomist in order to make it so. All too often industrial medicine was the forgotten factor here. Finally, he warned against the results of transferring labour without regard to the fact that many groups of workers have their own characteristic traditions, skills, and social standards. Experience in industry had already shown that special problems of adaptation arose in such cases. The progress of industrial automation should be regulated so as to achieve benefit for the largest possible groups without at the same time producing fear and uncertainty. Education could help make the transition to automation smoother by removing misunderstandings, one of the main causes of fear; so also would a sense of social responsibility.

Discussing Dr. Burger's paper, some speakers suggested that automatic factories could be designed so as to demand the expenditure of a certain amount of muscular effort by the workers; it might even be necessary to reverse the search for "easy" controls in order to accomplish this.

Boredom and Density of Machinery

Mr. A. T. WELFORD (University of Cambridge) said the general effect of automation was to reduce the load of fine adjustments while increasing that for sensory vigilance. There was more listening and watching for subtle information. Equipment should therefore be designed so as not to impose too great a strain on the operator or produce too great a demand on him during an emergency.

Boredom was a special problem, as it could not be overcome by using dullards, since in an emergency considerable skill and intelligence might be required. One answer might be to add some operation to the worker's task which was not strictly necessary; another perhaps to employ two people, one for routine operation and the other intelligent enough to deal with emergencies.

Dr. A. LUCAS (Régie Nationale des Usines Renault, Billancourt, France), an industrial psychologist in a factory with a considerable amount of automation, spoke of the need to differentiate muscular from nervous strain. In general, automation lightened the muscular load in all departments of industrial plant, he said. But whether it also led to an increase in nervous strain was difficult to say with certainty, as so far this question had not been investigated rigorously enough. However, since with automation the effect of errors was more serious and the responsibility of the maintenance worker higher, these coming on the top of the added intricacy of the machines might be expected to increase the nervous strain. The increased density of electrical motors and equipment in the factory, and the consequent increase in noise, were bound to impose an extra nervous strain also, if not countered by correspondingly better noise- and vibration-proofing.

Mr. J. A. SAROGROVE (Automation Consultants and Associates Ltd., London) provided a useful corrective to the more starry-eyed thoughts on automation by pointing out that the general rule was for its cost to rise progressively

*"Bit" is short for binary digit and is a measure of information.

with the amount achieved. For complete automation the cost would be infinitely high. There was therefore only a limited useful range for automation. The human operator would always be needed.

THE CONTEMPORARY EMBRYOLOGIST INTERNATIONAL CONFERENCE AT CAMBRIDGE

[FROM A SPECIAL CORRESPONDENT]

Since the time of Aristotle the study of unborn animals has been of great interest to biologists and medical men, for it seeks to provide an explanation of the way in which the complex organs of the normal adult are formed and of how malformations can arise. Until the nineteenth century the majority of embryologists were physicians concerned primarily with the treatment of disease. In recent times, however, embryologists have been drawn from many fields of science, and zoologists, biochemists, and anatomists, as well as practising doctors, have all added their quota to the subject.

Five years ago, to contend with the increasing volume of embryological research, the *Journal of Embryology and Experimental Morphology* was founded, and from time to time its editorial board sponsors international congresses for the discussion of current problems. The third of these congresses was held at the invitation of Professor J. D. Boyd in the anatomy department at Cambridge from April 10 to 13.

Causal Embryology

Modern embryological research is concerned with the underlying causes of development. This contrasts sharply with the detailed descriptive studies that characterized research in the last century and still form the major fare of the present-day medical student. It is now known that certain tissues cannot develop in isolation; the presence of some other specific tissue is necessary for their differentiation. For example, the neural plate will not arise and complete its development unless mesoderm and notochord lie beneath it. It is therefore accepted that these tissues influence the neural plate, and this phenomenon is known as neural induction. Such causal relationships can be demonstrated by taking tissues from their normal positions and grafting them into other parts of the embryo. Embryologists are also concerned with the possible chemical nature of embryonic inductions, although perhaps less so than they were 20 years ago. At that time they were searching for a single chemical substance which they believed might be responsible for neural induction and which was thought to be produced by a part of the embryo termed "the organizer." The search for this elixir-like substance appears to have been largely abandoned.

Biochemical changes in embryos are also widely studied nowadays. For example, protein metabolism can be investigated by administering amino-acids which include radioactive atoms. Another important aspect of embryology is the study of regeneration; such work is clearly related to processes of great medical interest such as the healing of wounds and nerve regeneration. Unfortunately the mammalian embryo, secluded as it is within the uterus, is a very difficult subject for the experimenter, and much of our knowledge of causal embryology is derived from the study of the chick embryo and from that of the aquatic eggs and tadpoles of amphibians. However, the basic processes of development in mammals are unlikely to differ greatly from those in other vertebrates.

Embryonic Induction and Differentiation

These research trends were fully reflected in the topics discussed at the conference. Several papers were directly concerned with the problems of embryonic induction. Dr. P. TSCHUMI (Cambridge) dealt with the interaction between

ectoderm and mesoderm during the growth of the limb-buds in the tadpole of the South African clawed toad, *Xenopus laevis*. First, he had separated the epidermis from the underlying mesoderm. The tissues could then be grown separately, or could be recombined with each other or with different tissues. He found that provided the epidermis was present the limb-bud would form a limb, but if the epidermis was absent a complete limb never developed. Dr. P. SENGEL (Paris) described his experiments on the growth of the feather rudiments in the chick embryo. It was found that at one stage the epidermis needed a stimulus from the dermis in order to develop properly; in the following stage the mesoderm became dependent on the influences from the overlying ectoderm. Professor T. YAMADA (Nagoya, Japan) gave an account of experiments in which the chemical nature of neural induction was studied. After establishing that lipids were not the substances involved he presented evidence to suggest that the protein component of ribonucleoproteins played a major role.

The factors controlling the differentiation of the embryonic eye were considered in a paper sent by Dr. G. V. LOPASHOV (Moscow), who was unfortunately unable to be present. His report drew attention to the importance of spatial relationships between developing cells of the retinal and pigment layers. His observations were made on tissues growing *in vitro* and in transplants, and he found that if the cells were overcrowded the pigment layer failed to develop, whereas if the cells were too widely separated the retina did not form.

Sites of Protein Synthesis

Protein metabolism was considered by Professor C. H. WADDINGTON, F.R.S. (Edinburgh). After immersing embryos in solutions of radioactive amino-acids he found that these compounds were incorporated more rapidly into some regions of the embryo than into others. For instance, they were taken up first into the cells around the blastopore lip and only later were they found elsewhere. The radioactive amino-acids had become concentrated mainly in the nucleoli and around the nuclear membrane. Professor Waddington suggested that these regions were the main sites of protein synthesis.

Studies of Regeneration

Some remarkable experiments were reported by Dr. D. R. NEWTH (London), who dealt with the regeneration of abnormal structures. The tissues with which he was mainly concerned were supernumerary limbs in newt larvae. These had been previously induced by implanting a nasal placode* into the flank region. These limbs tended to possess abnormal numbers of digits. Dr. Newth amputated them through the humerus, and in many cases they regenerated; if the amputation were repeated they usually regenerated again. Each new limb which formed was not, however, a replica of the one it replaced; the numbers of digits became more nearly normal with each regeneration, and after the second amputation a normal limb with the correct number of digits usually developed. Dr. Newth suggested that the influence of the surrounding flank ectoderm might perhaps play a part in this extraordinary process.

It was pleasing to be reminded of evolutionary problems during the paper by Professor E. C. WOLFF (Paris). It is well known that a complete fibula is seldom found in modern birds, and Professor Wolff was able to show that this may be because not enough cells are present in the normal limb bud before the various parts of the limb begin to form. He found that the limb bud was able to develop a complete fibula if extra prospective limb-tissue was grafted into it.

The papers mentioned above were, of course, only a few of those read at the Conference. Moreover, one afternoon was devoted entirely to research demonstrations. The conference provided an ideal opportunity for the exchange of ideas between embryologists from many different countries.

*A thickened plate of ectoderm forming the precursor of an organ.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Foetal Post-maturity

SIR,—I hesitate to cross swords with such a senior and respected obstetrician as Professor F. J. Browne, but I feel that his paper on foetal post-maturity and prolongation of pregnancy (*Journal*, April 13, p. 851) has confused rather than clarified the problem.

It is well known that even where pregnancy and labour are clinically normal the foetus may die before, during, or soon after labour—"unexplained" deaths.¹ In primigravidae such deaths are least common in the very young and become steadily more frequent with increasing age of the mother. They are most common when pregnancy lasts longer than 42 weeks. The incidence of dystocia also increases with increasing age and length of gestation. These facts suggest that the uterus becomes steadily more inefficient as the mother gets older, both as regards placental function and labour. The studies of Walker and Turnbull,² referred to by Professor Browne, have shown that the passage of oxygen from the mother to the foetus decreases steadily from the 41st week onwards, and Turnbull³ has shown that, in apparently healthy primigravidae over the age of 30, the oxygen content of the umbilical vein often reaches dangerously low levels by the end of the 42nd week.

In the University of Aberdeen midwifery department clinic, between the years 1938-47, there were 46 "unexplained" deaths in booked primigravidae and half of them occurred after the end of the 41st week. In 40% of the cases death occurred before the onset of labour. Of 73 other deaths attributed to the effects of difficult labour, 46% occurred after the end of the 41st week.

Some advocate expectant treatment and caesarean section if foetal distress develops, but, as I have already shown, many of the deaths occur before the onset of labour, often before the patient reaches hospital. Even if she is under observation in hospital the foetal heart may stop suddenly and with little, if any, warning. It is clearly difficult to anticipate the death if it occurs at or about the expected date of delivery, but induction of labour to avoid undue prolongation of pregnancy seemed to us worth while. Our method initially was to rupture the membranes in the 42nd week routinely in primigravidae of 25 years or more, but the treatment spread to some extent to the younger age groups (doubtless, in time, tests for placental function may render treatment more selective). In some cases the liquor amnii was found to be heavily stained with meconium, indicating that the oxygen supply to the foetus was probably dangerously low. Sometimes this led to immediate caesarean section and in others to a shorter trial of labour. The results of this regime have already been described,⁴ and the following figures give the latest results:

Age groups:	Perinatal Mortality per 1,000 Births					
	15-19	20-24	25-29	30-34	35+	All Ages
1938-47	36	35	57	76	101	45
1953-6	40	26	28	17	25	28

They show that the trend of perinatal mortality with age has been changed to such an extent that the rate in primigravidae over 30 is now lower than in those under 20. The rate in very young primigravidae is unaffected by this regime, since in this group prematurity, accidental haemorrhage, and malformations account for most of the deaths, and unexplained intrauterine death and birth trauma are relatively unimportant. Undoubtedly artificial rupture of the membranes will increase the risk of intrapartum infection of the foetus, but, as our results show, this danger is small compared to the benefits of the method.

The present policy—namely, routine surgical induction of labour in the 42nd week and the greater use of caesarean section, instituted in 1952—has improved our results so much that we are convinced that the avoidance of prolonged pregnancy helps to decrease the number of foetal deaths due to placental insufficiency.—I am, etc.,

Aberdeen.

DUGALD BAIRD.

REFERENCES

- ¹ Baird, D., Walker, J., and Thomson, A. M., *J. Obstet. Gynaec. Brit. Emp.*, 1954, 61, 433.
- ² Walker, J., and Turnbull, E. P. N., *Lancet*, 1953, 2, 312.
- ³ Turnbull, E. P. N., personal communication, 1957.
- ⁴ Baird, D. *British Medical Journal*, 1955, 2, 1159.

SIR,—Many of the younger obstetricians will be sorry to find that Professor F. J. Browne (*Journal*, April 13, p. 851) has reopened the old controversy on post-maturity, suggesting that any danger to the foetus would come from an increase in size with potential disproportion. He somehow discounts the classical studies of Walker, who would appear to have shown conclusively that danger arises from diminishing oxygen tension in foetal arterial blood. He quotes foetal mortality statistics from various hospitals without reference to whether they serve a closed community or admit solely abnormal cases. He gives evidence to show that in certain countries prolongation of pregnancy is extremely uncommon. He also mentions various complications that may ensue when cases are unwisely selected for surgical induction of labour, suggesting that the disorders of uterine action so commonly found with post-maturity are due to this unwarrantable interference. In short, he tries to convince us that post-maturity is merely a process of slow maturation, and that anyway it is remarkably rare.

It is perhaps a pity that he does not discuss the reason for the onset of labour; although it remains largely obscure, it seems certain that it is not caused by the perfection of foetal maturity, although its usual association with this has been fortunate for the continuation of the human race. He does not mention the fact that graphs for foetal weights show a levelling off followed by a decline after the forty-second week, which is in line with the clinical observation that post-maturity is often most dangerous in cases which do not show any increased foetal growth. These are cases which frequently show the morbid changes of post-maturity, the dry foetal skin, the scraggy lean physique, and the absorption of the liquor amnii. The association of poor uterine action with these cases is surely due to the fact that the post-maturity is caused by poor uterine action of pregnancy with imperfect formation of the lower uterine segment, so that prolongation of the first stage of labour is almost inevitable.

It is well known that pregnancies may appear to be prolonged owing to delay in fertilization or embedding of the fertilized ovum. It would be bad obstetric practice to attempt an induction on every woman who believed that forty-two weeks had passed since her last period. But in pregnancies that have been followed carefully from the early weeks it would be foolish and retrograde to adopt a complacent attitude to the steadily falling foetal oxygen tension that accompanies post-maturity.—I am, etc.,

Birmingham, 15.

W. G. MILLS.

Hospital Confinement

SIR,—Dr. J. P. O'Dwyer (*Journal*, April 20, p. 947) is right up to a point. The safety of the mother is paramount. All other human and psychological considerations take second place. However, I suggest that it need not be safer for any woman to be confined in hospital, only more convenient. No general practitioner should do domiciliary midwifery unless he has at his command the same expert help as has the resident house-surgeon in hospital. With modern communications a woman can be as safely moved from her home to the operating theatre of a hospital as from the labour ward to the theatre in hospital. If she is unfit to be moved, expert help goes to her in bed whether at home or in hospital.

Obviously, if you anticipate trouble, you will book a bed for the patient in hospital for everyone's convenience; but the rules need not be hard and fast. A primigravida anxious to have her child at home will be told that she may make arrangements for a home confinement, but that if the labour gives any cause for anxiety it may be more convenient for her to be delivered in hospital. This in turn means that there must be real co-operation between general practitioner and hospital. In other words, every domiciliary confinement concerns the hospital as well as the general practitioner. The shame is that domiciliary confinements are being actively encouraged before this co-operation is secured.—I am, etc.,

Cambridge.

CLEMENT W. WALKER.

SIR,—Dr. J. P. O'Dwyer asserts (*Journal*, April 20, p. 947) that it is so much safer to have a baby in hospital than at home, and incidentally wonders how many doctors' wives are confined at home. I know he has had experience of working in maternity hospitals, but wonder what experience he has of general practice. As to his first point—is it so much safer? The same issue has a paper on the umbilicus as a reservoir of infection in a maternity hospital (p. 925). Surely it is recognized that cross-infection is a problem that constantly has to be tackled in hospital, and yet it hardly exists in even the poorest home.

We are lucky in having an excellent maternity hospital locally, and as our third child, born in the 27th week of pregnancy, has been successfully matured there we have every reason to be grateful for the hospital's special care. But he was booked for home delivery with our G.P. until he considered hospital necessary, and the other two children were born happily at home through choice. I am a G.P. My wife was a laboratory technician concerned with bacteriology in a laboratory attached to a general and maternity hospital. I have noticed experienced nurses decide not to have their second baby in hospital. As to what most doctors' wives do, there is no guarantee that their choice is the best one. By training, a doctor is still largely concerned with the treatment of abnormality, rather than the study of normality. It would be illogical to send one's child to a reformatory just in case it turned out to be a delinquent (even though the cost per boy is higher than Eton, I understand).

I suggest that, instead of this home v. hospital becoming an undignified battle of vested interests, we all keep our sense of proportion. I feel the G.P. should discuss the various points for and against the two places and let the mother decide. I have not seen much attention given to the mother's wishes in all that has been written on this "battle." In case you think I have a vested interest also, I do not now do obstetrics, although I believe that home is the normal place for a normal confinement.

Incidentally, my wife would have written to disagree with Dr. O'Dwyer, but she is feeding the baby, and anyhow she thought other doctors would be able to reply more adequately. And she is probably right.—I am, etc.,

York.

PAUL ROWNTREE.

Cardiac Arrest During Trichlorethylene Anaesthesia

SIR,—As one who has always found trichlorethylene a most useful and safe anaesthetic agent, I was interested to read the article by Drs. Walter Norris and Peter Stuart (*Journal*, April 13, p. 860). I have always thought that this drug should not be used for anaesthesia without full premedication and a thiopentone induction, and was therefore particularly interested to read that in the four personal cases of cardiac arrest occurring during induction no thiopentone had been given. In three of these premedication was with atropine alone. This suggests that trichlorethylene was being used to induce anaesthesia. In the cases surveyed from the literature the use of thiopentone is mentioned in only one. While I am aware that this is not common to all reports, I would be glad to know the opinion of the authors and other anaesthetists on the protective role of thiopentone, at least during induction. Finally, with

reference to air embolism, in my experience this does occur suddenly, and, if small, I believe is consistent with equally rapid and complete recovery.—I am, etc.,

London, E.C.1

ROBERT I. W. BALLANTINE.

REFERENCE

¹ Committee upon Deaths Associated with Anaesthesia. *Anaesthesia*, 1956, 11, 194.

SIR,—I have been using trichlorethylene for some years as a non-inflammable supplement to nitrous oxide and oxygen anaesthesia, and would regard it as suitable for almost all types of anaesthesia.

I have not seen a case of cardiac arrest during trichlorethylene anaesthesia, but on two occasions, however, using a Walton machine with a Rowbotham's "trilene" bottle, the patient has suddenly lost colour with diminished respiratory effort. The trichlorethylene was discontinued and the patient quickly returned to near normal—i.e., her colour was fair, but she felt dizzy and sick. In these cases I feel that no arrest had taken place, but certainly a diminished cardiac output. On each occasion the trichlorethylene had been in the Rowbotham's bottle for a week.

Now, Sir, this I maintain is the cause of cardiac arrest during trichlorethylene anaesthesia—i.e., that the trichlorethylene is not fresh and some deterioration has taken place. I feel certain that some, if not all, cases reported by Drs. W. Norris and P. Stuart (*Journal*, April 13, p. 860) were due to this cause. I never use trichlorethylene that has stood for any length of time other than in its tin container.—I am, etc.,

Ecclestone, Staffs.

E. R. SINTON.

SIR,—I was interested to read the paper on cardiac arrest during trichlorethylene anaesthesia by Drs. Walter Norris and Peter Stuart (*Journal*, April 13, p. 860). From my experience of this anaesthetic agent used in small children undergoing cardiac catheterization, I have good reason to dislike and fear what appears to be its effect on myocardial excitability. In 1955 I described a case of ventricular fibrillation in Fallot's tetralogy during cardiac catheterization under trichlorethylene. This case fortunately resumed sinus rhythm after treatment with procaine amide. At Sully Hospital we had a number of lesser, but very disturbing, episodes of ventricular arrhythmia during catheterization when trichlorethylene was used, so that we eventually refused to accept this anaesthetic for this purpose. Our definite impression of the higher incidence of troublesome ventricular arrhythmia during the use of this agent was confirmed by the cases in which the occurrence of myocardial excitability in a previously tolerant heart closely followed the administration of the drug and, again, by the fall in the incidence when trichlorethylene was abandoned.

Apart from the anxiety we felt for these patients, the frequency of the runs of ventricular tachycardia greatly impeded the efficiency of the catheterization. It appeared that small amounts of trichlorethylene were sufficient to have this effect, for these cases had rectal bromethol as a basal anaesthetic and trichlorethylene was only added when necessary to ensure a quiet child. As already mentioned, the increase in myocardial irritability was frequently noticed to be closely related to the first administration of the drug. All our cases had continuous E.C.G. monitoring, and it is likely that the tendency to ventricular arrhythmia which we observed passes unnoticed in many cases. The matter may need further investigation, but in the type of case we were dealing with our only desire was to avoid the effects described.—I am, etc.,

London, S.W.3

HUGH A. FLEMING.

REFERENCE

¹ Fleming, H. A., *Lancet*, 1955, 1, 617.

Premedication in Children

SIR,—The article by Dr. R. Goulding and his colleagues (*Journal*, April 13, p. 855) is a most provocative one, as doubtless was intended. As one of the workers charged with drawing unfair conclusions from their results, there are some points which I would like to take up with them.

As they themselves admit, the assessment of anxiety in a child is most difficult, and certainly behaviour is no measurement. I am sure that the psychologist in their team would be the first to admit that the apparently controlled child is probably suffering more emotional upset than the child who openly resists. In my original work¹ a trained psychiatric worker visited all the cases in their own homes after discharge from hospital and made an independent report. This showed that methylpentynol was at least as effective as the barbiturates in allaying fear of operation. To state, as they do, that neither a barbiturate nor chlorpromazine is more effective than a placebo can only mean that the dosage used by them was inadequate. And this is just where methylpentynol is so useful—it can be given in large enough dosage without danger of respiratory depression or uncontrolled behaviour. I would suggest that they use just twice the dose mentioned in their article.

I would also suggest a good way of assessing its value. Many of their cases will have to return for a further session in the "gas room." I am sure that a careful follow-up of these children will show a difference between those properly sedated and those without anything. And may I criticize their technique of removing all children, especially the younger ones, from their mothers to wait in a common waiting-room till their turn comes? A similar incident is indelibly fixed in my memory, which is perhaps why I am so keen to prevent other children suffering it. The mother should surely stay with the child until it has lost consciousness, which is one advantage of out-patient anaesthesia. If the mother is "too nervous" I would suggest that she receives a good dose of methylpentynol.

Another method of assessment I would recommend is the opinion of a good ward sister, which admittedly could not come within the scope of their trial. But I must record the insistence with which my ward sisters maintain that methylpentynol gives just the right amount of sedation without troublesome after-effects. Only this last week I had to anaesthetize a boy who had already received many anaesthetics at another hospital. His comment, unasked for, in the anaesthetic room was, "I have never felt like this before; I don't mind it to-day." In any case I should be very unhappy if 20% of my children, even the young ones, were "turbulent" at even an out-patient gas session. If this figure can be reduced slightly I am sure it is worth while, provided that safety is maintained.—I am, etc.,

Worthing.

F. R. GUSTERSON.

REFERENCE

¹ Gusterson, F. R., *Lancet*, 1955, 1, 940.

SIR,—Dr. R. Goulding and his colleagues (*Journal*, April 13, p. 855) have made a significant and much-needed contribution to the study of premedication in children. I was particularly impressed with the results of their analysis of behaviour in relation to age (figure 7), and take the liberty of offering some further factual data on this point.

Several years ago I set out to investigate the effects of ethyl chloride, when given by the open method, with the object of obtaining information bearing on the safety of this "old-fashioned" procedure. This investigation was not designed to test the efficacy of the premedication used. However, the behaviour of the children was noted as a matter of subsidiary interest. These behaviour patterns now seem worthy of recording, since they can be considered in conjunction with those of the carefully controlled experiment to which reference has been made.

I will refer to figures from a single homogeneous group—those for children about to undergo operation for tonsillitis and adenoidectomy. These children all came from the same ward, where they had all been given quinalbarbitone, $\frac{1}{4}$ gr. (50 mg.), by mouth pre-operatively (the reasons for, and the merits and demerits of, this oversimplified premedication regime do not concern us now). The children all came to the same anaesthetic room, where they received the attentions of the same nurse and the same anaesthetist (myself). Their behaviour was classified as follows: A: arrived asleep, and continued so; B: arrived awake and calm, and showed

no disapproval in any way of the experiences to which they were subjected; C: arrived awake and calm, but became a little upset during the induction of anaesthesia; D: arrived awake and calm, but became violently antagonistic to induction; E: arrived awake and already showing disapproval of their new environment. The numbers of children falling into these categories are tabulated below.

Age	Category				
	A	B	C	D	E
3	7	38	13	3	2
4	12	58	9	3	2
5	22	158	14	3	5
6	13	154	12	1	3
7	15	123	13	2	—
8	2	97	4	2	—
9	2	75	6	1	—
10	2	46	4	2	—

Making the same age division as that used by Dr. Goulding *et al.* for their dental cases, we note that in the 3–6 age group 54 (10.2%) out of 532 arrived asleep. In the 7–10 age group only 21 (5.3%) out of 397 were in a similar state. This difference is significant ($\chi^2 = 6.6$, $p = 0.01$). On a body-weight basis the younger children undoubtedly received a larger dose of sedative than the older ones, and the hypothesis could be put forward that the difference in results was due to this. However, in the absence of controls, giving comparable figures for unpremedicated children, no more can be said. Bearing in mind both the relatively greater dose of sedative used for the younger children in my own series, and the findings of Dr. Goulding *et al.* in theirs, it is of greater interest to consider the behaviour of the 854 children who came to the anaesthetic room awake. In the 3–6 age group 70 (14.6%) out of 478 children expressed disapproval of their experience in one way or another. The corresponding figures for the 7–10 age group are 35 (9.3%) out of 376. This difference is also significant ($\chi^2 = 5.1$, $p = 0.02$). And the discrepancy with respect to disapproval is even greater if we compare the 3–4 and 9–10 age groups (25% : 9.7%, $\chi^2 = 9.7$, $p = 0.002$).

It seems to me that the work of Dr. Goulding *et al.* has not only re-emphasized the futility of uncontrolled experiments in this field but also raised a big issue, at least where the value of premedication judged by objective methods is concerned. An experiment of a similarly excellent design, to evaluate the efficacy of premedication for in-patient children, might merely serve to remind us of the importance of the correct timing of administration. But it might also reveal that some of the drugs in general use for small children, when given in dosage insufficient to cause sleep, are not nearly so effective as is commonly supposed.—I am, etc.,

Hillingdon, Middlesex.

H. J. V. MORTON.

Prevention of Tetanus

SIR,—We are grateful for the comments on our notes and recommendations (*Journal*, March 16, p. 639). Dr. W. A. Reynard (*Journal*, April 6, p. 818) mentions our acceptance of 1,500 international units as the routine protective dose of antitoxin in a non-immune individual, and draws attention to Dr. L. S. Kind's article (*Journal*, March 2, p. 498) where an increase to 10,000 was suggested. Dr. M. R. Madigan (*Journal*, March 23, p. 706) also favours a larger dosage than we advised—i.e., a minimum initial dose of 3,000 units for adults and 1,500 units for children. This correspondent's recommendation may partly be based on articles published before 1950 to which he makes reference: no mention is made in his letter of the change in the value of the international unit on July 1 of that year. The present unit is equivalent to the U.S.A. unit and is twice the potency of the former (1928) international unit.

A prophylactic dose of 1,500 units is sufficient for routine use, and is still the initial dosage advised for non-immune

Service personnel and their families. This routine is based on the advice of a committee of Service and civilian experts. Two more similar doses may be given at weekly intervals if the surgeon in charge of the case considers this necessary; while this procedure may afford better protection than one large dose, it carries a slight risk of accelerated serum reaction after the third dose. A prophylactic dose of antitoxin is also advised before any fresh surgical interference with the wound.

There is a long tradition of injecting as a routine 1,500 units or less, including Army experience in two world wars. Nevertheless, some doctors, particularly in the U.S.A., prefer a dose of 5,000 or even 10,000 units. One reason for this preference is fear of the accelerated elimination of serum. As stated in our paper, certain patients may have become sensitized to horse serum, with the result that if they are given it again at some future date they may eliminate it so rapidly that protection is inadequate. This is now recognized as one of the main troubles in connexion with the repeated administration of serum. Unfortunately, the fall in blood antitoxin levels may be so rapid in sensitized individuals that there is little, if any, advantage to be expected from the higher dosage. There is, however, the possibility that in rare instances 10,000 units might offer some advantage in heavily contaminated wounds by neutralizing tetanus toxin, which may form very rapidly: the action of the serum would then be therapeutic rather than prophylactic.

With regard to the dosage of antitoxin for children, we favour uniformity in dosage for persons of all ages, as is recommended officially for British Service personnel and their families. The volume of refined serum injected for the 1,500 unit dose is quite small, and reactions would not be appreciably lessened by reducing the volume of the dose. There is thus no point in reducing the dose for children and some advantage in having the same dose for everybody.

Dr. E. D. B. Wolfe (*Journal*, April 13, p. 885) inquires about the best procedure to adopt when immunizing with diphtheria-tetanus-pertussis and T.A.B.T. vaccines. We shall first compare the recommendations for triple prophylactic with those for tetanus toxoid alone. The usual primary course for triple prophylactic is three injections at intervals of one month to six weeks in the first six months of life, say, between the second and fifth months; this should be followed by a boosting dose six to twelve months later. It will be recalled that we state in our article: "For primary immunization three 1-ml. doses of tetanus toxoid are injected subcutaneously or intramuscularly at intervals of 6 to 12 weeks between the first and second injections and 6 to 12 months between the second and third injections." Thus, in approximately the same period of time, four injections of triple prophylactic or three injections of tetanus toxoid are advised in the respective schemes for these two preparations. The recommendations in respect of tetanus in connexion with the schemes fall into line if the second dose of triple vaccine is disregarded from the tetanus standpoint. We would suggest that, in recommending a three-dose course of triple prophylactic for the early months of life, the makers have been more concerned about obtaining useful protection against pertussis: a two-dose rather than a three-dose course would have sufficed against tetanus. The first and third doses of triple prophylactic (omitting the second) could be expected to give similar titres of tetanus antitoxin to those which result from two doses of tetanus toxoid by itself in later life. In neither instance must the further injection six to twelve months later be disregarded, as it ensures much higher titres of circulating antitoxin. T.A.B.T. does not give rise to any difficulty, as the intervals between the three doses now recommended in the Forces are similar to those usually advised in this country for tetanus toxoid. The recommendations for T.A.B.T. and tetanus toxoid fall into line.

It is of course impossible to give exact instructions to cover every possible contingency, but the definitions already given in our article, supplemented by this letter, should serve as a useful guide to procedure. In conclusion, we would again urge active immunization, which is the ideal method

for the prevention of tetanus. This should preferably be begun in infancy, when a combined preparation is virtually essential to keep the number of needle-pricks within reasonable bounds.—We are, etc.,

H. J. PARISH.
L. J. M. LAURENT.

Beckenham, Kent.

SIR,—I have read the recent correspondence about tetanus prophylaxis with interest, and should like to put forward a suggestion for the comment of other readers. In my view all patients treated for a minor injury should be given an injection of 1 ml. of tetanus toxoid. The only exceptions should be patients with deep puncture wounds or other injuries known to carry a special risk of tetanus. These cases would be treated in the usual way with anti-tetanus serum.

By this system a fairly large proportion of the community would quite soon become actively immune to tetanus. Those whose occupations carry a high risk of minor injury would tend to receive frequent injections of the toxoid, and would therefore achieve a high antibody level. No special clinics or other arrangements would be needed, and the main population at risk would be protected.—I am, etc.,

London, N.6.

JOHN W. MYLES.

Athlete's Foot

SIR,—The extent of communal disability produced by athlete's foot well merits the space devoted in your issue of March 30 to two excellent articles and an annotation on the subject. Mr. J. C. Gentles in his article (p. 746) concludes that any measures for the control of infection must be taken by the individual. The formidable list of personal precautions given in your annotation (p. 755) would surely dampen the ardour of any but the most fastidious and over-zealous sufferer. Personal measures, if they are to be generally effective, must be simple. Something in the nature of a fungicidal soak, used routinely in sock washing, and of such a nature as to remain effective during the wearing period of the socks, might prove more effective and more popular than the application of sticky ointments and chalky powders.—I am, etc.,

Chester.

T. D. S. HOLLIDAY.

SIR,—Thirty years ago half my practice was with the boys of one of our great public schools, and I saw a good deal of ringworm of the groin and ringworm between the toes. At one time there were a number of cases of ringworm of the toes in a particular house, and the housemaster rather reluctantly gave me permission to examine the feet of all the 40 boys in his house. None of the little boys were affected, but among those from puberty onwards the majority had some degree, mostly extremely slight, of fissuring or scaling in the cleft between the 4th and 5th toes, and in all of these spores were found on microscopic examination. A little trouble was found in the matron's toes and a considerable amount in the housemaster's—much to his indignation. In most of these cases there were practically no symptoms, and, apart from the possibility of infecting others or developing a phase of more active inflammation oneself, the condition was of no importance.

It may well be that some individuals are more susceptible to this infection than others, and that there are many symptomless carriers. And of those that do get symptoms some will go to a doctor, but probably many more will keep the trouble to themselves and say nothing. I feel sure from my school experience that this infection can be passed round the members of a household. But quality of skin is also important. Boys before puberty were hardly ever affected, and I suppose their skin has a different quality from that of adults. I am told that the same trouble does occur in girls' schools, but much less frequently. This again may be because girls' skin is more like that of small boys and not so coarse as men's. Or is it because girls are cleaner in their habits?—I am, etc.,

Jersey.

N. A. SPROTT.

Sir Victor Horsley

SIR,—May I congratulate you and their authors on the most excellent centenary essays (*Journal*, April 20) on Sir Victor Horsley, which bring back vividly the memory of that eager and masterful personality? I was his house-surgeon in 1902, the year he was knighted, and he was a frequent visitor in my house in Harley Street when Wilfred Trotter, then his private assistant, was living with me. The deftness and accuracy of his operating on the brain were something one could never forget, and he would coax a tumour from the thyroid as if by a gentle magic. His ambidexterity naturally helped him in this, and he seemed to expect the same gift in others. I remember when I fumbled over tying an artery with my left hand, my right hand being occupied with a Spencer Wells, he advised me to have my eyes tested for astigmatism. With abdominal operations, however, he was more slapdash, having none of the meticulous patience of a Barker. He was always glad to leave other operations to his juniors, and I imagine few house-surgeons would have had the opportunity that fell to me of amputating a thigh single-handed.

He got through more work in a day than anyone else I have known, making use of every moment. Guests he entertained at breakfast, dashing out in the middle to develop photographs. Yet, with all his swiftness he was never hurried. Ward visits were accomplished in half the usual time, but the concentrated attention he devoted to each patient gave him the impression that he was his sole care in life, and he would arrange their pillows with a tender deftness that was the envy of the nurses. A hospital story illustrates this remarkable combination. When an assistant surgeon he had to see out-patients at half-past one, an occupation that normally took two or three hours. His senior, Christopher Heath, who used to chide him on not giving enough time to his hospital work, arrived for his ward visit one day at two o'clock to find Horsley leaning against the mantelpiece in the staff room. A tirade followed, culminating in the words: "And here I find you loitering when you should be seeing your out-patients." Horsley quietly replied: "I've seen them all already," and left for his laboratory.—I am, etc.,

Elsted, Sussex.

ERNEST JONES.

SIR,—The elephant's brain mentioned by Mr. Ernest Sachs in his interesting reminiscences of Sir Victor Horsley (*Journal*, April 20, p. 903) was certainly not the only one he received.

Colonel Martin-Leake, who won a bar to his Victoria Cross in the first world war, was after the South African war appointed as medical officer to the Bengal-Nagpur railway. In addition to being a very skilful surgeon and administrator, he was a notable shikari. On one occasion, in 1907 he was pursuing a wounded rogue elephant which had killed a man. After some six hours' tracking he found himself suddenly confronted by the infuriated animal, some 10 ft. 6 in. (3 m.) tall. He administered the *coup de grâce* and spent nine hours the following day in removing the brain, which he sent to Sir Victor in a stew-pan. He tells how he had to attach a rope to the trunk and have some twenty lusty coolies pulling before the vertebral ligaments went with a snap and the head was freed. One of the feet of this famous animal was mounted and is now in the officers' mess of 5 Field Ambulance, the unit to which Leake was posted in 1914 and with which he was serving when he obtained the bar to his Victoria Cross.—I am, etc.,

Crookham, Hants.

R. E. BARNESLEY.

SIR,—Sir Victor Horsley lived in our field ambulance in the forward area for a few days before he returned to Amara, where he died. One day when I came into lunch I mentioned that the last "mahela" (*anglicised* barge) which came up the river was loaded with "poshteens for the Piffer Brigade" (sheepskin coats for the Punjab Frontier Force). He said he would go at once to verify that statement, which

meant walking up or down the river to cross over. We tried to dissuade him in the heat of the day, but he said he had nothing to fear from the sun, as he was not a "drunkard" as we were. In those days we were very short of drinks except Tigris water. I do not doubt this example of the muddles in Mesopotamia was added to the notes which he did not live to pass on, but am pretty sure it was recorded.—I am, etc.,

Camberley, Surrey.

C. H. REINHOLD.

Safety Factor in Car Design

SIR,—Dr. Gareth R. Davies (*Journal*, April 20, p. 949) should not condemn three-wheeled cars because he has seen one turn over. Four-wheelers often turn somersaults, according to press reports, though I have never seen one do so. It is only a question of driving.

Strangely enough, since quite early days the most important safety factor in design for independently driven cars on public roads has been the one most completely neglected—namely, the driver's view. For many years, though the mode has lately changed somewhat, it has been the fashion to build up a long, high bonnet in front of the driver, who is seated as low as possible. To these disabilities are added obstructions and blind spots caused by low roof, thick pillars, mirrors, mascots, etc., on eye level, which may well account for many of the apparently inexplicable collisions and runnings-down. An extreme example occurred a few years ago, when, in the account of an inquest on a little girl killed in the street, the driver of the car concerned was reported as saying that if she had only been a foot or so taller it would not have happened, as he had not seen her. In this respect the latest three-wheelers seem admirable, and, since their drivers are not protected by several feet of steel in front of them, they are perhaps less likely to take risks which endanger others as well as themselves.—I am, etc.,

London, N.W.8.

R. J. CLAUSEN.

Speed Warning Device

SIR,—I was pleased to read the letter of Dr. G. E. Pinkerton (*Journal*, April 6, p. 820). My letter (*Journal* March 23, p. 705) was a letter of introduction to the idea of a device. Between 1932 and 1938 several patents were taken out. The one he mentions must have escaped the oblivion of the rest. A description of a device recently patented will, I trust, answer some of the questions he raises. First let me say the modern car has many contrivances which are concerned with its safety and that of its occupants. Since the casualties among pedestrians, and near pedestrians—the cyclists—are more than 50% of the total (car drivers and occupants only 22%—see leading article, "Road Accidents," *Journal*, March 30, p. 753), I would suggest that it may become necessary to get accustomed to the idea of a speed warning device. I agree with his suggestion that in many areas 40 m.p.h. is reasonable, and I keenly appreciate his further statement "whereas half that speed is *deadly dangerous* . . . in many other built-up areas" (my italics). With that pregnant phrase he destroys much of his argument and justifies the imposition of a warning device in these areas. The description and purpose of this device is to warn the driver of his speed, by means of two changing lights opposite to him on the dashboard, and, by a duplication of these lights on the roof of his car, to warn the external observer that he is aware of his speed. As with all other safety units on his car, it should be compulsory, and will require to be switched on in a protected area. A white light indicates that this has been done. At about 32 m.p.h. a red light also appears, and at about 37 m.p.h. the white light goes out, leaving only the red light. Changing lights are as necessary on this unit as are the intermittent trafficator lights and zebra crossing beacons. I am concerned with the humanity side, not the legality, though I would like to say more than space permits on this aspect.—I am, etc.,

Bradford, Yorks.

ALLEN GLENN.

Obituary

J. P. LOCKHART-MUMMERY, M.B., F.R.C.S.
F.A.C.S.

Mr. J. P. Lockhart-Mummery, consulting surgeon to St Mark's Hospital for Diseases of the Rectum, died at Hove, in his sleep, on April 24. He was 82 years of age.

John Percy Lockhart-Mummery was born on February 14, 1875, the son of J. Howard Mummery, a distinguished dental surgeon and research worker and former president of the Odontological Society. From the Leys School, Cambridge, he went on to Caius College, Cambridge, where he took second-class honours in the Natural Sciences Tripos and where for a time he was assistant demonstrator of anatomy in the medical school. Like so many Cambridge students at that time he went to St. George's Hospital for his clinical training, where he won the Thompson gold medal and qualified in 1899. After qualification he held the posts of assistant house-surgeon, house-physician, house-surgeon, and assistant in throat department at St. George's, took the F.R.C.S. in 1900, and graduated M.B., B.Ch. at Cambridge in 1901. For a time he worked as demonstrator of operative surgery at St. George's, but his first honorary appointments were at the King Edward VII Hospital, St. Mark's Hospital, and the North-East Hospital for Children (now Queen Elizabeth Hospital for Children, Hackney). Lockhart-Mummery soon made a name for himself as an able surgeon, and it was not long before he began to specialize in rectal surgery, though for many years he maintained an interest in the surgery of children's diseases. In 1904 he was Hunterian professor at the Royal College of Surgeons, his Hunterian lecture being on "The Physiology and Treatment of Surgical Shock and Collapse." He was also Jacksonian prizewinner at the College in 1909.

Lockhart-Mummery wrote easily and well and was in demand as a contributor to textbooks. In 1903 he published a paper on the diagnosis of tumours in the upper rectum and sigmoid flexure by means of the electric sigmoidoscope and four years later he described in this *Journal* an operation for removal of the entire rectum and neighbouring lymphatic area for carcinoma. Contributions from his pen appeared in *Allbutt's System of Medicine* and in the *Index of Treatment*. The first book he wrote himself, *Diseases of the Rectum and Anus*, was published in 1914. He also wrote *Diseases of the Rectum and Colon*, first published in 1923, and *The Origin of Cancer* (1932). His writings were not confined to technical subjects, for he was the author of two collections of essays, *After Us* (1936) and *Nothing New Under the Sun* (1947): the former of these contained some highly controversial suggestions on improving the human race by eugenic methods, but it was a book by one, as we said in our review, "who has obviously devoted much thought to the problem of the betterment of the human race."

Lockhart-Mummery was appointed assistant surgeon at St. Mark's in 1903. He became senior surgeon there in 1913. On retirement at the age of 60 in 1935 he was appointed emeritus surgeon there with charge of six beds. In 1940 he became consulting surgeon and was elected vice-president of the hospital. During the first world war he worked as special surgeon for diseases of the bowel at a number of military hospitals in London. At

the Annual Meeting of the B.M.A. in Newcastle in 1921 he was president of the Section of Proctology and he was also president of the same Section at the Royal Society of Medicine. An active supporter of the British Empire Cancer Campaign, he was for some time honorary secretary and chairman of the executive committee and he was also honorary editor of the Annual Reports of the Campaign. In 1937 he was elected a Fellow of the American College of Surgeons.

Mr. Lockhart-Mummery was twice married, first to Cynthia, daughter of R. A. Gibbons, and secondly to Georgette, daughter of H. Polak, of Paris. There were two sons of the first marriage.

We are indebted to Mr. W. B. GABRIEL for the following appreciation: The death last week of J. P. Lockhart-Mummery represents the loss of a great figure in proctology and the last member of that grand trio—Ernest Miles, Lockhart-Mummery, and Sir Charles Gordon-Watson. They were very active in the late nineteen-twenties and early 'thirties, and in their genial picturesque way contributed so much to the discussions held in that period, especially on cancer of the rectum. No one who was there will forget the impressive International Conference on Cancer held in London in July, 1928. Lockhart-Mummery contributed an important paper to this conference (*Report of the International Conference on Cancer*, 1928, p. 117) and described his clinical classification of cancer of the rectum into A, B, and C cases, which was the forerunner of Duke's more accurate pathological classification presented some years later.

J. P. Lockhart-Mummery was appointed to the honorary staff of St. Mark's Hospital in 1903, and he proceeded steadily to build up the reputation of the hospital. He raised the specialty of proctology until it was recognized as an important subject worthy of special study and training. He was the secretary of the British Proctological Society when it was founded in 1913, with F. Swinford Edwards as its first president, and later that year or early in 1914 it became the Subsection of Proctology (Section of Surgery) of the Royal Society of Medicine. It was through Lockhart-Mummery's efforts that proctology at last became an independent section in 1939. Lockhart-Mummery's work at St. Mark's Hospital and his writings attracted visitors from all over the world. His method of perineal dissection of the rectum by blunt-ended straight scissors was quick and accurate; it was greatly admired and is current practice to this day. His mortality for perineal excision of the rectum as a two-stage procedure was remarkably low—3.4% in 117 private cases is recorded. He did original work in teaching the importance of antiseptic technique in anorectal operations, and his method of scrupulous local cleansing with ether soap and "lysol" solution was certainly a great advance; it led to improved results and has been used ever since.

Lockhart-Mummery was a wise and far-seeing man in committee, and early saw the importance of pathology and x-ray diagnosis. He was largely instrumental in interesting the British Empire Cancer Campaign in the work done at St. Mark's on polyposis and cancer of the rectum. His impressive list of publications is recorded in the *Collected Papers of St. Mark's Hospital*, Centenary Volume (1935). It would be fitting here to record the terms of a resolution passed by the committee of management at a meeting held at St. Mark's Hospital on February 20, 1940:

"The Committee of Management wish to place on record their sense of the inestimable services Mr. J. P. Lockhart-Mummery has rendered to the Hospital during his terms of office as Honorary Surgeon and Emeritus Surgeon, and as a member of the Committee of Management."

"Over a period of 37 years his brilliant surgery, judgment, and skill have enhanced the reputation and usefulness of the Hospital. His wise counsels in the administration of its affairs have been of great value,

and his work an inspiration to all who have come into contact with him.

"The Committee of Management unanimously elected him an Honorary Consulting Surgeon."

In the following year Mr. Lockhart-Mummery was elected a vice-president of the hospital and continued to serve until the inauguration of the National Health Service in 1948. Lockhart-Mummery must have been the most senior Honorary Fellow of the American Proctologic Society, having been elected as far back as 1910.

We, his colleagues who survive him, would like to record our appreciation of his great services to St. Mark's Hospital and to proctology in general, and our pride at having served under him.

C. E. D. writes: J. P. Lockhart-Mummery was appointed to the staff of St. Mark's Hospital in 1903. He became senior surgeon on the retirement of Mr. Swinford Edwards in 1913 and held this position for the following 27 years, during which time he became well known as a surgeon of exceptional skill and experience in diseases of the rectum and colon, both in this country and abroad. In the smaller world encompassed by the walls of the hospital in which he worked he was equally esteemed and respected for other qualities also, such as his administrative ability and far-sighted plans for the development of the hospital. He made his influence felt in every department of the hospital life, and his colleagues who worked with him in the years between the first and second world wars will always retain a vivid impression of his inspiring leadership.

Looking back through the vistas of nearly twenty years, perhaps one's first recollection would be of the eager way he hopped up the steps of the hospital punctually at 2 p.m. (or even before this) each Monday afternoon to begin his operating session. He literally "hopped," because, as is well known, one of his legs was amputated when he was still a student in his early 20's: but perhaps it is not so well known that the surgeon who performed the operation was none other than Lord Lister and that it was carried out with full antiseptic ritual in a nursing-home in Cavendish Square. Lockhart-Mummery very seldom referred to his disability and did not let it debar him from sports in which he was interested. Thus for many years he played golf regularly with a handicap of 9. He was a keen fisherman, and became a devoted follower of dog racing, and was immensely proud when one of his dogs won the Dog Derby. After retirement from hospital work he took to bowls and quickly became proficient in this pastime. If he met any of his former hospital friends he would tell them with boyish enthusiasm of this latest achievement.

Another memory which those who worked with him at St. Mark's will always retain is of the way in which he relaxed after his operating list on Monday afternoon or after his regular round of the hospital on a Thursday morning. He never hurried away from hospital: in fact, he would not allow his secretary to make appointments for private patients which might in any way curtail his operating sessions or his weekly morning round. At the end of these he would sit down for a spell, and, if he had an audience, he greatly enjoyed expounding his views on the world in general, in picturesque language seldom free from exaggeration. He was an eager talker but also a willing listener, and if any colleague wanted his advice or help this was the time to approach P. L.-M. He interested himself in every department of the hospital life, particularly perhaps in the pathology laboratory, which he visited regularly at least once a week. He liked to know all that was going on, and, if there was any way in which he thought he could help, out came his notebook and he jotted it down at once. One could be quite sure the matter would be attended to and reasonably sure also that he would get what he wanted, even if this exceeded estimates, because P. L.-M. had a most persuasive way with hospital management committees. He attended to his committee obligations regularly, and if he took anything up one could rely on him to see it through to the end.

Finally his colleagues at St. Mark's will always remember Lockhart-Mummery's absorbing interest in anything related to the diagnosis and treatment of cancer. This found expression eventually in the plan he made for the founding of the British Empire Cancer Campaign. His main motive in this was to bring cancer research back to the human patient. He felt that existing cancer research organizations were divorced from the realities of human cancer and that what was necessary was the encouragement of research work in hospitals where cancer patients were being treated. He might be described as the real founder of the B.E.C.C., and in due course he became the first chairman of its executive committee and the editor of its annual reports.

If as a young man he had taken up cancer research as a career he might well have made some notable discovery, because he had originality, plenty of imagination, and indefatigable energy. Even in the odd moments of a very busy professional life as a consulting surgeon he found time to initiate at least two important advances in knowledge which will always be associated with his name. The first was his operation of perineal excision for cancer of the rectum, which was published in 1920 and became widely adopted for some years. The second was his paper on the inheritance of familial polyposis, which was published in the *Lancet* in 1925 under the heading "Cancer and Heredity." In this he gave details of three families he had personally investigated, and drew attention to their high incidence of intestinal cancer. The publication of this paper initiated a research into the inheritance of familial polyposis which has since been continued with the aid of a grant from the B.E.C.C. As a result more than 60 polyposis families have been investigated and family pedigrees prepared. These families now include approximately 1,200 members, amongst whom no fewer than 241 are known to have suffered from polyposis and 169 have developed intestinal cancer. This is one example out of many which might be mentioned to illustrate Lockhart-Mummery's influence at St. Mark's Hospital. His colleagues and successors have reason to be grateful to him and to cherish the memory of a versatile and colourful personality, a stimulating companion, and loyal friend.

W. L. HARNETT, C.I.E., M.D., F.R.C.S.

Lieutenant-Colonel W. L. Harnett died suddenly in London on April 24 at the age of 76. After a distinguished career as a surgeon in the Indian Medical Service, he became well known for his work as medical secretary of the Clinical Cancer Research Committee of the British Cancer Campaign.

Walter Lidwell Harnett was born on June 7, 1879, the son of Dr. W. J. Harnett, F.R.C.P.Ed., of Barnet, Hertfordshire. From the City of London School, he entered St. John's College, Cambridge, where he was a scholar and an exhibitor. He obtained a first-class in the Natural Sciences Tripos in 1899, and in the following year went on to St. Thomas's Hospital with a university scholarship. He graduated M.B., B.Chir. in 1903, was admitted to the Fellowship of the Royal College of Surgeons of England in 1904, and proceeded to the M.D. in 1929. After graduation he held the appointments of house-surgeon, demonstrator of morbid anatomy, and assistant pathologist at St. Thomas's Hospital. Harnett entered the Indian Medical Service in 1907, taking first place at the entrance examination and being awarded the first Montefiore Prize for Military Surgery at the Royal Army Medical College. While in India he held the appointment of surgeon to the Governor of Bengal, and was superintendent of the Campbell Medical School, Calcutta, from 1925 to 1930. For the last four years of his service in the I.M.S.—he retired in 1934—he was professor of surgery at the Medical College, Calcutta. His earlier appointments included those of civil surgeon, Gauhati (1911), and resident surgeon at Calcutta Medical College (1914). During the first world war he served in India and Salonika

and with the Army of the Black Sea, being mentioned in dispatches. He was appointed C.I.E. in 1933.

After his retirement from the I.M.S., Harnett returned to London and began to take an active part in the work of several medical organizations, including the B.M.A. He served on the Council of the Association from 1938 to 1942 and on the old Naval and Military Committee from 1935 to 1940, and his work as a member of the Committee on the Organization of the Medical Profession in India (1935-9) and the Committee on the Relationship of the Association to the Profession in India (1947-9) was particularly valuable. Earlier, in 1934, he was president of the Calcutta Branch, and from 1950 until his death chairman of the Chelsea and Fulham Division. During the second world war he served as an additional member of the India Office Medical Board, and for a good many years he was chairman of the Hammer-smith branch of the Invalid Children's Aid Association.

From 1938 to 1951 he was medical secretary to the Clinical Cancer Research Committee of the British Empire Cancer Campaign. His work for the Campaign culminated in the publication in 1952 of his *Survey of Cancer in London*.

Colonel Harnett married Miss Nellie Bartingale in 1909. There were no children.

We are indebted to Sir HENEAGE OGILVIE for the following appreciation :

Others will speak of Harnett's position in surgery, of his work in the Indian Medical Service and at the Postgraduate Hospital, and of his long and honourable service to Masonry. I came to know him in connexion with the compilation, analysis, and publication of the results of the investigation into cancer in Greater London conducted by the British Empire Cancer Campaign. After two years spent in preliminary planning, the registration of cases was begun in April, 1938, and, in view of the amount of work entailed, Colonel Harnett was appointed to take charge of the investigation. He visited several centres in the United States to study their recording systems and methods of analysis, and finally drew up a code for each of the 31 types of sheet intended for recording cancer of different regions.

Harnett was uniquely fitted for the exacting and onerous task of analysing the enormous mass of information that had been collected, a task to which he brought the experience of a life-time devoted to clinical surgery and surgical teaching, and to which he applied himself with unselfish devotion. Though not a statistician by training, he was at pains to subject the figures in each group to an actuarial estimation of the normal life expectation of that group. It is an index of his zeal that of the 15,201 cases entered on the records all but 2.63% were traced.

Between 1942 and 1950 Harnett published in the Annual Reports of the British Empire Cancer Campaign analyses of cases of cancer in 15 different regions of the body. In 1952 the Campaign decided to publish a report on the whole survey. All the previously published analyses were revised and brought up to date, and statistical analyses of cancer in regions of the body not previously dealt with were included. The whole of this work was done by Harnett, and the volume that he produced is something unique in scientific literature. Never before has so large a series, entirely unselected, been got together. Never before had an analysis so detailed, so carefully checked, and so impartial been presented.

Harnett was a man of great personal charm, and uncommon modesty. His industry in the statistical analysis of the immense mass of material over so many years, and his advice at all stages, were greatly appreciated by all those members of the British Empire Cancer Campaign who had the privilege of working with him. *A Survey of Cancer in London* will remain an enduring tribute to his memory in the profession he did so much to adorn.

V. B. G.-A. writes: After holding several house appointments at St. Thomas's Walter Harnett was lured to the East at a time when India beckoned only the very best men from every medical school. After a short spell in Assam as a civil surgeon he went to Bengal, where he quickly made a

niche for himself as a very skilled genito-urinary surgeon, but it was his administrative ability and quick grasp of financial problems that most endeared him to the Government of Bengal and earned him a C.I.E. Walter quietly pursued the things that attracted him, such as Freemasonry, fishing, and his own special branch of surgery, together with the study of statistics, which held for him a peculiar attraction. During the 20 years we lived so close to each other in Calcutta I do not think he ever played any form of game in club or private house, but nevertheless he was always happy and made great friends. After retirement he closely followed the rapid progress of surgery, and particularly the prognostic side thereof. He took a special part and interest in B.M.A. affairs, though fishing, Freemasonry, and high reading absorbed him. To me it was always a joy to meet him on a Saturday and talk of cabbages and kings, for he could be great fun with those he knew well.

MAUD CHADBURN, C.B.E., M.D.

Miss Maud Chadburn, consulting surgeon to the South London Hospital for Women and to the Marie Curie Hospital, died at the Elizabeth Garrett Anderson Hospital on April 24. She was 89 years of age.

Maud Mary Chadburn was born at Middlesbrough, the daughter of the Rev. James Chadburn, and was educated at Milton Mount College, Crawley, and at University College, London. She studied medicine at the London (Royal Free Hospital) School of Medicine for Women, qualifying L.S.A. in 1893. Obtaining the London degree of M.B. in 1894, she proceeded to the M.D. four years later, and took the B.S. in 1899. At the Royal Free Hospital she held for a time the post of curator of the museum, and after qualification she was resident anaesthetist there.

She then held senior and junior resident appointments at the Clapham Maternity Hospital, from which she went on to the New Hospital for Women (now the Elizabeth Garrett Anderson Hospital) as senior house-surgeon. After this impressive series of house appointments she became an assistant physician at the New Hospital for Women and surgical registrar at the Royal Free. In later years she worked as assistant obstetrician, surgeon to out-patients, and, ultimately, senior surgeon and obstetrician at the Elizabeth Garrett Anderson Hospital, where her devoted work and interest helped to build up the obstetric department. From 1902 to 1916 she was surgeon to the Women's Settlement Hospital at Canning Town.

Miss Chadburn also had a long association with the South London Hospital for Women, which she founded. She became senior surgeon there in 1912, just before the first part of the hospital, the out-patients department, was officially opened in April, 1913. She was largely instrumental in the founding of another hospital in 1928, the Marie Curie Hospital, at Hampstead, being its chairman from that year until 1934, and chairman of its cancer research committee until 1951. She was president of the London Association of the Medical Women's Federation in 1926-7, and for 63 years she was a member of the B.M.A. She was appointed C.B.E. in 1934.

We are indebted to Dr. MARY GILMOUR for the following appreciation: Miss Maud Mary Chadburn was a pioneer and one of the most prominent women who have worked for the advancement of women in medicine. As a medical woman holding senior posts while in her early years, she appreciated that many of the younger women at that time were not having opportunities of holding responsible posts, and it was for this reason that she resolved that there should be another general hospital created in London and began working in 1911 for the establishment of a women's hospital in the south of London, staffed entirely by women. At the commencement of this venture, a very disparaging letter about it in *The Times* evoked from Miss Chadburn a reply which was published in the same newspaper. As a result of her letter Miss Chadburn was invited to meet and discuss her project with the representatives of certain anonymous individuals. These latter became the anonymous donors to the South London Hospital of £35,000, which not only

defrayed the cost of the hospital but also established a trust, the income from which was to be used towards the working expenses of the institution. It was in Miss Chadburn's house at 16, Harley Street, that the first meeting of subscribers was held. She was the first surgeon appointed to the hospital, and she remained vice-chairman until the implementation of the National Health Service Act in 1948. Miss Chadburn liked to recall how notable a part her lifelong friend, Miss Merrilees, in the capacity of honorary organizer of the Patients' League, played in the smooth running of the hospital throughout the earlier years. In 1947 the College of Arms granted the hospital armorial bearings. The cross in the crest is the emblem of Chad, a man who died in the seventh century, noted for his merciful outlook. Chad, along with a sun, which also appears in the crest, suggests Chadburn. The motto *Et dato gaudetis*—"and in giving you rejoice"—is a worthy tribute to the honoured founder of the hospital.

Since her early days as an obstetrician and gynaecologist, Miss Chadburn had maintained a lively interest in the treatment of cancer in women, and this interest later crystallized in the founding of the Marie Curie Hospital in 1928. When the need arose of finding money to secure a site and a building to centralize the research work, the money was again found by Miss Chadburn. During a conversation with Dr. Elizabeth Courtauld Miss Chadburn described the work and the needs of research on cancer of the uterus—work which she had so much at heart—and Dr. Courtauld promised to give £10,000 towards the cost. In this way the establishment of the Marie Curie Hospital in Hampstead was secured. (Miss Chadburn often remarked to me that people had frequently said to her that she was a "good beggar," but that this was not so. She would meet and talk with people describing the work in which she was interested, but she did not ask for money. It was always offered spontaneously.) She became the first chairman of the Marie Curie Hospital, relinquishing this post in 1934, when it was put on record that "it was mainly due to her unflinching personal care and wise judgment that the hospital had steadily grown and prospered." She continued to be vice-chairman, retaining also the chairmanship of the cancer research committee and of the medical committee until her retirement in 1951. Throughout the last war, and indeed until her retirement, she continued, as always, to be a pillar of strength to the Marie Curie Hospital. Her energies and devotion were given wholeheartedly to safeguarding the research nature of the work done there. When the National Health Service Act came into force Miss Chadburn was the sole surviving member of the foundation committee of the hospital still on the active medical staff.

As a chairman, whether of boards of management, or cancer research or medical committees, she possessed in a most extraordinary degree the qualities of impartiality and sincerity, sound judgment, and wise guidance.

Vital Statistics

Acute Poliomyelitis

A feature of the outbreaks of acute poliomyelitis in recent years has been the rise in the number of cases towards the end of the second quarter of the year. The week of the peak incidence has varied between the 29th week (1951) and the 41st week (1949). The curve of the peak has varied in shape, but generally the incidence has fallen rapidly by the middle of the fourth quarter. With the exception of the seasonal rise in incidence there has been no well-marked periodic characteristic in the distribution of the cases. As the figures in the table show, it is not possible to estimate the approximate size of the summer epidemic from the returns of the first quarter.

Apart from 1957 the largest number of notifications in a first quarter was in 1950, and the total of cases recorded that year was almost as high as in the initial outbreak of 1947. The number of notifications in the first quarter of 1948 was the next largest to 1950, but the number of cases notified

Uncorrected Notifications of Acute Poliomyelitis in England and Wales

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
1947	125	273	6,263	2,593	9,254
1948	417	263	768	728	2,176
1949	245	306	3,085	3,224	6,860
1950	512	723	5,119	2,345	8,699
1951	339	468	1,398	888	3,093
1952	288	518	2,514	1,184	4,504
1953	345	672	3,063	1,171	5,251
1954	332	340	1,055	661	2,388
1955	208	367	4,060	1,321	7,305
1956	366	465	1,701		3,853
1957	516				

during the year was the lowest for the 10 years. On the other hand, the number of notifications in the first quarter of 1955 was, except for 1947, the lowest for any first quarter, but the total for the year was next highest to 1950. Consequently, though the number of notifications for the first quarter of 1957 slightly exceeds that of 1950, it is impossible to forecast from that what the incidence of poliomyelitis will be this summer. If a forecast is attempted, one feature of the recent returns may be relevant. It is that the loci of infection are few, one-third of the cases in the past fortnight having been notified from one county (Essex). Whether this presages a relatively restricted summer outbreak will be worth studying.

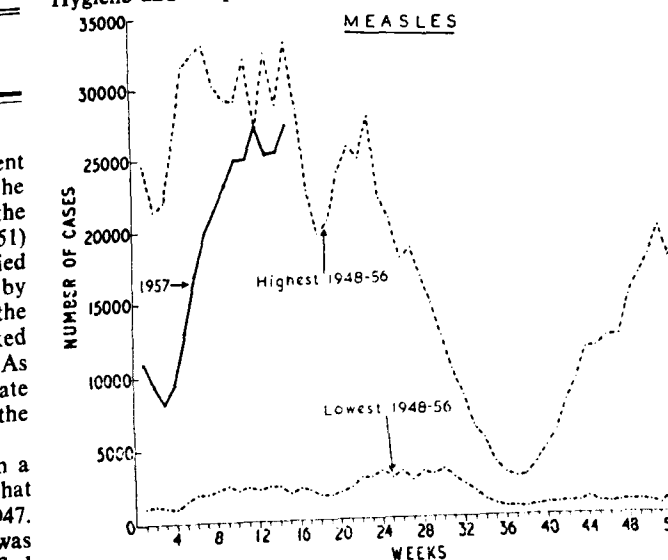
England and Wales in First Quarter 1957

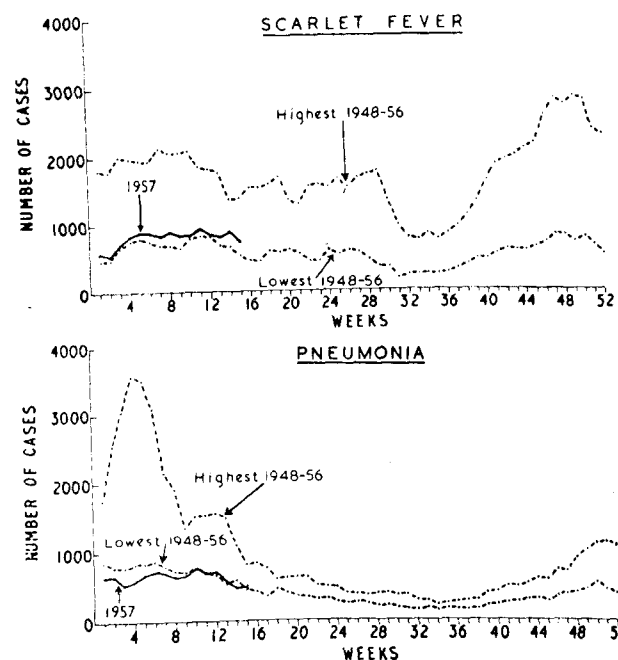
The infant mortality rate of 25.0 per thousand related live births was the lowest recorded for a first quarter. The previous lowest for this quarter was 28.4 in 1956. Live births numbered 183,676, giving a rate of 16.7 per thousand population. Comparable rates in 1956 and 1955 were 16.2 and 15.4. Deaths numbered 134,621, giving a rate of 12.2 per thousand population, the lowest ever recorded in this country for the first quarter. The previous lowest was 12.3 in 1948. The rate in 1956 was 15.3. 4,246 stillbirths were registered, giving a rate of 22.6 per thousand live and stillbirths, which compares with 23.4 in 1956.

The deaths of infants under 4 weeks of age during the year 1956 numbered 11,780, giving a rate of 16.9 per 1,000 related live births. This is the lowest annual rate recorded in this country; the previous lowest was 17.3 in 1955.—*Registrar-General's Weekly Return*, No. 16, 1957, H.M.S.O.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1948-56 are shown thus -----, the figures for 1957 ————. Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





Infectious Diseases

The largest variation in the trends of infectious diseases in England and Wales during the week ending April 13 were increases of 1,995 for measles, from 25,280 to 27,275, 120 for dysentery, from 1,051 to 1,171, and decreases of 152 for whooping-cough, from 2,768 to 2,616, 138 for scarlet fever, from 878 to 740.

Acute poliomyelitis notifications numbered 37, and these were 5 more for paralytic and 5 fewer for non-paralytic cases than in the preceding week. The largest returns were Essex 12 (Brightlingsea U.D. 7, Wivenhoe U.D. 4), London 3 (Wandsworth 2), and Hertfordshire 3.

In contrast to the general rise in the incidence of measles large falls were recorded in two counties—268 in Lancashire, from 3,055 to 2,787, and 226 in Essex, from 1,563 to 1,337. The towns with the largest rises in the notifications of measles were 293 in Birmingham C.B., from 840 to 1,133, 227 in Leeds C.B., from 500 to 727, 171 in Sunderland C.B., from 170 to 341, and 101 in Plymouth C.B., from 137 to 238. Only small variations were reported in the local returns of scarlet fever. The largest fall in the incidence of whooping-cough was 54 in Essex, from 190 to 136. 3 cases of diphtheria were notified, 6 fewer than in the preceding week.

The largest rises in the number of notifications of dysentery were Yorkshire West Riding 101, Lancashire 50, and Nottinghamshire 44. In the remainder of the country the incidence contracted and only 11 counties reported 20 or more cases, compared with 15 counties in the preceding week. The largest returns during the week were Yorkshire West Riding 346 (Leeds C.B. 85, Bradford C.B. 77, Rotherham C.B. 42, Rotherham R.D. 37, York C.B. 26, Huddersfield C.B. 14, Worsborough U.D. 13, Shipley U.D. 11, Aireborough U.D. 10), Lancashire 173 (Blackburn C.B. 22, Ashton under Lyne M.B. 21, Irlam U.D. 21, Manchester C.B. 20, Fylde R.D. 18, Liverpool C.B. 12, Stretford M.B. 12), Nottinghamshire 87 (Mansfield M.B. 41, Nottingham C.B. 22, Carlton U.D. 10), Cheshire 85 (Hyde M.B. 39, Stalybridge M.B. 26), London 62 (Lewisham 16, Islington 10), Northumberland 62 (Newcastle upon Tyne C.B. 25, Seaton Valley U.D. 23), Bedfordshire 38 (Luton M.B. 24), Durham 33 (Gateshead C.B. 12).

Week Ending April 20

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 567, whooping-cough 1,890, diphtheria 7, measles 21,787, acute pneumonia 382, acute poliomyelitis 42, dysentery 874, paratyphoid fever 4, and typhoid fever 4.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending April 13 (No. 15) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1957					1956				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	3	0	3	0	1	7	0	5	0	7
Dysentery ..	1,171	62	295	13	3	1,442	261	118	8	1
Encephalitis, acute	4	0		0		2	0		0	
Enteric fever:										
Typhoid ..	3	1	0	1		1	0	0	0	
Paratyphoid ..	2	0	0	0		7	0	2(B)	0	
Food-poisoning ..	194	13	12	1		185	30		0	
Infective enteritis or diarrhoea under 2 years ..				10	24				10	21
Measles * ..	27,275	2016	339	418	315	2,971	114	218	39	164
Meningococcal infection ..	24	2	15	1	1	35	3	16	1	1
Ophthalmia neonatorum ..	27	0	5	0		30	4	5	0	
Pneumonia † ..	497	20	102	3	13	631	39	207	3	7
Poliomyelitis, acute:										
Paralytic ..	22	2	3	0	5	12	2	0	0	4
Non-paralytic ..	15	1				8	1			
Puerperal fever ‡ ..	205	46	12	0		246	38	6	1	
Scarlet fever ..	740	56	78	48	13	537	40	62	27	23
Tuberculosis:										
Respiratory ..	697	88	313	18		738	61	115	45	
Non-respiratory ..	89	7	16	5		82	9	18	9	
Whooping-cough ..	2,616	130	292	8	59	1,451	74	143	66	129

DEATHS in Great Towns	1957					1956				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		1	1		0	
Encephalitis, acute		0			0		0			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	1	1	2	1	0	2	0	2	0	1
Influenza ..	11	2	0	0	3	18	1	0	0	2
Measles ..		0	1	0	0		0	0	0	0
Meningococcal infection ..		0	0				0	0		
Pneumonia ..	212	36	11	12	7	295	42	27	9	7
Poliomyelitis, acute	0	0			0	0	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory ..	52	6	9	1	2	69	9	11	2	4
Non-respiratory ..		2	0	0	0		1			0
Whooping-cough ..	1	0	0	0	0	2	0		1	1
Deaths 0-1 year ..	234	33	23	6		231	31	21	11	15
Deaths (excluding stillbirths) ..	5,109	732	523	105	185	5,757	833	580	107	163
LIVE BIRTHS ..	7,354	1,141	926	247	404	8,209	1,315	898	255	376
STILLBIRTHS ..	227	16	20			199	23	24		

* Measles not notifiable in Scotland, when returns are approximate.
† Includes primary and influenza pneumonia.
‡ Includes puerperal pyrexia.

Medical News

Durham University to Honour B.M.A. Meeting.—Durham University is holding a special congregation on July 18 during the B.M.A. meeting in Newcastle in order to confer honorary degrees. Dr. A. H. HALL, the Association's outgoing president, and Dr. S. WAND, Chairman of Council, are to receive the honorary D.C.L.; Professor G. W. PICKERING, regius professor of medicine at Oxford, the honorary D.Sc.; and Dr. MONA MACNAUGHTON, a general practitioner in Newcastle, the honorary M.D. At an earlier congregation, on July 5, Sir JOHN STOPFORD, F.R.S., until recently Vice-Chancellor of Manchester University, is to receive the honorary D.C.L.

Virus Research at Glasgow.—The first news of the endowment of a new department of virology at Glasgow University was given to a press conference in Glasgow on April 26. A sum of £225,000 has been provided by the Scottish Hospital Endowments Research Trust for building and equipping an institute, and for its initial running expenses. The institute, which is to be at Gilmorehill within the University grounds, is expected to be ready by about 1960. According to reports of the news conference, Sir JOHN ERSKINE, chairman of the Trust, described the main purpose of the new department as fundamental research into virus diseases of man, animals, and plants. Sir HECTOR HETHERINGTON, principal of the University, said that a chair of virology—claimed to be the first in Britain—would be established, and its occupant, besides directing the institute, would engage in a certain amount of postgraduate teaching. He added that the Medical Research Council had agreed to attach a research unit to the institute once it was functioning. Professor J. W. HOWIE, professor of bacteriology at Glasgow, is quoted as stating that, apart from fundamental work at the National Institute for Medical Research, Mill Hill, there was no virus research being done in Britain comparable to that in America and Australia. It was hoped, he said, that the new institute at Glasgow would become a centre for research workers from all parts of the world. Discussing virus diseases, Professor Howie emphasized the better prospects for their prevention than cure. Research on measles and latent viral infections was specially needed.

Empire Rheumatism Council.—The council's annual meeting was held at the House of Lords on May 1, with Lord ALEXANDER OF HILLSBOROUGH presiding. Dr. W. S. C. COPEMAN, chairman of the council, proposing the adoption of the twentieth annual report (1955-6), stressed the importance of research in the battle against rheumatic diseases. These diseases were estimated to cost the country £80m. annually in lost production, he said, but the council's activities were limited by its income—about £30,000 a year. This had decided the council to launch a nation-wide appeal to industry for £250,000 this year; the council's twenty-first anniversary. Lord ASTOR OF HEVER, a vice-president of the council, had agreed to undertake the appeal, and support was already forthcoming from both sides of industry. Dr. Copeman then gave two examples of recent major research discoveries. Electron-microscopy had now shattered the old conception that muscle consisted of homogeneous fibres. It had been established, he said, that muscle consisted, not of one, but of many different varieties of fibre. "The implications of a fundamental discovery of this nature are enormous," he added. The other example was the isolation of a hitherto unknown chondroitin sulphate complex from connective tissue fluid by Miss H. M. MUIR, one of the council's research fellows. After the adoption of the annual and financial reports Dr. COPEMAN was re-elected chairman of the council for the fifth year in succession, and Sir CHARLES DODDS, F.R.S., vice-chairman. The annual report is a 45-page booklet, obtainable from the council's offices at Tavistock House (North), Tavistock Square, London, W.C.1. It gives membership lists of the council's various administrative and research committees, the chairman's address, reports of the research and educational work sponsored by the

council, and details of administration, finance, and developments in the Commonwealth. An appendix describes the council's twenty-first birthday appeal.

World Medical Association.—The Norwegian Medical Association is acting as host to the W.M.A. council now meeting in Oslo (April 29–May 5). This session is preparatory for the Eleventh General Assembly of the World Medical Association in Istanbul from September 29 to October 5. Among the subjects being discussed by the council are the recognition of the emblem for civilian doctors in war; medical secrecy under social security schemes; international medical law; and the programme for the Second World Conference on Medical Education (Chicago, 1959). The present officers of W.M.A. are:—*president*: Dr. J. A. BUSTAMANTE (Cuba); *president elect*: Dr. AHMET RASIM ONAT (Turkey); *treasurer*: Dr. ERNST FROMM (Germany). Council officials include: Dr. LORENZO GARCIA-TORNEL (Spain), *chairman*; Dr. LEON GERIN-LAJOIE (Canada), *assistant to chairman*; Dr. T. C. ROUTLEY (Canada), *consultant general*; Dr. AUSTIN SMITH (U.S.A.), *executive editor*; Dr. S. S. B. GILDER (Canada), *associate editor*; Dr. JEAN MAYSTRE (Switzerland), *liaison officer*; and Dr. LOUIS H. BAUER (U.S.A.), *secretary general*.

World Health Assembly.—The tenth World Health Assembly opens on May 7 in the Palais des Nations, Geneva. According to the director-general's annual report W.H.O. participated last year in nearly 700 health projects in 120 countries and territories. Malaria eradication was one of W.H.O.'s main concerns, policy having shifted from control to eradication in view of the increasing insecticide-resistance among mosquitoes. During the mass campaigns against endemic syphilis and yaws—by the end of 1956 55 million people had been examined and 16 million treated with penicillin—a number of fatal reactions to penicillin were reported. W.H.O. was therefore co-ordinating research on the comparative value of different penicillin preparations and other antibiotics for such campaigns. W.H.O. continued its co-operation with Unicef against tuberculosis, particularly in primitive areas. Among other measures, the possibility of large-scale chemotherapy was being studied. W.H.O. recommended isoniazid for its field studies as the only antituberculous drug cheap enough for a public health budget and also likely to be taken readily by contacts. Among other subjects discussed in the director-general's report are public health administration, the health aspects of atomic energy, and international quarantine. W.H.O.'s income last year was \$10.2m. from its active member states supplemented by an allocation of \$5.4m. under the United Nations technical assistance programme.

Royal College of Physicians.—A quarterly comitia was held on April 25, at which the new president, Professor ROBERT PLATT, took the chair for the first time. The following were elected to fellowship and membership, respectively, of the College:

Fellows.—M. M. Suzman (South Africa), J. L. H. Easton (Bedford), P. C. C. de Silva (Ceylon), C. McDowell (New Zealand), A. B. Stokes (Canada), M. Hynes (London), O. A. Savage (London), E. C. O. Jewesbury (London), F. J. W. Miller (Newcastle upon Tyne), G. W. Boden (London), A. Leese (Leeds), J. N. Morris (London), J. H. Bolton (Australia), W. R. S. Doll (London), G. M. Komrower (Manchester), I. M. Anderson (London), R. B. Evans (Cardiff), J. C. Gilson (Penarth, London), P. L. Mollison (London), W. Somerville (Long-Glamorganshire), C. D. Needham (Aberdeen), J. M. Malins (Birmingham), N. D. Compston (London), J. F. Goodwin (London), A. G. Leatham (London), W. D. Brinton (Winchester, Hampshire), D. A. P. Anderson (Reading, Berkshire), E. J. Moynahan (London), J. M. Ledingham (London), J. A. Scott (London), P. M. F. Bishop (London), J. H. Biggart (Belfast), R. F. Loeb (U.S.A.), J. R. Paul (U.S.A.).

Members.—L. J. H. Arthur, J. H. Baron, N. M. Bleehen, D. R. Coles, J. M. Duggan, H. Duncan, D. A. W. Edwards, J. S. Garfield, J. M. Greenaway, L. Henry, T. H. Hughes-Davies, M. Kingsbourne, J. J. P. Lomas, P. J. Maloney, I. D. Melville, P. Mestitz, M. B. Morton, I. B. Munro, A. K. M. Nawab Ali, J. R. Officer, A. M. Parfitt, J. Platnauer, S. Shaldon, D. H. Trapnell, M. P. Wilkinson, R. T. Williams, B. W. Windeyer.

Therapeutic Substances Amendment Regulations, 1957.—These regulations, which came into force on May 1, bring under the control of the Therapeutic Substances Act, 1956, absorbent haemostatic materials used in surgery; parenteral preparations of tetracycline, polymyxin B, viomycin, hyaluronidase, streptokinase, streptodornase, and streptokinase-streptodornase; and heparin and corticotrophin and preparations of them. These are all added to the First Schedule of the Act as being therapeutic substances "the potency of which cannot be adequately tested by chemical means." Details are given of the requirements for their manufacture and testing. In addition the new regulations include a revised procedure for testing for pyrogens, and amendments to existing regulations concerning B.C.G. and smallpox vaccines, the labelling of antibiotics, and the manufacture of poliomyelitis vaccine. An earlier provision that the total volume of a poliomyelitis virus suspension should not exceed 50 litres has now been amended to read "such volume as may for the time being be approved by the licensing authority." This amendment is stated by the Ministry of Health to have been agreed to by the Medical Research Council's advisory committee. Copies of the regulations (S.I. 1957, No. 550) are obtainable from Her Majesty's Stationery Office, price 9d. net.

National Society for Clean Air.—At a special general meeting of the National Smoke Abatement Society on April 11 it was unanimously agreed that the society should seek incorporation as a company limited by guarantee and without share capital, and with the new name "National Society for Clean Air."

Professor R. J. Kellar, professor of obstetrics and gynaecology at Edinburgh University, is visiting New Zealand and Australia during June, July, and August as a guest lecturer. He has accepted invitations from the Australian Postgraduate Federation in Medicine and Auckland University College.

Mr. Hermon Taylor, surgeon to the London Hospital, is to be the guest of the American Gastroenterological Association at its annual meeting in Denver this month. While there he will also receive the Schindler award of the American Gastroscopic Society.

COMING EVENTS

Radio.—In "Science Survey" on May 9, 16, and 23, at 7 p.m. in the Home Service, Dr. D. R. NEWTH, Ph.D., will speak on the biology of development. Repeat broadcasts on May 11, 18, and 25, at 9 a.m.

Gideon de Laune Lecture.—Sir HENRY DALE, O.M., F.R.S., will lecture at the Society of Apothecaries of London on May 14 at 5.30 p.m. His subject will be "Medicinal Treatment; its Aims and Results."

Croonian Lectures.—Professor G. W. PICKERING will deliver the Croonian Lectures on May 14 and 16 at 5 p.m. at the Royal College of Physicians. His subject will be "The Regulation of Body Temperature in Health and Disease."

Association of Police Surgeons of Great Britain.—Sixth annual conference at Lytham St. Annes, Lancs, May 23–25. Details from the hon. secretary, Dr. R. D. SUMMERS, 69, Bow Road, London, E.3.

Symposium on Trichomonas.—Organized by the French Society of Gynaecology, May 28 to 30, at Rheims. Details from Dr. R. SENECHAL, 31, rue Raynouard, Paris, 16.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Sunday, May 5

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.—10.15 a.m., clinical demonstration for general practitioners. Dr. D. A. Pond: Acute Psychiatric Emergencies in General Practice.

Monday, May 6

MARLBOROUGH DAY HOSPITAL.—8.15 p.m., Dr. G. D. Fraser Steele: Psychotherapy in Mental Hospital Practice. Its Instruments and Aims. UNIVERSITY COLLEGE, LONDON: DEPARTMENT OF BIOCHEMISTRY.—At Physiology Theatre, Gower Street, W.C.2, 5 p.m., public lecture by Professor R. A. Alberty (Wisconsin): Kinetic Studies of Fumarase.

Tuesday, May 7

BIRMINGHAM UNIVERSITY: FACULTY OF MEDICINE.—At Large Anatomy Theatre, Medical School, 4 p.m., Leonard Parsons Memorial Lecture by Professor Rustin McIntosh (New York): Growth and Development—Somatic Growth.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. H. Meara: Xanthomatosis. LONDON UNIVERSITY.—At London Hospital Medical College, 5.30 p.m., special university lecture in pharmacology by Dr. S. Udenfriend (Bethesda, U.S.A.): Pharmacological Studies Relating to Serotonin.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnold Demonstration by Dr. R. McP. Livingston: The Placenta.

ROYAL VETERINARY COLLEGE.—4 p.m., special university lecture by Professor R. A. Gregory: Some Aspects of Mammalian Gastroenterology.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute, 5 p.m., Almoth Wright Lecture by Sir Cyril Hinshelwood: Some Quantitative Aspects of Bacteriology.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Dr. N. G. Hulbert: neurological demonstration.

Wednesday, May 8

BIRMINGHAM UNIVERSITY: FACULTY OF MEDICINE.—At Large Anatomy Theatre, Medical School, 4 p.m., Leonard Parsons Memorial Lecture by Professor Rustin McIntosh (New York): Growth and Development—Physiological Growth.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Eosinophilic Granulomas of the Skin.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. R. W. Riddell: Fungous Infections of the Lungs.

OXFORD UNIVERSITY.—At Radcliffe Infirmary, 5 p.m., Litchfield Lecture by Mr. I. S. Hall: Some Aspects of the Histopathology of the Temporal Bone.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. D. A. Long: Relationship of the Haemolytic Streptococcus to Rheumatic Fever.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Moynihan Lecture by Dr. J. Lyle (Cincinnati): Causes and Treatment of Exophthalmos.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—5 p.m., Dr. Henry Doubilet (New York): Pathology and Treatment of Pancreatitis.

SOCIETY FOR ENDOCRINOLOGY.—At Royal Society of Tropical Medicine and Hygiene, 5.30 p.m., Professor C. De Duve (Louvain University): Present Status of Glucagon.

Thursday, May 9

HONYMAN GILLESPIE LECTURE.—At Anatomy Theatre, University New Buildings, Edinburgh, 5 p.m., Professor W. I. C. Morris: Obstetrical Haemorrhage in Relation to Impaired Blood Clotting.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. O. L. S. Scott: Inherited Abnormalities of the Skin.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor T. Pomfret Kilner: Investigation of Defective Speech with Special Reference to Cleft Palate Conditions.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor A. C. McEachern: Evolution of Safety in Prostatectomy.

Friday, May 10

INSTITUTE OF CHILD HEALTH.—5 p.m., Professor Rustin McIntosh (New York): Meconium Ileus.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. G. B. Dowling: clinical demonstration.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. Brian Taylor: clinical demonstration.

INSTITUTE OF LARYNGOLOGY AND OTOLARYNGOLOGY.—3.30 p.m., Miss Edith A. M. Whetnall: Care and Training of Deaf Children.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. W. C. Cockburn: Provocation Poliomyelitis.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3 p.m., Professor M. F. A. Woodruff: Surgery of Replacement.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Mr. J. Suchet: Rupture of the Uterus in Pregnancy and Labour.

Saturday, May 11

KENT PAEDIATRIC AND CHILD HEALTH SOCIETY.—2.30 for 3 p.m., visit to "Rudolf Steiner" Schools, Larkfield Hall and the Gate House, Larkfield Hall, near Maidstone.

YORKSHIRE SOCIETY OF ANAESTHETISTS.—At Royal Bath Hospital, Harrogate, 11 a.m., Dr. E. J. L. Pearce: Demonstration of Patients Illustrating the Use of Therapeutic Nerve Block; Dr. Olive M. G. Jones: Recent Trends in Anaesthesia for Neurosurgery.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Edwards.—On April 21, 1957, to Phyllis, wife of Dr. David G. Edwards, of "Lynton," 1, Eaton Road, Cressington Park, Liverpool, a daughter—Jacqueline Mary.

Ellthorn.—On April 28, 1957, at University College Hospital, London, W.C.2, to Dr. Helen ("Wendy") Grant, wife of Dr. Alick Ellthorn, twins—Justin Richard and Sandra Clare.

Levy.—On April 20, 1957, at Cambridge, to Ruth, wife of Dr. J. I. Levy, D.M.R.D., a son.

Shribman.—On March 29, 1957, at Royal Bucks Hospital, Aylesbury, to Hazel and Irving Shribman, a sister for Jonathan Andrew—Amanda Helene.

Stone.—On April 18, 1957, at Wanganui, New Zealand, to Barbara Mary (formerly Dana), M.B., B.S., and Arthur Richard Stone, M.B., Ch.B., M.R.C.P., M.R.A.C.P., a son.

DEATHS

Hannigan.—On April 13, 1957, in hospital, London, Joseph Hannigan, M.B., B.Ch., of Epsom, Surrey, late of Ashgrove, Highfield Road, Dublin, aged 52.

Jeffcoat.—On April 15, 1957, at Aldershot, Hants, Leslie Fraser Elliott Jeffcoat, M.B., Ch.B., Major, R.A.M.C.

Minshull.—On April 17, 1957, at Warwick Hospital, Michael John Wilmott Minshull, B.M., B.Ch., of The Firs, Theatre Street, Warwick, aged 57.

Robertson.—On April 12, 1957, Arthur Robertson, M.B., Ch.B., D.P.H., of 8, Bracken Road, Seaford, Sussex, late of Beckenham, Kent.

Shattock.—On April 12, 1957, at 1, Burlington Gardens, Chiswick, London, W. Charles Robert Shattock, M.R.C.S., L.R.C.P., L.D.S.

Williams.—On April 17, 1957, in a nursing home, Poole, Dorset, Harold Austin Williams, M.D.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Long-term Anticoagulant Therapy

Q.—After a third attack of coronary thrombosis, a patient has been advised permanent phenylindanedione therapy. How should this treatment be managed? What are the indications for vitamin K₁ administration, and how effective is it?

A.—Long-term anticoagulant treatment using phenylindanedione needs the same careful laboratory control as the short-term treatment now widely used in the treatment of an attack of cardiac infarction. The aim is to reduce the prothrombin level of the blood to about 25% of normal and maintain it at this level throughout the period of treatment. The initial dose is 150 mg., with 100 mg. on the second day and subsequent doses adjusted according to the prothrombin level. In most patients a maintenance dose of 75–100 mg. daily, given in divided doses morning and evening, will be adequate, but the actual level of the dose must be adjusted according to the patient's response.

The chief danger of anticoagulant therapy is haemorrhage caused by undue depression of the prothrombin level, and this form of treatment should not be embarked on unless full laboratory control is available. Using phenylindanedione, the prothrombin levels remain reasonably stable, and blood estimations at weekly or fortnightly intervals are adequate after the initial period of stabilization during which more frequent estimations are essential.

Anticoagulants should not be given to patients with a history of peptic ulceration, or with liver disease. If surgical operation is needed the drug should be withheld for three days prior to operation, as its effects are usually over in 48 hours. With intercurrent illness, particularly infections, it is unwise to continue with anticoagulant therapy without more frequent prothrombin estimations. If undue depression of the prothrombin level occurs, withholding the drug for one to two days will usually result in the level rising to safe limits.

The chief indication for vitamin K₁ administration is haemorrhage or the need for emergency surgery, and the prothrombin level can be returned to normal quickly by giving 5 mg. intravenously or 15 mg. orally.

Drug Treatment of Vitiligo and Hyperpigmentation

Q.—Recent reports from the U.S.A. state that pigment-controlling drugs are being commercially produced now and are available on prescription. 8-Methoxypsoralen, under the trade name of "oxsoralen," is being used in the treatment of vitiligo. "Benoquin" is said to be effective against hyperpigmentation such as occurs on freckled skin. How are these drugs used, what are their hazards, and what results may be expected from them?

A.—There are considerable dangers in using local psoralens, combined with exposure to sunlight, for repigmenting areas of vitiligo. They are potent light-sensitizers, and consequently acute erythematous blistering reactions often result following incautious exposure to sunlight after painting mercury-vapour source is valueless after the painting; natural sunlight should be employed, and this of course limits the application of local therapy in this country.

For practical purposes psoralen treatment is limited to the "relative" types of vitiligo.¹ In these cases affected areas are not entirely devoid of pigment. These types usually occur in dark-skinned races and are diagnosed

clinically by the fact that the patches are not completely depigmented but are of a lighter colour than the surrounding skin. During treatment care must be taken to avoid hyperpigmentation of the normal surrounding skin. "Absolute" vitiligo—that is, lesions in which there are no dopa-positive melanocytes—does not repigment. Also these areas tend to react violently with erythema and blistering following the local application of psoralens and exposure to sunlight.

The treatment of "relative cases" should begin with painting the affected areas with a dilute solution of psoralens. We used 25% of the original strength as supplied by the Memphis Chemical Co.; the diluent was acetone. Paintings are carried out twice weekly and are combined with cautious exposure to sunlight. If no untoward reactions occur the strength should be gradually increased until a satisfactory repigmentation has been obtained. I have little experience of oral treatment with psoralens, but the cases I have treated have not responded satisfactorily.

"Benoquin" (monobenzyloether of hydroquinone) has been used for the treatment of hyperpigmentation. It may be used either as a lotion or as an ointment containing 5–33% of the hydroquinone.² It appears that the higher concentrations have been used with good results, but I have found these to be irritating to the skin. The results obtained are variable, and I have never had any satisfactory results myself. Some cases where success has been claimed may have been at the hyperpigmentary stage of vitiligo (this occurs most commonly in the darker races), the ensuing vitiligo being mistaken for a response to the treatment with hydroquinone.

REFERENCES

- 1 Jarrett, A., and Szabo, G., *Brit. J. Derm.*, 1956, **68**, 313.
- 2 Denton, R. C., Lerner, A. B., and Fitzpatrick, T. B., 1952, *J. Invest. Derm.*, **18**, 119.

Death and E.E.G. Activity

Q.—For how long after death can electroencephalographic activity be detected? What is its significance?

A.—There have been isolated observations on electroencephalographic activity at death, but since the forms of death were very varied no general statement can be made in answer to the question. It is probable that where the onset of death is slow electroencephalographic activity ceases before respiration ceases. In fact in one case studied by Schwab¹ very little electrical activity could be recorded from either hemisphere 14 minutes before death, although five minutes before death a single burst of normal alpha activity appeared on the left side. After respiration ceased no electrical activity could be detected from the head, but 26 minutes after death moving the chest induced three abnormal beats on the electrocardiogram. In this case the electrocardiogram was a better indicator of the point of death than study of the electroencephalogram.

REFERENCE

- 1 Schwab, R. S., *Electroencephalography in Clinical Practice*, 1951. Saunders, London.

Nodular Vasculitis

Q.—A woman of about 48 has had her year-old skin lesions diagnosed after biopsy as nodular vasculitis. What relationship has this condition to periarthritis nodosa, and could it account for a coincident menorrhagia?

A.—Nodular vasculitis was described by Montgomery, O'Leary, and Barker¹ as a non-tuberculous form of erythema induratum in which painful persistent or recurrent nodular lesions which seldom ulcerate occur chiefly on the calves, usually in women over 30. Histologically there is a vasculitis with obliterative changes affecting both arteries and veins, together with fibrosis of, and collections of giant cells in, the subcutaneous fat. The absence of distinct tubercles helps to distinguish this condition from erythema induratum, but prolonged observation of the case is advisable before making a firm diagnosis. Treatment is rest in bed with elevation of the legs.

The condition is distinct from periarteritis nodosa, in which systemic manifestations are usually also present. I know of no association between nodular vasculitis and menorrhagia.

REFERENCE

¹ Montgomery, H., O'Leary, P. A., and Barker, N. W., *J. Amer. med. Ass.*, 1945, 128, 335.

Refusal of Post-mortem Examination

Q.—Relatives of patients who die in hospital may refuse permission for a post-mortem examination for a variety of reasons. What can be done to obtain such an examination in a hospital patient where necropsy may be important from a scientific or research point of view? Can the doctor decline to sign the death certificate on the grounds that the cause of death is insufficiently known or understood? What is the legal position?

A.—Except when the death has to be, or has been, reported to the coroner or procurator fiscal, it appears to be the right of the relatives to grant or refuse permission for a post-mortem examination. Refusal, for which reasons need not be given, is then a bar to examinations which are conducted solely for clinical or scientific purposes.

It is the statutory duty of a doctor in attendance upon the deceased during his last illness to issue a medical certificate of cause of death. To bring pressure on relatives to permit a post-mortem examination by declining to sign the death certificate merely on the grounds that the cause of death is not exactly known would thus be illegal as well as utterly reprehensible. It is not a course of action to be recommended in any circumstances.

Whenever it is desired to make a post-mortem examination solely for clinical and scientific purposes, the executor, next of kin, or nearest available relative should be asked to give consent in writing. Experience has shown that, where the duty of obtaining consent is allocated to a carefully chosen official, refusals are rare. On the contrary, the relatives, properly approached, are usually most co-operative; most of them readily appreciate the potential scientific value of the examination.

Food Allergy in a Child

Q.—Since being weaned a 2-year-old boy has suffered severe allergic oedema of the face and limbs and asthmatic attacks whenever given any food other than soya meal. The slightest dietary indiscretion brings on an attack. What can be done to help establish a more normal diet?

A.—The information submitted is insufficient to enable specific advice to be given in this difficult case. Other factors besides foods could be causing some of the symptoms, and it is hard to believe that every food except soya meal provokes an allergic reaction. Presumably the child is allergic to cow's milk, and that is why soya meal was introduced into the diet. Egg, fish, and orange juice are other common sensitivities at this age.

If a child is allergic to a food, then the eating of even a trace of that food may cause allergic reactions. It is therefore important to be especially careful of all "made-up" foods which might contain traces of the food or foods to which the child is allergic. By careful attention to the diet on these lines the number of basic foods to which a child is apparently sensitive may be reduced and the problem narrowed. Foods rarely causing allergic symptoms in children are sugar, synthetic vitamins, meats (especially lamb), rice, tapioca, and olive oil. Occasionally children allergic to cow's milk will tolerate evaporated or well-boiled cow's milk and quite a proportion will tolerate goat's milk. Soya-bean milk is of course an accepted substitute for milk, as also are "meat-base milks," in which meats are used as the protein base. For a full and comprehensive account of the detailed management of food allergies in children *Allergy in Childhood*, by Jerome Glaser (Charles C. Thomas, 1956), is recommended.

NOTES AND COMMENTS

Drugs for Tension and Anxiety.—Dr. G. R. FRYERS (Medical Director, John Wyeth and Brother Ltd., London, N.W.1) writes: The expert's answer on drugs for tension and anxiety ("Any Questions?" March 30, p. 777) needs comment. The only published comparison of amylobarbitone and meprobamate¹ resulted in about the same proportion of patients improving on each drug. However, this simple statement conceals the fact that it was not the same patients that were improved; the differences in action were commented on. The statement that meprobamate is certainly more dangerous than barbiturate is not, so far as I can trace, based on published observations. The reference quoted by your expert² only lists 17 troublesome but non-fatal side-effects collected from the literature. This is in marked contrast to the numerous reports of fatalities with barbiturates (for example, 184 accidental deaths from barbiturates in 1954³). Additionally, the very large number of successful suicides with barbiturates (391 suicides with barbiturates in 1954³) is in marked contrast to the total lack of reports of suicides with meprobamate, despite many attempts. The observation that barbiturates in sedative doses impair judgment and make it inadvisable for a patient to undertake responsible tasks results in them being less suitable than meprobamate for use in patients leading active lives. Very large quantities of meprobamate have been safely used in the U.S.A. and elsewhere. In this country many patients have been treated with meprobamate; the number is now well into six figures. The occurrence of minor reactions and the absence of fatal complications must be set in perspective against the very great usage of the drug.

REFERENCES

- ¹ West, E. D., and da Fonseca, A. F., *British Medical Journal*, 1956, 2, 1206.
- ² *British Medical Journal*, 1956, 2, 1227.
- ³ Brooke, E. M., *Lancet*, 1956, 1, 150.

OUR EXPERT replies: I would not agree that suicide should be included among the complications of any drug. By a complication we normally mean an unexpected injury to health following the administration of the drug in normal doses. Dr. Fryers's observations become even less relevant when it is noted that he speaks of barbiturates whereas I was writing simply about amylobarbitone. The figures he takes from Miss Brooke's well-known article also refer to barbiturates in general, and there was nothing in Miss Brooke's paper to indicate what type of barbiturate had been used to cause death. A fairly extensive experience in a general hospital leads me to believe that most accidental deaths and must suicidal attempts from barbiturate involve dangerous members of the groups such as phenobarbitone or barbitone sodium. Amylobarbitone is used wherever possible because very large quantities of it can be tolerated, and it is difficult to commit suicide with it. I do not know who has observed that amylobarbitone in sedative doses impairs judgment, for I am sure this is not so. I hope Dr. Fryers will feel able to agree with my very moderate claim for amylobarbitone. If we were talking about barbiturates in general, I would agree with everything he says.

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BRITISH MEDICAL JOURNAL

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THE RENAISSANCE OF GENERAL PRACTICE*

BY

JOHN H. HUNT, D.M., M.R.C.P.
(General Practitioner, London)

In Great Britain, at present, our impression of general practice is coloured by the National Health Service, which was launched in rather a hurry for financial and political as well as for medical reasons. I am not concerned here with the pros and cons of this service at its present stage of development. Some are satisfied with it, others are not. If we look to the future we must realize that to be successful and permanent, with a contented profession doing its work well, it must give doctors a satisfactory wage, favourable settings for their work with enough time and the right instruments to do it properly, and encouragement to keep up to date. If, ten or twenty years from now, the National Health Service in this country satisfies these three conditions it will be successful and survive. If it does not, it will be replaced by something better—by some other type of service first developed, perhaps, in another land whose politicians will have been proved in the long run wiser than ours. Let us all be clear in our minds that the present service is in the nature of a long-term experiment, and that it is on trial in the eyes of the world. With good medicine, based on good general practice, as our primary aim, we should constantly compare progress with that of similar experiments in other countries and learn all we can from them; in that way we shall develop a medical organization in the British Isles second to none.

The renaissance of general practice, to which I refer in the title of my paper, stretches out beyond local health services and party politics. It is a world-wide movement concerned with the academic welfare and the scientific encouragement of family doctors in every continent. It is a movement which recognizes that *modern medicine, to do its greatest good, must reach patients promptly in and near their homes*. We have heard and read so much lately to the detriment of general practice in the British Isles that I would like to put on record something to its credit.

Definition of a General Practitioner

General practice is usually, but not always, synonymous with family doctoring; some families have different doctors for the father, the mother and for the children. A great deal of thought has been given in recent years to the definition of a general practitioner. I would like to suggest the following: *A doctor in direct touch with patients, who accepts continuing responsibility for providing or arranging their general medical*

care, which includes the prevention and treatment of any illness or injury affecting the mind or any part of the body. This definition covers the essentials of the general practice of medicine in the depths of the country or in the heart of a great modern city like Manchester; in a family, school, or university; in the merchant navy or the armed forces of the Crown; in a factory, prison, or other institution, at home or overseas. As the name so clearly implies, it is the general nature of the work which is characteristic, and part of it may be connected with neither illness nor injury—for example, infant feeding, marriage guidance, normal obstetrics, and the management of old age. Direct access of patient to doctor is even more important than that of doctor to patient. Continuing care may be from day to day, from month to month, from year to year or from generation to generation. Some specialists, it is true, such as ophthalmologists, dentists, and psychiatrists, have both direct access to patients and their continuing care, but the extent of this care is limited to one part of the body.

Early Development and Continuity of General Practice

To see general practice in its proper perspective it is helpful to consider how the first family doctors may have developed, some hundreds of thousands of years ago, when prehistoric men, women and their families lived in small groups, getting what food they could from plants and from hunting. One can visualize some of them having to treat an ill child or a wounded adult, or perhaps one poisoned by unsuitable food, or with a boil, a splinter in the hand, a foreign body in the eye, a broken bone, frost-bite, or a burn. These medical ancestors of ours were the most *general* practitioners of all time; they did everything, with whatever instruments, dressings, splints, or drugs that were handy or they could make themselves.

The specialists must have started hard on their heels. It is wrong to think of specialism as a product of the last hundred years. Some of these prehistoric men and women must have become adept, beyond the average, at extracting teeth, splinting bones, or delivering babies; we know for certain that some were trephining skulls many thousand years ago. Herodotus tells us that in ancient Egypt, with its full-time medical service, specialism was rife⁸; and you will remember that Hippocrates in his oath said, "I will not use the knife, not even on sufferers from the stone, but will withdraw in favour of such men as are engaged in this work."¹⁰ One can imagine these early specialists even developing small

*The Lloyd Roberts Lecture delivered in Manchester on March 1, 1957.



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clinics of their own: but nature has never dispensed illness or injury in a tidy manner entirely suitable for clinics; people have been ill or injured at any time or place, and many of them have had to be cared for in their homes, especially the children, pregnant women and older folk. So general practice gradually developed. Family doctors and specialists have worked together, on the whole happily, for tens of thousands of years, and I believe that they will continue to do so.

Scope of General Practice To-day

To-day we still have at one end of our medical scale truly general doctors, like those working single-handed on the islands off our coast, in the bush of Australia, or as missionaries in Central Africa, who cannot limit their doctoring at all and who have to turn their hands to any surgical, medical, gynaecological, or psychological problems that crop up. At the other end of the scale we have highly trained specialists studying small fields in microscopic detail: for example, Professor C. I. Thomas, of Cleveland, Ohio, has just written a book of 1,318 pages, with 400 illustrations, on the cornea—a part of the body 1 mm. thick and 12 mm. in diameter.⁵⁰ In between these two extremes there is every type of doctor.

However good the microscopes, the naked human eye with its breadth of vision will always be essential for everyday life. No matter how clever the consultants or how excellent the hospitals, it is the efficiency of the family doctors, and the work they do in and near the homes of their patients, which will determine the calibre of the medical services in any country. One sometimes hears the suggestion that general practice may be slowly disappearing, especially in the United States; but a recent survey there⁵¹ shows that 82% of the population claim to have a personal or family doctor—one whom they usually call first—which is probably as high a figure as ever before. In Great Britain in 1955 Mr. Iain Macleod, then Minister of Health, said: "I think we ought to make—and for it to be seen that we are making—the general practitioner the king-pin of the whole of the National Health Services in this country."⁵²

As medical science has become more complex, the tendency throughout the world has been for general practitioners, like their specialist colleagues, to limit their technique and share their work with others, so that they themselves may be more efficient in that which they elect to do. This trend is not new; it has been there from the beginning, but the rapid growth of medicine during the last one hundred years has made it more evident. In large communities, now, no family doctor can possibly be truly "general," giving his patients that excellence of care and attention in every branch of medicine which modern science leads them, rightly, to expect as their due. In this respect general practice to-day does differ from that of our ancestors long ago. A considerable part of what was once done in a simple way by a family doctor must now be carried out by teams of experts, under his direction. This has tended to reduce one severe handicap of the past—the isolation of the general practitioner.

Medicine, which was once as simple as a dugout canoe, is now as complicated as a modern battleship. Both need to be guided. The family doctor of to-day has to work, on his patients' behalf, in close and friendly co-operation with many different people, who include his general-practitioner colleagues (perhaps in partnership or in a group practice), all the specialists and consultants in his area (several of whom may be concerned in the diagnosis of even one difficult case), and all those ancillary services which are essential for his own task—secretarial, receptionist, nursing, the laboratory service, medical officers of health, and the personal health services of local authorities (maternity, child welfare, and school health with their personnel—health visitors, midwives, district nurses, home helps), and the special services for patients in particular categories (the tuberculous, the blind, the mentally ill, the aged and chronic

sick). To these must be added all other parts of the hospital service (including almoners, dietitians, chemists, dentists, oculists, physiotherapists, chiropodists, etc.) and also the instrument makers, pharmaceutical manufacturers, school-teachers, parsons, lawyers, and so on. This is a long list, and it could easily be made longer still; its length underlines the point I wish to make, which is that the activities of all these different people must be co-ordinated and correlated by the general practitioner to ensure that all of his patients' particular needs are met. In the general practice of the future this guidance of patients by their family doctors, and this team-work, will be needed still more; and all our plans must be based upon them.

Dr. Richard Scott, of Edinburgh, in his concept of the family doctor team and the personal relationships between doctors, their helpers, and the patients they serve, lays special emphasis on the need for reinforcing medical skill with that of the trained medico-social worker or almoner, and he points out how much is achieved and how much time is saved by regular personal discussions between members of this team.⁵³ It is a pity, and a mistake, when the personal and human nature of these relationships is forgotten. On July 21 last year, a doctor in the South of England wrote to the President of the College of General Practitioners saying that he had just received a letter from a certain executive council addressing him on the envelope as "Dr. 2126."

The Art of General Practice

You will have observed that in my definition of a general practitioner I have put care of the patient's mind before that of his body. This was done deliberately, because I know we all agree that the family doctor's awareness of what his patients think and feel is vitally important for the whole of his or her work. I should now like to discuss the future of the doctor-patient relationship and what is popularly called the "bedside manner," and also the parts to be played by more formal psychology and psychiatry in the general practice of to-morrow.

The Bedside Manner

In treating almost every illness there is need to strike a proper balance between science on the one hand and the art of medicine on the other; and much of the latter is to be found in the manner of the doctor by the bedside of his patients or in his surgery. It is true that, occasionally, either the art or the science of medicine may be paramount. When one is treating a mother who has lost an only child, or helping someone else in the last stages of cancer, compassion and sympathy may be all that really matter and science may hardly enter into the problem. On other occasions science and technique are all-important, as when a surgeon is doing a difficult operation, or a physician is treating an unconscious patient. By and large, we must agree with Dr. Geoffrey Barber when he says, "I would rather be in the hands of a man with an accurate knowledge of medicine, and with but little of the milk of human kindness, than in the care of the kindest man imaginable who didn't really know his job";⁵⁴ but luckily it is often possible to have the two together, because both the science and the art of medicine play essential parts in the care of nearly every patient. Not long ago a patient of mine had a baby girl who was born with a hare-lip and cleft-palate. We asked a famous plastic surgeon to talk to the mother a few hours after the child arrived, and I wish those who believe that modern science and a good bedside manner are incompatible could have heard what he said; the mother will remember it with gratitude all her life. No matter how much science develops during the next few hundred years, the need for the art of medicine will still be there. As Sir Arthur Hall wrote in 1941: "The need for it is as great to-day as it ever was, or ever will be, so long as human sickness continues."⁵⁵

The courtesy of a good doctor is not something he puts on like a white coat when approaching a patient's bed, or in the surgery, or when speaking to him on the phone; when that is so, it will inevitably be artificial and insincere.

Doctors with the best bedside manners—and it is largely a question of manners—are those who are their own natural, decent selves with their families, their friends, servants, nurses, secretaries, and with their patients. It is a paradox that the doctor with the best bedside manner is the one who puts on no special manner by the bedside of his patients.

Let us try to analyse what we mean by this term "bedside manner," which is now out of date and a target for the wit of the music-hall artist and the caricaturist; and let us see what others have thought about it in the past. Although there are very few papers on it, several references are to be found tucked away in the journals. It is something that gives confidence to patient and doctor alike, and helps them both. Like charm, it is almost impossible to define. Its components, I think most people will agree, are personal interest, kindness, sympathy, friendliness, understanding, cheerfulness, and humour; beyond this the list may easily deteriorate into a dull one of all the virtues, missing the important points. Oliver Wendell Holmes, nearly a hundred years ago, added: "Good dressing, quiet ways, low tones of voice, lips that can wait, and eyes that do not wander . . . to belong to the company you are in."⁵⁶ Sir Archibald Garrod in 1926 supplemented this with "tact, resourcefulness, courage and prudence . . . patience with fads."⁵⁷ This last, I think, is important. Good doctors are often those with "high boiling points."

Sir Francis Walshe, a scientist of renown and a Fellow of the Royal Society, added, "vigilant and humane insight . . . and at times . . . firmness." I agree with him there. It is no use trying to please everyone. One cannot help feeling that if Hippocrates himself was now a doctor in Manchester or London there might be several who would not want him as their personal physician. Sir Francis deplored the fact that the term "bedside manner" was so vulnerable to the simple-minded jester. "Long experience," he said, "has taught me that those who most readily make wisecracks about the bedside manner are themselves, when sick, commonly most exigent of what they conceive this manner to be. They like to eat their cake and have it."⁵⁸

There are other attributes which are helpful. One is a good memory for names. Dr. William Pickles, the first President of our College, whose practice is in a Yorkshire dale at Aysgarth, has told us recently that he used to know the Christian names of every man, woman, and child in all the villages in his dale.⁵⁹ To be able to do this one must be fond of one's patients; and Francis Peabody epitomized the whole matter when he said, "The secret of the care of the patient is in caring for the patient."⁶⁰

The point I wish to make is that scientific medicine and a good manner by the bedside are not incompatible; indeed, they are really complementary to each other. The best clinicians of the future, as in the past, will be those who can combine them to the fullest extent; they are both essential to all good doctoring. This idea is not at all new, but it is sometimes forgotten. There is an urgent need for some of the scientific and organized medicine of to-day to be infused with more of the wisdom, courtesy, and charity of our predecessors, to bring up to date the psychological insight of the family doctors of fifty or a hundred years ago.

Psychology and Psychiatry in General Practice

This brings us to the part that more formal psychology and psychiatry play in general practice. Psychology has been defined as "the science which deals with the mind and mental processes,"⁶¹ and psychiatry as "the recognition and treatment of diseases of the mind."⁶² The attitude of general practitioners towards patients with nervous symptoms should, I believe, be based primarily on normal psychology and on study of variations in normal behaviour, rather than on psychiatry and mental disease. The limits of normal behaviour are far wider than was at one time thought. The Kinsey Reports,⁶³ based on the sexual behaviour of normal men and women, illustrate this; and honest reports on other aspects of human activity and emotions show the same wide range of normality. It can be argued that the

great majority of behaviour problems in children and in adults which confront family doctors, and many cases of emotional disorders with anxiety and depression arising from the disappointments, frustrations, anxieties, and sorrows of everyday life, fall within this wide range of normality, and should be regarded fundamentally as physiological rather than as pathological or psychiatric. In so many of these cases the patient, his relatives, his friends, and his family doctor know that he is not really mentally "diseased"; and it is natural that they should all dislike the idea of the patient being under the care of one who specializes in mental illness, which is, by definition, what treatment by a psychiatrist implies.⁶⁴ I believe that this fact is at the root of much of the distrust and resentment which have for so long surrounded the management of these particular cases by psychiatrists. A much wider popular interpretation of the word "psychiatry" is required. A definition said recently to be "fairly acceptable" in America is "the study of interpersonal relationships."⁶⁵

Wise family doctors of the past have nearly always been depicted as elderly men who, by long experience in a life of general practice, came to recognize the wide range of normal behaviour—to "understand human nature." The same has applied to specialists. W. E. Fothergill has told us that David Lloyd Roberts was "A born healer, it did people good merely to see him; he could not only help those who were ill, but he could also cure those who were well—a much more difficult matter."⁶⁶ This wisdom can be learned, as Dr. Lindsey Batten has charmingly put it, "from the professors or from the poets, the novelists, the Bible, and your own experience, or you can mix them all; but you must not suppose that Psyche is an illusion, an invention of the psychologists, or that you can afford to neglect her. She has a finger—sometimes a fist—in every medical pie."⁶⁷

Given the opportunity, many older doctors still learn this lesson in time; but all medical students, especially those who are to enter general practice, should be given more instruction than they get at present concerning the surprisingly wide range and variation of normal human behaviour and emotional reaction. Some medical schools are already doing this—especially Leeds, Cardiff, Guy's, and the Middlesex—teaching psychology from the dynamic point of view, imparting an understanding of the principles underlying good mental health. Students must also be taught the art of listening, which can be acquired. It is not unknown for doctors to talk so much, and to ask so many questions when taking a history, that the patient learns far more about the doctor than the doctor does about the patient. With adequate training and a charitable disposition, a family doctor, even if he is rushed and has little time to spare, can manage fairly well many of these behaviour and emotional problems. When he can do this himself the result is often better than when such patients are referred to a psychiatric clinic, there to mingle with some who are really mentally sick with more severe personality or behaviour upsets, neuroses, depression, hysteria, psychoses, organic cerebral disease, etc. One would like to see the general practitioner of the future an expert at recognizing and dealing with more of these normal variations—a wonderful field for further observational research.

The treatment of these emotional upsets by general practitioners raises the problem of how much time they can spare for it. The "time versus service" difficulty is one that confronts every practising doctor nearly every day; each must solve it for himself. There is little doubt that every new patient should be allowed, one time or other, at least half an hour's conversation with his doctor. In some circumstances the history can be taken on one occasion and the examination done on another. Four sessions of a quarter of an hour each may sometimes be nearly as good (though not quite so good) as one hour at a stretch; and by adding together even shorter periods a full history and examination can in the end be made, if there is order behind the investigation and if suitable notes are taken. In certain

circumstances, when personal problems are being unravelled, an hour or more of uninterrupted conversation may be required; but these longer sessions are not so often needed as is sometimes supposed and, when they are, time can usually be found for them by planning ahead. It is impossible to state categorically the number of patients whom any general practitioner may look after well. Doctors and patients vary so much—in different age groups and in different communities—that each doctor must decide for himself, at each stage of his career, how many patients he should rightly have under his care.

General Practitioners with Special Interests

In cities and large towns, family doctors, whether they work on their own, in partnership, in group practice or in a health centre, can get their specialist assistance from hospitals or consultants working near by. The advantages and disadvantages of these different types of practice have been discussed elsewhere.²²⁻²⁶ Over much of this country, however, and indeed over a great part of the world, consultants are further away, and groups of practitioners are working together more in teams, developing special interests among themselves so that they can help one another by pooling a variety of experiences, skills, and techniques.

Let us take obstetrics as an example of one of these special interests. Not all the members of a partnership may have the inclination, time, or training to do midwifery. If one of them has taken the trouble to train himself carefully in this subject he may be of inestimable value to his group. In its memorandum to Lord Cranbrook's Committee, presented this year, the Royal College of Obstetricians and Gynaecologists said about the maternity services in the Oxford area: "... Every encouragement is given to those general practitioners who have fitted themselves by postgraduate study to practise obstetrics, and general-practitioner maternity units are encouraged and are regarded as integral parts of the area department. ... These general-practitioner obstetricians can become highly skilled and exert a powerful influence over the work of their colleagues both in the maternity unit and in domiciliary practice."²⁷

From their memoranda to the Cranbrook Committee, the Royal College of Obstetricians and Gynaecologists and the College of General Practitioners¹⁷ seem to be in complete agreement regarding the role of the general-practitioner obstetrician, whose future seems likely to be assured. The problem and its solution is much the same for family doctors with one or more special interests in other branches of our profession—medicine, surgery, anaesthetics, paediatrics, geriatrics, dermatology, rheumatology, psychiatry, allergy, public health, tropical medicine and so on. Every group practice of the future must borrow from the specialties as much of their knowledge and technique as is applicable to family doctoring. To call these general practitioners with special interests "general-practitioner consultants" as has been done recently¹² is, I believe, wrong. They are primarily general practitioners who have studied, in a limited way, one or more particular fields of medicine. The more complex the specialties become, the more will these general practitioners with special interests be needed; but it is extremely important that they should remain first and foremost general practitioners, and that they should limit themselves strictly to the general-practice aspects of their special subjects as these apply to family doctoring in and near their patients' homes. Their success depends on the proper limitation and supervision of this special work.

One of the main advantages of this type of group practice is that its members can teach each other as they go along; each of them leavens the whole group. A specialist appreciates a general practitioner who uses him efficiently; and often there are no greater friends or more loyal colleagues than a general practitioner with a special interest and a consultant in that subject, be they neighbours or many miles apart. They speak the same technical language, and learn from each other every time they meet. Such close and

friendly co-operation between general practitioners and consultants is possible in all branches of medicine, and is much to be desired.

The encouragement of general practitioners with special interests, so that a group may fulfil all the functions of the family doctor as we have known him in the past, is the way that general practice in many places, especially those far from hospitals and consultants, can keep in step with the rapid expansion of modern medicine. It is a logical development, and one that is already working well in a great many parts of the world. It helps patients by saving them much travelling and time, and many visits to hospitals; it helps groups of family doctors by making general practice more interesting, by easing their burden of responsibility and in many other ways which have been described elsewhere²⁸; it helps hospitals by relieving crowded out-patient departments and in-patient waiting-lists, giving consultants more time to do their own work properly.

Many excellent new types of group practice are being tried out at present in this country—in Bristol,²⁹ at Corby,³⁰ and at Harlow,³¹ among others. At Harlow the family doctors are doing nearly all the work of the maternity and infant welfare clinics, and running the industrial health service. In future, emphasis must be more and more on prevention, early consultation, and early treatment; and it is a pity that the statutory term "health centre" applies, now, only to one form of group practice.²⁹

Diagnostic and Therapeutic Aids for General Practitioners

One of the most essential needs of every family doctor is direct and easy contact with diagnostic and therapeutic procedures—pathological, radiological, nursing, minor surgical, etc. This is his right, for with them he can diagnose and treat many of his patients more quickly, more fully, and more cheaply than has hitherto been possible.³² One of the medical lessons we have learned in this country during the last ten years is that when family doctors are given these diagnostic and therapeutic aids they do not squander them. The recent reports of Dr. F. N. Marshall, of the Manchester Regional Hospital Board,³³ and of Dr. H. W. Ashworth and others, of the Darbshire House Health Centre,³⁴ have shown this again. Patients and their doctors, consultants and their hospital departments, all benefit. Considerable progress has already been made, but there is still a great deal to be done to help general practitioners in this way, especially in places far from a general hospital.

General Practitioners in Hospitals

General practitioners visit hospitals, or work there, for five main reasons, which may overlap: (1) to diagnose and treat their own patients or those of their partners; (2) to visit or consult over their patients; (3) to foster their own general postgraduate education; (4) to acquire and maintain experience in a special subject in which they are interested; and (5) to teach undergraduate medical students. Here I would like to comment briefly on the first three of these; the fourth has already been discussed and the fifth is mentioned later.

(1) In small hospitals in country districts, family doctors for many years have done excellent work on their own patients who, for purely social or economic reasons and not because they need specialist care, have had to be moved from their homes into hospital beds. In larger towns and cities, family doctors do the same work as their country colleagues, their patients have the same straightforward complaints, some of which may be difficult to treat at home; and yet, in towns, for a reason never properly explained, it is considered that family doctors should have few, if any, hospital beds. Throughout England and Wales each general practitioner has, on an average, one-third of a share of one hospital bed.³⁵ This means that many consultants, specialists and their assistants are doing general-practitioner jobs, spending their valuable time being responsible for the

treatment of patients in hospital who do not really need their expert knowledge and attention and who, in many instances, would prefer to be cared for by their family doctors. Overseas this anachronism does not exist to such an extent, and in time it will, perhaps, be corrected in the British Isles.

(2) Every opportunity should be taken by general practitioners to visit their own patients who have been admitted into hospital under the care of specialists; to talk to the house officers and nurses in charge; to be present at a consultation in an out-patient department, a ward, pathological laboratory or elsewhere; and to attend an operation or perhaps the post-mortem room. This entrée of family doctors to hospitals, and the contacts thus made with hospital staff and consultants, may sometimes be difficult to arrange and be time-consuming for all concerned, but they are well worth while.

(3) For their continuing education general practitioners may learn much from attendance in hospitals—at lectures, ward rounds, clinical demonstrations or other meetings which have been enumerated elsewhere.¹⁶ They can also work with specialists in hospital out-patient or in-patient departments as senior or junior hospital medical officers, or as clinical assistants, for one or two sessions a week.¹⁶ If these appointments in hospital departments are held in rotation, several subjects may be covered in a few years. This may not help the hospital as much as when a general practitioner works in one department permanently, as he may do if he has a special interest, but it is almost certainly better for the doctor's general postgraduate education. It should be remembered that the primary object of this particular hospital work by a family doctor is to help him to keep up to date, and not to use him as a convenient source of extra help when there is a shortage of staff, or when the specialist is busy or away; that is a job for a trainee consultant. The temptation must be resisted to make use of family doctors, as has recently been suggested, "to keep the hospital services going" or as "pairs of hands for ... relieving the junior staff of much routine work."³⁶ In an emergency, or at specially busy times, general practitioners will nearly always be most willing to help a hospital; but with all their responsibilities in the homes of their patients—their first concern—they have more than enough of their own work to do.

The College of General Practitioners

In many countries general practitioners are developing academic headquarters of their own. The Americans were first with their Academy of General Practice in 1947; we were second with the foundation of the College of General Practitioners in 1952; and the Canadians third with the College of General Practice of Canada, founded in 1954. The Netherlands, Germany, India, the South American states, Australia, and other countries are following these examples. There is talk of an International Committee of General Practice to co-ordinate the activities of them all.

If our College had, in fact, been formed a hundred years ago, as it nearly was, the development of general practice in this country and the part which family doctors play in the National Health Service would have been, I am sure, different from what they are to-day. The response to its foundation on November 19, 1952—over 1,200 members and associates joining within the first three weeks, the steadily growing membership since then (it is now 4,152), and the co-operation of the Ministry of Health, the General Medical Council, the British Medical Association, the Medical Research Council, the Society of Apothecaries, and many other institutions—has made it abundantly clear that this College was needed, and that it has an important part to play in the future of medicine in this country and in the Commonwealth. When we began it seemed to us, as Dr. G. F. Abercrombie said at our last annual general meeting, that "the home of our College would have to be in the hearts and minds of men"; but the generosity of an anonymous donor, and the foresight and co-operation of the President

and Council of the Royal College of Surgeons, have made it likely that we shall, before long, have a fine building of our own.

During its first four years the College has developed 35 regional faculties, 13 of them overseas—in Eire, Australia, New Zealand and Africa. It has published fourteen issues of a *Research Newsletter*, of more than 1,000 pages, with Dr. R. M. S. McConaghey as editor; it has a research register of more than 500 general practitioners interested in doing original work. A College Records Unit is being developed; a General-Practitioner Teaching Register is being drawn up of those family doctors who are willing to take students and to lecture; and a list of those diseases and injuries which are met significantly often by general practitioners in this country has been prepared. A ten-page questionnaire on the continuing education of family doctors has received more than 2,000 replies. Each month a list of postgraduate lectures, demonstrations, and courses in London and the Home Counties is circulated as a Postgraduate Information Diary. A College Research Fund has been opened.

The College is represented on many academic bodies, and has worked in the closest possible liaison with the Ministry of Health in England (and the corresponding departments in Scotland, Northern Ireland, Eire, and Australia), with the British, Irish, and Australian Medical Associations, and with the British Postgraduate Medical Federation of the University of London. It has been invited to submit reports to the General Medical Council on the "Medical Curriculum," and to the Ministry of Health on "Medical Manpower," "General-Practitioner Obstetrics," and "Psychiatry and the General Practitioner." It has been presented with the annual James Mackenzie Lecture, the Butterworth Gold Medal, the Pfizer Postgraduate Grant, and the Public Welfare Foundation Grant, and it has been invited to adjudicate for the Benger Prizes for original observations by general practitioners. The College hopes to help young doctors with their equipment and premises. Twenty thousand copies of an obstetric record card designed by members have already been distributed, and other cards, charts and diet sheets are being prepared.

Dr. F. M. Rose said at our first annual general meeting that doctors have joined the College "not because we think we are good practitioners but because we want to be better ones." On June 17, 1954, on the occasion of the foundation of the College of General Practice of Canada, our first President, Dr. W. N. Pickles, sent a recorded message across the Atlantic: "It is my firm hope and belief," he said, "that the inauguration of our Colleges will be a turning point in the history of general practice, and that the patient endeavour of each will inevitably raise its standard and perpetuate the high ideals which we associate with this great branch of our profession."¹³

It is not only the foundation and other members and associates of our College who believe sincerely in its future, and in the good work that it will do; thousands of others, both within the medical profession and outside it, think so too. It is right and fair that everyone should now co-operate with us and help us to carry out our difficult task. I would ask all individuals and institutions to search their hearts and their records for what they themselves have done during the past half century to encourage, academically, family doctors in active general practice; and I would invite them to compare their lists with what our College has achieved during its first four years.¹¹⁻¹⁵

Teaching of General Practice

In spite of attempts to prove otherwise, by juggling with figures and definitions, there is no reasonable doubt that the majority of students still enter general medical practice of some sort or another—at home or overseas, in towns or in the country, in schools, factories, or other institutions, or in the armed forces. While this remains so—and it is unlikely to change—it seems illogical that students should not be taught something by those with personal knowledge of this important branch of medicine. Our College is

encouraging general practitioners to teach, and the majority of the medical schools have already accepted this idea. The report of the British Medical Students' Association last year showed how well the schemes of student-attachment to family doctors, and lectures by general practitioners, were developing—supplementing and not replacing in any way specialist teaching. In some teaching hospitals in this country (St. Bartholomew's and others), and also in Canada⁷ and in the U.S.A.,⁸ general-practice resident appointments are being developed for those who wish to become family doctors. In Australia the attachment of students to general-practitioner hospitals is becoming popular.

Dr. John Ellis, who has had so much to do with the recent reports of the Royal College of Physicians on Medical Education, said in his Goulstonian Lectures last year: "The standard of medical care in this country depends upon the standard of general practice, and medical schools must regard it as their first duty to ensure the best possible undergraduate education and postgraduate training for their students who will take up general practice. . . . This branch has for centuries attracted many of the finest men in medicine, and it will continue to do so."⁹

Teaching hospitals have departments allotted to many different subjects, and it is probable that before long a department of general practice will be considered an essential part of each medical school in this country, as it already is in many medical schools in the United States¹ and Canada.¹⁰ Last year the House of Delegates of the American Medical Association unanimously approved a resolution directing "that all possible means be taken to stimulate the formation of a Department of General Practice in each medical school."¹¹ All that it may be possible to have, to start with, in some of the teaching hospitals in our country may be a small room, perhaps shared with another department, where a general practitioner of experience, preferably one who works near by, can give advice on any problem connected with general practice to anyone in the hospital—from the most junior student to a full-time professor or other member of the staff. These problems may be concerned with family doctoring in the neighbourhood of the hospital or further afield, with the selection of students, with the teaching of general practice through student-attachment to family doctors or through lectures by them, with the problems of the pre-registration year, with the difficulties met with by young doctors entering practice in this country or overseas, and with the continuing education of old students of the hospital.

From these small beginnings—with a part-time practitioner in a single room—this service will be given a chance to prove its value. Its future development will depend on the needs of that particular school, the response from the students, and the enterprise of the general practitioner concerned. Departments in different medical schools will develop along different lines; and it is likely that in time they will all prove as valuable as the general-practice teaching units have already done in Edinburgh^{12,13} and at Darbshire House in Manchester¹ for conveying to students a proper appreciation of general practice. Before long, perhaps, one of our enlightened universities will found a Chair of General Practice as an example for others to follow.

The less a medical school has taught its students about general practice, the more will they need to learn about it after they have left their teaching hospital. Paucity of training in this subject may be one of the reasons why such a small proportion of general practitioners return to their own medical schools for help and advice once they have left. A department of general practice in each school, keeping in touch with its old students year by year, would supply a permanent centre of information and assistance which, if properly organized, would do the school and its sons and daughters a great deal of good. Until such departments are formed the Regional Faculties of our College, which are nearly all based on a medical school, may do much to help students and young doctors in this way.

The Continuing Education of General Practitioners

A new attitude of mind towards the continuing education of family doctors is developing, and our College is particularly interested in it. The academic status of the general practitioner of the future will depend very largely upon his keeping up to date. As Dr. E. G. Housden has said: "If we wish to be thought of and treated as a learned profession we must live to justify it."¹⁴ Medicine is changing so much, and so quickly, that if the family doctor is to contribute his proper share to the well-being of his patients he must know about recent developments as they occur, not only in diagnostic and therapeutic techniques but also in public health, preventive medicine, social and industrial medicine, and so on. The need for this postgraduate training was stressed recently by the Canadians,¹⁵ who have shown that about 90% of prescriptions written now by family doctors could not possibly have been written twenty years ago, because the drugs did not then exist. Nowadays, in a maze of specialties and new forms of specialist treatment—many of them frightening and some of them dangerous—the general practitioner has got to be his patients' trusted guide. This he cannot be unless he keeps in touch with each major diagnostic and therapeutic advance, unless he knows his patients and his judgment is sound. A broad education, wide experience, and a deep understanding of medicine and personalities, and the knowledge that he has kept himself up to date, will establish him as a competent and responsible leader of his patients' medical team.

Apart from keeping in touch with these recent advances, he needs also much revision. His time is limited, and one must remember that he has the whole of medicine to cover. If he can do one hour of formal postgraduate training a week he has done well, though this is a total of only fifty-two hours a year. This is too little time for an enormous job, so that the subjects for his postgraduate classes must be chosen carefully and be limited to those of interest to him. Postgraduate courses must be organized thoughtfully and integrated one with another; anyone who has tried to do this will realize what a stupendous task it is. A country-wide general-practitioner postgraduate curriculum is really what is needed.

Less than half of the varieties of postgraduate education for general practitioners are measurable¹⁶ or formal enough to allow the Ministry of Health to pay for them. One doctor may keep much more up to date by reading his journals carefully, seeing his patients with consultants, and attending meetings of his local medical society, than does another who goes to formal intensive or extended courses once or twice a year. The second programme may be paid for by the State, while the first is not. Official postgraduate courses are by no means necessarily the most important part of the continuing education of a general practitioner; we must remember that all the rest is important too—carrying on his practice efficiently, attending consultations and meeting consultants elsewhere, reading, going to medical society meetings or lectures, demonstrations, or ward rounds, working in hospitals, taking students, entering for prizes or travelling scholarships, doing research, and so on.¹⁶ Family doctors must learn to teach themselves and each other more, and not look to specialists for all their instruction.

The part played by general practitioners in the work of medical societies is steadily increasing; the recent development and success of the General Practice Section of the Royal Society of Medicine is an outstanding example of this.

Travelling fellowships may be of greater importance to family doctors in future: and so will correspondence courses for those in outlying areas, especially abroad.

Publications for General Practitioners

For the last half-century many of the articles and books published for general practitioners have been written by specialists. At first they were generally acceptable, because the writers had themselves been in general practice and

known its problems; but in recent years many of these authors have spent little or no time as family doctors, and some of their writings have become less and less applicable to the work of those for whom they are intended. For example, in a recent textbook on the practice of medicine published in this country, and in by no means its first edition, there are scores of pages on diseases which the average general practitioner in the British Isles may not meet even once in his professional lifetime, while such important things as insomnia and breathing exercises are omitted from the index and from detailed discussion.

There is an increasing need for books on general practice to be written by general practitioners and specialists working in co-operation. This will ensure that the content and the emphasis of the articles will be correct from the family doctor's point of view. Many general practitioners are taking an interest in one or other of the different specialties—about one-quarter of the members and associates of our College have obtained a higher diploma in a special subject that interests them, others have studied special branches of medicine that have no diploma—so that it should not be difficult, in time, to find a general practitioner to cover every article. Several excellent books have been written recently by general practitioners and by those closely connected with them,^{18,19,20,21,22} and there has been a marked increase in the number of articles by family doctors appearing in the medical journals.

This leads to another matter of concern. From the mass of medical literature now published each year, how may good material best be picked out and kept for future use? Our recent questionnaire has shown that no fewer than seventy-five medical journals, published in different parts of the world, are taken regularly and read by members and associates of the College of General Practitioners. No doctor in practice has time to read more than a few of these, though he may perhaps glance through several others. He cannot attempt to remember all he reads. Few bind their journals or have room in their houses to store them; fewer still are in close touch with a medical library. What, then, should the average general practitioner do with the articles he wishes to keep? The easiest solution is for him to tear them out of the journals and file them, as many already do. The tearing up of journals has now become almost essential for those who wish to keep articles for easy reference. Many journals are bound in such a way that tearing out pages is easy; in others it is well-nigh impossible to do so without leaving an untidy, jagged edge which frequently tears into the script. The *Proceedings of the Royal Society of Medicine* and the *Canadian Medical Association Journal* are among the most difficult in this respect. It may be cheaper to bind these journals as they are, but it must reduce their value to many a busy doctor, who may not always have a pair of scissors or a penknife at hand while he reads them. It is surprising, too, that some journals still fail to give an adequate reference (to the journal, year, and volume) on the first page of each article, yet this is most important if articles are to be filed.

It is hoped to develop soon a general-practitioner library service, in connexion with the College, perhaps with a full-time director and secretary. This service will give general practitioners much literary help in collecting references and extracts from journals and monographs, and photostatic copies of papers. It should be of great value, too, in the continuing education of family doctors.

I cannot leave the subject of publications without mentioning a form of literature for general practitioners which is steadily increasing in size—that which reaches us at our breakfast tables six mornings a week, as leaflets, pamphlets, booklets and blotters from pharmaceutical firms. It has been described somewhat cynically as our "blotting-paper reference library." That from the reputable firms contains much useful information about new drugs and preparations which is sometimes difficult to find elsewhere. Much of it is as scientific, well set out, and documented as one could wish, and I am now thinking particularly of some of the recent

booklets on the new hypotensive drugs. General practitioners can help themselves greatly, when filing information about the proprietary medicines they prescribe, by being highly selective and by using as few preparations as possible of any one drug. Selective replacement in one's files is much more helpful than frequent addition.

I would make a plea to the pharmaceutical industry not to flood us general practitioners with too much paper, smothering useful information with advertising technique, to avoid mixtures as much as they can, and not to duplicate preparations more than is absolutely necessary. Doctors and patients are easily bewildered and confused by too many different names for the same substance. I have weighed the literature from the pharmaceutical firms which has reached me by post during the past year; it comes to about half a hundredweight. Those doctors who have worked out some plan of campaign for making good use of this mass of postal information can gain a great deal from it; but if the volume increases much more it will defeat its own object, because we shall all be forced to consign it at once to our "round files," as an American once described to me his wastepaper baskets.

Research by General Practitioners

The idea that family doctors can do research, and good research, is not new. That they can be successfully encouraged to take part in large-scale investigations over a period of time has been shown recently to be possible. One of the most valuable and stimulating contributions which the College of General Practitioners is making to medicine at present is concerned with such organized general-practitioner research. As Dr. R. J. F. H. Pinsent has written: "Never before have general practitioners in this country had an opportunity to develop a sense of corporate endeavour in their work, nor have they had the inducement to apply themselves to research into the problems which they encounter every day."²³

The recent Measles Survey, the work of the Epidemic Observation Unit under the direction of Dr. G. I. Watson, the Obstetric Survey of the South-west England Faculty, and the National Morbidity Survey carried out with the help of Dr. W. P. D. Logan of the Registrar-General's Department, are good examples of this. Hitherto it has not been practicable to arrange a study for a whole year of morbidity in a hundred general practices scattered over England and Wales; all previous studies have been limited to a handful of doctors over a short period of time. This latest investigation has been on a scale so much greater than anything ever attempted previously, anywhere in the world, that it may well prove to be a landmark in the history of collective investigations and an example for other countries to follow. The College Records Unit, mentioned already, will seek to carry on the work of this National Morbidity Survey, attempting a continuing study of the morbidity met by family doctors; and it is hoped that this will reveal changes in the patterns of disease in the community as soon as they occur.

Joint investigations by small groups of practitioners interested in a particular subject, working perhaps even in different continents, open up vistas of research on unusual matters never before attempted. A report from one study group on acute chest infections has already been published; others are still at work. Many faculty-sponsored investigations are also under way. By means of the Register of Research Interests compiled by our College, its members and others can now be put in touch with general practitioners who are prepared to help in the study of particular problems.

Investigations by single individuals, too, have been encouraged. The Benger Award of annual prizes worth £500, for original observations by general practitioners, may lead to some fascinating and unexpected discoveries.

There are proposals for developing, through the College, a central organization to help with the planning and analysis

of individual and collective research in general practice, especially in epidemiological problems. There is also a need to increase the number of "research practices" (some of them subsidized perhaps by the Clinical Research Board) in which the doctor is given a grant to enable him to employ trained assistance to carry out observational research into epidemiology, therapeutics or other subjects according to his bent or capacity.

Conclusion

We are living in exciting times for the medical profession, academically and politically. Everyone in our country now has a family doctor and can receive attention without financial embarrassment. There are, it is true, certain disquieting signs—excessive resort to hospitals and to specialists, the partial avoidance of responsibility by some general practitioners and their subsequent loss of efficiency, the incursions of clinics, the deadening effect of a uniform and universal capitation fee, and now money-squabbles with the State—all of which threaten the future welfare of medicine in Great Britain. We must see to it that these setbacks are only temporary. Unless conditions become such as to stimulate initiative and enthusiasm, to open out the possibilities of advancement, and to create the maximum sense of responsibility, there is a danger that many general practitioners will soon find themselves doing mainly routine sorting work.

Fortunately there are signs of a new birth too, of which I have tried to tell something in this lecture. Modern science has equipped us as we have never been before; whether we reach our patients by car, on foot in the jungle, by breeches buoy between two ships at sea, or by air as a flying doctor, we now have drugs for treating them in their own beds, or while they remain at work, that were undreamed of thirty years ago. We have many more helpers, both within the profession and outside it, co-operation with whom should bring lasting benefits to our patients in and near their homes; and several new types of group practice are being successfully tried out. The academic renaissance of general practice that is taking place throughout the world, just now, is a very real thing; and among its most convincing manifestations has been the foundation, growth, and vitality of our new College and of its sisters overseas. They have all made tremendous progress in a short time; their future is bright, and in many other places there is enthusiasm to follow their example.

We inherit from our predecessors a better concept of the art of family doctoring than any other country in the world; and a great responsibility rests on us all—doctors, laymen, and politicians alike—to ensure that here and throughout the Commonwealth the present opportunity is seized to regain for general practice its rightful place as one of the finest branches of our profession and one of the most interesting and satisfactory in which to serve.

REFERENCES

- American Academy of General Practice (1954). *Manual on General Practice Departments in Hospitals*.
- Ashworth, H. W., et al. (1955). Darbshire House Health Centre, Manchester. First Annual Report.
- Barber, G. O. (1956). "Medical Education and the General Practitioner," *Practitioner*, 176, 66.
- Batten, L. W. (1956). "Essence of General Practice," *Lancet*, 2, 365.
- Canadian Medical Association Journal (1956). "The American Medical Association and General Practice," 74, 304.
- (1956). "Public Attitudes Towards Doctors," 75, 768.
- (1956). "General Practice Residencies," 75, 771.
- Castiglioni, A. (1947). *A History of Medicine*. New York.
- College of General Practice of Canada (1955). *Newsletter*, Vol. 2, No. 2.
- (1956). "General Practice Departments in Hospitals" (booklet).
- College of General Practitioners (1952). Report of the General Practice Steering Committee, *British Medical Journal*, 2, 1321.
- (1953). First Annual Report, *ibid.*, 173, Suppl., p. 1.
- (1954). Second Annual Report, *ibid.*, 175, Suppl., p. 1.
- (1955). Third Annual Report, *ibid.*, 177, Suppl., p. 1.
- (1956). Fourth Annual Report, *ibid.*, 177, Suppl., p. 1.
- (1956). Fourth Annual Report, *ibid.*, 177, Suppl., p. 22.
- (1957). Memorandum submitted to the Maternity Services Committee of the Ministry of Health (the Cranbrook Committee).
- Craddock, D. (1953). *An Introduction to General Practice*. Lewis, London.
- Edelstein, L. (1943). "The Hippocratic Oath." Supplements to the *Bulletin of the History of Medicine*, No. 1. Johns Hopkins Press, Baltimore.
- Ellis, J. R. (1956). "Changes in Medical Education," *Lancet*, 1, 867.
- Ewins, J. A. (1956). "The Role of Psychiatry in Medical Education," *British Medical Journal*, 2, 503.

- Fothergill, W. E. (1920). Dr. D. Lloyd Roberts's Obituary Notice, *Lancet*, 2, 766.
- Garrod, A. (1926). "The Science of Clinical Medicine," *British Medical Journal*, 2, 621.
- Hall, Alexander (1956). "The State of General Practice To-day," *ibid.*, 2, 57.
- Hall, Arthur J. (1941). "The Science and Art of Medicine," *Practitioner*, 146, 395.
- Holmes, O. Wendell (1859). *The Professor at the Breakfast Table*.
- Housday, E. G. (1956). *South London Faculty Gazette* (College of General Practitioners), 1, 24.
- Hunt, J. H. (1951). "A Diagnostic Unit for Practitioners and its First Five Years' Work," *British Medical Journal*, 2, 1575.
- (1955). "The Scope and Development of General Practice in Relation to Other Branches of Medicine," *Lancet*, 2, 681.
- Kinsey, A. C., Pomeroy, W. B., and Martin, C. E. (1948). *Sexual Behaviour in the Human Male*. Philadelphia.
- and Gebhard, P. H. (1953). *Sexual Behaviour in the Human Female*. Philadelphia.
- Lancet*, 1954. "A Diagnostic Centre," 1, 871.
- Marshall, F. N. (1956). Manchester Regional Hospital Board: Abstract of Statistics for 1955.
- Ministry of Health (1956). Report for year ended December 31, 1955. Part I, Appendix 2, p. 154.
- Ollerenshaw, J. G. (1953). "Group Practice: Present and Future," *Practitioner*, 170, 619.
- and Hunt, J. H. (1954). "Family Medical Centres," *Med. Wld (Lond.)*, 80, 509.
- Oxford English Dictionary (Shorter)* (1933). Oxford.
- Peabody, F. W. (1927). *The Care of the Patient*. Oxford University Press.
- Pickles, W. N. (1955). "Epidemiology in the Yorkshire Dales," *Practitioner*, 174, 76.
- Pinsent, R. J. F. H. (1953). *An Approach to General Practice*. Livingstone, Edinburgh.
- Royal College of Physicians (1956). Committee on Medical Teaching. Fourth Interim Report, p. 34.
- (1957). "The Structure of the National Health Service in Relation to the Needs of the Community." Report of Meeting of Members held on November 29, 1956.
- Royal College of Obstetricians and Gynaecologists (1957). Memorandum submitted to the Maternity Services Committee of the Ministry of Health (the Cranbrook Committee).
- Scott, R. (1949). "The Almoner and the Family Doctor," *Almoner*, 1, 209.
- (1950). "A Teaching General Practice," *Edinb. med. J.*, 57, 454.
- (1956). "Edinburgh University General Practice Teaching Unit," *J. med. Educ.*, 31, 621.
- Stedman's Medical Dictionary* (1954). Baillière, Tindall and Cox, London.
- Taylor, S. (1954). *Good General Practice*. Oxford Univ. Press, London.
- Thomas, C. I. (1955). "The Health Centres of Harlow," *Lancet*, 2, 863.
- Thomas, C. I. (1955). *The Cornea*. Blackwell Scientific Publ., Oxford.
- Thwaites, J. G. (1954). *Into General Practice*. Heinemann, London.
- Walshe, F. M. R. (1951). "The Arts of Medicine and Their Future," *Lancet*, 2, 895.
- Watts, C. A. H., and Watts, B. M. (1952). *Psychiatry in General Practice*. Churchill, London.
- Wofinden, R. C., and Parry, R. H. (1952). "Bristol's New Health Centre," *Lancet*, 1, 1297.

MANAGEMENT OF THE TUBERCULOUS DIABETIC

FOLLOW-UP OF 84 CASES FOR ONE YEAR

BY

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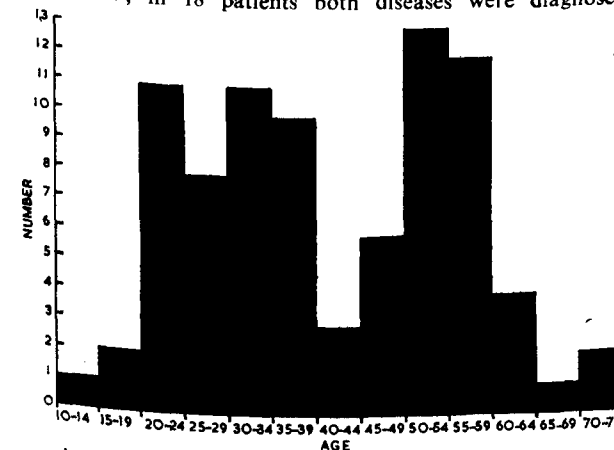
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Pulmonary tuberculosis is a common and important complication of diabetes mellitus, but only in the last few years has there been an increasing appreciation of the necessity to ensure special treatment for patients with the combined diseases. Oakley (1947), Luntz (1947), and Lawrence (1948) advocated the establishment of special units for the treatment of tuberculous diabetics. The Central Health Services Council (1952) suggested that tuberculous diabetics should be concentrated in sanatoria where expert advice and full facilities for laboratory investigation and supervision would be available. The Ministry of Health (1953) recommended regional planning for diabetic services with special provision for tuberculous diabetics.

In September, 1951, a scheme for the management of tuberculous diabetics was introduced in Birmingham. It comprises a hospital unit of 25 beds, an out-patient clinic, and a domiciliary service, and provides continuity of treatment and supervision (Luntz, 1952, 1954).

Present Study

This report gives a one-year follow-up of 84 tuberculous diabetics who have been under my care at the Regional Diabetic Unit at Romsley Hill Hospital in Birmingham. These cases were all the patients admitted consecutively over the four years between September, 1951, and September, 1955, and have been under observation for periods ranging from five years to one year. Of the 84 patients, 66 were known diabetics in whom pulmonary tuberculosis had recently been diagnosed; in 18 patients both diseases were diagnosed



Age distribution of the series of 84 tuberculous diabetics.

simultaneously. There were 49 males and 35 females, and their age distribution is shown in the Chart. The majority of the cases fall into two main groups—40 patients aged 20-39, and 35 aged 45-64. These are the age groups at which both diabetes and tuberculosis are commonly diagnosed. The youngest patient was 13 and the oldest 71. The mean age was 41 years.

Condition on Admission.—Clinical assessment of the patient's condition was made by studying symptoms, physical findings, general condition, temperature, weight, and sedimentation rate (E.S.R., Westergren, 200 mm. reading at one hour). Table I shows the condition of the patients on

TABLE I.—Clinical Condition on Admission

		No.		%	
		No.	%	No.	%
General condition	Good	28	33		
	Fair	34	40		
	Poor	22	26		
Temperature	Afebrile	20	24		
	Febrile	56	67		
	Not recorded	8	10		
E.S.R. (Westergren 200 mm. reading at 1 hr.)	0-10	6	7		
	11-20	2	2		
	21-50	40	48		
	51+	27	32		
	Not recorded	9	11		
	Positive on direct examination	70	83		
Sputum	" " culture	4	5		
	Negative on direct examination (no culture)	6	7		
	Negative even on culture examination	3	4		
	Not recorded	1	1		
	Total	84	100		

admission and before treatment for tuberculosis was started. The general condition was poor in 22 (26%), 56 (67%) were pyrexial, the E.S.R. was raised in 69 (82%), and 74 (88%) had a positive sputum. The data indicate that clinically most of the patients were rather ill.

Radiographic Appearances at Start of Treatment.—The radiographic appearances at the start of treatment are set out in Table II. Over half the patients had bilateral disease, 68% had three or more zones involved, and cavitation was present in 87% of the cases. An assessment of the extent of cavitation was made in each case by adding the maximum diameters of the individual cavities; 34 patients had cavi-

TABLE II.—Radiographic Appearances at the Start of Treatment

		No.		%	
		No.	%	No.	%
Extent of disease	Unilateral	36	43		
	Bilateral	48	57		
No. of lung zones involved	1 or 2	27	32		
	3 " 4	37	44		
	5 " 6	20	24		
	Total	84	100		
Principal type of shadowing	Discrete	20	24		
	Intermediate	26	31		
	Confluent	38	45		
Radiographic assessment of disease activity	Acute	27	32		
	Intermediate	44	52		
	Chronic	12	14		
	Miliary	1	1		
Cavitation	Absent	11	13		
	Present	73	87		
	Total diameter:				
	Less than 2.5 cm.	11	15		
	2.5 cm.-4.9 "	28	38		
	5 " 7.4 "	13	18		
	7.5 cm. or more	21	29		

tion of an extent greater than 5 cm. Twenty-seven (32%) had acute disease and one had miliary tuberculosis. The principal type of shadowing was confluent in 45% of the cases.

Results During the Year

Clinical, radiographic, and bacteriological assessments were made regularly, and those at three months, six months, and one year are presented.

Mortality.—During the year there was one death, and this was non-tuberculous. The patient, a 58-year-old man, died in the fifth month of treatment. Necropsy revealed an aneurysm of the bifurcation of the aorta with a massive thrombosis of the aorta, the common iliac arteries, and the inferior vena cava.

Disease Status at One Year.—The disease status in the 83 survivors at 12 months was classified as quiescent or active (Table III). One year is a short period when assessing the progress of tuberculous patients, but quiescence was

TABLE III.—Survival and Disease Status at One Year

TABLE III.—DEATHS AND MORTALITY											
Dead		Alive								Total	
		Active						Quiescent			
		Improved		Stationary		Worse					
No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	1	11	13	0	0	2	2	70	83	84	99

TABLE IV.—Progress in Clinical Condition After the Start of Treatment

	At 3 Months		At 6 Months		At 1 Year	
	No.	%	No.	%	No.	%
Clinical condition:	(84)*		(84)		(84)	
Considerable improvement	14	17	29	35	41	49
Moderate " "	45	54	46	55	38	45
Slight " "	20	24	4	5	1	1
No change	5	6	4	5	2	2
Deterioration	0	0	0	0	1	1
Death	0	0	1	1	1	1
Weight:	(83)		(81)		(82)	
Gain 21 lb. (9.5 kg.) or more	9	11	33	41	51	62
" 14-20 lb. (6.4-9.1 kg.)	21	25	18	22	13	16
" 7-13 lb. (3.2-5.9 kg.)	33	40	21	26	10	12
" less than 7 lb. (3.2 kg.)	15	18	7	9	5	6
No change	4	5	0	0	1	1
Loss less than 7 lb. (3.2 kg.)	1	1	1	1	1	1
" 7-13 lb. (3.2-5.9 kg.)	0	0	1	1	1	1
Average gain in weight (lb.)	11.45		18.32		25.57	
Temperature:	(56)		(55)		(55)	
Afebrile	47	84	48	87	50	91
Temperature fall (including fall to normal)	53	95	52	95	53	96
Sedimentation rate:	(69)		(67)		(66)	
Fall to normal (0-10)	15	22	25	37	34	52
" (including fall to normal)	67	97	67	100	64	97

* The figures in parentheses indicate the total number of patients upon which the percentages are based.

attained in 70 (83%). Of these, 31 had neither collapse therapy nor resection. Thirteen patients still had active disease, but in only two was the disease worse.

Clinical Assessments.—The changes in clinical condition and in weight, and the resolution of pyrexia and the lowering of the E.S.R., are set out in Table IV. Seventy-nine (94%) of the patients had improved clinically at three and six months, and 80 (95%) by a year, considerable improvement being recorded in 17%, 35%, and 49% of patients at these three intervals respectively. The average gain in weight was 11.5 lb. (5.2 kg.) at three months, 18.3 lb. (8.3 kg.) at six months, and 25.6 lb. (11.6 kg.) at one year. Only two patients had lost weight at one year. Of a total of 56 febrile patients in the week before the start of treatment, 47 (84%) were afebrile at three months, 48 (87%) at six months, and 50 (91%) at one year. Of 69 patients with an initial E.S.R. of 11 or more, a fall occurred in 67 (97%) at three months, in 100% of 67 at six months, and in 97% of 66 at one year, the sedimentation rate being normal in 15 at three months, in 25 at six months, and in 34 at one year.

Radiographic Changes.—Radiographic assessments (Table V) were made by a physician who was unaware that the radiographs were those of tuberculous diabetics. Moderate,

TABLE V.—Radiographic Assessments at Three Months, Six Months, and One Year

Radiographic Changes	At 3 Months		At 6 Months		At 1 Year	
	No.	%	No.	%	No.	%
Exceptional improvement ..	1	1	11	13	27	32
Considerable ..	28	33	42	50	38	45
Moderate ..	34	40	20	24	13	15
Slight ..	17	20	7	8	3	4
No change ..	1	1	0	0	0	0
Slight deterioration ..	2	2	1	1	1	1
Moderate ..	1	1	2	2	1	1
Considerable ..	0	0	0	0	0	0
Death ..	0	0	1	1	1	1
Total ..	84	98	84	99	84	99

considerable, or exceptional improvement had occurred in 75% of the patients at three months, in 87% at six months, and in 93% at a year, considerable or exceptional improvement having been recorded in 35%, 63%, and 77% of patients at these three intervals respectively. There were three deteriorations at three months, three deteriorations and one death at six months, and two deteriorations and one death at a year. An analysis of the timing of the radiographic changes showed that the greatest radiographic improvement occurred in the first three months in 56 (67%) patients and in the second three months in 17 (20%). In 7 (8%) patients improvement was evenly divided between the first and second three-month periods. In only two cases did the greatest improvement occur in the second six months. One patient improved steadily throughout the 12 months.

Changes in Cavitation.—The changes in the extent of cavitation were assessed from postero-anterior and lateral radiographs (Table VI). Considering the patients with

TABLE VI.—Changes in Cavitation

Changes in Cavitation	At 3 Months		At 6 Months		At 1 Year	
	No.	%	No.	%	No.	%
Disappearance of cavitation ..	(73)*	34	(72)	58	(72)	83
Cavities smaller or fewer ..	25	58	28	39	11	15
No change in cavitation ..	4	8	2	3	0	0
Cavities larger or more numerous	0	0	0	0	1	1

* The figures in parentheses indicate the total number of patients upon which the percentages are based.

initial cavitation, cavitation was no longer visible in 34% of 73 patients at three months, in 58% of 72 patients at six months, and in 83% of 72 patients at one year. Only one patient had more cavitation at a year than at the start of treatment.

Bacteriology

If available, sputum was examined monthly by direct smear and by culture; when there was no sputum, laryngeal swab cultures were sometimes performed. The results in Table VII are biased in favour of positivity, since regular

TABLE VII.—Examination of Sputum for Tubercle Bacilli

Presence of Tubercle Bacilli in Sputum (or Laryngeal Swab Cultures)	Pre-treatment		At 3 Months		At 6 Months		At 1 Year	
	No.	%	No.	%	No.	%	No.	%
Positive direct ..	70	83	19	23	8	10	5	6
.. culture only ..	4	5	1	1	1	1	1	1
Negative direct, culture not examined ..	6	7	12	14	19	23	11	13
Negative direct, negative culture ..	3	4	46	55	46	55	62	75
Not recorded ..	1	1	6	7	9	11	4	5
Total ..	84	100	84	100	83	100	83	100

examinations were performed only in patients considered at all likely to be positive bacteriologically. Examinations were often omitted in patients considered very likely to be negative bacteriologically. It is noteworthy that whereas 83% of 83 patients were initially positive on direct examination only 6% of 79 patients still had a sputum positive on direct examination at a year; 78% of the 79 patients were known to be negative even on culture.

Treatment of the Tuberculosis

Rest in bed together with chemotherapy was the basis of treatment for nearly all the patients. Chemotherapy with an effective combination in full dosage was begun as soon as possible after diagnosis. The combinations used were streptomycin plus para-aminosalicylic acid (P.A.S.), streptomycin plus isoniazid, P.A.S. plus isoniazid, and all three drugs. Two patients had no chemotherapy. The average duration of chemotherapy was 28 weeks, the shortest course being six weeks and the longest 52 weeks.

Collapse therapy or resection was undertaken in 47 patients. The procedures are set out in Table VIII. Minor collapse therapy was undertaken in 29 patients, major sur-

TABLE VIII.—Collapse Therapy (Induced and Maintained) and Surgery During the Year

Artificial pneumothorax ..	2
.. pneumoperitoneum ..	9
Phrenic crush and artificial pneumoperitoneum ..	13
Thoracoplasty ..	7
Resection—Lobar ..	3
.. Segmental ..	8
Total patients with collapse therapy and resection ..	47

gery in 18 patients (thoracoplasty in 7 and resection in 11). No difficulty was encountered with major surgery, and all the operative procedures were well tolerated. Physician and surgeon collaborated closely in the management of the patients undergoing thoracic surgery. The physician was present in the theatre during the operation, and the following procedure was adopted.

Resections were carried out first thing in the morning at the beginning of a list. Long-acting insulins, such as protamine-zinc insulin and insulin zinc suspension, were discontinued and soluble insulin was substituted. A dose of 20–30 units of soluble insulin was given at 7 a.m. together with 50–60 g. of glucose and the resection carried out under general anaesthesia some two hours later. Blood-sugar levels were estimated at intervals throughout the day, and small doses (10–20 units) of soluble insulin were begun in the evening together with 25-g. carbohydrate feeds at four-hourly intervals. Four or five doses of soluble insulin were given the day after operation and continued for the next three to four days. The carbohydrate requirements were supplied in the form of glucose until the patient was able to take light solids. The patients were generally back on their usual regime of a mixture of soluble insulin and

protamine-zinc insulin in the morning with or without a further dose of soluble insulin in the evening within a week and often by the fifth day.

Thoracoplasty, on the other hand, was carried out under local analgesia in the afternoon, the patient having had his usual dose of insulin in the morning and his ordinary breakfast and an early lunch. In this way no meals were missed. In the evening a small dose of soluble insulin (10–20 units) was given together with a carbohydrate feed. On the day after thoracoplasty control of the diabetes was maintained with four or five doses of soluble insulin together with two-hourly 25-g. carbohydrate feeds. The patients were back on their usual routine by the third or fourth day.

Treatment of the Diabetes

From the beginning of treatment the patients were placed on a diet whose caloric value and food components were considered suitable for their needs. The diet depended on their age, bodily habitus, weight, and state of nutrition. Three main diets were used as set out in Table IX. As the

TABLE IX.—Three Types of Diet Used

Diet	Calorie Value	Proportions of Three Main Component Foodstuffs	At Start of Treatment		At 3 Months		At 6 Months		At 1 Year	
			No.	%	No.	%	No.	%	No.	%
Basic	2,500	275 g. carbohydrate 100 „ protein 110 „ fat	63	75	63	75	60	72	57	69
Maintenance	2,000	200 „ carbohydrate 90 „ protein 90 „ fat	17	20	16	19	18	22	18	22
Restricted	1,750	183 „ carbohydrate 81 „ protein 77 „ fat	4	5	5	6	5	6	8	10
Total			84	100	84	100	83	100	83	101

body weight increased the patients were sometimes given a lower calorie diet. The majority of patients (never less than 69%) received the 2,500-calorie diet. Few (5–10%) received the 1,750 calorie diet.

When the patients first came under the care of the unit at the start of treatment they were receiving a variety of insulin combinations. These are set out in Table X. The

TABLE X.—Combinations of Insulin when Patients First Came Into the Scheme and Subsequently at Three Months, Six Months, and One Year

Morning Insulin	Evening Insulin	Total Patients							
		Start of Treatment		At 3 Months		At 6 Months		At 1 Year	
		No.	%	No.	%	No.	%	No.	%
S.I.	S.I.	24	29	6	7	4	5	3	4
P.Z.I.	—	6	7	3	4	1	1	1	1
Globin	—	3	4	1	1	0	0	0	0
S.I.+P.Z.I.	—	29	35	16	19	15	18	18	22
S.I.+P.Z.I.	S.I.	11	13	39	46	40	48	35	42
S.I.+P.Z.I.	S.I.+P.Z.I.	0	0	4	5	6	7	7	8
I.Z.S.	—	7	8	15	18	17	20	19	23
None	None	4	5	0	0	0	0	0	0
Total		84	101	84	100	83	99	83	100

three main combinations were soluble insulin (S.I.) morning and evening, S.I. and protamine-zinc insulin (P.Z.I.) in the mornings, and S.I. plus P.Z.I. in the mornings with a further dose of S.I. in the evenings. Four patients were receiving no insulin.

Insulin requirements were then determined with the help of regular urine examinations for sugar and acetone and estimations of blood-sugar levels. The main treatments used were S.I. plus P.Z.I. in the mornings in approximately a fifth of the cases, and S.I. plus P.Z.I. in the mornings together with a further dose of S.I. in the evenings in half the cases. Insulin zinc suspension was used in seven patients

at the start of treatment and 19 patients at one year. The insulin requirements were steadily increased during rest in bed and also as most patients were having too little to begin with. It is difficult to express the average insulin requirements for a group of patients receiving several insulins in a number of combinations. A rough assessment of insulin requirements expressed in terms of soluble insulin showed that the average was 68 units at the start of treatment and 96 units at one year. For insulin zinc suspension the corresponding figures were 37 units and 66 units.

The insulin dosage was altered when indicated by urine tests and blood sugar pattern throughout the day, and by the occurrence of hypoglycaemia. Even when good control of the diabetes was established, blood-sugar estimations were carried out at weekly or two-weekly intervals. Studies of the diurnal variations were performed so that the overall control could be more accurately assessed.

There was usually a fall in insulin requirements when the patient was allowed up, and in anticipation the dosage of insulin was reduced beforehand.

Discussion

A one-year follow-up is given of 84 tuberculous diabetics treated in the special unit for patients with the combined diseases. The patients, the majority with poorly controlled diabetes, had recently diagnosed pulmonary tuberculosis. On average they were ill and many had acute and extensive lesions. They were admitted to the unit without delay. The immediate response to treatment and the progress one year after the start of treatment have been very satisfactory. The success achieved may be ascribed to the fact that prompt and adequate treatment for both diseases was given in a hospital unit with adequate laboratory facilities, where the detailed attention required for the careful and precise management of both diseases was possible.

Results published during the past 25 years report a poor prognosis for the combined diseases, with a high death rate. The great majority of patients died within three years of diagnosis of the pulmonary lesion. In 18 published reports, set out in Table XI, there were 1,051 (52.8%) deaths in a total of 2,010 patients. Some of these reports include deaths up to five years, but, even so, the immediate mortality when presented was very severe. All but two of these reports concern the pre-chemotherapy era.

This very bad prognosis in tuberculous diabetics has improved with the use of modern chemotherapy according to the two reports so far published. Thosteson and Tibbits (1953) reported on the results in 294 tuberculous diabetics (1953) reported on the results in 294 tuberculous diabetics discharged between 1940 and 1952 in Detroit and had an overall mortality of 58%. They divided their cases into the pre-chemotherapy (1940–6) and chemotherapy (1947–52) eras. Of 167 discharged in the former period, 50 (30%) are living. Of 127 cases discharged in the era of anti-tuberculous antibiotics, 73 (57%) are living. Reaud (1953), describing the results of treatment of 38 patients in Cuba

TABLE XI.—Mortality Rate in Tuberculous Diabetics

Author	No. of Cases	Period of Observation	Mortality	
			No.	%
Fitz (1930) ..	35	3 years	26	74
Lorenzen (1931) ..	116	3 „	96	82
Kennedy (1933) ..	41	2 „	21	51
Root (1934) ..	245	3 „	160	65
Myers and McKean (1935) ..	80	1 1/2 „	35	44
Wiener and Kavee (1936) ..	218	2 „	102	47
Himsworth (1938) ..	29	5 1/2–4 „	6	21
Mark et al. (1942) ..	349	5 years	115	33
Banyai and Cadden (1944) ..	115	Not stated	67	58
Poulsen (1946) ..	100	5 years	91	91
Gauld and Lyall (1947) ..	17	3 „	11	65
Lawrence and Whittaker (1948) ..	110	Not stated	39	35
Ferrara (1952) ..	53	4 years	29	55
Munkner (1953) ..	15	2 „	9	60
Jacobs et al. (1953) ..	55	4 „	55	100
Gais (1953) ..	100	5 „	24	24
Thosteson and Tibbits (1953) ..	294	5 1/2 „	171	58
Reaud (1953) ..	38	2 1/2 „	4	11
Total ..	2,010		1,061	53

during 1950-2, showed that 19 (50%) were improved, 15 (40%) were unimproved, and 4 (11%) died during their stay in the sanatorium. Little can be drawn in the way of conclusions from these reports. The bad prognosis given in the literature is no longer justified and should be regarded as largely of historical interest only.

In view of the high mortality previously reported the single death in the present series of 84 patients is particularly noteworthy. Mortality figures alone, however, give an incomplete picture of the effects of treatment, and it is important to know the clinical condition of those who survived and the activity of their tuberculosis. At the end of a year 70 of the patients have quiescent disease, and of the 13 with active disease improvement has occurred in 11. A total of 47 (56%) of the patients had collapse therapy or resection as part of their treatment, and these played an important part in helping to control the disease. Major thoracic surgery has proved perfectly safe in the well-controlled tuberculous diabetic.

Results at one year can only be regarded as a short-term evaluation, but the attainment of quiescent disease was closely linked to the immediate clinical and radiographic response to treatment. Even patients with features usually indicative of acute or extensive disease made striking progress. Quiescent disease was attained in the presence of such individual factors as an initial pyrexia of over 100° F. (37.8° C.) (in 77% of 13 patients), a high E.S.R. (in 78% of 27 patients), involvement of five or six zones of the lungs on a standard radiograph (in 75% of 20 patients), and even in the presence of all of these features in five patients. In these cases most of the radiological improvement occurred in the first six months with chemotherapy. It can be said that the prognosis depends on the early response to treatment, and where the clinical and radiological response in the first six months with chemotherapy is good the outlook may be regarded as favourable. Acute bilateral pulmonary tuberculosis in a diabetic is a serious complication to be regarded as a medical emergency. It calls for immediate treatment in a special hospital unit with an effective dosage of combined chemotherapy for the tuberculosis and stabilization of the diabetes as a matter of great urgency. The start of chemotherapy should not be delayed until the patient is admitted to hospital.

In conclusion, the immediate response to treatment in this group of cases as judged by the results at one year has been very satisfactory. The progress of the pulmonary tuberculosis—despite the diabetes—compares very favourably with the progress in the non-diabetic. As with the non-diabetic, however, it is necessary to follow these cases for several years before the final picture will be clear.

Summary

A one-year follow-up of 84 tuberculous diabetics is presented. Clinically most of the patients were ill. The pulmonary tuberculosis was bilateral in 48 patients, and 57 had involvement of three or more zones; 27 had acute disease, and cavitation was present in 73.

By one year there was only one death and this was non-tuberculous. Quiescence of the tuberculosis was attained in 70 patients. The average gain in weight per patient was 25.6 lb. (11.6 kg.) at a year. At least moderate clinical and radiological improvement occurred in over 90% of patients. Cavitation had either disappeared in 83% or become less evident in a further 15%. Only 5 of 83 patients still had a positive sputum on direct examination.

Rest in bed and chemotherapy, with an effective combination of anti-tuberculosis antibiotics in full dosage, was the basis of treatment for the tuberculosis in nearly all cases, and 47 had collapse therapy or resection, major surgery being carried out in 18 patients. In addition the diabetes was carefully controlled. Three diets were used, but the majority of patients had a 2,500-

calorie diet. The commonest combination of insulin used was a mixture of S.I. plus P.Z.I. in the mornings and a further dose of S.I. in the evenings.

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REFERENCES

- Banyal, A. L. and Cadden, A. V. (1944). *Arch. intern. Med.*, 74, 445.
Central Health Services Council (1952). Annual Report.
Ferrara, M. A. (1952). *New Engl. J. Med.*, 246, 55.
Fitz, R. (1930). *Amer. J. med. Sci.*, 180, 192.
Gais, E. S. (1953). *N.Y. St. J. Med.*, 53, 1844.
Gauld, W. R., and Lyall, A. (1947). *British Medical Journal*, 1, 677.
Himsworth, H. P. (1938). *Quart. J. Med.*, 31, 373.
Jacobs, S., Leonard, A. J., and Yager, I. (1953). *J. med. Ass. Ga.*, 42, 519.
Kennedy, W. R. (1933). *Canad. med. Ass. J.*, 29, 482.
Lawrence, R. D. (1948). *Tubercle, Lond.*, 29, 255.
— and Whitaker, H. (1948). *Ibid.*, 29, 256.
Lorenzen, J. N. (1931). *Acta tuberc. scand.*, 5, 265.
Luntz, G. R. W. N. (1947). *British Medical Journal*, 1, 943.
— (1952). *Tuberculosis in the Commonwealth*, p. 270. N.A.P.T., London.
— (1954). *Lancet*, 1, 973.
Mark, M. F., Mosenthal, H. O., and Liu, F. (1942). *Amer. J. med. Sci.*, 203, 490.
Ministry of Health (1953). Circular No. 62.
Munkner, T. (1953). *Acta tuberc. scand.*, 28, 335.
Myers, G. B., and McKean, R. M. (1935). *Amer. Rev. Tuberc.*, 32, 651.
Oakley, W. (1947). *British Medical Journal*, 1, 780.
Poulsen, J. E. (1946). *Acta med. scand.*, 123, 403.
Reaud, A. (1953). *Sth. med. J.*, 46, 248.
Root, H. F. (1934). *New Engl. J. Med.*, 210, 192.
Thosteson, G. C., and Tibbits, R. S. (1953). *J. Mich. med. Soc.*, 52, 1088.
Wiener, J. J., and Kavee, J. (1936). *Amer. Rev. Tuberc.*, 34, 179.

PERIODIC DISEASE: PERIODIC FEVER REPORT OF A CASE

BY

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Disease conditions manifesting rhythmic recurrence of symptomatology of diagnosable organic origin are well known in medicine—notably epilepsy, Hodgkin's disease, malaria, and brucellosis, to mention a few. The natural history of such illnesses is known and some of them are curable.

However, a distinct group of conditions with periodic symptoms and signs which elude exact diagnosis has been reviewed by Reimann (1951) and called periodic disease. These conditions may occur in childhood or adult life and recur regularly over several years, sometimes for a decade. Various systems may be involved, and symptoms are so regularly cyclic as often to be predictable. The general health is unaffected and patients have been fully investigated without a correct diagnosis or cure being made. They have sought advice from numbers of physicians and have been known at times to seek the help of unorthodox practitioners.

Reimann has included such conditions as periodic fever, periodic abdominal pain, periodic arthralgia, and perhaps periodic (cyclic) vomiting and Behcet's syndrome (recurrent ulceration of oral and genital mucosa with hypopyon) in his description of periodic disease. Several cases of periodically occurring fever closely resembling Reimann's description of periodic fever are to be found in the literature (Wolf and Wolff, 1942; Albahary and de Villero, 1951; Hitzig and Fanconi,

1953). Reimann (1947, 1948, 1951, 1953) has followed up a number of cases himself.

The following is presented as a case of periodic fever because of regularly occurring pyrexia for over five years with no convincing evidence of aetiology and, so far, no palliation.

Case Report

A housewife, aged 51, has had undiagnosed pyrexia for five years. Her symptoms date from 1951, about a year after her menopause, at the age of 45. About this time she developed diarrhoea and vomiting lasting several days. She improved, but was left with persistent fever and headache. She was treated without success by her own doctor, who then referred her to a local hospital, where she was admitted for observation three weeks after the onset of her illness.

She had migraine-like headaches at the age of 17. The headache used to be right-sided, lasted most of the day, and was accompanied by nausea and occasionally sickness. At the age of 21 tuberculous lymph nodes were excised on the right side of her neck. She was reported to have had "dry pleurisy" for a few days at the age of 26. At 38 she had shingles on the right side of her chest. She has never been outside England, has never kept pets—bird or animal—and has never been a drinker of raw milk.

The patient has always presented a picture of good nutrition and fitness, and, in particular, has not lost weight. There is an operation scar on the right side of her neck. The ears, throat, and teeth have always been healthy and no abnormal physical signs have been noted in the systems at any of the several careful examinations documented on admission to various hospitals. The spleen has never been palpable, and examinations of the central nervous system have revealed no abnormal signs. Her blood pressure has been in the region of 135/70 mm. Hg.

Her temperature chart has been characteristically periodic, rising over a day or two to 102-103° F. (38.9-39.4° C.), accompanied by a concomitant rise of pulse rate, every third or fourth day, falling again over a day or two to normal levels (see Chart). Associated with the pyrexial bouts she has headaches, anorexia, and malaise. Rectal temperatures taken in hospital have always confirmed simultaneous oral readings.

Investigations

A multitude of investigations have been done and many have been repeated on several occasions.

Haematological.—Routine blood counts made when the temperature was normal and during pyrexial periods showed: Hb, 80-100%; W.B.C., 5,000-8,000 per c.mm. (neutrophils 50-60%, eosinophils 4-5%, lymphocytes 32-43%, monocytes 0.2%). Films—normochromia, normocytosis. E.S.R. 5-12 mm. in one hour (Westergren): normal throughout illness. Platelet count, 262,000 per c.mm. Bleeding time 2½ minutes. Thick and thin smears negative for malarial parasites. Sternal marrow: no evidence of any specific infection, no reticulosis.

Bacteriological.—Blood cultures sterile (specimens taken at height of pyrexia). No agglutinations for *Salm. typhi* H and O; *Salm. paratyphi* A H, A O, B H, B O, L O; composite salmonellae; *Brucella abortus*; or *Brucella melitensis*. Paul-Bunnell test negative. Leptospiral agglutinations negative with *L. icterohaemorrhagiae*, *L. canicola*, *L. sejevae*, *L. grippityphosa*, *L. bataviae*, and *L. pomona*.

Complement-fixation Tests.—Lymphocytic choriomeningitis virus, negative 1/2; mumps virus, negative (Virus Reference Laboratory, Colindale); influenza virus tests negative;

influenza sol. A<1/8, sol. B<1/8; Q fever, <1/4; psittacosis L.G.V., <1/8; agglutination streptococcus M.G., ±1/10. All negative results (Virus Reference Laboratory, Colindale).

Tests for Toxoplasmosis.—Dye test negative; C.F.T. negative (Hospital for Sick Children, Great Ormond Street).

Miscellaneous.—Mantoux, positive 1/100. Intradermal brucellin test negative. Plasma proteins: total 7.1 g. per 100 ml. (albumin 4.3 g., globulin 2.8 g.). Normal electrophoretic pattern.

Urine Examination.—No albuminuria, sugar, or acetone. No abnormalities on direct examination of deposit on numerous occasions. Culture sterile. Tubercle bacilli not seen on direct examination of deposit or culture on four occasions: 24-hour collections.

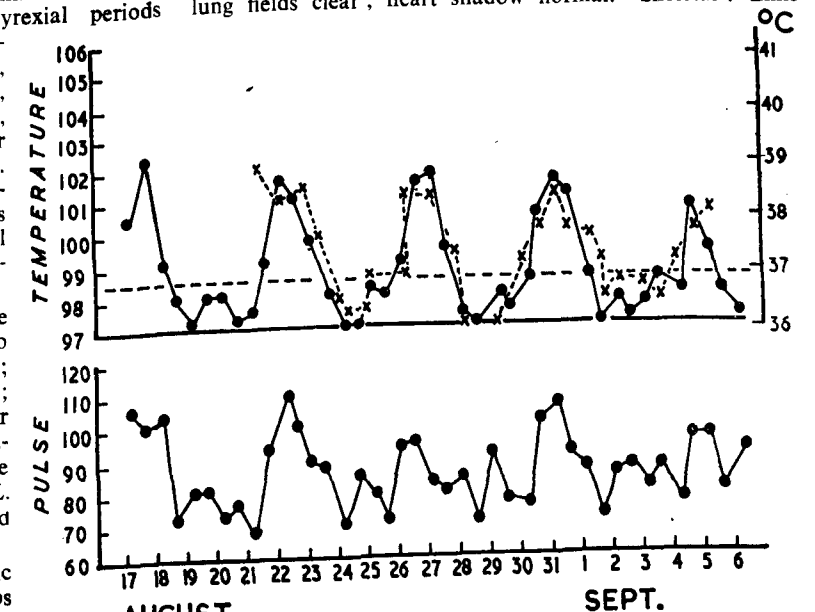
Cerebrospinal Fluid.—Lumbar puncture was first done in 1951 after the onset of the pyrexial illness. Pleocytosis was the only abnormal finding that has been inconstantly noted at subsequent examinations (see Table). C.S.F.

Cerebrospinal Fluid Findings

Date	Cells	Protein	Chloride	Sugar	Miscellaneous
		mg. per 100 ml.			
2/2/52	44 red, 2 white	10			Wassermann negative
27/2/52	36 white (70% lymphs, 30% polys.)	20			
5/3/52	50 lymphs	10	770	63	No organisms on direct exam. Negative agglutinations for <i>Br. abortus</i> . Culture sterile. <i>Myc. tuberculosis</i> not grown
18/4/52	27 lymphs	30		57	Lange—no change. No yeasts found. <i>Myc. tuberculosis</i> not isolated on direct exam. or culture
30/5/52	29 white (90% lymphs, 8% polys.)	20	740	53	No organism seen. Torula not isolated on culture
21/5/54	5 red, 11 lymphs	30	720		No organisms on direct exam. No <i>Myc. tuberculosis</i> . Culture sterile. Lange negative

pressure has always been within normal limits and no block has been demonstrated; fluid clear and colourless. A suggestion that lymphocytes in the C.S.F. might, in fact, be yeast cells was unconfirmed. Torulosis was also excluded.

Radiological.—Chest: calcification in both hilar glands; lung fields clear; heart shadow normal. Skeletal: films



Temperature and pulse chart. Rectal temperature indicated by interrupted lines.

of sacro-iliac joints, lumbar spine, and hips showed mild osteoarthritic changes; no other abnormality. Skull: no abnormality shown; pineal body calcified but not displaced. Sinuses: clear. Electroencephalogram: no significant asymmetry or focal abnormality suggestive of a localized lesion.

Treatment

Courses of various antibiotics were tried empirically—sulphonamide, penicillin, chloramphenicol, and chlortetracycline (aureomycin). All were without effect. A course of streptomycin and isoniazid was given, as it was thought that a deep-seated tuberculoma might account for her symptoms and also her persistently abnormal C.S.F. It had no beneficial effect.

On a second occasion she was given a course of cortisone, together with streptomycin, isoniazid, and P.A.S., for about nine weeks. Again her symptoms did not improve at all.

Quinine was tried for a week without any change in the periodicity of her pyrexia. Arsenicals, antihistamines, including chlorpromazine, thyroid, and codeine phosphate were all ineffective.

She did mention that she had been having severe hot flushes, and herself suggested that her symptoms might be related to the menopause. Oestrogens and also testosterone was tried, but no benefit accrued.

Finally, she had a course of mild hypnotherapy in the hope that it might enable her to accept her symptoms rationally, but her state remained unchanged.

Discussion

The whole condition of the patient is puzzling. The outstanding feature is a regularly occurring pyrexia at intervals of three to four days for as long a duration as five years. Careful checks on the temperature ensure that it is not an artifact.

Physical examination has been quite negative apart from the scar of an operation for a tuberculous lymph node twenty years ago. There are no abnormalities in the central nervous system. All relevant investigations have drawn a blank. Interestingly enough, the first lumbar puncture was negative, and it may be just possible that the slight pleocytosis could be a consequence of repeated lumbar puncture.

The patient has been under observation at regular intervals and no change has been noted. The condition is apparently benign. Her general health and nutrition remain unaltered, except that over the years she has become nervous and introspective, which seems a reasonable reaction to such a prolonged and tedious organic disease.

Various specialists—medical, surgical, and gynaecological—have seen this patient and are unable to arrive at an aetiological diagnosis.

An infective cause appears unlikely. The pattern has been one of regular, uniform, recurrent pyrexia over many years, not suggestive of a known condition. It seems reasonable to assume that there is no good evidence of tuberculous activity. Empirical treatment with sulphonamide, penicillin, broad-spectrum antibiotics, and anti-tuberculosis drugs (with the possibility that she might have a tuberculoma) have been of no avail.

Atypical epilepsy has been suggested as a diagnosis in patients with periodic abdominal pain in whom abnormal electroencephalographic patterns are demonstrated, relief being obtained with anticonvulsants (Moore, 1944, 1948). Our patient, however, shows no suggestion of epilepsy on electroencephalography.

An obvious reticulosis has been excluded on clinical and haematological grounds.

Periodic fever may be a hypothalamic sign of craniopharyngioma (Müller and Wohlfart, 1950). In the absence of pituitary involvement, radiological calcification of the

tumour, and signs of raised intracranial tension with such a prolonged history, that diagnosis seems untenable.

Reimann's Case 9 (1949) developed periodic fever, similarly after the menopause, which may or may not have served as a trigger mechanism to set it off. It is difficult to postulate a definite endocrine basis. In some patients episodes lessen in intensity or cease after the menopause. Menstruation does not seem to influence periodic disease (Reiman, 1956, personal communication).

Allergy might be suggested as a cause of periodic disease; but in the absence of associated allergic phenomena, such as asthma, urticaria, and hay-fever, family history and lack of response to antihistamines and corticotrophin and to cortisone given empirically in adequate doses, it seems hardly tenable here.

In Wolf and Wolff's case (1942) fever was related to emotional disturbances. No one, however, has been able to entertain a psychogenic cause for this patient's illness. If anything, her nervous symptoms are secondary to her prolonged periodic fever. She herself suggested that her condition might be related to the menopause, and, indeed, as one physician remarked, "who are we to say that it is not?" She has reached the stage where she most adamantly resists the suggestion of any further investigation, such as lumbar puncture, cerebral angiography, or ventriculography unless it can be guaranteed to produce the answer to her illness.

It is difficult to know what management is advisable. Amidopyrine slightly reduced the temperature in one of Reimann's (1951) cases, but the cycles of periodic fever were unaltered. Another case appeared to respond temporarily on cortisone (Reimann, 1953). We have not been able to demonstrate any change with antipyretics or cortisone.

Dr. Reimann has been consulted about this case and has made these comments: "I feel quite sure that this patient has periodic disease, or, more specifically, periodic fever. From all the evidence, positive and negative, I don't know what else it could be. You have excluded most other possibilities, but, from the old history, the spectre of tuberculosis remains despite the absence of evidence. Even if tuberculosis were present, the periodicity of fever still would be of interest. She is lucky that (as yet) none of the more distressing symptoms of severe abdominal and thoracic pain or of arthralgia occur. This should be of some consolation to her. Unless you find some cure the best she can hope for is that the intervals may lengthen and/or the episodes may lessen in severity as time passes."

With all the therapeutic failures it seems necessary to regard her illness as periodic fever, if only to save her from further medical and surgical measures.

Summary

A case of periodically recurring pyrexia for five years is detailed. No satisfactory explanation is possible. It would seem a sufficiently clear-cut case to merit inclusion in Reimann's well-described condition—periodic disease.

Thanks are due to Professor J. McMichael for his constant encouragement, to Dr. H. A. Reimann, of New York, for his kind help and advice, and to Dr. Horace Joules, Central Middlesex Hospital, London, for access to notes made whilst the patient was under his care.

REFERENCES

- Albahary, C., and de Villeroz, H. (1951). *Bull. Soc. méd. Hôp. Paris*, 67, 1391.
- Hitzig, W. H., and Fanconi, G. (1953). *Helv. paediat. Acta*, 8, 326.
- Moore, M. T. (1944). *J. Amer. med. Ass.*, 124, 561.
- (1948). *Rev. Gastroent.*, 15, 381.
- Müller, R., and Wohlfart, G. (1950). *Acta med. scand.*, 138, 121.
- Reimann, H. A. (1947). *Ibid.*, Suppl. 196, p. 666.
- (1948). *J. Amer. med. Ass.*, 136, 239.
- (1949). *Ibid.*, 141, 175.
- (1951). *Medicine (Baltimore)*, 30, 219.
- Wolf, S., and Wolff, H. G. (1942). *Ibid.*, 70, 293.
- (1953). *A.M.A. Arch. intern. Med.*, 92, 494.

PLASMA FIBRINOGEN IN RHEUMATIC FEVER

BY

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In a study of indices of rheumatic activity, Ernstene (1930) investigated the fall in plasma fibrinogen concentration in 22 patients with rheumatic fever. He found that the mean fibrinogen concentration did not reach the normal value of 0.3 g. per 100 ml. until after about 12 weeks of intermittent salicylate therapy, and that there was pronounced individual variation in the rate of fall of plasma fibrinogen, so that the distribution of fibrinogen concentrations apparently became increasingly dispersed with the passage of time.

We have been studying the plasma fibrinogen concentration in rheumatic fever for some time, and since our experience, in 33 consecutive cases of acute rheumatic fever during the first 21 days of full salicylate therapy, differs from that of Ernstene (1930), our results are presented in this paper and their implications discussed.

Clinical Particulars and Methods

All the patients were febrile, and had a migrating polyarthritis with involvement of at least two joints when admitted to hospital. Patients with temperatures below

Plasma Fibrinogen Concentrations in Acute Rheumatic Fever Treated with Full Doses of Aspirin

Time	No. of Obs.	Range (g. per 100 ml.)	Mean Plasma Fibrinogen (g. per 100 ml.)	S.D.
On admission	33	0.49-1.15	0.78	0.14
4th day of aspirin therapy	32	0.40-1.02	0.64	0.14
7th " " " "	33	0.30-0.82	0.51	0.12
14th " " " "	32	0.24-0.63	0.39	0.10
21st " " " "	31	0.20-0.59	0.35	0.09
On discharge	33	0.20-0.41	0.30	0.05

100° F. (37.8° C.) or who complained of arthralgia unaccompanied by objective signs of arthritis were excluded, so that there was no doubt about the clinical diagnosis of acute rheumatic fever. Twenty-two were males and 11 females. Their ages ranged from 10 to 46 years; 26 were between 10 and 20 years.

Each patient was given full doses of aspirin to maintain the serum salicylate concentration between 30 and 45 mg. per 100 ml. Serum salicylate was estimated by Trinder's (1954) method, which we have found the simplest and most reliable for clinical use. The drug was given four-hourly, omitting one dose in the middle of the night, and actual doses ranged from 1 to 1.6 g. five times daily. In this way maximal doses were given without inducing serious side-effects.

Fibrinogen was estimated gravimetrically as fibrin, by the method of Foster and Whipple (1922), modified as follows: the fibrin was whipped on to a 30 s.w.g. stainless-steel wire held in a pin vice; the wire was trimmed and bent into a hook for drying and weighing on a 10-mg. capacity torsion balance.

Results

The plasma fibrinogen concentration before treatment was, in every patient, above the upper limit of normal,

taken as 0.4 g. per 100 ml. (see Table). It ranged from 0.49 to 1.15 g. per 100 ml. and the mean was 0.78 g. per 100 ml. During aspirin therapy the fibrinogen concentrations returned steadily to normal. By the 4th day, when polyarthritis had been relieved and fever had subsided, the mean value had fallen to 0.64 g.; on the 7th day it was 0.51 g.; on the 14th day 0.39 g.; and on the 21st day of intensive aspirin therapy 0.35 g. per 100 ml. At the time of discharge it was 0.3 g. per 100 ml., but this figure is not strictly comparable with the others because of the great variation of the duration of stay in hospital.

The frequency distribution of plasma fibrinogen concentrations (Fig. 1) during the first three weeks of aspirin treatment shows a remarkable uniformity in the return of the fibrinogen concentrations to normal. There is no evidence of progressively increasing variance. In terms of plasma fibrinogen concentration these cases form a homogeneous group during the first 21 days of full salicylate therapy. This is an unexpected result in a disease which, even with salicylate treatment, runs a notoriously variable course. It is particularly striking when compared with the great variation in rate of fall of plasma fibrinogen concentration found by Ernstene (1930),

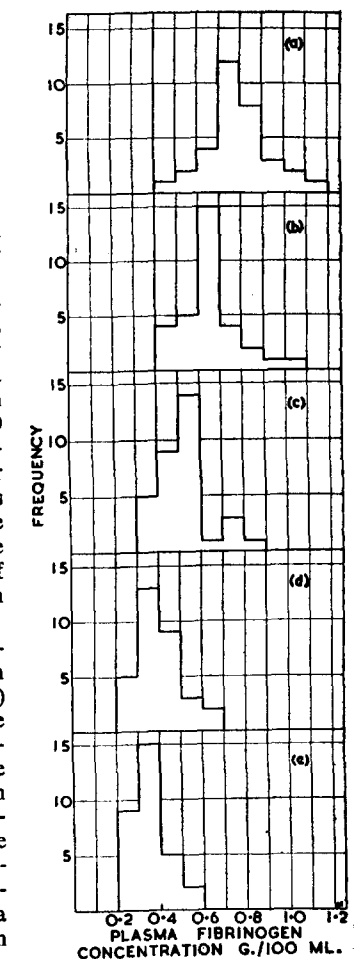


FIG. 1.—Frequency distributions of plasma fibrinogen concentrations in acute rheumatic fever treated with aspirin, (a) on admission, (b) to (e) 4, 7, 14, and 21 days respectively after the start of treatment.

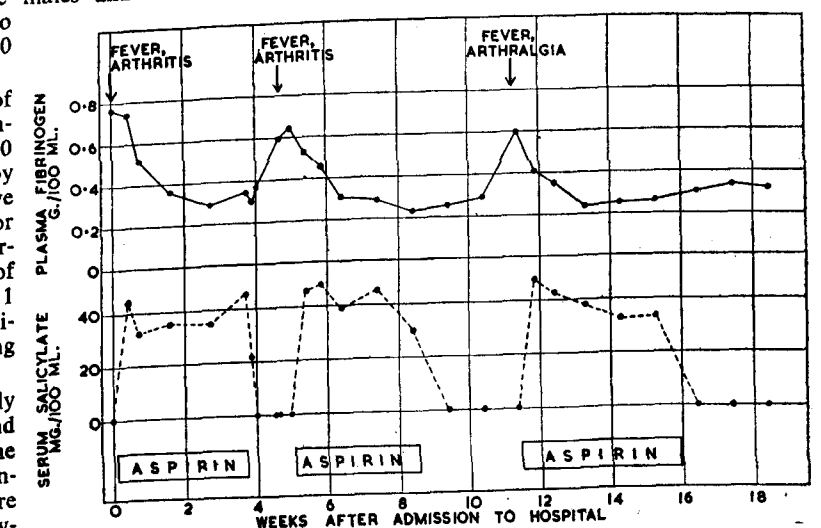


FIG. 2.—Plasma fibrinogen and serum salicylate concentrations in a case of rheumatic fever with relapses. —●—●— plasma fibrinogen, - - - - - serum salicylate.

who used short intermittent courses of salicylate, in contrast to our continuous intensive and controlled therapy. In all other respects the two series are comparable, and, like Ernstene (1930), we had a small number of "polycyclic" cases which promptly relapsed after salicylate was discontinued. This happened in six of our patients, and each relapse was accompanied by elevation of the plasma fibrinogen, which reverted to normal after a second course of aspirin.

One of the patients developed a second similar relapse, and the findings are shown in Fig. 2, where it will be observed that discontinuation of salicylate was followed by clinical relapse and simultaneous elevation of plasma fibrinogen; these changes were immediately reversed when aspirin was started again. It is also noteworthy that in this case two parenteral courses of penicillin, in which 0.6 million units and 1.2 million units daily were started 12 and 7 days respectively before the first and second relapses, were not effective in preventing relapses.

Discussion

The plasma fibrinogen concentration in acute rheumatic fever treated with full doses of aspirin has been found to fall rapidly and uniformly in a series of 33 cases. Comparison of the present results with those of Ernstene (1930) emphasizes these features of our results: the mean plasma fibrinogen of his best, "monocyclic," subgroup did not reach 0.4 g. per 100 ml. till the fourth week of treatment; the corresponding time for all the present cases was two weeks. Even more striking in the present series is the lack of increasing scatter in the plasma fibrinogen concentration with the passage of time. This finding is difficult to reconcile with the view that salicylate only relieves the symptoms of rheumatic fever, and is impossible to interpret in relation to the careful study of Ernstene (1930) without inferring that an intensive and continuous course of salicylate does indeed, within three weeks, consistently lead to a rapid reduction in the plasma fibrinogen concentration in acute rheumatic fever.

Certain practical implications arise from the present study. Since hyperfibrinogenaemia is an essential feature of rheumatic fever (Fig. 1(a)), (1) the plasma fibrinogen concentration may be a reliable index of the course of the disease, and (2) sufficient salicylate, given for an adequate time, can restore the plasma fibrinogen to normal, and presumably arrest the rheumatic process, without necessarily influencing the chain of events leading to the elevation of the plasma fibrinogen concentration.

Above all, the present results provide definite evidence that salicylate does more than relieve symptoms. Even after 21 days' treatment seven of our cases showed fibrinogen levels which, although reduced, were still slightly abnormal; this confirms that there is no set optimum dosage schedule of the drug, and that in each case dosage and duration of therapy must be controlled not only by frequent serum salicylate estimations but also with reference to the fibrinogen concentration or some comparable index of rheumatic activity.

The connexion between plasma fibrinogen and the characteristic clinical and pathological features of rheumatic fever is being investigated further.

Summary

The abnormally high plasma fibrinogen concentrations found on admission to hospital in 33 patients with acute rheumatic fever fell rapidly and uniformly during a continuous intensive course of aspirin, controlled by serum salicylate estimations. This clearly demonstrates the advantage of proper aspirin therapy.

REFERENCES

- Ernstene, A. C. (1930). *Amer. J. med. Sci.*, **180**, 12.
Foster, D. P., and Whipple, G. H. (1922). *Amer. J. Physiol.*, **58**, 365.
Trinder, P. (1954). *Biochem. J.*, **57**, 301.

SUPERFICIAL MALIGNANT LESIONS OF BLADDER TREATED BY RADIOACTIVE COLLOIDAL GOLD (^{198}Au)

BY

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In the treatment of multiple superficial lesions of the bladder intracavitary irradiation has a distinct advantage over external deep x-ray therapy because it protects adjacent healthy organs. Several techniques have been developed for the use of gamma-radiation-emitting radioactive substances as an intravesical source of irradiation (Friedman and Lewis, 1949; Becker and Scheer, 1952; Schulte, Hinman, and Low-Beer, 1952; Walton and Sinclair, 1952). The disadvantage of penetrating gamma-radiation, however, is the development of secondary cystitis and a risk of fibrosis with impaired function of the bladder.

For very superficial lesions it seemed possible to use beta-radiation. Because the dose of beta-emission falls rapidly at depth the best method is the instillation of a radioactive solution direct into the bladder in order to get the emitting substance into close contact with the bladder mucosa and to surround the papillomatous villi by the radioactive material. Ellis and Oliver (1955) used radioactive gold (^{198}Au) in this way. Einhorn, Larsson, and Ragnhult (1955) suggest the use of radioactive yttrium (^{90}Y), and Walinder (1955) colloidal $^{76}\text{As}_2\text{S}_3$ for the purpose.

Radioactive colloidal gold is suitable for this method because of its half-life, its type of emission, and its colloidal nature. Since the half-life is short (2.7 days), there will be no danger of contamination after a few days. It emits about 95% of beta-radiation with 0.96 MeV energy, and 5% of gamma-radiation with 0.41 MeV energy. The maximal penetration of its beta-particles in soft tissue is about 3.8 mm., and of the half-value layer about 0.3 mm. Thus its maximum effect is confined to the bladder epithelium, leaving the sub-epithelial tissue almost unirradiated. Its colloidal nature protects against its resorption.

This preliminary report is based on our experience with radioactive colloidal gold (^{198}Au) in the treatment of superficial malignant lesions of the bladder since May, 1955. Our material included papillary cancer and also recurring extensive papillomata without histological cancer. Three cases are here briefly reported.

Methods

The radioactive material was obtained from Harwell. After the decision to use the colloidal gold method, fluid intake was restricted on the day prior to treatment and forbidden on the day of treatment. When the activity in millicuries per millilitre had been determined, the desired dose in millicuries was drawn into the lead-shielded syringe and introduced into the bladder through an ordinary bladder catheter. Injection was readily accomplished after removal of urine by catheter. Sterile isotonic saline solution was used for rinses. At an appropriate time the contents of the bladder were run off, and the bladder was washed out with a warm solution. The volume of the removed fluid was measured for dose calculation. With suitable precautions the personnel received no hazardous amounts of radiation.

Most patients received approximately 300 mc. of gold. The range was 100 to 375 mc., the former amount being used in one instance because no more was available at the time. The injected gold was retained in the bladder for four to six hours. With the dose-rate formula of Walinder (1955) it was calculated that some 300 mc. should be given in about 70 ml. of saline; so that, taking into account the increase of volume of the bladder due to the flow of urine from the ureters, the total dose of beta- and gamma-radiation received by the bladder epithelium in six hours would be 4,000 to 5,000 r.

Case Reports

Case 1.—A 56-year-old man was seen for the first time in March, 1952, complaining of haematuria of one month's duration. Cystographic and cystoscopic examinations revealed a tumour about 4 cm. in diameter situated in the left of the bladder. The growth was removed by suprapubic electroresection and histologically reported as transitional-cell papilloma. During the following three years papillary tumours reappeared in the bladder serially, requiring six transurethral fulgurations and two suprapubic coagulations. The histological diagnosis was benign papilloma. As the repeated call for fulguration was thought to indicate a malignant change, it was decided to try radioactive colloidal gold radiation for multiple villous papillomata. On May 5, 1955, 300 mc. of gold was instilled into the bladder for six hours. Thus the bladder epithelium was estimated to have received a total dose of 4,640 r of beta- and gamma-radiation. Three weeks after instillation cystoscopic studies revealed a slight redness of the bladder mucosa. The tumour seemed to be eradicated. However, six months later cystoscopy revealed recurrent papillomata in the base of the bladder. Another treatment with radiogold was suggested, and on November 11, 1955, 215 mc. of radioactive colloidal gold was instilled into the bladder for six hours and twenty minutes. The estimated dose at the bladder epithelium was 3,860 r. When examined three weeks after instillation no tumour was seen in the base of the bladder. Four months after the second instillation, in March, 1956, cystoscopy revealed a small recurrent papilloma in the fundus of the bladder.

Case 2.—A 50-year-old man was referred in August, 1955, from another hospital with a diagnosis of tumour of the urinary bladder. Cystoscopic examination revealed a band-form area of low papilliferous tumour extending from the right ureteric orifice to the mid-portion of the right bladder wall. The biopsy specimen was reported as malignant papilloma. On August 11 100 mc. of radioactive colloidal gold was instilled into the bladder for six hours. The estimated dose at the bladder mucosa was 1,700 r. Ten days later an attempt at cystoscopy resulted in a marked haemorrhage presumably due to irradiation epithelitis. One month after treatment cystoscopic examination revealed a normal bladder except for an epithelial defect at the site where the tumour had been. Cystoscopy on September 26 showed the site of the tumour to be indistinguishable from the remainder of the bladder mucosa, but near the prostatic orifice there was a small polypoid tumour; this was removed by diathermy. The histological diagnosis of the tumour was polyp. On October 29, two and a half months after the radioactive gold treatment, there was no sign cystoscopically of any neoplastic lesion. The patient had no clinical evidence of tumour at the time of writing.

Case 3.—A 58-year-old man was admitted in May, 1955, with a history of haematuria of one month's duration. Cystoscopy revealed a papillomatous growth about 3 cm. in diameter lateral to the right ureteral orifice. The bladder was opened suprapubically, and the tumour was electroresected. The histological diagnosis was transitional-cell papilloma. In February, 1956, cystoscopy revealed multiple papillomata of various sizes at the operation scar. Furthermore, there were small villous dots throughout the bladder epithelium. The bladder was opened suprapubically and the scar was widely excised. Because of the multiplicity of growth it was decided to treat the patient with radioactive gold instillation. One month post-operatively, on March 14, 200 mc. of

radioactive gold solution was instilled into the urinary bladder for six hours. The estimated surface dose was 3,400 r. One month after instillation, cystoscopy revealed that the small multiple papillomata had entirely disappeared. In the fundus of the bladder there was a solitary persistent papilloma which was fulgurated transurethrally.

Discussion

It is our opinion that radioactive gold therapy yields good results in certain selected cases of bladder tumours. Each case, however, should be considered individually before deciding whether or not radiogold instillation is advisable. Primarily we divided our material into two groups, one including all papillary tumours and the other including non-papillary infiltrating solid carcinomas.

The essential character of the papillary type of cancer is that the lesion is superficial, involving only the mucosa of the bladder. The papillary type includes those formerly benign papillomata which have undergone malignant changes. However, it is difficult to say when the malignant change has developed. Small biopsy specimens can completely miss malignant portions of a papillary tumour and show only the innocent appearance of benign villous epithelium. Multiplicity is regarded by most urologists as an indication of malignancy. Our material included papillary cancer and recurring extensive papillomata without histological cancer.

Papillary tumours are well known to have a tendency to serial reappearances. Most of the patients received surgical treatment before the radioactive gold therapy, consisting of multiple transurethral or suprapubic fulgurations and segmental resection of the bladder. In some of the cases radioactive cobalt needles had been implanted. None of these patients received external x-ray treatment to the bladder.

Before instituting radiogold therapy we considered the histopathology, size, number, and location of the tumours of each case, as well as other complicating factors such as severe infection, with or without the formation of incrustations or stones, and severe haemorrhage. It is clear that infiltrating lesions cannot be treated by intracavitary instillation of radioactive gold because the dose received at depth will be too small to be effective. This method is designed to treat non-infiltrating lesions in which the tumorous lining is not beyond the range of the maximum penetration of the beta-rays emitted by radioactive gold.

We avoided instillation when thick papillomata were present in cases of multiple or extensive lesions. Nevertheless, when the small tumour seedlings and the thin frosting of tumour of the bladder epithelium have disappeared, small residual tumours might be easily eradicated by fulguration. In some cases bulky tumours were removed prior to instillation, leaving small villous tumours to be exposed to subsequent radioactive gold radiation.

The radiation dose in most cases ranged between 4,000 and 5,000 r, estimated at the mucosal surface. The doses were given as single exposures for four to six hours. In reference to dosage, Case 2 deserves special mention. Prior to the use of radioactive gold the patient had had no other treatment. Following intravesical instillation of 100 mc. of radioactive gold for six hours, the tumour had completely disappeared on cystoscopic examination. The estimated surface dose was 1,700 r. One patient (Case 3) had a persistent lesion following a dose of 3,400 r. It was borne out, in these cases, that villous tumours responded satisfactorily to adequate doses of intracavitary radioactive gold irradiation. Thick papillomata do not respond to the treatment.

In Case 1 new lesions developed in the bladder after radioactive gold therapy. This patient received two treatments of 4,600 r and 3,800 r, respectively. We do not expect, however, that even with higher doses all lesions will be permanently eradicated. Papillomatosis is a disease of the entire bladder epithelium, and radiation treatment will not, of course, prevent the development of new lesions.

In patients of this group, no significant bladder symptoms developed following treatment by radiation. Cystoscopically, the immediate reaction after radiogold instillation was

transient epithelitis, which subsided within the next weeks. No evidence of more severe tissue reaction was observed. None of the patients treated experienced radiation sickness characterized by the symptoms of lassitude, anorexia, nausea, or vomiting.

We know that the number of patients studied is not large enough or the time of observation long enough for conclusive evaluation of this method of treatment. However, we feel that the results to date are encouraging. Complete regression of the tumour was accomplished in cases of really superficial lesions. It is realized that any anatomical classification based on cystoscopic findings is subject to error. None the less, we believe that when the clinical findings are favourable this therapy should be considered as a primary measure.

Summary

Intracavitary instillation of colloidal radioactive gold (^{198}Au) was used for treatment of patients with multiple papillomata of the bladder. Approximately 300 mc. of gold was instilled into the bladder for four to six hours to deliver a dose of about 4,000 to 5,000 r to the bladder epithelium. The treatment had no harmful side-effects locally or on the general condition of the patient.

Three selected cases suitable for radioactive gold therapy are briefly reported.

It is our impression that this method is an excellent type of irradiation for really superficial malignant lesions. The method was used for treatment of multiple papillomatosis of the bladder alone or in conjunction with surgery.

REFERENCES

- Becker, J., and Scheer, K. E. (1952). *Strahlentherapie*, 86, 540.
 Binhorn, J., Larsson, L.-G. and Ragnult, I. (1955). *Acta radiol. (Stockh.)*, 43, 298.
 Ellis, F., and Oliver, R. (1955). *British Medical Journal*, 1, 136.
 Friedman, M., and Lewis, L. G. (1949). *Radiology*, 53, 342.
 Schulte, J. W., Hinman, F., and Low-Beer, B. V. A. (1952). *J. Urol.*, 67, 916.
 Walinder, G. (1955). *Acta radiol. (Stockh.)*, 44, 521.
 Walton, R. J., and Sinclair, W. K. (1952). *Brit. med. Bull.*, 8, 158.

DIPIPANONE HYDROCHLORIDE AS AN ADJUNCT TO ANAESTHESIA IN OBSTETRICS AND SURGERY

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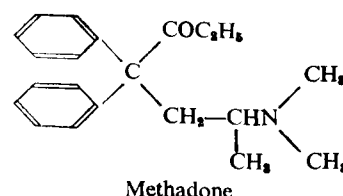
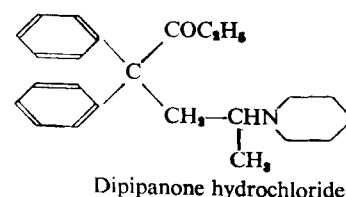
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Balanced anaesthesia developed over recent years has been made possible by the introduction of a large range of drugs with specific actions. In 1947 Neff, of San Francisco, introduced pethidine into anaesthetic practice as an adjunct to nitrous oxide anaesthesia. Since then pethidine has proved itself as useful in the operating theatre as in the general and obstetric wards. Over the past 18 months we have investigated the use of another analgesic, dipipanone hydrochloride, in obstetrics and as an adjunct to general anaesthesia. This paper describes our results.

Pharmacology

Dipipanone hydrochloride (DL-6-piperidino-4,4-diphenylheptan-3-one), which is the piperidino analogue of meth-

adone ("physeptone"), was first described by Ofner, Thorp, and Walton in 1949. Its analgesic properties in animals were investigated by Ofner, Walton, Green, and White (1950) and by Green and Young (1951). Its use as an analgesic for the control of post-operative pain and that arising from a variety of acute and chronic medical conditions has been



reported on by Gillhespy, Cope, and Jones (1956). In man 25 mg. of dipipanone administered intramuscularly or subcutaneously is equi-analgesic with 10 mg. of morphine, 100 mg. of pethidine, or 10 mg. of methadone. The analgesic effect develops within 15 minutes and lasts from five to six hours. Nausea and vomiting are rare and there is no significant change in the blood pressure or pulse rate. As with morphine, the respiratory minute-volume is reduced mainly by a reduction in the respiratory rate; this effect, however, is less than that of an equi-analgesic dose of morphine. There is no appreciable hypnotic effect, and prolonged administration produces no significant change in the blood picture.

Dipipanone hydrochloride, like methadone, is metabolized in the liver and excreted in the faeces and urine. Therefore it should be used with caution in patients with severe liver or kidney disease.

Methods

Clinical Material.—The cases investigated were (1) a series of 53 consecutive obstetric cases which received dipipanone to relieve pain in labour (as a control pethidine was used in a further series of 53 consecutive cases); (2) a series of 200 general surgical cases which received dipipanone as an adjunct to general anaesthesia, and (3) a series of 100 thoracic surgical cases in which dipipanone was the main supplement to nitrous oxide anaesthesia and was used in place of a muscle relaxant.

Obstetric Cases.—During a period of one month, 53 consecutive patients were given dipipanone hydrochloride for the relief of pain in labour. As a control, a similar number of cases were treated with pethidine. For ease of statistical analysis, the midwife present at each delivery recorded the particulars of the case, the dose of analgesic given, the relief obtained, and the progress of labour on a specially designed form. The similarity of the two series of cases with respect to age and body weight will be seen from Table I.

General Surgical Cases.—Anaesthesia for the general surgical cases followed a standard technique. The patients were premedicated with papaveretum ("omnupon"), $\frac{1}{2}$ gr. (20 mg.), and hyoscine, 1/150 gr. (0.43 mg.), or with

TABLE I.—Age and Weight of Obstetric Patients

TABLE 1. Age and Weight of Obstetric Patients								
Age in Years:	15-	20-	25-	30-	35-	40-45	Total	
Dipipanone	3	20	17	11		2	53	
Pethidine	5	26	15	4	1	2	53	
Weight in Stones:	8-	9-	10-	11-	12-	13-	14-	Total
Dipipanone	7	12	14	9	7	1	3	53
Pethidine	10	9	19	10	3	2		53

morphine, $\frac{1}{2}$ gr. (10 mg.), and atropine, 1/100 gr. (0.65 mg.), subcutaneously. After induction with thiopentone, anaesthesia was maintained with nitrous oxide and oxygen. The initial dose of dipipanone was given intravenously, the dose being graded according to the patient's age, weight, and physical condition, and varied from 2.5 to 5 mg. The concentration of dipipanone found most convenient was 2.5 mg. per ml. When an endotracheal tube was passed, 50 mg. of suxamethonium was given and gallamine triethiodide was injected later in divided doses if full muscular relaxation was required. The adequacy of the initial dose of dipipanone was judged from the respiratory rate. A rate of 10 to 12 respirations a minute was aimed at, and when this returned to 16 to 18 a minute a further dose of dipipanone was given. It must be stressed here that patients may easily receive an overdose if subsequent doses are given at fixed intervals without reference to the respiratory rate. The nature of the operations performed is shown in Table II.

TABLE II.—Operations Performed in 200 General Surgical Cases

Hernia	27	Thyroidectomy (toxic)	4
Cystoscopy	18	D + C	4
Partial gastrectomy	16	Fothergill repair	4
Vaginal hysterectomy and repair	13	Cholecystectomy	3
Tonsils and adenoids	13	Cystoscopy, vasotomy, and suprapubic prostatectomy	3
Abdominal hysterectomy and appendectomy	12	Varicose veins	2
E.U.A.	12	Orchidectomy	2
Dental roots extraction	11	Thyroidectomy (non-toxic)	2
Appendicectomy	8	Carcinoma of middle ear and block dissection of neck	1
Abdomino-perineal resection of rectum	8	Cystectomy	1
Nephrectomy	7	Laryngectomy	1
Local mastectomy	7	Minor mammary operation	1
Open reduction of fracture of femur	6	Removal of nodule of tongue	1
Pancreatotomy	6	Removal of parotid tumour	1
Laparotomy	5	Sympathectomy	1

Thoracic Surgical Cases.—Guedel and Treweek (1934) and Nosworthy (1941) established controlled respiration to provide greater safety for thoracotomy. They induced apnoea by deep anaesthesia aided by hyperventilation of the lungs. Present-day methods employ light nitrous oxide anaesthesia with a muscle relaxant to produce apnoea, thereby avoiding deep anaesthesia. However, some muscle relaxants, for instance, D-tubocurarine, are reported to produce excessive bleeding, and in cases where haemorrhage should be carefully avoided it is preferable that they should not be used. In the series of thoracic surgical cases reported, dipipanone in sufficient dosage, combined with hyperventilation, was used to produce apnoea. Following intubation under thiopentone and suxamethonium, and, if necessary, the insertion of an endobronchial blocker or tube, apnoea was induced with an intravenous injection of dipipanone aided by hyperventilation. Anaesthesia was then maintained with nitrous oxide and oxygen, with the occasional addition of 2.5 to 5 mg. of dipipanone intravenously.

Results in Obstetric Cases

In the series of obstetric cases dipipanone was found to be a perfectly satisfactory analgesic for use in labour (see Table III). Only in the occasional case was supplementation with nitrous oxide and air required in the second stage. The doses used, the times of administration, and the results obtained are given in detail in Table IV.

In many cases 25 mg. of dipipanone appeared to produce better analgesia than 100 mg. of pethidine. This was particularly so in the early stages of labour in those cases in which there was a large baby or where the foetal head had presented in the occipito-posterior position. Where adequate

TABLE III.—Obstetric Cases: Pain Relief with Dipipanone and Pethidine

	Dipipanone	Pethidine
Adequate relief	48	47
Moderate	5	5
Little or no	0	1
Total	53	53

analgesia could not be produced with dipipanone, morphine and pethidine also failed. The midwives formed the impression that dipipanone speeded up labour relative to pethidine and that relaxation between the contractions was better.

TABLE IV.—Dipipanone: Details of 53 Obstetric Cases

Case No.	Dose	Time from Administration of Dipipanone to Full Dilatation		Degree of Analgesia	Comment
		Hrs. Mins.	Hrs. Mins.		
1	25 mg.	6 45	0 25	Adequate	
2	25 "	2 0	0 30	"	
3	25 " re-peated after 6 hrs., re-peated after 4 hrs.	11 5	0 9	Moderate	Also received morphine 1/6 gr. and hyoscine 1/150 gr. Infant required 1 mg. N-allylnormorphine
4	25 mg.	8 30	0 15	Adequate	
5	25 "	11 45	0 17	"	
6	25 "	2 15	0 30	"	
7	25 "	0 25	0 15	"	Dipipanone appeared to shorten second stage of labour
8	25 "	0 15	0 13	"	
9	25 "	1 55	2 10	"	
10	25 "	3 20	0 45	"	
11	25 " re-peated after 4 hrs.	4 40	0 15	Moderate	
12	25 mg., re-peated after 3 hrs.	3 25	2 0	"	
13	25 mg.	1 15	0 20	Adequate	Dipipanone appeared to shorten second stage of labour
14	25 mg.	4 0	2 0	"	
15	25 " re-peated after 6 hrs.	6 35	0 25	"	
16	25 mg., re-peated after 3 hrs.	11 15	0 25	"	
17	25 mg.	1 30	0 30	"	Dipipanone appeared to shorten second stage of labour
18	25 " re-peated after 4 hrs.	5 0	0 30	Moderate	
19	25 mg.	11 50	0 30	Adequate	
20	25 "	1 0	0 20	"	
21	25 "	0 45	0 20	"	
22	25 "	3 30	0 35	"	
23	25 " re-peated after 6 hrs.	13 10	2 20	"	
24	25 mg.	1 20	0 35	"	
25	25 "	2 30	3 5	"	
26	25 "	3 55	1 5	"	
27	25 "	1 0	0 35	"	
28	25 " re-peated after 5 hrs.	6 0	2 30	"	
29	25 mg., re-peated after 4 hrs.	10 55	1 0	"	
30	25 mg.	3 0	0 55	"	
31	25 "	3 0	0 25	"	
32	25 "	0 30	1 15	"	
33	25 "	2 55	1 5	"	
34	25 "	4 15	0 25	"	
35	25 "	1 10	0 30	"	
36	25 " re-peated after 8 hrs.	13 15	2 45	"	
37	25 mg.	4 30	1 15	"	
38	25 "	2 10	0 50	"	
39	25 "	0 40	1 5	"	
40	25 "	1 55	1 30	"	
41	25 "	3 34	0 55	"	
42	25 " re-peated after 11 hrs., re-peated after 5 hrs.	16 55	0 45	Moderate	Also received morphine 1/6 gr., hyoscine 1/150 gr., and pethidine 100 mg. Infant required 1 mg. N-allylnormorphine
43	25 mg.	4 50	1 0	Adequate	
44	25 "	0 30	0 55	"	Dipipanone appeared to shorten second stage of labour
45	25 "	4 10	0 25	"	
46	25 "	1 5	0 35	"	
47	25 "	0 5	0 0	"	
48	25 "	1 5	1 20	"	
49	25 "	2 20	0 40	"	
50	25 "	1 20	0 45	"	
51	25 "	1 0	0 35	"	
52	25 "	21 0	2 10	"	
53	25 "	2 45	2 30	"	

Buthalitone sodium, a short-acting thiobarbiturate, was first described by Miller *et al.* (1936). Following reports by Weese and Koss (1954) on its pharmacology and clinical use, it has been marketed as "transithal," "ulbreval," "baytenal," and thialbutone. Weese and Koss report on its use in 350 cases, both alone and combined with other anaesthetic agents. Similarly, Davidson and Love (1956) describe a series of 200 cases, the majority of which had buthalitone alone as a single dose. In both series an unspecified proportion of cases were out-patients, although in Davidson and Love's they constituted the largest group. Previously Nobes (1955b) had reported that if buthalitone is used for induction only and nitrous oxide and oxygen used for maintenance "a smooth and rapid recovery can be predicted far more confidently than with other intravenous agents used in the same way." No data were given in support of this statement, and the present paper describes an investigation into this technique of using buthalitone in 150 out-patients. Two other small series of cases are also included, illustrating the use of this drug in younger children and in out-patients where intubation was required.

Operations were performed for the following conditions : septic hands, 77 cases ; other septic lesions, 25 ; removal of toenails, 13 ; manipulation of fractures, 21 ; miscellaneous, 14.

As can be seen from Table I, the majority of anaesthetics lasted between 5½ and 10 minutes; the average duration was 7.2 minutes, and the longest lasted 40 minutes.

TABLE I.—Duration of Anaesthesia

Time in Minutes	No. of Cases	Percentage of Total No. of Cases
Up to 5	55	36.66
5½ to 10	76	50.66
Over 10	19	12.66

All cases were premedicated with atropine, 1/100 gr. (0.65 mg.), half an hour before operation, as was the routine in this out-patient department. The reason for this was that there was always a possibility that the operation might prove to be a prolonged one and thus require the addition of trichlorethylene to the nitrous oxide-oxygen mixture. This is in accord with the recommendation of Ostlere (1953) that when trichlorethylene is used "atropine or hyoscine premedication should always be given." The use of atropine was continued in this series, so that in comparing it with previous methods a possible variable factor could be eliminated. Nothing was allowed by mouth for four hours before operation.

A 10% solution of buthalitone was used. After trial in a few cases with varying dosages, it was found that an induction dose of 70 mg. per stone (11 mg. per kg.) body weight was the most suitable for our purposes. With larger doses recovery was delayed in most patients, while smaller doses produced insufficient basal narcosis, often requiring undue restraint of the patients.

All patients were therefore given a single induction dose at the rate of 70 mg. (0.7 ml.) per stone (11 mg. (0.11 ml.) per kg.) body weight, and anaesthesia was continued with nitrous oxide 8 litres a minute and oxygen 2 litres a minute. The injection was given rapidly and the patients fell asleep during or a few seconds after injection. They were particularly sensitive to extraneous noise during the induction period, and sudden noises were found to disturb them and often led to a stormy anaesthesia. This confirms the findings of Ruddell (1955), who emphasizes the need for quietness during induction. There were no instances of respiratory depression with this rate of dosage.

The following times were observed: "waking-time," "sitting-time," and "standing-time." These were recorded to the nearest half-minute and were measured from the conclusion of the anaesthesia. The waking-time was that at which the patient was awake and able to answer questions. Sitting-time was that at which the patient could sit up unaided; it corresponded to the time at which he or she could be assisted into a wheel-chair for removal from the casualty theatre. The standing-time was when the patient could stand unaided and was fit enough to leave for home. Although the patients were quite fit and mentally alert at the time of leaving, they were all sent home accompanied, travelling by car or ambulance.

Results

The results are shown in Table II. Approximately 90% of patients were awake by three minutes, able to sit by four minutes, and able to stand, and therefore be ready to leave for home, within 20 minutes of the cessation of the anaesthesia.

The trial was free from any serious complications. Slight movements occurred in 17 cases (11.3%), but they did not affect the operation in any way. In another 10 cases (6.6%) the movements were more marked, but with a moderate amount of restraint there was no interference with the operation. Retching occurred in 5 cases (3.3%) and vomiting whilst recovering consciousness in 9 (6%). Cough during induction was troublesome in 6 cases (4%) and hiccup occurred in 2 (1.3%), but disappeared quickly and spontaneously without special treatment. There was no instance of laryngeal spasm or of respiratory depression.

Series B: Use of Buthalitone in Children

Buthalitone has also been given to a group of 25 children (out-patients) aged from 6 to 9 years, using the same technique as described above. For these cases a smaller level of dosage was found to be adequate, and each child was given 50 mg. (0.5 ml.) per stone (8 mg. (0.08 ml.) per kg.) body weight. Anaesthesia was continued in the same way as with the adults and the same times were observed. The duration of anaesthesia varied from 4 to 39½ minutes, the average being 9.76 minutes.

The results, shown in Table III, demonstrate that this technique can be used in children when it is possible to give an intravenous injection. The results are similar to those obtained with adults, as can be seen by a comparison of the average times of waking, sitting, and standing in Tables II and III.

TABLE II.—Results in Adults

Waking-time			Sitting-time			Standing-time		
Time in Minutes	No. of Patients	% of Patients	Time in Minutes	No. of Patients	% of Patients	Time in Minutes	No. of Patients	% of Patients
0-1	48	32	0-1	36	24	0-1	6	4
1-2	37	24.6	1-2	56	37.3	2-3	20	13.3
2-3	20	13.3	2-3	27	18	4-5	22	14.6
3-4	18	12	3-4	13	8.6	6-7	6	4
4-5	5	3.3	4-5	8	5.3	8-9	18	12
5-6	7	4.6	5-6	5	3.3	10-11	14	9.3
6-7	4	2.6	6-7	2	1.3	12-13	9	6
7-8	3	2	7-8	—	—	14-15	13	8.6
8-9	1	0.6	8-9	—	—	16-17	11	7.3
9-10	4	2.6	9-10	—	—	18-19	13	8.6
10-11	—	—	10-11	1	0.6	20-21	3	2
11-12	—	—	11-12	—	—	22-23	1	0.6
12-13	—	—	12-13	—	—	24-25	4	2.6
13-14	—	—	13-14	—	—	26-27	1	0.6
14-15	—	—	14-15	1	0.6	28-29	—	—
15-16	—	—	15-16	—	—	30-31	1	0.6
16-17	—	—	16-17	1	0.6	32-33	—	—
17-18	—	—	17-18	—	—	34-35	1	0.6
18-19	—	—	18-19	—	—	36-37	—	—
19-20	—	—	19-20	—	—	38-40	1	0.6
Average, 1.57 minutes			Average, 2.58 minutes			Average, 11.43 minutes		

TABLE III.—Results in Children Aged 6 to 9 Years

Children 6-9	Limits in Minutes	Average in Minutes
Duration of anaesthesia	4-39½	9.76
Waking-time	1-4½	1.66
Sitting-time	1-5	2.60
Standing-time	2-20	8.18

Series C: Use of Buthalitone where Intubation is Required

Dietmann (1954) was the first worker to advocate the use of buthalitone with suxamethonium chloride for endotracheal intubation, and this combination has been tried on a group of 25 out-patients who, by nature of the surgical operation proposed, required intubation. Twenty-two cases required complicated dental extractions, and the other three the suturing of lacerations of the face and mouth. Their ages ranged from 10 to 57 years. The technique used was induction with buthalitone in similar dosage to that described in series A, immediately followed by suxamethonium chloride, 50 mg., and intubation. Maintenance was with nitrous oxide 6 litres a minute, oxygen 2 litres a minute, and trichlorethylene.

The recovery times (Table IV) are prolonged when compared with those in the other series. This is presumably due to the time required for the elimination of trichlorethylene by these patients.

TABLE IV.—Results in Series C

	Limits in Minutes	Average in Minutes
Duration of anaesthesia	5-35	14.54
Waking-time	1-12	2.94
Sitting-time	1-13	4.74
Standing-time	6½-56	21.32

Discussion

In most hospitals the routine method for out-patient anaesthesia is nitrous oxide and oxygen, either alone or with trichlorethylene. When nitrous oxide and oxygen are used alone it is not always easy to anaesthetize every patient, and often undesirable restraint has to be used to enable the operation to be performed, the patient remaining in the stage of analgesia throughout. Also, if the operation is prolonged for more than two or three minutes it may be difficult to avoid cyanosis and anoxia. These difficulties can be overcome if the nitrous oxide and oxygen are supplemented with trichlorethylene, but the recovery period is then often prolonged—a characteristic feature of trichlorethylene anaesthesia.

In the out-patient department where this work was carried out these problems were particularly acute because the surgical techniques employed often demanded a longer operating-time than is usual in most out-patient departments. This meant that the full recovery times were often prolonged, with consequent increased demands for post-operative supervision and space for recovery. Therefore, for these reasons and others given below, it was decided to try buthalitone for induction, followed by nitrous oxide and oxygen, in the hope that a more satisfactory anaesthesia could be obtained for the majority of patients.

Thiopentone was not chosen initially for the inducing agent, as, generally speaking, it has not found full acceptance as a suitable routine agent for out-patient anaesthesia, in spite of its use with other types of surgery for many years. Nobes (1955a) was the first in this country to suggest buthalitone as a suitable drug for out-patient anaesthesia because of its apparent shorter duration of action than thiopentone. It was this fact that led to buthalitone being adopted as an inducing agent when a new technique was being considered. The experience gained with buthalitone has led us to reconsider the position of thiopentone in out-patient anaesthesia. We have used the latter in equipotent dosage for a number of cases, but, as yet, our experience is not sufficient to justify a definite comparison between the two drugs. We hope to report on this in a subsequent paper.

On the basis of the results from our three series, totalling 200 cases, we consider that this method of out-patient anaesthesia is a satisfactory alternative to those involving inhalation anaesthesia alone, and, in fact, has some advantages over them.

For the anaesthetist, induction is smooth and rapid, and adequate oxygenation can be maintained throughout the anaesthetic. Satisfactory operating conditions are produced for the surgeon. The speedy recovery ensures that, in a busy out-patient department, the need to provide nursing supervision and space for recovery is lessened compared with that often required by more orthodox inhalation techniques when the operating-time is prolonged.

For the patient, induction is rapid and pleasant, and is usually preferred to methods involving the use of a mask. Recovery is also rapid, and the most striking feature is absence of post-anaesthetic drowsiness and confusion. This latter has been confirmed by spontaneous remarks from patients who have experienced other methods and from the casualty nursing staff, who report that there is less post-anaesthetic nausea and confusion after this method than when nitrous oxide and oxygen combined with trichlorethylene or thiopentone have been used.

Summary

A short review of buthalitone sodium and its use in out-patient anaesthesia is given.

Three series of cases totalling 200 are reviewed and a method of using it combined with nitrous oxide and oxygen is described. The view is put forward that this technique is a suitable method of anaesthesia for use in out-patient departments.

Reasons for suggesting that this technique has some advantages over inhalational methods of anaesthesia, especially when surgery is prolonged, are given.

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REFERENCES

- Davidson, J., and Love, W. J. (1956). *Brit. J. Anaesth.*, 28, 377.
Dietmann, K. (1954). *Chirurg.*, 25, 185.
Miller, E., Munch, J. C., Crossley, F. S., and Hartung, W. H. (1936). *J. Amer. chem. Soc.*, 58, 1090.
Nobes, P. (1955a). *Lancet*, 1, 797.
— (1955b). *Ibid.*, 2, 1296.
Ostlere, G. (1953). *Trichlorethylene Anaesthesia*, 1st ed., p. 35. Livingstone, Edinburgh.
Ruddell, J. S. (1955). *Lancet*, 2, 1138.
Weese, H., and Koss, F. H. (1954). *Dtsch. med. Wschr.*, 79, 601.

MITRAL VALVOTOMY DURING PREGNANCY

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Rheumatic valvular lesions constitute over 90% of all cases of organic heart disease complicating pregnancy (Hamilton, 1954). Predominant or pure mitral stenosis is by far the most common individual lesion. Pulmonary oedema resulting from mitral stenosis is the most important cardiac cause of death in pregnancy (Jones, 1951). It appeared to us that mitral valvotomy might diminish mortality from mitral stenosis complicated by pregnancy. Several reports of valvotomy performed during pregnancy have appeared (Brock, 1952; Cooley and Chapman, 1952; Logan and Turner, 1952; Mulcahy, 1954; Watt *et al.*, 1954; O'Connell and Mulcahy, 1955; Glover *et al.*, 1955; Bailey and Bolton, 1956). However, the published experience of each of these authors is limited.

Since 1950, 404 patients under the care of one of us (J. F. P.) have had mitral valvotomy; 274 were women of child-bearing age, and 18 of these had the operation performed during pregnancy. Our experience with these cases is summarized below.

Clinical Features

The clinical features are summarized in Table I. The majority of the patients had been supervised during their pregnancy at an antenatal clinic, but despite careful medical management had undergone rapid deterioration at various times between the 6th and 36th weeks of gestation.

The 12 multigravidae had suffered from dyspnoea requiring prolonged bed rest during one or more previous pregnancies. Only one of the primigravidae had significant disability before the onset of pregnancy, but dyspnoea was noted in each toward the end of the second month and increased rapidly in severity.

In each case the physical signs at the time of presentation indicated a diagnosis of pure mitral stenosis with severe pulmonary congestion or actual pulmonary oedema. The rhythm was regular; the first sound at the mitral area was slapping in quality and there was a rumbling mitral diastolic murmur with pre-systolic accentuation; an opening snap was usually heard; the pulmonary second sound was

moderately or greatly accentuated. In no instance was there clinical evidence of aortic valve disease or of mitral incompetence. Crepitations were audible over the lung bases, and in a few cases pleural transudates were detectable.

Electrocardiograms showed unequivocal evidence of mild to gross right ventricular hypertrophy in six cases; there was no evidence of left ventricular hypertrophy in any record. Chest radiograms showed moderate to gross increase in hilar vascularity and increased vascular markings throughout the lung fields, and in a few cases pericardial and pleural effusions were noted.

In several instances fluoroscopy was not performed, since these patients were operated on when still in pulmonary oedema a few hours or days after admission; in the remainder the appearances were characteristic of pure mitral stenosis with gross pulmonary congestion.

The occasional necessity for emergency operation is illustrated by Case 1 (previously reported—Pantridge *et al.*, 1953).

A woman aged 34 noted rapidly increasing dyspnoea on exertion since the onset of pregnancy. On admission on December 4, 1952, during the 34th week of pregnancy, she was in *extremis*, with acute dyspnoea, cyanosis, and tachycardia. She had the signs of pure mitral stenosis. Crepitations were audible over both lungs and there was an extensive left-sided pleural effusion. Despite rigorous medical measures, deterioration continued. Operation was undertaken in the upright position. The lungs were sodden, pleural and pericardial effusions were present, and the mitral valve orifice would not admit a finger-tip. Both commissures were easily split with the finger and there was immediately a striking improvement in the patient's condition. Her baby was born two days later and survived. Convalescence was uneventful and she is now well.

In patients whose condition on admission was less critical, operation was not immediately undertaken; they were treated with complete bed rest, rigid salt restriction, and mercurial diuretics.

Cardiac catheterization was performed in two cases after an initial period of rigorous medical treatment (Table II). In view of the persistent marked increase in "pulmonary capillary-venous pressure" despite medical treatment, operation was considered mandatory. In the remaining patients in this group, persistence or recurrence of pulmonary congestion after periods of one to four weeks indicated the necessity for operative treatment.

TABLE II.—Mean Pressures in mm. Hg. with Reference to the Sternal Angle

Case No.	Main Pulmonary Artery	Pulmonary "Capillary" (Resting)
8	45	29
13	39	29

Results of Mitral Valvotomy

Standard techniques were employed. The findings at operation and the effectiveness of the procedure are shown in Table I.

Valvotomy was undertaken at various times between the 12th and 36th weeks of pregnancy. In Cases 1 and 3 premature infants were born two days after operation and one of these failed to survive. Two patients recently submitted to operation (Cases 17 and 18) were still pregnant at the time of writing; the remainder continued without incident to term, and with one exception (Case 16) were fit for normal household duties and free from dyspnoea on ordinary activity.

The women invariably noted symptomatic relief within 24 hours of operation. Significant post-operative complications were few and had no relationship to the pregnancy; one patient had a small pneumothorax, a second had localized surgical emphysema, and two others developed atrial fibrillation which proved refractory to quinidine therapy.

Following mitral valvotomy it became evident that one patient (Case 16) had an associated tricuspid valve lesion. Cardiac catheterization demonstrated an end diastolic gradient of 10 mm. Hg across the tricuspid valve. This patient was awaiting tricuspid valvotomy.

Three patients have undergone subsequent pregnancies. One of these (Case 7), the only patient in whom valvotomy was not technically satisfactory, required prolonged bed rest. The others (Cases 5 and 8) had uneventful pregnancies.

Discussion

During pregnancy increased demands are made on the cardiovascular system owing to salt and water retention, rise in blood volume, and increased cardiac output. In healthy women these changes are readily tolerated. Patients with severe mitral stenosis can, however, maintain the

TABLE I

Case No.	Age	No. of Pregnancy	State of Pregnancy at Operation (Weeks)	Clinical Features	Size of Valve	Valvotomy	Present Condition
1	34	2	34	Pulmonary oedema, pleural effusions. Appeared moribund	Less than finger-tip	Good split—both commissures	Unlimited activity
2	27	1	20	Pulmonary oedema	Finger-tip	" " lateral commissure	Fit for normal housework
3	30	1	32	" "	Less than finger-tip	" " "	Fit for all housework
4	34	2	26	Pulmonary oedema, repeated haemoptysis	Finger-tip	" " "	" " "
5	25	1	16	Pulmonary oedema	Easily admitted finger-tip	" " "	" " "
6	32	1	16	Pulmonary congestion and orthopnoea	Finger-tip	" " "	" " "
7	27	1	18	Pulmonary oedema. Recent haemoptysis	Easily admitted finger-tip	Fair split—medial commissure only	Fit for most housework
8	25	2	28	Pulmonary congestion and orthopnoea	Less than finger-tip	Good split—both commissures	Unlimited activity
9	25	1	20	Pulmonary oedema, repeated haemoptysis	" " "	Good split—medial commissure (knife)	" "
10	33	3	36	Pulmonary congestion and orthopnoea	Finger-tip	Good split—lateral commissure	" "
11	30	3	18	Pulmonary oedema, pleural effusions	Less than finger-tip	" " "	Fit for all housework
12	34	3	12	Pulmonary congestion and orthopnoea	" " "	" " "	Unlimited activity
13	25	2	24	Pulmonary oedema, haemoptysis	Admitted forefinger	" " "	" "
14	26	4	18	Pulmonary congestion, orthopnoea	" "	" " —both commissures	" "
15	33	4	22	Pulmonary congestion, orthopnoea, haemoptysis	Less than finger-tip	" " "	" "
16	36	3	22	Pulmonary congestion, orthopnoea	Admitted distal phalanx	" " lateral commissure	Awaiting tricuspid valvotomy. Pregnant. No dyspnoea
17	31	4	20	Pulmonary oedema	Less than finger-tip	Good split—both commissures	" "
18	27	4	20	Pulmonary congestion, orthopnoea, haemoptysis	Admitted forefinger	" " medial commissure	" "

altered circulatory state only at the expense of a considerable rise in left atrial and subsequently pulmonary capillary-venous pressure. Hence, pulmonary oedema during pregnancy is a not uncommon event. As previously noted, Morgan Jones (1951) found pulmonary oedema to be the most important cardiac cause of death in pregnancy.

In four of our cases (Nos. 13, 14, 16, and 18) the stenosis was only moderate, the valve orifice admitting the index finger to the proximal interphalangeal joint. Nevertheless, these women presented with pulmonary congestion or oedema which persisted or recurred despite treatment with salt-free diets, complete bed rest, and mercurial diuretics. In one of the patients in whom cardiac catheterization was performed the resting pulmonary "capillary" pressure was still 29 mm. Hg after two weeks' such treatment. It is clear that moderate stenosis in the presence of the raised cardiac output and hypervolaemia of pregnancy can produce the same effects as tight stenosis in the non-pregnant patients, and that pre-operative assessment of the size of the valve orifice in many cases is a matter of great difficulty.

Opinions are still divided concerning the indications for mitral valvotomy in pregnancy. Burwell and Metcalfe (1954) state that surgery of the mitral valve should be avoided if at all possible and that the operation should be carried out only when "the safer procedure of interruption is not practicable." It is their opinion that most women who undergo valvotomy during pregnancy "would probably do well without an operation if the medical supervision was adequate" and that the operation is more hazardous during pregnancy.

It is true that pulmonary congestion and mild pulmonary oedema occurring in pregnant women with mitral stenosis are often easily controlled by medical means. However, in the cases reported here several of the patients were admitted in *extremis* and remained so despite therapy. The others showed pulmonary congestion or oedema uncontrolled by a fair trial of medical measures. It is apparent that patients in this state demand valvotomy. This is particularly so since the experience recorded here indicates that the operative risk is no greater during pregnancy than in the non-pregnant state.

In two patients (Cases 1 and 3) the operation was apparently the cause of premature labour at the 34th and 32nd weeks; one of these infants failed to survive. The remaining pregnancies, however, continued without incident. Since valvotomy was undertaken at the 18th week or later in all but three cases, it might be held that the incidence of post-operative abortion would be higher for operations performed earlier in pregnancy. However, all seven cases reported by Watt *et al.* (1954) had their operations between the second and fifth months of pregnancy; in none of these was there "any hint of threatened abortion." Several authors (Glover *et al.*, 1955; Bailey and Bolton, 1956) recommend that when surgery is likely to be required it should be undertaken as early as possible in pregnancy.

Summary

Mitral stenosis is an important cause of morbidity and mortality during pregnancy. The principal hazard is pulmonary oedema, which may develop with dramatic suddenness. Moderate mitral stenosis during pregnancy may produce the same effects as tight stenosis in the non-pregnant patient.

In the past six years 18 patients have undergone mitral valvotomy during pregnancy. The indications for the operation and the results are reported. The operation was undertaken in some as an emergency and in the remainder after a fair trial of medical treatment. There was no maternal death or any important post-operative complication. One foetus, born prematurely, failed to survive.

In suitably selected cases mitral valvotomy is preferable to termination of pregnancy.

We are indebted for the co-operation of Mr. T. B. Smiley, who performed valvotomy in 14 of the cases, and that of Mr. J. A. W. Bingham, who performed the operation in four cases.

REFERENCES

- Bailey, C. P., and Bolton, H. E. (1956). *N.Y. St. J. Med.*, 56, 825.
 Brock, R. C. (1952). *Proc. roy. Soc. Med.*, 45, 538.
 Burwell, C. S., and Metcalfe, J. (1954). *Mod. Con. cardiovas. Dis.*, 23, 250.
 Cooley, D. A., and Chapman, D. W. (1952). *J. Amer. med. Ass.*, 150, 1113.
 Glover, R. P., McDowell, D. E., O'Neill, T. J. E., and Janton, O. H. (1955). *Ibid.*, 158, 895.
 Hamilton, B. E. (1954). *Circulation*, 9, 922.
 Jones, A. M. (1951). *Heart Disease in Pregnancy*, p. 22. London.
 Logan, A., and Turner, R. W. D. (1952). *Lancet*, 1, 1286.
 Mulcahy, R. (1954). *J. Irish med. Ass.*, 34, 96.
 O'Connell, T. C. J., and Mulcahy, R. (1955). *British Medical Journal*, 1, 1191.
 Pantridge, J. F., Smiley, T. B., and Henry, E. W. (1953). *Ulster med. J.*, 22, 126.
 Watt, G. L., Bigelow, W. G., and Greenwood, W. F. (1954). *Amer. J. Obstet. Gynec.*, 67, 275.

NYDRANE IN THE TREATMENT OF EPILEPSY

BY

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Epilepsy is a disease which presents a continual challenge to the skill of the physician. He has waged war against this disease throughout the centuries, using whatever therapeutic weapons were at his disposal and influenced by the prejudice and state of knowledge of his era. Epileptics were subjected to treatment which embraced the whole gamut of empirical medicine. They were exorcised for devils, blistered, and bled according to the prevailing fashion.

Many remedies were tried and discarded, such as borax, amylene hydrate, zinc, chlorbutol, urethane, simulo, hydrotherapy, and serotherapy. The first measure of any importance was the introduction of bromides by Laycock just over a century ago. These drugs were applied with such enthusiasm during the ensuing years that Spratling (1904) mentions bromide acne as being the hall-mark of the epileptic.

Modern drug therapy was ushered in in 1912 by the synthesis of phenobarbitone, a drug which has established itself firmly in the treatment of epilepsy right up to the present day. Hydantoins were introduced in 1938 and proved effective in the control of grand-mal convulsions, while drugs of the oxazolidine: dione series have been in use since 1945 in the treatment of petit mal. Biochemists in different parts of the world have been intensifying their researches recently, and their efforts have brought to light several new compounds which have been shown to possess anticonvulsant activity. This modern empiricism reminds one of the biblical admonition that "many are called, but few are chosen"; nevertheless it is to the advantage of the patient that the physician should have at his disposal as many useful drugs as possible and each new drug must be studied carefully, so that its uses and limitations may be assessed.

It was with these considerations in mind that a trial was begun of a recently introduced anticonvulsant called "nydrane." It has the chemical composition of N-benzyl-β-chloropropionamide and was originally discovered in America, where it was marketed as "hibicon." Experimental studies on laboratory animals have shown that nydrane raises the electrical threshold and

will protect them against a lethal dose of pentylene-tetrazole and artificially produced convulsions. It is a benzylamide with the formula $\text{Cl-CH}_2\text{-CH}_2\text{-CO-NH-CH}_2\text{-C}_6\text{H}_5$, and as such differs considerably from the anticonvulsants in everyday use. It is supplied in the form of tablets, each tablet containing 0.5 g.

Clinical Material

The drug was administered to 11 male patients. All were in-patients of Purdysburn Hospital, a mental hospital, and, as well as having epileptic fits of varying frequency, they suffered from an associated psychosis with some confusion, retardation, and antisocial behaviour. All were subject to convulsions of grand-mal type (idiopathic epilepsy) in spite of long-continued anticonvulsant therapy. They may be regarded as a refractory group resistant to ordinary medication and a severe test for any drug. Their ages ranged from 28 to 53, and detailed reports of their past behaviour, convulsion frequency, etc., were available for several years previously. All were under continual observation. The average number of convulsions per month to which the patients were subject varied from thirty-six to one. They were receiving phenobarbitone, phenytoin sodium, and primidone in varying dosages and combinations—for example, phenobarbitone, 1½ gr. (0.1 g.) twice daily, and phenytoin sodium, 1½ gr. (0.1 g.) twice daily, or phenobarbitone, 1½ gr. (0.1 g.), and 3 primidone tablets a day.

Before the trial started each patient was given a thorough examination, which included testing the urine and a full blood and differential white-cell count. Electroencephalograph (E.E.G.) tracings were taken of five patients.

Administration.—Initially nydrane was given in a dosage of one tablet (0.5 g.) three times a day in addition to existing medication, which was continued throughout the course of the trial in all cases. After one week this was increased to five tablets a day, and thereafter the dosage was increased by one tablet weekly until all patients were receiving seven tablets (3.5 g.) daily in divided doses. This was continued for a period of five months, after which the nydrane was gradually withdrawn. During this time a close check was kept on the blood picture, which showed minor variations, but in all cases the leucocyte count and haemoglobin were approximately the same at the end of the trial as at the beginning. There was no agranulocytosis or anaemia at any time. There was no albuminuria or sign of liver damage. The only side-effect noted was a slight gastro-intestinal upset in four patients within two days of beginning treatment, but this was of short duration and did not return.

Results

In assessing results, attention was paid both to the anticonvulsant activity and to the other actions of the drug. The usual criterion on which an anticonvulsant drug is assessed is its ability to reduce or abolish convulsions, although this strictly arithmetical method does not tell the whole story. The average number of fits per month was estimated in each case for the five months preceding the trial and compared with the average number over the five months during which they received nydrane.

Average Number of Convulsions Per Month in 11 Epileptics During Five Months' Treatment with Nydrane, Compared with the Preceding Five Months

Case	Age	Average Fits per Month	
		Before Treatment	While Receiving Nydrane
1	33	36.6	19.2
2	46	4.8	5.8
3	32	11.0	9.0
4	46	8.8	5.8
5	53	1.8	3.0
6	40	6.6	5.0
7	28	6.0	2.4
8	44	2.6	3.6
9	37	2.8	0.8
10	31	10.6	7.4
11	33	4.8	3.0

The results are given in the Table. It will be seen that eight out of the eleven patients showed some improvement—that is, a reduction in fits—and this was quite considerable in one patient, who was the most severely affected in the series. Three patients had an increase in convulsions. There was no difference in the E.E.G. tracings. Four of the patients volunteered the information that they felt better during the time they were receiving the drug. Subjective assessments are justifiably suspect, but an increased alertness was also noted by nurses in charge of the patients.

Discussion

In considering the results it must be borne in mind that these patients were a highly selected group in that they were so severely disabled by epilepsy with psychosis that they required mental hospital treatment—that is, they were the most refractory type of epileptics. The number in the group was small, and for that reason it would not be profitable to apply statistical tests; nevertheless certain facts are evident, and the opinions expressed may be helpful to future users of the drug.

The most important fact which emerged from the trial was the lack of toxicity. Although the dosage was moderately high, especially when combined with other anticonvulsants, there was no evidence of depression of bone-marrow function and the white-cell count was always within normal limits. There was no evidence of liver or kidney damage. Nausea and diarrhoea were experienced by a few patients at first, but this was purely transitory and did not necessitate any adjustment in dosage.

The convulsion pattern showed, in general, a downward trend, which was considered satisfactory. One patient improved considerably and his convulsions were reduced from 36 to 19 a month. The others showed the usual fluctuation which one expects with anticonvulsants, and altogether eight were improved to some degree.

There have not been many trials carried out with nydrane, but the results given here appear to be very similar to those obtained by Hoenig *et al.* (1956) in a series of epileptics, including 19 who were in-patients of a mental hospital and apparently comparable to the patients treated here. Those workers also comment on the lack of toxicity and side-effects, although three cases developed status epilepticus during the withdrawal stage. They mention a subjective sense of well-being, which was also noted in a few patients in the present group. There appear to be two possible explanations of this—either that it is due to a direct stimulating effect of the drug on the cerebral cortex, or that it is a secondary effect following control of convulsions. The chemical formula of nydrane is certainly different from that of other anticonvulsants, but it seems unlikely that a drug which suppresses convulsions would also stimulate. It must be remembered, however, that the motor cortex is only a small part of the total brain substance, and a feeling of euphoria must be largely a summation effect. The E.E.G. did not indicate any great change in cerebral rhythms in those cases in which it was performed, but, in any case, it does not admit of sufficient refinement to be used as an index of mental activity.

Hoenig *et al.* comment on some loss of weight among their patients, with three cases of status epilepticus during the withdrawal stage, but such mishaps were entirely absent from the present series. It has been my experience that status epilepticus is provoked as often by a disturbance of homeostasis due to causes easily overlooked—for example, slight infection or constipation—as by cortical hyperexcitability due to drug imbalance.

The only minor disadvantage in the treatment was the number of tablets which the patient had to take in the day, especially when, as in this case, other drugs are given as well. The pharmaceutical chemist, however, may be able to find the answer to this.

In conclusion, then, I may state that we found nydrane a satisfactory drug to use. It was not the purpose of this trial to compare it with other anticonvulsants, but it does

appear to be synergistic or additive. We were particularly impressed by its safety and freedom from side-effects, and its action tends to counteract depression. Its judicious use should prove to be of benefit to large numbers of epileptics.

Summary

Eleven patients suffering from grand-mal epilepsy with psychosis were treated for five months with nydrane in addition to other anticonvulsants. The results were considered to be satisfactory by subjective and objective standards. Very few side-effects were observed, and in particular there was no evidence of any damage to liver or kidney or depression of haemopoietic function.

We thank the resident medical superintendent for permission to carry out the trial, and Rona Laboratories for their supply of the drug.

REFERENCES

- Hoenig, J., Crotty, I. M., and Chisholm-Batten, W. R. (1956). *J. ment. Sci.*, 102, 105.
Spratling, W. P. (1904). *Epilepsy and Its Treatment*. New York.

PARTIAL GASTRECTOMY IN VON WILLEBRAND'S DISEASE

BY

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In the haemorrhagic diseases major operations are rightly held to be contraindicated except under the most desperate circumstances. To some extent von Willebrand's (1931) disease (pseudohaemophilia, constitutional thrombopathy) is an exception, and the following case is reported to show that the hazard of operation, though unpredictable, is not as great as is commonly supposed.

Case Report

The patient, a crane-driver aged 42, was one of a family of eight children. His father, one brother, and two sisters all suffered from a tendency to bleed. As a child he had been admitted to hospital on several occasions for severe nose bleeds, and at the age of 27 he had to have a blood transfusion for haemorrhage following a tooth extraction. On other occasions teeth had been extracted without incident. He had often noticed a tendency to easy bruising and had bled for as long as three to four hours after a cut while shaving. After a blood count he usually stopped bleeding at once, but had on one occasion continued to bleed for two hours.

This irregular bleeding tendency was investigated during 1954 and 1955. The bleeding-time (Duke) was generally prolonged. On eight occasions it was between 5 and 30 minutes and on five it was normal. The clotting-time and clot retraction were invariably normal. Hess's capillary fragility test was positive on 16 occasions, sometimes quite strongly, but on five others it was completely negative. The platelet count was always normal. Prothrombin estimations by the one- and two-stage methods and the thromboplastin generation test gave normal results. The family history and the evidence of a normal clotting mechanism associated with a prolonged bleeding-time and frequently positive capillary fragility tests confirmed the diagnosis of von Willebrand's disease, in which the cause of the haemorrhagic tendency is thought to lie in an abnormality of capillary function.

Since the age of 36 the patient had often been troubled by dyspepsia and gastro-intestinal haemorrhage. This was eventually shown radiologically and gastroscopically to be due to a lesser-curve gastric ulcer which healed once under medical treatment, only to recur later. In 1953 operation was thought to be indicated so far as the ulcer was concerned, but was not undertaken on account of the risk of haemorrhage. By 1955, however, the recurrent haemorrhages and increasing pain were causing severe disability, and it was evident that more drastic measures would be needed. It was decided to take advantage of the apparent variability of the haemorrhagic tendency and to operate when the bleeding-time was normal and the capillary fragility test negative.

Accordingly on August 5 laparotomy was performed by one of us: a chronic partly healed ulcer was found on the lesser curve of the stomach and a Billroth-I partial gastrectomy was carried out. No excessive bleeding occurred during the operation, but there was some continued oozing into the stomach for 48 hours afterwards, culminating in a brisk haematemesis, for which 5 pints (2,840 ml.) of blood was transfused. A five-day course of corticotrophin (100 mg. a day) was given, beginning 24 hours after the haematemesis. Recovery was uninterrupted, but there is no clear evidence that this drug affected the issue.

Three months after the operation the patient was very well, had no dyspeptic symptoms, and had put on half a stone (3.2 kg.) in weight.

Discussion

Von Willebrand's disease has recently been the subject of two able studies. Horler (1955) stresses the variability and unpredictability of the haemorrhagic tendency. He points out that the bleeding-time varies greatly from patient to patient, and in the same patient at different times. This agrees well with the experience of our patient, whose bleeding-time was normal on three occasions but prolonged, sometimes greatly, on others. Buchanan and Leavell (1956) have extended this observation by showing that the bleeding-times may vary when estimated simultaneously in different parts of the body. In a patient of theirs the bleeding-time was 17½ minutes in one ear and 180 minutes in the other.

This variability of the haemorrhagic tendency is reflected also in the patient's reaction to surgical operations. A patient may bleed heavily at one operation and no more than normal at another. In one of Horler's cases tonsillectomy led to severe haemorrhage, but a subsequent appendicectomy was uneventful. This author's series included nine major operations in five patients. In five operations the bleeding was excessive and in four it was not. In one case the operation had to be abandoned on account of the bleeding, but there were no deaths. Buchanan and Leavell's experience was similar. Thirteen of their patients were submitted to surgery. Several bled heavily, but the haemorrhage was ultimately controlled in all cases. There were no deaths, and no operation had to be abandoned. In their review of the literature these authors show that among 199 reported cases of von Willebrand's disease 39 have undergone surgical operation (excluding the extraction of teeth), with only one death, which followed a splenectomy (Little and Ayres, 1928). Even allowing for the natural tendency for successes to be reported and failures forgotten, this is a remarkable fact, and contrasts sharply with haemophilia, in which the mortality of major operations is at least 50% (Biggs and Macfarlane, 1953).

The cause of von Willebrand's disease is unknown and there is no specific treatment. Therefore nothing can be done at operation to prevent haemorrhage apart from the most scrupulous attention to the usual surgical techniques of haemostasis. Buchanan and Leavell state that the bleeding-time is not always a reliable guide to the behaviour of the patient at operation. Yet it is the only guide of any sort which we possess, and it would seem reasonable to avoid an elective operation when the bleeding-time is greatly

prolonged. The literature contains very little information about the bleeding-time on the day of operation, and there is room for more careful recording of data concerning this point.

Summary

The case is reported of a patient with von Willebrand's disease who had a successful partial gastrectomy for gastric ulcer. The operation was performed at a time when the bleeding-time was normal. There was no excessive haemorrhage at operation, but a haematemesis on the second post-operative day responded well to blood transfusion.

The case is discussed in relation to those previously reported, and it is emphasized that, although all authors stress the hazards of operation in von Willebrand's disease, the literature contains only one record of a fatal operation. The relatively favourable prospects for surgery in von Willebrand's disease are contrasted with the extremely bad results of operations in cases of haemophilia.

It is probably desirable to take advantage of the natural fluctuation of the bleeding tendency and to perform an elective operation when the bleeding-time is not greatly prolonged.

We are grateful to Dr. T. H. Boon for permission to report this case.

REFERENCES

- Biggs, R., and Macfarlane, R. G. (1953). *Human Blood Coagulation and its Disorders*, p. 252. Oxford.
Buchanan, J. C., and Leavell, B. S. (1956). *Ann. Intern. Med.*, 44, 241.
Horler, A. R. (1955). "The Hereditary Haemorrhagic Disorders," p. 51. M.D. Thesis, Univ. Durham.
Little, W. D., and Ayres, W. W. (1928). *J. Amer. med. Ass.*, 91, 1251.
von Willebrand, E. A. (1931). *Acta med. scand.*, 76, 521.

Medical Memoranda

A Case of Acute Inversion of the Uterus

As the incidence of acute puerperal inversion of the uterus is estimated at between 1 in 17,000 and 1 in 200,000 deliveries and the extreme gravity of this condition is equalled only by its rarity, it is worth while to record this case.

CASE REPORT

A 2-gravida aged 19 was admitted to hospital at midnight on March 19, 1955, with a history of having started in labour four hours before admission. Her pregnancy had been quite uneventful and the expected date of delivery was March 22.

On examination she was found to be a healthy young woman, well established in labour. The size of the uterus was consistent with a full-term pregnancy and the foetus was presenting by the vertex. The position was left occipito-anterior, with the foetal head in mid-cavity and the cervix uteri well applied to the head and dilated to one finger-breadth. Uterine contractions recurred every four minutes and the foetal heart was satisfactory.

Labour proceeded normally until spontaneous delivery of a live male child, weighing 8 lb. 9 oz. (3.9 kg.), at 3 a.m. after a first stage of seven hours and a second stage of 20 minutes. The placenta appeared to be in the vagina 30 minutes after delivery. There had been only very slight haemorrhage up to this point. An expulsive effort on the part of the mother delivered the placenta readily. There was slight delay with the membranes, but these eventually delivered following gentle traction. Immediately after the delivery of the placenta a severe post-partum haemorrhage occurred, a total of 3 pints (1.7 litres) being lost within a few minutes. On examining the abdomen no definite fundus could be palpated, nor could one be rubbed up. Ergometrine tartrate, 0.2 mg., was immediately given intraven-

ously, and within a minute what appeared to be a fundus developed low in the abdomen.

The blood loss ceased, but the patient's condition continued to deteriorate rapidly. She was in profound shock, was restless, and complained feebly of lower abdominal pain. The pulse rate was 120 a minute and the blood pressure could not be recorded.

On further examination what appeared to be the fundus had a definite cup-shaped depression on its upper surface. A vaginal examination revealed the uterus to be inverted and lying in the vagina. At this point, six minutes from delivery, the only pulses detectable were the carotids and the apex beat. The patient was unconscious. A dextran drip was set up while blood was being cross-matched. The transfusion was run in rapidly, 1 pint (570 ml.) being given in about 15 minutes. Cross-matched blood was then available and a rapid transfusion of this was begun.

The blood pressure was 70/50 mm. Hg and the wrist pulses were detectable. Slight improvement in the general condition having occurred, it was decided to reduce the inversion. With the transfusion continuing, and under nitrous oxide and oxygen anaesthesia, reduction by taxis was accomplished without undue difficulty. After the reduction, recovery could only be described as dramatic. The blood pressure rose to 110/80 mm. Hg and the pulse rate dropped to 80. Colour, respiration, and general appearance improved rapidly.

A further 2 pints (1,140 ml.) of blood was given to replace the initial loss. The patient recovered consciousness two hours after the reduction of the inversion, "feeling fine."

The puerperium was uneventful, involution proceeding normally. Breast-feeding was readily established and the patient was discharged from hospital on the tenth post-partum day, feeling fit and well, with a haemoglobin of 10 g. per 100 ml. Further progress at home was maintained.

COMMENT

Though the majority of inversions seem to be due to some error of management on the part of the attendants, cases of spontaneous inversion have been recorded. In this case the placenta was expelled by the mother's effort, and the only factor that may have contributed to the production of inversion was traction on the foetal membranes. This was very gentle and no resistance to the delivery could be discerned. It is felt that this was probably a case of spontaneous inversion, though traction on the membranes, however gentle, cannot be excluded as a probable cause.

The importance of making a vaginal examination in a case of shock following delivery must be stressed, as an incomplete inversion of the uterus may not be diagnosed unless it is done. We were grateful to have available a plasma substitute: its effect was life-saving while blood was being obtained and matched.

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Agranulocytosis during Phenindione Therapy

Agranulocytosis is an apparently rare complication of anticoagulant treatment with phenindione (phenylindanedione, "dindevan," "indema"). MacMillan and Brown (1953) reported two Canadian cases, one being fatal; both, however, had also received other drugs. Kirkeby (1954) described a definite case from Norway. A suspected case (without blood counts) was contributed by Mayer (1954).

We estimate that some 900 patients have been treated with phenindione in this hospital: we have been unable to trace a previous case associated with agranulocytosis.

CASE REPORT

A man aged 59, editor of a periodical, was admitted on October 23, 1956, five days after a myocardial infarction and three years after a previous attack. Routine phenindione treatment was supported with heparin for the first

two days, and thereafter continued on 100-125 mg. daily in two doses, with prothrombin times (Quick) between 1.4 and 2.1 times the control readings—that is, in the range of moderate therapeutic effect.

After 27 days of treatment, during which the only additional drugs given were chloral hydrate and liquid paraffin, a fever of 102° F. (38.9° C.) was recorded. The following day the white-cell count was 3,700 per c.mm. (polymorphonuclears 3%, mononuclears 97%), compared with a count of 11,000 (polymorphonuclears 80%) on admission. The throat was injected but not sore, and there was no rash on the skin. Phenindione was withdrawn and 600,000 units of procaine penicillin injected daily. On the next day a marrow aspirate showed numerous myelocytes but no mature polymorphs; a few metamyelocytes and band polymorphs were seen in the peripheral blood.

After four days of fever the temperature dropped to around 100° F. (37.8° C.), finally settling after a further week. Mature polymorphs reappeared in the peripheral blood on the sixth febrile day.

COMMENT

It seems from the reported cases that, when agranulocytosis occurs, it is to be looked for after 20 to 30 days of phenindione treatment. In Kirkeby's case, that of a man aged 58, the complication presented with a rash during the fourth week of treatment, which was apparently continued, and agranulocytosis appeared in the fifth week. MacMillan and Brown observed fever in the fourth week, followed by agranulocytosis after some days, in one of their cases, that of a woman aged 57; and in the other case, that of a woman of 64, pyrexia, rash, and agranulocytosis appeared together in the fifth week of a course of treatment which had been interrupted during the fourth week. Mayer's patient developed a rash and fever also in the fourth week. This time interval was observed in our case.

It would probably be wise to withdraw phenindione if a rash or fever appears during treatment, particularly during the fourth week. In our case heparin was substituted.

Kirkeby's patient died in uraemia after marrow function had recovered. MacMillan and Brown's second patient died of agranulocytosis. The other, with our own, recovered.

Numerous myelocytes in the marrow aspirate, as in the present case, suggest a favourable prognosis, provided that infection can be controlled. This is in line with Plum's (1937) work on amidopyrine agranulocytosis and with Hutt's (1951) observations on the agranulocytosis of thiouracil. Plum demonstrated the sequence of events to be: a fall in granulocyte precursors in the marrow; a fall in circulating polymorphs; return of marrow precursors; and, lastly, return of circulating adult cells. Thus to find myelocytes in the marrow during the phase of granulopenia is to observe the beginning of recovery.

We are grateful to Dr. A. C. Dornhorst for permission to publish.

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REFERENCES

- Hutt, M. S. R. (1951). *St. Thom. Rep.*, 7, 98.
Kirkeby, K. (1954). *Lancet*, 2, 580.
MacMillan, R. L., and Brown, K. W. G. (1953). *Canad. med. Ass. J.*, 69, 330.
Mayer, A. C. (1954). *Lancet*, 2, 708.
Plum, P. (1937). *Agranulocytosis*. Lewis, London.

Twin Pregnancy: Well-formed Hydatidiform Mole Associated with Normal Viable Child

An African, Jalu, woman aged about 28 was admitted to the Nyanza General Hospital, Kisumu, on July 6, 1955. She was a multipara and had not been attending the hospital or other antenatal clinic. So far as could be judged, she had a menstrual period about mid-December, 1954, and was expecting her child in September. Her obstetric history was: a girl in 1945, a boy in 1947, a girl in 1951, and a boy

in 1952 (all these children are still alive and well, and there was no history of obstetrical complication either during pregnancy or on confinement); four-months abortion in March, 1954, apparently complete and uncomplicated.

The patient could only give mid-December as the nearest date of her last menstrual period. She stated that her pregnancy proceeded normally until during the first week in June, when she noticed a slight blood-stained vaginal discharge. This continued until her admission, and, although slight, was more or less continuous.

On examination the height of the fundus of the uterus corresponded to an eight-months pregnancy. The foetus was readily palpated in the R.O.A. position, but was high. The

feel of the lower segment indicated that there was an apparent soft mass in the lower left-hand quarter. The foetus seemed to be small, but the foetal heart was strong. The vaginal discharge was a bright red and appeared to be normal blood. On vaginal examination a soggy mass was felt between the examining finger and the foetal head. A tentative diagnosis was made of left-sided marginal placenta praevia, but as loss per vaginam was minimal it was decided to be conservative in treatment.

The patient was confined to bed and sedated with 10 gr. (0.65 g.) of potassium bromide thrice daily. She settled down under this treatment and the bleeding ceased. On July 26 she went into spontaneous labour, and within an hour delivered herself of a live male child weighing 4 lb. (1.8 kg.) and obviously premature. Its state of development was approximately that of a 30-weeks gestation. While waiting for pulsation to cease in the cord, a mass appeared at the perineum and a moderate-sized hydatidiform mole (see Fig.) slipped out, aided by slight pressure on the fundus. The cord was separated and a complete normal placenta and membranes were delivered five minutes later.

It is the intention to follow up the case by Aschheim-Zondek tests at regular intervals, subject to the patient's co-operation—a doubtful possibility in a peasant African. At the time of writing the mother was well and fit, and the puerperium was running a normal course. The baby, on the other hand, was very weakly, and it is doubtful if it will survive.

COMMENT

It is admitted that if the possibility of hydatidiform mole even crossed my mind it was almost immediately discarded because of the advanced stage of pregnancy. My previous experience is of one similar twin pregnancy, but the patient, an Asian, spontaneously emptied her uterus in the fifth month. Discussion with colleagues at the Nyanza General Hospital confirmed my opinion that such pregnancies were a rarity, and no one had heard of one proceeding so far. Investigation at the Medical Research Laboratory Library produced an article by Dr. Elizabeth M. Rose (1952), who had a similar case on June 13, 1949. She could trace only two such previous cases: one by Waters and Crunden (1943) and the other by Favreau and Bélanger (1939).

My thanks are due to the Honorary Director of Medical Services, Kenya, for permission to publish this case; to Mr. McVeigh, of Kisumu, for the photograph; and to Miss Allen, Librarian, M.R.L., Nairobi.

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REFERENCES

- Favreau and Bélanger (1939). *Bull. Soc. Gynec. Obstét. Paris*, 28, 179.
Rose, Elizabeth M. (1952). *British Medical Journal*, 1, 1285.
Waters, E. G., and Crunden, A. B. (1943). *Amer. J. Obstet. Gynec.*, 46, 299.



Reviews

MIGRAINE

Treatment of Migraine. By John R. Graham, M.D. (Pp. 149+vii; illustrated. 28s.) Toronto, Boston: Little, Brown and Company. London: J. and A. Churchill Ltd. 1956.

Dr. Graham is chief of medical service, Faulkner Hospital, Boston; clinical associate in medicine, Massachusetts General Hospital; attending physician, Veterans' Administration, Roxbury, Mass.; instructor in medicine, Harvard Medical School; and director of the headache clinic, Massachusetts General Hospital.

It isn't usual at the beginning of a review of a book to expend so much space on the qualifications of the author to write it. When the book deals with so important a subject as migraine it is worth the space, because of the extraordinary amount of nonsense that has been written about it by publicists with no such qualifications. You may or may not agree with Dr. Graham, but you may as well know from the beginning that you are agreeing or disagreeing with somebody worth the effort of either. The introduction, anyway, will put you in the right mood. Never has so bad a frontispiece or paltry a poem so perfectly expressed the present chaos in thought about migraine, a field in which at least six groups of specialists compete without understanding of each other. It may or may not be significant that, in his drawing, Dr. Graham puts the endocrinologist in the position of the mahout of the migraine elephant, but thereafter gives him scant notice. The introduction is superb, disposing altogether of the possibility of any such animal as the specialist in migraine. It will infuriate any who aspire to be mahouts, which is a good thing.

The theme of the book is that the treatment of the patient with migraine must be "tailor-made"—a point strongly made by our own Macdonald Critchley, to whom Dr. Graham pays tribute rarely given to British by American authors. He stresses the importance of general considerations, such as the psychological and social backgrounds of the patients, the necessity for taking the patient into one's confidence and discussing the problem in all its aspects with him, for avoiding the facile prescription of the "wonder drug" in every case. Enthusiasm in the doctor for a single line of approach, whether it be psychological, pharmacological, allergic, or endocrinological, will almost invariably produce temporary alleviation and will make more difficult the attempts of subsequent less specialized physicians, who will find themselves dealing with patients whose illusions have previously been shattered. "Complete freedom from migraine is rarely achieved by any [one] therapeutic program."

But perhaps Dr. Graham does to a certain extent fall into the trap he seeks to expose for others. His advice on the manifold ways in which ergot may be prescribed is worthy of the most careful study. No one who has read this book will prescribe ergotamine tartrate during an attack and, having failed to achieve the perfect result, will then consign ergot to the rubbish heap, as so many of us have done. But it may be thought that he pins his faith (for all his protests) a little too hopefully to this super-eminent drug. He forgets to mention carbachol. He pays almost no attention to fluid retention and the use of urea, to which Sir Walter Langdon-Brown directed our attention a generation ago. His discussion of the use of hormones is vague and superficial, and he has obviously not appreciated the frequency with which migraine in women occurs in the ovulatory and premenstrual phases of the menstrual cycle and the frequency with which such attacks can be allayed by progesterone. One gets the impression that progesterone, oestrogens, cortisone, and corticotrophin are useful in certain cases, but he apparently does not fully realize that such remedies should be used only after careful study and, if so used, can often produce the results expected of them more often than mere chance allows.

Despite these minor criticisms, this is a book which not only should be read with care by everyone from whom the sufferers from migraine habitually seek advice, but should be bought and often read again. It takes only an hour or two.

RAYMOND GREENE.

RECURRENT LARYNGEAL NERVES

The Recurrent Laryngeal Nerves in Thyroid Surgery. By William H. Rustad, M.D. Illustrations by Ralph Sweet. (Pp. 47+xiii, illustrated. 34s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1956.

This brief, well-illustrated, and beautifully printed monograph on the recurrent laryngeal nerves is a welcome addition to the subject, as it may help to reduce what was described at a recent meeting of the Section of Surgery at the Royal Society of Medicine as the "inherent risk of damage to the recurrent laryngeal nerve in thyroidectomy." The book starts off with a pleasant historical account of the recurrent nerves and their identification, and then describes how the nerves have been dissected out in 110 cadavers in the dissecting-room and the results grouped and subsequently drawn. There follows a series of partly schematic drawings, 77 in all, illustrating the eleven different groups of anatomical type that were found. These form a useful guide to those who want to know what the pattern of the nerves is likely to be if they are displayed at operation and the sort of risk to which they may be exposed. The idea of using a partly schematic type of drawing is excellent, as any additional detail would have provided no further information but only obscured the essential anatomy. There is a good bibliography, but no recent British contributions to this subject, such as those of Riddell (*Lancet*, 1956, 2, 638), Bowden (*Brit. J. Surg.*, 1955, 43, 153), or Barry (*Proc. roy. Soc. Med.*, 1955, 48, 437), are included. There will always be two schools of thought—those who wish to identify the nerves at operation, and those who feel that the nerves are only safe if not seen. Perhaps a happy middle way, such as that described by Riddell, provides the best answer for most surgeons, but it is always very comforting to see the nerve and see also that it is not damaged.

This little book will provide a useful work of reference for the thyroid surgeon, and its beautiful typography and illustrations make it a pleasure to handle.

SELWYN TAYLOR.

MENTAL HEALTH AND DISORDER

Mental Health and Mental Disorder: A Sociological Approach. Edited by Arnold M. Rose and eight others. (Pp. 626+xii; 40s.) London: Routledge and Kegan Paul Ltd. 1956.

The general physician glancing through the contents of this "sociological approach" to mental health and disorder might be forgiven if for a moment he thought he had purchased by mistake a textbook of psychiatry. The psychiatrist, however, accustomed to exploiting the services of psychiatric social workers, will have no difficulty in recognizing the book for what it is, a survey of social psychiatry overlapping on one side with clinical psychiatry and on the other with pure (non-clinical) sociology. Because of his own bias in favour of environmental factors in mental disease he may have more difficulty in recognizing that, although the social psychiatrist and his friend the statistician combine to form one of our more recent portents, the former is nevertheless faced with the same limitations that eternally confront the sociologist, in particular that the peripheral approach to mental function is likely to be peripheral in understanding. Nevertheless psychiatrists should make a point of reading this book if only as an exercise in mortifying the psychiatric flesh. The 36 papers of which it is comprised vary, it is true, in scope, quality, and comprehension, many of them being born of a sociological industry which,

in the view of most dynamic psychologists, leaves their problems precisely where the writers found them. But it contains some excellent surveys, not only of existing literature and of socio-psychiatric ideologies, but of such subjects as trends in mental disorders, schizophrenia among primitives, mental health among the Hutterites (an isolated Anabaptist religious sect), changing ideas on mental treatment, and the social psychology of mental health. Psychoanalysts will be intrigued by an essay on infant training and the personality of the child, the burden of which is that the personality adjustment and traits of children who have undergone varying training experiences do not differ significantly. On the whole and despite the varying orientation of the writers, the book can be recommended as representative of social psychiatry at its best and worst. It might well be made obligatory reading for the D.P.H., possibly also for the D.P.M.

EDWARD GLOVER.

CEREBRAL INJURIES

Das Hirntrauma. Beiträge zur Behandlung, Begutachtung und Betreuung Hirnverletzter. By Dr. Med. E. Rehwald. (Pp. 527+xii; illustrated. D.M.44.) Stuttgart: Georg Thieme Verlag. 1956.

This is a selection from papers given at the annual meetings of the Society (*Die Arbeitsgemeinschaft*) for Problems of Traumatic Brain Injury, which was founded in Germany in 1948. There is a clinical chapter on the acute and late stages of head injury, a chapter on neuropathology and on pneumo- and electro-encephalography, on forensic aspects and rehabilitation, and on the effect of traumatic brain injury in children. The majority of the contributions are short and consist of case reports; a few others give a more comprehensive picture of certain aspects of the problem. In particular, Frowein and Harrer describe the vegetative disorders and the biochemical methods of investigation. Zuelch demonstrates characteristic changes of the pneumo-encephalogram in diagrams and photographs. The E.E.G. finding and its significance is discussed by Duensing: the E.E.G. in pure concussion, when taken a week after the injury or later, was always negative; in the late stages of contusion, changes in the E.E.G. were present only in post-traumatic epilepsy or indicated complications such as abscess and encephalitis. A number of articles refer specially to the clinical symptomatology and the E.E.G. findings in lesions of the frontal and temporal lobes. Tönnis gives some case histories of traumatic brain damage in children. In his experience the defects are, contrary to the opinion widely held, essentially identical with those in adults; they are less distinct when they occur very early in childhood.

In a collection such as this a balanced presentation of the various problems of traumatic brain injury cannot be expected, nor is it surprising that the individual contributions should vary in usefulness. However, the articles are in general of good standard and of interest for psychiatrists and neurologists, although the literature referred to is almost exclusively German.

R. KLEIN.

CHILD PSYCHIATRY

Six Children. By Estelle J. Foote, M.D. (Pp. 317+ix. 42s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1956.

The title of this book leads the reader to expect a detailed study of six children. Instead one gets a review of the diagnosis and disposal of six kinds of child. These are: the quick-thinking child; the slow-thinking child; the child whose brain has been injured; the child maladjusted emotionally; the child of unusual cultural background; and the child of unusual training. The author has worked through her 3,600 personal cases with good common sense,

and in this book has tried to give a generalized statement. This statement, unfortunately, adds nothing to our knowledge, and is written in too discursive a manner for use by any significant group in this country. As an example of the author's style it might be fair to extract a couple of paragraphs:

"A symptom to be studied carefully was bedwetting. Characteristically, he had become tidy at not far from the usual age; then after some psychic trauma—some hurt to his feelings—as the threat of being displaced from first place in his parents' affection by the birth of a sibling, he started bedwetting again. I rather thought that this occurred only when the child was already more or less emotionally insecure."

"I had a theory, as far as I know held by no other psychiatrist, that a cheerful, friendly first grade teacher who likes children and shows understanding to all equally, has saved many a child from eventual psychosis, to which he would certainly have progressed had he spent his entire childhood in his own home where one or both parents covertly or openly rejected him. Who has not seen first grade children run to meet a popular first grade teacher?"

Of psychometrists she writes: "To be bossed around freely by a psychometrist is the mark of an inept and spineless psychiatrist. Why bother with the psychiatrist in the clinic at all if the psychometrist gives the diagnosis?" Nevertheless she uses intelligence tests in every case, and it would seem that the main work on each case is kept at the emotional level of the educational psychologist. One remark gave me fellow-feeling: "Occasionally she would smile normally, as when I let her listen, with my stethoscope, to her own heart beat." But this human detail does not indicate by itself a very profound understanding of psychology or case work.

D. W. WINNICOTT.

HUMAN THOUGHT

On Human Thinking. By K. W. Monsarrat. (Pp. 155. 15s.) London: Methuen and Co. Ltd. 1955.

Several members of the medical profession have been eminent philosophers—for example, John Locke, who practised medicine at Oxford; Thomas Brown (1778–1820), a Scottish metaphysician; and William James, who graduated M.D. at Harvard and became professor of philosophy there in 1872. Mr. K. W. Monsarrat has found or made time in his busy life as a surgeon to write a number of books on philosophy which have received attention, and the present book indicates that his study of the subject continues to be vivid and interesting. Space will not permit of a detailed analysis of a complex thesis. Broadly, the author first points out that there has been a general failure within and between the nations of the world to give the individual the kind of life that he desires. This probably lies deeply in our habits of thought, so full of inconsistencies and confusion. The earlier chapters of the book are devoted to a philosophical analysis of human thinking, with quotations from Locke, Berkeley, Hume, and Kant. This is still a vexed question, and many will still feel after reading these chapters that little advance has been made since Descartes wrote: "Cogito, ergo sum." Other chapters deal with beliefs and ideas concerning the self and the body, images of a world and images of the other man. Here evolution, physics, anatomy, physiology, and biochemistry are marshalled in support of a socialized philosophy. Finally, an appeal is made to experience and the histories to enable the human being to decide what organization of social relations will give him the life he desires. Many readers will disagree with Mr. Monsarrat's conclusions, especially with his references to revealed religion, but none will doubt his serious purpose in writing this book.

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THE CHANGED PICTURE

The General Medical Services Committee decided on April 30 by 24 votes to 22 to recommend to the Special Conference of Local Medical Committees that "in view of latest developments evidence should now be given to the Royal Commission and a decision on withdrawal from the Service should be deferred." On the same day the Central Consultants and Specialists Committee unanimously approved of co-operation with the Royal Commission. The Special Conference of Local Medical Committees, however, decided to defer a decision until the meeting of the Annual Conference in June. The Special Representative Meeting, a day later, on May 1, reached a similar decision in the form of the following resolution:

"(1) that in the opinion of this meeting circumstances have so changed that the position has altered since the Council issued its recommendation to the Representative Body not to give evidence to the Royal Commission; but, realizing that Divisions and the profession generally have not had an opportunity of considering the statements by the Chairman of the Royal Commission or the letter (April 26) from the Minister of Health to the Chairman of Council, this special representative meeting defers a decision on the question of giving evidence to the Royal Commission until the next meeting of the Representative Body; (2) that the decision on withdrawal of service be deferred."

What are the circumstances? After hearing of the exchange of letters between Sir Russell Brain and the Prime Minister, the Royal College of Physicians on April 12 decided to co-operate with the Royal Commission, and on the same day the Royal Commission issued a statement explaining how they intended to proceed. Dr. S. Wand, Chairman of the B.M.A. Council, had conversations with the Minister of Health, whose assurances on certain points were given in a letter dated April 26. All these facts have been recorded in recent issues of the *Supplement*, and it will not be until the Special Representative Meeting on June 12 that the policy of the B.M.A. will be finally decided. Decision will not be easy. The profession is unfortunately not united. The Royal College of Physicians was quick off the mark in advocating co-operation with the Royal Commission. In this confused situation the general practitioners, through the

G.M.S. Committee, by a narrow margin of two votes, followed suit. But the Special Conference and Representative Meeting delayed action by the resolutions referred to above. The three courses open seem to be: (1) to withdraw from service and to refuse to give evidence to the Commission; (2) to suspend plans for withdrawal but to continue to refuse to give evidence; (3) to give evidence but to hold in reserve plans for withdrawal.

There can be little doubt that many general practitioners dislike the idea of withdrawal from the N.H.S. to enforce a claim for more pay. Withdrawal has not been presented as a method of enforcing a claim for 24% increase in pay, but of securing the elementary rights of negotiation or arbitration. Many have regarded the threat to withdraw as distasteful and undignified and as equivalent to threatening to strike. To strike is to withhold certain services; but it is not proposed to do this. Our colleagues in Denmark before the war withdrew their services under an insurance scheme in order to remedy an injustice, and our colleagues in Sweden are doing the same to-day. There are also now severe conflicts between doctors in France and Belgium and those in charge of the social security schemes under which they give their services. Dental surgeons in Holland are at this moment engaged in a similar conflict. Hearing of these events last week the Council of the World Medical Association considered it was wrong to call such actions as withdrawal from service strikes, so long as doctors continued to look after their patients. Nevertheless, if a substantial number of doctors are to withdraw from a service so comprehensive as the N.H.S. the issue must in its impact be big enough to persuade them to take such an action. It will be for the R.B. in June to decide whether the present conflict demands such a method of settlement.

It is, of course, necessary to define just what the conflict is about. A claim was made for an increase of 24% for consultants and hospital staff and for general practitioners working in the Health Service. This claim was based on the recommendations of the reports of the two Spens Committees. It was not an arbitrary claim for new money. It was simply a rather belated request that a promise should be fulfilled, that a bargain should be kept. And Dr. Wand, as Chairman of the Council of the B.M.A., made it quite plain that the profession would accept a fair decision of an arbitrator in the event of disagreement. In his letter to *The Times* on April 8 he wrote: "May I say, on behalf of the Council of the British Medical Association, how warmly we concur in Lord Jowitt's plea in the House of Lords yesterday that there may be acceptance 'far more generally of the principle of

arbitration rather than resort to force, pressure, and the like to win desired ends' in the present dispute between the medical profession and the Government." The B.M.A. advertised its desire for arbitration in the national press. Now one thing is clear. The profession has not been offered arbitration. All its efforts to secure this have failed. It has been plainly stated to the profession's representatives that the Royal Commission is not an arbitrating or adjudicating body. The B.M.A.'s legal advisers state that it is "abundantly clear that the Royal Commission will not consider the essential basis of the present claim—namely, the binding promise of the Government to give effect to the Spens Reports." There can be no doubt that the Government firmly intends to nullify the Spens Reports and that it has set up a Royal Commission to do this. No one can feel happy about this, or about the exclusion of our colleagues in the public health service from consideration by the Commission.

Certainly the events set in train by the exchange of letters between Sir Russell Brain and the Prime Minister have altered circumstances, and it is possible that the Representative Meeting in June may think that the alteration justifies a reversal of decisions previously reached, especially if it accepts the view that non-cooperation with the Commission is linked with withdrawal from the Health Service. If eventually co-operation with the Commission is agreed upon it would be unwise to expect too much from this. After all, the medical profession really did believe that the promises made in the two Spens Reports of 1946 and 1948 were binding upon the Government. And it believed in these so sincerely that its doubts about the wisdom of entering the N.H.S. were considerably modified. The Spens Reports are now a dead letter so far as the Government is concerned, a Government, moreover, that has refused to negotiate or to arbitrate, and, by establishing a Royal Commission, has avoided all normal procedures of settling disputes. The Government is succeeding in imposing its will on the profession, and as the paymaster has the whip hand.

PHARMACEUTICAL RESEARCH

Few of the recently introduced drugs were discovered in Britain, and because of this there may be a suspicion that we are behindhand in pharmaceutical research. Of the more important tranquillizing drugs, reserpine, an active principle of *Rauwolfia*, was isolated in Switzerland and chlorpromazine was synthesized in France. From Germany we have received analgesic drugs like pethidine and methadone, drugs for use in schistosomiasis like miracil, and recently a

lead towards the oral treatment of diabetes. The United States must be thanked for the newer antibiotics, for cortisone and the purified forms of A.C.T.H., for the Salk vaccine for poliomyelitis, and recently for a ganglion-blocking drug that can be taken by mouth. This is not to say that there have been no British advances. Vitamin B₁₂ was isolated almost at the same time in Britain and the United States. Two important antimalarial drugs, proguanil and pyrimethamine, were introduced here, and also the trypanocide antrycide. Piperazine has been discovered as a cure for roundworms. And within the last few months "fluothane," a non-explosive anaesthetic, has been put on the market.

The money spent on research and the size of the research staffs must be greatest in the United States, where the rewards both to firms and to the individual members of their staffs are also greatest. This is in part the result of the activity of the American Medical Association, which has helped a great deal to make the public conscious of the value of the doctors' services to the nation. Because of this, and of the constant publicity given to medical discoveries in newspapers and magazines with enormous circulations, the American public takes an enthusiastic interest in clinical medicine, particularly in new methods of treatment. The channels for exploiting popular and fashionable new remedies in the U.S.A. are so extensive that the sales in a year run into millions of dollars.

Research is for many American firms the main business: their aims are to make the very large profits which the introduction of a new drug can bring. British firms rely for the greater part of their income on the sales of established remedies or well-known substances with proprietary names, and, while they hope to be successful in discovering something new, they do not in any way depend on this. It would be, perhaps, misleading to make a very sharp distinction of this sort, but it is clearly true that far more is at stake for many American firms if the research does not yield results. The certainty that successful research brings the highest profits leads American firms to offer their leaders of research much more than they would earn in a university. The salaries run from \$25,000 to \$60,000 a year. Even a young man who has recently taken his Ph.D. will earn \$6,000 to \$8,000 a year. This means that American firms attract some very able research workers: people of the same calibre in Britain would probably refuse to leave a university post because the difference in salary would not be attractive enough. In Britain the salaries paid by firms are usually not sufficient to compensate for the alleged loss in freedom

suffered on joining a commercial firm; and, when the salary is high, the Inland Revenue takes the bulk of it. Because of this biologists, who are few in number, mostly prefer to stay in university posts. The direction of pharmaceutical research is therefore placed more and more in the hands of chemists, and it may be doubted whether the chemist always knows where the opportunity lies. This being so, the question arises whether more in the way of useful as distinct from academic research could be done in the universities. This might be arranged as a collaborative effort between the department of organic chemistry and the biological departments—biochemistry, microbiology, and pharmacology. Such collaboration, however, is rare, because the head of a department has his own research plans made without reference to those of other departments. If the plans concern the fundamental aspects of his work he is right to pursue them to the exclusion of others, for they are likely to prove of greater value to the nation and to the world. But it might be worth considering whether, without interruption of their own work, the heads of the departments concerned could form a committee to organize pharmaceutical research to be carried out by workers free from other duties. Such a suggestion would no doubt arouse opposition, for many would take the view that the field was an industrial one into which university workers should not enter. Nevertheless, with the concentration of talent in the science departments of some of our universities, such a scheme might achieve great results.

MALARIA CONTROL

The name of Sir Ronald Ross, who was born on May 13, 1857, will live for ever as one of the great benefactors of mankind. Though he was himself disappointed that his discovery of the transmission of malaria by the mosquito did not have the immediate practical results he hoped for, his work, as we recorded at the time of his death in 1932, "laid the foundation on which a truly scientific prophylaxis might be built, and [he] himself did much to build it." Since his death, and particularly in recent years, few subjects have been studied more thoroughly and more fruitfully than malaria. New methods of control and better drugs for prophylaxis and treatment have been discovered, and by the application of these discoveries the disease has been wellnigh overcome in some parts of the world. Quoting data gathered by the World Health Organization, Dr. Paul Russell¹ reports that eradication is

practically complete in Barbados, Corsica, Chile, Cyprus, French Guiana, Italy, Mauritius, Puerto Rico, and the United States, while in another 15 countries the process is well under way. Yet the sober fact remains that malaria still ranks as one of the major diseases of the world, for in 1955 there were 200,000,000 cases of clinical malaria and over 2,000,000 deaths from it. The position may be summarized by saying that in well-populated and more advanced countries, if the necessary measures are adopted, the disease can be eradicated, but that in sparsely populated and underdeveloped regions only the fringe of the problem can be touched. There is much still to be done in working out the most efficient and economical way of applying these control measures, and many lessons to be learnt about the best way of maintaining control once eradication has been achieved. This is an expensive procedure and the need for it apt to be overlooked.

A recent issue of the *Bulletin of the World Health Organization*² brings together under one cover a series of papers on malaria control which were presented by international authorities at recent conferences. They give a comprehensive account of modern methods and modern trends of investigation, together with the results which have been achieved in certain countries. Emphasis throughout is on vector control, particularly by the use of the synthetic insecticides—D.D.T., gammexane, and dieldrin. The most important innovation of the last decade has been the development of residual spraying, a process which entails spraying the walls of huts and other dwellings with a suspension of one or other of these compounds so as to leave, after drying, a surface film of the insecticide. Under suitable conditions this remains active for some months (hence the term "residual"), and any susceptible mosquito which alights on the treated surface becomes contaminated and is killed by the poison. These compounds are equally effective as larvicides when scattered on the surface of or mixed with the water on which the mosquitoes lay their eggs, and thus can be used for killing the insects at every stage of their development.

Unfortunately the margin of effectiveness of residual spraying is not great, and mosquitoes, with the ebullient adaptability which characterizes most living

¹ Russell, P. F., reported in *Trop. Med. Hyg. News*, 1957, 6, 9.

² *Bull. Wld Hlth Org.*, 1956, 15, 361-862.

³ Livadas, G. A., and Thymakis, K., *ibid.*, 1956, 15, 403.

⁴ Chow, C. Y., and Soeparmo, H. T., *ibid.*, 1956, 15, 785.

⁵ Gillies, M. T., *ibid.*, 1956, 15, 451.

⁶ Bruce-Chwatt, L. J., *ibid.*, 1956, 15, 491.

⁷ Frizzi, G., and Holstein, M., *ibid.*, 1956, 15, 425.

⁸ Archibald, H. Munro, and Bruce-Chwatt, L. J., *ibid.*, 1956, 15, 775.

⁹ Houel, G., *ibid.*, 1956, 15, 767.

¹⁰ Ciuca, M., *ibid.*, 1956, 15, 725.

¹¹ Simic, C., *ibid.*, 1956, 15, 753.

creatures of a lower order (and especially those which can be classified as pests), are beginning to develop resistance to these insecticides, a circumstance which arouses some anxiety for the future. It is true that they have not yet reached the carefree level of immunity acquired in certain localities by the housefly, and that resistance to one of the insecticides does not necessarily mean resistance to all, but the danger is nevertheless there. It is causing particular concern in Greece, and G. A. Livadas and K. Thymakis³ give an account of the position in that country, while C. Y. Chow and H. T. Soeparmo⁴ report a somewhat similar state of affairs in Java.

Resistance of this kind is not the only reason why residual spraying sometimes fails to do all that is expected. Certain species of mosquito have a tendency to rest outside rather than inside man-made shelters—a characteristic which has been called *exophily*—and thus may fly into a sprayed hut, bite their victim, and fly out again without alighting on the poisoned surface. Such behaviour may be a natural or instinctive habit, but this is not always the case. *Anopheles gambiae*, the most important vector in Central Africa, acts in this way for a different reason; it is irritated by the insecticide, and, if it alights on a treated surface, quickly flies off again before it has picked up a lethal dose. Clearly it is important to know the exact habits of each vector species, not only in general terms but in each particular area, for there is considerable local variation in their behaviour, and new ways of studying mosquito ecology are now being used. It is important to be able to estimate the age of the female mosquitoes, and information on this point can be gleaned from the stage of development of the ovaries. M. T. Gillies⁵ now describes a mating-plug found in the common oviduct which persists for 12 hours after mating, and is finally absorbed within 36 hours. This provides an objective feature for recognizing one section of the nulliparous population, and, taken in conjunction with other characteristics, is of value in assessing the age composition of different mosquito catches, say before and after spraying. Again, some mosquitoes feed on domestic animals as well as on human beings, and in certain circumstances it is necessary to know the source of the blood in an engorged insect. For this purpose a delicate precipitin test devised by B. Weitz has been used, by means of which the species of the animal "donor" can usually be recognized with certainty. L. J. Bruce-Chwatt⁶ discusses the use of radioisotopes for labelling insects to be used for experimental purposes, while G. Frizzi and M. Holstein⁷ describe variations in the chromosome structure of *A. gambiae* which they believe may be related to differences in the behaviour of that versatile insect in different localities. By these and other perhaps more commonplace methods a store of useful knowledge is rapidly being accumulated.

In general, it can be said that chemoprophylaxis plays a relatively minor part in modern control schemes, and there are only scanty references to it in this *Bulletin*. H. Munro Archibald and L. J. Bruce-Chwatt⁸ successfully suppressed malaria in Nigerian schoolchildren with pyrimethamine; and in Morocco, where vector eradication is well advanced, G. Houel⁹ has obtained satisfactory results by mass treatment with widely spaced doses of chloroquine, amodiaquine, and pyrimethamine. In Rumania¹⁰ and Yugoslavia¹¹ chemoprophylaxis has been used as an adjuvant to insect control, mainly with a view to eliminating gametocyte carriers, and this indeed is the policy generally recommended. Those who had experience of the striking successes achieved by chemoprophylaxis in the second world war in circumstances where vector control was impossible may wonder if this very effective method of attacking the problem is receiving as much attention as it deserves.

It would be unrealistic to imply that there is any likelihood that research now in progress will provide a short cut to the eradication of malaria throughout the world. It is mainly designed to allow existing methods to be used with more effect. Given the necessary funds and the necessary manpower, there is no reason to doubt that world-wide eradication could in time be achieved, but this is at present economically impracticable. The first and fundamental requirement in backward countries where the disease is now rife is steady progress in education and an accompanying increase in material prosperity. Only when these have undergone a substantial improvement can it be hoped to apply with the necessary intensity and determination the methods of malaria control which are proving successful in more developed countries.

MEDICAL SERVICES IN NORWAY

Norway seems to have solved the insoluble. It has provided a comprehensive medical service for the whole population in a way that meets with the approval of everyone concerned—public, profession, and Government. Our Norwegian colleagues explained the system to the Council of the World Medical Association when it met in Oslo last week. They laid great stress on the fact that their system of organized medical care had evolved slowly, and that in this way they had escaped the manifest disadvantages of sudden revolu-

tionary changes, as had happened in Britain. Compulsory health insurance was introduced in 1911 for a small proportion of the population. Last year the final step was taken by making health insurance compulsory for the whole population. The employee contributes about half the premium (amounting to about 2% of his weekly wage), his employer a third, and the municipality where he works and the State about 10% each. Premiums are graded according to income: a student, for example, pays less than a shilling a week, and a well-to-do person about five shillings.¹ The administration of this system is spread over some 750 local insurance offices.

Norway has for some years been under a Labour Government, but the authorities there believe in making the individual patient bear some direct responsibility for the cost of illness, in order, as the Director-General of Health Services, Dr. Karl Evang, puts it, to "prevent abuse of the privileges of the system and to help out with its total cost." Accident insurance for workers in factory and forest, and for seamen, provides completely free treatment. For all but a few services the patient has to pay part of the fee—between a third and a quarter. There is complete freedom of choice of doctor, and no "lists." Any doctor can start a practice anywhere he likes. The patient has to pay for ordinary medicines (except in hospital). For what the Australians call the "life-savers" the patient has to pay about a quarter of the cost, and drugs are prescribed free of direct charge only in certain prolonged illnesses, such as diabetes, pernicious anaemia, tuberculosis, epilepsy. Nearly all the hospitals are owned by the State and the municipality; there are few private hospitals. Under the compulsory health insurance scheme hospital treatment is free for all who need it. Admission is usually on the advice of the general practitioner, though patients have the right to go direct. If a practitioner sends a patient to hospital "for immediate treatment" the hospital has to admit him however overcrowded it is. The hospital staff is employed on a whole-time basis, and senior physicians and surgeons are allowed a certain amount of private practice. If a patient goes to a private hospital all he has to pay is the difference in the cost between it and the public hospital.

There appears to be a remarkably happy relationship between the medical profession and the administration of the insurance scheme. The Norwegian doctor is a highly respected person in Norwegian society, and enjoys on the whole a better income than other professional men. There is, if anything, a shortage of doctors, and the number of new students admitted each year to the university is limited.

Norway has managed to combine compulsory health insurance with maximum freedom for the doctor to pursue his own career in a system which brings out a maximum sense of responsibility in both physician and patient. There seems to be peculiarly little abuse of the method of paying the general practitioner by fee for

item of service, and an efficient machinery for dealing with the abuse when it occurs. We have much to learn from our northern forebears.

TREATMENT OF LIVER CANCER

Cancer of the liver, whether primary or secondary, is such a depressing therapeutic problem that any measure, even with possible toxic side-effects, must be carefully considered. Recently Theodore Gillman and his colleagues from Durban have reported preliminary results with alloxan in the treatment of primary liver cancer.¹ This substance was originally observed to cause degeneration in the cells of the islets of Langerhans of the pancreas in laboratory animals² and has proved useful for the experimental production of diabetes. The effect on liver cancer might be linked with the diabetogenic one, and D. A. Salzberg and A. C. Griffin have shown that alloxan diabetes in rats prevents the induction of hepatomas by feeding them with azo dyes.³ However, Gillman and his co-workers⁴ now believe that alloxan may perhaps have an anticarcinogenic action by exerting a widespread effect, intracellularly, on carbohydrate metabolism in all cells and especially on tumour cells, which are believed to be more dependent on glycolysis; hepatocellular carcinomas might be expected to be specially sensitive to interference with their carbohydrate metabolism. Eight patients with primary liver cancer have been treated. In two pain disappeared and in four the grossly enlarged liver diminished in size. Maintained hyperglycaemia was noted in only one. One patient developed anuria for four days, a complication that emphasizes the known nephrotoxic effects of alloxan. The drug should not be given to patients with renal damage. Histological study of two cases showed extensive necrosis of the tumour and in one sclerosis was also present. In one case the kidney and pancreas were not damaged. Results of further experience with this drug will be awaited with interest.

A recent paper by Irving M. Ariel, of New York, reviews the other methods available for the treatment of primary and metastatic cancer of the liver.⁵ Radiologists have been chary of administering radiation to patients with liver tumours, believing that the organ is particularly sensitive to its effects. This does not prove to be the case, provided the liver damage is not gross and the beam can be localized on a tumour. Ten patients with primary hepatoma were treated and five responded well, the liver decreasing in size and the mean duration of life after treatment being 3½ years. The five who did not respond lived only a mean of five months after treatment. The ten patients with metastatic carcinoma did not respond to radiation and were all dead within six months. Nitrogen mustard introduced via a polyethylene cannula into the aorta at the level of the coeliac axis might be expected to arrive in high concen-

¹ Gillman, T., Hathorn, M., and Lamont, N. McE., *Lancet*, 1957, 1, 80.
² Dunn, J. S., Sheehan, H. L., and McLetchie, N. G. B., *ibid.*, 1943, 1, 484.
³ Salzberg, D. A., and Griffin, A. C., *Cancer Res.*, 1952, 12, 294.
⁴ Gillman, T., Hathorn, M., and Lamont, N. McE., *Lancet*, 1957, 1, 687.
⁵ Ariel, I. M., *Surgery*, 1956, 39, 70.

tration in the tumour, which is supplied by the hepatic artery. However, fourteen patients with metastatic carcinoma treated thus showed little benefit, the mean duration of life after treatment being only five months. Surgical removal of malignant tumours is usually doomed to failure, though partial hepatectomy is a technically feasible procedure in skilled hands. But the growths are usually multiple and post-operative recurrence is usual.

INCIDENCE OF GLANDULAR FEVER

The true incidence of glandular fever is difficult to assess, for it is not notifiable and there must be many cases in which the diagnosis is never confirmed. Some idea of the prevalence of the disease in England and Wales in 1955 is given by K. W. Newell¹ in a recent analysis. The information was provided voluntarily by pathologists in hospital and public-health laboratories, but it is not claimed that all known cases were reported. Rather more than half the 1,861 cases were in people aged 15 to 24, while the remainder were almost equally divided between those under 15 or over 24 years. But the rates per 100,000 show that young people between 15 and 24 were much the most susceptible. Many of these were nurses or members of the defence services—occupations associated with communal living. It might be expected that most infections would arise in people who had recently joined these groups, but statistical analysis showed that this was probably not so. Male doctors provided only 7 cases, but their occupation carried an attack rate of 59.8 per 100,000, this figure being surpassed only by nurses and midwives. By contrast the risk to workers in wood, metal, or transport industries was only 2.6 per 100,000. These figures, as Newell points out, may reflect only the accessibility of diagnostic services. The reported incidence of the disease in the south of the country (6 per 100,000) was three times as great as in the north. Cases were spread fairly evenly through the year, but there was a slight increase in summer and autumn in persons over 15. None of the cases in this report occurred in outbreaks.

It is pleasing to find that the diagnosis was based on clinical and haematological evidence in 92 cases only; in all the others it was confirmed serologically. The original serological test for glandular fever described by Paul and Bunnell depends on the presence in the patient's serum of antibodies which agglutinate sheep red cells. This test has its limitations, for the antibodies are not specific. They are present in low titre in most normal persons; they rise in a variety of infections, and in serum sickness may be present in a titre as high as in glandular fever. Final confirmation of the diagnosis requires the differential test,² which shows that the antibodies associated with glandular fever remain after the serum has been absorbed with guinea-pig kidney, while they are almost completely removed by absorption with ox red cells. A simplification of this test has recently

been described by A. I. Messer.³ Before the development of the differential test there was confusion about what constituted glandular fever and whether the epidemic and sporadic cases were one and the same disease. Further use of it may help to solve this problem, but the final solution awaits the isolation of the causative agent.

SIGNALS FROM THE GUT

There is now little novel in the idea of a meteorologist setting free balloons which transmit back to him information about the temperature and pressure in the upper atmosphere. Thanks to the ingenuity of workers at the Rockefeller Institute it is now possible to set free into the alimentary tract a similar transmitter on a smaller scale which will signal the pressures it encounters to a wireless receiver close to the subject. The device, referred to as a "radio pill," is contained in a plastic capsule 2.8 cm. long and 1 cm. in diameter. Variations in pressure cause a change in the frequency of transmission of a small transistor oscillator, the signal from which is picked up, amplified, and recorded by the receiving set. The device can be traced by fluoroscopy and possibly held or manipulated by a magnet after the manner described by A. H. James.¹

Although a comparison is sometimes made between the value of measurements of arterial blood pressure and the potential value of measurements of pressure in the alimentary tract, there is a fundamental difference between the two. In large arteries the bore is relatively fixed in most circumstances, whereas in the alimentary tube the bore may change by a factor of ten—indeed, the transferring function of the gut depends upon such active changes. Equal pressures, therefore, do not signify equal tensions in the wall of the gut, since the tension in the circumference of a cylinder varies with the radius of the cylinder, a fact that can easily be appreciated by examining a balloon at its point of maximal circumference and at its neck. Since the sensation of pain arising from the gut and the initiation of peristalsis probably depends upon tension, the fact that tension in the wall and pressure within the gut cannot with certainty be equated renders difficult the interpretation of records of pressures within the alimentary tract. Nevertheless changes of pressure recorded by the "radio pill" will at least indicate activity at the site of the instrument. In the study of the physiology of the intact animal such a miniature transmitter which can be modified to signal other variables will certainly have its uses. In fact H. S. Wolff² has already described a similar telemetering device on a larger scale.

The next session of the General Medical Council will open on Tuesday, May 28, at 2.15 p.m., when the President, Sir David Campbell, will take the chair and will deliver an address.

¹ James, A. H., *Lancet*, 1951, 1, 209.
² Wolff, H. S., *Proc. Nutr. Soc.*, 1955, 15, 77.

¹ Evang, Karl, *Health Services in Norway*. Published by Norwegian Joint Committee on International Social Policy.

¹ Newell, K. W., *J. clin. Path.*, 1957, 10, 20.
² Davidsohn, I., *Amer. J. clin. Path., tech. suppl.*, 1938, 2, 56.
³ Messer, A. I., *J. clin. Path.*, 1957, 10, 23.

THE RESEARCH REGISTER OF THE COLLEGE OF GENERAL PRACTITIONERS

BY

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The Research Committee of the Foundation Council of the College of General Practitioners was formed on January 21, 1953. The Steering Committee before then had been aware that some doctors in general practice realized the value of the clinical material in their hands, but the number of potential research workers and the range of their interests were unknown. One of the first decisions of the research committee, therefore, was to open a College Research Register to members and associates who were interested in the conduct of research in their practices. This was done by an invitation published in both the *British Medical Journal* (1953) and the *Lancet* (1953) inviting members and associates to join the register, specifying their particular research interests.

The first object of the register was therefore to locate and record those general practitioners who had an interest in research. A second was to bring about collaboration between doctors who might live miles apart, so that they could work together on some subject in which they had a common interest. This type of group research can be done by private arrangement, but it can be arranged more easily if a central organization exists. The Morbidity Survey (which was jointly organized by the College and General Register Office) and the Group Investigation of Acute Chest Infections were examples of this procedure. These studies were made possible by recruiting those who had expressed an interest in the subjects concerned.

A rough-and-ready form had been designed on which the applicants were asked to record basic details of their practices as well as their interests, and an analysis of the interests of the earliest members to join the register was published in the first Research Newsletter (*Practitioner*, 1953). Subsequent entrants to the register were asked to complete a practice classification sheet, which was enlarged and improved as time went on. On January 1, 1957, there were over 500 names on the research register, and classification sheets have been completed by the large majority. Analysis of these records is interesting and provides useful information showing the extent to which the register has developed, the range of interests, and the practice details of the doctors concerned.

Doctors' Interests

An examination was first made of the interests of the members on the register. These results, of course, do not remain static, and the Registrar is continually receiving additions to those originally recorded by doctors. These findings therefore refer to those interests recorded at a given time. A very wide variety exists, including those subsumed under broad groupings, such as obstetrics and paediatrics, and more specific conditions such as lead-poisoning and tetanus. Furthermore, interests are not confined to clinical

subjects; the administration of general practice has its adherents, while others are interested in subjects as diverse as clergy and doctors, medical photography, and the medical aspects of sailing. It is difficult to classify such an assortment of interests. This problem has been discussed by Bevan (1948), who adopted a twofold system of classification for the analysis of contributions to "Any Questions?" in the *British Medical Journal*. One group was made up of specific diseases, and the other of subjects belonging to the field of medical science generally.

It seemed that interests specified in the register fell more naturally into three groups: (1) disease groups, specialties and allied subjects; (2) clinical entities and symptoms; and (3) miscellaneous topics. Other methods of classification could be adopted, but this one was considered satisfactory for our purpose, which was to show their range and relative popularity.

The results of such an analysis are shown in Table I, which lists the interests in order of frequency within each group. Where a doctor entered more than one interest,

TABLE I.—Doctors' Interests

Group 1		Group 2	
Paediatrics	90	Measles	114
Obstetrics	74	Asthma	55
Respiratory diseases	74	Hypertension	11
Psychiatry	51	Backache	7
Cardiovascular diseases	48	Fibrositis	6
General medicine	37	Glandular fever	2
Skin diseases	30	Otitis media	2
E.N.T. conditions	25	Appendicitis	1
Allergic diseases	22	Injuries	1
Geriatrics	18	Lead-poisoning	1
Gynaecology	12	Mental defect	1
Rheumatic diseases	12	Chilblains	1
Neurology	11	Tetanus	1
Anaesthesia	11	Congenital pyloric stenosis	1
Virus diseases	10	Diverticulitis	1
Alimentary diseases	9	Peptic ulcer	1
Surgery	9	Pink disease	1
Metabolic diseases	4	Poliomyelitis	1
Orthopaedics	4	Pulmonary tuberculosis	1
Malignant diseases	3	Raynaud's phenomenon	1
Occupational diseases	3	Menopause	1
Fevers	3	Fluorosis	1
Animal diseases	2	Symptoms	3
Renal diseases	2		
Stress diseases	2		
Dental conditions	1		
Streptococcal infections	1		
Endocrinology	1		
Tropical diseases	1		
Diseases peculiar to general practice	1		
Minor medical conditions	1		
		Group 3	69
Epidemiology	40	Therapeutic trials	57
Pharmacology	22	Statistics (including morbidity survey)	9
Genetics	16	Organization of practice	6
Pathology	8	Appointment systems	6
Haematology	6	Photography	5
Preventive and social medicine	4	Education of patient	5
Forensic medicine	3	Metecology and medicine	4
Industrial medicine	3	Administration	4
Biochemistry	3	Group practice	3
Parasitology	1	History of medicine	3
Dietetics	1	Vitamins	2
Anatomy	1	Home care	2
		Records	2
		Penicillin	2
		Economics of practice	1
		Clergy and doctors	1
		Equipment	1
		Research analysis	1
		Sailing, medical problems of	1
		Special schools	1
		Manipulation	1
		Somatotyping	1

each has been included. As was to be expected, the first group contains the bulk of the interests specified. Measles and asthma are both outstanding, although the figures are artificially inflated because the College had been conducting a survey on measles (Research Newsletter, 1956) and a long-term study of asthma is still in progress. The relatively large number of doctors who are interested in statistics, morbidity surveys, and therapeutic trials denotes a useful potential research weapon.

Distribution of Members According to Type of Practice

By recourse to the classification sheets, members on the register have also been grouped according to the type of area in which they are practising and to the organization of their practices. These results are given in Table II, and correspond with figures given in a report of the Ministry of

TABLE II.—Distribution by Type of Area and Number of Practitioners

No. of Practitioners	Urban	Rural	Mixed	Total
Single-handed, no assistant	79	17	23	119
2 partners with "	9	4	7	20
3 " " "	71	23	41	135
4 " " "	29	12	37	78
5 " " "	14	11	7	32
6 " " "	9	1	9	19
7 " " "	—	—	4	4
8 " " "	1	—	3	4
Total	212	69	131	412

Health (1955). The division into urban, rural, and mixed areas, however, is not strictly comparable, since the classification used by the Ministry was based on a "mileage" scheme, whereas our system is based on the interpretation of the doctor.

Knowledge of the type of practice has two uses. Firstly it makes it possible for one research worker to compare his findings with a colleague in a similar type of practice. Hopkins (1956), for example, was able to compare some of his findings with those given by Logan (1953) for similar urban types of practice. The value of being able to check and compare statistical data is obvious. Secondly, by careful selection of various practices—urban, rural, and mixed—it is possible to have under survey a sample of the population representative of the country as a whole.

One-third of the members on the register are in single-handed practice, with or without assistants, and a further third are in partnership with one other doctor. Almost one-fifth are in partnership with two other doctors. The proportion of members who are single-handed is much greater among those practising in urban areas than for those in the other two types of area. The distribution of members geographically and by type of area is given in Table III, taking a standard region as a unit of area in which they are practising.

TABLE III.—Distribution by Type of Area and Standard Regions

Standard Regions	Urban	Rural	Mixed	Total
Ireland	6	6	6	18
Scotland	6	6	7	21
Wales	9	5	2	9
England:				
Northern	7	2	7	16
E. and W. Riding	36	5	10	51
North-Western	19	4	14	37
North Midland	9	9	6	24
Midland	17	2	12	31
Eastern	9	5	12	26
London and South-Eastern	79	8	20	107
Southern	7	13	18	38
South-Western	10	7	17	34
Total	212	69	131	412

Size of Doctors' Lists

The number of N.H.S. patients on each practice list, and in the case of partnerships the estimated number of patients

TABLE IV.—N.H.S. Patients per Doctor by Standard Region and Type of Area

Standard Regions	Urban			Rural			Mixed			Total		
	No. of Doctors	No. of Patients	Patients/Doctor	No. of Doctors	No. of Patients	Patients/Doctor	No. of Doctors	No. of Patients	Patients/Doctor	No. of Doctors	No. of Patients	Patients/Doctor
Ireland	5	6,150	1,230	6	13,675	2,279	7	19,270	2,753	18	39,095	2,172
Scotland	18	44,906	2,495	5	8,786	1,757	13	28,315	2,178	36	82,007	2,278
Wales	11	25,064	2,279	8	18,250	2,281	2	4,700	2,350	21	48,014	2,286
England:												
Northern	17	46,550	2,738	5	12,641	2,528	15	33,100	2,207	37	92,291	2,494
E. and W. Riding	63	149,099	2,367	11	22,800	2,073	30	73,104	2,437	104	245,003	2,356
North-Western	35	84,856	2,425	6	10,258	1,710	28	65,108	2,325	69	160,222	2,322
North Midland	24	61,600	2,567	16	36,878	2,305	18	34,739	1,930	58	133,217	2,297
Midland	38	102,771	2,705	6	12,100	2,017	30	74,306	2,477	74	189,177	2,556
Eastern	18	48,778	2,710	9	22,600	2,511	32	69,514	2,172	59	140,892	2,388
London and South-Eastern	124	294,699	2,377	16	30,831	1,927	61	131,886	2,162	201	457,416	2,276
Southern	14	31,267	2,233	31	66,163	2,134	56	127,655	2,280	101	225,085	2,229
South-Western	13	31,149	2,396	24	46,110	1,921	40	79,204	1,980	77	156,463	2,032
Total	380	926,889	2,439	143	301,092	2,106	332	740,901	2,232	855	1,968,882	2,303

for whom the member himself was responsible, were also recorded on the classification sheet. Members' own lists varied in size from fewer than 500 patients to over 3,500. These figures are valuable in the planning stages of research work, since it is essential to be able to draw upon an adequate sample representative of the population. If it is assumed, for example, that there are five epileptics to every 1,000 of the population, and one wishes to make an analysis of 1,000 epileptics, it is a matter of simple arithmetic to work out how many practices must be included in the survey.

The sizes of the lists of practices represented by members of the register have been used to calculate the average number of patients per doctor in different parts of the country and in each type of area. Details are given in Table IV. Where two or more partners in the same practice are members of the register, that practice is included once only; the number of doctors specified is the total number responsible for patients on combined lists. With the exception of patient-doctor ratios based on small numbers of doctors there is close agreement between regions. This is true of each type of area, and for each region in England there are rather more patients per doctor in urban than in rural areas.

Discussion

The Research Register of the College of General Practitioners has been analysed in some detail to demonstrate the function and the potential of the organization. It may help workers both inside and outside the College. Any member or associate of the College can obtain from the registrar a list of names and addresses of other doctors who are interested in a particular subject or who live in a particular region. It has been suggested that any general practitioner who undertakes research should inform the secretary or the chairman of the Research Committee of his project. This suggestion has been made for two reasons: (1) an investigator, if he so desires, can obtain advice on methods of collecting, handling, and analysing data; and (2) the risk of work overlapping and wasteful repetition is reduced. Although it is useful deliberately to check the work of others, it is disappointing for a doctor to discover that work that he thought was original has already been carried out by others. Workers outside the College, such as consultants who need the assistance of general practitioners, can ask the Research Committee for the names of those who are likely to be able to help them in their problems. A number of subjects lend themselves to a combined operation by both specialist and general practitioner, as was demonstrated in two recent surveys of alcohol addiction.

By the co-ordinated work of individuals and groups of practitioners, new methods of research in general practice are being evolved and improved; and for the first time it will be possible to make an accurate assessment of morbidity in relation to the background against which it arises. The discipline of research not only assists in the investigation of problems that confront doctors in their work, but it gives

to those who take part in such projects a stimulus to observe and record which inevitably improves the quality of their medical practice.

We acknowledge all the help and encouragement we have received from Drs. R. J. F. H. Pinsent, D. L. Crombie, and the Publications Committee of the College of General Practitioners.

REFERENCES

- Bevan, R. T. (1948). *British Medical Journal*, 1, 294.
British Medical Journal, 1953, 1, 270.
 Hopkins, P. (1956). *British Medical Journal*, 2, 873.
Lancet, 1953, 1, 237.
 Logan, W. P. D. (1953). "General Practitioners' Records." Studies on Medical and Population Subjects No. 7. General Register Office, H.M.S.O., London.
Practitioner, 1953, 171, 307.
 Ministry of Health (1955). *Annual Report*. Part I, Appendix XVIII. H.M.S.O., London.
 Research Newsletter, 1956, Supplement to No. 11.

ROYAL SOCIETY OF HEALTH

CONGRESS AT FOLKESTONE

The Royal Society of Health held its 64th annual congress at Folkestone from April 30 to May 3. There were 13 sectional meetings and five conferences. The Congress was inaugurated by Mr. J. K. VAUGHAN-MORGAN, Parliamentary Secretary to the Ministry of Health.

Here, besides Mr. Vaughan-Morgan's inaugural address, we give short accounts of the Conference of Medical Officers of Health and of some of the papers read in the Sections of Food and Nutrition, Occupational Health, and Hospitals. Other Sections, not here reported, were concerned with subjects such as preventive medicine, health education, the health and welfare of the family, mental health, tropical hygiene, "World Health," and housing and town planning. There were also special conferences for domiciliary nurses and midwives, engineers and surveyors, health visitors, and public health inspectors. Some 3,000 delegates and their friends attended the Congress, many from abroad.

Mr. Vaughan-Morgan's Address

The Congress opened in the Odeon Cinema, Folkestone, on April 30, under the chairmanship of Professor HAROLD BURROW, of the Royal Veterinary College, London, chairman of council of the Society. After a welcome to delegates by the Mayor of Folkestone, Professor Burrow installed Mr. Vaughan-Morgan as President of the Congress, and called upon him to deliver the inaugural address.

Mr. VAUGHAN-MORGAN began by referring to the food and catering trades. They had shown a gradual improvement in hygiene, he thought, since the Food Hygiene Regulations had come into force 15 months ago. People could see for themselves some of the improvements in shop layout which had taken place. But thanks to the work of medical officers of health and public health inspectors, and with the good will of the trades, he believed there had also been a similar improvement behind the scenes, where hygiene mattered just as much.

The President then raised the question of the health visitor. To-day the health visitor was faced by a dilemma, he said: whether to stick firmly to the job on which she had concentrated since the beginning of the century and in which she had seen such remarkable improvements—the care of mothers and young children—or whether to devote more and more of her time to special problems and to adopt what was now known as "selective visiting." But, said Mr. Vaughan-Morgan, the health visitor was the starting-point from which many of the more specialized services began to operate, and much would be lost if she was not, as a routine, watching for the early signs of physical or mental handicap among all the young children in her care. Although the total number of health visitors had been rising year by year since the Health Service started, there was an alarming drop in the numbers training. He hoped the publication of the Working Party Report would stimulate recruitment.

Turning to mental health, Mr. Vaughan-Morgan said it was essential for the child welfare services to pay increasing

attention to the mental and emotional development of the child. The recent reports of both the committees on mal-adjusted children and the Working Party on Health Visitors had emphasized this. A working party, appointed last year, was now inquiring into the field of work and training of all types of social workers employed by local authorities, but in view of the very wide range of this inquiry its report could not be expected for some time.

New Methods of Food Preservation

The use of antibiotics and ionizing radiations in food preservation was discussed by two of the staff of the D.S.I.R.'s low-temperature research station at Cambridge at the opening session of the Section of Food and Nutrition. The Section was meeting in conjunction with the Food Group of the Society of Chemical Industry. Miss ELLA M. BARNES, D.Phil., said that during the past year there had been a steady increase in the number of countries using one or more antibiotics as food preservatives, although at the moment this was not allowed in Britain. Almost all the antibiotics used therapeutically were active against the bacteria but they had little activity against yeasts and moulds. Some had a narrow range of antibacterial activity, others a broad spectrum, but the choice of a suitable antibiotic for food preservation depended not only on the type of spoilage to be controlled but also on other important considerations. Would the use of antibiotics ensure a better quality of food for the consumer, she asked, or would they be employed merely to disguise insanitary conditions in the food-processing plants or to prolong the marketing period?

In the case of fish it was the time necessarily spent at sea before bringing the haul to market which largely governed its condition on arrival. Although the flesh and body fluids of newly caught fish were sterile, their external surface (as well as the gut) might carry considerable bacterial loads. Ice was used to prevent the rapid growth of these organisms, but even at freezing-point most marine bacteria grew actively. Fish remained fresh for only about 14 days under the best conditions of handling. The use of chlortetracycline in the ice would enable fish to reach the market in a considerably better bacteriological condition. The position with meat and poultry was different. Other factors being equal, the rate of spoilage depended on both temperature of storage and the initial load of micro-organisms. Tetracycline compounds were of little value for meat or poultry of low initial bacteriological quality or if kept at temperatures higher than usual. The use of antibiotics in hospitals had led to a progressive build-up of resistant staphylococci, and it was difficult to believe, said Miss Barnes, that there would not be a similar development in the holds of trawlers, in slaughterhouses, or in poultry-processing plants unless suitable precautions were taken.

Dr. R. S. HANNAN, Ph.D., said that food preservation by irradiation was still some way from general application in Britain, but there were some aspects of it which were beginning to show promise for commercial use. Foodstuffs were irradiated until they had accumulated a given dose of radiation, for times ranging from minutes or hours with gamma-ray sources to seconds or less with cathode-ray generators. Several aspects of this work were of obvious interest to the public-health worker, the most obvious being the possibility of the food itself becoming radioactive. If radiation energies not exceeding 15 MeV were used there was not much danger, but above that energy common elements in food could become radioactive, although in many cases their half-life was short. The other possible harmful effect was the induction of changes in the chemical composition of the food. It would need considerable work before irradiated foods could be accepted as harmless after treatment at any but the lowest dose levels.

Conference of M.O.H.s

Dr. J. D. KERSHAW, President of the Society of Medical Officers of Health, opened the Conference of Medical Officers of Health with an address entitled "Physicians in

Public Health." The founder and succeeding generations of medical officers of health had had inspiring tasks before them, said Dr. Kershaw. To-day most of those tasks had been accomplished. Were they, the great grandchildren, left with nothing but the glory of the past for inspiration? He thought not. Certainly public health and the public health service had been dealt some crippling blows by the Education Act of 1944 and the National Health Service Act, and the enthusiasm of some of their most able and promising medical officers of health had been suddenly damped and the administrative machine so remodelled that it was inevitably less attractive to the eager mind. They could not, however, avoid some self-doubt, and he thought not the least among their faults was that they were forgetting that they were doctors. There might be an insidious fascination in bureaucracy, but he suspected they were also being persuaded into the acceptance of some inferior status.

Within the community's services it was vital that someone should see people as patients and be ready and willing to intervene on their behalf, especially with the vulnerable groups, the young, the old, and the handicapped. Every man, woman, or child who asked or received the services of the health department was as much a doctor's patient as the sick man whom the G.P. visited at home or the sick woman in a hospital. It was by no means illogical to extend that principle also to some other aspects of local authority work not officially recognized or described as health services. If the keeping of houses in repair was their concern, so also was the provision of new houses. New sewage schemes, refuse-disposal plans, and water supplies ought to be their business. It was not too difficult to get that recognized, but why should they stop there? Schools, swimming-baths, libraries, recreation grounds, and in fact all the services the authorities provided were the tools of living, whose absence or misuse played an important part in impairing health. Every state of illness had its social components, and social therapy played an essential part in its treatment. To return a patient to the social environment which had helped to make him ill was as stupid as to dress the burns of a child and throw it back into the fire which had burned it.

Medical officers of health had the means of social therapy in their hands and were the specialists in its use. They were the physicians to the community and society at large. Society could be sick, just as each of its members could be sick. A community in which delinquency and neurosis were increasing, in which the sense of responsibility was running down, in which the philosophy of "couldn't care less" was accepted as part of the way of life, was far from healthy. A society which accepted total war as inevitable or was content fatalistically to drift towards its own destruction was sick to the heart. Whether they liked it or not they had a duty of community leadership. Since it was they, the medical officers of health, who were most intimate with the community aspects of medicine the obligation was theirs in a special degree. They had before them more inspiring tasks than their predecessors had had—if only they were prepared to look for them.

Health of the Adolescent

The Conference of M.O.H.s then proceeded to a symposium on "The Health of the Adolescent." A student health service, geared to the needs of the adolescent at college, must recognize not only the health needs of the student community but also the fact that the sick student often presented problems of a socio-medical nature which could not be effectively solved by the usual health agencies, said Dr. GRAHAM GRANT, senior health officer of the University of Wales Student Health Service. Family doctors, he continued, had not access to the information needed for a complete evaluation of the medical and psychological problems of the student group. The possible effects of social, academic, and athletic stresses on the physically or emotionally handicapped student had to be assessed in every case. Indeed, a university health service

was best thought of as an integral part of the whole educational process through which the undergraduate was passing. Environmental factors, both at home and at college, had to be taken into account. Physical fitness and the promotion of healthy recreational interests were other matters in which a university health service was legitimately interested. It was, moreover, as much concerned with the undergraduates' academic performance as were the academic departments themselves. But perhaps most important of all was its growing understanding of the relationships between learning and living at college and the developing physical, social, emotional, and intellectual maturity of the student.

Dr. M. E. HERFORD dealt with the medical supervision of the adolescent in the factory. He thought the great task of education for health in the fullest sense was a partnership in which doctors and teachers shared. They had to help people not only to live well but to live well together. Doctors were helping to form the pattern of the future attitude towards health and towards doctors. One of their functions must be to give patients, so far as they could, a reasonable understanding of and attitude towards health. They had to help young people to come to terms with their inescapable ailments. Health, in no small measure, was dependent on an attitude of mind; the mental and physical aspects of health were indivisible.

Technically the power of the doctor was increasing steadily: could he develop mentally and spiritually to be worthy of that power? There was a great test in work with adolescents. In it they had to seek the integration of medicine, or else the steady fragmentation would continue, leaving the doctor as a mere technician. Every medical examination was an opportunity for constructive influence. Although the basic patterns were laid down in early years through parental influence, all through life, and especially in the impressionable years of adolescence, mental attitudes created an atmosphere as real as the air we breathed. It could be healthy or poisonous. The doctor and nurse could help to influence attitudes of people at work as they affected adolescents. For the adolescent, the early years in employment must be concerned with learning in the fullest sense, as well as earning. There had to be continuity of education as well as of medical supervision.

Occupational Health

Addressing the Occupational Health Section, Dr. R. S. F. SCHILLING, President of the Association of Industrial Medical Officers, said the most notable advance in industrial medicine had been the growth of medical services in factories, mines, transport, shops, and offices. The doctor first went into industry with a narrow concept of his work and concentrated on providing a treatment service and on preventing occupational disease, because that was the employer's idea of industrial medicine. Although the scope of industrial medicine had now broadened, the giving of treatment to sick and injured workers was still one of the main functions of the service. Where the treatment was good and readily available, time lost from accidents was reduced by preventing complications and aiding rehabilitation. But, above all, treatment provided data for preventive action.

Many diseases had been successfully prevented by changing the physical environment. Prevention was now more dependent on changing people in their ways of living. Similarly the promotion of occupational health depended very much on the attitude of working communities to occupational health services, on educating and encouraging them to use guards on dangerous machines, to wear protective clothing, and so on. Health education was now an accepted part of preventive medicine. But how useful was it? Was it not time, said Dr. Schilling, to try to evaluate more critically our methods of health education?

If an attempt to reduce sickness-absence was to succeed, it must have the good will of all parties, said Dr. W. E. CHIESMAN, speaking in the Occupational Health Section's symposium on "Absenteeism in Industry." He had been

arguing the case for the "sickness-record." A record containing such details as the extent of sickness-absence year by year, the diagnosis causing each absence and their number, and the worker's age enabled a preliminary assessment of the likely type of problem to be found, without even seeing the patient. A good sickness-record interrupted by a long illness suggested something serious, while a record showing a number of short absences for a great variety of indefinite diagnoses indicated that the patient had not been adequately investigated, that he had a high standard of health for his job, or that he was, perhaps, wrongly placed. It was surprising how many patients and their doctors did not realize the extent of the sickness-record until it was presented as a fact. There was a tendency to treat each illness separately, overlooking the possibility that previous episodes might have some bearing on the present state. A study of the records of bronchitis cases often suggested that, had energetic treatment been undertaken at a very early stage when the chest symptoms were considered unimportant, the inevitable deterioration of the condition winter by winter would have been avoided. Psychological upset due to poor management, or ill-health owing to a previously unrecognized toxic hazard, could be suspected and investigated when a high proportion of a group had frequent absences due to similar symptoms.

Most observers agreed that true malingering was very rare. Dr. Chiesman continued, and, although uncertified sick absence was often quoted as an important factor, in spite of an allowance of seven days' uncertified sick leave per annum in the Civil Service that accounted for only 8% of the total sickness-absence. Ideally a man should have a job neither below nor above his physical and mental capacity, both of which were very flexible. Dissatisfaction with working conditions could often be counteracted by escape to outside interests, which, unfortunately, included ill-health and absence from work. Lax certification was often suggested as an important factor in absenteeism, but when diagnoses were checked it was difficult to disagree with them, even though many were vague.

Dr. D. D. REID said that most of the lost working-time in industry was due to general diseases not specifically associated with occupational hazards. Any hope for its control must come from a better understanding of those features of our environment which favoured the onset of disease.

Hospitals and Local Authority Health Services

There was no room for complacency in the National Health Service, was the conclusion arrived at by Dr. H. M. C. MACAULAY, S.A.M.O. of the North-west Metropolitan Regional Hospital Board, in his review of "The Hospital Service and its Relationship to Other Branches of the National Health Service" before the Hospitals Section. It had, he continued, certain glaring faults, of which one was fragmentation. This led to gaps and overlaps. Much could be done to overcome this defect by co-operation at hospital level, for that was the point where the shoe pinched. Possibly a small committee representative of the senior medical staff of the hospital and of the local medical practitioners could do much to resolve local difficulties or provide explanations where no satisfactory redress seemed possible.

A second serious fault was rigidity of control. The Civil Service was a magnificent instrument composed of men and women of ability and of the highest integrity, but it was one never designed for the detailed administration of a personal service. It was fantastic that a regional hospital board entrusted with the spending of £20m. annually should have to go cap in hand to the Ministry of Health if it wanted to engage an additional junior clerk on its establishment; or that a hospital management committee entrusted with the spending of £1m. a year should have to seek the approval of the regional hospital board before it could have put on the telephone a radiographer, laboratory technician, or engineer whom it might want to summon in the middle of the night to deal with an emergency.

Such faults, however, were not fundamental and did not imply inherent defects in the Service. They were just instances of plain bad administration, perpetrated in the name of economy, but frequently producing just the reverse. The essential structure of the National Health Service was sound and did not call for any radical and iconoclastic reform. Since 1948 phenomenal progress had been made, and in most hospitals in Great Britain the standard of service to the public was immeasurably higher than it was at the time the Act came into operation.

Dr. J. F. GALLOWAY, M.O.H. of Wolverhampton, who spoke on "The Local Authority Health Services and their Relationship to Other Branches of the National Health Service," thought local authorities were making a contribution to the National Health Service which was undervalued.

Most people now realized that the time had come to consider conserving manpower and concentrating our resources, he said. As the third largest employer of labour in the country, the Health Service was spending £540m. annually—a figure which would soon be over £600m.—yet it did not give the greatest possible value for the manpower and money spent upon it, in spite of the verdict of the Guillebaud Committee. Few could be unaware of the unhealthy state of the National Health Service. The fundamental defect was the tripartite structure of the Service, but in 1948 there was no alternative. Although that was unavoidable, the results had been unsatisfactory and called for consideration. While patients had to wait considerable lengths of time to see the doctor, there were doctors unable to satisfy their desire to enter general practice; hospitals had difficulty in securing medical staff, while experienced men desiring a career in a specialty were dismissed from the hospital service because they were surplus to the requirements for consultants; while the public health service sought experienced doctors, they were discouraged by it being the only branch of medicine in which in-training was not provided.

One problem was simple and urgent: they needed administrative units that were not too large for the maintenance of local interest but were large enough to allow areas of health, welfare, and properly financed hospital management committees to be co-extensive. That was a requirement essential for introducing not only efficiency but sanity into the administration. The reorganization of the local administration of our health services was an urgent need if we were to reverse their growing paralysis, gradual enfeeblement, and mounting expenditure and the decline of local interest. Radical reconstruction of the National Health Service might even need considering.

NEW RESEARCH BUILDING AT THE LONDON HOSPITAL

On May 1 the London Hospital's new research building was opened. It is a three-story block in Ashfield Street, just behind the hospital itself. The cost of the building—£200,000—was met from the hospital's endowment funds. The new building brings conveniently together seven research units connected with the hospital, and the instrument workshop. At the same time it frees space at the hospital for clinical laboratories. The research units accommodated in the building are the hospital's physics, dental research, and experimental surgery units; the Medical Research Council's industrial medicine and social medicine research units; the V.D. reference laboratory (partly hospital and partly Public Health Laboratory Service); and the cancer research department, which is largely maintained by the British Empire Cancer Campaign. Among those present at the opening was the Minister of Health, Mr. DENNIS VOSPER.

Research Units

A large section of the ground floor is taken up by the hospital instrument workshop. The workshop makes instruments for both clinical and research departments of

the hospital, but mainly for the physics unit. The latter unit, which originated in 1943 as a branch of the radiotherapy department, achieved independent status in 1951, although most of its work has continued to be connected with radiotherapy. The chief physicist is Dr. L. A. W. Kemp, Ph.D. In addition to the usual facilities, the unit has a small laboratory which can be screened against electricity, and a small isotope dosimetry laboratory. Most of the research on isotopes, however, is carried out in the department of experimental surgery on the top floor, under the direction of Professor V. W. Dix. In the main laboratory of the physics unit is the apparatus with which Dr. Kemp recently revalued the roentgen. Also on the ground floor is the M.R.C. department for research in industrial medicine, under Dr. Donald Hunter. This department, as its name suggests, studies occupational diseases and methods for their prevention. Present research includes a study of chronic cadmium poisoning, a hazard of metal workers. For this, rats are subjected to cadmium dust in a tunnel for five hours a day. At intervals the amounts of cadmium in the tissues and the degree of histological damage are assessed. The P.H.L.S. venereal diseases reference laboratory was joined with the London Hospital Whitechapel Clinic last year and the present venereal diseases reference laboratory was formed, under the directorship of Dr. I. N. Orpwood Price. This unit, situated on the first floor, besides carrying out serological and bacteriological examinations for the Whitechapel Clinic and the hospital, examines "problem sera" from laboratories in Britain and elsewhere in the Commonwealth, and prepares and standardizes reagents used in the laboratory diagnosis of venereal disease. The M.R.C. social medicine unit, directed by Dr. J. N. Morris, is also on this floor. It was transferred to the London Hospital last year. Its work includes studies on the aetiology of coronary thrombosis, the aftercare implications of the advances in the treatment of mental diseases, and problems within the London Hospital itself. Professor A. E. W. Miles directs the dental research department, where experimental studies on the relationship of defective nutrition to dental caries are proceeding. The cancer research department is directed by Dr. M. H. Salaman. The two principal subjects of study here are chemical carcinogenesis and the action of tumours on the enzymes of the host. As stated above, most of the department's funds come from the British Empire Cancer Campaign. The new accommodation is expected to make possible a considerable extension in the cancer department's research.

B.M.A. OFFICIAL SEAL

We reproduce below a photograph of the Association's new seal. It was designed and engraved by Mr. WILLIAM M. GARDNER, A.R.C.A., F.R.S.A., one of the Royal Mint's panel of artists. The seal is included in this year's exhibition of the Royal Academy of Arts at Burlington House, where it may be seen in the Royal Mint's case of coins, medals, and seals (Exhibit No. 1439).

One aspect of Mr. Gardner's work is familiar to all of us—his engravings on our coinage. He designed the reverses for the English and Scottish shillings and for the threepenny piece. Less well known perhaps is the fact that he is the designer of the Royal Signet—the seal used by Her Majesty's Ministers of State—and the seal of the Privy Council. He is also a skilled craftsman in heraldry and lettering and in the illumination of manuscripts. We are indebted to Mr. Gardner for the following description of the Association's seal.

Artist's Description

One of the consequences of the granting of armorial bearings to the British Medical Association by Letters Patent dated May 25, 1955, has been the taking into use of a newly engraved Official Seal.

To impress parchment or paper with or without wax or wafer requires crisp shallow cutting of the kind which allows seal and document to part readily when released from pressure, and the Association is fortunate in its possession of a fine nineteenth century sealing press by Alan Wyon, now adapted by the Royal Mint to the new seal.



At a diameter of 2½ in. (6.3 cm.) the full armorial bearings are displayed within a circumscription "THE BRITISH MEDICAL ASSOCIATION" and outer border of pomegranate flower and fruit. The shield is charged with a Maunch, or sleeve, as borne by the ancient family of Hastings, to commemorate the foundation of the Association by Dr. (later Sir) Charles Hastings in 1832. A Lion passant in a Chief differences the Hastings arms.

On a tablet below is inscribed the Association's motto "WITH HEAD AND HEART AND HAND," while the shield is flanked by figures of Hippocrates and Harvey to left and right respectively. Only as recently as 1940 the excavation of a burial ground near Porta de Roma on the mouth of the Tiber yielded a contemporary marble bust of the philosopher, carved during a period of acknowledged skill in portraiture. The facial expression is one of benevolence. He wears the humbler dress of his compatriots and holds a pomegranate (*Punica granatum*), symbol of Life and Regeneration.

Of William Harvey there exists an embarrassment of portraiture in various media, but the researches of Sir Geoffrey Keynes, as set forth in his Thomas Vicary Lecture of 1948, were bound to influence and assist any endeavour towards a true likeness of the physician. Harvey appears in the gown of his profession and bears in the left hand an Annulet divided horizontally—red above, blue below—in token of the discovery by which he is so largely remembered.

The Shield is surmounted by a mantled helm, which in turn carries for a crest the Rod of Aesculapius combined with crossed torches aflame.

It is of interest to follow the Blazon, or herald's description in words, from the Letters Patent of 1955: "Per pale Or and Azure a Maunch counterchanged, on a Chief of the first a Lion passant also Azure." And for the Crest on a Wreath of the Colours: "In front of two Torches in saltire Azure enflamed proper a Rod of Aesculapius Or." Also the supporters: "On the dexter side a figure representing Hippocrates holding in the exterior hand a Pomegranate proper, and on the sinister side a figure representing William Harvey Physician also proper holding in the exterior hand an Annulet per fesse Gules and Azure."

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Retirement and Employment

SIR.—Your annotation (*Journal*, April 20, p. 937) on retirement and employment was of particular interest and value to us because of our study of the influences on the health of older men of work and retirement.¹ This was carried out on 323 men aged 65 and more at the Rutherglen Consultative Health Centre. It showed that most of the retired men were compelled against their desire to cease work. The commonest factors were the "heaviness" or strain of work, ill-health, and compulsory retirement. Few had the privilege to retire truly contented and mentally adjusted to meet their altered mode of life. When work was lost late in life it was difficult to obtain other employment. The men successful in their quest for work usually experienced a decline in social status from skilled to unskilled or semi-skilled jobs. Arterial degeneration was the most frequent cause of retirement due to ill-health. Of 80 men working at the time of their examination, 51% were not in good health. Older men may continue to work with significant degrees of ill-health. There was no evidence that children neglected their parents. Financial aid given when required is a measure of filial responsibility, and this was commonly provided by the relations if they could afford it.

We believe that, as men in their youth train to enter employment, so should older men be educated in the art of retirement. Painful adjustments by trial and error from an active regulated life to one of leisure would be reduced to a minimum with an enhancement in mental health. An educational and medico-social service is urgently needed to cover the older worker before, during, and after retirement. Work should, where necessary, be modified to meet the decline in physical or mental powers. Non-gainful pursuits should be learned, and the mind attuned to regard retirement as a happy period in life, thus avoiding the emptiness and the insecurity, financial and otherwise, associated by so many with cessation of work. A further essential is an employment office to co-ordinate available jobs for older men, advertise them adequately, and interview and test candidates.

Further study (as yet unpublished) on men aged 55 to 64 underlines the need for our suggested services. Of 64 men in this age group, 9 were already retired because of ill-health and the inability to find work within their capacity. One man stated that he was looking forward to the time when he retired. Thirty were definite in their minds that they were going to work on after 65. Twenty-four, however, had given no thought to the subject and were vague in their ideas as to how retirement would affect them. The nearer men were to 65 the greater was the number wishing to delay the time of their retirement.—We are, etc.,

W. FERGUSON ANDERSON.
NAIRN R. COWAN.

Rutherglen.

REFERENCE

- ¹ Anderson, W. F., and Cowan, N. R., *Lancet*, 1956, 2, 1344.

Rh-Hr Nomenclature

SIR.—According to R. R. Race¹ the chief advantage of the C-D-E notations is that they are "self-explanatory." Race and Sanger² assert: "The C-D-E notation is invaluable; it alone indicates which antigens and genes are present. . . ." If this were true, the C-D-E notations would be unique, since in no other field of science are the symbols used expected to be self-explanatory, until certain basic definitions and conventions are first established. For example, in chemistry only after one learns that the symbol

Na stands for sodium and Cl for chlorine, and one adopts the convention that two symbols in juxtaposition represent a compound, does it become obvious that the symbol NaCl represents the compound sodium chloride. Similarly, in my own Rh-Hr nomenclature, after defining the symbol R¹ to represent a gene which gives rise to an agglutinin Rh₁, and gene r as representing a gene giving rise to an agglutinin rh, one can readily deduce that a person of genotype R¹r must have blood cells which react with anti-sera for the blood factors characteristic of both the agglutinogens Rh₁ and rh. On the other hand, if one attempts to make a nomenclature completely self-explanatory, paradoxes are inevitable unless the symbols are changed whenever something new is learned about the substances they represent. For example, to avoid paradoxes the symbols for chromosome cde would have to be changed to cdef, and the corresponding gene products from cde to cef, now that it is known that anti-d was never really found.

As an example I would like to cite a sentence from the *American Journal of Clinical Pathology*³: "The D-negative control of genotype dce/dce serves chiefly for the detection of anti-c, anti-e, and anti-f." To me this statement appears self-contradictory rather than self-explanatory. I wonder can Dr. Race demonstrate how the use of the C-D-E notations in this sentence is self-explanatory as he claims? Incidentally, this sentence again illustrates the incorrect use of the genotype symbols, because all that is determined by the blood tests is the individual's phenotype. I have already discussed⁴ some of the errors to which this practice had led.—I am, etc.,

Brooklyn, New York, U.S.A.

A. S. WIENER.

REFERENCES

- ¹ Race, R. R., *Antonie v. Leeuwenhoek*, 1949, 15, 29.
² — and Sanger, R., *Blood Groups in Man*, 1954, 2nd ed. Oxford.
³ Muschel, L. H., Nolte, L. B., and Keiderling, L. J., *Amer. J. clin. Path.*, 1957, 27, 42.
⁴ Wiener, A. S., *Lancet*, 1957, 1, 791.

E.C.T. Fractures

SIR.—The recent law case (*Bolam v. Friern Hospital*, *Journal*, March 9, p. 591) of a patient who sued a mental hospital for having suffered a fracture of both acetabula when receiving E.C.T. would seem to show a regrettable lack of agreement regarding the best technique for this procedure.

As with other treatments in medicine, there is (1) the ideal technique, where expense and other factors allow, and (2) the best technique which is practicable under mental hospital conditions and which still avoids serious risks to the patient.

Nine years ago a film was made at the West London Hospital showing a technique for giving electroshock and electronarcosis. In these treatments the anaesthetist gives premedication which consists of atropine, thiopentone intravenously, and tubocurarine. The respiratory equipment includes a rubber reservoir bag, and to this is attached a respiratory valve and a face mask. During the period of muscular relaxation a rhythmic manipulation of the reservoir bag is kept up. An even simpler apparatus is the Oxford inflating bellows. This film has been shown regularly at different mental hospitals, the only essential modification being the substitution of a quick-acting relaxant like succinylcholine for tubocurarine. If this technique could have been used during the past ten years in every hospital, practically all the accidents and deaths described by Maclay¹ as occurring in England and Wales would have been avoided. It was said in court that the two dangers of treatment with succinylcholine were prolonged apnoea and regurgitation of stomach contents. The former, however, is extremely rare. There is no danger to life as long as respiration is maintained with the above apparatus. Blood transfusion has, however, been used to shorten the apnoea by providing the deficient cholinesterase.² The second hazard can be prevented by the patient fasting, but where he has managed to secure food unobserved a suction apparatus can be used. Intubating forceps and endotracheal tubes should also be available. Where a hospital

cannot provide an anaesthetist, doctors should be trained in this work by one of that specialty.

Many thousands of treatments, however, are carried out all over the world at the present time without anaesthetic or relaxant. Often a treatment has to be given as an emergency. Where an E.C.T. has to be given without a relaxant, it is essential that the psychiatrist should understand that the current can cause muscular contractions in two different ways.³

It was stated in court that the acetabula were fractured while the patient was having an epileptic convulsion, but from the evidence it is by no means certain that this was so. The sequence of events during E.C.T. is as follows: The current is passed between bitemporally placed electrodes for a period of between one-tenth of a second and several seconds, and the current spreads to some extent throughout the brain. This gives rise to two quite different sequences of events, both of which cause contractions of muscle, the first sequence being called indirect stimulation and the second direct stimulation. (1) *Indirect stimulation*.—With bitemporally placed electrodes an adequate current will cause an impulse to be transmitted physiologically to a trigger area in the mid-brain, and from there back to the motor area of the cortex, so that a tonic-clonic self-continuing convulsion is initiated. This process may take as long as fifteen seconds from the (often brief) initial stimulus until the onset of the convulsion. (2) *Again, with bitemporal placement of electrodes, in addition to the above process there is a direct stimulation of other intracranial structures, including the pyramidal tracts, mostly at the level of the internal capsule. There is also stimulation of the cranial nerves as they leave the skull. There is a sudden, powerful flexion of the thighs and arms, and generally of the vertebral column. The suddenness of onset makes the danger of a fracture particularly great. In the case of the thighs, the head of the femur may strike the socket like a hammer. The phenomenon has been called a "jack-knife contraction."*

In electrocerebral treatment the main therapeutic effect comes from the tonic-clonic convulsion. Fractures and other complications occur more commonly from the way in which the original stimulus is given to cause the convulsion than from the convulsion itself. The only safe way to prevent fractures and other complications is by employing an anaesthetist to give thiopentone and a quick-acting relaxant. Where that is impossible it is safer to give the original impulse by placing the electrodes rather far forward on the forehead, over the outer half of the eyebrows. The current should be turned on gradually, taking less than a second to reach the maximum, and allowing the current to pass only for the minimum period.—We are, etc.,

A. SPENCER PATERSON.
D. W. KING.

London, W.6.

REFERENCES

- ¹ Maclay, W. S., *Proc. roy. Soc. Med.*, 1953, 46, 130.
² Harrison, B. L., Seward, E. H., and Skinner, L. C., *Anaesthesia*, 1954, 9, 21.
³ Paterson, A. S., *Confin. neurol. (Basel)*, 1952, 12, 311.

Tropical Pulmonary Eosinophilia

SIR.—The article by Dr. Rosemary Davies entitled "Tropical Pulmonary Eosinophilia" (*Journal*, December 22, 1956, p. 1470) demonstrates again how in Europe we are sometimes confronted with problems which are the rule in the tropics. Therefore it is very useful to publish our incidental experiences with tropical disease, so that attention does not slacken. That is why I should like to add the following to the above-mentioned article.

Besides the English literature, various contributions have been made in the Dutch literature on the differential diagnosis and the aetiology of tropical eosinophilia. Among others, filariasis was pointed out to be the causal factor.¹⁻⁴ Together with Winckel and Collier I⁵ described at Paramaribo (Surinam) three cases of relapsing asthmatic bronchitis with tropical eosinophilia (63-82%). Blood examination for syphilis, malaria, and filaria was negative. A remarkable

point was that all three patients were infected with histoplasma, which appeared after histopathological examination of removed lymph glands (Giemsa and Gram staining) and repeated animal tests (mice). The glands, when examined in sections, did not contain filariae.

The first patient, a Hindustani soldier, also suffered from *Strongyloides stercoralis* and ankylostomiasis. After a course of gentian violet and antimony ("fuadin") the worms disappeared, but leucocytosis and hypereosinophilia persisted. This patient failed to react to modern treatment against filariasis (diethylcarbamazine, "hetrazan"), but improved considerably after administration of oxophenarsine hydrochloride ("mapharsen"). The two other patients, a Creole boy of 15 and a Creole girl of 9 years old, did not suffer from worms. They showed the marked therapeutic effect of diethylcarbamazine.

Some authors consider hypereosinophilia as a first reaction to an early infection with filaria. However, this does not explain why hypereosinophilia is comparatively rarely discovered in the out-patient clinics of Paramaribo, where blood examinations are regularly made. For in this town, where microfilariae are found daily in the blood of clinically healthy people, it is to be expected that a considerable number of persons harbour microfilariae in the lymphatic system, though they cannot yet be demonstrated in the peripheral blood.

It was very remarkable that our three patients were all carriers of a type of histoplasma. But according to Collier and de la Fuente⁶ a high percentage (43%) of the population of Paramaribo is hypersensitive to histoplasmin. Wildervanck, Winckel, and Collier⁷ described a case of a 5-year-old healthy boy who died after an accident and had a positive histoplasmin test two months earlier. Mice tests showed that the liver, thymus, spleen, lung, and a lymph gland were infected with histoplasma. Histoplasmosis may probably be assumed as a markedly prevalent disease, even without clinical symptoms, in humans and animals in Paramaribo. Therefore the combination of tropical eosinophilia with histoplasmosis in our three patients might only be a coincidence.

Nevertheless, various authors hold the opinion that a combination of factors is necessary to cause the hypereosinophilia syndrome. The aim of our paper was to suggest such a possibility in future examinations of lymph glands and to look for histoplasma by means of Giemsa and Gram staining, and eventually by animal tests and cultures, too. Moreover, I believe it would be desirable to do a blood-examination for microfilariae in all cases with tropical eosinophilia, while treatment with diethylcarbamazine possibly might be considered.—I am, etc.,

Eindhoven, Holland.

A. WILDERVANCK.

REFERENCES

- ¹ Meyers, F. M., and Kouwenaar, W., *Geneesk. T. Ned.-Ind.*, 1939, 79, 853.
² Sar, A. van der, and Hartz, H., *Amer. J. trop. Med.*, 1945, 25, 83.
³ Bras, G., and Lie Kian Joe, *Docum. neerl. Indones. Morb. trop.*, 1951, 3, 289.
⁴ Reisel, J. H., and Groen, J., *ibid.*, 1951, 3, 320.
⁵ Wildervanck, A., Collier, W. A., and Winckel, W. E. F., *ibid.*, 1953, 5, 108.
⁶ Collier, W. A., and de la Fuente, A. A., *Ned. T. Geneesk.*, 1953, 97, 208.
⁷ Wildervanck, A., Winckel, W. E. F., and Collier, W. A., *Docum. neerl. Indones. Morb. trop.*, 1953, 5, 67.

Herpes Zoster and Chicken-pox

SIR.—In view of the current correspondence, I think the following two cases will be of interest.

Case 1.—A man, 41 years, presented with a severe facial herpes on September 10, 1956. There was conjunctival involvement. He was seen by the ophthalmologist and put on chloramphenicol eye ointment, and was also given chloramphenicol systemically, with liq. pic. carb. in calamine for the skin. On the fourth day of the illness he developed a generalized eruption typical of chicken-pox. He eventually made a complete recovery without any residual scarring or neuralgia. *Case 2.*—A housewife, 68 years, presented on April 15, 1957, with a rash on the adductor aspect of the left thigh, of six days' duration. The lesion was typical of

herpes zoster. On questioning she had no knowledge of contact with either chicken-pox or herpes. However, she stated that a fortnight before the rash started she had an airmail letter from her sister, aged 73 years, in California, U.S.A., who said she was in bed suffering from a severe attack of shingles. The coincidence with the approximate period of incubation is remarkable. It would be interesting to hear of any similar cases.—I am, etc.,

Camborne, Cornwall.

S. W. VIVIAN DAVIES.

Mental Deficiency

SIR,—The modern medical concept of mental deficiency is of social incapacity due to incompleteness of development of mind. Thus we find detained on order under the Mental Deficiency Acts not only the obviously idiot, imbecile, and feeble-minded, but patients who might equally well be regarded as aggressive psychopaths, habitual criminals, or merely members of the social problem group. Whatever our professional concept may be, there is no doubt that in the public's mind mental deficiency is identified with low I.Q. I feel it is the interpretation of this concept to include a wide range of I.Q.s which underlies the recurring allegations of wrongful certification. It was repeatedly put to the Royal Commission on the law relating to mental illness and mental deficiency that high-grade patients should not be cared for in the same hospital as lower-grade patients, and there is no doubt they resent being classified in the same way as patients in whom the defect is more obvious.

Those of us concerned with the care of mental defectives have been at some pains in the past to avoid the acceptance of the I.Q. as a basis for diagnosing mental defect. However, it seems to me that it would help clarify the present position and ultimately improve the therapeutic possibilities if we limited the term "mental defect" to a condition of social incapacity with low I.Q. (below 70) and treated as a separate problem social incapacity with higher I.Q.s. Patients falling into the latter group are often more in need of psychotherapy than the type of training given in most mental deficiency hospitals. To this extent they are more a mental treatment problem than a mental deficiency problem, and if they are considered to require institutional care I suggest this should be given outside the provisions of the Mental Deficiency Acts. At present there is no other legislation to cover this group, apart from their voluntary admission to a mental hospital. Most of these patients are not suitable for admission to the ordinary mental hospital, and there would seem to be a need for separate accommodation for them. Where their voluntary admission was not considered appropriate, their admission could be obtained on magistrates' order after the presentation of a petition as under Section 6 of the Mental Deficiency Act; such legislation should be incorporated in the Mental Treatment Acts.

I am aware that there will always be borderline cases which will give rise to difficulty, but the sooner we stop calling the socially inadequate group with "normal" I.Q. "mental defectives" the sooner we shall remove a powerful source of resentment among these patients, the greater will be our chance of obtaining their co-operation in psychotherapy, and the less frequently will we be accused of wrongful certification.—I am, etc.,

Bristol, 8.

W. ALAN HEATON-WARD.

Eleven-plus Examination

SIR,—Recent changes proposed in the secondary schools' selection procedure have once more brought the bogey of the so-called 11-plus examination into the limelight. It is interesting to speculate why the advice of the children's psychiatrists has never been sought in a matter that is alleged to concern the happiness and mental stability of children. In the last five years of child guidance work, with an annual average of 350 new cases, I have seen less than a handful of children whose problems could be directly related to the strain of this examination, and this experience seems shared by my colleagues. Temporary anxiety

symptoms induced by parental apprehension are only slightly more frequent, but I have yet to see the child who has suffered more permanent damage emotionally because of failure at the 11-plus. No child of that age does appreciate, on his own accord, the possible consequence of failure, and if given the right support he readily identifies himself with any secondary school community selected for him by his elders.

At the present system of selection girls would be at a slight disadvantage over boys because of the unsettling physical and emotional changes accompanying the pre-pubertal age, but their advanced social maturity amply compensates for this. In any selection procedure between the age of 13 and 15 years parents will find that boys are at a great disadvantage because even the promising high flyers are then passing through the temporary phase of a negative attitude toward their scholastic obligations, well known and accepted by all experienced teachers in grammar schools, while girls, having overcome the turmoil of earlier adolescence, are at ease at examinations. We will therefore find that an unfair proportion of girls will be accepted for higher studies, while the potential male scholars, who would have easily reassured themselves in the sixth form or at the university, will be discouraged from an academic career. This would result in a large number of disgruntled and emotionally dissatisfied clever men who could have filled the many vacant university places that girls, whose academic promise and interest was not sustained into more mature years, did not accept.—I am, etc.,

Leicester.

A. K. GRAF.

Hospital Confinement

SIR,—With reference to the letter by Dr. Aileen M. Dickens and her colleagues (*Journal*, March 16, p. 645) upon this matter, I would like to answer and give my observations.

It is my contention that, so far as possible, all mothers should be confined in hospital. The accent is upon the word "confined," and this does not necessarily mean the addition of lying-in in hospital. I believe that this policy would secure the following advantages: (1) the better use of hospital beds; (2) a saving of the doctor's time in travelling to and from a confinement while it is in progress when he has many other duties in his practice; (3) proximity of confinement to the doctor's surgeries in the event of the doctor being wanted for abnormalities; (4) to lessen two particular risks inherent in any confinement, but of particular danger to a home confinement, neither of which can be foreseen: (a) haemorrhage—obviously best treated in hospital, blood bank, and giving sets; and (b) anaesthetic risks, inhalation of vomit—anaesthetists these days are very fussy, and will soon refuse to give an anaesthetic in the home because of the impossibility or difficulty of fixing up a sucker: the tilting bed cannot be arranged in the home; (5) to lessen the risks to the foetus—resuscitation on modern lines with intubation cannot await transfer to hospital; (6) lessen risks of cross-infection, which increase with the longer the hospital stay. In addition to the foregoing, I personally dislike doing difficult forceps in the home and large-scale suturing if it is required.

There is no reason why the mother should not be returned home within a few hours of delivery if her condition permits, but certainly, I think, she should be discharged at least within two days—that is, before the milk comes in. When I first thought of this arrangement I had imagined that the mother would be looked after in hospital by a hospital midwife and discharged home to the district nurse, so that the latter could undertake all breast-feeding supervision before the milk came in. To discharge her a little later once some of the earliest difficulties have occurred would be unsuitable.

Since reading an article by Drs. Sluglett and Sarah Walker,¹ it would seem most desirable that the district midwife should herself bring the mother into hospital when she is in labour, and stay with her throughout, and see her home, conducting the delivery herself, or with the patient's doctor taking over as and when necessary. This would get over the difficulty

of doing district midwives out of their legitimate confinement experience. The latter would, presumably, have necessitated some rota system in which district midwives come into hospital for three months or so at a time to keep up their practice. This would be unnecessary if they could be allowed to come in to conduct their cases in the hospital. Since they have other duties in the district, they might not necessarily have to remain with the mother throughout the whole of the labour, but be allowed to go and do domiciliary visits during the first stage, as, of course, they do now when they are in charge of the mother at home.

Difficulties to be overcome: (1) Allowing district midwives to come into hospital to work presumably under the maternity sister: I think this is not insuperable, and mainly relies on the willingness to create precedent and team in one with the other. (2) The mother would not be allowed the £3 home confinement grant if she knew well beforehand that arrangements had been made for hospital confinement, even if the hospital stay was for as little as twelve hours: regulations would have to be made to amend this. When it is a last-minute decision due to abnormality, the money is payable. When applying, the mother has to state in writing when she first knew admission to hospital was going to be arranged. (3) At present, hospital bookings can only be made for ten days' stay by Ministry regulation. The county on behalf of the R.H.B. cannot therefore book a 48-hour stay or less without the Ministry revising its regulations. Of course it would be for the mother's own doctor to decide whether or not she should come in for confinement only. The mother might wish for home confinement and have to be persuaded to agree to hospital confinement. No regulation could be made; the doctor himself would decide. As I foresee it at present a number of ten-day stays would still have to be booked for domestic reasons, but not nearly so many as at present. It is usually the difficulties of domestic confinement itself, not the lying-in, that determine the hospital booking. The general move would be towards encouraging admission and early discharge whenever the home conditions permit.

Then to express a personal opinion on this matter of use of hospital beds. It is only a matter of time before something of this nature comes about. I think it is inevitable. Already discharge from hospital after operations can be considerably hastened by the more enlightened surgeon in team-work with the general practitioner, with advantage to all. We must not be hidebound by traditional ten-day lying-in periods and fortnight for appendicectomy, three weeks for repair, etc., unless we can be sure there is no better way. On the basis of cost alone, a vast amount of money is being wasted by keeping people in hospital unnecessarily long. They are being fed, heated and lit, and laundered at Government expense without any money being recouped from them. This they would have to have paid out if living at home.—I am, etc.,

Tiverton, Devon.

D. S. FOSTER.

REFERENCE

¹ Sluglett, J., and Walker, S., *Lancet*, 1956, 1, 684.

Premedication in Children

SIR,—I read with much interest the article on sedation for dental out-patient children by Dr. R. Goulding and his colleagues (*Journal*, April 13, p. 885). Since this study was primarily a pharmacological one, the emphasis, naturally enough, was laid on the findings that no drug tested helped to improve children's behaviour better than a placebo. What the authors have not stressed—and I feel this to be of at least equal importance—is that the behaviour of the children given a "medicine," whether an inert placebo or active drug, was less disturbed than the behaviour of the children observed in the preliminary assessment.

On the basis of the figures and charts available, in both pilot and main studies, it appears that in this preliminary assessment the proportion of children showing distress (adding the "disturbed" and "turbulent" groups) was 42% in the theatre and 56% when presented with the anaesthetic,

as compared with the group receiving the placebo, where the corresponding figures were 31% and 44% respectively. Whether such a change in behaviour is statistically significant can perhaps only be determined by the authors, who know the exact context of the experiment, but, at any rate, the matter might with profit be looked into further. It would certainly be of interest to know more of the manner in which the "medicine" was administered and the personality of the person who gave it out. Could it have been that the hand that held the medicine glass was more therapeutic than the drug that glass contained?

Might I, in conclusion, express the hope that further work of this kind be undertaken? I work next door to a dental hospital, where the screams of terrified children demonstrate daily how present techniques in dental anaesthesia lie still in some small way short of perfection.—I am, etc.,

Leeds, 2.

C. H. NEVILLE-SMITH.

Amphetamine Psychosis

SIR,—Dr. P. H. Connell's letter on amphetamine psychosis (*Journal*, March 9, p. 582) and the article on the inter-related subject of acute amphetamine poisoning by Drs. Raymond Greenwood and R. S. Peachey (*Journal*, March 30, p. 742) suggest that reports of amphetamine psychosis in this country are still relatively rare. It may therefore be worth while briefly to record one more such patient who was recently in my care.

A man, aged 20, was admitted to hospital because he appeared acutely agitated, tremulous, and apprehensive. He believed that he was being followed and watched, and that a door-handle had turned of its own accord. He had been terrified to observe a stain on a door growing larger and appearing to him to be smoke. Later he imagined that he saw and smelt smoke coming through a keyhole. He heard a noise "like someone squeezing a rubber bulb" and felt as though he was being burnt behind the right knee. He saw the faces of his sister and others outside the ward window. Thus he had hallucinations of all sensory modalities other than the kinaesthetic. He admitted that shortly before the onset of symptoms he had swallowed the best part of the contents of two "benzedrine" inhalers.

He recovered within a few days and was discharged from hospital. However, he was very soon readmitted because he had taken another and very similar quantity of benzedrine from inhalers. He thought that he might be a "research guinea-pig" and that "gases and fumes and sprays" were playing on him. Again he was the subject of illusions ("every shadow appeared as the figure of a person") and again smoke figured prominently in his hallucinations.

Ultimately he proved to be an early schizophrenic, and it transpired that he took benzedrine, as well as excesses of alcohol, in an effort to reduce his distress caused by ideas of reference and by the "gap" between himself and others. Very possibly this underlying psychosis coloured the acute toxic reactions to amphetamine.—I am, etc.,

Gosport, Hants.

G. G. WALLIS.

Safety Factor in Car Design

SIR,—The press has recently contained reports of statements made by prominent members of our profession, and others, regarding the dangers of the new miniature cars—especially those of "bubble" design.

I have recently acquired one of these for use as a runabout, and have found difficulty in obtaining fully comprehensive insurance cover. As it seems possible that note may have been taken of this publicly voiced criticism, I should like to make two points: (1) In view of the small number of these cars in use up to the present time I do feel that this criticism must be based on theoretical consideration rather than practical experience. (2) It is surely wrong to lump all the various makes together and condemn them out of hand. Mine, for instance, is a four-wheeler with a tubular

steel chassis, very positive steering, and an engine capable of useful acceleration. Because of the fourth wheel I have to pay a full road-fund tax, and it seems unfair that this fact is not reflected in the insurance rates.

If it can be shown that criticism is justified, and that all these vehicles, whether three- or four-wheelers, whether with or without a chassis, are a menace, then the profession is right in condemning them. We should be careful to see, however, that experience of any one particular model does not lead to an unjustified criticism of the whole group.—I am, etc.,

Ely, Cambs.

J. LEONARD HINE.

Operations for Varicose Veins

SIR,—In connexion with your very interesting leading article on operations for varicose veins (*Journal*, March 23, p. 692) I would like to draw the attention of your readers to two papers on this subject: that of M. G. Wilson¹ and my own written in collaboration with Dr. F. B. MacDonald.² These two papers describe the method of subcutaneous ligation using two different techniques developed independently by the respective writers. In our experience, this method has achieved very satisfactory results and has now been used in quite a large series of cases which will later be published.

A perfect cosmetic result is obtained because the operation leaves no scars. But it is quite apart from this advantage that we value the method. Much more important is the fact that by employing so-called "tandem ligation" on several levels we are able to control not only all incompetent perforating and communication veins but also the anastomoses of normal collaterals. Since this "tandem ligation" can be extended to include a large part or even the entire circumference of the limb on several levels, the column of blood is interrupted at these points and thus venous pressure is reduced. Owing to this, the cause of recurrence (high venous pressure) is removed: the more so, in that the collaterals themselves, which might be the site of recurrence, are also controlled. To accomplish this would be very difficult by the most radical operations proposed by those who consider the stripping operation unsatisfactory because of recurrences—for example, the method devised by W. H. Prioleau and J. M. Stallworth.³

Because of the success with our method we abandoned first the stripping operation, and then the conventional high ligation—used in conjunction with subcutaneous ligation for a period of time—in favour of subcutaneous ligation alone regardless of the extent of the varices. It seems to me that this method is the best answer at present to the difficulty of "locating incompetent communications" which you point out in your leading article.—I am, etc.,

Sydney, N.S., Canada.

C. A. F. UHMA.

REFERENCES

- 1 Wilson, M. G., *Lancet*, 1953, 1, 1273.
- 2 Uhma, C. A. F., and MacDonald, F. B., *Canad. med. Ass. J.*, 1956, 74, 294.
- 3 Prioleau, W. H., and Stallworth, J. M., *Amer. Surg.*, 1955, 21, 50.

The Hurt Brain

SIR,—Dr. E. E. Prebble states (*Journal*, April 13, p. 885) that "the trivalent arsenicals, being incapable of reaching the cerebrospinal fluid, have long been known to be useless in neurosyphilis." In 1919, as I could not understand why my clinical results were often so satisfactory if the trivalent arsenicals were indeed incapable of reaching the cerebrospinal fluid, I gave a long series of injections of nearsphenamine (N.A.B.) to a paretic policeman and then withdrew his cerebrospinal fluid one hour after the last injection. The fluid was analysed for me by Professor Hugh Maclean in the chemical pathological laboratory at St. Thomas's Hospital. Under stringent analytical precautions with arsenic-free reagents and apparatus, he showed me the metallic deposit of arsenic obtained from this cerebrospinal fluid. Thus, it was proved in 1919 at St. Thomas's Hospital that the trivalent arsenicals do penetrate into the cerebrospinal fluid, and this is confirmed by authorities such as Brahme¹ and Fordyce, Rosen, and Myers.² Arsenic is absorbed so

rapidly, mostly within the first two hours, into the cerebrospinal fluid, and eliminated so quickly, that this may be the reason why others have failed to detect it.

My experience forces me even more emphatically to agree with both Dr. Prebble and Dr. J. Purdon Martin (*Journal*, April 13, p. 885) that to rely on a meagre ten injections of penicillin to cure neurosyphilis is to invite failure. This comparatively small dosage may destroy any natural immunity that exists while replacing it with a modicum of therapy, which, as Dr. Martin writes, can hardly satisfy one's obligations to the patient.—I am, etc.,

London, W.1.

T. ANWYL-DAVIES.

REFERENCES

- 1 Brahme, L., *J. Amer. med. Ass.*, 1923, 81, 870.
- 2 Fordyce, J. A., Rosen, I., and Myers, C. N., *Amer. J. Syph.*, 1923, 7, 444.

Immediate Treatment of Apoplexy

SIR,—Following your annotation, "Immediate Treatment of Apoplexy" (*Journal*, January 7, 1956, p. 35), we decided to undertake a controlled investigation of the value of cortisone in this condition. As you pointed out, in the original report¹ no controls were studied, so that no definite conclusions could be drawn from the results. We adopted a "double blind" programme with independent clinical and physiotherapeutic assessment of progress, and a series of 12 patients with cerebral thrombosis has been studied. Six received prednisolone tablets in the dosage recommended, while six received placebo tablets which were similarly scored to the prednisolone tablets.

The following were the results in brief:

	Placebo	Prednisolone
Number of patients	6	6
Mean age	71	64
Unconscious on admission	2	1
Hypertension	2	3
Death	3	2
Improved	2	4
Not improved	1	1

At this stage we read the report of Dyken and White² in which a similar trial was reported with 17 patients in the control and 15 patients in the cortisone-treated group. These observers also found no benefit from cortisone treatment compared with placebo—in fact, the cortisone may even have been deleterious.

Under these circumstances, Sir, we have decided to discontinue our own therapeutic trial, as we believe further use of large doses of cortisone to be of no value and even contraindicated in these patients.—We are, etc.,

B. S. HETZEL.
H. LANDER.
H. N. ROBSON.

Adelaide, Australia.

REFERENCES

- 1 Russek, H. I., Russek, A. S., and Zohman, B. L., *J. Amer. med. Ass.*, 1955, 159, 102.
- 2 Dyken, M., and White, P. T., *ibid.*, 1956, 162, 1531.

Lymphadenoid Goitre

SIR,—The title, "Lymphadenoid Goitre (Hashimoto's Disease)," of the paper by Dr. Deborah Doniach and Mr. R. Vaughan Hudson (*Journal*, March 23, p. 672) is, I fear, misleading. Lymphadenoid goitre is free of the atrophy and disappearance of follicles with replacement fibrosis as described by Hashimoto.¹ Lymphadenoid goitre, on the other hand, has a relatively natural follicular structure with the added feature of numerous lymphoid follicles.² It is perhaps unfortunate that Hashimoto used the term "struma lymphomatosa" in his title, which has led many unfamiliar with his paper in the original German to apply his name to thyroid conditions with prominent lymphoid tissues but lacking the fibrosis he described.—I am, etc.,

Los Angeles, U.S.A.

S. M. RABSON.

REFERENCES

- 1 Hashimoto, H., *Arch. klin. Chir.*, 1912, 97, 219.
- 2 Rabson, S. M., and Arata, J. E., *Amer. J. clin. Path.*, 1949, 19, 750.

Budgerigars in Wards

SIR,—Your correspondent Dr. N. A. Thorne (*Journal*, April 27, p. 1008) writes regarding the "advisability or otherwise of banning the presence of budgerigars from hospital wards." My experience is confined solely to the keeping of these pets in tuberculosis wards in sanatoria, but perhaps some of my observations may be applicable to certain wards of other types of hospitals.

I feel that, while there is very little danger of infection from psittacosis from a budgerigar obtained from a breeder of repute in this country (or, in fact, of any infection from a bird that is kept clean and healthy), such a pet is not to be recommended in any acute ward, as it could prove distracting for a very ill patient. As regards having budgerigars in other types of wards, I have found that the average "long-term" bed cases—as well as ambulant patients—derive much pleasure and interest from these pets, which certainly aid in relieving tedium, and that they can provide an excellent kind of diversional therapy, especially for women who spend interminable hours at high-speed knitting (a potent source of nervous tension). Incidentally, more than one bird in a cage can be distracting, with their constant chatter. In short, a healthy budgerigar can give valuable relaxation (with a minimum risk of infection) for non-acute patients, particularly for those undergoing prolonged hospitalization.—I am, etc.,

High Wycombe, Bucks.

MURIEL G. E. CLARK.

Smoking and Lung Cancer

SIR,—It may be of interest to record that the Council of the British Tuberculosis Association decided recently that a letter should be written to the lay press on its behalf, affirming the relationship between carcinoma of the lung and cigarette-smoking. The Council was not optimistic enough to suppose that such a letter would have any great effect in diminishing the smoking habit, but at least no member of the public would be able to say, either now or in the future, that the British Tuberculosis Association had not attempted to give guidance in the matter. I was accordingly instructed to write a letter, briefly drawing attention to the evidence relating carcinoma of the lung to heavy smoking, and also to the recent work which indicated that this might also be a factor in the development of pulmonary tuberculosis in the middle-aged male. A final plea was made to those in charge of children to prevent them starting the smoking habit.

This letter was sent to the two leading British daily papers. One replied that they found the letter of interest but lacked space for publication, and the other referred only to lack of space. The letter was then sent to a popular daily newspaper and a daily picture paper. One replied that it had recently published a leading article on the subject and would keep the letter for reference, and the other ignored it. The letter was finally sent to the best-known provincial newspaper, which published it in an abbreviated form, so that it drew attention only to the possible relationship between tuberculosis and smoking.—I am, etc.,

W. E. SNELL,

President,
The British Tuberculosis Association.

London, N.W.9.

Cardiac Arrest During Trichlorethylene Anaesthesia

SIR,—In their interesting article (*Journal*, April 13, p. 860) Drs. Walter Norris and Peter Stuart describe several cases of cardiac arrest occurring during trichlorethylene anaesthesia. There is no doubt at all that, in common with most if not all inhalation and intravenous anaesthetics, trichlorethylene can cause this condition, but it seems to me that the important question is the approximate risk compared with other drugs. The mere reporting of individual cases is of limited value, as it has been estimated that in Great Britain about 2,250,000 anaesthetics are admin-

istered annually and, as a large proportion of these include trichlorethylene, a minute incidence of cardiac arrest would soon account for an impressive total.

This question was discussed at a recent meeting of the Society of Anaesthetists of the North-east Metropolitan Region, and Mr. T. B. Boulton, then senior anaesthetic registrar to St. Bartholomew's Hospital, kindly spent a great deal of time and trouble looking up the figures for in-patients at this hospital for the ten years beginning January 1, 1946. In just over 29,000 administrations in which trichlorethylene had been used, there were two deaths which were considered due to primary cardiac arrest. One of these followed the infiltration of the neck with 1 in 250,000 adrenaline solution for a cervical sympathectomy (it might be mentioned that our usual practice is not to exceed 1 in 500,000). The figures for Hill End Hospital (St. Bartholomew's) are unfortunately incomplete owing to the lack of clerical assistance, but I kept a record of the first 15,000 administrations after the introduction of the drug in 1940. There was one death suggestive of primary cardiac arrest, which incidentally is included in the article. On a basis of 44,000 cases the approximate incidence is therefore 1 in 14,600.

Some comparison with chloroform can be made on the figures obtained in the classical work of R. M. Waters and his colleagues at Madison, Wisconsin.¹ One thousand one hundred and eleven administrations were made under ideal and controlled conditions, and sudden cardiac arrest occurred in four patients, an incidence of 1 in 278. I am aware of the statistical perils of comparing a large series with a small one, but the difference is, to say the least, striking. The possible occurrence of cardiac arrest is a constant nightmare to the introducers of new anaesthetic agents, especially as animal experiments are not of great value in this respect. It may be that "fluothane" will prove to be a safer non-flammable inhalation anaesthetic and analgesic than trichlorethylene, but time alone will tell. Meanwhile it is desirable to keep a sense of proportion.—I am, etc.,

London, E.C.1.

C. LANGTON HEWER.

REFERENCE

- 1 *Chloroform—A Study After 100 Years*, 1951, edited by R. M. Waters. University of Wisconsin Press.

Bolus Obstruction

SIR,—Recent interest in bolus obstruction prompts me to record a recent case.

A man of 67 gave a history of mild pain in the left umbilical and lumbar regions for 48 hours, which had for the past 24 hours been more severe, colicky in nature, and had moved across the centre of the abdomen. The patient did not vomit, nor, however, did he pass flatus. On examination he was found to be tender to the left of the umbilicus; there was no distension, but the bowel sounds were high-pitched and excessively frequent. An x-ray confirmed the existence of a low small-gut obstruction. Five and a half years previously the patient had a lesser curve gastric ulcer treated in another hospital by Billroth I gastrectomy. The operation note remarked, "Good stoma." Laparotomy was performed and a considerable amount of free fluid was present. The small intestine was obstructed by a sausage-shaped food bolus 7.5 × 2.5 cm. situated about 1 metre proximal to the ileocaecal valve. This bolus was gently "milked" into the caecum, where it was broken up. A normal Meckel's diverticulum was noted just proximal to the obstruction. The post-operative recovery was uneventful. After careful questioning post-operatively the patient remembered eating an orange somewhat voraciously on the day of onset of symptoms. The obstructing bolus could well have been orange pith.

This case emphasizes the importance of surgeons ascertaining that patients subjected to gastrectomy are equipped with adequate teeth or dentures which they use. Miss Irene S. Cade and Mr. G. Qvist (*Journal*, April 20, p. 948) and Dr. J. T. Corbett (*Journal*, March 2, p. 524) in earlier correspondence have already stressed the importance of adequate mastication, especially following gastric surgery.—I am, etc.,

Leicester.

WILLIAM J. GALL.

B.C.G. Vaccination on Christmas Island

SIR.—The total population of Christmas Island is employed in the phosphate industry, except for a limited few who are employed as servants. A complete medical service is provided by the employer. B.C.G. vaccination was performed for the first time in August, 1955, and applied to the age groups ranging from 6 months to 20 years. It is intended that further vaccinations shall be carried out this year on those who did not undergo Mantoux conversion, or have lost their induced allergy to tuberculin, or have not been vaccinated previously. This year the population is greater by 900 persons, and I am fortunate in having the help of another medical officer. Supplies of tuberculin and B.C.G. vaccine were obtained from the Ministry of Health in Singapore.

The vaccinations were carried out on almost all members of the group selected. Figures for total child population are quoted and these approximate to the total number of persons in the group vaccinated. The population statistics for the month of August, 1955, were as follows:

Europeans		Chinese		Malay		Total
Male	Female	Male	Female	Male	Female	
19	19	328	315	114	94	889

Results of Mantoux Tests and Vaccinations			
Number Tested	Positive	Negative	Vaccinated
776	79	697	558

All results were recorded on the individual medical record cards. Tuberculosis is a problem of no great magnitude here and does not need more than the medical facilities which already exist, which include help from Tan Tock Seng Hospital in Singapore at stages needing more than chemotherapy and sanatorium regime.

The main interest, to my mind, is the fact that such a programme as this could be carried out within any general-practitioner unit. By the latter term I mean that unit comprised by the doctor and that doctor's patients. The unity becomes more real with each succeeding year, as all co-operate in maintaining the health of the unit.—I am, etc.,

Christmas Island.

E. R. BLAY.

Post-maturity

SIR.—With reference to Professor F. J. Browne's article (*Journal*, April 13, p. 851) and Mr. J. McClure Browne's letter (*Journal*, April 27, p. 1005), when considering induction for post-maturity, one factor that never is listed in hospital statistics, but greatly concerns the general practitioner, is maternal fatigue. The last weeks of any pregnancy are very tiring for the housewife, especially if she has an energetic toddler. When this "heavy" period is prolonged for two or three weeks the strain becomes almost intolerable. The slightly larger child and possibly longer labour add to the strain. I think of one patient whose second baby was allowed to go three weeks over term. Labour was very long, although obstetrically normal. The baby weighed 11 lb. (5 kg.). It was eight or nine months before the mother felt really fit. Her next two pregnancies miscarried. When she did achieve a full-term pregnancy the baby was induced at term. Labour was short and easy. The baby weighed 7 lb. (3 kg.). The mother regained her vigour in five or six weeks, although her life was much harder, in other ways, than it had been after the birth of number two. Possibly it is a coincidence that the first and third children born at term have always been exceedingly fit, while the second child has never been a really robust person.—I am, etc.,

London, W.8.

ROSAMOND BISCHOFF.

Obituary

W. V. COPPINGER, C.I.E., D.S.O., M.D., F.R.C.S.I.

Major-General W. V. Coppinger, formerly Surgeon-General under the Government of Bengal, died at his home at Midgham Green, near Woolhampton, Berkshire, on April 9. He was 82 years of age.

Walter Valentine Coppinger was born in Dublin on March 1, 1875, the son of a barrister, and studied medicine at Trinity College, Dublin, where he was a gold medallist and senior moderator in natural science. Graduating M.B., B.Ch. in 1897, he proceeded to the M.D. two years later. After graduation he held the appointment of house-surgeon at the Mater Misericordiae Hospital, Dublin. From 1900, when he entered the Indian Medical Service, until the outbreak of the first world war in 1914 he served as a district civil surgeon in various parts of Bengal and Assam and as a member of the staffs of the Calcutta and Rangoon general hospitals. He took the F.R.C.S. of Ireland in 1909. During the first world war he was employed on the Indian frontier and in Mesopotamia, being mentioned in dispatches. He was awarded the D.S.O. in 1918.

From 1918 to 1928 Coppinger was professor of ophthalmic surgery at the Medical College Hospital, Calcutta, and superintendent of the Mayo Hospital, and he then became inspector-general of civil hospitals in the Central Provinces. In 1930 he was appointed C.I.E., and in the same year became Surgeon-General under the Government of Bengal, a post he held until he retired from the I.M.S. in 1933. He was president of the Calcutta Branch of the British Medical Association in 1932-3. He is survived by his wife, formerly Miss Margaret M. O'Kelly, whom he married in 1910 and by whom he had one son and one daughter. He was the elder brother of Colonel F. R. Coppinger, late R.A.M.C., and Rear-Admiral R. H. Coppinger.

JOHN ARMSTRONG, M.D., F.R.C.S.I.

By the death of Dr. John Armstrong on April 1, Northern Ireland has lost one of its best-known and most respected figures and Ballymena one of its most loyal citizens. He was in his 80th year.

John Armstrong was born on December 11, 1877, and received his early education at the Belfast Royal Academy, going on to Queen's College, as it then was, in 1895. After a year in the faculty of arts, as was the custom with all matriculated students, he entered the medical school, obtaining his clinical training in the old Royal Hospital in Frederick Street. In 1902 he graduated M.B., B.Ch., with honours, from the former Royal University of Ireland. After graduation Professor Johnson Symington invited him to become demonstrator in anatomy, and he soon obtained his Primary Fellowship of the Royal College of Surgeons in Ireland, taking the final in 1907. He had proceeded to the M.D. in the previous year.

S. T. I. writes: When the young John Armstrong entered general practice at Ballymena in 1903 he can hardly have foreseen what fate held in store for him. The beginning of the century was the time when medicine was only just emerging from an age of empiricism and the study of living pathology in the operating theatre was replacing the pathology of the mortuary. The surgeon was for the first time demonstrating to the naked eye the early and curable stages of disease, especially those within the abdomen. No doubt Armstrong held the view which was then prevalent that so far as the foreseeable future in medicine was concerned surgery held the key. He took his first steps in surgery by using the beds in the cottage hospital. Within its limited capacity it was a very pleasant place in which to work. But a wider vista was opening, for plans were in existence for

the building of the new Waveney Hospital in the town, and it seems certain that he saw clearly the opportunities which this would offer. When it was opened in 1914 with its 185 beds, the sole medical appointment was that of the man who had held the post in the old infirmary. He made no pretence of being a surgeon, and surgery was going to be an essential feature of the hospital from its very beginning. The committee of management thus found itself in a quandary, but Armstrong stepped into the breach and became the unofficial, and almost unpaid, surgeon to the Waveney. He was in fact the first honorary surgeon, in the best meaning of the term, to a hospital in Northern Ireland outside the city of Belfast.

It was at this time, too, that the first world war broke out, and the recently opened Waveney Hospital became a military hospital and almost its first admissions were war casualties from France. Armstrong became its civil surgeon and was responsible throughout the war for dealing with the varied and often difficult problems which these cases presented. This greatly widened his experience of surgery and entitled him henceforth to be considered a general surgeon—at a time when this term bore no reproach. The post of surgeon which he then attained he held for the remainder of his professional life, giving generously of his operative skill and knowledge to all the people of the district without thought or prospect of reward. I use this phrase advisedly, and the truth of it will be apparent when it is told that upon retirement it was only after a legal battle that he was given a miserably inadequate pension.

But Armstrong was more to the profession in Ballymena than merely the surgeon to the hospital. He set a high standard of scientific medicine in all departments of medical practice, and his precept and example were of inestimable benefit to the town in general. John Armstrong's main attributes were ability, industry, and modesty. He served the Waveney Hospital with unswerving devotion for more than half a century. But in his early days great difficulties surrounded the surgeon working in isolation in Ballymena. The Waveney was not then the well-equipped institution which it is to-day. It is true there was an x-ray plant—but no technician to use it. Anaesthesia was still at the "rag-and-bottle" stage and there were none of the ancillaries now considered essential and which to-day make surgery straightforward and comparatively easy. And so we find that in order to practise his specialty our young surgeon had also to keep himself competent in radiology, anaesthesia, and bacteriology. His hospital duties were carried out for years by day and by night without fully skilled assistants and for such a scanty remuneration that he had at first to combine surgery with general practice. His time was so fully occupied with his work that he had little left for hobbies, but he was a competent photographer, first in black and white and later in colour. When he retired in 1949 he took up painting with very considerable success, but his absorbing interest in later years was that of the new geriatric unit at the Braid Valley Hospital, which was a pioneer venture in Northern Ireland. He was chairman of the committee of management from its foundation, and it was while showing a deputation over the hospital that he was struck down by his final illness—an extensive haemorrhage from an oesophageal varix.

Dr. Armstrong's wife was Dr. Maria Rowan, whose father and grandfather had been doctors in general practice in County Down. The Armstrongs had a family of five sons and one daughter, all but one of whom were graduates in medicine in Queen's University: James Rowan is an orthopaedic surgeon in London; Arthur is anaesthetist to the Mid-Ulster Hospital; Jack and Sydney are in general practice; and his daughter, Moira, who was in general practice in Ballymena, died some years ago. His fifth son, Edward Brian Armstrong, is a physicist holding a lectureship at Queen's and working at the research establishment at Armagh Observatory.

Armstrong served on many professional committees. From 1927 to 1939 he was a member of the Council of the British Medical Association, and from 1927 to 1936 a mem-

ber of the Irish Committee. In 1926-7 he was chairman of the Belfast Division and in 1933-4 president of the Northern Ireland Branch. From its foundation in 1939 he was a member of the Northern Ireland Council for Orthopaedic Development.

CHARLES LAMPLOUGH, M.D.

Dr. Charles Lamplough, who was in general practice at Gosport, Hampshire, for over forty years, died in Gosport War Memorial Hospital on April 7, a few days after a fall in which he sustained a fractured hip and humerus. He was 84 years of age.

Charles Lamplough was born at Wetwang, Yorkshire, on November 13, 1872, and was educated at Leamington College and at Mason College, Birmingham, from which he went on to St. Bartholomew's Hospital. Qualifying M.R.C.S., L.R.C.P. in 1895, he took the Brussels M.D. three years later. After qualification he held the appointment of resident medical officer at Marylebone Infirmary, and then became senior house-physician and, later, resident medical officer at the City of London Hospital for Diseases of the Chest. He first went into practice at Chatteris, in the Isle of Ely, where he was also medical officer of health to the urban district council, but in 1904 he settled at Gosport as a young married man, taking over a practice which he greatly increased in the course of time. In 1908 he was joined by his brother, the late Dr. Wharram H. Lamplough, and, some years after the first world war, by Dr. N. L. Russell. After the war, in which he served as a captain in the R.A.M.C. at the 5th Southern General Hospital at Portsmouth, Dr. Lamplough was one of the most active supporters of the project to build a hospital at Gosport, and when the War Memorial Hospital was completed he became an honorary consulting physician and a vice-president. At the hospital he instituted a medical committee which has helped to maintain a very friendly atmosphere among Gosport doctors. Kindly and charming in manner, he was an excellent diagnostician, and was especially interested in diseases of the chest. He published a paper on the treatment of tuberculosis in this *Journal* sixty years ago. He retired from practice in 1947. For recreation, Dr. Lamplough had a shoot in the Meon valley, but his great hobby was rose-growing. He was amateur champion rose-grower in 1919, 1920, and 1921, and later acted as a judge for the National Rose Society. The Mrs. Charles Lamplough rose is called after his wife, who survives him, together with two sons and a daughter.—D. C. M.

J. L. HAMILTON, M.C., T.D., M.D.

Dr. J. L. Hamilton, who had had a distinguished career as a Territorial officer, and who had also rendered many years of valuable service to the St. John Ambulance Brigade, died on April 24. He was 68 years of age.

John Livingston Hamilton was born at Great Missenden, Buckinghamshire, on January 29, 1889, the eldest son of Lieutenant-Colonel D. L. Hamilton, R.A.M.C., and was educated at Epsom College and at Downing College, Cambridge. Receiving his clinical training at the London Hospital, he qualified L.M.S.S.A. in 1915, and then held the appointment of senior house-surgeon at the Albert Dock Seamen's Hospital. Soon afterwards he entered the R.A.M.C. as a lieutenant, and saw service during the first world war in Egypt, Palestine, and Syria, and was wounded. In 1917 he was awarded the Military Cross. After the war Hamilton returned to London, and held the appointments of resident anaesthetist, senior clinical assistant, and receiving-room officer at the London Hospital. For a time he was in partnership with his father in North London, but in 1921 he set up in practice on his own account in the Kingsland Road. While there he also acted as public vaccinator for the south-west district of Shoreditch and as honorary medical officer to the Mission of the Good Shepherd, in Harman Street. In 1928 he moved to Chingford, where he stayed

for a few years until he finally settled at Colchester in 1933. He obtained the Durham M.D. in the previous year.

Hamilton had been associated with the Territorial movement for close on forty years. Returning from the first world war with the rank of captain, he was promoted major in the early 'twenties, lieutenant-colonel in 1932, and brevet colonel four years later, retiring from the Territorial Army in 1949. He was awarded the Territorial Decoration in 1927, and four clasps to the decoration in 1950. During the second world war he was at different times A.D.M.S. of the 54th and 38th divisions and officer commanding the 37th and 55th general hospitals. Last year the Queen approved his appointment as honorary colonel of the 21st General Hospital. Since 1922, when he became an examiner, he had given similar devoted service to the St. John Ambulance Brigade. Appointed divisional surgeon in 1926, he became county surgeon for Essex in 1932. From 1937 to 1950, when he relinquished the appointment, he was county commissioner. In recognition of his services he was appointed a Knight of the Venerable Order of St. John of Jerusalem, and he received the service medal with two bars. He had been a deputy lieutenant for the county of Essex since 1950, a past president of the Colchester Medical Society, and chairman of the North-east Essex Division of the British Medical Association in 1948-9. He is survived by his widow, formerly Miss Winifred M. Gunningham, whom he married in 1922, and two sons.

STEWART HUNTER, M.B., F.R.C.S.Ed.
M.R.C.P., D.C.H.

Dr. Stewart Hunter, who practised in Christchurch, New Zealand, died on March 19, aged 54.

Stewart Hunter was the son of a doctor, and studied medicine at the University of Otago, graduating M.B., Ch.B. in 1925. After graduation he held the appointment of house-surgeon at Ashburton Hospital before coming to Britain for postgraduate study. He spent two years in Scotland, taking the Fellowship of the Royal College of Surgeons of Edinburgh in 1928. Later he worked at the Rotunda Hospital, Dublin, and the Chelsea Hospital for Women. During the second world war he served with the New Zealand Medical Corps, and after demobilization returned to London to take the M.R.C.P. and the D.C.H. of the English Royal Colleges, both in 1947. On return to New Zealand he became assistant obstetrician at St. Helen's Hospital, Christchurch, and assistant physician in paediatrics at Christchurch Hospital. Dr. Hunter was honorary secretary of the Canterbury Division of the B.M.A. from 1937 to 1942 and president of the New Zealand Branch in 1948-9.

A. C. NORMAN, C.B.E., M.D.

Dr. A. C. Norman, formerly professor of radiology in the Royal College of Medicine, Bagdad, died at his home at Tillingham, Essex, on April 23. He was 75 years of age.

Alfred Clarence Norman was born at Shepton Mallet, Somerset, on August 20, 1881, the son of a well-known farmer, and was educated at Tewksbury, Bromsgrove, and Edinburgh University, where he graduated M.B., Ch.B., in 1908. After holding a number of resident appointments, including one at the Sunderland Eye Infirmary, he decided to specialize in ophthalmology, and proceeded to the M.D. in 1911 with a thesis on miners' nystagmus. Later he turned to radiology, in which he had always taken a keen interest. As a student he spent much of his spare time in the x-ray department of Edinburgh Royal Infirmary. In August, 1914, he published a handbook entitled *Practical Medical Electricity*, which was very well reviewed by the medical press. Commissioned into the R.A.M.C. in 1914, he served as a radiologist in India and Mesopotamia, and in the following year was appointed consulting radiologist to the Mesopotamian

Expeditionary Force. At the end of the war he joined the then infant medical service of Iraq, which later became the Iraq Health Service. He founded the x-ray Institute of Iraq in Bagdad and was its director until his retirement in 1948. Responsible for its development from the lowest minimum into a well-organized and up-to-date institution, he trained staff and arranged for the provision of equipment for the many off-shoots of the institute in the provincial hospitals. On the formation of the Royal College of Medicine at Bagdad he became professor of radiology. For his services Norman was appointed O.B.E. in 1931 and C.B.E. in 1942. He was also awarded the Order of Al-Rafidain (class III, civil division). After his retirement he settled at Tillingham, where he died after a prolonged illness. He was a keen golfer and in his time a first-class shot. He is survived by his widow and two sons.—W.D.

M. J. McCORMACK, M.R.C.S., L.R.C.P.

Dr. M. J. McCormack, who had been in general practice at West Ham for many years, died on April 28, after a long illness, at the age of 51.

Michael Joseph McCormack was born on September 21, 1905, at West Ham, where his father, the late Dr. James McCormack, had been in practice for over fifty years. He was educated at Beulah Hill College, Norwood, and at St. George's, Weybridge. He studied medicine at the London Hospital, qualifying M.R.C.S., L.R.C.P. in 1933. After holding hospital appointments for two years, he went into partnership with his father at West Ham, where he remained until his death. He took a full share in the organization work of the profession, serving on the old local medical panel committees, and presiding over the local medical committee in more recent years. Up to his death he was a member of the local executive council. An active supporter of the B.M.A., he was chairman of the Stratford Division in 1952. For some years he had been a member of the board of governors of St. Bonaventure's and St. Anthony's schools, Forest Gate, and he was also a syndic of the Franciscan Friary there. He leaves a widow, one son, and one daughter.

Dr. J. W. DIGNAN writes: Dr. M. J. McCormack, during his long association with West Ham, gave over twenty years of devoted public service in an unobtrusive manner. He was a man who liked the simple way of life, and although he served on many important medical committees he never sought the limelight or high office: but he was a very shrewd observer, and a delightful man to work with. He loved his patients, particularly children, and his sincerity, quiet efficiency, and sustained interest in everything he undertook made him an ideal confidant. He delighted to watch motor-racing and cricket, and to play a little golf, but most of all he loved to talk with his colleagues about everyday affairs. He was a devout Roman Catholic and a staunch supporter of the Guild of St. Luke, SS. Cosmas and Damian, being master of the Brentwood branch in 1951 and again in 1955. It may be truly stated that he commanded the respect and affection of all who knew him.

E. C. EROKWU, M.R.C.S., L.R.C.P.

Dr. E. C. Erokwu, senior medical officer of the Eastern Nigeria Ministry of Health, died at Park Lane Hospital, Enugu, on March 10, nine days before his 43rd birthday.

Dr. C. NWOKOLO writes: Edward Chukwunwike Erokwu was born on March 19, 1914, the son of a court clerk. He showed great promise early in his life and won a scholarship to Government College, Umuahia. After a brilliant secondary school career he was again awarded a scholarship to study medicine in the old School of Medicine of Nigeria at Yaba. In 1939 he qualified as an assistant medical officer, with honourable mention in surgery. Those were the days when the local graduate occupied an inferior place

to his colleague trained overseas, and Erokwu at once set to work to rectify this anomaly. He knew that recognition would come to the "Yaba Doctor" only by honest hard work and dignified behaviour: in this respect he and his colleagues were not found wanting. Indeed, it was largely as a result of the high standard set by Erokwu and his colleagues that the efficiency of the local graduate came to be accepted by all, and when the agitation came for better recognition the general public were unequivocal in their support. Erokwu led several delegations in this fight for recognition, but the most fruitful was the one before the Elliot Commission for Higher Education in the Colonies in 1944. He outlined his case with characteristic lucidity, and there can be no doubt that the commission was favourably impressed, for soon afterwards the General Medical Council announced its concession to enable the graduates of the School of Medicine of Nigeria to obtain qualifications registrable in the United Kingdom and so opened the door to higher qualifications. With the battle won, Erokwu was given a Government scholarship, and, with a view to specializing later in surgery, he took the London Conjoint Diploma in 1951.

Erokwu was a well-built man of dignified appearance. Kind and reliable, he was a most consistent and dogged fighter when convinced about the rightness of a cause. Though often engaged in battles for the betterment of his profession, he was a very clean fighter and despised recklessness and irresponsibility. He was always prepared to consider both sides of a case, and this level-headedness earned him the respect of his friends and opponents alike. It is not surprising that he was elected chairman of most organizations to which he belonged. He believed that the African should be second to none in integrity, dignity, and discipline, and he believed that local conditions should encourage nothing but the highest ethical behaviour. His shining personal example was an eloquent expression of these beliefs.

Professionally, he was interested in surgery, and it was a pleasure to watch his well-proportioned fingers moving swiftly and skilfully at the operating table. When a few years ago he was called on to accept an administrative post it was with regret that he gave up surgery, but he accepted it in good part because it was a national call.

"Eddie," as he was popularly called by his friends, was a very sociable figure, but he was happiest when with his colleagues discussing old school days and entertaining everyone with his inexhaustible stock of timely jokes. His health began to fail about five years ago, and he knew then that he was suffering from a disease for which medical science has found no lasting answer. It is remarkable that in spite of this knowledge of his fate he continued to give his best for the service of his country and his people. Many would have retired broken-hearted, but he stood up to his misfortunes like a man, and two days before his death he still discussed freely the welfare of his department and his colleagues. This was characteristic of the man. He was always selfless and courteous, and always put others before himself.

By his death the eastern region of the Nigeria Branch of the British Medical Association, of which he was an active member, has lost its most dynamic exponent of professional dignity, and Nigeria is infinitely poorer for his untimely loss. He is survived by his widow and six children, to whom goes the heartfelt and profound sympathy of his many colleagues and friends.

RAYMOND GAUTIER, M.D.

Dr. Raymond Gautier, Research Director for the International Children's Centre in Paris, and a former Assistant Director-General of the World Health Organization, died recently in Geneva at the age of 72.

Raymond Gautier was born in Geneva on January 7, 1885, and after graduating in medicine at Basle in 1915 he was appointed an assistant in the institute of pathological anatomy there. Two years later he left to become first assistant in

the physiological laboratory at the University of Geneva. Here he gained the Bizot award for his research on the cerebrospinal fluid and his enunciation of the concept of the "blood-brain barrier." As director of the university institute of hygiene and bacteriology at Geneva he carried out research on bovine fluorosis. In 1924 Gautier joined the League of Nations Health Organization, where he was at first concerned with biological standardization. From 1926 to 1930 he was director of its Eastern Office at Singapore, where he established a radio service of epidemiological information. Returning to Geneva in 1930, he devoted his full time to biological standardization and published some important studies. In 1939 he became Acting Director of the Health Section of the League, and from 1942 until the end of the war he was entrusted with missions to London and Washington for the purpose of organizing public health in the liberated territories of Europe. On the establishment of the World Health Organization Interim Commission in 1946, Gautier became Counsellor and, later that year, Director of the Geneva Office; in 1948 he was appointed Assistant Director-General of the permanent Organization. His retirement in February, 1950, did not mean the end of his career, for he became research director for the International Children's Centre, then recently formed in Paris by the French Government for the promotion of infant and child welfare at international level.

Raymond Gautier was a member of the Senate of the Swiss Academy of Medical Sciences and an honorary member of the Epidemiological Section of the Royal Society of Medicine. Besides his studies on biological standards, he published numerous works on epidemiology and immunology, but his greatest contribution to medicine was as an international health administrator, who, on the occasion of his retirement, was described as "truly the soul of the World Health Organization."

JEKABS ALKSNIS, M.D.

Dr. Jekabs Alksnis, formerly professor of surgery in the University of Riga, died at the German Hospital, London, on March 7. He was 86 years of age.

Jekabs Alksnis was born in Latvia on August 22, 1870, the son of a carpenter. He studied medicine at Dorpat University in Estonia, then a Russian province, where he qualified in 1895 and later obtained his degree of M.D. From 1897 until 1910 he served as a surgeon in the Russian army, being attached to the Academy of War Medicine in St. Petersburg from 1903 to 1907, and taking part in the Russo-Japanese war of 1905-6. In 1910 he left the army to take up private practice at Liepaja, Latvia. He was a general surgeon who subsequently specialized in urology and later interested himself largely in surgery of the thorax. Whereas in the first world war he was surgeon-in-chief of several Russian military hospitals he became leading surgeon and medical inspector of the Latvian forces when Latvia became an independent state in 1918. In 1920 he was appointed professor of surgery and director of the surgical clinic of the Latvian University of Riga, a post which he held until 1940. During his tenure of office he was also dean of the faculty of medicine, founder and editor of the *Latvian Medical Journal*. During the second world war, when Latvia was overrun in succession by the Germans and the Russians, his properties were confiscated and he was forced to return to private practice to earn a living. In September, 1944, he escaped from communist Latvia and worked, at the request of the French and American authorities, first at the displaced persons camp at Mulhouse and later at a similar camp at Blomberg, in Germany. In both places he earned the highest praise from the respective governments. Finally, in August, 1948, he sought refuge in England, where he stayed with his daughters until his death.

Dr. Alksnis was the author of a large number of scientific papers in the Latvian, Russian, and German languages. He

travelled extensively and visited the universities of most European countries. The Lithuanian University of Kaunas conferred on him an honorary degree, and the Finnish and Estonian medical societies elected him an honorary member. Over forty of his former pupils, including his son, are practising in exile or in occupied Latvia. A Professor J. Alksnis Scholarship for medical students has been created by the Latvian Medical Association in exile to perpetuate the memory of their eminent master. His unselfish devotion to his suffering Baltic compatriots gained him the admiration and affection of everybody. His greatness was matched by a rare nobility of character and unusual modesty.—H. R.

G. MONTUS, M.D.

Dr. G. Montus, deputy director of the World Health Organization's regional office for Europe, died in Geneva on April 1. Gérard Montus was born in 1902 at Carry-le-Rouet, near Marseilles, and graduated in medicine at Montpellier University. After postgraduate study in Paris at the Pasteur Institute and at the university, he took a degree in public health. For some time thereafter he was in charge of the children's clinic at the University of Marseilles, and later became departmental director and then regional director of health at Marseilles, and director of child health at the Ministry of Health in Paris. Dr. Montus was a member of several French delegations to the World Health Organization and its Interim Commission. He joined W.H.O. in 1949 as European regional adviser on maternal and child health, and later became chief of the headquarters social and occupational health section. In 1952 he was appointed deputy director of the regional office for Europe, and after the death of the Director, Dr. Begg, in 1956, he took over the direction of the office until ill-health forced him to relinquish his duties.

W. L. HARNETT, C.I.E., M.D., F.R.C.S.

J. B. H. writes: The death of Lieutenant-Colonel W. L. Harnett, whose obituary was printed in last week's *Journal* (p. 1067), removes one of the most distinguished officers of the late Indian Medical Service, remarkable alike for his work in the Service and after retirement. A surgeon of great judgment and dexterity, he was one of a group of outstanding teachers of surgery in the years between the wars. His influence was felt throughout North-East India and beyond, where he did more than any other man to instil the principles and practice of asepsis. He was a man of great charm and simplicity, always accessible, never hurried or discourteous, and, as the writer of these notes has good reason to remember, always helpful to juniors whom he considered to be keen. His pride and affection for his service were deep; and of late years nothing gave him more pleasure than to meet its members and talk over old days. It was characteristic of him on these occasions that he seldom mentioned his own great contributions to its reputation.

SIR JOHN MEGAW, K.C.I.E., writes: The news of the sudden death of Lieutenant-Colonel Harnett will cause deep sorrow to his many friends—he had no enemies. Few men have been so richly endowed with a natural gift for enlisting the esteem and friendship of everyone with whom he came in contact. There is an element of tragedy in the circumstances that only five days before the funeral at which he died he had been attending another one, that of his very old friend Major-General W. V. Coppinger, I.M.S., though for himself the sudden end was not a tragedy but a blessing. Harnett served with great distinction, especially in the last years of his career in India, and he would certainly have been selected for a high administrative appointment if it had been possible for him to delay his retirement. The award of the distinction of C.I.E. was universally regarded as a fitting recognition of his outstanding work as professor of surgery at the Medical College of Calcutta, where he was equally successful as a teacher and a highly

skilled surgeon. He was one of the most distinguished of the many able alumni of the great London hospitals who occupied this post and did so much to maintain high standards of surgery in Calcutta and eastern India.

FREDERIC DURAN-JORDA, M.D.

The obituary of Dr. Frederic Duran-Jorda was printed in the *Journal* of April 20 (p. 953).

B. H. writes: I was among the first to meet "Frederico" in his laboratory technician days at Ancoats Hospital. I shall never forget the charm of his personality, the cheerfulness that radiated from him, the dynamic energy, the smile, originating from Hispanic sunshine, that even Manchester fog could not subdue. He had fought for what he thought was right, had lost everything, and then had had to start all over again, from a lab-boy position (or bottle-washer, as he would describe it with a smile), and then he would tell me without any bitterness of the degradation and humiliation of the refugee before he is accepted. His smile was for all, even for the most junior of his staff, who all worshipped him. Here was a man whose personality was completely emancipated from the virus of prejudice of any kind. I shall miss his "Amigo mio." He was finally doomed to die from a blood disease whose remorseless advance he knew, as it came within his own specialty, and yet in spite of this knowledge he carried on with his work till a couple of days before his death. Verily, *Sunt lacrimae rerum et mentem mortalita tangunt*. My deepest sympathy goes out to his wife and children.

R. H. DALE, M.B., F.R.C.S.Ed.

The obituary of Dr. R. H. Dale was printed in the *Journal* of April 13 (p. 887). The following appreciation was given by Professor ERIC M. NANSON, professor of surgery in the University of Saskatchewan, at the opening of surgical "grand rounds" on April 6.

"This morning I wish to speak to you about Dr. Robin Dale, who died suddenly last Tuesday and whose funeral will take place this afternoon. I purposely did not cancel these 'grand rounds' because I wanted to take this opportunity to speak to you about Dr. Dale, and because I felt that he would have preferred us to continue with our rounds as usual and for you to feel that he was with us in spirit as we carried on with our discussions. As you know, he was a regular attendee of these surgical rounds and contributed much to our discussions from his broad knowledge. I feel that I can speak on three counts about Dr. Robin Dale. First as a friend and colleague: I was very fond of him, and he often used to visit our house and have a meal with us. I got to know him reasonably well and admired him tremendously. Secondly, as a surgeon I can speak of him, as he and I operated on several cases together. He was a most pleasant colleague to work with, and he was a most able surgeon. I had a great admiration for his judgment and his ability, and we in this university and in this department of surgery are going to miss his ability in the field of plastic surgery a great deal. Thirdly, I can speak of him as a teacher. I often used to call upon him to give lectures and clinics to the students, and he was always willing to do so and never turned me down. He prepared his lectures with great care. He was not a fluent speaker; if anything, he tended to be somewhat hesitant, but the material which he presented and the order in which he presented it, and the clarity with which he presented it, were indeed excellent, and the students who have listened to him, I am sure, will remember him always and be grateful to him. On these three counts, therefore, I feel confident to express the deep regrets of the department of surgery on the untimely death of our colleague Dr. Dale, and I would therefore ask you to rise for a minute's silence to express our sorrow at his passing."

Medical Notes in Parliament

Strontium Contamination

Mr. HECTOR HUGHES (Aberdeen, North, Lab.) called attention on May 3 to the necessity of preserving world food supplies from contamination by strontium-90 released in nuclear bomb tests. He asked what was being done by the British Government, alone or in conjunction with others, to protect people from the dangers of this infection, and urged that it was the duty of any Government undertaking these tests to provide protective measures.

Mr. J. GODBER, Parliamentary Secretary, Ministry of Agriculture, Fisheries and Food, said the danger of contamination of fish from the gradual fall-out from the upper atmosphere was negligible. In 1956 the Agricultural Research Council embarked on a field trial at Compton Research Station of the uptake of strontium from the soil by barley, grass, and sugar beet, using strontium-89. This experiment provided fundamental knowledge in the event of agricultural land becoming contaminated by nuclear attack or by an accident at an atomic power station. The results had not been published, but he could say that the uptake of strontium by the plants grown was less than 1% of the amount put down. The trial was being extended this year to various experimental husbandry farms of the Ministry, and five different types of soil had been chosen. Crop and soil samples would be taken during the growing season, and it was hoped that a report on the results would be available before the end of the year.

The Atomic Research Establishment at Harwell, in co-operation with the Ministry of Agriculture, had been for some years carrying out investigations to show the uptake of strontium-90 from the soil and in its movement through plants, animal tissues, and milk. Nine sites had been chosen, and samples of soil, grass, animal bones, and milk were taken. The results were being compared with the results of similar work in the United States, and the work was also extended to Commonwealth countries. The seriousness of the possible results of radioactivity must be realized, but it would be wrong to leave the impression that all this work was being done because of any immediate or foreseeable danger to human beings or farm animals.

Strontium Contamination in Wales

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked the Minister of Agriculture, Fisheries, and Food if he had considered the report of the Medical Research Council regarding the heavy contamination of the soil and of green vegetables by radio-strontium in some areas of Wales; and what warning or advice he had issued. Mr. J. GODBER, the Parliamentary Secretary, replying on May 6, said that in a few mountain areas precipitation had been found to be higher than average. The report of the Medical Research Council did not, however, suggest that this was a cause for alarm, and the Minister was advised that the safety margin before there could be any fear of risk to human beings or to animals was a very wide one. The position was being closely watched.

Mr. CLEDWYN HUGHES (Anglesey, Lab.) asked what was the reason for this greater contamination in Wales, and what specifically was being done to watch the situation. Mr. GODBER said he was unable to give any reason. The Government had arranged for tests to be made at regular intervals. It was necessary to find out more about this subject before any more could be said.

Compensation Sought for Dr. Adams

Mr. HECTOR HUGHES (Aberdeen, North, Lab.) asked the Home Secretary on May 2 whether he proposed to award out of public moneys a payment to Dr. Adams, who was wrongly detained in custody for a considerable period on a charge of murder, tried and found not guilty, and discharged;

and whether he would set up a tribunal to hear and determine publicly in a judicial manner on evidence and argument the correct amount to be so assessed and awarded to Dr. Adams. Mr. R. A. BUTLER replied that it was not the practice to make an *ex-gratia* payment from public funds to a person who had been acquitted of a criminal charge unless there had been misconduct or negligence on the part of the police or other public officials. If a defendant was acquitted after trial on indictment the court had power under the Costs in Criminal Cases Act, 1952, to order the payment of such sums as appeared to the court to be reasonably sufficient to compensate the accused for the expenses incurred in carrying on the defence. He understood that the court did not make any order in this case, and he could find no grounds on which he would be justified in making a payment out of public funds.

Mr. ENOCH POWELL, Secretary to the Treasury, told Mr. Hughes that the accounts and claims for fees had not yet all been received. Mr. HUGHES then asked him whether the Treasury intended to pay any part of the expenses for Dr. Adams's defence. Mr. POWELL said he would like to see that question before answering. Mr. SYDNEY SILVERMAN (Nelson and Colne, Lab.) said that, in spite of the expenditure of what must have been a very large sum of money, at the trial the prosecution seemed to be totally unaware of a number of basic and elementary facts which the defence was able to produce. Would the Financial Secretary consider whether the money, whatever sum it was, was wisely and efficiently spent? Mr. POWELL said that the initiation and conduct of the case was a matter not for him but for the Attorney-General.

Freedom to Prescribe Drugs

The EARL OF CRAVEN asked the Government on May 1 if they would consider, in the light of conditions arising out of the case of Dr. Adams, whether the time was appropriate for a review of the laws relating to the use of drugs for medical purposes. Lord STRATHCLYDE, Minister of State at the Scottish Office, said the Government did not consider it appropriate to circumscribe the clinical freedom of doctors to treat their patients in accordance with their individual judgment, except in so far as a doctor's authority to possess or prescribe dangerous drugs might be withdrawn after conviction for an offence under the Dangerous Drugs Act, as might happen at present. The EARL OF CRAVEN then asked if the Government were prepared to sanction euthanasia in any form. Lord STRATHCLYDE said that was a completely different question, of which he would require notice before answering.

Vacancies in the Colonies

Mr. DAVID JONES (The Hartlepoons, Lab.) asked the Secretary of State for the Colonies to what extent there were still vacancies for doctors in the Colonial territories, after the 300 applications which he received each year from qualified doctors already in the Health Service in this country had been appointed to the Colonial medical service and allocated their posts. Mr. A. LENNOX-BOYD stated on May 1 that there were generally some 120 to 150 vacancies at any given time, recruitment being roughly balanced by normal wastage, and, in some cases, by expansion in territorial establishments. By no means all the 300 applicants took up appointments.

He stated in another reply that approximately 45 of the 300 applicants were, on the average, rejected. Of the remainder, about half withdrew their applications or declined offers of appointment. Not all of these applicants were employed in the Health Service.

General Practitioners in Health Service

In reply to Mr. SOMERVILLE HASTINGS (Barking, Lab.), Mr. D. VOSPER stated on May 3 that the number of doctors providing unrestricted general medical services under the Health Service in England and Wales on July 1, 1956, was 20,996. Of these, 19,082 were principals, 1,546 were assistants, and 368 were trainees.

Mental Hospital Superintendents

Mr. KENNETH ROBINSON (St. Pancras North, Lab.) asked the Minister of Health if he was aware of the increasing difficulty in obtaining suitable candidates for the post of physician superintendent in mental and mental deficiency hospitals, owing to the lack of any financial inducement to compensate for the extra responsibilities involved; whether he had considered the views of the Bradbeer and Guillebaud Committees which had a bearing on this subject; and what he proposed to do to remedy the situation. Mr. D. VOSPER replied that he was aware of the difficulty. The level of remuneration of these officers was within the terms of reference of the Royal Commission on the pay of doctors and dentists.

Weekly National Health Contribution

The introduction of separate weekly contributions by all nationally insured people to the National Health Service is the main provision of a Bill published last week. At present about £40m. a year is transferred from the National Insurance Fund to the Health Service. This corresponds to 10d. a week for insured men, 8d. for insured women, and 6d. for insured boys and girls. The Bill provides for these contributions to be doubled, for them to be paid into a separate fund for the Health Service, and in consequence for the contribution of about £40m. from the National Insurance Fund to cease.

Medico-Legal

FAMILY LIMITATION AND DESERTION

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

Mr. and Mrs. Whitehead were married in 1945, when both were in their twenties. They had two children. The elder, a boy born in 1948, subsequently died. Mr. Whitehead wanted further children, but his wife expressed a marked unwillingness, amounting in effect to a refusal, to have any more. Her husband then left, and after leaving her said everything he could to make it clear that his intention to leave her was absolute and permanent. Mrs. Whitehead took out a summons for maintenance against him before the Burnley justices on the grounds of desertion and wilful neglect to maintain, but the justices decided that her refusal to have a third child was a good defence for the husband. Mrs. Whitehead then appealed to the Divorce Divisional Court.

In giving the judgment of the court allowing the appeal¹ the President, Lord Merriman, said that the real question in the case was whether the husband had proved that he had "just cause" for leaving his wife. What the magistrates had found was that the wife's refusal to have a third child, though he would prefer to call it marked unwillingness, was governed by the same principle as refusal to have any children at all. A refusal to have sexual intercourse at all or without contraceptives could, if calculated to injure the husband's health, amount to cruelty and therefore be an answer to any complaint of desertion or wilful neglect to maintain. But to apply that principle where there were children already was a step for which there was no authority. Where was it to stop? At the Scriptural quiverful of three, or at four or at five? It would make havoc of the conception of marriage if after what many people might think a large enough family had been raised the husband could then say: "Thank you very much. You refuse to have any more children. I am now justified in leaving you." That was reducing marriage to an absurdity.

The court held that Mr. Whitehead had both deserted his wife and wilfully neglected to provide reasonable maintenance for her, and ordered that the amount of maintenance should be referred for determination to a different bench of justices.

¹ Daily Telegraph, May 3, 1957.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending April 20 (No. 16) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	7	0	0	0	1	5	1	2	0	4
Dysentery ..	874	36	235	21	6	1,125	187	170	7	3
Encephalitis, acute	4	0		1		6	1		0	
Enteric fever:										
Typhoid ..	4	0	0	0	2	3	0	0	0	
Paratyphoid ..	4	0	1 (B)	0		12	0	1 (B)		1 (B)
Food-poisoning ..	207	16	40	0		166	24		18	
Infective enteritis or diarrhoea under 2 years ..					22				12	12
Measles *	21,787	1767	257	363	220	2,102	83	242	37	207
Meningococcal infection ..	19	2	12	2		18	1	17	4	
Ophthalmia neonatorum ..	31	1	3	0		39	1	3	0	
Pneumonia †	382	29	171	4	13	433	28	192	6	1
Poliomyelitis, acute:										
Paralytic ..	26	16		3	1	15	1		1	0
Non-paralytic ..	4	0			5	6				
Puerperal fever ‡	193	33	5	0		253	35	11		1
Scarlet fever ..	567	55	56	29	18	516	27	50	28	32
Tuberculosis:										
Respiratory ..	551	73	306	17		701	72	130	21	12
Non-respiratory ..	60	7	8	5		88	6	9		
Whooping-cough ..	1,890	93	169	11	38	1,545	75	157	53	129

DEATHS in Great Towns	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	1
Dysentery ..	0	0		0		2	0		0	
Encephalitis, acute		0		0			0			0
Enteric fever ..	1	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	5	0	0	1	0	4	0	1	0	0
Influenza ..	6	0	2	0	1	15	0	0	0	0
Measles ..		0	1	0	0		0	0	0	0
Meningococcal infection ..		1	0				0	1		
Pneumonia ..	230	22	13	3	5	244	38	16	3	9
Poliomyelitis, acute	1	1			1	2	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory ..	55	7	4	2	8	67	5	8	1	2
Non-respiratory ..		2	0	0	0		0	1	0	0
Whooping-cough ..	3	0	0	0	0	1	0	0	1	3
Deaths 0-1 year ..	247	32	25	3	6	213	23	35	11	16
Deaths (excluding stillbirths) ..	5,469	769	559	110	138	5,410	759	622	121	183
LIVE BIRTHS ..	6,601	1032	826	204	345	7,860	1175	929	255	428
STILLBIRTHS ..	195	19	26			236	18	41		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

‡ Includes puerperal pyrexia.

Vital Statistics

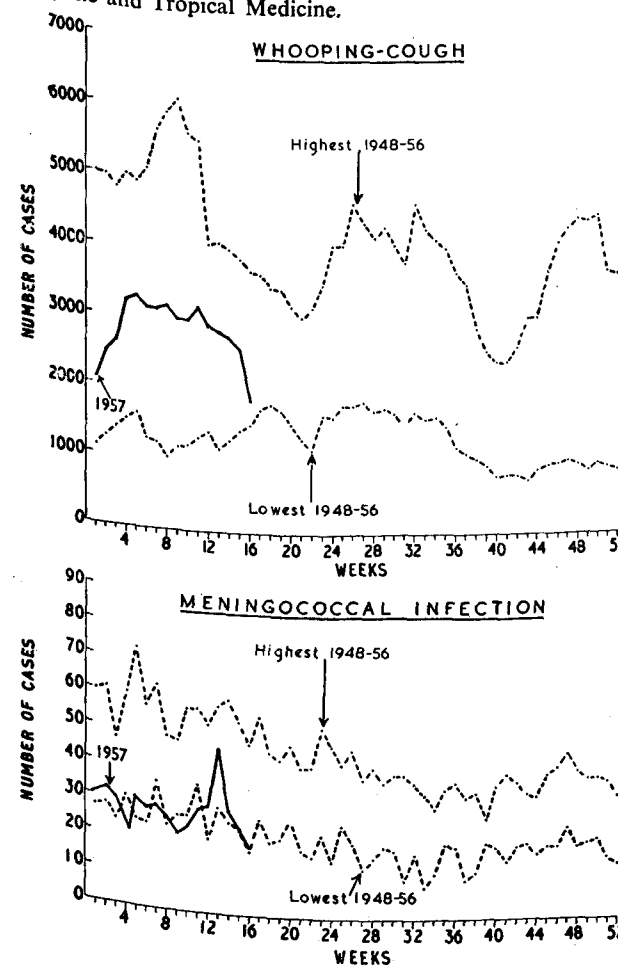
Scotland in 1956

The preliminary return for the year shows that the birth rate for 1956 was 18.5 per 1,000 population. This was 0.5 above the rate for 1955 and was the highest since 1949. The infant mortality rate, at 29 per 1,000 live births, was 1 below the rate for 1955 and the lowest ever recorded. The death rate was 12.0 per 1,000 population, the same as for 1955 and 1954. The 318 deaths attributed to the principal infectious diseases included 262 from influenza, 26 from meningococcal infections, 14 from whooping-cough, 10 from measles, and 2 each from diphtheria, scarlet fever, and typhoid. Deaths from tuberculosis numbered 714 from respiratory and 85 from other forms, and these were 146 and 37, respectively, fewer than in 1955. Deaths attributed to violent causes included 397 to suicide, and 586 to road transport accidents.

In the December quarter of 1956 the birth rate was 17.9 per 1,000 population, and was 0.9 above the average of the five preceding fourth quarters. The infant mortality rate was 30 per 1,000 registered live births and was the lowest for any fourth quarter, being 1 below the preceding lowest level. The death rate was 11.6 per 1,000 population and was 0.1 below the five years' average.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1948-56 are shown thus -----, the figures for 1957 are shown as a solid line. Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

Infectious diseases were less prevalent in England and Wales during the week ending April 20. The falls in the notifications included 5,488 for measles, from 27,275 to 21,787, 726 for whooping-cough, from 2,616 to 1,890, 297 for dysentery, from 1,171 to 874, and 173 for scarlet fever, from 740 to 567.

42 cases of acute poliomyelitis were notified, being 4 more for paralytic and 1 more for non-paralytic cases than in the preceding week. The largest returns were Essex 14 (Brightlingsea U.D. 11, Colchester M.B. 2), London 4 (Lambeth 2), Kent 3 (Beckenham M.B. 2), and Surrey 3 (Malden and Coombe M.B. 2).

The chief exception to the falling trend in the incidence of measles was a rise of 212 in Leicestershire, from 195 to 407, and the main contributors to this rise were 71 in Barrow upon Soar R.D., from 28 to 99, 55 in Castle Donington R.D., from 0 to 55, and 42 in Market Harborough U.D., from 102 to 144. Decreases of 100 or more in the notifications of measles were reported from 13 counties. Within these counties some areas recorded large increases, the principal being 82 in Essex, Romford M.B., from 52 to 134, 73 in Lancashire, St. Helens C.B., from 143 to 216, 67 in London, Lewisham, from 120 to 187, and 59 in Yorkshire West Riding, Dewsbury C.B., from 121 to 180. The largest declines in the notifications of whooping-cough were 65 in Hertfordshire, from 109 to 44, 59 in Yorkshire West Riding, from 145 to 86, 58 in Kent, from 201 to 143, 51 in Glamorganshire, from 94 to 43. 7 cases of diphtheria were notified, being 4 more than in the preceding week; the largest returns were Birmingham C.B. 3, and Hull C.B. 2. A small fall in the incidence of scarlet fever occurred throughout the country; the largest fall was 33 in Middlesex, from 53 to 20.

The chief feature of the returns for dysentery was an increase of 95 in the number of notifications from Surrey. The largest falls were 133 in Yorkshire West Riding, 71 in Lancashire, 51 in Cheshire, and 50 in Nottinghamshire. The

chief centres of infection during the week were Yorkshire West Riding 213 (Bradford C.B. 64, Leeds C.B. 40, Rotherham R.D. 26, Rotherham C.B. 23, Sheffield C.B. 18), Surrey 114 (Chertsey U.D. 108), Lancashire 102 (Liverpool C.B. 17, Manchester C.B. 17, Ashton under Lyne M.B. 14, Blackpool C.B. 13), Northumberland 66 (Longbenton U.D. 31, Seaton Valley U.D. 24), Nottinghamshire 37 (Nottingham C.B. 13, Mansfield C.B. 12), London 36 (scattered through 13 boroughs), Essex 34 (West Ham C.B. 19), Cheshire 34 (Hyde M.B. 19), Kent 33 (Dartford M.B. 16, Chislehurst and Sidcup U.D. 12), Durham 31 (South Shields C.B. 14), Southampton County 26 (Southampton C.B. 13), and Warwickshire 22 (Birmingham C.B. 19).

The largest outbreak of food-poisoning was 67 notifications in Glamorganshire, Cowbridge R.D., and this was the largest outbreak in recent weeks.

Week Ending April 27

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 542, whooping-cough 2,237, diphtheria 7, measles 26,960, acute pneumonia 425, acute poliomyelitis 63, dysentery 570, paratyphoid fever 2, and typhoid fever 5.

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in March was 123, compared with 101 (revised figure) in the previous month and 117 (revised figure) in March, 1956.

The numbers of cases of industrial diseases in the United Kingdom reported during March, 1957, were as follows: lead poisoning 1, phosphorus poisoning 1, epitheliomatous ulceration 10, chrome ulceration 18, total 30. There were no deaths.—*Ministry of Labour Gazette*, April, 1957.

Northern Ireland in 1956

The Registrar-General for Northern Ireland reports that in 1956 the general death rate, infant mortality rate, and tuberculosis death rate were the lowest ever recorded. As elsewhere, the cancer death rate for males increased.

The birth rate was 21.1 per 1,000 population, an increase of 0.3 over that for 1955. The general death rate was 10.6 per 1,000 live births. The death rate from cancer for males rose from 155 per 100,000 male population in 1955 to 162 in 1956. The corresponding rates for females were 157 and 154. The increase in the rate for males was mainly due to deaths from lung cancer and to a less extent to deaths from cancer of the stomach. Since 1946 male mortality from lung cancer has increased by 210%. The death rate from tuberculosis was 12 per 100,000 population. No deaths from diphtheria were registered.

Universities and Colleges

UNIVERSITY OF OXFORD

Dr. E. D. Acheson has been elected to a Radcliffe Travelling Fellowship.

UNIVERSITY OF CAMBRIDGE

In Congregation on March 23 the following degrees were conferred:

M.Chir.—C. H. Talbot (by proxy).
M.B.—S. J. Steele, D. E. R. Bateman, W. M. A. Wright.

UNIVERSITY OF LONDON

Professor B. S. Platt has been nominated as representative of the University on the governing body of the National Society's Training College of Domestic Subjects, and Dr. Aubrey Kagan as representative on the governing body of the Holland Park Secondary School.

The Paul Philip Reitlinger Prize for 1956 has been awarded to Lionel Edgar Thomas (King's College Hospital Medical School).

Medical News

World Red Cross Day.—May 8, the 129th anniversary of the birth of Jean Henry Dunant, the Swiss philanthropist and founder of the Red Cross movement, was celebrated as "World Red Cross Day." When it began the Red Cross was almost entirely confined to the treatment of those wounded in war, but to-day, states LORD WOOLTON, chairman of the British Red Cross Society, the peacetime demands on it are almost as great as those in times of war. Lord Woolton appeals for both money and more members. "Helping in inter-nation disasters, providing nursing and education, work in the Colonies—where we have 47 branches—is costing the British Red Cross £70,000 a year more than its income," he states, "and for my part I do not know where we could withdraw or withhold the help we give." Describing the Society's work, Lord Woolton tells of the setting up of a new organization, the Radio Amateur Emergency Network, to deal with breakdowns in communications as occurred during the East Coast floods in January, 1953. It is a co-operative venture between the G.P.O., the Red Cross, and the Radio Society of Great Britain.

Clinical Genetics Research Unit.—The Medical Research Council announces the establishment of a Clinical Genetics Research Unit under the directorship of Dr. J. A. FRASER ROBERTS, lecturer in medical genetics at the London School of Hygiene and Tropical Medicine. Accommodation for the unit has been provided at the Institute of Child Health, The Hospital for Sick Children, Great Ormond Street, London, W.C.1. The unit's research programme includes the investigation of congenital malformations and hereditary abnormalities and diseases and studies of the role of inheritance in common diseases.

Clinical Research in the N.H.S.—The Ministry of Health has issued a memorandum on clinical research, stressing the importance of its continuance and development for the efficiency of the Health Service. The memorandum describes the powers and duties of regional hospital boards, boards of governors, and management committees for promoting clinical research; the opportunities for co-operation in this field; and the means of financing it. Attention is drawn specifically to the four-year-old White Paper, *Clinical Research in Relation to the National Health Service* (H.M.S.O., 1953), whose recommendations were accepted in principle by the Government at the time (see *British Medical Journal*, 1953, 2, 140), and to the powers to conduct research conferred on hospital boards and committees by Section 16 (2) of the National Health Service Act, 1946. The Minister, states the memorandum, hopes that boards and committees will do "all that lies in their power to foster clinical research in their hospitals." The memorandum goes on to recall the functions of the Medical Research Council's Clinical Research Board—the organization of major clinical research schemes financed from Exchequer funds and the suggestion of new clinical research units for which the M.R.C. might assume responsibility—and explains how hospital boards and committees may avail themselves of the Clinical Research Board's assistance. Besides this "centrally organized" research, the memorandum also deals with "decentralized" research carried out with Exchequer funds by hospital boards and committees themselves. There is also a short note on locally organized research from non-Exchequer funds. An appendix gives the composition of the Clinical Research Board. Its chairman is Sir GEOFFREY JEFFERSON, F.R.S., and the secretary, Dr. F. J. C. HERRALD, of the M.R.C. Headquarters Staff, at 38, Old Queen Street, London, S.W.1.

Children in Hospital.—The Paediatric Committee of the Royal College of Physicians has issued a five-page report on the care of children in hospital. The committee was

appointed in October, 1952, under the chairmanship of Professor N. B. CAPON. After affirming that special children's hospitals offer the best service for children, the report recommends that the children's block in large general hospitals should be self-contained. Close association with the obstetric department is desirable. If there is no separate children's block, then all children should be in special wards in a single unit supervised by a paediatrician. Units of less than 20 beds are uneconomic; and the report goes on, "It is unnecessary and undesirable to attempt to provide a children's unit in every general hospital or even every area hospital... the emphasis should be on the best treatment for children and on the best training for those who are responsible for the medical and nursing care of children, and this implies some concentration of children's beds." The establishment of branch out-patient departments lessens the need for small residential units. In teaching centres there should be at least one paediatric bed for "each annual student entry." As to the nursing of sick children, the report states that the most suitable curriculum and training has yet to be evolved. Experiments now being carried out at some centres may help to solve this problem. In the larger paediatric units a child psychiatric unit of 8 to 12 beds would be an advantage. Accommodation for the isolation of infectious cases must be available in all paediatric units, and hospitals for infectious disease should work in close association with paediatric departments. When a vacancy occurs on the staff of an existing infectious disease hospital, the committee recommends that a paediatrician should be appointed. The committee's final recommendation is that in each region there should be a paediatric committee to advise the regional board.

W.M.A. Delegation to World Health Assembly.—The World Medical Association has sent a delegation to the tenth World Health Assembly which opened in Geneva on May 7. The delegation's object, in accordance with one of the aims of the W.M.A., is "to present the views of the medical profession to the World Health Organization." The W.M.A. council is specially concerned to give evidence in the Assembly's technical discussion on "The Role of the Hospital in the Public Health Programme," and it has forwarded a document to W.H.O. setting forth the "practising doctor's evaluation" of what this role should be. Among others, the W.M.A. document makes this point: "The general practitioner is the doctor best qualified to offer continuity of health care. He should have free access to the hospital to continue the patient's health care and to provide him with the opportunities of continuing medical education provided through hospital meetings and research."

Rockefeller Foundation Grants.—In the Rockefeller Foundation's list for the first quarter of 1957, grants totalling \$2.7m. are reported. Medical education and public health received \$571,000, biological and medical research \$806,600. Grants to the British Commonwealth included: \$36,000 for research equipment for the School of Biochemistry, Cambridge; \$25,000 for research equipment for the Calcutta School of Tropical Medicine; £10,000 (over two years) to London University to support work directed by Professor J. Z. YOUNG, F.R.S., at University College, on the structure and functioning of the brain; \$27,500 (over three years) to support research on the physical chemistry of nucleic acids, directed by Professor D. O. JORDAN at Adelaide University; and \$25,000 (over three years) to support research on the biochemical factors affecting fertility by Dr. T. R. R. MANN, F.R.S., at the School of Veterinary Medicine, Cambridge. In the Republic of Ireland Professor E. J. CONWAY, F.R.S., of University College, Dublin, receives \$12,000 (over three years) towards his research on the biochemistry of cell membranes. Harvard University receives a grant of \$8,500 for the preparation of an edition of Newton's *Principia*.

Medical Portraits at Royal Academy.—The 189th exhibition of the Royal Academy of Arts, which opened at Burling-

ton House last week, includes a number of portraits of doctors. Among the oil paintings are portraits of Sir GORDON HOLMES, F.R.S. (No. 37), the late Dr. JOAN MALLESON (No. 55), Sir HUGH GRIFFITHS (No. 114), Sir HAROLD BOLDERO (No. 306), Professor JOHN FULTON, of Yale (No. 585), and Dr. ARTHUR BOUSFIELD (No. 664). There are also a pencil drawing of Sir GEOFFREY KEYNES (No. 1141), a bronze medallion of Sir HENRY DALE, O.M., F.R.S. (No. 1382), and a bronze bust of Mr. DOUGLAS ROBB, F.R.C.S., Vice-president of Auckland University College, New Zealand (No. 1422). Among other exhibits of medical interest are the B.M.A.'s new seal (No. 1439), described by its designer, Mr. W. M. Gardner, on p. 1117 of this *Journal*, an oil painting, "Anti-polio Vaccination Begins" (No. 294), and a pen drawing called "Minor Operation" (No. 1012).

Sir Hugh Cairns Memorial Fund.—At a meeting of Congregation at Oxford on April 30 approval was given to the establishment of a Fund in memory of the late Sir HUGH CAIRNS. Viscount NUFFIELD is associated with the University in the memorial, which is to take the form of a fund for neurological research. The fund will be administered by the Nuffield Committee for the Advancement of Medicine and will receive a sum of £2,000 annually from the Nuffield Medical Benefaction to assist research in neurology and neurosurgery in the Oxford Medical School. Sir Hugh Cairns was Nuffield professor of surgery at Oxford at the time of his death in 1952. He was then 56.

Gift to Wright-Fleming Institute.—The Pfizer Corporation has presented an automatic sample-changer Geiger counter to the Wright-Fleming Institute of Microbiology at St. Mary's Hospital, Paddington. The counter, which was built in the United States and is valued at about £1,500, brings up automatically 35 different sample-pans containing isotopically labelled samples for counting. It is currently being used by Dr. D. ROWLEY, head of the department of bacterial physiology at St. Mary's, for research on non-specific immunity. It is stated that the only other similar machine in Britain is the one in the department of radiotherapy at Cambridge.

Treatment Centres for Venereal Diseases.—The Ministry of Health has published a revised list of treatment centres in the United Kingdom and the Republic of Ireland. This list has been issued to treatment centres, regional hospital boards, hospital management committees, medical officers of health, and port health authorities. The leaflet for seamen, naming treatment centres in ports of Great Britain and Northern Ireland, has also been revised. It has been issued to port health authorities and through the Ministry of Transport to ships.

Dr. H. L. Glyn Hughes has retired as S.A.M.O. of the South-east Metropolitan Regional Hospital Board. He is to survey the needs of homes for the dying in Britain on behalf of the Calouste Gulbenkian Foundation. Most of these homes are religious foundations. Dr. Glyn Hughes's successor is Dr. J. S. S. FAIRLEY, the Board's deputy S.A.M.O.

Middle East Medical Assembly.—Sir RUSSELL BROCK (Guy's Hospital), Dr. PAUL WOOD (Institute of Cardiology), and Mr. RODNEY MAINGOT (Royal Free Hospital) are attending the Middle East Medical Assembly in Beirut, Lebanon, from May 10 to 12. Afterwards Sir Russell Brock will lecture in Turkey, and Dr. Wood in Italy. These visits are under British Council auspices.

Dr. A. S. Parkes, F.R.S., head of the division of experimental biology at the National Institute for Medical Research, left for a three-week visit to Yugoslavia on May 5. He is lecturing in Belgrade, Zagreb, and Ljubljana on low-temperature research and the grafting of ovarian tissue. His visit is at the invitation of the Yugoslav National Commission for Unesco and the British Council.

COMING EVENTS

National Conference on Medical Records.—Arranged by the Association of Medical Records Officers. Brighton, May 16–19. Details from Mr. B. B. BONNER, 11, Queensway, Horsham, Sussex.

German Postgraduate Medical Congress.—Sixth congress, West Berlin, June 12–16. Details from the secretariat, Klingsorstrasse 21, Berlin-Steglitz.

British Council Courses for Overseas Specialists.—"Plastic Surgery," East Grinstead and Oxford, June 16–29 (£46); "Radioisotopes in Medicine," Sheffield and London, September 15–28 (£44); "Psychological Treatment of the Problem Child," London, November 17–30 (£42). Apply to local representative of the British Council.

Problems of Child and Juvenile Health.—International Conference in Berlin, June 25 to 27. Papers in English, German, and Russian. The conference aims at an exchange of experience between specialists from Eastern and Western countries. Details from Professor WINTER, Institut für Sozial-hygiene, Neue Wilhelm Strasse 15, Berlin W. 8.

NEW ISSUES

British Journal of Preventive and Social Medicine.—The new issue (Vol. 11, No. 1) is now available. The contents include:

CONTROL OF TUBERCULOSIS. IMPORTANCE OF HEREDITY AND ENVIRONMENT. A. W. Anderson, B. Benjamin, R. Grenville-Mathers, and H. J. Trenchard.
HOUSING AND TUBERCULOSIS IN A MASS RADIOGRAPHY SURVEY. G. Z. Breit and B. Benjamin.
CONTRIBUTION OF CIGARETTE SMOKING TO RESPIRATORY DISEASE. J. H. Edwards.
A SURVEY OF HANDICAPPED PERSONS. A. Leslie Banks, R. G. Carpenter, James A. Hislop, and George Nisbet.
RETINOBLASTOMA. OCCURRENCE OF THE CONDITION IN NORTHERN IRELAND, 1938–1956. A. C. Stevenson and V. A. F. Martin.
OBSERVATIONS ON THE INCIDENCE OF UPPER RESPIRATORY INFECTIONS IN A ROYAL AIR FORCE FORMATION IN SOUTHERN RHODESIA. W. B. Thorburn.
THE CONTRIBUTION OF THE NURSE IN GENERAL PRACTICE. D. L. Crombie and K. W. Cross.
VARIATIONS OF LOCAL MORTALITY RATES UNDER THE 1953–54 RULES FOR TRANSFER OF DEATHS. David Hewitt.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Medical and Biological Illustration.—The new issue (Vol. 7, No. 2) is now available. The contents include:

FRONTISPIECE.
CASTING FINGERS IN PLASTER. W. Looker.
PHOTOSENSITIVE ANODISED ALUMINIUM PLATES. R. A. Kempe.
LINE PHOTOGRAPHY. Percy W. Bullock.
THE IDEAL LECTURE THEATRE—I. PROJECT IN SIGHT AND SOUND. Peter Hudson and Allan Low.
RETINAL CAMERA REVIEW. Peter Hansell.
A TECHNIQUE FOR DISPLAYING DEMONSTRATION SPECIMENS. Fred L. Miltenberger and Carroll R. Ball.
EQUIPMENT AND METHODS.
CLOSE RANGE STEREOSCOPY.
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SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Sunday, May 12

KING'S COLLEGE HOSPITAL.—10.30 a.m. to 12 noon, clinical meeting for general practitioners.

Monday, May 13

LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., special university lecture in medicine by Professor Charles Huggins (Chicago): On the Treatment of Mammary Cancer.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—5 p.m., Harben Lecture by Professor P. Drinker, D.Sc.: Air Pollution and the Public Health—Problem of Great Cities (illustrated).

UNIVERSITY COLLEGE LONDON.—At Chemistry Theatre, Gower Street, W.C., 5.30 p.m. Karl Pearson Centenary Lecture by Professor J. B. S. Haldane, F.R.S.

Tuesday, May 14

CHELSEA CLINICAL SOCIETY.—At Rembrandt Hotel, Thurloe Place, S.W., 7.30 p.m., annual dinner.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. F. A. Whitlock: Neuro-physiology of Itching.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Croonian Lecture by Professor G. W. Pickering: Regulation of Body Temperature in Health and Disease.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Imperial Cancer Research Fund Lecture by Professor G. Hadfield: Application of Physiological Principles to Hormone-dependent Human Breast Cancer.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—5 p.m., Harben Lecture by Professor P. Drinker, D.Sc.: Air Pollution and the Public Health—Problem of Industry (illustrated).

ROYAL VETERINARY COLLEGE.—4 p.m., special university lecture by Professor R. A. Gregory: Some Aspects of Mammalian Gastroenterology.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute, 5 p.m., Almroth Wright Lecture by Dr. B. A. D. Stocker: Heritable Transformations of Bacteria.

SOCIETY OF APOTHECARIES OF LONDON.—5.30 p.m., 2nd Gideon de Laune Lecture by Sir Henry Dale, O.M., F.R.S.: Medicinal Treatment: Its Aims and Results.

WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Dr. D. F. Bosanquet: Neuropathology.

Wednesday, May 15

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: The Dyskeratoses.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Mr. C. E. Drew: Experimental studies of the Extracorporeal Circulation.

LIVERPOOL UNIVERSITY: FACULTY OF MEDICINE.—At Physiology Lecture Theatre, Old Medical School, 5.15 p.m., Professor G. Wald (Harvard): Molecular Basis of Vision.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Sir Howard Florey, F.R.S.: Endothelium.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE.—5 p.m., Harben Lecture by Professor P. Drinker, D.Sc.: Air Pollution and the Public Health—Prevention and Control (illustrated).

ROYAL MICROSCOPICAL SOCIETY.—5.30 p.m., Dr. E. H. Huxley and Dr. Jean Hanson: Studies on the Mechanism of Muscular Contraction.

WILKESDEN GENERAL HOSPITAL MEDICAL SOCIETY.—At Department of Physical Medicine, 8.45 p.m., Dr. P. R. Evans: Recent Changes in Paediatrics.

Thursday, May 16

ALFRED ADLER MEDICAL SOCIETY.—At 11, Chandos Street, W., 8 p.m., Dr. A. Spencer Paterson: Psychopathology of Schizophrenia.

BRITISH INSTITUTE OF RADIOLOGY.—8.30 p.m., Presidential Address by Mr. I. G. Williams: Role of Surgery and Radiotherapy in the Treatment of Breast Cancer.

INSTITUTE OF NEUROLOGY.—5.30 p.m., Dr. R. D. Hahn (U.S.A.): Tabes Dorsalis, with especial reference to Primary Optic Atrophy.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Croonian Lecture by Professor G. W. Pickering: Regulation of Body Temperature in Health and Disease.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—3.45 p.m., Arnott Demonstration by Miss J. Dobson: Curiosities of Natural History.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—7.30 p.m., symposium to be opened by Dr. C. A. Hoare, followed by Group Captain W. P. Stamm, Dr. R. A. Neal, and Dr. G. Woolfe: Laboratory Aspects of Amoebiasis. A discussion will follow.

Friday, May 17

DUBLIN UNIVERSITY. TRINITY COLLEGE.—At Anatomy Theatre, 5 p.m., Montgometry Lecture on Ophthalmology by Dr. F. B. Walsh (Baltimore): Ocular Movements Associated with Regeneration of the Third Nerve.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. P. J. Hare: clinical demonstration.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. F. H. Young: open clinical demonstration.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—10 a.m., Professor A. M. Boyd: Management of Obliterative Arteriosclerosis of the Lower Extremity.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Mr. J. D. S. Flew: Genital Prolapse.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Laidlaw.—On May 1, 1957, at Ronswood Hospital, Worcester, to Greta (formerly Mair), wife of Dr. A. J. Laidlaw, a brother for Fiona and Alastair—Kelvin Alexander Mair.

Nathanson.—On March 15, 1957, to Margaret (formerly Milman), wife of Dr. N. E. Nathanson, of 61, Mill Road, Higher Bebington, Cheshire, a daughter.

O'Kelly.—On April 18, 1957, at British Military Hospital, Tripoli, to Dorothy, wife of Captain Frank O'Kelly, R.A.M.C., a sister for Margaret.

DEATHS

Balleney.—On April 22, 1957, George Christopher Balleney, M.B., Ch.B., of 61, Higher Drive, Banstead, Surrey, aged 28.

Brown.—On April 18, 1957, at the London Hospital, Gerald Rowland Hamilton Brown, M.R.C.S., L.R.C.P., of 40, Lancaster Road, London, N.

Causton.—On April 18, 1957, at St. John of God Nursing Home, Torquay, Devon, Edward Postle Gwyn Causton, O.B.E., aged 80.

Cheyne.—On April 19, 1957, William Hunter Watson Cheyne, M.B., B.Ch., D.T.M., of Crewkerne, Somerset, aged 67.

Fison.—On April 20, 1957, James Fison, M.D., of Flat 2, 28, York Place, Harrogate, Yorks.

Isaac.—On April 21, 1957, at his home, 1, Harwood Court, Upper Richmond Road, Putney, London, S.W., Hyman (George) Isaac, M.B., B.S., D.P.H., aged 77.

Norman.—On April 23, 1957, at the Old House, Tillingham, Essex, Alfred Clarence Norman, C.B.E., M.D., late of Bagdad, Iraq.

Porritt.—On April 23, 1957, at 71, Wavertree Court, Streatham Hill, London, S.W., Austin Thomas Porritt, M.R.C.S., L.R.C.P., Warwick.

Whitehouse.—On April 18, 1957, at 14, The Crescent, Solihull, Warwickshire, Edwin St. John Whitehouse, M.B.E., M.R.C.S., L.R.C.P., aged 89.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Indications for Exchange Transfusion

Q.—What are the clinical indications for carrying out an exchange transfusion in a newborn infant suspected of having haemolytic disease? Is it safe to defer decision for a day or two in a doubtful case, or should the transfusion be carried out at once?

A.—Infants with very severe haemolytic disease of the newborn are pale and oedematous at birth and may display signs of cardiac failure; exchange transfusion should be carried out immediately. Less severely affected infants appear healthy at birth but may develop jaundice within a few hours. The onset of jaundice within the first 24 hours is an indication for exchange transfusion.

It is much better not to wait for the onset of jaundice but to carry out laboratory tests immediately after birth to discover whether the infant is affected, and, if so, how severely. Exchange transfusion can then sometimes be carried out before jaundice develops and the results are likely to be better.

Respiratory Failure after General Anaesthesia

Q.—What are the likely causes of respiratory failure after apparent recovery from a long anaesthetic? The patient in question gradually stopped breathing soon after the operation, and, although oxygen and artificial respiration were administered, circulatory failure and death ensued. At post-mortem examination no cause was found to account for death.

A.—Hypoventilation is commonly permitted to occur in patients under general anaesthesia: it may be caused by central respiratory depression by opiates and anaesthetics, or by peripheral respiratory paralysis induced by curare or similar agents, or by both acting together. However, the usual signs of underventilation may easily be masked if an oxygen-rich mixture is being used. In addition, the anaesthetic apparatus itself, by imposing additional dead space and often by permitting carbon-dioxide accumulation (for example, from faulty design, incomplete carbon-dioxide absorption, or inadequate gas flows), may accentuate this hypercapnia. At the end of the operation, when the patient is disconnected from the anaesthetic apparatus a sharp fall in carbon-dioxide levels results, and this may be followed by a state of collapse with circulatory and respiratory depression—the condition named "cyclopropane shock." Some patients may succumb to this type of depression.

Respiratory depression in the post-operative period may result from partial respiratory paralysis due to the persisting effects of relaxants administered during anaesthesia; in addition there may be central respiratory depression from persisting anaesthetics (for example, intravenous barbiturates). Respiratory depression in the post-operative period due to opiates may be caused in various ways. Premedication given late may exert its maximal effect after anaesthesia; similarly, in shock the absorption of drugs may be retarded. Overdosage is especially likely to occur in elderly and debilitated patients, and the effect of drugs such as pethidine given during maintenance of anaesthesia may persist afterwards. The too early administration of post-operative analgesics or their inadvertent intravenous injection may also produce serious respiratory depression. Respiratory obstruction arising from inadequate post-operative supervision may also impair ventilation, and the signs of this may be minimal if respiratory depression coexists. In all these circumstances a climb in carbon-dioxide levels is certain and

oxygen lack may also develop (but this is often prevented by the use of oxygen during the recovery period).

It is believed that central depression can result from carbon-dioxide retention beyond a certain level, a vicious circle then being established. The progressive rise in carbon-dioxide tension will ultimately lead to cardiac failure, and, as in the case cited in the question, no characteristic changes are likely to be found at necropsy.

The results of the various factors discussed will be accentuated in the presence of surgical or haemorrhagic shock and also in the poor-risk patient—for example, with fluid and electrolyte depletion or emphysema.

Respiratory inadequacy is usually therefore the result of errors in technique. A greater awareness of the dangers of respiratory depression and paralysis should help to prevent deaths of this type.

Flea Repellent

Q.—What is the best flea repellent?

A.—Fleas cannot jump very far—probably less than 9 in. (23 cm.) upwards—and a common method by which they may gain access to a new host is by crawling up the lower limbs. It is therefore advisable to apply repellent to socks and the lower part of trouser legs. The best available repellent is dimethyl phthalate (DMP), which should be used undiluted. A few drops are poured into one hand, and the hands are rubbed together and then dried by wiping them on the garments mentioned. This should be repeated two or three times. Women can safely use the same repellent on nylon or cotton stockings, but its effect on cellulose fibres (e.g., artificial silk) is deleterious. A single treatment would last for several days, but would be removed by washing. This cannot guarantee protection from fleas which jump on to the person from infested furniture, or from infested individuals in a crowd. The only protection from these pests would be to dust the underwear with a rapidly acting insecticide such as pyrethrum, a powder containing 1% of pyrethrins.

Antilipæmic Therapy in Atherosclerosis

Q.—What place have thyroid extract and laminarin sulphate in the treatment of atherosclerosis?

A.—The use of thyroid extract or laminarin sulphate in the treatment of atherosclerosis is based on the assumption that it may be desirable to lower the levels of the circulating lipids, which are often elevated in patients who have developed clinical features of coronary or cerebral atherosclerosis. Thyroid extract lowers the plasma cholesterol and beta-lipoproteins, and laminarin sulphate decreases the prolonged lipaemia, but both are unsuitable for the treatment of atherosclerosis.

The administration of thyroid extract will increase the oxygen consumption and metabolic requirements of most tissues, and relative anoxaemia can result if the blood supply is impaired by atherosclerosis. For example, the function of atherosclerotic coronary arteries may be just adequate for the ordinary demands of the myocardium, but as soon as metabolism is increased by the administration of a thyroid derivative the atherosclerotic coronary arteries become relatively inadequate and angina develops or is aggravated; indeed, myocardial infarction can be precipitated by disturbing the balance between the supply and demand of the myocardium. Equally, thyroid extract should not be used for the treatment of cerebral atherosclerosis, since anoxaemia can lead to disorientation. Recently it has been shown that triiodothyronine and triiodothyroacetic acid can depress the plasma cholesterol without elevating the basal metabolic rate. However, this dissociation may be more apparent than real, since the oxygen uptake of certain tissues, particularly the myocardium, is increased even although there is no reflection of this in the overall measurement of the basal metabolic rate.

Laminarin is a polysaccharide obtained from seaweed, and when sulphated it possesses properties analogous to heparin. If it is only weakly sulphated, it retains its antilipæmic

property but no longer has any anticoagulant activity. Intravenous injection of laminarin sulphate results in temporary clearing of lipaemia and a temporary increase in the mobility of the beta-lipoproteins. Laminarin sulphate must be administered at least once daily to maintain either of these actions, and is apparently ineffective except when given intravenously. Even if some other parenteral route is found to be effective, it is unjustifiable to submit patients to an indefinite course of injections until more evidence is produced to show that the clearing of lipaemia is desirable.

This question is important because it raises a fundamental issue which is sometimes overlooked. It is not on the correction of the abnormal circulating lipids or of lipaemia that the efficiency and suitability of any particular treatment must be judged, but on its effect on prognosis. It has not yet been shown that the prolonged correction of the abnormal circulating lipids by any treatment has been associated with improvement in morbidity and mortality, and there is no conclusive evidence that the atherosclerotic process can be inhibited in the human. When an efficient and acceptable treatment can be proved to influence prognosis and inhibit the atherosclerotic process in the human, it should probably be offered primarily to the younger and apparently healthy members of the community. Any such prophylactic regime will depend on the perfection of diagnostic tests, so that those individuals who are likely to develop the clinical features of atherosclerosis can be selected with certainty from the healthy population.

Psychological Effects of Castration in Prostatic Cancer

Q.—What intellectual and temperamental changes result from therapeutic castration in the male (biochemical or surgical), as, for instance, in the treatment of cancer of the prostate?

A.—The type of case selected for this treatment is usually of an age where little or no temperamental or other changes occur. For the most part they are people who are more worried about the advance of their malignant disease than about the effects of castration, and if the situation is discussed with both them and their wives pre-operatively little or no trouble should ensue.

Royal Jelly

Q.—Startling claims are made for the rejuvenating effects of royal jelly, the food given to bee larvae to convert them into queens. What is the composition of the jelly, what is known of its mode of action on the bee larva, and what grounds are there for expecting a therapeutic effect in man?

A.—Royal jelly is the term reserved for bee milk in or from queen cells. This secretion is very rich in protein and contains some sugar and small quantities of thiamine, pyridoxine, nicotinic acid, pantothenic acid, biotin, inositol, and folic acid. It has a moisture content of about 67%.¹ Queen larvae and young worker larvae are entirely fed on bee milk, and subtle differences between the quality of the bee milk provided for queens and workers have been postulated. A very full presentation of the findings of a number of investigators on the composition of the food of queen and worker larvae and of the vitamin-B analysis of larvae and their foods, as well as a careful exposition of the whole position, is given by Ribbands.² He writes, "All investigators consider that the basis of the differentiation is nutritional, but the food supply of worker larvae differs from that of the queen larvae in both quantity and quality and the relative importance of these two attributes has not been agreed."

It is largely on the basis of the pantothenic acid and biotin content of royal jelly that the idea of a qualitative significance in food supply has arisen. Ribbands points out that considerable difficulties appertain to these vitamin analyses. Bee milk undergoes chemical changes when exposed in the open air and the sampling is of minute quantities. He also writes, "The idea of a vitamin-controlled differentiation based on biotin, pantothenic acid, or some combination of

vitamins is not fantastic. But there is no proof that these substances control the differentiation of queens and workers."

The theoretical basis for the use of royal jelly in man thus rests on a hypothesis which even in bees is as yet unproved. It will be extremely surprising, therefore, if the startling claims made for royal jelly as a human rejuvenator are eventually substantiated.

REFERENCES

- Butler, C. G. (Rothamsted Experimental Station). Personal communication.
- Ribbands, R., *The Behaviour and Social Life of Honeybees*, 1953. Bee Research Association, Ltd.

Improving the Nose

Q.—What are the essential principles of the various plastic operations to improve the shape of the nose?

A.—Plastic operations to improve the shape of the nose usually follow a set plan, of which the following are the main features: (1) The approach is by intranasal incisions between the lateral and alar cartilages and continued medially so as to detach the columella from the septum. An elevator is introduced and the skin over the nose completely freed from its osteocartilaginous framework. (2) Bone and cartilage from the bridge are then removed to give the desired profile. (3) Shortening of the nose is achieved by removing a wedge from the lower end of the septum, narrowing by infracturing the bony arch. (4) If there is a deformity of the tip of the nose needing correction, it is usually necessary to excise portions of the alar and lateral cartilages to reduce the bulk and the breadth of the tip. (5) Finally a splint is applied to immobilize the nasal bones and help mould the nose to its new shape.

Mercurial Diuretics and Falling Hair

Q.—Two women in their seventies have been taking a mercurial diuretic for the last eighteen months. Both now complain that their hair is rapidly falling out. Is this a recognized toxic effect of mercurial diuretics?

A.—Falling hair, unassociated with dermatitis, is not a recognized toxic effect of mercurial diuretics; nor is it typical of chronic inorganic mercury poisoning, all the symptoms of which may occur with organic mercury diuretics, although it has occasionally been recorded as occurring with mercury as with other heavy metals. It is extremely unlikely that these two patients are suffering from mercury poisoning, especially if there has been a good response to the diuretic. Poor growth of hair has been described in chronic heart failure.

Correction.—We regret that in the *Journal* of April 27 (p. 999) the late Mr. Stephen Paget, founder of the Research Defence Society, was inadvertently described as Sir Stephen Paget.

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AETIOLOGICAL FACTORS IN MOUTH CANCER AN APPROACH TO ITS PREVENTION

BY

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History has always been one of man's best teachers, a truism which applies also to man's quest to comprehend the nature of disease. We call to mind Snow's classical study on cholera through the use of epidemiological techniques. Through his observations a disease was curtailed and the mechanism of an illness more closely understood at a time when its exact pathogenesis was unestablished. To be learned from this historical study, too, is that one does not need to understand the mechanism of a disease completely in order to accomplish a reduction of its incidence.

This point is stressed because it represents the basis of current epidemiological studies in the field of cancer. While many factors may induce cancer and the basic mechanism of cancer is still beyond our reach, we know factors which do play a part in the development of cancer whose removal or reduction will lead to a decrease in incidence of this disease. This is the primary goal of the epidemiologist in his fight against any disease. If a given factor is found to contribute to a disease it is of little importance to the patient whether this factor was of causative or of catalytic nature. What matters to the population is whether the removal of a given factor will reduce the incidence of a given disease. The present investigation on aetiological factors of cancer of the oral cavity was designed to serve towards this end. This report, to be presented in greater detail elsewhere, will outline some of the factors which influence the development of cancer of the mouth and whose control can lead to a drastic reduction in this type of cancer (Wynder, Bross, and Feldman, 1957).

Incidence Pattern

One reason why environmental factors are thought to play a part in certain types of cancers is that these cancers have a varying incidence distribution. Environmental factors found to be statistically significant in an epidemiological study must, at least in part, account for variations in incidence patterns in any given cancer. Some interesting features of the incidence pattern of cancer of the oral cavity are as follows: (1) Cancer of the oral cavity in males has not increased during the last two or three decades, and even may have slightly decreased (Public Health Service, 1950-2). (2) A small increase has been noted in cancer of the oral cavity among women (Public Health Service, 1950-2). (3) Can-

cer of the oral cavity is predominantly a male disease, with sex ratios for different sites ranging from 2:1 to 10:1. (4) Cancer of the oral cavity is relatively common in Swedish women. In Sweden cancer of the tongue, gum, and buccal mucosa is about as frequent in women as in men (Wynder, Hultberg, Jacobsson, and Bross, 1957). (5) Cancer of the oral cavity is common in India, where it accounts for 40% of all male cancer admissions to the Tata Memorial Hospital (Khanolkar, 1950). (6) Cancer of the lip is more common in southern than in northern areas. Cancer of the lip is very uncommon among negro patients (Public Health Service, 1950-2). (7) At the Memorial Center for Cancer and Allied Diseases, New York, mouth cancer occurs relatively more often among Catholic than among Jewish men.

Methodology

The method was similar to that used in our previous studies (Wynder, Bross, and Day, 1956). We obtained information from a series of study-group and control patients through trained interviewers. The questions related to environmental, medical, and social background. This study sought to investigate all of those factors that at one time or another had been suspected to be associated with cancer of the oral cavity (Table I).

TABLE I.—Factors Suspected to be Related to Cancer of the Oral Cavity

1. Tobacco smoking	7. Dentures
2. Tobacco chewing	8. Dentures irritation and sharp teeth
3. Betel-nut chewing	9. Nutritional deficiencies (iron, riboflavin)
4. Sunlight	10. Hot beverages and foods
5. Alcohol consumption	
6. Syphilis	

With the exception of data on tobacco and syphilis, however, none of the factors had hitherto been based upon statistical analysis of data (Martin *et al.*, 1940; Moore, Bissinger, and Proehl, 1953; Sadowsky, Gilliam, and Cornfield, 1953; Sanghvi, Rao, and Khanolkar, 1955).

Upon completion of the interviews, the information was coded on International Business Machine (IBM) cards and the controls and the cancer cases were matched for age, religion, hospital status, and socio-economic background. The study cases were analysed separately for each specific site as well as for the whole group.

All cases had microscopical diagnosis and represented epidermoid cancer. The statistical analyses were carried out by one of us (I. B.), with the assistance of R. Feldman.

If a given factor was found to differ significantly, it was tested against other variables to determine possible interdependence.

The study is based upon 543 male cases of cancer of the oral cavity compared with 207 male control patients who had benign diseases of the head and neck, lymphomas, benign diseases of the thoracic region, or cancer

TABLE II.—Number of Cases by Site and Sex (Whites)

Site	Male	Female	Total
Lip	74	2	76
Floor of mouth	86	8	94
Gum	41	18	59
Buccal mucosa	40	12	52
Tongue	180	57	237
Palate	41	7	48
Tonsil	57	7	64
Pharynx	24	5	29
Total	543	116	659
Controls	207	246	453

of the lower gastro-intestinal tract as well as of the skin. The female group includes 116 female patients with cancer of the oral cavity who have been matched against 246 female control patients* (Table II). All cases studied—male and female, study and control—have been matched for the same background factors.

Results in Males

Tobacco

Smoking was found to be an important factor in the development of cancer of the mouth. Three per cent. of the study group were non-smokers, in contrast to 10% of the controls. Twenty-nine per cent. of the study cases had smoked 35 cigarettes or the equivalent of cigars or pipes per day for at least 20 years, in contrast to 17% among the controls (Fig. 1). No significant variations were found within the study group. The two sites which contained no non-smokers were the floor of the mouth and the buccal mucosa. The former site had been of particular interest to us because we have rarely seen a lesion of the floor of the mouth in a non-smoking male.

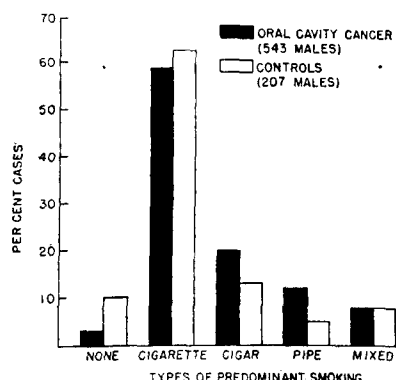


FIG. 1.—Incidence of mouth cancer according to number of cigarettes smoked daily.

The type of tobacco consumed by patients with cancer of the oral cavity is of considerable importance. The percentage of cigar and pipe smokers among patients with cancer of the mouth is higher for all sites than for the controls. Twenty per cent. among the study cases smoked predominantly cigars, 12% predominantly pipes, and 3% cigars and pipes equally. The respective percentages for controls were 13, 5, and 2 (Fig. 2). This again was uniform for the total study group. The group with the fewest predominant cigarette smokers was the buccal mucosa cancer group containing 43% predominant cigarette smokers. The highest group of predominant cigarette smokers were patients with cancer of the floor of the mouth, 67% (Table III).

TABLE III.—Diagnosis by Type of Smoking (Percentages Males)

Site	None	Cigarette	Cigar	Pipe	Mixed, With Cigarettes	Mixed, Without Cigarettes
Lip (74)	4	51	18	15	8	4
Floor of mouth (86)	2	67	16	12	2	2
Gum (41)	2	54	20	15	7	2
Buccal mucosa (40)	4	43	30	18	10	4
Tongue (180)	4	63	18	7	4	4
Palate (41)	2	54	22	12	7	2
Tonsil (57)	4	56	21	14	2	4
Pharynx (24)	4	50	25	13	4	4
Total (543)	3	59	20	12	5	3
Controls (207)	10	63	13	5	6	2

TABLE IV.—Percentage Distribution of Male Patients with Different Cancer by Predominant Type of Tobacco Smoked

Predominant Type of Tobacco	Lung (132)	Intrinsic Larynx (107)	Extrinsic Larynx (93)	Oral (543)	Control (207)
None	1	1	0	3	10
Cigarette	93	90	82	63	69
Pipe	1	2	9	20	13
Cigar	5	7	9	12	5

ance. The percentage of cigar and pipe smokers among patients with cancer of the mouth is higher for all sites than for the controls. Twenty per cent. among the study cases smoked predominantly cigars, 12% predominantly pipes, and 3% cigars and pipes equally. The respective percentages for controls were 13, 5, and 2 (Fig. 2). This again was uniform for the total study group. The group with the fewest predominant cigarette smokers was the buccal mucosa cancer group containing 43% predominant cigarette smokers. The highest group of predominant cigarette smokers were patients with cancer of the floor of the mouth, 67% (Table III).

It was of interest to compare the type of smoking against the data previously determined for cancer of the lung and larynx (Table IV). These data show the percentage of pipe and cigar smokers to increase as one moves upward in the respiratory tract. A comparison between the group with lung cancer and the group with oral cavity cancer is particularly remarkable, with the former including only 5.4% pipe and cigar smokers.

Seventeen per cent. of the study group chewed tobacco, compared with 8% of the controls. With one exception, however, a patient with cancer of the gum, all the tobacco chewers were also tobacco smokers. In cases of lip and gum cancer the lesion was usually found at the site where the tobacco was held. No relationship of tobacco chewing

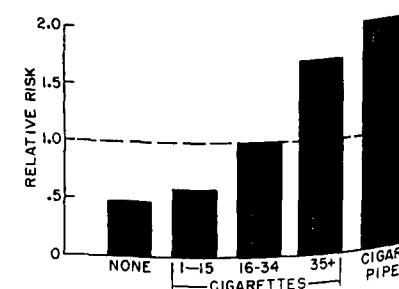


FIG. 3.—Risk of oral cancer in males in relation to amount of tobacco smoked.

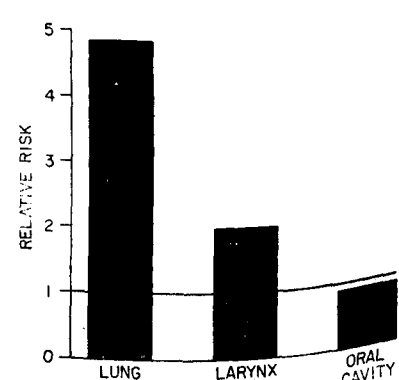


FIG. 4.—Risks of smoking 35+ cigarettes a day relative to pipe and cigar smokers, by cancer site.

was found to cancer of the pharynx, floor of the mouth, and tonsil. The highest percentage of tobacco chewers was among patients with cancer of the palate, 22%, and buccal mucosa, 20%. Among the 17% tobacco chewers in the total study group, 11% had chewed for more than 10 years, the remainder having chewed less than 10 years. Though tobacco chewing appears to have some influence on the development of some cancer sites of the mouth, it is less important than tobacco smoking.

The relative risk of smokers developing cancer of the mouth rises with the amount of tobacco consumed (Fig. 3). This risk among cigarette smokers, however, does not appear to the same degree as that found for cancer of the lung, while the relative risk among cigar and pipe smokers of developing mouth cancer is greater than that of cigarette smokers (Fig. 4).

TABLE V.—Diagnosis by Quantity of Alcohol (Percentages) (Males)

Site	Rare and Occasional	Units			Sporadic Binges
		1-2	3-6	7 or More	
Lip (74)	36	26	23	15	1
Floor of mouth (86)	26	6	24	42	2
Gum (41)	34	24	17	24	—
Buccal (40)	48	18	18	18	—
Tongue (180)	21	19	22	34	3
Palate (41)	14	20	32	35	—
Tonsil (57)	18	11	30	37	5
Pharynx (24)	12	17	25	42	4
Total (543)	26	17	24	31	2
Controls (207)	46	27	15	12	—

Heavy alcohol consumption, particularly that of whisky, was found to be a significant factor among patients with cancer of the oral cavity. Forty-six per cent. of the controls were occasional drinkers or non-drinkers compared with 26% among the study group (Fig. 5, Table V). In contrast,

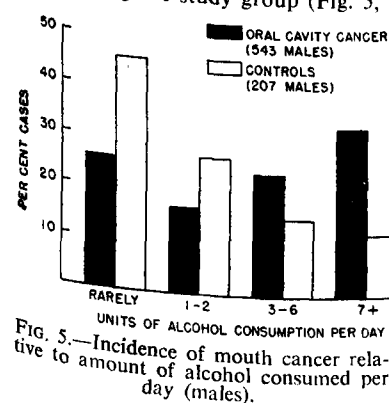
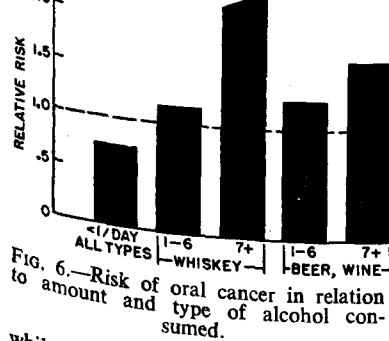


FIG. 5.—Incidence of mouth cancer relative to amount of alcohol consumed per day (males).



The types of alcohol consumed among the study cases include 31% whisky, 7% wine, and 36% beer, while 26% varied in type of alcohol consumed, roughly the same distribution as found for the controls. Among the study cases the percentage of people who drank whisky straight was 44%, which is greater than found among the controls, 26%, a difference which is probably associated with the fact that

the patients in the study group were heavy drinkers. Analysis for relative risk shows heavy alcohol consumption to significantly influence the development of cancer of the oral cavity. Whereas this relative risk increases in the moderate drinker, it rises very sharply among the heavy drinkers. The increased risk of developing oral-cavity cancer is significantly greater among people who drink whisky predominantly than among those who drink wine and beer predominantly (Fig. 6).

It was again of interest to compare the alcohol intake among patients with cancer of the oral cavity with patients with cancer of the lung and larynx (Table VI). Alcohol intake is significantly greater among patients with cancer of the mouth than among patients with cancer of the lung.

TABLE VI.—Percentage Distribution of Male Patients with Different Cancer Types by Amount of Average Daily Alcohol Consumption

Alcohol Consumption (Units)	Lung (132)	Intrinsic Larynx (107)	Extrinsic Larynx (93)	Oral (543)	Control (207)
Less than 1 a day	36	35	22	26	46
1-2 a day	26	18	15	17	27
3-6 ..	25	21	20	24	15
7 plus or sporadic	14	24	42	33	12

and also, though to a less extent, among patients with cancer of the vocal cords. The alcohol intake for patients with cancer of the extrinsic larynx is slightly (but not significantly) higher than for the oral-cavity series. This effect may be in part due to the lip-cancer cases in the oral-cavity series, where there is little, if any, influence of alcohol.

Syphilis

A history of syphilis or positive serology was found more common among patients with cancer of the mouth, 11%, than among the controls, 5%. The only sites, however, which showed statistically significant differences were lip, 17% (at the 1% level) and tongue, 12% (at the 5% level). Dividing the results for the tongue into anterior two-thirds and posterior one-third showed that among 86 cases of cancer of the anterior two-thirds of the tongue 22% had a history of syphilis, whereas among 89 cases of posterior one-third only 3% gave such a history. A relationship of syphilis to cancer is therefore particularly significant among those with the anterior two-thirds of the tongue affected. We attempted to determine what effect, if any, therapy might have on this association. Forty-three per cent. of those patients who could recall the type of therapy employed stated that they had received arsenical treatment. This, however, is roughly the same percentage as that found in the controls, since a majority of these patients were treated at a time when arsenical therapy was in vogue. We are thus unable to determine what influence, if any, arsenical therapy has on cancer of the tongue in man.

Dental Conditions

Edentia was more prevalent among male patients with cancer of the oral cavity, 44%, than among the controls, 28%. Edentia did not appear to be related to the tobacco and alcohol consumption of the two groups. Sixty per cent. of the study group wore dentures, compared with 63% among the controls. Eleven per cent. among the denture-wearers in the study group gave a history of irritation from the denture compared with 7% of the controls, a difference which was not significant. Six per cent. among the study group complained of sharp teeth compared with 4.7% among the controls. There were a few instances (especially in two cases involving cancer of the buccal mucosa and one case of cancer of the tongue) where a sharp tooth present for many years was in direct line with the lesion; however, no definitive conclusions can be drawn from such isolated cases. Dental hygiene was somewhat poorer among the study group, a finding not related to alcohol and tobacco consumption.

Miscellaneous

Analysis of previous disease showed no significant differences between study and control groups with the exception of a high level of leucoplakia, 19%, present in the study group. The two sites with the least history of leucoplakia among the study group were tonsil and pharynx, 4% each, and the highest buccal mucosa, where 45% of the patients gave a history of leucoplakia. We cannot make a comparison here with the control group because an individual with leucoplakia could not enter the control series. Fifty-nine patients with cancer of the mouth gave a history of multiple primary cancers. In 60% of these cases the second or third cancer occurred in the upper alimentary or respiratory tract. The alcohol consumption and the history of syphilis were similar among patients with multiple primary cancers, but the percentage of excessive smokers among the cases with double primaries was twice as high as in the remaining study cases.

Evaluation of nutritional intake of the patients showed no significant differences. This does not necessarily mean, however, that no differences exist. It would be surprising if there were no nutritional differences among people who drink more heavily than those who drink moderately. However, it is difficult to obtain accurate nutritional histories by interview technique, particularly in a country with such variations in dietary patterns as in the United States.

Outside exposure was suggestively, but not significantly, higher in the lip series than in the controls. However, the proportion of outdoor labourers was significantly higher in the group with lip cancer. The 3 non-smokers among 74 patients with cancer of the lip were all outdoor workers.

A certain group of occupations, though not more prevalent for the entire study group, were more commonly affected at specific sites. These included plumbers among patients with cancer of the tonsil, 12%, and pharynx, 16%, compared with 6% for the controls; cold-metal workers among those with the gum lesion, 17%, in contrast to 4% among the controls; painters among those with cancer of the pharynx, 13%, in contrast to 2% among the controls; and labourers among those with cancer of the lip, 15%, compared with 4% among the controls.

Among the factors studied which did not give significant findings were food temperatures, a history of general trauma to the oral cavity, and family history of cancer.

Results in Females

The study included 116 cases of cancer of the oral cavity and 246 controls. In general, the female data confirm the previous findings for the male cases. Forty-seven per cent. of the female study cases were non-smokers compared with 70% of the controls. Thirty-four per cent. of the females smoked more than 16 cigarettes per day for at least 20 years compared with 11% of the controls, a significant difference.

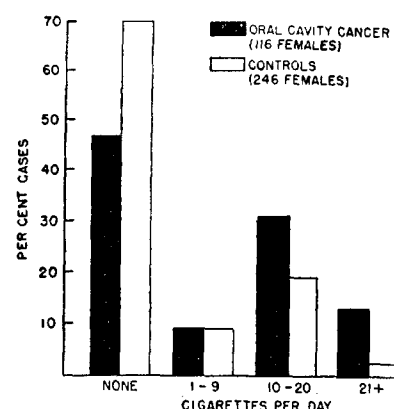


Fig. 7.—Incidence of oral cancer relative to number of cigarettes smoked by females.

No differences were found for the individual study sites, some of which of course contained too few cases to permit statistical analysis. All of the smokers were cigarette smokers (Fig. 7).

There was also a slightly greater amount of heavy alcohol consumption among the female study cases than among the controls. Ten per cent. among the

former drank more than two "shots" of whisky a day compared with 3.4% among the controls. Obviously, a much smaller group admitted alcohol consumption than was demonstrated for the males.

A history of syphilis was found in five patients in the study group (including two with tongue cancer), compared with three of the controls (3.8% and 0.8% respectively).

Forty-nine per cent. of the study cases gave a history of edentia compared with 29% among the controls, and 14% among the study cases had lost their teeth prior to the age of 40 compared with 8% among the controls. The variable of edentia was analysed against the variable of pregnancy.

TABLE VII.—Per Cent Edentulous by Number of Pregnancies—Study and Control Groups

No. of Pregnancies	Study Group (116)	Control Group (246)
None	29	22
1-2	44	30
3-4	70	24
5+	71	62
Total	49	29

A significant association exists between the number of pregnancies and edentia (Table VII). In the study group, among the women who had never been pregnant 29% were edentulous, those with three or four children 70%, and those with five or more children 71%. A similar phenomenon, though to a less marked extent, was noted among the controls. These data therefore indicate that pregnancies have a marked influence on the loss of teeth, particularly among patients with cancer of the mouth.

Study of the history of dental irritation or trauma due to sharp teeth showed that, in general, women tend to recall such histories more often than men. But again, with the exception of a few isolated cases, the histories of site and duration of irritation were not particularly impressive.

As to previous disease, no differences were found, with the exception of a slightly higher proportion of women with glossitis, 8%, as compared with the controls, 3%, and with oral fissures, 5%, against the control, 2%. The study includes only one case of Plummer-Vinson disease that could be verified by x-ray studies of the hypopharynx; the patient was a 64-year-old woman with cancer of the gum who was born and raised in Scotland. Leucoplakia was again found to be more common among women in the study group, 30%, and the largest proportion was again found for the buccal mucosa, 58%. Nutrition-wise, there was again no remarkable difference with the exception of tongue cancer cases, whose intake of citrus fruit was deficient among 38% of the study group compared with 25% among the controls.

Discussion

It is pertinent to determine how different variables found to be significant in the development of cancer of the oral cavity act and interact, and to ascertain to what extent their reduction or modification can lead to a decrease in the incidence of cancer of the oral cavity.

Tobacco

Smoking, as in previous studies of lung and larynx cancer, was found to be an important factor in the development of cancer of the mouth. This applies to all sites of mouth cancer and to women as well as men. Of particular interest is the fact that the relative risk of a cigar and pipe smoker developing cancer of the mouth appears greater than for a cigarette smoker, which is in contrast to the pattern encountered in lung cancer, where the risk of developing this type of cancer is far greater for the cigarette smoker than for the pipe and cigar smokers.

One can only speculate on why cigar and pipe smoking carries a greater risk for mouth cancer than cigarette smoking. One must consider the fact that inhalation is practised more commonly among cigarette than among cigar and pipe smokers. We found 90% of the former and only

15% of the latter to claim that they inhale intentionally. The smoker who does not consciously inhale perhaps keeps the smoke condensate in his mouth longer than those who inhale it into their lungs. It is also possible that the cigar and pipe smoker who tends to keep the cigar and pipe in his mouth longer than a cigarette smoker is exposed more extensively to the tobacco juices.

The fact that the relative risk of a cigarette smoker to develop lung cancer is greater than the corresponding relative risk for mouth cancer might be due to a greater susceptibility of bronchial epithelium compared with oral mucosa. It is also likely that in the smaller confines of the bronchial tree tobacco condensate tends to accumulate more extensively than on the wider and smoother surfaces of the oral mucosa. Furthermore, the constant washing of the oral mucosa through salivation and mastication may prevent the settling of tobacco condensate on its surfaces.

Experimental work has demonstrated that cigarette tar extracted with hexane from unsmoked cigarettes is far less carcinogenic than cigarette smoke condensate (Wynder and Wright, 1957). This demonstrates that the carcinogens in tobacco smoke are largely formed through combustion. These data are compatible with the present data that tobacco chewing plays a lesser part in the formation of cancer of the oral cavity than tobacco smoking.

It has been stated that tobacco could not be a major cause of cancer of the oral cavity because no increase has been noted in males for mouth cancer though there has been a sharp increase in cigarette consumption. U.S. Census data show that, although there has been an increase in cigarette consumption during the past two or three decades,

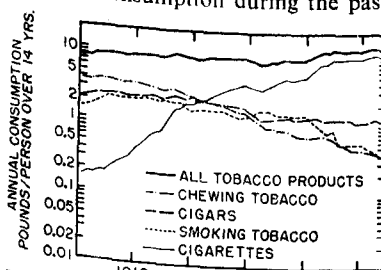


Fig. 8.—Consumption of tobacco during the twentieth century. (From Haenszel and Shimkin, 1956.)

the total number of smokers has not increased very much, and, in fact, for cigar and pipe smokers there has been a marked drop (Haenszel and Shimkin, 1956) (Fig. 8). In other words, the principal change has been for cigar and pipe smokers to become cigarette smokers. In view of the fact that cigar and pipe smoking involves greater risk for cancer of the mouth than cigarette smoking, we would not expect an increase in cancer of the oral cavity. On the other hand, we would anticipate a slight increase in women because they never smoked cigars and pipes, but are now beginning to have an increased cigarette consumption, which should increase their risk of developing cancer of the mouth.

In a separate report a study of environmental factors of cancer of the mouth in India is presented (Wynder, 1957). The results of this study are in line with those recently reported by Sanghvi and his associates (1955) in that they show cancer of the mouth to be significantly related to bidi smoking and betel-nut chewing. The association of the latter seems to be limited chiefly to cancer of the lip, gum, and buccal mucosa. We attempted to determine whether tobacco was a necessary ingredient of the betel-nut quid among patients with mouth cancer. This was difficult to determine, because there were very few patients with mouth cancer who chewed betel-nut quid without tobacco and were at the same time non-smokers. There is a suggestion, however, based primarily upon female data, that the person of mouth cancer than the person using one that does not contain tobacco.

Alcohol

Alcohol has a marked influence on the development of cancer of the mouth. As in previous studies on larynx cancer, we were unable to effect a simple separation of

tobacco and alcohol effects, since there were few heavy drinkers who are not at the same time heavy smokers. However, it was possible to obtain some estimate of the separate effects of each factor by a rather complex analysis (Wynder, Bross, and Feldman, 1957). The effect of alcohol on mouth cancer occurs primarily, though not exclusively, in patients who are heavy whisky drinkers. One can only speculate on how alcohol increases the risk of oral cavity cancer. This could be due to a direct effect of the alcohol on the tissues. It could be due to a decrease of protective saliva from the mucosa, which would tend to make it more susceptible to the effect of tobacco. A third possibility is an indirect action due to nutritional deficiencies. Though we were unable to determine significant nutritional differences between study and control groups, it is generally accepted that a majority of people who drink heavily will none the less have certain nutritional deficiencies. In reviewing the literature we were surprised at the lack of detailed studies in this respect. However, available data suggest that alcoholics have deficiencies in ascorbic acid, thiamine, riboflavin, and, upon liver involvement, also vitamin A (Jellinek and Jolliffe, 1940).

The elucidation of the mechanism of the alcohol effect would seem to be a problem for laboratory investigation.

Plummer-Vinson's Syndrome

It is interesting to speculate how nutritional deficiencies associated with alcoholism may tie in with the nutritional deficiencies of Plummer-Vinson disease. In a separate investigation we have demonstrated that Plummer-Vinson disease in Sweden is responsible in large part for the relatively high rate of cancer of the mouth in Swedish women (Wynder, Hultberg, *et al.*, 1957). In addition to a chronic iron-deficiency state, Plummer-Vinson disease probably also involves other nutritional deficiencies, notably vitamins C and B. Future laboratory studies in Sweden and in the United States may determine what common basis there may be in nutritional deficiencies of alcoholism and Plummer-Vinson disease, and from the possible finding of a common denominator much may be learned about some of the intrinsic factors that regulate the formation of cancer of the oral cavity.

Dental Conditions

Dental hygiene and dental irritation have often been stressed as important factors in cancer of the mouth. There is some evidence for this in the present study, though these factors do not appear to be major ones. It is possible that in the isolated case a specific irritation may add to the development of a cancer already initiated, which is compatible with laboratory experiments. The most interesting finding about dental conditions is that edentia occurs more commonly among the study cases than among the controls and more commonly among women than among men. It may be theorized that the same type of deficiency which leads to a loosening of the teeth, perhaps through atrophic changes in the gums and mucous membrane, also promotes cancer of the mouth. In studies on Plummer-Vinson disease we had previously emphasized the marked degree of early edentia. It is of interest in that respect that we found a relationship of pregnancy to edentia, particularly among the study cases. This may indicate that some deficiencies promoted by pregnancy may be the same ones which promote edentia and neoplastic changes in the mucous membranes. Deficiencies commonly associated with pregnancy involve especially calcium and iron, but undoubtedly must involve other minerals and vitamins.

Syphilis

Syphilis was shown to be of some importance in the development of cancer of the lip and of the anterior two-thirds of the tongue. It cannot be established whether this relationship is due to syphilitic glossitis or to arsenical therapy, which most of these patients have received. At any rate, with the modern methods for control of syphilis through its early treatment with antibiotics, this factor will be less important.

Other Factors

Other factors of significance in the development of cancer of the lip include excessive exposure to sunlight, a finding in line with the general geographical distribution of cancer of the lip.

A few occupations seemed to influence the development of certain types of cancer, particularly those of cancer of the tonsil and pharynx, which showed a suggested relationship to the type of exposures that confront plumbers and metal workers. It is of interest that the general occupation of metal workers had been under previous suspicion in cancer of the lung. All of these patients, however, were also smokers. There were no single occupations so outstandingly frequent among the study group as to cause particular concern or to be of special academic interest. However, it would be of value to investigate causes of death within these industries to determine whether the present data can thus be confirmed.

Incidence Pattern

We stated, when introducing this report, that variables significant in a given statistical study will gain causative importance if these variables can account for the incidence pattern of a given cancer. We have summarized the incidence variations among different population groups and compared these with the extent of exposure of these groups to variables found to be of statistical significance. In general, there is a close agreement between the degree of exposure of these variables and the incidence of cancer in a given population group.

1. The greater prevalence of male over female cases of cancer of the mouth is consistent with the heavier consumption of tobacco and alcohol among the male population.

2. The fact that cancer of the oral cavity in males has not increased and perhaps has even decreased in some areas is consistent with the fact that the relative risk of mouth cancer is greater for cigar and pipe than for cigarette smokers. During the past decade, although there has been a slight increase in the total number of smokers, there has been a decrease in the number of people smoking cigars and pipes. In view of this fact, we should not expect an increase in mouth cancer as has occurred in lung cancer, a type of cancer predominantly related to cigarette smoking.

3. A small increase of cancer of the oral cavity in women should be expected, because women to-day smoke more cigarettes than in the past and they have never smoked any cigars and pipes. This increase, however, should be small, because there are relatively few women in the cancer age who have smoked extensively for 20 years. Incidence data, of course, are furthermore influenced by some other factors, as suggested by this study and by improved therapy, which makes an exact comparison difficult. However, the present incidence of mouth cancer in men and women is certainly not inconsistent with the relative exposure to different tobacco types and to alcohol.

4. The greater prevalence of cancer of the oral cavity among Catholic men than among Jewish men at the Memorial Center is consistent with the finding that there are three times as many heavy alcohol drinkers among the former.

5. The relatively high rate of cancer of the oral cavity in Swedish women is consistent with the prevalence of Plummer-Vinson disease among this group.

6. The relatively high rate of lip cancer in southern countries is consistent with the greater exposure to sunlight as compared with northern areas.

7. The high frequency of cancer of the mouth in India is consistent with the high rate of bidi smoking and betel-nut chewing.

In addition to the above factors, syphilis and a few occupations influence the rates of cancer of the mouth, particularly for specific sites, but do not seem to have a major influence on the overall incidence.

Preventive Measures: A Summation

The main objective of this communication is to consider possible preventive measures which might effect substantial reduction in the incidence of oral cancer. From this point of view those environmental factors are of special importance which involve a sizable proportion of the general population and which are susceptible to control, either directly or indirectly.

From the point of view of preventive medicine, the main question is whether this study revealed any factors which are susceptible to control and whose control could effect a marked reduction in the nation-wide incidence of oral cancer.

In order to make any prediction of the effect of control of a given factor or factors, it is necessary to make some assumptions. However, if one makes several predictions, each based on somewhat different assumptions, and if these predictions are in general agreement, one can have greater confidence in the prediction. If we assume that control measures are fully efficient and hence the risks for individuals now exposed to an agent would be reduced to the risks of the individuals with little exposure to the agent, we can use the data in this study to predict the potential reduction in incidence rates. Thus, if tobacco and alcohol effects were eliminated by fully effective control measures we would predict that about four out of five male cases of oral cancer could be avoided. If we assume that the inherent susceptibility of males and females to oral cancer is about the same, then if tobacco and alcohol effects were absent the male rates would diminish to the female rates. For example, in New York State (exclusive of New York City) the 1951-3 incidence rates for oral cancer were 15.1 (per 100,000) in men and 4.0 in women. (These data from New York City were supplied to us by Dr. Morton Levin through personal communication.) This would suggest that three out of four male cases of oral cancer are preventable. In view of the fact, as shown by this study, that at least some of the female cases are also related to tobacco and alcohol, the actual lowering of incidence rates that can be achieved should be even more pronounced. We derived a partial check on the assumption of similar inherent susceptibilities of males and females by further analysis of the basic data presented here. While the check is a crude one, we can say that the data seem compatible with this assumption. The Swedish data suggest that, if anything, women may be inherently somewhat more susceptible (Wynder, Hultberg, *et al.*, 1957).

These estimates are, of course, too optimistic, since we would not expect to develop full effective control measures with respect to tobacco and alcohol. Yet, even if the measures were only half effective, there should be a sizable reduction in the incidence of oral cancer in American males.

The question remains, what specific control measures are feasible? From a hypothetical point of view, the individual should reduce or moderate his consumption of tobacco and alcohol. Here it must be emphasized that there is a distinct difference in the use of the term "moderation" as it applies to tobacco and alcohol consumption. Most people will agree that the person who consumes seven or more drinks daily is an excessive drinker, and it is primarily this kind of drinker who carries an increased risk of cancer of the mouth. On the other hand, the person who smokes 20 cigarettes a day or the one who smokes three or four cigars or five or six pipes a day is usually considered a moderate smoker. Yet from the point of view of cancer risk this does not represent smoking in moderation. Only the smoker consuming fewer than 10 cigarettes a day or the equivalent in cigars and pipes has a relatively low risk of cancer of the upper alimentary or respiratory tract. From a practical point of view, voluntary restriction of consumption does not work out effectively. Hypothetically, prohibition of the agents might be a control measure, but past experience with prohibition indicates that this approach is not feasible.

The most promising field in respect to tobacco at present appears to be further research to identify the carcinogens in tobacco smoke and to reduce the exposure to the carcinogens by effective filtration or modification of the tobacco in cigarettes, pipes, and cigars. If safer tobacco products can be developed—and current laboratory results are encouraging—then these can be substituted for present products. Such modifications might reduce the incidence of oral cancer and also the incidence of lung and larynx cancer and other cancers related to smoking. Another measure which can be begun now would be the health education of students in high school. One preventive measure, in conjunction with alcohol effects, would be improved nutrition, particularly with respect to possible supplements of iron and vitamins B and C.

These recommendations apply primarily to oral cancer in countries such as the United States. Preventive measures have to be tailored to the particular situation, and therefore the emphasis in other countries might be somewhat different. In Sweden, for example, current preventive measures in respect to dietary supplements are already achieving a reduction in Plummer-Vinson disease, and, we believe, will eventually reduce the incidence of oral cancer in women from Northern Sweden. In India, moderation in the use of bidis and betel-nut chewing should lead to a great reduction in oral cancer. In the warmer regions of the globe protection against excessive exposure to sunlight, particularly among fair-skinned people, represents a preventive measure for lip cancer.

From the point of view of preventive medicine we can avoid many of the semantic tangles and arguments that have hampered the study of environmental agents in cancer. The important question is not whether an agent is "associated with," "increases the risk of," "causes," "initiates," or "promotes"

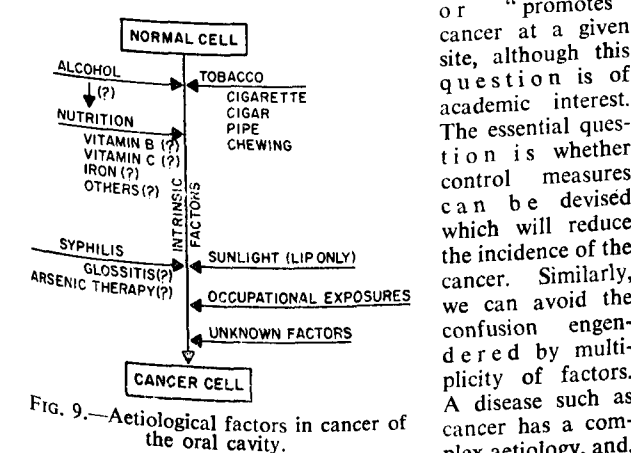


Fig. 9.—Aetiological factors in cancer of the oral cavity.

as this study indicates, there may be many factors operating (Fig. 9). Even if a given factor accounts for a few cases, this is surely no reason to ignore factors which account for the majority of the cases. The viewpoint of preventive medicine enables us to maintain some perspective and to keep us from focusing all of our attention on a handful of highly interesting but very rare case histories.

Finally, we would like to make clear the spirit in which these predictions and recommendations are made. We cannot claim that some assertions are absolutely correct, since they have not been subjected to the final test of experience. Until control measures actually reduce the incidence of disease, we can only employ indirect arguments. The final proof of epidemiological data, however, the reduction of disease, cannot be accomplished until proper control measures have been instituted.

The goal we expect to attain demands that we give this problem our fullest attention. If our conclusions are correct, then perhaps much of the suffering and death from oral cancer can be avoided. We do not believe, as stated at the onset of this discussion, that the development of practical control measures must await a complete understanding of the pathogenesis of a given disease. This holds

as true to-day as it did during the days of Snow. In this concept lies the practical significance of epidemiological research and preventive medicine.

REFERENCES

- Haenszel, W., and Shimkin, M. B. (1956). *J. nat. Cancer Inst.*, **16**, 1417.
Jellinek, E. M., and Jolliffe, N. (1940). *Quart. J. Stud. Alcohol*, **1**, 110.
Khanolkar, V. R. (1950). *Acta Un. int. Cancr.*, **6**, 881.
Martin, H. E., Munster, H., and Sugarbaker, E. D. (1940). *Arch. Surg. (Chicago)*, **41**, 888.
Moore, G. E., Bissinger, L. L., and Proehl, E. C. (1953). *J. Amer. Geriat. Soc.*, **1**, 497.
Public Health Service, Federal Security Agency (1950-2). *Cancer Morbidity Series*, 1-10 (Public Health Service Publ. No. 13, 65, 67, 112, 126, 152, 178, 216, 217, 244). Washington, D.C. Government Office.
Sadovsky, Doris A., Gilliam, A. G., and Cornfield, J. (1953). *J. nat. Cancer Inst.*, **13**, 1237.
Sanghvi, L. D., Rao, K. C. M., and Khanolkar, V. R. (1955). *British Medical Journal*, **1**, 1111.
Wynder, E. L. (1957). In preparation.
Bross, I. J., and Day, E. (1956). *Cancer*, **9**, 86.
— and Feldman, R. (1957). *Ibid.* In press.
Hultberg, S., Jacobsson, F., and Bross, I. J. (1957). *Ibid.* In press.
— and Wright, G. (1957). *Ibid.* In press.

SEROLOGICAL EVIDENCE OF INFECTION WITH SENDAI VIRUS IN ENGLAND

BY

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The first description of Sendai virus as a possible cause of human disease was given by Sano *et al.* (1953), who investigated an outbreak of pneumonitis among newborn infants in a hospital at Sendai, Japan. Twelve out of 17 patients died. The onset was acute, with pyrexia, cyanosis, and marked dyspnoea. X-ray examination showed opacities in the lung fields of some cases, but there were few physical signs in the chest. Jaundice developed in a few cases. From five of the fatal cases, Kuroya *et al.* (1953) isolated a virus by the intranasal inoculation of mice with lung extracts and adapted it to grow in fertile hens' eggs. These workers also reported that a pyrexial disease with pneumonitis occurred in a human volunteer aged 8 years who had been inoculated intranasally with the virus and from whom it was subsequently re-isolated. Later the virus was found to have the property of agglutinating the red-blood cells of a fowl. Haemagglutination-inhibiting antibodies were found in the residents of the town of Sendai but were not present in residents of three other districts. The properties of this virus were also investigated in Japan by Fukumi *et al.* (1954).

In the course of a serological survey of sera from a variety of illnesses in the U.S.A., Jensen *et al.* (1955) found evidence of infection with Sendai virus in two patients; one had suffered from an atypical pneumonia and the other from a nondescript respiratory illness of two to three days' duration. No virus was isolated by these workers. They suggested that the virus might be termed influenza D.

Serological evidence of infection with Sendai virus was detected in this country in 1956 (Bruce White, Gardner, and Hope-Simpson, 1957), during the investigation of an outbreak of respiratory disease in a hospital for the chronic sick. Additional serological evidence of infection has been found in England in a number of other patients, details of which are the subject of this report.

Materials and Methods

For this investigation use was made of all suitably paired sera sent to this laboratory during 1956 from patients suffering

from respiratory disease. Only paired samples of serum consisting of one taken during the acute stage and one taken about ten days later during convalescence were judged suitable for examination by complement-fixation tests (C.F.T.).

The Sendai and mumps virus particle antigens were prepared as described by Bruce White *et al.* (1957), having been made from the same virus strains.

A total of 872 pairs of sera were examined for complement-fixing antibodies to Sendai and mumps virus particle antigen. These consisted of 615 pairs of sera examined for the routine diagnosis of respiratory disease and 257 sera collected at various Royal Air Force stations during a survey of respiratory illness. The R.A.F. sera were examined only for antibodies fixing complement with the antigens of influenza A and B, adenovirus, Sendai, and mumps (virus particle antigens); the remaining sera were tested with antigens of *Rickettsia burneti* and the viruses of influenza C and psittacosis, as well as the antigens used for the R.A.F. sera. A *Streptococcus M.G.* agglutination test for the detection of atypical pneumonia was carried out on the sera of cases sent to this laboratory for routine testing.

Case Reports

Serological evidence of recent infection with Sendai virus, as denoted by a fourfold rise in the titre of complement-fixing antibodies to Sendai virus, was found in 23 cases (4 children and 19 adults): the convalescent titres ranged from 1/8 to 1/64. The salient features of the histories of these cases are summarized in the accompanying Table.

Summary of Clinical History of Patients Suspected of Being Infected with Sendai Virus

Case No.	Age and Sex	Date of Onset	Respiratory Illnesses			History of Mumps
			With Pneumonia	Without Pneumonia	Laryngeal Symptoms	
1	79 M	19/1/56	+	—	—	N.K.
2	59 F	20/1/56	+	—	—	N.K.
3	79 M	3/2/56	—	+	—	N.K.
4	87 F	13/2/56	+	—	—	N.K.
5	90 F	13/2/56	—	+	—	N.K.
6	Ad. M	11/2/56	—	+	—	N.K.
7	21 M	9/2/56	—	+	—	N.K.
8	18 F	14/2/56	—	+	—	N.K.
9	20 M	14/2/56	—	+	—	N.K.
10	20 M	16/2/56	—	+	—	N.K.
11	34 M	21/2/56	—	+	—	N.K.
12	50 M	23/1/56	—	+	—	—
13*	2 M	11/4/56	—	+	—	—
14	8 F	28/5/56	+	—	+	—
15	6 M	27/9/56	—	—	+	—
16	8 F	2/10/56	—	—	+	—
17	49 M	12/11/56	—	+	—	+
18	Ad. F	20/11/56	—	+	—	—
19	51 F	24/11/56	—	+	—	N.K.
20	35 M	Late Nov. 1956	—	+	—	—
21	52 F	5/12/56	+	—	—	N.K.
22	58 M	10/12/56	—	+	—	N.K.
23	51 F	11/12/56	+	—	—	N.K.

Ad. = Adult. N.K. = Not known. + = Predominant feature. — = Minor or absent feature. * This patient also had conjunctivitis and a lymphadenitis.

Cases 1–6 occurred or were associated with an outbreak in a hospital for chronic sick (Bruce White *et al.*, 1957).

Cases 7–11 were single cases which occurred in R.A.F. stations and were not associated as an outbreak. Influenza A was prevalent in these stations at this time.

Cases 12–23 were cases of sporadic disease or family outbreaks in Southern England, from which sera were sent to the laboratory for routine diagnostic tests for respiratory infection. Cases 15 and 16 were brother and sister; Cases 17 and 20 occurred in the same doctor's practice; Case 23 occurred in the same town as the original outbreak in the hospital for the chronic sick. Some members of the families of Cases 6, 17, and 18 had a similar illness but no sera were available for testing.

The most severe illnesses were in those over 50, five of whom had pneumonia. Three of the children showed a predominance of laryngeal symptoms, such as hoarseness, loss of voice, dyspnoea, and stridor. All cases were characterized by an infection of the upper respiratory tract and in

most there were signs of a more general systemic infection. The only evidence available regarding the probable incubation period of this illness was obtained at the hospital for the chronic sick, where the technician (Case 6) was in contact with Cases 2 and 3 on the third day of their illness. If he acquired his infection from Case 3 the probable incubation period would be about five days, if from Case 2 about 19 days.

Discussion

When both Sendai virus and influenza virus A infection were occurring together, as in the R.A.F. and in the hospital for the chronic sick, no clinical differences between the types of infection were apparent. Cases of Sendai virus infection were detected throughout 1956, although the majority occurred at the beginning and the end of the year. The apparent concentration of cases at the beginning of the year may be of no significance, as six cases were from one outbreak occurring in January and February, and five were in R.A.F. personnel from whom the sera were collected only during the five-weeks period February 10 to March 19.

During 1956, 96 of 615 pairs of sera tested, excluding those from the R.A.F., gave fourfold or greater rising titres positive to a variety of virus agents in the routine examination of sera from patients with pyrexia of unknown origin or infection of the respiratory tract. These consisted of 60 positive to influenza A, 16 to adenovirus, 2 to influenza C, 11 to psittacosis, and 5 to *Rickettsia burneti*; there were also two rising titres in the agglutination test with *Streptococcus M.G.* None of these had rising titres to Sendai virus. However, in Case 9, one of the R.A.F. series, there was a diagnostic rise in titres to influenza virus A (the titre for influenza A rising from <1/2 to 1/64 and for Sendai rising from <1/4 to 1/16). This may be regarded as of evidence of a dual infection, or, alternatively, it might be due to an anamnestic response of one of the antibodies. Influenza virus A and Sendai virus infection also occurred about the same time in the hospital for the chronic sick (Bruce White *et al.*, 1957).

From work proceeding at the moment, there appears to be an antigenic relationship between the virus of mumps and Sendai virus. A proportion of patients suffering from mumps, having the usual fourfold or greater rising antibody titre to mumps virus particle antigen, had, in addition, fourfold or greater rising titres to Sendai virus when the paired sera were examined by complement-fixation tests. A proportion of single sera sent to this laboratory having a high titre to mumps virus particle antigen also had a raised titre to Sendai antigen by complement-fixation tests. Until more information has been obtained on this point, all sera suspect of containing Sendai antibodies are being tested with mumps virus particle antigen.

Case 10 shows a fourfold rise to mumps virus particle antigen as well as to Sendai (the antibody titre for Sendai rising from <1/4 to 1/16 and that for mumps from <1/4 to 1/8). Shortage of serum prevented further investigation of this interesting case. The serological findings in this case are open to at least three interpretations. In the first place, it is possible that this was a case of mumps virus infection in which Sendai complement-fixing antibodies were evoked by an anamnestic reaction. Clinically this was unlikely, since the patient had none of the stigmata of mumps. In the second place, the infection may have been with Sendai virus, which provoked a mumps virus particle antibody response of the anamnestic type. A third possibility is that Sendai virus, or some strains of the virus, share an antigenic component with mumps virus, or some strain of mumps virus, with the result that infection with Sendai virus produces antibodies capable of reaction with both viruses in the complement-fixation test. The true explanation is at the moment doubtful, but it is of interest that Chanock (1956), in the U.S.A., found a relationship between his "croup agent" and mumps virus.

Where possible, patients were questioned for a past history of mumps, and this is recorded in the Table. It is worth noting that Case 14 had a definite history of mumps nine

NEWBORN PNEUMONITIS VIRUS (TYPE SENDAI)

EVIDENCE OF INFECTION IN SOUTH-WEST SCOTLAND

BY

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WITH THE TECHNICAL ASSISTANCE OF

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months earlier. She was found to have a raised but unchanging titre of complement-fixing antibodies to mumps virus particle antigen in her two specimens of sera (the titres of Sendai complement-fixing antibodies showed a rise from 1/16 to 1/64, but the corresponding titres of mumps complement-fixing antibodies were 1/32 and 1/32).

In the 23 cases reported here evidence of Sendai infection was found in retrospect and no specimens of throat washings or swabs were available for isolation tests. The failure, so far, to isolate a virus only stresses the importance of obtaining suitable specimens for attempted virus isolation from cases of suspected influenza.

Summary and Conclusion

During 1956 the 872 suitably paired sera from cases of respiratory illness sent to this laboratory for investigation were examined for evidence of complement-fixing antibodies to Sendai virus.

Twenty-three cases of respiratory illness have been described in which a fourfold or greater rise in titre of complement-fixing antibodies to Sendai virus was found.

The illnesses varied from a mild influenza-like malady to a severe pneumonia; cough and laryngeal symptoms were often prominent. Cases were found in both sexes and among all age groups.

Evidence of an antigenic relationship between mumps and Sendai antigens was found. This was illustrated in a proportion of patients suffering from mumps who showed a rise in complement-fixing antibodies to both Sendai and mumps virus particle antigens.

Only one case in the present series gave a rising titre of complement-fixing antibodies to both Sendai and mumps virus particle antigen. The possible cause of this is discussed.

The C.F.T. for Sendai virus infection appears to be reliable, and a diagnosis can be readily made by serological means in cases of respiratory illness. Cross-reactions did not occur with other virus antigens used during the routine investigation of sera for respiratory illness.

Sendai virus or a related virus should be considered as a possible cause of respiratory disease, especially during the winter months.

I wish to acknowledge the help given to me in this series by many persons: Dr. F. O. MacCallum, the director of the Virus Reference Laboratory, for his helpful criticism in preparing this paper; Dr. R. E. Hope-Simpson and his staff at the hospital laboratory, Cirencester; Dr. I. M. Librach, of Ilford Isolation Hospital; Dr. G. P. McKendrick and staff, of St. Ann's Hospital, Tottenham; Dr. J. MacMurray, of the Royal East Sussex Hospital, Hastings; Drs. P. L. Masters and J. A. Davies, of the Paediatric Home Care Service of St. Mary's Hospital; Drs. P. Wormald, G. T. Cook, P. Martin, and F. A. Holden, of the Public Health Laboratories at Cambridge, Guildford, Ipswich, and Peterborough; and the following general practitioners, Drs. R. Southern, J. Shackleton-Bailey, J. C. Inglis, J. Sturridge, and C. Nesbitt-Wood, for supplying sera and case histories. I am also indebted to Drs. B. E. Andrews and J. C. McDonald, and the Director-General of R.A.F. Medical Services for sera and case histories of R.A.F. patients; also to Dr. C. E. D. Taylor for the routine screening of sera from October to December, 1956.

REFERENCES

- Chanock, R. M. (1956). *J. exp. Med.*, **104**, 555.
Fukumi, H., Nishikawa, F., and Kitayama, T. (1954). *Jap. J. med. Sci. Biol.*, **7**, 345.
Jensen, K. E., Minuse, E., and Ackermann, W. W. (1955). *J. Immunol.*, **75**, 71.
Kuroya, M., Ishida, N., and Shiratori, T. (1953). *Yokohama med. Bull.*, **4**, 217.
Sano, T., Niitsu, I., Nakagawa, I., and Ando, T. (1953). *Ibid.*, **4**, 199.
White, G. B. B., Gardner, P. S., Hope-Simpson, R. E. (1957). *British Medical Journal*, **1**, 381.

The newborn pneumonitis virus (N.P.V.) (type Sendai) was isolated by Kuroya *et al.* (1953) from the lungs of newborn infants who died during an outbreak of pneumonitis in the wards of the department of paediatrics of the Tohoku University, Japan. The virus was cultured by intranasal inoculation of mice and was subsequently adapted to the allantoic cavity of the embryonated egg. Isolations of N.P.V. were reported about the same time by Misao (personal communication to Kuroya *et al.*) and Ohashi (personal communication to Kuroya *et al.*), from an epidemic of A prime influenza; later Matsuzawa *et al.* (1954) found antibody to the virus in healthy adults in various parts of Japan.

In the U.S.A. Jensen *et al.* (1955) found antibody to N.P.V. by haemagglutination inhibition tests in about 40% of paired sera from a variety of illnesses. These authors observed the highest levels of antibody in the under 18 age group, and in serum from more than 559 varied illnesses they found eight instances of what they considered a significant rise in antibody titre to N.P.V. In only two patients were they able to correlate rising titres of antibody with a clinical illness: one patient was diagnosed as a case of atypical pneumonia; the other case as a mild respiratory illness.

This paper presents evidence for the existence in south-west Scotland of an antigenic stimulus producing antibodies to N.P.V. Antibody was discovered on routine screening of paired serum specimens. Fourfold rising titres were observed in nine instances by complement-fixation tests; clinical details of these are summarized. No attempts were made to isolate the virus.

Methods

The population investigated and the techniques used have been described briefly in a previous paper (Grist, Sommerville, and Carson, 1957). During the winter seasons of 1955 and 1956 the sera were drawn from three sources: paired sera were obtained from 175 adults admitted to the pneumonia wards of Ruchill Hospital, Glasgow; 97 pairs were obtained from infants admitted to the infant pneumonia wards of the same hospital; and 172 serum pairs were provided from cases of upper respiratory illness by general practitioners participating in the scheme for detection of influenza in the community during the course of influenza vaccine trials by the Medical Research Council (1955). In every instance the interval between collection of the serum samples in a pair was more than 7 and usually between 10 and 14 days.

The Sendai strain of N.P.V. was supplied by the World Influenza Centre of the World Health Organization. This virus was passed by the allantoic route in embryonated eggs at the eleventh day of incubation. Allantoic fluids were harvested and pooled 72 hours after incubation with 0.1 ml. of 1/1000 dilution of virus. After titration in "chess-board" experiments the pooled allantoic fluid was used at an

optimal dilution as an antigen in complement-fixation (C.F.) and haemagglutination-inhibition (H.I.) tests. Positive and negative control ferret sera were supplied by the Virus Laboratory of the School of Public Health, University of Michigan.

The C.F. and H.I. techniques employed have both been described by Grist (1955). A small-volume C.F. test with a 90-minute fixation period at 37° C. was used with all adult sera, but infant sera were tested by a small-volume cold-overnight test in view of the relative insensitivity of short fixation with infant sera reported by Grist (1957). In H.I. tests identical techniques were used with adult and infant sera, but owing to shortage of serum C.F. tests only were performed in some instances.

Tests for virus-neutralizing antibody were not performed because of shortage of serum.

Results

The results of C.F. tests on paired sera, using N.P.V. as antigen, are shown in Table I. Failure to fix complement at a dilution of 1/8 or less was observed in 88% of sera, and a small proportion from each group was found to be anti-complementary. Complement fixation at 1/16 or 1/32 and twofold rise or fall in titre were observed in 12 cases, but only fourfold rises were regarded as positive evidence of the relevant antigenic experience. A fourfold rise in titre was found in nine instances—three in the adult pneu-

TABLE I.—Distribution of Antibody Titres to Newborn Pneumonitis Virus by Complement Fixation

Category of Cases	Total Cases	C.F. Antibody Titres of Serum Pairs							
		A.C.*	<8	8	16	32	Rising ×2	Falling	Rising ×4
Adult pneumonia	175	8	154	6	—	1	2	1	3
Infant pneumonia	97	10	87	—	—	—	—	—	—
"Influenza"	172	13	130	15	4	—	3	1	6

* Anticomplementary.

TABLE II.—Distribution of Antibody Titres to Newborn Pneumonitis Virus by Haemagglutination Inhibition

Category of Cases	Total Cases	H.I. Antibody Titres of Serum Pairs							
		<8	8	16	32	64	128	Rising ×2	Falling
Adult pneumonia	162	112	19	11	12	1	1	3	—
Infant pneumonia	58	24	13	16	4	—	—	—	1
"Influenza"	161	95	37	14	8	2	—	4	—

TABLE III.—Serological Results in 9 Cases Showing Fourfold Rise in Complement-fixation Titre with Newborn Pneumonitis Virus Antigen

Case No.	Date of Onset	Age and Sex	Diagnosis	Day of Disease—Serum Specimens	C.F. Titres			H.I. Titres	
					N.P.V.	Flu. A	Flu. B	N.P.V.	Flu. C
F2	3/12/54	38 F	"Influenza"	5	<8	N.T.	N.T.	N.T.	8
				22	16	<8	<8	N.T.	16
F32	1/1/55	35 M	"	5	<8	<8	N.T.	<8	16
				21	32	8	<8	16	16
F38	8/1/55	47 M	"	5	<8	N.T.	N.T.	8	<8
				14	16	<8	<8	8	<8
F136	3/1/56	52 F	"	1	<8	8	<8	16	64
				15	32	16	<8	16	64
F141	8/1/56	42 M	"	1	8	N.T.	N.T.	16	N.T.
				25	8	<8	<8	32	N.T.
				47	32	N.T.	N.T.	64	N.T.
F147	13/1/56	36 F	Pneumonia	1	<8	N.T.	N.T.	32	64
				10	16	<8	<8	32	64
R293	17/11/54	69 M	Bronchopneumonia	5	<8	N.T.	N.T.	<8	16
				15	32	<8	<8	16	16
				4	<10	N.T.	N.T.	8	16
				14	>160	<8	<8	128	N.T.
R496	24/1/56	75 M	Pneumonia	21	>160	N.T. } Pool	<8	N.T.	N.T.
				28	160	N.T. } 80	N.T.	N.T.	N.T.
				42	160	160	N.T.	40	N.T.
R574	26/3/56	65 F	Pneumonia + congestive cardiac failure	22	<8	N.T.	N.T.	<8	64
				32	128	<8	<8	128	64

N.T. = Not tested.

monia and six in the "influenza" group. For comparison the results of H.I. tests are shown in Table II. In this series 78% failed to inhibit haemagglutination at a serum dilution of 1/8 or less, but this proportion is raised to 95% if a dilution of 1/32 or less, as is customary with the influenza viruses, is used as the index of negativity. Only four cases were found with a fourfold rise in titre by H.I., and these also showed a similar rise by C.F. tests. A falling titre by H.I. in the case of one infant was not reflected in the C.F. test.

The main findings in the nine cases which showed a fourfold rise in titre by one or other test are shown in Table III. In contrast to the experience of Japanese investigators all cases in this series were adult. The description "influenza" in the diagnosis column denotes an influenza-like illness of varying severity in a patient drawn from the general-practitioner "influenza" group in Tables I and II. The other cases belong to the group of adult pneumonias.

In general, antibody reacting with N.P.V. appeared between the 5th and 10th days of illness, and the titre increased until the end of the second or third week. Thereafter the level decreased slowly during the third and subsequent weeks.

The appearance of antibody was delayed in two cases—F141 and R574. In these an initial febrile illness was complicated later by acute respiratory symptoms, which in turn were followed by rising titres of antibody reacting with N.P.V. One case (R496) developed a rising antibody titre to influenza during the course of his stay in hospital at a time when the antibody titre to N.P.V. was at its highest level. The influenza antibody response followed a clinical relapse during the convalescent phase of his initial illness. Apart from this case no other evidence of infection with influenza viruses was found in the nine patients under discussion.

Clinical Aspects of Infection with N.P.V.

All patients suffered from an acute respiratory illness which differed in severity from case to case but which presented no distinguishing pattern. All were diagnosed clinically as suffering from either pneumonia or influenza during winter months when both pneumonia and influenza were prevalent. The main features of the illness in each group are summarized in Table IV.

The cases of patients who were admitted to hospital with a diagnosis of pneumonia may be briefly described.

Case R293.—A man aged 69, whose illness began on November 17, 1954, was admitted to hospital five days after the onset of febrile illness. The presenting symptoms were headache, pleural pain, cough, and breathlessness. On admission there was minimal sacral oedema with slight overfilling of neck veins. Chest examination revealed coarse moist sounds at all areas despite

TABLE IV.—Summary of Two Types of Case Showing Antibody Reacting with Newborn Pneumonitis Virus

	Influenza	Pneumonic
No. of cases	5	4
Age (average)	43 years	61 years
Sex	M—3; F—2	M—2; F—2
Duration (average)	3 weeks	6 weeks
Previous history	Normal	1 normal; 1 congestive cardiac failure; 2 chronic bronchitis
Onset abrupt with	Headache; myalgia; fever—not over 101° F. (38.3° C.); malaise	Headache. Fever±. Malaise
Followed by	Nasal catarrh; pharyngitis; cough	Signs of pneumonia with or without congestive cardiac failure
Physical findings	Few	Lobar or bronchopneumonia with or without congestive cardiac failure
Treatment	Antipyretic therapy	Penicillin
Result	Satisfactory	Satisfactory

absence of dullness or diminution of air entry. W.B.C. was 20,600 per c.mm. X-ray examination revealed patchy consolidation in lower lobe of right lung, and a normal heart shadow. Treatment with crystalline penicillin removed fever in 24 hours, and thereafter improvement was rapid despite the development of a few crepitations at the left lung base following an attack of tachycardia on the 12th day of illness. X-ray examination showed chest clear at 15 days. This patient was reputed to have had a coronary thrombosis three years previously which was followed by an episode of congestive cardiac failure, but electrocardiograms during the course of the present illness revealed only "left heart strain and myocardial disease." During the first ten days in hospital antibody reacting with N.P.V. increased from less than 1/8 to 1/32 by C.F. and from less than 1/8 to 1/16 by H.I. tests.

Case R496.—A man aged 75, whose illness began on January 24, 1956, had a history of chronic bronchitis for many years. On admission to hospital three days after the onset of acute exacerbation of bronchitis, he was cyanosed and orthopnoeic and producing large amounts of grey sputum. Auscultation revealed marked bronchospasm with some scattered adventitious sounds. X-ray examination showed patchy consolidation and a normal heart shadow. W.B.C. was 8,000 per c.mm. Treatment with crystalline penicillin and aminophylline produced clinical improvement in three days, but relapse occurred 15 days after admission to hospital with exacerbation of symptoms, fever, and malaise. A second course of treatment with penicillin and aminophylline again produced improvement, and the subsequent recovery was uneventful. Antibody reacting with N.P.V. increased from less than 1/10 to more than 1/160 by C.F. tests between the 4th and 14th days of illness. During the same time a rise in titre from 1/8 to 1/128 occurred by H.I. A specimen obtained at the 42nd day of illness still revealed a C.F. antibody titre of 1/160, although the H.I. titre had fallen to 1/40. Titration of this specimen for antibody to influenza A in parallel with the serum specimen obtained at the 14th day revealed that during this time antibody to influenza A had increased by C.F. tests from less than 1/8 to 1/160. The pooled specimen resulting from serum obtained at the 21st and 28th days of illness, when tested for antibody to influenza A, revealed a C.F. titre of 1/80, and it was therefore concluded that, while the initial illness had produced the rise in titre of antibody reacting with N.P.V., the clinical relapse, occurring at the height of the antibody response to the first agent, had produced antibody to influenza A.

Case R574.—A woman aged 65, whose illness began on March 26, 1956, was admitted to hospital with severe dyspnoea of sudden onset 21 days after a mild influenza-like illness. She was afebrile on admission, but overfilling of neck veins and cyanosis were present. Chest examination revealed inspiratory and expiratory rhonchi and crepitations at all areas. W.B.C. was 12,800 per c.mm. X-ray examination showed cardiac enlargement with bilateral extensive pulmonary congestion, consistent with cardiac failure. A temperature of 101° F. (38.3° C.) which developed 24 hours after admission to hospital was controlled in 72 hours by crystalline penicillin although no pathogenic bacteria were isolated in culture. An E.C.G. revealed myocardial damage. Treatment with penicillin continued for 10 days, and aminophylline was administered frequently during the first few days, after which the patient was digitalized. Subsequent recovery was uneventful. During the first ten days following admission to hospital antibody reacting with N.P.V. increased from less than 1/8 to 1/128 by both C.F. and H.I. tests.

The cases classified as "influenza" were with one exception treated at home by general practitioners and were mild

febrile infections of the upper respiratory tract. Three were female and three male, and the ages ranged from 35 to 52 years. The illness lasted between two and eight weeks and none was fatal. In five cases the onset was abrupt, with headache, myalgia, fever, and malaise rapidly followed by nasal catarrh and pharyngitis. The temperature did not exceed 101° F. (38.3° C.) and quickly settled. An irritable cough developed in two cases. All five had few physical findings within the chest, and none had an x-ray examination. The condition resolved with mild antipyretic therapy.

The sixth patient had a prolonged illness. A basal pneumonia which was treated with penicillin was slow to resolve at first and x-ray examination revealed consolidation of the right middle and lower lung lobes. The patient was detained in hospital, and resolution occurred spontaneously over five weeks.

Discussion

The present studies reveal the presence of a hitherto unrecognized antigenic stimulus in the adult population of south-west Scotland. This is capable of producing antibody reacting with N.P.V. The number of reports in the world literature of infection with this agent is small, and the pattern of illness attributable to it has not been clearly defined. However, all reports are in agreement that the severe illness and high fatality rate in newborn infants originally reported by Kuroya *et al.* (1953) are not seen when the adult is infected. Volunteer experiments in adults by Kuroya *et al.* (1953) suggested that the illness was mild and febrile, affecting the upper respiratory tract and clinically resembling influenza. Collateral confirmatory evidence was supplied by Misao and by Ohashi (personal communications to Kuroya *et al.*) when they isolated viruses antigenically similar to N.V.P. from adults during an influenza epidemic in Japan. One of two adult cases described briefly by Jensen *et al.* (1955) suffered from a mild respiratory illness at a time when influenza B was prevalent, and the second case was described clinically as suffering from an atypical pneumonia.

The present investigation revealed infection with this agent during winter months when influenza viruses A and B were present, but influenza antibody was only once associated with antibody reacting with N.P.V. The incidence of infection with influenza in the population under investigation has already been described (Grist *et al.*, 1957).

In addition our present experience confirms the mild influenza-like nature of the illness in the majority of cases, but adds the possibility of a more severe type affecting persons who have a previous history of chronic bronchitis or heart disease, and who fall within an older age group.

Summary

We examined 444 paired sera by complement-fixation test, and 381 of these pairs by haemagglutination-inhibition test for antibody reacting with newborn pneumonitis virus in the population of south-west Scotland. Evidence was found in adults for the existence of an agent which is capable of producing this antibody. Nine instances were detected of a fourfold rising titre by complement-fixation test, and clinical details recorded from these cases revealed that the infection presented either as a mild influenza-like illness or as pneumonia.

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ADDENDUM.—Since this paper was prepared for publication an outbreak of respiratory illness caused by infection with newborn pneumonitis virus in a hospital for the chronic

sick and infirm has been reported by Bruce White *et al.* (*British Medical Journal*, 1957, 1, 381). In this outbreak six patients developed rising titres of antibody, and the clinical illnesses resembled influenza.

REFERENCES

- Grist, N. R. (1955). *British Medical Journal*, 2, 994.
 — (1957). *Scot. med. J.*, in press.
 — Somerville, R. G., and Carson, H. G. (1957). *British Medical Journal*, 1, 378.
 Jensen, K. E., Minuse, E. and Ackermann, W. W. (1955). *J. Immunol.*, 75, 71.
 Kuroya, M., Ishida, N., and Shiratori, T. (1953). *Yokohama med. Bull.*, 4, 217.
 Matsuzawa, M., Shiratori, T., and Kikuchi, H. (1954). Quoted by Jensen *et al.* (1955).
 Medical Research Council (1955). *British Medical Journal*, 2, 1139.

AGAMMAGLOBULINAEMIA WITH SPLENOMEGALY

BY

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Agammaglobulinaemia is a biochemical defect characterized by absence of serum gamma-globulin and is usually associated with deficiency of immunoglobulins, resulting in increased susceptibility to infection. The frequent recurrence of infection, which is the principal clinical feature of this condition, has been accentuated by the use of antibacterial drugs which have enabled these subjects to survive a succession of infections to which they might otherwise have succumbed.

Since agammaglobulinaemia associated with recurrent sepsis was first described by Bruton (1952) over 40 cases have been recorded. In these cases the symptoms and signs of the disorder have usually been those of recurrent infections. The purpose of this paper is to report two cases of agammaglobulinaemia in which enlargement of the spleen and liver and generalized enlargement of lymph nodes were also outstanding clinical features.

Case 1

The patient, a man of 33, had suffered from measles and pertussis in childhood, but apart from this had enjoyed good health until 1942, when at the age of 19 he had pneumonia. Enlarged lymph nodes were palpable in the neck and in both axillae, and the chest radiograph showed enlarged lymph nodes at the hilum of the right lung and shadows in the right lung. Respiratory symptoms recurred four months later and septic tonsils were removed. He remained in poor health and in the subsequent 14 years suffered numerous infections. In 1945 he had gingivitis, laryngitis, and pleurisy, and in 1946 seborrhoeic impetigo, herpes zoster, laryngitis, and pneumonia. In 1946 generalized enlargement of lymph nodes was present, enlarged nodes being palpable in the cervical, epitrochlear, axillary, and inguinal regions on both sides. In 1948 he had mumps and a respiratory infection, and in 1949 furunculosis and several respiratory infections.

In 1950 he was admitted to hospital with pleurisy. A firm spleen was palpable 1 in. (2.5 cm.) below the left costal margin, and the liver was palpable 1 in. (2.5 cm.) below the right costal margin. Generalized enlargement of superficial lymph nodes similar to that found in 1946 was noted and the chest radiograph again revealed right hilar node enlargement. Penicillin was given and respiratory symptoms improved, but jaundice occurred later and lasted three weeks. At this time the level of serum globulin was normal and albumin was raised. Total protein was 8.8 g. per 100 ml. (albumin 6.1 g., globulin 2.7 g.). The thymol turbidity was 4 units (normal). The blood count was normal. Biopsy of an enlarged lymph node showed reactive hyperplasia but no other abnormality.

Between 1950 and 1954 he suffered six acute respiratory infections. In 1954 sarcoidosis was suspected because of respiratory symptoms, hilar node enlargement, lymphadenopathy, hepatosplenomegaly, and a negative Mantoux test. Another enlarged lymph node was removed and showed reactive hyperplasia but no evidence of sarcoidosis or any primary reticuloses. The total serum protein was 8 g. per 100 ml. (albumin 6.4 g., globulin 1.6 g.).

In November, 1955, he had measles for the second time. In December the zinc flocculation test was 5 units (normal). In February, 1956, he had pneumonia and was treated with tetracycline, but pneumonia recurred in May and he was again treated with tetracycline. In May the zinc flocculation test showed only 1.5 units, suggesting that the serum gamma-globulin was low. In June the total serum protein was 6 g. per 100 ml. (albumin 4.6 g., globulin 1.4 g.). In July he had another acute respiratory infection which responded to chlortetracycline.

On admission to hospital in July he was seen to be a lean man with a frequent dry cough. The spleen was palpable 8 cm. below the left costal margin and felt firm. The liver was palpable 6 cm. below the right costal margin. Moderately enlarged firm lymph nodes were palpable in the epitrochlear, axillary, and inguinal regions on both sides. Rales were heard at the bases of both lungs.

Investigations

Paper electrophoresis of serum revealed no detectable gamma-globulin. Total serum protein was 6.39 g. per 100 ml. Electrophoretic analysis on the Tiselius apparatus (Professor N. H. Martin) showed: albumin, 62.8% (4.01 g.); globulins—alpha-1 5.4% (0.34 g.), alpha-2 14.4% (0.94 g.), beta 17.5% (1.12 g.), gamma 0.0% (less than 100 mg. per 100 ml.). Gamma-globulin was present in negligible quantities as determined by immunological techniques—approximately 60 mg. per 100 ml. by both red-cell agglutination and precipitation diffusion methods. Zinc flocculation test, 1 unit; thymol turbidity test, 2 units.

Deficiency of circulating antibodies was demonstrated by the following investigations. His red blood cells were group A, but anti-B isoagglutinins were present in the serum in negligible quantities (titre 1 in 2). His serum failed to agglutinate suspensions of *Salm. typhi* or *Salm. paratyphi A* and *B* in spite of previous T.A.B. inoculation. Mumps complement fixation was negative in spite of a previous history of mumps. The antistreptolysin titre was less than 10 units per ml. The Schick and Dick skin tests were positive. No skin reaction occurred with 100 tuberculin units of P.P.D., or with *Candida albicans* antigen, which gives delayed-type reactions in 95% of healthy adults. The *C. albicans* complement-fixation test was negative.

Another axillary lymph node was removed. Examination of sections stained by haematoxylin and eosin showed diffuse hyperplasia of the reticulo-endothelial elements of the stroma of the node. The germinal follicles were numerous, with considerable variation in size, some follicles being large and hyperplastic. The axillary lymph node removed in 1954 had a similar appearance, and that removed in 1950 was also similar except that stromal hyperplasia was not so intense. Reticulin stains revealed well-marked follicular patterns. Examination of sections stained specially for plasma cells with Unna-Pappenheim methyl-green pyronine stain showed that in the node removed in 1956 transitional plasma cells (Fagraeus, 1948) were plentiful in the germinal follicles and along the sinuses. Mature plasma cells were very sparse, however, in contrast to normal nodes, where large numbers of mature plasma cells can usually be found in the sinuses. The appearance of the node removed in 1954 was similar.

The chest radiograph showed bilateral hilar lymph-node enlargement and shadows at the bases of both lungs.

The E.S.R. was persistently low even during infections (1–4 mm. per hour, Westergren). Red-cell and white-cell counts were normal. During infection normal neutrophil leucocytosis occurred.

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Soon after admission to hospital he became severely ill with pneumonia, but responded to penicillin and streptomycin. However, only one week after stopping these drugs pneumonia recurred and he was given tetracycline. Gamma-globulin, 0.15 g. per kg. body weight, was administered intramuscularly. This was followed by weekly maintenance doses of 0.05 g. per kg. body weight. The serum gamma-globulin, estimated by paper electrophoresis one day and seven days after the second maintenance dose, was 0.5 g. per 100 ml. and 0.2 g. per 100 ml. respectively. Seven days after the tenth injection serum gamma-globulin was 320 mg. per 100 ml. by the precipitation diffusion method and 270–320 mg. by the red-cell agglutination method. During the three months he has been on the treatment he has had some minor infections, but none of them have been severe or have required antibacterial drugs.

Investigation of the Family.—The patient's parents, sister, and five brothers were all well and not unduly susceptible to infection. The father, mother, and sister all had high levels of serum gamma-globulin. Total protein was determined by the Van Slyke method, using tyrosine standard and Folin-Ciocalteu reagent. The globulin fractions were determined by paper electrophoresis. In healthy subjects the total serum globulin was 2.4 g. per 100 ml. (standard deviation 0.30) and the gamma-globulin 0.99 g. per 100 ml. (standard deviation 0.18) by these techniques. The levels (in g. per 100 ml.) were: father—albumin 3.4, globulin 3.8, gamma-globulin 1.9; mother—albumin 3.7, globulin 3.4, gamma-globulin 1.6; sister—albumin 4.3, globulin 3.2, gamma-globulin 1.7. The serum proteins of three brothers and the patients' two sons were normal.

Case 2

This patient was born in 1940, one month prematurely; her birth weight was 5 lb. (2,270 g.). She was well until the age of 2 years, when measles was followed by recurrent bilateral otorrhoea. After whooping-cough at 3 years she had persistent cough and failed to thrive. She first attended hospital in 1951, aged 11 years, with bilateral mucopurulent otorrhoea.

At 12 years she was admitted to hospital with an acute febrile respiratory infection. She was physically underdeveloped, underweight, partially deaf and mentally dull. The spleen was grossly enlarged, its edge being palpable below the umbilicus. The liver edge was palpable 5 cm. below the right costal margin, and lymph nodes were palpable in the neck. The chest radiograph showed shadows at the bases of both lungs. In spite of this acute febrile respiratory infection there was no leucocytosis, the total leucocyte count being 5,000 per c.mm. (neutrophils 53%, lymphocytes 41%). There was no anaemia, and iliac crest bone marrow was reported as normal. The infection responded to penicillin. Thereafter, apart from cough, she remained without symptoms until the age of 14 years, when she was again admitted to hospital with another acute respiratory infection. The spleen was even larger, its edge being palpable in the left iliac fossa. The chest radiograph showed shadows in the lingula and left lower lobe. There was no leucocytosis; total count 6,000 (neutrophils 60%, lymphocytes 36%). The pulmonary infection was controlled with antibiotics, but persistence of cough, sputum, and some radiological shadows suggested the presence of bronchiectasis.

Because of its large size the spleen was removed, although the cause of the splenomegaly was obscure. At laparotomy the liver was slightly enlarged, but of normal consistency, and a biopsy was taken. About the splenic and hepatic vessels there were several enlarged lymph nodes, which were removed.

In a microscopical section of the spleen there was a relative increase in the amount of splenic pulp with reduction in the number of Malpighian bodies. In the pulp most of the sinuses were widely dilated and lined by cells which were more pleomorphic than is usually seen in a normal spleen. Germinal follicles were sparse and of varying size. No cells of the plasma-cell series, either mature or trans-

sitional, were demonstrated by Unna-Pappenheim stains. The lymph node from the splenic hilum consisted chiefly of diffuse sheets of lymphocytes with only an occasional germinal follicle, which again varied considerably in size. There was diffuse hyperplasia of the reticulo-endothelial elements of the stroma. Reticulin stains confirmed the sparseness of germinal follicles. No cells of the plasma-cell series were demonstrated by Unna-Pappenheim stains. There was no significant change in the liver cells.

After the operation, paper electrophoresis of the serum showed absence of gamma-globulin. Total serum protein was 5.4 g. per 100 ml. (albumin 4.2 g., globulin 1.2 g.).

Eighteen months after splenectomy the patient developed severe pneumococcal meningitis. A leucocytosis was now present; total leucocytes, 40,000 (neutrophils 88%, lymphocytes 8%). She responded well to antibacterial therapy. Paper electrophoresis of serum again showed no gamma-globulin. Two months later the patient developed another respiratory infection, which responded poorly to penicillin.

In 1955 (aged 15 years) she was admitted to Brompton Hospital. The liver edge was palpable 5 cm. below the right costal margin, and moderately enlarged firm lymph nodes were palpable in neck and axillae. Total serum protein was 5.7 g. per 100 ml. (albumin 4.2 g., globulin 1.5 g.). No gamma-globulin was detected by paper electrophoresis of serum. Thymol turbidity and zinc flocculation tests showed only 1 unit.

Deficiency of normal circulating antibodies was shown by deficiency of beta-agglutinins in her group A blood (the anti-B titre varied between 0 and 1 in 8). Her serum failed to agglutinate suspensions of *Salm. typhi*, *Salm. paratyphi A* and *B*, *Br. abortus*, and *Br. melitensis*. The Schick reaction was positive in spite of previous diphtheria toxoid. The Dick test was positive. The reaction to 100 tuberculin units was negative. *C. albicans* reaction was also negative.

Leucocytes were 26,000 per c.mm. (neutrophils 71%, lymphocytes 19%). Cultures of sputum yielded pneumococci, haemolytic streptococci, and coagulase-positive staphylococci. Penicillin improved respiratory symptoms and cleared pathogens from the sputum, but prompt clinical and bacteriological relapse occurred on stopping penicillin. The patient developed a fulminating *H. influenzae* meningitis, which, in spite of the administration of gamma-globulin and antibiotics, proved fatal. Post-mortem examination was refused.

Investigation of the Family.—Her parents and sister were well and were not unduly susceptible to infection. Her mother's serum globulin was raised—albumin 3.3 g., globulin 3.2 g. per 100 ml. The increase of globulin was distributed evenly throughout the alpha-2, beta, and gamma fractions. The serum protein of her father and sister showed no abnormality.

Discussion

Agammaglobulinaemia may occur as an isolated defect of the serum, the other electrophoretic components of globulin and albumin being present in normal quantity. This abnormality may be associated with a variety of clinical features on the basis of which cases may be divided into two broad groups, congenital and acquired.

In congenital agammaglobulinaemia increased susceptibility to infection occurs in infancy or childhood, exclusively in males; and its occasional occurrence in brothers and other males in the family suggests that the defect is genetically determined and probably transmitted as a sex-linked recessive trait (Janeway *et al.*, 1953). In this condition the deficiency of gamma-globulin is permanent, and it should be distinguished from cases of agammaglobulinaemia of limited duration occurring in infants of either sex in whom it is thought that the passively transferred gamma-globulin from the mother is not replaced by the infant's own gamma-globulin owing to a delay in the assumption of normal gamma-globulin synthesis (Good and Mazzitello, 1956).

Acquired agammaglobulinaemia may occur in either sex at any age. It may be secondary to disorders of the

reticulo-endothelial system, and has been found in association with malignant lymphoma (Arends *et al.*, 1954), chronic lymphatic leukaemia (Brem and Morton, 1953; Jim and Reinhard, 1956), myelomatosis (Zinneman *et al.*, 1954), and histoplasmosis (Seltzer *et al.*, 1955). There are other cases in which the disease is acquired but no cause for the gamma-globulin deficiency can be found, and these are referred to as the acquired idiopathic type (Good and Mazzitello, 1956).

Agammaglobulinaemia may occur not as an isolated defect, but in association with a general hypoproteinaemia, such as occurs in a variety of conditions, including nephrosis.

The term agammaglobulinaemia implies absence of gamma-globulin as detected by electrophoresis of serum. However, the use of more delicate immunological techniques for the detection of gamma-globulin may reveal small quantities of gamma-globulin where electrophoresis fails to demonstrate any. Strictly speaking, therefore, these are cases of hypogammaglobulinaemia. Moreover, immunoglobulins may occasionally occur in serum which is apparently deficient in gamma-globulin, and, probably because of this, agammaglobulinaemia is not always associated with increased susceptibility to infection (Martin, 1954).

The two cases described here have the features of the acquired idiopathic type of agammaglobulinaemia, in that there was good health before onset of symptoms of recurrent infection and also absence of any primary disorder to which the development of agammaglobulinaemia might be attributed. Moreover, in Case 1 the normal zinc flocculation, thymol turbidity, and total globulin levels in the early stages of the disease are strong circumstantial evidence that gamma-globulin was present in appreciable quantities at the time, so that the agammaglobulinaemia must have developed later.

Gross enlargement of the spleen was a striking clinical feature of both cases. In Case 2 enlargement of the spleen was present before severe infections had occurred, and the spleen was observed to increase in size during the next three years until splenectomy. In Case 1 enlargement of the spleen was noted eight years after the onset of the disease with symptoms of infection and enlarged lymph nodes, and the spleen increased in size over the next six years. The liver was enlarged in both patients. Generalized enlargement of lymph nodes was present in both patients, including hilar nodes in Case 1 and intra-abdominal nodes in Case 2.

Among 45 cases of agammaglobulinaemia reported in the literature there are six cases in which the spleen was enlarged (Rohn *et al.*, 1954; Grant and Wallace, 1954; Rosecan *et al.*, 1955; Collins and Dudley, 1955; Young *et al.*, 1955; Good and Mazzitello, 1956). All six were of the acquired idiopathic type; three were in males and three in females, their ages ranging between 17 and 53 years.

In these cases the microscopical appearance of the reticulo-endothelial tissue showed similar features to those described here. Of four cases in which the spleen was examined there was reticulum-cell hyperplasia of variable degree in all four. Germinal follicles were sparse in two. Lymph nodes were examined in two and showed reticulum-cell hyperplasia in both. In the present cases there was diffuse hyperplasia of the reticulo-endothelial elements of the stroma of all lymph nodes examined, and also of the spleen in Case 2. Germinal follicles were sparse in the lymph node and spleen in Case 2, in contrast to Case 1, in which the numbers of germinal follicles were consistently within normal limits in three separate biopsies taken over the course of six years.

The most striking variation from normal, present uniformly in all histological material from both Case 1 and Case 2, was the virtual absence of mature plasma cells. Absence of plasma cells has been noted previously in cases of agammaglobulinaemia (Good and Mazzitello, 1956). Plasma cells are known to be concerned with the production of gamma-globulin and circulating antibodies (Sundberg, 1955), and agammaglobulinaemia has been attributed to absence of these cells. Although there was severe deficiency of

mature plasma cells in both cases, they differed in that transitional plasma cells were plentiful in the germinal follicles and sinuses of Case 1, whilst in Case 2 no cells of the plasma-cell series were present in the sparse germinal follicles or in the sinuses. It may be, therefore, that the deficiency of mature plasma cells present in both cases resulted from a disturbance acting at different stages of development of the plasma cells.

Among the relations of these patients deficient in gamma-globulin there were healthy individuals of both sexes with hypergammaglobulinaemia. Abnormally high serum gamma-globulin occurred in the father, mother, and sister of Case 1, and the mother of Case 2 had a raised total globulin level. Similar findings were reported by Young *et al.* (1955), who found hypergammaglobulinaemia in the healthy mother and brother of an adult male patient with acquired idiopathic agammaglobulinaemia. This evidence suggests that the abnormalities of globulin production in these families might depend upon genetic factors and that some cases of acquired idiopathic agammaglobulinaemia are genetically determined like the congenital variety, but differ from it in the late onset of symptoms and the occurrence in females as well as males.

No neutrophil leucocytosis occurred in response to infection in Case 2 until after splenectomy, when neutrophils increased readily in infection. Among the six cases of agammaglobulinaemia with splenomegaly detailed above, three had neutropenia and neutrophilia did not occur in infections. Three cases had an acquired haemolytic anaemia, in two of which the spleen was removed, with relief of the anaemia in both. The relief of haemolytic anaemia and neutropenia by splenectomy suggests that these disturbances were due to destruction of erythrocytes or leucocytes by the enlarged spleen and not to an immunological mechanism, since circulating antibodies were deficient or absent in these patients.

The E.S.R. determined in Case 1 on 11 separate occasions, usually during infection, was 5 mm. per hour or less (Westergren), except on one occasion. In Case 2 the E.S.R. was moderately raised during infection except in the last few weeks before death, when in spite of much pulmonary infection the E.S.R. was 3 mm. per hour or less. Persistently low E.S.R. readings during infection have been noted in some other cases of agammaglobulinaemia (Elphinstone *et al.*, 1956).

It is concluded that agammaglobulinaemia of the acquired idiopathic type may be associated with generalized hyperplasia of the reticulo-endothelial system and should be considered in the diagnosis of enlargement of the spleen and lymph nodes of obscure origin, particularly in the presence of recurrent infection.

Summary

Attention is drawn to the association of acquired idiopathic agammaglobulinaemia with enlargement of the spleen and lymph nodes. Two cases are described and six similar ones in the literature are reviewed. The principal histological features are diffuse reticulo-endothelial hyperplasia and deficiency of plasma cells. Haemolytic anaemia and neutropenia may occur. In some cases increase in the serum globulin of healthy relatives has been found.

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ADDENDUM.—Since this paper was submitted another patient with hypogammaglobulinaemia, whose mother had increased serum gamma-globulin, has been investigated. The patient was a girl of 14 years who during the past

year had suffered from 14 attacks of acute pulmonary infection. Previously she had been well. Her serum gamma-globulin was only 0.2–0.3 g. per 100 ml. Her mother was quite well, but had a marked increase in serum gamma-globulin (2 g. per 100 ml.). The serum proteins of the patient's father and sister were normal. This observation adds further support to the suggestion that in some cases of acquired idiopathic agammaglobulinaemia (hypogammaglobulinaemia) the abnormality of gamma-globulin production is genetically determined.

REFERENCES

- Arends, T., Conrad, E. V., and Rundles, R. W. (1954). *Amer. J. Med.*, 16, 833.
Brem, T. H., and Morton, M. E. (1953). Cited by Zinneman *et al.* (1954).
Bruton, O. C. (1952). *Pediatrics*, 9, 722.
Collins, H. D., and Dudley, H. R. (1955). *New Engl. J. Med.*, 252, 255.
Elphinstone, R. H., Wickes, I. G., and Anderson, A. B. (1956). *British Medical Journal*, 2, 336.
Fasraeus, A. (1948). *Acta med. scand.*, 130, Suppl. 204, p. 9.
Good, R. A., and Mazzitello, W. F. (1956). *Dis. Chest*, 29, 9.
Grant, G. H., and Wallace, W. D. (1954). *Lancet*, 2, 671.
Janeway, C. A., Apt, L., and Gitlin, D. (1953). *Trans. Ass. Amer. Phys.*, 66, 200.
Jim, R. T. S., and Reinhard, E. H. (1956). *Ann. Intern. Med.*, 44, 790.
Martin, N. H. (1954). *Lancet*, 2, 1094.
Rohn, R. J., Behnke, R. H., and Bond, W. H. (1954). *J. Lab. clin. Med.*, 44, 918.
Rosecan, M., Trobaugh, F. E., and Danforth, W. H. (1955). *Amer. J. Med.*, 19, 303.
Seltzer, G., Barton, S., and Toporek, M. (1955). *New Engl. J. Med.*, 252, 252.
Sundberg, R. D. (1955). *Ann. N.Y. Acad. Sci.*, 59, 671.
Young, I. L., Wolfson, W. Q., and Cohn, C. (1955). *Amer. J. Med.*, 19, 222.
Zinneman, H. H., Hall, W. H., and Heller, B. I. (1954). *J. Amer. med. Ass.*, 156, 1390.

AGAMMAGLOBULINAEMIA

REPORT OF TWO ADULT CASES

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The clinical and laboratory findings in patients with deficiencies or absence of gamma-globulin in their serum have been described only in the past few years. Most of the cases have been in children (Bruton, 1952; Fried and Henley, 1954; Elphinstone *et al.*, 1956), but a number of examples of the condition have been recorded where the deficiency has not appeared until adult life (Grant and Wallace, 1954; Wall and Saslaw, 1955).

The purpose of this paper is to record the findings in two further adult female patients in whom this deficiency was present.

Case 1

A single woman, born in 1907, was perfectly well until 1933, when she had a chronic cough for a few months. In 1937 she had her first attack of pneumonia, two more attacks following in 1943. She was admitted to hospital in 1949 for investigation of diarrhoea of one year's duration, and was found to have a mild degree of steatorrhoea (4–8 g. of faecal fat on a 50-g. daily fat intake). Her blood count showed: red cells, 4,460,000 per c.mm.; haemoglobin, 9.9 g. per 100 ml.; M.C.V., 96 cubic microns; M.C.H.C., 25%; white cells, 7,400 per c.mm., with normal differential; and serum proteins: albumin, 4 g. per 100 ml.; globulin, 1.2 g. with gamma-globulin 0.04 g. (alcohol precipitation method—G. Thomas, 1954, unpublished observation). The serum

bilirubin, alkaline phosphatase, cholesterol, empirical tests of liver function, and pancreatic enzymes were normal. Chest radiographs showed no abnormality.

Over the next two years she had pneumonia on four further occasions and her diarrhoea increased. In 1951 she complained of severe attacks of abdominal pain, on account of which an exploratory laparotomy was performed by Mr. B. N. Brooke. A swollen pink pancreas was seen, but no other abnormality.

For the next three years she continued to have recurrent attacks of pneumonia and constant diarrhoea of up to 10 stools a day, and in 1954 she was readmitted to hospital. Estimations of faecal fat then showed an excretion of 10–20 g. a day. The serum amylase fluctuated between 183 and 370 units per 100 ml., with one period of a week during which it rose steadily to 670 units per 100 ml. On admission serum electrolytes showed: sodium 146 mEq, potassium 2.9 mEq, chloride 106 mEq per 100 ml. The blood count, serum proteins, bilirubin, alkaline phosphatase, cholesterol, and empirical tests of liver function showed no significant change from 1949. Gamma-globulin was estimated at 0.05 g. per 100 ml. by alcohol precipitation method and 0.1 g. per 100 ml. by paper electrophoresis (Dr. Hardwick), but none was shown by the Tiselius method (Dr. Kekwick). Serum tested by the immunochemical method (Gell, 1955) for gamma-globulin showed that some was present in amounts approximating to 10% of that in the normal control serum. A routine blood grouping at this time showed absence of iso-agglutinins. She was treated with a high-protein and low-fat diet and pancreatin, 12 g. daily with meals. Her diarrhoea improved on this regime, though she continued to excrete 10–20 g. of fat daily. She was discharged relatively well after two months in hospital.

During the past 18 months the patient has had one further attack of acute bronchitis, which subsided within a week in response to antibiotic therapy. In order to raise her gamma-globulin level before the winter 1 litre of fresh plasma was transfused in October, 1955. The last estimation of gamma-globulin, in July, 1956, by paper electrophoresis, showed it to be 0.3 g. per 100 ml.

Case 2

A single woman born in 1916 was well until the age of 20, when she began to suffer with severe nasal catarrh and repeated "colds" each winter. In 1947, at the age of 31, she had her first attack of pneumonia, followed by further attacks in 1948 and 1949, when she was admitted to hospital for drainage of an empyema. In 1950 and 1951 she had further attacks of pneumonia, and in 1952 she was admitted to another hospital, where she underwent a resection of her right middle lobe for bronchiectasis. This, however, did not prevent her from having a further attack of pneumonia in 1953. In 1954 she had another attack, and later in that year (October) was admitted to hospital for investigation and treatment of her chronic nasal catarrh by Mr. Stirk Adams. A routine blood grouping disclosed at this stage an abnormality in her iso-agglutinins which suggested an absence of gamma-globulin.

Examination of the serum proteins showed albumin 4.1 g. and globulin 1 g. per 100 ml. No gamma-globulin was revealed by the alcohol precipitation method, but paper electrophoresis showed 0.3 g. per 100 ml. The immunochemical method showed the presence of gamma-globulin in quantities below that present in normal control serum. Blood counts, serum bilirubin, alkaline phosphatase, and empirical tests of liver function were within normal limits. Shortly before her intended discharge she again developed pneumonia, which responded to penicillin, but two days after discontinuation of the therapy she had a second attack and, whilst convalescing, a third.

During this period the white blood cells rose from a normal level of 7,000 to 19,000 per c.mm., with 12,000 polymorphs per c.mm. No alterations in the levels of the serum proteins were detected. As no gamma-globulin was available at this

time it was decided to raise the level of her serum gamma-globulin by the transfusion of fresh plasma, 300 ml. being administered every three days until a total of 3 litres had been given. This resulted in a rise of gamma-globulin to 0.6 g. per 100 ml. as assessed by paper electrophoresis, but it gradually fell over the next 14 days to 0.3 g. per 100 ml., at which level it seemed to be relatively stationary. She was therefore given a further boosting transfusion of 600 ml. of plasma and discharged. Before the winter of 1955 1 litre of fresh plasma was transfused, which again raised the gamma-globulin level from 0.3 to 0.6 g. per 100 ml. Apart from one short attack of pneumonia aborted by antibiotic therapy during the summer of 1956, the patient has remained well.

Examination of blood from all her living relatives by paper electrophoresis and blood-grouping techniques failed to show any evidence of a deficiency in gamma-globulin and there was no history of recurrent infections.

Diagnosis

The condition, although attracting much attention, is rarely found with the present methods for detection. Nearly all cases, however, including the two reported above, have a history of recurrent infection, pneumonia being particularly frequent.

The deficiency of total gamma-globulin may be readily picked up by paper electrophoresis or by using the alcohol precipitation method, but techniques for detecting important partial deficiencies have not yet been developed. The immunochemical method is one such improvement which may allow the detection of some of the many protein fractions necessary for protection against infection.

The simple procedure of blood grouping, performed with care, will in most cases produce a result indicating an abnormality in the protein moiety of the serum that should invite further investigation. The pattern obtained in both of the above cases was more or less identical. The first case grouped by cell grouping as group O, but at first no alpha- or beta-agglutinins were identified in the serum, a finding usually associated with group AB. Further investigation of the serum at different temperatures (4° C., 20° C., and 37° C.) against A and B cells showed that at 4° C. group A cells were agglutinated up to a titre of 2, whereas group B cells showed hardly any agglutination at all. In spite of the fact that several high-titre group O sera did not agglutinate the patient's cells, it was thought necessary to exclude a possible subgroup of B, analogous to A2 or A3. Grouping-serum of moderate potency was incubated at room temperature for two hours with an equal volume of packed cells from the patient and with control group O cells, no difference being found. Interestingly enough, an indirect Coombs test performed with the serum from the patient against group A and group B cells at low temperature gave a weakly positive result against A cells only. Investigation for the presence of other immune antibodies gave a negative result, using a fairly large number of test cells. Later, when the serum contained some gamma-globulin, the abnormal grouping results had rectified themselves somewhat, and both group A and group B cells were now agglutinated at room temperature to a titre of 4, and, if anything, group B cells showed better agglutination than group A cells.

The diagnosis in the second patient was, as pointed out, actually suggested by a routine blood grouping. Again the cells grouped regularly, group A this time, and one would have expected the serum to contain beta-agglutinins. However, neither group A nor group B cells were agglutinated at either 22° C. or 4° C. To exclude a low-grade B antigen absorption experiments were performed with completely negative results. To exclude the possibility of a "blocking" anti-B antibody giving no reaction in saline media an indirect Coombs test was performed, using group B cells. Also trypsinized cells and cells suspended in albumin were used. A uniformly negative result was obtained. About six weeks later, when the patient had had treatment for some time, a little activity was demonstrated, but this only to a

titre of 2. From the findings obtained in both patients and others (Janeway *et al.*, 1953; Grant and Wallace, 1954; Sanford *et al.*, 1954; Wall and Saslaw, 1955; Kuhns *et al.*, 1956) it would appear that careful blood groupings might in all cases of group O, A, or B give an indication of agglutinin abnormality which should invite further investigation. Group AB patients would in this respect be at a disadvantage, as no iso-agglutinins are normally present in their serum.

Treatment

Once the condition is detected the use of antibiotics will control most infections, but it may also be necessary to raise the plasma gamma-globulin level. If fractionated gamma-globulin is not available in adequate amounts, this can be done temporarily by the transfusion of fresh plasma. Both of the above cases appeared to derive benefit from this form of treatment.

Discussion

The absence of gamma-globulin in the serum of young children has been ascribed to a hereditary defect resulting from a sex-linked recessive characteristic (Janeway *et al.*, 1953; Gitlin, 1954; Good, 1954). It is less likely, however, that such a concept holds good where the condition is first detected in adult life, such as the two cases reported here. In neither patient was there evidence of any unusual or recurrent illness in infancy and childhood. The familial occurrence of the condition was sought for in Case 2, but was not detected. In neither case was there any evidence of liver dysfunction, and, with the exception of the gamma-globulin, the other serum proteins were normal on all occasions, findings which support the view that gamma-globulin is not formed by the liver.

It is of interest that three further cases at least (Sanford *et al.*, 1954; Saslaw and Wall, 1954; Good 1954) have been reported somewhat similar to Case 1 in having a sprue-like syndrome. Some diminution in gamma-globulin, usually in conjunction with a general diminution of serum proteins, has been noted in a number of our patients with steatorrhoea due to varied causes, but in Case 1 the recurrent respiratory infection preceded the symptoms of steatorrhoea by at least 10 years, and it seems more likely that the pancreatitis and steatorrhoea were secondary to the agammaglobulinaemia.

The condition of agammaglobulinaemia in the two patients reported here would appear to be phasic, and it may well be that the administration of fresh plasma is adequate to tide them over any temporary crisis.

Summary

Two further cases of agammaglobulinaemia are described; both had recurrent attacks of pneumonia and one also had recurrent pancreatitis and steatorrhoea. The method of diagnosis, with particular reference to the blood-group screening test, is discussed. Transfusion of fresh plasma is recommended as a means of combating recurrent acute infection in these cases.

REFERENCES

- Bruton, O. C. (1952). *Pediatrics*, 9, 722.
 Elphinstone, R. H., Wickes, I. G., and Anderson, A. B. (1956). *British Medical Journal*, 2, 336.
 Fried, C. T., and Henley, W. L. (1954). *Pediatrics*, 14, 59.
 Gell, P. H. H. (1955). *J. clin. Path.*, 8, 269.
 Gitlin, D. (1954). Address at 27th Graduate Fortnight, New York Academy of Medicine.
 Good, R. A. (1954). *J. Lab. clin. Med.*, 44, 803.
 Grant, G. H., and Wallace, W. D. (1954). *Lancet*, 2, 671.
 Janeway, C. A., Apt, L., and Gitlin, D. (1953). *Trans. Ass. Amer. Phys.*, 66, 200.
 Kuhns, W. J., Ridley, E., and Weigle, W. (1956). *Amer. J. clin. Path.*, 26, 750.
 Sanford, J. P., Favour, C. B., and Tribeman, M. S. (1954). *New Engl. J. Med.*, 250, 1027.
 Saslaw, S., and Wall, R. L. (1954). *J. Lab. clin. Med.*, 44, 925.
 Wall, R. L., and Saslaw, S. (1955). *A.M.A. Arch. intern. Med.*, 95, 33.

ACUTE IMMEDIATE REACTIONS TO PENICILLIN

BY

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Severe reactions, often fatal, occurring immediately after the administration of penicillin continue to be reported in this and other countries. The now extensive literature was reviewed by Calvert and Smith (1955). Cases have since been reported by Winton and Nora (1955), Dubberley (1955), Wright (1955), Bhattacharya (1955), Tidswell (1955), and Bell (1956).

Many of the reactions described are typically anaphylactic in type. In others vasomotor collapse may not be a prominent feature and bronchiolar spasm and angio-neurotic oedema do not occur, the main reaction being one of acute emotional upset. This type of reaction occurs usually within seconds of an injection of procaine penicillin, often after several injections of a course have been given without ill effect, and in a number of instances further injections of the same material have been given without incident. Batchelor *et al.* (1951) believed this type of reaction to be due to accidental intravascular injection of emboli consisting of agglomerations of crystals.

Angor animi and cacogeusia have been described as features of both this and the anaphylactic type of reaction.

Penethamate hydriodide ("neo-penil," "estopen") has earned a particularly bad reputation for producing severe and dangerous reactions, possibly on account of an inherent toxicity of this compound rather than on account of its penicillin content (Welch *et al.*, 1953).

The reaction potentiality of the very slowly absorbed repository penicillins is uncertain, but Anderson (1954) described a severe and protracted reaction following a single injection of benzathine penicillin.

The following comments were made in the *British Medical Journal* (1955b): "The frequency of accidental intravenous injection as a factor is still uncertain and calls for closer investigation. . . . More exact information is needed on the relative degrees of danger associated with soluble and procaine penicillin, and on whether sensitivity to procaine itself is a factor."

Since nearly all injections of penicillin given in hospital are administered by the nursing staff it was thought that more intimate information on these problems might be obtained from general practitioners, as they have to administer most of their injections themselves. Therefore the College of General Practitioners made an appeal to all members to supply information on any acute immediate reactions to penicillin seen by them. In order to define "immediate reaction" the arbitrary figure of one occurring within 15 minutes of the injection was adopted. The case reports which follow were obtained in this way. Cases 3 and 4 (Lewis, 1953, 1954) and Case 2 (Singh, 1955) have been described elsewhere. The cases have been divided into three groups.

Group 1

Case 1

A middle-aged medical practitioner described his own experience. There was no personal or family history of allergy. After an appendicectomy in 1949 he had a chest infection for which he was given twice-daily injections of

500,000 units of crystalline penicillin. On the third day he developed pyrexia and irritation of toes and groins in the same distribution as he had had a fungus infection whilst serving in the Western Desert. On ceasing the penicillin treatment his temperature fell to normal and the irritation subsided. In 1951 he had an acute sinusitis which was treated with daily injections of 300,000 units of procaine penicillin for four days without any ill-effect.

In September, 1954, he developed a very painful boil inside his nostril. A colleague gave him an injection of 1,000,000 units of crystalline penicillin followed immediately by 900,000 units of procaine penicillin in aqueous suspension. His experiences are best told in his own words: "About 15 minutes after the injection I felt nauseated and shortly afterwards became very red in the face. This was followed by swelling of the upper lip, and I felt so ill that I decided to drive to the local hospital. During the drive I had a feeling of constriction in the chest and a conviction of impending doom. I could feel that my heart rate was greatly accelerated and irregular. Having reached the hospital, I staggered in, dimly remembering being led to a side-ward, and then lost consciousness. I vaguely remember being looked at by a sister several times and by one of my colleagues, but regained full consciousness only after two hours, feeling very weak, itching as though I had a thousand fleas, and with a stiff, swollen upper lip. I was told that my pulse had been very fast, thready, and irregular. I was given promethazine hydrochloride ("phenegan") and spent the rest of the day in bed in a sleepy state, possibly due to the promethazine hydrochloride. The next day, though feeling weak and a little itchy, I was able to carry on with my work. One week later, whilst on holiday, the severe itching returned, with large urticarial weals all over my body."

Case 2

A medical practitioner aged 53 had received many previous injections of penicillin. On the last occasion, following an injection of procaine penicillin, he developed slight and transient swelling of the face. In January, 1955, having decided to give himself a further course of penicillin, he took two tablets of mepyramine maleate about five minutes before an injection of procaine penicillin in aqueous suspension which he administered to himself. Immediately after the injection he developed dryness of the throat and redness of the eyes, followed by a choking sensation, loss of sphincter control, and unconsciousness. He was given 0.5 ml. of a solution of adrenaline, 1 in 1,000, by an attendant.

When seen a few minutes later he was unconscious, incontinent, and sweating profusely. His breathing was laboured and stertorous and his pulse was impalpable. As he had already been given adrenaline, nikethamide was injected. After about two minutes he regained consciousness and complained of a burning sensation in the epigastrium and severe buzzing in the ears. He was given 30 min. (1.8 ml.) of aromatic spirit of ammonia but again lapsed into unconsciousness, with an impalpable pulse, profuse sweating, and dyspnoea with laryngeal stridor. A further injection of nikethamide and 1 ml. of adrenophedrine was given. He regained consciousness in about two minutes, again complained of a burning sensation in the epigastrium, and was shivering violently. The shivering continued for half an hour. When seen one hour later he had slight swelling of the upper lip, slight puffiness of the face, and complained that his whole body was aching. Next morning he seemed in perfect health, but 24 hours later he again developed aching of the whole body, which persisted for quite a long time.

Group 2

Case 3

A woman aged 34, with no personal or family history of allergy, had received courses of penicillin three and a half years and one year previously without incident. In September, 1953, she had acute otitis media, and 1,000,000 units

of crystalline penicillin was injected into the buttock. One minute later she suddenly lost consciousness. Her pulse was rapid, feeble, and irregular, but there was no evidence of cyanosis or respiratory embarrassment. She recovered consciousness in half a minute and repeatedly stated that she was dying. During the next 15 minutes her pulse became stronger and slower but was still irregular and she continued to feel very weak and ill. She then quite suddenly developed a severe colic, felt deep in the pelvis, with exacerbations and remissions each lasting about 10 seconds. These pains were described as "like labour pains, not a bellyache." This colic remained severe for half an hour, then ceased suddenly, and a few minutes later she seemed to be normal and had a strong regular pulse. An adrenaline injection was prepared but was not used. Twenty-four hours after the attack she began to menstruate, 10 days before her period was due. She had never previously had the slightest menstrual irregularity and had never suffered from dysmenorrhoea. Fifteen days later an intracutaneous injection of 4,000 units of crystalline penicillin produced neither an immediate nor a late reaction.

Case 4

A robust man aged 38 with no personal or family history of allergy had received a seven-day course of penicillin injections 20 months previously. A few days after the termination of this course he developed a rash which cleared quickly. In October, 1954, he developed a large carbuncle in his back with considerable surrounding cellulitis. Streptomycin was injected for two days with no improvement, so treatment was changed to daily injections of 900,000 units of procaine penicillin in aqueous suspension. After four days of this treatment without incident the cellulitis had resolved and the core was separating. For the next three days he received only local treatment, but the local condition deteriorated and daily injection of 900,000 units of procaine penicillin was resumed.

Four hours after the second injection of the resumed course he felt faint for a minute or two. Next day he received a similar injection into the buttock. Within seconds he lapsed into semi-consciousness with a rapid, irregular pulse and a conviction of impending doom. There was no cyanosis, respiratory embarrassment, or overfilling of neck veins. He was able to answer simple direct questions throughout. After about one minute he complained of severe throbbing in his back, indicating the tip of his fourth lumbar spine as the exact spot, and of paralysis from that level downwards. He could not feel the chair beneath him but could raise both feet just clear of the ground with difficulty. His arms felt numb and heavy. His pulse was still irregular, rate 160 a minute. About three minutes from the onset of the attack his legs felt a bit better and the throbbing in his back had ceased, but he then developed crippling substernal pain and complained of "pounding of the heart." His pulse was still irregular, rate 140. About six minutes from the onset of the attack he felt much better; the palpitation had ceased and sensation had returned to his body and legs. He had a feeling of coldness from the waist downwards and of tingling in the arms and fingers. These sensations passed quickly and 10 minutes later he seemed normal and cheerful. His pulse was regular, rate 80. He was given a card to place in his wallet stating that he had suffered a severe reaction to penicillin.

Case 5

A man aged 50 had had one injection of penicillin, probably crystalline, four years previously without incident. He was given an intramuscular injection of 500,000 units of crystalline penicillin for an acute bronchitis of three days' duration. Within two minutes of the injection he collapsed. His pulse was weak, rapid, and irregular, and the skin pale and cold. Within a further two minutes he showed signs of reviving, and the injections of adrenaline and nikethamide which had been prepared were not given. When able to

speak he said he felt very weak and was sure he was dying. He experienced a vague pain in the right leg as he was reviving. The chest infection was short-lived, but his recovery from the effects of the reaction was protracted. One month after the attack he still felt so weak that he was unable to walk more than about 50 yards (45 m.). Three months later he was in excellent health.

Case 6

A man aged 60 who had no personal or family history of allergy and who had never previously had penicillin by mouth or by injection was given a course of penicillin injections for a carbuncle. The course consisted of daily injections of 600,000 units of procaine penicillin in aqueous suspension. Five injections were given without incident. About half a minute after his sixth injection he turned pale and said he felt sick and queer, and that he was about to die. His breathing became rapid and shallow and his pulse impalpable. He next complained of a severe throbbing headache and then lost consciousness. He remained unconscious for about two minutes. As he was recovering he complained of severe substernal pain, but after lying recumbent for a while this eased off and in 15 minutes he had recovered sufficiently to go home. On examining the syringe used for the injection it was noted that the dregs were slightly blood-stained.

The practitioner recording this case reports that over a period of five years he has discarded a syringe of procaine penicillin on three occasions because traction on the plunger had withdrawn blood.

Case 7

A married woman aged 35 was given daily intramuscular injections of 600,000 units of procaine penicillin in aqueous suspension for chronic sinus infection and bronchitis. So far as could be ascertained she had not previously had penicillin by injection but had applied penicillin cream for an infected dermatitis four years previously. The injections were given by the district nurse, the first four without incident. Immediately after the fifth injection the patient collapsed, with greyish pallor and feeble pulse. When seen about half an hour later she had recovered considerably but was still very frightened. Following the attack her personality changed; previously jolly and active, she became depressed and anxious. Her menses were diminished and she suffered from hot flushes. She was now sensitive to all forms of penicillin and also to chloramphenicol and sulphonamides. She had improved somewhat one year later, when she left the district, but was still far from being her old self.

Case 8

A woman aged 54 was a chronic invalid with a history of rheumatoid arthritis, paroxysmal tachycardia, asthma, bronchiectasis, and emotional instability. She is believed to have had injections of penicillin on previous occasions. In October, 1955, it was decided to give her a course consisting of 500,000 units of penethamate hydriodide plus 1 g. of streptomycin sulphate daily on account of an acute flare-up of her bronchiectasis. When both preparations had been mixed in one syringe, the syringe used was filled to capacity, rendering it impossible to withdraw the plunger before injection, and the full injection was given into the buttock. This was followed immediately by exclamations of fear and by dizziness, confusion with partial loss of consciousness, and a complaint of pain up the back of the neck. There was no evidence of collapse, and recovery was complete within about 15 minutes without treatment. Intradermal injections of penethamate hydriodide and of streptomycin sulphate a few days later produced no reaction and she was subsequently given five daily injections of 600,000 units of procaine penicillin in aqueous suspension without ill effect.

The practitioner recording this case believes that the reaction was due to accidental intravascular injection of some of the material.

Group 3

Case 9

A guardsman aged 21 who had had a boil on one of his fingers for several days was prescribed a course of penicillin injections. There was no personal or family history of allergy. Three years previously he had been given a course of penicillin injections with no ill-effect. An injection of 600,000 units of procaine penicillin in aqueous suspension was given by an experienced orderly. Within seconds he complained of feeling queer and collapsed. When seen, almost immediately, he was shocked, with cold sweating hands, impalpable radial pulse, regular apex beat of 120, dyspnoea with rapid deep breaths, and bouts of intense shivering; he complained of "pins-and-needles" in, and inability to move, his lower limbs. There was no withdrawal of the feet or movement of the great toes on plantar stimulation. He was restless and very anxious. He remained conscious throughout. Within a few minutes he was given 1 ml. of 1 in 1,000 adrenaline solution. After about 30 seconds his dyspnoea ceased and he began to feel better, but one minute later all his symptoms reappeared in full. A further 1 ml. of the adrenaline solution was given and again he improved, this time permanently. The whole episode lasted about five minutes. Later that day he felt quite well.

The practitioner who treated this case mentions that he has since given penicillin injections himself whenever possible and has been surprised to find how easily blood is aspirated into the syringe occasionally.

Case 10

A healthy woman aged 55 gave no history of allergy. She had received several previous courses of penicillin injections without incident. In August, 1955, on account of an abscess, a course of injections of procaine penicillin in aqueous suspension was given, the dose being one injection of 600,000 units daily. The first three injections were given without incident. During the fourth the plunger was withdrawn and about a quarter of the dose injected before it was realized that a trace of blood had entered the syringe. The needle was withdrawn a little before completing the injection. Within a few seconds she felt dizzy and became confused and obviously frightened, calling for her husband and child in anguish and complaining of failing vision. The pulse and colour remained good and none of the classical signs of shock were present. Five minims (0.3 ml.) of adrenaline solution 1 in 1,000 was injected and in about 10 minutes she had recovered completely. Ten days later an intradermal injection of procaine penicillin produced a slight red flare.

Case 11

A man aged 56 gave no personal or family history of allergy and had not had penicillin previously in any form. He had an excision of caecum and ascending colon performed in February, 1956, on account of chronic infection with an abscess cavity extending into the substance of the iliacus as far as the periosteum. For six days before and six days after operation 900,000 units of procaine penicillin in aqueous suspension was injected daily without incident. Six days after the last injection he developed a pyrexia, and it was decided to give him a further course of procaine penicillin. Immediately after the first injection of 900,000 units, given into the left buttock, he complained of severe stabbing pain across the buttocks and extending up the back of the spine to the occiput, and that his head felt "muffled and numb." He had a feeling of impending death, but this passed quickly. There was no clouding of consciousness or any evidence of circulatory collapse. He recovered his composure within about half a minute and felt much better, but his left arm and leg seemed "numb and bloodless." This passed quickly, and within 15 minutes he felt normal. The attack was attributed to accidental intravascular injection. Four further daily injections of 900,000 units of procaine penicillin were given without incident. Three months after the attack his head still felt a bit numb and his legs were still weak.

Case 12

A middle-aged woman who had suffered from bilateral bronchiectasis for many years had received numerous courses of penicillin injections during acute exacerbations. The earlier courses consisted of various preparations of soluble penicillin, but for the past eight years a course had consisted of five daily injections of 900,000 units of procaine penicillin in aqueous suspension. In October, 1953, immediately after the last of five daily injections, she became unconscious, with stertorous breathing and Jacksonian movements of the left side of the body. Both pupils were widely dilated and her pulse was weak, rapid, and irregular. She recovered consciousness after about five minutes and had a premonition of death; the pulse became more irregular and she lapsed into unconsciousness again. The pulse slowly became more regular, and in a further 20 minutes she had recovered sufficiently to be taken home by car.

Discussion

There seems little doubt that many of the acute reactions described in the literature after the administration of penicillin have been anaphylactic. This is suggested by the following facts: crystalline penicillin has been given intravenously in very large doses without incident (Janowitz *et al.*, 1948; Whipple, 1951); there is usually a history of previous penicillin therapy and often of a mild reaction following one of the preceding doses; some but by no means all patients can be shown, by means of cutaneous and intradermal tests, to be sensitized following the reaction; the clinical picture of an acute reaction bears a close resemblance to those following anaphylactic reactions to foreign sera and proteins; and the pathological findings in fatal cases of acute reactions to penicillin (Harpman, 1952; Curphey, 1953; Rosenthal, 1954) are essentially similar to those resulting from serum and foreign protein anaphylaxis (Vance and Strassmann, 1942). Most of the fatalities with penicillin have been attributed to profound circulatory failure or to asphyxia due to intense bronchospasm.

The sensitizing agent usually incriminated is injected crystalline or procaine penicillin; but sensitization, and even severe reactions, may occur after oral administration or topical application. Severe reactions have been reported after the use of penicillin tablets (Welch *et al.*, 1953; Bell, 1956), lozenges (Mayer *et al.*, 1953; Calvert and Smith, 1955), "aerosol" (Leibowitz and Schwartz, 1950; Blanton and Blanton, 1953), ophthalmic ointment (Carter and Cope, 1954), and after instillation into the sinuses (Everett, 1951; Weiss, 1953) and application to a wound (Irwin *et al.*, 1951). It has been claimed that penicillin O is antigenically different from penicillin G (Volini *et al.*, 1950), but this has been disproved (Siegal, 1951; Feinberg *et al.*, 1953). The simultaneous administration of an antihistamine has been shown to be without significant protective value (Mathews *et al.*, 1955); and the danger of relying on the simultaneous administration of either adrenaline or cortisone in sensitized individuals is illustrated by the fatal cases of Pick and Patterson (1953) and Winton and Nora (1955).

Waldrott (1953) has suggested that a major factor in the production of anaphylaxis in man is accidental intravenous injection or introduction into a vein by back-seepage. From his experience with foreign proteins he emphasized that, except in highly sensitized individuals, intravenous injection produces a much more rapid and profound anaphylactic reaction than does local injection. Rosenthal (1954) failed to find any evidence of penetration of a vein by the needle in the course of necropsy on six cases of acute reaction to penicillin, but in a case before the Westminster coroner (*British Medical Journal*, 1955a) in which a woman aged 72 died within five minutes of an injection of 500,000 units of crystalline penicillin, the pathologist reported that a vein in the arm showed evidence of having been transfixed by the needle. It is thus probable that both the type and the severity of the anaphylactic type of reaction to penicillin

may depend on whether any of the material has reached the blood stream directly as well as on the degree of sensitization of the patient.

Everything that has been said of crystalline penicillin applies equally to procaine penicillin, but in the case of the latter it is necessary to consider whether all or part of the reaction might not be due to the procaine moiety. Provided procaine is absorbed slowly, large doses can be given without producing central effects, but the toxicity of procaine is enormously increased if rapidly injected intravenously. Martin (1928) described acute toxic reactions to procaine as being of two types. One is characterized by clonic convulsions due to irritation of nerve centres, and may be followed by respiratory paralysis. The other is characterized by an abrupt fall in blood pressure, also probably due to central irritation, in which the patient becomes cold, clammy, and dazed. Buff (1950) described a syndrome due to procaine toxicity which is characterized by tachycardia, tremor, irregular respiration, blurring of vision, sweating, paraesthesiae, dilated pupils, and intense anxiety with angor amini—a symptom-complex which is very reminiscent of some of the acute reactions described following injections of procaine penicillin. State and Wangenstein (1946) found that intravenous injection of procaine at a rate in excess of 8 mg. a minute caused flushing, dizziness, and generalized numbness.

Commercial preparations of procaine penicillin contain 32–40% by weight of procaine base (Batchelor *et al.*, 1951) and an injection of 600,000 units of procaine penicillin will contain about 240 mg. of procaine base (Goodman and Gilman, 1955). The accidental intravascular injection of all or part of this dose within a period of, say, half to one minute would be expected to produce an immediate reaction on the basis of the known toxic effects of procaine without there being any need to invoke the phenomena of sensitization, hypersensitivity, or idiosyncrasy. Such a toxic reaction might well resemble an anaphylactic reaction in many of its features. If, however, there were smooth-muscle spasm, or if the attack were accompanied or followed by urticaria or angioneurotic oedema, none of which is a manifestation of procaine toxicity, the reaction might be a mixed one, some of the symptoms being due to procaine toxicity and some to the intravascular injection of penicillin in a slightly sensitized individual.

In those instances of acute reaction to procaine penicillin in which subsequent injections of the same material have been given without incident, as in Case 11 of this series and in five of the eight cases reported by Batchelor *et al.* (1951), it is probable that the reaction was due to the procaine moiety gaining direct access to the blood stream, but the danger of assuming that any reaction following injection of procaine penicillin is due to its procaine content alone is borne out by the experience of Thomson (1952). His patient developed a severe immediate reaction after an injection of procaine penicillin. On the assumption that the reaction was due to procaine hypersensitivity this patient was given an injection of crystalline penicillin five weeks later and died in profound shock within 15 minutes.

It is believed that the diverse pattern of acute immediate reactions to injected preparations of penicillin is due in part to variation in the degree of sensitization of the patient, and in part to direct entry of injected material into the vascular system. In the present series there was direct evidence of intravascular injection in three instances. It is suggested that the reaction in the cases placed in group 1 was due to intramuscular injection of penicillin in sensitized individuals, in group 3 to rapid intravascular injection of procaine, and in group 2 to intravascular injection of penicillin in slightly sensitized individuals. Of the cases placed in group 2, the preparation used in Cases 3 and 5 was crystalline penicillin, whereas in Cases 4, 6, and 7 the preparation was procaine penicillin, and the reaction in these may have been due, in part, to the procaine moiety. In Case 8 the reaction followed an injection of penethamate hydriodide and may have been due to the known toxicity of this compound, since

subsequent injections of procaine penicillin were given without incident. Alternatively, the reaction may have been due to the streptomycin administered at the same time.

Precautions

The following precautions are suggested as a means of minimizing the incidence and severity of acute reactions to penicillin preparations.

1. *Reduction of Incidence of Sensitization.*—Topical application of penicillin in the form of cream, ointment, lozenges, chewing-gum, tulle gras, aerosol, etc., is of very doubtful value and probably should be abandoned. Oral and parenteral administration should be confined to cases in which there is a clear indication.

2. *Careful History-taking.*—Inquiry should be made concerning any personal or family history of allergy, and details obtained of any previous treatment with penicillin—parenteral, oral, or topical. An effort should be made to elicit any evidence of a reaction following previous administration of penicillin, a point being made of inquiring about any reaction experienced within 10 days, as late reactions might not have been interpreted as being due to the penicillin. Even a mild reaction such as irritation or a mild pyrexia is significant.

3. *Handling of the Suspicious Case.*—In the allergic individual, one who has experienced a mild reaction previously, and those who have received many previous courses of penicillin it may be wise to carry out dermal and intradermal tests where feasible, using solutions of crystalline penicillin. A positive reaction would indicate the need to exercise extreme caution; a negative reaction means absolutely nothing. In all suspicious cases the technique suggested by Waldbott (1953) of injecting a small amount of the preparation and then waiting 45 seconds with the needle *in situ* before giving the rest of the dose has much to recommend it. Alternatively, it may be possible to give a preliminary test dose by mouth as suggested by Schiller (1953), since any reactions to penicillin by this route are likely to be less acute than when it is given parenterally. The patient should be kept under observation for 20 minutes after the injection, and a solution of adrenaline should be at hand ready for immediate use. Several writers have suggested that the arm or leg should be used for the injection in preference to the buttock, so that a tourniquet can be applied immediately should a reaction occur.

4. *Spacing of Injections.*—The interval between individual injections of a course should never exceed 10 days, the time required for sensitization to become established.

5. *Technique of Injection.*—A wide-bore needle, not smaller than a No. 1 serum needle, should be used for both crystalline and procaine penicillin so that blood will be readily aspirated if the needle penetrates a vein. To the same end, the syringe should never be filled to capacity. After insertion of the needle, traction should be applied to the plunger and should be prolonged in the case of procaine penicillin, as it is difficult to recognize the entry of a small amount of blood and the blood takes time to reach the side of the syringe on account of the viscosity of the suspension. The patient should be recumbent or sitting on a chair in such a way that there will be little or no movement during the process of injection; and should the position of the needle change, even slightly, during the injection, this should be halted and traction again applied to the plunger to ensure that the needle is still outside a vein. The injection should be given slowly and without applying more than light pressure on the plunger. Not infrequently there is considerable resistance when beginning an injection of procaine penicillin, due to blockage of the needle by an agglomeration of crystals. In this event it is probable that the preceding traction on the plunger could not have produced blood even if the needle had been in a vein. The needle should be withdrawn, the block cleared by pressure on the plunger, and the needle reinserted. After completion of the injection, pressure should be applied to the injection site for a few seconds to prevent

oozing, but the injection area should not be massaged for fear of producing back-seepage of the injected material into a punctured vessel.

All nurses, and other personnel who may be required to give penicillin injections, should receive instruction on the minutiae of the injection technique.

6. *Precaution Against Repetition.*—All patients who have suffered an acute immediate reaction from the administration of penicillin should be given a card or disk indicating this fact, and this should be carried in the wallet or handbag.

Treatment

The fact that so many of the patients in this series recovered rapidly without treatment suggests that the claims made for this or that treatment may be unjustified, recovery occurring in spite of treatment rather than because of it. However, since it is impossible to forecast the train of events and there is a danger that severe bronchospasm may occur rapidly, it is best to regard every acute reaction as an anaphylactic one so far as immediate treatment is concerned. At the first sign of an acute reaction 0.5 ml. of a solution of adrenaline 1 in 1,000 should be injected intramuscularly. This should be repeated as required or injection of the solution continued at the rate of 0.1 ml. a minute until the attack shows signs of terminating. An intravenous antihistamine such as diphenhydramine hydrochloride in a dose of 50–100 mg., or of promethazine hydrochloride in a dose of 25–50 mg., may also have some value, but they tend to produce a state of drowsiness lasting several hours. Positive-pressure oxygen should be administered where indicated and if available, and in cases where recovery is delayed intravenous hydrocortisone has been found to be valuable.

Those patients who experience weakness and malaise for a considerable time after the reaction, such as Cases 5, 7, and 11 in this series and one of the cases described by Bell (1956), may benefit from the administration of neostigmine, as did three of the patients described by Winston and Nora (1955). Acute reactions believed to be due to procaine toxicity in which there is evidence of gross central stimulation, such as generalized convulsions, might be expected to benefit from the administration of an intravenous barbiturate.

Summary

Twelve instances, from general practice, of acute immediate reactions following injection of preparations of penicillin are recorded.

The nature of these reactions and their possible modes of production are discussed. It is suggested that they may be produced in one of three ways: (1) intramuscular injection of penicillin in sensitized individuals; (2) accidental intravascular injection or back-seepage in sensitized individuals; or (3) accidental rapid intravascular injection of procaine penicillin suspensions.

A scheme for minimizing the incidence and severity of these reactions is outlined and suggestions are made for treatment.

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REFERENCES

- Anderson, H. C. (1954). *Lancet*, 2, 1157.
Batchelor, R. C. L., Horne, G. O., and Rogerson, H. L. (1951). *Ibid.*, 2, 195.
Bell, R. C. (1956). *Ibid.*, 2, 439.
Bhatnagar, B. (1955). *British Medical Journal*, 2, 972.
Blanton, W. B., and Blanton, F. M. (1953). *J. Allergy*, 24, 405.
— (1955b). *British Medical Journal*, 1955a, 1, 1289.
Buff, I. B. (1950). *Amer. Practit. (Philad.)*, 1, 347.
Calvert, R. J., and Smith, E. (1955). *British Medical Journal*, 2, 302.
Carter, E. S., and Cope, C. B. (1954). *J. Allergy*, 25, 270.
Curphey, T. J. (1953). *N.Y. St. J. Med.*, 53, 1107.

- Dubberley, C. L. (1955). *British Medical Journal*, 2, 563.
Everett, R. (1951). *J. Amer. med. Ass.*, 146, 1314.
Feinberg, S. M., Feinberg, A. R., and Moran, C. F. (1953). *Ibid.*, 152, 114.
Goodman, L. S., and Gilman, A. (1955). *The Pharmacological Basis of Therapeutics*, 2nd ed. Macmillan, New York.
Harpman, J. A. (1952). *British Medical Journal*, 2, 392.
Irwin, J. W., Graham, M. J., Jacobson, B. M., and Burrage, W. S. (1951). *New Engl. J. Med.*, 245, 246.
Janowitz, H. D., Schneerson, S. S., Sussman, M. L., and King, F. H. (1948). *J. Lab. clin. Med.*, 33, 933.
Leibowitz, H., and Schwartz, E. (1950). *Ann. Allergy*, 8, 668.
Lewis, G. W. (1953). *British Medical Journal*, 2, 778.
— (1954). *Ibid.*, 2, 1168.
Martin, E. G. (1928). *J. Amer. med. Ass.*, 91, 555.
Mathews, K. P., Hemphill, F. M., Sheldon, J. M., Lovell, R. G., and Forsythe, W. E. (1955). *J. Allergy*, 26, 78.
Mayer, P. S., Mosko, M. M., Schutz, P. J., Osterman, F. A., Steen, L. H., and Baker, I. A. (1953). *J. Amer. med. Ass.*, 151, 351.
Pick, F. J., and Patterson, J. F. (1953). *British Medical Journal*, 2, 605.
Rosenthal, A. (1954). *N.Y. St. J. Med.*, 54, 1485.
Schiller, I. W. (1953). *J. Allergy*, 24, 383.
Siegal, S. (1951). *Amer. J. Med.*, 11, 196.
Singh, S. D. (1955). *J. Indian med. Ass.*, 24, 645.
State, D., and Wangenstein, O. H. (1946). *J. Amer. med. Ass.*, 130, 990.
Thomson, W. O. (1952). *British Medical Journal*, 2, 70.
Tidswell, T. H. (1955). *Ibid.*, 2, 721.
Vance, B. M., and Strassmann, G. (1942). *Arch. Path. (Chicago)*, 34, 849.
Volini, I. T., Shlacs, W. H., and Felsenfeld, O. (1950). *J. Amer. med. Ass.*, 143, 794.
Waldbott, G. L. (1953). *J. Amer. med. Ass.*, 151, 1023.
Weiss, L. R. (1953). *J. Allergy*, 24, 407.
Welch, H., Lewis, C. N., Kerlan, L., and Putnam, L. E. (1953). *Antibiot. and Chemother.*, 3, 891.
Whipple, R. L., jun. (1951). *Amer. Heart J.*, 42, 414.
Winston, S. S., and Nora, E. D. (1955). *Amer. J. Med.*, 18, 66.
Wright, D. C. (1955). *British Medical Journal*, 1, 724.

CHLORAMPHENICOL IN TREATMENT OF ACUTE RESPIRATORY INFECTION

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During recent years medical teaching in this country has tended to limit the use of chloramphenicol primarily to the treatment of the typhoid group of infections in view of its alleged toxic effects on the haemopoietic system; it has been suggested that respiratory infections are more appropriately treated with other chemotherapeutic agents. The view is now generally held, however, that the micro-organisms commonly invading the human respiratory tract are of a mixed type. Of these, probably the most important in the United Kingdom are the *Haemophilus influenzae* and the pneumococcus (*Lancet*, 1955). The former organism is highly sensitive to chloramphenicol both *in vitro* (Fairbrother, 1956) and *in vivo* (May, 1953a, 1953b, 1954; Elmes, Knox, and Fletcher, 1955; Franklin and Garrod, 1953). Cohen and Schwartz (1950) believed chloramphenicol to be the antibiotic of choice in acute respiratory infections of undetermined origin, in the absence of an influenza epidemic or a "common cold."

Tunbridge (1953) points out that in infections usually of mixed origin it is advisable to use a chemotherapeutic agent which is effective against both Gram-negative and Gram-positive organisms, as well as against some virus infections. Penicillin alone is not always effective, as it has a limited action against Gram-negative organisms, especially *H. influenzae* (Stuart-Harris *et al.*, 1953), and May and Oswald (1956) have suggested that a combination of penicillin and streptomycin gives prompt and complete remission of exacerbation in the early stages of chronic bronchitis.

In our view, however, there are several possible objections to this combination of antibiotics in such cases. Firstly, in the absence of absolute negative evidence of a tuberculous basis for the bronchitis, the use of streptomycin carries the risk, albeit small, of inducing resistance in the causative tubercle bacilli, even with a relatively small total dose (Medical Research Council, 1948). Secondly, it seems irrational to subject a severely ill patient to frequent and possibly painful injections where simple oral therapy could be used. Thirdly, as Zinnemann (1953) has shown, chloramphenicol was the only one of five antibiotics capable of inhibiting 100% of strains of *H. influenzae* tested at the comparatively low concentrations obtained with the usual recommended therapeutic doses; it would therefore seem that this organism cannot always be eradicated by such a combination. Finally, there is no doubt that many staphylococcal infections, especially those seen in hospital, are due to penicillin-resistant strains (Barber and Burston, 1955).

As Hausmann and Karlish (1956) have suggested, staphylococcal infections are responsible for a considerable number of cases of pneumonia failing to respond to penicillin, and such infections are likely to present a major problem in the future. In a series of 17 cases of penicillin-resistant staphylococcal empyemata reported by Brownrigg (1955) chloramphenicol was found to be the most effective drug. De Vries and Pritchard (1955) isolated *Staphylococcus pyogenes* from 87 post-mortem specimens. Of these, 100% were sensitive to chloramphenicol, and 88% were resistant to penicillin, 48% being resistant also to the tetracyclines. Rantz and Rantz (1956), studying the resistance pattern of 242 strains of *Staphylococcus aureus*, showed 81.8% to be penicillin-resistant, 51.7% streptomycin-resistant, 52.5% tetracycline-resistant, and only 5.8% chloramphenicol-resistant.

It would seem, therefore, that oral antibiotic therapy is preferable in the treatment of acute respiratory infections, and the choice lies between chloramphenicol and the tetracyclines. For short-term therapy we elected to use the former antibiotic, in the belief that the tetracyclines were better reserved for the long-term treatment of more chronic advanced cases of bronchial infection, and there is some evidence (Helm *et al.*, 1956) that stopping such treatment and restarting after a short interval may encourage the development of resistant strains of *H. influenzae*.

We report here our observations and results of treatment with chloramphenicol in 80 consecutive admissions to the Royal Infirmary, Edinburgh, all of whom were suffering from acute and severe respiratory infection, either *per se* or complicating other conditions. This is a report of experience only and is in no way a controlled trial.

Materials and Methods

The 80 patients selected for treatment were consecutive admissions to the hospital during the period June 10, 1956, to February 7, 1957. There were 63 males and 17 females, whose ages ranged from 34 to 79 years, and all were suffering from acute respiratory infection, characterized by fever, dyspnoea, and cough with the production of a purulent or mucopurulent sputum. Of these, 54 were suffering primarily from respiratory disease with an acute exacerbation. The remaining 26 had an acute respiratory infection complicating another condition. Out of the total number, 24 patients had received previous treatment with penicillin alone, 6 with penicillin combined with streptomycin, and a further 6 with

spiramycin. None of these 36 patients had shown a favourable response to such treatment, given in adequate total dosage by modern standards. Details of these patients are shown in Table I.

TABLE I.—Patients' Main Disease and Previous Antibiotic Treatment, if Any

Main Disease Complicated by Respiratory Infection	No. of Cases		Previous Antibiotics		
	Male	Female	Penicillin	Penicillin and Streptomycin	Spiramycin
Chronic bronchitis— empyema	29	12	17	5	6
Bronchiectasis	6	—	1	—	—
Bronchial asthma	3	4	2	—	—
Pulmonary embolism	5	—	—	—	—
Mitral stenosis	2	1	—	—	—
Coronary artery disease	8	—	2	1	—
Diabetes mellitus	10	—	2	—	—
Total	63	17	24	6	6

Observations made in all cases before, during, and after treatment included assessment of general physical state, degree of fever, character, quantity and bacteriology of the sputum, and full peripheral blood counts.

The treatment consisted of chloramphenicol, 2 g. daily (500 mg. six-hourly) to a total of 10 g.—that is, five days' treatment. Careful observations on possible side-effects such as glossitis, skin rashes, sore throat, and alteration in the character and frequency of the stools were also made during treatment.

Pre-treatment sputum cultures on blood-agar medium showed the predominant organism to be *H. influenzae* in 15 cases, pneumococcus in 24 cases, *Staph. pyogenes* in 19 cases, and no predominant growth from mixed organisms in 22 cases. These figures are summarized in Table II. Of the

TABLE II.—Culture of Sputum Before Treatment with Chloramphenicol

No. of cases	Mixed Organisms. No Predominant Growth	Predominant Organism Obtained from Mixed Growth		
		<i>H. influenzae</i>	Pneumococcus	<i>Staph. pyogenes</i>
22	—	15	24	19

19 cultures yielding a predominant growth of *Staph. pyogenes*, only two were found to be fully sensitive by routine laboratory methods—that is, to penicillin, streptomycin, chloramphenicol, and the tetracyclines. Seventeen were resistant to penicillin, seven to streptomycin, and eight to the tetracyclines. All were sensitive to chloramphenicol and five to this antibiotic alone.

Results

The results of treatment are shown in Table III. The general condition of 77 patients was regarded as improved at the end of the fifth day of treatment in that they were afebrile and free from respiratory symptoms and signs. Of these, 73 remained free from symptoms, continuing to be

TABLE III.—Results of Treatment with Chloramphenicol

Main Disease Complicated by Respiratory Infection	No. of Cases	Effect of Treatment with Chloramphenicol on				
		General Condition		Infection		
		Improved	Unchanged	Controlled	Initially Controlled	Uncontrolled
Chronic bronchitis— empyema	41	40	1	39	—	2
Bronchiectasis	6	6	—	4	2	—
Bronchial asthma	7	6	1	6	—	—
Pulmonary embolism	5	4	1	4	—	—
Mitral stenosis	3	3	—	3	—	—
Coronary artery disease	8	8	—	8	—	—
Diabetes mellitus	10	10	—	9	1	—
Total	80	77	3	73	3	4

without sputum for periods varying from one to eight months after treatment. Relapse occurred in three patients within seven days of stopping therapy: return of fever and productive cough with infected sputum. One patient, although subjectively improved, had a mucopurulent sputum at the end of treatment, while three patients were totally unaffected.

As to the control of infection, the assessment of the change in purulence of the sputum before and after treatment is shown in the Chart. The bacteriological results are shown in Table IV. Forty-eight patients had no sputum at the end of treatment. Twenty-five produced mucoid sputum from which no growth of organisms was obtained on culture. Of the seven patients considered either to have been unaffected by treatment or to have relapsed within one week, mixed organisms were cultured from the sputum in four—*H. influenzae* in one, and pneumococcus in two.

It is noteworthy that in none of the 19 patients whose sputa grew *Staph. pyogenes* before treatment could any growth of organisms be obtained on culture thereafter.

TABLE IV.—Culture of Sputum After Treatment with Chloramphenicol

No. of cases	No Sputum Produced	No Growth Obtained	Mixed Org. No Predominant Growth	Predominant Organism Obtained from Mixed Growth		
				<i>H. influenzae</i>	Pneumococcus	<i>Staph. pyogenes</i>
48	25	4	1	2	0	—

TABLE V.—Side-effects Observed During or After the Treatment with Chloramphenicol

No. of cases	Side-effects				No Side-effects
	Blood Disorders	Diarrhoea	Skin Rash	Dry Mouth	
Percentage	0	1	1	3	75
	6.25				93.75

Side-effects (See Table V).—Seventy-five patients (93.75%) in this series were completely free from any side-effects attributed to chloramphenicol. Of the remaining five (6.25%), one had slight transient diarrhoea for 24 hours, which did not necessitate stopping the drug. Three developed a dry mouth, detected only by direct questioning, and one of them had in fact a mild "black tongue." The fifth patient exhibited a slight erythematous rash over the arms and hands during treatment, although this may have been caused by concomitant phenobarbitone medication. No evidence of bone-marrow depression as a result of therapy was elicited by comparative blood counts before and after treatment in all cases.

Discussion

In deciding to employ chloramphenicol in this series, we were well aware of the serious objections which have been raised against its use. Probably as a result of the negligible incidence of reported side-effects, chloramphenicol was extensively and often indiscriminately prescribed prior to 1952, by which time a number of blood dyscrasias, including aplastic anaemia, thrombocytopenia, and neutropenia had been reported. All of these were surveyed by the Food and Drug Administration of the United States of America in 1952 (Lewis *et al.*, 1952). As a result, a policy of restraint in its use was advocated thereafter. Since then exhaustive work, both experimental and clinical, has been carried out

in an endeavour to elucidate the questions raised by such reactions. These have been admirably posed by Parker (1955-6) as follows: What is their true significance? Are they purely coincidental? Are they a toxic reaction to the nitrobenzene radical? Are they related to the total dosage of the drug? Are they precipitated by previous or concomitant medication?

Research workers now seem to be in a little doubt about the cause of the abnormal bone-marrow finding in experimental animals after the administration of large doses of chloramphenicol. They seem to agree that the earlier reports on the marrow findings (Radomski and Nelson, 1953; Rigdon *et al.*, 1954) are mainly, if not wholly, due to malnutrition of the animals resulting from the administration of chloramphenicol (Nelson and Radomski, 1954; Weston *et al.*, 1954; Saslaw *et al.*, 1954-5; Radomski *et al.*, 1955; Reutner *et al.*, 1955; Rigdon *et al.*, 1955; Reutner *et al.*, 1955-6). This malnutrition was shown to be due to the marked anorexia induced by chloramphenicol, noted earlier by Gruhitz *et al.* (1949).

Following the earlier reports attributing blood dyscrasias to chloramphenicol administration, a nation-wide survey was carried out by Lewis *et al.* (1952) in the U.S.A., which produced no definite clinical evidence incriminating chloramphenicol in this respect. Welch *et al.* (1954), in a similar survey two years later, emphasized that "it cannot be stated categorically that chloramphenicol actually caused the blood dyscrasias which developed following its use." In the United Kingdom Hodgkinson (1954) surveyed 31 blood dyscrasias attributed to chloramphenicol from 20 centres, 28 of which were classified as aplastic anaemia. Seventeen of these patients had received concomitant treatment with other drugs, including sulphonamide (12), pyribenzamine (2), and streptomycin (1), each of which has been reported to be associated with the occurrence of aplastic anaemia. In 24 cases the dosage was over four times that employed by us, and the average was more than double that calculated to be the maximum necessary to control most infections.

In an endeavour to determine whether or not early blood or bone-marrow depression occurred in a controlled group of 43 children receiving antibiotics—75% of whom had chloramphenicol for 10 days—Doyle *et al.* (1953-4) found by serial examinations no change in the normal pre-treatment marrow or peripheral blood findings either during treatment or three months thereafter. Among others, Bercovitz (1953-4) also reported no abnormal blood findings in 67 patients with ulcerative colitis treated intermittently with chloramphenicol for long periods. In our series of 80 patients there was no significant clinical or laboratory evidence of blood disorders as a result of chloramphenicol administration.

Accordingly, we feel that the risks incurred by giving chloramphenicol in short courses of 10 g. are negligible or, at most, no more than with any potent drug. It is worth recalling that following early reports of serious sulphonamide toxicity, such as that of Sutcliffe *et al.* (1943), a restricted total dosage has been in use for many years. Even penicillin administration carries the risk of anaphylactic reactions in susceptible individuals, amounting to 100 to 200 acute reactions in a single year (Welch *et al.*, 1954), and three deaths have recently been attributed to this cause (Andersen, 1955-6).

As has been stated already, the tetracyclines should be reserved for the long-term treatment of more chronic advanced cases of bronchial infection, rather than for short-term treatment of acute episodes. There is already some evidence that repeated short courses of tetracyclines may encourage the development of resistant strains of *H. influenzae* (Helm *et al.*, 1956). Moreover, the high incidence of tetracycline-resistant staphylococci may be attributed to repeated or prolonged exposure, or to hospital infection (Brownrigg, 1955; de Vries and Pritchard, 1955; Barber and Burston, 1955; Rantz and Rantz, 1956; May and Oswald, 1956). We would also hesitate to use the tetracyclines in such cases as diabetic ketosis aggravated by bronchial infection or

mitral stenosis with cardiac failure attributable to bronchial infection, where any diarrhoea caused by these drugs would be detrimental to the underlying disease.

Summary and Conclusion

Eighty patients with acute respiratory infection of mixed bacterial origin either *per se* or complicating other conditions were treated with chloramphenicol, 2 g. daily for five days. Clinical improvement resulted in 77, three being totally unaffected. Relapse occurred in three patients within one week. The infection was controlled in 73 patients for periods varying from one to eight months after treatment.

Seventy-five patients were quite free from side-effects; dry mouth was observed in three, a mild skin rash in one, and slight transient diarrhoea in one. No blood dyscrasias of any kind were detected.

The potential toxicity of chloramphenicol has been overstressed. If it is given in short courses of 10 g. over five days to patients with acute and severe respiratory infections a satisfactory and prompt response is obtained, with a very low failure and relapse rate, and with negligible toxicity. Chloramphenicol has therefore a definite place in the treatment of such cases, but should not be employed in prolonged dosage or for trivial infections. It may well be that the avoidance of its extensive use in recent years has had the advantage of enabling us to deal effectively with organisms now frequently resistant to the other antibiotics more commonly employed.

We are grateful to Professor D. M. Dunlop for helpful advice and criticism on the preparation of this paper, and for allowing us to study the patients under his care. We also thank Dr. J. H. Bowie and the staff of the bacteriology department of the Royal Infirmary, Edinburgh, for carrying out the sputum cultures and sensitivity tests.

REFERENCES

- Andersen, A. H. (1955-6). *Antibiotics Annual*, p. 814. Medical Encyclopedia Inc., New York.
- Barber, M., and Burston, J. (1955). *Lancet*, 2, 578.
- Bercovitz, Z. T. (1953-4). *Antibiotics Annual*, p. 261. Medical Encyclopedia Inc., New York.
- Brownrigg, G. M. (1955). *Canad. med. Ass. J.*, 73, 787.
- Cohen, P., and Schwartz, R. (1950). *J. Pediatr.*, 37, 23.
- de Vries, J. A., and Pritchard, J. E. (1955). *Canad. med. Ass. J.*, 73, 827.
- Doyle, J. S., Bell, D., Ross, S., and Rice, E. C. (1953-4). *Antibiotics Annual*, p. 268. Medical Encyclopedia Inc., New York.
- Elmes, P. C., Knox, K., and Fletcher, C. M. (1955). *Lancet*, 1, 120.
- Fairbrother, R. W. (1956). *Ibid.*, 1, 716.
- Franklin, A. W., and Garrod, L. P. (1953). *British Medical Journal*, 2, 1067.
- Gruhzit, O. M., Fisker, R. A., Reutner, T. F., and Martino, E. (1949). *J. clin. Invest.*, 28, 943.
- Hausmann, W., and Karlsh, A. J. (1956). *British Medical Journal*, 2, 845.
- Helm, W. H., May, J. R., and Livingstone, J. L. (1956). *Lancet*, 1, 775.
- Hodgkinson, R. (1954). *Ibid.*, 1, 285.
- Lancet*, 1955, 2, 601.
- Lewis, C. N., Putnam, L. E., Hendricks, F. D., Kerlan, I., and Welch, H. (1952). *Antibiot. and Chemother.*, 2, 601.
- May, J. R. (1953a). *Lancet*, 2, 534.
- (1953b). *Ibid.*, 2, 899.
- (1954). *Ibid.*, 2, 837.
- and Oswald, N. C. (1956). *Ibid.*, 2, 814.
- Medical Research Council (1948). *British Medical Journal*, 2, 769.
- Nelson, A. A., and Radomski, J. L. (1954). *Antibiot. and Chemother.*, 4, 1174.
- Parker, R. T. (1955-6). *Antibiotics Annual*, p. 972. Medical Encyclopedia Inc., New York.
- Radomski, J. L., and Nelson, A. A. (1953). *Fed. Proc.*, 12, 358.
- and Deichmann, W. B. (1955). *Antibiot. and Chemother.*, 5, 674.
- Rantz, L. A., and Rantz, H. H. (1956). *A.M.A. Arch. intern. Med.*, 97, 694.
- Reutner, T. F., Maxwell, R. E., Weston, K. E., and Weston, J. K. (1955). *Antibiot. and Chemother.*, 5, 679.
- and Weston, J. K. (1955-6). *Antibiotics Annual*, p. 84. Medical Encyclopedia Inc., New York.
- Rigdon, R. H., Crass, G., and Martin, N. (1954). *A.M.A. Arch. Path.*, 58, 85.
- Martin, N., and Crass, G. (1955). *Antibiot. and Chemother.*, 5, 38.
- Saslaw, S., Doan, C. A., and Schafer, R. L. (1954-5). *Antibiotics Annual*, p. 383. Medical Encyclopedia Inc., New York.
- Stuart-Harris, C. H., Pownall, M., Scothorne, C. M., and Franks, Z. (1953). *Quart. J. Med.*, 22, 121.
- Sutcliffe, W. D., Helpert, M., Griffin, G., and Brown, H. (1943). *J. Amer. med. Ass.*, 121, 307.
- Tunbridge, R. E. (1953). *Practitioner*, 171, 608.
- Welch, H., Lewis, C. N., and Kerlan, I. (1954). *Antibiot. and Chemother.*, 4, 607.
- Weston, J. K., Reutner, T. F., Thompson, R. Q., and Maxwell, R. E. (1954). *Fed. Proc.*, 13, 416.
- Zinnemann, K. (1953). *British Medical Journal*, 2, 1069.

ORAL TREATMENT OF TRICHOMONAS VAGINITIS WITH AMINITROZOLE

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The work described below is a controlled trial of oral treatment of trichomonas vaginitis, using the oral product aminitrozole (2-acetyl-5-nitrothiazole, "tritheon"). During the course of the trial, attempts have been made to culture the *Trichomonas vaginalis*, using the simplified trypticase serum medium of Kupferberg.

Literature

Cuckler, Kupferberg, and Millman (1955) showed that aminitrozole administered orally is effective against trichomonas infection *in vitro* and *in vivo*. It was shown to have a therapeutic effect in experimental vaginal trichomoniasis in monkeys and mice. It is also effective against amoebae and against schistosomiasis. Aminitrozole was well tolerated in six species of animal for extended periods when administered by various routes. In some cases in dogs, brown urine was produced, and this has also been noted in humans.

Perl, Guttmacher, and Raggazoni (1956) treated a series of 174 cases of trichomonas vaginitis with aminitrozole and a cure was obtained in 35%. Out of 48 husbands of infected women, trichomonads were found in the semen of 28 (58%). Of these, 16 who brought further seminal specimens after treatment with aminitrozole were cured after one course of treatment, while a further two were cured after two courses of treatment. The remaining 10 defaulted. In the female trichomonas infection was found to be heaviest one week before and one week after menstruation. When husband and wife both received treatment the percentage of cures was increased.

Plentl, Gray, Neslen, and Dalali (1956) treated a series of cases of trichomonas vaginitis, using aminitrozole in a dose of 150 mg. three times a day. Severe side-effects were noted, including nausea, abdominal pain, anorexia, and dark urine. When the dose was reduced to 100 mg. three times a day, using enteric-coated tablets, side-effects were minimal. Eradication of trichomonas was achieved in 35% and clinical improvement in 67%.

Kupferberg, Johnson, and Sprince (1948) gave a detailed description of the method of preparing a simplified trypticase serum medium for the culture of *Trichomonas vaginalis*. Kean and Day (1954), using this medium for the diagnosis of trichomonas infection, found that culture was more reliable than the hanging drop method for the diagnosis of infection. In 500 consecutive patients examined from a gynaecological clinic the hanging drop was positive in 12.2%, while culture was positive in 18%. They concluded that culture of the organism was essential for diagnosis.

Present Investigation

This investigation was planned with two main objects. The first was to test the effectiveness of aminitrozole for the oral treatment of trichomonas infection. During the course of the trial the second object was to test the use of the simplified trypticase serum medium for the culture of *Trichomonas vaginalis*.

Cases of trichomonas vaginitis were divided alternately into two groups—treated and control. The treated group received aminitrozole 100 mg. three times daily by mouth for ten days, and "aci-jel" vaginal jelly inserted night and morning for three weeks. The control group received aci-jel only, night and morning for three weeks. (Aci-jel is a buffered vaginal jelly with a pH of 4, containing acetic acid, boric acid, oxyquinoline sulphate, ricinoleic acid, and glycerin in a vegetable-gum base.)

In all cases the aim was to take smears at the first visit and after two, four, and six weeks. Treated cases which were negative at six weeks were re-examined at 12 and 24 weeks. Control cases which remained positive after four weeks were given treatment and thus transferred to the treated group. Treated cases positive after six weeks and those which relapsed were given further treatment, some patients receiving three courses in all. Cases regarded as failures with oral treatment were removed from the trial and given local treatment with acetarsol or other forms of medication; in a few cases local symptoms were so persistently severe that it was necessary to institute this after only one course of oral treatment.

The husbands of eight of the patients were examined at St. Paul's Hospital through the kind co-operation of Mr. D. Innes Williams.

Diagnosis

In the early stages of the trial all swabs were submitted to examination of a hanging-drop preparation and to culture using a simplified trypticase serum medium containing antibiotics and prepared as follows: (1) Maltose, 1 g.; (2) bacto agar, 1 g.; (3) distilled water, 400 ml. Heat in autoclave at 10-lb. (0.7 kg. per square cm.) pressure for 10 minutes, dissolve agar. Filter through coarse paper (Reeve Angel). (4) Trypticase (B.B.L.), 20 g.; (5) cysteine hydrochloride, 1.5 g.; (6) 0.5% methylene blue, 0.48 ml.; (7) distilled water to make 600 ml. Adjust pH to 6 with 5N NaOH. Make up to 950 ml. volume with distilled water. Tube in 9.5-ml. amounts. Autoclave at 15-lb. (1.05 kg. per square cm.) pressure for 15 minutes and cool to room temperature. Add 0.5 ml. of sterile serum 100%, which has been adjusted to pH 6. Add 250 units of penicillin and 1 mg. of streptomycin per ml. of medium. (In practice 5-ml. aliquots had been found satisfactory.)

In the early stages of the trial a swab of the vaginal secretion was rotated in 1-2 ml. of saline, brought at once to the laboratory, and immediately examined. Several drops of the suspension were then inoculated into bijou bottles containing 5 ml. of the culture medium. The bottles were incubated at 37° C. and the cultures examined after 48 and 96 hours. As the results were unsatisfactory the technique was modified, the swab being placed immediately into the culture medium to avoid the addition of saline and ensure a heavy inoculum.

The temperature of the incubator was next tested and found to vary by several degrees on different shelves. Stabilization at 37° C. was attained, but the results remained unconvincing.

About 40% of those preparations which revealed large numbers of trichomonads in the hanging drop were still positive after 48 hours' cultivation, but in most instances the numbers were much reduced, motility was sluggish, and disintegrating forms were visible. If the wet preparation showed only a few trichomonads, survival after 48 hours was infrequent, and after 96 hours rare. The impression gained was that the medium encouraged the protozoa to survive for a limited period but did not promote their growth.

On only one occasion was a positive culture obtained from a negative hanging-drop preparation, although several of these strongly suggested a trichomonas infection. Lately it was felt that thorough examination of a hanging-drop preparation was the far more reliable guide to the presence of trichomonads and culturing was discontinued.

The results obtained from 113 swabs examined directly, after 48 and 96 hours' culture, are shown in Table I. These results were disappointing, and compared very unfavourably with those reported by American workers using a similar medium.

TABLE I

	Hanging Drop Positive (77)		Hanging Drop Negative (36)	
	Positive	Negative	Positive	Negative
48-hour culture ..	30	47	1	35
96- " " ..	10	67	0	36

Results

A total of 60 women were enrolled in the trial, consisting initially of 34 treated cases and 26 controls; 9 in the treated group and 5 in the control group defaulted and did not attend for further treatment. The results in the remainder are shown in Table II.

TABLE II
Treated Group (25)

Cured of trichomonas vaginitis ..	5
" " but monilia infection appeared ..	1
Still positive after treatment ..	11
Relapsed after one negative swab or more ..	6
Underwent hysterectomy, cured of trichomonas vaginitis ..	1
Toxic symptoms; did not take tablets ..	1

Control Group (21)

Remained positive, treated ..	17
Dilatation and curettage, and cauterization of cervix, cured ..	1
Symptomatic improvement ..	2
Other treatment given ..	1

Controls Treated with Aminitrozole (17)

Persistently positive ..	12
Relapse ..	2
Defaulted ..	1
Recent cases not followed up ..	2

Twelve of the 25 treated patients had one course of aminitrozole, six had two courses, and seven had three courses. Of the five cured of trichomonas vaginitis, four had one course of aminitrozole and one had two courses.

Eight of the treated controls had one course of aminitrozole, four had two courses, and two had three courses.

Thus of 37 patients (23 treated and 14 treated controls) who received treatment with aminitrozole and aci-jel, six were cured of trichomonas vaginitis.

Husbands Examined by Prostatic Smear (St. Paul's Hospital).—Eight husbands were examined: five were negative, two were positive, and one had pus but no trichomonads. The two men with positive smears were both treated and the smears became negative; the wife of one was treated but relapsed after 18 weeks; the wife of the other was cured after treatment with aminitrozole. In the man with pus only, this disappeared after treatment with aminitrozole, and his wife was cured by a further course of aminitrozole.

Summary and Conclusions

Aminitrozole (2-acetyl-5-nitrothiazole, "tritheon") has been recommended for the oral treatment of trichomonas vaginitis.

The results of a controlled trial of oral treatment are presented.

Attempts to culture *Trichomonas vaginalis*, using a simplified trypticase serum medium, have proved unsuccessful; careful examination of a hanging-drop preparation has proved the best method of diagnosis.

The main conclusion of this work has been that aminitrozole with a buffered acid vaginal jelly ("aci-jel") cannot be recommended for the treatment of trichomonas vaginitis. Only 6 out of 37 patients treated

were cured, and in fact the results have proved so disappointing that it has been reluctantly decided to abandon the trial.

Further work might show whether aminotroazole is effective in eliminating trichomonads in the female urinary tract and in the male, but the results so far suggest that it is not suitable alone for vaginal infections. There may be a place for it in conjunction with an effective trichomonicide, used locally in the vagina, especially in chronic cases, but its use without such treatment does not give sufficiently good results to make it a practical method.

We acknowledge our indebtedness to Ortho Pharmaceutical Limited for their generous support of this investigation. This has included help with the technical side and supplies of tritheon, aci-jel, and materials for the culture medium. This help has been given without prejudice to any results that might be obtained. We also thank Mr. D. Innes Williams and the staff of St. Paul's Hospital. Miss Landau, Miss Mocatta, and Miss Hurter kindly allowed us to treat patients under their care.

REFERENCES

- Cuckler, A. C., Kupferberg, A. B., and Millman, N. (1955). *Antibiot. and Chemother.*, 5, 540.
Kean, B. H., and Day, E. (1954). *Amer. J. Obstet. Gynec.*, 68, 1510.
Kupferberg, A. B., Johnson, G., and Sprince, H. (1948). *Proc. Soc. exp. Biol. (N.Y.)*, 67, 304.
Perl, G., Guttmacher, A. F., and Raggazoni, H. P. (1956). *Obstet. Gynec.*, 7, 128.
Plentl, A. A., Gray, M. J., Neslen, E. D., and Dalali, S. J. (1956). *Amer. J. Obstet. Gynec.*, 71, 116.

SENSITIVITY TO FOLIC ACID

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Folic acid (pteroylglutamic acid) has been extensively used since 1945 not only for the treatment of certain megaloblastic anaemias but also as an ingredient of numerous vitamin preparations. In spite of this wide use the only report of sensitivity to this drug is that of Mitchell, Vilter, and Vilter (1949). Their patient, a woman aged 35, reacted on two occasions to folic acid. On the first occasion she developed a pruritic rash which disappeared on withdrawal of the drug; on the second occasion an anaphylactoid reaction followed an intravenous dose. Subsequent skin tests confirmed that she was sensitive to folic acid. She was known also to be sensitive to phenobarbitone, various foods, wool, soaps, and face-powder.

The purpose of this paper is to report an example of sensitivity to folic acid arising in a previously healthy subject. The results of intradermal tests with folic acid and closely related compounds are also described.

Case Report

A healthy male doctor aged 35 was given, for experimental purposes, 3 mg. of folic acid as a solution of the sodium salt by mouth without untoward reaction. The material was absorbed normally, for the serum folic-acid concentrations, measured with *Streptococcus faecalis* R assay (Jukes, 1955), rose from 0 to 40 m μ g. per ml. in the first four hours after the dose.

*In receipt of a grant from the Medical Research Council.

Six weeks later the same subject was given four 5-mg. tablets of folic acid by mouth. Forty minutes after taking the tablets he complained of general malaise, aching pain in the lower thoracic region, and respiratory difficulty with restricted inspiration. This was followed 20 minutes later by itching of the palms of the hands and soles of the feet. Pruritus then became generalized; it was worse at the flexures, and was associated with a generalized erythematous rash, most pronounced on the thighs and forearms. The reactions disappeared within three hours of taking the folic acid.

Investigations.—Intradermal tests were carried out by injecting 0.1 ml. of the test solutions into the skin on the front of the forearm. A test solution of folic acid was included in each set of tests together with a distilled-water control. Positive reactions with weal, red flare, and itching were obvious in 10 to 15 minutes after the injection; they reached a peak in about 20 minutes and disappeared in 45 to 60 minutes. The substances tested, the concentrations of test solutions, and the results are given in the Table.

Two different samples of commercially available folic acid (pteroylglutamic acid) gave positive reactions after intradermal injection in concentrations of 5 μ g. per ml. or more, as did similar concentrations of a crystalline preparation of folic acid of high (97%) purity kindly supplied by Dr. William L. Williams, of Lederle Laboratories Inc. Similar reactions followed the intradermal injection of the same concentrations of aminopterin (4-aminopteroylglutamic acid). On the other hand, no reactions followed the intradermal injection of the following solutions: two preparations of folic acid ("leucovorin," N¹⁰-formyltetrahydropteroylglutamic acid), N¹⁰-formyltetrahydropteroylglutamic acid; anhydroleucovorin; a folic acid conjugate "teropterin"; and amethopterin (4-amino-N¹⁰-methylpteroylglutamic acid).

Free antibody was tested for by a precipitation method using a constant antibody optimal-proportions technique (Dean and Webb, 1926) and also by adsorbing folic acid to tanned red cells and testing the ability of the patient's serum to agglutinate these cells (Boyden, 1951). No antibodies were demonstrated by either method.

Six months after the development of sensitivity the blood count was: red cells, 5,300,000 per c.mm.; haemoglobin, 15.4 g. per 100 ml.; packed cell volume, 46%; white cells, 8,000 per c.mm. There were no abnormalities in the stained film.

Discussion

The results of skin tests in our patient show that while he was sensitive to folic acid (pteroylglutamic acid) and its analogue aminopterin (4-aminopteroylglutamic acid), he did not react to folinic acid, anhydroleucovorin, N¹⁰-formyltetrahydropteroylglutamic acid, and amethopterin, which are related compounds with substituents in the 5 and 10 positions (see Table).

None of the compounds we used was absolutely pure; the purest folic acid obtainable contained about 3% impurities, and the aminopterin and related compounds contained traces of folic acid as well as other chemical contaminants.

Results of Intradermal Tests with Folic Acid and Related Compounds

Substance	Concentration (μ g. per ml.)	Result
Commercial folic acid (a)	<5	—
" " " (b)	5 to 100	+
Purified " " "	<5	—
" " "	5 to 100	+
Aminopterin	<5	—
" " "	5 to 100	+
Folinic acid (a) (leucovorin)	250	—
Folinic acid (b)	250	—
Anhydroleucovorin	Saturated solution	—
N ¹⁰ -formyltetrahydropteroylglutamic acid	250	—
Teropterin	250	—
Amethopterin	250	—

A CASE OF CONJOINED TWINS

BY

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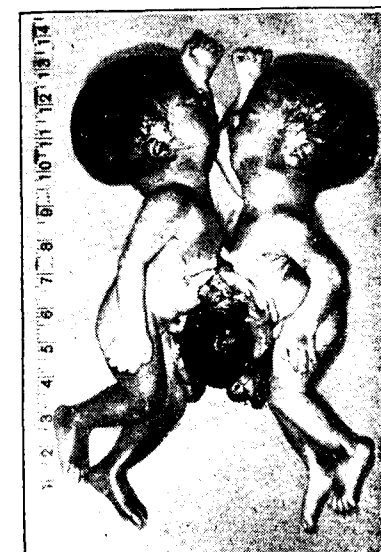
Conjoined twins are rare and may at times offer serious difficulties to delivery. The following case seems of sufficient interest to merit publication, as the monsters were delivered intact vaginally. Frequently some form of mutilating operation is necessary before vaginal delivery can be effected, or a caesarean section may have to be done.

Case Report

A Cantonese woman aged 30 was admitted in labour to the Kangang Kerbau Hospital in the thirty-second week of her eighth pregnancy. All seven previous confinements had been normal and had resulted in live births.

On examination she was anaemic, her face and hands were puffy, and there was clinical oedema of her feet and ankles. The abdomen was the size of a full-term pregnancy and rather tense.

There seemed to be definite hydramnios and the uterus was contracting. The possibility of a multiple pregnancy was considered, though no foetal heart sounds could be heard with certainty. Her blood pressure was 160/100 mm. Hg. The urine contained a trace of albumin. Vaginal examination revealed a bulging bag of membranes, a cervix practically fully dilated, and something other than a head presenting—probably



Photograph of the omphalopagus.

feet. A straight x-ray film of her abdomen showed twin foetuses both presenting by the breech. However, the fact that the two heads were on the same level and facing each other suggested the possibility of some form of foetal union.

By this time the patient was beginning to bear down and the membranes ruptured spontaneously. A large quantity of dark-coloured liquor amnii drained away and two feet presented at the vulva. It was decided to attempt delivery and she was anaesthetized. Vaginal examination now confirmed that the twins were joined together, and there did not seem to be any second sac, as the other pair of lower limbs and feet were felt at the cervix. These were brought down easily, and with traction on the four limbs the bodies descended parallel to each other through the dilated cervix and vagina. The legs and trunks were now lifted well forward over the symphysis pubis, allowing the posterior head to engage in the pelvis and be born with the anterior head following quickly afterwards. Both foetuses were fresh, and the one whose head was delivered last made feeble attempts to breathe. A single placenta, with velamentous insertion of two cords at opposite sides, was expressed a few minutes after delivery of the monster. There was no excessive blood loss, and episiotomy performed during the delivery was repaired with catgut. The puerperium was uneventful.

It was therefore of some importance that a positive reaction was obtained with both folic acid and aminopterin at equal concentrations of 5 μ g. per ml. and that at greater dilutions the reactions became doubtful with both substances. The patient reacted to the aminopterin *per se* and not to traces of folic acid which might have been present as a contaminant.

The formation of specific antibodies against folic acid by the subject studied indicates that this substance functioned in him either as an antigen or, more probably, as a haptene or antigenic determinant in a larger complex. An essential criterion of antigenicity is that the compound in question is "foreign" to the subject. These observations therefore suggest that pteroylglutamic acid was not normally present in the tissues of our "patient." As he remained perfectly well, however, and was not anaemic the requirement of his tissue cells for "folic acid" on this hypothesis must have been supplied by substances other than pteroylglutamic acid.

It has been recognized for some time that pteroylglutamic acid is itself unlikely to play a part in tissue metabolism. Recent work suggests that N¹⁰-formyltetrahydropteroylglutamic acid or a closely related compound is the physiologically active member of this group of substances (Greenberg, 1954). N¹⁰-formyltetrahydropteroylglutamic acid is itself highly unstable and probably exists in the liver in a bound stable form (Greenberg, 1954). Under aerobic conditions it is rapidly oxidized to N¹⁰-formylpteroylglutamic acid, and this in turn, under alkaline conditions, is converted to pteroylglutamic acid. Under anaerobic conditions, on the other hand, N¹⁰-formyltetrahydropteroylglutamic acid is converted to N⁵-formyltetrahydropteroylglutamic acid (folinic acid).

The isolation of folic or folinic acid from foodstuffs does not necessarily imply that this was the form in which this substance was originally present. It is possible that the absence of sensitivity reactions in our subject after meals is due to the fact that pteroylglutamic acid is not absorbed from food as such, and not that too little is absorbed to produce these reactions.

Summary

A subject is described who was found to have become sensitive to folic acid six weeks after taking an oral dose.

Intradermal tests showed that he was sensitive to folic acid and aminopterin, but not to folinic acid (leucovorin), anhydroleucovorin, N¹⁰-formyltetrahydropteroylglutamic acid, a folic acid conjugate (teropterin), or to amethopterin.

We thank Professor J. V. Dacie for advice and encouragement; and Dr. William L. Williams, of Lederle Laboratories Inc., for supplying the pure specimen of pteroylglutamic acid used in the study and also for the anhydroleucovorin, folinic acid (leucovorin), and teropterin.

REFERENCES

- Boyden, S. V. (1951). *J. exp. Med.*, 93, 107.
Dean, H. R., and Webb, R. A. (1926). *J. Path. Bact.*, 29, 473.
Greenberg, G. R. (1954). *Fed. Proc.*, 13, 745.
Jukes, T. H. (1955). In D. Gillick's *Methods of Biochemical Analysis*, 2, 121. Interscience, New York.
Mitchell, D. C., Vilter, R. W., and Vilter, C. F. (1949). *Ann. intern. Med.*, 31, 1102.

A Society of Indexers has been formed in London, its principal objects being to improve the standard of indexing and secure some uniformity in its technique, to set up a panel of indexers, and to publish papers and notes on the subject. It is believed to be the first society of its kind in the world. The chairman, Mr. A. R. HEWITT (librarian of the Institute of Commonwealth Studies), is son of a former librarian of the Royal Society of Medicine. Among those elected to the council of the society was Miss D. F. ATKINS, librarian of the Postgraduate Medical School of London. Further information may be obtained from the hon. secretary, Mr. G. NORMAN KNIGHT, 4, Fitzroy Street, London, W.1.

Examination of the twins showed them to be well formed and symmetrical (see photograph). Both had normal female external genital organs. The combined weight was 4 lb. 10 oz. (2,100 g.). They were joined by a bridge of skin-covered soft tissue at a level just below the xiphoid processes. Both infants showed exomphalos and there appeared to be a large common liver. The monster can be classed as an omphalopagus (Hirst and Piersol, 1892). The specimen is being preserved.

Comment

The incidence of conjoined twins is difficult to ascertain. Aird (1954) suggests that the greater frequency of case reports is "due to the increasing accessibility of very large populations in Asia and Africa, to the greater possibility of the successful birth of conjoined twins in improved modern obstetrical circumstances," and, of course, to the greater possibility of successful surgical separation should they be born alive.

From the clinical aspect it is interesting to note how most standard textbooks agree that double monsters can be delivered spontaneously in many cases. They also agree that when the monsters give rise to dystocia dangerous and complicated operations are often needed to effect delivery. Many cases, of course, come into premature labour when the foetuses are small and vaginal delivery is thus possible. In general, delivery is easier by the breech, and Munro Kerr and Chassar Moir (1949) advise version if the heads are presenting. The advantage of breech extraction is that destructive operations, if they become necessary, can be more easily carried out. An interesting case of a thoracopagus delivered through the vaginal route in a very unusual fashion, the foetuses being extracted one after the other in cephalic presentation, has been described by Morrone (1954).

As regards the diagnosis, the association between hydramnios and foetal abnormality is so frequent that the latter should be suspected whenever hydramnios occurs. Careful abdominal palpation and internal examination, if the dilatation of the cervix is adequate, are important. Radiography is valuable, and in the case described suggested the possibility of conjoined twins, as the two heads were at the same level, faced each other, and the thoracic cages of the foetuses were together. However, if the union be very flexible the two heads may well be at different levels, as in a case described by Rawlings and Warwick (1951).

My thanks are due to Professor B. H. Sheares for permission to publish this case report, and to Mr. Austin Bennett for the photograph of the monster.

REFERENCES

- Aird, I. (1954). *British Medical Journal*, 1, 831.
Hirst, B. C., and Piersol, G. A. (1892). *Human Monstrosities*. Pentland, London.
Kerr, J. M. M., and Moir, J. C. (1949). *Operative Obstetrics*, 5th ed., p. 243. Baillière, Tindall and Cox, London.
Morrone, A. A. (1954). *Obstet. Gynec.*, 4, 658.
Rawlings, E. E., and Warwick, R. (1951). *J. Obstet. Gynaec. Brit. Emp.*, 58, 452.

A considerable range of lecture courses are now offered to Cambridge medical students during the Long Vacation. These cover not only the preclinical and transitional periods of medical studies but also provide opportunities for continuing a general education in the arts. For the preclinical student there is a course in pharmacology as well as the usual lectures and demonstrations in anatomy and physiology. Practical experience in the department of pathology may be arranged, and formal instruction in biochemistry is also available. For the student who has passed in anatomy and physiology, the Medical School offers a course of instruction in elementary clinical methods at Addenbrooke's Hospital, and there is also an introductory course in psychology. The Faculty of Modern Languages under the Pressland Bequest provides an elementary course of 24 lectures in German, Russian, and Italian for science and medical students. More advanced courses are also available in some of these languages. A special series of lectures in English literature and poetry for students in scientific faculties is arranged by the Faculty of English.—*Cambridge University Reporter*, March 8.

Medical Memoranda

Lichen Urticatus as an Allergic Manifestation of Pregnancy

It has been noted (Urbach and Gottlieb, 1946) that, in general, pregnancy has an influence which tends to diminish a pre-existing allergy, and this can be frequently observed in cases of asthma and hay-fever. Various theories have been postulated to explain this (Ahlmarm, 1944; Zondek and Bromberg, 1945a, 1945b).

There are, however, certain conditions of an allergic nature which can be actually brought about by the pregnant state. During pregnancy the skin can show a definite hypersensitivity to substances originating in the foetus and also to the placental protein (Urbach and Gottlieb, 1946), and in some women various dermatoses of pregnancy can result, due, it is believed, to the production of an abnormal amount of endogenous allergens from the foetus or placenta. It is assumed that, normally, specific antibodies are produced in the pregnant woman as a reaction to this foetal or placental protein (Seegal and Loeb, 1943). The assumed presence of such specific antibodies has been used to explain (Freund, 1909) the good results achieved with systematic injections of the serum of pregnant women in the treatment of the dermatoses of pregnancy, a form of treatment used with success in America. The presence of these antibodies in the injected serum effectively neutralizes the increased supply of antigen which presumably causes the condition.

Lichen urticatus is one of the ways in which an allergic manifestation of pregnancy can show itself; the following three cases illustrate this.

CASE REPORTS

Case 1.—A primigravida aged 22, blood group O, Rh positive, developed, seven days before delivery, a typical papular urticarial rash covering the entire body, which was extremely itchy and caused great discomfort. Both the rash and the irritation were completely unresponsive to phenindamine or diphenhydramine in full dosage. In an attempt to afford her relief a subcutaneous injection of adrenaline was given without any effect. Within 24 hours of the normal delivery of the baby (full term) there was definite relief from the irritation, and the lichen urticatus began to fade, but took nearly two weeks to disappear completely. There was no personal or family history of allergy or allergic response to any drugs excepting that her mother suffered with migraine.

Case 2.—A primigravida aged 23, blood group A, Rh positive, began to develop, when 33 weeks pregnant, a typical lichen urticatus with irritation, covering the body and upper parts of the arms and legs. She was given full doses of mepyramine maleate and mepyramine maleate cream to apply locally. In four to five days the rash disappeared, whereupon she stopped the treatment. The irritation and resulting distress returned within 12 hours, and two days later the papular urticaria had reappeared. Recourse was had once more to mepyramine maleate tablets and cream, but this time with no relief. Within a few hours of the normal delivery of the baby (full term) the pruritus had gone, and the rash began to fade within 24-48 hours, the final traces taking nearly three weeks to completely disappear. There was no personal history of allergy or allergic response to any drugs, but the family history showed that the mother had asthma.

Case 3.—A primigravida aged 23, blood group O, Rh positive, developed, about the fourth month of pregnancy, lichen urticatus with pruritus covering the body, especially the front of the chest. No treatment, except calamine lotion locally, was given, and the rash persisted throughout the remainder of the pregnancy. Within 24 hours of the normal delivery of the baby (full term), the rash and

irritation had completely disappeared. There was a definite history of allergy in this patient, when as a young girl she suffered with severe asthma.

COMMENT

Not infrequently pregnant women exhibit urticaria, but in most cases it can be related to an external cause, the removal of which brings about the disappearance of the rash, sometimes accelerated by the use of antihistamines. In the three cases described above, lichen urticatus was due to the foetus or placenta only, and persisted until the cause was removed with the expulsion of the child and placenta. In all three cases relief from irritation occurred soon after, and the papular urticaria began to fade as quickly, finally disappearing when the last traces of the antigenic substances were removed from the blood.

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General Practitioner.

REFERENCES

- Ahlmark, A. (1944). *Lancet*, 2, 406.
Freund, R. (1909). *Berl. klin. Wschr.*, 46, 682.
Seegal, B. C., and Loeb, E. N. (1943). *Fed. Proc.*, 2, 99, 101.
Urbach, E., and Gottlieb, P. M. (1946). *Allergy*, Heinemann, London.
Zondek, B., and Bromberg, Y. M. (1945a). *J. Allergy*, 16, 1.
— (1945b). *J. Amer. med. Ass.*, 127, 669.

Range of Movement of Testicle

One of the peculiarities of present habits of thought in our profession is that matters of demonstrable fact are treated as matters of opinion. Anatomy is essentially concerned with matters of fact, yet I have found in a number of instances that assertions of the inaccuracy of generally accepted anatomical teaching are treated as if they had to do with religion or politics—subjects in which opinions incapable of proof are held on grounds of habit or emotion. An instance is that of the range of movements of the testicle. It is common knowledge that in all children and many adults the testicles can move upwards out of the scrotum over the pubic bone. The anatomists have not described any cavity into which they could go, and in consequence the strange idea has arisen that the cremaster dragged them into the inguinal canal. I say the idea was strange, since the normal testicle is far too big to go into the normal external ring at any age; and to bring it into the canal the cremaster would need a contractility totally unlike that possessed by similar muscle elsewhere.

What actually happens can easily be demonstrated at an operation for inguinal hernia on a child, if the testicle is pushed upwards out of the scrotum and held there by an assistant pressing from below while the surgeon cautiously dissects down on it. The fascia of Scarpa is first defined, and when it is opened the testicle will be found lying in an extremely loose areolar space between it and the external oblique. (Incidentally the nature of tissue which permits such extreme mobility would be an interesting study.)

I described this upward prolongation of the scrotal cavity as the "superficial inguinal pouch" (Browne, 1938) and suggested that much bad treatment and inaccurate prognoses in cases of maldevelopment of the testicle could be avoided if it were understood. My statement produced an annotation and many letters disagreeing with it; but no one then or since suggested examining the human body to see who was right. I do not think that in sciences such as physics or chemistry a similar question would be left similarly in the air; it would be promptly settled one way or the other.

An interesting and important paper by Mr. John Baty (1956) illustrates the persistence of the anatomical error and throws a light on the significance of this upward extension of the scrotum. He states that it is well known that in small boys the testicle may temporarily disappear up the inguinal canal or into the abdominal cavity; actually, as I have said, this is not a well-known fact but a widespread delusion. The purpose of his paper, however, is to describe a painful spasm of the cremaster dragging the testicle upwards and jamming it against the pubic bone. This spasm is apt to occur in mental stress, and it seems to me quite possible that it is an involuntary atavistic reflex to withdraw

the organ into the pouch away from possible danger; and that if this withdrawal could be completed the spasm would not occur. It is a common observation that the testicle tends to withdraw upwards in extreme cold; and, although the prudery so marked in our country and profession makes it difficult to obtain information, it does the same in certain males during sexual excitement.

The illustrations show a normal male in whom, as is not uncommon, the early range of movement has been retained. They show the remarkable nature of the belief that a testicle of that size could pass through the external ring.

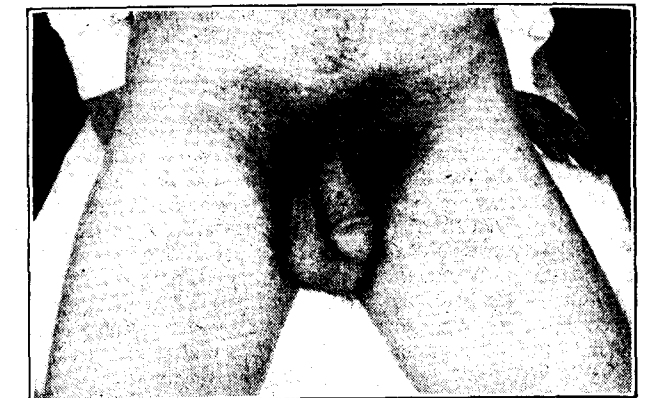


FIG. 1.—Testicles in usual position at bottom of scrotum.

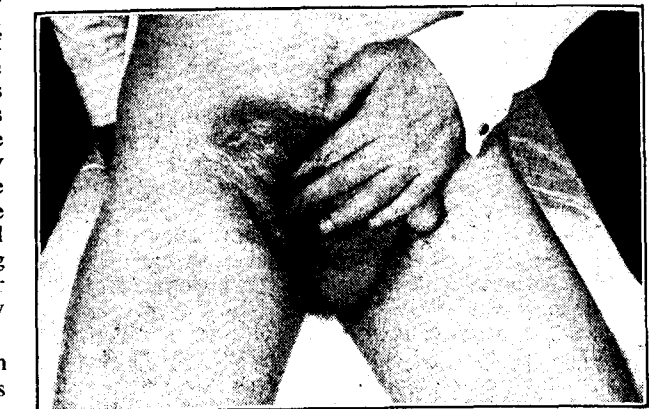


FIG. 2.—Right testicle pushed up out of scrotum into the superficial inguinal pouch.

This particular question raises a much larger one—that of the mechanism of distribution of knowledge throughout the profession. How long will it take for this piece of knowledge to get into the anatomy books, from thence to the students, and finally be applied to the benefit of the general population? We are all so conditioned by our medical education to reciting the orthodox anatomy by rote as gospel that surgeons are very unwilling to move without the authority of the professors. The professors, apart from the loss of face involved in admitting that they have been reproducing errors and omissions for generations, must all move together or not at all, since otherwise one of them might fail the students of another in an examination for reproducing what they had been taught. From my experience in several other cases, notably the pointing out of the dangerous vessel in tonsillectomy (Browne, 1928), I anticipate that it will take many years and be done gently in stages. The first stage probably will be a statement that, though the retracting testicle usually goes into the inguinal canal, in certain cases it goes into the recess I have described.

DENIS BROWNE, F.R.C.S.

REFERENCES

- Baty, J. (1956). *British Medical Journal*, 1, 1014.
Browne, D. (1928). *J. Anat.*, 63, 82.
— (1938). *British Medical Journal*, 2, 168.

Reviews

DISSECTING MANUAL

A Manual of Human Anatomy. By J. T. Aitken, M.D., G. Causey, M.B., F.R.C.S., J. Joseph, M.D., M.R.C.O.G., and J. Z. Young, M.A., F.R.S. Vol. I: Thorax and Upper Limb. (Pp. 161+viii; illustrated. 14s.) Vol. II: Head and Neck. (Pp. 179+viii; illustrated. 16s.) Vol. IV: Lower Limb. (Pp. 117+viii; illustrated. 12s. 6d.) Edinburgh and London: E. and S. Livingstone, Ltd. 1956.

Three volumes of a new dissecting manual have just been published, the authors being four anatomists of the London group of medical schools. They have set out to present to the preclinical student a method of dissection and a guide to the amount of knowledge of the topography of the human body that will be expected from him in the second professional examination. They have endeavoured to link together structure and function, and stress the importance of practical exercises in osteology and surface anatomy, instructions being given for the conduct of such classes. The fact that this new manual has been written draws attention once more to the concern felt by many teachers about the overcrowding of the preclinical course and to the fact that some measure of pruning is desirable—nay, even imperative. What form such pruning should take is a matter of extreme difficulty to decide, and it will only be through study of how books such as the present one serve the students' and teachers' needs that progress in the solution of this problem can be made.

The work is well written in an easy, pleasant style, the dissection of each part being divided into regions centering around important landmarks, such as the joints in the limbs and the major viscera elsewhere. In each section dissecting instructions are first given and are then followed by structural details. Description of the unimportant branches of arteries and the precise attachments of muscles have been omitted with benefit to the text. It is doubtful, however, if information about the ossification times of each part of the skeleton should be retained. The ossification of certain bones should be emphasized, but for the remainder it is an unprofitable exercise in memory. The importance of the lymphatic system is stressed by including a chapter on the regional lymphatics of each part. Too often this clinically important system is not properly appreciated by the student, since it is not demonstrable by him to any extent in the cadaver. The notes on osteology and surface anatomy for small tutorial classes form a useful guide for teachers, most of whom will, however, modify them according to their own ideas of the importance of this method of instruction, including more physical examination of the normal living body with appropriate radiological study. The illustrations are simple, clear line drawings with a judicious use of colour and with the minimum of reference pointers. There are a very few which seem of dubious value—for example, Fig. 17, Vol. I—and there is the occasional error—for example, Fig. 7, Vol. IV—which will no doubt be corrected in any future edition.

This dissecting manual deserves the serious consideration of anatomists who are conscious of the changing plan of anatomy in the preclinical curriculum, and it should go a considerable distance towards relieving the burden upon our students of an overloaded curriculum.

J. S. BAXTER.

OCULAR AND CEREBROSPINAL FLUIDS

Physiology of the Ocular and Cerebrospinal Fluids. By Hugh Davson, D.Sc. (Pp. 388+viii; illustrated. 65s.) London: J. and A. Churchill Ltd. 1956.

The advancing stream of scientific research is becoming more and more a series of rivulets extending in diverse directions and isolated completely from one another. Any attempt to bring these individual channels of research together is very welcome, and, although no startlingly new concept emerges from this comparative study of aqueous humour and cerebro-

spinal fluid, it does bring to light the similarity of the fundamental processes in their formation. In both fluids certain electrolytes are present in higher concentrations than in the plasma, and both can be considered secretions in the sense that they involve the performance of osmotic work and the utilization of metabolic energy, and both fluids are continuously being formed and drained away.

The morphological aspects of intraocular and cerebrospinal fluids are described first, and then follow chapters on their chemical composition and the exchange of substances between them and the blood. The properties of the blood-aqueous and blood-cerebrospinal-fluid barriers and the changes which take place when these barriers are disrupted are discussed, as are the principles governing the maintenance of the fluid pressures in the two systems. The author is rightly critical of much of the earlier work on chemical composition of the fluids, and points out many of the errors which may influence the results. For example, plasma concentrations of substances such as glucose may vary widely, and it is essential to attain reasonably stable levels before comparative measurements of aqueous and plasma concentrations can be made. Isolated measurements of substances in aqueous or cerebrospinal fluid are likewise of little value unless the concentration in the plasma is known. The importance of the vitreous body in modifying the kinetics of the penetration of substances into the aqueous is fully recognized. The author does not hesitate to express his personal views and theories, so that the book is never dull and should prove a useful stimulant to future work in these fields. The bibliography is extensive and up to date. A brief summary of the main conclusions at the end of each chapter would be helpful to the general reader. The book is well printed and bound and adequately illustrated. It brings together a mass of material from a wide range of specialist journals, and, while its main value will be to physiologists, clinical ophthalmologists and neurologists will find in it much to interest them.

E. S. PERKINS.

SQUINT

Strabismus: Diagnosis and Treatment. By Beulah Cushman, M.S., M.D. (Pp. 208; illustrated. 45s.) London: Henry Kimpton. 1956.

This book on strabismus has arisen from a series of notes on the objective examination of the extrinsic ocular muscles which were prepared originally for postgraduate students of the Northwestern University. It considers in detail the various forms of ocular muscle imbalance, and it emphasizes the importance of an accurate assessment of this imbalance, not only in the primary position but also in the six cardinal positions. It stresses the need for an understanding of any secondary deviation or secondary contracture of the ocular muscles, in addition to a knowledge of the paretic muscles, in order to plan the surgical approach to the problem in the best possible way. It is doubtful, however, if the ability to achieve a binocular result in each individual case is considered in its true perspective, and it is inaccurate to state that in all cases of strabismus it is usual to find some type of binocular fixation at the angle of squint. Furthermore, there is a tendency to regard a binocular result as the outcome of correct objective examination methods and of correct surgical technique, whereas in reality a detailed objective examination will not necessarily determine whether a binocular result is possible or not, and a correct surgical technique is unlikely to produce ultimate binocularity in cases showing no fundamental binocular ideas pre-operatively. There is an elaborate account of the screen cover test incorporating the use of prisms, and this is a very important objective method of examination which has not been stressed sufficiently in recent years. There should be a place, however, for a description of the simple cover test, using a target for fixation and the hand for a cover, as a preliminary to the prism screen test. It is doubtful if prolonged occlusion should be stressed as the ideal method of eliciting a minor degree of muscle imbalance in preference to such tests as the Hess screen test.

This is an interesting book because it presents against a personal background a detailed account of the methods used in a series of 62 cases of strabismus and of the results following treatment, but it is not comprehensive, and it is likely to appeal more to the experienced ophthalmic surgeon than to the ophthalmologist in training.

KENNETH WYBAR.

THE EFFICIENT USE OF STEAM

Principles and Methods of Sterilization. By John J. Perkins, M.S. (Pp. 340+xi; illustrated. 60s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1956.

The author is Director of Research in the American Sterilizer Co., and his book replaces that by the late W. B. Underwood of the same firm. Underwood's book plainly exposed the pitfalls in steam sterilization 23 years ago. Perkins teaches the same lessons with equal clarity, and embodies in his text the great advances in the design of sterilizing equipment which have since been achieved. It has been stated recently that 90% of surgical autoclaves in this country are inefficient, and in seeking to remedy this state of affairs no better guide can be found than this book. American practice in this field is admittedly far ahead of that in most other countries, and our own surgeons and theatre sisters are likely to break the Tenth Commandment repeatedly when they read of such things as the automatic washer-sterilizer for instruments and a rapid instrument sterilizer employing steam at very high pressure for only three minutes. Another novelty to us is the "carboxyclave," in which heat-sensitive materials can be sterilized with ethylene oxide ("carboxide" is the mixture of this gas with CO₂ used to eliminate explosion risk). There is also an automatic "glove conditioner": gloves are autoclaved at full pressure, but should be allowed to "rest" for one to two days thereafter to regain their tensile strength. The use of metal drums is firmly discouraged. Syringes, having passed through a mechanical cleaner in which stacked rings hold 32 each, are sterilized by dry heat; autoclaving is said to be an alternative only if they are disassembled.

Although the efficient use of steam is the principal theme, there are also chapters on a central department for the supply of all sterilized equipment; on disinfection by boiling water (for the benefit of those not so generously endowed); on chemical disinfection (with emphasis on formalin as the most efficient reagent); on water sterilizers, the use of dry heat, the preparation of parenteral solutions and of infant feeds; and on sterilization indicators, chemical and microbiological. There are admirable illustrations, and some eye-opening graphs of performance under varying and sometimes bad conditions. The history and theory of the subject as well as its practice are dealt with, and each chapter includes a useful list of references.

L. P. GARROD.

AIR POLLUTION

Air Pollution Handbook. Edited by Paul L. Magill, Francis R. Holden, Ph.D., and Charles Ackley. Editorial Consultant: Frederick G. Sawyer, Ph.D. (14 sections plus 24-page index. \$12.50; £5 12s. 6d.) London: McGraw-Hill Book Company. 1956.

The editors of this book say that it "brings together in readily available form useful information on the major aspects of the problem of air pollution." So handsomely does it justify this modest assertion that it must surely become an indispensable reference book for anyone working in this field. It is authoritative and comprehensive. In 14 well-documented sections it deals with most aspects of air pollution, including chemistry, physics, epidemiology, meteorology, city planning, chemical engineering, plant damage, hazards to livestock, experimental techniques, sampling and analytical methods, and legislation. Emphasis is properly placed throughout on the abatement of air pollution. The section on epidemiology by Dr. Phair, of the University of Cincinnati, is a thoughtful essay in very general terms which puts this great problem in perspective

and shows how little is known and how much remains to be learnt. It is disappointing to find that lung cancer is barely mentioned. There are 349 references in the section on analytical methods, and it is an indication of the complexity of the analyst's task that, despite this vast amount of published work, we are still without a satisfactory method for the determination of free sulphuric acid in London air. Dr. Siiverman's section on experimental test methods is invaluable; he deals with exposure-chamber design and the generation of gas, vapour, and particle concentrations in sufficient detail to satisfy most research workers.

There are serious air-pollution problems in the U.S.A. which are not encountered in Britain, but the American origin of this book in no way detracts from its value in this country: its scope is international. It suffers from a defect, largely unavoidable, which is common to works of such large scope and detail: it quotes no work later than 1954, and much has been done since then. But it will be a very long time before this book is out of date.

P. J. LAWTHOR

MALARIA DIAGNOSIS

The Microscopic Diagnosis of Human Malaria. Part II. A Morphological Study of the Erythrocytic Parasites. By John W. Field and P. G. Shute. Illustrated by Yap Loy Fong. (Pp. 251. No price.) Kuala Lumpur: Institute for Medical Research, Federation of Malaya. 1956.

After seeing the first volume of this work, expectations with regard to the second were set at a very high level. It is a pleasure to report that, for once, such expectations have been more than realized. The highest praise is due to the authors and publishers for a fine production. The contents include a short account of the history of the microscopic diagnosis of malaria and a provocative and stimulating discussion on the parasite in relation to the erythrocyte (the problem of "in" or "on" is neatly suspended). Full descriptions of all four human *Plasmodia* follow, covering synonyms, host and habitat, and geographical distribution; the schizogonic cycle, including notes on incubation and prepatent periods, erythrocyte invasion, and parasite anatomy; parasites in the peripheral blood, distribution in the host, and cultivation *in vitro*. Gametogony is equally fully described. There is also much important information regarding blood examination, degrees of parasitaemia, and morphological variation of parasites. One interesting section deals with doubtful species and "sub-species." A chapter on methods of examination deals with diagnosis during life and after death. With regard to the latter point the authors have attempted with only moderate success the almost impossible task of discussing in a few pages everything from pathological processes to necropsy findings.

The triumph of this book lies in its final sixty-odd coloured and tone plates illustrating the parasites in all stages and in all circumstances—in smears, blood vessels, and phagocytes. Most of these beautifully drawn and reproduced plates possess the added virtue of having been prepared "in the course of the day-by-day routine of the Malaria Research Division of the Institute" and of coming from Asian patients naturally infected in Malaya. Each is accompanied by a full description on the facing page, which sensibly includes, where relevant, a short clinical account of the patient from whom the blood was taken. These pictures should be displayed in every teaching institution concerned with medicine in the tropics.

B. G. MAEGRAITH.

This year's edition of the *British Journal Photographic Almanac* contains the usual sections, brought up to date, on technical data and new apparatus. Among the signed articles are two that may be of special interest in hospital photographic departments—namely, "Replenishing the Developer," by K. M. Hornsby, and "The Use of Filters in Colour Photography," by G. W. Ashton. A large section is now devoted to flash photography. All told, this well-known almanac is well up to standard, and will be of great interest to amateur as well as professional photographers. It is published by H. Greenwood and Co. for 8s. 6d.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY MAY 18 1957

POLIO VACCINATION IN SUMMER

If sufficient vaccine is available to inoculate children against poliomyelitis throughout the summer, doctors will have the anxious task of advising parents on whether it is advisable for their children to have it. Precise data on the risks, if any, of inoculating when the incidence of the disease is high or rising are still rather scanty. Moreover, if there are any risks they need to be set against the possible benefits of inoculation; but these too are hard to define in Great Britain. The vaccine used here differs from the American and Canadian vaccines; it has been given to only relatively few children; and last summer, when its prophylactic efficacy was first measured in the field, the incidence of the disease was low. While the Medical Research Council has not yet published the epidemiological evidence it has gathered on the protection conferred by the British vaccine administered last year, its study of the vaccine's antigenic activity, recently reported in this *Journal*,¹ showed that it was able to produce an antibody response to all three types of poliomyelitis virus in a high proportion of children. The results were similar to those obtained in America and better than some obtained elsewhere; and reports from the U.S.A. encourage the hope that their vaccine (apart from the faulty batch) has not been found to provoke the disease.

The observation that an injection might provoke attacks of paralytic poliomyelitis was first (somewhat debatably) reported by M. De Teyssien, of Bordeaux, in 1921.² Sporadic observations followed until in 1950 several investigators³⁻⁶ in Great Britain and Australia reported series of cases which confirmed the facts, first, that inoculation with diphtheria and pertussis antigens can sometimes provoke an attack

of paralytic poliomyelitis, and secondly that the site of paralysis is related to the site of inoculation. Workers in the U.S.A. came to the same conclusion.⁷⁻⁹ A recent contribution from a Medical Research Council Committee¹⁰ agrees with previous reports in finding that the risk does not extend beyond a month after the inoculation. The nature of the prophylactic to some extent determines the risk, which was found to be greatest with alum-precipitated diphtheria-pertussis vaccine and absent with smallpox vaccine. In none of these investigations was the effect of inoculation with the poliomyelitis vaccine studied, and the first observations on it were discussed in the report of the American field trials in 1954 issued by the Vaccine Evaluation Centre of the University of Michigan.¹¹ This stated that there was "no evidence of disproportionate frequency of paralytic poliomyelitis in vaccinated or inoculated children up to four weeks after the completion of vaccinations, nor was there any indication of selective localization of paralysis when present." A later report from the Surgeon-General of the U.S. Public Health Service¹² on these 1954 trials added two contraindications to the injection of poliomyelitis vaccine when the incidence of the disease is high. The first of these is the presence of minor illness, "especially fever, sore throat, or gastrointestinal upset," when the patient is due to be inoculated, and the second is the occurrence of a case of poliomyelitis in the household immediately before the proposed injection.

In 1955-6 a severe outbreak of poliomyelitis occurred among U.S. naval personnel and their dependants in Hawaii. To combat it the authorities boldly decided to carry out an immediate large-scale campaign of inoculation, and they were on the alert to detect any signs of a provoking effect.¹³ The outbreak resulted in 53 cases, including 2 deaths. Thirty-seven of these cases were considered suitable to include in the investigation of whether or not the vaccine had a provoking effect. No such provocation could be found. Among 25 of these patients, who went down with the disease when the incidence was rising rapidly, were 13 vaccinated within 30 days and 8 unvaccinated. The 13 vaccinated cases comprised 7 paralytic and 6 non-paralytic, while the 8 unvaccinated comprised 4 paralytic and 4 non-paralytic. As the authors say, the similarity of these figures does not suggest a provoking effect. A fortnight ago another important contribution appeared in the U.S.A. in the form of a preliminary report on the large outbreak of poliomyelitis in Chicago in 1956.¹⁴ During the year 1,111 confirmed cases were reported, of which 75% were paralytic. The attack rate for the city was 29.2 cases per 100,000

population, but non-whites were affected much worse than whites, having an attack rate of 108.1 against 13.5 for the whites. Of the paralytic cases, 221 had been inoculated within 0 to 30 days of the onset of the disease. For 42 of these the data are incomplete, so 179 are left on which to base conclusions. The distribution of paralysis in these cases does not show any significant relationship to site of inoculation. Looking back on the outbreak as a whole, the authors recommend administering Salk vaccine when the incidence of poliomyelitis is rising in a community that has not previously prepared itself—presumably by earlier vaccination—for, they say, "the possible benefits are greater than the possible provocative effects."

On the whole, therefore, the evidence, sparse though it is and in addition a somewhat unsure basis from which to generalize about British conditions, suggests that the advantages of continuing the inoculations through the poliomyelitis season outweigh the disadvantages. A joint committee of the Central and Scottish Health Services Councils has gathered information from many countries overseas with experience of the vaccine, and recommends that vaccination "need not in general be suspended" during the summer season of higher incidence (see p. 1178). The Ministry of Health is consequently going to continue issuing supplies when they are available. American opinion seems to be that, if the vaccine does have a provoking effect, the risk is most effectively offset by giving the vaccine in areas where the incidence of the disease is rising fast or already high. Some theoretical justification for believing any provoking effect to be slight or absent may be drawn from Bodian's experiments on monkeys,¹⁵ by which he showed that the degree of irritation produced locally was related to the severity of paralysis: and the poliomyelitis vaccine, in comparison with some other vaccines, is relatively non-irritant.

ORAL CANCER

When, many years ago, a senior surgeon at one of the London teaching hospitals was asked whether pipe-smoking or syphilis was the most important factor in the production of cancer of the tongue, he replied that he could not give a direct answer, but that the wise man should certainly avoid the combination of the two. At that time it was widely believed that syphilis, pipe-smoking, and alcohol might all contribute in varying degrees to the production of the various cancers of the buccal cavity. The evidence was based mainly on impressions and failed to convince critical reviewers,¹ and only recently, with the re-

awakening of interest in the possible carcinogenic effect of social habits, has any extensive body of facts been collected. In 1953 D. A. Sadowsky and colleagues² reported the results of a detailed analysis of the smoking habits of over 2,500 white male patients attending hospitals in four American cities, including 571 men who suffered from cancer of the lip, 132 with cancer of the tongue, 85 with cancer of the pharynx, and 348 with cancer in other parts of the buccal cavity. Prevalence rates for their diseases in the different categories of smokers were estimated on the assumption that the smoking habits of the patients with diseases other than cancer were representative of the population at large, and it was found that: first, the rates for cancer of the lip were significantly higher among pipe smokers than among non-smokers; secondly, the rates for cancer of the tongue and other parts of the oral cavity were significantly higher among both pipe smokers and cigar smokers; and, thirdly, the rates for cancer of the pharynx were not significantly raised with any type of smoking. These results were in sharp contrast to those which had been obtained for cancer of the lung, in which an increased prevalence was confined to persons who smoked cigarettes.

In Bombay, where cancer of the buccal cavity is one of the most important forms but where the relative proportions arising from different sites within the mouth are entirely different from those in the U.S.A., L. D. Sanghvi and colleagues³ found that smoking was associated with cancer of the oropharynx and tonsils, that the combination of smoking and chewing betel and tobacco was associated with cancer of the base of the tongue and of the hypopharynx, and that chewing—but not smoking—was associated with cancer of the mucosa and anterior part of the buccal cavity. In this part of India tobacco is smoked in the form of hand-rolled "bidis," which differ in many ways from the cigars and cigarettes which are smoked in Europe and North America.

The preliminary results of a more thorough inquiry by Drs. E. L. Wynder and I. J. Bross, of the Sloan-Kettering Institute, New York, are now reported in the opening pages of the *Journal* this week. They studied 543 male and 116 female patients with cancer of the oral cavity and compared their histories with the histories given by 207 male and 246 female patients suffering from other conditions who were selected to be of the same age, religion, hospital status, and socio-economic background as the patients with

¹ Lane-Clayton, J. E., *Rep. pub. Hlth. med. Subj. (Lond.)*, No. 59, 1930, H.M.S.O.

² Sadowsky, D. A., Gilliam, A. G., and Cornfield, J., *J. nat. Cancer Inst.*, 1953, 13, 1237.

³ Sanghvi, L. D., Rao, K. C. M., and Khanolkar, V. R., *British Medical Journal*, 1955, 1, 1111.

⁴ Wynder, E. L., Bross, I. J., and Day, E., *Cancer*, 1956, 9, 86.

¹ Report to the Committee on Laboratory Investigations of Poliomyelitis of the Medical Research Council, *British Medical Journal*, 1957, 1, 366.

² De Teyssien, M., *J. med. Bordeaux*, 1921, 92, 77.

³ Geffen, D. H., *Med. Offr.*, 1950, 83, 137.

⁴ Martin, J. K., *Arch. Dis. Childh.*, 1950, 25, 1.

⁵ McCloskey, B. P., *Lancet*, 1950, 1, 659.

⁶ Hill, A. B., and Knowlton, J., *British Medical Journal*, 1950, 2, 1.

⁷ Anderson, G. W., and Skaar, A. E., *Pediatrics*, 1951, 7, 741.

⁸ Greenberg, M., Abramson, H., Cooper, H. M., and Solomon, H. E., *Amer. J. publ. Hlth*, 1952, 42, 142.

⁹ Korn, R. F., Albrecht, R. M., and Locke, F. B., *ibid.*, 1952, 42, 153.

¹⁰ Report of the M.R.C. Committee on Inoculation Procedures and Neurological Lesions, *Lancet*, 1956, 2, 1223.

¹¹ *British Medical Journal*, 1955, 1, 1083.

¹² Scheele, L. A., *J. Amer. med. Ass.*, 1955, 158, 1271.

¹³ Poos, R. S., and Nathanson, N., *ibid.*, 1956, 162, 85.

¹⁴ Bundesen, H. N., Graning, H. M., Goldberg, E. L., and Bauer, F. C., *J. Amer. med. Ass.*, 1957, 163, 1604.

¹⁵ Bodian, D., *Amer. J. Hyg.*, 1954, 60, 358.

cancer. In addition to the tobacco history, inquiries were also made into the consumption of alcohol, the incidence of syphilis, the extent of exposure to sunlight, the state of the teeth, and the extent of possible past nutritional deficiencies. The results for smoking are in general conformity with those of the earlier American study, in that Wynder and Bross find a close association between cancer of all parts of the oral cavity and pipe smoking, a somewhat less marked association with cigar smoking, and a relatively weak association with cigarette smoking. On the other hand, the association with cigarette smoking is distinct, whereas in the earlier study² it was inappreciable. Wynder and Bross use the data to estimate the risk associated with the different methods of smoking—a procedure which has proved to be justified in relation to cancer of the lung. They conclude that the average risk of oral cancer among men who smoke cigars or pipes is somewhat greater than that for men smoking 35 or more cigarettes a day and four times greater than the risk for non-smokers. Similar data for alcohol consumption are more difficult to interpret owing to the tendency for heavy drinking and smoking to be found together in the same individual. The authors have, however, been able to make some estimate of the separate effects of each factor, and they conclude that the risk among heavy whisky drinkers may be as much as 15 times the risk to which men are exposed who drink only occasionally. In this case it is striking that, in contrast to the findings with tobacco, there is little increase in risk with more moderate consumption, and the authors suggest as one possibility that alcohol may exert an indirect action through association with nutritional deficiency, or that, by decreasing the amount of saliva, it might sensitize the mucosa to other external agents. In the classification used heavy whisky drinking is defined as the consumption of seven or more "shots" a day, so that it would certainly not be surprising if nutritional deficiencies were observed. What may be surprising to British readers is that 12% of the "control" patients admitted they had a daily consumption equivalent to this amount of alcohol in one or other forms. Not all types of oral cancer were equally associated with alcohol; for patients with cancer of the lip the association was slight or non-existent, while it was most marked for patients with cancer of the pharynx, floor of the mouth, or tonsil.

A history of syphilis or a positive serum test was found more often among the cancer cases than among the controls, but the excess was significant only for cancer of the lip or of the anterior two-thirds of the tongue. Other positive associations were also noted (particularly with regard to edentia), but the findings

were not altogether self-consistent and it will be necessary to await the detailed publication of the full results—and probably further studies of more cases—before they can be properly assessed.

Of particular interest is the contrast presented in the present paper between the findings in cancer of the lung, intrinsic and extrinsic larynx,⁴ and oral cavity. These go far to account for the paradox that, while cancers of all parts of the respiratory system are related to smoking, the mortality attributed to the individual sites has variously fallen, remained almost stationary, and, in one case, risen dramatically. Between 1935 and 1955, for example, crude annual death rates from cancer of the buccal cavity among men in England and Wales fell from 145 to 66 per million; during the same period the mortality from cancer of the larynx (intrinsic and extrinsic) decreased from 45 to 32 per million, but the mortality from cancer of the lung increased from 131 to 693 per million. These differences, it would now seem, may be explained by the almost complete change in habit from pipe smoking to cigarette smoking, accompanied by the reduction in the amount of spirit drinking and in the prevalence of syphilis. But though this appears to be a reasonable explanation the evidence is far from complete. It is, for example, unknown why tobacco smoked in different ways should affect such different parts of the respiratory system. To some extent the differences may be explained by the individual differences in the extent of inhaling, but it may also be that the physical state of the smoke particles on entering the mouth depends on the method of smoking and so affects the ease with which they are distributed throughout the respiratory system.

ELIMINATION OF STRONTIUM

Man but not fish is cunningly designed to retain calcium. Our renal tubules reabsorb most of the calcium from the glomerular filtrate, whereas the fish's kidney is largely a haemopoietic organ and excretes an ultrafiltrate. Since man clears in the kidney only about 2 ml. of plasma per minute¹ and the gut can do little if any better, most of the calcium circulating in the plasma is available for exchange with bone. It can be shown by means of radioactive tracers that the reaction $\text{Ca (plasma)} \rightarrow \text{Ca (bone)}$ is exceedingly rapid, so rapid that the total plasma must be cleared many times over in the course of an hour. Strontium, another alkaline earth, is chemically

¹ Harrison, G. E., Raymond, W. H. A., and Tretheway, H. C., *Clin. Sci.*, 1955, 14, 681.

² Sowden, E. M., and Stitch, S. R., Atomic Energy Research Establishment, Medical Research Council Unit, Report 2030, 1956.

³ Comar, C. L., Wasserman, R. H., and Nold, M. N., *Proc. Soc. exp. Biol. (N.Y.)*, 1956, 92, 859.

⁴ — in *Progress in Nuclear Energy, Biological Sciences*, 153, 1956, London.

⁵ Looney, W. B., Maletskos, C. J., Helmick, M., Reardon, J., Cohen, J., and Guild, W., *Radiology*, 1957, 68, 255.

⁶ Michon, G., and Jeanmaire, L., *C.R. Acad. Sci. (Paris)*, 1957, 244, 396.

like and widely distributed with calcium in nature, so that all natural sources of calcium in the diet contain strontium in amounts from about 0.1–1%. In human bone strontium is present to about 70–170 p.p.m. of ash,² which indicates that there is some discrimination by the body between calcium and strontium. In fact calcium is about twice as readily absorbed, and the kidney excretes it twice as readily.³ The mammary gland also differentiates between the two, so that milk is relatively poor in strontium.⁴

Radioactive strontium, especially the isotope strontium-90, is produced in some abundance in nuclear fission. It is considered to be the most hazardous of all fission products and as a result of the testing of nuclear weapons is now widely detectable in the soil and in plant and animal material. It would be desirable therefore to prevent its further uptake into man or to facilitate its removal if present in dangerous amounts. However, because the bone has such a great affinity for calcium and its analogues, the removal of strontium presents formidable difficulties. Some success has been announced from Boston.⁵ About one-third of recently injected strontium could be removed from the body of experimental dogs by means of an artificial kidney or by means of a cation-exchange column included in the circulation. Similarly, reports from Saclay⁶ show that cation-exchange resins fed to rats immediately after an oral dose of strontium result in a retention within the body of only about one-third of the amount retained by untreated control animals. Both these experimental essays make use of the favourable conditions immediately following the administration of the strontium, when it is still in circulation or held loosely by bone. As time elapses the element is held much more tenaciously.

LABORATORY CONTROL OF ANTI-COAGULANT THERAPY

Anticoagulant therapy with coumarin and allied drugs has been in general clinical use for over ten years. The generally accepted laboratory method of control has been the one-stage "prothrombin" test first introduced by A. J. Quick in 1935,⁷ who discussed certain features of it in this *Journal* two years ago.⁸ In 1951 P. A. Owren and K. Aas described a new method for the control of therapy with these drugs.⁹ The method of Owren and Aas has been called the prothrombin and proconvertin determination, sometimes abbreviated to the "P. and P." method. Most clinicians and pathologists responsible for the control of anticoagulant therapy have become familiar with the use of the one-stage test of Quick and have found it, in general, reliable, provided a brain extract is used as the source of thromboplastin. Because of this, the P. and P. method has not yet come into general use in Great Britain. Moreover, the preparation of the reagents is somewhat more complicated technically. But the method has been used at several centres particularly interested in these problems, and R. Biggs and W. Trillwood comment that the con-

trol is more sensitive, trends towards overdosage are more obvious, and the correct dose can be decided two or three days earlier than by the more usual method.¹⁰

The coumarin drugs interfere with the thromboplastin mechanism responsible for the conversion of prothrombin to thrombin and also cause some depression of prothrombin itself. The interference with the tissue thromboplastin system is by lowering the concentration of a coagulation factor called factor VII (proconvertin). In Quick's one-stage test a brain extract is added to the plasma and the plasma-brain mixture recalcified by the addition of calcium chloride, the clotting time being recorded. In addition to prothrombin and factor VII other components of the clotting mechanism may cause prolongation of the one-stage test as recorded in Quick's method. A further plasma coagulation component called factor V is responsible together with factor VII and brain extract for the conversion of prothrombin to thrombin in the tissue thromboplastin mechanism. The concentration of fibrinogen may also be of importance in causing prolongation of the one-stage test. In the P. and P. method as described by Owren and Aas steps have been taken to control the concentration of factor V and fibrinogen in the test system. A preparation rich in factor V and fibrinogen is obtained by the Seitz filtration of ox plasma. The Seitz filtration is carried out through paper pads with a specified content of asbestos under certain detailed conditions. This Seitz filtration removes the prothrombin and proconvertin (or factor VII) from the plasma, leaving the factor V and fibrinogen. A large amount of this plasma can be prepared and stored frozen at -20°C . in amounts suitable for daily use. To carry out the assay, the test plasma is diluted 1 in 10; 0.2 ml. of the ox plasma free of prothrombin-factor VII is mixed with 0.2 ml. of the diluted test plasma and 0.2 ml. of thromboplastin. This is then recalcified in the usual way and the clotting time recorded. The result on the test plasma is then compared with the results obtained from dilutions of a normal plasma in a similar system and the concentration read from a suitable dilution curve. In this test system the brain extract, factor V, fibrinogen, and calcium are all present in excess in standard amounts and the variable is the concentration of prothrombin and factor VII, which thereby is measured. It is probable that in Quick's technique the main factor controlling the prolongation of the one-stage test is the depression of factor VII, and the concentration of prothrombin itself is probably less significant in such a test system. In the P. and P. method, in which the test plasma is used at considerably greater dilution in the final test system, it may be that such a system is sensitive not only to the changes in factor VII but also to some extent to the changes in prothrombin concentration itself.

This newer method may well have advantages, but obviously it is not so simple as that described by Quick. The technique entails collection of the ox plasma and its preparation by Seitz filtration. Some British laboratories have modified the method in so far as they use adsorption by barium sulphate for the removal of prothrombin and factor VII from the ox plasma, finding this to be more constant in its action than Seitz filtration. When

⁷ Quick, A. J., *J. biol. Chem.*, 1935, 109, 73.

⁸ — and Hussey, C. V., *British Medical Journal*, 1955, 1, 934.

⁹ Owren, P. A., and Aas, K., *Scand. J. clin. Lab. Invest.*, 1951, 3, 201.

¹⁰ Biggs, R., and Trillwood, W., *British Medical Journal*, 1957, 1, 405.

it is decided to introduce the newer technique, it is wise not to abandon the older, standard method before the newer system has been given adequate trial in the individual laboratory.

DECLINE OF ACUTE RHEUMATISM

Rheumatic fever and rheumatic heart disease have for long been major causes of death in children and young adults, and even in 1955, of all the deaths at ages between 1 and 30 years, probably some 4% were due to acute rheumatic fever or to its late cardiac sequelae.¹ There is, however, clear evidence that the toll of acute rheumatism is declining. R. A. N. Hitchens² has recently reviewed the records of the clinic for acute rheumatism that was established by the school health service in Cardiff in 1929. He examined all the original case records in an endeavour to secure uniformity of diagnosis, and found that in the period 1931 to 1950 there were altogether 407 children who could be diagnosed as having had acute rheumatism with carditis and 341 who had had acute rheumatism without carditis. Inception rates were calculated by relating the number of children falling ill with a first attack of acute rheumatism in any year to the mid-year school population. Prevalence rates were based in the same way on the number of children known to have, or to have had, the disease in the particular year or earlier. During the first few years of the clinic's work the rates fluctuated somewhat, and the prevalence rate even increased, doubtless owing to increasing completeness of ascertainment. But from about 1935 onward there was a steady decline both in incidence and in prevalence. For example, the incidence of new cases with carditis and with a defined date of onset was 0.86 per 1,000 in the quinquennium 1931-5; it fell to 0.44, 0.35, and 0.29 in the three succeeding quinquennia. Prevalence rates fell from about 5.2 per 1,000 in 1935 to 2.3 per 1,000 in 1950.

This well-documented study by Hitchens has a precision that was necessarily lacking from most earlier reports of the decline of the disease, because these reports had to be based largely on mortality statistics. In 1949 J. Knowelden,³ reviewing the Registrar-General's figures, showed that mortality from rheumatic heart disease in children had declined between 1921 and 1938. J. A. Glover,⁴ in 1930, showed that the decline had been in progress since the beginning of the century, and A. Newsholme,⁵ in 1895, claimed that a decline had in fact started around 1875. Similar reports came from the United States^{6,7} and from Scandinavia.⁸

The decline is evidently real enough, but whether it is due to some decline in the pathogenic abilities of the haemolytic streptococcus—now accepted as an essential agent in the genesis of the disease—or to some improve-

ment in the resistance of the host is quite unknown. Hitchens makes the point that the decline in acute rheumatism was checked in the early 1930's, to be resumed again around 1935, and that this check coincided with a period of industrial depression, but his records do not really go back far enough to justify much argument on this point: the high prevalence of rheumatism in the early 1930's might have been associated simply with a widespread epidemic of streptococcal infection which was only partly reflected in the scarlet fever notifications. That the streptococcus is now less virulent than it was seems undoubted: among children under 15 years of age the death rate from scarlet fever has, in fact, decreased more than a thousand-fold since about 1860,¹ and the major decline occurred long before the advent of antitoxin or chemotherapy. Toxic scarlet fever is now extremely rare. In contrast, there is little evidence that streptococci are much less prevalent in the community now than they were. Equally there is no doubt that standards of living have improved. Hitchens discusses the various factors included in "standard of living" and suggests that the most relevant may be "quality of maternal care." But this is a very indefinite concept, and we still need to know just what it is that makes some children respond to a streptococcal infection by developing rheumatic fever. Until we know this we are unlikely to explain the fact that fewer children develop rheumatic fever to-day than previously.

IVAR THE BONELESS

In *A History of the English-speaking Peoples* Sir Winston Churchill tells how Ragnar Lodbrok the Viking was taken prisoner by King Ella, of Northumbria, cast into a snake-pit, and sang his death-song foretelling the vengeance his four sons would take. "The little pigs would grunt now if they knew how it fares with the old boar." The son destined to keep his father's promise by killing King Ella was Ivar the Boneless, a great warrior of command and guile, the master-mind behind the Scandinavian invasion of England in the last quarter of the ninth century. Dr. Knut Hatteland, who has undertaken an investigation of the incidence of osteogenesis imperfecta in three families in the north of Norway, has now traced the ancestry of Ivar the Boneless.²

He was the oldest son of Ragnar Lodbrok by his second wife, who was reared in great poverty in Norway. Lodbrok took her to Denmark, and on proposing to share a bed with her he was asked to bide awhile to meet her fancies. Disobliging, he paid the forfeit of having a first-born son, Ivar, with cartilages where bones should have been. He could not walk on his legs, and he was carried around on shields or bars. Yet his stature was such that he dwarfed all his contemporaries, and his wisdom was such that "it is doubtful if anyone has ever been wiser than he." In battle he was always in the van, determining its issue. His arms were so strong that his bow was more powerful and his arrows heavier than those of his companions, bending his bow as if it were an elm branch and twanging his bowstring to an

unheard-of pitch. After subjecting King Edmund of East Anglia to martyrdom, Ivar suddenly quitted England for ever. Laden with loot and seemingly invincible, he settled in Dublin and died there peacefully two years later. Of his bloodthirsty past and pious end, Churchill has written: "Thus it may be that he had the best of both worlds." Dr. Hatteland claims that Ivar's is the earliest-known record of osteogenesis imperfecta in the Scandinavian countries. He can find no record of this disease in any of Ivar's descendants. The sagas built up around Ivar are richer in poetic flights of the imagination than in sober descriptions of his physical handicap, so Dr. Hatteland has found it difficult to weigh the evidence for and against the diagnosis of osteogenesis imperfecta and possible alternative diagnoses. Any scrutiny of Ivar's bones is now out of the question, since William the Conqueror is said to have dug up his grave and burnt its contents in a great bonfire.

TREATMENT OF HEPATIC FAILURE

The treatment of cardiac, respiratory, and renal failure is based on a reasonably accurate knowledge of underlying physiological and biochemical processes. It is only recently that a similar approach has been made to the problem of hepatic failure.¹ Ascites and hepatic coma are the most important manifestations of the failing liver, and can often be treated very satisfactorily if the way in which they arise is properly appreciated. The development of ascites depends on a combination of portal hypertension and hypoalbuminaemia, and is associated with retention of sodium. Recognition of the sodium retention has led to a rational form of therapy, similar to that used in cardiac failure; it is based on bed rest, rigid salt restriction, and mercurial diuretics.² Intake of protein should be kept as high as possible unless there are signs of hepatic coma, and paracentesis should be avoided, except in the initial stages, since it drains off a considerable amount of protein. After a period of several weeks fluid no longer accumulates in the peritoneal cavity, and the albumin level in the serum rises. At this point it may be possible to allow a higher intake of sodium.

Hepatic coma is believed to be due to a failure in synthesis of urea, with subsequent intoxication by ammonia and other nitrogenous compounds. The most rational treatment therefore is to restrict the intake of protein, and as little as 20 g. a day can be tolerated for long periods.³ Carbohydrate should be given in large quantities, if necessary intravenously, to ensure an adequate intake of calories. A short course of chlor-tetracycline or neomycin is recommended to destroy nitrogen-forming bacteria in the gut. Unfortunately no specific drug is yet known for the treatment of hepatic failure comparable, for example, to digitalis. Glutamic acid is occasionally successful, but does not influence the

course of the more severe forms of hepatic necrosis.⁴ More recently an encouraging report has appeared on arginine, an amino-acid which plays a part in the formation of urea from ammonia.⁵ It is given intravenously, 25 g. of L-arginine hydrochloride being dissolved in 500 ml. of 10% dextrose; the dose can be repeated if necessary. More than half the fifteen patients studied, including two with severe viral hepatitis, responded favourably, but the course of liver failure is so unpredictable that larger numbers will have to be treated before conclusions are justified.

It is important to avoid the various precipitating factors of hepatic failure, since it is difficult to estimate the functional capacity of the damaged liver. Nitrogenous intoxication can be produced by ammonium compounds, amino-acids such as methionine,⁶ ion-exchange resins, and acetazolamide. Bleeding from oesophageal varices provides another source of protein which may be dangerous. For this reason control of bleeding by the Sengstaken tube, followed by gastric lavage, mild aperients, and high enemata has been recommended. Anaemia must be corrected, if necessary by blood transfusions, though these may increase ascites because of their high salt content. Morphine should be given sparingly, and the short-acting barbiturates are probably safer. Even minor surgical procedures are poorly tolerated, and it cannot be too strongly emphasized that porta-systemic anastomoses in patients with severe portal hypertension should be avoided until every effort has been made to ensure adequate liver function by conservative medical treatment.

SCOTLAND'S HEALTH IN 1956

About 70,000 people were occupied wholly or partly in running the Health Service in Scotland during 1956, 55,700 of them on whole-time work.¹ Medical men and women comprised only 10% of the whole-time workers, since they numbered 5,570. This was an increase of 68 over the previous year's total. In round figures, there were 1,400 dentists, 29,300 nurses and midwives, 2,800 pharmacists, 900 opticians, 2,300 medical auxiliaries, 4,300 administrative and clerical staff, and 23,000 ancillary and domestic staff. This great team between them succeeded in continuing to improve Scotland's health, especially the health of the children. At 28.6 per thousand live births, the infant mortality rate was below 30 for the first time. For schoolchildren aged 5-14 the main cause of death among the 343 deaths registered was accident (40%), and the second was malignant disease (11%).

Deaths from respiratory tuberculosis numbered 714 and non-respiratory tuberculosis 85, giving rates of 14 and 2 per 100,000 population. Only eight years ago, in 1948, these rates were 66 and 9 respectively. The proportion of "safe" milk sold in Scotland is now higher than anywhere else in the United Kingdom; 99.5% comes from cows which have passed the tuberculin test, and almost all the remaining 0.5% is pasteurized.

¹ Report of the Department of Health for Scotland, 1956, 1957. H.M.S.O.

¹ The Registrar General's Statistical Review of England and Wales for the Year 1955, Part I, 1956, H.M.S.O., London.

² Hitchens, R. A. N., *Ann. rheum. Dis.*, 1956, 15, 160.

³ Knowelden, J., *Brit. J. soc. Med.*, 1949, 3, 29.

⁴ Glover, J. A., *Lancet*, 1930, 1, 499.

⁵ Newsholme, A., *ibid.*, 1895, 1, 589, 657.

⁶ Atwater, R. M., *Amer. J. Hyg.*, 1927, 7, 343.

⁷ Wolff, G., *Childhood Mortality from Rheumatic Fever and Heart Diseases*, 1948, U.S. Children's Bureau, publ. 322, Washington.

⁸ Clemmesen, S., *Acta med. scand.*, 1949, 138, Suppl. 234, 109.

² Hatteland, K., *T. norske Lægeforen.*, 1957, 77, 75.

¹ *British Medical Journal*, 1955, 2, 1607.

² Eisenmenger, W. J., Blondheim, S. H., Bongiovanni, A. M., and Kunkel, H. G., *J. clin. Invest.*, 1950, 29, 1491.

³ Sherlock, S., Summerskill, W. H. J., and Dawson, A. M., *Lancet*, 1956, 2, 689.

⁴ Walsh, J. M., *ibid.*, 1955, 1, 1235.

⁵ Najarian, J. S., and Harper, H. A., *Amer. J. Med.*, 1956, 21, 832.

⁶ Watson, C. J., *Ann. intern. Med.*, 1949, 31, 405.

CONCEPTS OF SCHIZOPHRENIA*

BY

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Eugen Bleuler, the great Swiss psychiatrist, was born on April 30, 1857. During the next few months psychiatrists all over the world will hear and talk a great deal about schizophrenia. These discussions will reach their climax in September, when the International Congress of Psychiatry will meet at Zurich for the Bleuler centenary. I should like to make a small contribution to this world-wide discussion by speaking about concepts of schizophrenia, especially those of Bleuler, who coined the term.

Everyone who has attended meetings or clinical conferences on schizophrenia must on occasion have had the uneasy feeling that not all of the participants were talking about the same thing, and that, in fact, their concepts of schizophrenia differed considerably. The inconclusiveness of many a discussion among psychiatrists is partly due to their insufficient awareness of these differences. It therefore appears profitable to re-examine the concept of schizophrenia from its inception and to see what has become of it since it was first advanced.

It is often taken for granted that with the term, which caught on almost immediately, Bleuler's concept of the schizophrenias, too, was generally accepted. Such an assumption is unjustified. This is not surprising if Bleuler's concept is viewed in its proper historical perspective and in its relationship to other notions concerning this mental disorder or group of mental disorders.

Kraepelin and Dementia Praecox

The majority of textbooks give the impression that the Kraepelinian conception of dementia praecox (Kraepelin, 1919), which was based on symptoms and outcomes supposedly common to a large majority of cases, had reigned supreme from 1896, until it was superseded by that of schizophrenia which did justice to the frequent absence of deterioration and to the onset of the illness in various age groups. This is historically not quite correct.

When Bleuler first proposed the term "schizophrenia" in 1908, Kraepelin's concept of dementia praecox as a clinical entity was still highly controversial. It was opposed by a number of leading psychiatrists. Adolf Meyer had published his objections against it well before Bleuler. Meyer never accepted the notion of a disease entity. Kraepelin soon became aware of the shortcomings of the term "dementia praecox," which had been coined by Morel (1860). He conceded that a certain number of cases did not deteriorate and even recovered, and that the illness did not always start in young age. Bleuler himself did not regard his stronger emphasis on those two facts as his main contribution. On the contrary, he disclaimed any merit on that account. Referring to the concept of dementia praecox, he said in his monograph (Bleuler, 1911), almost angrily: "Peculiarly enough, one of the objections which even now can be heard frequently, especially abroad, is that we are dealing neither with dementia nor with precocity. Considering that Kraepelin defined his concept so clearly, and expressly referred to recoveries and to later onsets, this can be called a gross misunderstanding: those critics concentrate on the name, but they really reject the concept." Bleuler

endeavoured to gain recognition for it, though in a modified and less rigid form (the main title of his monograph was "Dementia Praecox," with a subtitle: "The Group of the Schizophrenias"). It cannot even be said that the widening of the area of schizophrenic manifestations was Bleuler's special contribution. Kraepelin's clinical concept of dementia praecox was for a certain period of its evolution quite as wide as Bleuler's. In what respect, then, did his concept differ from that of Kraepelin; and how much of Bleuler's contribution has stood the test of time?

Adolf Meyer and Eugen Bleuler

Bleuler and the other members of the Zurich school, among whom Jung was prominent, were profoundly influenced by Freud, whom Bleuler credited with having inspired his work. It is often forgotten that Kraepelin, Freud, and Bleuler were contemporaries, born in three consecutive years. The concept of schizophrenia presented by Bleuler in his monograph in 1911 was really a joint creation of those three men.

There is another historical fact which is insufficiently known, although it may explain the comparative indifference with which Bleuler's concept was received in the English-speaking countries. Adolf Meyer's theories of reaction types and habit deterioration, implying a rejection of Kraepelin, preceded Bleuler's concept; Meyer (1906) stated his views in a symposium on dementia praecox at the Annual Meeting of the British Medical Association at Toronto in 1906. His address contained in a nutshell practically the whole of his teachings. This article was known to Bleuler. Meyer's intervention in the discussion of dementia praecox several years before Bleuler had completed his work of modernizing Kraepelin was decisive for American psychiatry. Bleuler's monograph was translated into English only a few years ago, when Meyer's influence was already on the wane.

Bleuler's Hierarchy of Symptoms

Bleuler's clinical concept of schizophrenia is basically Kraepelinian, but with a greater emphasis on the variety of manifestations and developments. Compared with Kraepelin, Bleuler was much less pessimistic about the outcome, but nevertheless was more so than present-day psychiatrists. These differences concerning prognosis are not fundamental. They have obviously been largely due to the longer follow-up periods studied by successive generations of psychiatrists. Bleuler postulated some underlying structural cause. Some such working hypothesis has always been adopted by most clinical psychiatrists and underlies modern research into the experimental psychoses produced by drugs.

Bleuler distinguished basic, or primary, from accessory, or secondary, symptoms. The former were the disturbances of association and of affectivity as well as the patient's tendency to replace reality by fantasy which was responsible for the various manifestations of autism. Hallucinations, delusions, and all the other manifestations of schizophrenia were regarded as secondary.

Bleuler therefore, unlike Kraepelin, proposed a hierarchy of symptoms, of which the basic ones were supposed to be directly caused by the hypothetical organic process, while the secondary symptoms were regarded "partly as distorted mental functions, partly as the result of more or less unsuccessful, or even successful, attempts at adaptation to the primary disturbance." Here we meet already the concept of adaptation which has played a considerable part in more recent theories of schizophrenia. In differentiating primary and secondary symptoms, Bleuler was influenced by Freud, who, it seems, had been impressed by Hughlings Jackson's distinction between negative and positive symptoms.

Jung's "Complexes"

In the primary symptoms of disturbance of association, emotionally charged largely repressed groups of ideas, which Jung had called complexes, were regarded to be of particu-

lar importance. In his monograph on the psychology of dementia praecox, which appeared three years before Bleuler's book on schizophrenia, Jung (1909) had described the ways in which complexes became isolated in hysteria and schizophrenia and how they interfered with the normal processes of thinking. Any idea could become the nucleus of a complex, which may be transient and short-lived. Jung's and Bleuler's use of the term differed from its later use in psycho-analysis, where it was reserved for a very small number of emotionally charged ideas of great dynamic power and representing basic and universal tendencies. This difference illustrates the gradual replacement of association psychology by a more specifically Freudian dynamic psychopathology. Jung and Bleuler were not only concerned with the formal aspects of the formation and isolation of complexes in schizophrenia; they also studied their contents in relation to the individual's history along Freudian lines.

Bleuler made it clear that the assumption of an underlying organic process was not an essential premise to his concept of schizophrenia. He said: "It is not unthinkable that the symptoms may be caused psychologically, and that they may develop from slight quantitative deviations from the normal; in the same way as in some individuals the predisposition to hysterical symptoms is so great that they tend to react hysterically to the ordinary difficulties of life, while the average person does so only as the result of an exceptionally severe psychic trauma." However, Bleuler did not pursue this hypothesis further, as he favoured that of an organic cause.

Alternatives to Bleuler's View

What were the alternatives to Bleuler's concept of schizophrenia? One, of course, was strict adherence to Kraepelin, a course taken by many clinicians all over the world. Another alternative was Adolf Meyer's hypothesis of reaction types and habit deterioration, which was widely accepted in the United States and in this country. Meyer lacked Bleuler's clarity of thinking and he failed to formulate auxiliary hypotheses. Many psychiatrists found it difficult to understand how faulty habits in childhood should lead to schizophrenic symptoms and even to personality disintegration. Meyer did not expressly address himself to the question why this sequence of events should take place in some individuals and not in others. His aetiological theory, which most psychiatrists classified as psychogenic, is remarkable in that it did not undergo any noticeable change since it was first advanced 50 years ago. Its great value lay in the emphasis on the individual and his environment and their interaction. In his theory of the aetiological importance of current life situations he introduced an infinite number of changeable variables and discouraged discrimination between environmental factors of different pathogenic significance. His approach, though productive of therapeutic optimism, had the fundamental weakness of paying too little attention to the unknown.

The psycho-analytical theories of schizophrenia have developed almost independently of Bleuler's work. He refused to think in terms of mental energy. "We possess," he said, "no means of measuring psychic energy and therefore we are quite unable to discuss dynamic theories." For this reason he had no use for Janet's (1903) "abaissement du niveau mental" and similar notions, nor did he follow Freud, who thought in terms of mental forces. In Bleuler's concept of ambivalence the idea of conflict so fundamental to psycho-analysis did not enter. In fact, this word was hardly mentioned in his writings. There is another term which is conspicuous by its absence in his work—namely, that of regression, which one could almost call the alpha and omega of the psycho-analytical theory of schizophrenia; this mental disorder is viewed as a regression to one of the earliest phases of mental development. However, it is still highly problematical why such a regression should take place in some individuals. Most psycho-analysts seem to imply some kind of very early psychological influence still un-

known. The valuable psycho-analytical contribution to schizophrenia will come to fruition only when it is considered together with the knowledge of other factors, some of which will probably be non-psychological. Such a view is more in keeping with Freudian principles than a purely psychogenic hypothesis (Stengel, 1956).

There is yet another aspect of regression in relation to schizophrenia—that is, the anthropological; Storch (1924) described the similarities between schizophrenic and archaic-primitive modes of thinking and behaviour. This aspect, which has been neglected for some time, will no doubt come to the fore again with the increasing interest in the social and anthropological problems of schizophrenia.

Schizophrenia in the Melting-pot

What is the status of Bleuler's concept to-day? In 1951 Manfred Bleuler presented a balance-sheet of his father's work. His review, which was based on an unrivalled knowledge of the literature, was a sober statement free from filial sentimentality. Manfred Bleuler saw the most important recent development in this field not in the growth of the physical methods of treatment but in the shattering of the classical notions concerning schizophrenia. Every one of them had become questionable, although none of them had been finally refuted. The whole problem was in a state of fermentation to-day. What yesterday appeared to be generally accepted and established was to-day to some at best a precarious working hypothesis, to others a dogma to be fought, and to others again a fairy tale from a remote past. This applied to questions such as those of disease entity, of aetiology, of the influence of heredity and environment, etc. In his view the following facts stood out from the welter of theories and observations. (1) Even if a disease process—that is, an impersonal catastrophe—should play an essential part in the schizophrenic development, it did so in its relationship to the development of a personality. (2) All the observations which previously were regarded as indicative of an underlying somatic illness—that is, Bleuler's primary or basic symptoms—could nowadays be just as well or even better explained as secondary—that is, as results of the schizophrenic mental disorder with its profound emotional fluctuations and its abnormal behaviour. This also applied to all findings concerning abnormal physiological functions in schizophrenia. He regarded the effects of the somatic therapies as theoretically inconclusive. Manfred Bleuler concluded that we had tried to answer the wrong questions, especially in examining heredity and environment as independent factors and in insisting on the artificial antithesis of organic versus psychogenic aetiology. Manfred Bleuler's appraisal of the present state of the theory of schizophrenia is both correct and fair.

In addition to the psycho-analytical approach there are a variety of concepts which derive from current biological, sociological, or philosophical trends. The following are representative modern views on schizophrenia.

Hoskins (1946) expressed the view that this psychosis represented an end-result of a general failure of adaptation arising from a defective evolution of the maturing process. Manifestations of this failure were defective somatic and psychic homeostasis, defective empathy, and final disintegration of the personality. The accessory symptomatology of the psychosis constituted secondary adaptations to the difficulties arising out of the primary defect. These are Bleuler's ideas expressed in the language of adaptation theory.

Norman Cameron (1944) regards inadequate empathy as the primary defect. He formulated his theory of schizophrenia thus: "social disarticulation resulting from the cumulative replacement of communication by private fantasy, in persons who have been unable to establish themselves firmly in their cultural pattern, because of failure to develop adequate role-taking skills." This formulation does not go beyond Bleuler and Meyer, but a new approach was

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adumbrated when Cameron expressed the view that the study of interpersonal relations and their changes in schizophrenia must also include the social fields within which all human organisms operate. This and similar ideas have recently led to interesting researches into the ecology of schizophrenia.

Harry Stack Sullivan (1940) also stressed, almost exclusively, the social aspects in the aetiology and symptomatology of schizophrenia. To him psychiatry was the study of disturbed interpersonal relations. He distinguished dementia praecox, which he regarded as an organic process, from a variety of schizophrenic personality developments arising from situations of panic and resulting in a throw-back to the interpersonal relations of earliest childhood. Sullivan combined Freudian, Meyerian, and sociological concepts with a philosophy of his own. He spoke of "a collapse of the individual-world synthesis" and of "the resort to a wild compensatory programme leading to schizophrenia." He regarded personalities and mental disorders as abstractions: "There are only degrees of developments and vicissitudes of the communal existence of the person with others."

Current Continental Trends

I should like to make some brief comments on concepts of schizophrenia prevailing on the European Continent. Bleuler's hierarchy of symptoms and the psychological theories underlying it were not generally accepted, though most of his clinical observations were incorporated into European psychiatry.

A new and important aspect was introduced with the differentiation of process schizophrenia and defect schizophrenia, an attempt which has never quite succeeded. Another modification of Bleuler's clinical system was the distinction between a nuclear and a marginal group of schizophrenias, which again has not found general acceptance. Similar proposals of a differentiation within, or even a dissolution of, the clinical entity of schizophrenia have been made repeatedly. The concept of the schizoid personality, which was launched by Bleuler and elaborated by Kretschmer, was an addition of fundamental significance from both the clinical and the theoretical point of view.

The most important trend in Continental psychiatry since Kraepelin and Bleuler has been the phenomenological orientation which has cultivated a careful study of the subjective psychological experiences in mental illness. From the clinical point of view, it has aimed at establishing diagnostic and prognostic criteria based on differences of subjective experiences. This school of thought has created a vocabulary of its own which makes translation into other languages difficult. Their standard work is Jaspers's *Allgemeine Psychopathologie*, which appeared in 1913, only two years after Bleuler's monograph. It is an amazing fact that psychiatry is still living on the capital investments made by a few brilliant men before the first world war. This is especially true for the concepts of schizophrenia. Jaspers has found a successor in Ludwig Binswanger (1946), who, like Bleuler and Meyer, is a Swiss psychiatrist. He is the father of "existential analysis," which, he maintains, owes a great deal to Jaspers and Freud. He tries to establish in what kind of subjective world, or worlds, the schizophrenic lives and thus to understand his mode of existence and its changes. He regards his method as fundamentally descriptive. He claims that even in advanced schizophrenia the human mind has at its disposal definite principles of organization and structure. According to Binswanger this kind of analysis enables the psychiatrist to communicate with his patients more closely than other methods and to help them by psychotherapy which has to be based on careful study of the individual case.

This approach is not as remote from current trends as it may appear. It has something in common with the theories of Cameron and Sullivan, whose ideological background, is, of course, different from Binswanger's. While he speaks of "being in the world" and "existence," they talk of interpersonal relations and empathy, but fundamentally they

mean something very similar. The need for establishing contact with the schizophrenic on his own ground for the purpose of treatment has been repeatedly stressed by psychoanalysts; they have no doubt that the schizophrenic's world is fundamentally that of the infant, while Binswanger would allow himself to be guided mainly by his patients' experiences. Also, the emphasis on "object relations," which started as a controversial issue in psycho-analysis, is bound to lead to a closer study of the social field of which the individual is a part. But existential analysis in its present form has great limitations. While it may be a method of getting closer to certain types of patient and thus gaining a full insight into some aspects of delusions and abnormal behaviour, it is difficult to see how it can advance knowledge of the aetiology of a condition such as schizophrenia. There is a growing awareness among those interested in this approach that it requires to be integrated with other methods.

Conclusions

This review demonstrates the divergences of the concepts concerning this vast group of mental disorders. Psychiatry has in this field not progressed beyond working hypotheses, of which Bleuler's hypothesis can be regarded as the one which was the most comprehensive when it was first advanced, and which even now, if brought up to date, poses more relevant questions than any other. It is often believed that attempts at clarification of concepts are futile in the present state of knowledge but to-day, when there is so much therapeutic and experimental activity, it is more than ever important for psychiatrists to look after their tools of communication. It cannot even be said that, although we are using different concepts of schizophrenia, we know a schizophrenic when we see one.

There are many indications that differences of theoretical concepts, however vaguely held, are frequently responsible for diagnostic disagreements. The uncertainty about the effects of various treatments would be less general if there was a closer understanding among psychiatrists about the conditions they are treating. Similar difficulties exist in experimental psychiatry. The important question of the relationship of the "model psychoses" experimentally produced by drugs to mental illness cannot be answered without reference to concepts such as those discussed here. Some psychiatrists take it for granted that they are dealing with experimental schizophrenia, but this has been contested by others.

There is a tendency among research workers to get away from current concepts of mental illness altogether and to concern themselves with fundamental phenomena, but some of these workers seem to be unaware that they are doing this, and they continue to talk and to write in terms of current clinical concepts to which they pay scant regard. Such a state of affairs is apt to reduce the value of many interesting observations. These are only some of the reasons why careful attention to concepts is essential for progress in psychiatry.

REFERENCES

- Binswanger, Ludwig (1946). *Schweiz. Arch. Neurol. Psychiat.*, 58, 1.
Bleuler, E. (1911). *Dementia praecox oder Gruppe der Schizophrenien*. Leipzig and Wien. Transl., 1950, Ziskin, New York.
Bleuler, M. (1951). *Fortschr. Neurol. Psychiat.*, 19, 385.
Cameron, Norman (1944). In *The Functional Psychoses Personality and the Behaviour Disorders*, Vol. 2, edited by J. McV. Hunt. New York.
Hoskins, R. G. (1946). *Biology of Schizophrenia*. New York.
Janet, P. (1903). *Les obsessions et la psychasthénie*. Paris.
Jaspers, K. (1913). *Allgemeine Psychopathologie*, Berlin. (5th ed., 1945. Berlin and Heidelberg.)
Jung, C. G. (1909). *The Psychology of Dementia Praecox*. Transl., Peterson and Brill, New York.
Kraepelin, E. (1919). *Dementia praecox*. Transl., Barclay, Edinburgh.
Meyer, A. (1906). *British Medical Journal*, 2, 757.
Morel, B. A. (1860). *Traité des maladies mentales*. Paris.
Stengel, E. (1956). *British Medical Journal*, 1, 1000.
Storch, E. (1924). *Nervous and Mental Diseases*. Monograph No. 36. Washington.
Sullivan, Harry Stack (1940). *Psychiatry*, 3, 1.

MEDICAL RESEARCH AND ANIMAL WELFARE RESPONSIBILITY OF THE EXPERIMENTAL WORKER

[FROM A SPECIAL CORRESPONDENT]

The old controversy on vivisection is regrettably still with us, and anything that can manifestly integrate scientific inquiry and animal welfare is a blow to this particular folly. Such was a symposium on "Humane Technique in the Laboratory," organized by the Universities Federation for Animal Welfare and held at Birkbeck College, London, on May 8. Professor P. B. MEDAWAR, F.R.S., took the chair.

Considerate Experimentation

Introducing the symposium, Major C. W. HUME, secretary-general of the Universities Federation for Animal Welfare, drew attention to the two separate aspects of humane-ness towards laboratory animals: good husbandry, which needs no defence, and considerate experimentation, which is the aim of all normal workers. It was the latter aspect with which the symposium was especially concerned. Improvements in technique could be effected in three ways. Sentient animals could be replaced by non-sentient animals, by biological systems of a lower order, or by non-biological systems. Reduction in the number of animals required for a given test could be brought about by choosing the most suitable species or strain, regulating the environment appropriately, and applying statistical methods to observations so as to make them yield the maximum information. Lastly, refinements designed to reduce or eliminate pain from experimental procedures should always be pursued.

The use of laboratory animals in this country was put in perspective by a discussion on logistics by Dr. W. LANE-PETTER, director of the Medical Research Council's Laboratory Animals Bureau. Enough information had been collected by the Bureau to show not only how many animals were used, for what purposes, in what sort of laboratories, where they came from, how they fell short of ideal quality, and what had to be done to improve matters, but also to indicate future trends in demand and how they could be anticipated. This information was useful in ensuring that the biologist continued to be supplied with adequate experimental material. It also showed where efforts to improve conditions should be directed to produce the most effect.

The criteria of a humane technique were considered by Miss PHYLLIS G. CROFT, Ph.D., research fellow of U.F.A.W. Dr. Croft insisted that the necessity for a potentially painful procedure must be established in every case. Care must also be taken to rid the experiment of as much of its element of discomfort as possible by expert handling and management, good design, suitable anaesthesia and manipulation, and, finally, euthanasia. The presence and degree of pain in animals were hard to define, but it was possible to assess them by analogy with human experience and by physiological and other evidence.

Dr. W. M. S. RUSSELL, D.Phil., also a U.F.A.W. research fellow, developed the theme introduced by the first speaker, of taking the animal pain or discomfort out of biological inquiry. His three "R's"—replacement, reduction, and refinement—formed a neat classification of the next nine papers.

Alternatives to Animals

The replacement of sentient animals by micro-organisms was well illustrated by Mr. G. SYKES, M.Sc., head of the microbiology division of the standards department of Boots. There were many similarities between animal and bacterial nutrition, he said. Given a suitable choice of organism and of assay, these similarities could be exploited by various techniques. Assays of vitamins and amino-acids were among those susceptible to this treatment. Similarities, however, were particular, not general, and care was neces-

sary in relating microbiological assays with clinical findings—a warning that applied to every investigation on a substitute, whether inanimate, living but non-sentient, or higher laboratory animal.

Another type of lowly substitute for experimental animals, tissue culture, was discussed by Dr. F. K. SANDERS, D.Phil., director of the M.R.C. virus research group at the London School of Hygiene and Tropical Medicine. In a sense the use of a tissue culture was not so much replacement of a higher animal by a lower organism or a chemical system as the selection of a relevant and immortalized fraction of the higher animal. Dr. Sanders showed, from his own experience in virus research, that tissue culture could be made to yield in appropriate cases information both of a precision and of a kind unobtainable when whole animals are used.

Dr. W. GREY WALTER, Sc.D., of the Burden Neurological Institute, Bristol, going a stage further, showed the possibilities of machines in working out problems normally presented to animals or parts of animals. There was nothing new in using forks for fingers or abaci for mental arithmetic, but developments of electronic apparatus in recent years had enormously enlarged the field of replacement of biological systems by physical ones, he said. Moreover, the use of machines might even present advantages, because the components of a mechanical system could be accurately enumerated and specified.

Control of Variance

When animals are being used for quantitative estimations there is obviously a great advantage in ensuring that the individual animals show a maximum degree of uniformity: the less variation between individuals, the fewer animals required for a given degree of precision. There are two main causes of variation in a group of animals—namely, genetical and environmental. The genetical aspects were dealt with by Dr. LANE-PETTER, who discussed the relationship between variations due to genetical and environmental causes. They were not simply additive, nor were they simply complementary. So it came about that a group of animals which, through inbreeding, had been rendered very similar genetically, might because of their increased homozygosity prove extremely labile or sensitive to small changes in the environment. There could, therefore, be great uniformity in the genotype but increased variability in the phenotype. One way of mitigating this disadvantage was to make first-generation crosses between different inbred strains. The result was a group of genetically similar but generally heterozygous animals possessing all the stability which heterozygosity normally confers.

Environmental aspects of variance control were discussed by Dr. M. R. A. CHANCE, of the department of pharmacology, Birmingham University. He drew attention to our considerable ignorance of the profound effect that certain environmental factors can have upon the biological responses of common laboratory animals. Not only was this so in regard to such obvious factors as temperature, amount of light, and type of diet, but such relatively unexpected factors as the number of animals in a cage and the type of cage in which they were confined were also capable of producing variable responses in certain types of bio-assay. In a further contribution to the symposium Dr. CHANCE emphasized the importance of taking note of the animals' innate behaviour pattern. Details of day-to-day management, which might be arranged or altered to suit human convenience, could be profoundly disturbing to the animal, and this might be reflected in an increased variability of the group. On the other hand, a little trouble taken in training animals to co-operate, so to speak, in the test for which they were being used might remove a substantial element of variability and effectively increase their uniformity.

Technical Handling

Miss CROFT discussed aspects of anaesthesia. For much experimental work it was necessary to sedate or anaesthetize

the experimental animal, and much depended on the actual technique involved in bringing about a state of anaesthesia. Technique, indeed, was just as important as pharmacological knowledge. Recognition of the state of anaesthesia of the experimental animal was, of course, of supreme importance. This was especially so if relaxant drugs were being used because of the risk of the effect of the anaesthetic wearing off while the relaxant was still acting.

In a final paper Dr. RUSSELL showed how refinement in methods of research with animals could contribute substantially to a humane approach. It was a commonplace for research workers attempting to design original experiments to discover that their first thoughts were unnecessarily complicated or likely to be inconclusive. Further thought might lead to a more clear-cut, crisp design, or, put in other words, to a more elegant experiment. Elegance, in this sense, embraced not only scientific suitability but also humane considerations.

A Significant Occasion

To devote a whole symposium, a whole day's meeting, to the consideration of humane technique in the laboratory may appear to some people to be an extravagant waste of scientific time. This point of view might be supportable if it were shown that animal suffering was incapable of interfering with scientific investigations or observations, and also if it were considered to be beneath human consideration in any event. The fact is, however, that suffering or pain is in most cases to be avoided for purely scientific reasons because it is an undesirable cause of variability, and in all cases because we have an obligation of humanity towards our experimental animals. So far, therefore, from being irrelevant, a symposium of this nature is a landmark comparable to those other occasions when British scientists have demonstrated their awareness of humane obligations; such as, for example, in 1870, when the British Association appointed a committee to consider the subject of physiological experimentation, or when, in 1927, the British Medical Association held a conference on animal experimentation. Such occasions give the lie to those opponents to the use of experimental animals who would endeavour to stop this method of inquiry and, in so doing, bring medical research to an end.

POLIOMYELITIS VACCINATION TO CONTINUE DURING THE SUMMER

The following statement on poliomyelitis vaccination has been received from the Ministry of Health. The Joint Committee mentioned in the statement is a committee of the Central and Scottish Health Services Councils.

Among the questions which the Joint Committee on Poliomyelitis Vaccine, under the chairmanship of Lord Cohen, has considered was whether it was necessary to suspend poliomyelitis vaccination during the summer months. It will be recalled that last year vaccinations were stopped at the end of June. This was because of the lack of knowledge of the possible danger of provoking poliomyelitis by vaccination.

The Committee sought detailed information from the directors-general of the Public Health Services of Australia, Canada, Denmark, the Federal Republic of Germany, South Africa, and the United States on the wide-scale use of poliomyelitis vaccine at various periods of the year. The experience in this country following the vaccinations done in May and June last year was also reviewed. Information was provided by the surgeon-general of the United States Public Health Service on the experience following administration of poliomyelitis vaccine in all seasons. In Canada no case of provocation poliomyelitis has been reported, and in Australia provocation poliomyelitis has not been encountered in well over one million injections. From this and other information received from the countries which had used poliomyelitis vaccine there seemed to be unanimity on

the absence of provocation poliomyelitis following poliomyelitis vaccination. In Great Britain nearly 400,000 injections of poliomyelitis vaccine were given in May and June last year, and here again no evidence was found that vaccination provoked paralysis. In none of the three cases of paralytic poliomyelitis which occurred in vaccinated children in May, June, and July, which were reported to the Ministry, did there seem to be evidence of the attack having occurred by reason of the use of the vaccine.

After consideration of this information the Committee recommended that poliomyelitis vaccine need not in general be suspended during the period when the disease was prevalent on the ground that the disease might be provoked by the use of the vaccine, as no evidence of provocation existed. Accordingly, distribution of vaccine to local health authorities will continue throughout the year as supplies become available, but it will be for medical officers of health to determine, in the light of local conditions, whether to suspend vaccinations in their area or not.

ELECTRONICS IN MEDICINE

[FROM A SPECIAL CORRESPONDENT]

It is fashionable to refer to the present period as the electronic age. But few people, professional or lay, are aware of the impact this relatively new field is having on their work or of the pace at which it is developing. During the last two weeks nearly 200 firms have been showing their latest products at Olympia, at the Instruments, Electronics, and Automation Exhibition. The relevance of many of these instruments to medicine, and particularly for the bench worker, is attested by the fact that one of the seven conferences held in connexion with the exhibition was entitled "Medical Day." At it Professor J. ROTBLAT (St. Bartholomew's Hospital Medical School) spoke on instrumentation in medicine, Dr. D. G. MELROSE (Postgraduate Medical School of London) on the artificial heart-lung, and Mr. N. VEALL (Guy's Hospital) and Mr. E. W. PULSFORD (Atomic Energy Authority) on electronic instruments for clinical tests with radioactive isotopes.

On visiting the exhibition one was impressed at once by the number and variety of instruments available in all fields—from the balance which will weigh with an accuracy of one microgram to remote-control manipulators designed to handle with safety large quantities of radioactive material.

A great many firms displayed "automatic chemists," which in general consist of an apparatus capable of titrating an acid or basic solution to a pre-selected end-point and recording the result on a chart. Although some of the less complicated models are reasonably priced (down to £200) and would be very useful in routine laboratory work, they will certainly not replace the chemist. In addition an automatic apparatus for pipetting and mixing liquids from a number of different reservoirs was demonstrated. This too could be very useful in hospital dispensaries; once the vessels were filled with the appropriate solutions a technician could accurately dispense a large number of identical prescriptions in a short time.

There were also a number of displays of more direct clinical interest. The newest version of the artificial heart-lung machine originally developed by Melrose at the Postgraduate Medical School of London was on show. Essentially the pumping action is produced by means of an undulating metal plate squeezing a plastic tube which leads directly from the vascular bed. Valve action is obtained by two sets of smaller metal plates which clamp the tube shut. Three such tubes are synchronized by means of cams to reproduce the complete heart cycle. The lung consists of a rotating "perspex" cylinder containing a number of perspex disks within the lumen and into which oxygen can be admitted. The cylinder is maintained at a slight angle to the horizontal, and the blood, which enters through the upper end, flows down the cylinder under gravity and is picked up by the moving perspex disks and exposed to the oxygen. Although no figures were available, there is little doubt that

this design produces a minimum of red-cell destruction. The apparatus has now been used successfully for a number of years.

Another ingenious instrument is the apparatus developed at the Middlesex Hospital for the continuous measurement of the diastolic and systolic blood pressure. The pressure is measured in a finger. A piezo-electric crystal on the finger responds to variations in the digital pulse, and the output from the crystal is then used to control the pressure in an occlusion cuff surrounding the finger; hence a continuous recording is obtained.

A fully automatic blood-cell counter aroused considerable interest. The instrument used the wide-track scanning principle with a stationary beam and moving specimen. The compensation for "edge effect" was made by successively scanning the field with two slits of different size, the count of the smaller being subtracted from that of the larger. This technique makes the count independent of the upper size of the cell, the size distribution, or cell shape. The actual time taken for a cell count is approximately one minute; assuming an error due to dilution and chamber-filling of $\pm 3\%$, the total error in the count would be $\pm 4\%$. At the present time the cost of the instrument (£650) makes its purchase by other than a hospital or large clinic impracticable.

A bench version of the famous Histokine was displayed. This instrument automatically goes through the entire cycle of tissue fixation, dehydration, washing, staining, and setting in wax or "celloidin," thus eliminating much of the tedium involved in routine histological preparations. Once set in motion no further attention by the operator is required. The instrument is readily adaptable to a number of chemical processes.

PRESENT STATUS OF GLUCAGON

ANNUAL LECTURE TO SOCIETY FOR ENDOCRINOLOGY

The existence of a hyperglycaemic factor in extracts of the pancreas has been suspected ever since Banting and Best first isolated insulin. Although much work has been done in this field in the past 35 years, the position is still far from clear, and Professor C. DE DUVE, of Louvain University, delivering the annual lecture to the Society for Endocrinology on May 8, chose as his subject "The Present Status of Glucagon." He reminded his audience that five years earlier he had been able to say, "Glucagon is the long-sought hormone of the α cells and acts as an antagonist to insulin." Now the position was less satisfactory.

Relationship to Insulin

Professor DE DUVE examined the evidence concerning three most important aspects of glucagon: its mode of action, site of formation, and hormonal status. Did glucagon act antagonistically to or synergistically with insulin? In the intact animal the overall effect was that of antagonism. If insulin were injected, a normal blood-sugar level could be maintained by infusion of glucagon without any significant change in muscle and liver glycogen or in the excretion of urea. On the liver, glucagon exerted a catabolic effect on carbohydrate, fat, and protein metabolism opposed to that of insulin. This fact was illustrated by an experiment in which the effect of insulin and glucagon was separately studied on the incorporation of ^{14}C into glycogen, carbon dioxide, fatty acids, and cholesterol by liver slices incubated in media containing ^{14}C -labelled glucose and fructose.

Peripherally the action of glucagon was less clear. Some experiments suggested an anti-insulin action at the periphery, but others failed to show this; while a third group of experiments had shown an insulin-like effect on the isolated rat diaphragm. Professor DE DUVE suggested that since the crystalline preparations of glucagon used in recent years were not prepared by a method involving specific inactivation

of insulin, as were earlier preparations, they might have been contaminated with insulin. If so, this would explain the insulin-like activity noted in some experiments. However, if glucagon were a hormone, the peripheral effects were probably of only secondary importance, since the liver, through which the hormone would first have to pass, contained a very powerful glucagon-destroying system. Thus he envisaged glucagon as a specific corrector of insulin, suppressing or reversing the effects of insulin on the liver, but with little peripheral action.

An essential tool in the search for the site of glucagon biosynthesis is an adequate bioassay procedure, and here the lecturer emphasized the need for adequate statistical control. The most straightforward technique employed the intact animal, but to compare even two samples of glucagon 300 rabbits would be needed to make the assay statistically sound, he said. With the liver-slice assay only two animals were needed, but there were difficulties due to a potentiating effect of traces of insulin, the insulin inhibiting the inactivation of glucagon by the liver slices.

Professor DE DUVE said he thought the evidence for the α -cell origin of glucagon was overwhelming, citing the high concentration of glucagon found in foetal pancreas and in the pancreas of certain species of birds which contain a high proportion of α cells. There was also a good histological correlation between the distribution of the α cells and glucagon concentration within the pancreas of the dog. In the pancreas of the dog the proportion of islet tissue, insulin, and glucagon increased from the head of the pancreas to the tail. In addition the head (processus uncinatus) contained very low amounts of glucagon relatively to its insulin content, and it had been recently shown that the islets in this part of the pancreas were essentially lacking in α cells. In the guinea-pig too, where cobalt caused reversible injury to the α cells, there was a good correlation between this α -cell damage and loss of glucagon.

Is Glucagon a Hormone?

Whether or not glucagon is a hormone had not been finally settled, although the indications that it is were very strong. Glucagon was a peptide of molecular weight 4,500. It exerted powerful specific effects on various metabolic processes in the liver at very low concentrations of the order of 10^{-8} molar, distant from its site of production. There was also other, albeit rather indirect, evidence to support a hormonal status. For instance, diabetic animals with α cells had larger insulin requirements than those without; and synthalin A and some other compounds which caused cell damage limited to the α cells also provoked hypoglycaemia. Bornstein, Reid, and Young had obtained evidence for the presence of a hyperglycaemic factor in the pancreaticoduodenal veins of cats treated with growth hormone, but Best and his colleagues, who repeated this observation on dogs, found that if the blood were injected into an ergotamine-treated animal the effect was inhibited. This would seem to preclude glucagon being the hyperglycaemic factor involved in this instance. In spite of this, the other evidence would seem to justify Professor DE DUVE's closing verdict on glucagon, "If not a hormone it jolly well ought to be."

The current issue of the *Mouse News Letter* (No. 16) includes information from some 30 laboratories from all over the world on the strains of mice they maintain. A *Collected News* number is available from the Laboratory Animals Bureau, and includes all reports of inbred strains, substrain symbols, mutant genes and linkages, up to *Mouse News Letter* No. 15. The next issue of the *Mouse News Letter* (July, 1957) is a consolidated number which will include information on all stocks of inbred strains, other strains, and mutants held by regular contributors to the *News Letter*. Inquiries about the *Mouse News Letter* should be sent to the Director, Laboratory Animals Bureau, M.R.C. Laboratories, Holly Hill, London, N.W.3.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Radiological Hazards

SIR,—A committee was set up last year by the Secretary of State for Scotland and the Minister of Health "to review the present practice in diagnostic radiology and the radiotherapy of non-malignant conditions, with the object of considering the hazards involved." This review was recommended by the Medical Research Council in their report on "The Hazard to Man of Nuclear and Allied Radiations," for they found that medical radiology is in fact the chief source of the extra radiation to which we are now exposed. They emphasized the genetic damage which might be caused by irradiation of the gonads, and it is this damage with which our committee is chiefly concerned. Its importance is difficult to assess, but it means that we must not neglect even very small sources of radiation.

Since I fear that our inquiries are bound to add to the work of busy people I hope you will allow me to describe the investigations which we have in mind. Our first requirement is a more accurate estimate of the amount of gonadal radiation over the whole population, for the genetic hazard depends ultimately on the total rather than on the individual dose, and we must know the present figure if we are to keep in touch with future developments. To obtain such a base-line we need a survey of the total number and type of x-ray examinations carried out within a given period, followed by estimations of the gonadal dose in a representative sample.

We have already sent out detailed questionnaires to make a census of all medical and dental procedures involving x rays and radioactive substances, and a similar more limited inquiry will be made six months hence to take care of any seasonal fluctuations which might affect the result. To measure the probable dose to the gonads in different radiological procedures we are asking a number of hospital physicists to make a detailed investigation in a sample group of about 100 hospitals. This will enlarge the excellent surveys which have been carried out already in particular departments, and when it is finished we shall have a figure for the total gonadal radiation in this country which should be at least more accurate than any former estimates, here or elsewhere.

We are told that any exposure of the gonads may induce some mutations and that all mutations are more likely to be harmful than beneficial. But medical radiology must not be unduly hampered; the possible harm to the race must be set against the certain benefit to the individual. We must aim, however, at reducing all unnecessary exposure of the gonads, and with this in view the committee has formed small specialist groups which are to consider individual procedures in different clinical fields and to suggest measures for improving their safety.

In seeking through your columns to put this information before the profession as a whole, my committee hopes to enlist the interest of all those whose work touches on the use of x rays and radioactive substances. We are fully aware of the inconvenience and extra work we are causing, and we have learnt with regret of occasional failures in our arrangements for giving notice of the survey. But we believe that the final result will justify what we are doing. We live in a period when a rise in the level of man-made radiation cannot be ruled out and ought not to go undetected. It is disturbing to think that medical radiology may be causing unnecessary exposure of the gonads and that it may cause more if we take no steps to measure the present level. We hope that all doctors and dentists will co-operate with us in our work.—I am, etc.,

Cambridge.

ADRIAN.

Danger of Iso-immunization from Intramuscular Blood Injections

SIR,—A recent case has illustrated the danger of iso-immunization to a blood-group antigen (in this case Rhesus D) from the intramuscular injection of donor blood. Blood was being matched for a male patient prior to operation for partial gastrectomy and the patient was found to be group B Rhesus D-negative (d). Since there was no history of previous blood transfusion and repeated transfusions were unlikely, group B Rhesus (D)-positive blood was matched as well as group B Rhesus-negative blood (cde). The latter was compatible, but the former incompatible by the indirect anti-globulin (Coombs) technique. Subsequent investigation showed that there was anti-D present in the patient's serum in the incomplete form detectable by the albumin and by the indirect anti-globulin technique.

The behaviour of the anti-D suggested that it was an immune type of antibody, but there was no history of a previous blood transfusion. Detailed investigations subsequently have failed to reveal any previous transfusion of blood, but 27 years ago the patient did receive two intramuscular injections, each of 10 ml. of malarial blood, for treatment of general paralysis of the insane.

While intramuscular injections of donor blood are probably not now given on a large scale, the danger of blood group iso-immunization should be kept in mind. The writers have in fact encountered a case of severe haemolytic disease of the newborn in a first pregnancy in a Rhesus-negative woman who had never received a transfusion of blood, but had previously been treated with intramuscular injections of her husband's blood (Rh D-positive).—We are, etc.,

Glasgow.

IAIN A. COOK.
JOHN WALLACE.

SIR,—The recent correspondence in the *Journal* on "The Hurt Brain" draws attention to the fact that, though most venereologists and psychiatrists use penicillin alone or with other drugs for the treatment of neurosyphilis, there are still some who also use malaria therapy for selected cases.

A recent case seen by one of us developed a severe haemolytic anaemia of idiopathic acquired type during malaria therapy. During the serological investigation of the acquired haemolytic anaemia the patient's serum was found to contain the immune Rhesus antibody anti-D active at 37° C. in saline and albumin. The only history of exposure to red-cell antigens was the intramuscular injection of malarial blood some three weeks previous. A sample of blood from the donor of the malarial blood was obtained and this grouped as O, CDe/CDe. In view of the absence of transfusion history and in the fact that the anti-D gave the characteristics of an immune antibody, we feel the source of the immunization was the malarial blood.

The literature contains few references to immunization by intramuscular injection of blood, and the only proved cases known to us were reported by Thomson and Walsh¹ and van Loghem.² Subsequent inquiries of users of malarial blood leads us to believe that the possibility of immunization by intramuscular injection is not fully appreciated.—We are, etc.,

Doncaster.
Sheffield.

A. L. HILTON.
G. OWEN.

REFERENCES

- Thomson, E. F., and Walsh, R. J., *Med. J. Aust.*, 1950, 1, 440.
- van Loghem, J. J., *British Medical Journal*, 1948, 2, 326.

Women's Footwear

SIR,—A few weeks ago, as I left a lecture in the West End on Eastern colour prints and went into the darkness of the streets, I was faced with a series of such brilliantly lighted windows that for a moment I thought I was still in the lecture hall. I looked again and thought that these were a series of magnificent modern paintings. This was not the case. I looked again more closely and thought I was looking at a museum of ladies' shoes. Even this was not the case. I looked even more intently at a window and saw

that the shoes were indeed modern ones. For some of the models the captions should have been "As worn in old Pekin," or "Hallux valgus guaranteed in three months and bunions in one year." Others again looked guaranteed to cripple in six months. I then realized that I was looking at "fashion shoes of high décor." My mind went back to the anatomy I had learnt and taught, and to the human feet I had seen.

What has happened to women's shoes? Many of the present models have little relationship to the anatomy or physiology of the normal human foot. They produce a self-conscious and stilted gait with hardly any normal movement at the ankle joint, and the slightest wearing of the pencil-point heels produces valgus or varus deformity or wobble of the whole foot during walking. Yet these shoes have become so fashionable that there is a demand that buses, escalators, and gratings should be modified to avoid danger. They must be extremely uncomfortable, since the royal parks in summer are filled with women resting their feet with their shoes by their sides.

There is, however, a practical problem involved. In a certain proportion of my patients I have to take some interest in the type of footwear which is being worn. Over the past few years it has become clear that many women are finding it more and more difficult to get reasonable walking shoes for normal feet. On inquiry I find that they have tried shop after shop without success. Some well-known firms seem to have given up the manufacture of ordinary walking shoes, and at one shop which was, in the past, celebrated for the quality, style, and normality of its shoes, a lady was recently informed that they now only sold high décor shoes and they advised her to go to an orthopaedic shoe-maker. Another lady, who had previously had no trouble at all in getting shoes, recently spent a whole day in London shoe-shops in a completely vain endeavour to get reasonable shoes.

My interest is not merely clinical. I spent the whole of my early life in a county celebrated for its boots and shoes and in a town whose manufacture of these has a world-wide reputation. I have visited many boot factories, I have known hundreds of clickers, finishers, closers, and men in the rough stuff room, and I know the quality of their workmanship. Even years ago, many of the firms took the greatest possible interest in the anatomy and physiology of the foot and made every endeavour to relate this to the design and quality of the footwear they produced. I wonder what the craftsmen think of some of the shoes that are now being produced? The explanation of the present position is that the fashions are entirely commercial. How far is this due to the altered financial structure of the boot and shoe industry? Children's shoes are very satisfactory, but they become more and more abnormal and commercial as the girl of teenage is approached. Many of the women who are wearing contemporary shoes get pain in the calf, oedema of the foot, hallux valgus, and fatigue, to say nothing of the more serious injuries, such as sprains and fractures. It has been estimated that 75% of girls leaving school have hallux valgus. These represent potential patients in the future. All these matters are related to the cost of the Health Service. If animals were treated with the degree of inhumanity to which women now are prepared to subject their feet at the behest of the boot manufacturers, there would be an outcry from all the humanitarian societies in the country. A young doctor, uncertain of the future, might do worse than take up the study of chiropody, for it will obviously be of increasing importance. Eventually he might become a consultant and serve on Government commissions, or an industrial adviser on feet, or he might turn to politics. Whichever course he finally chose, he would have valuable knowledge as to where the shoe really pinches.

As an immediate step, I suggest that the Minister of Health has a talk with the President of the Board of Trade. It might even be necessary to promulgate new sumptuary laws in connexion with women's footwear in order to save the tax-payer and the Treasury.—I am, etc.,

London, W.1.

REGINALD T. PAYNE.

Scapulo-thoracic Crackling in Youth

SIR,—Some time before the second world war, at the German Hospital in London, I was asked by one of the German house staff to see a young Englishwoman living in the neighbourhood of the hospital who had come to the out-patient department. On movement of the shoulder-blades a peculiar kind of crackling could be felt (not heard) over the region of the shoulders at the back of the thorax, apparently unaccompanied by any pain or even disagreeable sensation. This young woman was not in the least afraid nor wished to appear ill, but simply wanted to know the nature of her condition, and whether she ought to do anything about it. On examination the "crackling" seemed clearly to be due to some unusual unevenness of development between the scapulae and the bony cage of the thorax. It could hardly be called crepitous, and certainly there was no actual bony grating, such as may be due to exposed bony surfaces after a fracture. She seemed perfectly normal in every other respect. The chief questions in my mind were whether one was justified in assuming that the abnormality was "rheumatoid" in nature and if it varied at all with the weather. Was it likely to increase or diminish with the age of the patient? Such abnormalities were associated in my mind with changes commonly occurring in later life. One had heard the well-known lines in Dr. Edward Jenner's (the vaccination Jenner) famous poem on the signs of the weather:

"Hark how the chairs and tables crack;
Old Betty's joints are on the rack."

But there were no pains in this case, nor need there be any pain associated with obvious so-called osteoarthritic changes in later life. As a matter of fact, I need go no further than my own person in that regard. Sometimes, on movement of my neck during conversation, a loud crack can be heard, though I feel nothing whatever, and the sound only interrupts my talk. In this young woman, the crackling which one felt with one's hands on her shoulders was obviously of the same nature as crackling which can actually be heard, but I do not know of any other case of crackling like this in youth, or even in elderly people. Minor degrees, I believe, are not rare, though they have attracted very little attention.

On the whole, I thought it better not to advise any special treatment. The young woman was desirous of making a holiday tour in Germany, and, hearing this, the residents of the German Hospital invited her to tea in order to work out the best itinerary for her and her father. It happened that my wife and I met them on the cross-Channel steamer. She introduced us to her father. Her peculiar symptoms remained much the same, and I determined to bring her to a meeting of the clinical section of the Royal Society of Medicine. Mr. Duncan Fitzwilliams was then the president of the section, and I got him to examine her carefully. His commanding figure, great knowledge, and pleasant manner could certainly do no harm. With his hands on her shoulder-blades he said very seriously: "Ah, those are where the wings were amputated." The meeting was a very large one, but beyond this gallant remark I could get no other information worth mentioning. My case was quite rightly not reported in the published account of the meeting.

At the end of the second world war I ascertained by letter that the crackling was still present, apparently neither better nor worse. I now regard the case as a little-known abnormality of development, allied to other conditions, such as camptodactylia of Landouzy, often associated with varying degrees of Dupuytren's contraction of the palmar fascia. Such abnormalities may commence to show themselves as varying ages, often excited by local traumatism; then after reaching a certain stage they tend to remain stationary or regress. In middle age my father, my eldest sister, and myself suffered from a peculiar chronic tenderness about the metacarpo-phalangeal joint of both index fingers, which might have been thought to be of so-called

gouty nature, but in later life it completely disappeared without special treatment. In my own person the Dupuytren's patchy thickenings of the palmar fascia have practically disappeared, though of course the camptodactylia of the fourth and fifth fingers must be expected to remain. I am inclined to think that a congenital bent little finger, with slight webbing to the fourth finger, may be regarded as a non-progressive variety of Landouzy camptodactylia.—I am, etc.,

London, N.W.1.

F. PARKES WEBER.

Hospital Confinement

SIR,—Even although the antenatal period has been uneventful, the position of the foetus normal, and the mother in excellent condition, the actual labour is always an anxious time. Surely, then, it is best to deliver the mother in a maternity unit where all modern resources are immediately available should the need arise, and she should be delivered by the G.P.-obstetrician-midwife team who have supervised her antenatal care. In most cases all will go well, and after an hour or two's rest the mother and baby, accompanied by the midwife, could go home by ambulance. Nursing would be continued as in a domiciliary confinement. The labour would be conducted under ideal conditions, and going home so soon would lessen the risks of cross-infection. Such a scheme, already described in detail,¹ would require the closest co-operation between the G.P.-obstetrician, midwife, and consultant-obstetrician.—I am, etc.,

Bristol.

J. SLUGLETT.

REFERENCE

1. Sluglett, J., and Walker, S., *Lancet*, 1956, 1, 684.

SIR,—Dr. J. P. O'Dwyer states (*Journal*, April 20, p. 947) that "it is so much safer to have a baby in hospital than in the home." It would be interesting to have the facts on which he bases this statement.—I am, etc.,

Newcastle upon Tyne, 2.

FRANK STABLER.

Pulmonary Embolism Following Ear Operations

SIR,—I have recently had two patients who suffered from pulmonary embolism following clean operations on the ear. Neither patient showed any abnormality of the cardiovascular system before operation and a careful search did not reveal any sign of thrombosis in the extremities after operation. In both cases the operations were prolonged, one fenestration and one for bilateral removal of osteomata from the meatus.

In my experience pulmonary embolism is so rare after operations on the ear that I feel that these cases call for comment. I would be grateful for any information as to the experience of others in similar cases and particularly as to whether they were associated with the use of chlorpromazine or similar drugs.—I am, etc.,

Dublin.

V. O. MCCORMICK.

Budgerigars in Wards

SIR,—I should like to reply to Dr. N. A. Thorne (*Journal*, April 27, p. 1008), as one who keeps a variety of birds as a hobby. He makes reference to the danger of psittacosis. In spite of there being a rigid import ban on budgerigars, I personally am very concerned about the manner in which seamen can bring these birds into the country. I am not altogether satisfied that the regulations are observed. Fortunately the disease has not been known in this country for several years, but should it appear it would be extremely difficult to diagnose other than under the title of virus pneumonia.

Although the budgerigar is a most interesting and charming pet, it could be rather a nuisance to the patient who was very ill. Not only that: kept in cages, they are constantly moulting, and there is always a fine dust in and around the cages derived from feathers, skin, food, and excreta. This would adversely affect people allergic to dusts.

In my opinion these pets are not really suitable for general wards, but eminently desirable in outside aviaries where they could be seen from the wards or visited by the patients. I would like to recommend Bengalese or zebra finches as ward pets. They do not create a din; they are tight-feathered and very clean and healthy; they are constantly on the move and are extremely interesting.

I would conclude by stating that in my opinion some type of living creature, such as bird or fish, is very desirable in certain wards, relieving the somewhat drab background.—I am, etc.,

Dalry, Ayrshire.

ALEX. WATT.

Sexing Cells

SIR,—Since 1954 we have been sexing cells.¹⁻³ We have always done so in fresh, unfixed, unstained material—oral, genital, urinary epithelial cells, tumour surface scrapings, amniotic fluid sediment, etc.—observed with the phase-contrast microscope. The method is simple and very rapid.



FIG. 1.—Sex chromatin in epithelial cell of female urethra. FIG. 2.—Sex chromatin in epithelial cell of female urethral polyp ($\times 950$). FIG. 3.—Sex chromatin in cells of thyroid cancer (female) ($\times 950$).

Results are as reliable as those obtained with the observation of stained preparations. Counts of sex chromatin are based only on the presence of planoconvex masses in intimate contact with the inner surface of the nuclear membrane (see photomicrographs).—I am, etc.,

Santiago, Chile.

EDNA SILVA-INZUNZA.

REFERENCES

1. Coutts, W. E., and Silva-Inzunza, E., *Rev. Soc. chil. Urol.*, 1955, 18, 70.
2. ——— and Coutts, W. R., *J. Urol. méd. chir.*, 1955, 61, 828.
3. ———, *Brit. J. Urol.*, 1956, 28, 268.

Thyroid Disorders in the Newborn

SIR,—The paper on thyroid disorders in the newborn by Drs. I. D. Riley and G. Sclare (*Journal*, April 27, p. 979) brought to my mind the case of a former patient of mine, aged 30 years, who in 1924 suffered from a large adenomatous goitre for which she refused any kind of treatment. On two occasions I delivered this woman of a male child; each was born with a well-marked goitre, but each was still-born. From the size of the goitre I believe there is little doubt that the cause of death in each case was respiratory obstruction from pressure by a nodular goitre. This observa-

tion appears to support the views held by Drs. Riley and Sclare, and by the other observers mentioned; furthermore, it strengthens the view that heredity and iodine deficiency are possible factors in the production of the condition. It is interesting to recall that I took a photograph of one of the stillborn children, which showed very clearly the outline of the goitre, and sent it to Sir Thomas Dunhill (then Mr. T. P. Dunhill), of St. Bartholomew's Hospital, who was greatly interested.—I am, etc.,

Cardiff.

T. STENNER EVANS.

Diagnostic Sign of Intussusception

SIR,—I thought that the following sign might be of aid in diagnosis of intussusception. It is one of the most difficult things to feel the lump in the abdomen at times. I would like to suggest that the child is turned in the knee and elbow position, and, as the abdominal wall is usually completely relaxed, the lump is usually felt, because it literally falls into the hand.—I am, etc.,

Dartford, Kent.

E. GANCZ.

Popular Delusion

SIR,—I first heard of the delusion described by Dr. Clifford Allen (*Journal*, April 6, p. 822) in barracks at Aldershot in 1939. A regular Army sergeant who had left his family in married quarters at Catterick one month before explained to me that the bromide took about this time to make its presence felt.

Later on I found that married men on sleeping-out pass did not have any complaints, and it was therefore deduced from this that the culprit was gunfire, or early-morning tea. My physiologist colleagues had explained to me before the war that if I cared to fast in a tub on Blackpool front I would not have any trouble with my appetite after the first 72 hours. I formed the opinion in the Army that, whatever the virtues of the celibate life, its difficulties after three or four weeks could well be exaggerated by anyone who had not been forced to lead it.—I am, etc.,

Dudley, Worcs.

L. H. G. MOORE.

Malignant Melanoma

SIR,—I would like, with your permission, to make the following comments concerning the paper, "Malignant Melanoma," by Sir Stanford Cade (*Journal*, January 19, p. 119).

Sir Stanford Cade states that "the most important recent contributions on the histogenesis and pathology of these tumours are those of Spitz^{1,2} (1948, 1951), A. C. Allen³ (1949), and Allen and Spitz⁴ (1953)" and that their studies reorientated the rationale of treatment. This, I believe, gives more credit to these authors than is their due, even though Allen, in 1954, produced a colossal work dealing in great detail with the subject.⁵ Traub,⁶⁻⁸ Montgomery,⁹⁻¹¹ Sachs and his colleagues¹² (who also quote unpublished notes by Satenstein), Becker,¹³⁻¹⁷ among others (who, unlike Allen and Spitz, are and were clinicians as well as histopathologists), are those mainly responsible for reorientating the rationale of treatment by their studies and findings both prior to and since the above dates. They were the first, to the best of my knowledge, to describe and draw attention to the fact that the junction and/or compound naevus were the only ones that could become malignant. They also were the first to draw attention to the fact that it was safe to perform a partial biopsy of a naevus provided a microscopical report was submitted and acted upon if necessary within 48 hours, preferably within 24 hours. This innovation has since saved many unnecessary mutilations for suspected "malignant melanomata."

They also drew attention to the fact that there was no reasonable proof that a single trauma or injury has ever initiated malignancy in a mole. I see that Sir Stanford Cade has come now to agree with this, since he states on page 122 that "there is no definite evidence, only a

presumption, that these interferences [such as local excision] with a pigmented lesion were actually the trigger action which transformed a benign lesion into a malignant melanoma."—I am, etc.,

Sydney, Australia.

J. C. BELISARIO.

REFERENCES

1. Spitz, S., *Amer. J. Path.*, 1948, 24, 591.
2. ———, *J. Amer. med. Wom. Ass.*, 1951, 6, 209.
3. Allen, A. C., *Cancer (N.Y.)*, 1949, 2, 28.
4. ——— and Spitz, S., *Ibid.*, 1953, 6, 1.
5. ———, *The Skin: A Clinicopathologic Treatise*, 1954. St. Louis.
6. Traub, E. F., *Sth. med. J. (Bgham, Ala.)*, 1947, 40, 1000.
7. ——— and Keil, H., *Arch. Derm. Syph.*, 1955, 72, 129.
8. ———, *A.M.A. Arch. Derm.*, 1955, 72, 129.
9. Montgomery, H., 1948, personal communication.
10. ———, in *Diseases of the Skin*, 1954, by O. S. Ormsby and H. Montgomery, p. 760. Lea and Febiger, New York.
11. ———, *A.M.A. Arch. Derm.*, 1955, 72, 130.
12. Sachs, W., MacKee, G. M., Schwartz, O. D., and Picerson, H. S., *J. Amer. med. Ass.*, 1947, 135, 216.
13. Becker, S. W., in *The Biology of Melanomas*, 1948, p. 82. New York Academy of Sciences.
14. ———, *Minn. Med.*, 1951, 34, 1153.
15. ———, in *Pigment Cell Growth*, 1953, p. 109. Academic Press, Inc., New York.
16. ———, *Arch. Derm. Syph.*, 1954, 69, 11.
17. ———, *J. invest. Derm.*, 1954, 22, 217.

Polyneuritis and Illness in Cats

SIR,—During the last two years I have had three cases of acute polyneuritis of the infective type with raised protein in the cerebrospinal fluid in which the onset of the disease was associated with an acute illness of a cat in the house of the patient. Veterinary surgeons had diagnosed the illness in the cats as "cat influenza." On one occasion the cat died, and on the other two occasions the cats recovered. The association may be entirely coincidental, but, in view of our inability to explain the aetiology of polyneuritis on many occasions, it is worth while considering the possibility that certain cases might be associated with disease in cats. If any other medical men have experience of this kind, I would be grateful to hear their views and to receive any data on any such case.—I am, etc.,

79, Pembroke Road,
Clifton, Bristol, 8.

A. M. G. CAMPBELL.

Animal Experiments

SIR,—In an annotation (*Journal*, April 27, p. 999) you refer to Sir Henry Dale's lecture on behalf of the Research Defence Society, and state that "Sir Henry Dale . . . had given a devastating exposition of the untold suffering among men and women and children, to say nothing of domestic animals and pets, that the anti-vivisectionists would have inflicted if they had had their way." This is odd logic. As the anti-vivisectionists have never had their way, such a statement is beyond proof. Indeed, the human organism being what it is, neither Sir Henry nor anyone else could confidently give the name and address of one person upon whom increased suffering or death would have been inflicted in that contingency. I suspect that neither you nor he has much idea of what the "way" of the anti-vivisectionist is. Certainly it is not simply a question of dropping animal experimentation; and in any case the latter is far from being the only means of conducting research, and allopathy is not the only road to health. If vivisection had been ended 50 years ago, it is at least possible that the enormous resources of money, time, and energy thus freed and directed into other channels might have produced quite astonishing results. To deny that this is even possible would be a slight to the intelligence of the medical and allied professions. Apart from this, is it really a good thing that, whenever we are ill, we must "take" something? Modern medicine is riddled with what might be called the "disease-therapeutic complex." The anti-vivisectionist has a number of positive suggestions to make, and not the least among them is the sensible notion that health education should replace a good deal of therapeutics. Time was when the general practitioner was dependent on illness for his living, but it is now entirely in his interests to try to see that people stay well. He can therefore afford

to tell his patients, quite frankly, to smoke less, to drink less, to stop eating too much rubbish, to exercise more, and to behave generally on less pathogenic lines. He could then, perhaps, spare a little time to do battle against what may be called the social or corporate factors of a kind inimical to health.

I read Professor Miles's lecture¹ with much more interest and respect than I did that of Sir Henry Dale; but it is not correct to say that "he neatly turned the tables on the critics of animal experiments." It is obvious that many species have organs and functions related to those in man; but there are wide differences, and one can rarely argue with any confidence from one species to another, or even in some cases from one member of a species to another of the same kind. The kinship is based, not on a similarity of organ or function, but on the two facts that all have conscious life and all can suffer. The more religious would say that all come from God, and that therefore an offence against one of them, whether human or other, is a sin.—I am, etc.,

WILFRID TYLDESLEY,

Secretary,
British Union for the Abolition of Vivisection.

London, S.W.1.

REFERENCE

¹ Miles, A. A., *Conquest*, 1957, 45, 2.

Benactyzine

SIR.—We regret not having included in our paper (*Journal*, February 9, p. 306) the data necessary for the statistical calculation Dr. F. K. Taylor makes in his letter (*Journal*, April 27, p. 1006). The contrast between drug and control was increased by the rejection of four, and decreased by the rejection of two, of the six cases, which, to use Dr. Taylor's model, is equivalent to throwing four heads and two tails in six spins of a coin. P is therefore not 0.016 but 0.34, which is of much lower significance than any of the P values reported in the paper.—I am, etc.,

Leeds, 2.

G. R. HARGREAVES.

Prevention of Tetanus

SIR.—The present correspondence on tetanus and its prevention following the inquest at Hanley on two men who died from post-operative tetanus (*Journal*, April 13, p. 897) revives interest in the unsatisfactory measures employed for the sterilization of rubber gloves, which was discussed in a leading article two and a half years ago (*Journal*, January 15, 1955, p. 156).

The Report of the Central Pathology Committee of the Ministry of Health on the Sterilization of Hospital Equipment, issued in December, 1954, recommended that rubber gloves should first be boiled and then autoclaved at 5 lb. pressure for 30–40 minutes. Your leading article was critical of the details of the process, but you did not condemn the process itself, although you implied disapproval when you spoke of the intolerable position that "gloves, of all things used in an operation, should be of doubtful sterility." Trillwood¹ has recently discussed what happens when steam is admitted to a drum containing rubber gloves and has pointed out the crux of the matter—that rubber is impervious to steam. He concluded that "if surgeons' gloves are required to be sterile a method other than autoclaving is indicated."

Surely the time has come to consider whether the solution to this problem may not be a re-examination of surgical techniques. If rubber gloves cannot be sterilized by autoclaving, and if sterilization by chemical means is uncertain (there are additional dangers if rubber is in contact with phenolic solutions), then may not the only alternative be a change in surgical procedure? One could make several suggestions: (1) a no-touch technique, almost impossible in most types of surgery; (2) the use of dry "clean" gloves, washed with a detergent and finally rinsed in a long-acting antiseptic, or smeared with chlorhexidine cream (where this is not contraindicated, as it is in brain surgery); (3) if tetanus is the biggest risk, a careful search for its source in hospital and the immediate banning of such common offenders as talc and tow; (4) the prophylactic protection by tetanus toxoid of

all patients for operation, and not just those with accidental injuries as suggested by Dr. J. W. Myles (*Journal*, May 4, p. 1064).

There are of course many other facets to this problem, but these suggestions may provide a basis for a useful discussion.—I am, etc.,

Oxford.

JAMES CALNAN.

REFERENCE

¹ Trillwood, W., *Pharm. J.*, 1957, 178, 298.

Dimenhydrinate in Chicken-pox

SIR.—Dr. G. I. Watson, in his article on infectious diseases in general practice (*Journal*, January 5, p. 39), mentions the use of mepyramine maleate in chicken-pox. In January, 1956, while suffering from chicken-pox, the irritation drove me to trying antihistamines because of the reasonable theoretical proposition that the great irritation is due to release of histamine. The most effective proved to be dimenhydrinate 50 mg. twice a day with pentobarbitone 1½ gr. (97 mg.) in the morning. Mepyramine maleate 100 mg. alone made me sleepy and depressed. In August, 1956, I used dimenhydrinate 50 mg. with pentobarbitone ½ gr. (50 mg.) on 57 children between 2½ and 12 years old. There were ten children additionally who were siblings and also had chicken-pox; these were used as controls. The results were striking, because the treated children became quite happy and tractable. Further, because there was no cause for scratching, there was only one case of secondary infection of the pocks, yet other doctors in the same district were much troubled by secondary infection. Later, in another area of Sydney, it seemed that dimenhydrinate 50 mg. was sufficient for children up to 5. However, in the older children pentobarbitone did relieve them from worrying about their pocks. Since chicken-pox is a dangerous, a depressing, and a disfiguring disease, it should be worth while having several clinical trials in general practice.—I am, etc.,

Tasmania.

MICHAEL V. PERKINS.

Local Analgesia and Kielland's Forceps

SIR.—Drs. J. S. Scott and R. L. Gadd have made a very useful contribution to the art and technique of forceps delivery (*Journal*, April 27, p. 971). I read their paper on the use of local analgesia and Kielland's forceps with great interest, but was surprised to find myself quoted as giving 70 lb. (31.8 kg.) as the critical level of traction force.¹ When I looked over my old paper I was even more surprised to find I had been quoted correctly, for I had forgotten my first efforts to find some guide to the safety of traction force.

The figure of 70 lb. (31.8 kg.) was based on theoretical considerations and some experimental work which was not very convincing. Over the years I have acquired a considerable experience of measured traction force, but I still do not know the level of critical traction. It probably varies from foetus to foetus, and a fixed figure is extremely unlikely. I have found that a force of 100 lb. (45.4 kg.) may be used with safety provided the foetus is at term, the blades of the forceps applied along the cheeks or mento-vertical diameter of the fully flexed head, and traction force applied slowly through a spring handle. I have little experience and no data relating to forceps delivery of premature infants. The excessively moulded head of the term foetus may not withstand the same compression force as the unmoulded head, and I have always assumed that the compression force is proportionate to the traction force and is supplied by the resistance of the maternal tissues. To commit oneself to the forceps operation when the head is at the mid-cavity station or higher, without due consideration of all the factors involved, is to court disaster, and, it seems to me, no rule of thumb can ever replace obstetrical judgment and the technical skill which come with experience.

Anyone who has used a recording instrument for the obstetrical forceps operation must have been rather shocked at the ease with which the magnitude of the traction force

can be raised, and alarmed at the effects such force might have on the foetal brain. Seated on a sterilizing drum 10 in. (25 cm.) high, and pulling with one hand, 100 lb. (45.4 kg.) is the maximum force which I can exert with the Milne-Murray axis-traction instrument. A powerfully built man may exert a much greater force under the same conditions. Infants delivered with a force of this magnitude have been examined at intervals up to 10 years of age, and nothing has been found to suggest that such force has been harmful.

The great majority of these difficult forceps cases were due to contraction at the pelvic outlet. The rickety flat pelvis which was common in this locality 20 years ago has gradually been replaced by a type of contraction more difficult to detect because more often it involves the outlet. This preponderance of outlet contraction has been confirmed by x-ray pelvimetry. About 30% of the women admitted to this hospital are under 5 ft. (1.5 m.) in height, and many of these have some degree of outlet contraction. In the past we usually allowed trial of labour in this group and had little trouble when the foetus was no more than 6½ lb. (3 kg.). Not infrequently, however, when the foetus was larger, we were faced with the unhappy choice of delivery by caesarean section after the head had become deeply engaged, or by a difficult forceps operation. In recent years we have been inducing labour more often in this group, and the difficult forceps delivery has become something of a rarity.

When dealing with persistent occipito-posterior and deep transverse arrest positions, I have always preferred manual rotation followed by application of the Milne-Murray instrument. My objections to Kielland's instrument include the difficulty of accurate application of the blades along the cheeks and the greater traction force apparently required to effect delivery. This latter is merely an impression, but it has seemed to me that infants delivered with Kielland's forceps show more bruising due to the impress of the blades. I have a device which allows attachment of a spring recording handle to the Kielland's instrument, but have collected no useful data. Scott and Gadd are on rather thin ice when they argue traction force on the basis of one case of brow presentation. From the position of the head in their illustration delivery would be effected by the movement of flexion alone, and if more than slight traction force had been required after complete flexion was reached the blades would probably have slipped. Moreover, the head must have been small to rotate from the brow to the vertex position when so low in the pelvis. This movement of the head between the blades was probably due to the fact that the blades were not designed for application to the short arm of the head lever in the biparietal diameter, and the authors were fortunate to deliver so easily, for this application is dangerous. Some years ago I produced an indented fracture with a somewhat similar application and I have been careful to avoid it ever since. Movement of the head between the blades properly applied to a vertex presentation occurs for very different reasons and is disturbing because it presages slipping of the blades. I attempted to demonstrate these reasons some time ago.² However, there can be little doubt that in the hands of competent operators different types of obstetrical forceps produce equally good results.

During the war years we began to use local analgesia for the forceps operation in the Rankin Memorial Hospital. We have gradually increased this practice, and in recent years we have been performing over 90% of these operations using no other analgesia or anaesthetic. This has required a variation in technique which has developed along much the same lines as those described by Scott and Gadd, although we deliver face to pubis when this can be easily accomplished—a technique which at one time we regarded with some suspicion and generally avoided. In all cases we perform a generous episiotomy before applying the blades.—I am, etc.,

Greenock.

JAMES BAXTER.

REFERENCES

¹ Baxter, J., *J. Obstet. Gynaec. Brit. Emp.*, 1946, 53, 42.
² *ibid.*, 1947, 54, 35.

SIR.—Our experience at Perivale Maternity Hospital fully confirms that of Drs. J. S. Scott and R. L. Gadd (*Journal*, April 27, p. 971) regarding the safety and efficiency of local analgesia combined with the use of Kielland's forceps. Two hundred and twenty-three of the last 231 forceps extractions were done using local analgesia alone. Of these, 184 were simple outlet extractions, 23 were forceps rotations and extractions for deep transverse arrest, and 16 a similar

manœuvre for persistent occipito-posterior position. Ninety-seven per cent. of all forceps extractions were done using local analgesia.

Of the eight cases requiring general anaesthesia, four were extremely agitated mothers who would probably have responded well to the supplementary sedation suggested. Otherwise trichlorethylene self-administered with the "emotril" or "cyprane" inhaler has been adequate here. Three were delivered by temporary residents not practised in the technique. One was a compound presentation requiring much intravaginal manipulation. A straight sacrum is almost the only common pelvic abnormality in this area. This may explain our higher percentage of delivery under local analgesia alone.

We found that the technique of injection as described by Gate and Dutton¹ was effective but complicated by formation of paravaginal haematomata in a fair number of cases. Latterly we have had excellent results by the simple injection transvaginally around the pudendal nerve of 10 ml. 1% lignocaine on each side, using a technique similar to that described by Wilds.² Only two injections are required in all.—We are, etc.,

M. D. MANION.

F. G. FEINSTEIN.

Greenford, Middlesex.

REFERENCES

¹ Gate, J. M., and Dutton, W. A. W., *British Medical Journal*, 1955, 2, 99.
² Wilds, P. L., *Obstet. Gynaec.*, 1956, 8, 385.

A Verbal Shock

SIR.—The English in the *British Medical Journal* is usually exemplary, witness your insistence on the correct spelling of "disk" and "connexion," and therefore any lapse comes as a shock. In your annotation on the M.R.C. report on emmetropia (*Journal*, April 27, p. 1000), the last word (if it may be called such) is "emmetropization." I hope that this is indeed the last appearance of this word. Such neologizations should be blue-pencilled.—I am, etc.,

Liverpool, 1.

JOHN MATTHEWS.

Congenital Ring Constrictions

SIR.—I am at present working on a hypothesis of the cause of congenital ring constrictions of the limbs and body. I should be most grateful if anyone who is in attendance at the birth of a child with this condition would send the placenta and membranes in a jar containing 10% formal saline to the morbid anatomy department, the Hospital for Sick Children, Great Ormond Street, London, W.C.1. Any expenses incurred will be paid with thanks.

I should also like to hear from anyone who has seen one of these congenital constrictions round the trunk, or any part of the body excluding the limbs.—I am, etc.,

London, W.1.

DENIS BROWNE.

Post-maturity

SIR.—The article by Professor F. J. Browne on foetal post-maturity and prolongation of pregnancy (*Journal*, April 13, p. 851) draws attention once again to the divergence of opinion in relation to post-maturity. There is one aspect of the subject which does not appear to be covered by his article, so you will perhaps excuse me if I draw attention to it.

In my experience post-maturity is only of serious obstetric significance if it occurs in association with what De Lee aptly termed the "dystocia dystrophica syndrome."¹ In this syndrome we find stocky, obese women, who are often about 5 ft. (1.5 m.) in height, with short thighs, broad shoulders, and a short thick neck. It is said that these women exhibit certain well-marked and unfavourable clinical features. First, the cervix is small and the vagina narrow and rigid. Secondly, there is a far greater tendency to pre-eclampsia. Thirdly, pregnancy commonly continues for a week or more beyond full term. Fourthly, primary uterine inertia, slow dilatation of the cervix, and early rupture of the membranes

are frequent. Fifthly, interference with the placental circulation by utero-foetal pressure follows. Sixthly, there is a high incidence of uterine sepsis. Lastly, these patients commonly exhibit the so-called android pelvis of Caldwell and Moloy.³

Some years ago, Miss Meave Kenny⁴ wrote an interesting paper on the x-ray findings in 1,000 suspect pelves, which she had collected from some 10,000 consecutive pregnancies at the British Postgraduate Hospital, Hammersmith. Among these 1,000 suspect pelves were some 450 pelves with android features in the hind pelvis. The outcome was as follows (there is some reduplication): caesarean section, 115; mid-forceps delivery, 176; low-forceps delivery, 69; occipito-posteriors, 67; deep transverse arrest, 50. But that is not the whole sad story. Speaking from memory she found an incidence of both pre-eclamptic toxæmia and of puerperal infection, which was six to nine times that of the patients who had not android pelves. And the incidence of puerperal infection was not necessarily related to interference. Mal-presentations occurred in 25% of cases.

What is even more interesting is to note that, in the seven cases of post-maturity from hospital F, quoted by Professor Browne, five had conditions that one associates with android pelves—deep transverse arrest of the head, transverse lie, accidental haemorrhage, toxæmia of pregnancy, and, lastly, a case of intrauterine sepsis.

Every stillbirth is a complicated problem in detection. It may be due to faults in the powers, passages, or passenger—not forgetting diseases affecting the mother and the child. I, for one, am not in the least convinced by Dr. Walker's work in Aberdeen.⁴ I cannot recall a single stillbirth or intrauterine death which might have been the result of post-maturity where there was not some complicating factor such as one associates with the dystocia dystrophica syndrome.—I am, etc.,

Praa Sands, Cornwall.

D. G. WILSON CLYNE.

REFERENCES

- De Lee, J. B., *The Principles and Practice of Obstetrics*, 1933, 6th ed. Saunders, Philadelphia.
- Caldwell, W. E., and Moloy, H. C., *Amer. J. Obstet. Gynec.*, 1933, 26, 479.
- Kenny, M., *J. Obstet. Gynaec. Brit. Emp.*, 1944, 51, 277.
- Walker, J., *ibid.*, 1954, 61, 162.

Smoking and Lung Cancer

SIR.—It is known that the ash of cigarettes contains on the average the following inorganic substances: 29.1% K, 3.2% Na, 36% Ca, 7.4% Mg, traces of Rb, etc.¹ In all potassium there is 0.012% of the radioactive isotope ⁴⁰K. The half-life of this isotope is 1.3×10^{10} years, the beta energy has the maximum value of 1.36 MeV and the gamma energy is of the order of 1.5 MeV. In total rubidium there is 27.2% of the radioactive isotope ⁸⁷Rb. The half-life of this isotope is 6×10^{10} years, the electron energy has the maximum value of 0.13 MeV, and the gamma energy is of the order of 0.13 MeV.² It has been shown that the exposure of living tissues to long-life radioactive isotopes may initiate the onset of a malignant neoplasm.

Mulvany³ filled a geiger counter (M₀) with cigarette or cigar ash and found a radioactivity varying from 70 to 170 counts per minute against a normal background of 12, and concluded from this: "There would appear to be no doubt that radioactive particles are actually deposited in the bronchial tree; and, absorption here being very slow, these tissues must be continually subjected to bombardment by active beta particles. This fact would seem to support the statistical evidence linking inhalation of cigarette smoke with carcinoma of the lung by heavy smokers."

I have tested the cigarette ash of Greek and Virginia tobacco for radioactivity with a similar geiger counter shielded by 2 in. (5 cm.) of lead (lead castle). I filled this M₀ tube with the ash of 10 cigarettes and found a reading varying from 80 to 126 counts per minute against a background count of 10 ± 1 (the variation depended on the particular type of cigarettes examined). I therefore agree with the above measurements of Mulvany, but, at the same time, I think that the existence of radioactivity in the cigarette ash

is not sufficient to prove that there is any relation between this radioactivity and the lung carcinoma.

I think that before any significance can be attributed to the radioactivity of inhaled cigarette smoke as a factor in the aetiology of lung cancer, it must be demonstrated that the radioactive isotopes ⁴⁰K and ⁸⁷Rb are inhaled as an aerosol and deposited in the bronchial mucous membrane. I therefore decided to find out whether the radioactive isotopes ⁴⁰K and ⁸⁷Rb were present in the water of a wash-bottle after cigarette smoke had been passed through it. The velocity at which the smoke entered the bottle was about the same as in natural smoking. The radioactivity of 10 ml. of the water from the washbottle after the artificial smoking of 100 Greek cigarettes (total quantity of water in the washbottle being 20 ml.) was 10 ± 1 counts per minute against a background count of 8 ± 1 ; in other words this was really 2 ± 1 counts per minute, and equivalent to the radioactivity of the water of Athens.

I also examined the radioactivity of 10 ml. of water from a narghile (total quantity 100 ml.) after passing the smoke from a coarse Persian tobacco through it. There were 10 ± 1 counts per minute against a background of 9 ± 1 (almost the same as the radioactivity of water of Athens). That I did not find more radioactivity in the water of the washbottles after artificial smoking than in the water of Athens shows that the radioactive isotopes ⁴⁰K and ⁸⁷Rb cannot be deposited in any form in the bronchial mucous membrane. Therefore I think that it is improbable that the radioactivity of cigarette smoke is an aetiological factor in bronchial cancer.

I wish to thank Assistant Professor Ninis for providing the facilities for the experiments.—I am, etc.,

Athens, Greece.

GEORGES RETZEPIS.

REFERENCES

- König, P., in *Handbuch der Lebensmittel-Chemie*, 1933-5, edited by von A. Bomer, A. Juckenack, and J. Tillmans. Berlin.
- Sawyer, G. A., and Wiedenbeck, M. L., *Phys. Rev.*, 1950, 79, 490.
- Mulvany, D. K., *Lancet*, 1953, 2, 205.
- "An Investigation into the Radioactive Content of the Human Body and Its Significance as a Factor in the Aetiology of Cancer," IX Biennial Congress of the International College of Surgeons, April, 1954, São Paulo.

Mental Performance in Chronic Anoxia

SIR.—With reference to the article on mental performance in chronic anoxia by Dr. Raymond Greene (*Journal*, May 4, p. 1028), during some twenty years of medical practice I have frequently encountered serious mental deterioration in men of good social and professional standing. All of them had two things in common: they suffered from considerable reduction in the alveolar capacity of their lungs for several decades; and they were in their 50's when deterioration became very obvious. Some had been gassed during the first world war, others had suffered from extensive pulmonary abscesses during the second and third decade of their lives, or smoked over 60 cigarettes per day. They all lost the greater part of their livelihood, as they became cantankerous, erratic, and offended consistently against the code of conduct in their social setting.—I am, etc.,

London, S.W.3.

E. F. BLUMBERG.

Transfusion Service

SIR.—Recently I have been greatly disturbed by the serious shortage of blood which is available for blood transfusion purposes. On more than one occasion I have been obliged to contact other hospitals in the region in order to ascertain whether they were in a position to supply us with one or two pints of blood when we have had seriously ill patients and the blood bank has been depleted. I am wondering whether other hospitals have experienced a similar shortage and whether this is a particular problem of the S.E. Region. If so, the time should seem ripe for an appeal to the public for more blood donors.—I am, etc.,

London, S.E.5.

T. KRAFT.

Obituary

G. A. AUDEN, M.D., Ph.D., F.R.C.P., D.P.H.

Dr. G. A. Auden, school medical officer to the City of Birmingham from 1908 to 1937 and a former professor of public health in the University of Birmingham, died at Repton on May 3, aged 84.

George Augustus Auden was born on August 27, 1872, the son of the Rev. John Auden, of Burton-on-Trent. From Repton he won a scholarship to Christ's College, Cambridge, where he was Porteus gold medallist and took first-class honours in the natural sciences tripos. For his clinical training he went to St. Bartholomew's Hospital, where he won the Kirkes and Lawrence scholarships and gold medals. Qualifying in 1896, he graduated M.B., B.Chir. in the following year, proceeded to the M.D. in 1900, and took the M.R.C.P. in 1909 and the D.P.H. in 1910. After qualification he held resident appointments at Bart's and became resident medical officer and physician to out-patients at the General Lying-in Hospital. In 1898 he moved to York, and was appointed physician to the York County Hospital, where he developed his interest in the care of sick children. He also took part in the public life of the city, serving on the education committee, and consequently, when he went to Birmingham in 1908, he well knew of the need for the school medical service and of the increasingly important part it would play in the work of education authorities. All through his professional life he was particularly interested in the psychological problems of children, including those resulting from infections such as encephalitis, and he was appointed to the staff of the Birmingham Children's Hospital as honorary psychologist. During the first world war he served in the R.A.M.C. in Egypt, Gallipoli, and France, and on his return to Birmingham he was elected F.R.C.P., an unusual honour for a whole-time school medical officer. For many years he was lecturer in public health in the University of Birmingham, and in 1940, some years after his retirement from the post of school medical officer, he was appointed professor of public health. He was also sanitary adviser to the governors of Rugby School.

A scholar all his life, Dr. Auden had a European reputation as an expert on early Scandinavian history. He was a foreign member of the Society of Northern Antiquaries of Copenhagen, and he translated into English the guide to the prehistoric collection of the National Museum at Copenhagen as well as F. Rathgen's monograph on *The Preservation of Antiquities*.

Dr. Auden married Miss Constance Rosalie Bicknell in 1899 and had three children. One of his sons is W. H. Auden, professor of poetry in the University of Oxford.

Dr. MALCOLM ALLAN writes: I first met Dr. Auden when he returned to Repton in 1949. He had previously resided in the Lake District, but the call of his early associations in Horninglow, Burton-on-Trent, and of his old school, Repton, was a combination too strong for even him to resist, and so he returned to spend the last years of his already crowded life in the village. If anyone assumed he came to rest from his labours they were quickly disillusioned. His was a strictly disciplined life, and his day was methodically apportioned, beginning at 6 a.m. with breakfast, and as I regularly passed his home at 8 a.m. he was always seated at his desk. He kept up a most voluminous correspondence with friends, medical and lay, all written in his own hand, and it distressed him so much when he had perforce to employ an amanuensis. At the suggestion of the vicar he wrote a series of more than a dozen articles for the parish magazine on the history of Repton from before the ice-age up to recent times. Such a series involved much research and labour, but how he enjoyed it! Naturally he continued his long and keen interest

in archaeology by his studies of ancient camps on Askew Hill, St. Joseph's Well, and earth mounds by the River Trent. Another task was to keep a lengthy list of old Reptonians carefully annotated and up to date.

A heart attack about two years ago shook him badly and for long we despaired of his recovery, but his robust constitution and his determination asserted themselves. Can it be said of any other similar versatile scholar that he was also a craftsman? It amazed me when he said that nearly all the furniture in his room had been made by himself, including the bed he slept on. Just behind the door of his room was a carved wooden screen, and on it an inscription in Greek which being translated read, "Live as on a mountain." Naturally his conversation was mostly of interests in the past, but until very recently he kept himself abreast of advances in medicine, especially in public health, and had very decided views on the recent negotiations with the Minister of Health.

Gone now from our village streets is the old familiar slight figure with his most faithful of companions, his dog "Biddy," but his comparatively short time amongst us has made a deep impression, and his zest and enthusiasm for life have been a great inspiration, especially as he struggled manfully with his failing physical and mental powers. The final lines of Tennyson's *Ulysses* might well have been written about him:

"One equal temper of heroic hearts,
Made weak by time and fate, but strong in will,
To strive, to seek, to find, and not to yield."

Dr. A. A. E. NEWTH writes: At the beginning of the century there were several doctors of outstanding calibre who foresaw a great future for the school medical service—George Newman, Ralph Crowley, James Kerr, and Ralph Williams—and Auden was one of them. He undertook the pioneer work in Birmingham in 1908 with enthusiasm, and quickly established such a reputation that school medical officers throughout the country thinking of starting some new scheme went to Birmingham to see what he was doing there. Auden had had a brilliant academic career, and his profound knowledge of medicine backed by a close attention to detail was the secret of his success. For instance, at his residential school for rheumatic children at Baskerville he had the children dressed in different-coloured shirts or jerseys according to their stages of convalescence, so that the lay staff could be under no misunderstanding as to what physical activities were allowable, and when he started a school for partially sighted children he personally rooted round the second-hand book shops of Birmingham to pick up church bibles and other books with large type, as at that time specially printed educational books for the partially sighted were unobtainable. Auden was one of the first to realize the importance of child guidance, and the Birmingham clinic was one of the earliest outside London; but he was no believer in the vocational guidance on psychological lines which was attracting so much attention at one time. His knowledge of psychiatry was wide, and he contributed many authoritative articles to the *Journal of Mental Science*. His familiarity with the classics enabled him to write with authority on the history of medicine, and his paper on "The Madness of Ajax, as Conceived by Sophocles, Clinically Considered," written in 1926, was a masterly treatise. He was a great man of very considerable charm, and one is proud but at the same time humbled to have had the privilege of knowing him.

BERNARD MYERS, C.M.G., M.D., F.R.C.P.

Dr. Bernard Myers, consulting physician to the Royal Waterloo Hospital, died at his home in London on May 9. He was 85 years of age.

Bernard Ehrenfried Myers was born at Thames, Auckland, New Zealand, in 1872, and was educated at Wellington College and at Auckland Grammar School. On leaving school he studied chemistry at University College, Auckland, and

became analyst to the family brewery. In 1894 he decided to study medicine in Britain, and spent three years at Edinburgh University before going on to St. Bartholomew's Hospital for his clinical training. He took the London Conjoint diploma and the Edinburgh degrees of M.B., C.M. in 1898, and two years later he proceeded to the M.D., with commendation. Becoming a Member of the Royal College of Physicians of London in 1912, he was elected to the Fellowship in 1933. After graduation Myers held the appointment of junior house-physician to Sir Dyce Duckworth at St. Bartholomew's Hospital, and then became clinical assistant at the Coombe Hospital for Women, Dublin. He obtained the Dublin L.M. in 1899. After a trip to New Zealand and back as a ship surgeon, he settled in practice in London, becoming a well-known consultant physician in children's diseases, and a popular member of the staff of the Royal Waterloo Hospital for Women and Children. He wrote a number of papers on infant feeding and was the author of a *Practical Handbook of Diseases of Children*. In 1915, during the first world war, he was appointed officer commanding the 2nd New Zealand General Hospital at Walton-on-Thames, with the rank of lieutenant-colonel, and in 1918-19 he was A.D.M.S. of the New Zealand Expeditionary Force in the United Kingdom, with headquarters in London. For his war services he was appointed C.M.G. in 1917.

From 1932 to 1934 Myers was president of the Clinical Section of the Royal Society of Medicine, and he was president of the West London Medico-Chirurgical Society in 1935, the year in which he attended the New Zealand Biennial Conference as the delegate of the British Medical Association. Keenly interested in the work of the Red Cross, in 1937 he became commissioner of the New Zealand Red Cross Society in the United Kingdom, and two years later commissioner to the Joint Council of the Order of St. John and the New Zealand Red Cross Society. He was also a consultant physician to the New Zealand Government in London. During the second world war he represented New Zealand on the technical advisory committee on medical supplies and services of the Allied Post-war Requirements Bureau. Dr. Myers was a widower, and is survived by three daughters.

J.L.C. writes: "Bernie," as Myers was affectionately called by his friends, was noted for his kindness and geniality. He had a quiet and gentle manner, but when questions of high principle arose it was swiftly apparent that he was also made of very stern moral fibre. Another facet of his character was his intense loyalty to his country and the Crown, and he placed himself entirely at their disposal whenever occasion demanded. He was very fond of his work as a paediatrician, and his writings show an extraordinary depth of knowledge of his specialty. In dealing with children he showed a vast clinical wisdom as well as skill in handling them. He was greatly esteemed by colleagues and nursing staff. A lovable character, he was courteous and considerate, and for these qualities he will long be remembered. He died after a short illness, having enjoyed several years of retirement. Our sympathy goes out to his three daughters.

E. St. J. WHITEHOUSE, M.B.E., M.R.C.S., L.R.C.P.

Dr. E. St. J. Whitehouse, a well-known general practitioner at Solihull, Warwickshire, died peacefully at his home on April 18. He was in his 90th year and had practised in Solihull for 62 years. The late Bishop Chavasse of Liverpool was his uncle, and Dr. Noel Chavasse, the double V.C. of the first world war, was his cousin.

Born at Sedgley, Staffordshire, on October 30, 1867, Edwin St. John Whitehouse graduated from St. John's College, Cambridge, and received his medical training at Mason's College, Birmingham. He qualified M.R.C.S., L.R.C.P. in

1893 and then became house-surgeon to his uncle, Sir Thomas Chavasse, at the General Hospital, Birmingham. Later he was appointed resident surgical officer and resident medical officer at the Children's Hospital. In 1895 Dr. Whitehouse became a partner of Dr. A. V. Bernays, who had been practising in Solihull for over ten years: the practice flourished to such an extent that at the time of his death Dr. Whitehouse was head of a partnership of nine general practitioners. He was appointed medical officer to the old fever hospital and smallpox hospital at Sheldon and was instrumental in the building of the new Catherine de Barnes Fever Hospital. Before the first world war he organized and became the first doctor to attend the Solihull welfare centre, and later, together with other trustees, bought and equipped the first Solihull maternity home. He did the work of three general practitioners during the first world war and also found time to look after 150 wounded soldiers housed at the Hermitage. For this work he was appointed M.B.E. in 1920. During the second world war, in spite of advancing years, he worked as hard as ever and was in command of the medical section of the local civil defence organization.

He belonged to the old school of doctors, and besides being an excellent physician he had a wide knowledge of law and a deep sense of religion. Always very interested in the younger generation, he was a member and, later, chairman of the board of governors of Solihull School; subsequently he became chairman also of Malvern Hall School for Girls (now the Solihull High School). Whatever he undertook, whether in the hospital, in the committee room, or in the countryside, he did with all his considerable might, and neither at work nor at play did he allow matters to drift. A man of wide interests, he had a good singing voice and was excellent at games and field sports. He had been a first-class golfer and a keen fisherman, and with his keen sense of humour he brought a boyish enthusiasm into everything he did which made him a delightful companion and friend. His passing reduces the ranks of the great characters in medicine who have upheld professional traditions in present-day circumstances. He was a power of strength to all, ever ready to help anyone in trouble. He will be sadly missed by all those to whom he was doctor, friend, and counsellor.—P. Q.

D. J. THOMAS, M.R.C.S., L.R.C.P., D.P.H.

Dr. D. J. Thomas, who died at Salisbury on May 4 in his 85th year, was for more than 30 years medical officer of health for Acton.

David Jones Thomas qualified M.R.C.S., L.R.C.P. from the London Hospital in 1899, and, after acting as house-surgeon to Sir Frederick Treves, took the D.P.H. of the English Royal Colleges in 1900 and was appointed medical officer of health at Merthyr Tydfil. In those days there was more drama in public-health work: outbreaks of smallpox and typhoid fever were commonplace, and Dr. Thomas even had to combat an epidemic of typhus. In 1907 he was appointed medical officer of health for Acton, and held the appointment until 1940. During these years he saw great changes not only in the physical appearance of the town but in the whole structure of the preventive-medical services, which he himself did so much to develop. He was one of the pioneers who popularized diphtheria immunization and published several papers on the subject.

Dr. Thomas was born at Newcastle Emlyn, Carmarthenshire, on October 4, 1872, and will be remembered as an intensely patriotic Welshman, as a man of deep religious convictions, and as a distinguished freemason. His life was one of hard work and unselfishness. His hobby was the study of early parochial registers. He married Gwladys Roberts, the Welsh singer, and devoted himself to caring for her during her long illness until her death last year. They had four children, two of whom are doctors.

Medical Notes in Parliament

HEALTH SERVICE CONTRIBUTIONS

The National Health Service Contributions Bill, which was read a second time on May 8 by 303 votes to 230, sets up a separate Health Service contribution (as distinct from the existing system in which this forms part of the National Insurance contribution) and approximately doubles the rate of payment.

The proportion of the cost of the Health Service financed by direct contribution is also increased. Mr. DENNIS VOSPER, Minister of Health, moving the second reading, said that although much of the increase in the total cost of the Health Service (from about £450m. in 1949-50 to an estimated £690m. this year) was due to higher earnings and prices, there had been a substantial increase in real terms. The estimate of £690m., when adjusted to changes in the consumer price index since 1949-50, became £515m.—an increase of about 15%. Of the estimated current cost of £690m. about £550m. would have fallen on the Exchequer, compared with £345m. in 1949-50. This was about 80% compared with the 72% estimated when the original calculations were made in 1946. The Government had therefore decided that this heavy and growing burden was more than the taxpayer could reasonably be expected to bear.

No service could be allowed to impose a completely unlimited annual charge on the Exchequer. It would have been possible to reduce the scope of the Service or to impose further charges on patients. Rather than do this, they had decided that the proper course was to increase the direct contribution in accordance with the rise in earnings and costs. It was better that people should be asked to contribute when well towards the cost of the burden when they were sick. Further, the share of the total cost met from the existing Health Service contribution was now far less than was ever contemplated. When the original Health Service Bill was before Parliament it was expected that the contribution from the Insurance Fund would pay about 20% of the gross cost of the Service. In 1956-7 it provided approximately 6% only; the contribution had remained unchanged at approximately £40m. a year over the past ten years. When the new rates came into force they would be providing only 11½% of the total cost—considerably less than the 20% originally estimated before the Service started. Average earnings to-day were about twice what they were in 1946.

Misunderstanding

The opportunity was also being taken to remove the frequent misunderstanding that all, or none, of the Health Service was financed by weekly contributions. When this Bill was law about three-quarters of the cost would still be found by the taxpayer, and the remainder from contributions, charges, and rates. A single stamp would continue to be used, but on each stamp there would be overprinted the rate of the Health Service contribution. When a new stamp design was introduced words would be incorporated to make it clear that there were separate insurance and health contributions. The same criteria for liability had been adopted as applied to the existing weekly payments—whenever the National Insurance contribution was paid a Health Service contribution would also be collected. The existing Health Service elements were—for a man 10d., a woman 8d., and a juvenile 6d.; for employed persons 1½d. of this was payable by the employer. The new rates were to be man 1s. 8d., woman 1s. 4d., juvenile 1s., with 3½d. of these amounts payable by the employer. Altogether the increased contributions would provide roughly £80m. a year, compared with the present £40m.

Regressive Poll Tax

Miss MARGARET HERBISON (Lanarkshire, North, Lab.) expressed the Opposition's dissent from these proposals, which they regarded as a regressive poll tax. This increased

contribution was only one of many similar actions by the Government, including school meals, welfare foods, and food subsidies, which taken altogether might well mean that families of lower-paid workers would suffer in health because of the resulting lower standard of living, and thus put an additional cost on the Health Service. If the increase in the population and the increase in the number of aged people were taken into account the rise of cost in real terms would be seen to be much lower than the figures the Minister had given.

Dr. DICKSON MABON (Greenock, Lab.) looked forward to the day when there would be no contributory element in the Health Service. Such a contributory principle was all wrong. Socialized medicine rested its case entirely on the concept that the country provided the money according to its ability, and that people in need could go to the Service and obtain it without immediate cost.

Dr. DONALD JOHNSON (Carlisle, Con.) regarded the Bill as a necessity, if a disagreeable one. The effect of making people pay more, and in more direct fashion, for the Health Service would, he hoped, lead to an increasing interest and informed opinion about economies in the Service. General practitioners' surgeries were no longer filled with instruments of healing but were places with files, "in" trays and "out" trays containing specialists' letters from hospitals. The B.M.A. had pointed out that practitioners were complaining that there was a tendency for hospitals to retain unnecessarily patients sent to them for consultation. This was one of the mysteries of the Health Service. Why busy hospitals wished to take on more and more work when they were already stretched to capacity he did not know. Perhaps the most difficult and intractable item in rising costs was drugs. There was undoubtedly an advertising pressure on the general practitioner, which tended inevitably to replace his naturally acquired skill in prescribing and in using what he learned as a student. The problem he thought arose in the medical schools, in the lack of pharmaceutical training.

Mr. JAMES GRIFFITHS (Llanelly, Lab.), in the final Opposition speech, hinted that there might be a case for the State manufacturing drugs, and expressed the Labour Party suspicions that the Government did not merely seek to get £40m. from contributors, but really wanted to establish the Health Service as a contributory system. One of these days there would be an award on doctors' salaries which would probably increase the cost of the Service substantially. Was that to be paid for by the taxpayer, through the Exchequer, or by an increased contribution?

Radio-strontium and Tumours

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked the Prime Minister on May 7 about the possibility that there might be no threshold dose for radio-strontium, and that tests of nuclear weapons might already be responsible for some 50,000 cases of bone tumour in the future, and if he would therefore postpone the proposed British tests.

Mr. R. A. BUTLER, Home Secretary and Lord Privy Seal, who replied, said he assumed that Dr. Stross had in mind certain statements in a report recently published by the Atomic Scientists' Association. He would draw his attention to the very careful reservations made by the authors of this report. They stated that, apart from the considerable margin of error due to lack of adequate data, the estimates were based on the as yet unproved hypothesis of a proportional relationship applying to very small doses; from this point of view they represented the most pessimistic approach. He was informed that the estimates made in this report from the Atomic Scientists' Association were interpretations of factual evidence which was available last year to the Medical Research Council's special committee, but that the latter did not consider it an adequate basis to justify their making such calculations. In these circumstances the Government were not prepared to postpone the proposed tests.

Dr. STROSS said that while there was some doubt the benefit of it must be given to posterity. They had no right to be optimistic about this. The only possible approach was by pessimism. Mr. H. GAITSKELL (Leeds, South, Lab.) suggested that in view of the time that had elapsed since the M.R.C. report, and the statements since made by scientists in various countries, the Council could be asked for a further report to bring the matter up to date. Mr. BUTLER said he was ready to do that, and would discuss it with the Prime Minister, but no relevant new fact had become available, so far as the Government were aware, since that report was published.

Bomb Tests

In the House of Lords on the same day Viscount THURSO asked how many hydrogen bombs had been exploded by Russia and the United States during 1956, and so far this year; the sites of the explosions; the approximate number of people living within 750,000 square miles of them; whether the Government's attention had been drawn to the estimate by the American scientist, Dr. Linus Pauling, that if the British bomb was exploded this year it would result in the deaths of at least 1,000 people; and whether they had any idea of the number of deaths caused by the Russian and American explosions.

The EARL OF HOME, Lord President of the Council, stated that from the beginning of 1956 to the present time 14 nuclear tests by the U.S.S.R. had been reported, and the United States authorities had announced that they had carried out one test series. He could not say how many thermonuclear explosions were included in these tests. The Russian tests were believed to have occurred in south-west Siberia. The U.S. tests took place in the Marshall Islands. It was impossible to give even a rough estimate of the number of people living within 750,000 square miles of the test sites in either case. The Medical Research Council, to whom the Government looked for advice on radiation hazards, took the view that there was insufficient evidence to justify making the kind of estimate which had been attributed to Dr. Linus Pauling. The Government had no information that any deaths had been caused by the U.S.S.R. and/or U.S. explosions during 1956-7.

Lord Cherwell's Strictures

Uninformed comment on the risks to health from hydrogen bomb tests was roundly criticized by Lord CHERWELL in the House of Lords debate on defence on May 8. He said the argument that Britain ought to have thermonuclear weapons but ought not to test them displayed such a degree of technological innocence that discussion was difficult. The argument that the British tests constituted a danger to the health of humanity was unmitigated nonsense. They could not in any circumstances cause any significant increase in the number of stillbirths or in leukaemia or cancer. The excitable and sometimes hysterical people who rushed forward to stop the British tests left out of account that this would prevent Britain having the deterrent which would probably save her from a war costing millions of lives. The highest authorities who had investigated the alleged dangers had stated that the risks were negligible or non-existent. Yet for some reason people tended to believe the views of less knowledgeable men, whose assertions were circulated as though they were the last word on the subject. It was very undesirable that tendentious views, clearly based on wishful thinking and directly at variance with the conclusions of the International Commission on Radiological Protection, should be promulgated as though they were authoritative.

The so-called leading scientists who objected to the British tests should have explained to the Labour Party the distinction between fission of the heavy nuclei, which did form radioactive products that might in sufficient quantities be obnoxious, and the fusion of hydrogen nuclei, which could not in any circumstances produce fall-out emitting rays harmful to man or beast. The gamma rays to which people were exposed from the fission products of all tests

up to date were 150 times weaker than the radiation to which everybody was exposed in the course of nature. To frighten people by making out that this slight increase—two-thirds of 1%—was going to increase the mutation rate by an appreciable fraction was deliberately dishonest. About 10,000 times the amount of gamma radiation caused by the tests to date would be needed to cause sterility in women and about 15,000 times in men.

Strontium-90 seemed to frighten people because it had been linked with the hated word cancer. According to the Medical Research Council's investigations the amount which people had absorbed up to date was 1,000 times less than the amount they considered safe for people working where radium was used. The amounts of ordinary radium in the soil were 60 times greater than the amount of strontium-90 that had been deposited there, and radium was about 10 times as obnoxious as strontium-90. Though radium did not enter the food chain in the same way as strontium, it was, to say the least, striking that 600 times the effective activity appeared to be harmless. Only those with detailed knowledge of the design of the bombs, who knew how much strontium would be produced in the detonation or blanket, could form any idea of the amount that the Christmas Island test would add to the atmosphere. It was monstrous that, lacking this essential datum, anyone should allow the assertion to appear in the press that the debris of every megaton equivalent would kill 1,000 people. He would agree to the United Kingdom not carrying out more tests than the Americans or the Russians, but it would be criminal folly to limit her to fewer tests, and worse than that to delay those on Christmas Island.

Evidence of Strontium Hazards

Mrs. B. CASTLE (Blackburn, Lab.) asked the Minister of Health what further evidence he had received from the Medical Research Council on strontium hazards since its report in June, 1955. Mr. VOSPER stated that he was advised by the Medical Research Council that the present evidence did not lead them to modify the conclusions published in their report in June, 1956. The Council were supporting an increased programme of research on the biological effects.

Mrs. CASTLE said that two scientists, Professor Haddow and Professor Penrose, who signed the Medical Research Council report, had since signed a report by a committee of the Atomic Scientists' Association on strontium hazards in which they stated that new evidence seemed to support the view that there was not a threshold below which there was no danger, but that there was a proportional relationship between each extra fall-out of radioactive material and the number of bone cancer cases. In view of this new report, would the Minister ask the Medical Research Council officially to reconsider the matter with a view to amending their own report? Mr. VOSPER said the Lord Privy Seal had already indicated that he would consider whether the Council should prepare a further report, but the fact remained that all the evidence available about the level of radioactive strontium was that there had been no appreciable increase in the past few months. Dr. EDITH SUMMER-SKILL (Warrington, Lab.) asked whether the Minister's attention had been drawn to the public controversy during the week-end between eminent authorities on ionizing radiation, and whether it was not desirable to reconvene the committee of the Medical Research Council to reconsider the subject. Mr. VOSPER said he was aware of the controversy, but he was advised that there had been no appreciable increase since the report was published.

Alcoholism.—1,053 certified patients were admitted to mental hospitals in 1955 in consequence of alcoholic psychosis or alcoholism. No figures of this kind were available before 1949, when the number was 438.

Clean Air Council.—The Clean Air Council has been constituted, with 29 members. Among them are Dr. L. I. Roberts, Medical Officer of Health of Sheffield, and Professor A. B. Semple, Medical Officer of Health of Liverpool.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending April 27 (No. 17) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	7	0	2	0	1	8	0	1	0	3
Dysentery ..	570	26	323	13	5	1,319	231	195	10	2
Encephalitis, acute	2	0		0		1	0		0	
Enteric fever:										
Typhoid ..	5	0	0	1		2	0	0	3	
Paratyphoid ..	2	0	4(B)	0		7	1	3(B)	0	
Food-poisoning ..	134	12	14	1		190	22		2	
Infective enteritis or diarrhoea under 2 years ..				11	25				10	14
Measles* ..	26,960	1780	213	376	339	1,993	80	217	55	203
Meningococcal infection ..	35	2	12	3	2	27	3	6	1	1
Ophthalmia neonatorum ..	21	0	5	0		27	1	4	0	
Pneumonia† ..	425	22	171	9	1	360	21	199	3	8
Poliomyelitis, acute:										
Paralytic ..	44	5		4	0	10	2		3	0
Non-paralytic ..	19	2			5	5	1			1
Puerperal fever§ ..	248	42	8	1	1	222	22	7	0	2
Scarlet fever ..	542	30	65	39	16	647	50	80	23	15
Tuberculosis:										
Respiratory ..	570	81	371	23		801	109	161	19	
Non-respiratory ..	68	5	14	3		89	6	17	2	
Whooping-cough ..	2,237	84	236	7	59	1,767	109	176	90	132

DEATHS in Great Towns	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute		0			0		0			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	2	1	0	2	0	4	0	0	0	0
Influenza ..	7	0	1	0	0	12	2	1	0	0
Measles ..		0	0	0	1		0	0	0	0
Meningococcal infection ..		0	1				1	0		
Pneumonia ..	228	40	18	14	5	233	39	9	8	10
Poliomyelitis, acute	2	2			0	0	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory ..	47	10	5	2	5	70	5	9	1	2
Non-respiratory ..		0	1	1	0		0	3	1	1
Whooping-cough ..	3	0	0	0	0	0	0	0	1	1
Deaths 0-1 year ..	210	27	15	11	16	216	25	31	7	14
Deaths (excluding stillbirths) ..	5,361	781	583	123	193	5,449	765	592	82	11
LIVE BIRTHS ..	7,767	1160	1122	206	424	7,893	1183	1006	258	439
STILLBIRTHS ..	225	24	24			242	28	20		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

§ Includes puerperal pyrexia.

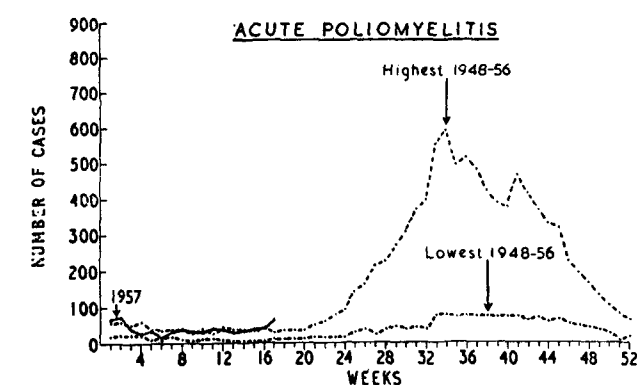
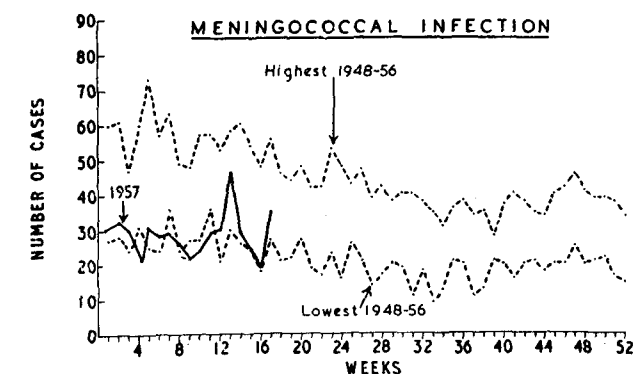
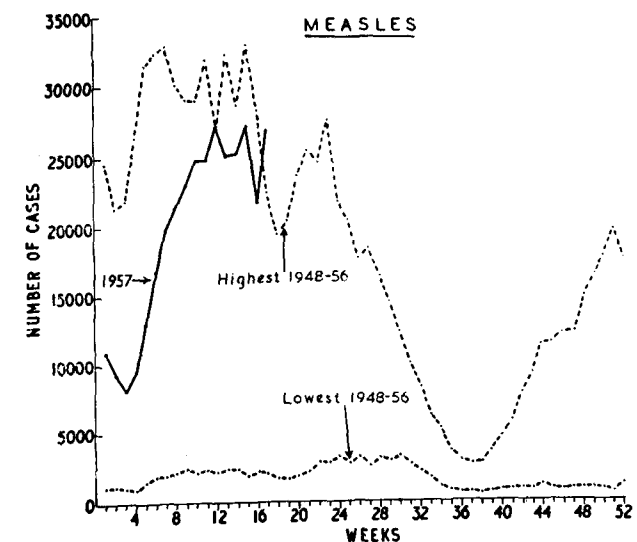
Vital Statistics

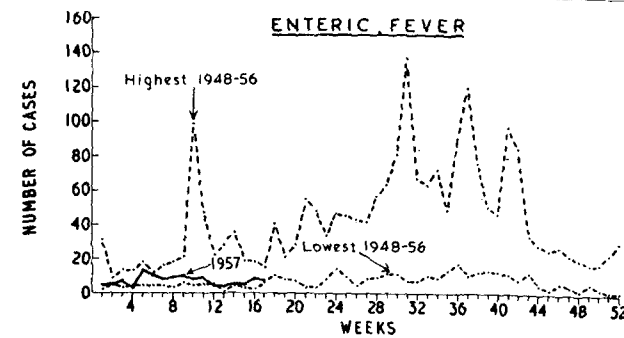
Week Ending May 4

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 480, whooping-cough 2,399, diphtheria 1, measles 23,188, acute pneumonia 447, acute poliomyelitis 60, dysentery 574, paratyphoid fever 1, and typhoid fever 2.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1948-56 are shown thus ----, the figures for 1957 ———. Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.





Infectious Diseases

The largest rises in the notifications in England and Wales during the week ending April 27 were 5,173 for measles, from 21,787 to 26,960, 347 for whooping-cough, from 1,890 to 2,237, and 43 for acute pneumonia, from 382 to 425; the largest falls were 304 for dysentery, from 874 to 570, 73 for food-poisoning, from 207 to 134, and 25 for scarlet fever, from 567 to 542.

63 cases of acute poliomyelitis were notified, and these were 18 more for paralytic and 3 more for non-paralytic cases than in the preceding week. The largest returns were Essex 16 (Colchester M.B. 6, Brightlingsea U.D. 5), Sussex 9 (Brighton C.B. 9), London 7 (Wandsworth 2), and Yorkshire West Riding 5.

Rises of 100 or more in the number of notifications of measles were reported from 16 counties. The towns with large increases included 334 in Birmingham C.B., from 905 to 1,239, 245 in Nottingham C.B., from 115 to 360, 212 in Sunderland C.B., from 227 to 439, 212 in Coventry C.B., from 333 to 545, 115 in Bristol C.B., from 213 to 328, 113 in Ealing M.B., from 98 to 211, 110 in Swindon M.B., from 96 to 206, and the largest decreases were 112 in Liverpool C.B., from 356 to 244, and 91 in Dewsbury C.B., from 180 to 89. The largest rises in the incidence of whooping-cough were 46 in Durham, from 72 to 118, and 44 in Kent, from 143 to 187. The largest declines in the number of notifications of scarlet fever were 25 in London, from 55 to 30, and 24 in Yorkshire West Riding, from 67 to 43. 7 cases of diphtheria were notified, the same number as in the preceding week; 2 of the cases were notified in Plymouth C.B.

No further cases of dysentery were notified from Surrey, Chertsey U.D., where 108 cases were recorded in the preceding week. The other large fall in the number of notifications of dysentery was 106 in Yorkshire West Riding. The largest returns of dysentery were Lancashire 132 (Manchester C.B. 45, Liverpool C.B. 18, Ashton under Lyne M.B. 13, Blackpool C.B. 12), Yorkshire West Riding 107 (Bradford C.B. 31, Leeds C.B. 12, Rotherham C.B. 12), Northumberland 50 (Newcastle upon Tyne C.B. 16, Newburn U.D. 16, Longbenton U.D. 15), Cheshire 49 (Hyde M.B. 25, Stalybridge M.B. 13), Durham 27 (South Shields C.B. 12, Sunderland C.B. 12), London 26, Yorkshire East Riding 24 (Kingston upon Hull C.B. 20), and Essex 20 (West Ham C.B. 11).

In Scotland the number of notifications of dysentery increased by 88, from 235 to 323. The largest returns were Glasgow 154, Lanark county 47, Edinburgh 31, Midlothian county 25, and Aberdeen burgh 17.

Universities and Colleges

UNIVERSITY OF LONDON

The following degrees were awarded by the Senate on March 27:

M.D.—E. A. Boyse, Margaret R. Dix, P. W. G. Tasker.
M.S.—W. J. Atkinson.

UNIVERSITY OF GLASGOW

The following degrees were conferred on April 27:

M.D.—A. S. Douglas (with honours).
Ch.M.—J. W. Sutherland (with honours).

Medical News

Scottish House of the Association.—During the past few years the Scottish House of the Association at 7, Drumsheugh Gardens, Edinburgh, has been undergoing a lengthy process of renovation. The extensive alterations have now been completed, and the President of the Association, Dr. ALEXANDER HALL, officially reopened the House last Tuesday afternoon. About 150 guests were present at the ceremony by invitation of the chairman, Dr. W. M. KNOX, and members of the Scottish Committee.

Bath Hospital for Rheumatic Diseases.—The British Rheumatic Association held a press conference on May 13 to draw attention to the dilapidated condition of the Royal National Hospital for Rheumatic Diseases, Bath. Mr. TOM WILLIAMS, M.P., chairman of the B.R.A., presided at the conference, which was held at the Royal College of Surgeons. The hospital was opened in 1742 and enlarged in the nineteenth century. In 1938 money for new buildings was collected, but rebuilding was prevented by the outbreak of war, states the B.R.A. During the war a wing was destroyed by bombing. When the hospitals were nationalized in 1948 £130,000 of the hospital's endowment funds, including £89,000 subscribed specifically for its rebuilding, was appropriated by the Ministry of Health for the central hospitals endowment fund, and this money is now said to have "lost its identity." In spite of this, and of approaches to both the Ministry of Health and the South-western Regional Hospital Board, no decision has yet been taken about financing the hospital's rebuilding. "It is obvious to all connected with the hospital," states the B.R.A., "that it cannot continue to serve the community in its dilapidated state. If the hospital is to continue its unique specialist functions in the future, either one of two actions is of the utmost urgency: (a) the regional board to give it top priority for immediate rebuilding as a regional operation, or (b) the Minister of Health to direct—as he is empowered to do—that the hospital shall be rebuilt, as a first priority, from central finances."

More Children Eligible for Polio Vaccination.—The Minister of Health has now sanctioned the vaccination of children born in 1955 and 1956. In a circular to local health authorities, acquainting them of this and of his decision to continue the distribution of the vaccine during the summer polio season (see p. 1178 of this issue), the Minister states that the Central and Scottish Health Services Councils' joint committee on poliomyelitis had advised that these children, and those born in the years 1947-54 and not so far registered, were those to whom vaccination should next be offered. As, however, continues the circular, there is unlikely to be enough vaccine for some time to come to provide for all the children in these categories whose parents desire their vaccination, a two-phased operation is suggested. First, authorities should find out how much vaccine will be needed for the children born in 1955 and 1956, notifying the Ministry by August 1. This amount of vaccine will then be supplied as soon as the inoculation of the originally registered children has been completed. Then would come the turn of the children born between 1947 and 1956 who were not registered during last year's campaign. The precise timing of these children's vaccination will depend on the availability of vaccine and local arrangements.

Perinatal Mortality Survey.—The National Birthday Trust Fund is planning a nation-wide survey designed to throw light on the aetiology and prevention of perinatal deaths. After obtaining the sanction of all concerned with the maternity services—hospital boards and committees, local health authorities, general practitioners, and relevant professional bodies—the Trust will ask midwives and health visitors to collect data on births in England, Wales, and Scotland during a week in November. It is hoped that pathologists will also assist by providing necropsy reports on perinatal deaths during this period. Information will be sought on

such factors as previous obstetric history, antenatal supervision (including pelvic radiography) and abnormalities detected, the course of labour, post-natal progress, etc. The survey is being directed by Dr. NEVILLE BUTLER, a paediatrician, assisted by a steering committee under the chairmanship of Miss JOSEPHINE BARNES, F.R.C.O.G. The steering committee includes representatives of the B.M.A., the Royal College of Obstetricians and Gynaecologists, the College of General Practitioners, the Society of Medical Officers of Health, and the Royal College of Midwives, as well as observers from the Health Ministries and the Central Midwives Board. Dr. J. W. B. DOUGLAS, director of the National Survey of the Health and Development of Children and a senior lecturer at Edinburgh University, will supervise the survey in Scotland. Further information about the survey will be sent to those concerned during the next few weeks.

Tenth World Health Assembly.—Professor JACQUES PARISOT, the out-going president, honorary dean of the medical faculty at Nancy, opened on May 7 the Tenth World Health Assembly in Geneva. After Professor Parisot's speech of welcome, Mr. DAG HAMMARSKJÖLD, secretary-general of the United Nations, addressed the Assembly, drawing attention to the close relationship between W.H.O.'s work for health and the efforts of the United Nations and its other specialized agencies against poverty, ignorance, injustice, and war. "Medicine," he said, "is more and more concerned with the whole man, the physical and psychological unity in its total environment." The Assembly was attended by delegations from most of W.H.O.'s 88 member States. On May 8 the Assembly met in plenary session to hear Dr. S. H. AL-WAHBI's presidential address and to discuss the report of the director-general of W.H.O., Dr. M. G. CANDAU (see *Journal*, May 4, p. 1071). Dr. Al-Wahbi, a former Minister of Health for Iraq, is at present director of Karkh Hospital, Bagdad; last year he was chairman of W.H.O.'s executive board. Among other officers elected by the Assembly were Dr. DONALD A. CAMERON, the Australian Minister of Health, as one of the three vice-presidents; and Dr. B. M. CLARK, deputy chief health officer, South Africa, as chairman of the programme and budget committee. At the close of his speech introducing his report on W.H.O.'s work in 1956, Dr. Candau gave a special welcome to the delegation from Ghana, admitted a member State on April 8.

London Fluoridation Council.—Dr. J. L. PATTON, M.O.H. for Hendon, Mr. R. B. D. STOCKER, a London dentist, and Dr. J. GREENWOOD WILSON, M.O.H., City and Port of London, under the title "London Fluoridation Council," are asking for the support of local householders in lodging a complaint about the low level of fluorine in London's water. According to the Fluoridation Council's circular letter to householders, the Metropolitan Water Act of 1852 provides "that the Minister of Housing and Local Government may appoint a person to inquire into any complaint by 20 or more householders as to the quantity or quality of the water supplied. If the complaint appears to be well founded the Minister must notify the Board (Section 12), which must then remove the grounds for complaint (Section 13)." The letter states that the fluorine concentration of London's water is below 0.3 part per million, "which is practically negligible." Householders are asked to sign a declaration, addressed to the Ministry of Housing and Local Government, complaining that the water supplied by the Metropolitan Water Board contains less fluorine than one part per million. The address of the London Fluoridation Council is given as 73, Harcourt Terrace, London, S.W.10.

Suggestions to Authors.—The *Biochemical Journal* has just issued a revision of its "Suggestions to Authors" on "Chemical Nomenclature and Abbreviations, Symbols, Usages, and Conventions." This 16-page reprint will be most helpful to many medical writers, and to editors of medical and scientific journals. Copies can be obtained on application to *The Biochemical Journal*, The Lister Institute of Preventive Medicine, Chelsea Bridge Road, London, S.W. (price 1s. 6d. post free).

British Hospital in Paris.—Lady ALEXANDER, wife of Field-Marshal Lord Alexander, reopened the former Hertford British Hospital in Paris on May 4 as a British military hospital. The hospital was closed in 1952 owing to lack of funds, but it has since been reconstructed and now has 60 beds. Although a military hospital, with a permanent R.A.M.C. staff, civilian members of the British community in Paris will have access to beds and out-patient facilities.

F.R.F.P.S.—At a meeting of the Royal Faculty of Physicians and Surgeons of Glasgow on May 6, the following were admitted fellows: *Qua* physician, V. Benjamin and J. W. Howie; *Qua* surgeon, B. T. Hammond, J. D. L. KIRSTEIN, C. J. Longland, and M. S. Tin.

British Association of Physical Medicine.—About 80 members attended the association's annual meeting, which was held at the Middlesex Hospital on April 5 and 6. Dr. P. BAUWENS, the president, was in the chair. On the first day the principal event was a discussion on the treatment of poliomyelitis, but in addition five short papers were read. Two of these concerned lesions of the tendons in rheumatoid arthritis. Dr. J. H. JACOBS (St. Stephen's Hospital, Chelsea) described seven cases in which tenosynovitis was the primary manifestation of the disease, four of which had been operated upon before the true diagnosis became apparent. Dr. D. A. BREWERTON (King's College Hospital) had found a history of trigger finger in just over a third of 300 patients with rheumatoid arthritis. Usually the condition cleared up spontaneously, but he emphasized how commonly minor lesions of the flexor tendons in the hand gave the first clue to a diagnosis of rheumatoid arthritis. On the second day clinical cases were shown. The annual dinner was held at the Royal College of Surgeons on April 5 (see *Journal*, April 13, p. 899).

The Brompton Hospital.—Sir CLEMENT PRICE THOMAS, presiding at the sixth annual dinner of the Brompton Hospital Association on May 10, paid a warm tribute to the memory of those pioneers of chest surgery, Mr. TUDOR EDWARDS and Mr. J. H. ROBERTS.

British Occupational Hygiene Society.—Dr. P. PRINGLE, chief medical officer of the Central Electricity Authority, assumed office as president during the Society's seventh conference, held in London on April 16 and 17. He succeeds Dr. C. G. WARNER, of the National Coal Board. At the conference eight papers were read on instruments used in safeguarding the health of industrial workers. A full report of the conference will appear in the June issue of *Instrument Practice*, extra copies of which may be obtained from the Society's scientific secretary, Dr. D. J. TURNER, M.R.C. Laboratories, Holly Hill, Hampstead, London, N.W.3.

Birmingham Medical Institute.—The Institute is closing its library and office at 154, Great Charles Street, and reopening on May 27 at 36, Harborne Road, Edgbaston. The regional office of the B.M.A., the Birmingham office of the Medical Insurance Agency, and the Birmingham local medical committee are among other organizations moving to 36, Harborne Road at the same time. From June 1 the facilities of the library of Birmingham University will be available to members of the Institute.

Assistant D.-G. of W.H.O.—Dr. W. A. TIMMERMAN has been appointed assistant director-general of W.H.O. in charge of central technical services. He succeeds Dr. H. S. GEAR. Until his appointment in 1950 as director of W.H.O.'s division of therapeutical substances, Dr. Timmerman had been for 16 years director of the Netherlands National Institute for Public Health.

Professor Arne Tiselius was one of four distinguished scientists elected as foreign members of the Royal Society on May 9. Dr. Tiselius has been professor of biochemistry at Uppsala University, Sweden, since 1938 and has made important contributions in the field of physicochemical analysis.

COMING EVENTS

Tissue-grafting.—Discussion on research, B.B.C. Third Programme, May 22, 8.25 p.m., repeated May 23, 6 p.m. Professor P. B. MEDAWAR, F.R.S., will be the chairman, and among the panel will be Professor M. F. A. WOODRUFF, F.R.C.S., and Dr. J. F. LOUIT.

Fourth European Congress of Dietetics.—Madrid, September 26–28. Details from the secretary-general, Dr. E. A. VALLEJO, Dirección General de Sanidad, Plaza de España, Madrid. Apply before June 1.

Institute of Dermatology.—June 5 to 29, semi-permanent exhibition on "The Xanthomatoses."

International Society for the Welfare of Cripples.—Seventh world congress, London, July 22–26, followed by annual study tour (July 27–August 3). Details from Mr. D. GUTHRIE, 34, Eccleston Square, London, S.W.1.

NEW ISSUES

British Journal of Venereal Diseases.—The new issue (Vol. 33, No. 1) is now available. The contents include:

EDITORIAL.
OCCURRENCE OF LATE SYPHILIS IN UNTREATED SYPHILITIC PATIENTS. József Tówpik.
COMPARATIVE STUDIES ON THE HISTO-PATHOLOGY OF SYPHILIS, YAWS, AND PINTA. C. M. Hasselmann.
CONGENITAL SYPHILIS IN ONE OF TWINS. Sydney M. Laird.
ON THE TREATMENT OF EARLY FORMS OF SYPHILIS. N. S. Smelov.
PRELIMINARY REPORT ON A COMPLEMENT-FIXATION TEST FOR TREPONEMATOSIS (TWR). J. N. Orpwood Price and M. J. Whelan.
FURTHER ASSESSMENT OF CARDIOLIPIN ANTIGEN BY PARALLEL TESTING AGAINST STANDARD ANTIGEN IN ROUTINE WASSERMANN REACTIONS. Sidney Shaw.
COMPARISON OF THE RESULTS GIVEN BY A COMPLEMENT-FIXATION TEST FOR SYPHILIS USING THE REITER TREPONEMA AS ANTIGEN WITH THE TREPONEMAL IMMOBILIZATION TEST. A. E. Wilkinson.
LUMBAR PUNCTURE HEADACHE IN RELATION TO SEX, AGE, AND CEREBROSPINAL FLUID FINDINGS. C. B. S. Schofield.
GONOCOCCAL INFECTION IN TEEN-AGED GIRLS AND MATURE WOMEN. Leopold Z. Goldstein.
BENZATHINE PENICILLIN G IN THE CONTROL OF GONORRHOEA. Carl E. Hookings and L. M. Graves.
TREATMENT OF NON-GONOCOCCAL URETHRITIS. E. E. Prebble.
LYMPHOGANGLIOMA INGUINALE IN THE MALE IN LIVERPOOL, ENGLAND, 1947–1954. C. D. Alergant.
TREATMENT OF NON-GONOCOCCAL URETHRITIS WITH NOVIOICIN. R. R. Wilcox.
EXTRACT FROM THE ANNUAL REPORT OF THE CHIEF MEDICAL OFFICER FOR THE YEAR 1955.
BOOK REVIEWS.
ABSTRACTS.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Abstracts of World Medicine.—Issued in the first week of each month, this journal contains abstracts of important papers selected from the current medical literature of the world. Annual subscription £4 4s., single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, May 20

LONDON UNIVERSITY.—At Wright-Fleming Institute Lecture Theatre, St. Mary's Hospital Medical School, 5 p.m., special university lecture in medicine by Professor G. W. Thorn (Harvard): Studies on Aldosterone Secretion in Man.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. W. S. C. Cope-man: Steroid Treatment in Rheumatoid Arthritis.

Tuesday, May 21

DUBLIN UNIVERSITY.—TRINITY COLLEGE.—At Anatomy Theatre, 4.30 p.m., John Mallet Purser Lecture by Professor A. H. Schultz (Zurich): Past and Present Views of Man's Specializations.
LIFORD MEDICAL SOCIETY.—At King George Hospital, 8.45 p.m., annual general meeting followed by cocktail party.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. D. O'Neill: Emotional Aspects of Skin Diseases (I).
LIVERPOOL UNIVERSITY.—FACULTY OF MEDICINE.—At Surgery Theatre, Old Medical School, 5.15 p.m., Professor J. B. S. Haldane, F.R.S.: Idiocy, syncrasy, or Genetics and Medicine.
LONDON UNIVERSITY.—At Wright-Fleming Institute Lecture Theatre, St. Mary's Hospital Medical School, 5 p.m., special university lecture in medicine by Professor G. W. Thorn (Harvard): Some Effects of Adrenal Cortical Steroids on Intermediary Metabolism.
MEDICAL RESEARCH COUNCIL.—At National Institute for Medical Research, Mill Hill, N.W., 5 p.m., Dr. Paul C. Zamecnik (Boston): Recent Studies on Protein Synthesis.
MIDDLESEX HOSPITAL.—4 p.m., Sanderson-Wells Lecture by Dr. R. F. Milton, Ph.D., F.R.I.C.: Trace Elements in the Biological Relationship of Soil, Plant, and Animal.

SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bolingbroke Hospital, Wandsworth Common, S.W., 8.30 p.m., Bolingbroke Lecture by Professor C. G. Rob: Advances in Cardiovascular Surgery.
UNIVERSITY COLLEGE LONDON.—At Chemistry Theatre, Gower Street, W.C., 5.30 p.m., Walter VanDyke Bingham Lecture by Sir Cyril Burt: Inheritance of Mental Ability.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY.—5.30 p.m., Mr. L. C. Oliver: Surgical Aspects of Head Injuries.

Wednesday, May 22

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—8 p.m., symposium by Dr. A. M. Spencer, Dr. C. A. H. Watts, and Dr. G. A. Wray: Who Should be Sent to a Mental Hospital?
BRITISH ASSOCIATION OF SPORT AND MEDICINE.—At London Hospital Medical College, 5.30 p.m., Sir Adolphe Abrahams: Stitch and Cramp.
EUGENICS SOCIETY.—At Royal Society, Burlington House, Piccadilly, W., 5.30 p.m., Mr. C. M. Stewart, F.I.A., F.S.S.: Population Problems in the British Caribbean.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. I. A. Magnus: Epidermal Energy Relationships in Health and Disease.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. J. Smart: Pleural Neoplasms.
KING'S COLLEGE.—5.15 p.m., Halliburton Lecture by Professor A. von Muralt (Berne): Chemical Aspects of Nervous Excitation.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. B. A. D. Stocker: Heritable Transformations of Bacteria.

Thursday, May 23

HONYMAN GILLESPIE LECTURE.—At Anatomy Theatre, University New Buildings, Edinburgh, 5 p.m., Professor J. C. Goligher: Surgery of Ulcerative Colitis.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. D. O'Neill: Emotional Aspects of Skin Diseases (II).
LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of London, 8.30 p.m., Mr. M. A. Falconer: Advances in Surgical Treatment of Temporal Lobe Epilepsy.
NUFFIELD ORTHOPAEDIC CENTRE.—At Winfield-Morris Orthopaedic Hospital, 8.30 p.m., Mr. W. Waucho: Pathology of the Tarsal Navicular: A Clinical and Laboratory Study.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute, 5 p.m., Dr. S. Udenfriend (U.S.A.): Biogenesis and Metabolism of 5-Hydroxytryptophan.

Friday, May 24

BIOCHEMICAL SOCIETY.—At Department of Biochemistry, Physiology Institute, Newport Road, Cardiff, 2 p.m., 362nd meeting.
●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. J. S. Pegum: clinical demonstration.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. F. H. Young: clinical demonstration.
INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—3.30 p.m., Mr. G. H. Howells: Sinusitis.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—10 a.m., Mr. E. G. Muir: Pathology, Treatment, and Results in Malignant Disease of the Large Bowel.
●ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS.—5 p.m., William Blair-Bell Memorial Lecture by Mr. C. W. Taylor: Mesodermal Mixed Tumours of the Female Genital Tract.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Mr. S. Bender: Obstetric Problems in General Practice.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Herbertson.—On April 27, 1957, at Cambridge, to Margaret and Basil Herbertson, a son—Michael Jonathan.
MacTaggart.—On May 4, 1957, at Torbay Hospital, Torquay, to June M.B., Ch.B., D.P.H., and Douglas MacTaggart, M.B., Ch.B., D.P.H., of Broadwater, Preston, Paignton, Devon, a son.
Quamina.—On April 13, 1957, at the Colonial Hospital, San Fernando, Trinidad, B.W.I., to Dr. Elizabeth (formerly Smith), and Dr. David Quamina, a daughter—Jacqueline.
Rainford.—On May 5, 1957, at Aughton, Lancs, to Janet, wife of Dr. F. A. Rainford, a daughter—Alison Jean.
Smith.—On May 10, 1957, at West Hill Hospital, Dartford, Kent, to Pat (formerly Frisby), M.B., B.S., wife of the Reverend R. Allington Smith, M.A., a son—Jeremy Richard.

DEATHS

Auden.—On May 3, 1957, at Repton, Derbys, George Augustus Auden, M.D., Ph.D., F.R.C.P., D.P.H., aged 84.
Condon.—On April 30, 1957, in London, Gerald Fitzgerald Aloysius Condon, L.R.C.P. & S.I. & L.M., Lieutenant-Colonel, I.M.S. (retired), late of Ballyshannon, Co. Donegal.
Cory.—On May 5, 1957, at Bournemouth, Hants, Evan James Trevor Cory, O.B.E., T.D., M.D., Lieutenant-Colonel, R.A.M.C. (retired), formerly of 38, Hyde Park Gate, London, S.W., aged 95.
Couppland.—On May 1, 1957, at Winchester, Hants, James Alane Couppland, M.B., F.R.C.S.
Fry.—On May 1, 1957, the result of an air accident, Richard Oswald James Fry, M.R.C.S., L.R.C.P., Major, R.A.M.C., aged 35.
Harris.—On April 26, 1957, Louis Harris, M.B., B.Ch., of 141, Castelnau, London, S.W.
Hughes.—On April 16, 1957, Clement Alston Hughes, M.D., of Bolton-le-Sands, Lancs, formerly of Liverpool.
Murray.—On April 28, 1957, Percy Hope Murray, M.B., C.M., of Oakhurst, Hambledon, Hants, aged 88.
Panton.—On April 26, 1957, at The Court Nursing Home, Malvern, Worcs, Henry Forbes Panton, D.S.O., M.C., M.B., Ch.B., Colonel, late R.A.M.C., retired, of Ham Court, Upton-on-Severn, aged 71.
Pratt.—On April 24, 1957, at 35, Chartfield Avenue, Putney, London, S.W., Eldon Pratt, M.D., aged 87.
Randolph.—On May 1, 1957, William Henry Randolph, M.R.C.S., I.R.C.P., of Wiveliscombe, Somerset.
Wilson.—On April 27, 1957, in hospital, William Wilson, M.D., of Cald, Marine View Crescent, Rhos-on-Sea, Denbighshire, formerly of Manchester.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Cause and Treatment of Stitch

Q.—What are the causes, treatment, and prevention of stitch? A boy of 16 finds his efforts at cross-country running frustrated by this symptom, particularly in the more important races.

A.—Stitch probably results from a tugging of the diaphragmatic attachments of the peritoneal ligaments which suspend the liver, spleen, and stomach. Sinclair¹ has ably reviewed the evidence for this conclusion and confirmed such previously known facts that shoulder pain may be associated with stitch, that it may shift from right to left following a meal, and that it is provoked by deep expiration and relieved by deep inspiration; it is also relieved by assuming the upside-down posture.

There are no measures that can guarantee freedom from stitch, which sometimes troubles the most experienced runners. It occurs less frequently if the subject is well trained for the distances over which he is racing, if he avoids a lengthy and hence a bounding stride, and does not eat a meal within three hours of racing. When stitch occurs it may sometimes be eased by breathing more deeply, but it may be necessary to stop racing and bend the trunk forwards for some seconds until the pain eases and running may be resumed.

REFERENCE

¹ Sinclair, J. D., *N.Z. med. J.*, 1951, 50, 607.

Agranulocytosis from Drugs

Q.—When giving drugs under domiciliary conditions which are known to carry a risk of agranulocytosis, how often should a blood count be done and what other precautions should be taken? To what level may the leucocyte count safely be allowed to fall before stopping the drug?

A.—There seems to be no practical way of predicting whether a particular patient will develop serious agranulocytosis when treated with a drug known to produce this complication. The reason for this is that in the majority of cases bone-marrow depression leading to agranulocytosis appears to come on suddenly. There seems to be little information on how rapid is the consequent decline in the leucocyte count in the circulating blood, but it seems likely that the neutrophil count falls from normal levels to a few hundreds, or less, per cubic mm. within 48 hours. This means that leucocyte counts carried out at intervals of a week or more can seldom be expected to detect agranulocytosis before it actually happens. More frequent counts are no doubt impracticable. Indeed, unless counts are done daily there seems little point in carrying them out at all. A better course would seem to be to impress on the patient that should he develop any new symptoms or untoward reaction—e.g., sore throat, temperature, skin rash, etc.—he should immediately stop taking the drug and report without delay to the doctor supervising the treatment, who could then arrange for a blood count to be carried out. The drug should be withheld until the result is known.

Certain drugs—e.g., sulphanilamide and thiouracil—as well as producing acute agranulocytosis, have been shown to produce not infrequently moderate (and apparently harmless) degrees of symptomless leucopenia. Even so, the total leucocyte count rarely fell below 3,000 per cubic mm. The sulphonamide derivatives and antithyroid drugs now in use may do the same. However, it was found that the moderate leucopenia produced by thiouracil might become less severe

even if the patient continued taking the drug, and that the development of leucopenia did not by any means mean that the patient might develop serious agranulocytosis (or that patients who did not develop leucopenia might escape agranulocytosis). The undertaking of routine blood counts in order to detect symptomless leucopenia thus does not seem to be a useful procedure.

Cancer in Chronic Alcoholics

Q.—How does the incidence of cancer at different sites differ in chronic alcoholics from that found in the general population? Are there any types of cancer known to be less frequent in alcoholics?

A.—The incidence of cancer at different sites in the body has not been fully studied in relation to chronic alcoholism, and statistical analysis has up to date been incomplete. There is a correlation between cancer of the pharynx and cancer of the larynx and alcoholism; these forms of cancer seem to be commoner in those who take alcohol habitually and in excess than they are in abstainers. Cancer of the mouth also seems commoner in those addicted to spirits than in others, a view supported by evidence provided by Professor E. L. Wynder and Dr. I. D. Bross elsewhere in this issue (p. 1137). It has been suggested, also, though it has not been clearly proved, that carcinoma of the oesophagus is commoner in spirit drinkers, and a similar relationship has sometimes been thought to exist in cancer of the stomach.

A cirrhotic liver is more prone to malignant disease than is a liver free from cirrhosis, and consequently a relationship might be predicted between chronic alcoholism and primary liver cancer, though the relative rarity of this last disease in this country makes it unlikely that the increased risk of cancer of the liver to which the chronic alcoholic is exposed is a very important or notable hazard here.

Amateur Boxing Queries

Q.—What are the points to look for in deciding whether a boxer who has taken several counts should be allowed to box on? If a boxer is unable to walk back to his corner after a knock-out, should the M.O. insist on his being removed from the ring on a stretcher? Is adrenaline still the best haemostatic to use for cut eyebrows, etc.?

A.—If a boxer is knocked down and on rising is obviously unable to defend himself, the bout should be stopped immediately. It should also be stopped if he staggers on rising or hangs on to the ropes. If a boxer is unable to walk back to his own corner after a knock-out he should be carried to his corner, and if he is unable to leave the ring on his own he should be removed on a stretcher.

Adrenaline solution is still the safest haemostatic to be used for cut eyebrows.

The London Amateur Boxing Association (69, Victoria Street, London, S.W.1) issues full notes on the treatment of boxing injuries and the physical standards for amateur boxing. These will be sent gratis to any doctor applying for them.

Prolonged or Repeated Courses of Cortisone

Q.—In using cortisone for an acute exacerbation of a chronic condition how long is it wise to continue the drug, and what risk is there attached to repeated courses? Similarly, how advisable are repeated applications of cortisone by nasal spray for allergic rhinitis?

A.—Cortisone may often be given for long periods without harm, provided overdosage is avoided. This may be indicated by oedema, low serum potassium, mental changes, or deterioration in other ways. The greater dangers arise at the end of the course, when too sudden withdrawal may lead to a flare-up of the original condition or to a state of temporary adrenal deficiency. The latter is due to the fact that prolonged cortisone medication leads to adrenal cortical atrophy; when the drug is withdrawn, the patient's

own adrenals are for a time unable to produce the normal supply. Stoppage of the drug should therefore be gradual, the dose being progressively reduced over one or two weeks.

There is no additional risk from repeated courses. Some disorders respond less well a second time, but sensitivity to the drug does not develop.

The amount of cortisone absorbed from a spray in allergic rhinitis would be small and unlikely to have any adverse systemic effects.

Mental Exercise

Q.—What is the general educational value, in terms, for example, of increased mental agility and ease of association, of regular attempts to solve difficult crossword puzzles? Has there been any research work on this so far as children are concerned?

A.—How much does doing one thing help us to do something else? The answer used to be, "A great deal." But this is not so any longer. One of the arguments advanced in favour of the old type of classical education was that translating from and into an ancient language was good "mental exercise." Similarly, geometry was good practice in reasoning and so on. William James carried out one of the early investigations on transfer of training, as it is called, at the close of the nineteenth century. His subjects were used to discover whether memorizing one thing made people any better at memorizing other things. His results were entirely negative. More recent work has, on the whole, given similar results, and the whole argument seems to have been based upon the fact that the abler pupils tended to have a more rigorous academic course at school, and tended to do well in after life whatever their job might be. They did well, however, not because of their rigorous schooling but because of their ability. As one research worker in this field put it, "If the abler pupils should all study physical education and dramatic art, these subjects would seem to make good thinkers. These were, indeed, a large fraction of the programme of studies for the best thinkers the world has produced, the Athenian Greeks."

It is, however, true that common elements and techniques exist between many different kinds of task. Through these common elements and techniques one field of study may produce valuable results in another. So far as crossword puzzles are concerned, it is clear that by doing them we enlarge our vocabularies, though the words we learn may not come readily into ordinary conversation or writing. We should also acquire a certain resourcefulness in trying out different kinds of solution. This would certainly help us in decoding a cipher, and the persistence and ingenuity required might confer still further general benefits.

To sum up, we should not look for too much of general educational value from our crossword puzzles, but we may expect something. In any case, they are good fun and worth doing for their own sake.

Vocational Guidance for the Mentally Retarded

Q.—Where may skilled advice be obtained on the type of employment likely to be suitable for a patient who is somewhat mentally retarded? What agencies exist to help such people find the type of employment recommended?

A.—Many institutions for the care of mental defectives now make it their chief aim to train these patients in simple industrial tasks and to help them to become self-supporting members of the community. Psychological assessment and vocational advice are given at out-patient clinics run in conjunction with these hospitals. For those who are not in institutions but who are too severely handicapped to enter normal employment there exist some 272 occupation centres which provide training in manual skills. These are controlled by the local health authorities (in London, by the Mental Health Department of the L.C.C.). Where the handicap is less severe, advice on suitable employment can

be obtained at the local youth employment bureau of the Ministry of Labour. Older patients should first be registered as disabled persons, after which they can receive advice and preferential employment through the disablement rehabilitation officer at the Labour Exchange. Advice on special cases can also be had from the National Association for Mental Health, 39, Queen Anne Street, London, W.1.

"Wind" in the Young of Mammals

Q.—Human infants are distressed if their "wind" is not brought up after feeds, and often this is a laborious process which makes a sleepy child restless and irritated. Other mammals seem to suckle their young without such troubles. Has the human body some peculiar defect to account for this, or is the difficulty with our infants due to some departure in our habits from the natural?

A.—It is probable that most mammals swallow air when eating and drinking. It is difficult to see how it could be otherwise, and indeed calves have been observed to belch after suckling.

It is possible that the problem is more acute in the human baby because in its case a full meal is taken in a limited time. Many other mammals are suckled intermittently, so that the amount of air and food in the stomach at any time is likely to be less, and a fully distended stomach, such as must commonly occur in the human baby after a full feed, must be rare. The wind can be brought up without much trouble in most human babies if it is done after about two-thirds of the full feed and again at the end of feeding. It is uncommon for a baby to have difficulty in eructating air, but if it does the infant will then often be uncomfortable. There is no reason to suppose that such a difficulty is due to any aberration in human anatomy or habit.

NOTES AND COMMENTS

No Diastolic Reading.—Dr. F. M. RIFKIN (Salford) writes: I was interested in the question on the diastolic reading ("Any Questions?" April 6, p. 840). This is a phenomenon that every doctor notices and is unable to explain. I have found from my own experience that a low diastolic pressure of between 40 and 60 mm. Hg can be obtained in nearly if not all of these cases by using extremely light pressure with the stethoscope on the brachial artery. I have come to the conclusion that where people have these "soft" pulses with low diastolic pressures, even medium pressure with the stethoscope can continue to act on the brachial artery in place of a sphygmomanometer cuff. This is a simple matter to prove, because in cases where it is impossible to obtain a diastolic reading, even if it is 80 or 90 mm. Hg, if one puts a stethoscope on the brachial artery without using the sphygmomanometer cuff and listens, gradually increasing the pressure of the stethoscope on the brachial artery, one will hear the diastolic come through.

Correction.—Last week on p. 1133 we wrongly stated that Dr. H. L. Glyn Hughes had retired as S.A.M.O. of the South-east Metropolitan Regional Hospital Board. He retires on October 31.

Books of "Any Questions?" and Refresher Course Articles.—The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices include postage. *Any Questions?* Volumes 2 and 3 (8s. each); *Refresher Course for General Practitioners*, Volumes 2 and 3 (26s. 6d. each inland, 26s. overseas); *Clinical Pathology in General Practice* (22s. 3d. inland, 21s. 9d. overseas).

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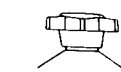
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BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 25 1957

RECENT WORK ON LEUKAEMIA IN MAN*

BY

L. J. WITTS, M.D., F.R.C.P.

Nuffield Professor of Clinical Medicine, University of Oxford

In this lecture I shall confine myself to human leukaemia, and in particular to recent work on the aetiology, course, and treatment. This work has been mainly inspired by two events. The first is the apparent steep rise in the incidence of leukaemia in Western Europe, North America, and Australasia. The second is the discovery of new and powerful drugs for the treatment of acute and chronic leukaemia. Connecting these two events is the use of the numerical or statistical method to study the incidence of leukaemia at different epochs and in different places, to define the natural history of the disease and its individual variations, and to control the large-scale trials which have proved to be necessary if methods of treatment are to be satisfactorily evaluated.

Classification of Leukaemia

So far I have talked about leukaemia, but in fact we should talk about the leukaemias, for the different forms of leukaemia differ from each other at least as much as the different forms of malaria. The classification of leukaemia offers difficulties, some of which are semantic and others technical. The two parameters used in classification are the acuteness of the disease process and the type of cell involved. Demographers are not fond of the words "acute" and "chronic," and it must be confessed that the definitions given by the Committee for Clarification of the Nomenclature of Cells and Diseases of Blood-forming Organs in 1950 have not proved entirely adequate to deal with the subsequent course of events. With modern therapy an occasional acute leukaemia may last for more than five years, or longer than many patients with chronic leukaemia.

The type of cell involved in acute leukaemia is also sometimes difficult to decide. Fashions in the diagnosis of myeloblastic, lymphoblastic, monocytic, and erythroblastic leukaemia have changed too often for one to have much confidence in *ex cathedra* statements based on a look down the microscope. It is probable that in atypical cases a group of characteristics should be determined before a decision is made—the microscopical appearances of the cells, their physical, histochemical, and immunological reactions, and their cultural characteristics. This would be impracticable as a routine procedure, but it might be of value if it was used as a method of sampling from time to time to keep a check on working diagnoses.

In the seventh revision of the *International List of Causes of Death* leukaemia is classified under the headings of lymphatic leukaemia, myeloid leukaemia, mono-

cytic leukaemia, acute leukaemia, and other and unspecified leukaemias. Acute leukaemia includes all forms of acute leukaemia whether the type of cell is specified or not, with the exception of monocytic leukaemia, which is treated as a separate entity. This is probably as far as the demographers are justified in going at present, and it must be left to the haematologists to discover methods of differentiating the subgroups of acute leukaemia which will stand up to statistical appraisal.

Incidence of Leukaemia as a Whole

With this knowledge in mind we can now turn to recent figures for overall death rates from leukaemia. The rate of increase of leukaemia as a recorded cause of death in Western Europe and North America has been greater than that of any other disease except lung cancer and coronary thrombosis. The figures of the

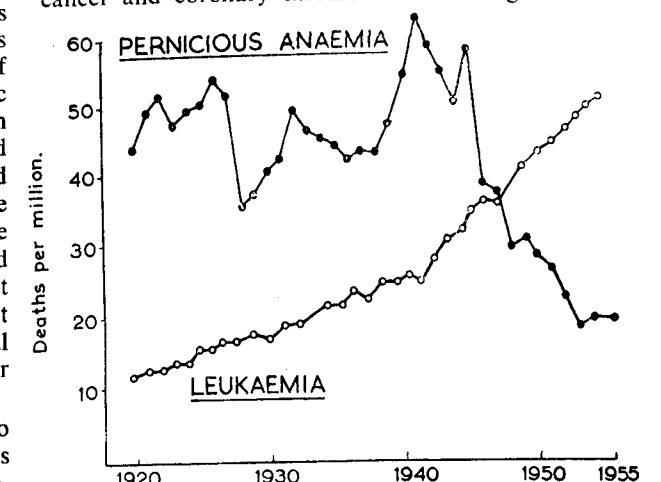


FIG. 1.—Death rates per million from leukaemia and pernicious anaemia for all persons in England and Wales over the years 1920-55. The data are taken from the Registrar-General's *Statistical Reviews*.

Metropolitan Life Insurance Company of New York (1955) show a rise from 1.8 to 4.7 per 100,000 in their policy-holders between 1930 and 1951. In England and Wales the incidence was more than two and a half times as high in 1953 as in 1931 (Hewitt, 1955) (Fig. 1). Nevertheless, the fear of leukaemia should not blind us to the fact that it is an uncommon disease. In 1955, 2,224 people died of leukaemia in England and Wales, as compared with 17,569 deaths from cancer of the respiratory system and 20,869 from violence. Indeed, something like three times as many children died from accidents as from leukaemia.

*The Gwladys and Olwen Williams Lecture delivered in the University of Liverpool on February 19, 1957.

Men and women have been equally affected by the increase in leukaemia, so that the cause is unlikely to be smoking, cosmetics, or occupation. The upward trend has been visible for at least twenty-five years and cannot be explained by recent events such as the introduction of the sulphonamides and antibiotics. The main correlation is with the standard of living. Hewitt noted that as between different countries the incidence followed the order U.S.A. and Denmark; England, Wales, and Scotland; Western Germany and Ireland. As between economic strata, leukaemia is more frequent in the rich than the poor, and in the United States it is more frequent in the white than the non-white. As between different regions of England it was higher in the south than the north, and over the period of observation the south of England had been more prosperous than the north. In the United States the contrary is true, and there leukaemia is commoner in the north than the south.

Incidence of Different Types

It is not easy to demonstrate how changes in the incidence of leukaemia as a whole are related to changes in the incidence of the different types of leukaemia, for until recently the International Classification of Diseases and Causes of Death did not distinguish between acute and chronic forms of the disease. Moreover, crude figures for deaths from leukaemia have little meaning unless we know also the age and sex structure of the population, because leukaemia occurs with increasing frequency over the age of 50 and because males are affected more often than females. Two studies have recently been reported in which a high level of ascertainment and diagnosis of leukaemia was combined with a full knowledge of the structure of the populations under study. MacMahon and Clark (1956) analysed the incidence of leukaemia in the Borough of Brooklyn, a city with a population of 2,700,000, over the ten-year period 1943-52. Hospital records were available in 87% of the cases and marrow puncture or necropsy records in 63%. Gunz and Hough (1956) carried out a similar analysis of deaths from leukaemia over the quinquennium 1950-4 in New Zealand, where the population is just under two million and the level of medical care is high.

In Brooklyn the overall distribution of cases was, acute leukaemia 53%, chronic lymphatic leukaemia 26%, and chronic myeloid leukaemia 21%. Acute leukaemia falls from a level of 44.3 per million in the first decade to 11.9 per million in the decade 20-29. It then rises steadily to

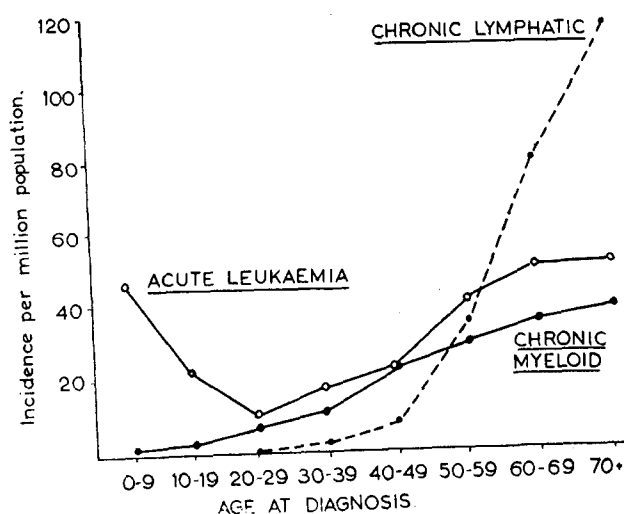


FIG. 2.—Age incidence of the leukaemias in Brooklyn. The data are taken, by permission, from the article by B. MacMahon and D. Clark (*Blood*, 1956, 11, 871).

reach levels over 50 per million in the seventh and eighth decades. Acute lymphatic leukaemia shows an exaggeration of this tendency of the acute leukaemias to occur at the extremes of life. Acute myeloid leukaemia was the commonest form of acute leukaemia except in the first few years of life, but too much reliance should not be placed on the differentiation of the various types of acute leukaemia. Chronic myeloid leukaemia rises steadily from an incidence of 1 per million in the first decade to 39.4 per million in the eighth. Chronic lymphatic leukaemia rises from less than 1 per million in the first three decades to 114 per million in the eighth.

The figures for the relative frequency of acute and chronic leukaemia are in agreement with those of Gunz and Hough, who found that the proportion of acute cases was almost 100% in the first five years of life, falling to about 60% in the forties, and 40% over the age of 75. Noteworthy features in both surveys are the sharp rise in the death rate from all forms of leukaemia over the age of 50, the frequency of chronic lymphatic leukaemia in the aged, and the high proportion of acute leukaemias even in the oldest age groups. Acute leukaemia in later life is often atypical, with few signs pointing to affection of the haemopoietic system, and the diagnosis can easily be overlooked if the blood is not examined. Other observers have confirmed the relative decline in frequency of chronic myeloid leukaemia in the West (Gauld, Innes, and Robson, 1953).

Racial and Geographical Differences

Much less accurate information is available about the racial and geographical incidence of leukaemia, though

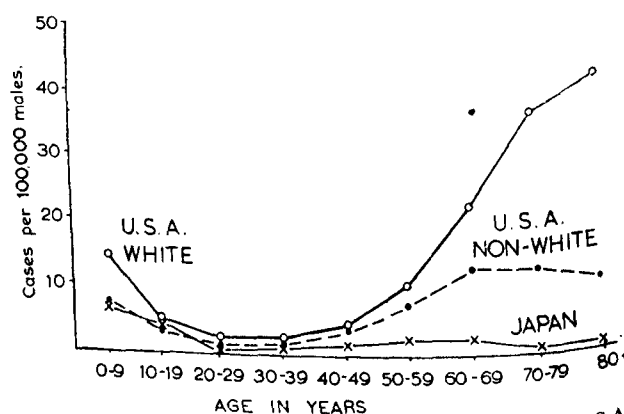


FIG. 3.—Mortality rates from leukaemia in males in the U.S.A. and Japan from data collected by the World Health Organization (1955).

there is a general impression that leukaemia is less common in the indigenous populations of Africa and Asia, particularly chronic lymphatic leukaemia. An analysis of the mortality from Hodgkin's disease and leukaemia in different countries has recently been made by the World Health Organization (1955). Unfortunately, the only non-Western country is Japan, but separate figures are given for the white and the non-white population of the United States of America. The contrasts are striking. The overall mortality from leukaemia in men is 7.5 per 100,000 in the white population of the United States, 3.9 per 100,000 in the non-white, and 2.0 per 100,000 in Japan (Fig. 3). In the age group 60-69 the mortality from leukaemia in men is 22.0 per 100,000 in the white population of the United States, 13.8 per 100,000 in the non-white, and 2.5 per 100,000 in Japan.

Causes of Increased Incidence

If these differences in the incidence of leukaemia in time and place are real, they suggest that it resembles cancer of the lung, the liver, and the scrotum, and that environmental factors must be important in its causation. If the differences are spurious, we should have to rank leukaemia with

carcinoma of the breast and the stomach as one of those forms of malignant disease whose incidence we are unlikely to be able to modify until the general problem of neoplastic disease is solved.

Part of the increase is due to the ageing of the population; but this is not the whole story, because not only the absolute numbers but the incidence of leukaemia in the later decades has increased. Cooke (1954) showed that the crude incidence of leukaemia increased from 2.1 to 5.5 per 100,000 in the U.S.A. between 1930 and 1949. At all ages up to 54 the incidence had uniformly doubled, but above age 54 there had been a much sharper increase. In 1949 there were over 23 deaths per 100,000 from leukaemia in patients over 70, which was about four times the figure in 1930. Of these 23 cases one can calculate from MacMahon and Clark's data that 11 were chronic lymphatic leukaemia, 5 acute leukaemia, 4 chronic myeloid leukaemia, and 3 unspecified.

The main correlation of the death rates is with the standard of living. People with a high standard of living have a greater probability of detection of leukaemia owing to better medical attention, and a larger proportion of patients in the older age groups where leukaemia is especially common. I can look back on my own experience as a student and recollect cases which were diagnosed as oral sepsis or haemorrhagic fever, and which would nowadays be almost certainly shown to be leukaemia. A high proportion of acute leukaemias occur at the extremes of life, and if laboratory facilities are not easily available they are apt to be diagnosed as infections in infancy and as cardiovascular or renal disease in later life. It seems certain that a big factor in the increase of deaths attributed to leukaemia is the more frequent recognition of the disease at all ages, particularly in later life.

It is, nevertheless, difficult to believe that enough cases of leukaemia were misdiagnosed in the past, particularly in middle life, to account for the total increase in notifications. In this country a notable improvement in the facilities for the diagnosis of blood disorders was initiated by the expansion of the Hospital Laboratory Service between 1939 and 1948, and this was soon reflected in a fall in the mortality from pernicious anaemia (see Fig. 1). If the increased incidence of leukaemia was entirely a matter of better ascertainment, one would have expected that the curve of deaths from leukaemia would have risen even more sharply about fifteen years ago and then flattened out, but this did not happen.

It looks as if the rise is not just a matter of greater availability of medical care. An improved standard of living seems to contain elements which bring about a real increase in leukaemia. In our discussions together, Alice Stewart has suggested that, as a result of the greatly reduced mortality from infections, people who have sustained leukaemogenic damage to the bone marrow survive to develop leukaemia after the appropriate incubation period. However that may be, it would be complacent at present to assume that the increase in leukaemia is entirely a matter of better notification, and we must continue searching for factors in our greatly changed environment which may have contributed to the increase.

Chronic Lymphatic Leukaemia

The variation in the incidence of chronic lymphatic leukaemia, a disease with manifest clinical signs, is particularly hard to explain by failure of detection. In a recent visit to India and the Far East I saw many cases of acute leukaemia and myeloid leukaemia but none of chronic lymphatic leukaemia. Acute leukaemia and myeloid leukaemia occurred in typical and atypical forms, and it was not unusual to see myeloid leukaemia of the chronic myelocytic type in children. Aplastic anaemia, which is probably related in aetiology to leukaemia, was not infrequent.

Anaemias of all kinds are so common in hospital patients in Africa and Asia that the absence of chronic lymphatic

leukaemia is especially noteworthy. Pernicious anaemia, which is likewise a disease of the later decades, is even less common. Otsuka *et al.* (1956) report that only 309 cases of pernicious anaemia have been described in Japan in the last fifty years. They were atypical in age distribution, occurring most often in the age group 20-40, and a proportion were undoubtedly due to pregnancy or to gross lesions of the intestine. Otsuka and his colleagues emphasize that the Japanese medical profession has been keenly interested in haematology throughout this period and that the rarity of pernicious anaemia contrasts with the frequency of aplastic anaemia.

As already mentioned, the age structure of the populations is very different from ours. In Singapore, for example, 50% of the population are under age 21 and anyone over 45 is described as old. In the absence of written records, the age of middle-aged and elderly people is often unknown to the individual and cannot be determined, but the populations of the Oriental countries are so numerous that in absolute figures there must be large numbers of people in the sixth, seventh, and eighth decades, where chronic lymphatic leukaemia has its greatest incidence with us.

Reasons for a failure to recognize chronic lymphatic leukaemia and pernicious anaemia may be that elderly people are less likely to be referred to hospital for diagnosis or to be admitted for treatment when the pressure of the younger age groups is so great. The proportion of doctors to the population in Eastern countries is rarely higher than one in ten thousand, and certification of the cause of death cannot be expected to be precise, particularly at the extremes of life. Owing to religious prejudices post-mortem examinations are hardly ever made except in persons who have died a violent or unnatural death. In parenthesis, one cannot resist commenting on this failure of Oriental peoples to contribute their quota to our knowledge of the morbid anatomy of disease. When all is said and done, however, one is left with the feeling that there is a real difference in the incidence of leukaemia and pernicious anaemia in elderly people in the West and the East, which might be due to genetic factors or to environmental factors such as differences in diet.

Observations of the kind just made are useful only in so far as they serve as hypotheses for further work. Obviously one thing to be done is to try to improve our statistics of leukaemia. In this country it must be unusual, now, for any patient, however old, to develop a chronic illness like lymphatic leukaemia and die without the blood being examined. In Asia and Africa a comparable standard of diagnostic facilities is unlikely to be achieved for some time, and by then other differences between the two populations, which are at present playing a part in the differing incidence of leukaemia, may have been obliterated. In other words, we are faced with something like Heisenberg's principle of uncertainty. As the incidence of all forms of leukaemia is only about 5 per 100,000 per annum, a pilot survey would be impracticable. In this state of affairs it would be reasonable to act on the hypothesis that there is less chronic lymphatic leukaemia in the East than the West, to enumerate the differences in environment between Asian and Western peoples, particularly in reference to diet, and to study them experimentally.

Aetiological Factors in Human Leukaemia

When a disease occurs in only 5 out of every 100,000 people, it suggests that either the make-up of the patient or his experience has been unusual. The inheritance of leukaemia is still controversial, and it is unusual to find cases in more than one member of a family. Videbaek (1947), who analysed the family histories of 209 patients with leukaemia and a corresponding number of controls, concluded that the chance of a relative of a patient with leukaemia getting leukaemia was 1 in 250 as compared with 1 in 4,000 of the control population. It will be interesting to see if the current survey by Alice Stewart and her co-workers (1956) confirms these ratios. As regards

environmental factors, the only one known for certain is the somewhat unusual one of exposure to large doses of x rays.

This story has so often been recapitulated in the last few years that I shall summarize it briefly. Leukaemia has probably been unduly frequent in doctors and nurses who work with x rays. It has occurred after x-ray treatment of non-malignant diseases such as ankylosing spondylitis in adults and enlargement of the thymus in infants. It is also occurring with abnormal frequency in the survivors of the atomic-bomb explosions in Hiroshima and Nagasaki who were within range of the ionizing radiations. In all these instances there is reason to believe that the dosage was high, usually more than 100 r over a short period of time or more than 200 r over a longer period.

The total normal background radiation over a generation in man amounts to about 3 r. The ordinary chest film exposes the patient to only a fraction of a roentgen, but a gastro-intestinal examination with the apparatus commonly used at present may expose the patient to 15 r a minute if full precautions are not taken. Children are more susceptible to x-radiation than adults, and in their preliminary communication Stewart *et al.* (1956) reported that about twice as many of the mothers of children who died of leukaemia or malignant disease before the age of 10 in the years 1953-5 had had an x-ray examination of the abdomen during the relevant pregnancy as the mothers of a group of control children. Many of these x-ray examinations were probably for pelvimetry, in which it has been stated that a radiation dose of only about 2.5 r is received by the foetus (Rabinowitch, 1956).

While genetic damage is accounted for by a relatively few sites of examination, principally the hip, the lumbar spine, the lower abdomen, and the pelvis, it seems probable that extensive radiation over any part of the trunk or the proximal ends of the long bones would increase the likelihood of leukaemia. The committee appointed by the Medical Research Council (1956) to report on the hazards to man of nuclear and allied radiation considered that there would be little increased risk of leukaemia if an individual received a total dose of 200 r in his lifetime in addition to radiation from the natural background, provided that the dose was distributed over tens of years and that the maximum weekly exposure, averaged over any period of thirteen consecutive weeks, did not exceed 0.3 r. However, there is probably no threshold below which x rays are harmless, and even with small doses ill effects will be seen if a sufficient number of people are observed. In the survivors of the atomic-bomb explosion at Nagasaki who had been most severely irradiated, the incidence of leukaemia has been 1 in 80 or over. At the other extreme of dosage, Court Brown and Doll (1957) suggest that a dose of 1 r averaged over the red bone marrow of the whole body would cause about one case of leukaemia annually in a population of a million people.

It is axiomatic that we should exercise the greatest care in exposing ourselves, our patients, and above all the pregnant woman to x rays and radioactive agents. Nevertheless, it is probable that the contribution made by x-radiation to the total incidence of leukaemia is small. From the figures of Stewart *et al.* (1956) it would appear that 50 children a year may have developed leukaemia or malignant disease because their mothers had an abdominal x-ray examination during pregnancy. All the leukaemias so induced may not yet have appeared, but at the very most the figure for leukaemias induced by x-ray examinations *in utero* is unlikely to exceed 50 per annum. If the number of adults developing leukaemia from diagnostic or therapeutic x-radiation is of the same order as the number of children, x-radiation is unlikely to account for more than 15% of the total deaths from leukaemia.

Most of the leukaemias occurring after radiotherapy for spondylitis have been acute or subacute myeloid leukaemia. Of 92 cases in Hiroshima and Nagasaki, 39 were chronic myeloid leukaemia and only one was chronic lymphatic

leukaemia; the remainder were acute and subacute leukaemias, with the myeloid form predominating and the younger age groups more severely affected (Moloney, 1955). The study of post-irradiation leukaemia thus throws little light on the apparent increase in spontaneous leukaemia, which affects more heavily patients over the age of 50 and which has been largely of the chronic lymphatic type.

Finally, we must balance the risks of x-ray diagnosis and therapy against their benefits. The amount of radiation received by a patient who has a chest film is exceedingly small, and it would be unfortunate if people refused to participate in mass x-ray programmes because of a possible risk of leukaemia. It is protracted screening over the trunk which is dangerous, and the amount of radiation is likely to be greatly reduced by more stringent precautions and improved apparatus. The possible 50 cases of leukaemia a year from x-radiation *in utero* must be set against 439 deaths of mothers in childbirth, 15,829 stillbirths, and 9,750 deaths in the first week of life in 1955. Obstetricians and radiologists believe that the mortality of mother and child may be significantly reduced by appropriate x-ray examinations in pregnancy, and that they can save more lives than are likely to be lost from leukaemia, appreciating as they now do the hazards of x-radiation. Similarly, the death rate from leukaemia after radiotherapy for ankylosing spondylitis is only 3 per 1,000, and, though this is at least ten times as high as the usual incidence of leukaemia in this age group, it is a good deal lower than the mortality of 13 per 1,000 for interval partial gastrectomy for peptic ulcer in the best hands.

Important as has been the discovery of the leukaemogenic effects of x rays in man, their role does not seem to be comparable with cigarette smoking in cancer of the lung or saturated fats in coronary thrombosis. The search for other aetiological factors must be intensified. Alice Stewart and her colleagues are shortly extending their survey to leukaemia in adults, and it is to be hoped that those in charge of patients with leukaemia, especially in hospitals, will give them full co-operation in their important task.

Natural History of Leukaemia

The recent introduction of new remedies for leukaemia and the consequent need for therapeutic trials have attracted the attention of statisticians to the course of the disease and the effect of treatment on it. It is the old story that when we begin the intensive study of a disease we commonly find that we do not know as much as we thought we did about its natural history. For example, a question we want to answer is whether the initial treatment of chronic myeloid leukaemia should be by x rays, radioactive phosphorus, nitrogen mustard, or busulphan ("myleran"), and the data are not yet available.

In leukaemia there are two factors which make therapeutic trials difficult. The first is the great variation in the length of survival in all forms of leukaemia. The second is the occurrence of spontaneous remissions in acute leukaemia. The times of survival in leukaemia, as in other forms of malignant disease, do not have a symmetrical distribution about a mean but are skew—that is to say, the majority of the patients die relatively soon after the onset of the disease but a few live a surprisingly long time. This variable course of the disease is something we are already familiar with in non-lethal diseases such as infective hepatitis, and it means that we require a lot of cases and a long period of observation for therapeutic trials. Numbers required are further increased by the necessity to match cases by type of leukaemia and age of the patient.

The remissions of acute leukaemia are one of the most remarkable phenomena in the natural history of malignant disease. They occur typically in acute leukaemia and they may be complete or partial. In a complete remission all signs and symptoms of the disease disappear and the bone marrow becomes practically normal: a partial remission is substantial improvement but something less than this. Remissions may be spontaneous or induced. Swaen (1954),

who reviewed 97 spontaneous remissions in acute leukaemia, occurring in the days before chemotherapy, thought that the remissions were not, in fact, spontaneous but that they usually followed an infection, probably a virus infection. He thought that the infection caused necrosis of the leukaemic cells, and cancer and leukaemia have been treated by deliberate infection of the host with non-lethal virus diseases, though unfortunately with only scant success.

Spontaneous remissions are not common, at any rate complete ones, occurring probably in less than 5% of cases (Southam *et al.*, 1951). The great discovery of the last decade in leukaemia research has been the ability to provoke remissions by treatment. In acute lymphatic leukaemia in childhood remissions can be induced in 85% of cases. Two main groups of remedies have been used—corticoid hormones, and chemotherapeutic agents which act by blocking the synthesis of nucleic acid. At present three subgroups of the chemotherapeutic agents are available—antagonists of folic acid, purine, and glutamine respectively—but the synthesis of nucleic acid goes through so many stages and research in this field is so active that other agents are certain to be discovered.

The average duration of spontaneous remissions is about four months, and then some of the damaged cells recover and the disease rapidly recurs. Induced remissions may last longer because the therapeutic agent can be continued, but relapse eventually occurs owing to the development of resistance. This may be circumvented by alternating different remedies, and in this way life may be prolonged well over a year, even as long as five or six years. Theoretically, resistance could be postponed by using different drugs in combination. The chemist's dream is that if he can block one stage of the synthesis of nucleic acid so effectively that only, say, one in ten milliard cells becomes resistant, and if he can do the same at other stages, the odds against resistance or recurrence will finally become astronomical.

Nothing quite comparable with the spontaneous remissions of acute leukaemia occurs in chronic leukaemia, though almost all signs of the disease may be temporarily banished by effective therapy. Moreover, the remedies used in acute leukaemia are ineffective in chronic leukaemia, and vice versa. Arsenic, x rays, busulphan do harm and not good in acute leukaemia. Nevertheless, in both types of leukaemia the working hypothesis is that the remedy has a disproportionately lethal effect on the leukaemic cells and works very much as the sulphonamides and the antibiotics do in bacterial infection. The development of strains of resistant cells is likewise used as the explanation of the ultimate failure of treatment. Of course, not all haematologists share these views. Some believe that treatment does something to the defence mechanisms of the body rather than to the leukaemic cells.

Therapeutic Trials

Remedies must first be synthesized, then screened in experimental animals for efficiency in leukaemia and new growth, next studied pharmacologically, and finally tested in human leukaemia. Therapeutic trials are taking on the same shape as in tuberculosis, though it is difficult to get comparable numbers of cases. Survival is estimated from the onset of the first symptom that is identifiable as due to leukaemia—splenomegaly, adenopathy, or bleeding. We may in addition measure survival from the time of diagnosis or the onset of therapy. In analysing and comparing the data the mathematician uses the logarithms of the survival times because these have a normal distribution. For ordinary purposes it is not necessary to make any calculations, as the survival data can be represented graphically by the use of log-probability paper. For comparing different groups of cases, the time at which 50% and 10% remain alive can be read to the nearest half-month. By appropriate statistical methods it is possible to calculate the median survival, the standard deviation of a series, and the standard error of the mean, and in this way to test the significance of the differences between the various groups of cases. If a series con-

tains both living and dead patients, it is necessary to construct a life table such as is used in vital statistics and by insurance companies.

Satisfactory statistical studies of the natural history of the leukaemias are now available. Tivey (1952), who pioneered these studies, showed that of children with acute leukaemia treated only by supportive measures, without antibiotics or specific therapy, 50% will die within a period of approximately four months from the onset of symptoms but 10% will live as long as eleven months. There is no evidence that the prognosis in children with acute myeloid or monocytic leukaemia differs from that of children with the more common lymphatic leukaemia when no specific treatment is given. Haut and co-workers (1955) were unable to find any trials in which patients treated with the new remedies were compared with simultaneous untreated controls, which was perhaps not surprising, but there is good evidence that when patients are treated with the new remedies 50% live for twelve months and 10% for two years.

Tivey (1954) found no difference in survival between chronic myeloid and chronic lymphatic leukaemia. Half the patients will die 1.6 years after beginning therapy or 2.65 years after the first symptom. Ten per cent. will live 7 years after the onset of the disease and 1% will live for 15 years. Treatment has little or no effect on the length of survival, though the period of useful life is almost certainly increased. Additional criteria such as time spent in usual activities, time in hospital, and freedom from pain, could be used to measure the value of treatment.

The position reached in therapeutic research on leukaemia is that we now have full knowledge of the course of the disease and accurate methods for comparing different forms of treatment. Large numbers of cases and long periods of observation are necessary if new remedies are to be promptly evaluated. In England and Wales there were 2,224 deaths from leukaemia in 1955, of which just over half must have been acute leukaemia. No single centre can see enough cases for a therapeutic trial, and co-operative studies must therefore be planned on a national or international basis. Apart from the inertia which affects all of us, resistance to therapeutic trials comes from two quarters. Some physicians believe they can do better for their patients by individual treatment than by including them in a therapeutic trial. As trials in leukaemia nowadays consist in a comparison of remedies or of combinations of remedies this belief is not well founded. Some research workers believe that therapeutic trials mean the expenditure of a great deal of time and money for a relatively small return and that our resources would be better devoted to basic research in the laboratory. However, the expenditure is trifling compared with the national drug bill, and much of the work can be done by practising doctors and public health workers.

Conclusion

The exciting feature of research on human leukaemia in the last decade is that it has passed from the phase of description and classification to a study of the disease as it affects the community as a whole, its apparent increase, and the action of new remedies which relieve the symptoms and, in acute leukaemia at any rate, prolong life. As a side-effect we have learned what a lot can be achieved by co-operative endeavour within the framework of the National Health Service. The work of Abbott, Court Brown, Doll, Lea, and others on the occurrence of leukaemia after x-ray treatment of ankylosing spondylitis could not have been completed without the help of radiologists, physicians, records officers, and others in widely separated areas. Alice Stewart and her colleagues have shown how much the public health services can contribute to the mass study of a disease like leukaemia, reducing a problem of daunting size to manageable proportions. Therapeutic trials in tuberculosis and ulcerative colitis have shown how cases can be pooled and treated on a central plan.

Leukaemia is a hard nut to crack, and we shall have to wait for further fundamental scientific discoveries before we can greatly modify its frequency and mortality. In the meantime current interest in the incidence of leukaemia and in new forms of therapy can contribute significantly to the welfare of the unfortunate victims of the disease. My experience of therapeutic trials is that they arouse an enthusiasm for treatment which might otherwise be lacking and produce an improvement in results quite apart from the specific remedy. Indeed, as in the famous Hawthorne experiment at the Bell Telephone Works, community studies on the incidence and treatment of disease may sometimes have side-effects which are just as important as the original aim of the investigation.

Summary

Acute leukaemia is becoming commoner than chronic leukaemia, and chronic lymphatic leukaemia commoner than chronic myeloid leukaemia.

Important factors in the increase in the incidence of leukaemia in Western Europe, North America, and Australasia, and in the higher incidence of leukaemia in these countries than in Asia and Africa, are greater availability of medical care with consequent improvements in diagnosis and ageing of the population, leukaemia being more frequent in later life. It is nevertheless unlikely that these factors account for the whole of the increase, and the search for aetiological factors in leukaemia associated with the rise in the standard of living should continue.

Man-made ionizing radiations such as x rays can induce leukaemia, but there is no evidence that they can account for the considerable increase in notifications of leukaemia in the later age groups, which is largely of the chronic lymphatic type, whereas leukaemia after irradiation has so far been predominantly myeloid.

The risks of irradiation may be greater in the foetus than in the adult, and stringent precautions should be taken when x-raying pregnant women. These risks should be carefully balanced against the reduction in maternal mortality, stillbirths, and perinatal deaths which can be secured by the intelligent application of radiography.

Our recently discovered ability to provoke remissions in acute leukaemia, and the accelerating development of powerful chemotherapeutic remedies and new methods of administering ionizing radiations, have made it essential to organize therapeutic trials in leukaemia. Owing to the spontaneous variations in the course of the disease large numbers of cases are required for valid trials, which must therefore be organized on a co-operative basis.

Although we shall have to wait for further fundamental scientific discoveries before we can greatly modify the frequency and mortality of leukaemia, there is no doubt that current interest in the incidence of leukaemia and in new forms of therapy has contributed materially to the welfare of the unfortunate victims of the disease.

REFERENCES

- Brown, W. M. C., and Doll, R. (1957). *Lancet*, 1, 97.
Committee for Clarification of the Nomenclature of Cells and Diseases of Blood and Blood-forming Organs (1950). *Amer. J. clin. Path.*, 20, 571.
Cooke, J. V. (1954). *Blood*, 9, 340.
Gauld, W. P., Innes, J., and Robson, H. N. (1953). *British Medical Journal*, 1, 585.
Gunz, F. W., and Hough, R. F. (1956). *Blood*, 11, 882.
Haut, A., Altman, S. J., Cartwright, G. E., and Wintrobe, M. M. (1955). *Blood*, 10, 875.
Hewitt, D. (1955). *Brit. J. prev. soc. Med.*, 9, 81.
MacMahon, B., and Clark, D. (1956). *Blood*, 11, 871.
Medical Research Council (1956). *The Hazards to Man of Nuclear and Allied Radiations*. London.

- Metropolitan Life Insurance Co. (1955). *Statist. Bull. Metrop. Life Insur. Co.*, 36, No. 3, p. 3.
Moloney, W. C. (1955). *New Engl. J. Med.*, 253, 88.
Otsuka, S., Koshiishi, Y., Naruto, K., and Kumai, K. (1956). *Acta haemat. (Basel)*, 16, 199.
Rabinowitch, J. (1956). *Lancet*, 2, 1261.
Southam, C. M., Craver, L. F., Dargeon, H. W., and Burchenal, J. H. (1951). *Cancer*, 4, 39.
Stewart, A., Webb, J., Giles, D., and Hewitt, D. (1956). *Lancet*, 2, 447.
Swaen, G. J. W. (1954). *Remissions in Acute Leukaemia*. Brill, Leyden.
Tivey, H. (1952). *Pediatrics*, 10, 48.
— (1954). *Amer. J. Roentgenol.*, 72, 68.
Videbæk, A. (1947). *Heredity in Human Leukaemia and its Relation to Cancer*. Copenhagen.
World Health Organization (1955). *Epidem. vital Statist. Rep.*, 8, 81.

TREATMENT OF STONE IN THE COMMON BILE DUCT

BY

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There are few conditions so disappointing to patients and their doctors as a recurrence of biliary colic following an operation on the biliary tract. I am concerned not so much with the case in which there has been a simple cholecystectomy for stones and a stone has been overlooked in an unopened common duct, as with the case in which there has been a careful exploration of the duct and removal of stones or mud, and at a later date colic has occurred. There is no doubt that surgeons open the common duct much more often than they used to, perhaps because it is easier owing to better anaesthesia and the better general condition of patients, and perhaps owing to information gained from experience and possibly also from cholangiography.

When small stones or biliary mud have been sought and found it is easy to leave some more behind in the lower part of the duct or even in the upper part, be the search ever so careful. They may later pass into the duodenum, though they are more likely to remain in the duct and increase in size or amount and cause further trouble. This may take the form of pain and/or jaundice, or it may only show as recurring attacks of "chills" due to cholangitis. To repeat the operation of exploration and evacuation of the common duct alone is neither sound nor satisfactory, and it is wise to establish some larger opening from the common duct instead of the small lumen at Oddi's sphincter. This may be made at the lower end by some form of sphincterotomy (perhaps combined with a long-armed T-tube) or plastic operation on the duct, or it may be made higher up by a new anastomosis between the common duct and the duodenum. One of the purposes of putting forward this brief communication is to make a plea for the wider use of the latter operation—choledochoduodenostomy. Most surgeons will have done this operation a number of times, some very readily, others less readily, being uncertain of the later results. There are several points connected with the operation about which one may be anxious: whether duodenal contents will get into the common duct and cause infection or other trouble; whether stones or debris may collect in the part of the duct distal to the stoma and set up inflammatory changes or obstruct the main duct of the pancreas; or whether, indeed, the stoma may close.

I have been so well satisfied with the results of the operation over a period of some years that it seemed worth while making a few remarks about it. These are based on an experience of 21 cases.

The subject of division or injury of the ducts is not considered here, but only cases in which the duct is still intact but obstructed from within. Nor do I propose to argue here whether stones and mud found in the duct at a second operation were necessarily overlooked at the first, or whether they had formed since then. In all probability the correct answer is that it is sometimes one and sometimes the other.

It is not possible to give exact indications for the operation, but it is hoped that from the following account of one's experience and cases the place and usefulness of the operation may be gathered.

At first I did a choledochoduodenostomy only when there had been a previous operation and when the obstruction had recurred owing to biliary mud or sand; but since finding how good the results are I have done it as a first operation for common-duct stones when these were associated with much mud or sand, and particularly when the duct was thickened and somewhat rigid from inflammation as well as dilated from obstruction.

I have been most gratified with the singular freedom from symptoms these patients have afterwards. There is a free way between the duodenum and the common duct, as can be shown by a barium meal being seen to enter the biliary tree. A plain x-ray film of the region in many of these cases after operation shows the common duct, and sometimes branches of the hepatic duct as well, outlined by air. A "biligrafin" x-ray film does not show up the ducts, probably because it passes through them too quickly, but one can see the dye in the duodenum. I imagine that, provided fluid and solid particles can get out of the common duct as easily as they can get in, it does no harm and neither obstruction nor liver infection occurs: certainly the patients remain in good health without pain or jaundice or fever. The first part of the duodenum is probably sterile in healthy people on a normal diet.

Technique

There are certain points about the technique of the operation which I think are worth mentioning.

The common duct is approached by whatever route the surgeon favours, and this may, of course, be very difficult if there have been several previous operations on the duct. I usually use a modified Kocher's subcostal incision or a paramedian, and approach the duct from the antero-lateral aspect. I have no experience of the postero-lateral approach through the bed of the tenth rib, which is advocated by some surgeons in cases that are likely to prove difficult. If the common duct is largely covered over by the duodenum, as is sometimes the case in a virgin operation and frequently so in a second operation, the first part of the duodenum must be mobilized by careful dissection and drawn downwards, and the blood vessels which are usually present ligated and divided. If it is the type of case in which it is thought that choledochoduodenostomy may be required the duct is opened by the usual vertical incision, but this should be low down very close to the point where the duct passes behind the duodenum.

When the duct has been fully explored, and if it has been decided to do a choledochoduodenostomy, a vertical incision is made in the duodenum as shown in Fig. 1, the upper end of the incision being very close to the lower end of the incision in the common duct. If the edges of the opening in the common duct are held gently apart by stay sutures the anastomosis, which is done with interrupted sutures of fine catgut, is not difficult. The first suture joins the lower end of the incision in the duct to the upper end of the incision in the duodenum. Sutures are then put in on each side alternately from below upwards, each being

tied as it is put in and so arranged that the cut edges are inverted as shown in Fig. 2. The stoma is about 2 cm. in length, and six or seven sutures are placed on each side. A few reinforcing sutures are put in on each side through any

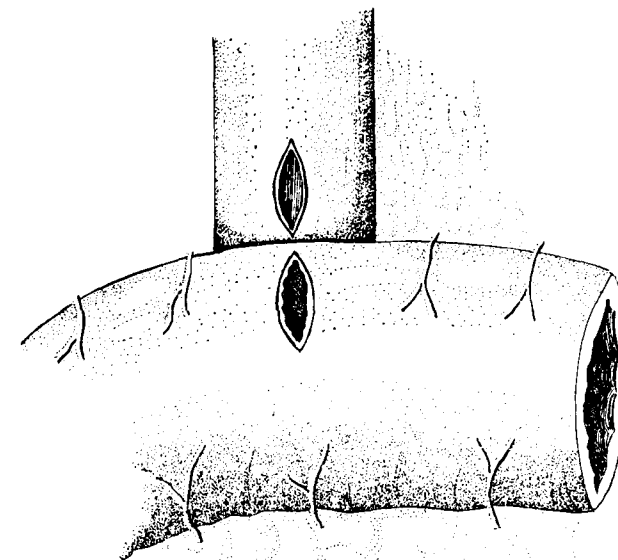


FIG. 1.—The vertical incisions in the common bile-duct and duodenum for a choledochoduodenostomy.

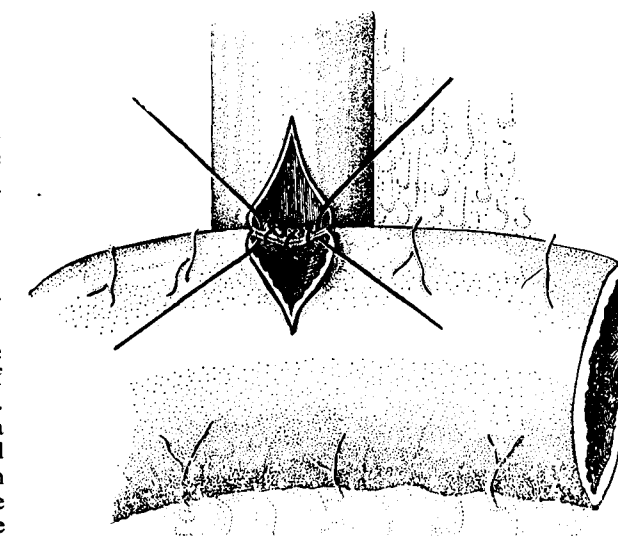


FIG. 2.—The first five catgut sutures placed in making the anastomosis.

conveniently placed tissue. A corrugated rubber drain is introduced through a stab wound down to the site of the anastomosis.

Most of the descriptions of this operation are of a horizontal stoma, the opening being placed transversely in the common duct, but I prefer the vertical stoma described above and have found it very satisfactory from the technical point of view as well as functioning well. What is more, when the operation is begun a decision on whether an anastomosis will be done or whether the duct will be closed or drained has not always been made, and the usual vertical stoma for the exploration of the duct can be used for the anastomosis provided it has been placed far enough down the duct adjacent to the duodenum.

Case Reports

Five out of the 21 cases are described. They have been chosen to illustrate different typical points: in three there had been previous operations on the biliary tract, and in two it was the first operation. The ages are those at the time of the choledochoduodenostomy.

Case A.—A housewife, aged 64, began to have attacks of biliary colic in 1930. In 1932 she was operated on elsewhere, but apparently it was possible to remove only a part of the gall-bladder, with stones in it, owing to extensive adhesions and inflammation. In 1939 she had attacks of jaundice and pain. At operation in November, 1940, the remains of the gall-bladder were removed and the common duct was opened. It was dilated, and stones and much mud were removed. A choledochoduodenostomy was performed. She had no further trouble until 1944, when she developed a carcinoma of the stomach which a colleague removed, doing a Billroth-I type of operation. She lived for another ten years, dying in 1954 with metastases in the liver at the age



Fig. 3.—Case A. Radiograph following a barium meal 11 years after choledochoduodenostomy. Barium is clearly seen in the common bile-duct and smaller ducts higher up.

of 78. During the 14 years she lived after the choledochoduodenostomy she had no symptoms referable to the biliary system, and a barium meal examination 11 years after the operation showed that barium very readily entered the common duct (Fig. 3).

Case B.—A man aged 46, the manager of an English firm in Lisbon, had had occasional attacks of pain in the upper abdomen for three years; they were never very severe, but on one occasion had been accompanied by a shiver. There had never been any jaundice. He was a very fit man, and nothing abnormal was found on examination. Cholecystograms in 1947 and 1950 showed no filling of the gall-bladder, but in the 1950 films air could be seen in the bile passages in the liver, and a tentative diagnosis of a fistula between the gall-bladder and duodenum was made. Operation was performed in November, 1950. A dense mass of adhesions surrounded the gall-bladder and common duct. A fistula found between the shrivelled gall-bladder and duodenum was divided and the opening in the duodenum closed. The common duct was much dilated and thickened, and was filled with a soft stone about 1.5 by 3 cm. The lower part of the duct immediately distal to the stone was contracted. As this part had so thick and rigid a wall, and the upper dilated part was also thick and rigid from chronic inflammation, it was thought wise to do a choledochoduodenostomy. The patient made an uninterrupted recovery, and in 1955 he

wrote from Lisbon saying, "Since my operation I have enjoyed perfect health so far as my digestive organs are concerned."

This is an example of a choledochoduodenostomy being done at a first operation on the biliary passages. The large mass of soft stone in the duct had been able to form quite quietly, as there was an adequate escape for the bile through the gall-bladder into the duodenum.

Case C.—A very remarkable man of 87, a doctor of science who worked six days a week as a research chemist, was first seen in 1954. The history was that he had had an attack of obstructive jaundice in 1934 for which a cholecystostomy was performed. He remained well until 1953, when he had attacks of biliary colic and nausea. A cholecystectomy was performed elsewhere. The lower end of the common duct was said to be stenosed. In 1954 the pain recurred and he became jaundiced. At operation in February, 1954, a grossly dilated and thickened common duct was found to contain biliary mud and small stones. As the duct was large and thickened and it was the third operation on his biliary tract a choledochoduodenostomy was performed. His recovery was interrupted by a severe chest infection, but he got perfectly fit and returned to his full work six days a week. He has remained in excellent health, but as he is now in his 91st year he works only five days a week. In 1956 he enjoyed to the full the good fare provided on a Mediterranean cruise.

Case D.—A housewife of 72 began to have attacks of biliary colic, vomiting, and jaundice in 1949. In 1951 at operation a macroscopically normal gall-bladder without stones in it was removed. Several stones and some mud were removed from the common duct, which was then drained by a T-tube. She remained well until 1954, when there was a recurrence of pain and jaundice. At operation in August, 1955, the common bile-duct was so dilated that it admitted the thumb. A large stone and some mud were removed from the duct and a choledochoduodenostomy was performed. Apart from a mild infection of the wound with a coliform bacillus there was an uninterrupted recovery. She has remained well and free from symptoms since the last operation.

Case E.—A man aged 82, a retired confectioner, had an attack of mild upper abdominal pain followed by jaundice in January, 1955. In March, 1955, there was a return of the jaundice but no pain. A biligrafin x-ray film showed a very dilated common duct with filling defects in it. In April, 1955, at operation the gall-bladder was found to be small and to contain a few stones, and was removed. The common bile-duct was grossly dilated and had a thick wall; it contained much biliary mud and stones. A choledochoduodenostomy was performed. There was a clostridium infection of the outer end of the wound which cleared up well with penicillin. He has remained in good health apart from spinal arthritis, an old trouble of his.

This was a case in which it was thought right and proper to do a choledochoduodenostomy at the first operation, in view of the patient's age and the very dilated and thickened condition of the duct.

Results

A choledochoduodenostomy has been performed on 21 patients (12 men and 9 women) for obstruction of the common bile-duct by stone or biliary mud. In all the cases the duct was dilated, and in most of them it was thickened and rigid. Sixteen of the patients had had one or more previous operations on the biliary system, but in five cases there had been no previous operation. One patient died from a massive pulmonary embolus on the fourth day after the operation: the other patients all left hospital well recovered from the operation. One, aged 73, died suddenly from coronary thrombosis five months after the operation. Most of the patients were rather old, the average age being 66. Two men were over 80, one being a remarkably sprightly doctor of science who was 87 at the time of the operation (Case C) and another was 82 (Case E). The youngest was aged

MASS SPECTROMETRY APPLIED TO
CLINICAL PRACTICE AND
RESEARCH

BY

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46 (Case B). As the majority of the patients were in an old age group it is not surprising that three more have died, 15 years, 4 years, and 2 years respectively after the operation, apparently from conditions unassociated with it.

There were no particular complications in the post-operative period. In four of the cases there was some infection of the abdominal wound. In one the organism was a clostridium: the patient was not ill with it, but it delayed healing of the wound by about 10 days.

In none of the cases was there any apparent leakage at the anastomosis.

I have been a little surprised at the freedom from symptoms shown by these patients since operation. None has had jaundice or chills. A few have had some abdominal discomfort occasionally, and one man who had had four operations in all had a severe pain lasting three to four hours ("just like my old pain") 16 months after his choledochoduodenostomy. Three patients noticed a slight dragging feeling in the right hypochondrium after a big meal: whether this was due to distension of the common duct, to a pull on the anchored duodenum, or to adhesions it is impossible to say.

There are no apparent digestive or duodenal symptoms following this operation. Three patients said their motions were looser than previously.

In a number of cases, post-operatively, air can be seen in a large part of the biliary passages. A barium meal can be seen to go into the ducts for a considerable distance, but it soon comes out again. In one of the patients, who had a barium-meal examination post-operatively, the radiologist made the interesting observation: "Barium meal: in the erect film the biliary tract is outlined by air. As soon as the patient was placed in the supine position, the barium refluxed up the bile duct, which is rather dilated." One wonders whether this observation by the radiologist should prompt us to advise patients who have had a choledochoduodenostomy not to lie down after a meal until sufficient time has elapsed to allow the stomach to empty. I have not done so. Another thought that has passed through my mind is whether mud or stone forms in the duct distal to the anastomosis or whether food collects there. I do not know the answer to this; but trouble, so far as fresh symptoms are concerned, does not seem to arise.

Conclusions and Summary

A vertical, supraduodenal choledochoduodenostomy is an operation which gives good results with a surprising freedom from symptoms afterwards.

It is very valuable in cases in which there are recurrent stones or biliary mud in a thickened, dilated common bile duct when previous operations have been done.

It is also probably sound practice to do the operation in any patient in whom the duct, in addition to being dilated from obstruction by stones, is thickened and rigid from chronic inflammation, even though no previous operation has been done. It is not advised when the duct appears healthy, even though it contains stones.

Twenty-one cases in which this operation has been performed for stone are referred to.

Some points in the technique of the operation are mentioned.

The results and post-operative radiographic appearances are discussed.

The 113th annual issue of the *Medical Directory* is now available from Messrs. J. & A. Churchill Ltd., 104, Gloucester Place, London, W.1 (2 parts, 84s.). It contains 87,122 names, nearly 2,000 more than last year.

Defects in the function of many organs in the body may be detected by chemical analysis of blood or of secretions, such as gastric or intestinal contents, faeces, or urine. The collection of specimens for such analyses can be done by nurses or technicians, and their analysis is usually accepted as a routine by departments of clinical chemistry.

The situation is quite different in testing lung function. Impairment of the lungs' action as a bellows can be assessed from study of their ventilatory reserve by measuring the maximum breathing capacity either directly, by asking the patient to hyperventilate maximally for a given period of time, or indirectly from a spirometric tracing of a single forced expiration. This measurement is relatively simple and is becoming an accepted clinical investigation; nevertheless it requires trained observers. But the study of defects in pulmonary gas exchange usually demands analysis of expired gases. The taking of gas samples for such analysis, either at a specific time in the breathing cycle or from a collection of gas expired over even a short period of time, requires intricate or bulky apparatus, while the established methods of chemical analysis of the gases so collected are tedious, time-consuming, and beyond the routine capacity of many laboratories. Before most of the tests of defects in gas exchange can be accepted as part of routine clinical study simpler and more rapid techniques of gas sampling and analysis are needed.

Automatic gas-analysers such as the infra-red analyser for carbon dioxide or carbon monoxide, the spectrophotometric nitrogen analyser, the para-magnetic oxygen analyser, the katharometer for helium or nitrous oxide, etc., have simplified some of these tests sufficiently for them to be performed routinely in specialized laboratories. But advances have been limited, and the problems of gas sampling have remained because none of these instruments, except the nitrogen meter and some forms of infra-red carbon dioxide analyser, can continuously record the changes in gas concentration occurring within the breathing cycle. Their response time is too slow and the gas flow required for their operation is too large a fraction of the total breath expired. Moreover, each instrument can estimate only one gas, whereas simultaneous analyses of several gases is required for many purposes.

It has long been realized by workers seeking new methods of gas analysis that the mass spectrometer is a versatile instrument, theoretically capable of overcoming

*Working with the aid of a grant from the Medical Research Council.

all these difficulties, but machines commercially available are designed mainly for isotope separation or for hydrocarbon analysis in the oil industry, and even if modified for respiratory use, as some have been in the U.S.A., they are not entirely satisfactory. Some have been designed for continuous analysis for one or for two gases (Hitchcock and Stacy, 1948; Miller *et al.*, 1950), but none has fulfilled the requirements of respiratory work. A new type of instrument was required for this purpose which was also reliable enough for daily routine use, and one has been designed by one of us (K.T.F.). We propose to describe it briefly and to show some of its potentialities in clinical investigation and physiological research. A full technical description will be published elsewhere.

The Respiratory Mass Spectrometer

Specifications.—The instrument was designed to fulfil the following requirements: (1) It should provide a continuous analysis of inspired and expired gases drawn either from a mouthpiece or from within the bronchial tree at bronchoscopy. (2) It should simultaneously record concentrations of at least four gases, including oxygen, nitrogen, and carbon dioxide, and some other foreign gases of physiological interest. (3) It should present the analysis both as meter deflections and continuous traces on a direct-writing recorder. (4) It should require a sample not greater than 15 ml. per minute, which is a negligible fraction of the respiratory minute-volume. (5) It should have a response-time short enough to follow accurately changes in gas concentrations throughout the respiratory cycle. Full deflection in 0.1 second was required. (6) It should be stable and accurate enough to detect 1% change of concentration. (7) It should be readily transportable from the laboratory to ward, theatre, clinic, or field survey. This meant dispensing with the running water and dry ice required to maintain the vacuum system of existing machines.

Principles of Operation.—Analysis in a mass spectrometer is performed by separation of the molecules in the gas sample according to their molecular weight. This separation is achieved by bombarding the gas molecules entering the machine with a beam of electrons so that the molecules are ionized, and then deflecting the ions with a magnetic field. This field is at right angles to the direction of travel of the ions, so that they are deflected into circular paths. The deflection is greater for light than for heavy ions, so the stream splits up into beams of different molecular weight, any of which can be caught on a suitably placed collecting electrode. As each ion carries a positive charge, the number in any beam can be found by measuring the minute electric current which it carries to the collector. The proportion of molecules of different weights in the gas sample can thus be found, and a complete analysis of the gas sample can be made provided that all the constituent gases have different molecular weights, which is usually the case in respiratory work. These processes are conducted in a high vacuum, normally produced by water-cooled pumps and vapour-traps cooled by liquid air or dry ice.

Description

In this instrument (see Fig. 1) a small fraction (0.1%) of the patient's exhaled breath is drawn continuously and at high velocity through a length of hypodermic tubing into the spectrometer by a sampling pump. An even smaller fraction (0.01%) of this sample passes through a molecular "leak"

into an ionization chamber where the gas molecules are charged (ionized) by bombardment with a transverse stream of electrons. The charged molecules (ions) diffuse out of a slit in the chamber wall and are accelerated by being attracted towards a plate (P_2) to which a negative accelerating voltage is applied. A similar slit in this plate permits

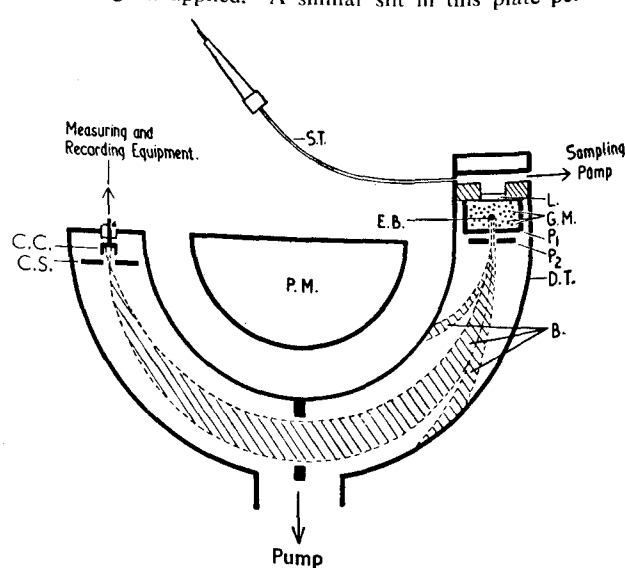


Fig. 1.—Diagram of the mass spectrometer. (B.=ion beams of different mass; C.C.=collector cup; C.S.=collector slit; D.T.=dispersion tube; E.B.=electron beam, at right angles to plane of diagram; G.M.=gas molecules within ionization chamber; L.=molecular leak; P_1 and P_2 =accelerator plates; P.M.=permanent magnet; S.T.=sampling tube.)

many of the accelerated ions to stream as a narrow pencil into a magnetic field at right angles to their course so that they are deflected and separated into a fan-like pattern of beams of different molecular weight.

The position of this pattern of ion beams may be altered by changing the velocity with which all the ions enter the magnetic field. This velocity is controlled by the voltage which accelerates them from the ionization chamber; by variation of this voltage it is possible to move the "fan" and so direct a beam of ions of a given mass on to one collector. An analysis can thus be performed by varying the accelerating voltage from its maximum to its minimum value, thus "scanning" all the ion beams across the collector. The collector current therefore rises to a series of peak values representing the abundance of ions in each beam in turn, and falls to zero between them.

The scanning process is in practice made repetitive at 25 cycles per second. The pulses of current thus brought to the collector, as the array of ion beams swings across it, are amplified and displayed on a cathode-ray oscilloscope running synchronously with the scanning accelerating voltage. The current pulses are thus spread out as a series of peaks in an apparently stationary "mass spectrum" (see Fig. 2). The horizontal position of a peak identifies the molecular weight of a gas in the sample, and the vertical height of a given peak is proportional to the abundance of molecules

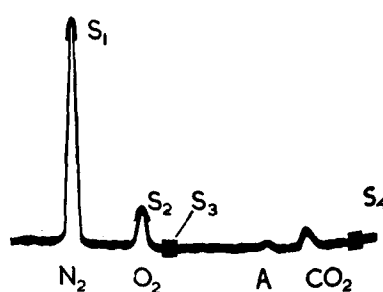


Fig. 2.—Drawing of mass spectrum as seen on the oscilloscope screen with the instrument sampling expired air. (N_2 , O_2 , A, CO_2 =peaks of nitrogen, oxygen, argon, carbon dioxide, respectively; S_1 , S_2 , S_3 , S_4 =light spots for "tuning" pen-recorder to following variations in height of any peak.)

of that gas at a given instant, and hence its partial pressure. Thus, when air is being drawn down the sample tube the nitrogen (mass 28) is represented by a tall peak on the left, next the oxygen (32), then the argon (39), and finally the carbon dioxide (44). On exhaling over the end of the sampling tube the oxygen peak will fall and the carbon dioxide peak will rise immediately the expired gas from the lungs enters the instrument. During breathing the heights of the peaks

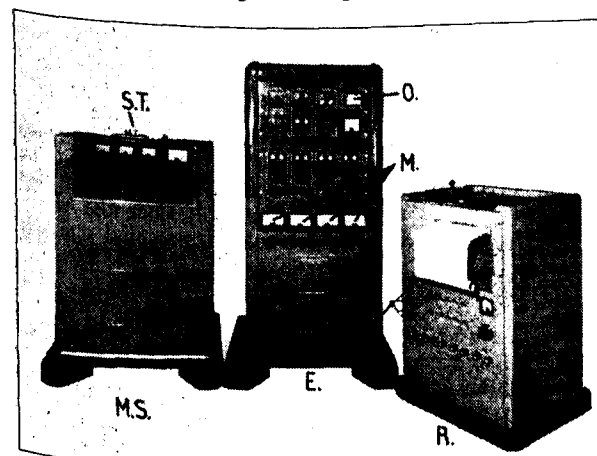


Fig. 3.—Photograph of mass spectrometer (M.S.), electronic measuring equipment (E.), and four-channel pen-recorder (R.). (S.T.=entrance for sampling tube; M.=monitoring meters; O.=oscilloscope displaying mass spectrum.)

fluctuate as inspire or expire passes the sampling point. The height of one or more of the displayed peaks can be automatically reproduced on a multichannel pen-recorder, so giving a continuous trace of the variations in partial pressure of a gas against time.

The selection of the peak or peaks to be recorded is done with the aid of a number of brightened spots (Fig. 2) which may be moved along the baseline of the oscilloscope trace by their respective control knobs on the electronic selector cabinet (Fig. 3, E) so that they climb the required peak. When the spot is tuned to the apex of a peak, as determined by the monitoring meters (Fig. 3, M.), one of the pens will automatically follow the variations in height of that peak. For instance, to measure oxygen concentration the operator positions one spot on the top of the peak corresponding to mass 32, and one pen of the recorder will then continuously record the changing partial pressure of this gas. As many "selector" channels as required can be incorporated; four are used on this machine, and it is thus possible to analyse simultaneously for any four constituents of the gas mixture. A pen of the recorder actually jumps each 25th of a second to the new height of the peak revealed as the ion beam of the relevant mass crosses the collector. This time is sufficiently brief in comparison with the respiratory cycle for the record to appear continuous.

Sampling Tubes

The sampling tube for general use consists of

about 3 feet (91 cm.) of fine (0.5 mm. outside diameter) hypodermic stainless-steel tubing. This is heated electrically to 70° C., to prevent condensation of water vapour, and covered with a protective, thermal insulating cover. The end of the tube goes into a taper plug so that it can be sited accurately at the centre of a gas stream, usually in a mouthpiece, as a push-fit (Fig. 4, A).

For use regionally within the lungs at bronchoscopy an alternative 4½-ft. (137-cm.) sampling tube is used, on the end of which different sizes of "cage" (Fig. 4, B) can be screwed so that the end of the sampling tube can lie centrally within the lumen of the chosen segmental bronchus. Three cages (of 5, 9, and 13 mm. diameter, respectively) have been made for us by Dr. B. M. Wright so that they fit different parts of the bronchial tree as determined initially from a precision cast of the tree made in plastic (Tompsett, 1952). The wire to carry the heating current is replaced by wider-bore hypodermic tubing (electrically insulated from the sample tube itself). This wider tubing makes the whole sample tube more rigid for manipulation down the bronchoscope, a short flexible end being left, as shown in the diagram, for bending as required. The outer hypodermic tube is finally covered with heat-insulating plastic. Sampling tubes can be changed for sterility between cases or in the event of blockage during sampling, and the instrument brought back into operation within two minutes.

Dimensions and Performance Data

The general appearance of the instrument is shown in Fig. 3. It consists of three mobile cabinets: the spectrometer itself (2 ft. 6 in. by 2 ft. 6 in. by 3 ft.—76 by 76 by 91 cm.), the electronic measuring equipment (2 ft. 6 in. by 2 ft. 6 in. by 4 ft. 6 in.—76 by 76 by 137 cm.), and finally the four-channel "Sanborn" pen-recorder (2 by 2 by 3 ft.—61 by 61 by 91 cm.). Each selector channel of the electronic equipment is on a plug-in separate chassis allowing immediate replacement. The case of the spectrometer is rapidly removable for servicing.

The instrument is designed so that potentially any stable gas of molecular weight between 18 (water vapour) and 80 (krypton) can be analysed. In practice the instrument is normally set for the mass range 25 to 50, thus including most gases of physiological importance, except helium (mass 4) which, because of its insolubility, has often been used for measuring the lung volume and distribution of ventilation within the lungs (Meneely and Kaltreider, 1949; Gilson and Hugh-Jones, 1949, 1955; Bates and Christie, 1950; Briscoe *et al.*, 1951). To have included helium would have meant more complex design and cost, using high-potential electrical components; moreover, neon (mass 20) is an almost equally insoluble inert gas available in substitute.

If the gas concentration at the tip of the sampling tube changes abruptly there is a constant "delay time" before the pens start to respond to the change, of 0.10 to 0.15 second, depending on the length and bore of the sampling tube in use. The pens then rise to the new level, 95% of the movement being completed in 0.10 second. It is this latter "response time" which is important in following fast gas-concentration changes. The delay time which is small may usually be ignored; it simply means that events are recorded slightly later than they occurred. If precise time relationship with other events is required the gas concentration tracing may be moved back by the required time interval.

The machine is normally left in a "stand-by" condition, with only the vacuum pumps running. To put it into operation the ionizing electron beam is turned on, the sample pump is started, and the electronic valves are warmed up. An air sample flow is then admitted and sufficient time allowed to elapse for the temperature and pressure conditions in the ionization chamber to stabilize. Our experience has been that one hour is sufficient time to prepare the machine for use. The various selector spots on the oscilloscope trace are positioned on the relevant peaks and the

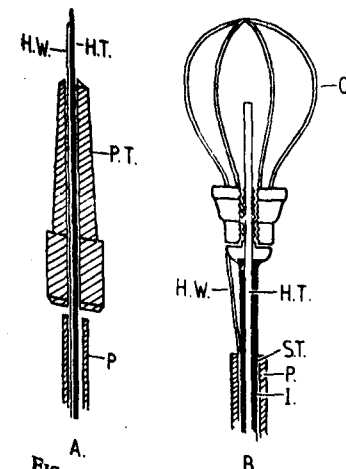


Fig. 4.—Diagrams of ends of sampling tubes: A, with taper plug (P.T.) for routine use in a mouthpiece; B, with protecting interchangeable cages (C.), sizes from 5 to 14 mm., for use at bronchoscopy. (H.W.=wire carrying heater current; H.T.=0.5-mm. bore hypodermic steel sampling tube; S.T.=outer steel tube for rigidity; I=electrical insulating coating; P=plastic covering.)

sensitivity of each channel is adjusted to give a known and convenient full-scale deflection, by using standard mixtures of the gases to be included in the analysis. Stability is affected by conditions in the ionization chamber, which are changed slightly if widely different gas mixtures are used. An overall control of the sensitivity of all channels together is therefore provided to make any minor corrections necessary during operation, using room air or a known mixture as standard.

At any time the trace has an absolute accuracy within 3%, though relative variations can be determined within 1%, of the full-scale deflection selected. Exact full-scale deflection is selected for convenience to the work in hand, and may be given by gases whose partial pressure is anything from 3% to 100% of the total.

Clinical Use of the Spectrometer

The instrument's ability to provide a continuous analysis for several gases should remove the difficult problem of gas sampling for routine clinical tests, and facilitate advances in research on the mechanism of gas exchange in the lungs.

Lung-function tests are rapidly proving their value in clinical medicine. With their help the mechanism of a patient's signs and symptoms, such as breathlessness or cyanosis, can often be understood from a quantitative measure of such factors as the relation between the distribution of gas and blood in the lungs, or of any barrier to the normal diffusion of gas between the alveoli and the blood. Such an assessment not only provides a basis for logical therapy, but repeated tests enable the physician to follow the efficacy of treatment. Measurement of all the different aspects of lung function aids the surgeon in gauging the likely functional effects of proposed operation. But lung-function tests are of no value in making a diagnosis of chest disease in terms of morbid anatomy or histology, with the notable exception of making a positive diagnosis of the presence and degree of emphysema.

The likely uses of the spectrometer in lung-function testing can best be considered under two headings: (1) studies of expired gases sampled at the lips; and (2) regional analysis within the bronchial tree.

Analysis of Expired Gases at the Lips

Multiple Breath "Wash-out" Data

The well-established procedure for determining the degree of inequality of gas distribution in the lungs by "washing-out" the nitrogen in them with successive breaths of oxygen or, alternatively, "washing in" a foreign inert and insoluble gas can readily be done. Part of a typical tracing taken from the spectrometer is shown in Fig. 5. Nitrogen is being washed out of the lungs by the inhalation of a mixture of argon and oxygen, the spectrometer being set to record the concentration of argon and nitrogen at the lips. Before the point marked S in Fig. 5 the subject is sitting breathing air, fluctuations in the nitrogen concentration between inspiration

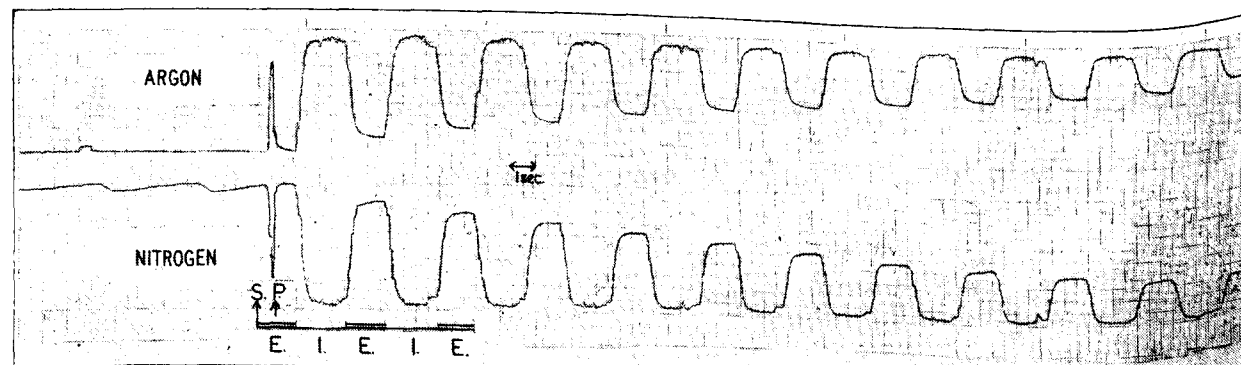


Fig. 5.—Assessment of uneven ventilation in the lungs by the "gas wash-out" technique. (Part of a record in a normal subject showing the nitrogen in the lungs being washed out by a mixture of argon and oxygen, as described in text. Tap turned in expiration following point S; puff of gas to clear apparatus dead space at P. E and I=expiration and inspiration, respectively. Ordinates, relative gas concentrations. Paper speed 10 mm. per second.)

and expiration being caused by the effect of the respiratory quotient and of the different moisture content of inhaled and exhaled air. During the expiration after S, a tap is turned so that the subject will breathe the argon-oxygen mixture in the next inspiration, the brief spike of the records at P. being caused by a puff of argon-oxygen mixture used to flush the dead space in the tap. In each subsequent breath as nitrogen is washed out argon is washed in, so that finally the exhaled argon is at the same concentration as that inhaled, while nitrogen almost disappears from the expirate. The steplike changes in concentration of these two gases are virtual mirror images.

The usual analysis of these curves is to plot the change in concentration of either gas on a logarithmic scale against the number of breaths. When the gas distribution in the lungs is "even," as in normal subjects, a nearly straight line is obtained on this semilogarithmic plot, since the wash-out process is approximately a simple exponential one. If

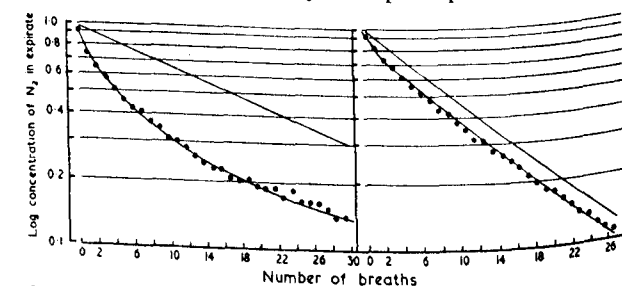


Fig. 6.—Nitrogen concentration in each successive expiration during a period of breathing a nitrogen-free gas mixture of a patient with emphysema (left) compared with a normal subject (right), plotted on a logarithmic scale against the number of breaths on a linear scale.

ventilatory inequality exists, as in emphysema, a biphasic exponential process becomes more obvious, and the semilogarithmic plot is curved (Fig. 6). The procedure is simple and rapid with the spectrometer. The continuous analysis throughout each breath will make it possible to find the effect of sampling at different times during the expirate and hence assess the results that were obtained when using some of the older methods of gas analysis; while the effect of using gases of different solubility or of nitrogen excretion from the blood to the lungs during the process can be determined.

Single-breath Data

Useful as the spectrometer is for "wash-out" tests, the information it will provide from analysis of a single breath is much more useful. By analysis of a single expiration with this instrument it should be possible not only to elucidate the unevenness of gas distribution but also to determine the way in which blood is distributed in the lungs in relation to gas distribution, and to estimate the diffusion barrier between blood and alveolar gas. This multiple information from analyses of single expirations is obtainable in no other way.

Nitrogen Analysis

Nitrogen analysis in a single expirate following an inspiration of oxygen (Fig. 7, bottom tracing) gives information similar but supplementary to that obtained from the "wash-out" data. Initially, oxygen from the upper respiratory dead space is exhaled so that there is a negligible amount of nitrogen in the record (phase 1), then an S-shaped portion (phase 2) appears which represents dead-space oxygen dilut-

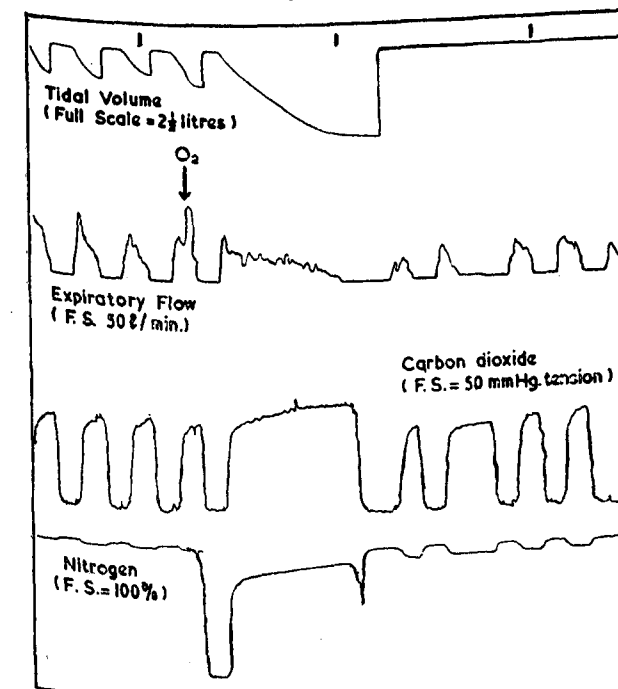


Fig. 7.—Analysis of a long expiration following a single breath of oxygen. Tap turned from air inspiration to oxygen at point marked O₂. Lower two tracings: concentration of CO₂ and N₂ sampled at the lips. Upper two tracings: concurrent rate of flow of expired gases from pneumotachograph, and gas volume, from electrical integration of flow. Paper speed 5 mm. per second.

ing alveolar nitrogen, and finally a plateau of alveolar nitrogen (phase 3). The slope of the alveolar plateau gives a measure of the inequality of gas distribution, for a difference in concentration at the beginning and end of the alveolar plateau results from nitrogen being preferentially diluted by the breath of oxygen in some parts of the lung at the expense of others (Fowler, 1948). But this slope must depend not only on the uneven distribution of gas to the different parts of the lung but also on the timing of emptying of these parts. If all the regions, with different dilutions of nitrogen in them, emptied together, the alveolar plateau would be horizontal. By combining data from the nitrogen wash-out and single-breath experiments it may be possible to obtain measure both of inequality of gas distribution and of the relative timing of emptying of the different parts.

Carbon Dioxide and Oxygen Analysis

Carbon-dioxide and oxygen analysis will provide even more important data. Although inequality of gas distribution is important in itself (for example, in diagnosis and assessment of emphysema), from the functional point of view the significance of this factor depends on the relative distribution of blood to the well and badly ventilated parts of the lungs. If air is sent to parts of the lung which are poorly perfused with blood there is wasted ventilation, while blood flow through poorly ventilated parts causes "venous admixture" in the arterial blood. In fact, the distribution of ventilation-perfusion ratios in the lung determines the gas tensions which can be maintained in the blood, and likewise those appearing in the exhaled breath. Since there is practically no carbon dioxide in the inspired air, that exhaled

must come from the blood, and the concentration of this gas in the alveolar phase of the expiration is an indication of the uniformity of the ventilation-perfusion ratio (Comroe *et al.*, 1955). Unfortunately, other factors besides the ventilation-perfusion ratios affect the carbon-dioxide curves. However, the respiratory quotient is also a function of the ventilation-perfusion ratio, and a simultaneous record of oxygen and carbon dioxide in a long exhalation following an ordinary inspiration of air can readily be got from the spectrometer, on a tracing similar to that in Fig. 7, and hence the variation in respiratory quotient during expiration can be measured.

Calculations from the respiratory quotient with the aid of the oxygen-carbon-dioxide diagram (West *et al.*, 1957) will enable an estimate of the variation in the ventilation-perfusion relationships throughout the lungs to be made, and provide a simple test of this factor for routine clinical use. This measure, not hitherto available in a form simple enough for clinical use, may be of great help in understanding the behaviour of the lung in such conditions as asthma and emphysema, besides being an important measure for determination of the cause in patients who exhibit cyanosis or carbon-dioxide retention.

Carbon Monoxide

Carbon monoxide has recently been used increasingly for studying the readiness with which gases diffuse between gas in the alveoli and the blood. It has such a high affinity for haemoglobin that its rate of uptake is primarily a function of this diffusion. This test of carbon-monoxide uptake readily permits the detection of a barrier to diffusion caused by pathological change in the alveolar wall ("alveolar-capillary block" of Cournand, 1952) in diseases such as sarcoidosis, scleroderma, etc., or from any reduction in the effective surface area of the lung. It can be performed by either the multiple-breath (Filley *et al.*, 1954; Bates *et al.*, 1955; Gilson and Hugh-Jones, 1955) or the single-breath (Forster *et al.*, 1954) technique. Infra-red gas analysis has made it a clinically practicable procedure, but the infra-red analyser has a response time too slow and needs a gas sample too big to observe accurately the "alveolar plateau" for carbon monoxide. The new spectrometer would be ideal for the analysis, especially as for many calculations it is really necessary to know the distribution of an inert insoluble gas given concurrently with the carbon monoxide, were it not that nitrogen has the same molecular mass (28) as carbon monoxide, hence they both contribute to an identical peak in the mass spectrum. However, it may be possible to wash out the nitrogen in the lungs with, say, argon-oxygen mixtures and then record a single breath of carbon monoxide together with another inert gas, say, neon, as a tracer for gas distribution.

Since this spectrometer can record the analysis of a gas mixture for four gases concurrently there seems no reason why, ultimately, the degree of inequality of ventilation, of ventilation-perfusion ratios, and of perfusion (the latter from the relation between the first two) should not be measured at the same time as the diffusing capacity from single expiration measurements following the inhalation of a suitable mixture of gases.

Regional Analysis at Bronchoscopy

Gas analysis, similar to that of the expirate sampled at the lips, can be used to determine ventilation and perfusion relationships in individual lobes and segments. A special sampling tube (Fig. 4, B.) is introduced at routine bronchoscopy so that the appropriate cage holds the tip of the sampling tube itself centrally within the required branch of the bronchial tree. The small (0.5 mm.) tube causes little obstruction to the air flow from lobar or even segmental bronchi. When the sampling tube has thus been sited under direct vision, the bronchoscope (redesigned with a side arm proximally and an inflatable cuff near the distal end) can be withdrawn just above the main carina, and its cuff inflated.

By closing the usual inlet of the bronchoscope round the sampling tube, gas is washed out through the side arm, while a record is taken on the pen-recorder of the changes in gas concentration from the lung segment under exploration. We have not yet done detailed investigations within the bronchial tree, though tracings from the main bronchi show the procedure to be quite practicable.

From such tracings it should be possible to calculate the ventilation, ventilation-perfusion relationships, relative blood flow, and gas uptake of any portion of the lung which can be individually probed. Even a knowledge of the respiratory quotient, which can be measured from a continuous tracing of oxygen and carbon dioxide taken with an unmodified bronchoscope at routine diagnostic bronchoscopy (Fig. 8), will provide a measure of differential lung

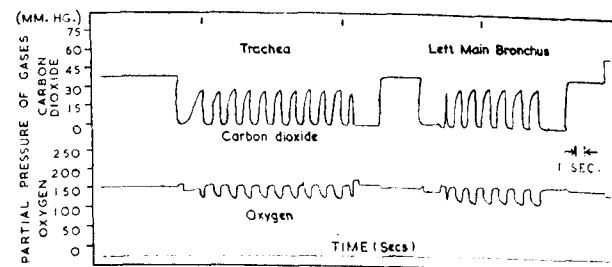


FIG. 8.—Continuous gas analysis within the bronchial tree at diagnostic bronchoscopy. Upper tracing, carbon dioxide (5-cm. full-scale deflection $\equiv$ 75 mm. p.p. CO_2); lower tracing, oxygen (F.S.D. $\equiv$ 250 mm. p.p. O_2). Paper speed 5 mm. per second.

function without bronchospirometry (Armitage and Taylor, 1956), and since this can be done segmentally with the mass spectrometer it should provide useful information for the surgeon before local resection is contemplated. For example, if the respiratory quotient of a part of the lung is unchanged by a pathological process there may be no functional indication for resection of this part, since there would be no venous admixture or wasted ventilation caused by it.

Applications in Medicine and Surgery

The procedures which we have described would be quite impracticable without the mass spectrometer. With its help they may well become practicable as routine diagnostic procedures. They demand but little effort and co-operation from the subject, and neither the complex apparatus for "snap" gas samples nor the bulky apparatus for gas collection are necessary.

Both prognosis and treatment of the large group of chronic chest diseases at present lumped together within the general terms of asthma or bronchitis and emphysema are unsatisfactory and empirical. The mass spectrometer should enable large series of such cases to be submitted to frequent functional testing, which by clarifying the functional disturbance should place prognosis and treatment on a more rational basis. Moreover, since the instrument is transportable, it could be used in field survey work, such as that designed to enlarge our knowledge of the evolution of chronic chest diseases.

The regional assessment at diagnostic bronchoscopy will be of obvious value to the surgeon as an indication of the advantages or danger of subsequent lobectomy or pneumonectomy. Perhaps in this field the *ad hoc* advances with the instrument will be greater than in any other. Regional continuous gas analysis within the lungs should also open up wide research possibilities in the elucidation of the changes in pulmonary blood flow associated with heart disease, such as mitral stenosis, and congenital abnormalities, and help in the study of the mechanism of pulmonary hypertension.

By contrast the use of the spectrometer in anaesthesiology will be limited, since the complex organic gases employed in modern anaesthetics are not readily analysed by this type of machine. It could be used for such simple purposes as

checking the level of carbon dioxide in the patient's breath during an operation, but there are other much simpler and less expensive instruments available for doing this. On the other hand, the spectrometer can prove very useful in checking the efficiency of oxygen masks, detecting leaks in equipment, rapidly checking the calibration of gas-delivering equipment, and so on.

Finally, the spectrometer can provide the most elegant and convincing demonstrations, for teaching purposes, of many classical experiments in physiology. The effects of breath-holding, hyperventilation, carbon dioxide narcosis in emphysema from oxygen inhalation, and many other phenomena can be beautifully demonstrated.

Summary

A mass spectrometer has been made, specifically for clinical practice and research, which will continuously and automatically analyse a gas mixture containing components of molecular weight in the range 18–80; this includes the majority of gases of physiological importance. It requires only electricity for operation, is transportable, and draws its gas sample (at a rate of 15 ml. per minute) through about 4 feet (122 cm.) of fine (0.5 mm.) hypodermic steel tubing.

The uses of this instrument are described. It will make the study of the gas exchange of the lungs as simple as measuring their ventilation for many clinical purposes. Analysis of single expirates and "wash-out" curves will enable measurements to be made of the inequality of gas distribution in the lungs, of the relation between distribution of gas and blood, and of the efficiency of gas transfer between alveoli and blood. These measurements are of value in making a positive diagnosis of emphysema, in elucidating the nature of the functional changes in chronic lung disease, in determining factors causing effects such as breathlessness, cyanosis, and carbon dioxide retention, and in following the efficacy of treatment in lung disease.

By passing the fine sampling tube into the bronchial tree, at diagnostic bronchoscopy, individual lobes and segments of the lung can be explored and local function examined; this should open new possibilities in cardio-respiratory research, and should be of considerable help to the thoracic surgeon.

The instrument provides a continuous record of the constituents of the gas sample as a series of peaks on an oscilloscope screen; the horizontal position of the peaks represents their identity as nitrogen, oxygen, carbon dioxide, etc., and their vertical height is directly proportional to their partial pressure in the mixture. Up to four components can be selected independently and simultaneously from this display, which represents their varying partial pressures, and these are recorded continuously on a direct-writing multi-channel pen-recorder. Pneumotachygraphic, electrocardiographic, or other information can be recorded simultaneously.

The response time when one gas is changed to another is such that 95% of full-scale deflection with the new gas is given in less than one-tenth of a second. The sensitivity is such that full-scale deflection may be obtained for partial pressures of anything between 3% and 100% of the total. The absolute accuracy is within 3%, though incremental changes can be measured within 1%, of the full-scale deflection selected.

The cost of construction and work with the spectrometer has been borne by the Medical Research Council, to whom we are most grateful. We would also like to record our thanks for the help and encouragement given by Dr. D. K. Hill, Director of

Bio-Physics Laboratory, and by Professor John McMichael and Dr. C. M. Fletcher, of the Department of Medicine of the Postgraduate Medical School. Dr. J. West, of the Medical Research Council's staff, has made valuable contributions in the initial use of the instrument. Mr. C. Lawden and Mr. T. Neal were responsible for construction of the instrument in the Postgraduate Medical School workshop.

REFERENCES

- Armitage, G. H., and Taylor, A. B. (1956). *Thorax*, 11, 281.
Bates, D. V., Boucot, N. G., and Dormer, A. E. (1955). *J. Physiol. (Lond.)*, 129, 237.
— and Christie, R. V. (1950). *Clin. Sci.*, 9, 17.
Briscoe, W. A., Becklake, M. R., and Rose, T. F. (1951). *Ibid.*, 10, 37.
Comroe, J. H., Forster, R. E., Dubois, A. B., Briscoe, W. A., and Carlsen, E. (1955). *The Lung—Clinical Physiology and Pulmonary Function Tests*, p. 74. Year Book Publ. Inc., Chicago.
Cournaud, A. (1952). *Rep. ann. Meet. and Proc. roy. Coll. Phys. Surg. Canada*, p. 34.
Filley, G. F., MacIntosh, D. J., and Wright, G. W. (1954). *J. clin. Invest.*, 33, 530.
Forster, R. E., Fowler, W. S., Bates, D. V., and Van Lingen, B. (1954). *Ibid.*, 33, 1135.
Fowler, W. S. (1948). *Amer. J. Physiol.*, 154, 405.
Gilson, J. C., and Hugh-Jones, P. (1949). *Clin. Sci.*, 7, 185.
— (1955). *Spec. Rep. ser. med. Res. Coun. (Lond.)*, No. 290. H.M.S.O., London.
Hitchcock, F. A., and Stacy, R. W. (1948). *Amer. J. Physiol.*, 155, 443.
Krogh, M. (1915). *J. Physiol. (Lond.)*, 49, 271.
Meneely, G. R., and Kaltreider, N. L. (1949). *J. clin. Invest.*, 28, 129.
Miller, F. A., Hemmingway, A., Nier, A. O., Knight, R. T., Brown, E. B., and Varco, R. L. (1950). *J. thorac. Surg.*, 20, 714.
Tompsett, D. H. (1952). *Thorax*, 7, 78.
West, J., Fowler, K. T., Hugh-Jones, P., and O'Donnell, T. V. (1957). *Clin. Sci. in press.*

COMPARISON OF SIDE-EFFECTS AFTER PARTIAL GASTRECTOMY AND VAGOTOMY AND GASTRO-ENTEROSTOMY*

BY

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Partial gastrectomy is a well-established procedure with a low mortality rate and a low incidence of anastomotic ulcers. Dissatisfaction with it correctly centres in its side-effects—that is, those symptoms not due to ulceration. The figures for mortality rates and anastomotic ulcers are easily definable, but the side-effects prove a difficult field to chart. Numerous surgical procedures have been devised with the object of reducing or eliminating them: fixing the gastric stump, changing the position of the stoma, the combination of vagotomy with practically every known variant of partial gastrectomy, and, more recently, Billroth I for duodenal ulcer. If gastric operations, in an attempt to reduce side-effects, are not to show a discouraging tendency to rotate in popularity, the results of different procedures must be compared with a fixed standard.

This fixed standard should be a simple clinical yardstick which illustrates principles rather than catalogues symptoms and which omits comparative terms as a basis or aid to comparison.

This paper compares the side-effects in 100 patients who have had partial gastrectomy for duodenal or anastomotic ulcer with the side-effects in 100 cases of duodenal ulcer treated by vagotomy and posterior

gastro-enterostomy. Each type of operation was carried out in comparable and unselected cases.

No case included in this report has been operated on during the past 12 months. As long-term results of vagotomy and posterior gastro-enterostomy are still unknown, it was decided to limit to 100 the number of cases in which this operation was carried out as a routine.

Facts have been collected in respect of the following points; (1) biliary regurgitation; (2) ability to take a normal-size mixed meal; (3) ability to take a one- or two-course meal; (4) the presence of selective impairment of digestion; (5) the incidence of dumping; and (6) the existence of any interrelation between the above.

All 200 patients have been personally interviewed on more than one occasion. The above questions were evolved with the object of demonstrating underlying principles.

PARTIAL GASTRECTOMY FOR DUODENAL ULCER

This operation was carried out for duodenal ulcer in 83 cases and for anastomotic ulcer in 17 cases (after posterior gastro-enterostomy 16, after pyloroplasty 1). Gastric section in all cases was carried out after division of the left gastric artery at the point at which it gives off the descending branch and after division of the lower two vasa brevia. Reconstruction was as follows: antecolic with spur, 85 cases; Polya, 8; Moynihan 1; Schoemaker 5; and Finsterer, 1. The afferent loop was made as short as possible consistent with the avoidance of tension.

Follow-up—Ninety-eight cases were operated on between 1947 and 1953, inclusive, and two in 1954. The average time between the date of operation and the date of this follow-up was four years five months. Eleven patients did not attend for review; the next 11 were therefore reviewed.

Biliary Regurgitation

Investigation into the incidence of biliary regurgitation in 100 patients gave the following results:

Nil	74 patients
Definite	5
(1) $\frac{1}{2}$ pint (285 ml.) once a day	1 patient
(2) " " (285 " " " week	1 "
(3) " " (285 " " " in two months	1 "
(4) Half a cupful (85 ml.) three times a week	1 "
(5) (85 " " once a month	1 "
Negligible (less than a mouthful once a week)	21 patients

Regurgitation of bile was therefore nil or negligible in 95 patients. Of the five patients with definite biliary regurgitation four had an antecolic partial gastrectomy with a spur and one had a Polya gastrectomy; four were females and one was a male.

Ability to take a Normal-size Mixed Meal

By this is meant the ability to take the normal-size two-course meal, whether in the evening or midday, composed of meat or fish and potatoes as the first course, and milk puddings, steamed puddings, etc., as the second course. The patient was asked to compare the size of the meal with the size of the corresponding meal prior to the development of the ulcer. No account has been taken of any patient's inability to take a large meal.

Group A: 55 patients were able to take a normal-size mixed meal.

Group B: 45 patients were unable to take a normal-size mixed meal.

In just under 50% of patients, therefore, there is a quantitative reduction in the food taken in this meal. An inability to take a normal-size meal may be a major handicap. The underlying problem has, we believe, not been pursued to its logical conclusion. A patient who is unable

*Based on a paper read before the Section of Surgery of the Manchester Medical Society on March 13, 1956.

to take a normal-size meal may be found to be omitting either course or to be taking a reduced amount of each course.

Ability to take a One- or Two-course Meal

The patient was asked whether he was taking a one- or two-course meal, and if the former, which course he now omitted. The patient was also asked to compare this with his ability to take a two-course meal before the development of the ulcer. Of the 100 patients under consideration, 35 were found to have been deprived by partial gastrectomy of their ability to take a sweet course. The distribution of these 35 patients in the two groups is as follows:

Group A: of the 55 patients able to take a normal-size meal, only 6 did not take a sweet course.

Group B: of the 45 patients unable to take a normal-size meal, 29 did not take a sweet course.

No patient had been deprived of his ability to take a meat or fish course.

The actual figures obtained were:

Sweet Course			
Group A		Group B	
Yes	46	Yes	13
No	6	No	29
No (and no pre-ulcer)	3	Occasionally (daily pre-ulcer)	3

It will be seen that 46 patients were taking a normal-size meal with a sweet course and 29 were not taking a normal-size meal or a sweet course.

Selective Impairment of Digestion

Patients were asked to compare their ability to take milk, as such, milk puddings, eggs, fatty foods, chocolates, and pastries at the time of the follow-up, with their ability to take the same foods prior to the development of the ulcer. These foods—fatty, sweet, and sweet fatty—were chosen as representing the constituents of the second or sweet course; any patients being deprived of the ability to take these foods would also be deprived of the ability to take a sweet course in virtue of what may be termed—for want of a particular phraseology—a selective impairment of digestion.

Group A

Selective Impairment of Digestion in 46 Patients Having a Normal-size Meal with a Sweet Course

Ability to Take	Yes	No	No/No	Uncertain
Milk	25	9	5	1
Milk puddings	41	3	3	2
Fatty foods	40	1	3	2
Eggs	42	1	2	1
Chocolates	31	7	6	2
Pastries	31	8	5	2

Six patients in addition stated that they could take milk but that they did not require it.

The word "No" in the tables indicates that the patient has been deprived of the ability to take the food in question because of the production of clearly defined symptoms after ingestion: nausea, palpitation, weakness, vertigo, sweating, marked flatulence, or a feeling of marked distension. Occasionally a definite dislike only has led to the omission of these particular foods.

"No/No" indicates that the patient did not take the particular food prior to the ulcer or after gastrectomy. Under the heading "Uncertain" are placed those few patients who gave uncertain or conflicting answers or who were not asked the question under consideration.

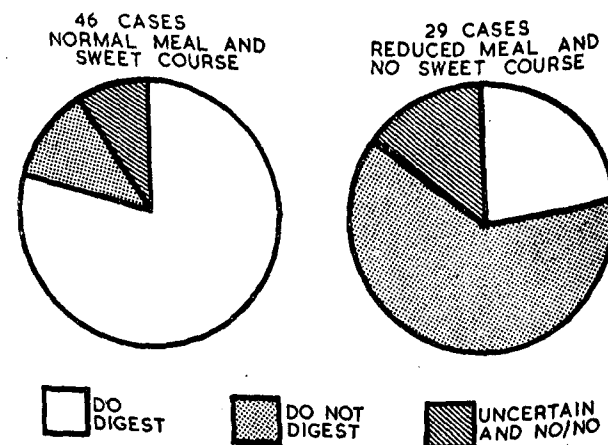
Of the 46 patients in this group having a normal-size meal and a sweet course, 25 were taking all of the following: milk, milk puddings, fatty foods, and eggs. (These include three patients who usually did not drink milk because they felt they did not need it but who could do so if they wished.) Not one patient out of the 46 had been deprived by partial gastrectomy of his ability to take all of the following: milk, milk puddings, fatty foods, and eggs.

Group B
Selective Impairment of Digestion in 29 Patients Not Having a Normal-size Meal or a Sweet Course

Ability to Take	Yes	No	No/No	Uncertain
Milk	9	16	2	—
Milk puddings	6	22	—	3
Fatty foods	8	16	2	2
Eggs	12	15	—	4
Chocolates	6	16	3	4
Pastries	8	16	1	4

Two patients in addition stated that they could take milk but they felt they did not require it. Similarly one patient could take milk puddings if he wished.
One patient included in the nine taking milk was taking cold but not hot milk. The statistics relating to the ability to take cold but not hot milk may be fallacious owing to the small number of patients taking hot milk by itself.

The diagram compares the selective impairment of digestion in those patients who can and those who cannot take a sweet course.



Of the 29 patients not taking a normal-size meal or a sweet course, only two were taking milk, milk puddings, fatty foods, and eggs. Five patients in this group had been deprived by partial gastrectomy of their ability to take all of the following: milk, milk puddings, fatty foods, and eggs; in addition 10 had been deprived of their ability to take three of these four foods.

There is an impressive difference in selective impairment of digestion between those patients who can and those who cannot take a sweet course. This indicates clearly that the main reason why the patient cannot take a sweet course is a failure of digestion for the sweet fatty foods which constitute this course. The attempt to digest these foods produces unpleasant symptoms, and they are therefore omitted from the diet. The facts set out in these tables cannot be accounted for solely by a reduction of reservoir or holding capacity. For example, a reduction of this holding capacity sufficient to allow a patient to take meat and potatoes but not a sweet course would be quite inadequate to account for the inability of the same patient to take the same quantity of fatty foods and eggs or to drink milk with the stomach empty, especially when he can drink the same quantity of water, tea, or beer.

There is much confusion between sweet and sweet fatty foods, the fat element usually being overlooked. One patient stated that she never took anything sweet. This on further questioning was found to mean that she never ate chocolates but was very fond of barley sugar or sugar in tea. Six patients had been deprived by partial gastrectomy of their ability to take fatty foods, chocolates, and pastries and yet were taking substantial amounts of sugar in tea. This suggests that it is the fat in reputedly sweet things—that is, chocolates and pastries—either by itself or in combination with the sweet element which determines the inability to digest.

This selective impairment of digestion has occurred after the following types of partial gastrectomy—antecolic with spur, Polya, Schoemaker, and Moynihan.

It should be emphasized that the average time of follow-up after partial gastrectomy was four years and five months.

Varying accounts have been given of the incidence of the pulmonary tuberculosis after partial gastrectomy. The correct answer is surely the most obvious. The main difference in any patient after partial gastrectomy and, for example, cholecystectomy, or in the same patient before and after partial gastrectomy, is the severe quantitative and qualitative reduction in food intake that may follow this latter operation. This must at times be responsible for lighting up a latent tuberculous focus. One patient who had been deprived by partial gastrectomy of the ability to take milk, milk puddings, fatty foods, chocolates, and pastries for five years developed pulmonary tuberculosis with a cavity and a positive sputum.

Incidence of Dumping

By dumping is meant attacks consisting of most or all of the following symptoms: vertigo, weakness, palpitation, and sweating. The total number of patients dumping was 19. This bald statement, however, conveys nothing of the underlying physiological defect or of the handicap imposed. It is essential, where possible, to establish what precipitates the attacks.

In six patients the attacks bore no ascertainable relation to any particular food; in two of these the dumping attacks came on after a large meal irrespective of the type of food consumed. In two patients the attacks were not related to meals at all. In one patient moderate attacks of dumping occurred on entering a warm room. In one patient there was no dumping for two years; attacks of dumping then came on, and were worse after exercise. In four patients, therefore, the attacks bore no relation to meals or any particular food.

The largest number of patients dumping—13 in number—all fall into one well-defined group. In every patient in this group the dumping attack was directly induced by one or more of the following: milk, milk puddings, fatty foods, eggs, chocolates, and pastries. In three of these patients the dumping was, in addition, produced by a large meal. The relation of dumping to a large meal, however, was not specifically asked for in each case. If a patient has dis- covered that attacks of dumping are directly induced by certain foods it is reasonable to suppose that these foods would be omitted from the diet. An inquiry into the diet of these 13 patients reveals the following:

	No	Yes
Normal-size meal	11	2
Sweet course	12	1

The selective impairment of digestion in these 13 patients was as follows:

	No	Yes	Doubtful
Milk	10	3	—
Milk puddings	12	1	—
Eggs	8	4	1
Fatty foods	11	2	—
Chocolates and pastries	12	1	—

The conclusion to be drawn from these tables is clear—in order to avoid attacks of dumping the patient has omitted from his diet those foods that produce them. In other words, the main handicap of dumping in these patients is the handicap imposed by avoiding it. It should be again emphasized that these findings do not relate to the early post-operative period in which dumping may more often follow a large meal and in which the patient has not had time to sort out those foods particularly associated with dumping.

On further questioning, all these 13 patients have stated that, with particular care in avoiding the foods that produce dumping, the attacks of dumping have been eliminated. The number of patients, therefore, who were actually experiencing unavoidable dumping attacks was four—that

is, those patients already referred to whose attacks bore no relation to meals or any particular food.

In order to confirm statements that attacks of dumping followed ingestion of certain foods, patients have been brought to the out-patient department and given a glass of hot milk containing two eggs. It had previously been ascertained from the patients that attacks followed these foods. Attacks of dumping have followed and have been directly observed. The production of dumping by a glass of milk with two eggs, the fatty meal of the cholecystogram test, with its known hormonal action, may eventually put the dumping syndrome on a firm physiological basis. It will also be recalled that systemic disturbances in a case of argentaffinoma have been provoked by fatty foods (Bleehen, 1955).

A loss of reservoir or holding capacity and an inability to take sweet foods does undoubtedly occur after partial gastrectomy; an inability to take purely sweet foods is no material handicap or hardship to anyone; a loss of holding capacity is undoubtedly responsible for a definite reduction in food intake, but has previously been allowed to over-shadow in importance the effect of selective impairment. An inability to take milk, milk puddings, fatty foods, and eggs is a determining factor in the production of the post-gastrectomy defects—inability to take a normal-size meal, inability to take a sweet course, and attacks of dumping. The cause must be physiological; it is therefore difficult to understand how this digestive disability can be reduced or eliminated by such advocated procedures as fixing the gastric stump or changing the position of the stoma from the lower third to the middle third in Billroth II modifications.

It will have been noticed that no attempt has been made to place patients into categories determined by the use of comparative terms—that is, "good" or "bad" results—or to give the number of "satisfied" patients. This classification so frequently distorts the truth because it hides it, and it is no substitute for factual statements.

VAGOTOMY AND POSTERIOR GASTRO-ENTEROSTOMY

Routine abdominal vagotomy and posterior gastro-enterostomy with the stoma in the pyloric antrum was carried out.

Follow-up—Ninety-six cases were operated on between 1948 and 1953 inclusive and four in 1954. The average time between the date of operation and the date of this follow-up was two years and nine months. Nine patients did not attend for review; the next nine patients were therefore reviewed.

Biliary Regurgitation

The following were the results of investigation into biliary regurgitation in 100 cases:

	67 patients
Nil	8
Definite	1 patient
(1) 1 pint (285-570 ml.) twice a week	1
(2) 1 cupful (170 ml.) daily before breakfast	1
(3) Half a cupful (85 ml.) twice a week	1
(4) Half a cupful (85 ml.) after fats only	2 patients
(5) One mouthful three times a day	2
(6) One mouthful almost daily	25
Negligible (less than a mouthful once a week)	—

Evaluation.—Seven cases more have regurgitated bile after vagotomy and gastro-enterostomy than after partial gastrectomy. In each of these seven cases not more than a mouthful of bile was returned at once. There was no material difference in major biliary regurgitation after partial gastrectomy and after vagotomy and gastro-enterostomy.

Ability to take a Normal-size Mixed Meal

Group A: Seventy-seven patients were able to take a normal-size mixed meal.

Group B: Twenty-three patients were unable to take a normal-size mixed meal.

Evaluation.—Comparing the above figures with those after partial gastrectomy it is clear that there is an overwhelming advantage in favour of vagotomy and posterior gastro-

enterostomy, 45 patients being deprived of their ability to take a normal-size meal by partial gastrectomy as against 23 by vagotomy and gastro-enterostomy.

Ability to take a One- or Two-course Meal

Of the 100 patients under consideration, nine were found to have been deprived by vagotomy and gastro-enterostomy of their ability to take a sweet course. The distribution of these nine patients in the two groups is as follows:

Group A: of the 77 patients able to take a normal-size meal, only one did not take a sweet course.

Group B: of the 23 patients unable to take a normal-size meal, eight did not take a sweet course.

The actual figures obtained were:

Sweet Course			
Group A		Group B	
Yes	69	Yes	13
No	1	No	8
No/No	7	No/No	2

"No/No" indicates that the patient did not take a sweet course prior to the ulcer or after operation. It was found that 69 patients were taking a normal-size meal with a sweet course and eight were not taking a normal-size mixed meal or sweet course.

Evaluation.—The advantage here is overwhelmingly on the side of vagotomy and gastro-enterostomy, 35 patients being deprived by partial gastrectomy of their ability to take a sweet course as against nine similarly deprived by vagotomy and gastro-enterostomy.

Selective Impairment of Digestion

Group A

Selective Impairment of Digestion in 69 Patients Having a Normal-size Mixed Meal With a Sweet Course

Ability to Take	Yes	No	No/No	Uncertain
Milk	52	2	7	—
" puddings	63	3	2	—
Fatty foods	58	8	3	—
Eggs	59	7	3	—
Chocolates	55	5	7	—
Pastries	58	5	6	—

In addition to the above, eight patients did not drink milk and one did not take milk puddings; both could have done so had they wished.

Group B

Selective Impairment of Digestion in Eight Patients Unable to Take a Normal-size Mixed Meal or a Sweet Course

Ability to Take	Yes	No	No/No	Uncertain
Milk	3	5	—	—
" puddings	1	6	1	—
Fatty foods	1	6	—	1
Eggs	3	4	—	1
Chocolates	3	3	1	1
Pastries	2	5	1	—

The selective impairment of digestion in the 100 patients treated by partial gastrectomy and the 100 patients treated by vagotomy and gastro-enterostomy was as follows:

	No Milk	No Milk Puddings	No Fatty Foods	No Eggs
After P.G.	30	32	25	20
" vag. and P.G.E.	7	10	17	14

Evaluation.—These figures show a clearly defined advantage on the side of vagotomy and gastro-enterostomy.

Incidence of Dumping Attacks

The total number of patients with dumping was 12. In six these attacks were not related to meals. This group is constituted as follows: one patient with dumping attacks approximately once a month after exercise; one patient

with dumping attacks twice a week associated with emotion and exercise; one patient with dumping attacks occasionally after emotion; two patients with dumping attacks once a month with no ascertainable cause; one patient with three attacks of dumping in eight months with no ascertainable cause.

In the six patients in whom dumping attacks bore a definite relation to meals the record is as follows: two had dumping after hot milk, one after "horlicks"; one slightly after fatty foods; one after the midday meal irrespective of its nature; and one had two attacks a month, usually after breakfast.

Evaluation.—The incidence of dumping after vagotomy and gastro-enterostomy is less than after partial gastrectomy. The attacks are less often associated with particular foods, and there is therefore not the same necessity to restrict the diet in order to avoid the attacks.

Summary

There is no material difference in the incidence of biliary regurgitation after partial gastrectomy and that after vagotomy and gastro-enterostomy; the incidence of dumping is less after vagotomy and gastro-enterostomy; the outstanding advantage of vagotomy and gastro-enterostomy over partial gastrectomy is in the nutrition of the patient; more patients take a normal-size meal, more patients take a sweet course, fewer patients suffer from a selective impairment of digestion—and the difference in all three points is substantial.

It is a pleasure to thank the South Manchester Hospitals Management Committee for financial assistance in carrying out this work. The diagram was produced by the department of medical illustration.

REFERENCE

Bleehen, N. M. (1955). *Lancet*, 2, 1362.

CLINICAL EVALUATION OF THREE ANTICOAGULANTS IN THROMBO-EMBOLIC DISEASE

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Although anticoagulant therapy is at present widely accepted as being of value in thrombo-embolic disorders, there is less agreement on the best agent for inducing a therapeutic degree of prolongation of the one-stage prothrombin time.

The most commonly used oral anticoagulants in this country are ethyl biscoumacetate ("tromexan") and phenindione ("dindevan"), both of which rapidly produce an effect of comparatively short duration. The former is apt to produce frequent wide fluctuations in the prothrombin time, particularly during the first ten days of treatment (Barker, 1952). Toohey (1953) has reported favourably on the actions of phenindione. A third anticoagulant, cyclocoumarol ("cumopyran"), or 3,4-(2'-methyl-2'-methoxy-4'-phenyl) dihydropyranocoumarin, has become available in this country recently. It was first synthesized by Ikawa in 1942 in Link's laboratory during an investigation of substances chemi-

cally related to dicoumarol. Under the name of anti-coagulant No. 63 it has been experimentally and clinically assessed in America (Battle *et al.*, 1950; Brambel *et al.*, 1950; Rotter and Meyer, 1951, 1952; Barker *et al.*, 1952), but so far no account of its effects has been published in this country.

In this paper the results obtained in treating 57 patients with cyclocoumarol, 125 with ethyl biscoumacetate, and 179 with phenindione are analysed and compared.

Methods

In general, in estimating the initial dosage, attention was paid to the age and weight of the patient and to evidence of cardiac failure and renal or hepatic disease. Any history of recent dyspepsia, especially in patients known to have been sufferers from peptic ulceration, and any source of bleeding were considered contraindications to the use of anticoagulants.

Patients given ethyl biscoumacetate or phenindione received 10,000–15,000 units of heparin intravenously every six hours for the first 24 hours of anticoagulant therapy. Because of its slower effect on the prothrombin time, those given cyclocoumarol received the same dosage of heparin six-hourly for 48 hours.

Each of the three drugs was given by mouth in divided doses at 2 p.m. and 10 p.m. An initial prothrombin time was estimated only when there was any reason to suspect that it would be abnormal. Subsequent dosage was dictated by the prothrombin time. For this purpose blood was withdrawn each day at 9 a.m. and the prothrombin time (Quick's one-stage clotting-time) was estimated, using as a source of thromboplastin a carbol-saline extract of human brain (Toohey, 1950). A control prothrombin time was done daily on a suitable subject, and all results were expressed in seconds. The control prothrombin time varied between 14 and 16 seconds. If the control prothrombin time exceeded 16 seconds it was discarded as unsuitable and a fresh control was selected. A patient's prothrombin time was regarded as being within therapeutic limits if it lay between two to three times the control value.

We decided to avoid converting the patient's prothrombin time into a percentage of normal prothrombin activity by the use of a calibration curve of the prothrombin times of serial dilutions of normal plasma. The use of such a percentage figure—the so-called "prothrombin concentration"—makes comparisons between the results from different laboratories using dissimilar sources of thromboplastin difficult and leads to the misconception that prothrombin activity is measured by the prothrombin time.

All dosage was controlled by us and by the consultant clinical biochemist. The urine of each patient receiving cyclocoumarol was examined daily for microscopic haematuria.

Results

The age, sex, and weight distributions of the three series were similar. Table I shows the diagnoses in the respective series. The initial dosages of the three substances were:

Ethyl Biscoumacetate.—The usual initial dose was 600 mg. followed eight hours later by a further 600 mg. On the second day of therapy two doses of 300 mg. were most

TABLE I.—Diagnoses in the Three Series

Diagnosis	No. of Cases		
	Ethyl Biscoumacetate	Phenindione	Cyclocoumarol
Coronary artery disease	56	76	42
Venous thrombosis	53	83	11
Pulmonary embolism	2	10	—
Arterial	12	4	4
Cerebral thrombosis	2	5	—
Post-operative prophylaxis	—	1	—
Total	125	179	57

frequently used. The total amount given in the first 48 hours, however, varied from 300 to 2,400 mg.

Phenindione.—The most common dosage schedule was 200 mg. divided into two doses on the first day with two 50-mg. doses on the second, but again there was a wide variation in the amounts used. The sum of the doses given in the first 48 hours varies from only 125 mg. to as much as 650 mg.

Cyclocoumarol.—Two 75-mg. or two 50-mg. doses on the first day were found to be adequate for most cases. On the second day two 12.5-mg. or two 25-mg. doses were most often necessary.

Initial Response.

—The Graph shows the initial responses achieved in each of the three series. Within 48 hours of the first dose of ethyl biscoumacetate the prothrombin time of 85% of patients had reached therapeutic levels; the corresponding figure for phenindione was 76% and for cyclocoumarol only 40%.

Daily Maintenance Dose.—The ranges of the daily maintenance doses are shown in Table II. These daily maintenance doses were calculated only for those patients who

TABLE II.—Daily Maintenance Doses

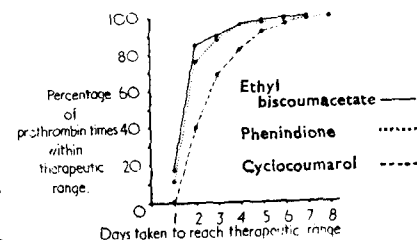
Anticoagulant	Daily Maintenance Dose in mg.	No. of Patients
Ethyl biscoumacetate	Less than 150	11
	150–300	34
	300–450	25
	450–600	16
	600–750	8
	750–900	5
	900–1,050	2
Phenindione	1,050–1,200	2
	More than 1,200	1
	Less than 25	11
	25–50	38
	50–75	56
	75–100	33
	100–125	22
Cyclocoumarol	125–150	4
	150–200	1
	200–300	2
	Less than 12.5	12
	12.5–25.0	23
	25.0–37.5	9
	37.5–50.0	1

received anticoagulants for a sufficient length of time. No close relationship was found between the daily maintenance dose of any of the drugs and the age, sex, or weight of the patients.

Time Spent within Therapeutic Limits.—After exclusion of the prothrombin times affected by the initial dosage, the number of days under treatment during which the prothrombin time was within therapeutic limits was calculated for each patient. Table III compares the three series. Although the figures shown seem to reflect a poor degree of control of the prothrombin time, it should be emphasized that, whereas in practice one is satisfied when the patient's prothrombin time is within one or two seconds of two to three times the control prothrombin time, strict interpreta-

TABLE III.—Comparison of Time Spent Within Therapeutic Limits

Percentage of Days During which Prothrombin Time Lay between Therapeutic Limits	Percentage of Patients		
	Ethyl Biscoumacetate	Phenindione	Cyclocoumarol
80–100	42	75	45
Over 60	79	95	71



Initial response obtained in each of the three series. The therapeutic range is between two and three times the control prothrombin time.

In these studies of men examined before national service, records were collected from a variety of centres. In view of most of the evidence given above, it was surprising to find that the proportion of men who had been operated on was much higher in a group of men drawn from Clydeside and the West of Scotland (Clydeside A in Table II) than it was in similar groups drawn from North-west London and the Home Counties. In my studies the rates found in North-west London and in the Home Counties agreed well with those found by Stewart (1955) in Southend, Northampton, and Leicester. These are also given in Table II. To check

TABLE II.—Proportion of Men Who Had Undergone Appendicectomy Before Their Pre-Service Medical Examination. By Area

Area:	Part of Home Counties (1)	North-west London (1)	Leicester (2)	Northampton (2)	Southend (2)	South-east Lancashire (1)	Clydeside A (1)	Clydeside B (3) (4)
Proportion of men who had undergone the operation	4.0%	4.8%	4.4%	4.0%	3.9%	5.0%	6.4%	7.2%
No. of men examined	1,823	460	4,870	4,387	4,424	602	271	587

(1) Previously unpublished data from studies of the findings of the medical boards that examined young men before military service in 1953-4. The numbers given refer to the actual examinations reported, and are not reconstructed populations. 63% of these men were aged 18, and almost all the rest were under 23.

(2) These figures are from Stewart (1955). The men were examined during the war, and were aged 17 to 19.

(3) These figures are from the special study made at the boards to check the high appendicectomy rate in young men found in this area. The men were aged 17-18½ in 1955. This was a study specially directed towards appendicitis. This may explain the slightly higher value than Clydeside A, the data for which were taken from a general survey of all diseases. However, Webb (1955) showed that appendicectomy scars were reliably recorded by those boards.

(4) Because of the different conditions under which the various data used in the calculation of the different rates were collected, no formal tests of significance have been used. However, with samples of this size it is unlikely that the variations are entirely due to chance.

TABLE III.—Death Rates from Appendicitis. Greater London and Glasgow Area.* Per 100,000 Per Annum Over the Period 1945-54

Ages:	0-14	15-44	45-64	65 and Over	All Ages
Males					
Glasgow Area	Deaths 94	90	90	76	350
	Rate 3.5†	2.0	4.2	9.5	3.5
Greater London	Deaths 220	265	402	441	1,328
	Rate 2.5	1.5	4.3	12.7	4.4
Females					
Glasgow Area	Deaths 59	87	89	64	299
	Rate 2.2	1.8	3.6	6.3	2.7
Greater London	Deaths 169	187	270	419	1,045
	Rate 2.0	1.0	2.4	7.7	2.9

* As defined in the text.

† The excess of the Glasgow rate over the corresponding London rate is unlikely to be due to chance: $\chi^2=6.92$; $P<0.01$.

that the Scottish figures were reliable a further special study was made of the records. The figures are given in Table II as Clydeside B. Thus there seems to be, for young males, an operation rate substantially higher in Clydeside than in London.

Mortality from Appendicitis in Males

These variations in the geographical distribution of the operation in young men are not closely reflected by the total death rates from appendicitis, taking all ages together. This is not surprising, since in the latest series of hospital admissions published (collected in 1951) only 15% of the admissions of males were over the age of 44, while during the same period in this country 62% of the deaths in men from this condition occurred at greater ages than this (Registrar-General, 1953, 1955a). However, if the age-specific death rates are taken—here it has been done for Greater London and the Glasgow area*—we get a different pattern (Table III). There is a definite excess in Glasgow of deaths in the younger age groups.

Thus substantially higher operation and death rates from appendicitis have been demonstrated in the Glasgow area in

* A better comparison would be between the two conurbations of Greater London and Central Clydeside. This is not possible, as the figures have not been available for Clydeside for long enough to give stable rates. An approximation to this area has been made by taking the counties of Lanark, Renfrew, and Dunbarton, with their burghs, and adding their experience and population to that of Glasgow City. This was necessary as the boundaries of the conurbation cut across the older administrative units, in terms of which the figures are given. The population of this composite area was 2,103,000 in 1951. At the same census the population of the Central Clydeside Conurbation was 1,758,000.

young men. In view of the evidence that this disease is associated with high social and economic status, and that the proportion of people in social classes I and II is lower in Glasgow than it is in London (Registrar-General, 1952), this finding seems to indicate that there must be a further independent environmental factor in the causation of the disease, at least in the young.

The contrasted ways in which the appendicitis death rate behaves in young and old people are shown as we examine the rates for England, the Glasgow area, and the rest of Scotland. These are given in Table IV. The excess death rate of young people in the rest of Scotland is unlikely to be

TABLE IV.—Death Rates from Appendicitis by Ages. England, the Glasgow Area, and the Rest of Scotland. Males. Per 100,000 Per Annum Over the Period 1945-54*

	England	Glasgow Area†	Rest of Scotland
Ages under 15			
Deaths	1,079	91	110
Rate	2.6	3.7	3.3
Ages over 64			
Deaths	1,667	68	130
Rate	10.1	9.5	10.7

* Excepting in each case 1950, the figures for which year for England have not been published in this form.

† As defined in the text.

the result of the distance that some of them live from surgical facilities, for it is also found in the Glasgow area. Further, this excess is not found in old people in the rest of Scotland. The excess death rate from appendicitis in males under 15 in the rest of Scotland suggests that the factor, whatever it is, is not confined to Glasgow. A similar excess is found in Wales.

Discussion

The operation of appendicectomy is performed both in the acute stage of the disease and when it is more chronic. There is controversy over the usefulness of the latter type of operation (British Medical Journal, 1955), and the practice of different surgeons varies widely. Thus it might be expected that substantial variations in the operation between different areas would not reflect real differences in the disease. But the differences demonstrated here apply to the death rates as well as to the operation rates. They are thus likely to reflect actual differences in the disease, and not in its treatment.

The geographical and social variations of the disease discussed here relate only to the fairly homogeneous population of this country. With greater differences in conditions—as when people in the West Indies or tropical Africa are compared among themselves or with Europeans—much greater differences in the prevalence of the disease emerge, which do not seem to be related to differences in the surgical care available (Leacock, 1952; Karn, 1952; Barker, 1952).

The geographical variation found in Britain seems to fit in with the evidence that there is a link between appendicitis and duodenal ulcer. The prevalence of duodenal ulcer seems to be high in young men in Glasgow (Doll, 1952), and “duodenal ulcer proved to be an important fallacy in the diagnosis of chronic appendicitis” in a series reported from Glasgow (McLennan and Watt, 1954). Further, the hospital admission rates among troops in the U.K. for these two conditions have moved in a similar way. From 1946 to 1952 both rates rose, at a time when the general level of sickness fell, and since then they have both fallen a little (War Office, 1954a, 1956).

No information is given by these inquiries about the distribution of the operation among females. It is known that the incidence of the operation is very high in young women (Ferguson, 1950b; War Office, 1954b; Ministry of Pensions and National Insurance, 1955). There is no rise in the death rate of young women, to correspond with this high operation rate (Table III). The mortality of females under the age of 15 is greater in the Glasgow area than it is in London, but the excess is not so great as for males.

INFLUENCE OF VITAMINS UPON SOME TERATOGENIC EFFECTS OF RADIATION

AN EXPERIMENTAL STUDY

BY

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Developmental malformations may readily be produced in the embryo by exposure of the dam to ionizing radiation during pregnancy (Hicks, 1953). Extensive investigations have been carried out upon chemical agents which either increase or diminish the radio-sensitivity of the tissues, but little attention has been paid as yet to the possibility that the teratogenic effects of radiation may be modified in a similar fashion. Wolff and Kirmann (1954), however, have shown that certain substances, such as cystamine, protect the developing tissues to some extent from the effects of x-radiation, and thus reduce the incidence of malformations in the offspring of dams exposed to x-radiation during pregnancy.

A large body of evidence has now accumulated which indicates that the induction of a maternal hypovitaminosis or hypervitaminosis is an effective method of producing a wide range of deformities in the embryo. The literature has recently been reviewed by Woollam and Millen (1956). Alteration of the maternal vitamin intake produces deformities in the young remarkably similar to those which occur when the dam is exposed to ionizing radiation during pregnancy. Defects of the eye and hydrocephalus which are readily produced by radiation (Hicks, 1953) also occur when the dam is subjected to the effects of hypovitaminosis or hypervitaminosis A (Giroud, 1955). The question naturally arises whether alteration of the vitamin intake of the dam during pregnancy might not have some effect in increasing or reducing the sensitivity of the young to the teratogenic action of radiation. The present communication deals with a group of experiments in which the effects of a combination of vitamins on the radiosensitivity of the foetus were studied.

Material and Methods

Preliminary Investigations.—It was considered necessary to concentrate on a single deformity, the presence or absence of which could be demonstrated unequivocally. Anophthalmia fulfilled this criterion satisfactorily. Preliminary experiments were therefore conducted to establish the time of administration and level of dosage of x-radiation which would produce a suitable standard incidence of anophthalmia.

Experimental Details.—Virgin female white rats of the Wistar strain were divided into four groups of 12 each as follows: Group 1 received radiation and vitamins; group 2 received radiation only; group 3 received vitamins only; and group 4 (controls) received neither radiation nor vitamins. Pregnancy was dated by vaginal smears taken daily at 9 a.m.; the day on which sperm was found in the smear was taken as Day 1. Animals in groups 1 and 3 received the following vitamins by parenteral injection at 2 p.m. on Day 1: vitamin A, 10,000 i.u.; vitamin D₂, 50,000 i.u.; α -tocopherol acetate, 60 mg.; aneurine hydrochloride B.P., 70 mg.; nicotinamide, B.P., 45 mg.; riboflavin B.P.,

The mortality from appendicitis is still far from negligible (969 deaths in 1954 in England and Wales) although it is falling. Allowing for changes in the age structure of the population, the mortality of the males is 27% of what it was in 1938 (Registrar-General, 1955b).

Age, sex, social class, and place of residence probably affect the incidence of the disease, and these and other factors certainly affect the incidence of appendicectomy and the death rate from appendicitis. The distinction between (a) the distribution of the disease, (b) the distribution of the operation, and (c) the mortality rate is necessary at the present time, as nothing is known about possible variations in the minor forms of the condition. The variety of factors that influence the operation and death rates, and interact in a complex way, seems to rule out the possibility of there being a single cause for the disease. At the present time we are almost entirely ignorant of what these causes may be. Fuller knowledge, while valuable for its own sake, might well lead to better treatment or rational prophylaxis. Thus the use of purgatives is still very common among young people—a problem to which Reid (1956) has recently drawn attention.

What is the geographical and social distribution of the use of these drugs? Is appendicitis related to their routine or sporadic use? The operation rate is very high in young women, while the death rate is very low. What proportion of these appendixes removed from young women show good evidence of inflammation? Is the severe disease commoner here, or do these young women have an excess of the minor forms of the disease? If they do, why is this so? Children and young people in certain areas seem unduly exposed to the disease. Is the disease process different from that found in old people, when the social distribution may be quite different? These and many other problems of the disease could be approached by epidemiological methods.

Summary

Young males are more likely to be operated on for appendicitis and to die of the disease in the Glasgow area than they are in London. This is an unexpected finding, in view of the association between appendicitis and high economic and social status. The existence of a further factor in the causation of the disease is postulated.

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REFERENCES

- Bailey, N. T. J. (1951). *J. Hyg. (Lond.)*, 49, 81.
- Barker, E. A. (1952). *British Medical Journal*, 2, 1045.
- British Medical Journal, 1955, 1, 776.
- Doll, R. (1952). In *Modern Trends in Gastroenterology*, edited by F. Avery Jones, p. 366. London.
- Ferguson, T. (1950a). *Hospital and Community*. 11 Hospital-treated Sick-ness Amongst the People of Ayrshire, p. 68. Nuffield Provincial Hospitals Trust, London.
- (1950b). *Ibid.*, p. 66.
- Karn, H. M. (1952). *British Medical Journal*, 2, 566.
- Leacock, A. (1952). *Ibid.*, 1, 1347.
- Lee, J. A. H. (1955a). *Publ. Hlth (Lond.)*, 68, 102.
- (1955b). *Proc. roy. Soc. Med.*, 48, 653.
- McLennan, I., and Watt, J. K. (1954). *British Medical Journal*, 2, 736.
- Ministry of Pensions and National Insurance (1955). *Digest of Statistical Analysis of Certificates of Incapacity, 1953-4*. Table 7. Ministry of Pensions and National Insurance.
- Reid, J. J. A. (1956). *British Medical Journal*, 2, 25.
- Registrar-General (1952). *Census of Great Britain, 1951. 1% Sample Tables Part I*, p. 83. H.M.S.O., London.
- (1953). *Annual Statistical Review of England and Wales, 1951. Tables Part I (Medical)*, p. 158. H.M.S.O., London.
- (1954). *Decennial Supplement, England and Wales (1951). Occupational Mortality*, p. 11. H.M.S.O., London.
- (1955a). *Statistical Review of England and Wales, 1950-1951. Supplement on Hospital In-patient Statistics*, p. 66. H.M.S.O., London.
- (1955b). *Statistical Review, England and Wales, 1954. Tables Part I (Medical)*, p. 58. H.M.S.O., London.
- Stewart, A. M. (1955). Personal communication.
- Webb, J. W., and Hewitt, D. (1955). *Brit. J. Prev. Soc. Med.*, 9, 147.
- War Office (1954a). *Report on the Health of the Army, 1951 and 1952*, p. 780.
- (1954b). *Ibid.*, p. 79.
- (1956). Personal communication of provisional figures.
- Webb, J. (1955). *Proc. roy. Soc. Med.*, 48, 656.

1 mg.; pyridoxine hydrochloride B.P.C., 15 mg.; calcium pantothenate, 1.5 mg.; benzyl alcohol B.P., 40 mg.; and ascorbic acid B.P. as sodium ascorbate, 150 mg.

The animals of groups 1 and 2 received x-radiation on Day 2 at 9 a.m. The details of the radiation are as follows. Each animal received a single dose of x-radiation. The animal was placed in a lead tube which had an aperture $1\frac{1}{2}$ by $1\frac{1}{2}$ in. (3.8 by 4.4 cm.) situated over the anterior abdominal wall so as to expose both cornua of the uterus to the rays. A beam of x rays was used at a potential of 85 kV.P., filtered through 1 mm. of aluminium at a tube current of 8 mA and exposure of 2 minutes; the skin dose, as measured with a Baldwin-Farmer substandard dosimeter at focal skin distance of 10 cm., was 258 r. The animals were killed on Day 20. The young were removed and weighed. The heads were preserved in Bouin's solution. Celloidin sections of heads were later prepared and the presence and dimensions of each eye accurately ascertained.

Findings

There were no significant variations in the weights of the young in the four groups. The incidence of anophthalmia, microphthalmia, and hydrocephalus in the four groups is given in Table I.

In Table II the incidence of anophthalmia and microphthalmia in the hydrocephalic young of groups 1 and 2 is shown.

TABLE I.—Incidence of Anophthalmia, Microphthalmia, and Hydrocephalus in the Four Groups

Group No.	No. of Dams	No. of Young	Anophthalmia. No. of Absent Eyes	Microphthalmia. No. of Eyes Less than 1.5 mm. in Diameter	No. of Hydrocephalic Young
1	12	88	47	36	8
2	12	81	15	30	3
3	12	100	0	0	0
4	12	88	0	0	0

TABLE II.—Incidence of Anophthalmia and Microphthalmia in the Hydrocephalic Foetuses of Groups 1 and 2

No. of Hydrocephalic Young in Groups 1 and 2	Anophthalmia. No. of Absent Eyes	Microphthalmia. No. of Eyes Less than 1.5 mm. in Diameter
11	13	8



A litter of 5-week-old rats; the dam was exposed to 258 r on Day 11 of pregnancy.

Nature of the Deformity.—Only the neuro-ectodermal elements of the eye were affected, the muscles and lacrimal apparatus being present and well differentiated. Anophthalmia was more commonly bilateral than unilateral. In the preliminary experiments, in which the young were allowed to survive for one month after birth, bilateral anophthalmia was more rarely encountered (see Fig.), suggesting that some anophthalmic foetuses were either born dead or destroyed at birth by the mother. Hydrocephalus was invariably associated with stenosis of the cerebral aqueduct.

Discussion

The findings of this investigation indicate that the administration of vitamins A, B, C, D, and E to the pregnant rat increases to a marked extent the incidence in the young of anophthalmia induced by x-radiation. The incidence of anophthalmia in group 2 (10.8%) contrasts markedly with that in group 1 (37.4%). The absence of anophthalmic young from the control group (group 4) suggests that genetic factors are not in any way involved. Moreover, since there were also no anophthalmic young in the group which received vitamins alone (group 3), the possibility can be ruled out that the increased incidence of anophthalmia in group 1 over group 2 represents an additional teratogenic effect of excess of one of the vitamins.

It seems, therefore, that the action of the vitamins in the combination administered is to sensitize the cells of the developing eye to the destructive action of radiation. It is tempting to associate this effect with the part played by the vitamins in the metabolism of the cell, and to contrast the findings of this experiment with the observation of Wolff and Kirmann (1954) that the protective action of cystamine applied equally to the developing foetus as to the adult.

The finding that the development of the lacrimal apparatus and other structures associated with the eye are not affected by radiation administered on Day 11 confirmed the report of Hicks (1953). Hicks also noted hydrocephalus in the young of dams irradiated on this day, and attributed its occurrence to stenosis of the cerebral aqueduct. Although the present investigation confirms the association between hydrocephalus and stenosis of the aqueduct, it is far from certain that stenosis of the aqueduct invariably bears a simple causal relationship to hydrocephalus when both are present (Millen, Woollam, and Lamming, 1954). It was particularly interesting to find that, whilst deformity or absence of the eye occurred frequently in association with apparently normally developed brains, hydrocephalus when present was almost invariably associated with absence or severe retardation of development of the eye. It is important to note, however, that in the case of hydrocephalus due to maternal hypovitaminosis-A the appearance of hydrocephalus may be delayed for some weeks after birth (Millen and Woollam, 1956). It is possible that the association between hydrocephalus and anophthalmia would have been as constant as that which occurs in the young of female rats subjected to experimental vitamin-B₁₂ deficiency (Ransdell, 1956) if the anophthalmic young had been allowed to survive for some weeks after birth.

It would be most satisfactory if subsequent investigation were to disclose that a single vitamin was responsible for the effects described in this paper. There is, however, much evidence of interaction between the vitamins in the development of the foetus. Lefebvres-Boisselot (1951), for example, has shown that the teratogenic effects of a maternal deficiency of pantothenic acid are greatly enhanced if the diet is supplemented with an excess of nicotinic acid. It therefore appears that the effects of the administration of a wide range of vitamins do not represent a simple summation of the individual actions of the vitamins but result from a complex interaction in which the relative amounts of each vitamin given may be of considerable significance. In following up the present study, therefore, and in attempting to find an explanation for the phenomenon described in this paper, the effects of combinations of the various vitamins in various proportions as well as the influence of individual vitamins on the teratogenic effects of radiation will require investigation.

Summary

The effect of the combined administration to pregnant rats of vitamins A, B, C, D, and E upon the incidence of anophthalmia produced in the embryo by subsequent x-radiation has been studied.

The incidence of anophthalmia in the group receiving radiation and vitamins (37.4%) is in strong contrast with that in the group receiving radiation alone (10.8%).

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REFERENCES

- Giroud, A. (1955). *Biol. méd.*, 44, 524.
Hicks, S. P. (1953). *Amer. J. Roentgenol.*, 69, 272.
Lefebvres-Boisselot, J. (1951). *Ann. Méd.*, 52, 225.
Millen, J. W., and Woollam, D. H. M. (1956). *J. Neurol. Psychiat.*, 19, 17.
— and Lamming, G. E. (1954). *Lancet*, 2, 679.
Ransdell, J. F. (1956). *Int. Z. Vitaminforsch.*, 26, 412.
Wolff, E., and Kirmann, J. M. (1954). *C.R. Soc. Biol. (Paris)*, 148, 1629.
Woollam, D. H. M., and Millen, J. W. (1956). *British Medical Journal*, 1, 1262.

HYPERTENSION AND TUBERCULOUS RENAL LESIONS

BY

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Since the first demonstration of hypertension resulting from clamping of renal vessels by Goldblatt *et al.* (1934) and the subsequent report of a case of renal hypertension treated with nephrectomy by Butler (1937), great interest has been shown and large numbers of papers have been written on the subject. Reviews of the literature have been given by Abeshouse (1941), Langley and Platt (1947), Pickering and Heptinstall (1953), and others. The literature on tuberculous renal lesions and hypertension, however, is surprisingly small, and it is intended to review the published cases in the literature and to report two further cases.

Literature

The first reference I can find to renal tuberculosis as a possible cause of hypertension is Leadbetter, who is quoted by Mulholland (1940) as having performed nephrectomy on two cases of unilateral renal tuberculosis with initial blood pressures of 160/100 and 180/100; in one of these patients the blood pressure returned to normal after operation.

Braasch *et al.* (1940) referred to a series of 158 patients operated on for renal tuberculosis of whom 12 were hypertensive. He also reports a group of 37 patients with "auto-nephrectomy" due to tuberculous renal lesions of whom five were hypertensive. In discussing the reasons for this low incidence of hypertension in patients with extensively damaged kidneys he points out that these patients tend to be from a lower age group and also that "vascular sclerosis is uncommon in the presence of the renal pathological changes which occur with tuberculosis." He also noted that there was no greater incidence of hypertension in bilateral disease. Of the 11 cases which were traced, only two showed no fall in blood pressure post-operatively, and seven maintained a normal blood pressure on follow-up.

Abeshouse (1941) reviewed the literature concerning renal tuberculosis and hypertension and quoted details concerning five cases of tuberculosis of the kidney and hypertension which were operated on with successful cure of their hypertension. He adds three cases of his own, two of which are not quoted here, for although they had a fall in blood pressure the initial diastolic pressures were at no time above 96 mm. Hg.

Goidsenhoven (1947), in a review of 92 cases of renal tuberculosis, found six with hypertension, of which two only had a nephrectomy, both with subsequent fall in blood pressure. Barker (1951), in reporting a series of 100 patients with hypertension and unilateral renal disease, quoted nine cases of renal tuberculosis (some of which had been pre-

viously reported by Braasch), five of which were reported as successful two years post-operatively, two fair, and two unsuccessful.

In the accompanying Table are shown the cases reported in the literature. Seventeen of these are from series of five or more cases, and therefore give an indication of the actual success rate.

Cases of Hypertension and Tuberculous Renal Lesions from the Literature

Source	No. of Cases	Successes	Doubtful	Unsuccessful	Length of Follow-up
*Braasch <i>et al.</i> (1940) ...	11	7	2	2	2-5 years
*Crabtree and Chaset (1940) ...	1	1	—	—	14 months
Ostry (1948) ...	1	1	—	—	1 year
*Goidsenhoven (1947) ...	2	2	—	—	2-5 years
*Barker (1951) ...	2	—	—	2	—
Leadbetter and Burkland (1938) ...	2	1	—	1	—
Everett (1940) ...	1	1	—	—	2 years
Abeshouse (1941) ...	1	1	—	—	—
*Pickering and Heptinstall (1953) ...	1	1	—	—	—
Nesbitt and Ratiff (1940) ...	1	—	—	1	—
Total ...	23	15	2	6	—

* From series of five or more cases.

Case 1

The patient, a boy of 17, was admitted to hospital on May 4, 1955. His story was that he had had a tuberculous thoracic spine at the age of 4 and for the year prior to admission he had complained of frequency, haematuria, and right-sided renal pain. Three months before admission he had been found to have a lesion in the right retina which was diagnosed as being a tuberculoma.

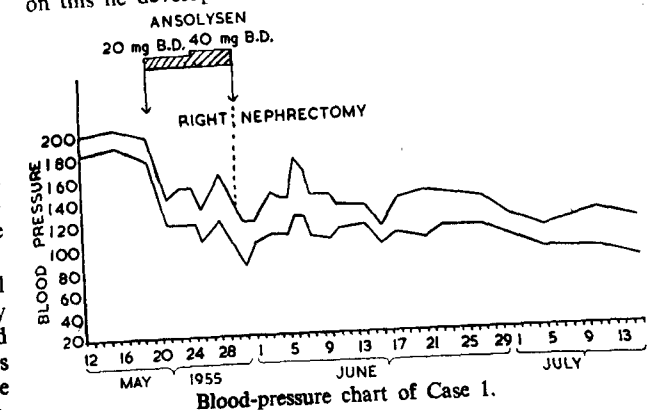
On examination he was seen to be small for his age. He had an angular kyphosis of the thoracic spine. His blood pressure was 210/180, but there were no other abnormal cardiovascular signs.

Investigations.—Blood urea, 36 mg. per 100 ml.; haemoglobin, 78%; leucocytes, 13,500 (polymorphs 78%). Urine culture showed the presence of tubercle bacilli in two out of three specimens examined. An intravenous pyelogram showed a non-functioning kidney on the right side.

As a result of these findings cytoscopy was carried out on May 11, when a diffusely inflamed bladder was seen and both ureteric orifices were partially occluded. It was impossible to pass catheters up either of the ureters because of the inflammation.

Following this investigation he began to develop severe headaches, blurring of vision, and slight but definite papilloedema. Furthermore, his blood urea rose from 36 to 59 mg. per 100 ml. and it appeared that his hypertension had entered the malignant phase. In view of this, a right nephrectomy was performed on May 28, when a kidney extensively damaged by tuberculosis was removed.

Following this his blood pressure came down from 210/180 to 136/90 and has remained at this level for the seven months that he has been at this hospital (see Chart). During this time he has received antituberculous therapy, but while on this he developed a cold abscess on the sternum.



Examination of the resected kidney showed caseating tuberculosis accompanied by secondary pyelonephritis. There was considerable fibrosis of Bowman's capsule, leading in many instances to partial or complete obliteration of the glomeruli. The interlobular arteries showed fibroblastic thickening of the intima and the larger arteries medial hypertrophy.

Case 2

A 49-year-old man was admitted to hospital on October 16, 1954, complaining of shortness of breath of 18 months' duration. Together with this he had had a cough productive of white sputum. There was also a history of orthopnoea and retrosternal tenderness on exertion.

On examination he was ill and cyanosed. The blood pressure was 240/160; there was pulsus alternans and a presystolic gallop rhythm at the apex. The heart was enlarged to the left, the apex beat being in the fifth left space in the anterior axillary line. The fundi showed the presence of early papilloedema.

Investigations.—A specimen of urine contained albumin and a deposit of epithelial cells and scanty hyaline casts. Blood urea; 100 mg. per 100 ml. An intravenous pyelogram showed good concentration of the dye in the right kidney. The left renal pelvis, however, was not outlined. Three specimens of urine cultured for tubercle bacilli gave negative results.

On October 29 cystoscopy showed that the right ureteric orifice was normal, as was the rest of the bladder. The left ureteric orifice was scarred and prevented the passage of a catheter. A further intravenous pyelogram done when his condition had improved showed that the left kidney was, in fact, non-functioning and there was no excretion of dye. Also, calcification was present in the upper part of the kidney.

In view of the severe hypertension and the non-functioning left kidney, nephrectomy was performed on November 17. A tuberculous left kidney was removed. Following this the blood pressure, which prior to the operation was 210/110, came down to 120/80 and remained at or under 150/100 until he was discharged.

Three months later he was readmitted for hypotensive drug therapy as his blood pressure was again 210/110. He was stabilized on reserpine 0.25 mg. three times a day and pentolinium tartrate ("ansolysen") 40 mg. twice daily by mouth. On this dose his blood pressure was controlled in the neighbourhood of 155/95 and he was again discharged.

He was seen again in the out-patient department when the dose of these drugs was readjusted because his blood pressure was once again increasing. In May, 1955, despite further antihypertensive therapy, he died in cardiac failure.

Pathological examination of the resected kidney showed areas of fibrosis and calcification. There was advanced glomerular fibrosis, and the arterioles showed intimal and medial proliferation.

Discussion

Hypertension occurring in patients suffering from renal tuberculosis seems to be rare, and it is doubtful if it differs from the incidence of hypertension in normal people of the same age group. In a series of 40 patients with renal tuberculosis who have been subjected to nephrectomy and therefore had fairly extensive disease, I have found only the two cases of hypertension reported above. This low incidence of hypertension is of interest in that renal tuberculosis causes progressive complete destruction of renal substance, and the fact that this process is not associated with the production of hypertension suggests that some other factor is responsible. This question of the relation between the renal lesion and the hypertension has, of course, been discussed since the original observations were made, but no very satisfactory conclusion has been reached. Attempts to relate specific vascular lesions to the onset of hypertension have not met with any real success (Longcope, 1937), nor has any specific

pathological change been found in those kidneys removed from hypertensive patients compared with similar changes not associated with hypertension. It would seem, then, that simple destruction of renal substance is not related to the incidence of hypertension, as is shown in its low incidence in tuberculous lesions.

The results of nephrectomy in these cases seems to be very satisfactory. Langley and Platt (1947), in a review of cases with various renal diseases, quote four successes in 18 in hydronephrosis, six successes in 16 in calculus and pyelonephrosis, and 17 successes in 27 in pyelonephritis, with a total success rate of 44%, which may be compared with 15 successful cases in 23 in this collected series from the literature. These collected results undoubtedly give a rather optimistic estimate of the position, since they include isolated case reports of successes without mentioning the concomitant failures, but 17 of the total of 23 come from series reporting five or more consecutive cases and therefore should be representative. It seems likely that this success rate can be related to the age group of these patients (83% of the series of Braasch *et al.* were under the age of 50), for in all these cases one is studying hypertension in a person suffering from a renal lesion, and a causal relation can only be assumed in cases where the blood pressure falls. In the older age groups there is an increasing incidence of patients with "essential hypertension" who also have a renal lesion and in whom nephrectomy causes no change in the blood pressure.

The two cases related above are of interest in that they both had malignant hypertension. Schroeder and Steele (1939) reported two cases of unilateral renal tuberculosis associated with malignant hypertension as shown by fundal exudates and haemorrhages, and a case reported by Pickering and Heptinstall (1953) had fundal exudates and was found to have arteriolar necrosis on section of the resected kidney. Otherwise this condition does not appear to have been reported. In Case 1, since the malignant phase developed while the patient was under observation, it is known to have been of short duration, whereas in Case 2 unfortunately no record of blood pressure was made before October, 1954. Case 1 is also of interest in that the patient undoubtedly had bilateral lesions, and in spite of that had a prompt and excellent response to nephrectomy. It has been stated by Platt, Pickering, Barker, and others that bilateral lesions are a contraindication to nephrectomy in the treatment of hypertension of renal origin. In renal tuberculosis, however, the remaining lesion is treatable by chemotherapy. It would seem justifiable to consider nephrectomy as treatment for the hypertension even in cases where there is bilateral disease but good renal function remains.

As mentioned in the pathology of the two cases here reported, there was evidence of a secondary pyelonephritis in addition to tuberculous renal lesions, and it seems likely that this is a factor, and possibly the chief one, in causing the few cases of renal hypertension in renal tuberculous lesions.

Finally, in this discussion of the subject I would like to emphasize the good results obtained in these cases. A still very commonly held opinion is that renal hypertension responding to nephrectomy is frequently talked about but rarely seen at first hand. Of series quoting all cases, successful and unsuccessful, hypertension is completely and permanently abolished in between one-third and one-half of the cases. In the cases with tuberculous renal lesions these figures are even better.

Summary

The literature concerning tuberculous renal lesions and hypertension is reviewed and cases which have had nephrectomy performed are reported. Of the total of 23 cases, 15 had a fall in blood pressure to normal levels following operation, two had a fall but a subsequent rise in blood pressure, and in six there was no alteration.

Two further cases are reported here, both having malignant hypertension, one responding to nephrectomy and one not.

I am grateful to Dr. Horace Joules and Dr. R. A. J. Asher for permission to report cases admitted under their care. I am also grateful to Dr. J. H. O. Earle for his help in the pathological examination of these cases.

REFERENCES

- Abeshouse, B. S. (1941). *Surgery*, 9, 942; 10, 147.
Barker, N. W. (1951). *Med. Clin. N. Amer.*, 35, 1041.
Braasch, W. F., Walters, W., and Hammer, H. J. (1940). *J. Amer. med. Ass.*, 115, 1837.
Butler, A. M. (1937). *J. clin. Invest.*, 16, 889.
Crabtree, E. G., and Chaset, N. (1940). *J. Amer. med. Ass.*, 115, 1842.
Everett, H. S. (1940). *Urol. Cutan. Rev.*, 44, 557.
Goldschoven, F. van (1947). *Brux.-med.*, 27, 321.
Goldblatt, H., Lynch, J., Hanzal, R. F., and Summerville, W. W. (1934). *J. exp. Med.*, 59, 347.
Langley, G. J., and Platt, R. (1947). *Quart. J. Med.*, 16, 143.
Leadbeater, W. F., and Burkland, C. E. (1938). *J. Urol.*, 39, 611.
Longcope, W. T. (1937). *Ann. intern. Med.*, 11, 149.
Mulholland, S. W. (1940). *Bull. N.Y. Acad. Med.*, 16, 244.
Nesbit, R. M., and Ratliff, R. K. (1940). *J. Urol.*, 43, 427.
Ostry, H. (1948). *Canad. med. Ass. J.*, 58, 498.
Pickering, G. W., and Heptinstall, R. H. (1953). *Quart. J. Med.*, 22, 1.
Schroeder, H. A., and Steele, J. M. (1939). *Arch. intern. Med.*, 64, 927.

A CASE OF MYOTONIA CONGENITA WITH HYPOTHYROIDISM

BY

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Symptoms and signs suggestive of myotonia have been described in association with hypothyroidism. Since these are relieved by treatment of the thyroid condition, they have been regarded as part of the hypothyroid state (Hoffmann, 1896; Debré and Sémelaigne, 1935).

This paper records a case in which myotonia congenita (Thomsen's disease) and hypothyroidism were present simultaneously and in which the myotonia was not completely relieved even when the patient was made hyperthyroid.

Myotonia congenita is a hereditary disease of muscle characterized by prolonged involuntary contraction following a voluntary contraction (active myotonia) or mechanical stimulation (mechanical myotonia). The condition was first described by Leyden (1874), and Thomsen later published his classical account (Thomsen, 1876).

Case Report

A man aged 20 was referred to University College Hospital in September, 1954, for assessment of his myxoedema, diagnosed nine months earlier. He stated that at the age of 5 he had suffered from stiffness in the legs. This did not greatly trouble him and disappeared after two years. At 12 years the stiffness reappeared. It was more severe and extensive than previously. His main difficulty was in starting a movement, especially if sudden, owing to stiffness of the muscles. The calves and forearms were particularly affected. He noticed that the muscle became prominent and hard and was occasionally painful. After performing a movement repeatedly the stiffness wore off. He was sometimes unable to move a limb for some seconds. The symptoms were worse in the mornings and when cold.

His athletic abilities, previously excellent, fell off markedly, and by the time he was 13 he had given up sport completely, though doing well at his studies. At 14 he was becoming slower physically and mentally. He gained weight rapidly and complained of lethargy and difficulty in concentrating,

and his work deteriorated, so that instead of being near the top he was now near the bottom of his class.

At 18 he joined the Army and was constantly in trouble on account of slowness and clumsiness. On a cold morning he was almost incapacitated. While on sentry duty he once "went stiff all over" and fell to the ground when an officer unexpectedly appeared.

He next complained of frontal headaches, constipation, and occasional double vision. On investigation at that time he was puffy about the eyes, his skin was cold and dry, his pulse 55, his basal metabolic rate -25%, and serum cholesterol 470 mg. per 100 ml. A diagnosis of myxoedema was made and he was treated with thyroid. His weight decreased, the headaches became less severe, and the stiffness was less marked.

When first seen at University College Hospital there was, in the absence of full details, some doubt about the diagnosis, and thyroid therapy was discontinued. A month later, on admission, there was slight puffiness around the eyes, his skin was cold and dry, his temperature 97° F. (36.1° C.), his voice low-pitched, his pulse 44, and blood pressure 130/80 mm. Hg. The thyroid was not clinically enlarged. The muscles were well developed, the calves appearing abnormally bulky; tone was normal and there was no wasting. The arm-, knee-, and ankle-jerks were sluggish, and direct percussion of the calf muscles and forearm extensors produced a contraction lasting about five seconds with marked grooving at the site of percussion. Following a firm handshake there was considerable delay in relaxation of the grip.

Investigations.—Plasma cholesterol was 275 mg. per 100 ml. (later 370 mg.). His basal metabolic rate was -30%; radioactive iodine uptake at 24 hours was 5% of total dose. The electrocardiogram showed a rate of 39 with normal voltage curves. The blood sodium, potassium, chloride, calcium, magnesium, and inorganic phosphate were all normal. His intelligence quotient was 100.

Electromyography (Dr. W. D. Fletcher).—"The strength-duration curves of the right extensor carpi radialis were quite normal, although the type response was rather sluggish. Electromyography with needle electrodes, however, revealed trains of high-frequency oscillations on insertion of the needle and on mechanical stimulation of the muscle. These findings, taken together, are typical of myotonia congenita."

Improvement, objective and subjective, followed the administration of quinine. There was no urinary creatine. The creatine tolerance was high (71% retained) and administration of creatine had no observable effect on the myotonia. These findings are in keeping with other recorded observations in Thomsen's disease (Milhorat and Wolff, 1938; Poncher and Wade, 1938).

While under investigation the patient became more myxoedematous and his myotonia more marked. Thyroid therapy resulted in an improvement in both conditions. Correction of the hypothyroidism, however, was not accompanied by abolition of the myotonia, although active myotonia became less obvious.

He was discharged from hospital on December 3, 1954, taking 0.4 mg. of sodium L-thyroxine daily. Six weeks later he was readmitted for observation. He stated he was physically and mentally more agile, but complained of perspiring hands and palpitations. He had been less troubled by stiffness.

On examination he had lost a stone (6.4 kg.) in weight since taking thyroxine. His pulse was 68 a minute and regular. Active myotonia was not observed, the grip relaxing rapidly, but there was still marked mechanical myotonia, particularly of the calf and forearm extensors. His basal metabolic rate was now +53% and plasma cholesterol 247 mg. per 100 ml. No urinary creatine was detected. Electromyography showed no change, being still typical of myotonia; the electrocardiogram showed no significant change. Slit-lamp examination revealed no lens opacities.

Histology of calf-muscle biopsy showed well-developed muscle fibres with no muscle atrophy. In spite of the weight

loss, arm and leg volumes showed no significant change since his first admission. He was discharged on 0.2 mg. of sodium L-thyroxine daily.

Family History.—The mother, a maternal aunt, and her daughter all gave a history of myotonia and were found on clinical and electromyographic examination (Dr. Fletcher) to exhibit myotonia. The mother's father had had an operation for a cataract at the age of 74. Another sister of the mother had suffered from "Derbyshire neck."

Discussion

The history and findings are so characteristic of myotonia congenita and of hypothyroidism as to leave no real doubt that this patient suffers from two separate conditions.

The early age of onset of myotonia and the prolonged muscular contractions, worse in the morning, when cold, and becoming less marked on repeated movement, are typical. Difficulty in relaxing a grip following a handshake is a usual complaint. His falling "muscle bound" on being suddenly surprised recalls the behaviour of myotonic goats who suffer from a condition which completely resembles myotonia congenita in man (Levin, 1934; Brown and Harvey, 1939). Further, the bulky calf muscles exhibiting mechanical myotonia, the electromyographic records, and the strong family history indicate that this is a case of myotonia congenita. The diagnosis of hypothyroidism cannot be in doubt, and the history suggests that the myotonia preceded the hypothyroidism by about nine years.

Very few cases of the two diseases occurring together seem to have been described. Gordon *et al.* (1952) reported four cases of myotonia congenita in a family, one of whom had a basal metabolic rate of -20% and a blood cholesterol of 371 mg. per 100 ml.

The reason for stressing the existence of two separate conditions is that a number of cases have been described in which myotonoid symptoms and signs were due to hypothyroidism.

Hoffmann (1896) described a syndrome in which myxoedema was associated with hypertrophy and slow action of the muscles. Electromyography in such cases is not typical of myotonia (Nevin, personal communication; see Poncher and Woodward, 1936), and the condition responds completely to thyroid therapy (Malloret and Sigwald, 1939). Debré and Sémelaigne's cases exhibited the combination of myxoedema, muscle hypertrophy, and retarded growth. The condition occurs chiefly in young children (Thomsen, 1948) and responds completely to thyroid (Debré and Sémelaigne, 1935). Thomsen (1948) described a similar case to that recorded here, but the electromyographic records were not those of myotonia congenita, there was no family history, and all symptoms responded completely to thyroid therapy. Goldstone and Ford (1955) described the cases of two patients who developed severe myotonia as a complication of post-operative thyroid deficiency. The symptoms were completely relieved by the administration of thyroid extract.

The relief of myotonia with thyroid, noted in this case, is interesting, but cannot be a specific effect, for myotonia could still be demonstrated when the patient was hyperthyroid.

Thyroid therapy has been tried in uncomplicated cases of Thomsen's disease with either no effect or a worsening of the myotonia, and one case of Thomsen's disease with hyperthyroidism was improved by thyroidectomy (Thomsen, 1948).

Summary

A case in which myotonia and hypothyroidism co-existed is reported and reasons are put forward for believing that the patient suffers from two distinct diseases, myotonia congenita and myxoedema.

Treatment with thyroid brought improvement in both conditions. With correction of the hypothyroidism, however, myotonia could still be demonstrated.

I am grateful to Dr. W. D. Fletcher for performing the electromyographic studies; to Dr. D. R. Laurence and Dr. T. Geffen for their advice; and to Professor M. L. Rosenheim for his help and encouragement and for allowing me to publish the case.

REFERENCES

- Brown, G. L., and Harvey, A. M. (1939). *Brain*, 62, 341.
Debré, R., and Sémelaigne, G. (1935). *Amer. J. Dis. Child.*, 50, 1351.
Goldstone, H., and Ford, F. R. (1955). *Bull. Johns Hopk. Hosp.*, 97, 53.
Gordon, W. H., Kaufman, J. M., and Kashton, H. A. (1952). *J. Mich. med. Soc.*, 51, 188.
Hoffmann, J. (1896). *Dtsch. Z. Nervenheilk.*, 9, 278.
Levin, M. (1934). *Arch. Neurol. Psychiat.* (Chicago), 32, 1286.
Leyden, E. (1874). *Klinik der Rückenmarkskrankheiten*, vol. 2. Berlin.
Malloret, P., and Sigwald, J. (1939). *Rev. neurol. (Paris)*, 71, 513.
Milhorat, A. T., and Wolff, H. G. (1938). *Arch. Neurol. Psychiat.* (Chicago), 40, 1135.
Nevin, S. Personal communication. See Poncher, H. G., and Woodward, H., *Amer. J. Dis. Child.*, 1936, 52, 1084.
Poncher, H. G., and Wade, H. W. (1938). *Amer. J. Dis. Child.*, 55, 945.
Thomsen, E. (1948). *Myotonia*. Aarhus.
Thomsen, J. (1876). *Arch. Psychiat. Nervenkr.*, 6, 702.

Medical Memoranda

Sensitization Reactions to Tulle Gras Dressing, B.P.C.

After the conquest of Peru in the sixteenth century balsam of Peru was introduced into European medicine. It is obtained from the trunk of the tree *Myroxylon pereirae*, and contains cinnamic and benzoic acids.

Fuller (1730) says it has many uses; for instance, in treating coughs, spitting of blood, and dysentery, or with bees burnt, mouse dung, and honey for baldness. Graham (1832) states that the balsam is a stimulant and tonic, cleansing and stimulating foul and indolent ulcers.

More recently balsam of Peru has been used as a mild antiseptic. In the *Extra Pharmacopoeia* (1952) it is said to have a slight irritant local action and to stimulate epithelial regeneration, being employed, diluted with castor oil, for bedsores and chronic ulcers, and as an ointment for skin diseases such as eczema and pruritus. It is also mentioned as a treatment for scabies. Bloom and Lorincz (1954) used balsam of Peru, 10% in petrolatum, as a remedy in three cases of dermatitis repens; they found, using *in vitro* tests, that the balsam had bacteriostatic effects in similar concentration on several pathogenic bacteria commonly found in skin lesions.

The commonest use of balsam of Peru at present is in curatio carbasi paraffini B.P.C., otherwise known as tulle gras dressing. This consists of bleached cotton cloth impregnated with yellow soft paraffin containing balsam of Peru, 1 part in 80. Several identical proprietary brands are made as well as tulle gras with the addition of sulphanyl-amide, etc.

It is known that balsam of Peru may cause sensitization reactions. Andrews (1954) states that balsam of Peru may cause dermatitis when incorporated in perfumes (it has been used in brilliantine); Schwartz, Tulipan, and Peck (1947) mention the balsam as a cutaneous irritant. Alexander (1955) says: "The constituents of this drug [balsam of Peru], once so widely used, are largely cinnamoin with esters of cinnamic and benzoic acids. It was an ingredient of a large number of proprietary preparations. According to Engelhardt, sensitivity to it was first described in 1880. It is a strong contactant, and if applied freely may sensitize some 10% of patients. Patch tests are readily secured. Which of its constituents is the determinant allergen is unknown, but both cinnamon and benzoic acid have the capacity to sensitize the skin."

Tulle gras dressing is widely used, and sensitization of the skin to the balsam of Peru may be overlooked. Sensitization is probably more likely to occur, and more easily overlooked, when the material is applied to already diseased skin.

Recently two examples have been seen. Both patients were women with hypostatic eczema of the legs; following the application of tulle gras there was increased soreness and exudation. Patch tests with tulle gras were strongly positive,

whilst control patches (in one case of plain gauze and in another of gauze impregnated with yellow soft paraffin) were negative.

When such untoward reactions may occur, however rarely, it seems reasonable to doubt whether the continued incorporation of balsam of Peru in tulle gras dressing B.P.C. is justified; moreover, its beneficial effects are probably slight.

I thank Dr. Brian Russell for his help and advice in preparing this report.

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REFERENCES

- Alexander, H. L. (1955). *Reactions with Drug Therapy*, p. 250. Saunders, Philadelphia.
Andrews, G. C. (1954). *Diseases of the Skin*, p. 116. Saunders, Philadelphia.
Bloom, R. E., and Lorincz, A. L. (1954). *A.M.A. Arch. Derm. Syph.*, 70, 819.
Extra Pharmacopoeia (Martindale) (1952). Vol. 1, p. 244. Pharmaceutical Press, London.
Fuller, T. (1730). *Pharmacopoeia Extemporanea*. Innys, London.
Graham, T. J. (1832). *Modern Domestic Medicine*. Simpkin Marshall, London.
Schwartz, L., Tulipan, L., and Peck, S. M. (1947). *Occupational Diseases of the Skin*, p. 766. Kimpton, London.

Haemolytic Disease of Newborn: Delivery at Term of Living Affected Infant after Previous Stillbirths

A rhesus-negative woman whose husband is homozygous rhesus-positive, and who has had one or more infants still-born owing to haemolytic disease, is usually told that the chance of having a live infant from any future pregnancy is virtually nil. However, this view has been challenged by Watson, Crosse, and Hatchuel (1954), and by Watson (1956); they advocate premature induction of labour in such mothers, or delivery of the infant by caesarean section if foetal movements are diminishing. Williams (1956) described one case successfully managed by induction at the 34th week of pregnancy, followed by immediate exchange transfusion of the infant. The mother in question had previously had three stillbirths. Watson (1956) also mentions two other similar cases in which the infants were saved by inducing labour at the 36th week. Buffa, Francois, and Davidsohn (1956), in studying the outcome of pregnancy in 167 women whose sera contained immune Rh antibodies, reported that of 15 mothers who had had previous stillbirths five were delivered of affected but living infants, all of whom survived after treatment. They comment that these findings contradict the extreme pessimism often expressed to such mothers on the likelihood of their having a liveborn infant.

A further case is described which supports the new-found optimism expressed by these writers. It is of interest partly because the mother, after two previous stillbirths, was delivered at term of a liveborn affected infant, successfully treated, and partly because the mother's antibody titre in any pregnancy, whether it produced an affected live or stillborn infant, was relatively low throughout.

CASE REPORT

The mother's previous obstetric history is summarized as follows. 1941: caesarean section (India) for disproportion. Given 2 pints (1,140 ml.) of blood at operation; infant liveborn and normal. 1943: normal delivery; infant liveborn, no transfusions; severe jaundice for over a week; retarded development with incontinence and ataxia until death at 2½ years, presumed kernicterus. 1947: normal delivery; infant liveborn, jaundiced; simple transfusion first day; generalized spasticity and incoordination of movements, diagnosed as kernicterus by paediatrician; died at 4 years. 1949: normal delivery; exchange transfusion (Salisbury); infant alive and well. 1951: pregnancy terminated at 4 months, reason unknown. 1952: macerated stillbirth at 36 weeks. 1953: macerated stillbirth at 36 weeks. 1954: spontaneous abortion at 16 weeks.

She became pregnant again in November, 1955. Her attendances at the antenatal clinic were irregular, and,

although induction of labour at 36 weeks was considered, she did not present herself for admission until term: labour was induced surgically and a liveborn male infant weighing 6 lb. 15 oz. (3,150 g.) delivered.

Serology.—This woman was group O cde/cde; her husband was group B, cDE/cDE (presumptive). Antibody tests had been done at frequent intervals in her various pregnancies. The highest titre was 1/20 either in albumin or by indirect antiglobulin techniques. In her fourth, fifth, sixth, and seventh pregnancies no saline antibodies were demonstrated; but in 1956 an antibody titre of 1/20 in saline was detected in March, and remained at this level, as did the titre in albumin, until delivery. The specificity of the antibodies (both in 1953 and in 1956) was anti-D only. It is probable that this woman's sensitization dates from her blood transfusion (probably Rh-positive blood) in 1941.

The baby at birth (August, 1956) looked normal, but within an hour jaundice at the base of the cord was noticed. Cord blood findings were: haemoglobin, 13.9 g. per 100 ml.; serum bilirubin, 5.7 mg. per 100 ml.; direct Coombs test positive; group B, Rh (D) positive; blood film showed erythroblastemia. Exchange transfusion was carried out within three hours of birth, 306 ml. of blood being withdrawn, and 296 ml. of compatible (saline, albumin, and indirect antiglobulin techniques) blood injected. Samples of cord blood immediately before and after this exchange showed bilirubin levels of 8.7 and 7.8 mg. per 100 ml. respectively. Twelve hours later the infant was deeply jaundiced, and the bilirubin level was 24 mg. per 100 ml. (heel prick). A further exchange transfusion was therefore given, 400 ml. of blood being withdrawn and 380 ml. injected (O Rh negative); immediately after the exchange the bilirubin was 10.3 mg. per 100 ml., and haemoglobin 13.6 g. per 100 ml. The next day (40 hours) the haemoglobin was 15.8 g. per 100 ml. and the jaundice not increased; thereafter the jaundice faded rapidly during the next three days.

COMMENT

This case clearly demonstrates that it is possible for an Rh-negative woman, having had previous stillbirths due to Rh incompatibility, to have a liveborn affected infant at term. It is generally agreed (Mollison and Walker, 1952) that premature induction of labour is not indicated in most mothers with antibodies. However, induction of labour at the 36th or even 34th week in certain selected cases—that is, those who have had previous stillbirths due to haemolytic disease—is the treatment of choice, followed by immediate and large exchange transfusion of the infant. That the infant described here required two exchange transfusions within 12 hours is almost certainly due to the relatively small first exchange. Preliminary investigations here (J. R. H. P.) based on estimation of percentage of foetal haemoglobin before and after exchange transfusion, show that the efficiency of exchange transfusions is not as high as is generally supposed, even with exchanges of 50–60 ml. per lb. (110–132 ml. per kg.) of body weight. It seems desirable to aim at 80 ml. per lb. (176 ml. per kg.) for the more seriously affected infants.

We are indebted to Mr. J. G. Reynolds, under whose care the mother was admitted, for permission to describe this case; to Dr. G. H. Tovey, Director, South-west Regional Transfusion Centre, for confirmation of some of our serological findings; and to Dr. H. E. Harding for much advice.

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REFERENCES

- Buffa, F., Francois, P., and Davidsohn, I. (1956). *Amer. J. clin. Path.*, 26, 608.
Mollison, P. L., and Walker, W. (1952). *Lancet*, 1, 429.
Watson, H. B. (1956). *British Medical Journal*, 1, 292.
—, Crosse, V. M., and Hatchuel, W. L. F. (1954). *Ibid.*, 1, 679.
Williams, E. A. (1956). *Ibid.*, 1, 152.

Reviews

THE INFANT CEREBRAL CORTEX

The Postnatal Development of the Human Cerebral Cortex. By J. LeRoy Conel. Volume V. *The Cortex of the Fifteen-month Infant.* (Pp. 220; 109 plates. £5.) Cambridge, Massachusetts: Harvard University Press. London: Oxford University Press. 1955.

This is the fifth volume of a series in which certain histological features of the immature cerebral cortex are described in great detail. Between 30 and 40 cytoarchitectonic areas are treated separately, and each in terms of such criteria as the depth of the entire cortex and of individual laminae, the density and size of the cells, the development of Nissl substance, of neurofibrillae, of nerve fibres, and so on. The quantitative results are given in tables, and the actual material is fully illustrated in the plates. Comparisons with younger brains are made, so that conclusions about the growth which has occurred in the different areas and laminae can be drawn.

This work will provide a useful cytoarchitectonic atlas of the cortex of a 15-month infant. The photographs of the Nissl preparations are good and form a standard for comparison with sections from specimens of other ages. It is doubtful, however, whether the detailed descriptions and quantitative estimates will serve any very useful purpose. The methods used are open to serious criticism. Measurements of the maximum and minimum diameter, in one plane, give only a poor idea of the size of the cell, and no information is given of how large the samples measured were or how the range of cell size was distributed within them. The width of laminae is given to the nearest 0.005 mm., but the uncertainty about their boundaries must be much greater than this, and none of the usual statistical methods have been applied to the results to assess their level of significance. The estimates of the degree of development of Nissl granules or of neurofibrillae are very largely subjective, and may be affected by technical variations which cannot be accurately controlled. Taking all this into consideration, one cannot feel great confidence in the more detailed conclusions which the author draws about the differences between the present observations and those made in younger specimens, particularly since variations in the amount of shrinkage affect all the quantitative estimates to a serious degree. This is the more important when, owing partly to the laborious character of the work, only very few specimens can be examined (the description at 15 months is based on three), so that little account can be taken of individual variation.

Sections prepared by the Cox-Golgi and a Cajal silver impregnation method have also been studied. Though beautifully reproduced, the photographs of these are almost valueless as illustrations, and it is difficult to see what purpose is served by publishing them in such numbers. The drawings from the Cox-Golgi preparations are good, but, to judge only from the photographs, they seem to bear little relation to the actual sections. In general, one must conclude that neither the material nor the methods used in its examination are capable of giving precise and detailed answers to the questions asked. It is as if the magnification had been raised with no corresponding increase in resolving power, so that the information obtained remains on the same approximate and imprecise level as before, and subject to the same uncertainty of interpretation. It is only fair to point out, however, that nothing similar dealing with the immature human brain is available. It is to be hoped that the author will at some future date publish a critical summary of those features of the growth of the human brain which can be observed in the material on which he has done so much work, and where the really significant results are not obscured by the presence of excessive detail of doubtful validity.

F. GOLDBY.

THE CHILD'S SKELETON

Das Skelett des Kindes: Entwicklung, Bildungsfehler und Erkrankungen. By W. Swoboda. (Pp. 184+xii; illustrated. D.M. 48.) Stuttgart: Georg Thieme. 1956.

This volume on "The Skeleton of the Child," which forms one of the series in "Advances in the Field of X Rays and Nuclear Medicine," maintains the high standard of its predecessors. It fills a gap very conveniently in providing the paediatrician with a full radiographic reference work of normal and abnormal skeletal development. This inevitably means some compression, and there is still room for a book detailing fully the variants in growth and radiological appearances of the normal child, though the subject is successfully handled in the first 32 pages of this volume. The next 32 pages are devoted to the systemic disturbance of bone growth of hereditary, congenital, or developmental origin. In this section there is one serious omission—the disturbance of epiphyseal growth first described by David Trevor as tarso-epiphyseal aclasis (*J. Bone Jt Surg.*, 1950, 32B, 204) and more recently enlarged upon by T. G. Fairbank (*ibid.*, 1936, 38B, 237). Localized skeletal areas of maldevelopment such as hemivertebrae and coxa vara are then discussed, and next endocrine disturbance of the skeleton and disorders associated with general disease—for example, renal rickets. Osteochondritis juvenilis is included in the latter section, as it is considered secondary to disease of the epiphyseal vascular system. Inflammatory and toxic diseases are next described, then diseases of the reticulo-endothelial system producing secondary skeletal changes, and finally and briefly there is mention of tumours of bone and infantile fractures.

The positive radiographic illustrations throughout are beautifully clear and carefully chosen. Their limitation in number is probably on the grounds of cost, as there is obviously no shortage of clinical material; this is regrettable, as their perusal will be a source of pleasure to the experienced akin to that of visiting one's own National Gallery, and, for those unacquainted with radiographic appearances, of a first tour of the gallery. Brief clinical and radiological notes accompany each disease mentioned, and the grouping of the diseases is stimulating and thought-provoking. The volume would make a valuable preliminary study to Sir Thomas Fairbank's *Atlas of General Affections of the Skeleton*. It is unfortunate that no English translation is available, but no difficulty will be found in extracting the core of the information provided, which is essentially visual.

J. G. BONNIN.

MODERN SURGERY

Modern Operative Surgery. Edited by the late G. Grey Turner, LL.D., D.Ch., M.S., F.R.C.S., F.R.A.C.S., F.A.C.S., and Lambert Charles Rogers, V.R.D., M.Sc., M.D., F.R.C.S., F.R.A.C.S., F.A.C.S. Foreword by Sir Gordon Gordon-Taylor, K.B.E., C.B., M.A., LL.D., Sc.D., M.D., M.S., F.R.C.S., F.R.C.S.Ed., F.R.C.S.I., F.R.A.C.S., F.A.C.S. Fourth edition, Volume II. (Pp. 1231-2614+xii; illustrated. 75s.) London: Cassell and Company Ltd. 1956.

The second volume of this well-known work on operative surgery contains over 1,200 pages of text, which bring the number of pages for the two volumes to a total of 2,475—truly a magnum opus. There are over 1,000 illustrations, of which 600 are in this second volume; they are mostly clear, but some (as Figs. 715 and 716) are not easy to make out. This volume contains some very fine accounts of the surgery of special regions. The chapter on hernia was written by Grey Turner himself and is full of practical wisdom, though it may not find favour with the modern anti-Bassini school. Mr. Naunton Morgan compresses the whole of rectal surgery, and does it very efficiently, into the small compass of under 70 pages. Operations on the ear, eye, nose, pharynx, jaws, tongue, and hare-lip and cleft palate are described by recognized experts in the surgery of those parts. Mr. John Howkins covers the field of

gynaecological operations in a competent manner. For urological operations the accounts of Mr. Ogier Ward and of the late Mr. Everidge have been ably supplemented by revisions undertaken by Mr. Badenoch, Mr. David Wallace, and Mr. Henry Vernon. Professor Windeyer has written an excellent chapter on radiotherapy in malignant disease. Plastic surgery is dealt with in a masterly manner by Sir Harold Gillies, who has been assisted by Mr. Barron. The name of Sir Geoffrey Keynes is sufficient to guarantee the accuracy and the clarity of the section on surgery of the thyroid and thymus. We reserve for final mention the 100 pages devoted to the surgery of the skull and brain written in inimitable style by Sir Geoffrey Jefferson. The question is sometimes discussed whether, failing the opportunity actually to see an operation performed, one can learn more from a series of illustrations or from a well-written account of the operation. If everyone could write as Sir Geoffrey does we believe the written description would win. One could almost say that he wrote pictorially, and he also manages to get in, almost as an aside, some excellent principles of general application. For example: "Neurosurgery demands an apprenticeship in which the neophyte learns to regard all lesions as exercises in applied physiology and all operations as experiments, to be carried out with the greatest caution and solicitude for the welfare of the patient." If the word "surgery" were substituted for "neurosurgery," I doubt whether a better motto could be devised to be put up in large type over the door of every operating theatre. As the writer so truly adds, such principles cannot be forgotten without detriment.

ZACHARY COPE.

MEDICINAL CHEMISTRY

Medicinal Chemistry—Volumes II and III. A series of reviews prepared under the auspices of the Division of Medicinal Chemistry of the American Chemical Society. Volume II, edited by F. F. Blicke and C. M. Suter (Pp. 311+vi, 80s.) Volume III, edited by F. F. Blicke and R. H. Cox. (Pp. 346+vi, 84s.) New York: John Wiley and Sons, Inc. London: Chapman and Hall, Ltd. 1956.

These volumes maintain the high standard of accuracy of the first volume (which appeared in 1951) and are even more elegantly produced on better paper. Each volume contains four chapters. Apart from one chapter in Vol. 2 on some chemical aspects of the cardiac glycosides by A. Stoll, each chapter aims to include references to all the compounds that have been tested for a particular pharmacological activity. The chapters are therefore compilations of information rather than review articles, and their chief virtue lies in their comprehensiveness. Tables of compounds and reference lists occupy about two-thirds of the pages in these books, and the tables enable the reader to track down quickly what compounds have been tested and what activities have been reported for them. The remaining text gives an account of synthetic methods, of screening tests and of structure-action relationships. The treatment of structure-action relationships is naturally the most uneven of the aspects discussed, since it involves a more critical approach to published information on pharmacological activities, but some chapters reach a very high standard, particularly those on β -haloethylamine adrenergic-blocking agents by G. E. Ulyot and J. F. Kerwin and on synthetic analogues of physostigmine by A. Stempel and J. A. Aeschlimann.

Both volumes appear to cover the literature up to the end of 1952, but some chapters contain supplementary reference lists (with titles) for 1953. It would seem, therefore, that these volumes have taken three to four years to be printed and published, a circumstance which must be disheartening to the authors of chapters, and which raises the question whether speedier production in a less expensive form might not better fulfil the objects which the editors have in view. In future volumes it would be helpful if the date up to which the literature is covered was clearly stated at the beginning of each chapter. In the present volumes some, but not all, chapters contain this information.

The subjects dealt with, apart from those already mentioned, include synthetic oestrogens, arylpiperidine analgesics, methadone and related analgesics, quaternary ammonium germicides, and non-mercurial diuretics.

H. R. ING.

HISTAMINE IN ANAPHYLAXIS AND ALLERGY

Histamine: Its Role in Anaphylaxis and Allergy. By M. Rocha e Silva, M.D. Foreword by Carl A. Dragstedt, M.D. (Pp. 248+xii, 54s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1955.

The author of this monograph, at the Department of Biochemistry and Pharmacodynamics at São Paulo, Brazil, is internationally known for his many contributions to this subject. In his preface he points out that "many different threads must be followed simultaneously in order to clarify details of the mechanism of any physiological or pathological phenomena." The threads of the histamine problem are certainly most tangled, and after reading this book it is obvious that "even now, in spite of intensive and inspiring work . . . all the pieces of this jigsaw puzzle do not fit. We are still looking for missing parts which would give us the whole picture." In allergy histamine is only a part of the picture, for other substances undoubtedly have their place, but here also the boundary-line is indistinct.

The book is described on the jacket as being designed to interest clinicians, investigators, and students. It should indeed attract the attention of clinicians and investigators and all who are interested in histamine and the part it plays or may play in anaphylaxis and allergy. It is largely a compendium of experimental work. Not much space is given to the clinical aspects of the subject of the book; and here there is not enough critical discussion, some observations being of doubtful clinical value. Clinicians and investigators might well like to have this volume as a convenient reference book to experimental work, but one doubts its value to medical students.

D. A. WILLIAMS.

IMMUNOLOGY AND SEROLOGY

Immunology and Serology. By Philip L. Carpenter. (Pp. 351+viii, 45s. 6d.) London: W. B. Saunders Company Ltd. 1956.

The average student has little time to systematize and integrate into a pattern the knowledge he has gained from books, lectures, and demonstrations relating to the subject of immunology and serology. For years there has been a demand for the type of book under review by those who have reached the level, as the author so aptly puts it, of advanced undergraduate or early graduate status. The book is well produced and of reasonable compass, and the subject-matter is presented in an easy and readable manner. The emphasis is undoubtedly on serology, and the student is initiated, without too many of the details of technique, into the principles and practice of this fascinating subject. He is shown how serology is used in the furtherance of our knowledge of immunity as well as in the diagnosis, control, and treatment of disease. In a concise and interesting style the author lucidly expounds the generally accepted present-day views on immunity, allergy, antigens, antibodies, and antigen-antibody reactions *in vitro* and *in vivo*. If as a result of reading this book the student feels impelled to pursue his studies of this subject he will find useful lists of references at the end of each chapter.

This is not a manual of serology, and therefore the inclusion of the appendix might well be questioned. Nevertheless, it is clear that the book should prove to be of great value to those students for whom it has been written. As it stands it is excellent, and it is to be hoped that in future editions the author will not be tempted to expand the work so that it becomes neither a book for the student nor yet one for reference.

I. N. ORPWOOD PRICE.

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DISSEMINATED SCLEROSIS

The cause or causes of disseminated sclerosis remain unknown, but it is possible that there may be a clue in the geographical incidence of the disease. C. C. Limburg,¹ who compared the mortality rates in different countries, concluded that the colder the climate the higher the crude death rate from the disease, and in comparing death rates in the American states and Canadian provinces he found that all the states or provinces with high rates either touched or were north of the fortieth parallel. Although statistics are lacking, it is probable that the disease is rare in China² and in India,³ while in South Africa G. Dean⁴ searched the records of the principal hospitals for the years 1939 to 1948 and found records of only 36 cases and states that the disease is unknown among the native and coloured peoples of South Africa. Two most careful regional surveys have been carried out in the United Kingdom in the past few years by R. S. Allison and J. H. D. Millar⁵ in Northern Ireland and by J. M. Sutherland⁶ in Northern Scotland, the great majority of the suspected cases being personally examined. In Northern Ireland the prevalence rate for the disease was found to be 7.9 per 10,000 of population for all groups over the age of 20: there was no evidence to suggest that the disease was more prevalent in any one district or that there was any tendency to focal distribution of cases. In the survey of the seven northern counties of Scotland the overall prevalence of probable cases was 5.5 per 10,000 of population, but in studying the local distribution Sutherland found in Shetland the surprisingly high figure of 11.3 per 10,000 and in the Western Isles (including Skye) only 3.4 per 10,000. He suggests that there may be a constitutional vulnerability to the disease in people of Nordic extraction in

Shetland as compared with the more Celtic population of the Western Isles. R. Swank^{7, 8} has suggested that the geographical distribution of the disease might be related to the amount of fat in the diet, and thought that there was some confirmation of this in a survey of cases which he made in Norway. On this assumption he has treated patients with disseminated sclerosis by a low-fat diet and has published several reports on the results.⁹⁻¹¹ In his last report he gave an account of 47 patients who had been on such a diet for at least seven and a half years and 107 for a somewhat shorter period. Unfortunately he had no comparable control series, but took the three years before the diet was started as a control period. He states that it is increasingly evident that the low-fat diet alters the course of the disease, and that there is a substantial decrease in both frequency and severity of exacerbations. The better results were obtained when the diet was started early in the disease, while in late progressive cases deterioration continued. Swank is very restrained in his claims for the treatment, admitting that this may be the natural course of the disease, but in view of the apparent benefit he is preparing to continue with the diet in his patients for a further four years.

In a recent number of this *Journal* Dr. Douglas McAlpine¹² has put forward once more the possible allergic origin of disseminated sclerosis, and suggests that this implies more than one factor in the aetiology. There does appear to be a slight familial tendency to the disease: in a survey of 310 cases from the Middlesex Hospital¹³ a familial incidence of 6.5% was found, a finding similar to that of Allison and Millar in their study of cases in Northern Ireland, while Sutherland in Northern Scotland gives the figure of 11%. In these familial cases siblings are affected more often than parents or children of the patients. The genetic factor is clearly a small one. A recent investigation at Oxford¹⁴ suggests that there may be a disorder of the normal immunological processes in disseminated sclerosis. This suggestion is based on the response to intrathecal injection of a purified protein derivative of tuberculin (P.P.D.). As a control, a similar injection was given to a number of chronic psychotic patients who had no signs of progressive neurological disease and in whom the cerebrospinal fluid was normal. The psychotics and the patients with disseminated sclerosis (when both were positive to the Mantoux test) responded quite differently to the injection. In the psychotics the initial response in the C.S.F. was the appearance of many hundreds or thousands of polymorph cells; these disappeared in the course of two to four days, to be replaced by a considerable increase of lympho-

cytes. In the patients with disseminated sclerosis the initial polymorph response did not occur, and, in addition, the correlation found in the psychotics between the intrathecal reaction and the result of the Mantoux test and the dose of P.P.D. injected was not present. The authors believed that the reaction was a true antibody-antigen response and that the consistent distortion of the pattern in disseminated sclerosis indicates that the normal immunological processes are disordered.

As to treatment of disseminated sclerosis, McAlpine states that no drug can be relied on to prevent relapses or modify the course of the disease. Nevertheless he advocates the use of arsenic—four courses of intravenous neoarsphenamine a year, with Fowler's solution in between the courses, the treatment to be continued for five years or more—because he believes that this treatment may modify the frequency and severity of relapses and so delay or even prevent the stage of progression. N. D. Compston,¹⁵ also working at the Middlesex Hospital, in a careful study of the effects of treatment in 57 patients given artificial pyrexia and arsenic, found no significant difference in the relapse rate before and after treatment. Many physicians would take the view that in a disease for which up to now no specific treatment has been discovered it is wiser to avoid a drug such as arsenic, which, whether given in inorganic or organic form, may cause toxic symptoms. The difficulty of assessing treatment in this disease is well illustrated in a short report from Gothenburg, where L. H. Blomberg,¹⁶ reporting on a small series of patients, found that those receiving a placebo showed greater subjective improvement than those given a substance which it was thought might influence the disease.

AMERICAN POLIO VACCINE

Public opinion now seems to be rather in favour of staking a claim for some of America's exportable surplus of poliomyelitis vaccine, though last year many parents declined to register their children for inoculation with the British vaccine, a product that is known to have passed the strictest tests of safety. It is now also known to have an antigenic efficacy equal to the best of the American vaccines¹ and better than some. Encouraging reports from the U.S.A., combined with the present rather high incidence of the disease in Britain, have raised public demand. But the medical pros and cons have hardly been argued—at least in public. No doubt those medical men who have the most expert knowledge of the subject are making their advice available to the Ministry of Health in official or semi-official ways, and they may,

understandably, feel restrained from simultaneously making it known to a wider audience. In consequence public opinion, and indeed ordinary medical opinion, is in some doubt about the possible benefits or disadvantages that must be considered.

Perhaps the main reason why the Government has not yet ordered American vaccine to supplement our own is that the same warranty for its safety cannot be given as the Glaxo product receives from the Medical Research Council's tests. Though the chances may be remote that live virus will contaminate any vaccine supplied to the public nowadays, the fact that this did apparently once happen is enough to impose caution. The Mahoney strain used for the type-1 antigen is many times more virulent than the Brunenders strain used in Great Britain, so that if by mischance some in a live state reached the public the results could be serious. Regulations for testing the American vaccine were tightened up in 1955, and, so far as the public health authorities there know, about 100 million injections have been given without serious misadventure; apart from the disaster in 1955, about 25 cases of poliomyelitis are suspected of being associated in some way with the vaccine or its injection. But those responsible for the surveillance of the American vaccine would concede that their knowledge of its effects in the vast population which have now received it, though considerable, is not necessarily complete. Apart from infection by live virus, some other possibly related ill effects have been reported to the authorities. These include about a dozen neurological cases varying from transient meningism to permanent paralysis of a non-poliomyelitic type. A few cases of allergic reactions have been reported, but there is little evidence of any haematological or renal reactions. The risk of provoking poliomyelitis by injection, discussed in these columns last week,² is exceedingly small. In general, American opinion seems to be that significant reactions to the vaccine must be occurring at a very low frequency. Against that must be set the difficulty of detecting any that might occur in Britain if some millions of doses were injected during a short period of perhaps rising incidence of the disease. Yet immediate detection is essential if a faulty batch is to be stopped before great damage has been done. A second reason for caution in importing American vaccine is that the antigenic potency of the products of different manufacturers varies. While some are excellent, some are not, and

¹ Report to the Committee on Laboratory Investigations of Poliomyelitis of the Medical Research Council, *British Medical Journal*, 1957, 1, 366.

² *Ibid.*, 1957, 1, 1168.

³ Agerholm, M., *Lancet*, 1957, 1, 1038.

⁴ *British Medical Journal*, 1955, 1, 1083.

⁵ Langmuir, A. D., Nathanson, N., and Jackson Hall, W., *Amer. J. publ. Hlth*, 1956, 46, 75.

⁶ Poos, R. S., and Nathanson, N., *J. Amer. med. Ass.*, 1956, 162, 85.

⁷ Bundesen, H. N., Graning, H. M., Goldberg, E. L., and Bauer, F. C., *ibid.*, 1957, 163, 1604.

⁸ See Parliamentary report at p. 1249.

¹ Limburg, C. C., *Res. Publ. Ass. nerv. ment. Dis.*, 1950, 28, 15.

² Woods, A. H., *Arch. Neurol. Psychiat.* (Chicago), 1929, 21, 542.

³ Sprawson, C. A., *Trans. 7th Congr. Far East Ass. trop. med.*, 1927, 1, 8.

⁴ Dean, G., *British Medical Journal*, 1949, 1, 842.

⁵ Allison, R. S., and Millar, J. H. D., *Ulster med. J.*, Supplement 2, 1954, 23.

⁶ Sutherland, J. M., *Brain*, 1956, 79, 635.

⁷ Swank, R. L., *Amer. J. med. Sci.*, 1950, 220, 421.

⁸ Lerstad, O., Strom, A., and Backer, J., *New Engl. J. Med.*, 1952, 246, 721.

⁹ —, *A.M.A. Arch. Neurol. Psychiat.*, 1953, 69, 91.

¹⁰ —, *ibid.*, 1955, 73, 631.

¹¹ —, *Ann. intern. Med.*, 1956, 45, 812.

¹² McAlpine, D., *British Medical Journal*, 1957, 1, 475.

¹³ Pratt, R. T. C., Compston, N. D., and McAlpine, D., *Brain*, 1951, 74, 191.

¹⁴ Smith, Honor V., Espir, M. L. E., Whitty, C. W. M., and Russell, W. R., *J. Neurol. Neurosurg. Psychiat.*, 1957, 20, 1.

¹⁵ Compston, N. D., *Lancet*, 1953, 2, 271.

¹⁶ Blomberg, L. H., *Lancet*, 1957, 1, 431.

clearly it would be desirable to specify which brands are wanted.

In considering the benefits to weigh against the possible, if remote, risks of using American vaccine, the epidemiologist may have a slightly different viewpoint from the family doctor or parent—and they may have something to learn from each other. There may or may not be an epidemic this summer; the present incidence of the disease cannot be interpreted either way; but, as M. Agerholm³ emphasized last week, no one can be certain that there will not be one. The protection conferred by the American vaccine, which seems to have been measured only in the mass and not by separate products, is impossible to express with any great precision. The estimate on the original trials was 60–90%.^{4–5} A recent one from the U.S. Department of Health, based on 1956 data which were not so rigorously controlled, is that, when a large proportion of the vaccinated population have received fewer than the recommended three doses, the vaccine prevents about 75% of the paralytic cases that would occur in an unvaccinated population. In the Hawaii epidemic in 1955–6⁶ statistically significant differences in severity were not found between the vaccinated and unvaccinated patients who had paralytic disease, though the figures suggested that the vaccinated patients did better. In the Chicago epidemic in 1956⁷ the figures were again in favour of vaccination. The difficulties in collecting valid data when a large-scale vaccination campaign is rushed through are evident in the reports on these two outbreaks, and many of the inoculations were given too soon for the vaccine to have its full effect. It is reasonable to conclude, though, that at least two doses of the American vaccine, and certainly the best brands of it, confer a fairly high degree of protection against the paralytic disease. Protection against the non-paralytic disease is probably slight.

No one can say that the Government and its advisers have an easy task in finding the best way through the maze of probabilities, favourable and unfavourable, that surround this question. But it has a duty to explain more fully than it has done the thoughts that animate it,⁸ for they are open to dispute. There is certainly a strong argument for importing the best brands of American vaccine, if that is possible. If the arguments against doing so outweigh it, they would be all the better for public discussion.

LUNG CANCER AND CHROMATES

The first reports of lung cancer among chromate workers came from Germany in the 1930's.^{1,2} At least 62 cases are now known to have occurred in that

country, but the size of the population at risk is not known with accuracy, and the existence of a specific industrial hazard was not established until after the second world war, when the data for the American industry were published. These data concerned the workers at seven chromate plants; the mortality from lung cancer among them was some 30 times greater than would have been expected from either the national mortality data or the records of other industrial employees of corresponding ages.^{3,4} In contrast, the mortality from other types of cancer among the chromate workers was similar to that recorded for all men throughout the country.

No suspicion of a risk had been raised in the British industry, and both management and men were so confident that none existed that attempts began to be made to explain the different experiences in the three countries by an analysis of differences in the techniques of manufacture. A preliminary clinical and radiological examination of 724 men employed in the three British plants engaged in the manufacture of chromates from chromite ore revealed only one case.⁵ Such a finding showed only that it would be necessary to observe the men for a long period before a conclusion could be reached, and a continuing study of the health of the employees was therefore initiated by P. L. Bidstrup and R. A. M. Case.⁶ As a result, 15 cases have been discovered in a little under six years. Of these, 12 occurred among the group of 723 men who had previously been x-rayed by Bidstrup; the affected men had all died before the end of the follow-up period and their deaths had been certified as due to lung cancer. Of the other cases, one had been found by Bidstrup at the initial x-ray examination and had consequently been excluded from the study, another was found to have lung cancer at a repeat x-ray examination at the end of the inquiry, and the third was an employee who had not been included at the initial examination. If the men who were studied had experienced the same mortality from lung cancer as other men of the same ages in Britain, the number of deaths from lung cancer would have been about 3 (actual calculated number 3.3), and the observed mortality was therefore more than three and a half times the normal. The mortality from other causes was, in contrast, close to the normal; 9 deaths were recorded from other types of cancer against 7.3 expected and 38 deaths from all other causes against 36.3 expected. Thus the men were not unhealthy in general, and the excess mortality from lung cancer must be attributed to some specific factor. The size of the excess is such that it cannot reasonably be explained by residential or social factors or by differences in smoking habits, and it seems that it must be due to a specific hazard in the industry. At first sight it might appear that the extent of the risk in Britain was substantially less than in the U.S.A., but this is probably

¹ Pfeil, E., *Dtsch. med. Wschr.*, 1935, 61, 1197.

² Alwens, W., Bauke, E. E., and Jones, W., *Arch. Gewerbepath. Gewerbehyg.*, 1936, 7, 69.

³ Machle, W., and Gregorius, F., *Publ. Hlth Rep. (Wash.)*, 1948, 63, 1114.

⁴ Brinton, H. P., Frasier, E. S., and Koven, A. L., *ibid.*, 1952, 67, 835.

⁵ Bidstrup, P. L., *Brit. J. Industr. Med.*, 1951, 8, 302.

⁶ — and Case, R. A. M., *ibid.*, 1956, 13, 260.

⁷ Baetjer, A. M., *Arch. Industr. Hyg.*, 1950, 2, 487.

not so. The "normal" mortality with which the mortality of the American workers was compared was recorded at a time when mortality from lung cancer was less than half as common as it was during the period of Bidstrup and Case's study, and "normal" American mortality is, moreover, only about half the British. The fact that the risks may be much the same is illustrated by the proportion of the total deaths which were attributed to lung cancer in both countries. Out of 193 deaths from all causes W. Machle and F. Gregorius³ found 42 attributed to lung cancer (22%), whereas Bidstrup and Case found 12 out of 59 (20%).

Apart from the cases of lung cancer, three other cases of respiratory cancer have been described among chromate workers.⁷ All occurred in the nose, but they did not arise from the nasal septum and were unrelated to previous perforation of the septum. It seems, therefore, that the perforation of the septum commonly found among all types of chromate workers, like the chrome ulcer of the skin, does not predispose to malignancy. One of the three cancers arose from the inferior turbinate and the two others from the maxillary antrum. These cases are reminiscent of the nasal cancers—principally ethmoid or antral in origin—which together with lung cancer have been a major hazard to men employed in the refining of nickel in South Wales. In view of the rarity of nasal cancers in normal conditions, it seems likely that the reported nasal cancers among chromate workers are also industrial in origin.

Evidence of the exact nature of the substance responsible for the induction of cancer is conflicting. No cases have been reported among miners of chromite ore, and the ore itself might therefore be considered innocuous had it not often been shown that an important cause of cancer can easily be overlooked. Apart from men engaged in the manufacture of chromates from the crude ore the only other group reported to have suffered a high mortality from the disease is a group of men engaged in the manufacture from dichromates of chrome pigment (that is, lead and zinc chromate). Machle and Gregorius, on the other hand, found no cases of lung cancer in one of the plants which they studied, in which the men were exposed only to dichromates and chromic acid. Apart from two cancers in rabbits which followed the intrafemoral injections of metallic chromium, animal experiments have so far proved negative, and it has not been possible to isolate the carcinogen by this means. The consensus of opinion is that the carcinogen will probably prove to be trivalent chromium in the form of acid-soluble–water-insoluble compounds. However this may be, it appears that one further example must certainly be added to the list of relatively simple inorganic substances which, under suitable conditions, can cause cancer of the respiratory tract.

MASS SPECTROMETRY

A spectrometer is an instrument for the quantitative measurement of radiations of different wavelengths. Various means, such as quartz prisms, diffraction gratings, and crystals, are used for dispersing the light

rays into their component spectra. The mass spectrometer utilizes the same principle for the analysis of a mixture of gases, the individual molecules being first ionized and then dispersed by means of a powerful magnetic field. The greater the molecular weight (mass) of a particular gas the less will be its deflection in the magnetic field. Thus the stream of ionized molecules will be split up into beams of different molecular weight, the electrical charge of which can be measured. Physicists have used mass spectrometry for thirty years, and it has been applied to the industrial separation of radioisotopes and hydrocarbon gases. But only a few attempts have been made—notably in the United States—to extend its use to the biological sciences. This week we publish an enthusiastic account by Mr. K. T. Fowler and Dr. P. Hugh-Jones of the value of the mass spectrometer in the study of respiratory function in man. The instrument has been designed and built entirely in the workshops of the Postgraduate Medical School at Hammersmith Hospital—a notable example of the contribution which electronic engineering is making to clinical medicine.

A pump draws air either from the mouth or from a bronchus during bronchoscopy through a fine stainless-steel tube into an ionizing chamber, where the gas molecules are bombarded by a beam of electrons. The ions are then accelerated by means of a negatively charged plate, through which they stream into the magnetic field. Here they are deflected in a circular pathway towards a collecting plate, which is connected to a cathode-ray oscilloscope. By varying the accelerating voltage it is possible to obtain a continuous scan of the different beams, so that the oscilloscope shows a series of peaks, the horizontal positions of which indicate the molecular weight and hence identity of the component gases. The abundance (partial pressure) of each gas can be determined from the height to which the peak rises. A continuous tracing of variations in partial pressure with time can be obtained by connecting the spectrometer with a multichannel recorder. The present instrument is capable of continuously analysing up to four different gases during the whole of the respiratory cycle. It requires a negligible fraction of the respiratory minute volume, has a response time of less than a tenth of a second, can detect changes in concentration of 1%, and is readily transportable. It has been designed to detect gases of molecular weights ranging from 18 to 80, which includes those of physiological importance as well as certain inert gases which are useful in this type of work.

The advantages of such a device will be appreciated by anyone engaged in investigating lung disease. Most methods for measuring respiratory gases depend on laborious chemical analysis of samples obtained at a particular time in the respiratory cycle. Automatic gas analysers are available for continuous sampling, but they can be employed in the study of only one gas at a time.

One of the most puzzling aspects of lung function at present is the manner in which exchange of gas takes place in the lungs. The mass spectrometer can provide information about the distribution of inert gases and

therefore will detect any inequalities of ventilation. It can be used to assess the relationship between ventilation and blood flow through the lungs, the so-called ventilation-perfusion ratio. In addition it should be capable of measuring the ease with which gases diffuse between the alveoli and the blood. Such measurements are of great importance in the study of chronic lung diseases, such as emphysema and asthma, and serial readings would help in assessing the results of treatment. The advantage of mass spectrometry over existing techniques is that it can simultaneously provide simple, rapid, and accurate estimations of several different variables in pulmonary gas exchange. Time will show whether it can supply the answers to some of the many problems which confront the chest physician.

RESCUE WORK IN MINES

For purposes of study, mines provide a situation typical of hot working environments. Physiological research in mines has recently been renewed, and there have been reports from the deep mines of the Rand¹ and of the Gold Coast,² and now a Medical Research Memorandum³ from the National Coal Board draws attention to a different aspect of the same problem. This study is concerned not with the miner himself and the maintenance of thermal equilibrium, but with rescue workers who when saving life or fighting underground fires must endure conditions well beyond the usually accepted limits of human tolerance. Any environment may be tolerated for a period: clothed men at rest can withstand temperatures of 240° F. (115° C.) in dry air (relative humidity 1.5%) for 20–25 minutes before suffering "intolerable discomfort"⁴; in mines temperatures are not so high, usually below 113° F. (45° C.), but the air is near saturated and still, and rescue personnel must work extremely hard, carrying the added burden of equipment for oxygen breathing. The tests were carried out with the assistance of the Medical Research Council's Unit for Research on Climate and Working Efficiency on members of the rescue teams employed in mines. Preliminary screening trials were performed at Oxford; the men were not exposed in these to severe conditions, nor were they worked hard. Older men (39 to 45 years) reacted more sharply than did the younger men (19 to 31),⁵ with higher skin and body temperatures and greater circulatory changes. But these differences were not large, and men in both age groups were exposed to more severe conditions in the National Coal Board's testing chambers at Doncaster. In these trials men carried out the sort of work they might have to do during rescue operations, building sandbag stoppers, at a mean

metabolic rate of 200 kilogram calories per square metre of body surface per hour in saturated environments at temperatures ranging from 85 to 100° F. (29–38° C.) with an air movement of less than 20 ft. (6 m.) per minute. They were withdrawn when their rectal temperatures reached 101.8° F. (38.8° C.). Tolerance time was not affected by age, nor did it differ with occupation. But it did vary according to the type of breathing apparatus worn; at 100° F. (38° C.) men wearing the "aerophor" equipment could tolerate these working conditions for 32 minutes, but with the "proto" they lasted only 29.5 minutes. At 85° F. (29° C.) the corresponding figures were 64.5 and 54 minutes. These differences were associated with the higher temperatures from the inspired air when wearing the proto equipment. Further tests were carried out at higher temperatures in unsaturated environments and included observations on "vigilance." The tolerance times finally recommended by the authors and incorporated in an Information Bulletin⁶ from the National Coal Board are 10 minutes less than those determined experimentally in order to allow a safety margin for any rescue workers who might be unduly susceptible to heat. The recommendations extend to temperatures up to 120° F. (49° C.) dry bulb, 95° F. (35° C.) wet bulb.

This is probably the first time that such high rectal temperatures have been regarded as permissible: 101.8° F. (38.8° C.) is beyond the point at which sweating diminishes with further rises in rectal temperature,⁷ but in saturated atmospheres evaporative cooling is minimal, and the effects of the inevitable rise in body temperature are a calculated risk that must be taken. The men can cool down only when they return to their "fresh air base," but no recommendation has been made about the temperature of the base; presumably the authors did not consider this necessary, as E. F. DuBois⁸ has shown that an unclothed inactive man has difficulty in maintaining his body temperature even at 80° F. (26.7° C.), and it is unlikely that any "fresh air base" in Britain would be warmer than this.

GROWTH IN CHILDHOOD

The physiological processes of growth are so complex that studies of deviations from the normal may be developed in a great variety of conditions. Heredity, antenatal disorders affecting the foetus, and prematurity have all been—and still are—subjects of intensive research. Normal variations in pattern throughout childhood are well recognized, and the introduction of such aids to evaluation as the Wetzel grid has done much to stimulate the study of these individual differences. It is, however, in disease that deviations become particularly evident and the natural inherent struggle to maintain or regain normal growth can be seen. The problems have been approached in many different ways, and three recent papers have contributed to our knowledge of childhood reactions to some adverse factors.

¹ Sheldon, W., *Gt. Ormond Str. J.*, 1956, 8, 31.

² Hubble, D. V., *British Medical Journal*, 1957, 1, 601.

³ Ansell, B. M., and Bywaters, E. G. L., *Ann. rheum. Dis.*, 1956, 15, 295.

The effects of coeliac disease on growth have been known since the condition was first described over seventy years ago. Coeliac dwarfism was a well-recognized condition. Now that the aetiology is established and a means of control is available, studies of the effect of withdrawing, and of subsequently reintroducing, gluten into the diet of affected children have shed light on the prognosis, particularly for growth. W. Sheldon¹ analysed 86 cases of coeliac disease and found that in 64 growth continued normally after the reintroduction of ordinary (that is, gluten-containing) diet; in 5 there was a prompt recurrence of symptoms, which again subsided when gluten-free diet was given. The remaining 17 were an interesting group, for in these the only sign observed after the reintroduction of gluten to the diet was retardation of growth. Subsequent withdrawal of gluten was followed by increase in growth. In none of the 86 cases was growth accelerated when the children were on a normal diet; indeed, this resulted in an overall diminution in the rate of growth. The cause of this effect on growth of gluten intolerance remains to be explained.

D. V. Hubble² considered the problem of growth from the point of the hormonal influences—the competition between protein anabolizers (growth hormones, thyroxine, insulin, and androgen) and catabolizers (chiefly the adrenal cortical compound F)—and discussed the effects of certain pituitary and adrenal dysfunction on growth. He constructed an ingenious "hormonal formula" to explain the features of these endocrine, and of some metabolic, disorders. The annual percentage increase in height, he suggested, offered a clinical index of the activity of the protein-anabolic hormones when disease and malnutrition were absent. He stressed particularly the metabolism of protein in relation to growth and considered that the anabolic hormones were in the ascendant during active growth phases, when the growth hormone, about which little is yet known, may be directly stimulating tissue synthesis from amino-acids.

Rheumatoid arthritis in childhood afforded B. M. Ansell and E. G. L. Bywaters³ an opportunity to study the changes in growth caused by this disease. They followed up 119 cases over several years, studying particularly height, weight, and bone development and the effects of testosterone and cortisone on the growth and maturation of the children. In this careful investigation they found that slowing in rate of growth in height was common during periods of active disease but that growth was rapidly resumed and indeed returned to normal rates during quiescent periods. The weight similarly varied. Abnormalities of bone development were the result of the general retardation of growth due to the chronic disease, together with local changes in the neighbourhood of affected joints. Treatment with testosterone stimulated a rapid increase in weight, particularly when the disease was becoming less active, and cortisone produced a slowing in growth which was maintained even when the disease was well controlled clinically; increase in height was resumed only after the dose of cortisone had been reduced to 50 mg. a day or less.

These three papers may be considered complementary to one another in their approach to an understanding of

how disease may affect growth in childhood. Each in its different way helps to clarify the subject and will well repay study by all who are interested in the vagaries of growth, normal and abnormal.

WELLCOME TRUST

Henry Solomon Wellcome was born in Wisconsin, U.S.A., in 1853, and it was as a traveller for an American pharmaceutical firm that he first landed in Great Britain. As a pharmaceutical student he had met Silas Mainville Burroughs, a fellow student, at Philadelphia, who conceived the idea of developing a British market for compressed tablets containing accurate doses of drugs. These two young men joined forces in 1880 to found the firm of Burroughs Wellcome and Co. It was not long before what started as an importing business grew to be a large manufacturing firm, and "tabloids" became familiar to almost everyone in the country. Burroughs died of pneumonia in 1895, and Sir Henry Wellcome, as he became in 1932, built up the firm while retaining all the capital in his own hands. All his life interested in a wide variety of researches, many of which he financed on a generous scale, he founded in 1924 the Wellcome Foundation Ltd., to provide more formal arrangements for financing them from the profits of Burroughs Wellcome and Co. On his death in 1936 trustees¹ appointed by his will took over these affairs, and the first report of the Wellcome Trust, from which these biographical notes are taken, has now appeared.² It covers the twenty years 1937–56, twenty years of most discerning and fruitful help to medical (and some other) research.

In recognition of Wellcome's own interests the trustees early decided to support research in pharmacy and pharmacology, tropical medicine, and veterinary medicine. Among the ventures it has endowed in one way or another are a professorship of clinical tropical medicine at the London School of Hygiene and Tropical Medicine, a professorship of pharmacy at the School of Pharmacy, London, research fellowships in veterinary medicine, biochemistry, and anaesthesia, grants to the Universities of Oxford, Leeds, and St. Andrews to improve their departments of pharmacology, and special sums to buy expensive apparatus such as electron microscopes. Large sums have also been given to all three Royal Colleges in London and to the Royal Society of Medicine to help to expand their libraries and museums. These are only a few of the many benefactions that this remarkable trust has been able to make in pursuance of its policy of "giving support to enterprises of which the merits were endorsed by the best available scientific opinion, but which, for one reason or another, had not so far received the support which they needed." It is evident from this report not only that Wellcome was a man of far-seeing vision but that his trustees have served him well.

¹ The present trustees are Sir Henry H. Dale, O.M., F.R.S., L. C. Bullock-M. Price, Lord Piercy, and Brigadier J. S. K. Boyd, F.R.S.

² *The Wellcome Trust First Report Covering the Period 1937–56*, 1957, 52, Queen Anne Street, London, W.1.

¹ Wyndham, C. H., Bouwer, W. v. d. M., Devine, M. G., and Patterson, H. E., *J. appl. Physiol.*, 1952, 5, 290.

² Ladell, W. S. S., *Brit. J. Industr. Med.*, 1955, 12, 111.

³ *Reactions of Mines-Rescue Personnel to Work in Hot Environments*, National Coal Board Medical Research Memorandum No. 1, 1957.

⁴ Blockley, W. V., and Taylor, C. L., *Heating, Piping and Air Conditioning*, 1949, p. 111.

⁵ Hellon, R. F., Lind, A. R., and Weiner, J. S., *J. Physiol. (Lond.)*, 1956, 133, 118.

⁶ National Coal Board Production Department Information Bulletin, No. 55/140. See Appendix II of *Reactions of Mines-Rescue Personnel to Work in Hot Environments*.

⁷ Ladell, W. S. S., reported in *British Medical Journal*, 1957, 1, 580.

⁸ DuBois, E. F., *Fever and the Regulation of Body Temperature*, 1948, Springfield.

PREVENTION OF RECURRENCES OF RHEUMATIC FEVER

BY

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Each attack and every recurrence of rheumatic fever is preceded by infection of the throat with group A beta-haemolytic streptococci. If this infection could be prevented or eliminated by early treatment, rheumatic fever and rheumatic heart disease would be exterminated. This is now almost universally accepted. It is, however, not feasible to prevent all group A beta-haemolytic streptococcal infections in the general population, and, while it is theoretically possible to eliminate such infection in the individual by early treatment, this is difficult in practice in more than a small proportion of patients. A more limited objective is the prevention of rheumatic fever recurrences.

Prophylaxis of Proved Value

It is 18 years since sulphonamides were first used for the prevention of rheumatic fever recurrences by Thomas and France (1939) and Thomas *et al.* (1941), and almost simultaneously by Coburn and Moore (1940). All subsequent studies and all those conducted using penicillin in a similar way have confirmed the value of these measures (Houser and Eckhardt, 1952; Bywaters, 1952, 1954). Experts agree on their value (Mortimer and Rammelkamp, 1956), and on the amount of invalidity and suffering that could be avoided were these measures used throughout the world. Experienced observers hold that "the extent of cardiac damage appears to increase with the number of recurrences" (Wilson, 1940), and "the degree of disability and the ultimate longevity of those with injured hearts are largely influenced by the frequency, duration, and severity of recurrences" (Bland and Jones, 1952).

Yet in this country it is an exception to find children or adults who have recently had rheumatic fever protected in this way against further attacks. Apart from some paediatric teaching centres, few of the teaching hospitals and fewer of the non-teaching hospitals use this measure. It is true that only a small number of rheumatic fever cases are now admitted, compared with, say, 50 years ago, yet in notifying areas 0.027% of schoolchildren are attacked by rheumatic fever each year (Leff, 1956) (taking the mean of the last three years, 1951-3, for all areas). If this rate applies to all the children of England and Wales, we can calculate that each year about 2,000 children develop rheumatic fever and need protection for an average period of five years. It becomes important, therefore, to find out why this well-established prophylactic measure is not being used in this country either by consultants in the hospitals or by general practitioners in the home. Some of the reasons have been uncovered by a review of our own prophylactic scheme and the extent to which it has been implemented when the patient returns home.

Why Prophylaxis is Abandoned

Prophylaxis has been undertaken in this unit since 1951, using either sulphadiazine or triple sulphonamide 0.5 g. b.d. or penicillin G 200,000 units b.d. All patients with proved or probable rheumatic fever or chorea since then have been

discharged from hospital on this regime. They are given a supply to last three months and a letter is sent to the family doctor suggesting that this should be continued until the age of 20. The patients are seen at 6- or 12-month intervals at our own follow-up clinics. Erythrocyte sedimentation rate and antistreptolysin O titre are measured and urine tests for sulphonamide made at each attendance. Results of such follow-up examinations and recommendations are incorporated in letters to the family doctor and school medical officer. Sulphonamide is dispensed in the clinics in amounts to last six months. If the patient has finished the supply before his next visit, he may either write in for more or obtain them from his own doctor. Penicillin is given by prescription for three months at the follow-up clinics or is supplied by the family doctor; patients may write directly to the hospital for further supplies.

By inquiry of patients, parents, and doctors we have found that most parents co-operate to a variable extent, depending upon their conscientiousness, ability to control their children, their comprehension of the measure, and their trust in the doctor: others are apathetic, and still others appear to be confused by the difference between their own doctor's instructions and those of the hospital doctor. Many doctors approve of the scheme and co-operate well, but others are apathetic, and others oppose this measure.

The difficulties we have encountered may be summarized as follows:—(1) *Parental*: (i) apathy, (ii) lack of supervision. (2) *General practitioner opposition* on account of: (i) swelling the drug bill, (ii) making children hypochondriacs, (iii) lack of knowledge of its value, (iv) fear of toxic reactions, (v) fear of bacterial resistance developing, (vi) fear of penicillin loss of potency over three-month periods and subsequent too frequent (monthly) prescribing, and (vii) the fact that the disease is now uncommon and diminishing.

Medical Opposition Examined

It must be admitted that most of these reasons for medical opposition have some element of validity in them, but the measures advocated have been tested out practically and successfully over a prolonged period of time. For reasons often stated before, we consider, in common with the American Heart Association (1953), recently reviewed in this *Journal*, that the advantages greatly outweigh the possible disadvantages. To take the medical objections serially:

1. Cost per day (based on hospital costs).

	Dosage	Daily cost
Crystalline penicillin G*	200,000 units b.d.	3.68d.
Phenoxymethylpenicillin (penicillin V)	120 mg. b.d.	8.8d.
Sulphadiazine	0.5 g. b.d.	2.04d.
Tab. trisulphonamide ("sulphatriad")	0.5 g. b.d.	1.62d.
Sulphafurazole ("gantrisin")	0.5 g. b.d.	4.60d.

This seems a small price to pay for protection against a second attack of rheumatic fever and possible further cardiac damage.

2. Hypochondriacs are made, not by pills but by parental attitudes.

3. Failure to realize the value of prophylaxis is widespread and bears no relation to the excellence or otherwise of the physician in general.

4. Toxic reactions are rare with sulpha drugs, and if they occur they usually do so within the first three months of prophylaxis—i.e., with our own patients usually while they are still convalescent under observation in hospital. In a five-year period with about 500 patients discharged on prophylaxis—mostly a sulphonamide but some on penicillin—we have had only one serious (but not fatal) reaction, a patient developing agranulocytosis after sulphadiazine for eight weeks. Others have shown transient leucopenia (2 cases) or urticarial rash of doubtful aetiology. Renal damage will not occur in this dosage and with these drugs. Rarely, reactions have occurred with therapeutic dosage, after a prior period on prophylactic dosage. Penicillin sensitivity (mainly skin reaction) is rare on prophylactic

*Benzathine penicillin is only long-acting intramuscularly, and offers no commensurate advantage for its extra cost by mouth.

dosage, and also occurs in the early convalescent period. We have had very few, none severe.

5. Streptococcal resistance to sulphonamides develops only under epidemic conditions, in closed institutions: it is not serious, since change can be made to penicillin, to which streptococci remain sensitive. Staphylococcal resistance to penicillin can be a nuisance, but again emerges in this country usually only under institutional or hospital conditions, not at home. We have had no trouble in this institution over the last five years. If staphylococcal-resistant strains appear, other antibiotics are available.

6. Loss of potency of penicillin tablets may occur on exposure to moist air, but penicillin should last at least three months unimpaired if stored in an air-tight bottle in a cool place. Some brands are packed in metal foil as an additional protection against humidity.

7. This is no reason for not protecting those particularly susceptible.

8. Another objection, more difficult to meet, is that another method of prophylaxis exists—that of treating promptly every sore throat in such patients with bactericidal doses of penicillin. This is useful should a sore throat develop in a rheumatic child because of omission of prophylaxis, but it is not always successful and it is not practical as a general measure, since all group A streptococcal infections are not manifest as sore throats, all children do not complain, all parents do not go to the doctor, and all doctors do not use this method. We consider routine daily prophylaxis safer.

The prevention of first attacks of rheumatic fever in a susceptible population also needs attention but is another and separate problem.

Conclusions

We conclude that measures should be taken in this country to acquaint physicians in general with the advantages to be gained from routine daily prophylaxis against rheumatic fever relapses. Opportunities exist at meetings of learned societies and in medical publications. Full discussion of possible disadvantages is needed together with accounts of practical experience in this field. Lay education should not be neglected.

REFERENCES

- American Heart Association (1953). *Lancet*, 1, 285.
Bland, E. F., and Jones, T. D. (1952). *Ann. intern. Med.*, 37, 1006.
Bywaters, E. G. L. (1952). *Brit. med. Bull.*, 8, 343.
— (1954). *Courier*, 4, 357.
Coburn, A. F., and Moore, L. V. (1940). *Med. clin. N. Amer.*, 24, 633.
Houser, H. B., and Eckhardt, G. C. (1952). *Ann. intern. Med.*, 37, 1035.
Leff, S. (1956). *Ann. rheum. Dis.*, 15, 33.
Mortimer, E. A., and Rammelkamp, C. H. (1956). *Circulation*, 14, 1144.
Thomas, C. B., and France, R. (1939). *Bull. Johns Hopk. Hosp.*, 64, 67.
Thomas, G. T., and Reichman, F. (1941). *J. Amer. med. Ass.*, 116, 551.
Wilson, May G. (1940). *Rheumatic Fever*. Commonwealth Fund, New York.

TERMINOLOGY OF THE HEREDITARY HAEMOGLOBINOPATHIES WITH HAEMOGLOBIN VARIANTS

BY A WORKING PARTY* OF THE COLONIAL MEDICAL RESEARCH COMMITTEE

The following recommendations are based on immediate practical requirements rather than on fundamental theoretical considerations, and are put forward at the present time solely with the aim of discouraging the growth of ambiguous systems of terminology until an agreed international system has been devised.

General Recommendations

(a) The term *sickle-cell disease* should be used to denote any pathological condition which is, in part, attributable to sickling of the red cells. The term *sickle-cell anaemia* should be reserved to denote the presumably homozygous state. Its use is (strictly) conditional upon the demonstration of homozygosity from family studies.

(b) Foetal haemoglobin is excluded from the present discussion of terminology, though its persistence in varying degree is an often-observed feature of states involving the haemoglobin variants. Statements regarding its occurrence should be made as part of the biochemical findings.

(c) The working party appreciates the desirability of having a complete statement of the haemoglobin variants actually present, preferably in order of decreasing proportions, leaving the clinician to decide if an actual (or potential) pathological situation needs to be described, and the geneticist to state how the observed combination of haemoglobin variants has arisen. The working party also appreciates the undesirability of using a terminology with genetic implications in the absence of family studies.

(d) The term *haemoglobinopathy* should be used to denote a condition in which the production of normal adult haemoglobin (Hb-A) is partly or wholly suppressed and it is partly or wholly replaced by one or more haemoglobin variants, which may include foetal-type haemoglobin (Hb-F).

Specific Recommendations

(a) The term *sickle-cell* should be hyphenated when used as an adjective.

(b) Excluding Hb-F from consideration, the biochemical state involving Hb-A and any other one haemoglobin variant (Hb-X) should be described as *Hb-X trait*.

(c) The term *disease* and not the term *anaemia* should be used generally to denote pathological conditions associated with haemoglobin variants.

(d) The term *thalassaemia* should be retained because the genetic variants of thalassaemia present themselves as such. These variants should be described as *Hb-C/thalassaemia*, *Hb-E/thalassaemia*, etc. The term *thalassaemia* should be used rather than the terms *Cooley's anaemia*, *microcythemia*, etc. The qualifying terms *major* and *minor* are in practice used to denote the presumably homozygous and heterozygous states respectively, but their use in this way is (strictly) conditional on supporting evidence for the nature of the genotype from family studies.

(e) A morbid condition, not presenting itself as sickle-cell disease or as a variant of thalassaemia, but produced by any one or two Hb variants, in the absence of Hb-A, should be described as a *disease*—e.g., *Hb-C disease*, *Hb-C/Hb-D disease* (hypothetical). It is appreciated that some of the possible combinations are not yet known to produce morbidity in adults.

Examples of Known Haemoglobin Combinations

(Note.—In these examples the haemoglobin variants given in parentheses are not always found).

A	..	..	..	Normal adult
A+F	..	..	..	Infants
A+F	..	..	..	Thalassaemia
S+F	..	..	..	Sickle-cell anaemia
A+S	..	..	..	Sickle-cell trait
A+S+F	..	..	..	Sickle-cell/thalassaemia
C (+F)	..	..	..	Hb-C disease
A+C	..	..	..	Hb-C trait
A+C+F	..	..	..	Hb-C/thalassaemia
S+C (+F)	..	..	..	Sickle-cell/Hb-C disease
D	..	..	..	Hb-D disease
A+D	..	..	..	Hb-D trait
S+D (+F)	..	..	..	Sickle-cell/Hb-D disease
E (+F)	..	..	..	Hb-E disease
A+E	..	..	..	Hb-E trait
E+F (+A?)	..	..	..	Hb-E/thalassaemia
G	..	..	..	Hb-G disease
A+G	..	..	..	Hb-G trait
A+I	..	..	..	Hb-I trait
A+H	..	..	..	Hb-H trait
A+J	..	..	..	Hb-J trait

*The Colonial Medical Research Committee's working party on sickle-cell trait and sickle-cell anaemia, which prepared these recommendations on terminology, consists of the following: Professor A. W. Woodruff (*chairman*), Dr. A. C. Allison, Professor P. C. G. Garnham, Dr. H. Lehmann, Dr. R. Lewthwaite, Professor B. G. Macgrath, Dr. A. E. Mourant, Dr. A. B. Raper, Dr. J. C. White, Dr. G. H. Beaven (*secretary*).

PROFESSIONALISM AND BUREAUCRACY

MR. GRAHAM HUTTON'S ADDRESS TO
WINCHESTER DIVISION

This year's "Winchester Address" was given on May 15 by Mr. GRAHAM HUTTON, the economist, before a large audience of members of the Winchester Division and their ladies, and guests. Dr. J. T. ROWE, chairman of the Division, presided.

Changes in Human Societies

Mr. Hutton said that the title of his talk, "Professionalism and Bureaucracy," although topical, in fact summarized a problem of human organization which had regularly reared its head throughout the history of civilizations. During this twentieth century—a paradoxical century of the two worst wars, and the most rapid rise in humanity's material standards of well-being in peacetime—this problem of professionalism and bureaucracy had reared its head higher and higher. "Let us begin," he said, "by looking carefully at what has been happening in all kinds of human societies, organized in differing states and civilizations, during this century, and to the individuals in those societies. Let us try to trace the nature of changes, the direction of change, and the rate of change."

First Change

The threefold nature of the change in all human societies would not provoke much dispute among sociologists, economists, anthropologists, social psychologists, and other such. First, the techniques of human control over the powers of Nature, and therefore over men, had immeasurably multiplied and accelerated. These powers were humanity's means to its differing ends: means to produce more; means to influence, communicate, and convey more, communications of goods and of ideas and of rules and regulations; means to develop and use more human faculties and potentials, and thereby to put more strains and stresses on both individual and collective humanity; means to exert power over other men, which also put new strains and stresses on human tolerances; and, finally, means to lighten mankind's burdens, ease and lengthen human life, and further develop mankind's powers over environment. Most, if not all, of these rapidly extending human powers were as potent for evil as for good. "But," Mr. Hutton said, "we must not get long-run things into short-term perspectives. It is good that human powers over inhuman powers are being so rapidly increased. It is a bad thing that increased human power is used—or, I should say, abused—to stress human beings beyond their normal tolerances, or to frustrate their natural modes of expression and development, or to dehumanize them by compelling them to behave as machines or automata at the bidding of other human beings."

Second Change

The second great change in society was that, whereas the course of last century, all over the world, was towards the liberation of individuals from collective restraints that had endured for many centuries, the course of the twentieth century everywhere had been towards more and more collective powers and restraints over individuals and their self-expression. Everywhere, this century, and never more so than in the past decade or two, the State had steadily increased its power over almost every walk of individual life. This had occurred in the arts and sciences, in education and medicine, in the everyday lives of households and families, in business and travel, in the means and uses of leisure and pleasure, in the totality of laws and administrative regulations within which individual life must be lived and self-expression sought.

It was true, keeping things in perspective, that this second or political change, the greatly increased powers of the State, had brought both material and non-material benefit to millions of human beings in many nations. Many old evils had been removed: slums, real poverty below subsistence

level, exploitation of the masses who work for a living. But in the same perspective it must be observed that, whether in democracies or dictatorships, power over individual and family lives had been immeasurably magnified and concentrated in a more and more centralized form of State apparatus. From there it is more and more exerted, through more and more agencies and agents of central political power—functionaries (as the French call them), bureaucrats (as rude Americans call them), and *apparatchiki*, or "apparatus-boys," as the Russian Communists call them.

So, while leisure increased and the means for self-expression and creative realization of human potentials increased, on the other hand "the political revolution of our time cribs, cabins, cramps, and confines the freedoms of individual life." To-day economic, professional, trade union, legal, travel, and other freedoms were narrower, not at the administrative centres of these sectors of life, but on the periphery where the individual members live and operate. Even apart from the centralizing political power of the State, these other sectors of individual life—in business, trade unions, professions, vocations, sport, commercialized pleasures and leisure, and media of publication and radio communication—were all of them more centralized, more collectively organized in larger administrative units, in which what was once an outstanding British advantage (namely, individual originality and even eccentricity) was scarcely any longer permissible, tolerable, or indeed observable.

"Make no mistake," Mr. Hutton said; "all this blanketing, by administrative centralization of a standardizing power, is a political manifestation, in the proper sense of the word 'political.' It stems, as it always has in history, from the exercise of collective, social power over the individual citizen's life." The manifestation of centralized administrative power was quite as clear—though, luckily, not as repressive, yet—on our own side of the Iron Curtain as on the other. It was a phenomenon of all human societies now. As the first or technical change had shrunk the whole world and crammed the human race cheek by jowl, so had the second or political change unfolded everywhere—"the concentration of vastly enhanced social or political power in the hands of the few over the lives of the many, and the once-vaunted 'rule of Law' has given way everywhere to the contemporary rule of laws and regulations affecting more and more of individual life."

Third Change

The third great change in all human societies was also a result of widening, increasing, and accelerating human techniques and controls over the powers of Nature. It was the resulting, and at the same time the causing, of ever-deepening, ever-narrowing specialization in all human knowledge. This accelerating process showed up in the arts and sciences, in leisure and pleasures, as well as in the everyday economic business of life, public administration, professions, and vocations, young persons' education, industrial and professional training, and all other kinds of instruction, experimentation, or research. It was found on both sides of the Iron Curtain, in America as in Russia, in democracies as in dictatorships, in the world's most developed and in its least developed societies. Allied to the other two great social changes in our time, this third change still further weakened the powers, potentials, and freedoms of the individual citizen. It still further strengthened the tendency of all political and administrative power to be centralized, because the individual learner, researcher, operative, technician, professional man, trade unionist, or manager tended in parallel to become submerged by an ever-expanding, ever-more-powerful collectivity which ruled and regulated more and more of his functional or working or professional life. He tended to become so submerged because his craft, or expertness, or profession, expanded its technical scope at an accelerating rate, and he saw his own individual mastery of only a little part of a widening field becoming smaller and smaller; in short, he himself became ever more dependent upon the end-results of other individuals' current work, without his being able

either to understand or to control their operations. This process could be traced with equal clarity among experts of all kinds—medical men, physical scientists, economists, accountants, lawyers, engineers, business managers—and among the skilled and less skilled operatives on a factory floor, in transport, or even in public and private administration and government itself.

Tensions, Strains, and Stresses

Complaints about this third change in mankind's social process arise, Mr. Hutton pointed out, on both sides of the Iron Curtain, in America, in Russia, in India, in Africa, in school and university and other training curricula, in religions, castes, social classes, and income brackets of all levels. "The burden of complaint is one and the same—namely, that the individual's distinguishing individualities are tending more and more to be ironed out, that differentials and varieties are being flattened into standard and more rigid moulds or types, and that frustration of human potentials follows upon such a narrowing specialization." Following such a sense in individuals and technical or vocational groups of being ever more compulsorily and collectively circumscribed bad social outbreaks occur: the inevitable tensions, strains, and stresses in the society, the malaises and maladjustments, cause something like social earthquakes. One stratum slips as against another. One grouping, one profession, one social class reacts, in time explosively, against others. Next the system of law and custom, rights and duties, sentiments and beliefs and values, begins to lose its binding force, and the whole social fabric is threatened. Law, political power, the State and its agencies and agents, the rulers (whether they are despots or elected democrats)—all these equally quickly come into contempt. Men begin to rebel, to become "anti-minded," against their own society. They begin openly to set law, custom, morality, religion, all the ingredients of the necessary social mortar, in defiance. "That is why such changes—changes of phase—are rightly called social revolutions, whether human blood flows or not. And that is the stage, or phase, wherein all human societies now wander. The same new stresses and strains impinge on the older, familiar tolerances, in all kinds of human society to-day, for the first time in recorded human history. The phase, the era of social revolution, is world wide for the first time. It is far, far wider than that temporary 'class warfare' imagined by Karl Marx over a century ago—for that was virtually confined by him to industrial countries already possessing an urban, industrial proletariat. Our contemporary time of troubles involves all mankind."

Communist Russia

Mr. Hutton thought the most significant event of the post-war era would prove to be the working-out of these same revolutionary social changes inside Communist Russia after forty years of Communist Party dictatorship. We others of the West could learn a lot from what had gradually, remorselessly, inevitably unfolded inside the Russian social laboratory, under totalitarian rule, in the last decade or two. Not since the time of the ancient pyramids, perhaps, had there been so totalitarian, so compulsive a society as that of Russia in the past forty years. It began dedicated to equality. It soon took away all powers, rights, and privileges of trade unions, professions, vocations, and other self-governing voluntary and functional groupings; and it fell back on naked force, even for forced slave labour. "But then see what happened, just as Plato said it did over 2,000 years ago. Because of the technical needs of society—of all society, everywhere, in our time as in Plato's—a new set of groupings, orders, castes, classes, and functional *élites* speedily came about under a dictator, nearly all of them necessarily organized on the lines of the former professional and other functional groups. But this time the bureaucrats—the State's agents, or the 'apparatus-boys'—gradually lost their power and prestige, their privileges and esteem. As modern techniques advanced in all walks of life—in economics, science, medicine, the arts—it was the profes-

sions, not merely the State's agents or functionaries, who gathered and accumulated esteem, powers, and privileges. To-day a qualified engineer, economist, medical scientist, doctor, or ballerina, for that matter, can exert more power than a mere Russian functionary, whose unpopularity stems in direct line from old Tsarist Russia."

Lessons to Learn

This paradox compared very badly with our own society in Britain, whatever you care to call it—half Socialist, half egalitarian, half State-run, half baked. Mr. Hutton asked his hearers to consider the long-term significance of one feature of the convulsions in Russia and other Communist lands during the past three years. It was that the profound uprush of protest against flattening and standardization by the omnipotent State, against unqualified egalitarianism, and against the tyrannies of an all-pervasive bureaucracy in Russia after nearly forty years, and in other Communist lands after only a decade or so, had occurred in the ranks of the experts, the artists, the technicians, the professional men, the people with long-acquired and long-trained vocations, the people of whom a really up-to-date, progressive modern society needed more and more. The State and its agents had had to perform in public the most extraordinary intellectual and verbal acrobatics, in a pathetic effort to preserve merely the semblance of consistency in their outworn and exploded myths, slogans, and dogmas. "And there is one heartening, encouraging feature of all this ferment in Communism," the speaker continued, "for us who have not—or not yet—become 100% State-run and State-ordered in our individual lives—namely, that the old-line Communists, even after forty years of despotism and bureaucracy, have utterly failed to standardize the reactions and the actions, the beliefs and the desires, of the young generation of Communists." It was among these—among the experts and artists, the technicians and the professional persons above all—that the ferment of dissatisfaction with the bureaucracy was at its height.

We on this side of the Curtain ought to learn that the lesson, which Messrs. Bulganin and Krushchev and others were even now publicly proclaiming inside Russia, was in effect that modern industrial, technical, progressive societies must not over-centralize; they must not subject the skilled, the expert, the scientists, the trained persons, the professions, the *élites* without whom no society could progress or could even be run decently, to the dogmas, myths, slogans, and fantasies of ignorant—and often of psychopathological—bureaucrats, politicians, State agents, power-boys, or (as the Russians so neatly put it to-day) "apparatus-boys."

Penalizing Ability

It must be asked why it had developed this way in other societies, and to an alarming extent among ourselves of the West. Why, for example, did both the major political parties in Britain tacitly and substantially agree to penalize outstanding abilities in the professions, in management of all kinds, in science and the arts? It was an odd reflection that in a Communist country the children of outstandingly responsible, able, and therefore highly privileged and highly paid experts—in any walk of life—were encouraged by the State to secure a better education, and at the State's expense, in special (what we would call private) schools; while in Britain, even if the child of such an outstanding contributor to the nation's welfare won a scholarship, and even if there were 10 children in the one surtax-paying household, he or she was not allowed to have it, though it was gained on merit in open examination. "I know," and Mr. Hutton expected his audience knew, "cases in which the young person in such a family has point-blank refused to allow the parents to undergo the penalty prescribed for them by our State, and has either emigrated or by-passed a university and gone into another walk of life, but socially and politically embittered, and dedicated to a kind of adult vengeance at some time or other upon a society that treats a decent and responsible family that way. That has become—till

the Budget of a month ago, the effects of which private persons will not feel for another 18 months, by which time the cost of living will have wiped out its concessions to them—increasingly common in this country."

The speaker wished some scientists and medical men would report on the myth, dogma, and fantasy that individual mammals are either born equal, or ought to be treated as equals, and that societies of them are in some unexplained way better if they are so treated. All the evidence of human history that he had found showed the precise opposite, and that any societies who tried to secure such equality of treatment of their members had to be despotisms, and did not long endure. Yet the ravages of these myths and dogmas persisted among us, while they had long since been abandoned by the Communist States.

So at both the superficially seeming opposite poles of world politics to-day, in North America and in Soviet Russia, really substantial differential rewards for differential responsibilities and differential expertnesses were the order of the day; while British society lagged behind those in material progress and was mixed up between them in social and political organization. It was a social phenomenon yet to be adequately explained, but some justification better than the mere mouthing of myths and slogans was long overdue.

Burden on Minority

Mr. Hutton said it might shock his audience if he stated one simple economic fact in a rather unpleasant, and certainly unusual, way; it needed saying in our confused society to-day. "It is this: all the material sacrifices due to the last war's effects upon us—all the material losses of warfare, the burdens of becoming a debtor nation for the first time in centuries, the loss of our overseas investments, the cost of running the swollen national debt and heavy defences and rebuilding our economic potential and developing our associates in the Commonwealth and sterling area—all material sacrifices thus entailed upon the British people have fallen, net and on balance, only upon roughly one-fifth of our people; and that fifth includes not only the one-twentieth who can be termed rich in personal property, but another three-twentieths who are the old and retired at all levels of income (some very poor and on National Assistance), and all the skilled, trained, and responsible paid leaders of the nation in all its branches of activity. The others—the four-fifths of our people represented by the wage-earners and lower-salaried groups and their families—have made no sacrifices at all in material terms; they are living better than ever they did, for easier work."

He did not say this was even wrong. In one sense, it was the goal of all human endeavour to create so much productive capital that human lives, the lives of individuals, should be made longer, healthier, fuller, better, and wiser. "But just as an examination and a justification of equality of treatment for everybody is long overdue in our political and social system, so is an examination of the distribution of rewards for responsibilities." After all, the locomotive engineer, among trade unionists, bemoaned the fact that inflation and social or political policies had eroded his long-standing "differential" over the earnings of the less-skilled railwaymen. He, and others like him in the ever-more-complex hierarchy of industrial functions, could organize to keep abreast of this inflation and these new social or political policies. "But somewhere around the current figure of £1,000 to £1,500 a year gross for a breadwinner—no matter what his training or responsibilities, or how big his family, or what his hours of work or conditions of service—British society seems to shut up shop in consideration of him."

How, asked Mr. Hutton, could our society ever match the rates of technical progress, the massive educational, medical, and other social experimentation going on in North America and Russia, their concentration on creating more productive capital equipment and research apparatus of all kinds and for all purposes, individual and social? We knew how badly starved the whole field of British medicine was for equipment and buildings and research. But so

were many other departments of our national life on which our progress depended. If we added these together we should better appreciate the overriding need not to penalize, but positively to stimulate and increase differential rewards for any and every citizen who could command such enhanced rewards in virtue of his abilities, responsibilities, and social contributions. "And we might do well to remember that, while an overworked doctor or engineer or manager in Britain ends up his day helping his wife at the kitchen sink, his opposite number in North America (probably without any servant either) has a labour-saving house fully equipped with cheap domestic capital equipment, while his opposite number in a Communist country may well have servants allotted to him by the State."

Radical Rethinking

In terms of the older professions, and all the younger functional groupings now organized or being organized on the basis of special training and responsibilities, this accelerating technical and social revolution meant that much radical rethinking, much radical reform, much reorganization, and much imaginative planning for the future had got to be done in Britain. There was no doubt in the speaker's mind that this process had got to extend to the State itself, the political parties, the press, and all other influencers and media of public opinion. What we had undergone in the last 11 post-war years, in a world of technical revolution, had merely been a revolution in the apparatus of the State and in its administration. We had had no post-war revolution of thought and ideals and imagination. "The future of this country, to most of our people and their politicians in all parties, in my judgment, is still limned far too much—pathetically and perilously too much—in terms of old ideals, slogans, and myths, of 'far-off things and battles long ago,' of cosy and familiar British notions for an enfeebled nation growing rapidly older, and with most of its people's eyes glued on leisure and retirement: a pension-minded, past-orientated people; glad to escape from anything approaching an effort to the womb-like warmth of a darkened room and the 'telly'—a womb with a view," as one of my young medical friends put it." But we now depended 50% more than we did before the war upon competitive international trade for our people's standards of life. That demanded savings and efficiency and endeavour and skilled leadership before they could be applied and developed for our own use. Certainly the State and its political parties had to reshape their thinking and look more to the future than to the past.

Mr. Hutton here put in a word of praise for "our leading agents of the State, our responsible civil servants." It was not their fault that they were so often opposed to, or put in conflict with, the professions and the other functional or vocational groups in the country. They, too, were overworked, underpaid, and loyal to their political chiefs; and they often, nowadays, had to do their best to carry out policies with which they did not and could not agree, but on which they could not publicly comment. "No; the blame must be placed fairly and squarely where it belongs—namely, in our democracy, on the people, and their influencers, and their politicians, who are to a very great—perhaps an overwhelming—extent the people's influencers. Without a proper elite, any society, any people, will fail."

Role of Professions

But meanwhile we could not dance attendance upon the State and political parties, waiting for a wind to change, Mr. Hutton said. We had still in our hands the power to change the contents of professional training, to publicize, to protest, to go direct to the public through its media of communication, to put pressures on Governments and politicians, to get together with our opposite numbers in other countries and profit from current trends there. "But if our British professional bodies are to play the part they are equipped, and deserve, to play in the reshaping of our people's thought and the reform of our national institutions, they must first be sure that on balance what they propose to

do will not only benefit themselves but will primarily benefit the community or communities they serve in their professional capacities."

The justification for a profession which guarded its own standards of training could only be that in so doing it constantly proved its contributive power to the community was kept at top pitch. "Any profession will lapse in public esteem if either it fails to do that or fails to make public why the State or some other factor beyond its power prevents it from doing it. The great power of our professions still resides in their vocational mission, their safeguarding of training and education, and their role—quite apart from their particular skills—in turning out the well-rounded, socially adjusted, contributory, and responsible leaders of the nation in all its walks of life. It is perhaps this last role which is so often overlooked in our land to-day. Without wise leaders, without a widely trained and humanistic elite, any society on earth, both to-day and in the even more technical complexity of the future, will perish. It is as much the function of our professions—and pre-eminently of yours—to turn out members of such a national elite as it is to turn out technically qualified young men who are certified as able to perform certain skills adequately."

Time to Build Anew

"Our time of troubles in this world," Mr. Hutton concluded, "is vexatious, but exciting and capable of eliciting much enthusiasm. It is a time of pulling down the old and building anew. Many of us—the older ones naturally—regret much in all this. Mistakes are bound to be made. New tensions, between social groupings and political groupings and professions and State agents and all down the echelons of a country's economic organization, arise all the time. But we must, as I said, look not to the extremes but to that centre, that middle of the road, at which British common sense and sobriety and stability have always come to rest. They may have come to rest a bit too long sometimes. It is a time now for them to be up and doing more. But if we look to the hectic experimentation, often wildly successful, often over-costly, in North America at one extreme and in Russia at the other, we need not despair or repine. Technically it is well within our scope to succeed, in any sector of social life, as well as they, if not better. There is, believe me, no economic reason why we should not. It depends on us, and on no one else. We are, we need be, the creatures or dependants of none. If we bring it off in our nation it will primarily be due to leadership; and that must still come largely from our professions. It is therefore up to them to set their own standards, and then to fight for them until they prevail. There is nothing wrong in that for the nation. On the contrary, I think this nation has everything to gain from it. And if our professions are not prepared to do that, then they cannot complain if they are overwhelmed by a bureaucracy; and the people of the nation must take the consequences—perhaps, like the Russians, for forty years in a wilderness. But, even then, professional leadership has to come back."

FROZEN-TUMOUR BANK

In the last report of the Imperial Cancer Research Fund,¹ Dr. JAMES CRAIGIE, F.R.S., reviewed briefly his work on the preservation of transplantable tumours in the frozen state. He described among other things the frozen-tumour bank he has built up at the Fund's central laboratories. This frozen-tumour bank is believed to be unique. Its aim is to provide a representative collection of experimental tumours for research workers. The tumours are not frozen simply as part of some relatively temporary study, but for long-term storage. At present about 50 types of transplantable tumour are available, and they are listed below. The variety of strain-specific mouse tumours is limited at the moment by

¹ See *British Medical Journal*, April 27, p. 1004.

the number of colonies of different strains of mice maintained, but it is hoped to add to them as time goes on. Tumours still being studied experimentally in the Fund's laboratories are not included in the bank.

Research workers from at home or abroad wishing to obtain tumour samples from the bank should write to the director, Imperial Cancer Research Fund central laboratories, Burtonhole Lane, The Ridgeway, Mill Hill, London, N.W.7.

List of Available Tumours

In this list ascites tumours are marked with an asterisk.

Mouse Tumours.—(a) *Not strain-specific.* Ehrlich carcinoma,* S 37 (1906-08),* T 2146* (originally a tar-induced epithelioma), 63* (Bashford, 1907; originally a mammary carcinoma). (b) *Strain-specific.* C_H tumours: mammary carcinoma, SM/B 26; epithelioma, Bp/Ep/S₁*, sarcoma, L/β*, Bp 1, Bp 3, Bp 8,* Bp 9, Bp 10, Bp 17, A/Bp, HA/Bp, HK/Bp, Q/Bp; hepatoma, H 10 R; fibrosarcoma, H 10 X; ascites tumour, DR/7/54.* **Strong A tumours:** Lung carcinoma, L/α; sarcoma L/ξ; mammary carcinoma, L/ε. C_s tumours: mammary carcinoma, L/γ; squamous epithelioma, T/Ep; sarcoma, MC_s; leukaemia, EL 4.* **R III tumours:** mammary carcinoma, F 11/52 and L/α; mammary adenocarcinoma, T VI/21; squamous-cell carcinoma, C 1/3; sarcoma, BRT*; fibrosarcoma, L/φ. C_s × R III tumour: F/BR 16.*

Rat Tumours.—Jensen rat sarcoma (1907), Walker rat tumour (1928), Yoshida* (ascites tumour), Murphy* (lymphosarcoma).

Rabbit Tumour.—Brown-Pearce.

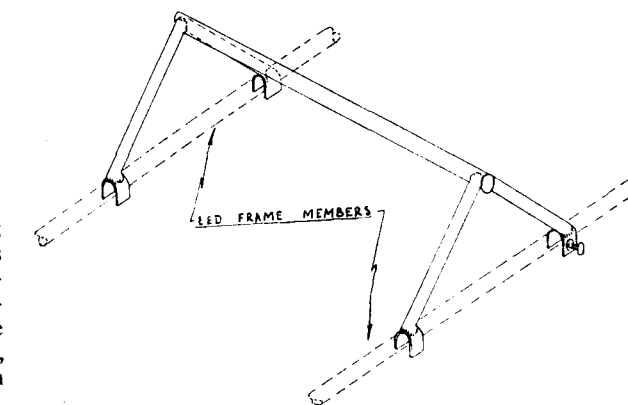
Guinea-pig Tumour.—Daels (radium-induced sarcoma).

Fowl Tumours.—RPL 12, RPL 16, RPL 19, Rous, Fujinami, MH₁, MH₂, Erythroblastosis.

Preparations and Appliances

FOOT-REST FOR LABOUR BED

Dr. DAVID BOWER, formerly of the Derby City Hospital, writes: It is observed that patients lying upon the labour bed find most ease with the hips and knees flexed. However,

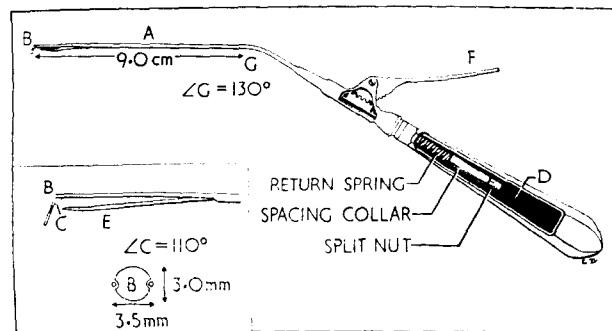


this position is difficult to maintain owing to lack of friction between the patient's heels and the surface of the bed, the legs constantly tending to extend. The device here illustrated is extremely simple, and, by providing a transverse bar for the feet, allows the patient to rest in a comfortable position between contractions. The footpiece is a 1½-in. (3.8-cm.) tube of mild steel, and is supported at either end by two 1-in. (2.5-cm.) tubes at right angles to each other. At the lower ends of the supporting tubes are welded curved sections of mild steel, which fit over the longitudinal tubes of the bed frame. One of the curved sections on each side of the device has a hole drilled through, and this is tapped to ½-in. (0.8-cm.) Whitworth thread. Along this thread is passed a brass thumbscrew which when tightened locks the footrest to the bed frame. The device was constructed by a local light engineering shop at a cost of 35s.

A MYRINGOPLAST

Dr. R. FRANCE ROHAN, research fellow, ear, nose, and throat department, Guy's Hospital Medical School, writes: Of recent years a great impetus has been given to research into the management of chronic suppurative otitis media by the excellent results obtained in operative restoration of the perforated drumhead in carefully selected cases. In the clinical assessment of patients who may benefit by plastic otological surgery, it is essential to know the degree of efficiency of the ossicular chain. This can often be done by means of an acoustic probe, which is laborious in application, or by patching of the perforated tympanic membrane with various materials, a simpler procedure for routine use in the out-patient department. Even so, it is a difficult manoeuvre to carry out. I have made a special study of the latter method in the accurate diagnosis and management of chronic otitis media, and have evolved an instrument which could perhaps be called a myringoplast.

It is based on a well-tried principle, and embodies (see diagram): (1) a fixed outer tube, A (11 cm. long), fitted with a notched end-plate, B, which is set at an angle, C, of 110 degrees to the axis of the tube; and (2) a mobile inner wire, D. The latter carries two prongs, E, which can be protruded by a trigger, F, to a distance of 2 mm. beyond the end-plate, in order to pick up a patch prior to application; the prongs subsequently retract by means of a spring fitted inside the hollow handle (see Diagram), and the patch can thus be shed at will by gently releasing the trigger.



The tube and wire are bent to an angle of 130 degrees, G, 9 cm. from the end-plate, and the whole tube is 11 cm. long. This allows one to see the tip of the instrument when a patch is being applied. The inner wire is moved by means of the trigger, which is set above the handle, allowing one to grasp the instrument between the thumb and middle finger, while the index is used to operate the trigger. This ensures accurate control, especially in the final stage of patching, when the trigger is released, the prongs are retracted, and the instrument is moved gently on, thereby applying the patch to the eardrum by means of the end-plate.

The advantages of this instrument are that it does not traumatize the tympanic membrane, and a patch can usually be applied with certainty, under direct vision, and often without anaesthesia, although it is advisable to cocaineize the deep meatus and drumhead beforehand, to avoid hurting the patient. This is particularly true if a tenacious adhesive is used to apply a patch.

It is a pleasure to thank Mr. Philip Reading, who first put me on to the problem of patching the perforated drumhead, and under whose guidance this work was done. Mr. R. J. Cann made some valuable suggestions, and he as well as Mr. L. F. W. Salmon allowed me to treat their patients. I am most grateful to Mr. A. E. Marshall, instrument maker in the works department at Guy's Hospital, for constructing the myringoplast to my design. The drawing is the work of the department of medical illustration of Guy's Hospital Medical School.

Reports of Societies

CHILDREN WITH RECURRENT ABDOMINAL PAIN

[FROM A SPECIAL CORRESPONDENT]

The susceptibility of the nervous child to recurrent attacks of vomiting and abdominal pain was well known to Hector Cameron a generation ago, though Hutchison considered the pain organic and due to unusually active contractions of the intestine. In recent years the importance of psychological causes has been stressed. It is of course possible to reconcile these apparently contradictory views, for we now know that emotion can affect gastrointestinal function, and the increased peristalsis blamed by Hutchison may have been the result of some underlying nervous disorder.

An extensive survey of recurrent abdominal pain in children has been made by Dr. J. Apley, who recently opened a discussion on the subject at the Bristol Medico-Chirurgical Society, and the matter was further discussed at a sectional meeting of the Royal Medico-Psychological Association held in Bristol on May 2.

The Emotional Factor

Dr. GAYNOR LACEY, a child psychiatrist, described a series of 25 children with recurrent abdominal pain and compared them with 25 in-patient controls. Her general finding was that recurrent abdominal pain was more common in the emotionally unstable child or those whose home conditions were unsatisfactory. A peak incidence of abdominal pain at 8 years might be due to the strain of work at school, which often becomes more severe at this age.

Dr. NORA NAISH said she had surveyed 1,000 school-children by attending the normal school medical examinations. Taking as her criterion three attacks of pain sufficiently severe to stop the child from playing, she had found that 10.8% of these children suffered from attacks of recurrent abdominal pain. Again, high incidence of emotional disturbance was evident among the children with pain.

It is not easy to understand why a disturbed mental state should be disclosed by abdominal pain rather than by some other subjective manifestation. One factor is certainly the well-known relationship between the emotions and gastrointestinal function; but Dr. Naish also found a high incidence of organic abdominal disease such as peptic ulcer and appendicitis in the parents of the affected children, and this no doubt is one factor accounting for the location of the pain.

Urinary Tract often to Blame

In the concluding paper Dr. K. SIMPSON, as a paediatrician, emphasized that recurrent abdominal pain could quite well have an organic basis. Nor did the presence of an emotional disturbance in any way exclude serious organic disease. The child with recurrent abdominal pain was no less likely to get appendicitis than his fellow without recurrent pain, but he was much less likely to be diagnosed correctly in the first six hours of the attack. Pain of organic origin, continued Dr. Simpson, was usually more severe in successive attacks and generally situated away from the umbilicus; the umbilicus was the characteristic site of psychosomatic abdominal pain in children. In half the patients with recurrent abdominal pain due to organic disease the lesion was in the urinary tract; it was therefore important always to examine the urine as well as carry out a full physical examination. This aspect of the problem was also emphasized by Professor A. V. NEALE, professor of child health, who in the later discussion called attention to the catastrophic error which could be made if pain was wrongly assumed to be psychogenic when the child had, in fact, some such lesion as an internal hernia or recurrent intussusception.

Recurrent abdominal pain remains a common and difficult problem. It demands care in diagnosis and sympathetic management of both parents and child.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Isolation of Measles Virus

SIR,—Workers interested in the isolation of measles virus from patients may like to hear, before the present epidemic closes, of some investigations now in progress. A main object of the work has been to use for culture tissues which are readily available everywhere and thus to obviate the use of human or monkey kidney cultures, which, it may be recalled, were employed by Enders and Peebles¹ in their original investigations on the isolation and cytopathogenicity of measles virus.

In the present investigation cultures of human chorion and human amnion² were inoculated with nose and throat swabs taken from measles patients on the first or second day of the rash. The swabs were inoculated, within 20 minutes of taking them, direct into the nutrient fluid (medium 199+ of 20% ox serum) of the cultures. Fluid changes were made shortly before inoculation, on the day following, and thereafter at 3-4-day intervals. Culture tubes were incubated in the stationary position throughout. Cytopathic changes followed the inoculation in all of five chorion cultures and eight of nine amnion cultures.

In both types of culture the lesions were usually first detectable on the 3rd or 4th day after inoculation. Development of cytopathic changes differed in the two tissues. In the chorion cultures they were diffusely distributed; little necrosis occurred and, on staining, large numbers of nuclei containing eosinophilic inclusions in various stages of development were seen. These were present in many individual cells as well as in the multinucleate syncytia which developed, more particularly, in the marginal areas. In the amnion cultures, on the other hand, the affected areas were discrete, large, and round, and could in fact be seen as "plaques" with the naked eye or hand-lens. They varied in number in individual cultures from one to about twenty. Vacuolation was conspicuous. With continued incubation the lesions increased in size but apparently not in number: the margins of the syncytia became more sharply defined and necrosis developed early. On staining, large eosinophilic inclusions were seen in the nuclei of the multinucleate cells of the affected areas.

The relative merits of the two tissues for serial propagation of virus following isolation in them has not yet been assessed. The widespread invasion of the cultured chorion suggested that this might prove the better tissue, and the few experiments which have as yet been undertaken supported this view. The chorion had an advantage in that it was harder in withstanding any deleterious influences during placental delivery and subsequent collection; it proved a uniformly reliable tissue with which to prepare cultures. On the other hand, an advantage in isolation in amnion lay in the ease with which the discrete plaque-like lesions could be detected in the living unstained cultures; in the chorion the full extent of the cytopathic changes was only revealed by staining. The results suggest that both these tissues, in culture, may find a place in the clinical and epidemiological investigation of measles—for example, in the diagnosis of doubtful cases, in studies of infectivity in the incubation period, and in the prodromal stages of the illness, duration of viraemia, possible faecal excretion of virus. In addition, their use provides a generally available method for the isolation of strains for virus studies.—I am, etc.,

JOYCE WRIGHT.

London, N.15.

REFERENCES

- Enders, J. F., and Peebles, T. C., *Proc. Soc. exp. Biol. (N.Y.)*, 1954, 86, 277.
- Zitcer, E. M., Fogh, J., and Dunnebacke, T. H., *Science*, 1955, 122, 30.

Notification of Infectious Diseases

SIR,—In the first quarter of 1957 notification of 305,531 cases of infectious diseases in England and Wales alone cost some £38,000. Of this total approximately £36,000 was expended in the notification of four diseases—namely, scarlet fever, whooping-cough, acute pneumonia, and measles, of which the fees for measles alone amount to nearly £30,000.

Can there any longer be justification in notifying these four diseases? In any event those in general practice well know that, owing to pressure of work and oversight, many cases are notified either late or not at all, rendering these statistics open to doubt. These observations do not apply to such diseases as acute poliomyelitis, diphtheria, meningococcal infection, and the enteric dysentery group, the notification of which is of value in public health and research. It is with these facts in mind that we present the following table, for which we are indebted to Dr. W. J. Martin, of the London School of Hygiene and Tropical Medicine.

Year	Total Notifications	Useful Notifications	Total Cost Approx.	Useful Cost Approx.
1952	654,896	21,527	£81,800	£2,700
1953	826,591	25,305	£103,300	£3,160
1954	358,621	36,126	£44,700	£4,500
1955	879,153	45,668	£109,900	£5,700
1956	365,642	54,360	£45,700	£6,700

These figures are for notification fees alone and make no allowance for the considerable expenditure of money and time in the collection and compilation of the statistics. We ourselves can find no justification whatever for the continued notification of the four diseases enumerated, which in the past five years alone have accounted for close on £390,000. By subtracting these four diseases the cost in that five-year period we estimate at £23,000.

The loss in fees would make little difference to the individual practitioner, whereas the global sum saved would be considerable. We tentatively suggest that this money could be better used to further research into the more serious of the infectious diseases.—We are, etc.,

R. M. EMRYS-ROBERTS.
E. O. GIBSON.

Weybridge.

Addison's Disease in a Child

SIR,—The case report by Dr. R. G. Welch of a fatal case of Addison's disease in a 9-year-old girl (*Journal*, April 27, p. 980) is of great interest—and not only because of the rarity of the condition. It illustrates the great difficulty that may be met in treating Addisonian crises, as well as the catastrophic rapidity with which the crisis may occur. On the very day of publication of Dr. Welch's paper, a 9-year-old boy under our care died. The similarity in the terminal pictures seems to us to warrant the following summary being put on record.

A boy of 9 had developed typical clinical features of Addison's disease over two years. The electrolyte findings on admission in March, 1957, were typical except for normal values for blood urea and glucose. His condition did not permit complete investigation then, and he was treated with cortisone. To our surprise he needed 1,200 mg. over six days before he showed a dramatic improvement to good appetite and spirits. After a period of maintenance, cortisone was gradually withdrawn and corticotrophin was given to prove the total absence of adrenal response. His deterioration was slow, but sufficiently great for the test to be abandoned after three days of corticotrophin, and a total of eleven days off cortisone. His blood pressure was 90/50 and his electrolyte values (mEq/litre) had fallen to sodium 117, potassium 5.6, chloride 72. These figures were similar to those on his original admission, but his general state was less grave. Cortisone (100 mg.) was given at noon and repeated at 7 p.m.,

The following week another child about to undergo cardiac catheterization collapsed and became pulseless

shortly after the anaesthetic had started but before the cardiac catheterization had been attempted. Fortunately he responded to stimulation by slapping the chest over the heart. In this case trichlorethylene was not used, the anaesthetic being nitrous oxide, oxygen, and pethidine following induction with thiopentone, and was administered by another anaesthetist.

When glancing through the volume in which Dr. Fleming wrote up his case, I found, shortly after his letter, three letters²⁻⁴ in which the writers state that they had found trichlorethylene to be effective in correcting pre-existing cardiac irregularities. While not denying their value, I feel that these facts and the facts brought out by this and other letters and the facts deduced from the case histories in the article written by Drs. Walter Norris and Peter Stuart (*Journal*, April 13, p. 860) illustrate once more the difficulties and dangers necessarily associated with *post hoc ergo propter hoc* statements. In conclusion, one must always keep in mind the saying, "There are no dangerous anaesthetics; only dangerous anaesthetists."—I am, etc.,

Glasgow.

WOOLFRED SNIPER.

REFERENCES

- 1 Fleming, H. A., *Lancet*, 1955, 1, 617.
- 2 Barnard, J., *ibid.*, 1955, 1, 824.
- 3 Ballantine, R. I. W., Jackson, I., and Wells, B. G., *ibid.*, 1955, 1, 921.
- 4 Hewer, C. L., *ibid.*, 1955, 1, 921.

SIR,—With reference to the article "Cardiac Arrest during Trichlorethylene Anaesthesia" by Dr. Walter Norris and Dr. Peter Stuart (*Journal*, April 13, p. 860), we would agree with Dr. C. Langton Hewer, who in his letter (*Journal*, May 11, p. 1123) states that a sense of proportion should be kept in this matter.

In reviewing the 24,244 anaesthetics given in the Bangour Hospital in the five years ended March 31, 1957, we find that 10,984 of these cases received trichlorethylene. Of these, the only one to suffer cardiac arrest was a man who was found at necropsy to have a cystic phaeochromocytoma of the right adrenal. He was a man of 66 who had had a coronary thrombosis five weeks previously, and who had suffered from angina pectoris for the past seven years. He had been bed-ridden with gangrene of the toes for nine months, and was found to have a blood pressure of 200/105, generalized arteriosclerosis, and auricular fibrillation.

In a personal communication to one of us Dr. Norris states that he is unable to estimate the incidence of cardiac arrest due to trichlorethylene in the region reviewed. We therefore feel that outright condemnation of this agent is unwarranted in the light of our own figures and those of Dr. Langton Hewer.—We are, etc.,

J. E. NORMAN.

W. H. F. BOYD.

Broxburn, W. Lothian.

Aortic Stenosis

SIR,—Sir Russell Brock *et al.*¹ have taken us to task for saying that "pressure readings at operation are inaccurate and misleading." What we in fact said² was that "such measurements are likely to be unreliable under the abnormal conditions of the operation." This conclusion was not, as Sir Russell Brock has suggested, made without measurements to support it. It was based on the findings at operation for mitral valvotomy in 37 patients,³ and on a further series of 43 patients at the same operation, in 12 of whom results of a previous cardiac catheterization were available.⁴

We are open to the criticism that our argument was drawn from findings at a different operation. However, Sir Russell Brock himself (*Journal*, May 4, p. 1019) comes to almost identical conclusions for aortic valvotomy, when he says: "It is obvious that the conditions at operation may be different from those existing at other times, and proper allowance can be made for this. Thus the heart's action may be poor, the systemic pressure low, and the gradient correspondingly reduced. Clearly this must be taken into account after the manipulations of aortic valvotomy, when the ventricular pressure might be lower from the insult the heart has received. It is not difficult to recognize this state

and either wait until the condition has improved or just note that the observations are not fully reliable under the conditions pertaining" (our italics). The only point of disagreement seems to be the ease or otherwise with which a "proper allowance" can be made for the numerous variables which control such pressures. Our criticism does not of course apply to pressure measurements made under more physiological conditions.—We are, etc.,

Edinburgh.
London, S.E.1.M. B. MATTHEWS.
W. E. MEDD.

REFERENCES

- 1 Brock, R., Milstein, B. B., and Ross, D. N., *Thorax*, 1956, 11, 163.
- 2 Matthews, M. B., Medd, W. E., and Gorlin, R., *British Medical Journal*, 1955, 2, 759.
- 3 Wyatt, A., Matthews, M. B., McMillan, T. K. R., and Daley, R., *Lancet*, 1952, 2, 216.
- 4 Matthews, M. B., *Mitral Valvotomy in Rheumatic Heart Disease*, 1954. Cambridge M.D. Thesis.

Thrombocytopenic Purpura Following Quinidine

SIR,—The report of a fatal case of thrombocytopenic purpura following the administration of quinidine by Drs. Stanford Bourne and D. J. O'Sullivan (*Journal*, May 4, p. 1046) prompts this communication in which the circumstances were closely similar.

A 53-year-old coal-heaver was admitted to hospital following collapse at his work. The collapse was due to ventricular tachycardia, proved by electrocardiogram, and, with the systolic blood pressure being only 65 mm. Hg, his condition gave rise to concern. It was considered a matter of urgency to restore normal rhythm, and with this in view one gramme of procaine amide was administered intravenously three hours after admission. The tachycardia remained, but the general condition did not deteriorate further and the signs indicative of failure did not become any more manifest. It was decided to keep him under observation until next day, when quinidine was given in five-grain (0.32 g.) doses at two-hourly intervals for 16 hours. Again there was no response, so that on the third day resolute was made again to procaine amide, and before half a gramme had been injected normal rhythm was established. The general condition immediately showed signs of improvement, and although the normal rhythm was interspersed by bursts of tachycardia he remained well. An electrocardiogram revealed that a posterior infarction had been responsible.

On the tenth day following admission it was decided to antagonize the tendency to arrhythmia by giving quinidine in five-grain (0.32 g.) doses thrice daily. This seemed to be only partially successful, but it was continued for 14 days, when the onset of a generalized purpuric rash and epistaxis occurred after a total dosage of 250 grains (16 g.) of quinidine, although it was later discovered that he had been taking five grains (0.32 g.) of quinidine thrice daily for between two and three weeks following an emergency admission to another hospital, which roughly doubles the figure of 250 grains (16 g.). The urine was, at this time, free from red blood cells. The platelet count was then 20,000/c.mm., and the bleeding time exceeded 15 minutes. Quinidine was discontinued and oral procaine amide in 250-mg. doses twice daily substituted. The purpura continued to increase and epistaxis was intermittent, whilst the platelets dropped to 16,000 during the next 48 hours, and one pint of blood was then transfused. The following day the platelets reached 50,000/c.mm. and haemorrhages ceased to appear. His condition changed very little after this until his sudden death four days after the transfusion. Permission for post-mortem examination was not granted. The cause of death appeared to be accelerated by purpura in an individual already in jeopardy following coronary thrombosis.

Is it possible that quinidine is responsible for this serious development more often than reported cases would suggest, and that the dangers of quinidine, though already well known, are even greater by its ability to produce thrombocytopenia?—I am, etc.,

Wallasey, Cheshire.

C. H. STEWART-HESS.

Periodic Fever

SIR,—I have a patient, a man of 62, who, after careful, competent, intensive, and scrupulous investigation at two hospitals, including a London teaching hospital, under one of our most eminent haematologists, has been labelled, albeit reluctantly, periodic fever of Reimann.

In October, 1952, after a year of ill-health with vague symptoms of urinary dysfunction, muzziness, inability to concentrate, and definite symptoms of depression, he saw both a psychiatrist and a surgeon. Involutional depression was diagnosed and a papilloma of the bladder with enlargement of the prostate found. A transurethral operation was performed, the papilloma found to be benign, and the prostatic fragments simple hyperplasia. During his convalescence he began rises of temperature of up to 103.6° F. (39.8° C.) every 7½ days, associated with headaches, faintness, epistaxes, and petechiae of his chest. His depression remained neglected and untreated. He has spent months in hospital; observed to exclude pyrexia artefacta; and no investigation possible omitted. Preceding and during attacks antibiotics, antihistaminics, anticonvulsants, phenicarbazine, ergotamine tartrate, sodium and potassium para-aminobenzoate could not alter the course of the fevers. After three and a half years, in March, 1956, he attempted suicide by coal-gas poisoning, and recovered spontaneously to enter hospital as a voluntary patient. A course of E.C.T. cleared his depression and he experienced only one rise of temperature while an in-patient for four months. Until January, 1957, he had three further rises of temperature, but these were in no way so incapacitating as previously. His depression recurred, he was again suicidal, had E.C.T., and returned home, March, 1957. His pyrexias have returned, but he does not feel so exhausted by them. His general condition has been remarkably good all the time. His mental state is of childish hypochondriasis, full of self-pity, groaning when he can be heard, and given to moods. He had a spell of grunting and belching in the mornings until he made himself sick. On one occasion his wife rebelled against this, shouted at him to stop, and he has not repeated these outbursts.

I was much surprised to read in Dr. Kris Somers's admirable account of his case (*Journal*, May 11, p. 1086) that "no one, however, has been able to entertain a psychogenic cause for this patient's illness." Her periodic fever was preceded by three weeks of diarrhoea and vomiting, undiagnosed, unresponsive to physical treatments. Was this not psychogenic? She had non-classical migraine at the age of 17, which, even by diehards, is acknowledged to be often psychogenic. Her symptoms started at the age of 45, one year after her menopause, and she had severe hot flushes which did not respond to oestrogens and other hormones. Is this not a stress symptom? She received "mild hypnotherapy in the hope that it might enable her to accept her symptoms rationally, but her state remained unchanged." This insinuates an irrational state of mind in the patient. Is mild hypnotherapy carried out by an apologetic hypnotherapist?

As a general practitioner I can see the total misery of my own patient and wish that his depression had found the correct treatment, and his symptoms of dysuria been neglected. Incidentally, his father died in a mental hospital of "prostate trouble and liver abscess."—I am, etc.,

Sidcup, Kent.

L. A. NICHOLS.

Cause of Cancer

SIR,—The problem of the cause and cure of cancer in its various forms still eludes us, although for many years scientists of the first water have concentrated their efforts in this direction. Much has been accomplished by these workers and the boundaries of knowledge have been widely extended, but the fact remains that the cause is still not understood and the cure of many types still uncertain. Many theories as to the cause have been promulgated and an enormous amount of experimental work done in support of these theories.

Whether cancer is due to chronic irritation, chronic inflammation, cell rests, hormonal imbalance, vitamin deficiency, embryological stimulus, chemical action, radioactivity, or virus invasion seems still far from proved. All have their adherents and some support for each may be

postulated. But none of these wholly explains the behaviour and symptoms of malignancy to the satisfaction of the clinician. There seem to be no criteria by which it can be stated that, if a certain set of circumstances in or around a cell is created, then a mutation will always take place in that cell from normality to malignancy. Therefore I think the cause will have to be sought in connexion with something that is universally available to each cell, and yet if this "something" is either deficient or in excess it alters the behaviour of the cell from normality to malignancy and mad growth.

To add yet another theory, may I suggest that perhaps malignant growth is due to, first, irritation of some kind which causes natural reaction and chronic inflammation, which after a varying period settles down to a scarring or fibrosis of the tissue? This fibrosis affects both the nerve supply and the circulation. This dystrophic cell now loses full control of its metabolism with the result that nutrient circulated to its nucleus is wrongly metabolized, so that oxygen is retained in excess in the nucleus, resulting in its increased size and energy (mitosis, etc.) and in the cell giving off a monoxide instead of the normal dioxide. This monoxide, finding its way into the blood stream, combines with the haemoglobin to form carboxyhaemoglobin, thereby gradually producing the symptoms of carbon monoxide poisoning which are so like the clinical picture of malignancy.

This conception of the cause of malignancy requires much further elucidation and experimentation before it can be proved or refuted. Cancer is not just the rapid growth of an innocent tumour, nor does it sap the vitality only by absorbing nourishment intended for its host. It does this, but also it behaves in a toxic manner towards the whole organism.—I am, etc.,

London, W.1.

L. LLEWELIN DAVEY.

Acute Inversion of Uterus

SIR,—The report by Drs. James T. B. Bain and B. K. Ziolkowska (*Journal*, May 11, p. 1102) of spontaneous acute inversion of the uterus brings up again the aetiology of the condition. I believe that the majority are spontaneous, but it should be emphasized that the true origin is the atonic state of the uterus in the third stage of labour or after delivery of the placenta. The flying squads of this country deal predominantly with complications of the third stage of labour, and by far the commonest is atonic post-partum haemorrhage, sometimes with the placenta in the uterus, but more often, in my experience, with the placenta delivered. This atony of the uterus in the third stage of labour can be abolished by the routine use of ergometrine given either with crowning of the head or delivery of the anterior shoulder. A slight rise in the manual removal rate of 1-2% is a small price to pay for the prevention of post-partum haemorrhage and subsequent anaemia in the puerperium with the associated immediate complications of infection, thromboses and pulmonary embolism, and remote morbidity, as the *Journal* (February 12, 1955, p. 405) so truly stated of tiredness in the puerperium due to anaemia. To say that this would require more flying squad calls is obviously false if we could eliminate the calls for the treatment of atonic post-partum haemorrhage. Manual removal of the placenta in the fit patient may well be as safe or safer than blood transfusion and certainly less expensive to the country. I have asked two groups of consultant obstetricians in the south-west and midlands of England if anyone has ever seen inversion of the uterus in association with the routine use of ergometrine as above in the management of the third stage of labour. I would be interested to see a report of such a case, as to date I have not heard of a single instance. In the case reported, ergometrine was not given until the placenta was delivered and followed by a post-partum haemorrhage of three pints (1.7 l.) of blood.—I am, etc.,

London, W.C.1.

W. G. MACGREGOR.

Acute Disseminated Encephalomyelitis

SIR,—I wish to refer to the excellent article by Drs. H. G. Miller, J. B. Stanton, and J. L. Gibbons on acute disseminated encephalomyelitis (*Journal*, March 23, p. 668). Unfortunately, however, it perpetuates an error which has crept into the literature concerning the reports of cases in which the condition of acute haemorrhagic leuco-encephalitis has complicated an infectious exanthem. In 1945 Shallard and Latham¹ reported a case of acute haemorrhagic leuco-encephalitis occurring in a female child whose two younger brothers had developed measles one week before the onset of her first symptom. In 1955, in discussing briefly the possible role of a virus in the aetiology of the condition,² I mentioned, as possible superficial evidence, this presence of measles in the siblings of the female child described by Shallard and Latham. Subsequently, Blackwood³ incorrectly reported that the female child described by Shallard and Latham was herself suffering from measles. This error has now been reiterated by Miller, Stanton, and Gibbons.

While I would agree that the evidence certainly appears to suggest that acute haemorrhagic leuco-encephalitis and acute disseminated encephalomyelitis of a post-exanthematous type are but variants of the one pathological entity,⁴⁻⁶ the fact nevertheless remains, to my knowledge, that in only one human case so far has acute haemorrhagic leuco-encephalitis been reported as complicating an acute infectious disease—that is, varicella.⁴—I am, etc.,

Adelaide, Australia.

H. LANDER.

REFERENCES

1. Shallard, B., and Latham, O., *Med. J. Aust.*, 1945, 1, 145.
2. Lander, H., *J. Path. Bact.*, 1955, 70, 157.
3. Blackwood, W., *Proc. roy. Soc. Med.*, 1956, 49, 146.
4. Wolf, A., and Cowen, D., *Trans. Amer. Ass. Neuropath.*, June 26, 1946.
5. Csermely, H., and Haberland, K., *Acta Morph. Acad. Sci. hung.*, 1954, 4, 217.
6. Russell, D. S., *Brain*, 1955, 78, 369.

Unusual Twin Pregnancy

SIR,—I was most interested to read of the unusual twin pregnancy reported by Dr. J. H. Taylor (*Journal*, May 11, p. 1103), as I had a similar case which I reported¹ in 1953. This was an unusual twin pregnancy in which the woman had an extrauterine and intrauterine pregnancy occurring together. Despite salpingo-oophorectomy she went on to a full-term pregnancy and was delivered of a normal live child.—I am, etc.,

Bristol, 4.

H. I. HOWARD.

REFERENCE

1. Howard, H. I., *Lancet*, 1953, 2, 453.

The H-bomb

SIR,—Your leading article upon strontium-90 (*Journal*, March 30, p. 752) was followed by some interesting letters which emphasized the uncertainties of the situation, but made clear that human life is under risk and that the effects upon bone through atomic radiation are matters which cause anxiety. What I have failed to observe is any serious move by the B.M.A. to take any considerable action in protesting against further nuclear bomb tests. Perhaps there are political questions which make us hesitate to enter the arena of dispute. Yet in our practices, if we discover non-medical circumstances in the environment of our patients which may have a possible effect upon the evolution of disease, we do not hesitate to speak "for the good of their souls" and bodies. As doctors we should all take note of Professor Waddington's letter in *The Times* (May 15). As he says: "Is not the threat of a deterrent in our hands already playing whatever part it can in the preservation of peace? If so, we could offer to postpone the tests." We could also continue to work for an understanding and solution of the fundamental anxieties which are undermining the peace of mind of nations.

Since writing the above the bomb has fallen. Let us try and stop the rest.—I am, etc.,

Exeter.

NORMAN CAPENER.

Obituary

W. H. TYTLER, M.B.

Dr. W. H. Tytler, formerly professor of tuberculosis in the Welsh National School of Medicine, died at Banchory, Kincardineshire, on May 6 at the age of 71.

William Howard Tytler was born on November 2, 1885, and graduated B.A., with first-class honours in natural science, at the University of Toronto in 1906, and M.B. in 1909, obtaining a first silver medal. His interest at that time was in pathology, and he worked in Montreal under Professor J. G. Adami and Dr. Oskar Klotz. Later he held various posts as a pathologist in North America until, in 1911, he became research fellow at the Rockefeller Institute for Medical Research, New York, where, under Dr. Peyton Rous in the department of cancer research, he was engaged on experimental work on filterable tumours. He next became an instructor in pathology at Cornell University Medical College, New York, under Professor James Ewing, adding to his already considerable experience in teaching and research. At the outbreak of the first world war he joined the Canadian Army Medical Corps and came to England with the First Canadian Division. Throughout the war and for some time after it he was attached to laboratories, at first of the British Expeditionary Force and later of Canadian units. During this time he worked on the bacteriology and pathology of enteric fever, on spirochaetosis icterohaemorrhagica, and on the bacteriology of war wounds.

Towards the end of the war he studied influenza in France during the epidemic. It was at this time that he became associated with Professor S. Lyle Cummins, then adviser in pathology to the B.E.F. Tytler was later to work in close association with Cummins in Cardiff. Soon after the war Cummins became David Davies professor of tuberculosis in the Welsh National School of Medicine, and in 1922 Tytler joined him as research bacteriologist to the Welsh National Memorial Association. Between 1918 and 1922 Tytler worked with the Medical Research Council at Oxford and at the National Institute at Hampstead, and also served with the Yellow Fever Commission in West Africa. Cummins retired in 1938, and Tytler, who was his obvious successor, was appointed to the chair and occupied it with distinction until 1949.

In addition to carrying out important research in tuberculosis Tytler instituted a central laboratory service which has flourished ever since. Specimens of suspected tuberculous material from all parts of Wales are still dealt with in this central laboratory. At first Tytler's opportunities for research were restricted, but after a few years he began the study that was to be his chief interest for the next twelve years. This concerned the chemical constituents of the tubercle bacillus and particularly the protein fraction which is responsible for the tuberculin reaction. The growing routine demands of the central laboratory might have put an end to the research of a less energetic worker, but Tytler continued his inevitably restricted investigations with enthusiasm and made interesting observations. Some two years before he was due to retire Tytler was induced to undertake a further responsible and somewhat arduous task in the fight against tuberculosis. He resigned from his chair to become consultant on tuberculosis laboratories to the World Health Organization. This took him to many parts of the world, often where laboratories were primitive or non-existent.

He was rich in his hobbies—gardening, mushroom-growing, beekeeping, fishing, gastronomy—and in his last years in retirement at Banchory he developed a chicken-farm, to which he effectively and enthusiastically applied his ability for scientific planning. An outstanding personality in any company, not only had he extensive knowledge in his own particular scientific field and in practical matters generally, but he was also very well informed in the broad sweep

of world affairs. His surprising memory, shrewd judgment, and well-balanced views more often than not gave him the last word in the spirited arguments of which he was so often the centre. Someone hearing him for the first time, particularly on the telephone, might have been disconcerted by his curt, almost gruff manner, but one did not need to know him long to discover the warmth, kindness, and willing helpfulness of his true nature. He had many sincere friends, and during his last days he had much solace from the letters of those to whom he had said good-bye and who now mourn his passing. He leaves a widow and an adopted daughter.—J. G. and J. M. P.

W. P. YETTS, C.B.E., D.Lit., M.R.C.S.

Dr. W. P. Yetts, emeritus professor of Chinese art and archaeology in the University of London, died at his home at Chesham Bois, Bucks, on May 14, aged 79. He gave up medicine for an academic career in 1930.

Walter Perceval Yetts was born at Reading and educated at Bradfield College and at the universities of Lausanne and London. He became a medical student at St. Bartholomew's Hospital, qualifying M.R.C.S., L.R.C.P. in 1903, and straightway entered the Royal Naval Medical Service, winning the Admiralty gold medal for naval hygiene in 1904. Retiring from the Navy as staff surgeon in 1912, he became acting physician at the British Legation in Peking. During the first world war he served in the R.A.M.C. with the rank of major, and was appointed O.B.E. in 1919 for his wartime service. After working for two years as deputy commissioner of medical services in the Ministry of Pensions, he transferred to the Ministry of Health, working as a medical officer there until 1927.

For many years before this Yetts had been recognized as a leading authority on Chinese art, especially that of the prehistoric period. When in 1930 a lectureship in Chinese art and archaeology was established at London University he was appointed to the post. It was not only his scholarship which qualified him so well for this post, but, being an artist himself, he was able to convey in his writings and lectures his own deep aesthetic appreciation of Chinese art. Bronzes and jades were his special interest. He was a member of the executive committee and chairman of the selection committee of the renowned Exhibition of Chinese Art held at the Royal Academy in 1935. The author of many articles and several books, he wrote three volumes of the catalogue of the Eumorfopoulos Collection. He was promoted C.B.E. in 1944, and appointed to the Order of the Brilliant Star of China in 1948. A year ago Dr. Yetts was awarded the triennial gold medal of the Royal Asiatic Society.

He married Mary Gwendoline Hughes in 1912, and she survives him.

M. A. ARCHDALE, M.B., B.S., D.P.M.

Dr. M. A. Archdale, consulting physician to the psychiatric clinic at Sunderland Royal Infirmary, died on April 12. He was 82 years of age.

Mervyn Alexander Archdale was born at Gateshead on March 1, 1875, the son of Canon T. H. Archdale, and was educated at St. Bees School and at Durham University, where he graduated M.B., B.S. in 1897. He then held house appointments at the Monkwearmouth and Southwick Hospital and at the Royal Southern Hospital, Liverpool. Subsequently, in 1906, he became medical superintendent of the East Riding Mental Hospital, Beverley. During the first world war he served as a major in the R.A.M.C. with the 3rd Northumberland Field Ambulance. In 1918 he was appointed medical superintendent of the Cambridgeshire Mental Hospital, Fulbourn, and four years later he became medical superintendent of the new Sunderland Borough Mental Hospital, where he remained until he retired in 1938. He took the D.P.M. of Cambridge in 1922. Shortly after leaving Sunderland he founded a nursing-home for mentally

ill persons at Middleton Hall in Durham and remained in charge of this until the end of his life. Dr. Archdale, who was a widower, leaves two daughters.

E. O. L. writes: Psychiatry in this country has lost one of its most charming personalities with the death of Dr. Mervyn Alexander Archdale. His career as a doctor had many features of distinction. One was that at the early age of 31 he became medical superintendent of the East Riding Mental Hospital. While Dr. Archdale was at Fulbourn the University of Cambridge established a course of studies in psychological medicine, and granted a diploma in the subject. Dr. Archdale gave the lectures on psychiatry and carried out most of the clinical demonstrations for the course. In this work he was closely associated with such men as Sir Clifford Allbutt, Dr. W. H. R. Rivers, and Dr. C. S. Myers. At the hospitals where he laboured and in the districts these hospitals catered for, new attitudes to mental illness were to be found long before they appeared in the majority of hospitals. His outlook was progressive. For instance, he was the first medical superintendent to persuade his committee to appoint an academic psychologist to the staff of a mental hospital. Archdale was always to be found among the groups on study tours of hospitals in this and other countries. When he thought a new experiment to be sound—and he discriminated wisely in such matters—he would soon be testing the new idea in his own hospital. While he had a sound grasp of the more scientific aspects of psychiatry, his best achievements were a consequence of his attitude to his professional work. He was a man—or more precisely a Christian—dedicated to the service of those who are mentally ill. His natural humility and modesty made it easy for patients to talk to him of their anxieties and difficulties; relatives readily sought his advice and guidance; and the lay members of the hospital and the members of the hospital committee found his humanistic ideas on mental treatment contagious and inspiring. Another example of Archdale's progressiveness was his broadcast of short talks, for about five minutes each morning, from his office to all the wards in the hospital. In this respect he is to be regarded as a pioneer of one form of group psychotherapy. The talks were expressed in simple non-technical terms. They were designed to comfort the depressed, to soothe the excited, to give the deluded some insight, and to penetrate the loneliness of the schizophrenic patient. When I visited him a few months ago he was busy arranging for records to be made of these talks, so that they could be used at other hospitals.

JAMES FISON, M.D.

Dr. James Fison, who died on April 20 at the age of 73, was well known for many years as an ophthalmologist in Harrogate.

After obtaining first-class honours in the natural sciences tripos at Cambridge, James Fison went on to St. Bartholomew's Hospital. There, after graduating B.Chir. in 1912, he became ophthalmic house-surgeon. The first world war broke out soon after he left Bart's, and he served throughout in the Royal Navy, principally as ophthalmic surgeon at Chatham. He obtained the Cambridge M.D. in 1918, and soon after the war settled in practice at Harrogate, and there he remained and worked until his last illness. For the greater part of the time Fison was ophthalmologist to the Harrogate General Hospital and to the Leeds Dispensary. These and other posts brought him a reputation for kindness and thoroughness for which many patients will remember him with gratitude. He was president of the Section of Ophthalmology when the British Medical Association held its Annual Meeting at Harrogate in 1949.

Among other sides of his character which will be equally gratefully remembered by his many friends were a certain old-world courtesy which could disarm criticism and a great faculty for keeping in touch with old comrades. He was blessed with a sense of humour which enabled him to note

with delight the foibles of his colleagues—and others—and to comment on them with a choice of phrase and metaphor which he had made peculiarly his own. With other activities he was a skilful organist, a keen horticulturist, an optimistic golfer, and, it should not be forgotten, some thirty years ago the necessarily intrepid wicket-keeper to the Harrogate doctors' eleven. He was indeed a good companion; and our sympathy is extended to his widow and his three sons, all of whom were also at Bart's.—A. B. P. S.

WILLIAM TAYLOR, M.D., D.P.H.

Dr. William Taylor, for many years county medical officer of health for Shropshire until he retired in 1953, died in the Bridge of Earn Hospital, Perth, on May 1 at the age of 69.

A native of Perthshire, where he was born on February 24, 1888, William Taylor graduated M.B., Ch.B. in 1912 from Glasgow University, and held a number of resident appointments at the Glasgow Royal Infirmary and the Glasgow Maternity Hospital. During the first world war he served first in the R.A.M.C., but later, in 1915, transferred to the Royal Navy. After the war he adopted public health as his career, studying at the university and in the city of Aberdeen, and obtaining the D.P.H. in 1920. In the same year he was appointed a Carnegie research scholar and worked in the Rowett Institute for Nutritional Research and in the Aberdeen public health department, and he published the results of his researches into the physiology of lactation in a number of papers. In 1921 he proceeded to the M.D. with high commendation.

In 1922 Taylor was appointed assistant school and child welfare officer for Shropshire and worked in the Bridgnorth area of the county. He succeeded Dr. James Wheatley as county medical officer of health in 1929. Throughout his years of service with the Salop County Council Dr. Taylor devoted himself wholeheartedly to the duties of his appointment. The years 1947 and 1948, with the planning connected with the new social legislation and the responsibility of giving effect to the reorganized personal health services, imposed a heavy burden on a man whose health was far from robust, but his personality and drive were such that he never spared himself. If any qualities in his work merit special mention it would perhaps be his scrupulous attention to detail, which no doubt owed its origin to his early research work and also to his scholarly command of the written word. The greatest sadness in his life, from which he never fully recovered, was the loss of his only son on active service in Burma in 1943. He is survived by his widow and only daughter.

W. I. WEBSTER, C.I.E., M.C., M.D., D.P.H.
D.T.M.&H.

Lieutenant-Colonel W. J. Webster, formerly senior assistant director of the Central Research Institute of the Government of India at Kasauli, Simla Hills, died in hospital in Aberdeen on May 8, after a prolonged and painful illness. He was in his 64th year.

William Joseph Webster was born at Millmoor, Turriff, Aberdeenshire, on June 27, 1893, and received his early education at Robert Gordon's College, Aberdeen. He studied medicine at the University of Aberdeen, graduating M.B., Ch.B., with honours, in 1915. In the same year he became a lieutenant in the Special Reserve of the R.A.M.C., being promoted to captain seven months later and to acting major in January, 1918. Mentioned in dispatches in 1917 and 1919, he was also awarded the Military Cross and Bar. On leaving the Army in 1919, he returned to the physiology department of Aberdeen University as demonstrator, eventually joining the Indian Medical Service in September, 1920.

Webster spent the greater part of his Indian service in the Medical Research Department, working successively at the Haffkine Institute, Bombay, the King Institute of Preventive

Medicine at Guindy, Madras, and the Central Research Institute at Kasauli. Before assuming the senior assistant directorship at the latter institute he was the last director of the Pasteur Institute at Kasauli before its amalgamation with the Central Research Institute. Webster took the D.T.M.&H. in 1926 and the D.P.H. in 1931, when he also proceeded to the M.D. He became a Fellow of the Royal Society of Tropical Medicine and Hygiene in 1926. Possessing a wide experience of tropical research problems, he published the results of his investigations in numerous papers. It was during the second world war that he had the opportunity of demonstrating his flair for organization and administration, for he was responsible for the production of vast quantities of vaccines and sera for the armed Forces and civilian population of India and other eastern theatres of war. Recognition of his outstanding efforts in this field was the appointment to C.I.E. in 1947, immediately after his retirement from the Indian Medical Service.

His only son, who was an officer in the R.A.F., was killed in 1945. Colonel Webster is survived by his wife and married daughter.—C. L. G.

H. W. M. writes: Lieutenant-Colonel W. J. Webster was for twenty years one of the handful of I.M.S. officers who formed the hard core of the Medical Research Department in India. In addition to research and development work these men were required to accept responsibility for other duties, including public-health laboratory work, clinical pathology, preparation of biological products, teaching, and administration. Only too often did research become a spare-time activity. Although he contributed a number of papers on typhus, rabies, bacteriology, and water analysis, Webster brought to the day-to-day tasks he undertook a wide knowledge and experience as well as that scrupulous conscientiousness which is so essential to their proper performance. He deserves to be remembered not only for his peacetime contribution but for his distinguished service in two world wars. At the outbreak of the second world war Webster occupied a "reserved" post as officer-in-charge of the serum and vaccine section of the Central Research Institute, Kasauli, and he continued to be so employed until he left India on retirement in 1946. The staff of the institute was depleted by the recall of its younger officers for military duty, so that Webster had to meet the ever-increasing demands for biological products with inadequate staff and facilities. Even when the output of vaccines and sera exceeded one million doses a month all demands were met and there was no sacrifice of the very high standards to which all products were required to conform. Webster was a plain, blunt man, but he was greatly respected by all who worked under him. During his last three years of service he was deputy director of the institute at Kasauli during my period as director, and I could not have wished for a more loyal and dependable colleague.

E. T. H. DAVIES, M.D., M.S., F.R.C.S.

Mr. E. T. H. Davies, surgeon to Tredegar Hospital for nearly forty years and formerly medical superintendent of the Tredegar Medical Aid Society, died at his home at Tredegar on May 14. He was 77 years of age.

Edwin Thomas Harries Davies was born at Carmarthen on May 29, 1879. From University College, Cardiff, where he won a natural science scholarship, he went on to St. Mary's Hospital with an open scholarship, and subsequently gained the Meadows Prize in obstetrics at the hospital. In 1906 he took both the London Conjoint diploma and the London degrees of M.B., B.S. After qualification he held the appointments of house-surgeon, house-physician, and obstetric officer at St. Mary's, resident medical officer at Hampstead General Hospital, and surgical registrar at the London Temperance Hospital. During this period he took the F.R.C.S. and the degrees of M.D. and M.S. In 1911 he settled in practice at Tredegar, where he was soon appointed chief surgeon to the hospital and

medical superintendent of the Tredegar Medical Aid Society. Later he became also medical officer of health to the urban district council and medical superintendent of the infectious diseases hospital, posts he held for many years. After his retirement on reaching the age limit in 1949, a ward in the Tredegar Hospital was named after him. Mr. Davies did not give up his professional work entirely, however, for he held a part-time appointment as a surgeon under the Welsh Regional Hospital Board. He is survived by his widow and daughter.

Medical Notes in Parliament

VACCINATION AGAINST POLIOMYELITIS

THE MINISTER OF HEALTH, in a progress report on vaccination against poliomyelitis on May 15, announced the extension of registration to children born in 1955 and 1956, the continuation of vaccination during the summer months this year, and the decision not to import vaccine from America. His statement covered Scotland, as well as England and Wales. He said he had seen suggestions that arrangements should be made to import vaccine from America. When drawing up the scheme they decided on expert advice that the vaccine to be used in this country should have a composition different in certain respects from that of the American vaccine, which was made from strains of virus including the virulent Mahoney strain. That advice still stood, and, while the situation would continue to be kept under close review in all its aspects, they did not consider any departure from this policy was warranted in existing circumstances.

Dr. EDITH SUMMERSKILL (Warrington, Lab.) asked if, in view of the high number of cases of poliomyelitis already notified in the first four months of the year, the Minister could say when there would be enough vaccine available to vaccinate the million children already registered. Mr. VOSPER said he was most anxious not to make forecasts that might prove inaccurate because of production difficulties, but if all went well it should be possible to complete vaccination of those already registered by the end of this summer.

Mr. D. WADE (Huddersfield, West, Lab.) asked if it was correct that the disease common in this country differed somewhat from that in America, and therefore it was desirable to use the vaccine most appropriate here. Mr. VOSPER said he thought that was correct. The composition of the vaccine in this country was different from that in America, and the opposition to using the American vaccine was not so much that it might be unsuitable but that the vaccine used in this country to-day was more suitable for the disease here.

Mr. A. BLENKINSOP (Newcastle upon Tyne, East, Lab.) asked if the Minister was in touch with the United States in the use of the vaccine there, and if he would ensure closer contact with the general practitioners in this country in view of his comments. Mr. VOSPER replied that the present advice would be brought to the notice of all general practitioners that week. There was close contact with the United States, particularly through the Medical Research Council.

Scotland's Anti-tuberculosis Campaign

Mr. W. HANNAN (Glasgow, Maryhill, Lab.) questioned the Secretary of State for Scotland on May 14 about the mass x-ray campaigns against tuberculosis. Mr. J. NIXON BROWNE, the Under Secretary, told him that, in addition to Glasgow, Perth had just completed a magnificently successful campaign. A campaign was under way in West Lothian which had so far exceeded expectations. Eighteen other local authorities proposed to carry out campaigns in the next two years. They had been selected by the Department of Health as being those in whose areas the incidence of tuberculosis was greatest.

Mr. HANNAN asked if he was satisfied that there would be accommodation and nursing staff available to treat those who had been found to be suffering from tuberculosis. Mr. BROWNE assured him that there was.

Medical Care in Prisons

Mr. T. BROWN (Ince, Lab.) asked the Home Secretary on May 13, in order to reassure relatives and others who had been led to think that prisoners were deprived of medical care, what provision existed for the medical care of prisoners, and if he was satisfied that it was adequate for its purpose. Mr. R. A. BUTLER stated that all prisons had medical officers, and where the resources of a prison were insufficient to meet adequately the mental and physical needs of the prisoners arrangements existed for calling in consultant specialists and for sending prisoners to outside hospitals. These arrangements, which in his view were fully adequate, were described in the booklet *Prisons and Borstals*.

Pay for Junior Doctors

Mr. A. BLENKINSOP (Newcastle upon Tyne, East, Lab.) asked the Minister of Health on May 20 what representations he had received on behalf of doctors serving their interim year in hospitals; and whether he had any proposals to make to improve their conditions of service. Mr. J. K. VAUGHAN-MORGAN, the Parliamentary Secretary, told him that the Minister had received no representations on behalf of these doctors. In common with other junior doctors in the hospital service they had had an increase of 10% in their pay as from April 1 last, as an interim measure pending the report of the Royal Commission on doctors' and dentists' remuneration.

Mr. BLENKINSOP asked if the Minister was aware of the great anxiety that had arisen about the hours of work being done by many of these staffs. Was it not due to the restrictions imposed by the Department about the appointment of new senior staff in hospitals? Mr. VAUGHAN-MORGAN replied that living conditions and the organization of work were matters for hospital authorities and the senior medical staff. The other matter was for the appropriate Whitley Council.

Practice in Cyprus.—There are 363 doctors in practice in Cyprus; 312 are Greek Cypriots and 31 Turkish Cypriots.

Registration of Opticians.—Legislation will be introduced as soon as parliamentary time permits, but the Minister cannot say when. He has said that there is no other difficulty except finding parliamentary time in the way of introducing the Bill.

Mental Hospital Patients.—In 1955 the number of voluntary patients admitted to mental hospitals was 75% of the total admissions, and in 1954 it was 71.5%. Final figures for 1956 are not yet available.

Mental Illness Report.—The report of the Royal Commission on Mental Illness and Mental Deficiency is likely to be presented towards the end of May.

Universities and Colleges

UNIVERSITY OF OXFORD

The following degrees were conferred in Congregation on May 2:

D.M.—E. J. L. Lowbury, R. T. Turner Warwick, W. H. Taylor, J. D. L. Reinhold.
B.M.—D. S. Ellis, *J. A. Riley.
*In absence.

UNIVERSITY OF LONDON

Dr. C. F. Harris has been reappointed Deputy Vice-Chancellor for 1957-8.

Professor Esther M. Killick has been reappointed representative of the University on the governing body of Queen Elizabeth College.

Dr. C. F. Harris and Dr. R. S. F. Schilling have been nominated for appointment or reappointment on the governing bodies of the Royal College of Veterinary Surgeons and the Slough Industrial Health Service Ltd. Council of Management respectively.

The following have been recognized as teachers of the University in the subjects indicated in parentheses: *Guy's Hospital*

Medical School, Dr. A. M. Hutton (Anaesthetics); St. Mary's Hospital Medical School, Dr. Derrick Rowley (Bacteriology); London School of Hygiene and Tropical Medicine, Dr. G. R. Wadsworth (Nutrition).

UNIVERSITY OF MANCHESTER

The following candidates have satisfied the examiners at the examinations indicated:

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—Part II: L. Grimshaw, E. Howarth, K. E. Schmidt. Part I: G. Hopkinson, W. P. Walsh.

UNIVERSITY OF BIRMINGHAM

The following representatives have been appointed: Professor Thomas McKeown, at the annual congress of the Royal Society of Health to be held at Folkestone from April 30 to May 3; Professor J. M. Smellie, on the Stafford Local Medical Committee; Dr. R. W. H. Tavenner, on the Central Counties Dental Post-graduate Committee (during the absence of Professor J. Osborne); and the Vice-Chancellor, Dr. R. S. Aitken, on the Foyle Trust.

The title of University Research Fellow has been given to T. Anzai, M.D., British Council Research Fellow in the Department of Chemistry, and P. W. Dykes, M.B., M.R.C.P., M.R.A.C.P., a registrar in the teaching hospital and part-time research worker in the Department of Experimental Pathology, during the tenure of their present awards or appointments in the University.

Dr. N. G. Marr has relinquished his appointment as part-time Lecturer in Occupational Health in the Department of Social Medicine.

In Congregation on December 14, 1956, the following degrees were conferred:

M.D.—R. Astley, B. D. Bower, M. G. Fitzgerald, T. A. Phillips, Rachel E. W. Sillett, G. F. Trobridge.
Ph.D.—In the Faculty of Medicine: R. G. Brown, E. A. Cooper, M.B., B.Chir., D.A., J. W. L. Davies, A. J. Hance, C. E. Rowe, A. Todrick.

M.B., Ch.B.—Margaret J. Aldridge, G. H. Berry, K. G. Branch, D. C. Colwell, J. H. Croft, C. M. David, G. H. Davies, Marion K. Donovan, A. M. Evans, G. S. Farmer, I. M. Fletcher, D. M. Gardiner, N. H. N. Gardner, N. R. Houlston, J. W. E. Johnson, P. W. Lee, Barbara S. M. Marshall, D. H. Targett.

Professor Thomas McKeown has been appointed representative of the University on the governing body of the United Birmingham Hospitals.

The title of University Research Fellow has been given to the following during the tenure of their present awards or appointments in the University: Department of Experimental Pathology, Mrs. Dorothy R. Campbell, F.R.C.S., director of the research department, Birmingham and Midland Eye Hospital, and Dr. R. F. Fletcher, registrar in the metabolic unit, Little Bromwich Hospital; Department of Surgery, H. Sadeghi-Nejan, M.D., a postgraduate student from Iran.

Dr. E. H. L. Harries has been appointed Lecturer in Physiology from February 1, 1957.

UNIVERSITY OF LIVERPOOL

The following candidates have been approved at the examinations indicated:

Ph.D.—In the Faculty of Medicine: J. W. Dundee, M.D., F.F.A. R.C.S. D.M.R.(D.).—Part I: V. Amatyakul, E. H. Burrows, L. R. Levin, T. O'Brien, R. G. Pitman, H. G. Row.
D.M.R.(T.).—Part I: A. K. Bose, G. A. L. G. Glazebrook, N. K. Neogy, R. Spencer.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

At a quarterly comitia of the College held on April 25, with the President, Professor Robert Platt, in the chair, Dr. J. Forest Smith was appointed a representative of the College on the Council of the Imperial Cancer Research Fund.

Licences

Licences to practise were conferred upon the following 165 candidates who have passed the final examination in medicine, surgery, and midwifery of the Conjoint Board, and who have complied with the by-laws of the College:

P. Abraham, L. Adamson, Mary M. Adlington, D. R. Amies, R. St. J. Angel, J. R. Anthony, G. J. L. Ardouin, B. R. Baker, M. A. Barracough, G. Bevan, D. P. Birkett, B. D. Birt, Sybil Birtwistle, J. L. Booth, Anne Bromley, G. Brooke, R. J. A. Brown, J. A. W. Buckley, T. M. Bull, P. G. Burles, J. L. Canter, P. B. Carpenter, Margaret T. Challis, J. A. Chalmers, Zoe D. Chamberlain, T. D. Cochran, Jean R. Colston, Christina M. Comty, Phoebe M. Cotes, D. R. Couchman, J. M. R. Cox, Dorothy Cullen, D. W. Davies, Patricia W. R. Daymond, J. M. Denison, D. M. Dingle, B. C. Dixon-Warren, A. B. Dunderdale, M. J. Dyer, Joan M. Edwards, P. J. Edwards, B. J. Ellam, M. K. El-Din H. El-Rifi, Pauline M. Feavers, J. S. Ferguson, Ann L. M. Field, Elizabeth C. Finn, P. S. Firth, G. N. Flaherty, Evelyn C. Foot, J. A. Fox, G. G. Francis, P. I. Frank,

R. G. G. Gain, Ann F. Gamble, R. D. Gardner, J. C. Garnham, W. H. S. George, J. Goodchild, Pamela J. H. Goodwill, M. S. Gottlieb, J. H. C. Gough, Judith F. Gould, J. N. Graham-Evans, June S. Grant, D. Green-wood, Olive M. Grundy, J. Hajioff, A. Hakki, J. G. Hall, T. J. Hall, J. Hicks, D. L. Hamblen, V. J. Hartfield, Sally Haynes, M. R. Heal, R. C. Hicks, L. M. Hillman, L. J. Hobbs, Margaret B. Howell, P. J. W. Howes, S. W. Hyams, E. E. Inyang, J. D. Jowitt, A. C. Kaeser, J. O. Kesby, M. S. Kessel, K. C. Kewish, D. W. Keys, R. M. Kinsey, J. O. Knowles, M. I. Lander, M. J. Lavine, D. J. Lawson, D. H. Lawton, J. K. Lawton, F. I. Lee, Eva H. Lechner, G. C. Liddle, Helen A. Linn, D. B. Longson, Mary K. Lucas, Gillian B. McCullagh, M. J. McLoughlin, B. C. Mallaband, E. C. Marsh, Nancy E. V. Matthews, P. A. Mead, Katherine M. Moore, R. V. Morris, K. A. A. Mourin, R. C. Mulholland, Elizabeth M. Nicholson, K. F. O'Sullivan, D. W. Owen, R. E. Owen, D. W. Patient, Sylvia J. Pinder, M. A. Pratchell, V. J. Pratt, V. Riddle, E. O. R. Rasaretnam, S. Ravetto, R. L. Raymakers, P. R. Riddle, H. D. Roberts, M. Roburn, Marita R. Rodan, Christine A. Rodgers, H. D. Rogers, J. E. Rogers, Muriel E. Rolfe, K. W. Rowden, D. H. R. Saffer, Marie-Luise B. Seidler, H. G. S. Sergeant, Mary Sibellas, S. H. Simonian, G. B. Smith, J. L. Storey, P. E. Suter, A. R. Taylor, M. F. Terry, C. R. Thomas, Edith H. Thomas, C. D. Thompson, D. F. J. Thompson, I. G. Thomson, Janet E. Timberlake, J. A. D. Walkden, M. P. Walsh, R. R. Watkin, D. M. Wayne, Felice M. Weber, G. T. Whitfield, W. Whitrow, Anne M. Wigley, F. R. Wilkes, R. P. Williams, Wadad Williams, Anne M. Wilson, E. H. Wisely, B. E. M. Wright, Margaret E. G. Wright, G. B. Wyatt.

Diplomas

Diplomas in Physical Medicine, in Ophthalmology, and in Tropical Medicine and Hygiene were granted, jointly with the Royal College of Surgeons of England, to the successful candidates whose names are printed below in the report of the meeting of the Royal College of Surgeons of England held on April 11.

Diplomas in Child Health were granted, jointly with the Royal College of Surgeons of England, to B. K. North and J. N. Rea, and to the other successful candidates whose names are printed below in the report of the meeting of the Royal College of Surgeons of England held on April 11.

Jointly with the Royal College of Surgeons of England a Diploma in Anaesthetics was granted to J. E. S. Relton, and a Diploma in Medical Radiodiagnosis to K. M. Nuttall.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College held on April 11 with the President, Sir Harry Platt, in the chair, the following diplomas were granted, jointly with the Royal College of Physicians of London:

DIPLOMA IN CHILD HEALTH.—I. M. Adamson, B. K. Ahuja, N. J. Al-Chokhachi, Patricia M. Alexander, S. M. Al-Kudcy, Ursula M. Anderson, K. J. Ansari, K. M. M. Ansari, L. P. Balfour-Lynn, P. Bandyopadhyaya, J. F. X. Bastiampillai, Esther B. Bevan, May Blythe, Shirley P. A. Borgkoff, N. L. S. Bourchier, W. H. Brockett, C. W. Brookes, R. J. Buharwalla, Alison G. Carlsie, N. K. Chanda, Aileen P. Cherry, Daphne G. Chesshire, Sau-Lan L. Cheung, T. A. Daly, G. J. Davies, T. C. Dennison, G. S. Dhalliwal, Doreen J. Dicks, K. P. Dikshit, Jean E. Drake, P. G. Drummond-Smith, Ma Tin E, F. P. Frankel, J. D. Frankish, H. J. Fredericks, P. Ganerwala, A. J. Gazder, Grace M. Gee, A. G. Giddins, Marianne A. Gleason, E. Goldblatt, V. K. Gupta, R. D. Haigh, Daphne J. Hall, H. T. Heath, B. E. Heine, Margaret J. Hicks, Siew-Ting Hiew, F. K. M. Hillenbrand, A. Irvine, Hu, M. C. J. Hunt, M. F. Husain, Cecile Ibrahim, Kathleen A. Irvine, J. P. Jayalath, E. E. Jones, J. S. Kalsi, S. Kapur, Pensri Khanjanasthiti, G. S. T. Khoo, Eleanor C. Knox, J. S. Kothiwai, Joan M. Leeming, J. F. Leeton, R. L. Lindon, Barbara Lobo, D. Lonsdale, Kathleen M. Lumb, Jean Y. MacDougall, Agnes M. Maclean, P. N. Mehrotra, Barbara P. P. Melhuish, Inez R. Mendelson, C. J. Morgan, K. Muiranaura, Elizabeth C. Nelson, P. G. Newall-Watson, Pauline A. Nock, Nalinee V. Odak, M. M. Pandit, R. S. Parmar, Margaret P. Patterson, Monica B. Pool, B. R. Pratap, K. R. Purohit, C. R. Ranier-Pope, I. Ramage, P. N. Rastogi, M. J. Ree, Kathleen M. Robb, D. K. Robinson, W. G. Roper, M. A. Sasson, N. S. Satija, W. H. Schutt, Jane M. Semmens, B. C. Sen, R. K. Seth, L. Sinclair, J. J. Slome, Mary N. Smith, Mahalekshmi T. Sushila, R. N. P. Sutton, Sara Syrop, I. G. Taft, O. P. Thaman, Ann Thompson, J. A. R. Tibbles, S. M. Tucker, Naomi Turner, Marian A. Veitch, Lucy A. Warstaff, Allison S. Wallace, I. R. Wallace, R. G. Wari, G. H. Warrick, D. T. Weerawardene, Jean B. Wickins, Joan V. Willcock, A. R. Williamson, R. G. B. Willis, Mary B. Woodfield, Joyce O. Yates.

DIPLOMA IN PHYSICAL MEDICINE.—V. C. De Silva, Charlotte Feldman, S. A. James, B. W. Norington.

DIPLOMA IN OPHTHALMOLOGY.—P. A. Abeyaratne, J. Abraham, J. E. Ball, C. J. Benson, R. D. Billimoria, T. J. A. Casey, I. Cher, N. J. G. Chouler, B. G. Dias, M. El Sayed, R. F. Fisher, D. C. Gibbs, A. G. Ginawi, V. L. Gokhale, A. S. A. Goreish, P. A. Johnson, T. Keldouls, T. H. Kirmani, G. M. Krolman, H. F. Lake, V. J. Marmion, H. H. Massie, M. Maw, F. S. Owen, R. A. Owen, I. Papadopoulos, R. Pararajasegarani, C. S. L. Peiris, M. H. Rizvi, L. Rose, O. P. Sabharwal, B. D. Shrivastava, K. Singh, S. H. Swift, S. V. Thambar, L. J. Topham, P. L. A. Townshend, D. Venkateswarlu, Vera M. Vadden, Olga Voloshin, J. H. Wanla, B. Waters, W. Wilson.

DIPLOMA IN TROPICAL MEDICINE AND HYGIENE.—M. Y. Ali, T. R. Arulambalam, S. N. Basu, G. Battaglia, R. C. Braun, P. Brodie, T. D. Chatterjee, D. Chetty, A. Chopra, R. K. Chopra, J. A. Cooney, G. L. Das, Guha Majumder, A. B. C. Hotobah-During, V. K. Jayaram, Ko Ko, H. S. N. Dutta, M. A. Faghri, P. D. Fario, R. O. J. Fry, P. Grech, M. N. Lal, N. M. P. Mendis, V. R. Mody, A. S. Mohamed, P. R. H. Molesworth, D. A. Narasimhan, Nur-ud-Din, G. G. Prinsell, A. H. Qureshi, Phyllida M. M. Roberts, Y. P. Rudrappa, N. K. Sarker, M. G. Schmiedel, V. B. Setty, M. P. Shaw, M. Sinnappu, K. G. Somers-Dehancy, Tin U. F. Vitanza, Helena T. von Schantz, Wan Yam Mow, D. S. P. S. V. J. Wiesekera, Yao-Tsing Wu.

At a meeting of the Council of the College held on May 9 with the President, Sir Harry Platt, in the chair, the Cecil Joll Prize was presented to Professor P. R. Allison (Oxford); a Jacksonian Prize to Mr. Alan H. Hunt (St. Bartholomew's), and a Certificate

of Honourable Mention to Mr. R. E. Horton (Bristol); and the Begley Prize was awarded to Miss Sybil Birtwistle (Liverpool University).

A Diploma of Membership was granted to J. J. Key and to the other 165 successful candidates whose names were printed in the report of the meeting of the Royal College of Physicians of London held on April 25 (*Journal*, p. 1250).

ROYAL COLLEGE OF PHYSICIANS OF IRELAND

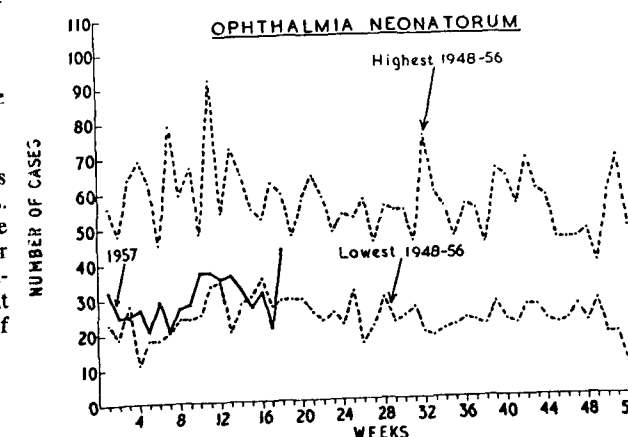
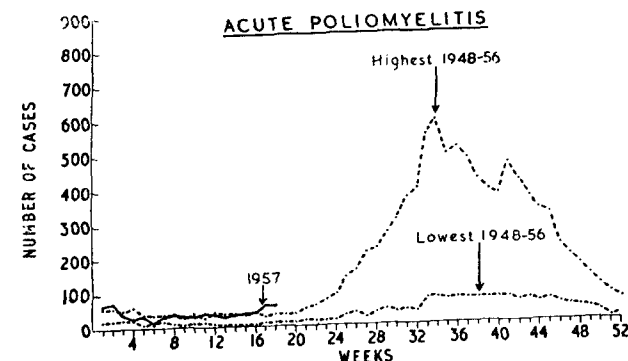
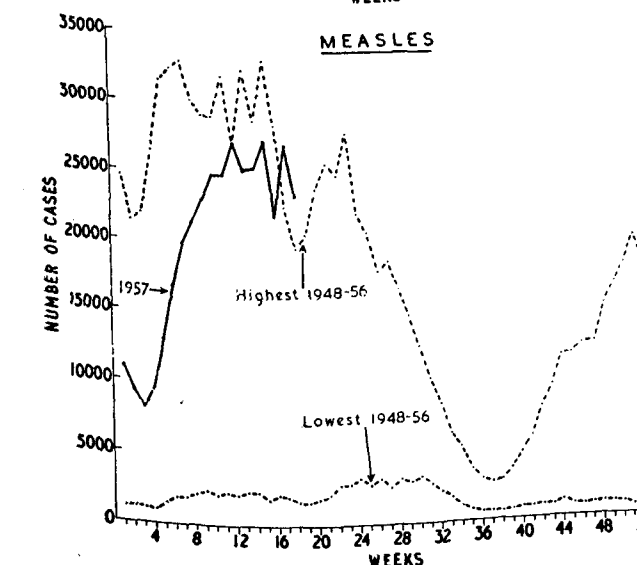
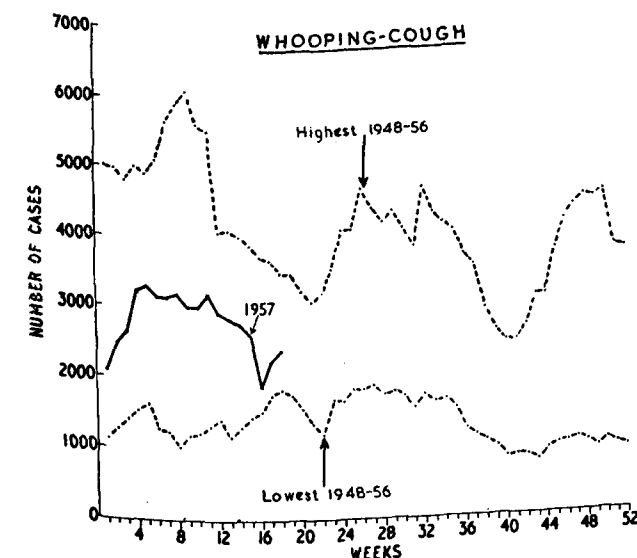
At a meeting of the College held on April 5 the President, Dr. F. J. O'Donnell, admitted to the Licence of Medicine and Midwifery the following candidates who had passed the recent Conjoint Final examinations:

A. S. A. Atchia, Beryl D. Chalkley, S. P. J. Halpin, R. W. Kneafsey, M. B. Labode, G. K. Maghraj, S. V. McAndrew, A. G. McInerney, H. J. O'Brien, C. P. Quinn, A. C. Walsh.

Vital Statistics

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1948-56 are shown thus ----, the figures for 1957 ———. Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Infectious Diseases

The largest variations in the notifications of infectious diseases in England and Wales during the week ending May 4 were decreases of 3,772 for measles, from 26,960 to 23,188, and 62 for scarlet fever, from 542 to 480, and an increase of 162 for whooping-cough, from 2,237 to 2,399.

The notifications of acute poliomyelitis numbered 60, and these were 9 fewer for paralytic and 6 more for non-paralytic cases than in the preceding week. The largest returns were Essex 19 (Colchester M.B. 10, Brightlingsea U.D. 2), Yorkshire West Riding 9 (Leeds C.B. 5, Thorne R.D. 2), and Sussex 5 (Brighton C.B. 4).

Falls of 100 or more in the number of notifications of measles were reported from 15 counties. The largest falls were 605 in Middlesex, from 1,746 to 1,141, and 498 in Warwickshire, from 2,211 to 1,713. Only small changes were recorded in the local incidence of scarlet fever. The only large fluctuation in the returns of whooping-cough was a rise of 59 in Cornwall, mainly due to increases of 24 in Newquay U.D., from 9 to 33, and 19 in West Renwith R.D., from 4 to 23. Only 1 case of diphtheria was notified, being 6 fewer than in the preceding week.

The notifications of dysentery numbered 574, or 4 more than in the preceding week. The largest centres of infection were Lancashire 113 (Manchester C.B. 23, Liverpool C.B. 18, Ashton under Lyne M.B. 13, Stretford M.B. 11), Yorkshire West Riding 102 (Leeds C.B. 23, Bradford C.B. 15, Worsborough U.D. 15, Rotherham C.B. 14), Cheshire 35 (Hyde M.B. 19), Shropshire 31 (Oswestry M.B. 31), Northumberland 30 (Seaton Valley U.D. 10), London 27 (Southwark 10), and Nottinghamshire 23 (Mansfield M.B. 16).

Week Ending May 11

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 497, whooping-cough 2,362, diphtheria 3, measles 18,265, acute pneumonia 392, acute poliomyelitis 69, dysentery 669, paratyphoid fever 1, and typhoid fever 1.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending May 4 (No. 18) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1957					1956				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	1	0	2	1		5	2	2	0	4
Dysentery	574	4	233	8	2	1,635	207	209	4	1
Encephalitis, acute	2	0		0		1	1		0	
Enteric fever:										
Typhoid	2	0	0	0	1	4	0	0	1	
Paratyphoid	1	0	6 (B)	0	1 (B)	11	1	1 (B)	0	
Food-poisoning	164	17	17	0		234	31		0	
Infective enteritis or diarrhoea under 2 years					14				23	21
Measles *	23,188	1640	193	321	229	2,176	94	268	95	272
Meningococcal infection	25	1	16	2	1	28	1	10	0	
Ophthalmia neonatorum	43	5	8	0		38	2	8	0	
Pneumonia †	447	35	159	5	6	459	26	195	8	6
Poliomyelitis, acute:										
Paralytic	35	2	0	4	1	11	0		1	2
Non-paralytic	25	0				10	4			
Puerperal fever §	211	34	8	4		245	34	14	0	
Scarlet fever	480	33	73	24	21	778	48	111	41	28
Tuberculosis:										
Respiratory	613	67	383	23		729	87	155	32	
Non-respiratory	100	7	13	2		103	9	19	5	
Whooping-cough	2,399	77	228	6	41	1,844	81	174	55	113

DEATHS In Great Towns	1957					1956				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	1	0	0	0	0
Dysentery	1	1		0		1	0		0	
Encephalitis, acute		1		0			0			0
Enteric fever	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	6	0	2	0	0	5	0	1	0	0
Influenza	8	0	0	0	0	5	1	0	0	0
Measles		1	0	0	0		0	1	0	0
Meningococcal infection		0	0				1	0		
Pneumonia	218	36	18	15	4	250	39	18	13	9
Poliomyelitis, acute	4	0		0		0	0			0
Scarlet fever		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory	41	5	6	1	3	66	10	8	2	5
Non-respiratory		0	0	0	1		1	1	0	1
Whooping-cough	0	0	0	0	0	0	0	0	0	0
Deaths 0-1 year	232	28	29	12	9	202	30	26	12	9
Deaths (excluding stillbirths)	5,290	784	573	111	170	5,461	795	579	117	197
LIVE BIRTHS	8,908	1212	1105	254	408	8,280	1228	1097	262	458
STILLBIRTHS	213	25	27			193	29	20		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Medical News

French and British Surgeons at R.C.S.—A joint scientific meeting of the Royal College of Surgeons of England and the Académie de Chirurgie de Paris will be held at the Royal College of Surgeons on May 30 and 31 and June 1. The French surgeons will present papers and films. The remainder of the programme will consist in demonstrations of operative technique, relayed from St. Bartholomew's Hospital on closed-circuit colour television. This is stated to be the first occasion in Britain on which colour television has been used for a medical programme of this sort. Attendance at the sessions on May 30 and 31 is by invitation, but, if seats are available, any member of the medical profession will be welcome on June 1 (10 a.m.-12 noon). On this day two operations will be shown—one for a Dupuytren's contracture by Sir ARCHIBALD MCINDOE, and a cardiac operation under hypothermia by Sir RUSSELL BROCK. Those wishing to attend should write at once to the secretary, Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.2.

Radiobiology Unit at Mount Vernon.—The DUKE OF DEVONSHIRE opened the British Empire Cancer Campaign's new radiobiology unit at Mount Vernon Hospital, Northwood, on May 20. The unit, whose director is Dr. L. H. GRAY, Ph.D., will carry out research on the effects of radiation on living cells, particularly during the early stages of damage. Counting the director, there is a permanent staff of three, with a number of visiting workers. A generous gift of £25,000 from an anonymous donor has paid for the unit's laboratories and a 200-kilovolt x-ray machine. In addition the unit is equipped with a "uniquely powerful" electron pulse generator. This machine emits bursts of electrons at such high intensity that cells in the path of the beam, it is stated, "can be exposed to any desired amount of irradiation, up to a limit exceeding anything previously attained, in a single pulse lasting only about two-millionths of a second." The Mount Vernon Hospital itself, which treats some 1,150 cancer patients annually, has an exceptionally well equipped radiotherapy department, fitted with a 4-million-volt x-ray machine and the cobalt-60 theratron unit given to the B.E.C.C. by Mr. MCCONNELL, of Canada. The directors of the other research departments at the hospital are Professor R. W. SCARFF (pathology), Professor J. E. ROBERTS (physics), and Professor B. W. WINDEYER (radiotherapy). Sir STANFORD CADE is engaged on research with the cobalt-60 unit.

Hospital for West Cumberland.—Details of a new 438-bed hospital for West Cumberland were given at a press conference in Carlisle on May 16. The conference was called by the special area committee of the Newcastle regional hospital board, under the chairmanship of Mr. R. S. VENTERS, F.R.C.S. The hospital is to serve an isolated, growing industrial population of 140,000, nearly 40 miles (64 km.) from the nearest alternative hospital centre. The site chosen for the new hospital is just south of Whitehaven. The total cost of the hospital is put at about £2m., and it will be built in four stages. The first stage—a 41-bed unit for tuberculous patients—was completed in January by the conversion of an existing building. Work began on the second stage in March. This provides for about 100 geriatric, psychiatric, and infectious-disease beds, as well as for some staff accommodation, service buildings, and site clearing for the main hospital buildings. Plans for the third stage, comprising the main hospital block with general and specialist departments, wards and out-patient facilities, offices, etc., are now awaiting Ministry approval. The last stage will be a 40-bed maternity and antenatal wing.

Civil Defence in the U.S.A.—The Board of Trustees of the American Medical Association has recently decided to co-operate in research with the Federal Civil Defence Administration in studying the best methods of providing medical care to the surviving population—casualty and non-casualty

—in the event of an enemy attack. The work will be carried out by the American Medical Association's Council on National Defence, and the estimated cost is \$150,000. "The Trustees of the A.M.A. looked with favour on the study because they felt that physicians would carry the primary burden and final responsibility for providing medical care for the American people in the event of a national emergency" (*J. Amer. med. Ass.*, April 20, p. 1542).

Narcotics Commission Warns Against Barbiturates.—The United Nations' Commission on Narcotics, now meeting in New York, has passed a unanimous resolution recommending governments to take measures to prevent the abuse of barbiturates. A "careful watch" on the "tranquillizers" is also advised. The resolution notes that, contrary to the commonly held view, the greatest danger from the barbiturates is not from acute poisonings, and brands their habit-forming propensities a "danger to public health." Governments which have not already done so are advised to take legislative and other measures to prevent abuse of these drugs. The Commission began its session—the twelfth—on April 29, and is expected to adjourn on May 31. The Commission comprises delegates from ten nations elected for an indefinite period (Canada, China, France, India, Peru, Turkey, U.S.S.R., United Kingdom, United States, and Yugoslavia) and delegates from five others elected for three years (Austria, Egypt, Hungary, Iran, and Mexico).

Beit Memorial Fellowships.—Changes in the Trustees, and in the advisory board, of the Beit memorial fellowships for medical research are announced in the Trustees' report for 1956-7. LORD HAILSHAM has been made a trustee in place of LORD SIMONDS. On the advisory board, Professor J. H. GADDUM, F.R.S., has been elected chairman in place of Sir RUDOLPH PETERS, F.R.S., who has resigned from the board after 18 years' membership, and Professor R. H. S. THOMPSON joins the board as a new member. Professor Gaddum is professor of materia medica at Edinburgh, Professor Thompson professor of chemical pathology at Guy's. The following have been elected to Beit memorial fellowships: *Fourth-year Fellowships (£1,000)*—Dr. B. T. DONOVAN, Ph.D., at the Institute of Psychiatry, London; and Dr. D. S. H. W. NICOL, at the Dunn Institute of Biochemistry, Cambridge. *Junior Fellowships (£800 a year)*—Dr. G. A. J. GOODLAD, Ph.D., at the department of biochemistry, Glasgow; Dr. I. OSWALD, at the Institute of Experimental Psychology, Oxford; Dr. I. C. RODDIE, at the department of physiology, Queen's University, Belfast; Dr. S. VARADARAJAN, Ph.D., at the department of radiotherapeutics, Cambridge; and Dr. PAULINE M. MEADOW, Ph.D., at the department of biochemistry, University College, London. Information about Beit fellowships may be obtained from the secretary, Beit Memorial Fellowships, Lister Institute of Preventive Medicine, Chelsea Bridge Road, London, S.W.1.

Chair of Neuropathology.—Dr. P. M. DANIEL, senior lecturer at the Institute of Psychiatry, has been appointed to the London University Chair of Neuropathology tenable at the Institute. The previous occupant of this chair was Professor ALFRED MEYER. Dr. Daniel graduated in medicine in 1942 from Cambridge and the Charing Cross Hospital, where he was T. H. Huxley scholar. He was prosector at the Royal Medical College, Edinburgh, and was awarded the John Hunter medal and triennial prize (1946-8) of the Royal College of Surgeons of England. In 1954 he obtained the M.R.C.P.(London), and in 1955 the D.M.(Oxford). He is honorary consultant neuropathologist at the Maudsley and Bethlem Hospitals and to the Army at home. He edited the section on neurological methods in *Lee's Microtome*'s *Vade-Mecum*.

F.R.C.S.Ed.—At a meeting of the Royal College of Surgeons of Edinburgh on May 10 the following were admitted fellows: B. M. ANDREA, A. C. ARULPRASAM, J. R. BADGER, D. D. BEARD, K. S. BREARLEY, J. J. BREITENBACH, M. R. CHAUDHARY, J. E. CHOO, K. CLARK, J. A. COOMES, K. B. CORNWELL, R. G. DENNIS, J. A. DOIG, G. R. GORDON, S. A. HUSSAINI,

K. JOHNS, R. DE R. JOOSTE, K. A. KALYANAM, I. J. KAPLAN, L. P. B. KIRIELLA, B. LOTZOF, H. L. J. LUSBY, D. C. MACPHAIL, E. MATTHEWS, F. A. MEINTJES, P. R. MYERSCROUGH, J. G. B. MYLES, C. V. PETERSON, W. H. RAYNHAM, A. A. ROUX, J. N. SEGELOV, M. V. SHETTY, T. P. SINGH, M. D. M. STANTON, I. B. TAIT, R. N. TIWARY, C. TOKER, W. K. M. C. WATKINS, H. G. WATTS, D. W. WHITWAY, and G. B. WYLIE.

M.R.C.P.Ed.—At a quarterly meeting of Royal College of Physicians of Edinburgh on May 7 the following were elected members: A. SLESSOR, D. M. DOUGLAS, S. P. V. SHERLOCK, W. G. MACFIE, J. G. OPIE, D. M. PRINSLEY, D. E. ANDERSON, M. M. KUBIK, K. B. YUILL, J. P. ANDERSON, J. C. DAVIDSON, A. E. STUART, B. S. CHINNIAH, T. P. TELFER, K. S. RAI, J. M. WALKER, J. P. LAVENDER, A. J. CAMERON, G. D. FORWELL, E. V. PIERIS, M. I. MEMON, P. T. PIERIS, J. I. FORBES, L. N. SHOURIE, S. P. KHATUA, P. W. A. BOTHA, F. LOTHE, G. P. MCNICOL, J. N. PARK, E. G. WARBURTON, G. ARJUNDAS, C. P. DANCATER, D. SARMA, S. R. ESRACHOWITZ, H. DE V. HOESE, W. J. FESSEL, and W. D. SMITH.

Shortage of Blood Donors.—On May 15 the Minister of Health, Mr. DENNIS VOSPER, appealed for over 100,000 more blood donors. He was speaking at a special showing of a film about the National Blood Transfusion Service called "Blood is Life." He said the Service had over 643,000 civilian donors at the end of March, but with the continually growing demand for blood from hospitals an effective panel of 750,000 donors was needed. Last year the record number of 803,000 blood donations was made, an increase of 44,000 on the previous year.

Doctors' Widows and Orphans.—The annual meeting of the Society for Relief of Widows and Orphans of Medical Men was held in London on May 15, under the chairmanship of the president, Sir ROBERT YOUNG. Last year the Society disbursed £4,130 in grants and presents to members' widows and orphans in financial difficulties. The Society dates from 1788, and membership is open to all male registered medical practitioners living, at the time of election, within 20 miles of Charing Cross. Further details may be obtained from the Society's secretary at 11, Chandos Street, Cavendish Square, London, W.1.

Gilbert Blane Medal.—Surgeon Commander S. MILES, R.N., has been awarded the Sir Gilbert Blane Naval Medal for 1957. This was announced at a council meeting of the Royal College of Surgeons on May 9.

COMING EVENTS

Medical Research Society Lecture for 1957.—Dr. STANLEY BRADLEY (Columbia University) will lecture on May 31 at the London School of Hygiene and Tropical Medicine, at 5.30 p.m. His subject will be "Circulatory Adjustments to Postural Changes." Lecture open to non-members.

Sixth International Congress of Preventive Medicine.—Organized by the International Society for Prophylactic Medicine. June 24-29, at Wassenaar, The Hague, and Scheveningen. Papers in French and German. Details from Dr. E. BERGHOFF, 41, Piaristengasse, Wenen 8, Netherlands.

"Flour and Bread."—Symposium arranged by the Nutrition Society, July 5 and 6, at the Anatomy School, Cambridge. Sir RUDOLPH PETERS, F.R.S., will be the chairman. Details from Miss D. F. HOLLINGSWORTH, c/o Ministry of Agriculture, Horseferry Road, London, S.W.1.

Twentieth International Congress of Psychoanalysis.—Paris, July 28 to August 1. Details from Dr. S. NACHT, 187, rue Saint-Jacques, Paris, 5.

Curare and Curare-like Agents.—International symposium under the auspices of Unesco at Rio de Janeiro, Brazil, August 5-17. Details from Professor D. BOVER, Istituto Superiore di Sanità, 299, Viale Regina Elena, Rome.

NEW ISSUES

Annals of the Rheumatic Diseases.—The new issue (Vol. 16, No. 1) is now available. The contents include:

HEBERDEN ORATION, 1955. Walter Bauer.
HEBERDEN ORATION, 1956. R. E. Tunbridge.
ISOLATED OSTEO-ARTHRITIS OF THE SHOULDER JOINTS. Arthur W. Bagnall.
PLACEROS IN THE TREATMENT OF RHEUMATOID ARTHRITIS AND OTHER RHEUMATIC CONDITIONS. Eugene F. Traut and Edwin W. Passarelli.
INCIDENCE OF RHEUMATIC FEVER IN RELATION TO IMMUNOLOGIC REACTIVITY. V. Rejchle.
RADIOLOGICAL STUDY OF SACRO-ILIAC JOINTS IN ANKYLOSING SPONDYLITIS WITH REFERENCE TO THE EVOLUTION OF THE DISEASE. J. Forestier and P. Desjouis-Paoli.
ENZYMATIC ELUCIDATION OF THE RELATIONSHIP BETWEEN COLLAGEN AND ELASTIN: AN ELECTRON-MICROSCOPIC STUDY. M. K. Keech and R. Reed.
OSTEO-ARTICULAR SITES OF BRUCELLOSIS. J. Rotés-Querol.
DIPHENYLAMINE REACTION IN CHRONIC JOINT DISEASES. Milam Adam.
Jiri Malecek, and Marta Kutyová with Vladimír Maly.
AGGLUTINATION OF SENSITIZED SHEEP ERYTHROCYTES IN DISSEMINATED LUPUS ERYTHEMATOSUS. Nanna Svartz and Karl Schlossman.
SYSTEMIC LUPUS ERYTHEMATOSUS. S. K. Conner.
ADDISON'S DISEASE AND RHEUMATOID ARTHRITIS. C. E. G. Robinson.
PERIPHERAL VASCULAR OBSTRUCTION IN RHEUMATOID ARTHRITIS AND ITS RELATIONSHIP TO OTHER VASCULAR LESIONS. E. G. L. Bywaters.
PLASMA PROTEINS AND CRYOGLOBULINS IN ANARTHRITIC RHEUMATOID DISEASE. L. Bagratuni.
AUGMENTING EFFECT OF RHEUMATOID SERA IN A STREPTOCOCCAL HAEM-AGGLUTINATION TEST. N. R. Link and H. J. Gibson.
PROPOSED DIAGNOSTIC CRITERIA FOR RHEUMATOID ARTHRITIS. Marian W. Ropes, Granville A. Bennett, Sidney Cobb, Ralph Jacob, and Ralph A. Jessar.
AMERICAN RHEUMATISM ASSOCIATION. PROCEEDINGS OF THE THIRD INTERIM SCIENTIFIC SESSION, 1956.
HEBERDEN SOCIETY.
LIGUE INTERNATIONALE CONTRE LE RHUMATISME.
UNIVERSITY OF TEXAS POSTGRADUATE SCHOOL OF MEDICINE.
THIRD ACQUI PRIZE, 1957.
ABSTRACTS.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

British Journal of Industrial Medicine.—The new issue (Vol. 14, No. 2) is now available. The contents include:

THE HEALTH OF THE WORKER. P. A. B. Raffle.
THE NEUTRALIZATION OF SILICA TOXICITY *in vitro*. J. Marks.
SILICOSIS HAZARDS IN ENAMELLING: A MEDICAL, TECHNICAL, AND EXPERIMENTAL STUDY. Lars Friberg and Harry Ohman.
SOME FACTORS INFLUENCING THE RESPONSE OF INDUSTRIAL WORKERS TO MASS RADIOGRAPHY. G. Z. Breit.
RADIOLOGICAL SURVEYS OF WORKING QUARRYMEN AND QUARRYING COMMUNITIES IN CAERNARVONSHIRE. T. Francis Jarman, J. Glyn Jones, J. H. Phillips, and H. E. Sciorry.
AN OUTBREAK OF WEAVER'S COUGH ASSOCIATED WITH TAMARIND SEED POWDER. Robert Murray, I. Dingwall-Fordyce, and Ronald E. Lane.
AN OUTBREAK OF TRI-ORTHO-CRESYL PHOSPHATE (T.O.C.P.) POISONING IN DURBAN. Mervyn Susser and Zena Stein.
INTERNAL DERANGEMENT OF THE KNEE JOINT IN MINERS. J. B. Atkins.
THE RESPONSIBILITIES OF THE MEDICAL PROFESSION IN THE USE OF X RAYS AND OTHER IONIZING RADIATIONS. United Nations Scientific Committee on the Effects of Atomic Radiation.
MISCELLANEA:
OCCUPATIONAL MORTALITY IN SCOTLAND. S. L. Morrison.
WORK, CONFLICT, AND COMMUNITY. D. H. Allcorn.
A DISCUSSION OF TECHNIQUE AND AN ANALYSIS OF ERRORS IN TAKING INDUSTRIAL HISTORIES IN COAL-MINERS. G. Jonathan, F. Moore, and L. Roberts.
A NEW KIT FOR SODIUM NITRIDE-THIOSULPHATE THERAPY IN THE TREATMENT OF ACUTE CYANIDE POISONING. N. Langdon Lloyd.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, May 27

INSTITUTE OF CARDIOLOGY.—9.30 a.m., Sir John Parkinson: Cardiovascular Syphilis.

INSTITUTE OF PSYCHIATRY.—5.30 p.m., public lecture by Professor H. G. K. Westenberg (Utrecht): Some Investigations Concerning Vitamin B₁₂ with Special Reference to Brain.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute, 5 p.m., Dr. S. Udenfriend (U.S.A.): Clinical Studies Relating to Tryptophan Metabolism.

Tuesday, May 28

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Professor C. A. Keele: Cutaneous Pain and Itch.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—5 p.m., Mitchell Lecture by Dr. F. P. Lee Lander: Rest and Pulmonary Tuberculosis.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor R. T. Turner-Warwick: Lymphatics of the Breast in Relation to the Spread of Carcinoma and its Treatment.

ROYAL STATISTICAL SOCIETY.—At Keene Lecture Theatre, 2nd Floor, Westminster Medical School, 5.30 p.m., annual general meeting. Dr. J. H. Edwards: Some Aspects of Cigarette Poisoning.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute, 5 p.m., Altmouth Wright Lecture by Dr. J. F. Loutit: Immune Response following X-irradiation.

UNIVERSITY COLLEGE LONDON: DEPARTMENT OF PHARMACOLOGY.—At Physiology Theatre, Gower Street, W.C., 5.15 p.m., public lecture by Professor P. Bálint (Budapest): Nervous Regulation of Renal Function.

Wednesday, May 29

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Differential Diagnosis of Fungous Infections of the Skin.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. P. D'Arcy Hart: Place of B.C.G. Vaccination in an Established Tuberculosis Service.

INSTITUTE OF NEUROLOGY.—5.30 p.m., Professor G. Schaltenbrand (Würzburg, Germany): Myographic Analysis of Spasticity and Rigidity.

●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—4 p.m., Mr. A. L. Gunn: Kielland's Forceps and Their Use.

LONDON AMATEUR BOXING ASSOCIATION.—At Great Northern Hotel, King's Cross, N., 8 p.m., Dr. J. H. Taylor: Psychiatric Aspects of Head Injuries.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Dr. Joan Taylor: Recent Developments on the Role of Enterobacteriaceae in Gastro-enteritis.

Thursday, May 30

●Guy's HOSPITAL MEDICAL SCHOOL.—5 p.m., Carbutt Memorial Lecture by Dr. William Evans: Conditions That Mimic Heart Disease.

HONYMAN GILLESPIE LECTURE.—At Anatomy Theatre, University New Buildings, Edinburgh, 5 p.m., Dr. J. A. C. Fleming: Some Radiation Injuries in Clinical Practice.

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. J. Wallace: Skin Diseases of the Vulva.

ROYAL NORTHERN HOSPITAL.—2.45 p.m., Dr. Martin Hynes: Urine. ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute, 5 p.m., Dr. S. Udenfriend (U.S.A.): Metabolism of Phenylalanine, Tyrosine, and Adrenaline.

Friday, May 31

●Guy's HOSPITAL MEDICAL SCHOOL.—5 p.m., Fison Memorial Lecture by Sir John Cockcroft, F.R.S.: Atomic Energy and its Biological Implications.

●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. G. B. Dowling: clinical demonstration.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. F. H. Young: clinical demonstration.

●INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—3 p.m., Mr. A. J. Wrigley: Deficiencies in the Present Obstetric Service.

MEDICAL RESEARCH SOCIETY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., Dr. Stanley F. Bradley (Columbia): Circulatory Adjustments to Postural Changes.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—10 a.m., Professor F. A. R. Stammers: Mechanical Factors in Post-gastroctomy Complications and Syndromes.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Professor W. J. Hamilton: The Early Ovum.

Saturday, June 1

LONDON ASSOCIATION OF THE MEDICAL WOMEN'S FEDERATION.—At Royal National Orthopaedic Hospital, Stanmore, Middlesex, 3 p.m., clinical meeting.

SOUTH-EAST METROPOLITAN REGIONAL TUBERCULOSIS SOCIETY.—At Royal Sea-Bathing Hospital, Margate, 10 for 10.30 a.m., meeting. Scientific papers and film.

WEST MIDLANDS PHYSICIANS ASSOCIATION.—At Holme Lacy Hospital, Hereford, 11 a.m., spring meeting.

Sunday, June 2

PADDINGTON GENERAL HOSPITAL.—11 a.m., clinical meeting for general practitioners.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL.—10.15 a.m., clinical demonstration for general practitioners. The Rt. Hon. Lord Amulree: Some Medical Problems of Old Age.

APPOINTMENTS

DAWKINS, JOAN M. St. V., M.B., B.S., D.P.H., D.C.H., Assistant County Medical Officer of Health and District Medical Officer of Health for Daventry Borough and Brixworth and Daventry Rural Districts.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—S. S. A. Jaffery, M.B., B.S., Anaesthetic Registrar, West Norfolk and King's Lynn General Hospital; I. N. S. Heald, M.B., Ch.B., Registrar in Psychiatry, Hellesdon Hospital; C. E. Cook, M.B., B.Ch., Registrar in Psychiatry, St. Andrew's Hospital, Thorpe, Norwich; E. G. Oram, M.B., Ch.B., Registrar in Psychiatry, Fulbourn and Addenbrooke's Hospitals; A. B. Shearer, M.B., B.S., Medical Registrar, Ipswich and East Suffolk Hospital; S. K. Sen, M.B., D.G.O., Registrar in Obstetrics and Gynaecology, West Norfolk and King's Lynn General Hospital.

HOSPITALS FOR DISEASES OF THE CHEST, London.—Ronald G. Grainger, M.D., F.F.R., M.R.C.P., D.M.R.D., and Basil Strickland, M.B., B.S., F.R.C., M.R.C.P., D.C.H., D.M.R.T., D.M.R.D., Part-time Consultant Radiologists.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Martin.—On May 8, 1957, at Birmingham Maternity Hospital, to Winifred (formerly Attenborough), wife of Dr. Robert F. Martin, a son—Nigel Paul.

Mulhern.—On May 11, 1957, at Queen Elizabeth Hospital, Birmingham, to Ruth (formerly Heller), wife of Dr. P. H. Mulhern, a daughter.

Searle.—On April 3, 1957, at Poole General Hospital, to Gwenllif (formerly Edwards), M.R.C.S., L.R.C.P., D.O., wife of J. S. T. Searle, M.B., B.S., D.R.C.O.G., a daughter—Anne.

DEATHS

Grant.—On April 10, 1957, Robert Grant, M.B., Ch.B., of Mackay, Queensland, Australia, formerly of Edinburgh.

Stuart.—On April 18, 1957, at 4, Clifton Terrace, Southsea, Hants, Alan Roy Douglas Stuart, M.R.C.S., L.R.C.P., aged 41.

Taylor.—On May 1, 1957, at Bridge of Earn Hospital, William Taylor, M.D., D.P.H., of Downfield, Stanley, Perthshire, formerly of Shrewsbury, Salop.

Wilson.—On April 30, 1957, at Queen Mary's Hospital, Roehampton, London, S.W., William Fothergill Wilson, M.C., M.B., B.Ch., Wing Commander, R.A.F. (retired).

Wylie.—On May 4, 1957, at his home, Woodlands, Doncaster, Yorks, John Wylie, M.C., M.B., Ch.B., aged 66.

Zanker.—On April 30, 1957, at his home, 35, Elmhurst Court, St. Peter's Road, Croydon, Surrey, Arthur Zanker, M.D.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Mental Disability and Testamentary Capacity

Q.—If a will is contested on the grounds that the testator was not of sufficiently sound understanding at the material time to realize fully what he was doing, what degree of mental disability must be proved to satisfy a court that this was so? I have in mind the case of an elderly person whose mental powers underwent a gradual deterioration during his last few years of life.

A.—First a caution is necessary. Within the scope of a reply to an "Any Question?" it is impossible to provide an answer that will necessarily apply to the facts of every case. It is possible to indicate guiding principles only.

Testamentary capacity is interpreted in a very wide sense. Provided a will is made voluntarily and without interference in an attempt either to remedy any mental defect or weakness of mind which may be present, or to influence the testator unduly in some particular direction, especially if the will is a sensible document—the courts will be loth to set it aside.

It is essential that the testator should understand the nature and effects of his acts and the extent of his property; be able to appreciate the claims that should be taken into account and their strength; that his memory should be good enough to remember all persons who might reasonably have a claim on him; and that no disorder or senility of mind should pervert his sense of right or influence him in the disposal of his property. A testator may, however, indulge his caprice or even malice, if he wishes, leaving nothing to his family, provided such caprice is not brought about by an insane state, senile suspicion, or undue influence. To upset a will in the case of a senile testator, the onus would normally be on those contesting the will to show that the testator had not complied with the above requirements.

Aetiology of Twinning

Q.—(1) What are the aetiological factors in twinning in man? How do they differ in the case of monozygous and dizygous twins? (2) What is the risk of twins in a couple where one of them is a twin? Is the risk the same for a parent who is a monozygous twin as for a dizygous twin, and does this affect the type of twin that may be born? (3) One of my patients, a monozygous twin, is marrying a man who is himself a monozygous twin. What are their chances of having twins, and do they incur an increased risk of having monozygous twins? What are the comparable risks in the marriage of a monozygous twin with a dizygous twin, and of two dizygous twins?

A.—(1) Monozygous twins are derived from the early splitting of a single cell and so are formed from a single sperm and a single ovum. Dizygous twins are derived from two ova which happen to have been released at the same time and two sperms. The results of genetic research on twinning have been conflicting, in part probably because the distinction between monozygous and dizygous twin pairs was not accurate. Recent work suggests that the two forms are aetiologically distinct, and that there is no tendency for the two types to occur together in the same family with more than random frequency. The frequency of monozygous twinning varies little if at all with the mother's age, and is much the same, 3 to 4 per 1,000, in widely different parts of the world. There is no convincing evidence that the tendency to monozygous twinning is in any way inherited. Dizygous twinning

is almost certainly more frequent in certain families than others; it is also more frequent in certain races than others—for example, the incidence is 9 to 10 per 1,000 in some European countries, but only about 2 per 1,000 in Japan. The frequency of dizygous twinning in European countries increases as the mother ages, from about 3 per 1,000 at age 20 to a maximum of 13 per 1,000 at about 35 years, after which it falls again.

(2) Where one of a couple is a monozygous twin there is probably no significant increase in the risk of the couple having twins themselves. Where the father is one of a dizygous pair there is also probably no increased risk of twinning. Where the mother is one of dizygous twins there is an increased risk that the couple will have twins, but this increase is only for dizygous twins.

(3) Monozygous twinning in either or both parents, or the father being one of a dizygous pair, probably has, as indicated above, no effect on the risk of the children being twins. If, however, the mother is one of a dizygous pair, the risk of her having dizygous twins is increased from the random risk of about 1% to a figure of the order of 10%. In one survey¹ 60 mothers with a twin brother, and therefore one of a dizygous pair, had 11 twins in 122 births.

REFERENCE

¹ Waterhouse, J. A. H., *Brit. J. Soc. Med.*, 1950, 4, 197.

Colostrum Test for Pregnancy

Q.—What is known of a pregnancy test in which colostrum is injected into the superficial layers of the skin of the forearm? It is said to be accurate within two or three weeks of conception.

A.—The colostrum test was described by Falls, Freda, and Cohen.¹ It was claimed that the intradermal injection of 0.02 ml. of a solution consisting of equal parts of human colostrum and physiological saline produced no reaction in pregnant women, but a typical allergic response (flare and weal) within half an hour in non-pregnant women. In the original publication there were 98% correct answers in 265 pregnant women and 96% correct answers in 113 non-pregnant women. Few subsequent reports have confirmed these findings, and most—for example, those of Pulver and Posner² and Allen and Donaldson³—indicate the test to be quite unreliable. There do not seem to have been any reports since 1945, and it may therefore be concluded that no further interest in the test remains.

REFERENCES

¹ Falls, F. H., Freda, V. C., and Cohen, H. H., *Amer. J. Obstet. Gynec.*, 1941, 41, 431.

² Pulver, M., and Posner, L. B., *ibid.*, 1942, 44, 690.

³ Allen, E., and Donaldson, L. B., *ibid.*, 1943, 45, 208.

Pulmonary Eosinophilia

Q.—What criteria are necessary to establish a diagnosis of "pulmonary eosinophilia of unknown cause"? Have there been any recent advances in the treatment of this condition, and in particular is steroid therapy of any value?

A.—The criteria necessary to establish a diagnosis of "pulmonary eosinophilia of unknown cause" are x-ray finding of pulmonary infiltration and a blood eosinophilia of over 6% in a case where either full investigation has failed to uncover a primary cause or the picture conforms to a known syndrome of unknown aetiology.

Crofton *et al.* in a paper from the Brompton Hospital (based on a personal experience of 16 cases and a review of some 450 others) pointed out that eosinophilia in the blood is an incidental finding in certain well-defined pulmonary conditions—the resolving stage of pneumonia, hydatid disease of the lung, Hodgkin's disease, and sarcoidosis. They defined pulmonary eosinophilia as a condition in which pulmonary infiltration on the radiograph is accompanied by blood eosinophilia (6% or over) but in which all of the four diseases listed above can be excluded. They considered that all cases of pulmonary eosinophilia form a

continuum, but suggested the following classification, which provides a very helpful clinical approach to these difficult cases: (1) Simple pulmonary eosinophilia or Loeffler's syndrome: transient infiltrations (less than one month), usually due to infestation with *Ascaris lumbricoides*. (2) Prolonged pulmonary eosinophilia: prolonged (over one month) or recurrent infiltrations without asthma (usual duration two to six months). (3) Pulmonary eosinophilia with asthma: infiltration with asthma (duration less than one month in just under a third of cases, one to three months in one third, and over three months in just over a third). (4) Tropical pulmonary eosinophilia: usually with arthritic symptoms. (5) Polyarteritis nodosa. The article should be read in order to assess any case of "pulmonary eosinophilia of unknown cause."

Steroid therapy is often an effective symptomatic therapy in pulmonary eosinophilia. A suitable dose of cortisone would be 300 mg. in divided doses on the first day, 200 mg. on the second, and 100 mg. on the third day, followed by 100 mg. for a period depending on the progress of the patient, with reduction to 75 mg. and then 50 mg. a day to tail off the treatment or for more continuous therapy. Continuous therapy should be on the smallest effective dose. Prednisone or prednisolone could be used at approximately one-fifth or one-quarter the above dosage. No case should be put on steroid therapy until the usual contraindications have been excluded, i.e., peptic ulceration, tuberculosis, an unstable nervous background, hypertension, or cardiac failure.

REFERENCE

- ¹ Crofton, J. W., Livingstone, J. L., Oswald, N. C., and Roberts, A. T. M., *Thargy*, 1952, 7, 3.

Barbiturate Addiction

Q.—What ill effects result from regular nightly doses of barbiturates?

A.—Forgetfulness, lassitude, impairment of mental concentration, mild depression, and prolongation of reaction-time are common results of a nightly dose of barbiturate, especially of the long-acting and widely prescribed phenobarbitone. The more pronounced effects of barbiturate addiction are described in such works as *The Pharmacological Basis of Therapeutics*¹ and *Narcotics and Narcotic Addiction*.² Heavy dosage with barbiturates also affects glucose metabolism, producing abnormal glucose-tolerance curves.³

REFERENCES

- ¹ Goodman, L. S., and Gilman, A., *The Pharmacological Basis of Therapeutics*, 2nd ed., 1955.
² Maurice, D. W., and Vogel, V. H., *Narcotics and Narcotic Addiction*, 1954.
³ Menivale, W. H. H., and Hunter, R. H., *Lancet*, 1954, 2, 939.

Artificial Respiration after Electrocutation

Q.—It is alleged by first-aid men that Eve's method is best for asphyxia caused by electric shock, owing to the fact that it keeps the blood circulating even if the heart has stopped, and that the heart may subsequently restart. Is this true?

A.—Ventricular fibrillation will not of course be countered by Eve's rocking method of artificial respiration, but it is just possible that in cases of severe circulatory collapse this method might force some blood into the thorax and thus improve cardiac output. The method is not therefore likely to help if the heart has really stopped, but might help if the heart is beating faintly though imperceptibly. In practice, the method of artificial respiration of choice should usually be the method which can be provided most quickly, as every second counts.

NOTES AND COMMENTS

Infra-red Apparatus.—Dr. G. C. Soeters (Philips Medical Information Service, N.V. Philips' Gloeilampenfabrieken, Eindhoven, Holland) writes: "I agree with the view that a source of radiation having a high output is necessary where the whole body or a large part of it is to be irradiated [*"Any Questions?"* March 23, p. 718]. Indeed, I consider an output of 500 watts rather low for that purpose, even if a good parabolic reflector is used. To my mind, however, it is neither necessary nor—for practical reasons—advisable to use sets of such high power for treating local affections (local inflammation, haematoma, circumscribed pain). The usual practice when localized treatment is given is to make the intensity of the radiation per unit area of the irradiated surface as high as possible. The limit is formed by the capacity of the skin to withstand burning and painful sensation. For a good (50-watt set with its source properly fitted in a good reflector the irradiation distance is between 12 and 16 in. (30–40 cm.). Raising the output of such sets would necessitate increasing the irradiation distance. This would merely mean higher current consumption without any compensatory advantage. The statement that domestic gas and electric fires would be an effective substitute for radiation sets designed for medical purposes seems to be open to discussion. Even should recent investigations inspire doubt as to the tenability of the view that short-wave (0.7–1.4 μ) infra-red radiation induces a higher temperature in the deeper skin layers and subcutaneous tissue than does the same quantity of radiant energy of longer wavelength (over 1.4 μ)—even then it will be well to recall the advice of Stafford L. Osborne, professor emeritus and chairman, department of physical medicine, Northwestern University Medical School. He writes: "First the evidence shows that when the skin-source distance and the energy output are identical more effective heating is secured with the far infra-red source. It does not prove that this band of radiation is absorbed at a greater depth. . . . From the evidence of Gersten and co-workers,² it would seem to indicate then, that, at a maximum skin tolerance for both sources, the inner band of infra-red would be more effective." With this I am in full agreement, and conclude that the most reasonable course for the time being is to use short-wave infra-red radiation for medical purposes. This, in accordance with the Wien displacement law, means radiation from sources operating at high temperature. Domestic gas and electric fires, and other sources of radiation giving infra-red of wavelengths almost exclusively above 3.4 μ , cannot be included in this category.

REFERENCES

- ¹ *Arch. Phys. Med.*, 1951, 32, 167.
² Gersten, J. W., Waxman, K. G., Herrick, J. F., and Krzycki, F. H., *ibid.*, 1949, 30, 601.

Dr. W. SUMMER, D.Sc. (Director, Barker Medico-Electronic Laboratories, Ltd., Birmingham), writes: "I would like to draw your attention to the fact that certain points have not been mentioned in the reply [*"Any Questions?"* March 23, p. 718], though they are of fundamental importance, namely: (1) that it is the power-area ratio (intensity) obtaining on the irradiated skin, and not the power of the source, which is a criterion; (2) that the absorption spectrum of the skin tissues requires the emitted infra-red radiation to centre at between 10,000 and 11,000 Å; (3) the fact of an optimum of skin transparency occurring within a well-defined spectral region also accounts for the view that neither gas nor electric space-heating appliances are quite the equipment to be used in physical therapy, even if the wavelengths of the radiations emitted by the fire should, by sheer accident, fall within the therapeutically optimal range.

Books of "Any Questions?" and Refresher Course Articles.—The following books are available through booksellers or from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1. TELEPHONE: EUSTON 4499. TELEGRAMS: *Atiology, Western, London*. ORIGINAL ARTICLES AND LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated. Authors desiring REPRINTS should communicate with the Publishing Manager, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad. ADVERTISEMENTS should be addressed to the Advertisement Director, B.M.A. House, Tavistock Square, London, W.C.1 (hours 9 a.m. to 5 p.m.). TELEPHONE: EUSTON 4499. TELEGRAMS: *Britmedads, Western, London*. MEMBERS' SUBSCRIPTIONS should be sent to the SECRETARY of the Association, TELEPHONE: EUSTON 4499. TELEGRAMS: *Medisecura, Western, London*. B.M.A. SCOTTISH OFFICE: 7, Drumshugh Gardens, Edinburgh

WILLIAM HARVEY, 1578-1657

TERCENTENARY OF HIS DEATH

With the kind permission of the University of Glasgow we reproduce overleaf the portrait of William Harvey at the age of about 78, now in the University's Hunterian Collection.

Sir Geoffrey Keynes, in his Linacre lecture, 1949, on "The Personality of William Harvey," says this of the portrait:

"It was acquired very early in the eighteenth century by the famous Dr. Mead, who knew all the famous men of his time, including some that must have known Harvey. At the sale of Mead's collection in 1754 it was bought for Hunter, and in his collection it has remained ever since. It is a much less formal, more intimate, picture of Harvey than the ceremonial portrait at the College of Physicians. He does not look a very happy or satisfied man, as we have reason to know that he was not. The characteristic eyebrow is there, and the complexion in the picture itself entirely agrees with Aubrey's description as olivaster, the colour of wainstot. The patches on the cheeks are due to high colour, agreeing with Aubrey's description of his hot-headedness, and our knowledge that his blood-pressure was certainly raised in his last years. Notice also the faithful rendering of the distended temporal vein. But you may ask, why does he finger the leaves of a book with a Vesalian engraving of a skull, and why a background representing a view of Rome? The book is the *Works of Spigelius*, 1645. It happens to contain a reprint of Harvey's *De Motu Cordis*, but in fact it serves also to remind us that Harvey was a general anatomist, not merely the demonstrator of the circulation of the blood. The background shows the Church of S. Maria de Loreto and Trajan's Column; for Harvey had visited Rome in 1636, and the library he had built for the College of Physicians was inspired by an admiration for Roman architecture. . . . The Hunterian portrait is, then, almost, if not quite, the most interesting representation of Harvey in his old age that we possess, and there are a number of other portraits derived from it, including the well-known engraving by Houbraken."

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TERCENTENARY OF THE DEATH OF WILLIAM HARVEY

To commemorate the death of William Harvey, Fellow of the Royal College of Physicians, we reprint from the pages of this journal two Harveian Orations (abridged) delivered at the Royal College of Physicians of London by two of its most distinguished Fellows: Sir William Osler and Sir Thomas Barlow

1. THE GROWTH OF TRUTH:

AS ILLUSTRATED IN THE DISCOVERY OF THE CIRCULATION OF THE BLOOD

Being the Harveian Oration delivered at the Royal College of Physicians, London, October 18, 1906

BY

WILLIAM OSLER, M.D., F.R.S.

[b. 12 July, 1849. d. 29 Dec., 1919]

I

After an introduction in which he discoursed on scientific truth the Orator continued: By no single event in the history of science is the growth of truth, through the slow stages of acquisition, the briefer period of latent possession, and the for us glorious period of conscious possession, better shown than in the discovery of the circulation of the blood. You will all agree with me that a Fellow of this College must take his courage in both hands who would, in this place and before this audience, attempt to discuss any aspect of this problem. After nearly three centuries of orations the very pictures and books in this hall might be expected to cry out upon him. But I have so taken my courage, confident that in using it to illustrate certain aspects of the growth of truth I am but obeying the command of Plato, who insists that principles such as these cannot be too often or too strongly enforced. There is a younger generation, too, the members of which are never the worse for the repetition of a good story, stale though it may be in all its aspects to their elders; and then there is that larger audience to be considered to which the season is never inappropriate to speak a word.

II

The sixteenth century, drawing to a close, had been a period of acquisition unequalled in history. Brooding over the face of the waters of mediaevalism, the spirit of the Renaissance brought forth a science of the world and of man which practically created a new heaven and a new earth, and the truths announced by Copernicus and Galileo far transcended

the searching schoolmen's view

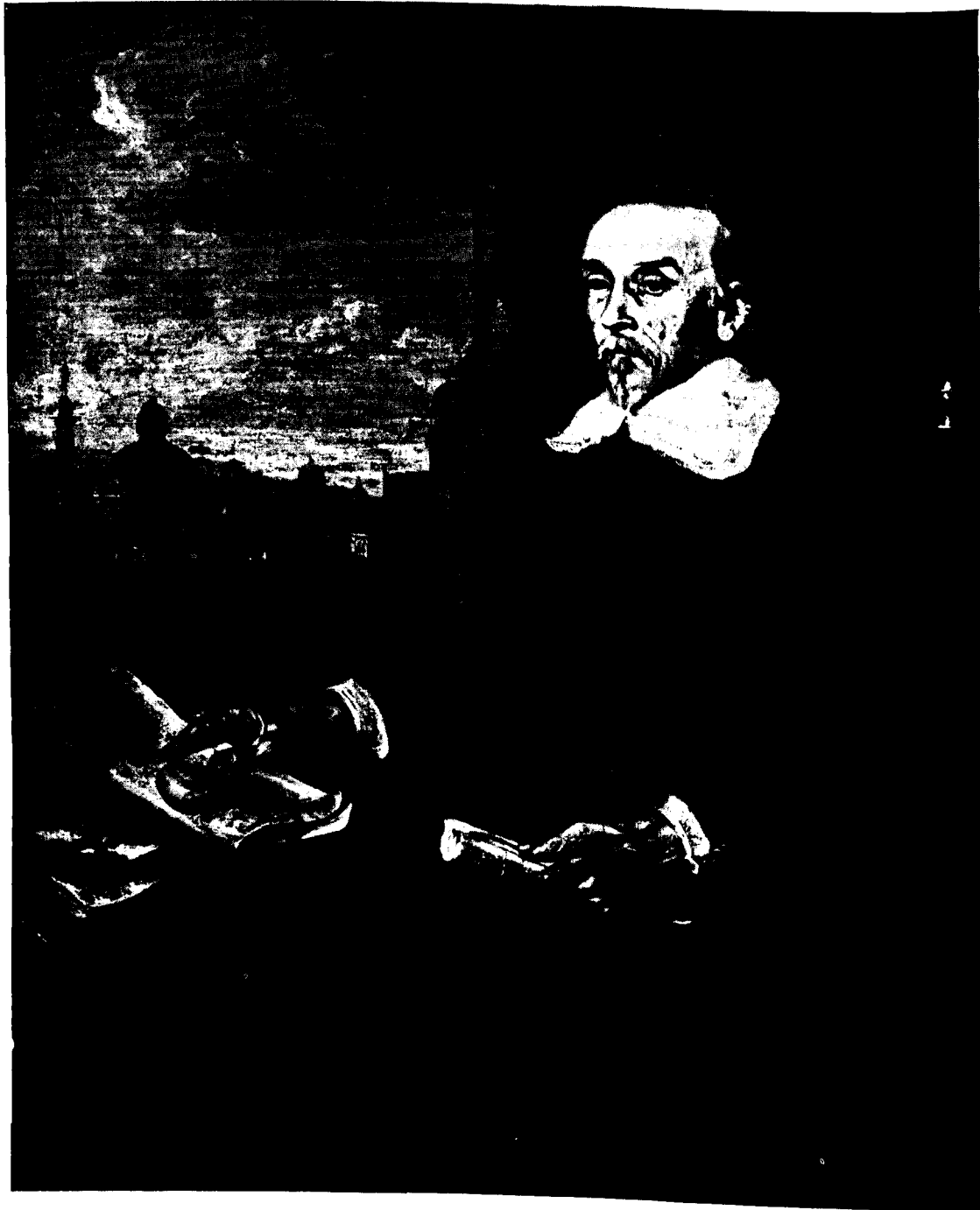
And half had staggered that stout Stagyrte.

Among other things, it had given to medicine a new spirit, a new anatomy, and a new chemistry. In the latter part of the fifteenth century Hippocrates and Galen came to their own again. A wave of enthusiasm for the fathers in medicine swept over the profession; and for at least two generations the best energies of its best minds were devoted to the study of their writings.

How numerous and important is that remarkable group of men, the medical humanists of the Renaissance, we may judge by a glance at Bayle's *Biographie Médicale*, in which the lives are arranged in chronological order. From Garbo of Bologna, surnamed the expositor, to Rabelais, more than 150 biographies and bibliographies are given, and at least one-half of these men had either translated or edited works of the Greek physicians. Of our founder, one of the most distinguished of the group, and of his influence in reviving the study of Galen and so indirectly of his influence upon Harvey, Dr. Payne's story still lingers in our memories. Leonicens, Linacre, Gonthier, Monti, Koch, Camerarius, Caius, Fuchs, Zerbi, Cornarus, and men of their stamp not only swept away Arabian impurities from the medicine of the day, but they revived Greek ideals and introduced scientific methods.

The great practical acquisition of the century was a new anatomy. Vesalius and his followers gave for the first time an accurate account of the structure of the human body, and while thus enlarging and correcting the work of Galen, contributed to weaken the almost divine authority with which he dominated the schools. Nearly another century passed before chemistry, in the hands of Boyle and others, reached its modern phase, but the work of Paracelsus, based on that of the "pious Spagyrist," Basil Valentine, by showing its possibilities, had directed men's minds strongly to the new science. Of the three, the new spirit alone was essential, since it established the intellectual and moral freedom by which the fetters of dogma, authority, and scholasticism were for ever loosened from the minds of men.

Into this world, we may say, stepped a young Folkestone lad, when, on the last day of May, 1593, he matriculated at Cambridge. Harvey's education may be traced without difficulty, because the influences which shaped his studies were those which had for a century prevailed in the profession of this country. We do not know the reason for selection of Caius College, which, so far as I can gather, had no special connexion with the Canterbury school. Perhaps it was chosen because of the advice of the family physician, or of a friend, or of



WILLIAM HARVEY, 1578-1657

his rector; or else his father may have known Caius; or the foundation may already have become famous as a resort for those about to "enter on the physic line." Or, quite as likely, as we so often find in our experience, some trivial incident may have turned his thoughts towards medicine. When he came up in 1593, there were those of middle age who could tell racy stories of Caius, the co-founder of the college, against whose iron rule they had rebelled. "Charged not only with a show of a perverse stomach to the professors of the Gospel, but with Atheism," the last days of Caius's noble life were embittered by strife and misunderstanding. Doubtless the generous souls among them had long since learned to realize the greatness of his character, and were content to leave "the heat of his faith to God's sole judgement, and the light of his good works to men's imitation," with which words, half a century later, the inimitable Fuller concludes a short sketch of his life. I like to think that, perhaps, one of these very rebels, noting the studious and inquisitive nature of Harvey, had put into the lad's hand the little tractate, *De libris propriis*, from which to glean a knowledge of the life and works of their great benefactor.

The contemplation of such a career as that of Caius could not but inspire with enthusiasm any young man. No one in the profession in England had before that time reached a position which I may describe as European. An enthusiastic student and the friend of all the great scholars of the day; a learned commentator on the works of the Fathers; the first English student in clinical medicine; a successful teacher and practitioner; a keen naturalist; a liberal patron of learning and letters; a tender and sympathetic friend—Johannes Caius is one of the great figures in our history. Nor need I dwell, before this audience, on his devotion to our interests, other than to say that the memory of no Fellow on our roll should be more precious to us. Four years hence, on October 6th, will occur the quarter-centenary of his birth. As well in love as in gratitude, we could celebrate it in no more appropriate manner, and in none that would touch his spirit more closely, than by the issue of a fine edition of his principal works (including the MS. annals of the College). For the preparation of this there are those among us well fitted, not less by veneration for his memory than by the possession of that critical scholarship which he valued so highly.

When Harvey set out on the grand tour, Italy was still the *mater gloriosa studiorum*; to which one hundred years earlier, so tradition says, Linacre on leaving had erected an altar. The glamour of the ideals of the Renaissance had faded somewhat since the days when John Free, an Oxford man, had made the ancient learning his own; and had so far bettered the instruction of his masters that he was welcomed as a teacher in Padua, Ferrara, and Florence. In a measure, too, the national glory had departed, dimmed amid the strife and warfare which had cost the old republics their independence. Many years earlier Fracastorius, one of our medical poets, had sung of her decadence:

To what estate, O wretched Italy,
Has civil strife reduc'd and moulder'd Thee!
Where now are all thy ancient glories hurl'd?
Where is thy boasted Empire of the world?
What nook in Thee from barbarous Rage is freed
And has not seen thy captive children bleed?

And matters had not improved but had grown worse. In the sixteenth century Italian influence had sunk deeply into the social, professional, and commercial life of England, more deeply, indeed, than we appreciate; and it was not for

a generation or two later that the candlesticks were removed from the Cisalpine towns to Montpellier, Paris, and Leyden. In 1593 a well-to-do young Englishman who wished to study medicine thoroughly went to North Italy, and most naturally to Padua—"fair Padua, nursery of the arts"—whose close affiliations with us may be gathered from the fact that, of universities next to Oxford and Cambridge, she has given us more Presidents than any other. In the years that had passed since Vesalius had retired in disgust, the fame of its anatomical school had been well maintained by Fallopius, Columbus, and Fabricius, worthy successors of the great master. Of each may be said what Douglas says of the first named: "*In docendo maxime methodicus, in medendo felicissimus, in secundo expertissimus.*" While the story of Harvey's student life can never be told as we could wish, we know enough to enable us to understand the influences which moulded his career. In Fabricius he found a man to make his life-model. To the enthusiastic teacher and investigator were added those other qualities so attractive to the youthful mind, generous sympathies and a keen sense of the wider responsibilities of his position, as shown in building, at his own expense, a new anatomical theatre for the University. Wide as was the range of his master's studies, embracing not alone anatomy but medicine and surgery, the contributions by which he is most distinguished are upon subjects in which Harvey himself subsequently made an undying reputation. The activity of his literary life did not begin until he had been teaching nearly forty years, and it is a fact of the highest significance that, corresponding to the very period of Harvey's stay in Padua, Fabricius must have been deep in the study of embryology and of the anatomy of the vascular system. His great work on generation was the model on which Harvey based his own, in some ways, more accurate studies—studies in which, as my colleague Professor Brooks of the Johns Hopkins University has pointed out, he has forestalled Wolf and von Baer.

The work of Fabricius which really concerns us here is the *De Venarum Ostiis*. Others before him had seen and described the valves of the veins, Carolus one of the great Stephani, Sylvius and Paul Sarpi. But an abler hand in this work has dealt with the subject, and has left us a monograph which for completeness and for accuracy and beauty of illustration has scarcely its equal in anatomical literature. Compare Plate VII, for example, with the illustrations of the same structures in the Bidloo or the Cowper *Anatomy*, published nearly one hundred years later; and we can appreciate the advantages which Harvey must have enjoyed in working with such a master. Indeed, it is not too far-fetched to imagine him, scalpel in hand, making some of the very dissections from which these wonderful drawings were taken. But here comes in the mystery. How Fabricius, a man who did such work—how a teacher of such wide learning and such remarkable powers of observation, could have been so blinded as to overlook the truth which was tumbling out, so to speak, at his feet, is to us incomprehensible. But his eyes were sealed, and to him, as to his greater predecessors in the chair, clear vision was denied. The dead hand of the great Pergamite lay heavy on all thought, and Descartes had not yet changed the beginning of philosophy from wonder to doubt. Not without a feeling of pity do we read of the hopeless struggle of these great men to escape from slavish submission to authority. But it is not for us in these light days to gauge the depth of the sacred veneration with which they regarded the Fathers. Their mental attitude is expressed in a well-known poem of Browning's:

those divine men of old time
Have reached, thou sayest well, each at one point
The outside verge that rounds our faculty,
And where they reached who can do more than reach?

Willing to correct observations or to extend anatomy by careful dissection, it was too much to expect from them either a new interpretation of the old facts or a knowledge of the new method by which those facts could be correctly interpreted.

The ingenious explanation which Fabricius gave of the use of the valves of the veins—to serve as dams or checks to the flow of the blood, so that it would not irrigate too rapidly and overflow the peripheral vessels to the deprivation of the upper parts of the limbs—shows how the old physiology dominated the most distinguished teacher of the time in the most distinguished school of Europe. This may have been the very suggestion to his pupil of the more excellent way. Was it while listening to this ingenious explanation of his master that, in a moment of abstraction—dimly dreaming, perhaps, of an English home far away and long forsaken—there came to Harvey a heaven-sent moment, a sudden inspiration, a passing doubt nursed for long in silence, which ultimately grew into the great truth of 1616?

The works of Vesalius, of Fallopius, and of Fabricius effected a revolution in anatomy, but there was not at the close of the sixteenth century a new physiology. Though he had lost an anatomical throne, Galen ruled absolutely in all conceptions of the functions of the body, and in no department more serenely than in that relating to the heart, the blood and its movements. Upon his views I need not dwell further than to remind you that he regarded the liver as the source of the blood, of which there were two kinds, the one in the veins, the other in the arteries, both kinds in ceaseless ebb and flow, the only communication between these closed systems being through pores in the ventricular septum. He knew the lesser circulation, but thought it only for the nutrition of the lungs. The heart was a lamp which was furnished with oil by the blood and with air from the lungs. Practically until the middle of the seventeenth century Galen's physiology ruled the schools, and yet for years the profession had been in latent possession of a knowledge of the circulation. Indeed, a good case has been made out for Hippocrates, in whose works occur some remarkably suggestive sentences. In the sixteenth century the lesser circulation was described with admirable fullness by Servetus and by Columbus, and both Sarpi and Caesalpinus had Hippocratic glimmerings of the greater circulation. These men, with others doubtless, were in latent possession of the truth. But every one of them saw darkly through Galenic glasses, and theirs was the hard but the common lot never to reach such conscious possession as everywhere to make men acquiesce. One must have the disinterestedness of the dead to deal with a problem about which controversy has raged, and in which national issues have been allowed to blur the brightness of an image which would be clear as day to those with eyes to see. Nor would I refer to a matter long since settled by those best competent to judge, had not the well-known work of Luciani, the distinguished Professor of Physiology at Rome, appeared recently in German dress, edited by Professor Verworn, and spread broadcast views to which, with a chauvinism unworthy of their history, our Italian brethren still adhere. It has been well said "that he alone discovers who proves," and in the matter of the circulation of the blood, this was reserved for the pupil of Fabricius. Skipping many arduous years we next meet him as Lumleian Lecturer to the College.

III

The really notable years in the annals of medicine are not very numerous. We have a calendar filled with glorious names, but among the saints of science, if we know an era it is as much as can be expected—perhaps because such men are less identified with achievements than representative of the times in which they lived. With many of our greatest names we cannot associate any fixed dates. The Grecians who made Hippocrates possible, live in memory with some theory, or a small point in anatomy, or in regard to the place of their birth; while the "floruit" cannot always be fixed with accuracy.

Hippocrates himself, Erasistratus, Galen, and Aretaeus have no days in our calendar. We keep no festival in their honour as the churches do those of St. Jerome and

St. Chrysostom. It is not until after the Renaissance that certain years (*anni mirabiles*) stand out in bold relief as connected with memorable discoveries, or with the publication of revolutionary works. Nevertheless, only a few in each century; even the sixteenth, so rich in discoveries, has not more than five or six such years, and not one of them is connected with work done in this country. As to the seventeenth century, it is hard to name four made memorable by the announcement of great discoveries or the publication of famous works; in the eighteenth century not three, while in the century just completed, though it is replete with extraordinary discoveries, one is hard pressed to name half a dozen years which flash into memory as made ever memorable by great achievements. Of the three most important, anaesthesia, sanitation, and antiseptic surgery, only of the first can the date be fixed, 1846, and that for its practical application. For the other two discoveries, who will settle upon the year in which the greatest advance was made, or one which could be selected for an anniversary in our calendar?

There is one *dies mirabilis* in the history of the College—in the history, indeed, of the medical profession of this country, and the circumstances which made it memorable are well known to us. At ten o'clock on a bright spring morning, April 17th, 1616, an unusually large company was attracted to the New Anatomical Theatre of the Physicians' College, Amen Street. The second Lumleian Lecture of the annual course, given that year by a new man, had drawn a larger gathering than usual, due in part to the brilliancy of the demonstration on the previous day, but also it may be because rumours had spread abroad about strange views to be propounded by the lecturer. I do not know if at the College the same stringent rules as to compulsory attendance prevailed as at the Barber Surgeons' Hall. Doubtless not; but the President, and Censors, and Fellows would be there in due array; and with the help of the picture of "The Anatomy Lecture" by Bannister, which is in the Hunterian collection, Glasgow, and a photograph of which Dr. Payne has recently put in our library, we can bring to mind this memorable occasion. We see the "Anatomy," one of the six annually handed over to the College, on the table, the prosector standing by the skeleton near at hand, and very probably on the wall the very *Tabulae* of dissection of the arteries, veins, and nerves that hang above us to-day. But the centre of attention is the lecturer—a small dark man, wand in hand, with black piercing eyes, a quick vivacious manner, and with an ease and grace in demonstrating which bespeaks the mastery of a subject studied for twenty years with a devotion that we can describe as Hunterian. A Fellow of nine years' standing, there was still the salt of youth in William Harvey when, not as we may suppose, without some trepidation, he faced his auditors on this second day—a not uncritical audience, including many men well versed in the knowledge of the time and many who had heard all the best lecturers of Europe.

The President, Henry Atkins, after whose name in our Register stands the mysterious word "Corb," had already had his full share of official lectures, less burdensome three hundred years ago than now. Let us hope the lecture of the previous day had whetted his somewhat jaded appetite. The Censors of the year formed an interesting group; John Argent, a Cambridge man, a "great prop of the college," and often President, of whom but little seems known; Richard Palmer, also of Cambridge, and remembered now only for his connexion with Prince Henry's typhoid fever, as Dr. Norman Moore has told us; Mathew Gwinne of Oxford, first Professor of Physic at Gresham College and a playwright of some note in his day; and Theodore Goulston of Merton College, one of our great benefactors, and for 267 years past and gone purveyor-in-chief of reputation to the younger Fellows of the College. Mayerne would be there, not yet a Fellow, but happy in his escape from the Paris Faculty; still dusty with conflict, he would scent the battle afar in the revolutionary statements which he heard. Meverell, fresh from incorporation at Cambridge, also not

is made by the veins, as its going forward is performed only by the arteries."

Sir William Temple well expresses the attitude of mind of the intellectual Philistine of the time, who looked for immediate results. Speaking of the work of Harvey and of Copernicus he says: "Whether either of these be modern discoveries or derived from old foundations is disputed; nay, it is so too, whether they are true or no; for though reason may seem to favour them more than the contrary opinions, yet sense can hardly allow them, and to satisfy mankind both these must concur. But if they are true, yet these two great discoveries have made no change in the conclusions of Astronomy nor in the practice of Physic, and so have been but little use to the world, though, perhaps, of much honour to the authors." It is pleasant to notice that our old friend, Sir Thomas Browne, with his love of paradox, declared that he preferred the circulation of the blood to the discovery of America.

Of the reception of Harvey's views in Holland and Germany there is nothing to add to the admirable account given by Willis. The early and strenuous advocacy of Descartes, must have influenced the Dutch physicians; but in this, as in so many other things, the infection of his early years proved too powerful, and he could not get rid of the "ancient spirits." Of the discovery of the circulation he says it is "la plus belle et la plus utile que l'on pût faire en médecine." "Tout à fait contraire au sien touchant le mouvement du cœur," which he held to be due to an ebullition of the spirits—a sort of ferment (*espèce de levain*) existing in it. Much more actively discussed in Holland than elsewhere, the writings of Drake, Walaëus, Regius, Plempius, Sylvius, de Bach, Conringius, T. Bartholini (the Dane), and others threshed out the whole question very thoroughly, and their views, with those of Hoffman, Slegel, and others, are referred to by Willis and given in greater detail by Riolan.

In the oft-quoted statement that Harvey, "conquering envy, hath established a new doctrine in his lifetime," Hobbes was right so far as England and Holland are concerned. But it was far otherwise in France, where it met with a bitter and protracted hostility. The Medical School of the University of Paris, at the time one of the best-organized and most important in Europe, declined to accept the circulation of the blood during his lifetime and for some years after his death. The history of the period is pictured for us in vivid colours in that *journal intime* which Gui Patin kept up with his friends, Spohn and Falkconet of Lyons and the Belins (*père et fils*). With all his faults, particularly his scandalous lack of charity, one cannot but feel the keenest sympathy with this dear old man. Devoted to his saints, Hippocrates and Galen, Fernel and Duret, and to his teachers, Piètre and Riolan, to him the circulation of the blood was never more than an ingenious paradox. To such a lover of books and of good literature everything can be forgiven, and in his letters we follow with deepest interest his vigorous campaign against his dear enemies, the *Cuisiniers Arabesques*, who had enslaved people and physicians alike, the haemophobes, the chemists, the astrologers and the *stibiate*, or as he calls it, the *Stygiate* group. To him the Koran was less dangerous than the works of Paracelsus, the appearance of the new Geneva edition of which he deeply deplores. Reverence for Galen and friendship with Riolan, rather than any deep interest in the question, inspired his opposition. To him the new doctrine was ridiculous, and it was he who called the partisans of it *circulateurs* in allusion to the Latin word, *circulator*, meaning charlatan. In 1652 he writes to Spohn that the question is still open whether the blood passes through the septum of the heart or through the lungs. In 1659 he promises to send him a work of Vineau against the circulation. More extraordinary still is the fact that as late as 1670, twelve years after Harvey's death, the thesis of one Cordelle, a bachelor of medicine, publicly discussed the circulation of the blood, and Gui Patin, who presided, decided in the negative. The fiction of an ingenious narrator, *le doux songe*

of Harvey, are the terms in which he speaks of it. The whole passage is worth quoting as possibly the last public denouncement of what seemed a rank heresy to the old Galenists: "Supposer que le sang se meut toujours circulairement, que de la veine cava ascendante il tombe dans l'oreillette droit du cœur, que de là il aille traverser toute la substance du poumon pour retomber de là dans l'oreillette gauche en passant par la veine pulmonaire, et qu'enfin de là il soit projeté dans l'aorte et toutes les artères qui le feront passer dans les veines, et dans le cœur, lui faisant par ce moyen suivre un circuit, voilà le doux songe de Harvey, la fiction d'un narrateur ingénieux, mais nullement prouvée par l'évidence. La circulation du sang, son transport circulaire par les vaisseaux, c'est l'enfantement d'un esprit oisif, un vrai nuage qu'embrassent les Ixions pour procréer les Centaures et les monstres."

As I said, we can forgive a great deal to the man who has left us such a picture of seventeenth-century life, drawn, all unconsciously, with a master hand; and through the mists of prejudice and hate we can recognize the good sense which had the courage to protest against the *forfanterie Arabesque et héraodesque* in much of the therapeutics of the day.

Though a professor in the Paris Faculty and a brilliant lecturer, Patin at that time did not occupy such a distinguished position, nor was his opposition of such importance as that of Riolan—"John Riolan, the Son, the most experienced Physician in the Université de Paris, the Prince of Dissection of Bodies, and the King's professor, and Dean of Anatomie and of the knowledge of simples, chief physician to the queen-mother of Louis XIII"—as he is quaintly, but very truly, described by Harvey. Brought up by his father to regard Hippocrates and Galen as the sources of all wisdom, the intensity of his zeal increased with his years until at last "to see the physic of Galen kept in good repair" became the passion of his life. The deep pity of it all is that such mental blindness should have stricken a really great man, for he was a brilliant anatomist and teacher, the author of the best anatomical textbook of its day, a man of affairs, profoundly versed in literature, a successful practitioner, and for years the head of the profession in France.

The opposition of such a man was serious, and naturally had a profound influence. Not content with the comparatively brief statement in the *Encheiridion*, 1648, Riolan published in England the following year his *Opuscula Anatomica nova*, one very large section of which is taken up with the problem of circulation. It was this probably as much as a present of the *Encheiridion* that induced Harvey to break his long silence and to reply. After a report of a discussion upon a thesis in 1645 and a statement of objections, a most interesting discussion follows the literature, in which the opinions of various writers are examined, particularly those of Cartesius, Conringius, Wallaeus, and Plempius.

It is quite possible that the second *Disquisition* of Harvey to Riolan, published with the first in duodecimo form at Cambridge in 1649, was brought out by Riolan's latter publication, though it is not directly referred to. Little did Harvey appreciate that his old friend was both blind and deaf—incapable of seeing obvious facts. It was not a question of being conversant with anatomy or of having had experience, on both of which points Harvey dwells at length. Riolan knew his anatomy as well as, or better than, any man of his generation. It was not that he would not—but that he could not—see the truth which was staring him in the face. As Raynaud mentions, an occasional thesis (Fagon, 1663; Mattol, 1665) supporting the circulation did slip through the Faculty; but the official recognition in France did not come until 1673, when Louis XIV founded a special Chair of Anatomy at the Jardin des Plantes for the propagation of the new discoveries.

The satire of Molière and the *Arrêt Burlesque* of Boileau completed the discomfiture of the "anticirculateurs," but it had taken nearly half a century to overcome the opposition of those who saw in the new doctrines the complete destruction of the ancient system of medicine.

IV

Even when full grown in the conscious stage Truth may remain sterile without influence or progress upon any aspects of human activity. One of the most remarkable of phenomena in mental biography is the failure of the Greeks to succeed after giving the world such a glorious start. They had every essential for permanent success: scientific imagination, keen powers of observation; and if in the days of Hippocrates the mathematical method of interrogating Nature prevailed rather than the experimental, Galen carried the latter to a degree of perfection never again reached until the time of Harvey. Only when placed in its true position in relation to Greek religion and philosophy, as has been done so skilfully by Gomperz,* do we realize the immensity of the debt we owe to those "our young light-hearted masters." And Gomperz makes clear the nature of the debt of Greek thought to the practical sense of the physicians. But alas! upon the fires they kindled were poured the dust and ashes of contending philosophies, and neither the men of the Alexandrian school nor the brilliant labours of the most encyclopaedic mind that has ever been given to medicine sufficed to replenish them. Fortunately, here and there amid the embers of the Middle Ages glowed the coals from which we have lighted the fires of modern progress. The special distinction which divides modern from ancient science is its fruitful application to human needs—not that this was unknown to the Greeks; but the practical recognition of the laws of life and matter has in the past century remade the world. In making knowledge effective we have succeeded where our masters failed. But this last and final stage, always of slow and painful consummation, is evolved directly from truths which cannot be translated into terms intelligible to ordinary minds. Newton's great work influenced neither the morals nor the manners of his age, nor was there any immediate tangible benefit that could be explained to the edification or appreciation of the "ordinary man" of his day; yet it set forward at a bound the human mind, as did such truths as were proclaimed by Copernicus, by Kepler, by Darwin, and others. In a less conspicuous manner Harvey's triumph was on the same high plane. There was nothing in it which could be converted immediately into practical benefit, nothing that even the Sydenhams of his day could take hold of and use. Not so much really in the demonstration of the fact of the circulation as in the demonstration of the method—the *inventum mirabile* sought for by Descartes, the *Novum Organum* of Bacon—lies the true merit of Harvey's work. While Bacon was thinking, Harvey was acting; and before Descartes had left his happy school at le Flèche Harvey was using *le nouvelle méthode*; and it is in this way that the *De Motu Cordis* marks the break of the modern spirit with the old traditions. No longer were men to rest content with careful observation and with accurate description; no longer were men to be content with finely spun theories and dreams, which "serve as a common subterfuge of ignorance"; but here for the first time a great physiological problem was approached from the experimental side by a man with a modern scientific mind, who could weigh evidence and not go beyond it, and who had the sense to let the conclusions emerge naturally but firmly from the observations. To the age of the hearer, in which men had heard, and heard only, had succeeded the age of the eye, in which men had seen and had been content only to see. But at last came the age of the hand—the thinking, devising, planning hand; the hand as an instrument of the mind, now reintroduced into the world in a modest little monograph of seventy-two pages, from which we may date the beginning of experimental medicine.

No great discovery in science is ever without a corresponding influence on medical thought, not always evident

*The three volumes of his *Greek Thinkers*, now in English dress, should be studied by every young man who wishes to get at the foundations of philosophy. The picturesque style of Professor Gomperz and his strong sympathy with science add greatly to the interest of the work.

at first, and apt to be characterized by the usual vagaries associated with human effort. Very marked in each generation has been the change wrought in the conceptions of disease and in its treatment by epoch-making discoveries as to the functions of the body. We ourselves are deeply involved to-day in toxins and antitoxins, in opsonins, tulases, and extracts, as a direct result of the researches in bacteriology and in internal secretion. There were sanguine souls in Harvey's day who lamented with Floyer that the discovery had not brought great and general innovations into the whole practice of physic. But had the old Lichfield physician lived he would have seen the rise of a school based directly upon the studies of Harvey and Santorini, the brilliant reasonings of Descartes, and the works of Bellini and Borelli. The mechanical school rose in its pride on solid foundations which appealed to practical men with singular force. Very soon that "beautiful epitome of creation," man, was "marked out like a spot of earth or a piece of timber with rules and compasses," and the medical terminology of the day became unintelligible to the older practitioners who could make nothing of the "wheels and pulley, wedges, levers, screws, cords, canals and cisterns, sieves and strainers," and they cracked their jokes on "angles, cylinders, celerity, percussion, resistance, and such-like terms which they said had no more to do with physic or the human body than a carpenter has in making Venice treacle or curing a fever." Once accepted, men had a feeling that so important a discovery must change all the usual conceptions of disease. As has been said before, Harvey tells that he had in preparation a *Practice of Medicine conformable to his Thesis of the Circulation of the Blood*, and it soon became customary to put in the title pages of works some reference to the new doctrine. Even Riolan's *Opuscula Anatomica* makes an allusion to it. Walaëus, a keen defender of Harvey, published in 1660 a little compendium of practice *ad circulationem sanguinis adornata*, but there is nothing in it to suggest any radical change in treatment. Rolfinck's *Dissertationes Anatomicae*, 1650, embracing the older and more recent views in medicine, are *ad circulationem accommodatae*, and even as late as 1690 the well-known anatomy of Dionis was *suivant la circulation*. With the loss of his work on the *Practice of Medicine* it is impossible to say whether Harvey's own practice was modified in any way. To part from the spirits and humours must have left his attitude of mind very sceptical, and that his "therapeutic way" was not admired (as Aubrey tells us) speaks for a change which may have set many against him. More important than any influence upon treatment was the irresistible change in the conceptions of disease caused by destruction of the doctrine of spirits and humours, which had prevailed from the days of Hippocrates. While Harvey, as he says, had in places to use the language of physiology, that is, the language of the day, he makes it very clear, particularly in the second letter to Riolan, that he will have none of the old doctrine to which the *De Motu Cordis* dealt the death blow.

[The Orator concluded with some general reflections on the College and its Fellows.]

"I remember he kept a pretty young wench to wayte on him, which I guesse he made use of for warmeth-sake as king David did . . .

"He was, as all the rest of the brothers, very cholerique; and in his young days wore a dagger (as the fashion then was) . . .

"He was not tall; but of the lowest stature, round faced, olivaster complexion; little eie, round, very black, full of spirit; his haire was black as a raven, but quite white 20 yeares before he dyed . . .

"He was much and often troubled with the gowte . . .

"He was hote-headed and his thoughts working would many times keepe him from sleepe; he told me that then his way was to rise out of his bed and walke about his chamber in his shirt till he was pretty coole . . .

"William Harvey." *Aubrey's "Brief Lives."* Oxford, 1898.

2. HARVEY, THE MAN AND THE PHYSICIAN

The Harveian Oration delivered before the Royal College of Physicians of London on St. Luke's Day, 1916

BY

Sir THOMAS BARLOW, Bt., K.C.V.O., M.D., F.R.S

[b. 4 Sept., 1845. d. 12 Jan., 1945]

After his introductory remarks the Orator said: We know that the young Harvey was a pupil at the King's School, Canterbury, from the age of 10 to 15, where we may well assume that he gained the foundations of that classical knowledge which stood him in such good stead throughout his life. It was there probably that he made his first acquaintance with Virgil, whose poetry fascinated him in his later life; is it possible that he may even have begun to read Aristotle, whose influence over him was probably greater than that of any other writer, ancient or modern?

But were there no other studies than the classics which laid hold of young Harvey in his schoolboy days?

Dr. Venn, the learned President of Caius College, Cambridge, has drawn my attention to the regulations of the scholarship which Harvey obtained and which enabled him to go from King's School, Canterbury, to Caius College for six years. It was founded in 1571 by Matthew Parker, Archbishop of Canterbury, who was an intimate friend of Dr. Caius, and it is not unlikely that Caius influenced Parker in framing the conditions under which it was given. The most interesting of these is the enactment that at the university the scholar shall be educated first in subjects that pertain to or are serviceable to medicine and then in subjects which actually constitute medicine itself. Such a regulation for a medical scholarship is very remarkable and Dr. Venn considers unique at that time.

Let us consider for a moment its bearing upon Harvey and his predilections. It is not unreasonable to assume that he had already determined to become a doctor. Are we justified in any further speculations?

We know that throughout his later life Harvey was not only devoted to comparative anatomy, but that he was a keen naturalist. Dr. Norman Moore points out that in Harvey's *Prelectiones* there are references to the anatomy of no less than eighty animals. His book on generation is a mine of observations on natural history. In his Continental travel with the Duke of Lennox he complains bitterly that there was scarcely a dog, crow, kite, raven, or any bird or anything to anatomize; and when he was travelling with Lord Arundel in Germany, on the testimony of Hollar the artist, he made frequent excursions in the woods, making observations on strange trees, plants, earths, and naturals, and caused some anxiety to Lord Arundel lest he should be waylaid or murdered.

This intense lifelong devotion to natural history is usually an inborn quality, and it is by no means unlikely that in Harvey's schoolboy days it was this strong predilection that justified the authorities in nominating him to what was practically a medical scholarship. Harvey's first term at Cambridge began in May, 1593, when we are told he was admitted to the scholars' table at Caius College. Dr. Caius had been gathered to his fathers twenty years before. Dr. Legge, whom he had appointed as his successor, was of Caius' way of thinking in his Roman proclivities, and there was a stormy time in the college for a while. There is no indication that Harvey

was drawn into this conflict, and it may have quieted down when he entered the college.

His tutor and surety was George Estey, who seems to have been a worthy parson and was appointed Hebrew lecturer the year after Harvey's entrance; but Harvey never refers to him.

Although Caius College had a medical reputation we find rather meagre evidence of systematic instruction in medical subjects, and this in spite of Dr. Caius having laid down certain definite plans for its maintenance. He had obtained a licence for the dissection of two bodies annually in the winter and for their decent burial. The church registers give evidence that bodies, chiefly of prisoners, were dissected. Demonstrations were given.

Dr. Venn, by reference to the *Exiit Book* and the *Computus Book* of the college, which give detailed entries respectively of the students' absences and the charges for their commons, has been so good as to furnish me with some interesting and suggestive information about Harvey's time at Cambridge. As these entries have an important bearing on the question of when Harvey left Cambridge and when he entered Padua I bespeak consideration of them. It is commonly stated that Harvey took his B.A. degree in 1597 and that he left Cambridge in 1598 and entered Padua in that same year. I think you will see that this is incorrect. He entered Padua in 1600.

The *Exiit Book*, which was made up half-yearly, shows that during the first three years there were no absences. This may mean that Harvey did not leave the college at all during this period or for such brief intervals as did not involve any deduction from the stipend of his scholarship. We have to remember that one month's absence for holiday was allowed by statute, and that could be taken at any time. The *Computus* or *Account Book* is consistent, for it shows that Harvey's stipend from his scholarship was very nearly sufficient to pay the cost of his commons.

But from 1596 to 1599 the *Exiit Book* shows repeated absences. It is clear from the dates that Harvey was away from college not less than sixteen months. Some of his absences were of two months' duration or more, and some of them a few days up to a fortnight, and from his own letter in Michaelmas, 1599, he evidently required at times a long period of convalescence. The accounts show that he only received a stipend for one quarter between Michaelmas, 1599, and Lady Day, 1600—so that his scholarship lapsed at Christmas, 1599.

We know that, like Sydenham, Harvey suffered at various times severely from gout. He complained very little of his ailments, and somewhere speaks of the help which his pathological and anatomical investigations gave him by rousing keen interest and making him forget his pains. I suggest that the absences during the last half of Harvey's time at Cambridge were probably due to attacks of gout.

Harvey took his Arts degree in 1597, but there are no details obtainable concerning it, nor about his work at

Cambridge after he had taken his degree. It is significant that there are no references in Harvey's works to his Cambridge life. His poor health and the limited facilities for anatomical study may have left this period as one which he would gladly pass by. There is a categorical statement in Aubrey's *Memoirs* that Harvey bequeathed the house in which he was born in Folkestone to Caius College, Cambridge, in spite of the protest of his brother Eliab. This has been quoted again and again, but, like many of Aubrey's statements, it is untrue. Harvey bequeathed nothing to Caius College.

We may take it, then, that following in the footsteps of Linacre and Caius and of other fellows of this college, Harvey went, in the year 1600, to Padua, and not in 1598. Now it is interesting to mention that an examination of the archives of Padua, made by the university authorities at Mr. D'Arcy Power's request, has failed to reveal any mention of Harvey before 1600. To quote from Mr. Power's admirable life of Harvey, there are entries which show that at the usual time of election—that is to say, on August 1st in the years 1600, 1601, and 1602—he was elected a member of the Council of the English nation in the Jurist University of Padua. This I take to have been a sort of Students' Association.

Those of you who have been to Padua will remember, in the university courtyard, the host of memorial tablets giving the arms and name and the nationality of centuries of alumni. Two in the lower cloister are alleged to pertain to Harvey. One of them is decayed and the inscription to Harvey. The other is well preserved, is undoubted, and gives 1600 as the date. This agrees with the data which I have given already.

The two most interesting things at the University of Padua are the great cathedra or wooden pulpit from which Galileo addressed his class in Harvey's time, and the anatomical theatre where Fabricius demonstrated his dissections to Harvey and his fellow students. They are not far apart.

There is a capital picture of the anatomical theatre in the charming book on Harvey written by Dr. Curtis of Columbia University and published last year. Dr. Curtis points out that the tiers are really standing places with rails in front to lean upon, which rise at a very steep angle from the central pit. The arrangement now in vogue, in fact, more resembles that in our hospitals, in which students stand and look down at the operations or at *post-mortem* demonstrations, than an ordinary anatomical lecture theatre. Dr. Curtis makes the suggestive remark that "the place looks fit to have been a nursery of object teachers, for it is too small to hold a pompous cathedra, and the veteran to whose Latin the young Englishman listened must have stood directly beside the dead body."

Before we follow Harvey's further career, let us pause for a moment to consider the intellectual atmosphere of Europe when he began his course at Padua.

There had been the great revival of classical learning, followed not only by the Reformation and the consolidation of the Protestant states, but by the Counter-reformation in the old Catholic countries. And there was a great ferment of free inquiry on philosophy, on the principles of government, on the polity of nations, the rights of the humbler folk, and the conduct of life. The creation and the dissemination also of our greatest literature was then in progress in our own country.

England, in spite of its insularity, always, I believe, the most tolerant and open-minded of European countries, welcomed to permanent posts many learned men from other lands. Continental travel attracted many of our countrymen, and English scholars sought illumination in those days far more in Italy than in Germany or even in France.

It concerns us most of all to ask what branch of natural science chiefly attracted educated men. I have already

referred to our president, William Gilbert, the inspirer of Galileo. Galileo had been lecturing six years at Padua before Harvey went there. But we must bear in mind that, though he had many ardent disciples both in Padua and Florence, yet he had to encounter formidable opposition as well as persecution, and both his discoveries and his doctrines were a long time in gaining acceptance. Harvey himself seems always somewhat timid about the findings of astronomy, and regards them as unprovable. Astrology was still widely accepted.

Robert Boyle was not born till 1627, and the work of Torricelli and of Pascal was yet to come. The Royal Society held a few informal meetings in 1645, but did not receive its charter till 1662.

Thus, although at the end of Harvey's life physics had made great advances, at the time of which we now speak—namely, 1600—it was by no means a popular science. The chemistry of that time was dominated by unverifiable hypotheses, and it is quite what we should have expected that Harvey, according to Aubrey's statement, undervalued its exponents, and spoke against it. It was much too vague and nebulous to suit Harvey.

We have, then, to turn from the physical to the biological sciences. The subject which not only engaged the energies of some of the greatest men of that generation, but also attracted the interest of educated people, was human anatomy. Italy was the Mecca of anatomical students. At Padua itself there was a great tradition, for Vesalius, Fallopius, and Fabricius formed a brilliant succession of teachers. Dr. Caius, as we know, had not only studied with Vesalius, but had lived in the same house with him.

But with regard to human anatomy as a subject of interest amongst educated people, let me quote a sentence or two from Evelyn's *Diary*, though they relate to a time a little later than this particular date. During the troublous years immediately preceding the Commonwealth, Evelyn travelled on the Continent. Whilst at Padua he took out a short course of anatomy and physics. During a month he tells us that he saw a man, a woman, and a child dissected by Veslingius, the anatomical professor, with all the manual operations of the surgeon on the human body. He also purchased from Veslingius's assistant some rare tables of veins and nerves, and gave orders for a third to be prepared of the lungs, liver, and nervi sexti par, and the gastric veins, which he sent to England and ultimately presented to the Royal Society. But before that presentation was actually made we find that Sir Charles Scarborough, who succeeded Harvey as Lumleian lecturer, induced Evelyn to lend them for a time to our College for his own lectures. Scarborough had been unable to induce Evelyn to present them to our College. They were given by the Royal Society to the British Museum and by the British Museum to the Hunterian Collection, and are now in the Royal College of Surgeons Museum. These tables are similar to those six preparations which were given to this College in 1823 by the Earl of Winchelsea. They were said to have been inherited from Harvey, and to have been used by Harvey at his lectures. That, I think, is more than doubtful.*

Thomas Hobbes, the philosopher, dissected many brains, and with his friend the many-sided physician William Petty, and at a later period Robert Boyle also dissected in Ireland under the same friendly guidance.

Descartes studied human anatomy, dissected many brains, and repeated Harvey's experiments on the circulation for himself. The Port Royalists, following Descartes's lead, repeated many vivisection experiments on the circulation.

*I suggest for consideration whether these tables may have come into the Winchelsea family not through Harvey, but possibly through Sir John Finch (the son of Sir Heneage Finch) who was M.D. of Padua, and not only English Consul there, but was a fellow of our College in 1660, and seems to have had for an anatomical pupil one Marchetti, who made "tables of veins, nerves, and arteries, five times more exact than are described in any author." Vide Dr. Edward Browne's letter to Sir Thomas Browne. *Sir Thomas Browne's Works*, vol. i, p. 91.

Fra Paolo Sarpi, the ecclesiastical statesman and adviser of the Venetian Republic, seems to have found time and opportunity to study anatomy to considerable purpose and even to make observations on the valves in veins. He was probably in touch with Fabricius, and we know that Padua partly depended on Venice for some of its anatomical material.

Charles I took the greatest interest in anatomy and in the numerous demonstrations, not only on the circulation of the blood but on embryology, which Harvey gave him from time to time.

But it is important to note that although the great Italian anatomists had made enormous strides in the study of structure their knowledge of function was lamentably small—in other words, physiology had not kept pace with anatomy. It has indeed been affirmed that physiology had not advanced since the time of Galen, and doubtless its inadequate progress was partly the consequence of the prevailing ignorance of physics and chemistry. But in the evolution of knowledge and of method the disproportionate study of human anatomy on its structural side must be credited with the development of observation, and so far it was a big step in the long and bitter struggle against the trammels of authority.

That was the beginning of a momentous epoch in the history of human knowledge when, on St. Luke's Day, 1600, a young Englishman, aged 22 years, rather under the average height, with raven hair, dark piercing eyes, rather sallow complexion, and with a keen restless demeanour and rapid speech, enrolled himself amongst the pupils of the learned, laborious, and generous Fabricius. What was Harvey's exact attainment at this time in the details of anatomy and the technique of dissection we have no means of knowing. But we have reason to believe that even then he was by no means ill equipped with ancient learning; we know that he was a keen and accurate observer and an enthusiastic naturalist, and that he had a mind reflective as to the causes and relations of things, fertile in recognizing resemblances, and, above all, ready in making working hypotheses and in devising experiments which would more or less verify those hypotheses. It was in these latter qualities that Harvey's supremacy over his teachers and predecessors ultimately became so manifest. The addition of experiment to observation was vital and far reaching. The exact relationship between teacher and pupil we do not know, but it must have been very intimate, as proved by all Harvey's references to Fabricius, not only in respect to the organs of circulation but also in respect to his observations and speculations on generation. These references are not merely respectful but reverent.

From the time when Vesalius described the valves of the heart the Italian anatomists had been keenly exercised on the valves in various parts of the vascular system, and Fabricius's discovery of the valves of the veins was as far back as 1574. But the scientific use of the imagination seems to have been dormant with these clever observers, and they were singularly inept in explaining the mechanism of the valves. Sir William Osler suggests that it was reflection on the mechanism of the valves of the veins which at this early period of his career set Harvey on the right track in his great discovery, and there is a remark of Harvey's friend Robert Boyle which is not inconsistent with that suggestion. Boyle says that Harvey's observations on "contrivances similar to the valves used in hydraulic engines for preventing counter currents led to his discovery of the circulation of the blood." Whether Boyle's remark refers to the period of study at Padua or not, it is certain from the terms of his diploma in our possession that Harvey enormously impressed his teachers and examiners with his knowledge and ability.

Harvey returned home in 1602, and after his incorporation as Doctor of Medicine at Cambridge he came to our College and submitted himself to examination as a "can-

didate," which title in those days I take to have been equivalent to our present designation of member.

Dr. Norman Moore has found, by consulting the *Annals*, that Harvey was examined no less than four separate times between May, 1603, and August 4th, 1604, although he satisfied his examiners on each occasion. Moreover, of his contemporary candidates he was the last to be elected to the fellowship—namely, on May 16th, 1607, he being then 29. Whether in that early period of his connexion with this College he had any opponents we have no other means of ascertaining, but he seems to have had the support of the president, Dr. Atkins, when he applied for the post equivalent to what we should now call assistant physician at St. Bartholomew's Hospital, and especially that of Dr. Wilkinson, whom he assisted and after his death succeeded.

In the literature about Harvey there is nothing more interesting than Sir James Paget's records, drawn from the *Annals* of St. Bartholomew's Hospital. The relations between the governors and Harvey are altogether honourable and creditable to both sides. I will only refer to the revised hospital regulations submitted by Harvey in 1633 and adopted. These rules show that in general medical policy Harvey was a strong conservative, and that he stoutly maintained the then existing supremacy of physicians over surgeons. The surgeon was not only obliged to consult the physician in all difficult cases, and whenever inward physic was required, but he was not to be allowed to perform any major operation without the approbation and the direction of the physician. The surgeon was not only forbidden to give inward physic, but was required to declare to the physician what external remedies he applied in any given case. The surgeon had to attend the physician in his weekly consultations in the great hall to which the patients were brought, and where both matron and apothecary attended. In those days the surgeons had to visit their patients in the wards, and the physician as a rule only went to the wards when his patients could not be brought to the hall where most of the medical work was done.

During the thirty-six years, with certain intervals, that Harvey was connected with St. Bartholomew's Hospital he must have seen a great deal of disease amongst the London poor. But his post of Court physician, first to James I and subsequently to Charles I, led to his having a considerable clientele amongst the well-to-do. We know that some of the most eminent men of the time were his patients. Aubrey disparages his "therapeutic way," and maintains that although he was a great anatomist he was not much of a physician, and that after his great discovery was fully announced his practice waned. Aubrey is a very inaccurate person, but this statement may have some truth in it. It is interesting to realize that the philistine is the same in every generation in his estimates of the merits of medical practitioners as in other estimates. If a doctor proves his greatness by some purely scientific discovery which has no immediate practical application, if he distinguishes himself in literature or art, the philistine shrugs his shoulders and says that is all very well, but that such a man should be a good practitioner is impossible. Let us, then, consider some of the evidences derived from Harvey's writings bearing on the subject of his clinical experience.

In his first disquisition to Riolanus, Harvey refers to his unpublished MS. on medical anatomy or anatomy in its relation to medicine. This MS., then in Harvey's possession, has alas! been lost, but it may yet be found. But his own references to this MS. are very relevant to our inquiry. In alluding to its contents Harvey says he "desires to relate from the many dissections of the bodies of persons diseased, worn out by serious and strange affections, how and in what way the internal organs were changed in their situation, size, structure, figure, consistency, and other sensible qualities from their natural forms and appearances, and in what various and remarkable ways they were affected." I quote this long sentence because it

embodies Harvey's ideal of the morbid anatomist and shows that he belonged to the truth faith—namely, that the best physicians are first of all good morbid anatomists. In this letter his illustrations are, as might be expected, chiefly drawn from the diseases of the circulatory system; he gives interesting references to aneurysms, apoplexies, and calcified arteries. In more than one place he refers to the small radial pulse on the distal side of an aneurysm of the neck. He recognized that empyema might ulcerate into the lung and discharge through the bronchi.

In his work on generation, which contains many clinical illustrations, there is a careful analytical description of the case of Lord Montgomery's son, who had an exposed heart, left bare after a severe suppurating injury to the chest, and his report of the *post-mortem* examination of Thomas Parr is a sample of the thorough way in which he made his autopsies.

In his second letter to Riolanus he shows how wide was his acquaintance with local disturbances of circulation, which he had discussed at length in the lost Medical Observations. There was one disease common in his contemporaries, and of which he had abundant experience in his own person—namely, gout. Whether he was permanently crippled is, I think, doubtful, but that he suffered severe pain, especially in his lower limbs, is quite certain. Heberden sneers at the methods which Harvey adopted to relieve what we may probably regard as attacks of localized gouty hyperaemia. But Harvey's plan of plunging his feet into a pail of cold water seems to have been justified by the results, and Heberden has the candour to admit that he lived till he was over 80 and does not appear to have died from gout, but from old age. This mode of treatment shows not only Harvey's courage, but his independence of conventional dogmas. In our own times we have learnt that the local application of cold in febrile and hyperaemic states is not the dangerous thing it was once supposed to be.

In Harvey's *Praelectiones* there are many clinical observations introduced by way of illustration. In his valuable introduction Dr. Norman Moore points out that Harvey was "familiar with scarlatinal desquamation; he had noted the enlarged liver in those who died after long suppuration, and the shrunken liver in cirrhosis." "The varying appearances of gall stones and the common shape of large renal calculi were well known to him, and he describes pericarditis and its symptoms from his own observation." It is quite true that Harvey says very little about drugs in any of his memoirs. That is not exceptional in physicians who are distinguished as morbid anatomists. One would like to believe that when the apothecaries of that time disparaged his "bills" (as prescriptions were then called), they may have been too short and too simple to please the apothecaries. There is a report on the case of Prince Maurice when Harvey was with the King at Oxford, in which it is stated about Harvey and his colleague, Edmund Smith, that the "doctors do resolve to give very little physic, only a regular dyett and cordyall antidotes." It is significantly added that Prince Maurice did well.

But I think I have noticed occasionally that when a morbid anatomist ventures into the realm of therapeutics he may show an immense confidence in some particular preparation, and it is not altogether an exceptional incident that in a letter to his friend Hamey, which we possess, concerning the ailment of a poor woman in whom they were both interested, Harvey extolled the therapeutic value of the heel bone of the deer. Perhaps he had found it a useful way of administering phosphate of lime. But whether he gave many drugs or few, Harvey had confidence in the relief or removal of pain by "the detraction of blood, the application of cupping glasses, or the compression of an artery which leads to a part." He also used cupping glasses for the relief of asthma.

In his work on generation Harvey shows practical acquaintance with both midwifery and gynaecology. He recognized the dangers of retained secretions in the body of the uterus and showed courage and decision in dilating the cervix, and

in some cases in the employment of intrauterine injections. He had carefully studied cancer of the uterus, and I commend to my gynaecological brethren a remark which shows Harvey's shrewdness. Speaking of certain uterine troubles he says: "Women are peculiarly liable to these accidents, especially those among them who lead a luxurious life or whose health is naturally weak and who easily fall into disorders. Countrywomen and those accustomed to a life of labour do not become dangerously ill on such small grounds."

But Harvey was not unacquainted with the surgery of his day. In this same mine of clinical experience—the work on generation—will be found reference to cases of large sarcoceles, the treatment of which he had initiated by tying the afferent artery so as to limit the blood supply. He subsequently removed the tumour by extirpation with the knife or the searing iron.

Perhaps Harvey's conservatism as regards the relative status in his time of physicians and surgeons and his daring to have an independent opinion on surgical cases and even performing some operations (for in his will he left his surgical instruments to his friend Scarborough) may have roused the antipathy of the Barbers' and Surgeons' Company. At all events, they endeavoured to convict him of ill practice in the case of an alleged fracture of the skull. There was no allegation of operation on his part, but only of erroneous opinion. But I do not gather that the Barbers' and Surgeons' Company supported their condemnation by any *post-mortem* evidence. I think we may rest content that our Harvey, who was universally admitted to be a great anatomist and naturalist, was also an experienced pathologist, a learned physician, and that he had the qualifications of a good all-round practitioner.

Harvey's Court duties were by no means strictly limited to medicine. As physician to the Court he was instructed to take two long and important Continental journeys. The first of these was in 1630, when he accompanied the young Duke of Lennox on a rather prolonged tour in which he was obliged to dodge the plague on several occasions and was greatly impressed with the impoverishment of the countries through which they travelled. The second Continental journey made at the Royal command was in 1636 when Harvey accompanied Thomas Earl of Arundel, the Lord High Marshal, on an embassy to Vienna and Ratisbon which was mainly concerned with efforts to secure the restoration of the King's nephew, the young Prince Palatine, to his proper status. About three years ago I had the good fortune to secure for this College eleven of Harvey's letters referring to a painful episode of this particular journey. Harvey's writing is very hard to read. It is the writing of a man of terse expression and who had no time to waste. The contractions are appalling. These letters are not quite so difficult as the few others which are extant, and they show that when he took pains he could make a tolerable script as well as express himself forcibly. They were written to Harvey's friend, Basil Lord Feilding, the eldest son of Lord Denbigh. Feilding was English Ambassador at Venice, and, it would appear, had invited Harvey to visit him. Harvey looked forward to this visit with great delight. There exist in the Clarendon State Papers fairly complete reports of this embassy on the official side, forwarded by Lord Arundel and his staff. It may interest you to follow Harvey's steps on this journey. Lord Arundel's reports are addressed to Sir Francis Windebank, one of the Secretaries of State for Foreign Affairs. The first is from Utrecht, in which Arundel informs Windebank that he has left his son at Leyden suffering from a stomach attack, but under the care of Dr. Harvey. They soon rejoined the party, and we next hear from Arundel at Cologne, where he says he has been this evening "at the Jesuits' fair new church and college where they used me with all civility. I found in the college little Dr. Harvey who means to convert them."

I think it is more than likely that this polemic related, not to theology, but to Harvey's doctrine on the circulation, for at the next stage, Nuremberg, Harvey writes a very

courteous letter to Dr. Hoffmann, in which he tries to disabuse his mind of certain misconceptions, and offers to give him a demonstration of the circulation. This letter is included in Harvey's published works, and shows that along with his scrupulous courtesy he could usefully blend a little elegant sarcasm, for he begs Hoffmann, if he will not come to a demonstration or investigate by his own dissection, that he will not vilipend the industry of others nor charge it to them as a crime; "do not derogate," he says, "from the faith of an honest man not altogether foolish nor insane who has had experience in such matters for a long series of years."

The first and second of Harvey's letters to Lord Feilding relating to this journey were written from Lintz, to which the ambassador's party had gone on leaving Nuremberg. Here the first meeting with the Emperor Ferdinand took place. Harvey says he accompanied the Emperor on some hunting excursions. He speaks of him as a pious, good man, desirous of all love, quietness, peace, and justice! He refers to the impoverishment of the country by the thirty years' war and to the licence and oppression and anarchy which prevailed in Germany. Nevertheless they had joined in a feast given by the Count of Milan, "the chief Major Domo of his Majesty where they drunk hard and had many expressions and many good wishes." There are ominous references to the plague and the fear of it.

The next move is to Vienna, where Harvey sees the Queen of Hungary and praises her two fine little babies. Then they go to Ratisbon, where they have to await the assemblage of the Diet of the German Empire, which somewhat shadowy and dilatory body will have to discuss the questions respecting the young Prince Palatine's claims. From the Clarendon State papers we learn that everybody in Lord Arundel's mission was excessively tired by the long delay. Harvey seems to have been terribly bored, and to have besought Lord Arundel to let him go to Italy during the vacancy, as he styles the waiting time. In one of the Clarendon dispatches there is a reference to "honest little Harvey, whom the Earl is sending to Italy about some pictures for His Majesty." This opens up a very interesting little bypath upon which other correspondence of Lord Feilding's throws additional light. Lord Arundel, as we know, was one of the great English virtuosos of that day, and was the first to collect objects of art from Italy and elsewhere. His name is chiefly associated with the collection of Greek and Roman marbles which was ultimately secured for the University of Oxford by the mediatory efforts of John Evelyn. But he was a collector of pictures also. In some of the Feilding letters there are references to the pictures which at various times Feilding acquired for the King's collection, and the Marquis of Hamilton writes to Feilding on the same subject, in which he delicately hints that Lord Arundel might take the opportunity of feathering his own nest, and that he might even forestall Feilding in some of his bargains.

At all events, the invitation to Harvey to visit Lord Feilding at Venice may well have led to the extemporized mission which was entrusted to Harvey by Lord Arundel. But poor Harvey little dreamed of what was in store for him. He doubtless left Ratisbon in high spirits at his escape from the weary diplomatic tedium so trying to his active spirit. He was armed with visé to his passport and commendatory letters, but when, having crossed the boundary of the Venetian territory, he arrived at Treviso, he writes to Lord Feilding that he was unjustly affronted, being stayed and commanded by the podestà to go into the lazaretto without any cause or suspicion alleged. It is clear that they were terribly and perhaps unreasonably afraid of the plague. Harvey produced his visé passport and recommendations from the King of Great Britain, from the Emperor, and from Lord Arundel, but the podestà would not look at them. Harvey refused to go to the lazaretto for fear of the infected persons who had been sent there before, and elected to stay in the open fields. He scribbles his letter on the grass in the field,

and begs Lord Feilding to procure his release with all expedition. He seems to have subsequently arranged to sleep in a poor open garden house and to lie upon straw, but was by force and threatening of muskets compelled to go into the lazaretto, into a very nasty room, where the vetturin and his two servants and saddles lay!

The podestà, probably as the result of Lord Feilding's complaint, in three days' time sent a coach offering to take Harvey back to the poor garden house (where he had been before). Harvey did not conceal his irritation, and indignantly refused to accept anything whatever from the town authorities, least of all a bed which he believed would have been an infected one, so he elects to sleep on straw. Subsequently the Senate of Venice sent him a message that he must stay where he was till further orders, without specifying the time. Meanwhile poor Harvey, having bad food and great exposure, had contracted sciatica. He seems to have been kept between a fortnight and three weeks, but we do not know the exact date or method of his release. He sent on his letters to Lord Feilding, and though he did not stay long in Venice he seems to have had a good time there, and then he went to Florence, where he enjoyed the hospitality of the Grand Duke, who lavished everything upon him that heart could wish.

Harvey's last letter to Lord Feilding was to announce his return to Ratisbon in November so as to be ready to accompany Lord Arundel on his return to England, his mission having turned out rather a fiasco. It has hitherto escaped notice, but I find in the Clarendon Papers a letter from Sir John Borough in which it is stated that they were aware at Ratisbon that Dr. Harvey had been kept in quarantine at Treviso, "being not as yet, for aught we hear, released." His return to Ratisbon may have been somewhat surprising. A perusal of Harvey's letters and of the State Papers gives us a poor opinion of the estimation in which Englishmen were held in Charles I's time in foreign lands, and we may be sure that Cromwell would not have brooked such scant consideration to any English subject during his rule.

Between the time of Harvey's leaving Florence and going back to Ratisbon we must, I think, intercalate his visit to Rome, where, under the hospitable roof of the English College, he dined with one who became a very staunch friend. This was Dr. Ent, who, in the evening of Harvey's life, secured for publication his work on generation. The alleged visit to Rome with Dr. Ent which Aubrey mentions has been shown by Dr. Munk to be one of his many inaccuracies. The joint visit was the one just mentioned; it was in October, 1636. Harvey was back in London at the end of the year. He doubtless made other visits to Italy, and probably to Padua.

As Court physician, Harvey accompanied the King for his Scottish coronation. It is eminently characteristic that the chief interest for Harvey was not the ceremony, nor the theological disputes, but his own visit to the Bass Rock in order to find out some points with regard to the solan goose, which then, as now, congregated on that island in great numbers. He probably also accompanied the King in his abortive warlike journey to Berwick in 1639, and perhaps again in 1640, but there do not appear to have been any important questions of natural history to be solved in those journeys, and I find no reference to them in Harvey's papers. The clouds were gathering for the Civil War, and Harvey's official association with the king rendered him persona ingrata not only to the Parliamentarians in the House of Commons, who tried to oust him from St. Bartholomew's Hospital, but to a mob who sacked and plundered his official lodgings in Whitehall. It is somewhat piquant and characteristic that Harvey, referring to this outrage, says the cause of his sorrow is that certain rapacious hands "stripped not only my house of its furniture, but what is subject of far greater regret with me my enemies abstracted from my museum the fruits of many years of toil, . . . whence it has come to pass that many observations, particularly on the generation of insects, have perished, with detriment, I venture to say,

to the republic of letters." It has been assumed that Harvey's "Medical Observations" as well as some other papers were destroyed by this mob. But Sir George Paget has drawn attention to the fact that Harvey himself speaks of these same Medical Observations being in his possession at the time when he writes, many years afterwards, his first letter to Riolanus.

In regard to the historic incident of Harvey looking after the two young princes at the fringe of the battlefield of Edgehill, it is interesting to remember that his friend Lord Feilding had been removed from his ambassador's post at Venice and was fighting on the Parliamentary side, whilst the Earl of Denbigh (Lord Feilding's father) was fighting for the King. There must have been many of Harvey's friends on both sides of the great struggle, but it is noteworthy that throughout the four years, from 1642 to 1646, that Harvey was with the King at Oxford there is no evidence that he took any part in political affairs, and there is no report of any utterance of greater resentment than is expressed in the one just quoted concerning his natural history collection.

Nothing daunted by the limitations of his surroundings at Oxford he goes to visit his friend Bathurst at Trinity College and conducts with him daily observations on the development of the hen's egg. He was incorporated a Doctor of Medicine of Oxford, and during the last year was appointed Warden of Merton College. His brief opening address to the fellows, appealing to them to cultivate harmonious friendship amongst themselves and pledging himself for the development of the welfare of the College, is quite in harmony with Harvey's subsequent utterances at the College of Physicians. One interesting experience at Merton was his welcome to Scarborough, who had been expelled from his fellowship at Harvey's old college in Cambridge on account of his Royalist principles. Scarborough seems to have been not unnaturally interested in the lively military expeditions around Oxford of Prince Rupert and his fellow officers. Harvey said to him, "Prithee leave off thy gunning and stay here and I will bring thee to practice." He probably recognized Scarborough's mathematical abilities and foresaw a great future for him, and Scarborough is said to have helped Harvey in some of his investigations.

In Clarendon's *History of the Rebellion* some of the most attractive pages are the character sketches of the chief men on both sides, and it is significant that Harvey finds no place. Indeed there is not a single mention of him in the whole of the work. Clarendon seems not to have concerned himself, in writing his history, with a single person who took no active political or military part in the great struggle. It seems remarkable in view of Harvey's long personal devotion to Charles I, in prosperous as well as in adverse days, that when the surrender came he left him, and it is doubtful if he ever saw him again. But in fairness we must remember that after the surrender Charles's movements up and down the country were not under his own control, and very shortly the access of particular adherents and attendants was regulated and Harvey may not have been permitted to join him even if it were desired. At all events, he retired a saddened man of 68 to the quiet and rest provided him by his relatives in London and its neighbourhood, and his rich and influential merchant brothers may well have secured him protection in his retirement.

It is probable that from 1602 onwards Harvey was working at his subject, and from 1609, when he was formally elected physician to St. Bartholomew's Hospital, he must have gradually acquired a reputation as an anatomist as well as a physician. In 1615, being then 37, he was appointed Lumleian lecturer to this College, a post which he held, with certain inevitable absences, until 1656, the year before he died. The *Preelectiones*, which bear the date of 1616, are really the lecture notes for the first anatomical course which he delivered. His introduction, with its detailed categories of anatomical study, is interesting as a logical academic statement, but the practical instructions which Harvey laid down for his own guidance in method

seem to me the last word as to the proper objects and limits of oral teaching and demonstration, and are a model to be utilized by every medical teacher of our own time. The special value of this MS., which deals chiefly with the viscera, is that we have here Harvey's first account of the circulation of the blood, the full exposition of which he gave in his printed book in 1628. For these twelve years Harvey had expounded his doctrines to our predecessors, and it is significant that from within this College there was no criticism or opposition to the full acceptance of those doctrines, with the solitary exception of one licentiate, a certain Dr. Primrose, who was rather an abject pupil and follower of Riolanus, the anatomical professor at Paris. Harvey demolished the master Riolanus in the two disquisitions addressed to him, and the pupil needs no further consideration.

I need not dwell on Harvey's masterpiece, so brief, so terse, and so convincing, a model for all time of inductive reasoning. Let us never forget the two supreme doctrines which he established, and which neither his predecessors nor his contemporaries had understood: (1) The circulation of blood from heart through arteries and back through the veins to the heart again. The pulmonary circulation, it is true, had been more or less apprehended, but it was reserved to Harvey to establish the true nature of the systemic circulation and to give the *coup de grâce* to the ebb and flow movement of the blood current now this way, now that, which was the accepted explanation up to his time. (2) The muscular contraction of the ventricles, the real motive force of the circulation, which had been conspicuously ignored and misinterpreted previously.

It is quite true that Harvey's view of the respiratory function was inadequate. For him it was summed up in cooling and ventilation; he never thoroughly faced the difference between arterial and venous blood, and it is doubtful if the meaning of oxidation had taken any definite shape in his scheme of life. But the day of chemistry was not yet, though it was not far off, and it was impossible for him without the help of the microscope to bridge over the space between the arteries and the veins. How he would have leapt for joy if Malpighi had only demonstrated the existence of the capillaries within Harvey's lifetime!

What was Harvey's method? It is certain that he had a wide and thorough acquaintance with the work of his predecessors, but he differs from them all in the courage and independence with which he really begins his work by ascertaining by his own senses what are the anatomical facts untrammelled by the statements of authority. He follows up his human anatomy by comparative studies of the circulatory organs of every animal that he can obtain. Then he reflects on the simplest explanation of the anatomical mechanism before him. Finally he devises experiments, vivisectional and otherwise, to test and verify his hypotheses.

The question has been asked again and again, What was the relation between Bacon and Harvey? Bacon, in his *Novum Organum*, which was published in 1620, makes no reference to Harvey's discovery. Harvey's book appeared in 1628, and Bacon died in 1626, but one would have supposed that Bacon might have heard the account of Harvey's discovery during the four years which had elapsed since he first expounded it in the College. On the other hand, Sir Samuel Wilks is not, I think, correct when he says that Harvey had not read Bacon's works, and owed nothing to Bacon. In the twenty-fifth exercise of Harvey's book on generation there is a sentence in which he proposes to review and analyse some of his previous results, and he says: "Wherefore I think it advisable here to state what fruits may follow our industry, and, in the words of the learned Lord Verulam, to enter upon our second vintage." If Aubrey is to be credited, Harvey, "esteemed Bacon for his wit and style, but would not allow him to be a great philosopher." He writes philosophy like a Lord Chancellor. Harvey says, 'but I have cured him.' I think probably, in spite of Bacon's many-

sided enlightenment, Harvey looked upon him as an academic *littérateur* who had had no claims to eminence in practical investigation, and it may well be that Bacon's deep-rooted antagonism to Aristotle, which dated from the time when he was a student at the university, may have roused Harvey's distrust. "A man of genius lights his own fire," said John Foster, and in spite of all that has been said about every man's work being more or less dependent upon his environment and the heritage of the past, I do not think we are wrong in claiming that Harvey was a creative genius.

The work on generation has been spoken of as Harvey's aftermath, but in many ways it is more interesting than his *magnum opus* on the circulation, and I do not think it has received adequate appreciation from my distinguished predecessors. It tells us a great deal incidentally about the world experiences of a long and chequered career, and it shows Harvey to us on the speculative and contemplative side. The anatomical observations are of course circumscribed by the absence of microscopical methods, though it must be admitted that Harvey used such magnifying lenses as he possessed to some purpose. There are some erroneous conclusions, but not bad ones.

The introductions on the manner and order of acquiring knowledge and on the method of study are, I submit, masterpieces of lucid exposition. This work is interesting as showing Harvey's own estimate of his teachers. "Foremost of all among the ancients," he says, "I follow Aristotle; among the moderns Fabricius of Aquapendente, the former as my leader, the latter as my informant of the way. . . . For even as they who discover new lands and first set foot on foreign shores are wont to give them new names which mostly descend to posterity, so also do the discoverers of things, and with perfect propriety, give names to their discoveries. . . . And now I seem to hear Galen admonishing us that we should best agree about the things, and not dispute greatly the words."

But with all Harvey's reverence for Aristotle's philosophy, I believe he respected him most of all as a great naturalist and observer, and it is noteworthy that for him as well as for Fabricius and for Galen, his reverence never prevented Harvey from pointing out their blunders in anatomical observation as well as in the deductions drawn therefrom. For example, in his fourteenth exercise, Harvey goes so far as to suggest that in one point Aristotle had not himself seen things he described but received them secondhand from another observer, and that the periods were not given rightly.

As I have already indicated, from 1646 to 1657, his Court duties ended, his private practice relinquished, Harvey lived henceforward in retirement, first with one of his merchant brothers then with another in London or in the country near by. His brothers were substantial and influential people. In earlier years, when their father had left Kent and had come to live in London, Fuller tells us that "as the sons got great estates they made their father treasurer thereof, who, being as skilful to purchase land as they to gain money, kept employed and improved their gainings to their great advantage; so that he survived to be the meanest of them of far greater Estate than himself." In later years his brother Eliab looked after Harvey's money affairs, and he had no anxieties.

We know little of Harvey's married life, but I think it must have been a happy one. His wife was the daughter of a cultivated and eminent physician, Dr. Launcelot Browne. They were married at the very outset of Harvey's professional career, and the wife died probably during the time Harvey was with the King at Oxford. The references in Harvey's will to his dear deceased loving wife show his solicitude to perpetuate her wishes and his gracious desire that certain of his benefactions should be regarded as from her, though she had long since passed away, manifest his tender affection for her. It is clear that his sisters-in-law and all their respective households were unceasing in their care and solicitude, and the detailed and thoughtful remembrance in his will of all his relatives and their servants, and of many poor folk,

is very touching. He was childless, but his care for his nephews and nieces was very marked.

This College was the chief interest of his old age. Besides being Lumleian lecturer he had been at different periods censor, treasurer-elect, and finally, when he graciously declined the proffered presidency, councillor of the College.

It is interesting to think of the devotion and long duration of his friendships. In old days he had nominated Dr. Edmund Smith as his substitute at St. Bartholomew's. Edmund Smith was with Harvey at Oxford, and now when Harvey was building at his own expense the costly and beautiful addition to the College edifice it was Edmund Smith who really superintended the whole business for him and whose name at Harvey's desire, along with that of Dr. Prujean, the president, appeared on the commemorative inscription. I have referred to the brotherly attachment of Harvey, Ent, and Scarborough. Harvey's discoveries were at length warmly accepted by foreign universities and by foreign anatomists and scholars, notably by Siegel, Bartholin, and Descartes. Some of these foreign anatomists stoutly defended Harvey's doctrines against the few remaining obscurantists who were still in opposition. His friend Thomas Hobbes said that Harvey was the only man whom he knew that had lived to see his own doctrine established in his lifetime. Abraham Cowley's poetry is seldom read in these days, but his two poems on Harvey, based on intimate knowledge of the man and of his work, are full of genuine feeling and devotion. But the recognition most precious to him was the homage of his College. Fuller says of him he was not only Doctor Medicinæ but Doctor Medicorum. The homage of the College was shown during his lifetime by the erection of his statue. It was further shown by the large gathering of fellows who followed his remains beyond the city walls in the first part of his funeral. How many of them gathered round his tomb at Hempstead in Essex we do not know. The homage of his successors in this College was shown in 1883 by the reverent removal of his remains from the damaged outer vault where they lay, to a sarcophagus in the chapel above.

Whilst we of this generation render our homage to our great benefactor let us in a few words picture to ourselves the outstanding features of his work and character.

First observe his pursuit of truth for its own sake, even though a complete solution were not forthcoming and quite independently of any ulterior benefit that might ensue. His discovery was one of those which, in Bacon's phrase, might fairly be called "light bearing" rather than "fruit yielding."

Amongst the objections which Harvey had again and again to combat in his work on the circulation was the ever-recurring question, *Cui bono?* Listen to his reply:

I own I am of opinion that our first duty is to enquire whether the thing be or not, before asking wherefore it is. . . . Meantime I would only ask how many things we admit in physiology, pathology and therapeutics the causes of which are unknown to us? Whoever therefore sets himself in opposition to the circulation because if it be acknowledged he cannot account for a variety of medical opinions, nor in the treatment of diseases, give satisfactory reasons for the phenomena that appear or who regards it as in some sort criminal to call in question doctrines that have descended through a long succession of ages; to all of these I reply that the facts cognisable by the senses wait upon no opinions, and that the works of nature bow to no antiquity for indeed there is nothing either more ancient or of higher authority than nature.

With what labour (he says) do we attain to the hidden things of truth when we take the averments of our senses as the guide which God has given us for attaining to a knowledge of his works, avoiding that specious path on which the eyesight is dazzled with the brilliancy of mere reasoning, and so many are led to wrong conclusions to probabilities only and too frequently to sophistical conclusions on things.

The doctrine of "spirits" dominated the physics and the physiology of that time. Harvey says:

As it is still a question what they are, how extant in the body, of what consistency, whether separate and distinct from the blood and solids or mingled with these—upon each and all of

these points there are so many and such conflicting opinions that it is not wonderful that "the spirits" whose nature is thus left so wholly ambiguous should serve as the common subterfuge of ignorance.

Persons of limited information when they are at a loss to assign a cause for anything, commonly reply that it is done by the spirits, and so they bring the "spirits" into play upon all occasions even as indifferent poets are always thrusting the gods upon the stage as a means of unravelling the plot and bringing about the catastrophe.

Harvey's demolition of the doctrine of "spirits" marks an epoch in the history of science.

Long sentences were the fashion of the time, but Harvey makes his meaning plain. He was keenly alive to the bondage of names and phrases. He was anxious to get the *knowledge of things* and not greatly concerned about names. He maintains that our business is not so much to inquire what a word properly signifies as how it is commonly understood. His writings are lit up by quaint and homely similes, but they are free from the pedantry of his time. Sir Clifford Allbutt thinks he was lacking in imagination. Perhaps that is so, and I think the result is that although some of his conclusions are incomplete and inadequate they contain remarkably little that is erroneous.

And about his character: There is in the opening sentences of his will a humble and definite statement of his Christian faith, and in his book on generation he expresses his conviction of the immanence of God. "He takes," Harvey says, "the right and pious view of the matter who derives all generation from the same eternal and omnipotent Deity at whose nod the universe itself depends."

THE ASSESSMENT OF THE BRITISH VACCINE AGAINST POLIOMYELITIS

A REPORT TO THE MEDICAL RESEARCH COUNCIL BY ITS POLIOMYELITIS VACCINES COMMITTEE*

In April, 1955, the report of a large-scale controlled trial, carried out in the United States in 1954, showed that the attack rate of paralytic poliomyelitis in about 200,000 children given formalized virus vaccine was significantly reduced compared with that in an equal number of children given placebo injections (Poliomyelitis Vaccine Evaluation Center, 1955). The allocation of children to the two groups had been made at random and the observations had been conducted without the observers having any knowledge of the group to which a particular child belonged. In these children, aged mainly 6-9 years, the rate of paralytic disease in the vaccinated was only 28% of that in the placebo group—that is, the vaccine conferred an apparent protection of 72%. With the numbers involved it is unlikely— $P=0.05$ —that the real level was less than 61% protection. No significant protection was conferred against non-paralytic illness.

At the time this report was published manufacture of vaccine by similar methods, and incorporating the same three strains of virus, had already begun in this country. A small quantity of this vaccine had been used in tests of antigenicity in adult volunteers when reports were received of the occurrence of cases of poliomyelitis in the United States associated with some commercial batches of vaccine. Further use of formalized vaccine was therefore abandoned for the time in Great Britain. Subsequently the Medical Research Council's Com-

*The members of the committee are: Professor C. H. Stuart-Harris (chairman), Dr. T. Anderson, Dr. W. C. Cockburn, Dr. W. H. Bradley, Professor G. W. A. Dick, Dr. J. A. Dudgeon, Professor A. Bradford Hill, Dr. F. O. MacCallum, Dr. C. Metcalfe Brown, Dr. W. L. M. Perry, Dr. W. Ritchie Russell, Mr. H. J. Seddon, Professor E. T. C. Spooner, Dr. I. N. Sutherland, Dr. G. S. Wilson, and Dr. J. Knowelden (secretary).

Aubrey says that Harvey, like his brothers, was choleric. You may say that the Treviso letters support that assertion, but remember he had great provocation, and he was a gouty subject. At all events, his choleric temper did not interfere with his courtesy and modesty in controversy, nor with generous appreciation of the work of his contemporaries. Harvey's power of concentration and detachment in biological observation in adverse surroundings was amazing. He was patient and laborious in his investigations, and reluctant to make any premature announcement of his conclusions. He was content to wait the judgment of time and enlightenment. He grew more and more fond of contemplation and even of solitude at times, because it gave him greater opportunity for contemplation. His love of family and of friends has been already noted, and to this may fitly be added his unfailing kindness to young men and readiness to advise them as to travel and books, and his willingness to take trouble on their behalf.

The concluding parts of his last letters are very touching. The nearer he approaches the great divide the more he craves for the abiding remembrance and the affection of his correspondents. It is not only the old man eloquent, but the old man mellowed and gentle.

And now in these severe and strenuous days, when we trust that "the winter of our discontent" is soon to pass away, we recall once again the last exhortation of our great master. He bids us "ever to search out and study the secrets of Nature by way of experiment, and for the honour of our profession to continue mutual love and affection amongst ourselves."

mittee on Safety Tests of Poliomyelitis Vaccine recommended that vaccine distributed in this country should not contain the virulent type I Mahoney strain used in American vaccine and adopted up to that time elsewhere. By the winter of 1955-6 further batches of vaccine were in preparation by Glaxo Laboratories, using the less virulent Brunenders strain as the type I component, but the same type II (MEF-1) and type III (Saukett) strains incorporated in earlier batches here and in America.

The Poliomyelitis Vaccines Committee of the Medical Research Council, which had been reviewing the situation, considered that two questions regarding such vaccine needed answering urgently. It was important to know first of all whether the substitution of the Brunenders for the Mahoney strain had reduced the capacity of the vaccine to protect against type I infection. Secondly, the American field trials had given evidence of protection in children 6, 7, 8, and 9 years of age only, with a slight suggestion of less protection in the youngest of this group. It was therefore also important to know whether formalized vaccine would protect younger pre-school children, who have the highest rates of paralytic poliomyelitis in this country and are, possibly, subject to a different epidemiological background from that of American children. Consequently, when the Minister of Health and Secretary of State for Scotland announced in January, 1956, that a poliomyelitis vaccination programme was to be started in England, Wales, and Scotland, the Medical Research Council's Statistical Research Unit, acting on behalf of the Poliomyelitis Vaccines Committee, was invited to plan for an assessment of the protective effect of the vaccine that

was to be issued later in the year. Antigenicity tests of the vaccine in the laboratory and in children were an essential part of this assessment. These were carried out by other departments and have been reported elsewhere (Committee on Laboratory Investigations of Poliomyelitis of the Medical Research Council, 1957). This report describes the investigation to determine the protective effect against clinical poliomyelitis in children.

Plan of Investigation

The plan of this study was influenced by two factors. It was estimated that sufficient vaccine might be available to give 400,000 children two doses of 1 ml. spaced at an interval of at least three weeks before the end of June. After this vaccination would stop in view of the possible risk of provoking paralytic illness by intramuscular injections given in an epidemic period—or of appearing to do so at a time when many cases would naturally be occurring. To be reasonably certain of a clear answer to the assessment it was necessary to have at least 250,000 vaccinated children under observation, and an equal number of unvaccinated children, if the paralytic attack rate in the unvaccinated group was 20 per 100,000. Such a rate had been reached in most years since 1947, but occasionally a lower rate had occurred and might be repeated in the 1956 epidemic during which observations were to be made. It followed that the assessment had to cover the whole country, as the available vaccine, by the terms of the Health Departments' announcement, was to be offered to all local health authorities, and that the administrative procedure had to be simple and of general applicability. It was organized through the generous help of the Ministry of Health and Department of Health for Scotland. The second factor, arising from the distribution of vaccine to the whole country and from the scale of the investigation, was that it was impossible to adopt the ideal of a controlled trial in which children were randomized to two groups, one to receive vaccine and the other placebo injections. It was, however, anticipated that the demand for vaccine would be in excess of the supply. If this were so it was intended to compare the incidence of poliomyelitis in those who received vaccine with the incidence in those who wanted it but for whom none was then available. As a form of random allocation the selection of children to be vaccinated was to be made according to the month of birth.

The Numbers Vaccinated

All but two of the local health authorities in England, Wales, and Scotland took part in the scheme. In January, February, and March, 1956, parents of children born in the years 1947 to 1954 were invited to register them for vaccination on the understanding that if there was insufficient vaccine for all before the summer they would be the first to be vaccinated when further supplies became available. Local health authorities sent returns to the Statistical Research Unit by mid-April of the numbers of children registered, dividing them by their year and the month of birth and by sex. Altogether, 1,910,093 children were registered, about 30% of the estimated total of 6,266,000 in this age group, roughly 1-9 years. The proportion of available children registered was greater in the school than in the pre-school years. After taking into account likely supplies of vaccine, then estimated to be about 400 litres, the months of birth selected for children who were to be vaccinated were November for those born in 1947-50 and March and November for those born in 1951-4. This allocation gave 95,723 children aged 5½ to 9½ and 98,687 children aged 1½ to 5½ eligible for vaccination. As a reserve for any excess vaccine that could not be used in these children, August was nominated for all years of birth. It had been anticipated that one or two other months of birth would also be selected for vaccination, but the limited supplies of vaccine available made this impossible.

Vaccination was carried out by local authorities in their clinics from early May to the end of June. Returns of the numbers given one and two injections were then furnished by local health authorities to the Statistical Research Unit. In total, 178,161 children were given two injections and 32,379 received one only.

Local Reactions to Vaccination

A total of 2,291 children in the counties of Buckinghamshire and London, and the county boroughs of Manchester and Sheffield, were visited the day after receiving their injections to determine the degree of any immediate reaction to vaccination. Taking children of all ages and of both sexes together, the proportions showing some degree of local reaction to the first injection were as follows: Buckinghamshire 7%, London 15%, Manchester 4%, and Sheffield 9%. In each area the corresponding proportions after the second injection were less, being 2, 13, 1, and 7% respectively. Most of these reactions were redness at the site of injection of less than ½ in. (1.3 cm.) diameter without swelling, and it is understandable that there should be considerable variability from area to area in the frequency of recording such minor conditions. First injections were accompanied by some degree of malaise, usually of minor degree, in about 2-3% of children, these proportions being fairly constant from area to area. After second injections those with malaise were less than 2% of those visited in each area.

The local reactions thus recorded seem to have been mild.

Examination of the Urine from Vaccinated Children

Arrangements were made for the examination of urine from a sample of vaccinated children in Sheffield, Glasgow, and Dundee.

Sheffield.—Thirty-seven children, some of whom had polio antibodies before inoculation, were included in this special investigation. During the first 15 days after the first inoculation 239 specimens of urine were examined from these children. During the 15 days after the second injection 176 specimens of urine were tested from 30 of them. In general, the urine tests were carried out at intervals of two days during the period following each inoculation.

In no instance was any albuminuria or haematuria encountered. A few hyaline casts appeared in the occasional specimen, and also leucocytes. In no case were these considered to be in excess of the normal. No attempt was made to carry out Addis counts.

Glasgow.—Fourteen children submitted 63 specimens of urine before and after the first or second inoculation of polio vaccine. Apart from one child with a symptomless urinary infection (discovered in the first specimen) no abnormality was found.

Dundee.—Seven children submitted 98 specimens after the first inoculation. One showed a very few red cells on the 10th day; one showed occasional leucocytes (3/4 per high-power field from the 6th to the 14th day). There was no other abnormality. Six of these same children submitted 84 specimens after the second inoculation, and all were normal.

Illnesses in Vaccinated Children, Possibly Related to the Injections

In letters sent in April, 1956, to medical officers of health and hospital clinicians in England, Wales, and Scotland outlining the scheme of investigation a request was made that they should report any illness in a vaccinated child which, in their opinion, might be related to the inoculation. As a result reports were received of six children who developed illnesses shortly after vaccination. These are described below:

1. A boy aged 4 years developed meningism and fever two days after his first injection. The C.S.F. findings were normal,

but culture of a throat swab grew β -haemolytic streptococci. Recovery was complete.

2 and 3. From one area two boys were reported to have had fever, one up to 104° F. (40° C.), following their first doses of vaccine. No other abnormalities were detected and they recovered completely.

4. A boy aged 3 years developed convulsions and meningism 10 days after his first injection. *Salm. typhimurium*, but no virus, was isolated from the stools.

5. A boy aged 18 months developed convulsions and hyperpyrexia 24 hours after vaccination. The C.S.F. was normal and no virus was isolated from the stools. The child made a gradual recovery, but was left with a left-sided hemiplegia. Six months later he was walking and had very little residual weakness. The clinician concerned regarded the incident as coincidental and in no way connected with the vaccination.

6. A boy aged 18 months developed nephrosis four days after his second injection. In the opinion of the paediatrician the illness was merely coincidental. Diuresis and complete recovery followed treatment with prednisolone.

In none of the six children could the illness be related definitely to the preceding injections on clinical or laboratory grounds. When such a large number of children, over 200,000, are being given intramuscular injections it is inevitable that some will develop coincidental illnesses within a short period of inoculation. It is obvious, too, that the reporting of such illnesses can come from the vaccinated group only. It is impossible, therefore, to determine whether there was an excess of such illness in vaccinated children. It is quite possible that all, or at least some, of the illnesses reported here had nothing to do with vaccination. At the worst, if all were related to vaccination, one child only of those involved in the episodes appeared to have any residual disability, and this was very mild.

The Case Reports

From the beginning of May local health authorities sent case reports to the Statistical Research Unit for all children under 10 years of age suspected to be suffering from poliomyelitis. Besides the name, address, and date of birth, each report indicated whether the child had been vaccinated, registered but not vaccinated, or not registered for vaccination. It also gave the hospital to which the patient was admitted or the name of the family doctor if treated at home. For vaccinated children the details of each injection were given. Nearly 2,000 of these reports were received by the Unit up to the end of January, 1957. A check was then made with each authority to ensure that complete reports had been made and that the details were correct. In many instances, for example, the original diagnosis of poliomyelitis was not confirmed.

On receipt of a case report on a child who had been vaccinated or registered but not vaccinated a request was sent to the clinician in charge of the patient for a clinical report. The form provided for this purpose asked for details of the history of the illness, extent and severity of paralysis if present, cerebrospinal fluid examinations, and final diagnosis. The section on paralysis included a chart distinguishing 56 separate muscle groups, to be completed at the 21st day of the illness. In addition to this initial clinical report, a follow-up report, to be completed three to five months from onset, was sent to the appropriate clinicians for patients who had exhibited some paralysis at the 21st day of illness. This form included a muscle chart like that in the earlier record. Through the co-operation of the M.R.C. Committee on Laboratory Investigations of Poliomyelitis and the Public Health Laboratory Service, arrangements were made for stools and sera taken from patients to be examined in the virus laboratories of the Universities of Aberdeen, Edinburgh, Glasgow, Manchester, and Sheffield, and in the public health laboratories at London (County Hall), London (Colindale), Cambridge, Leeds, Nottingham, Sheffield, Stafford, and Cardiff. In letters to hospital clinicians and pathologists outlining in advance the

scheme of investigation a request had been made that, when possible, two stool and two serum specimens, one early in the illness and the other about 10 days later, should be taken from each patient. These specimens were taken and examined in the majority of the patients for whom clinical reports were requested.

From the beginning of May, 1956, to the end of January, 1957, case reports were received from local authorities regarding 512 children who had been vaccinated or registered for vaccination. Clinical reports were completed for all except three of them. All these three were registered but not vaccinated and were treated at home by general practitioners. They have been excluded from the analysis. Follow-up reports in the paralytic cases must necessarily come some time after the original illness and are not yet complete for all the relevant children. The following analysis, therefore, is based on the initial reports only.

The clinical reports have been classified as follows:

Paralytic Poliomyelitis.—All patients with muscle weakness at any time during their illness, subdivided according to whether any paralysis recorded on the muscle chart for the 21st day of illness was of cranial, spinal, or mixed spinal and cranial distribution. A further subdivision of this group included all the children with a transient paresis, of whatever distribution, which had fully recovered by the 21st day.

Non-paralytic Poliomyelitis.—All patients with aseptic meningitis, as indicated clinically or by C.S.F. changes or by both. Patients with no signs of meningism, whether or not polio virus was isolated, were excluded from this group.

This classification of the clinical reports was made independently of the results of virus isolation from stools. Sera collected from patients have not yet been fully examined and the findings are not included in this analysis.

Cases Excluded from Analysis

Table I shows the number of patients reported as suspected poliomyelitis but excluded from the analysis on clinical grounds. In 10 children there were no signs of

TABLE I.—Patients Whose Illnesses were Reported as Suspected Poliomyelitis With Onset from May 1, 1956, to January 31, 1957, but Who Were Subsequently Excluded From the Analysis

Year and Month of Birth	No. of Children	Patients Excluded	
		* "Abortive Poliomyelitis"	Not Poliomyelitis
1947-50:			
November	95,723	—	1
August	106,825	1	2
All other months ..	1,116,359	4	17
1951-4:			
March	58,580	1	3
November	40,107	1	—
August	45,642	1	2
All other months ..	446,857	2	12
Total	1,910,093	10	37

* "Abortive poliomyelitis" includes healthy carriers and patients for whom no signs of meningism or paresis were recorded at any stage of their illness.

meningism, and in some of these hardly any illness at all (one child who was found to be excreting type 1 virus was perfectly well, but had been admitted to hospital solely because both parents were patients with paralytic illnesses). In 37 children the clinicians rejected the diagnosis of poliomyelitis altogether. From the records of children born in November and March there were 6 exclusions, and 5 would be expected at the rates observed for all other months. For the reserve month, August, there are 6 exclusions, and between 3 and 4 would be expected. There is therefore no indication from these exclusions that a diagnosis of poliomyelitis was being reported excessively in children who were registered and were in the selected months of birth for vaccination.

Table II shows the cases of poliomyelitis in registered and in vaccinated children in which the onset was in May

TABLE II.—Cases of Poliomyelitis with Onset from May 1 to June 30, 1956

Year and Month of Birth	No. of Children	No. of Cases		Rate per 100,000	
		Paralytic	Non-paralytic	Paralytic	Non-paralytic
1947-50:					
November	95,723	0	1	—	1.0
August	106,825	1	3	0.9	2.8
All other months	1,116,359	11	10	1.0	0.9
1951-4:					
March	58,580	1	1	1.7	1.7
November	40,107	2	—	5.0	—
August	45,642	1	1	2.2	2.2
All other months	446,857	8	3	1.8	0.7
Total	1,910,093	24	13	1.3	0.7

+ = Aseptic meningitis with isolation of typed polio virus from stools.
 — = Aseptic meningitis without isolation of typed polio virus from stools.

or June, 1956. During this period vaccination was in progress, and, although it was known whether an individual patient was vaccinated or not, the population at risk could not be determined. This table therefore groups patients according to their month of birth irrespective of vaccination history, but shows the selected months separately. There is no evidence of any significant or consistent difference in attack rates between the selected and unselected months of birth. In children born in November and March, 3 paralytic and 2 non-paralytic attacks were recorded. At the rates observed in the unvaccinated children born in all other months the expected numbers (to the nearest unit) are 3 and 3. For children born in August the observed numbers are 2 and 4 and the expected numbers 2 and 3. Though the numbers are small they suggest a similarity between the groups during the period.

Cases Occurring Within 30 Days of Vaccination

The reports on paralytic poliomyelitis provoked by injections of diphtheria and pertussis prophylactics suggest that the risk is limited to the period of 30 days following inoculation, and that in such provoked cases there is an association between the site of inoculation and sites of paralysis. In the report on the surveillance of poliomyelitis in the United States in 1955 Langmuir, Nathanson, and Hall (1956) show that the site of first paralysis in the cases associated with Cutter vaccine was commonly the inoculated limb, and that the interval from vaccination to onset was usually between 4 and 11 days. Special importance, therefore, attaches to cases of poliomyelitis occurring within 30 days after vaccination. Six children developed poliomyelitis within 30 days of vaccination, and in all the onset was in May or June. As was general throughout the programme, they had been given their injections intramuscularly in the left arm. Other details of their vaccination and illnesses are listed below.

Case 1.—Girl, born in August, 1951. First injection given May 30, 1956. Onset of illness on June 3—that is, four days later—with complete paralysis of muscle groups of right shoulder girdle and right arm, with minimal finger movements only. Type I virus isolated from the stools.

Case 2.—Boy, born in November, 1954. First injection May 11, 1956; second injection June 8. Onset of illness on June 12, four days after the second and 32 days after the first injection. Paresis of moderate severity affected the muscles controlling the left hip and knee; there was good recovery (M.R.C. grade 4) by December, 1956. Type I virus was isolated from the stools.

Case 3.—Boy, born in March, 1953. First injection May 9, 1956, second injection June 6. Onset of illness on June 27, 21 days after the second and 49 days after the first injection. He was not confined to bed completely, but appeared to have slight weakness of the right leg following a feverish cold with headache. The paresis disappeared rapidly. No virus was isolated from the stools.

Case 4.—Boy, born in November, 1950. First injection May 25, 1956, no second injection. Onset of illness May 30, five days later, with meningism, raised protein, and lymphocytic response in the C.S.F. No paresis was seen at any time. No virus was isolated from the stools.

Case 5.—Boy, born in August, 1950. First injection May 24, 1956, no second injection. Onset of illness on June 1, eight days later, with meningism, raised protein, and marked lymphocytic response in the C.S.F. No paresis was seen at any time. No response in the C.S.F. No paresis was seen at any time. In view of the finding of virus was isolated from the stools. In view of the finding of high titres to a single mumps complement fixation test on the 19th day, this illness may have been due to the mumps virus.

Case 6.—Boy, born in March, 1951. First injection May 31, 1956; no second injection. Onset of illness on June 24, 24 days later with meningism, raised protein and lymphocytic response in the C.S.F. No paresis was seen at any time. No virus was isolated from the stools.

These six cases gave no evidence of being associated with vaccination. In the three paralytic cases there was no involvement of the injected limb, which was a feature of those associated with the Cutter vaccine in the United States.

Defaulters from Vaccination

In the seven months following the completion of vaccination, from July 1, 1956, to January 31, 1957, the populations of children vaccinated and of children registered but not vaccinated were known from the returns supplied by local health authorities. The assessment of the protective effect of vaccine is based, therefore, on the cases occurring in this period. Although vaccination did not start again till mid-March, 1957, the few cases occurring since January 31, 1957, have not been included, as their records are not yet complete. About three-quarters of the eligible children born in the primary selected months, March and November, received two injections of vaccine, whereas only about 20% of those in the reserve month, August, received two injections. As there was no universal method by which children born in August were chosen for vaccination, each authority adopting its own appropriate system, it is not certain what factors governed this selection and how they may have influenced the result in these children. Consequently the children in this month of birth have been excluded from the further analysis.

In the months of November for those born in 1947-50, and of March and November for those born in 1951-4, all registered children were eligible for vaccination, but a proportion, referred to as defaulters, for one reason or another did not receive any vaccine. Table III compares the inci-

TABLE III.—Attack Rates in Unvaccinated Children (1) Born in November and March, the Months Selected for Vaccination, and (2) Born in Other Months of Birth (Excluding August)—Cases With Onset July 1, 1956, to January 31, 1957

Year and Month of Birth	No. of Children	No. of Cases *		Rate per 100,000	
		Paralytic	Non-paralytic	Paralytic	Non-paralytic
1947-50:					
All unselected months	1,116,359	91	25	8.2	2.2
November	15,271	0 (1.2)	0 (0.3)	—	—
1951-4:					
All unselected months	446,857	90	15	20.1	3.4
March	10,736	3 (2.2)	0 (0.4)	27.9	—
November	7,057	6 (1.4)	1 (0.2)	85.0	14.2

* = Aseptic meningitis with isolation of typed polio virus from stools.
 — = Aseptic meningitis without isolation of typed polio virus from stools.
 * The italicized figures in parentheses indicate the number of cases that would have been expected at the attack rates in the months not selected for vaccination.

dence of poliomyelitis in eligible children born in November and March who received no vaccine with that in children born in the months not selected for vaccination (vaccination was carried out in a few children born in these months, but the number was only 0.5% of the total). The older children in the unselected months, those born in 1947-50, show a paralytic attack rate of 8.2 per 100,000 based on 91 cases. No cases were seen in the 15,271 November-born defaulters, whereas 1.2 cases would have been expected at the rate for other months. For the younger children in the unselected months, those born in 1951-4, the paralytic attack rate was

20.1 per 100,000 based on 90 cases. In the 10,736 March-born defaulters the rate was 27.9 based on 3 cases, whereas 2.2 cases would have been expected at the rate for the other months. In the 7,057 November-born defaulters the rate was 85.0 based on 6 cases, whereas only 1.4 cases would have been expected at the rate for unselected months. This finding of a high incidence in the younger defaulters born in November might suggest that in some way the children who failed to be vaccinated were a selected group specially at risk, and that the children who were vaccinated were in consequence a biased sample liable to less risk even without vaccination. If such a bias were operating, however, there seems no reason why it should be limited to this month of birth in the younger ages alone. The defaulters of the same years of birth born in March and the 1947-50 November defaulters showed no excess of paralytic illness over the unvaccinated children in other months. Totalling the three groups of absentees gives 9 observed paralytic cases; at the corresponding rates for all other months the expected number is 4.8, a difference which is not formally significant. It is concluded, therefore, that the high attack rate of paralytic poliomyelitis in the young November-born defaulters is a chance finding and does not indicate a bias in the group receiving vaccination.

The Assessment of the Vaccine

(a) Paralytic Disease

The further analysis is a comparison between the attack rates in vaccinated children given two injections with those in the unvaccinated children in the remaining months (excluding August). Table IV shows the number of paralytic

TABLE IV.—Attack Rates of Paralytic Poliomyelitis—Cases with Onset from July 1, 1956, to January 31, 1957—in Vaccinated Children in Selected Months of Birth Given Two Injections and in Registered, Unvaccinated Children of all Other Months of Birth (Excluding August)

	No. of Children	[No. of Cases					Rate per 100,000 (All Forms)
		Spinal	Cranial	Spinal and Cranial	Transient*	All Forms	
1947-50 Births							
Boys:							
Vaccinated ..	37,893	—	1	—	—	1	2.6
Not vaccinated	569,053	32	7	7	9	55	9.7
Girls:							
Vaccinated ..	36,767	—	—	—	—	—	—
Not vaccinated	547,306	26	5	3	2	36	6.6
Both sexes:							
Vaccinated ..	74,660	—	1	—	—	1	1.3
Not vaccinated	1,116,359	58	12	10	11	91	8.2
1951-4 Births							
Boys:							
Vaccinated ..	37,998	1	—	—	—	1	2.6
Not vaccinated	229,992	39	1	4	4	48	20.9
Girls:							
Vaccinated ..	36,026	1	—	1	—	2	5.6
Not vaccinated	216,865	31	2	4	5	42	19.4
Both sexes:							
Vaccinated ..	74,024	2	—	1	—	3	4.1
Not vaccinated	446,857	70	3	8	9	90	20.1

* Transient = Cranial or spinal paresis, not remaining at the 21st day of illness.

cases in the four categories, spinal, cranial, mixed spinal and cranial, and transient paresis. In the older group, born 1947-50, the rate in vaccinated children of both sexes, 1.3 per 100,000, was only 16% of that in the unvaccinated, 8.2 per 100,000. At the unvaccinated rate 6.1 cases would have been expected compared with the 1 case observed. This reduction is significant: $P=0.019$ (single tail test). Although there is an apparent protection of 84%, this estimate, based on very small numbers, could vary widely from the true value. It is possible (95% confidence limits) that the degree of protection could have been as little as 6% or as much as 99%. Taking the two sexes separately there is apparent protection in each, but the difference in rates is not significant.

In the younger children, born 1951-4, the rate in vaccinated children of both sexes, 4.1 per 100,000, is only 20% of that in the unvaccinated, 20.1 per 100,000. At the unvaccinated rate 14.9 cases would have been expected compared with the 3 observed. This reduction is highly significant, $P=0.0005$ (single tail test). There is an apparent protection of 80%, and it is possible (95% confidence limits) that the degree of protection could have been somewhere between 39 and 96%.*

(b) Non-paralytic Disease

Table V presents the number of non-paralytic cases in the two categories—aseptic meningitis with and without isolation of polio virus. In the older group, born 1947-50, the rates in boys from whom polio virus was isolated were the

TABLE V.—Attack Rates of Non-paralytic Poliomyelitis—Cases with Onset from July 1, 1956, to January 31, 1957—in Vaccinated Children in Selected Months of Birth Given Two Injections and in Registered Unvaccinated Children of all Other Months of Birth (Excluding August)

	No. of Children	No. of Cases'			Rate per 100,000	
		+	-	Total	+	Total
1947-50 Births						
Boys:						
Vaccinated ..	37,893	1	8	9	2.6	23.8
Not vaccinated	569,053	15	63	78	2.6	13.7
Girls:						
Vaccinated ..	36,767	—	—	0	—	—
Not vaccinated	547,306	10	26	36	4.8	6.6
Both sexes:						
Vaccinated ..	74,660	1	8	9	1.3	12.1
Not vaccinated	1,116,359	25	89	114	2.2	10.2
1951-4 Births						
Boys:						
Vaccinated ..	37,998	—	1	1	—	2.6
Not vaccinated	229,992	9	23	32	3.9	13.9
Girls:						
Vaccinated ..	36,026	—	1	1	—	2.8
Not vaccinated	216,865	6	8	14	2.8	6.5
Both sexes:						
Vaccinated ..	74,024	—	2	2	—	2.7
Not vaccinated	446,857	15	31	46	3.4	10.3

+ = Aseptic meningitis with isolation of typed polio virus from stools.
 — = Aseptic meningitis without isolation of typed polio virus from stools.

same for vaccinated and unvaccinated, 2.6 per 100,000. The absence of any such cases in vaccinated girls was of no significance, as only 0.7 case would have been expected at the unvaccinated rate. There were no cases from whom virus was isolated in vaccinated boys and girls born in 1951-4, but the numbers expected at the corresponding unvaccinated rates were only 1.5 and 1.0 respectively. In the unvaccinated children the cases without virus isolation were over twice as common in boys as in girls. In neither age group was there any significant difference between the rates in the vaccinated and unvaccinated children.

It thus appears that two injections of vaccine conferred significant protection against paralytic disease in children of both school and pre-school age, but did not modify the incidence of illnesses reported as non-paralytic poliomyelitis consistently or significantly.

The Question of Bias

As it might be argued that the vaccinated children were a biased sample of those eligible in their month of birth, a comparison free from bias could be made between all those

* A girl born in March, 1952, received two injections of vaccine in May and June, 1956. While on holiday in August she was unwell but not feverish, and developed an "unusual" gait. She was not seen by a doctor until her return home, when no abnormal signs were detected and an injury was suspected. Some months later she was referred to an orthopaedic department and was found to have 4-in. (0.6 cm.) wasting of the left calf, slight tightness of the Achilles tendon, but no muscle weakness. The patient was then reported as a possible case of poliomyelitis. Lack of information about the early illness makes it impossible to classify her. If at the worst she is regarded as having had paralytic poliomyelitis, her inclusion in Table IV would increase the attack rate of the vaccinated group to 5.4, which is still significantly below the rate of 20.1 in the unvaccinated group.

registered in the selected months, including both vaccinated and defaulters, and those registered in other months. Because of the inclusion of unvaccinated children and those given only one injection in the selected months, such a comparison should underestimate the true effectiveness of vaccine. In those born in 1947-50 the apparent protection against paralytic disease is increased—1 case observed to 7.8 expected—and becomes more significant because the November-born group has been increased in size without any addition to the cases observed. On the other hand, in those born in 1951-4 the apparent protection is less than in the earlier comparison—12 cases observed to 19.9 expected—and is no longer significant. This change has occurred principally because of the inclusion in the November group of the unvaccinated defaulters with their high incidence, a feature which has already been discussed. For non-paralytic illnesses the pattern remains one of no significant protection against aseptic meningitis either with or without virus isolation.

Results of Virus Isolation

Table VI shows the results of virus isolation from the stools of all registered and vaccinated patients whose records were included in the assessment of the vaccine (Tables IV and V). Stool specimens were obtained from 64 of the 92

TABLE VI.—Isolation of Virus from Stools of Patients with Onset of Illness from July 1, 1956, to January 31, 1957—Vaccinated Children in Selected Months of Birth Given Two Injections and Registered Unvaccinated Children of all Other Months of Birth (Excluding August)

Year of Birth and Group	Polio Virus				Other Viruses	No Virus	Total Specimens	No Specimens	Total
	I	II	III	All Types					
Paralytic									
1947-50. Boys:									
Vaccinated	1	—	—	1	—	—	1	—	1
Not vaccinated	20	4	3	27	1	12	40	15	55
1947-50. Girls:									
Vaccinated	—	—	—	—	—	—	—	—	0
Not vaccinated	15	—	1	16	—	7	23	13	36
1951-4. Boys:									
Vaccinated	—	—	—	—	—	1	1	1	1
Not vaccinated	20	5	2	27	1	9	37	11	48
1951-4. Girls:									
Vaccinated	1	—	—	1	—	1	2	—	2
Not vaccinated	18	1	1	20	—	7	27	15	42
Non-paralytic									
1947-50. Boys:									
Vaccinated	—	—	1	1	1	6	8	1	9
Not vaccinated	11	2	2	15	11	30	56	22	78
1947-50. Girls:									
Vaccinated	—	—	—	—	—	—	—	—	0
Not vaccinated	9	1	—	10	3	12	25	11	36
1951-4. Boys:									
Vaccinated	—	—	—	—	—	1	1	—	1
Not vaccinated	7	2	—	9	1	9	19	13	32
1951-4. Girls:									
Vaccinated	—	—	—	—	—	1	1	—	1
Not vaccinated	4	1	1	6	1	5	12	2	14

TABLE VII.—Attack Rates of Paralytic Poliomyelitis with Isolation of Type I Virus—Cases with Onset from July 1, 1956, to January 31, 1957

	1947-50 Births			1951-4 Births		
	No. of Children	No. of Cases	Rate per 100,000	No. of Children	No. of Cases	Rate per 100,000
Boys:						
Vaccinated	37,893	1	2.6	37,998	0	—
Not vaccinated	569,053	20	3.5	229,992	20	8.7
Girls:						
Vaccinated	36,767	0	—	36,026	1	2.8
Not vaccinated	547,306	15	2.7	216,865	18	8.3
Both sexes:						
Vaccinated	74,660	1	1.3	74,024	1	1.4
Not vaccinated	1,116,359	35	3.1	446,857	38	8.5

paralytic cases born in 1947-50. Polio virus was isolated from 44 of these—36 type I, 4 type II, and 4 type III. In the children born in 1951-4, 67 specimens were obtained from 93 children and polio virus was isolated from 48—39 type I, 6 type II, and 3 type III. In both groups, therefore, specimens were obtained from just under three-quarters, and virus, predominantly type I, was isolated from about 70% of the specimens examined.

In the non-paralytic group, 89 specimens were obtained from 123 children born in 1947-50, but virus was isolated in only 26—20 type I, 3 type II, and 3 type III. From the 48 children born in 1951-4, 33 specimens were obtained and virus was isolated in 15—11 type I, 3 type II, and 1 type III. Apart from the less frequent isolation of virus compared with paralytic cases, the same pattern of predominantly type I infection emerges.

It might be inferred, therefore, that as the vaccine appears to have protected against paralytic illness it must have been effective against those due to type I infection. This is supported by Table VII, which, like Table IV, is a comparison of paralytic attack rates in vaccinated children in the selected months of birth and unvaccinated children in other months, but includes only those patients from whom type I virus was isolated. In both age groups there is a reduction in the attack rate in vaccinated children; in the older group the difference is not statistically significant, and in the younger group it is just significant ($P=0.018$, single tail test).

Children Given One Injection Only

Table VIII shows the number of children given one injection only and the attack rates in this group. Some of these children were in the selected months of birth, November and

TABLE VIII.—Attack Rates in Children Given One Injection Only—Cases with Onset from July 1, 1956, to January 31, 1957

Year of Birth and Sex	No. of Children	No. of Cases		Rate per 100,000	
		Paralytic	Non-paralytic	Paralytic	Non-paralytic
1947-50:					
Boys	9,151	0	1	—	10.9
Girls	8,991	0	0	—	11.1
Both sexes	18,142	0	1	—	5.5
1951-4:					
Boys	7,390	0	0	—	13.5
Girls	6,847	0	0	—	—
Both sexes	14,237	0	0	—	7.0

+ = Aseptic meningitis with isolation of typed polio virus from stools.
— = Aseptic meningitis without isolation of typed polio virus from stools.

March, but failed to complete both injections largely because there was insufficient time before the end of June or because they defaulted. A large proportion of this group were born in August and received their injection late in the vaccination period. The group is therefore heterogeneous and by no means randomly selected. Although no cases of paralytic poliomyelitis occurred among them, only 1.5 would have been expected in those born in 1947-50 and 3.0 in those born in 1951-4 at the corresponding rates of the unvaccinated children. This apparent reduction in attack rate is not statistically significant, and because of this and the nature of the group it is impossible to draw any conclusions regarding the effectiveness of one injection.

Summary and Conclusions

1. In the autumn of 1955 a British formolized vaccine containing the Brunenders type I, MEF-1 type II, and Saukett type III strains was put into production, and early in 1956 the Ministry of Health and Department of Health for Scotland announced a vaccination programme for children born in the years 1947-54. Through the

local health authorities parents of these children were invited to register them for vaccination.

2. It was anticipated that the demand would greatly exceed the supplies of vaccine that could be produced in the limited time available before the onset of the 1956 epidemic season. The efficacy of vaccines incorporating the Brunenders strain and the protection conferred by vaccinating children of pre-school age had not been previously measured. In these circumstances of scarcity, therefore, the opportunity was taken of issuing the vaccine in such a way as to allow its protective value to be scientifically assessed.

3. All but two of the local health authorities in England, Wales, and Scotland took part in the scheme and nearly two million children were registered for vaccination—almost one-third of the total number who were eligible.

4. To secure two large and comparable groups of children, equivalent except in respect of vaccination, it was essential that the vaccine should be distributed without bias on a uniform and simple basis throughout the country. For this purpose the allocation was based upon the month of the year in which a child had been born. It was offered to the 95,723 registered children born in any November of the years 1947-50 and to the 98,687 registered children born in any November or March of the years 1951-4. For various reasons, 33,064 of these eligible children did not receive any injections. The defaulters born in November, 1951-4, were subsequently found to have a higher attack rate of paralytic poliomyelitis than unvaccinated children who were not eligible for vaccination. The remainder of the defaulters, those born in November, 1947-50, and in March, 1951-4, showed no such excess. It was considered, therefore, that this excess limited to one group was due to chance and had not biased the assessment of the vaccine.

5. Vaccination was carried out by local authorities in their clinics from early May to the end of June, 1956. Of the registered children born in March and November 148,684 received the required two injections, with not less than three weeks between them. School and pre-school children each provided some 74,000. For comparison there remained over 1½ million registered children born in other months and for whom vaccine was not then available (children born in August were excluded from the comparison, since any supplies of vaccine surplus to the demands of March and November were distributed to them on any system that the medical officer of health found convenient).

6. From the beginning of vaccination until January, 1957, special returns were supplied by the local health authorities for every notification of poliomyelitis relating to a child under 10 years of age. Of these reports, 512 related to registered children, vaccinated or unvaccinated. Further details were then sought from general practitioners, hospital clinicians, and pathologists regarding each of these.

7. Nearly 400,000 injections were given and there was no evidence that they had been accompanied by any risk. Of six cases of notified poliomyelitis that occurred within thirty days of an injection only three were paralytic and in none of them was the injected limb involved. Local reactions to vaccination were mild. No albumination or obvious excess of cells or casts was

detected in an examination of specimens of urine from a small sample of children subsequent to vaccination.

8. In the 74,660 vaccinated children born in 1947-50 and aged, roughly, 5½ to 9½ years who received two injections of vaccine, one case of paralytic poliomyelitis occurred, giving an attack rate of 1.3 per 100,000. The attack rate in the corresponding unvaccinated children was 8.2 per 100,000. At this latter rate 6 cases would have occurred in the vaccinated group in place of the 1 actually observed.

In the 74,024 children born in 1951-4, and aged, roughly, 1½ to 5½ years who received two injections of vaccine, three cases of paralytic poliomyelitis occurred, giving an attack rate of 4.1 per 100,000. The attack rate in the corresponding unvaccinated children was 20.1 per 100,000. At this latter rate 15 cases would have occurred in the vaccinated group in place of the 3 actually observed.

In both age groups, therefore, the observed incidence of paralytic disease in the vaccinated children was only about one-fifth of the incidence in the unvaccinated.

9. The incidence of illnesses reported as non-paralytic poliomyelitis appeared to be uninfluenced by vaccination.

10. Although the number of observations is small there appears to be no doubt that the Brunenders strain incorporated in the vaccine conferred protection against type I infections prevailing in the community.

11. There was insufficient evidence on which to judge the effect of one injection only.

12. Owing to the shortage of vaccine and the very short time (6 weeks) in which to utilize supplies that were available the numbers of children who completed the course of two injections of vaccine (148,684) fell far short of the numbers originally hoped for. As a result it is not possible to assess with any real precision the degree of protection which was conferred by the vaccine. Since some cases of paralytic disease were observed in the vaccinated children, in the form in which it was given the vaccine did not offer complete protection. On the other hand it did confer some protection, which was probably quite substantial over the ages 1½ to 9½ years. If the small numbers available are taken at their face value the apparent protection conferred was very similar to that observed in the 1954 trial in the United States.

Acknowledgments

The assessment of poliomyelitis vaccine would have been impossible without the co-operation of a large number of people. The Committee wishes to express its appreciation of the generous help given to it by the medical officers of health of local health authorities in England, Wales, and Scotland, who provided records of the numbers of children registered and vaccinated in their areas and reports on children who were notified as cases of poliomyelitis, and who in Buckinghamshire, London, Manchester and Sheffield organized special visits to a sample of the vaccinated children. The Committee are grateful to the many general practitioners and hospital clinicians who willingly provided clinical reports on their patients, and to the pathologists in hospital and university laboratories and in laboratories of the Public Health Laboratory Services who examined specimens from these children. A study of this nature involves considerable administrative and clerical routine in the collection and analysis of the records. The Committee wishes to acknowledge its debt to Dr. A. H. Bottomley, Mrs. D. King, and Mrs. L. Clargo, of the Statistical Research Unit, for their invaluable contribution to this task.

REFERENCES

- Committee on Laboratory Investigations of Poliomyelitis of the Medical Research Council (1957). *British Medical Journal*, 1, 366.
Langmuir, A. D., Nathanson, N., and Hall, W. J. (1956). *Amer. J. pub. Hlth*, 46, 75.
Poliomyelitis Vaccine Evaluation Center (1955). *Ibid.*, 45, No. 5, Pt. 2.

A SIMPLE TEST FOR INTERATRIAL COMMUNICATION

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Atrial septal defect is one of the commoner congenital heart lesions. Wood (1956) found it in 18% of 900 cases of congenital heart disease that he studied. A large proportion of patients with this defect remain symptom-free for many years, but the average age of those seen by Wood was 23 years, and 84.5% were under 40, which suggests that these individuals tend to die young. Therefore it is not surprising that methods for surgical closure of the defect have now been developed, and, although the operative risks are being reduced, the physician is faced with the problem of weighing the prognosis of the natural course of the disease against the hazards of surgical correction at the present time. However, the risks and inconveniences to the patient suspected of having an atrial septal defect often begin long before surgery is even contemplated; for clinical diagnosis from physical signs, electrocardiography, and chest x-ray examination are not absolutely reliable, and more or less elaborate and potentially hazardous investigations involving cardiac catheterization and angiography are required before an accurate anatomical diagnosis can be made. These procedures are justified in patients with symptoms, but it would be a great convenience if a simple test were available that enabled the clinician to arrive at a firm diagnosis in the symptomless patient with atrial septal defect.

The present paper describes such a test, which depends upon being able to alter the pressures within each atrium separately. This produces changes in pressure differential between the two chambers, which consequently result in alterations of blood flow across any defect that may exist in the septum. As a result, alterations occur in oxygen saturation of the blood leaving the left atrium, and these can be detected by an oxymeter placed on the patient's ear.

Methods

Thirty-two patients have been studied. An oxymeter earpiece (Wood, 1950) was placed on the right ear and connected to a chopper amplifier similar to that described by Stott (1953), enabling percentage arterial oxygen saturation to be recorded continuously. The intrathoracic pressure was measured via a water-filled catheter placed in the oesophagus, connected to a Hansen capacitance manometer (Dornhorst and Leathart, 1952), while the brachial artery pressure was recorded by a second Hansen manometer (Hansen, 1949) connected via a "polythene" catheter to a fine needle inserted in the brachial artery after the overlying skin had been anaesthetized with 2% lignocaine hydrochloride.

The patient usually sat in a chair, or sat propped up on a couch or bed. A period of 10 minutes was allowed for him to become used to his surroundings; continuous recordings of arterial oxygen saturation, intra-oesophageal (intrathoracic) pressure, and brachial artery pressure were obtained. The patient was then asked to perform Valsalva's manoeuvre; this consisted in blowing a mercury column to a height of 50 mm. for 10–15 seconds. The mercury column

consisted of a standard blood-pressure machine, with a mouthpiece provided in place of the arm cuff and bellows. Following this procedure, the patient repeated the manoeuvre after exercising against two car foot-pumps. Patients who showed negative responses to the Valsalva tests were then asked to perform the reversed procedure, or Müller's manoeuvre. This consisted in inspiring against a fixed resistance to produce a negative intrathoracic pressure of 40–50 mm. Hg for 10–15 seconds. Most individuals found this a much more difficult task to perform. Lastly, the patient's legs were lifted whilst a continuous oxymeter recording was made. In three patients the test was also performed during diagnostic cardiac catheterization and the oxymeter record obtained simultaneously with the oesophageal and net intracardiac pressures, using a differential manometer system (Lee, Matthews, and Sharpey-Schafer, 1954).

Results and Discussion

A previous study of the pressures within the right atrium and "pulmonary capillary" (Lee *et al.*, 1954) has been used as the basis for the design of the present test. Right atrial and "pulmonary capillary" pressures minus the intrathoracic pressure were obtained, using a differential manometer system, and are referred to as net pressures. At rest, the net right atrial pressure was found to be 2–4 mm. Hg below the net pulmonary capillary pressure in the normal individual. Epps and Adler (1953) have shown that the pulmonary capillary pressure is almost identical with the left atrial pressure in man, so that this slight difference in pressure level is also representative of the pressure difference between the right and left atrium. Recently, Dexter (1956) has confirmed that the same pressure differences exist between the two atria in those individuals who have small atrial septal defects, but that in patients with larger atrial septal defects pressures tend to become uniform throughout both atria.

Valsalva's manoeuvre produces characteristic pressure changes in both the right atrium and pulmonary capillary (Fig. 1). Prior to the manoeuvre, the patient usually breathes in deeply. This lowers the intrathoracic pressure, which has the effect of sucking blood from the systemic venous system into the thorax, so that the net right atrial pressure rises (Fig. 1, A). During Valsalva's manoeuvre the intrathoracic pressure is raised, which impairs venous return to the heart, and the net right atrial pressure falls towards zero (Fig. 1, B).

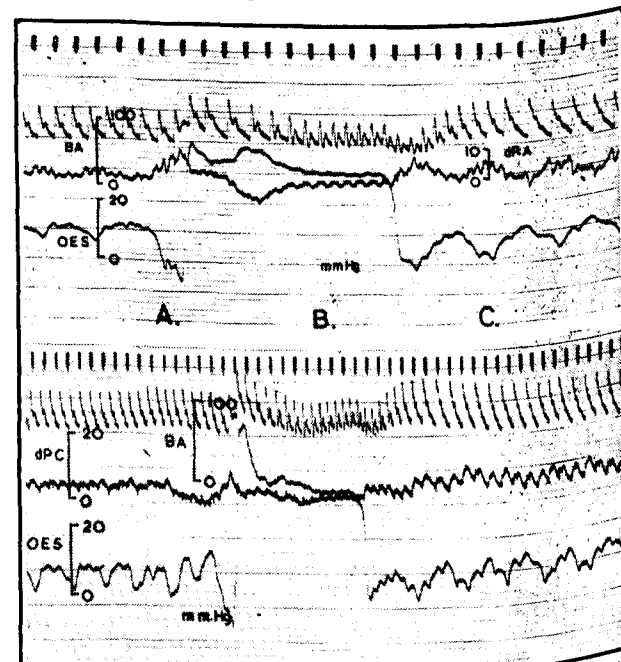


FIG. 1.—Comparison of effect of Valsalva's manoeuvre on net right atrial pressure (above) and net pulmonary capillary pressure (below). Time in seconds. BA=brachial artery pressure. dRA=net right atrial pressure. dPC=net pulmonary capillary pressure. OES=intra-oesophageal pressure. A, B, and C=before, during, and after Valsalva's manoeuvre, respectively.

The deflection below zero seen on the atrial pressure record is due to an artifact produced by a contraction wave passing down the oesophagus affecting the differential manometer system. After Valsalva's manoeuvre the intrathoracic pressure returns to normal, and the previously impaired venous return from the now engorged systemic veins is suddenly resumed. The net right atrial pressure therefore

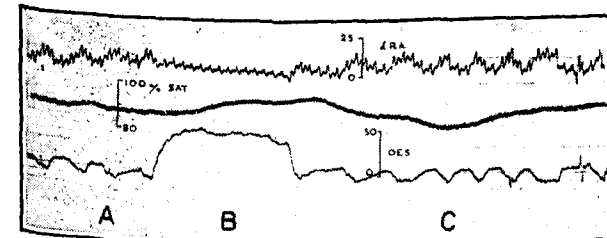


FIG. 2.—Effect of Valsalva's manoeuvre on arterial oxygen saturation in atrial septal defect. Abbreviations as Fig. 1. Middle line=arterial oxygen saturation (oxymeter).

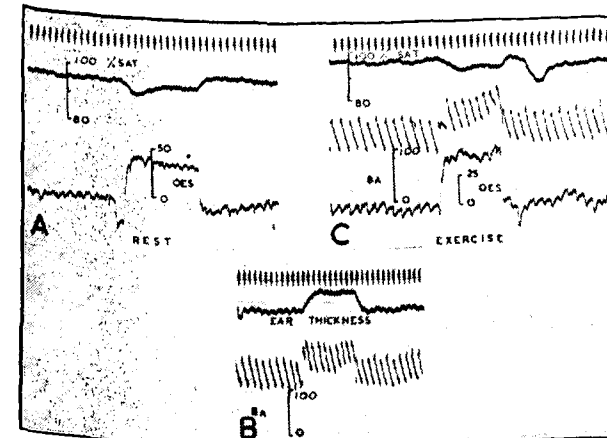


FIG. 3.—Effect of Valsalva's manoeuvre on arterial oxygen saturation in patient with small atrial septal defect. Abbreviations as Fig. 1. A, at rest. B, calibration of oxymeter for ear thickness change. C, after exercise.

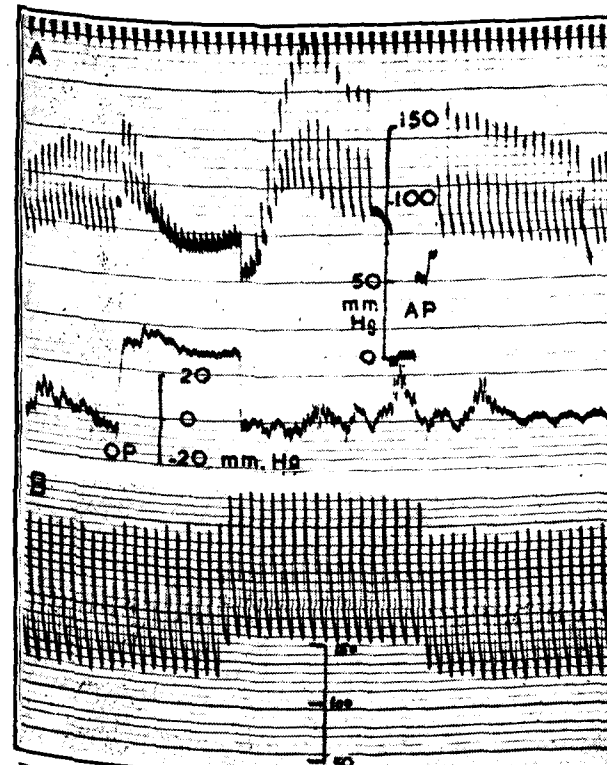


FIG. 4.—Effect of Valsalva's manoeuvre on the brachial artery blood pressure. Abbreviations as Fig. 1. A, Normal subject. B, Patient with congestive cardiac failure.

rises well above its resting level, and this becomes particularly marked during each phase of inspiration (Fig. 1, C). A similar series of events occurs in the pulmonary capillary, but some three to five seconds after events in the right atrium because of the circulation time through the right ventricle and lung vessels. There is not the same degree of modification by respiration as in the right atrium.

If an atrial septal defect exists, then a right-to-left shunt of desaturated blood should occur across the defect during the first few seconds after the end of the Valsalva manoeuvre, because the sudden rise in net right atrial pressure will cause a right-to-left pressure gradient across the defect. This has been found to be the case.

Fig. 2 shows a typical tracing obtained from a 24-year-old man with an atrial septal defect and moderate pulmonary hypertension. His resting arterial oxygen saturation was 89% (Fig. 2, A). Swan and his colleagues (1954) have shown by dye-injection studies in patients with atrial septal defect that, although the predominant shunt is from left to right, small right-to-left shunts also take place at the same time, due to streaming effects from the two venae cavae across the right atrium. We found that minor degrees of systemic arterial oxygen desaturation were common, and the oxymeter test confirmed that they were due to small right-to-left shunts at the atrial level. This was shown by the oxymeter response during the Valsalva manoeuvre (Fig. 2, B). At this time, when the intrathoracic pressure was raised and the net right atrial pressure was falling because of the decreased venous return to the heart, the systemic arterial oxygen saturation rose towards normal (97%). This was due to the disappearance of the small right-to-left shunt previously present. When Valsalva's manoeuvre was concluded and right atrial filling suddenly resumed (Fig. 2, C), the net right atrial pressure rose rapidly and a temporary pressure gradient was created from right to left across the atrial defect, with the result that desaturated blood entered the left atrium and the oxymeter record showed a fall in oxygen saturation below the initial resting level (81%). It will be noted that events in the oxymeter record occurred two to three seconds after the changes in intrathoracic pressure. This lag was accounted for by the circulation time from the atrial defect to the ear.

The Valsalva test was positive in all 12 patients where the diagnosis of atrial septal defect had already been proved, either by an exploring cardiac catheter entering the left atrium or by subsequent thoracotomy to close the defect. In one of these patients the test was negative at rest but positive following exercise. For this reason we made it a rule to exercise all patients in whom a negative response was obtained at rest. The patient mentioned was a boy of 7, who was referred to Dr. Raymond Daley for a cardiological opinion because of a soft systolic murmur at the base of the heart and complete heart-block. He did not complain of symptoms. Cardiac catheterization revealed a small atrial septal defect with an insignificant left-to-right shunt. The catheter tip entered the left atrium. It would seem, therefore, that if the defect is small the build-up of pressure gradient from right to left atrium is not great enough to produce a detectable right-to-left shunt following Valsalva's manoeuvre at rest. This is shown in Fig. 3, A.

The oxymeter record showed no characteristic dip in saturation following Valsalva's manoeuvre, and the record was indistinguishable from that of a normal subject. The slight dip in the tracing is thickness artifact due to congestion of the ear as the patient strains during Valsalva's manoeuvre. This was shown by an equal and opposite deflection when the oxymeter was switched to record changes in haemoglobin content only (Fig. 3, B). It is important to calibrate each record for thickness artifact in this way to avoid errors in interpretation. However, when the cardiac output is increased by exercising, then right atrial filling becomes much more rapid and a sufficient pressure gradient is created to produce a small right-to-left shunt following Valsalva's manoeuvre, with a consequent transient dip in the oxymeter tracing (Fig. 3, C).

A further 14 patients with evidence of a left-to-right shunt at the atrial level, but in whom the cardiac catheter could

not be manoeuvred into the left atrium, gave positive Valsalva tests, indicating the presence of an atrial septal defect. In three of these patients, anomalous pulmonary veins were entered by the exploring catheter. Two children with systolic heart murmurs and x-ray evidence of prominent pulmonary vessels have also shown positive Valsalva's tests after exercise. They are symptom-free and we have felt confident enough in the test to avoid submitting them to cardiac catheterization.

The Valsalva test was negative in only two cases of atrial septal defect. Both these patients had large atrial septal defects, and both had congestive cardiac failure at the time of the test. The explanation for the test's failure is shown in Fig. 4. Fig. 4, A shows the brachial artery pressure and oesophageal pressure obtained from a normal subject during Valsalva's manoeuvre. At the beginning of the strain period the brachial artery pressure is raised by approximately the same amount as the rise in intrathoracic pressure. This is due to the increased intrathoracic pressure squeezing the thoracic aorta. However, as already shown (Fig. 1), right atrial filling is impaired at the same time, so that the stroke volume soon falls, with the result that the brachial artery mean and pulse pressures also fall. By inference, therefore, a fall in brachial artery pulse pressure during Valsalva's manoeuvre indicates that right atrial filling has been impaired effectively, and that when the Valsalva is concluded it will

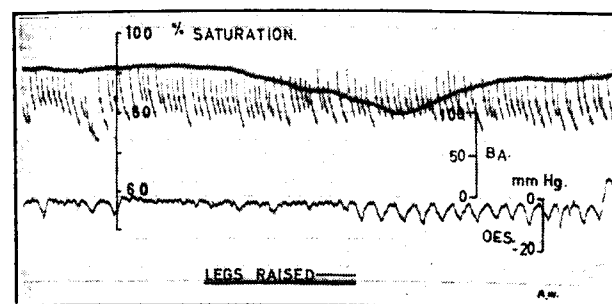


FIG. 5.—Effect of leg-raising on arterial oxygen saturation of patient with atrial septal defect and congestive cardiac failure. Abbreviations as Fig. 1. Top line: arterial oxygen saturation (oxymeter).

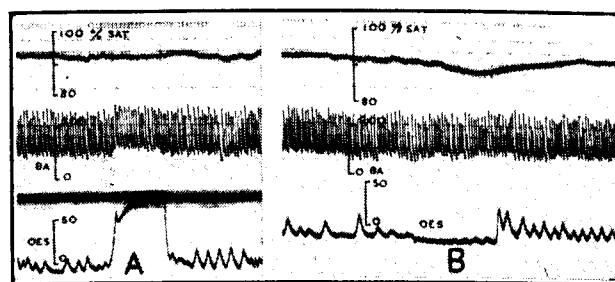


FIG. 6.—Changes in systemic arterial oxygen saturation in patient with atrial septal defect, coarctation of aorta, and congestive cardiac failure. Top line: arterial oxygen saturation. Abbreviations as Fig. 1. A=During Valsalva's manoeuvre. B=During Müller's manoeuvre.

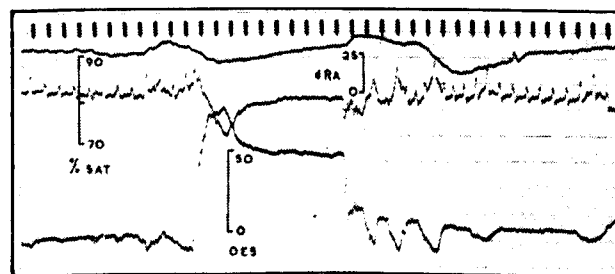


FIG. 7.—Effect of Valsalva's manoeuvre on systemic arterial oxygen saturation in patient with pulmonary hypertension and patent foramen ovale. Top line: arterial oxygen saturation. Abbreviations as Fig. 1.

be followed by a sharp rise in right atrial filling pressure, so that the necessary gradient across an atrial defect will be produced.

However, in very large atrial septal defects, and also in heart failure, no fall in brachial artery pulse pressure occurs during Valsalva's manoeuvre (Fig. 4, B), and the imposed squeeze on the thoracic aorta by the rise in intrathoracic pressure produces a sustained rise in brachial artery pressure, or square wave response. Under these circumstances, it appears that Valsalva's manoeuvre either produces insufficient change in right atrial filling pressure to alter the gradient across the atrial defect, so that no reversal of shunt occurs, or the defect is so large that the two atria behave as a common chamber (Dexter, 1956), and again no alteration of shunt is produced. However, if the right atrium is suddenly overfilled by elevating the patient's legs, then a reversal of shunt will occur across the defect and the systemic arterial oxygen saturation will fall. Fig. 5 shows this; it was obtained from a man aged 20 with congestive cardiac failure. The brachial artery pressure showed variations due to multiple extrasystoles. He died four days later with ventricular tachycardia, and at post-mortem examination a large fenestrated septum primum defect was found.

An alternative method of suddenly raising the right atrial pressure in such patients is by means of Müller's manoeuvre. Fig. 6 shows the oxymeter record from a 27-year-old man who had severe congestive cardiac failure, auricular fibrillation, coarctation of the aorta, and bacterial endocarditis. A systolic and diastolic murmur was audible in the pulmonary region. Valsalva's manoeuvre (Fig. 6, A) produced little alteration in brachial artery pressure, and the oxymeter recording showed no consistent change in arterial oxygen saturation. However, when the patient performed Müller's manoeuvre (Fig. 6, B) the systemic arterial oxygen saturation fell, indicating that a temporary right-to-left shunt had been produced. The patient died one month later, and post-mortem examination revealed an atrial septal defect 2 cm. in diameter, in addition to coarctation of the aorta, a bicuspid aortic valve, and bacterial endocarditis.

The oxymeter test has been negative in the small number of patients that we have studied with left-to-right shunts from causes other than interatrial communication. In these patients no significant alteration in arterial oxygen saturation occurred following Valsalva's manoeuvre, Müller's manoeuvre, or leg raising. One patient had a ventricular septal defect. The right ventricular pressure at rest was 63/3 mm. Hg, and at no time during the tests did the right ventricular pressure rise to systemic arterial levels. Two patients had evidence of a left-to-right shunt at the atrial level; both had moderately raised pulmonary artery pressures; in one, an exploring catheter passed into an anomalous right superior pulmonary vein entering the right atrium; in the other case, neither anomalous veins nor the left atrium were entered. From the negative oxymeter study, partial anomalous pulmonary venous drainage without an associated atrial septal defect was diagnosed. The diagnosis was confirmed in the first patient at post-mortem examination when she died from congestive cardiac failure a year later. Thoracotomy was performed in the second patient, as atrial septal defect was still suspect clinically and its repair was to be undertaken. Three anomalous pulmonary veins opening into the right atrium were found. No atrial septal defect was present. Mr. Charles Bailey, of Philadelphia, who undertook the operation, successfully corrected the anomaly surgically.

Occasionally data obtained from cardiac catheterization are still insufficient to allow an anatomical diagnosis to be made. Fig. 7 shows the oxymeter record and net right atrial pressure from such a patient in whom the Valsalva test was positive and aided the diagnosis. The patient was a 34-year-old woman who had a resting arterial oxygen saturation of 92% but who became deeply cyanosed on exertion. The cardiac catheter failed to enter the left atrium, to cross a ventricular septal defect, or to enter the aorta. Pulmonary hypertension was found. On the basis of the

positive Valsalva test, a patent foramen ovale was suspected. She died later from congestive cardiac failure, and post-mortem examination revealed a moderate-sized patent foramen ovale in addition to changes associated with pure pulmonary hypertension.

We have little experience in the use of the oxymeter tests in patients with cyanotic congenital heart disease, but preliminary work suggests that Fallot's tetralogy may be associated with a characteristic pattern of changing arterial oxygen saturation during Valsalva's manoeuvre. One possible source of confusion in interpreting results from such patients may occur from individuals with cyanosis due to lung disease. We have found that patients with cor pulmonale and central cyanosis who perform Valsalva's manoeuvre alter their arterial oxygen saturation considerably. During Valsalva's manoeuvre the breath-holding that is entailed is associated with a fall in arterial oxygen saturation. Following the manoeuvre the arterial oxygen saturation rises again, and often exceeds the resting value temporarily. This is probably due to hyperventilation that occurs as soon as the test is completed.

Conclusion

The oxymeter tests described appear to be both simple and reliable for demonstrating the presence of an atrial septal defect or patent foramen ovale. Having established the conditions under which the tests can be relied upon, we feel that it is not strictly necessary to record either the oesophageal pressure or brachial artery pressure provided that one is careful to follow a routine to eliminate false-negative results. We therefore record the arterial oxygen saturation with the ear oxymeter during Valsalva's manoeuvre at rest. If the test is negative it is repeated after exercise; if a negative response is still obtained, then the Müller procedure, followed by elevation of the patient's legs, is carried out. In this way what appears to be an extremely reliable test is available for use in the clinic, with symptom-free patients of any age suspected of having an interatrial communication. The youngest child we have studied was 3½ years old.

We have so far not encountered an incorrect response to the tests in any patient in whom the diagnosis was proved by alternative means. In addition, an atrial septal defect was demonstrated by the tests in three patients in whom catheter data were equivocal, and confirmed the absence of an atrial septal defect in two patients with anomalous pulmonary venous drainage, where atrial defects could not be definitely excluded from catheter data. Provided that balanced pressures between the right and left ventricles do not exist, the tests appear to be negative with ventricular septal defects; and the response pattern also appears to be different in the few cases of Fallot's tetralogy so far studied. We are also studying a group of normal subjects after exercise to discover whether it is possible to recognize those who have a persistent foramen ovale.

Finally, we would like to express our gratitude to Dr. Raymond Daley and Mr. Kent Harrison, who allowed us to study patients in whom they had established an anatomical diagnosis by cardiac catheterization or at subsequent thoracotomy. This information formed the main evidence that the oxymeter test was a reliable procedure for diagnosis of inter-atrial communication.

Summary

Thirty-two patients suspected clinically of having atrial septal defects have been studied by means of the ear oxymeter during the performance of Valsalva's manoeuvre.

Twelve of these patients in whom the diagnosis was proved by cardiac catheterization or thoracotomy had characteristic and reproducible changes in arterial oxygen saturation during and following Valsalva's manoeuvre.

If the defect was small, exercise prior to Valsalva's manoeuvre was required in order to obtain a positive oxymeter response.

Fourteen further patients gave positive oxymeter responses to the Valsalva test. These patients had catheter evidence of a left-to-right shunt at the atrial level but definite anatomical proof of an atrial septal defect was lacking. One patient with pulmonary hypertension, who became cyanosed on exertion and in whom cardiac catheterization was unhelpful in locating the site of the shunt, gave a positive response to the Valsalva test. Subsequent post-mortem examination revealed a patent foramen ovale.

Five patients gave a negative response to the Valsalva test. Two of these were subsequently found to have partial anomalous pulmonary venous drainage but no atrial septal defect. One patient had a ventricular septal defect; and two patients had congestive cardiac failure associated with atrial septal defects.

In the patients with atrial septal defect and cardiac failure, Müller's manoeuvre or elevation of the legs caused a fall in systemic arterial oxygen saturation, enabling the correct diagnosis to be made.

REFERENCES

- Dexter, L. (1956). *Brit. Heart J.*, 18, 209.
Dornhorst, A. C., and Leathart, G. L. (1952). *Lancet*, 2, 109.
Epps, R. G., and Adler, R. H. (1953). *Brit. Heart J.*, 15, 298.
Hansen, A. T. (1949). *Acta physiol. scand.*, 19, Suppl. 68.
Lee, G. de J., Matthews, M. B., and Sharpey-Schafer, E. P. (1954). *Brit. Heart J.*, 16, 311.
Stott, F. D. (1953). *J. sci. Instrum.*, 30, 120.
Swan, H. J. C., Burchell, H. B., and Wood, E. H. (1954). *Circulation*, 10, 705.
Wood, E. H. (1950). In O. Glaser's *Medical Physics*, 2, 664. Chicago.
Wood, P. (1956). *Diseases of the Heart and Circulation*, 2nd ed., p. 360. Eyre and Spottiswoode, London.

GONADAL DYSGENESIS IN NORMAL-LOOKING FEMALES

A GENETIC THEORY TO EXPLAIN VARIABILITY OF THE SYNDROME

BY

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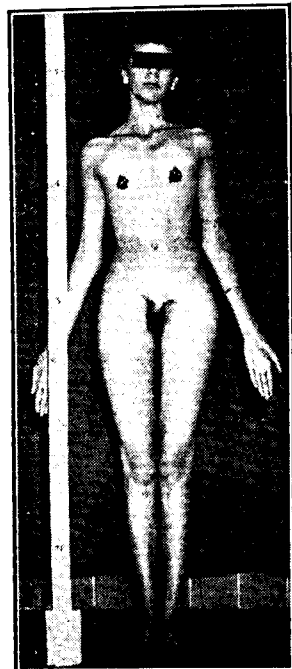
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Swyer (1955) described two cases with an unusual clinical picture under the heading of "Male Pseudohermaphroditism: A Hitherto Undescribed Form." Briefly, these patients showed normal height with eunuchoidal proportions, female appearance, and female genitalia. They did not develop secondary sexual characters nor did they menstruate. Their nuclear pattern was male. They had no congenital anomalies of the Bonneville-Ullrich-Turner type. Attempts to place these two patients into one of the recognized categories of intersex appear to have failed. In the *Year Book of Endocrinology, 1955-1956*, a précis of Swyer's paper is followed by an editorial comment which confirms this dilemma.

It is our contention that these patients suffer from a variant of the syndrome of gonadal dysgenesis. We present the case report of a patient showing a similar clinical picture but with female "genetic sex" in whom the presence of dysgenetic gonads was demonstrated at laparotomy.

Case Report

An attractive female school-teacher aged 22 presented with primary amenorrhoea. Her height was 66½ in. (169 cm.) and span 69 in. (175 cm.), and, apart from complete lack of breast development and eunuchoid proportions, she appeared a perfectly normal female (see illustration). Axillary and pubic hair were moderately profuse. The



Note eunuchoid proportions and lack of breast development.

vagina was small, the clitoris not enlarged, and the uterus infantile on palpation; adnexae could not be felt.

The family history was not contributory. There was no history of mumps or of other significant illness. The patient had not experienced hot flushes. The psychological orientation was completely female following a normal female upbringing and education.

The urinary gonadotrophin (F.S.H.) excretion was strongly positive at 6 mouse uterine units, but negative at 96 mouse units. A skin biopsy showed a normal female nuclear pattern.

At laparotomy typical primitive gonadal ridges were disclosed. Histology showed ovarian stroma, no follicles, but aggregates of cells resembling ovarian hilar cells (Dr. C. J. Uys).

Cyclical oestrogen therapy (1 mg. of stilboestrol daily) was instituted after the operation. Six months later the patient was extremely pleased with the results: her breasts had grown considerably; monthly bleeding had ensued; the vagina had increased in size; general feminization of the contours had occurred; and she was engaged to be married.

Vagaries of Gonadal Dysgenesis

Several major advances over the past few years have widened the original concept of "ovarian agenesis." It has been recognized that patients may lack many of the classical features which have been associated with the syndrome. There are numerous reports of tall patients and even of attractive ones (Wilkins and Fleischmann, 1944; Lissner *et al.*, 1947; del Castillo *et al.*, 1947; Kerkhof and Stolte, 1956; Greenblatt *et al.*, 1956; Hoffenberg and Jackson, 1957), axillary and pubic hair are often normal in amount or even luxuriant (Hoffenberg and Jackson, 1957). The congenital anomalies of Turner's syndrome need not be present (del Castillo *et al.*, 1947; Grumbach *et al.*, 1955; Greenblatt *et al.*, 1956) and good breast development has been reported (Varney *et al.*, 1942; Wilkins and Fleischmann, 1944; Lissner *et al.*, 1947; Hertz *et al.*, 1950; Hoffenberg and Jackson, 1957). The urinary gonadotrophin, while generally high, may be normal or low (Dorff *et al.*, 1947; Hertz *et al.*, 1950; Sternlieb *et al.*, 1954; Carpentier *et al.*, 1956; Hoffenberg and Jackson, 1957); cases have been described with androgenic manifestations (Gordan *et al.*, 1955; Greenblatt *et al.*, 1956), and one proved case showed pseudohermaphroditic external genitals (Grumbach *et al.*, 1955); finally, we have encountered two patients who claimed to have menstruated for five and six years respectively (Hoffenberg *et al.*, 1957). The skin sex pattern in gonadal dysgenesis may be male or female.

Our patient showed no recognizable congenital anomalies; she appeared, in fact, to be a normal thin female with

poor breast development. Her F.S.H. excretion was not raised and her skin sex pattern was female. Yet, at laparotomy, typical dysgenetic gonads were found.

Sun and Rakoff (1956) include in a series of 15 patients with gonadal dysgenesis one who was 64 in. (162.5 cm.) tall and had normal skeletal proportions. She, however, had a high urinary F.S.H. excretion, and the diagnosis was confirmed at laparotomy.

Greenblatt *et al.* (1956) refer to another tall patient without the anomalies of Turner's syndrome, but with poor breasts, primary amenorrhoea, and otherwise normal female appearance, except for enlargement of the clitoris; her urine F.S.H. excretion was normal and skin sex was female. The diagnosis of gonadal dysgenesis was proved in this patient at laparotomy. Our patient displayed an almost identical picture. There was, however, no clitoral enlargement.

Reconsideration of Swyer's Cases

The two patients described by Swyer were apparent females with primary amenorrhoea; they had poor mammary development, eunuchoid proportions, and normal axillary and pubic hair. The external genitalia were normal, except for clitoral enlargement in one. Each displayed a rudimentary uterus, a normal, non-oestrinized vagina, normal cervix, and apparently normal oestrogen levels. F.S.H. excretion was normal in one, low in the other. Blood smears showed a male pattern in both. Laparotomy was not performed.

Swyer considers gonadal dysgenesis in the differential diagnosis. He dismisses the condition on the grounds of numerous distinctions between his patients and those with the hitherto-accepted classical syndrome. However, in the light of the cases reported above, including our own, it is apparent that his cases differ in no specific manner from the less common variants of gonadal dysgenesis. The Table summarizes the salient features of "classical" gonadal dysgenesis, atypical gonadal dysgenesis, Swyer's "new" syndrome, and "classical" male pseudohermaphroditism. From a perusal of this Table it becomes apparent that Swyer's cases are, in fact, variants of the syndrome of gonadal dysgenesis. The difficulty in classification has arisen because his cases showed a number of atypical features, all of which have been described separately in other patients.

Genetic Considerations

These atypical cases of gonadal dysgenesis require some aetiological explanation. It has been suggested that the general Bonnevie-Ullrich-Turner syndrome might be produced by a primary intrauterine disturbance during early foetal life (Grumbach *et al.*, 1955). On the other hand, the type, multiplicity, and comparative constancy of the clinical features suggest that a genetic aberration is more likely. Thus this kaleidoscopic syndrome would resemble such states as mongolism, the Laurence-Moon-Biedl syndrome, and osteogenesis imperfecta, all of which show combinations of genetically determined anomalies. If the syndrome were caused by a mutation of dominant type occurring in one gene or in several closely related genes of a parental germ cell, no hereditary tendency could be observed because of the essential infertility of the sufferers.

This conception is supported by Rossi and Caffisch (1951), who demonstrate beyond all doubt the hereditary nature of the various skeletal anomalies of the pterygium and Bonnevie-Ullrich syndromes, which are variably embodied in Turner's syndrome. Indeed, in some of the families they describe, cases of infantilism—that is, gonadal dysgenesis—actually appear together with non-infantilistic siblings who have, for instance, webbed neck, but who are capable of reproduction. The authors adduce evidence of direct parent-child transmission of anomalies, and claim, apparently on excellent grounds, that the hereditary trait concerned is dominant, of high penetrance, and of variable expressivity. Further confirmation of the hereditary nature

Varieties of Gonadal Dysgenesis and Classical Male Pseudohermaphroditism Compared

	Stature	Congenital Anomalies	Breasts	Sex Hair	Vagina	Cervix	Chromosomal Sex	Gonadotrophins	Oestrogen	Gonads
"Classical" gonadal dysgenesis	Short	Usual	Undeveloped	Usually scanty	Infantile	Infantile	Male or female	High	Low	Primitive streaks
Atypical gonadal dysgenesis	May be tall or normal height	Often absent	Usually undeveloped	May be normal	Small or normal	Infantile or normal	Male or female	High, normal, or low	Normal or low	May show some development
Swyer's "new" syndrome	Tall or normal	Absent	Undeveloped	Within normal limits	Normal	Normal	Male	Normal	Apparently normal	?
Classical male pseudohermaphroditism	Normal or tall	"	Variable	Absent or scanty	Short; may be oestrogenized	Minute or absent	"	"	Low	Developed testes

of this syndrome is provided by the report of its occurrence in sisters (Davidson and Smith, 1956) and in twins (Solis and Schwartz, 1951).

It would seem possible to explain the varieties of this syndrome by postulating three closely connected genes situated on the same chromosome: one gene for infantilism—that is, intrauterine hypogonadism—called "I"; one gene for shortness of stature, "S"; and one gene or gene-complex for the various anomalies of musculo-skeletal, cardiac, cutaneous, renal, ocular, and other systems, "A." It is evident that the genetic factor A is very variable in its expressivity, since several different anomalies usually occur together, but never all in the same person. Now, if we imagine either that these three factors are not invariably inherited together or, alternatively, that they always occur together, but that the penetrance of each is not 100%, we can account for the complete syndrome and for the various partial ones. We thus have:

I+S+A (in genetic male or female)=Full Turner's syndrome.

S+A=Pterygium and other developmental syndromes, with short stature and normal sexual differentiation (Rossi and Caffisch, 1951).

A alone=Pterygium and other syndromes, with normal stature (Rossi and Caffisch, 1951).

I+S="Normal-looking" Turner's syndrome; with shortness of stature, infantilism, but no anomalies (Grumbach *et al.*, 1955; Hoffenberg and Jackson, 1957).

I alone=Apparent females of normal height with amenorrhoea and no anomalies (Swyer, 1955; Greenblatt *et al.*, 1956; Sun and Rakoff, 1956; and our case reported above). Nuclear sex may be male or female.

Grumbach *et al.* (1955) apply the experimental results of Jost and other workers to the problem of human intersex. The infantilism in gonadal dysgenesis results from very early failure of the developing gonad (our factor "I"), with consequent feminization of genital tract and body form. If gonadal failure occurs at a slightly later stage of male embryonic development, partial differentiation along masculine lines will already have taken place. Further development of the genital tract will be of female type, and so "male pseudohermaphroditism" will result. This is equivalent to our factor "I" coming into operation at a slightly later stage. Thus:

I alone (slightly later in genetic male)=Male pseudohermaphroditism.

I (slightly later in genetic male)+S+A=Male pseudohermaphroditism with short stature and anomalies (Grumbach *et al.*, 1955).

Stature in Gonadal Dysgenesis

The shortness of stature which is seen in most cases of gonadal dysgenesis conflicts with the tall eunuchoid proportions generally associated with prepubertal gonadal failure. It is best regarded as a distinct genetic anomaly. To test the validity of this hypothesis we have reviewed the reported cases of gonadal dysgenesis without shortness of stature.

Varney *et al.* (1942) describe the case of a patient 6 ft. (183 cm.) tall, with "eunuchoid elongation of the extremi-

ties." They also refer to patients reported by Pela in 1935 and Humphrey—the former 5 ft. 10 in. (178 cm.) tall with "long extremities," the latter 5 ft. 6½ in. (169.5 cm.) with "eunuchoid skeletal proportions." Wilkins and Fleischmann (1944) refer to a patient (reported by Kaliga) who was 5 ft. 9 in. (175 cm.) tall with "eunuchoid proportions." Del Castillo *et al.* (1947) cite a patient, 5 ft. 5½ in. (166 cm.) tall with the same arm-span. Greenblatt *et al.* (1956) state that their 5 ft. 10 in. (178 cm.) tall patient "resembles the tall eunuchoid male in appearance."

Of Swyer's two cases, the first is stated to have "definitely eunuchoid proportions," the second to have the general appearance of "a tall eunuchoid female." Our patient, referred to above, displays the same eunuchoid habitus.

Thus the majority of tall patients with gonadal dysgenesis show eunuchoid proportions. This supports the view that the typical shortness of stature seen in gonadal dysgenesis is genetic in origin (our factor "S"). If this particular genetic aberration does not occur, patients show the body-build which is expected in individuals who are deprived of gonadal function before puberty.

Conclusion

From a consideration of our own case and a review of reported instances of gonadal dysgenesis, we conclude that the two patients described by Swyer are, in fact, suffering from a variant of this syndrome. His patients may be re-appraised in the light of several other similar protocols. Consideration of the variable clinical picture in the syndrome of gonadal dysgenesis leads to the conclusion that this syndrome results from a genetic disturbance rather than a primary intrauterine disorder.

As the heterogeneous nature of gonadal dysgenesis becomes more widely recognized, we believe that this disorder will be found responsible for most cases of primary amenorrhoea—whatever the appearance of the patient.

Summary

A case of gonadal dysgenesis is reported in a patient who was tall and eunuchoid, had no congenital anomalies, and had a female nuclear pattern. This and two other cases are compared with two cases reported by Swyer under the title of "Male Pseudohermaphroditism: A Hitherto Undescribed Form." Reconsideration of Swyer's cases suggests that they, too, suffer from a variant of the syndrome of gonadal dysgenesis.

The genetic aberration responsible for gonadal dysgenesis and its variants is discussed and a hypothesis is submitted to account for the whole syndrome and its less complete forms.

A reconsideration of reported tall patients with gonadal dysgenesis lends support to the view that the shortness of stature is genetic in origin.

We are grateful to Professor F. Forman for his constant interest and advice; to Professor James T. Louw, under whose care the patient was admitted; to Dr. W. H. Muller, who performed the laparotomy; to Dr. C. J. Uys for the histological reports; to

Professor H. Zwarenstein and Mr. D. G. Duncan for the gonadotrophin (F.S.H.) estimation; and to Mr. B. Todt for the photograph.

REFERENCES

- Carpentier, P. J., Stolte, L. A. M., and Visschers, G. P. (1956). *J. clin. Endocr.*, 16, 155.
del Castillo, E. B., de la Balze, F. A., and Argonz, J. (1947). *Ibid.*, 7, 385.
Davidson, W. M., and Smith, D. R. (1956). *Postgrad. med. J.*, 32, 578.
Dorff, G. B., Appelman, D. H., and Liveson, A. (1947). *J. clin. Endocr.*, 7, 807.
Gordan, G. S., Overstreet, E. W., Traut, H. F., and Winch, G. A. (1955). *Ibid.*, 15, 1.
Greenblatt, R. B., Carmona, N., and Hladon, L. (1956). *Ibid.*, 16, 235.
Grumbach, M. M., Van Wyk, J. J., and Wilkins, L. (1955). *Ibid.*, 15, 1161.
Hertz, R., Cromer, J. K., and Westfall, B. B. (1950). *Ibid.*, 10, 610.
Hoffenberg, R., and Jackson, W. P. U. (1957). *J. clin. Endocr.*, in press.
Kerkhof, A. M., and Stolte, L. A. M. (1956). *Acta endocr. (Kbh.)*, 21, 106.
Lisser, H., Curtis, L. E., Escamilla, R. F., and Goldberg, M. B. (1947). *J. clin. Endocr.*, 7, 665.
Rossi, E., and Caffisch, A. (1951). *Helv. paediat. Acta*, 6, 119.
Solis, J., and Schwartz, M. M. (1951). *Rev. méd. Rosario*, 41, 3.
Sternlieb, I., Zundel, J., and Wilson, L. (1954). *N.Y. St. J. Med.*, 54, 1663.
Sun, L. C. Y., and Rakoff, A. E. (1956). *J. clin. Endocr.*, 16, 55.
Swyer, G. I. M. (1955). *British Medical Journal*, 2, 709.
Varney, R. F., Kenyon, A. T., and Koch, F. C. (1942). *J. clin. Endocr.*, 2, 137.
Wilkins, L., and Fleischmann, W. (1944). *Ibid.*, 4, 357.
Year Book of Endocrinology, 1955-1956, edited by G. S. Gordan, p. 258. Year Book Publishers, Chicago.

HUMAN INFECTION WITH SALMONELLA CHOLERAESUIS

BY

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Salmonella choleraesuis differs from other salmonellae by the frequency with which it invades the blood stream, causing a generalized infection, and by its high mortality. Infection may manifest itself in three ways: as a gastro-enteritis, a typhoid-like illness, or a septicaemia. The septicaemia may localize in the lungs, bones, joints, or meninges. Reports of sporadic cases of the generalized type of infection have been published by Harvey (1937). He reviewed the literature, finding 50 cases, and added a further 21 cases. Goulder, Kingsland, and Janeway (1942) reported 11 cases, and Jager and Lamb (1943) six cases. Saphra and Wassermann (1954) analysed 329 cultures of *Salm. choleraesuis* from human sources submitted for identification to the New York Salmonella Center between 1940 and 1954. The organism had been isolated from the blood in 247 instances, and in only 26 from the faeces alone.

In this country only 12 cases of the generalized type of infection have been recorded. Nabarro, White, Dyke, and Scott (1929) and Schwabacher, Taylor, and White (1943) reported two cases each, and single cases were described by Boycott and McNee (1936), Herring and Nicholson (1939), and Guthrie (1941). Five cases of unusual manifestations of *Salm. choleraesuis* were reported in the *Monthly Bulletin of the Ministry of Health* (1950a, 1950b, 1951). These comprise two cases of septicaemia, a septic arthritis, and a cold abscess of the scalp, and in one case the organism was isolated from the urine. No clinical details were given.

During 1923-53 *Salm. choleraesuis* was isolated from 66 food-poisoning incidents in England and Wales out of a total of 14,847 due to salmonella organisms.

The following two cases are put on record because they present features not previously reported in this country.

Case 1

A personnel manager in a bakery firm, aged 53, was admitted to Sefton General Hospital on December 16, 1954, with a history of an influenza-like illness and backache one month earlier, followed by swelling of his ankles. There

was no history of gastro-enteritis, but three months previously, in the course of his work, he had been in contact with the contents of a large tin of ham which was obviously decomposed and was in fact condemned, although no record of a bacteriological examination is available.

On admission his temperature was normal. Oedema of the ankles and sacrum was present, but no cause for this could be found. Three days after admission he had a temperature of 100-104° F. (37.8-40° C.). Four blood cultures were taken over a period of 24 hours, and an organism of the salmonella group was isolated from three. These were identified by Dr. Joan Taylor at the Salmonella Reference Laboratory as *Salm. choleraesuis* var. *kunzendorf*.

The patient was transferred to Fazakerley Hospital on December 24. He was treated with chloramphenicol, 500 mg. six-hourly for seven days. His temperature settled. On January 8, 1955, he complained of pain in the right loin and dysuria. *Salm. choleraesuis* was cultured from the urine. On January 14 he was again pyrexial, and on January 26 a further course of chloramphenicol, 500 mg. six-hourly for seven days, was started. His temperature settled. An intravenous pyelogram showed normal excretion of the dye.

On February 19 he complained of pain in both loins and was found to be tender over the lower dorsal vertebrae. X-ray examination of the spine showed diminution of the disk space between D9 and 10 with erosion of the adjacent vertebral margin and a paravertebral abscess, presumably due to *Salm. choleraesuis*.

Stools cultured 23 times between December 25, 1954, and March 3, 1956, failed to grow *Salm. choleraesuis*. The urine was frequently cultured, and was found to be sterile except on January 8.

The patient was eventually discharged from hospital on November 16, 1955, wearing a spinal support. The stools of relatives were examined but no carrier was found.

An x-ray film taken on August 21, 1956, showed the destructive lesion between the ninth and tenth dorsal vertebrae to be healed. There was very little destruction in these two vertebrae, but the intervertebral disk had been destroyed. The paravertebral abscess had almost disappeared. He was still wearing a surgical support.

Case 2

A woman confectioner aged 23, suffering from idiopathic thrombocytopenic purpura, was admitted to Sefton General Hospital for splenectomy on February 1, 1955. There had been no history of gastro-enteritis, and a chest x-ray examination showed the lung fields to be clear.

Splenectomy was performed on February 11, using a trans-thoracic approach through the bed of the tenth rib, and the chest was closed without drainage.

On the second post-operative day the patient became febrile. A chest x-ray film showed a left basal opacity. She was treated with penicillin, 500,000 units six-hourly by intramuscular injection, and her temperature settled slowly. On February 22 she again became pyrexial. On clinical examination there was an impaired percussion note at the left base and air entry was diminished. Chest x-ray examination showed consolidation of the left lower lobe. Penicillin was stopped and chlortetracycline, 250 mg. six-hourly, was given. Chest aspiration carried out three days later produced 3 fl. oz. (85 ml.) of dark straw-coloured fluid. Microscopical examination showed an excess of leucocytes, but the fluid on culture was sterile.

The patient remained pyrexial and exploration of the chest was carried out on March 17. A posterior loculated empyema was found and a drain inserted. An organism of the salmonella group was isolated from the pus. This was identified by Dr. Joan Taylor as *Salm. choleraesuis* var. *kunzendorf*. Treatment was begun on March 19 with chloramphenicol, 0.5 g. four-hourly for eight days. Her temperature settled after six days. An organism of the salmonella group was isolated from the pus draining from the chest on April 4 and 6.

Culture of numerous specimens of faeces failed to grow the organism. Blood cultures taken after the chest exploration also failed to grow the organism.

The drain continued to discharge pus until April 26, when it was gradually shortened. The wound closed at the end of May.

Stools of relatives were examined but no carrier was found.

Discussion

The commonest site for the infection to localize is the lungs, where it may produce a bronchopneumonia, lobar pneumonia, pleurisy with effusion, or an empyema. The organism has been isolated from the sputum and the pleural fluid. Pulmonary involvement occurred in one-third of Harvey's cases and in 32 of Saphra and Wassermann's, and in this country the organism was isolated from the lungs at necropsy in one of the cases of Schwabacher *et al.*

Harvey noted several cases of infection due to *Salm. choleraesuis* occurring post-operatively. It followed such procedures as laparotomy, cystoscopy, antral operation, and drainage of an ischio-rectal abscess. One patient developed bronchopneumonia after laparotomy for myomas of the uterus. The organism in this case was cultured from the blood but not from the sputum.

Localization in bone and joints occurred in 15 of Harvey's cases and in 19 of Saphra and Wassermann's. Two cases have previously been reported in this country; arthritis of the shoulder-joint in an infant 8 months old (Nabarro *et al.*, 1929), and arthritis of the shoulder-joint in an infant 7 months old (Guthrie, 1941).

The mortality is high. In Harvey's series it was 38%. In Saphra and Wassermann's series it was 21%, and they compared the mortality rate with 300 consecutive infections of *Salm. oranienburg* and *Salm. typhimurium*; here it was 4.7% and 4% respectively. There have been five deaths in the seven cases reported in this country.

The organism in both the above cases was sensitive *in vitro* to chloramphenicol, yet sterilization was not achieved by courses of this drug. In Case 1 the blood stream may have repeatedly been reinfected from the osteomyelitis of the spine which possibly was present for some time, although evidence of this was lacking.

American workers have shown that the hog is the main carrier of *Salm. choleraesuis*. Infection is probably acquired through careless handling of contaminated pork or eating it insufficiently cooked. The carrier rate is low compared with other salmonellae. Scott (1940), in this country, isolated 38 strains of *Salmonella* from mesenteric lymph nodes of 1,000 healthy pigs, 10 of these were of the species *Salm. choleraesuis*. A more recent investigation by the Salmonella Subcommittee of the Public Health Laboratory Service (1955) failed to isolate the organism from a large number of samples of bile, liver, mesenteric lymph nodes, and faeces of healthy pigs. It was suggested, however, that the medium used, selenite-F, may not have been the best medium for isolating this organism. The source of the organism in these two cases is not known for certain, but in Case 1 it is reasonable to suppose that infection was acquired by contact with diseased ham.

From the wider aspect it can be seen that in view of the patients' occupations the infections presented a major risk to the public health. It is surprising that no further infections by this organism were notified in Liverpool at this time.

Summary

Two cases of the generalized type of infection with *Salmonella choleraesuis* are reported: one case with septicaemia and osteomyelitis of the spine, and the other with empyema following splenectomy. The high mortality is noted. The source of infection in these two cases is not known.

I thank Dr. C. M. Miller for permission to report these two cases and for his helpful advice; Dr. A. B. Christie and Mr. J. P.

Heron for further details of Case 1, which was under their care at Fazakerley and Aintree Hospitals; and Dr. J. Carr Brundret.

REFERENCES

- Boycott, J., and McNee, J. W. (1936). *Lancet*, 2, 741.
Goulder, N. E., Kingsland, M. F., and Janeway, C. A. (1942). *New Engl. J. Med.*, 226, 127.
Guthrie, K. J. (1941). *Arch. Dis. Childh.*, 16, 269.
Harvey, A. M. (1937). *Arch. intern. Med.*, 59, 118.
Herring, R., and Nicholson, W. F. (1939). *Lancet*, 1, 1154.
Jager, B. V., and Lamb, M. E. (1943). *New Engl. J. Med.*, 228, 299.
Monthly Bull. Minist. Hlth (Lond.) (1950a), 9, 156.
— (1950b), 9, 263.
— (1951), 10, 235.
Nabarro, D., White, P. B., Dyke, S. C., and Scott, W. M. (1929). *Lancet*, 2, 868.
Salmonella Subcommittee of the Public Health Laboratory Service (1955). *Monthly Bull. Minist. Hlth (Lond.)*, 14, 132.
Saphra, I., and Wassermann, M. (1954). *Amer. J. med. Sci.*, 228, 525.
Schwabacher, H., Taylor, J., and White, M. H. G. (1943). *British Medical Journal*, 2, 358.
Scott, W. M. (1940). *Proc. roy. Soc. Med.*, 33, 366.

UNUSUAL HAEMOGLOBIN VARIANT IN A GUJERATI INDIAN

BY

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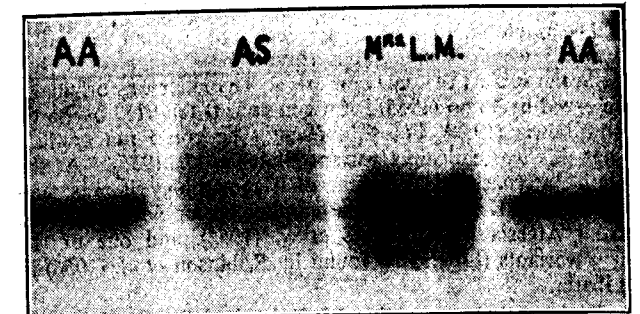
During a survey for haemoglobin D an example of an unusual haemoglobin was discovered. This haemoglobin, which was accompanied by normal adult haemoglobin, moved faster than the latter at pH 8.6 on paper electrophoresis, and its characters are described below.

The subjects surveyed were 326 Indians living in and near Kampala, Uganda, and nearly all were first-, second-, or third-generation immigrants from the Bombay region of India. A few Sikhs and Punjabis were included. Two unrelated subjects were found to exhibit both haemoglobins A and D. It may be mentioned here that this series, added to the 174 persons examined by Jacob *et al.* (1956), brings the total of Uganda Indians examined to 500; and among these the number of examples of haemoglobin D found now becomes four.

The Haemoglobin

One woman (Mrs. L. M.), however, showed the abnormal haemoglobin here described, and it was demonstrated in her blood on two subsequent occasions. Both she and her husband came from Gujerat, north of Bombay. Unfortunately the family is scattered in India, Tanganyika, and Kenya, and it was not possible to examine her husband, parents, brother, or sister. Three children, aged 16, 14, and 13, were examined, and showed normal adult haemoglobin only.

A haemolysate of the washed erythrocytes of Mrs. L. M., prepared without freezing, resolved into two components when subjected to electrophoresis on paper in 0.05 M barbitone buffer at pH 8.6. One of these components, representing 20-25% of the whole, moved more quickly than haemoglobin A, its separation being slightly less than that



Paper electrophoretic pattern, at pH 8.6 in barbitone buffer, of the new haemoglobin and haemoglobins A and S.

between haemoglobins A and S (see Fig.). In phosphate buffer at pH 7.8 two components were still discernible, the abnormal haemoglobin having the greater mobility, but complete separation did not occur. At pH 6.5 in phosphate buffer, however, the abnormal haemoglobin was not separable from haemoglobin A, but trailed behind it.

The solubility of Mrs. L. M.'s haemoglobin was 1.57 g. per litre in 2.58 M phosphate buffer, by the method of Itano (1953). After ten weeks' storage at about -25° C. no precipitate was formed in a haemolysate that contained 8 g. per 100 ml., and no change was observed in the proportion of the abnormal haemoglobin after this period of freezing.

Haematological Findings

The relevant findings in Mrs. L. M. and three of her children are given in the Table. None of these subjects showed sickling, malaria was absent in all, reticulocytes did not exceed 0.2% in any subject, the serum bilirubin was normal in all, and alkali-resistant haemoglobin was absent in every case—less than 2% by the method of Singer *et al.* (1951). No changes were observed in wet preparations in saline, dithionite, and cresyl blue.

Haematological Findings in the M. Family

	Mrs. L. M., Mother	T. M. (16), Daughter	P. M. (14), Son	N. M. (13), Son
Haemoglobin (g./100 ml.)	15.06	12.57	14.9	14.67
Erythrocytes (mil. c.mm.)	6.15	5.91	5.5	5.55
M.C.V. (cubic microns)	77.2	66.8	76.4	79.0
M.C.H.C. (%)	31.8	31.8	35.4	33.7
Plasma Fe (µg./100 ml.)	73	235	—	—
Osmotic Limits	0.42-0.3	0.34-0.24	0.42-0.3	0.42-0.3
fragility 50%	0.37	0.29	0.36	0.35

The stained blood film of Mrs. L. M. showed no abnormality except that a very occasional oval erythrocyte could be found. The films of the two younger children were quite normal, and, though the M.C.V. recorded in these three members was rather low, this did not appear to represent any abnormality. The daughter (T. M.), however, displayed definite abnormalities, her erythrocytes showed considerable variation in size and shape, there were many elliptocytes, target cells were numerous, but no polychromatic staining was seen. These findings accord with the lowered cell volume (66.8 cubic microns) and the increased resistance to hypotonic saline, and are suggestive of thalassaemia minor. The plasma iron of this girl was high (method of Ramsay, 1953), which is in favour of the same diagnosis. Presumably the inheritance was through T. M.'s father, who unfortunately was not available for examination. The presence of the thalassaemia gene in this family must be a coincidence, but it is not a surprising one, for thalassaemia is by no means rare in the Indian immigrants in Uganda.

Discussion

Several human haemoglobins having greater mobility than haemoglobin A at pH 8.6 have been described.

The present haemoglobin differs from haemoglobin H (Rigas *et al.*, 1956) in its cathodal mobility at pH 6.5, its stability when frozen, and the absence of any associated disease. It differs from haemoglobin I (Rucknagel *et al.*, 1955) and from the haemoglobin described by Cabannes *et al.* (1955), in that it appears to be less mobile at pH 8.6.

Haemoglobins J and K are less mobile than H and I. Exactly which haemoglobin should be designated K has been the subject of some confusion. The letter was originally reserved by Itano (1955) for a component reported by Battle and Lewis (1954), but subsequently he could not confirm that this was a distinct variant (Itano *et al.*, 1956). At the sixth International Congress of Haematology it was suggested that K might describe another haemoglobin reported from Algeria by Cabannes *et al.* (1956), and one of the new variants (Liberia II) found by Robinson *et al.* (1956) in Liberia.

Fortunately haemoglobin J is a clearly defined entity. Described by Thorup *et al.* (1956) in a negro, it had a mobility

similar to the present example, and was not associated with disease. Robinson *et al.* (1956) found a haemoglobin in Liberia (Liberia I) that is identical with haemoglobin J, and in both these descriptions the abnormal fraction in A-J individuals accounted for about 60% of the total haemoglobin. Huisman *et al.* (1957) reported the finding of haemoglobin J in an Indonesian, in whom it formed only 35% of the haemoglobin.

Through the kindness of Dr. H. Lehmann and Dr. T. H. J. Huisman the present haemoglobin has been compared with haemoglobins H, I, J, K, and found to correspond with haemoglobin J in its mobility at pH 8.6. Thus the presence of the gene for haemoglobin J in the Indian mainland is established, and this gene (like that for haemoglobin S) appears to have a rather wide variability of expression in heterozygotes, producing in different individuals from about 20% to 60% of the total haemoglobin.

Summary

A haemoglobin variant, with greater mobility than haemoglobin A at pH 8.6, was discovered in an Indian woman in Uganda. It was unassociated with any abnormality in the blood. Its properties are recorded, and correspond with those of haemoglobin J.

REFERENCES

- Battle, J. D., and Lewis, L. (1954). *J. Lab. clin. Med.*, 44, 765.
 Cabannes, R., Buhr, J. L., and Sendra, L. (1956). *Report, 6th International Congress of Haematology, Boston*, p. 448.
 — Sendra, I., and Dalaut (1955). *C.R. Soc. Biol. (Paris)*, 149, 914.
 Huisman, T. H. J., Noordhoek, K., and da Costa, G. J. (1957). *Nature (Lond.)*, 179, 322.
 Itano, H. A. (1953). *Arch. Biochem. Biophys.*, 47, 148.
 — (1955). *A.M.A. Arch. Intern. Med.*, 96, 287.
 — Berge, W. R., and Sturgeon, P. (1956). *Medicine (Baltimore)*, 35, 121.
 Jacob, G. F., Lehmann, H., and Raper, A. B. (1956). *E. Afr. med. J.*, 33, 135.
 Ramsay, W. N. M. (1953). *Biochem. J.*, 53, 227.
 Rigas, D. A., Koler, R. D., and Osgood, E. E. (1956). *J. Lab. clin. Med.*, 47, 5.
 Robinson, A. R., Zuelzer, W. W., Neel, J. V., Livingstone, F. B., and Miller, M. J. (1956). *Blood*, 11, 902.
 Rucknagel, D. L., Page, E. B., and Jensen, W. N. (1955). *Blood*, 10, 999.
 Singer, K., Chernoff, A. I., and Singer, L. (1951). *Ibid.*, 6, 413.
 Thorup, O. A., Itano, H. A., Wheby, M., and Leavell, B. S. (1956). *Science*, 123, 889.

Medical Memorandum

Acute Myeloblastic Leukaemia following Chloramphenicol Treatment

Various blood dyscrasias, ranging from slight granulocytopenia to agranulocytosis and aplastic anaemia, following administration of chloramphenicol have been reported during the last few years, but no case of acute leukaemia has yet been published. A case has recently been seen where acute myeloblastic leukaemia was discovered following agranulocytosis and hypoplasia of bone marrow after a single course of chloramphenicol.

CASE REPORT

A man aged 63 was first seen in September, 1953, with a history of sudden attacks of amnesia over the last year. No very definite abnormality was found on physical examination; a peripheral blood film showed a normal picture with haemoglobin 94%. Wassermann reaction negative. He had no symptoms when seen in January, 1954, but was admitted to this hospital in August, 1954, with further attacks of amnesia, frontal headaches, and momentary aphasia. Examination revealed slight nominal dysphasia, right homonymous hemianopia, slight papilloedema of right disk, and accentuated right-sided tendon jerks. A skull radiograph was normal, but the cerebrospinal fluid was xanthochromic, under enhanced pressure, and contained increased protein and excess globulin. Blood count on August 27: Hb 74%; R.B.C. 4,060,000 per c.mm.; C.I. 0.92; W.B.C. 6,800 per c.mm.; polymorphs 62%; lymphocytes 37%; monocytes 1%. A left carotid angiogram

showed a moderate-sized angiomatous malformation in the temporo-parietal region with pineal shift to the right.

He was admitted to the Manchester Royal Infirmary in October, 1954, for removal of the angioma. On October 14 his haemoglobin was 72%. Operation was on October 22, and the same evening a post-operative clot was removed and blood loss was replaced with 6 pints (3.4 litres) of blood. Chloramphenicol, 500 mg. six-hourly, was started by mouth. Four days later the haemoglobin was 48%. Blood examination on the 29th showed W.B.C. 1,110 per c.mm. (polymorphs 38%, lymphocytes 52%), and on this day chloramphenicol was stopped. A few pints of packed cells was transfused, and on his discharge on November 28 the haemoglobin was 72%.

He was readmitted on February 14, 1955, as he was becoming increasingly pale and listless. There was no enlargement of liver, spleen, or lymph nodes. A soft systolic murmur was present at the apex. Blood pressure 160/90 mm. Hg. Blood count: Hb 40%; R.B.C. 2,600,000 per c.mm.; C.I. 0.98; W.B.C. 850 per c.mm. (polymorphs 17%, monocytes 1%, lymphocytes 81%); platelets 147,000 per c.mm.

He was given a transfusion of 4 pints (2.3 litres) of packed cells on admission, followed by a course of treatment with penicillin, sodium pentose nucleotides, and pyrimidine hydrochloride. Blood examination after transfusion showed: Hb 54%; R.B.C. 2,630,000 per c.mm.; C.I. 1.02; W.B.C. 1,100 per c.mm. (polymorphs 18%, lymphocytes 82%). A further 4 pints (2.3 litres) of packed cells was transfused four days later, and 500 mg. of iron given intravenously; but on February 28 the leucocyte count fell to 600 per c.mm., with 28% polymorphs; sternal marrow puncture showed markedly decreased cellularity and very scanty precursor cells, the appearances being of severe hypoplasia of bone marrow. Packed cells, again 4 pints (2.3 litres), were transfused on March 1, and the blood picture on the 7th was: Hb 85%; R.B.C. 4,060,000 per c.mm.; C.I. 1.04; W.B.C. 1,800 per c.mm. (polymorphs 55%, lymphocytes 45%); platelets 199,000 per c.mm. On March 9 he suddenly became comatose and lumbar puncture revealed blood-stained fluid. After remaining in coma for a few days he gradually improved, C.S.F. on April 1 being clear with normal cells and chemistry. The blood picture during the rest of March remained steady with Hb 75% and W.B.C. 1,500 per c.mm. (polymorphs 42%).

He was fairly well, getting up and about, and cheerful though often irrational, till April 2, when an abscess developed in the right gluteal region and streptomycin treatment was added; the abscess opened spontaneously and discharged for a few days before healing. The blood count on April 4 was: Hb 68%; R.B.C. 2,910,000 per c.mm.; W.B.C. 1,700 per c.mm. (polymorphs 34%, lymphocytes 65%, monocytes 1%); but as the leucocyte count fell to 600 per c.mm. on the 19th 2 pints (1.1 litres) of packed cells was transfused. Average blood count during the following month was: Hb 45%; R.B.C. 2,100,000 per c.mm.; W.B.C. 2,000 per c.mm. (polymorphs 20%, lymphocytes 78%). He complained of abdominal pain, but examination of urine and by barium meal showed no abnormality, and liver function tests gave normal results.

Two pints (1.1 litres) of blood was transfused on May 10. Another abscess developed in the right buttock a week later; a further course of streptomycin and penicillin was given without effect, and the abscess was incised with removal of a small amount of thick pus containing a moderate number of leucocytes and numerous Gram-positive cocci in clusters, and from which coagulase-positive *Staphylococcus aureus* was grown. It gradually healed.

On May 26 raised circular pinkish nodules developed on the chest and back. Liver and spleen were not palpable and there were no enlarged lymph nodes. Peripheral blood count: Hb 41%; R.B.C. 1,840,000 per c.mm.; C.I. 1.12; W.B.C. 13,000 per c.mm. (immature cells, type not definitely identified, 33%; monocytes 41%, lymphocytes 11%, polymorphs 5%, polymorphs 10%). Sternal marrow puncture showed predominance of primitive blast cells with occasional premyelocytes, myelocytes, metamyelocytes, and

polymorphs. Erythrocyte reaction was normoblastic and cells were poorly presented, only an occasional proerythroblast and intermediate and late normoblast being seen. The picture was one of acute myeloblastic leukaemia; this was confirmed by Dr. J. F. Wilkinson, and 3 pints (1.7 litres) of packed-cell blood transfused. On June 1 a few areas of haemorrhages developed under the skin. For the first time both liver and spleen were palpable, but no lymph nodes. The pinkish skin nodules were more prominent. The patient was slightly febrile and occasionally irrational.

On June 11 he was given 6-mercaptopurine, 50 mg. six-hourly, and this was continued up to the 26th, 3 pints (1.7 litres) of packed cells having been given on the 18th. Blood counts remained as follows: on June 2—Hb 36%, W.B.C. 9,900 per c.mm. (blast cells 81%, unidentified cells 4%); and on June 15—Hb 39%, W.B.C. 12,300 per c.mm., with 81% blast cells. On June 23, following transfusion, the Hb was 56%, but the W.B.C. had fallen to 2,700 per c.mm., probably due to the 6-mercaptopurine; it further fell to 1,200 per c.mm. four days later.

On June 29 the patient suddenly became comatose, starting with a right-sided convulsion, and died two hours later. Permission for necropsy was withheld.

COMMENT

Since 1950 innumerable cases of blood dyscrasia following chloramphenicol administration have been reported in the world literature; these range from transient depression of the bone marrow causing minor granulocytopenia to fatal aplastic anaemia involving erythrocytes, granulocytes, and platelets. Usually they occur after prolonged administration of large doses, but cases are on record in which aplastic anaemia has developed after a single course or after a small precipitating dose at an interval of weeks or months after a sensitizing course. In the present case only one course of chloramphenicol to a total of 12 g. was given, and it seems certain that the patient had not had the drug previously.

No case has hitherto been described of acute leukaemia developing after chloramphenicol treatment. Recently Wilkinson (1955) has drawn attention to the occurrence of acute leukaemia as a sequel to agranulocytosis caused by sulphonamides, and he cited nine cases of acute leukaemia developing after sulphonamide therapy. If acute leukaemia can follow agranulocytosis due to sulphonamides there is no reason why it cannot similarly develop after treatment with chloramphenicol. The hypoplastic bone marrow, in an effort to produce cells, may suddenly pour primitive blast cells into the circulation, giving a picture of leukaemia.

In the present case leukaemia was found after an abscess had developed. Sometimes a leukaemoid reaction of the marrow is seen after an acute fulminating infection, but in the present case the findings in the peripheral blood and marrow, correlated with the clinical findings, left no doubt as to the diagnosis of leukaemia—severe anaemia, thrombocytopenia, granulocytopenia, and a high percentage of blast cells in the peripheral blood and marrow are not seen in any other condition. A sternal marrow biopsy was not carried out before the operation or immediately after it, and the possibility that the process was present before the administration of chloramphenicol cannot be ruled out. The patient died in spite of treatment with the new cytotoxic drug 6-mercaptopurine and repeated blood transfusions. Cortisone was not tried.

I am grateful to Dr. R. M. Maher for continuous encouragement and for permission to publish this case; to Dr. J. F. Wilkinson, Director of the Department of Haematology, Manchester Royal Infirmary, for seeing the case and for helpful criticism of this paper; to Mr. R. T. Johnson, Neurosurgeon, Manchester Royal Infirmary, who carried out the operation; and to Drs. R. A. Daly and S. Szutowicz, of the Department of Pathology, Birch Hill Hospital, for help with the haematological work.

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REFERENCE

- Wilkinson, J. F. (1955). *Modern Trends in Haematology*, p. 249. Butterworth, London.

Reviews

HARVEY'S LIFE AND WORKS

William Harvey: His Life and Times: His Discoveries: His Methods. By Louis Chauvois. Foreword by Sir Zachary Cope. (Pp. 271. 25s.) London: Hutchinson Medical Publications. 1957.

This new biography of William Harvey by an eminent French physician and classical scholar appears appropriately in this tercentenary year of Harvey's death. As Sir Zachary Cope observes in the foreword: "To Harvey's countrymen it should be regarded as a sincere and great compliment that such an enthusiastic biography should now be forthcoming from France." The biography published in Paris in French appears simultaneously with this English version. A word of praise is due to the anonymous English translator and the editor of the book, who seem to have performed their task with competence and wisdom. Only a few misprints have been noted; for instance, "Magendi" for Magendie and "Wilmott" for Sir Wilmot Herringham (footnote on page 177 and index).

Dr. Chauvois has spared no pains in this study. Not only has he carefully read the Latin text of Harvey's works and previous biographies, but he has sought aid from the College of Physicians and from English authorities on Harvey, especially Lady Moran and Sir Geoffrey Keynes. In addition he has made several visits to England to see the scenes of Harvey's labours—Cambridge, St. Bartholomew's Hospital, Oxford—and has stood beside Harvey's last resting-place in the Harvey Chapel at Hempstead parish church in Essex. The main facts of Harvey's life are well known and are ably set forth here. But Dr. Chauvois is a poet as well as a historian, and from time to time he enlivens the book by speculations as to what Harvey may have thought and done. Chapter I tells of "A Day with William Harvey, London, 1627"; in Chapter IV is given a charming but purely imaginative account of an Italian country ramble by Harvey after taking his doctor's degree at Padua; and in Chapter V it is suggested that Harvey met Shakespeare somewhere in London, although there are no documents of the time to prove that the two men were acquainted. These excursions into the realm of "what might have been" are unusual in a scientific biography. Dr. Chauvois is in error in surmising (on page 180) that the Harvey family has become extinct. Several members of the family, including some of Eliab Harvey's descendants, are with us at the present day and take a keen interest in their illustrious forebear.

The author's brilliant and learned commentary on *De Motu Cordis* adds to our knowledge of the magnitude of Harvey's discovery. He gives due credit to Servetus, Colombo, and Caesalpinus, but shows that their works on the circulation of the blood in no way detract from Harvey's fame as the discoverer. It will be remembered that Harvey, shortly before his death, told Robert Boyle that it was the existence and position of the valves in the veins that led him to think of the circulation of the blood. Re-examination of the Latin texts impels Dr. Chauvois to suggest that some current interpretations of Harvey's teaching on the circulation, especially as to the heart being its initiator, are seriously at fault. In this connexion he considers that too little attention has been paid to Harvey's two letters of 1649 to Jean Riolan, which represent Harvey's matured judgment on his discovery. Chapter IX gives an illuminating account of the contemporary reception of Harvey's discovery in France. Descartes was one of the first to accept this with some reservation. It is of interest that Louis XIV, having been advised by his surgeon, Dionis, that the Faculty of Medicine had ostracized the new doctrine of the circulation of the blood, decided in 1673 that Dionis should occupy an independent chair of anatomy in the royal *Jardin du Roy* where the teaching of Harvey should be imparted. This led

to mention and praise of Harvey's discovery by Molière, Boileau, and La Fontaine.

Only a short space is given in this book to an account of Harvey's *De Generatione*. Here the author's evaluation is based on the scholarly papers of H. P. Bayon. But *De Generatione* deserves greater appreciation than it has hitherto received. It reveals Harvey as a pioneer in embryology, a forerunner of Wallace and Darwin, the founder of scientific midwifery, an epidemiologist, one who first showed that contagious and infectious disease spread through the blood, and whose prophetic vision saw even to the threshold of bacteriology. The pillage of Harvey's papers, "the fruits of many years of toil," by the soldiers of the Parliament, and the destruction of his books and manuscripts in the burning of the College of Physicians in the Great Fire of London, have deprived medical science of much further knowledge obtained by Harvey in his busy and industrious life.

In the epilogue to this delightful book Dr. Chauvois pays homage to Harvey in a graceful French poem, which is worthy to rank beside the lyrical tributes penned by Cowley, Dryden, and John Collop on Harvey and his discovery.

ARTHUR S. MACNALT.

TONSILLAR TUMOURS

Les Tumeurs de l'Amygdale et de la Région Vélopalatine. By A. Ennuyer and J.-P. Bataini. (Pp. 536+vi; illustrated. 5,000 frs.) Paris: Masson et Cie. 1956.

This volume—one of a series dealing with cancer of small areas in the upper respiratory tract—confines itself to growths of the tonsil, soft palate, and parapharyngeal spaces in so far as they impinge on the tonsil. In their preface the authors point out that they are radiologists, so that ray treatment takes first place and surgery is but briefly discussed. Certainly it would be difficult to conceive a more comprehensive, painstaking, and detailed account of the varieties of ray treatments—radium needles, telradium, deep x-rays, cobalt bomb, and linear accelerators, alone or in combination—and their results; statistics from many sources are set out in tables. Through Dr. Fautrel the figures from the Curie Foundation over 30 years are made available, 534 cases of growths of the tonsil and palate having been followed up. A list of 1,500 references stresses the enormous extent of the authors' research in the literature. The treatise is divided into eight parts, of which the first, on epithelioma of the tonsil, occupies almost a third of the book; somewhat unusually pathology and treatment are dealt with first. The second part is concerned with the soft palate and the third with sarcoma. All treatments are described in great detail, and the results shown in many tables from diverse sources.

Surgical removal of the tonsil used to give very poor results, not to mention post-operative mortality, but in 1954 Dargent introduced transmandibular pharyngectomy with immediate plastic flaps, and there are several very clear pictures of the stages of this operation which greatly improved the results. Cures (survival for five or more years) among the 534 cases dealt with occurred in an average of 29%, though this figure was not reached in several of the sources quoted. Necrosis of the mandible occurred in 29 cases as a result of x-ray treatment of the tonsil, but never after telradium. For epithelioma of the soft palate diathermy excision is advised if the growth is localized; endobuccal x rays are applied through a metal tube (a *localisateur*) provided with a hinged flap which is adjusted behind the soft palate, so protecting the surrounding structures. There follows a discussion on symptoms and diagnosis of the early cases, since not unnaturally the prognosis is so much better when treatment is started during the first month and before cervical lymph nodes are palpable. All other types of growth—innocent, plasmocytic, and Hodgkin's disease—are dealt with, also treatment with radioisotopes and A.C.T.H. Finally there is an interesting list of 47 cures, each with a diagram showing the position of the original growth accompanied by details of treatment.

Throat surgeons will not find much new in this encyclopaedic work, but reference to it will assist them in choosing appropriate radiotherapy in individual cases. Radiologists should find the book of interest and a matter for admiration.

W. M. MOLLISON.

THERAPEUTICS

A Course in Practical Therapeutics. By Martin Emil Rehfsuss, M.D., F.A.C.P., LL.D.(Hon.), and Alison Howe Price, A.B., M.D. Third edition. (Pp. 972+xvii; illustrated. £6.) London: Baillière, Tindall and Cox Ltd. 1956.

The numerous textbooks on therapeutics which are published in America—mostly very large and expensive and nearly all of which run into several editions—are a testimony to the widespread interest in the subject which exists on that continent. They are nearly all composite works, written by groups of men whose investigations and teaching experience in certain aspects of internal medicine qualify them to make authoritative statements. From a British point of view their only drawbacks—apart from their price—are the unfamiliar nature of some of the proprietary drugs mentioned and the dreadful crimes which are often committed in them on our common heritage, the English language—though it must be confessed that such crimes are by no means the prerogative of Americans. The great majority of these textbooks are very good, and this one—the product of the staff of the Jefferson Medical College of Philadelphia—is among the best of them. It is the third edition since 1948, superbly bound, beautifully printed on excellent paper, and splendidly illustrated; it weighs over 6 lb. and sells in this country at £1 a pound. The extraordinarily rapid evolution of therapeutics which quickly renders large parts of such books out of date makes it doubtful whether it is wise to produce a volume of such evanescent value on such a sumptuous scale. This is the only serious criticism of the work, though it is inevitable that occasionally there should be a therapeutic recommendation in it with which the reviewer disagrees. The book, which is remarkably comprehensive, is produced in four sections: Section 1 deals with general therapeutic principles—prescription writing, dietetics, nursing problems, and the contents of the physician's bag; Section 2 is concerned with symptomatic treatment—backache, constipation, cyanosis, fever, etc.; Section 3—much the largest—with the treatment of specific disorders; and Section 4 with special treatment—antibiotics, psychotherapy, isotopes, rehabilitation, and so forth. The standard is everywhere worthy of the distinguished authors.

D. M. DUNLOP.

BLOOD TRANSFUSION

Physiologie und Klinik der Bluttransfusion. By Horst Möller. (Pp. 222+x; illustrated. D.M. 16.) Jena: Veb Gustav Fischer Verlag. 1956.

This book on the physiological and clinical aspects of blood transfusion contains a good deal of useful information, but it also contains rather a lot that is useless and even misleading. This arises from the fact that all opinions which can be supported by a reference to the literature are treated with equal respect. For example, four methods of collecting placental blood are described, two "open" and two "closed," but the author does not say which he prefers. The reader might conclude that allowing the cord to drip into a funnel is just as satisfactory as collecting the blood by puncture of the umbilical vein with a needle attached to a standard "taking" set. The book contains many statements which are out of harmony with modern views. Thus it is not nowadays believed that transfusion stimulates the marrow (p. 63), or that diathermy of the kidney is beneficial in anuria (p. 144), or that a compound with a molecular weight of about 13,000 would stay in the circulation for one or two days (p. 135), or that the transfusion of fresh blood is indicated in the treatment of cardiac infarction (p. 191), or that fresh blood is of any special value in the treatment of leucopenia (p. 96). Although quite a lot is said about the preservation of red cells the book contains no quantitative data about their post-transfusion survival. The information

about blood groups is behind the times. Thus the Kell, Lewis, Lutheran, Duffy, and Kidd groups are dismissed in a few lines as being rare blood factors to be dealt with only in special laboratories. It would be wrong to give the impression that this book is of no value at all; there are many interesting sections, such as those on the history of transfusion and on transfusion techniques. The weakness of the book lies in the fact that the author has too often been unable to call upon his own experience and has been uncritical in selecting the opinions of others.

P. L. MOLLISON.

PULMONARY EMPHYSEMA

Pulmonary Emphysema. Edited by Alvan L. Barach, M.D., and Hylan A. Bickerman, M.D. (Pp. 545+x; illustrated. 80s.) London: Baillière, Tindall and Cox. 1956.

Pulmonary emphysema is one of the common diseases which constantly challenge modern therapeutics. Much investigation has been carried out during the last decade into the aetiology, treatment, and laboratory tests of disturbed respiratory function in this disease. A book embracing the up-to-date views on these diverse aspects and presenting them lucidly to the general reader would indeed be welcome. *Pulmonary Emphysema*, a symposium written by 18 American authors and edited by A. L. Barach and H. A. Bickerman, is an attempt to supply this need. The book is written by experts; it contains a galaxy of facts; it is admirably produced and the bibliography is excellent. The current views on treatment are described in detail and treatment is logically related to the mechanical defects and impaired ventilation which occur in emphysema. The use and dangers of oxygen, the technique of physiotherapy, and the pharmacological approach to treatment are fully and dogmatically outlined. Yet, as a book, it fails because it appears to have been written without considering for whom it has been written. The physician, for example, approaching with relish the chapter on the use of corticotrophin and corticosteroids in emphysema, will find it irksome to read 25 pages devoted almost entirely to the well-established facts about these preparations in general medicine. The chest physician will find much of the material commonplace, whereas the chapter on respiratory function tests will give him a confused account of technique and terminology without supplying a guide to the practical application of the tests described. The general reader will find it cumbersome as a reference book. It is a pity that such excellent material drawn from such wide experience could not have been more clearly presented. It is hoped that future editions of the work will be written more concisely and with more regard and sympathy for the intended reader.

T. PARKINSON.

PHASE-CONTRAST MICROSCOPY OF THE BLOOD

Das Phasenkontrastverfahren in der Haematologie. By H. G. Hansen and Alexander Rominger. (Pp. 126; illustrated. D.M. 16.) Hamburg: Materia Medica Nordmark. 1956.

This book on phase-contrast microscopy in haematology consists of several hundred photographs of cells, each shortly described and linked by a more discursive text. The authors seem to be especially interested to assign cells seen by phase-contrast to categories devised for stained cells. The short sections on physical and cytological fundamentals are quite inadequate, and the book depends for its interest mainly on the pictures. These are of very unequal value. Most of them show less detail than can be attained in comparable material, and, though much of this is due to imperfect reproduction, some appear to be due to technical imperfection. There are, however, some excellent pictures of malaria, toxoplasma, trypanosomes, and leishmania, of unusual leukaemias, and capillaries and sinusoids of bone marrow. One can only learn phase-contrast cytology by using a phase-contrast microscope, and this book will be of very little help to beginners or to anyone else.

GEORGE DISCOMBE.

BRITISH MEDICAL JOURNAL

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THE OLD AND THE NEW

William Harvey died three hundred years ago—on June 3, 1657—and medical men and women from all over the world will commemorate the event at the Harvey Tercentenary Congress in London next week and in Folkestone, Harvey's birthplace, during the following week-end. The Congress will be under the presidency of Mr. A. Dickson Wright, and many professional and learned bodies, including the Royal Society and the Royal Colleges of Physicians and of Surgeons, have helped to draw up the programme, details of which are given elsewhere (p. 1296). The meetings will be held mainly in the commodious premises of the Royal College of Surgeons of England in Lincoln's Inn Fields. The place would have been even more appropriate had it developed as a joint centre of all the medical colleges, for there is no department of the healing art, whether surgery, internal medicine, obstetrics, or general practice, and no specialty from otology to psychiatry that is not deeply affected by advances in knowledge of the physical, chemical, and biological aspects of the circulation. May this occasion be an omen for the reunion of the fragmented body of medicine that would be as welcome to Harvey as to his great predecessors Hippocrates and Galen.

Apart from the many remarkable advances in the diagnosis and treatment of diseases of the vascular system, some may perhaps ask whether there is really anything new to be said about the work of such a historical figure as Harvey and about the man himself—the object of hundreds of "Orations," two of which we have chosen to reproduce in the opening pages of this issue. The true answer is surely in the affirmative. As F. N. L. Poynter remarks in his informative article (see p. 1297), Harvey's place in the history of scientific thought cannot be immutably fixed, but is subject to a continuing process of reassessment. First as regards the man himself. He is represented, or alleged to be represented, by a very large number of portraits. All were thought to be of Harvey well advanced in life. A few years ago Sir Geoffrey Keynes found at Rolls Park in Essex a portrait of him near the date of his discovery (reproduced in the middle of this issue). This is specially to be

cherished, for it represents him in the vigour of his forties. We know that he was then busied with the dissection and examination of every kind of animal, and this portrait is that of a man that we can well think of as so occupied. Sir Geoffrey has reproduced and described it in his admirable Vicary lecture *The Portraiture of William Harvey* (1949). In that volume he also discusses the portrait in the Hunterian Collection at Glasgow of about 1655, which is represented in the frontispiece to this number of the *Journal*, and the sculptured bust of about 1656 at Hempstead Church. This Sir Geoffrey believes to have been taken rather from a life-mask than a death-mask and is therefore in a sense the most authentic. It is of Harvey in the late seventies and renders very carefully the wrinkles, creases, and prominent temporal veins of old age. We would here draw attention also to the clear, concise, and interesting account of Harvey and his sojourns and travels by Mr. H. R. Trevor-Roper and others in the interesting handbook issued by the Congress itself. Above all there will be available at the Congress the new translation of Harvey's great book by Professor Kenneth J. Franklin, F.R.S., of the Medical School of St. Bartholomew's, Harvey's own hospital. Professor Franklin combines devotion to scholarship with practice in experimental physiology to a degree which must be unique. Harvey's book is difficult both in language and in structure, and it was high time for a new translation with all the apparatus of modern scholarship and modern scientific knowledge. Some further comment on this work will be found at p. 1293.

So much for *vetera*, of which we have pointed to a few highlights. Were we to attempt to treat in the same way the *nova* of even the last two or three decades neither this article nor even this number would suffice. We can but indicate a very few matters which must come under discussion at the Congress itself. Apart from the clinical aspects, which can hardly be discussed here, there is, in the region of naked-eye anatomy, the question of the astounding change at birth of the circulatory system of the foetus to that of the air-breathing child. This matter, though often discussed, was not treated adequately on an experimental basis until about twenty years ago with the work of Joseph Barcroft. It was hardly made clear until twelve years ago, with the remarkable book on *The Foetal Circulation* by Drs. Alfred Barclay, Kenneth Franklin, and Marjory Prichard. This showed that the modifications of foetal anatomy and physiology preparatory to the great event of birth had begun very early in foetal life and had already been in part functional long before birth. Nevertheless the oxygen saturation of the arterial blood of the

newborn—in the sheep at least—does not equal that of the adult for an hour or two after birth. It is worth recalling that nearly 1,800 years ago Galen saw the *via sinistra* (foramen ovale) and the ductus arteriosus and found their closure even more wonderful than their original creation.

In Harvey's time the microscope had not yet become an instrument of research. Thus he did not so much describe the circulation as demonstrate its inevitability, and left open the question of how the blood passes from the arteries to the veins. The capillaries, first of the lungs and then of the tissues, were described in his own century but after his death. Throughout the eighteenth and nineteenth centuries the vessels of the blood were described mostly from the point of view of their anatomy and mechanism, both of which were explored in detail. The seventeenth, eighteenth, and nineteenth centuries saw also a similar development in the knowledge of the lacteals and of the lymphatics, which were also treated as closed systems. It was always obvious that since the blood brought nourishment to the tissues there must be some stage at which it, or some part of it, issued from the apparently closed system and came in contact with the minute elements of those tissues themselves. Migrations of white blood corpuscles from the capillaries were described by Lister, Metchnikoff, and others during the nineteenth century, but it was upon the drama of the mechanics and physics of the theoretically closed vascular system that attention was almost entirely riveted. Only during the last sixty years has this emphasis changed. The rise of the sciences of biochemistry and biophysics has brought about this change. We can now at least gain a glimpse of how vast is the area of which we are ignorant. The extravascular fluid, dimly appreciated by Galen and Harvey, has now come into its own. It will in itself provide ample opportunity for observation and thought for generations to come of both clinicians and experimenters. *Quis separabit?* Who will or should sunder them? The time is coming for a reunion of medicine into one body as Harvey would have wished.

BRITISH POLIOMYELITIS VACCINE

The field trial carried out by the Medical Research Council last year on the British poliomyelitis vaccine is reported in the *Journal* this week at p. 1271. This vaccine differs from the American and Canadian vaccines in that its type I strain, called Brunenders, is considerably less virulent than the dangerous Mahoney strain, which caused trouble in America in 1955. The object of this change was to make as cer-

tain as possible that no paralytic cases of the disease could follow injection of vaccine containing active virus. The British vaccine is made from strains of such relatively low virulence that the infective dose for a child would be many thousands of times greater than the occasional "live" virus particle which might, most improbably, elude the very stringent tests by tissue culture and inoculation of monkeys.¹ At the same time antibody studies on monkeys and on children with no previous antibody to poliomyelitis have shown that the Brunenders strain is a good antigen.² It is important to know whether it can also prevent paralytic poliomyelitis, because the predominant type of virus causing the disease in this country is type I. Further, the highest attack rate of paralytic poliomyelitis in Great Britain is in children under 6 years of age. The American 1954 trial³ was only on children aged 6–9, and the results suggested that vaccination might be less efficacious at the youngest age. During the past year the Medical Research Council's Poliomyelitis Vaccines Committee has therefore endeavoured to answer two main questions: Can vaccine containing the Brunenders strain prevent paralysis, and will vaccination protect the younger children? The Committee's careful assessment answers both of these questions in the affirmative and tells how the answers were obtained.

The British vaccine available early in 1956 was administered to children born in the years 1947 to 1954 whose parents registered their wish for vaccination. Because there was enough vaccine for only about 200,000 of the nearly 1,900,000 who registered, it was possible, by giving vaccine only to children born in certain designated months, to accept those who registered but received no vaccine as strictly comparable controls, and to compare their experience of poliomyelitis through the ensuing poliomyelitis season with that of the vaccinated children. In the American 1954 trial the control group received injections of an inert substance; in the different circumstances of the British trial this, even if regarded as desirable, was impracticable. Nearly 400,000 injections of vaccine were given during May and June, 1956, with no ill effects; the only reactions attributable to the injections were trivial. Disregarding 32,379 children who received one injection only, the Committee considers the rest, who were all given two injections with about three weeks between them, in two groups, the older born in the years 1947 to 1950 and the younger in the years 1951 to 1954. In the older group only one case

¹ *Wild Hlth Org. techn. Rep. Ser.*, No. 101, 1956.

² Report to the Committee on Laboratory Investigations of Poliomyelitis of the Medical Research Council, *British Medical Journal*, 1957, 1, 366.

³ Francis, T., jr., et al., An Evaluation of the 1954 Poliomyelitis Vaccine Trials, Summary Report, *Amer. J. publ. Hlth*, 1955, 45, supplement.

⁴ *British Medical Journal*, 1955, 1, 1083.

⁵ Salk, J. E., *J. Amer. med. Ass.*, 1955, 158, 1239.

of paralysis occurred among the vaccinated children, corresponding to an attack rate of 1.3 per 100,000. Had the attack rate been the same as in the unvaccinated controls of this group (8.2 per 100,000), 6 cases would have been expected. The younger vaccinated children produced 3 cases (4.1 per 100,000), whereas 15 would have been expected on the rate observed among the younger controls (20.1 per 100,000). In both groups, therefore, the apparent protection was about 80%, though with such small numbers of cases this figure must be accepted with great reserve.

In the significant part of the American trial of 1954 (the so-called placebo control study) the numbers of children in both vaccinated and control groups were about 200,000. Though the number vaccinated was therefore about the same as in the British trial, the incidence of poliomyelitis was higher in both control and vaccinated groups, giving attack rates respectively of 16 and 57 per 100,000 and an apparent protection of about 72%. On this showing, the admittedly slender experience of Great Britain in 1956 gives no reason for thinking that the performance of the British vaccine, in spite of its greater margin of safety, was inferior to that of the American. The evidence on the effect of vaccination on non-paralytic poliomyelitis is hard to assess because of the inevitable difficulty of diagnosis, but it seems possible that vaccination may produce some reduction in non-paralytic cases yielding virus in the stools.

The ultimate value of the vaccine remains uncertain. Both American and British trials relate only to the months immediately after vaccination, when levels of antibody and probably protection are at their highest. In the American trial three doses of vaccine were given at intervals of a week and a month. Probably the spacing was too close and the effect much the same as that of two doses three weeks apart, as in the British trial. Salk's antibody studies⁵ suggest that a third dose given considerably later may produce a higher antibody level, which stays high for much longer. Does this higher antibody level imply better protection? In short, is a third dose necessary? There are theoretical dangers and practical disadvantages in giving many repeated doses. Will protection last without them? The younger the age at which children are given their poliomyelitis vaccine, the more important do these questions become. It is to be hoped that no opportunity to gain more information in later years will be missed.

In a remarkably short time a difficult and dangerous new manufacturing process has been brought to a high and consistent level of performance. Each batch of vaccine issued has been double-checked for

its safety and antigenic potency; and we now have the best assurance we can expect to get that the product is effective in preventing paralysis in children down to the age of 2 years. Great credit is due to the firm which has made the British vaccine, and to those who have put it through its laboratory tests, administered it, and learned from it what has so far been learned; and also to those who have directed the programme against a background of publicity not always helpful. Throughout, American colleagues have given all the help they could. Without their pioneer research and that of the Connaught Laboratories, there would be no vaccine. The development and testing of the British vaccine is a smaller but valuable contribution to the story which began hardly five years ago, and which will not be completely told for many more years.

NEW TRANSLATION OF "DE MOTU CORDIS"

There have been several English translations of *De Motu Cordis*. The first one, by an unknown translator, was issued in 1653.¹ On the occasion of the tercentenary of *De Motu Cordis* in 1928 this first English text was newly edited by Sir Geoffrey Keynes and printed at the Enschedé Press in Holland for the Nonesuch Press. In *The London Medical and Surgical Journal* for 1832 Dr. M. Ryan published a translation of *De Motu Cordis*, which ran through several numbers, and a biographical sketch. In 1847 *The Works of William Harvey* were translated from the Latin with a life of the author for the Sydenham Society by Dr. Robert Willis, librarian to the Royal College of Surgeons from 1828 to 1845. His translation of *De Motu Cordis*, hitherto, has been in general use. A revised edition, edited by Alexander Bowie, was published in 1889. Willis's translation, with an introduction by E. A. Parkyn, was included in Everyman's Library in 1907.

For a long time medical historians have desired a retranslation of Harvey's first great work, for the earlier versions were not sufficiently accurate for those doing either historical or experimental research upon the circulation. Dr. Chauvois, whose *William Harvey* is reviewed in this issue of the *Journal* (p. 1288), has emphasized that it is necessary to read Harvey's original Latin text in order to get the full meaning of *De Motu Cordis*. This need for retranslation was voiced a year or two ago by Professor John F. Fulton, and was shared by Sir Russell Brain, then President of the Royal College of Physicians. It was clear that the translator must not only be a Latin scholar but also a physiologist and medical historian. These gifts are united in Professor

¹ *The Anatomical Exercises of Dr. William Harvey concerning the motion of the Heart and Blood. With the Preface of Zachariah Wood. To which is added Dr. James De Back his discourse of the Heart.* London: printed by F. Leach for R. Lowndes, 1653.
² *Movement of the Heart and Blood in Animals. An Anatomical Essay by William Harvey.* Translated from the original Latin by Kenneth J. Franklin and now published for The Royal College of Physicians of London. (Pp. 209+xii.) Oxford: Blackwell Scientific Publications 1957.
³ Franklin, K. J., *J. Hist. Med.*, 1957, vol. 12, No. 2.

Kenneth J. Franklin, who occupies the chair of physiology at St. Bartholomew's Hospital Medical College, and at the official invitation of the President of the Royal College of Physicians he undertook the task in time for the new version to be ready by the tercentenary of Harvey's death. This new volume² contains Professor Franklin's elegant translation, Harvey's Latin text (standard 1766 edition), and, as frontispiece, a reproduction in colour of the contemporary portrait of Harvey by Cornelis Janssen in the Royal College of Physicians. It should increase understanding of Harvey's contribution to knowledge, on which modern scientific medicine is based, and will be valued especially by all physiologists and medical historians. We should have welcomed some notes on Harvey's text and the new interpretations which Professor Franklin has discovered. Some of this information will be found in his recent paper.³

It is no small tribute that Professor Franklin has rendered to the *manes* of William Harvey in this tercentenary year of his death. May we express the hope that at some future date he will translate the two *Anatomical Disquisitions* which Harvey addressed to Jean Riolan in 1649? These letters throw further light on Harvey's discovery and represent his mature judgment on the subject. There is need also for a retranslation of *De Generatione Animalium*. Professor Franklin has been so successful in his aims with this scholarly translation that like *Oliver Twist* we are impelled to ask for more.

GOITRE CAUSED BY COBALT

Since cobalt is a constituent of the vitamin-B₁₂ molecule, it may be regarded as essential for erythropoiesis. Moreover, there have been several reports that, in certain cases of anaemia failing to improve with vitamin B₁₂ alone, the addition of cobaltous chloride has led to favourable responses. Such responses have been observed in anaemias associated with chronic infection,^{4,5} chronic renal disease,⁶ prematurity,⁷ pregnancy,⁸ and sickle-cell disease.⁹ But unfavourable as well as favourable reports have appeared, and in particular many cases of cobalt toxicity have been recorded. Rashes, anorexia, nausea, vomiting, tinnitus, and nerve deafness have been encountered, and in addition there is now evidence that cobalt may in certain circumstances interfere with thyroid function.

D. Gairdner, J. Marks, and J. D. Roscoe have described the development of a goitre in an infant during treatment of anaemia with cobalt,¹⁰ while J. P. Kriss, W. H. Carnes, and R. T. Gross¹¹ observed a

goitrogenic effect while treating four children and one adult suffering from sickle-cell disease. Goitres appeared after as little as 6-9 weeks of treatment and evidence of depression of ¹³¹I uptake was obtained. In one of the patients obvious clinical myxoedema was present after three months of treatment, and the plasma protein-bound iodine was down to 1 µg. per 100 ml. Complete remission occurred within a month of withdrawal of the cobalt. In a case reported by H. Breidahl and Russell Fraser¹² a man aged 21 with microcytic anaemia was treated with cobaltous chloride 50 mg. three times a day because of failure to maintain an adequate level of haemoglobin with the usual haematinics alone. Within three months he developed a large, hard, painful goitre. Four days after stopping the cobalt there was rapid uptake of ¹³¹I and conversion to protein-bound ¹³¹I. The low basal metabolic rate (-19%) indicated that the thyroid gland, now active and avid, had previously been under-secreting as a result of the anti-thyroid action of the cobalt the patient had received. Breidahl and Fraser agree with Kriss and colleagues that the goitrogenic effect of cobalt is probably due to its action as a heavy metal in inhibiting an enzyme system, and indeed S. Kirkwood and D. Fawcett¹³ have shown that, in a cell-free suspension of thyroid tissue *in vitro*, cobalt inhibits the activity of tyrosine iodinase.

Though several other reports¹⁴⁻¹⁶ confirm the goitrogenic action of cobalt, it is clear that not everyone is susceptible to this action. Thus, of a series of 15 children receiving cobaltous chloride in a daily dose of 1 to 6 mg. per kg. of body weight for ten weeks, no clinical or laboratory evidence of thyroid dysfunction appeared in 13, though in 2 who received the higher dose significant depression of ¹³¹I uptake was noted.¹⁷ No thyroid dysfunction was observed in a group of 78 pregnant women (or in their offspring) when treated with 60 to 100 mg. per day of cobalt for at least three months.⁸ Nor was any goitrogenic effect observed in two other groups of adults and children treated for periods of up to several months, though thyroid function was not specifically studied.^{18,19} It therefore seems that only a small proportion of patients are susceptible to the goitrogenic effects of cobalt, but it is far from clear what determines this susceptibility. Though the risk is not great, and thyroid function becomes normal when administration of cobalt is stopped, it would nevertheless seem wise to reserve cobalt for the treatment of conditions other than anaemias simply due to pregnancy or to deficiency of iron.

THE SQUINTING CHILD

The advent of orthoptic treatment some thirty years ago revolutionized the attitude of the ophthalmic surgeon to the management of the squinting child. Until that time a squint was regarded largely as a cosmetic defect amenable to surgical correction during adolescence, and little attention was paid to the restoration of binocular function. As the study of orthoptics developed the treatment

¹ Chavasse, F. B., *Worth's Squint*, 1939, London. Baillière, Tindall and Cox, London.
² Lyle, T. K., and Foley, Jill, *Brit. J. Ophthalm.*, 1957, 41, 129.

³ Robinson, J. C., James, G. W., and Kark, R. M., *New Engl. J. Med.*, 1949, 240, 749.
⁴ Wintrobe, M. M., Grinstein, M., Dubash, J. J., Humphreys, S. R., Ashenbucker, H., and Worth, W., *Blood*, 1947, 2, 323.
⁵ Gardner, F. H., *J. Lab. clin. Med.*, 1953, 41, 56.
⁶ Coles, B. L., and James, U., *J. Lancet*, 1955, 75, 79.
⁷ Holly, R. G., *J. Amer. med. Ass.*, 1955, 158, 1349.
⁸ Wolf, J., and Levy, I. J., *A.M.A. Intern. Med.*, 1954, 93, 387.
⁹ Gairdner, D., Marks, J., and Roscoe, J. D., *Lancet*, 1954, 2, 1285.
¹⁰ Kriss, J. P., Carnes, W. H., and Gross, R. T., *J. Amer. med. Ass.*, 1955, 157, 117.
¹¹ Breidahl, H., and Fraser, R., *Proc. roy. Soc. Med.*, 1955, 48, 1026.
¹² Kirkwood, S., and Fawcett, D., quoted by Robey *et al.*,¹³
¹³ Klinck, G. H., *J. Amer. med. Ass.*, 1955, 158, 1347.
¹⁴ Roche, M., and Layrisse, M., *J. clin. Endocr.*, 1956, 16, 831.
¹⁵ Robey, J. S., Veazey, P. M., and Crawford, J. D., *New Engl. J. Med.*, 1956, 255, 955.
¹⁶ Jalmet, C. H., and Thode, H. G., *J. Amer. med. Ass.*, 1955, 158, 1353.
¹⁷ Hill, J. M., Lajous, J., and Sebastian, F. J., *Tex. St. J. Med.*, 1955, 51, 686.
¹⁸ Tevetoglu, F., *J. Pediatr.*, 1956, 49, 46.

of squint became directed along certain well-defined lines—the re-establishment of a harmonious relationship between the accommodation and convergence reflexes by the correction of any refractive error; the restoration of adequate vision in the squinting amblyopic eye by occlusion of the non-squinting eye; and, finally, the restoration of binocular single vision by orthoptic treatment, supplemented if necessary by surgical operation. This new approach represented a great advance over earlier methods, but there was a tendency to overstress the role of orthoptic treatment by applying it indiscriminately to all types of cases, sometimes for prolonged periods, with little regard to the ultimate value of such treatment. This danger was appreciated by F. B. Chavasse,¹ who showed that the presence of good vision in each eye is not enough for the re-establishment of binocular vision, and that the earlier the age of onset of the squint and the longer the interval of time before corrective treatment is carried out, no matter how intensive this treatment may be, the less likely is the restoration of binocular function.

A recent critical analysis of a large series of unselected cases of all types of squint by T. Keith Lyle and Jill Foley² puts into true perspective the part played by orthoptics in the treatment of squint. In some types of squint (for example, non-paralytic accommodative convergent strabismus) treatment by glasses and by operation will usually give binocular vision without recourse to orthoptic treatment. But in other types of squint (for example, non-paralytic non-accommodative convergent strabismus) full binocular vision is obtained in only a small number of cases despite the most energetic orthoptic treatment, although a few children may reach the stage of possessing a subnormal form of binocular vision. The likelihood of attaining binocular single vision may be determined accurately at an early stage in the investigation of a squint, because the age and mode of onset of the squint, the family history, and a simple clinical examination (quite apart from examination on a major amblyoscope) will give valuable information on which the ultimate progress of the case can be predicted. In this way it should be possible to avoid the tedious repetition of orthoptic procedures when the child will not obtain binocular single vision, and thus to enable the orthoptist to concentrate on the more promising cases. Consequently the orthoptic department must be essentially diagnostic before it can hope to be therapeutic.

CENTRAL HEALTH SERVICES COUNCIL

The annual report¹ of the Central Health Services Council, published last week, records the decisions of the council and of its advisory committees on a number of matters. The standing joint committee on the classification of proprietary preparations continued its work during the year, classifying about 400 new products. Of the 5,000 proprietary preparations classified by the committee and now on the market, 70 are in category 1 (new drugs of proved value not yet standard), 4,100 in cate-

¹ Report of the Central Health Services Council for the year ended December 31st, 1956, preceded by a statement made by the Minister of Health, 1957, H.M.S.O., London.

gories 2, 3, and 4 (not regarded as therapeutically superior to standard preparations), and the remainder in categories 5 and 6 (preparations of unproved therapeutic value). The standing medical advisory committee has been inquiring into the incidence and treatment of bronchitis and come to the conclusion that patients with this disorder should be admitted for treatment to hospitals in the country or to air-conditioned wards in urban hospitals. A majority of a subcommittee appointed to look into the present need for welfare food supplements decided that children between 2 and 5 received enough vitamin C from a mixed diet and that the issue of orange juice should be restricted to children under 2. This subcommittee also recommended that the content of vitamin D in national dried milk, welfare cod-liver oil, and infants' cereals should be reduced so as to minimize the risk of inducing hypercalcaemia.

A large part of the report is devoted to the work of the standing mental health advisory committee, which has been reviewing the functions of the various authorities concerned with the treatment and care of the mentally ill, including those who are mentally infirm because of old age. The primary purpose of this review was to see whether the pressure on mental hospitals could be relieved by devising alternative forms of care. After "exhaustive consideration" the committee, like others before it, found that many faults in the present system could be attributed to lack of co-ordination. Closer co-operation between the staff of mental hospitals and clinics, local health and welfare authorities, general hospitals, and general practitioners should do much to improve matters. A properly co-ordinated scheme—of the type which has been working well in Oldham and Nottingham—enables new patients to be admitted according to need to a mental or chronic-sick hospital or to a welfare home, or to be given help in their own homes, with possible attendance at a day hospital. The unsatisfactory nature of present arrangements can be judged from the fact that the committee finds it necessary to stress that "the general practitioner should be furnished with a report on his patients on discharge or as soon after as possible, and that it should state the diagnosis, the treatment given, the stage of recovery reached, and any suggestion for subsequent treatment or care. He should also be notified of the death in hospital of any of his patients." A useful suggestion is that housing authorities might help younger tenants to look after their elderly and infirm relatives by providing suitable accommodation for them either in the family home or in separate buildings near-by. In all this work the report emphasizes the continuing need for the help of voluntary organizations.

MECONIUM

Meconium is a viscid, semifluid mass which consists mainly of mucus. With it are mixed epithelial debris, keratin squames, and bilirubin, which imparts the dark green colour. It also contains a variable number of small, firm, yellow particles, meconium bodies, the origin of which is uncertain. The keratin squames are derived from the foetal skin, and are swallowed with liquor amnii. Their presence in meconium smears is used

ROYAL SOCIETY CONVERSAZIONE

Some years ago an astronomer remarked that he had more than once been asked, after lecturing to a lay audience, "You say the spectra showed you what the stars be made of, but how did you get at their names?"¹ We may be more sophisticated nowadays, but a visit to the Royal Society's annual conversazione is enough to stir the same feelings of amazement at man's ingenuity. The display this year on May 23, at which Sir Cyril Hinshelwood, P.R.S., received the guests, contained many striking exhibits, some illustrating new research in medicine and physiology.

Rotation of the eyeball to compensate for rotation of the head was the subject of a demonstration by Dr. P. A. Merton and his colleagues, of the neurological research unit, National Hospital for Nervous Diseases. Compensation by horizontal and vertical movements so as to keep the image on the retina steady is a matter of common observation, but the eye can also be seen to rotate as the subject's head is swung through a small arc. The conjunctiva, not being so mobile, slides over the eyeball. Glasgow University and the Western Regional Hospital Board were showing an artificial respirator for newborn babies. The infant's feeble efforts to take breath activate the machine to supply air in the volume he needs instead of in proportion to his weak muscular movements. Experience has already shown this device to be of great value in practice. Mr. J. A. Armstrong and Dr. Janet S. F. Niven, of the National Institute for Medical Research, showed some beautiful histological specimens in a fluorescence microscope, as well as colour transparencies obtained with this instrument. The sections are treated with fluorescent compounds and then illuminated with violet or ultraviolet light. This induces differential fluorescence, so that structures containing ribonucleic acid show red, while those containing deoxyribonucleic acid show yellow. An exhibit by Dr. A. C. Allison and Mrs. W. ap Rees, of Oxford University, illustrated the inheritance of the haptoglobins. These are serum proteins; four have been identified and their mode of inheritance analysed. Rarely, they are absent from the serum, and the patient then suffers from haemoglobinuria, since one of their functions is to prevent the renal excretion of haemoglobin. An exhibit of uncommon interest and beauty was put on by Professor H. G. Callan and Mrs. L. Lloyd, of St. Andrews University, showing giant chromosomes from the eggs of newts. The structure of the chromosomes, under moderate magnification, notably resembled the strings of beads to which they and their genes are sometimes colloquially likened. Elsewhere, the spirit that animates small boys to rush from case to case in the Natural History Museum on a Sunday afternoon in Kensington was found to be by no means absent from their seniors, and there was quite an ugly rush of Fellows and guests to see this Museum's exhibit of dinosaur eggs. Fragments over 100 million years old, and casts of actual specimens which included one showing baby dinosaurs hatching, stirred conflicting thoughts on the brevity of human existence.

in Farber's test to prove the patency of the alimentary tract. At the distal end of the mass of meconium, in the anus and rectum, is a cap of pale mucus, firmer than the meconium, and presumably derived from the colon and rectum.

The foetus does not normally pass meconium before birth, because the expulsive action of the rectum and anus is absent, though the small intestine has some peristaltic activity. At full-time birth the distal colon and rectum are loaded with it. The first meconium stool should be passed within twenty-four hours of birth. Passage of meconium before delivery is evidence of foetal distress, and is ominous because it indicates severe foetal anoxia and also because it creates the risk that the foetus will aspirate meconium into the lungs. If the baby is then born alive its respiration may be so impeded that it suffocates; or the meconium may cause death from obstructive emphysema and pneumothorax.

Impaction of meconium as a cause of intestinal obstruction in the foetus and newborn is familiar in association with fibrocystic disease of the pancreas. A feature of that disease is an abnormally viscid secretion from all mucous glands. Because of this and the absence of pancreatic enzymes, the viscosity of the meconium is greatly increased and causes it to be impacted in the distal ileum, where it is inspissated to clay-like consistency. Hirschsprung's disease with a long aganglionic segment causes similar impaction, but the fault is in the innervation of the bowel, not in the meconium, which therefore does not have such an extremely hard consistence. Two recent papers by J. L. Emery¹ and R. B. Zachary² draw attention to a less familiar and less serious cause of obstruction due to impacted meconium—the presence of meconium plugs. These are most often in the anus and rectum, and are formed from the cap of pale mucus, which is unusually hard, probably because of delay in passing it rather than because the meconium is abnormal. Removal of the plug by rectal examination or wash-out relieves the obstruction. Emery also describes plugs of tenacious meconium causing obstruction in the small intestine. He found that the water content of the plugs was much below that of the normal meconium, and ascribed them to a disturbance of water balance in the affected segment.

Inspissation and impaction of meconium may cause ulceration of the intestinal mucosa even before birth. Organization of inspissated meconium in the bowel at the site of ulceration is responsible for some examples of congenital intestinal atresia. When an ulcer perforates before birth, meconium escaping into the peritoneal sac causes an aseptic inflammation, with adhesions, among which particles of meconium become calcified. In newborn infants perforation of similar ulcers may cause death from septic peritonitis. Emery and Zachary describe several cases in which perforated ulcers were related to hard faecal masses, and suggest that the cause may be excessive absorption of water from the faeces, or possibly an anomaly or immaturity of the intrinsic innervation which eludes histological recognition.

¹ Emery, J. L., *Arch. Dis. Childh.*, 1957, 32, 17.

² Zachary, R. B., *ibid.*, 1957, 32, 22.

¹ Torr, C., *Small Talk at Wreyland*, Series 2, Cambridge, 1921.

HARVEY TERCENTENARY CONGRESS

On Monday the Harvey Tercentenary Congress opens at the Royal College of Surgeons. William Harvey was born at Folkestone in 1578 and died on June 3, 1657, in the eightieth year of his life. The Congress will commemorate, in the words of Mr. A. DICKSON WRIGHT, its president, "the passing of the great discoverer of the circulation of the blood."

The Congress is as much concerned with the present as the past. The theme for the five-day scientific meeting at the Royal College of Surgeons is "Our Present Knowledge of the Circulation." Here, distinguished speakers from the United States, Canada, Belgium, France, Germany, Sweden, and Switzerland will join British workers in reviewing our knowledge of the circulation of the blood. Their contributions will cover the role of the heart, haemodynamics, the coronary and pulmonary circulation, cardiac surgery, and the cerebral, splanchnic, and peripheral circulation. This contemporary conspectus will be preceded by an opening session on the knowledge of the circulation from the seventeenth century onwards. But the main historical commemoration will be during the two-day meeting at the week-end, under Sir GEOFFREY KEYNES'S chairmanship, at Folkestone. Harvey's birthplace, Harvey at Cambridge and Padua, Harvey's influence on French medicine, and Harvey the scientist will be the subjects of discourses.

The idea of the Congress originated with the Harveian Society of London two years ago. Since then other learned bodies have joined with the Society to make the Congress possible. The Congress president is this year's president of the Harveian Society.

Special Features

Accompanying the Congress will be memorial services in St. Paul's Cathedral (Royal College of Physicians) and at Canterbury Cathedral; banquets in London and Folkestone; Harveian exhibitions at the Wellcome Historical Medical Museum, the Royal College of Physicians, and the Royal College of Surgeons; a special meeting of the British Cardiac Society; a civic procession in Folkestone to Harvey's statue; films; and a number of receptions for the delegates.

Certain events, however, are of more than ordinary interest. During the scientific meeting at the Royal College of Surgeons the transatlantic radio-telephone will be used to allow American doctors attending the American Medical Association's annual meeting in New York to participate in the discussion on cardiac surgery. A programme of closed-circuit colour television, sponsored by Messrs. Smith, Kline and French Laboratories Ltd., has also been arranged. This is only the second time that colour television has been used at a medical meeting in Britain: the first was at the joint meeting of French and British surgeons at the R.C.S. this week, and next month there will be further demonstrations at the Royal College of Surgeons of Edinburgh and at the B.M.A. Annual Meeting in Newcastle upon Tyne. At the Harveian Congress delegates will see on television, among other "live" demonstrations, Melrose's heart-lung machine and the mass spectrometer described by Fowler and Hugh-Jones in our last issue (p. 1205). The Royal College of Physicians has sponsored a new translation of Harvey's *De Motu Cordis*, with Professor K. J. Franklin, F.R.S., as the translator, and also a new edition of the film on Harvey. The film will be shown at the Royal College of Physicians at 5 and 5.45 p.m. on June 3, 5, 6, and 7, admission to it being free to Fellows, Members, and licentiates of the College as well as to the Congress delegates. Finally, the banquet at Folkestone, which the civic authorities and Messrs. Pfizer Ltd. are arranging, will be Elizabethan in both setting and menu, and the banqueters will be regaled with madrigals.

Congress Handbook

As frontispiece to the official Congress Handbook are reproduced the Royal College of Physicians' portrait, show-

ing Harvey in his old age, and a specimen of his signature—"Will. Harvey"—taken from a document in the archives of St. Bartholomew's Hospital. The Handbook also provides some historical background. Mr. H. R. Trevor Roper writes on "Harvey: The Man and His Times," Professor F. J. W. Roughton, F.R.S., on "Harvey and Cambridge," Professor A. Dalla Volta on "Harvey and Padua," and Sir Charles Dods, F.R.S., on "The Royal College of Physicians and Harvey." There are also unsigned contributions on "Harvey and Folkestone" and "William Harvey at St. Bartholomew's Hospital." Lastly there is an account of the Royal College of Surgeons "and its surroundings," and an essay by Dr. M. C. W. Long, last year's president, on the Harveian Society of London. The Society began on September 15, 1831, as the Western London Medical Society, but only eleven days later changed its name to the Harveian Society, "in token of a resolution strictly to adhere to the course of observation and induction so successfully pursued by the illustrious discoverer of the circulation of the blood."

The Wellcome Exhibition

On June 3 (at 6 p.m.) Sir RUSSELL BRAIN will open a special tercentenary exhibition at the Wellcome Historical Medical Museum, Euston Road. It is designed to illustrate Harvey's life and the development of the ideas which led up to his discovery. The exhibition will then remain open to the public, from 10 a.m. to 5 p.m. daily, for about a month. Besides displaying the Wellcome Library's unrivalled collection of Harvey's books, beginning with the first edition of the short treatise in Latin in which in 1628 Harvey announced his discovery to the world, there will also be on view various personal documents such as the original probate copy of his will.

ROLLS PARK PORTRAIT OF HARVEY

The portrait, reproduced opposite, is the only known authentic likeness of William Harvey in his prime. It was identified by Sir Geoffrey Keynes at Rolls Park, near Chigwell, the estate acquired early in the seventeenth century by Eliab Harvey, William Harvey's brother. The portrait was one of seven uniform heads-and-shoulders of Thomas Harvey's sons surrounding a large panel depicting their father. In an addendum to his Thomas Vicary Lecture, 1948, on "The Portraiture of William Harvey" Sir Geoffrey Keynes describes the portrait as follows:

"William Harvey is shown as a man of about 45, with dark hair, a heavy moustache, and a small peaked beard. He is wearing a doublet. The background is inscribed, *Doctor William Harvey*. There is no date, but it is plain that we see here an image of Harvey as he was about 1620-1625, not long before he published his immortal treatise, *De Motu Cordis*. The picture adds authenticity, if any were needed, to the later images . . . since it was possible to recognize Harvey's face almost in the dark from knowledge of his appearance in old age, and demolishes more completely than ever the claims of pictures such as the forgery . . . dated 1628. It is a satisfaction," states Sir Geoffrey Keynes in conclusion, "to be able to round off this iconography of Harvey by the addition of a virtually unknown image painted 30 years earlier than any hitherto described."

The Rolls Park portrait is at present on loan to the Royal College of Physicians, where it may be seen in the entrance hall. We are indebted to Mr. Andrew Lloyd, the owner of the portrait, for permission to reproduce it.

CURRENT THOUGHT ON HARVEY

BY

F. N. L. POYNTER, Ph.D., B.A.

Prospect as well as retrospect marks the character of this week's Harvey Tercentenary Congress at the Royal College of Surgeons, and it is good that it should be so. There is no sharp dividing line which marks off past from present, history from current research. In pointing out those strands of the past which are woven into current thought the historian forces us to examine more closely and more objectively much of what is accepted as fact. When the historian is engaged in tracing the development of ideas in science and medicine his work is an essential complement to research, for it helps to maintain conditions favourable to critical inquiry and the emergence of new ideas, without which the most elaborate experimentation in the most splendidly equipped research laboratories becomes dull routine.

Nowhere is the emergence of a new fundamental truth from a critical examination of past beliefs more beautifully demonstrated than in Harvey's own *De Motu Cordis*. For generations medical historians have argued the significance of Harvey's debt to the past and some have questioned the originality of his ideas, so that eminent physicians paying tribute to Harvey's genius have felt it safer to emphasize the revolutionary nature of his work purely as a demonstration of scientific method. But the ideas and opinions of historians themselves have to be submitted to the same kind of scrutiny, and the reassessment of Harvey's place in the history of scientific thought has been proceeding steadily since 1928, when the tercentenary of the publication of the *De Motu Cordis* was celebrated. Some important aspects of this new assessment are to be found in the current issue of the *Journal of the History of Medicine* (1957, 12, No. 2) which is a commemorative number devoted entirely to Harvey. The editor of the journal, Dr. John Fulton, professor of the history of medicine at Yale University, has invited contributions from a

number of countries, and, of the 21 papers included, nine come from Britain, four from the United States, and one each from Canada, Denmark, East Germany, France, Israel, Italy, Spain, and Sweden, a collection which can truly be described as an international tribute to Harvey's memory.

Harvey's Debt to the Past

In an attempt to place this in its proper perspective no fewer than nine of these papers are concerned with the body of knowledge which was available to Harvey when he began to formulate his new doctrine. In a brief note on Harvey's use of Galen, Mr. Kilgour, of Yale, reminds us that in the *De Motu Cordis* alone Harvey quoted Galen a score of times, and with the greatest respect, in support of his new findings. Galen was, like Harvey himself, one of the greatest of experimental biologists, and Professor Lain Entralgo (Madrid), who published in 1948 a Spanish translation of Harvey's works, here provides us with an admirable summary of the scientific thought and method of both Galen and Harvey. Scattered quotations cannot do justice to this closely reasoned and penetrating analysis, but a few points should be noted. Harvey's inductive method was not that of Bacon but of Aristotle—and Padua, it will be recalled, was the stronghold of Aristotelianism. "To Galen his experiments were a paean of nature; Harvey's experiments are an ingenious trap to force nature into admitting the truth. . . . In Harvey's very simple calculations the expression of reality in terms of formal mathematical laws is still minimal. . . . [He] is still far from thinking, like Galileo and Descartes, . . . that the book of nature is written in mathematical language, and still farther from believing that only that which is measurable is true."

If Entralgo portrays Harvey as a Janus-like figure facing both past and future he does so in no spirit of denigration, and even suggests that this dual character has advantages over the narrow philosophy of some moderns. But the process of revealing Harvey's debt to the past has sometimes been employed to serve chauvinistic ends rather than the interests of historical accuracy. It is refreshing to see the "allusions, anticipations, and counter-claims," familiar to all who have studied the history of the discovery, so thoroughly examined and so decisively dismissed as they are in the long study by Walter Pagel. This shows how the idea of "circular motion" in the body is linked with circular



William Harvey, circa 1622
Formerly at Rolls Park, Essex

motion in the universe in order to satisfy the age-old analogy of microcosm and macrocosm. It is in this context that the "allusions" in Plato, Thomas Aquinas, Cecco d'Ascoli, and others (all quoted in translation) should be understood. They have little or nothing to do with physiology. The passages which are often employed to support claims for Cesalpino are quoted and examined at length, with the conclusion that "a reconciliation of his 'correct' and his 'incorrect' statements hardly supports the extreme claims made on his behalf in the history of the discovery of closed blood circulation. Cesalpino did not discover it."

Felix Boenheim, the present Director of the Institute of the History of Medicine at Leipzig founded by Karl Sudhoff, studies eastern parallels to the western ideas examined by Pagel, and particularly the claim first made by the Jesuit Father du Halde in 1770 that "the Chinese had known about the circulation of the blood for at least 2,000 years," with the conclusion that "it is evident that the Chinese did not know anything about the circulation of the blood in the Harveian meaning. Their doctrine is mystic, not biological."

Pagel's judgment on Cesalpino is strongly reinforced by Louis Chauvois, of Paris, whose new biography of Harvey has just been published in simultaneous French and English versions. Professor Pazzini, of Rome, writes of Padua as the nursery rather than the progenitor of Harvey's genius, and stresses the value of the training in the techniques of experimental biology offered there by Fabricius. Lord Cohen of Birkenhead rates the influence of Padua as highly as does Pazzini, but suspects "that a chance (though inaccurate) observation led Harvey to postulate a continuity of arteries and veins . . . [i.e.] 'that the arteries contain the same blood as the veins and nothing but the same blood.'" This may be true, for a discoverer does not always recall accurately what first put him on the track. Harvey told Boyle that his first clue was the valves in the veins, and Professor Leibowitz (Jerusalem), who discusses here early accounts of their discovery, credits Amatus Lusitanus with the first published account (1551) of the valves (in the azygos vein), but concludes, "It is clear that Amatus did not understand [their] physiological significance . . . any more than did all the other authors before Harvey, including Fabricius."

The early history of the discovery of the pulmonary circulation has also been the subject of much study since Meyerhof, in 1933, drew attention to the clear and convincing description in the surviving manuscripts of the thirteenth-century Arab, Ibn-an-Nafis, of Damascus. Recent research indicates the probability of some link (possibly by way of Andrea Alpago) between this early description and its "rediscovery" by Servetus and Colombo (cited by Harvey) in the sixteenth century. Professor O'Malley (Stanford University) offers some further suggestions towards a clarification of this problem.*

It should be noted that there are now no outstanding claims, from East or West, for priority in the discovery of the general circulation, and after this very thorough exposition of the climate of ideas in which Harvey began his great work those who come to praise Harvey may give him due credit for originality of thought as well as of method.

The Reception of Harvey's Discovery

How Harvey's little book impressed his younger contemporaries is vividly illustrated in a letter quoted by Professor Gottfredsen, of Copenhagen, writing of the reception of Harvey's doctrine in Denmark. This letter was written at Leyden on July 13, 1631, by a Danish student, Jacob Svabe, to his former teacher in Copenhagen, Oluff Worm, and in it he says, "This doctrine so greatly impressed my mind that, for a full week, I was quite heartsick owing to these profound thoughts." The young man consults his middle-aged professors (Conring, van Heurne, van Valkenburg) and is put off with platitudes: "in changing old

theories and approving of new ones we must rather be timid and hesitating than audacious and temerarious."

In spite of Worm's opposition, it was another of his protégés, Thomas Bartholin, who contributed most to the establishment of the doctrine in Denmark. Aided and abetted by his master at Leyden, Joannes Walaëus, Bartholin was also responsible for its first appearance in an anatomical textbook which was used widely throughout Europe. In neighbouring Sweden, Olaus Rudbeck chose the circulation as the theme of an academic dissertation which he defended at Uppsala in May, 1652. Dr. Sten Lindroth discusses this thesis at length, and traces the influence of Descartes as well as Harvey; for Rudbeck's teacher, Olaus Stenius, was Uppsala's first Cartesian and may even have met the philosopher at the court of Queen Christina. The Scots, as Douglas Guthrie shows in his survey of the Harveian tradition in Scotland, were strangely unenterprising in this cause. Archibald Pitcairne in 1701, when the circulation was already generally accepted, was the first Scot to write in its favour. As a guide to the reception of Harvey's doctrine in various countries, Dr. Ernst Weil has compiled a useful bibliographical table of Harvey references and allusions, both favourable and adverse, published in Harvey's lifetime.

Other Aspects of Harvey's Work

The *De Motu Cordis* has made us familiar with the range and character of Harvey's biological experiments, but the value of his work in this field is underlined by the very informative paper by Dr. F. J. Cole entitled "Harvey's Animals." From a study of Harvey's published work, as well as his lecture notes, Dr. Cole has collected references to "128 types of animal life which fall into the following categories: Zoophyta, Worms (3), Crustacea (4), Insecta (12), Arachnida, Mollusca (6), Fishes (18), Amphibia (3), Reptilia (4), Birds (33), Mammals (43)." The species are named and Harvey's work with them is briefly discussed, and the author believes that the evidence admits "of no conclusion but that he was the pioneer of the experimental method in biology."

Although this claim seems reasonable, it will surprise many to find the formidable array of evidence which Richard Hunter and Ida Macalpine have succeeded in amassing to support the claim which they make for Harvey as neurologist and psychiatrist. Why this evidence has so far been neglected is that it lies in scattered observations in his own notes and in the writings of others. "Modern neurology," state the authors, "developed from two fundamental discoveries—to each Harvey contributed: firstly, the distinction between motor and sensory nerves and, secondly, the differentiation of irritability from sensibility and contractility." Among the conditions recognized as of "nervous" origin by Harvey are syringomyelia, hydrocephalus, epilepsy, apoplexy, paralysis, loss of sensation, blindness due to cerebral disease, delirium, phrenitis, and coma. He also gave one of the earliest clinical descriptions of *folie à deux*, and "clearly recognized the signs and symptoms of the condition familiarized as 'la grande hystérie' by Charcot at the Salpêtrière more than two hundred years later." The authors also draw attention to the notes which Harvey wrote in a volume of Galen's tracts, now in the British Museum Library, which illustrate "how much thought he gave to mental illness."

The remaining contributions to this outstanding special number are of a biographical or bibliographical nature. Professor K. J. Franklin, whose new translation of the *De Motu Cordis* is published this week for the Royal College of Physicians, discusses the various attempts which have been made to produce an English translation which conveys Harvey's thought and style and gives some details of the various translators. Dr. Krumbhaar, of Philadelphia, thinks that the time is ripe for a bibliography supplementary to that of Sir Geoffrey Keynes in which all the literature that has been written about Harvey and his work would be brought together and classified. Dr. W. B. McDaniel, also of Philadelphia, describes the collection of Harveiana in the

library of the College of Physicians in that city, built up chiefly through the efforts of Weir Mitchell.

Dr. W. W. Francis, of the Osler Library at McGill University, gives an English translation of the untimely verses on the death of Harvey which Nikolas van Assendelft prefixed to his Dutch translation of the *De Motu Cordis* in 1650. The present writer contributes a note on the official probate copy of Harvey's will with the grant of administration made to Eliab Harvey in May, 1659, now in the Wellcome Library; and another note drawing attention to a hitherto unnoticed English version of the *De Motu Cordis* published in London in 1714.

Most interesting, however, for the fresh light which it throws on Harvey's personality, is the manuscript of a Harveian oration, almost certainly the missing oration of 1662 delivered by Sir Charles Scarborough, which has been discovered in the Bodleian Library and is described here by Mr. L. M. Payne, Assistant Librarian at the Royal College of Physicians. Scarborough was Harvey's own pupil and anything he has to tell us of his master must be enormously interesting. Some kinder and gentler touches are added to Aubrey's portrait, for we are told of "his candour of mind, charm of manner, and an affability which made it easy for all to meet the old man and ply him unceasingly with questions. One returned from his presence not only wiser—this was always so—but often more cheerful. The sharpness of his intellect continued unimpaired and a certain youthful disposition persisted to the end, as if this keen mind could not be weakened by age." Even better is Harvey's own reply to his friends, who urged him to reply to his detractors: "It is of no great importance that I for my own gratification should molest for a second time the republic of letters. I will not be the author or sponsor of any new controversial doctrine. Let my thoughts perish if they are worthless, my experiments if they are erroneous, or if I have not properly understood them. I am satisfied with my industry. It is not in my nature to upset the established order. . . ."

What better phrase could be chosen for closing this notice? For there speaks the very voice of the man who calls himself on the title-page of his epoch-making book, "William Harvey, Englishman," uttering the greatest understatement in the history of science.

FROM BOTH SIDES OF THE IRON CURTAIN

[FROM SPECIAL CORRESPONDENTS]

Below we print two dispatches from correspondents who attended congresses abroad last month, one on either side of the Iron Curtain. The first records a visitor's impression of what is said to have been the first international medical congress in Rumania; the other picks out some of the more challenging papers read at the May meetings of the American Society for Clinical Investigation and the Association of American Physicians, both held at Atlantic City.

RUMANIAN MEDICAL CONGRESS

The first international congress of medicine to be held in Rumania took place in Bucharest from May 3 to 11. It was the National Congress of Medical Sciences, and had been arranged by the Academy of the Rumanian Republic. This Congress, held in a communist country, differed somewhat from similar congresses over here. It was organized at national level, with active support from the Treasury as well as of all the various departments concerned with the medical and scientific life of the country. Delegates were drawn from twenty-three countries, including Great Britain, and hospitality was on an unusually lavish scale. The meetings were followed by excursions, including a three-day steamer journey down the Danube, around the delta, and back.

The delegates from Britain were officially invited through medical bodies, such as the Royal Society of Medicine, who nominated them, and their stay in Rumania was made particularly agreeable. An interpreter-guide was appointed to each delegate, and from arrival to departure everything was organized most efficiently. In a country such as ours it is difficult to appreciate how smooth such arrangements can be, once the essential authority has been granted, and we envied our hosts' ability to jump the economic hurdles which surround any similar undertaking here. At the same time, although the munificence of the State was so apparent, it was equally clear that individual physicians, surgeons, and physiologists had worked long and hard to achieve success in what was for them a unique enterprise. The personal friendship extended to delegates was impressive, and the opportunity for individual discussion in the lobbies of the Congress hall was as great as over here. Apart from this, the organization was a rigid one, with the efficient guides shepherding their charges to the hospitals and institutions chosen for visits and demonstrations.

Scientific Contributions

The Congress mainly concerned itself with four fields of medicine: physiology, the rheumatic diseases—particularly rheumatic fever—neurology, and virology. These four sections met simultaneously, and there were joint meetings of welcome and farewell. The latter were remarkable for the many lengthy speeches of a general kind. The sectional meetings lasted with breaks from 8.30 a.m. to 7 p.m., and consisted of a long succession of 15-minute papers, read from typescript.

In the physiological section the weight of interest was upon the endocrine system, particularly the adrenal glands, the electrophysiology of the nervous system, and the application of Pavlovian theory to the study of behaviour. In the "rheumatic" diseases focal infection was still the main subject of study. As yet there is not the interest in the associated biochemical upsets which hold our attention in this country and the United States. In the field of neurology, led by Academician PARHON and Academician KREINDLER, interest centred particularly on the physiology of epilepsy and the basis of the neuroses where the application of Pavlov's doctrines is dominant. In neurology, too, the chief preoccupation was with the effects of endocrine activity upon the vegetative nervous system and with the study of neuronal activity resulting from experimental changes in adrenal function. In bacteriology and virology the approach was very similar to that here, under the leadership of Academician NICOLAU.

Prestige of the Academic Worker

Naturally, we were as much interested in the delegates attending the Congress as by their work. We were impressed by the intensity of their listening and by the enthusiasm of the speakers. As everywhere, the social and economic background colours the pattern of work. Whereas in Britain so many of us engage in academic activities against a background of routine medical practice, in Rumania the academic worker is highly specialized, more highly paid than the clinician, and he may enjoy an increase in his income because of the quality or the quantity of his scientific output. He receives much publicity, and throughout the Congress arc lights, movie cameras, and photo flashes were much in evidence. An important foreign delegate would give his paper with six arc lights a few feet away and two cinematograph photographers and several press men at very close quarters. The photographers even attended all the hospital visits. The pictures were used for the Congress newspaper, for the national journals, and for record purposes. We saw articles and photographs dealing with a similar congress in Hungary, and no doubt they appeared in the papers of other countries too. Though we were rather disconcerted with such publicity, our hosts seemed to accept it as usual and desirable. By contrast the evening meals, excursions, and entertainments

*This paper should be read in conjunction with another on the same subject by Edward D. Coppola in the current issue of the *Bulletin of the History of Medicine*, 1957, 31, 44-77.

were quiet, very friendly, and without any pomp or publicity. The lasting impression which the Congress left with us was one of a level of communal and personal hospitality which transcended criticism.

ATLANTIC CITY MEETINGS

The American Society for Clinical Investigation held its 49th annual meeting at Atlantic City on May 6. A series of short papers were presented.

Growth hormone from the pituitaries of slaughterhouse animals has generally proved ineffective in man, so considerable interest attached to a report from Dr. M. S. RABEN (Boston, Mass.) on its preparation from human pituitaries. Human pituitaries, removed *post mortem*, were stored in acetone for weeks or months, and from these growth hormone was extracted and purified. The yield was two to three times that obtained from the equivalent weight of pig pituitaries, and the effective dose (0.1 mg. per kg.) appears small enough to make human necropsy material a practical source of growth hormone. A team of workers from Bethesda and Chicago discussed congenital defects in bilirubin metabolism. It has recently been found that bilirubin is excreted in the bile as a glucuronide (direct-reacting bilirubin). A study was made of three patients with congenital non-haemolytic jaundice (Gilbert's disease), and it was found that all the bilirubin (20-35 mg. per 100 ml.) was of the unconjugated type. This suggested a defect in the transfer of glucuronic acid to bilirubin in this disease. *In vitro* studies with liver enzyme confirmed this. But, as was pointed out in the discussion, the importance of these findings depends on how much this is a general rather than an isolated phenomenon.

"Buffy Coat" and Transfusion Reactions

Drs. T. E. BRITTINGHAM and H. CHAPLIN, jun. (St. Louis), discussed "non-specific" transfusion reactions. Patients had been observed to develop leucoagglutinins coincident with the onset of recurrent transfusion reactions, and it was postulated that this mechanism was responsible for the severe, febrile non-specific reactions often observed, particularly in those repeatedly transfused. In five such patients removal of the "buffy coat" from the donor bottle before transfusion prevented these reactions. Dr. E. BEUTLER (Chicago) spoke on iron enzymes in iron deficiency. It had been thought, he said, that the iron-containing intracellular enzymes were not affected by iron deficiency. A study was made of the tissue content of the iron-containing enzyme cytochrome C in induced iron-deficiency anaemia in rats. A spectacular decrease was observed in the concentration of cytochrome C in the liver and kidney, greatly exceeding the decrease in haemoglobin. He suggested that some of the symptoms in iron-deficiency anaemia, which are often out of proportion to the degree of anaemia, might be due to some such cause. He was careful to point out, however, that these might not necessarily be related to cytochrome C, as this enzyme had been chosen only as a model for the study. Dr. L. O. JACOBSON and his colleagues from Chicago reported increased haemopoietic activity in patients with certain blood diseases. The demonstration of plasma-erythropoietic activity has been facilitated by the finding that in the hypophysectomized rat an increased uptake of radioactive iron into the erythrocytes follows injection of human plasma. Normal plasma did not show any activity unless it was concentrated 30 times. Increased erythropoietic activity was found, however, in the plasma of patients suffering from hypoplastic anaemia, pernicious anaemia, anaemia following haemorrhage, and acute leukaemias. It was not found in plasma from anaemic patients with uraemia or advanced neoplasms.

Natural and Acquired Immunity to Polio

The meeting of the Association of American Physicians occupied the next two days, May 7 and 8.

On the first day workers from New Haven, Connecticut, reported a comparison of the responses of vaccinated and naturally immune children to the ingestion of live, attenuated poliovirus. In a residential children's institute a study was made of the effect of administering an attenuated type I oral poliomyelitis vaccine. The children with natural immunity were identified by antibodies studies, and the remainder then given a Salk-type vaccine. After oral administration of the attenuated virus it was found that those with natural immunity excreted less of the live virus, and for shorter periods, than those who had been vaccinated. It was concluded that there was a difference between the natural immunity and the acquired immunity. No absolute reversion to pathogenicity occurred in the excreted attenuated virus, but some change in behaviour was noted in two of nine recovered viruses by testing in the monkey and in three out of twenty tested *in vitro*.

Among the other papers on the first day two were on the action of bacterial endotoxins. Dr. L. THOMAS and his colleagues from New York said that rabbits injected subcutaneously with 200 µg. of adrenaline developed petechiae, progressing to confluent ecchymoses, at the site of injection if they had previously received an intravenous injection of endotoxin. In the absence of endotoxin no lesions occurred at this dose. They suggested that release of serotonin following the administration of endotoxin might be responsible, as similar lesions were produced by a combination of histamine and adrenaline but not by a combination of histamine and adrenaline. Dr. I. L. BENNETT, jun., of Baltimore, and his colleagues discussed the evidence for believing that the pyrogenic effect of endotoxins may be due to a direct cerebral action. Bacterial endotoxins are potent pyrogens. This effect, which is mediated through the central nervous system, has been thought to result from release of "endogenous pyrogen" from the leucocytes following the administration of the endotoxin. Endotoxin was therefore injected directly into the subarachnoid space, and it was shown that a pyrexial response occurred. These experiments were held to indicate that endotoxin exerted a direct effect in causing pyrexia. Careful control experiments with other substances did not cause pyrexia.

Hyperthyroidism and Infertility

Drs. S. P. ASPER, jun., and E. HUNTER WILSON, jun., on the second day, raised the question of whether testicular deficiency in hyperthyroidism could be due to the latter condition and not just coincidental. They reported six patients with hyperthyroidism in whom there was a coexisting testicular disease, as judged by azoospermia and testicular biopsy. Four of these cases also had gynaecomastia. They had also noticed a high incidence of infertility in the marriages of male thyrotoxic patients. Isolated cases of this combination of disorders have previously been described by other workers, but this series suggests that there may be some direct association.

Drs. J. A. LUETSCHER, jun., and A. H. LIEBERMAN (San Francisco) described 15 women with idiopathic oedema. All showed emotional lability, obesity, and fluctuating oedema. Low-salt diets and diuretics had been effective treatment for short periods of time. The blood pressure, liver function, and serum electrolytes were all normal. Urinary aldosterone excretion, however, was high, and some cases showed a marked impairment of sodium excretion. An interesting discussion followed in which it was agreed that these were probably further examples of secondary aldosteronism. Dr. CONN (Ann Arbor) described one patient in whom partial adrenalectomy had been carried out; aldosterone excretion fell but later returned to previous levels. Dr. THORN (Boston) described a case that had shown improvement on "amphenone" on three occasions, although adrenalectomy was carried out later. Dr. PERERA (New York) had seen five patients in one of whom spontaneous remission occurred after marriage. This speaker warned against adrenalectomy in view of the possibility of spontaneous remission, and there was general agreement on this point.

Periodic Paralysis

Dr. J. W. CONN and his colleagues from Ann Arbor presented their findings in two cases of periodic paralysis. In these subjects the attacks were preceded by increased urinary aldosterone output and retention of sodium. On a low-sodium diet no attacks occurred; biopsy studies showed a great increase in sodium content during an attack. It was postulated that these changes rather than the classical potassium changes were the primary cause of the paralysis. In the discussion that followed it was emphasized that these cases were sporadic cases of periodic paralysis, and that no such studies had yet been made on a familial case.

Dr. E. B. ASTWOOD (Boston, Mass.) reported a remarkable series of 15 patients with an extremely high protein-bound iodine serum level. The normal serum protein-bound iodine is 4 to 8 µg. per 100 ml., but these patients had values up to 4,000 µg. Isolation of the iodine compound from their sera made it clear that it had not been synthesized by the thyroid: it represented the persistence of a previously administered gall-bladder dye ("teridax"). The serum half-life of this compound was approximately 2½ years, and it would therefore be 33 years before it ceased to interfere with the protein-bound iodine determination.

WHO SHOULD BE SENT TO A MENTAL HOSPITAL?

[FROM A SPECIAL CORRESPONDENT]

The Birmingham Medical Institute has just moved to a new and pleasant building, and on May 22 its psychiatric section inaugurated the new hall with discussion of a question which, the section president, Dr. W. MAYER-GROSS, indicated, is now critical: What are mental hospitals for? Some of the differences of opinion about this were illustrated by the three principal speakers, who viewed the question from their own work as general practitioner, prison medical officer, and hospital superintendent respectively.

From General Practice

Dr. C. A. H. WATTS, a general practitioner from Leicester, sent people to mental hospital only if they required active treatment which they could not get as out-patients. Only a fraction of the mentally sick actually went to hospital, and the rest managed at home. He illustrated this with an analysis of his own practice in a part-rural, part-industrial area, with a static population. With two partners he serves 8,000 people, and in the decade 1946 through 1955 they saw 100 people with psychosis, some for more than one attack in that time; they saw about 14 attacks a year, therefore. Mostly these were attacks of endogenous depression, some mild, some severe. In the latter category were a number who would have benefited from in-patient hospital treatment but who refused to go voluntarily and whom he was loath or unable to certify. 32 out of a total of 84 stayed at home, but the recovery rate there (56%) was less good than in hospital (70%). However, even with the best modern treatment this meant that 30% of his endogenous depressives ended badly—in a chronic state or in death. He regarded the risk of suicide or depression with agitation as the only indications for immediate admission to hospital. Otherwise he preferred to befriend the patient, get a good rapport, and if the depression continued longer than three months he recommended hospital admission, and the patient was then very likely to trust his advice.

Apart from impending suicide, mania was the only other emergency, but it was rare. So were alcoholic psychoses (4) and acute confusional states (5)—in old people with bronchopneumonia treated with antibiotics—and both could be treated at home with sedatives and vitamins, since they mostly

resolved in a few days. Schizophrenics (about 20) went to hospital for treatment, but became an important responsibility of the G.P. when they were discharged home. Nearly half of them so far had been able to resume home life and employment. He made every effort to keep mental defectives, epileptics, and senile patients out of hospital. They got more individual attention and love at home, and the only role he saw for the mental hospital in such cases was that of a kind of holiday home—to give the relatives a fortnight's or a month's rest from their burden of care. Patients with hysteria or anxiety states should never be sent to mental hospitals, and indeed he wanted to see more psychiatric out-patient clinics and more in-patient psychiatric facilities in general hospitals, so that the mental hospital would remain for the intractable chronic case only. This would encourage depressive patients to enter hospital for treatment, and be less traumatic for the patient and his relatives than admission to mental hospital direct from home.

Finally he described a severe psychosis which subsided at home, a man with organized delusions about his wife's fidelity who frightened her with threats which had to be taken seriously. However, he remained a very good worker, and therefore, instead of sending him to hospital, which might well have confirmed him in his paranoid ideas, a legal separation from his wife was arranged. Two years later the couple were able to come together again, and the wife reported that, although a trace of his former delusions persisted, they had now all but vanished and were of no practical consequence.

Social Misfits

Dr. G. A. WRAY, as a prison medical officer, was averse to committing people to institutions of any kind unless it was really going to help them. He saw 300 or 400 people a year on remand to assess whether they needed mental hospital treatment, and some of these people were unusual, eccentric, certainly not average citizens, but in previous centuries would have been allowed to go their own way. They were caught up in the legal machine for vagrancy, sleeping out, minor delinquencies, or for unusual acts like trying to row across the Channel. Under the Welfare State we were always sending people into homes or hostels or Borstals or hospitals, trying to tidy them up instead of tolerating their peculiarities. In modern social work the answer too often seemed to be an institution.

He also raised the question of the meaning of the word "treatment" in psychiatry. Many prisoners might stand in need of re-education; few needed E.C.T. or courses of injections or drugs, which, when it came to the point, was what mental hospitals mostly offered. He did not feel, therefore, that many of the people he saw should be sent to mental hospital even though there was sometimes strong pressure to advise this in place of prison. He believed that the so-called psychopaths later either became frank psychotics or spontaneously grew out of their antisocial behaviour and therefore should not be sent to hospital.

Mental Hospitals To-day

Dr. A. M. SPENCER, superintendent of Powick Hospital, near Worcester, said mental hospitals were unfit for modern human habitation, and quite inadequately staffed—indeed, because the admission rates had risen and the number of staff if anything had declined, standards of care were going down. There was still a pauper outlook; there was no privacy, no culture; people became dehumanized in the vast mid-Victorian wards. The ordinary mental hospital was forced to mix psychotics with mental defectives (because of shortage of beds in mental deficiency institutions), and the many ordinary mentally ill people had their liberties restricted because the hospital had to house a few dangerous patients. At Powick 90 men were locked up in the only closed ward of the hospital because twelve of them at the most might escape and cause trouble. Mental hospitals ought to be much smaller—about 200 beds each, perhaps—the dangerous people segregated in a special hospital, mental

defectives excluded, and then we could begin to invite those who needed mental hospital treatment to come in.

But the mental hospital existed for more than active treatment. It ought to accept the chronic patient who made his relatives' lives intolerable to them, and it ought to take in the baby with the mother suffering from a puerperal psychosis. He thought Dr. Wray was too pessimistic about court cases, and believed lysergic acid diethylamide (L.S.D.) could help psychopaths. There were also what he called the "inadequate biological variants," people who could not cope emotionally with the complex responsibilities of modern life and craved an asylum. On the other hand, he feared that children at home were greatly upset, perhaps permanently harmed, by the admission of their parents to a mental hospital.

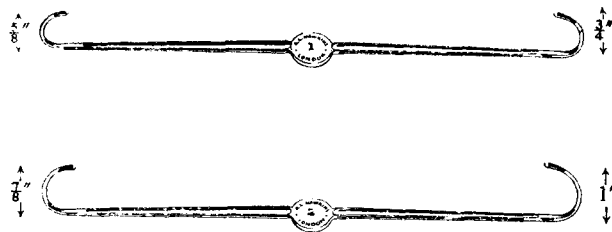
Discussion

Several speakers in the general discussion emphasized the importance of family difficulties. Dr. R. A. SANDISON said that the housewife with young children could not have out-patient E.C.T. because her home responsibilities conflicted with her treatment. The burden of nursing a chronic patient at home often fell on one person, the housewife, said Dr. MAY PEARCE, while Dr. MAYER-GROSS thought families who kept a chronic patient at home might sacrifice the other normal members of the family to do it. Dr. MYRE SIM suggested that a duly authorized officer—the man who in daily practice often decides who shall go to mental hospital—should have been asked for his views. Dr. J. R. MATHERS took up a theme of Dr. Spencer's, that the mental hospital is a community within the community, and emphasized that it was often the nature of the wider community which determined admission. Some communities were sick, and produced mental illness, because they were intolerant of eccentricities or slow to accept the lonely isolated individual. It was the psychiatrist's duty to educate the public into healthy ways of life by talking to small groups in churches and clubs. Mental hospitals in the past had worked too much in isolation from the community they served.

Preparations and Appliances

MODIFIED RYALL'S DIRECTORS

Mr. W. B. GABRIEL, surgeon, Royal Northern Hospital, writes: For many years Ryall's curved director has been a useful instrument in rectal surgery, particularly when dealing with anal fistulae secondary to infected crypts or fissures, when an internal opening in the anal canal has to be searched for and a probe passed from within outwards. Lately this



instrument has been unobtainable and seems to be no longer listed; I have therefore taken the opportunity of modifying the design in order to provide curved ends of different sizes, as follows: the No. 1 instrument has ends of $\frac{3}{8}$ and $\frac{1}{2}$ in. (16 and 19 mm.) diameter; the No. 2 size has curved ends of $\frac{3}{8}$ in. and 1 in. (22 and 25 mm.). In each case the narrower end is on the left side of the instrument. When the anal canal is inspected through a bivalve proctoscope or a proctoscope such as Fansler's, the surgeon can select one of these four sizes to suit any particular case, and it has proved useful in defining the main tract of a high-level fistula.

The directors have been made by A. L. Hawkins and Co. Ltd., 15, New Cavendish Street, London, W.1.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Ganglion-blocking Effect of Noradrenaline

SIR,—I gained the impression, while recently lecturing in the United States, that many anaesthetists and others were unaware of an important side-effect of noradrenaline. In common with adrenaline, noradrenaline has a blocking action on sympathetic ganglia.¹⁻³ When administered, as it is commonly, by intravenous drip in suitable dilution, its effect on the blood pressure by peripheral vasoconstriction is dominant—an effect desired by those treating the patient. However, when the drip is ultimately stopped, a sharp fall in blood pressure generally follows, and great difficulty is frequently encountered in "weaning" the patient from the noradrenaline. The ganglionic blockade now becomes apparent, and a patient originally suffering from hypotension due to, say, traumatic shock is transformed into one with hypotension due to ganglionic blockade.

This action should be borne in mind when embarking on noradrenaline therapy. The use of this substance, other than as an emergency treatment for a comparatively short time, should be most carefully considered in the light of this known effect on the ganglia. One cannot help wondering in how many cases recovery after prolonged administration of large doses of noradrenaline was in spite of, rather than due to, this form of treatment.—I am, etc.,

Cardiff.

WILLIAM W. MUSHIN.

REFERENCES

1. Burn, J. H., *Brit. J. Anaes.*, 1956, 28, 466.
2. Marrazzi, A. S., *J. Pharmacol.*, 1939, 65, 396.
3. Bulbring, E., *J. Physiol. (Lond.)*, 1944, 103, 55.

Pregnancy in Addison's Disease

SIR,—Dr. M. M. Singh (*Journal*, March 2, p. 503) reported the successful outcome of pregnancy in a patient suffering from Addison's disease treated with cortisone. In his review of the literature he found that only seven similar cases had been reported. We should like to describe a further case in which pregnancy was uneventful on cortisone maintenance therapy.

A nulliparous woman, aged 22 years, was admitted to the Royal Free Hospital in November, 1953, with an acute onset of diarrhoea, vomiting, and right lower abdominal colicky pain preceded by some weight loss, tiredness, and anorexia. Menses were regular. On admission she was underweight. Temperature was normal, but there was a tachycardia of 120 per minute. Blood pressure was 85/60. There was pigmentation of the tongue, lips, and skin, especially of the areolae and exposed pressure areas. There was slight tenderness in the right hypochondrium. A clinical diagnosis of Addison's disease was made and confirmed by the laboratory investigations: blood urea 70 mg. per 100 ml.; serum chlorides 82 mEq/litre; serum sodium 125.5 mEq/litre; serum potassium 6.56 mEq/litre; blood sugar 84 mg. per 100 ml.; haemoglobin 14.0 g. per 100 ml.; E.S.R. 17 mm. in one hour. Chest x-ray was normal. She was treated by a continuous intravenous glucose saline drip and oral cortisone 25 mg. six-hourly. Her condition steadily improved, the blood chemistry reverted to normal, and the haemoglobin fell to 11.2 g. per 100 ml. The blood pressure rose, but only to 100/60, the same figure as had been recorded on several routine medical examinations before this illness. The dose of cortisone was reduced so that on her discharge, two months later, she was taking 25 mg. daily, together with 6 g. sodium chloride. Subsequently this dose had to be increased at times of minor infections.

A year later she married. She was advised to take 25 mg. twice daily during her honeymoon in Switzerland; on this dose she was able to take violent exercise, such as ski-ing, without untoward effects. In February, 1955, she became pregnant and soon complained of morning nausea, which was treated beneficially by promethazine-8-chlorotheophyllinate ("avomine") 25 mg. each morning. During the first trimester the patient, who had some medical knowledge, was able to keep herself symptom-free by varying the dosage of cortisone, taking usually from 50 to

75 mg. daily but for three weeks 100 mg. In spite of these comparatively big doses, in May, 1955, her blood pressure was only 95/70. Therefore she was given in addition deoxycortone acetate 6 mg. sublingually daily and continued on this together with 50 mg. of cortisone until nearly the end of pregnancy. The blood pressure rose and she was well. Two weeks before delivery evidence of overdosage with cortisone was noticed: "mooning" of the face, mild hirsuties, slight evening oedema of the lower legs, and disproportionate weight gain. Her blood pressure, 120/90, was slightly raised. Cortisone was then reduced to 37.5 mg. daily and then deoxycortone acetate was discontinued. On November 5, 1955, she was admitted in labour; 100 mg. of cortisone was given immediately, intramuscularly. After an easy labour lasting six hours she was delivered of a 7 lb. 11 oz. healthy girl. Trichlorethylene, gas, and oxygen were given for repair of an episiotomy. The puerperium was uneventful and she was able to breast-feed the baby. Although well, her biochemical tests a fortnight after delivery suggested underdosage: serum chloride 94 mEq/litre; serum sodium 136 mEq/litre; serum potassium 6.4 mEq/litre; blood urea 50 mg. per 100 ml. She was discharged on the following day with instructions to take 100 mg. cortisone orally in divided doses. By the following week the blood chemistry had returned to normal so that the cortisone was reduced to 87.5 mg. and later to 75 mg. daily. Lactation proceeded normally for two months and then gradually diminished. The dose of cortisone was concurrently reduced to 50 mg. daily. Mother and child are both doing well.

We would like to stress the following points in our case: the ease of management, the patient adjusting the dose of cortisone herself with medical guidance; the signs of overdosage late in pregnancy, probably the effect of the additional steroids produced by the foetal adrenals; the single dose of cortisone at the onset of labour, which proved to be uneventful; the lactation lasting for two months and the absence of hypoglycaemic symptoms throughout. Gurling and his colleagues¹ have recorded another case of Addison's disease in which a successful outcome of pregnancy occurred, despite the complications of diabetes, uterine inertia, severe haemorrhage, and ruptured uterus. Although only ten cases have been reported, cortisone appears to have made pregnancy more likely and safer for the woman suffering from Addison's disease. However, careful medical supervision is still essential.

We would like to thank Dr. Una Ledingham and Miss Jocelyn Moore for their permission to publish this case.—We are, etc.,

A. GORDON BECKETT.
M. R. E. EVANS.

London, W.C.1.

REFERENCE

1. Gurling, K. J., Rackow, F., and Smith, M. J. H., *Lancet*, 1954, 2, 316.

Oral Treatment of Trichomonas Vaginitis

SIR,—It may be of interest to your readers in comment on a recent article by Miss Josephine Barnes and her colleagues (*Journal*, May 18, p. 1160) to report the following investigation.

A series of 41 partners in whom the woman had trichomoniasis were treated as out-patients of Paddington General Hospital and St. Mary Abbots Hospital by oral administration of 100 mg. of enteric-coated tablets of 2-acetylamin-5-nitro-thiazole ("trichorad") kindly supplied by Ward Blenkinsop and Co. Ltd. The tablets were taken thrice daily after food for fourteen days and no treatment of the vagina was carried out, and it was demonstrated that cure did occur, but infrequently. Trichomonads had been found in the case of each of the women in a suspension made by rotating a swab dipped in the vaginal discharge from the posterior fornix in 1-2 ml. saline. The men had not been examined. In two women of the 41 partners who had been given the tablets the parasite ceased to be demonstrated in the vaginal discharge with relief of symptoms after one course. Two women who were not cured by one course were free from trichomonads in the vaginal discharge when examined after a second course of treatment. The parasite temporarily disappeared with temporary relief of symptoms after two women and their partners had been given three or four courses each of fourteen days' duration. Recurrence occurred in these two in less than four weeks. Only one

patient showed any adverse effects of the oral administration and she developed severe vomiting after ten days' treatment. On cessation of the drug the vomiting ceased but the trichomoniasis continued.

Our figures of four successes and two partial successes in the treatment of 41 partners are not dissimilar to those of six cures out of 37 women treated. They are slightly less disappointing than the series of 44 partners reported by Gardner and Dukes,¹ but the incidence of failure suggests that the effectiveness of the drug is dependent on some rare factor as yet unknown.—We are, etc.,

KENNETH J. R. CUTHBERT.
VALENTINE M. HUSBAND.

London, W.

REFERENCE

1. Gardner, H. L., and Dukes, C. D., *Obstet. and Gynaec.*, 1956, 8, 591.

Acute Amphetamine Poisoning

SIR,—I read with interest Dr. M. S. Pathy's letter (*Journal*, April 20, p. 946) concerning acute amphetamine poisoning, in which he suggested that "the absence of severe symptoms was partly due to the form in which the drug was taken"—that is, "spanules."

An even better and more reliable method of delaying absorption from the gastro-intestinal tract, and one which is much more economical—an important advantage in view of the increasing cost of the N.H.S.—is one that bonds the drug to an appropriate physiologically inert resin and makes use of the "ion-exchange" principle. The drug is then released at an even rate from the resin complex over a period of 10 to 12 hours, and this is, moreover, entirely independent of the physiological factors that often affect the release of drugs from enteric-coated preparations. If the drug is taken in such a form the effects of a toxic dose would be greatly reduced by giving the patient a large dose—say 1 oz. (28 g.)—of the pure ion-exchange resin which would further considerably delay absorption. As the resin is entirely non-toxic this treatment would provide the margin of time necessary to apply other methods of detoxification, such as stomach wash-out, purging, etc.

My own clinical experience with amphetamine resinate suggests that the risk of poisoning is much reduced by this form of medication, owing to (1) the smooth and evenly spread action of the drug, and (2) the remarkably small incidence of side-effects. Some of my own cases sensitive to amphetamine itself were able to tolerate it when administered in the form of a resinate. The particular preparations which I now use are "dexten" and "barbidex," the latter containing also an amount of phenobarbitone.—I am, etc.,

GEORGE NEWBOLD.

London, E.18.

Rheumatoid Arthritis and Reiter's Syndrome

SIR,—As a result of my clinical investigations since 1942 into Reiter's syndrome, I suggested some six years ago to a member of the M.R.C. staff that research into this condition with a view to establishing its aetiology would be of the utmost importance towards the solution of rheumatoid disease in general, and it was pleasing to learn from the paper by Drs. G. W. Csonka and J. K. Oates (*Journal*, April 13, p. 866) that such a project has now at last been sponsored.

This paper and that of Dr. J. Sharp (*Journal*, April 27, p. 975), although of great interest, are, in my opinion, marred by an approach which on present knowledge is unwarranted, in spite of its general acceptance. At line 31 in the discussion, Drs. Csonka and Oates state that "arthritis following genital infection and classical rheumatoid arthritis are dissimilar in many respects," while Dr. Sharp, after beautifully illustrating the interrelationships among all the various groups, concludes that ankylosing spondylitis is also of a different genre. May I, as one whose interest in rheumatoid disease arose originally from cases associated with urethritis, put forward the following clinical findings as indicative, in conjunction with what is already known, of a

unitarian aetiology, and so open up a hopeful line of research so sadly lacking to-day?

(1) The systemic triad of "arthritis (rheumatoid distribution), eye and skin lesions" traditionally believed to result from gonorrhoeal infection has no foundation in fact. These manifestations are due to infection by the organism responsible for a type of urethritis that is clinically distinctive in itself and has nothing whatever to do with Neisserian infection. Incidentally, Case 4 in Drs. Csonka and Oates's cases should be excluded, as it is primarily a bladder condition not of viral origin, and not associated with Reiter's disease.^{1,2} (2) Reiter's syndrome may arise (a) following sexual intercourse, and (b) intestinal disorders of various types. (3) In the case of 2 (a) "sexual" must not be taken as synonymous with "venereal," and in 2 (b) all the available evidence indicates that the agent responsible for the bowel disorder is not itself the cause of the systemic complications, but by altering the mucosal barrier allows an unknown specific organism to pass the barrier and enter the circulation. (4) Reiter's syndrome, although originally described as consisting of urethritis, arthritis, and eye and skin lesions, may appear in many guises and *formes frustes*. Not only may all the signs, either singly or in any combination, occur, but other rheumatic facets—for example, sciatica, spondylitis, lumbago, etc.—may be so pronounced that the real condition may go unsuspected and tell-tale signs of minimal activity in other tissues are unobserved. (5) *Psoriasis and keratoderma blennorrhagica*.—These terms appear to describe identical skin manifestations. In a case of Reiter's syndrome under my care at present, nail changes, typical of psoriasis, are the only skin lesions present. (6) *Urethritis*.—Absence of discharge or a history of one must not be taken as absence of a urethral lesion. A two-glass test is essential, and it is surprising the clinical knowledge that may be gleaned from this simple test. Threads are often found in the first glass in cases where infection of the urethra has never been suspected. (7) *Rheumatoid arthritis in women*.—This subject is too vast to be discussed in a short letter, but two points may be recorded. The female may infect the male with non-specific urethritis, but she herself presents no obvious signs of genital disease, and, secondly, it is to be remembered that bowel disorder in the female is associated with classical rheumatoid arthritis.

Many more points could be raised, but I hope enough has been said above, which, if read in conjunction with Dr. Sharp's paper, presents a unitarian concept which suggests that an unknown organism (or group) whose habitat is the bowel is responsible for all rheumatoid disorders, be they affections of the joints, skin, or eyes. However, owing to the inert type of tissue involved—i.e., collagen—it appears that in order to penetrate this substance the organism needs the simultaneous presence of a spreading factor. Thus the traditional belief in streptococcal or various types of focal infection is afforded a reasonable explanation. It only remains to wish Dr. Csonka and Dr. Oates every success in their difficult task to discover the organism causing non-specific urethritis, since, in spite of various beliefs in viruses or organisms of the pleuro-pneumonia type, success in this direction has not as yet been achieved.—I am, etc.,

London, S.E.5.

F. L. LYDON.

REFERENCES

- Lydon, F. L., *British Medical Journal*, 1947, 2, 974.
- Czekalowski, J. W., and Horne, G. O., *ibid.*, 1951, 2, 879.

Dermatitis Medicamentosa Due to Tetracycline

SIR,—At present the application of tetracycline to the skin seldom causes a sensitization dermatitis, and I have been unable to find a record of an eruption due to oral administration. The following case report, therefore, may be of interest.

The patient was a woman aged 56 who was grossly obese and had mild diabetes, controlled by diet alone. She had been subject to winter bronchitis for many years, and on December 14, 1956, she was given phenoxymethylpenicillin 250 mg. six-hourly for six days for an exacerbation of this. As there was no clinical improvement, on December 22 tetracycline was given, 250 mg. six-hourly for four days. On December 27 she developed an itching eruption which somewhat resembled urticaria. On December 29 she was found to have a widespread eruption on the trunk, upper limbs, and thighs. The lesions were pink, raised, slightly oedematous, and relatively sparse. Some were discoid from 1 to

4 cm. in diameter, while others were annular and much larger. The skin inside the rings was either normal or of a faint mauve tinge. The individual lesions, once they had appeared, persisted and grew steadily larger, unlike the usual course of urticaria in which individual lesions tend to disappear after 12 to 48 hours and are replaced by fresh lesions.

A tentative diagnosis of dermatitis medicamentosa was made, but, as the itching and constitutional disturbance were severe and it was thought the eruption might possibly be the prodromal stage of bullous pemphigoid, she was admitted to hospital on December 30, 1956.

No other abnormal physical signs were found, and skiagrams of the chest, blood count, plasma proteins, and blood sugar were all normal. The temperature was raised to 100°–101° F. (37.8°–38.3° C.) on admission, but gradually subsided in the next five days without treatment.

The skin lesions steadily enlarged peripherally, some of the discoid lesions becoming annular. The central mauve colour became more obvious, but faded about the same time as the pink margin. The largest lesion on the back eventually measured about 25 cm. No bullae developed. The rash and all symptoms had completely gone on January 5. The probability of future attacks of bronchitis requiring antibiotic treatment was thought to justify giving her test doses, at 24-hour intervals beginning on January 9, of crystalline penicillin intramuscularly 100 units, then 1,000 units, then "penicillin pulvule" 125 mg. orally, which caused no reactions, and finally tetracycline 250 mg. A few hours after the last test dose on January 12 she developed severe generalized itching and uniform erythema, which had subsided 24 hours later without treatment.

The morphology of the original eruption was somewhat like the fixed drug eruptions caused by phenolphthalein, phenacetin, and occasionally other drugs, such as the sulphonamides and streptomycin, but the character of the reaction to the test dose of tetracycline, widespread and uniform erythema instead of a reproduction of the original lesions, makes it impossible to place it within that group.

I should like to express my thanks to Dr. Keith Lockhart for referring the case and for details of the clinical history.—I am, etc.,

Exeter.

J. R. SIMPSON.

Range of Movement of Testicle

SIR,—Mr. Denis Browne's memorandum on the range of movement of the testicle (*Journal*, May 18, p. 1165) reminds me that, when I was medical officer to the Mahratta Training Battalion in India, I noticed the sepoys were accustomed to make use of the pouch to which Mr. Browne draws attention. I asked the sub-assistant surgeon (*jemadar tewari*), who worked with me, about this, and he told me that all Mahrattas tucked their testicles up before taking part in games, physical training, horse exercise, and long parades. To the British officers this was a well-known habit and regarded as a very sensible one. There must be many members of the B.M.A. from India who could say whether or not this method of protection is practised in India by other Jats.—I am, etc.,

Edmonton, Canada.

J. SHEGOG RUDELL.

SIR,—In his article (*Journal*, May 18, p. 1165) Mr. Denis Browne refers to his description in the *British Medical Journal* of the "upward prolongation of the scrotal cavity as the 'superficial inguinal pouch'" and wonders "how long will it take for this piece of knowledge to get into the anatomy books." Surely figure 368 in Cunningham's *Textbook of Anatomy*,¹ 1937 edition (figure 398 in 1951 edition), showing better than verbal description the continuity of the membranous layer of the superficial fascia (Scarpa's fascia) of the abdominal wall and perineum, illustrates his point?—I am, etc.,

Aberdeen.

R. D. LOCKHART.

REFERENCES

- Browne, D., *British Medical Journal*, 1938, 2, 168.
- Cunningham, D. J., *Textbook of Anatomy*, 1937, 7th ed. London.

Operations for Varicose Veins

SIR,—I am distressed to see that once again the subcutaneous or percutaneous ligation of varices is being recommended by your correspondent, Mr. C. A. F. Uhma (*Journal*, May 11, p. 1122), especially since he gives this treatment without "the conventional high ligation." Davat found this treatment 120 years ago to be of little value, and it was not until Schede revived it in 1877 that it was reintroduced in a modified form again. Since that time there have been spasmodic attempts to reinstate that which has proved to be a most unsatisfactory pseudo-surgical procedure.

There is no way of guaranteeing a permanent success with any surgical method, but bloodless removal of varices by the stripping method after a careful high resection at the sapheno-femoral junction has been proved by many of us to offer the patient the most permanent results of any treatment so far evolved. Blocking a river spreads the waters into the surrounding fields, and ligation of veins similarly spreads the varices into the surrounding areas. This makes efficient stripping difficult or impossible at a later date. I do hope your readers will give this matter serious thought before considering local sub- or percutaneous ligations.—I am, etc.,

London, W.1.

R. ROWDEN FOOTE.

Mental Deficiency

SIR,—I am sure that all physician superintendents of mental deficiency hospitals will agree with the letter written by Dr. W. Alan Heaton-Ward (*Journal*, May 11, p. 1120) concerning the treatment of mentally defective patients. In fact in my letter to the *Journal* of June 23, 1956 (p. 1487) I mentioned most of the points that he has made in his more recent letter; and I made various suggestions concerning the solution to this problem.

I have found that a partial answer to this problem, within the framework of the present Acts, is to admit all high-grade cases to a hostel either directly or at least within a very short time of admission to the parent hospital. I look forward to the day when such hostels will be run jointly by the hospitals and by the local authority. Such a scheme would allow the early discharge of stabilized patients who have no home, and would also prevent the unnecessary certification of homeless patients in the community.—I am, etc.,

Driffield, E. Yorks.

J. NEWCOMBE.

Acute Immediate Reactions to Penicillin

SIR,—Dr. G. W. Lewis in his interesting article on the above subject (*Journal*, May 18, p. 1153) gives a detailed description of 12 of these incidents. There must be many hundreds of thousands of patients to whom these injections are given each year. It is at least probable that many of them are penicillin-sensitive but do not show signs of shock reaction when given injections.

It is generally agreed that the risk of precipitating a reaction is much increased if the injection passes directly into a vessel. The site of injection is therefore of considerable importance. The buttocks have been sanctified (if that is the right word to use) as the appropriate place for intramuscular injections ever since intramuscular therapy was introduced. A sillier place could hardly have been chosen. The skin of the buttocks has a particularly rich nerve supply (most of the older generation of public school boys would readily agree with this), and injections there can be very painful both immediately and for some time afterwards. Beneath the gluteus maximus a perfectly appalling concentration of nerves and large vessels is present; even the so-called "safe" quadrant has a very free vascular supply, and moreover it is unlikely that the area is invariably carefully delimited when injections are made. I have seen the whole of a child's buttock resembling an area of nodular leprosy after repeated injections of bismuth compounds; obviously no great attention had been paid to restricting the injections

to the "safe" area. The deltoid is often used, but the circumflex vessels and nerve form an intricate plexus just beneath the part of the muscle likely to be chosen, and under the triceps is the profunda brachii with quite large accompanying veins.

Of all regions, probably the safest in avoiding the risk of intravascular injection is the middle third of the outer aspect of the thigh into the substance of the vastus lateralis. No large venous plexuses are present and the relatively poor cutaneous nerve supply favours an injection with minimal pain. The usual precaution of a preliminary withdrawal of the plunger is of course necessary, but in this region proceedings are much less likely to be delayed by the appearance of blood in the syringe.—I am, etc.,

Carshalton, Surrey.

C. E. THORNTON.

SIR,—May I once again, having read Dr. G. W. Lewis's article (*Journal*, May 18, p. 1153) on acute immediate reactions to penicillin, repeat that for the past eight years, after consulting the late Sir Alexander Fleming, I have given all penicillin, when injected, subcutaneously, using only crystalline penicillin. I have never seen any reaction: there is no need to use any but a small hypodermic needle, even when injecting 500,000 units, which are easily dissolved in 1.5 ml. of water. The penicillin given by this route is probably more slowly absorbed. The pain is negligible—a very important thing in children.—I am, etc.,

Broadstairs, Kent.

MARTIN O. RAVEN.

SIR,—Following the publication of the original cases of an unusual reaction to procaine penicillin in aqueous suspension,¹ my patients continued to experience these reactions with about the same frequency until early in 1955. Injections of from 2 to 3 ml. were given intramuscularly into the buttock with the utmost care with the patient in the recumbent position. Some were given deeply and some superficially, but still the reactions occurred. The anxiety caused among the patients in the waiting-rooms by the noise as well as by hearsay made it imperative that the injections of aqueous suspensions be discontinued. A return was made to the supposedly outdated procaine penicillin in oil. For two and a half years till now all the patients under my care suffering from syphilis have received procaine penicillin in oil, and no patient has suffered an acute reaction. This undoubtedly is the solution to the problem which Dr. G. W. Lewis discusses (*Journal*, May 18, p. 1153).—I am, etc.,

Norwich.

REFERENCE

- Batchelor, R. C. L., Horne, G. O., and Rogerson, H. L., *Lancet*, 1951, 2, 195.

H. L. ROGERSON.

Sign of Rain

SIR,—The delightful poem on the signs of rain quoted by Dr. F. Parkes Weber in his letter (*Journal*, May 18, p. 1181) can be read in full in *Weather Lore*, by Richard Inwards.¹ However, the author is given there as Dr. Erasmus Darwin, and not Dr. Edward Jenner. Perhaps others of your readers could help to establish which of the two really did write it.—I am, etc.,

Dartford, Kent.

REFERENCE

- Inwards, R., *Weather Lore*, 4th ed., 1950, p. 227. Royal Meteorological Society, London.

J. C. BURNE.

Buthalitone Sodium for Electropexy

SIR,—Having noted favourable reports on the use of buthalitone sodium as an intravenous anaesthetic for electropexy it was decided to initiate a trial at this unit. So far we have used this drug on 500 occasions, and we have found the use of buthalitone sodium followed by succinylcholine, 50 mg., most satisfactory. We have been able to judge patients' responses more easily, with minimal doses of

buthalitone. Induction and recovery have been, in our experience, smoother and more rapid using buthalitone than with any other agents we have used. There has been consequent economy in staff time; this, we feel, is important, with the large number of cases treated daily. Although side-effects with buthalitone, such as headaches, generalized clonus, and trismus and hypotension, have been reported, we have not experienced any of these reactions. As the favourable results we have had agree with other trials, we feel it deserves wide attention.—We are, etc.,

Wakefield, Yorks.

MARSHALL FRIEZE,
IDA MATHER.

Herpes Zoster and Chicken-pox

SIR,—The report of two interesting cases by Dr. S. W. Vivian Davies (*Journal*, May 11, p. 1119) prompts me to mention a case which is at present under my care.

A male child, aged 2 years 9 months, was seen on May 8. Supra-orbital zoster of a severe type with conjunctival involvement was diagnosed (two days' duration). Slight headaches had been complained of for ten days previously, but the parents were adamant that he had no acute pain either before or after the appearance of the rash. The child was not unduly upset apart from the eye irritation; this was surprising, considering the severity of the lesion. The history of this case was rather interesting. When he was three months old he had a bad attack of chicken-pox, and three weeks before he developed zoster had been in contact again with the disease. Checking my records, I find that one or two points concerning herpes zoster may be of interest to fellow practitioners: (1) Ten cases out of the last 35 occurred in patients under 25 years of age, four of these being under 11. (2) The supra-orbital type (8 cases) is almost as prevalent as the more familiar thoracic one (11). (3) The lay public idea of "shingles" being a disease of middle and old age only is a fallacy.—I am, etc.,

Leicester.

ERIC LODGE.

Women's Footwear

SIR,—Mr. Reginald Payne points out (*Journal*, May 18, p. 1180) the appalling exploitation of the frailty of human nature by commerce, exemplified by fads and fancies in female footwear. In this respect, even the Government became an ally of commerce during the war, insisting on men's shoes of one pattern which compressed the forefoot. Doubtless austerity justified national care of production, but was not a harmful uniformity misgovernment? In happier times the failure is equal when a government ignores the deplorable fact of an unthoughtful populace expending its wealth injuriously.

Mr. Payne is right. Craftsmen may yield to the necessity of earning wages, but they regret debased work. Many are uneasy and many are demoralized when a social conscience is dumb. We all admire the fleet and enduring feet, often bare, of those peoples living closer to nature. Our hard paths, roads, and floors call for foot cover, but civilization can modestly choose shoes shaped to natural outlines of the foot, broadest at the front, and with a low heel that does not drive the toes against the shoe front. Will the Government please have the courage to reply to Mr. Payne's appeal by a national publicity campaign on healthy footwear? Fifty per cent. of foot troubles are due to improper shoes.—I am, etc.,

Bristol, 8.

A. WILFRID ADAMS.

SIR,—Although there is much truth in Mr. R. T. Payne's letter on women's footwear (*Journal*, May 18, p. 1180) the case against the boot trade as a whole is very much overstated. The third paragraph states distinctly that women "have tried shop after shop without success," and again another lady is quoted as having "recently spent a whole

day in London shoe-shops in a completely vain endeavour to get reasonable shoes." My wife has found no trouble in getting a thoroughly comfortable, well-balanced, and neat shoe with arch supports and moderate practical heels, and certainly did not spend more than a few minutes studying the windows for something of her choice. If women would only leave alone the absurd and even potentially deforming type of shoe displayed, the makers would not put them out. There are, to my personal knowledge, enough of the good type, provided the price can be met.—I am, etc.,

London, S.W.19.

B. J. BOUCHÉ.

Premedication in Children

SIR,—The paper by Dr. R. Goulding *et al.* on the sedation of children as out-patients for dental operations (*Journal*, April 13, p. 855) was a timely one and of considerable interest. There is no doubt that many children require some form of sedation in order to allay their anxieties before visiting the dentist—especially if extractions are contemplated. The problem of finding a suitable preparation for use in children is not an easy one, for whatever is chosen must be generally effective, safe, and acceptable to small patients.

In the article above quoted the authors state that "methylpentynol, butobarbitone, and chlorpromazine scarcely provide the answer." After trying a few likely preparations, including methylpentynol, my own experience has led me to prefer a combination of non-barbiturate sedatives of the open-chain ureide type, such as carbromal and bromvalone, which are well tolerated and have minimal toxicity, together with a small dose of mephensin and rauwolfia extract. I have found that in most cases such a preparation does help in reducing any anxiety and restlessness and in rendering dental procedures a less frightening experience for the child. If time permits I instruct the parent to give half a dose beforehand and then the full therapeutic dose about half to one hour before the appointment to see me. The particular preparation ("sedaltine") which I myself use has the additional merit of being easy to administer to children and has no untoward side-effects in the recommended dosage.—I am, etc.,

Chingford, Essex.

R. H. MOODY.

X-rays and Bronchial Carcinoma

SIR,—Smokers develop persistent coughs. Patients with persistent coughs are more frequently x-rayed than others. X-rays are known to encourage neoplastic developments. Therefore there should be a connexion between the incidence of bronchial carcinoma and radiography of the chest. Perhaps those with access to suitable facilities might care to test this hypothesis.—I am, etc.,

Paignton.

J. F. BURDON.

Infection of Umbilical Cord

SIR,—We have been interested to read Dr. Janet Jellard's paper on reservoirs of infection in a maternity hospital (*Journal*, April 20, p. 925). Similar problems have been met in the Catterick Camp Military Hospital, and some of the findings are mentioned below.

An outbreak of breast infections in mothers and of cutaneous pustules among babies in the families wing of this hospital was first noticed in December, 1956. The organism concerned in all cases was *Staph. pyogenes*, phage type 53. Investigations to determine the source and to trace the vectors were planned, and included bacteriological examination of swabs from nose and throat of all patients, nursing, and medical staff; dust sampling; cultures of nappies, baby powder, blankets, etc. As a result it was found that the focus of infection was in the nursery. *Staph. pyogenes* of the phage type implicated was isolated from all the babies' umbilici and also from certain nappies, petroleum jelly, and

safety-pin containers. *Staph. pyogenes* was also isolated from the nasopharynx of several members of the staff, but proved to be of different phage types. The standard measures to control the epidemic were used and the infected cases were isolated. Local treatment to the cord stumps of the infected babies was given with a 2% chlortetracycline cream followed by a longer prophylactic course of dibromopropamide cream. The nursery was meanwhile thoroughly cleaned with antiseptic and finally fumigated. After these active measures we were grateful to find a sharp diminution in the number of cases of infection, and were therefore dismayed to find that about 95% of clinically healthy babies yielded positive cultures of *Staph. pyogenes* from their umbilici. These organisms all belonged to the same phage type (type 53).

More recently we have run a series of tests to find at what stage the umbilici become infected. We swabbed the umbilici of a random selection of newborn infants hourly, and found that in all cases the organisms first appeared within 1-8 hours following birth. One further interesting feature is that, despite the constant isolation of the same phage type, we have found equal proportions of penicillin-resistant and penicillin-sensitive organisms. It has not been possible, however, to relate this in any way to penicillin therapy.

It is interesting to note that in this hospital we have seen no cases of enteritis or ophthalmia neonatorum. Despite a proved reservoir of pathogenic staphylococci we have only encountered cases of mild skin infections among the babies.—We are, etc.,

H. A. DAVIS.

D. J. PARISH.

Catterick Camp, Yorks.

H-bomb Tests

SIR,—I believe that on April 23 Dr. Albert Schweitzer expressed the feelings of many, if not all, of us regarding the urgent necessity for the cessation of H-bomb tests. I further believe, therefore, that the medical profession has a moral obligation to respond to Dr. Schweitzer's appeal for world-wide public opinion to make itself known. It does not make sense that we, who profess to care for human well-being, should condone by our silence something that we know may lead to unimaginable sufferings of future generations. Most members of the profession would, I am sure, welcome some evidence of the Association's concern regarding the effects of H-bomb tests, particularly if supported publicly by those specially qualified to speak authoritatively on these effects.—I am, etc.,

Port Credit,
Ontario, Canada.

DORIS BRECHIN JAFFÉ.

Idiosyncrasy

SIR,—In hospital practice patients are often encountered who have an idiosyncrasy to a drug in common use such as iodine, penicillin, chloramphenicol, etc. Not infrequently the fact of the existence of a specific idiosyncrasy has been noted in the clinical records of previous hospital examinations, but that fact is often tucked away in a mass of notes to such an extent that it may well escape notice by a practitioner subsequently examining the notes to ascertain what they reveal.

It has occurred to me, and I have put it into practice, that a simple and reliable procedure to follow to bring the fact of established idiosyncrasy to the notice of anyone examining a patient's clinical records would be for a rubber stamp to be available in the wards and the out-patient departments. That stamp should consist of a lined rectangle 2 by 2½ in. (5.1 by 6.4 cm.) with the word IDIOSYNCRASY at the top of the space. Whenever a hospital medical officer discovers that a patient has an idiosyncrasy to any drug he should immediately arrange for that word to be stamped prominently on the front of the folder or on the cover of the clinical notes, and under the word idiosyncrasy should be written the name of the drug involved. It would be an

added advantage if this entry were initialled by the person effecting the record.

In my opinion, procedure of this kind would possibly save many a patient from the unpleasantness or danger of a widespread dermatitis, or copious vomiting, or other clinical phenomena consequent upon the administration of a drug for which there exists a sensitivity.—I am, etc.,

Bristol, 9.

D. G. C. TASKER.

Sir Victor Horsley

SIR,—The recent tributes in the *Journal* of April 20 to the life and personality of Sir Victor Horsley recalled memories of 1912, when he asked me to aid him with an article on the subject of the brave women who obeyed their leader, Mrs. Pankhurst, and used force to gain the right to vote. Several had been my patients after having adopted the hunger-strike when imprisoned and been forcibly fed. Public opinion, at first indignant, was changing to admiration and even to sympathy when the cat-and-mouse order was instituted. The exhausted sufferers were sent home to recuperate, then again imprisoned, and underwent the same ordeal of forcible feeding. Serious consequences to health resulted in many cases. In those far-off days the newspapers were filled with letters expressing many shades of opinion. During social gatherings, when conversation paused, one would often hear such questions as: "And when were you last in prison, Dr. Mabel?"

Sir Victor proved a strong arm of defence. On many evenings Sir Victor and Lady Horsley invited me to the family dinner, after which we all adjourned to the large drawing-room. There we sat round a large table and worked several hours correcting and revising notes and comments on the sufferings of the victims. I have vivid memories of the happy atmosphere which prevailed in the beautiful room of that house in Cavendish Square.—I am, etc.,

London, W.1.

AGNES SAVILL.

Mental Defect and Phenylketonuria

SIR,—The cause of the mental defect in cases of phenylketonuria, hitherto unexplained, may be related to a 5-hydroxytryptamine (5-H.T.) deficiency.¹ We are therefore treating affected patients with 5-hydroxytryptophan, which readily passes the blood-brain barrier, to be decarboxylated to 5-H.T.² The number of available patients of a suitable age group to date is small, and we appeal, therefore, to doctors who may have phenylketonuric patients (aged 3 years or under) in their care for their help. If the relatives are agreeable to such a patient entering hospital for a period of up to six months for a controlled trial, we should be grateful if the doctor would communicate with Dr. C. M. B. Pare, Maudsley Hospital, Denmark Hill, S.E.5, for further details.—We are, etc.,

B. H. KIRMAN.

M. SANDLER.

C. M. B. PARE.

R. S. STACEY.

London.

REFERENCES

- 1 Pare, C. M. B., Sandler, M., and Stacey, R. S., *Lancet*, 1957, 1, 551.
- 2 Udenfriend, S., Weissbach, H., and Bogdanski, D. F., *J. biol. Chem.*, 1957, 224, 803.

Medico-Legal

DR. J. B. ADAMS COMMITTED FOR TRIAL

Last week at Eastbourne Dr. John Bodkin Adams was committed for trial in July at Lewes Assizes on fifteen charges under the Dangerous Drugs Act, 1951, the Forgery Act, 1913, the Cremation Act, 1902, and the Larceny Act, 1916. He was released on bail in his own recognizance of £2,000.

Obituary

H. G. TRIMBLE, M.D.

Dr. H. G. Trimble, associate professor of clinical medicine at Stanford University, California, U.S.A., and consulting chest physician at Oakland, California, died suddenly in Oakland on May 13. He was 60 years of age.

Harold Guyon Trimble was born and bred in California and had lived all his life at Oakland, having graduated from the University of Southern California and taken his specialists boards in internal medicine some years later. He was on the consulting staff of several hospitals in the San Francisco and Oakland areas and was particularly associated with the hospitals for diseases of the chest in Alameda county. He was an intrepid world traveller and had come regularly to Europe since 1950, and each year had spent some time attending conferences in Britain and visiting institutions and clinics specializing in diseases of the chest. His reputation as a physician and as a man of deep knowledge of and interest in his subject thus spread far from his home country, and he was known in Europe and in the Far East as a great scholar and as a friend of humanity.

In 1954 Trimble was awarded the Varrier-Jones gold medal and delivered the memorial lecture in London on a statistical analysis of the present-day treatment of pulmonary tuberculosis. The *British Medical Journal* was accorded the privilege of publishing his article based on the lecture, in January, 1955. He addressed the British Tuberculosis Association at Bristol as recently as June, 1956, on the subject of pneumoperitoneum therapy, to the literature of which he had contributed greatly. His monographs on this subject and on respiratory function tests are well known as standard contributions from a chest physician of great authority. In his own country Harold Trimble was a moving spirit in the American College of Chest Physicians and had recently been elected to its board of regents and was head of the board of examiners for the Fellowship of that college. He was also a member of the National Tuberculosis Association and American Trudeau Society, and his advice on tuberculosis problems was always being sought. He had an undying interest in medical research and was chairman of the research committee of the Californian Medical Association.

Harold Trimble enriched the lives of all those with whom he came in contact. His kindly bearing and his readiness to help were well known to his many friends all over the world and particularly to those in Britain. Only a few days ago he was to have been elected an honorary life member of the British Tuberculosis Association, in addition to his vice-presidency of the South-east Metropolitan Tuberculosis Society. The mode of his death—he was shot by a patient in his consulting-room—adds to the tragedy of his passing. He leaves a widow, who has been his constant companion in his home life and in all his travels abroad, five married children, and eleven grandchildren.—C. W. L. J. and M. M. N.

C. A. HUGHES, M.D.

Mr. C. Alston Hughes, formerly ophthalmic surgeon to the Eye and Ear Infirmary in Liverpool, died on April 16 at the age of 77.

Clement Alston Hughes was born in Liverpool and received his early education at St. Francis Xavier's College. As a student of medicine in Liverpool he showed early promise, winning the Gold Medal in anatomy, and when he graduated M.B., Ch.B. in 1903 he passed the examination with honours. His first posts were as house-surgeon and house-physician at the Liverpool Royal Infirmary. After a few years in general practice he joined the R.A.M.C. at the outbreak of the first world war, and in 1915 went to France. He had already by that time a leaning towards

ophthalmology, and at the hospital at Noyelles-sur-Mer he had among his patients large numbers of Chinese labourers suffering from trachoma. For his work in looking after the French civil population he received the Médaille d'Honneur from the French Government in 1919. On demobilization he returned to Liverpool and proceeded to the M.D. at the university, having chosen trachoma as the subject of his thesis. He joined the staff of the Eye and Ear Infirmary as honorary assistant ophthalmic surgeon and later he became full surgeon, a post he held until his retirement. Another of his appointments was that of ophthalmic surgeon to the Victoria Central Hospital, Wallasey. A member for many years of the North of England Ophthalmological Society, he served as its president in 1937-8. He was also a life member and English representative of the Société Française d'Ophthalmologie.

Outside his professional work he loved literature, nature, and walking and climbing in the Lake District. It was his proud boast that he had climbed every mountain and hill in the district that did not require roping. As a man, he was devout and self-effacing and believed in doing good by stealth. For some years past he had been living in retirement in the Lake District that he knew and loved so well. To his widow, son, and daughter we extend our sincere sympathy.—H. M.

Dr. J. A. McCANN writes: I first met Mr. Alston Hughes on my appointment as house-surgeon to the Liverpool Eye and Ear Infirmary twenty years ago, when he was secretary to the medical board of that infirmary. I was much in contact with him later as clinical assistant and ultimately became his assistant surgeon. I had, therefore, many opportunities of knowing him as an ophthalmologist and, in his later working years, as a friend. He had a great interest in optics and was a most expert refractionist; his thoroughness and patience in this aspect of his work was an inspiration to his juniors and students. As a diagnostician he was most conscientious, and every case of his was investigated and considered with the utmost care. I, and many other of his juniors, have every reason to be grateful for his training and guidance.

Mr. Alston Hughes was greatly interested in literature and a member of the Medico-Literary Association. He had himself written not a few plays: one, "On Clifton Moor," which he read to his colleagues at his retiral dinner, was a most interesting historical and literary work. His great and abiding interest, however, was walking and climbing in his beloved Lake District, which was for Clement Hughes the spot spoken of by his favourite author, Kipling:

God gives all men all earth to love,
But, since man's heart is small,
Ordains for each one spot shall prove
Beloved over all.

He was a sincere Roman Catholic and this always pervaded his attitude to his patients, and as a member of the Guild of St. Luke, SS. Cosmas and Damian he was most assiduous and energetic. His outstanding qualities were his thoroughness, industry, and modesty. It may be truly said that he commanded the respect and affection of all who knew him.

HAVEN EMERSON, M.D.

Dr. Haven Emerson, a former health commissioner of New York City and emeritus professor of public health at Columbia University, died at Southold, Long Island, on May 21, aged 82.

Haven Emerson was a grand-nephew of Ralph Waldo Emerson and the son of Dr. John Haven Emerson, one of the first specialists in public health to work in New York. He graduated first at Harvard and then took the degree of M.D. at Columbia in 1899. For the next few years he was in private practice in New York, holding the post of assistant visiting physician at Bellevue Hospital. One task he undertook at this time was the revision of Flint's *Manual of Auscultation and Percussion*. In the end, however, he

JOHN WYLIE, M.C., M.B., Ch.B.

Dr. John Wylie died at his home at Woodlands, near Doncaster, on May 4 after a short illness. He was 66 years of age.

Born on December 28, 1890, John Wylie graduated M.B., Ch.B. from Glasgow University in 1914, and then served in the R.A.M.C. during the first world war in Gallipoli, Egypt, and France. He was awarded the Military Cross in 1919. After the war he settled at the mining village of Woodlands and practised there for almost forty years. He was everybody's friend and never spared himself in his work; for this he was loved by his patients, and also for his quiet but genial manner. He was especially interested in midwifery. Much of his scanty spare time he gave up to work for the St. John Ambulance Brigade. The large attendance at his funeral was a measure of how much he will be missed in the community; but the triumphant tone of that service was a sign of that personal faith in Christ which had inspired and empowered much of his life's work. He leaves a widow and four children.

G. BRIDGEFORD PROCTOR, L.R.C.P.&S.Ed.

The death occurred early in May of Dr. G. Bridgeford Proctor, of Pitsea, Essex, where he had been in practice for over thirty years, being the first resident doctor in the district. He was 93 years of age.

George Bridgeford Proctor was born on May 22, 1863, and was educated at University College, Liverpool. He received his medical training at Edinburgh and the London Hospital, taking the Scottish triple qualification in 1889. On returning from a voyage as a ship surgeon he went into practice at South Norwood for a few years, until 1896, when he moved to Brighton, where he became physician to Mrs. Leopold de Rothschild's convalescent home. After the first world war, in which he served as a captain in the R.A.M.C., he settled in practice at Pitsea.

J. L. C. writes: In spite of his great age Dr. Bridgeford Proctor continued until recently to give medical advice. When 92 he underwent a successful cataract operation, and returned to normal life for another year. A physician of the old school, he was regarded by many of his patients as a friend and adviser as well as family doctor. He was held in the highest respect by all who came in contact with him. Notably good-looking and very particular about his appearance, he was a well-known figure in the district he served so faithfully for so many years. The sincerest sympathy will be extended to his widow, who survives him.

Medical Notes in Parliament

Further Report on Nuclear Hazards

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked the Prime Minister on May 23 if he would consider asking the signatories to the report on the *Hazards to Man of Nuclear and Allied Radiations* to meet again—not for a few minutes or half an hour, as he understood they had done—but to consider whether a further report was now needed, in view of further evidence which they did not have when they last reported. Mr. HAROLD MACMILLAN said that he would consider that, but he reiterated that the Medical Research Council's work was not something that was done and finished with, but was a permanent inquiry, with a standing committee appointed for the purpose. It had its own research units, and there was what might be called a continuing progress of research. Mr. H. GAITSKELL (Leeds, South, Lab.) thought the fact that this body was continuously at work was an argument in favour of inviting the Council to produce a further report. Mr. MACMILLAN agreed that, as in all these investigations, there was a moment when there might be enough new material to justify a new report.

followed his father into the public health service, being appointed a deputy commissioner of health in New York in 1914. In the following year he became commissioner and president of the board of health, holding this office in 1916 during the severe outbreak of poliomyelitis in New York. In fact, he was the first to set up an extensive investigation into the origin and possible forms of treatment of this disease. Always an advocate of mass immunization campaigns, he lived to see the introduction of vaccination against poliomyelitis on an enormous scale.

During the first world war Dr. Emerson was appointed epidemiologist to the American expeditionary forces, and after the war he was one of those whose nutritional studies were designed to help the starving populations of Europe. In 1919 he was appointed professor of preventive medicine at Cornell University, and three years later he became professor of public health practice at Columbia. From then until he retired in 1940 he led a life of great activity, becoming known as a forthright critic of everything—including alcohol—that he thought prejudicial to health. But he was constructive as well, and directed many hospital surveys in the U.S.A. and pioneered in epidemiological investigations of tuberculosis and cardiac disorders. President of the American Public Health Association in 1933, he was a member of the board of health of New York from 1937 until his death.

A few years ago thirty-five of his papers were selected for publication in book form to mark the occasion of Dr. Emerson's seventy-fifth birthday. Professor J. M. Mackintosh, reviewing the volume in this *Journal*, wrote of Dr. Emerson that he was not the first great worker in the field of public health to have forsaken a most promising career as a physician for the less obvious attraction of preventive medicine. "His rarity lies not only in his clear and able scientific work but in his constant awareness of its deeper social significance."

R. O. J. FRY, M.R.C.S., L.R.C.P., D.T.M.&H.

Major R. O. J. Fry, R.A.M.C., on posting for duty as D.A.D.M.S., 10 Armoured Division in Tripolitania, was a victim of the tragic air disaster at Blackbushe on April 30. He was 35 years of age.

Richard Oswald James Fry was born on April 11, 1922, the only son of Mrs. and the late Mr. R. B. Fry, of Wellington, Somerset. Educated at Wellington School, the University of London, and St. Thomas's Hospital, he qualified M.R.C.S., L.R.C.P. in 1946, and after house appointments at the City General Hospital, Plymouth, joined the R.A.M.C. in March, 1947. After two years in the United Kingdom, Fry saw foreign service in Hong Kong and Malaya, where, as a temporary major, he commanded the British Military Hospital, Cameron Highlands, for over two years with conspicuous success. On his return home in 1952 he was posted to Shorncliffe as D.A.D.M.S., 44 (Home Counties) Infantry Division (T.A.). When the command of 15 Field Ambulance fell vacant in May, 1954, Fry was selected to fill the appointment as a temporary measure, being granted the temporary rank of lieutenant-colonel. So successful and popular was he that, although junior in seniority, his appointment was confirmed and he remained with the unit at Shorncliffe and Lingfield until he proceeded on the R.A.M.C. senior course at Millbank in September, 1956. On completion of the latter he was granted a postgraduate period of study, which he put to good use by taking the D.T.M.&H. only a few weeks ago.

A colleague writes: "Dickie" Fry was one of the most popular young Regular officers in the Corps. Slight and of small stature, he was great in spirit and achieved his results by true leadership. His men would have followed him anywhere, because he never asked of them anything he would not willingly have tackled himself. Shy almost to the point of diffidence, he was gentle, kindly, and courageous, and his death is a great loss to the Corps. He married in 1949 Miss E. B. Sargent, of Gillingham, Kent, to whom the sympathy of his many friends goes out in her bereavement.

He did not think, as Mr. Gaitskell also suggested, there was really a great conflict of opinion—between, for example, Lord Cherwell and other scientists—but he would consider whether a supplementary report should be produced, either now or at some near date.

Edinburgh Hospitals' Consultant

Three Scottish M.P.s questioned the Secretary of State again on May 21 about the appointment of a consultant physician to the Bruntisfield Hospital for Women and Children and the Elsie Inglis Memorial Maternity Hospital, Edinburgh. Mr. J. S. MACLAY told them that the regional hospital board had recently received a deputation from the organizers of a public meeting about this case, and the whole matter was under consideration.

Mr. J. H. HOY (Leith, Lab.) said that at a conservative estimate more than 90% of the people of Scotland were against the decision of the hospital board. He asked the Secretary of State to use his authority to maintain the hospital as it was planned and paid for by the women of Scotland. Lady TWEEDSMUR (Aberdeen, South, Con.) said that everyone would be glad that a decision had not yet been taken to appoint a male consultant. She asked if there was any truth in the rumour that a woman consultant had been interviewed and was shortly to be appointed. Sir IAN CLARK HUTCHISON (Edinburgh, West, Con.) said the opinion of a great many people was that the appointment of a male consultant would contravene the spirit, and probably the terms, of the trusts on which these hospitals were founded. Mr. A. WOODBURN (Clackmannan and East Stirling, Lab.) asked the Secretary of State to keep in mind that these two hospitals were formed in memory of the entry of women into the medical profession. It was felt that part of the trouble lay in the resistance of the male members of the medical profession to the entrance of female consultants. It was important that some place should be left for women in the field of medicine which they could have as a prerogative for themselves. Mr. MACLAY repeated that the whole matter was under consideration. He could make no comment on rumours. He was well aware of the views that were held, but he thought Mr. Woodburn was drawing some conclusions that were not necessarily valid.

Preventive Medicine in Hospitals

Mr. H. E. RANDALL (Gateshead, West, Lab.) asked the Minister of Health if he would make a statement on the steps being taken to develop departments in hospitals for the practice of preventive medicine; and what progress had been made in this regard since the inception of the Health Service. Mr. J. K. VAUGHAN-MORGAN, Parliamentary Secretary, stated on May 20 that certain aspects of preventive medicine might require, and would obtain, the collaboration of any department of a hospital, but he did not think the establishment of special departments would be appropriate.

Shortage of Radiographers

Mr. D. VOSPER was faced with a dozen questions, from Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) and Mr. SOMERVILLE HASTINGS (Barking, Lab.) among others, on May 27 about the shortage of radiographers in the Health Service. He stated that the number of radiographers in the hospital service in England and Wales at the end of 1952 was 2,652 whole-time and 199 part-time. The provisional figures at the end of 1956 were 3,087 and 289 respectively. There had therefore been a marked increase, but there was evidence to suggest that it had not been enough to meet the increased demand for x-ray services. A sample inquiry in four hospital regions a year ago indicated that there was a shortage of 16% on establishment, and that not more than half the annual loss was due to reasons other than retirement, marriage, or domestic reasons. Since then, in November last, the salaries were substantially increased and the staffing structure improved following an award of the Industrial Court. The salary of the basic grade was now

£420-£485 per annum and of the highest grade of superintendent radiographer £675-£850. In his view it was too early to assess the effect of these increases. Meanwhile he had asked hospital boards for information about the staffing of radiography departments and the intake of students in order to obtain a full up-to-date picture of the position. The last return had just been received. When he had been able to study the results of this inquiry he would consider what steps might be necessary to meet the situation it revealed. He added in further replies that the result of the inquiry would be known in a few weeks' time. He hoped that one of the results would make it possible to tell more closely the reasons for the wastage. Mr. HERBERT MORRISON (Lewisham, South, Lab.) said that doctors in Lewisham had been informed of a shortage of radiographic facilities and warned that patients could not be taken or must be restricted, and this was worrying the doctors. Mr. VOSPER replied that the inquiry would reveal the relative shortage in various parts of the country. His information was that London was generally better off than elsewhere.

Hospital for Rheumatic Diseases

Mr. I. PITMAN (Bath, Con.) asked the Minister of Health if he is aware that the premises of the Royal National Hospital for Rheumatic Diseases at Bath were in a state of decrepitude and danger by risk of fire; and, in view of the national service and importance of this hospital as a centre for the treatment of rheumatic diseases, what steps he intended to take to expedite the necessary work of reconstruction. Mr. VOSPER said he was aware that this hospital fell short of modern standards, and he was examining the proposal of the South-western Regional Hospital Board that the project to restore it should be included in the programme of major building projects which were financed centrally.

Days Lost Through Rheumatism.—In 1954-5, the last year for which complete figures are available, the number of weekdays in respect of which incapacity for work was certified as due to rheumatic fever, rheumatism, or arthritis totalled about 22 million.

Prescription Costs.—The average cost per prescription dispensed in England and Wales in February was 5s. 7.87d. Complete figures for March are not yet available, but it is estimated from a sample that the average cost was about 3d. more than in February.

Malaria Eradication.—As provision for malaria eradication is included in the regular budget of the World Health Organization to which the United Kingdom contributes, the Government does not propose to contribute to the special fund established by W.H.O.

Toxic Chemicals.—A scheme for the voluntary notification of proposals to use toxic chemicals in agriculture has been agreed between representatives of the industry and the Advisory Committee on Poisonous Substances used in Agriculture and Food Storage, and has been approved by the Secretary of State for Scotland and the Minister of Agriculture and Fisheries.

Tuberculosis Among West Indians.—Investigations have failed to show any unusual incidence of tuberculosis among West Indians in this country.

Lung Cancer and Smoking.—The Medical Research Council's review of the connexion between smoking and lung cancer should be available within a few weeks.

Medical Manpower.—The report of the Committee on Medical Manpower is expected during the summer.

Universities and Colleges

SOCIETY OF APOTHECARIES OF LONDON

The following candidates, having completed the final examination, have been granted the diploma of L.M.S.S.A.:

D. L. Oldfield, J. L. Currah, W. A. Garson, S. H. Thomas, M. L. A. B. Bancillon, M. J. Allan, A. F. Broad, R. E. Owen, A. T. Darko, R. C. Snelling, J. H. Kendall, A. G. Snart, C. Bell, G. A. Robson, R. J. L. Potts, K. C. Kewish, R. Owen.

The following candidates have been awarded the Diploma in Industrial Health:

D. E. Marchant, C. C. Molloy, R. H. Pratt, J. D. Walters.

Vital Statistics

New Influenza Strain

A new strain of influenza virus A is at present causing large outbreaks of the disease in the Far East. Cases are relatively mild, with no unusual features. The World Health Organization's Influenza Centre in London, which is under the direction of Dr. C. H. Andrewes, F.R.S., has specimens of the virus, and Dr. A. Isaacs is studying it there. Cases caused by this virus were first identified in Hong Kong. Epidemics were recorded there and in Singapore during the second half of April. At the end of April an outbreak started in Formosa, where about 100,000 cases have occurred. During May about 800 cases, with 14 deaths, have been reported from Manila in the Philippines, and the disease has also spread to Indonesia. One or two cases in air travellers from Singapore have just been detected in Australia.

Urgent work on the preparation of a vaccine with the new strain is being carried out at the Influenza Centre, with a view to helping, in the first place, countries in the southern hemisphere. Owing to their being in mid-winter, it is thought possible the disease might spread there now rather than in the northern hemisphere. While new strains of influenza virus fairly commonly arise, this is the largest variation since A-prime appeared in 1946-7.

Week Ending May 18

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 664, whooping-cough 2,258, diphtheria 4, measles 16,665, acute pneumonia 374, acute poliomyelitis 66, dysentery 750, paratyphoid fever 1, and typhoid fever 2.

Infectious Diseases

The largest fluctuations in the notifications of infectious diseases in England and Wales during the week ending May 11 were decreases of 4,923 for measles, from 23,188 to 18,265, and 37 for whooping-cough, from 2,399 to 2,362, and a rise of 95 for dysentery, from 574 to 669.

69 cases of acute poliomyelitis were notified, and these were 4 more for paralytic and 5 more for non-paralytic cases than in the preceding week. The largest returns were Essex 17 (Colchester M.B. 8, Tendring R.D. 6), London 7 (Wandsworth 4), and Lincolnshire 6 (Grimsby C.B. 2, Lincoln C.B. 2, Spalding R.D. 2).

In 13 counties the numbers of notifications of measles were 100 or more fewer than in the preceding week; the largest falls were 1,049 in Yorkshire West Riding, from 2,915 to 1,866, 662 in Lancashire, from 2,214 to 1,552, and 471 in London, from 1,640 to 1,169. The largest falls in the towns were 354 in Leeds C.B., from 558 to 204, and 198 in Manchester C.B., from 419 to 221. A rise of 64 in the notifications of measles in West Bromwich, from 52 to 116, was an exception to the general trend in large towns. 497 cases of scarlet fever were notified, being 17 more than in the preceding week; only small variations were recorded in the local trends. The only large variation in the returns of whooping-cough was a rise of 31 in Liverpool C.B., from 42 to 73.

The rise in the incidence of dysentery was due to increases in established outbreaks rather than to new outbreaks. The largest rise was 49 in Cheshire, Stalybridge M.B., from 7 to 56, and the largest fall was 25 in Shropshire, Oswestry M.B., from 31 to 6. The largest returns during the week were Lancashire 127 (Liverpool C.B. 29, Manchester C.B. 25, Ashton under Lyne M.B. 19), Yorkshire West Riding (Leeds C.B. 24, Rotherham C.B. 18, Worsborough R.D. 13, Bradford C.B. 11, Sheffield C.B. 11), Cheshire 79 (Stalybridge M.B. 56, Hyde M.B. 10), Northumberland 45 (Newcastle upon Tyne C.B. 19), Durham 34 (South Shields C.B. 13), London 31 (Islington 11), Essex 28 (Southend on Sea C.B. 14), Yorkshire East Riding 24 (Kingston upon Hull C.B. 21), and Nottinghamshire 20 (Nottingham C.B. 10).

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending May 11 (No. 19) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included). London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

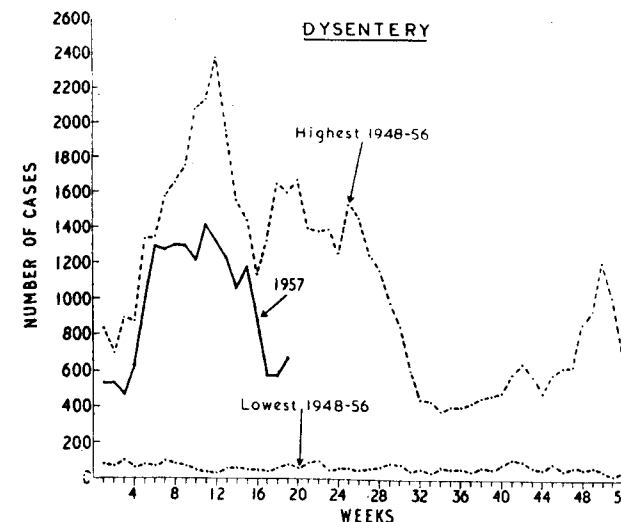
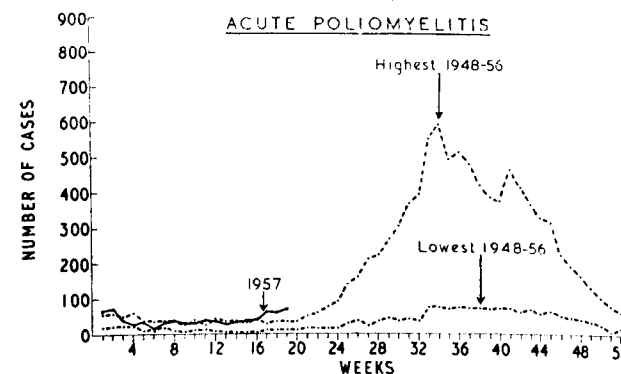
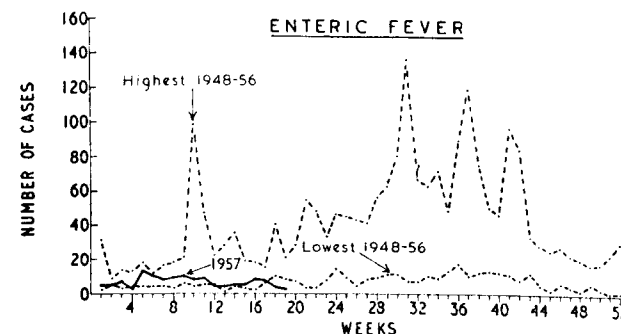
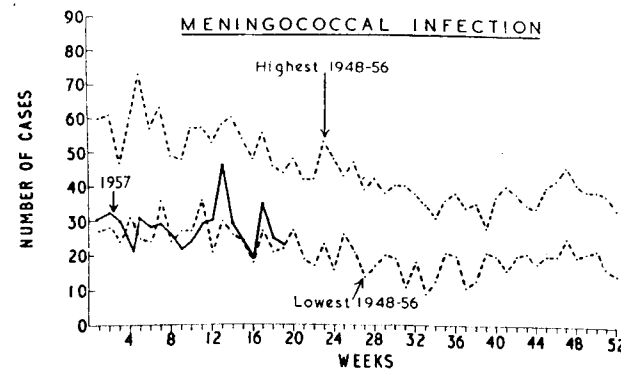
CASES In Countries and London	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	3	0	3	0		6	0	1	0	8
Dysentery ..	669	31	237	17		1,590	236	196	6	2
Encephalitis, acute ..	5	1		0		0	0		0	
Enteric fever: Typhoid ..	1	0	1	0		2	1	0	0	
Paratyphoid ..	1	0	1	0		19	13	(B)	0	
Food-poisoning ..	150	15	20	1		398	24		1	
Infective enteritis or diarrhoea under 2 years ..				20	11				8	19
Measles * ..	18,265	1,169	231	251	278	3,070	166	282	67	210
Meningococcal infection ..	23	1	14	0		33	4	8	0	
Ophthalmia neonatorum ..	39	1	6	0		30	3	4	0	
Pneumonia † ..	392	26	145	11	13	459	24	180	2	5
Poliomyelitis, acute: Paralytic ..	39	5			2	15	1		3	1
Non-paralytic ..	30	2		3		11	2			2
Puerperal fever § ..	207	38	6	1		225	32	10	2	
Scarlet fever ..	497	41	67	30	16	736	59	89	23	20
Tuberculosis: Respiratory ..	647	77	417	15		703	75	128	33	
Non-respiratory ..	99	7	12	2		103	6	14	7	
Whooping-cough ..	2,362	88	299	9	42	1,750	76	213	86	108

DEATHS In Great Towns	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	1	0	0	0	0
Dysentery ..	0	0		0		0	0		0	
Encephalitis, acute ..		0			0		0			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	3	0	1	0	0	10	0	1	0	4
Influenza ..	6	0	0	0	1	11	1	1	0	0
Measles ..		1	0	0	0		0	0	0	0
Meningococcal infection ..		0	0				0	1		
Pneumonia ..	221	28	19	9	10	224	25	20	4	11
Poliomyelitis, acute ..	3	0			0	0	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis: Respiratory ..	50	2	12	1	6	55	5	4	1	4
Non-respiratory ..		3	0	0	1		0	1	0	0
Whooping-cough ..	0	0	1	0	0	1	0	0	0	1
Deaths 0-1 year ..	208	30	29	10	14	206	27	26	10	15
Deaths (excluding stillbirths) ..	5,184	663	605	107	187	5,195	735	577	109	185
LIVE BIRTHS ..	8,537	1265	1036	244	427	8,121	1244	977	213	
STILLBIRTHS ..	236	31	36			200	15	22		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
§ Includes puerperal pyrexia.

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1948-56 are shown thus -----, the figures for 1957 -----. Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Diagnosis of Smallpox

A memorandum entitled *Diagnosis of Smallpox* has been issued by the Ministry of Health and the Department of Health for Scotland to medical officers of health and others likely to be interested. It includes notes on the laboratory diagnosis of smallpox, a paper by Dr. F. O. MacCallum on the subject, and instructions for collecting and dispatching specimens. Finally, it gives a list of laboratories available for diagnosis and a list of medical practitioners designated to assist medical officers of health in the diagnosis of the disease.

Medical News

Memorial to Mr. Cecil Calvert.—The death of Mr. CECIL CALVERT, neurosurgeon to the Royal Victoria Hospital, Belfast, occurred in a motor accident last year. Last week in Belfast further tributes were paid to his memory, when Sir GEOFFREY JEFFERSON, F.R.S., unveiled at the Royal Victoria Hospital a portrait of Mr. Calvert, commissioned by the medical staff. After Dr. R. S. ALLISON, chairman of the medical staff committee, had officially presented the portrait to the hospital, Mr. VICTOR CLARENDON, chairman of the board of management, announced that a Cecil Calvert scholarship was to be provided out of the "free funds" of the hospital for research work in any field of clinical science.

Treatment of Wound Shock.—The Medical Research Council has had its *War Memorandum* on the treatment of wound shock completely rewritten. It now appears as *M.R.C. Memorandum No. 34* (H.M.S.O., price 3s. 6d. net). The rewriting has been undertaken by a working party under the chairmanship of Sir ERNEST ROCK CARLING. The 39-page booklet discusses first the assessment of the patient's condition and then treatment. Under the latter heading are reviewed general treatment, transfusion, operation and post-operative care, the metabolic consequences of injury and special complications such as fat embolism and renal lesions, and burns. There are also appendices on the transfusion fluids available from the Blood Transfusion Services, plasma substitutes, transfusion apparatus, blood grouping and the giving of transfusions, and the various types of reaction encountered after transfusion. The memorandum will be invaluable to all concerned with the care of the injured.

Scottish Campaign against Tuberculosis.—During the first five days of the mass miniature radiography campaign in Ayr Burgh 9,924 of a possible 34,100 persons over 14 years of age were examined, while in Kilmarnock Burgh 9,138 of a possible 33,800. Two M.M.R. units are in use in each of these campaigns, which end on June 15. The Scottish Department of Health's programme for the rest of the year is as follows (the number of M.M.R. units in each case is given in parentheses): May 27 to June 29, Fife County (2); June 17 to 29, Port Glasgow Burgh (3); September 2 to October 5, Lanark County (5) and Midlothian County (3); October 28 to November 30, Aberdeen Burgh (7). After the five-week Glasgow campaign, in which 30 M.M.R. units were used as well as seven other units for taking large films in doubtful cases, the campaign moved to Perth. Here four M.M.R. units were used, and 28,365 persons, the equivalent of 70% of the population over 14 years of age, were examined during the two-week campaign. During the four-week campaign in West Lothian, in which again four units participated, 37,300 persons, 56% of the population over 14, were examined.

Tenth World Health Assembly.—The Assembly ended on May 24. It had approved the executive board's budget for 1958—\$13.5 million—in spite of a move by the U.S. delegation to cut it to \$12 million; it had offered an extension of office of up to a further five years to the director-general of W.H.O., Dr. M. G. CANDAU; it had accepted an invitation

from the U.S. Government to hold the next Assembly in the United States; and it had debated various recommendations affecting W.H.O.'s future programme of work. These included requests for W.H.O. to co-ordinate evaluation of polio vaccines on an international scale and to intensify its work on leprosy and schistosomiasis. The Assembly was told that the goal of total eradication of malaria was threatened by serious lack of funds: tentative estimates put the cost of eradicating malaria "in some of the larger countries of Asia" at \$15 million a year for five years. W.H.O. was also asked to study the environmental aspects of cancer and to help improve national cancer statistics. A proposal from India to appeal for a ban on atomic bomb tests was ruled out of order by the committee on programme and budget after its earlier debate in one of the plenary sessions. W.H.O. is, however, undertaking work on the health aspects of the peaceful uses of atomic energy. Each year six of the 18 countries nominating delegates to W.H.O.'s executive board retire, and to fill their places the U.S.A., Liberia, Australia, Western Germany, Egypt, and Afghanistan were elected. (The board acts in the name of the Assembly and its members do not serve as representatives of governments.) The Léon Bernard prize was awarded to Professor MARCIN KACPRZAK, rector of the Warsaw Medical Academy, for his outstanding contribution in the field of social medicine, and the Darling Foundation medal and prize to Dr. PAUL F. RUSSELL, of the Rockefeller Foundation, for his work on malaria, particularly his early demonstration in India of the place of insecticides in controlling the disease.

R.C.O.G.—At a meeting of the council of the Royal College of Obstetricians and Gynaecologists on May 25 the following were elected to fill statutory vacancies on the council: *As representatives of the fellows*, Professor W.C.W. NIXON (London), Mr. F. E. STABLER (England and Wales, excluding London), Mr. T. N. MACGREGOR (Scotland), and Professor C. H. G. MACAFEE (Northern Ireland and Eire); *as representatives of the members*, Mr. T. L. T. LEWIS (London) and Mr. R. MURDOCK (Scotland). Sir RUSSELL BRAIN was admitted to the honorary fellowship. In addition 27 new fellows and 33 new members were admitted.

Drinking Sea-water.—In its centenary report, issued last month, the Mercantile Marine Service Association calls for an authoritative statement on whether or not survivors of shipwreck should be advised to drink sea-water. The report notes the conflicting opinions on the subject and asks for an international commission to review "the practical effects of using sea-water to supplement or replace fresh water." The report points out that the inflatable life-rafts now being developed are liable to involve survivors in long periods awaiting rescue.

Nutrition Society.—At a recent meeting Dr. R. J. L. ALLEN, Ph.D., and Dr. W. F. J. CUTHBERTSON, Ph.D., were elected respectively hon. secretary and hon. treasurer. The Society's other officers and members of council are: president, Dame Harriette Chick, D.Sc.; hon. editor, Dr. S. K. Kon, D.Sc.; hon. programmes secretary, Miss D. F. Hollingsworth; members of council, Dr. A. J. Amos, Ph.D., Mr. A. L. Bacharach; Dr. G. H. Bourne, D.Sc.; Professor C. Fraser Brockington; Professor E. W. H. Cruickshank; Professor J. N. Davidson; Dr. O. Fitzgerald; Dr. R. H. Girdwood; Miss E. M. M. Hume; Dr. T. Mann, F.R.S.; Mrs. F. S. Patton; Dr. A. T. Phillipson, Ph.D.; Professor B. S. Platt, Dr. M. Pyke, Ph.D.; Dr. J. A. B. Smith, D.Sc.; and Dr. E. M. Widdowson, D.Sc. The hon. secretary's address is c/o Beecham Foods Ltd., Brentford, Middlesex.

Psychiatric Out-patient Facilities.—A directory of adult psychiatric out-patient facilities in England and Wales has been issued by the National Association for Mental Health. The information is classified under regional hospital board areas. The address and telephone number of each hospital, the psychiatric staff, and the appointment times are given. Clinics where children also will be seen are specially indicated, but further information about facilities for children is provided in the association's separate directory on child-

guidance clinics. The directory on facilities for adults is obtainable from the National Association for Mental Health, 39, Queen Anne Street, London, W.1, price 5s. net.

Essay Competition for G.P.s.—The subject of the Hunterian Society's next Gold Medal essay competition is "The Diagnosis and Management of Coronary Disease in General Practice." The competition is open to all general practitioners, and the closing date is December 31. Further details may be obtained from the hon. secretary, Dr. C. W. KESSON, 51, Harley Street, London.

Anglo-French Exchange Bursaries.—The following have been awarded bursaries to study in France this year under the exchange arrangements between the Institut National d'Hygiène, Paris, and the Ciba Foundation, London: Dr. G. A. COLLIE-KOLIBABKA (gynaecology in Paris); Dr. F. A. L. DA CUNHA (gynaecology in Paris and Lyons); Dr. R. J. T. GARDINER (alcoholism in Paris); Mr. T. H. MORGAN (orthopaedics in Paris); Mr. W. R. PROBERT (thoracic surgery in Lyons and Marseilles); Dr. J. T. SHEPHERD (cardiology in Paris); and Dr. I. McG. STEWART (cardiology in Paris and Dijon). Dr. Collie-Kolibabka and Dr. Gardiner are general practitioners.

Awards for Research on Ageing.—The Ciba Foundation offers not less than five awards, of average value £300 each, for papers describing research "relevant to basic problems of ageing." The papers must not exceed 7,000 words in length and be accompanied by a summary in English, although they may be written in the candidate's own language. Entries must be in the hands of the director of the Ciba Foundation (41, Portland Place, London, W.1) by January 1, 1958, from whom further particulars may be obtained. The awards will be announced in July, 1958.

Faculty of Ophthalmologists.—At the council meeting on May 10 the following were elected officers for 1957-8: president, Mr. L. H. SAVIN; immediate past president, Dr. JOHN MARSHALL; vice-presidents, Mr. E. G. MACKIE and Professor G. I. SCOTT; hon. treasurer, Mr. A. MCKIE REID; and hon. secretary, Mr. E. F. KING.

Leeds University.—The following appointments were announced after the council meeting on May 15: Dr. M. ATKINSON, as lecturer in medicine; Dr. F. O'M. SHIEL, as lecturer in pathology; and Dr. R. W. SPENCER, as lecturer in chemical pathology.

Sheffield University.—The title of reader in social and industrial medicine has been conferred on Dr. J. PEMBERTON, senior lecturer in the department. Dr. J. A. GRIFFITHS has been appointed part-time instructor in anaesthetics, and Dr. R. E. CHURCH part-time clinical teacher in dermatology.

Banting Memorial Meeting.—Among the speakers at the British Diabetic Association's Banting memorial meeting at Oxford on July 12 and 13 will be Professor C. H. BEST, F.R.S., of Toronto. He will speak on "The Present State of the Oral Hypoglycaemic Agents from the Experimental Viewpoint." Professor H. A. KREBS, F.R.S., Whitley professor of biochemistry at Oxford, will deliver the tenth Banting memorial lecture. His subject will be "Some Aspects of the Intermediary Metabolism in the Diabetic Organism." The full programme of the meeting is obtainable from the secretary-general, British Diabetic Association, 152, Harley Street, London, W.1.

Therapeutic Substances Act.—Under the Therapeutic Substances (Control of Sale and Supply) Regulations, 1957, which come into operation on June 1, novobiocin, oleandomycin, spiramycin, prednisone, and prednisolone are brought under the control of Part II of the Therapeutic Substances Act, 1956. The proprietary preparation "sigmamicin," being a mixture of tetracycline and oleandomycin, is also brought under control, according to an explanatory statement from the Ministry of Health.

Hofheimer Prize.—The American Psychiatric Association has awarded the 1957 Hofheimer Prize for "an outstanding research contribution in the field of psychiatry or mental

hygiene" to Dr. C. M. HEINICKE, Ph.D., for his work on the effects of separating 2-year-old children from their parents. This formed part of the research programme of the child development research unit of the Tavistock Clinic and Tavistock Institute of Human Relations.

Scottish Society of Anaesthetists.—The prize for the best paper submitted by a registrar was awarded to Dr. D. B. SCOTT (Edinburgh) at the Society's recent annual meeting at Dunblane Hotel Hydro. Dr. ROBERT LAWRIE (Perth) discussed the reporting of deaths under anaesthesia in his presidential address, and the guest speaker was Dr. ALFRED LEE (London), who spoke on epidural anaesthesia.

Society of Physicians in Wales.—The eighth annual meeting was held at Port Meirion on May 10 and 11, under the chairmanship of Dr. JOHN FORBES. Seven scientific papers were read.

Japanese Delegation Studying N.H.S.—Dr. HIROSHI HASHIMOTO, president of St. Luke's International Hospital, Tokyo, has been visiting Britain with three colleagues to study the Health Service. With him were the vice-president of the Japanese Red Cross Society, the chief of the planning section of the Ministry of Health and Welfare, and Dr. NOBUO TSUDA, who has been studying tuberculosis control on a W.H.O. fellowship. The arrangements for this visit were made by the British Council.

Professor R. J. A. Berry, formerly professor of anatomy, University of Melbourne, and for many years member of the B.M.A. Council, celebrated his 90th birthday on May 30 this week.

Dr. T. H. M. Kerfoot, joint managing director of Thomas Kerfoot and Co., has been elected this year's president of the Association of British Pharmaceutical Industry. He graduated in medicine at St. Andrews in 1931.

COMING EVENTS

William Harvey: Wellcome Exhibition.—At the Wellcome Building, Euston Road, London, N.W.1, 10 a.m. to 5 p.m. daily from June 4, for about a month.

Paddington General Hospital.—The clinical meeting for general practitioners arranged for June 2 has now been deferred until Sunday, June 16, at 11 a.m.

Davidson Clinic.—Summer school on "Human Conflict and its Solution: An Analytic Viewpoint," July 24-30. Details from the secretary, 58, Dalkeith Road, Edinburgh, 9.

Eleventh International Congress of Dermatology.—Stockholm, July 31 to August 6. Details from Dr. MALCOLM TOTTIE, Hudliniken, Stockholm, 60, Sweden.

World Federation for Mental Health.—Annual meeting, Copenhagen, August 11-17. The main theme will be: "Growing Up in a Changing World." Details from the secretary-general, 19, Manchester Street, London, W.1.

Second International Congress for Group Psychotherapy.—Zurich, August 29-31. Details from Dr. A. GUGGENBUHL-CRAIG, 28, Lenggstrasse, Zurich, 8.

British Veterinary Association.—Annual Congress in Cambridge, August 25-31. Details from the general secretary, 7, Mansfield Street, Portland Place, London, W.1.

NEW ISSUES

British Journal of Ophthalmology.—The new issue (Vol. 41, No. 5) is now available. The contents include:
INFLUENCE OF THE FIFTH CRANIAL NERVE ON THE INTRA-OCULAR PRESSURE OF THE RABBIT EYE. E. S. PERKINS.
CORNEO-SCLERAL TONOGRAPHY. T. H. HODGSON and R. K. MACDONALD.
EXPERIMENTAL DEGENERATION OF THE RETINA. I. THIOL REACTORS AS INDUCING AGENTS. ARNOLD SORSBY, J. P. NEWHOUSE, and D. R. LUCAS.
EXPERIMENTAL DEGENERATION OF THE RETINA. II. THE LESION PRODUCED BY BROMOACETATE: OPHTHALMOSCOPIC AND HISTOLOGICAL FEATURES. D. R. LUCAS, J. P. NEWHOUSE, and J. B. DAVEY.
ORBITAL CELLULITIS WITH EXUDATIVE RETINAL DETACHMENT. Manmohan Malhotra.

Issued monthly; annual subscription £4 4s.; single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked *. Application should be made first to the institution concerned.

Monday, June 3

MARLBOROUGH DAY HOSPITAL.—8.15 p.m., Dr. D. J. West: Hypnosis.

Tuesday, June 4

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. D. I. Williams: Ectodermal Defects.

LONDON UNIVERSITY.—At London School of Hygiene and Tropical Medicine, 5.30 p.m., special university lecture in pathology by Dr. M. Ruiz Castañeda (Mexico): Recent Developments in Diagnosis and Treatment of Human Brucellosis.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute, 5 p.m., Almoth Wright Lecture by Dr. R. M. Fry: Spread of Infections in Hospitals and Institutions.

Wednesday, June 5

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Benign Tumours of the Corium.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. Margaret Macpherson: Pulmonary Collapse in Children.

INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—3 p.m., Dr. G. I. M. Swyer: Intersex.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—2 p.m., Professor W. St. C. Symmers: Deep-seated Fungal Infections.

Thursday, June 6

FACULTY OF HOMOEOPATHY.—5.30 p.m., discussion: Homoeopathic Treatment of Asthma.

INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—4.30 p.m., Mr. L. P. Le Quesne: Post-operative Fluid and Electrolyte Balance.

NUFFIELD ORTHOPAEDIC CENTRE.—At Wingfield-Morris Orthopaedic Hospital, 8.30 p.m., Professor M. C. Mensor: Mobility Studies of the Lower Lumbar Spine in Relationship to Low Back Pain.

ROYAL SOCIETY OF HEALTH.—At Town Hall, Gateshead, 10 a.m., Dr. J. B. Tilley: Social Workers and the Health Department; Mr. J. P. Lavender: Some Observations on the Clean Air Act.

ST. ANDREW'S UNIVERSITY.—At Lecture Theatre, Department of Physiology, Queen's College, Dundee, 5 p.m., Professor G. H. Bell: In Search of Pellagra.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY.—4.30 p.m., clinical meeting and annual general meeting.

Friday, June 7

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. P. F. Borrie: clinical demonstration.

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. F. H. Young: clinical demonstration.

INSTITUTE OF NEUROLOGY.—5.30 p.m., Professor G. A. G. Mitchell: Innervation of Blood Vessels.

INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—4.30 p.m., Professor J. Chassar Moir: Diagnostic Radiology in Obstetrics.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—10 a.m., Mr. H. G. Hanley: Modern Treatment of Renal Tuberculosis.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Mr. L. H. W. Williams: Use and Value of X Rays in Obstetrics.

WHIPPS CROSS HOSPITAL MEDICAL SOCIETY.—8.30 p.m., Mr. D. M. Jackson: Managing the Burned Patient.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Champ.—On May 15, 1957, at Queen Charlotte's Hospital, to Doris and Charles Champ, a son—Roderick Charles.
King.—On May 20, 1957, to Shirley, wife of Dr. John G. King, a daughter.
Manson.—On May 8, 1957, at Morriston Hospital, to Mair, M.C.S.P., and William Manson, M.B., Ch.B., a brother for Helen—Robert Fraser.

DEATHS

Cheal.—On May 15, 1957, at his home, 63, Leigh Road, Eastleigh, Hants, Percival Cheal, M.R.C.S., L.R.C.P., aged 71.
Coffey.—On May 24, 1957, William Joseph Coffey, M.B., B.Ch., of 14, Slades Hill, Enfield, Middx.
Connan.—On May 16, 1957, at Tigh-na-Mara, Albany Street, Oban, Argyll, Donald Murray Connan, M.D., D.P.H., aged 67.
Lance.—On May 6, 1957, at his home, 27, Alexandra Road, Southport, Lancs, Roy Enyat Singh Dalliwali, M.R.C.S., L.R.C.P., aged 53.
Drummond.—On May 15, 1957, at Bandarawela, Ceylon, Russell John Drummond, M.D., aged 94.
Gaskell.—On May 12, 1957, Leonard Sadgrove Gaskell, M.B., B.Ch., of Braside, Budleigh Salterton, Devon, aged 85.
Hardwick.—On May 17, 1957, at Kirton, Boston, Lincs, Philip Vincent Hardwick, M.B., Ch.B.
Jarman.—On May 3, 1957, at Knightswood, Storthes Hall Lane, Kirkburton, near Huddersfield, Yorks, David Ewart Jarman, M.R.C.S., L.R.C.P., D.P.M., aged 41.
Lawrence.—On May 18, 1957, at Somerleyton, Hartley, Kent, Charles John Montagu Lawrence, L.M.S.S.A., late of Bedford.
Logan.—On May 16, 1957, in a hospital, Lanark, Alexander Logan, M.B., F.R.C.S.Ed., late of Broadford, Skye.
McQuaid.—On May 12, 1957, in Dublin, Helena Mary Josephine McQuaid, M.R.C.S., L.R.C.P., formerly of Putney, London, S.W.
Matthews.—On May 10, 1957, at The Lodge, Entry Hill, Bath, Somerset, Samuel Ryder Russell Matthews, M.R.C.S., L.R.C.P., aged 84.
Scott.—On May 3, 1957, at Ryde, Isle of Wight, Charles Frederick Trousdale Scott, M.B., Ch.B., late of 122, Brondesbury Park, London, N.W., aged 82.
Trimble.—On May 13, 1957, at Oakland, California, U.S.A., tragically shot, Harold Guyon Trimble, M.D.
Wall.—On May 19, 1957, at Dashpurs, Brixham, Devon, James Marsden Wall, L.M.S.S.A., aged 78.
Watson.—On May 18, 1957, John Desmond Watson, M.B., B.Ch., of 25, Kensington Court, London, W.

Any Questions?

publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Streptokinase and Streptodornase

Q.—What place have streptokinase and streptodornase in the treatment of tuberculous meningitis and empyema? Are these substances effective against micro-organisms?

A.—The early claims for the value of streptokinase in tuberculous meningitis have not been substantiated by further work. In fact, to give this enzyme intrathecally is likely to do more harm than good. Streptodornase has not been used in tuberculous meningitis. Streptokinase and streptodornase have been used in empyemata, usually of non-tuberculous origin, in order to liquefy thick pus and facilitate its aspiration, streptodornase being effective on the proteins derived from the pus cells and streptokinase on the fibrin. For this purpose a freeze-dried powder containing streptokinase 1,000 to 40,000 Christensen units (equivalent to 120,000 to 1,000,000 Cathie units) and streptodornase 10,000 to 20,000 units may be dissolved in 5 to 20 ml. of normal saline and injected into the empyema, pus then being aspirated after a few hours. The process often greatly facilitates the aspiration of pus, but is apt to give rise to quite a severe irritative reaction. Under similar conditions these substances might occasionally be useful in the treatment of tuberculous empyema.

Streptokinase and streptodornase do not have any action against bacteria. They are enzymes employed to liquefy clotted blood and fibrinous and purulent exudates and effusions.

Anaemia in Old Age

Q.—What types of anaemia are particularly common in old age, and are any limited to that period of life? Do they respond as readily as their juniors to treatment for anaemia, or are special measures indicated when treating them? Does their tolerance of anaemia differ from that of those who are younger?

A.—The incidence of the various anaemias shows an age-trend which depends on the type of the anaemia. Of the anaemias encountered after the age of 65 none are confined to old age. "Secondary" anaemia, either hypochromic or normochromic in character, is the most common, with pernicious anaemia running a close second. The various idiopathic haemolytic anaemias and aplastic anaemia are uncommon. A variety of hypoplastic normochromic anaemias, usually of protracted course, may be encountered in the older patient.

If dietary defects are excluded, hypochromic anaemia in old age is almost invariably due to chronic loss of blood from the alimentary tract, particularly as a result of haemorrhoids or of a silent, and sometimes relatively slow-growing, tumour in the stomach, colon, or rectum. Two frequently overlooked causes of unexplained anaemia in old age are iron deficiency due to prostatic disease and a peculiarly benign, practically symptomless, form of chronic lymphatic leukaemia with a not unduly raised total white cell count. Nutritional anaemias usually showing iron deficiency, but occasionally megaloblastic in type and often associated with multiple vitamin deficiencies in the diet, may be encountered among the old who live alone.

The elderly patient with uncomplicated pernicious anaemia will respond as readily as younger people to specific therapy. The old patient with an idiopathic hypochromic anaemia does tend to take appreciably longer to reach normal haemo-

globin levels than his younger counterpart on oral or parenteral iron therapy, but for practical purposes this difference in the rate of haemoglobin regeneration can be ignored.

Tolerance to anaemia is much less a matter of age than of the rapidity of onset and the nature of the anaemia. Thus, the 80-year-old with a haemoglobin of 30% due to pernicious anaemia may walk into the out-patient clinic complaining only of indigestion, whereas his junior with a haemoglobin of 50% following a silent intestinal haemorrhage arrives prostrate by ambulance. It should be remembered, however, that in a long-standing anaemia the heart may be involved, and, especially in the old, the cardiac reserve can be easily overtaken by, for example, injudicious blood transfusion. This applies especially to pernicious anaemia.

Young Glass-swallowers

Q.—There have been reports recently of chips of glass being found in school milk. How should a child be managed who swallows a piece of glass, and how urgent is the emergency?

A.—The emergency referred to in the question must be relatively rare, as there is no record of such a case in the paediatric department of a large teaching hospital during the past seven years. There are, however, certain principles affecting all types of swallowed foreign body. A small rounded foreign body will pass without any trouble. If, however, the foreign body is elongated, whatever its composition, and particularly if it has a sharp point or edge, it will tend to become caught during its passage through the bowel. During the seven years already alluded to twelve patients with swallowed foreign bodies were admitted. Only two of the foreign bodies required surgical removal, and these were hair grips which had become impacted in the duodenum. In these particular cases radiography was of great value. The operations were performed several days after admission.

Most schoolchildren drink their milk through straws, I understand, in which case a piece of glass of any size is unlikely to be swallowed. In the event of a piece large or sharp enough to cause trouble being swallowed, however, x-ray examination would be of little value. Reliance would therefore have to be placed on changing clinical signs which could be properly evaluated only with the patient in hospital. A suggested method of procedure would be to admit such a child to hospital for observation and repeated clinical examination for any evidence of developing peritonitis. At the same time, stools should be kept and examined for the passage of the foreign body. If the glass is passed, then the problem is solved. If, however, the glass becomes caught up and penetrates the bowel, laparotomy would have to be performed to remove it. The glass should be readily located owing to the development of peritonitis and exudation at the point of penetration. The damage to the bowel could then be repaired. To attempt to locate a foreign body at laparotomy without the help of radiography and the presence of some localizing physical signs might prove very difficult indeed, and in a considerable number of cases would in any event be unnecessary.

Endocrine Therapy after Radioactive Iodine

Q.—Does the treatment of thyrotoxicosis by radioactive iodine result in any alteration in the body's response to endocrine therapy, as, for instance, with oestrogens or androgens?

A.—Radio-iodine treatment should not affect the response of the patient to any other endocrine treatments except in so far as it may do so by altering thyroid function. In general, any lowering of thyroid function will decrease the body's response to other endocrine secretions or hormones, but not to any extent unless thyroid deficiency or myxoedema

has been caused by the radio-iodine treatment. In the latter event it would be better to treat the myxoedema with thyroid administration rather than to alter the dosage of any other endocrine treatment being given. Otherwise, any effect of the radio-iodine treatment on the dosage of other endocrine preparations needed would be so small that it could be ignored.

Sitosterol and Atherosclerosis

Q.—I have seen it stated that a preparation known as sitosterol has the property of eliminating cholesterol from the blood stream. Is there any truth in this, and, if so, is sitosterol of value in the treatment of atherosclerosis?

A.—Sitosterol is the generic term for the sterols present mainly in cereals; β -sitosterol is related chemically to cholesterol. One mode of action suggested is that it "competes" with cholesterol for the pancreatic cholesterol-esterase or other enzymes needed for the absorption of cholesterol. Another suggestion is that "mixed crystals" of the two sterols are formed. For long it was considered that sitosterol was not absorbed, but it is now known that it is and that it is metabolized in the body, the main excretory products appearing in the bile. Its main action, however, would appear to be in the intestine, consisting in interference in one way or another with absorption of cholesterol.

The observation that sitosterols hinder the absorption of cholesterol in experimental animals has been extended by various workers to the effect on cholesterol absorption in man, and it has been shown that sitosterol lowers the level of cholesterol and lipoproteins in the blood plasma. This might possibly be beneficial in patients with abnormalities of cholesterol and lipoprotein metabolism.

It is as yet too early to say whether sitosterol will be of value in the treatment of atherosclerosis.

Collapse During Dressing of Boils

Q.—What is the mechanism of the collapse which sometimes occurs in patients suffering from boils? I have seen five people lately who collapsed suddenly during the dressing of their boils. In all of them there was extreme pallor, sweating, faint pulse, low blood pressure, and dyspnoea. All recovered without any treatment in from a half to two hours. The collapse occurred during simple dressing without lancing or squeezing the lesion. Could the collapse have been due to anaphylactic shock following the sudden release of staphylococcal toxins?

A.—It seems probable that these patients had peripheral circulatory failure associated with vasovagal attacks. Such attacks are more common in young people and especially in those who are feeling out of sorts, as one does with boils. The attacks may be brought on by emotion, such as from the sight of blood, the prick of a needle, or a sudden fright, or by pain or fatigue, especially in an overheated room. They rarely occur if the patient is lying down.

NOTES AND COMMENTS

"Wind" in the Young of Mammals.—Dr. ESTHER WELBOURN (Cambridge) writes: I think your expert writing in "Any Questions?" (May 18, p. 1196) on the subject of "wind" in the young of mammals has omitted one important point—one stressed by Dr. E. R. C. Walker¹ in his excellent book. Discussing the techniques of feeding infants and the young of other mammals he remarks, "... In all other mammals, whether they suckle their young standing up or lying down, the body of the young is nearly always approximately at right angles to that of the mother. The advantages of this position are apparent. The teat, the mouth of the suckling, and his gullet are more or less in one straight line, which facilitates the process of swallowing and also, to some extent, obviates the swallowing of air, and renders less difficult the eructation of such air as is swallowed."

The difficulty your questioner mentions *vis à vis* the human infant lies in the lack of appreciation of this point. The hori-

zontal or near horizontal position in which I have seen so many babies (including paediatricians') breast or bottle fed disregards such anatomical considerations completely. An infant so fed tends to have trouble "getting up wind," as the air he swallows with his feed becomes mixed with the feed in the body of the stomach. In the more vertical position the air rises in the fundus whence it can be expelled comfortably with little or none of the feed with it. As I write as a mother and an erstwhile paediatrician, my remarks are not based solely on anatomical theory.

REFERENCE

¹ Walker, E. R. C., 1934, *The Healthy Infant*. W. Green and Son, Edinburgh.

Gynaecomastia from Oestrogen Therapy in Prostatic Cancer.—Dr. J. M. SIMISTER (Medical Adviser, Ward, Blenkinsop and Co. Ltd., London) writes: Your expert's reply ("Any Questions?" March 2, p. 353) to the doctor whose prostatic carcinoma patient was very distressed by his gynaecomastia incidental to the diethyl-oestrol treatment did not mention the alternative use of diethylstilboestrol phosphate ("hovan"). This drug is administered intravenously in a dose of 5 mg. daily to start with, later the dose and frequency of administration being reduced. In clinical work hovan has given rise to no gynaecomastia,^{1,2,3} or only occasional enlargement of the breasts,^{4,5} attributable to the drug. With this drug the oestrogenic activity appears to be negligible compared with the cystostatic effect.⁶

REFERENCES

- ¹ Carow, R., *Z. Urol.*, 1954, 47, 81.
- ² Schafer, W., *Dtsch. med. Wschr.*, 1954, 79, 221.
- ³ Flocks, R. H., Marberger, H., Begley, B. J., and Prendergast, L. J., *J. Urol.*, 1955, 74, 549.
- ⁴ Scharsach, F., *Ther. d. Gynäk.*, 1954, 93, 462.
- ⁵ Wilmanns, H., *Medizinische*, 1954, 17.
- ⁶ Krüpper, W., *Hamburger Arztblatt*, 1954, 8, 103.
- ⁷ Rudnick, R., Sioli, H. G., and Altwater, G., *Dtsch. med. Wschr.*, 1955, 80, 143.

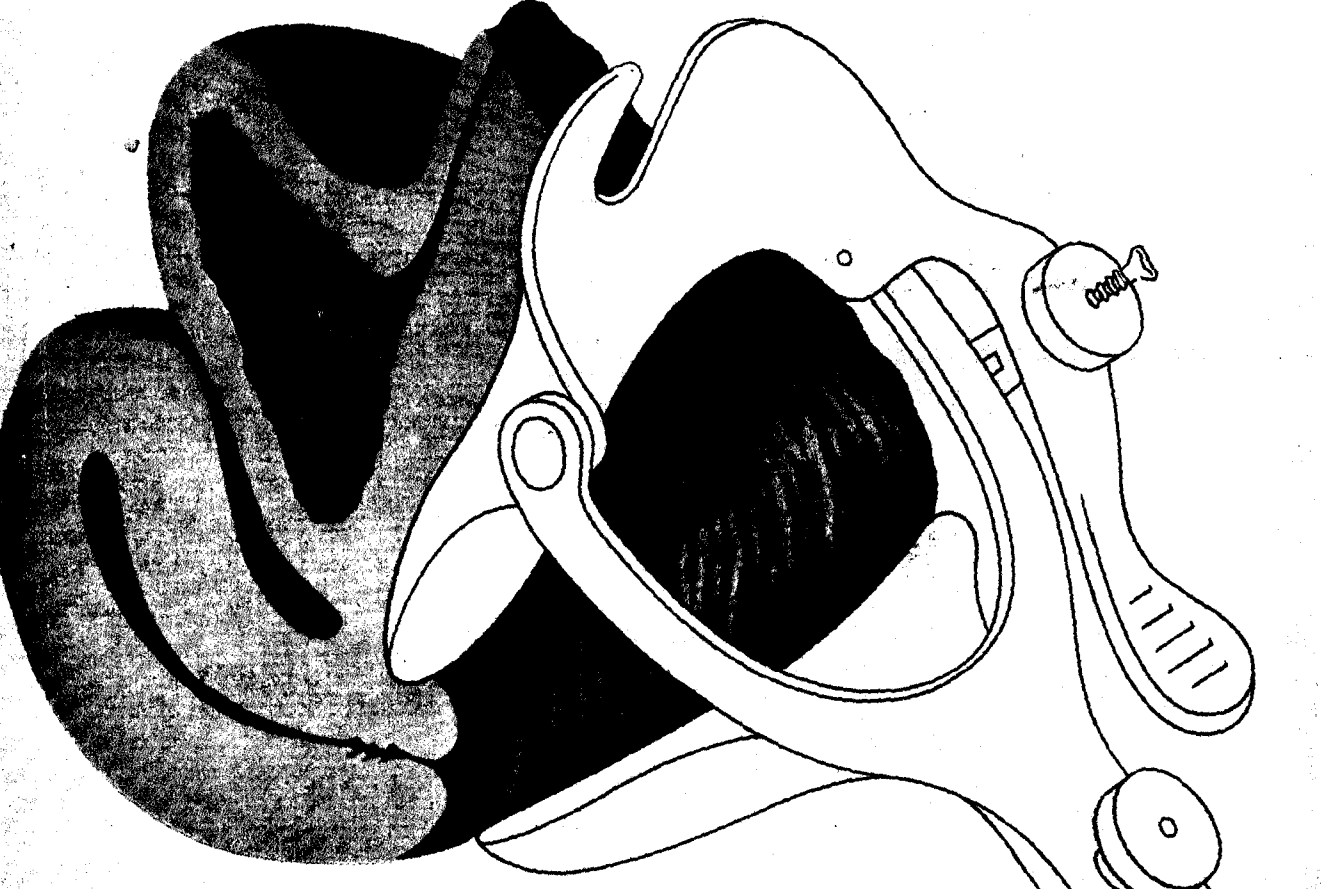
OUR EXPERT replies: It is of interest that diethylstilboestrol phosphate injected intravenously for prostatic carcinoma does not give rise to gynaecomastia. I note, however, that Flocks *et al.*¹ gave doses varying from 250 to 1,250 mg., average dose 500 mg., in 200 to 500 ml. isotonic saline infused intravenously at the rate of 300 ml. per hour; one or two infusions were given daily, usually for five days at monthly intervals. Of 66 patients treated by this method, 34 had previously failed to respond or had become refractory to the usual oestrogens. The authors reported that of the 66 patients treated by intravenous therapy "only one showed demonstrable evidence of improvement of evident metastases and 12 showed progressive bony metastases in spite of therapy." These results are not impressive. Surely for stilboestrol phosphate to exert its effect stilboestrol must be liberated from the compound by enzymatic action as occurs in the case of oestradiol benzoate and testosterone propionate, so that the end-result is the same as giving pure stilboestrol. If gynaecomastia does not occur, the conclusion is that stilboestrol phosphate is a weak oestrogen through failure of liberation of active stilboestrol and that its effect on prostatic carcinoma would be slight.

REFERENCE

- ¹ Flocks, R. H., Marberger, H., Begley, B. J., and Prendergast, L. J., *J. Urol.*, 1955, 74, 549.

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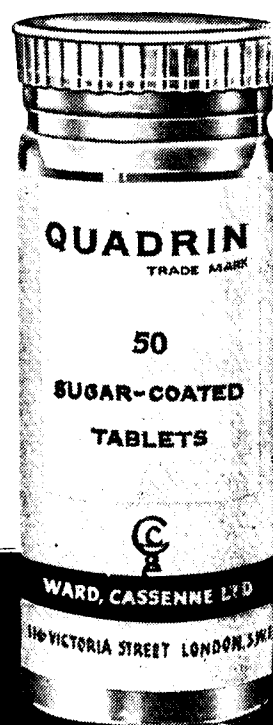


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BRITISH MEDICAL JOURNAL

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THE MEDICAL USE OF HYPNOTISM*

BY

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Although the written records describing hypnosis cover a period of over four thousand years no unifying hypothesis has emerged which can fully reconcile the facts of observation or be subjected to the test of experiment. For two centuries at least, however, there has been little doubt that use can be made of it in the treatment of functional nervous disorder. Indeed, that disorder in functions mediated by the central nervous system was possible without coexistent structural change came to be realized through a study of the illnesses which hypnosis was found to relieve. One has only to read Freud's ecstatic letters home after his first visits to Charcot's clinic in Paris to realize how much orthodox psychoanalysis must owe to the hypnotism which it now regards with a great deal of suspicion. The subject is thus one of great importance to psychiatry because of the field for research which it offers to the inquiring mind, for new principles of cerebral and mental activity will have to be developed to explain it.

Historically, too, the study of hypnosis was the starting point of present-day psychopathologies, and retrospect to this earlier stage may be helpful if we should in the future find it necessary to inquire whether at some point conventional psychotherapy may have strayed too far from the simple Hippocratic aim of making people feel better and behave better. From the point of view of education in psychotherapy we are able with the aid of hypnosis to present to the trainee an elementary version of the relationships of physician and patient which may occur in the therapeutic situation and of the ways in which these can be manipulated to the patient's advantage. If theoretical teaching is given while the trainee learns the practical management of hypnosis in suitable cases, the experience so gained can gradually be applied to more complex methods of treatment. Such a progression could be regarded as a recapitulation of the way in which Freud and many others, beginning with hypnosis and learning its valuable lessons, eventually found the way to other methods.

The use of hypnosis in the training of psychotherapists has also the advantage that it offers, without harm to the patient, the hope of providing experience of the therapeutic relationship while retaining the trainee's scientific objectivity. The principle of submitting to a personal psycho-analysis, with its incidental training in habits of self-reference and the danger of unquestioning indoctrin-

ation, must always be a matter for free individual choice. If there is a future for an objectively oriented training in psychotherapy, hypnosis might well play a useful though by no means exclusive part. Even if hypnosis in the hands of the unskilled or of those who do not accept responsibility for avoiding or resolving excessive transferences may lead to undue dependence on the hypnotist, it is on the whole a method which leaves few scars and makes no fundamental change in the personality that would not have occurred in the course of individual development. In responsible hands it is a safe method of treatment which can be combined with others and seems rarely to prejudice their use later in other hands.

Indications for Hypnosis

From the enormous literature of medical hypnotism it is difficult to extract much uniformity of opinion on the type of disability which is most likely to respond favourably. The account which follows is based on the experience of a single physician who has used it as a part, but by no means the main part, of his therapeutic armamentarium over a period of more than twenty years. During this time the opportunity has been taken to explore its possibilities in new fields. In the main, the choice of method has been governed by a wish to expose patients to the minimum of psychotherapeutic contact necessary to bring about a satisfactory readjustment. The aim has been to make a minimum of permanent impression on the patient, returning to him as soon as possible the unsupervised direction of his own life. As all psychotherapy must be opportunist in the light of the patient's response to it, hypnosis has not usually been the only technique used, for it can be combined well with the usual methods of therapeutic scrutiny and of the promotion of insight.

For the purpose of description the uses of hypnosis are divided into four groups: (1) Conditions in which hypnosis is often the method of choice. (2) Conditions and types of patient in which it ranks as one of the possible approaches or in which it may be used in combination with other methods. (3) Conditions in which hypnosis has produced useful results but in which its use is not firmly established and is worthy of further investigation. (4) Certain uses of hypnosis in subjects who are not the subject of psychiatric disorder.

Conditions in which Hypnosis is often the Treatment of Choice

(a) *States of recent onset in which there is an alteration or dissociation of consciousness which has something in common with hypnosis itself.*—These include hysterical amnesia and fugue, hysterical stupor, and also twilight states and generalized disabilities such as *astasia-abasia*,

*An address given at the Annual Meeting of the Royal Medical-Psychological Association on July 17, 1956.

which have appeared after acute stress, and the "recent hysteria" group of reactions. In these patients it is usually possible to induce a deep hypnotic state very rapidly, the patient accepting willingly this additional form of psychological retreat. Under hypnosis he is brought again into contact with the circumstances which led to his dysmnestic or dissociative reaction. This usually results in an emotional crisis, after which the depth of hypnosis can be brought under control and memory restored or the symptoms relieved by direct suggestion. This can easily be done in a hospital casualty department, and there is much to be said for thus removing the symptoms as soon as possible after their onset. Removal of the symptoms places upon the therapist the obligation of doing something about the stress or conflict he has brought to light and to which the patient has been unable consciously to adapt.

(b) *Where investigation or psychotherapy is made impossible by a symptom which prevents normal communication between patient and physician.*—Hysterical deafness and aphonia are the best examples, but tics, stammering, and choreiform movements may also conveniently be relieved temporarily in this way. An underlying organic predisposition or even a clear organic origin does not exclude the use of hypnosis; for tics, tremors, habit spasms, and rhythmic movements may be removed for a few minutes to an hour or two on the first occasion, and they can be disencumbered of any admixture of hysteria and thus brought within the range of communication.

(c) *Where in the course of treatment of a functional disability the psychological causes have become evident, even to the patient, but this insight has not led to a clearing up of the symptoms.*—Thus removal of symptoms, the psychogenesis of which has "expired," can be brought about by hypnosis when the patient has already reached a point where he can do without his disability. Hypnosis gives him a reason for recovery beyond mere talk, removes his apprehension that he may be thought to have been consciously simulating, and, by suggestion, supplies the critical initiative for recovery. In such patients the results are dramatic and permanent provided that the foregoing psychotherapy has really achieved its objects. When a patient is first seen it is sometimes difficult to convince him that his disability is in fact functional and that psychotherapy is indicated. Initial removal of the symptom under hypnosis, however temporary, makes it evident to the patient that his symptom can be removed by a purely psychological approach and his co-operation in deeper psychotherapy may be elicited.

(d) *In functional conditions superimposed upon and pre-disposed to by organic nervous disease.*—The hysterical superstructure found in patients with chronic encephalitis lethargica, epilepsy, and disseminated sclerosis are conveniently treated by this method. An important use of hypnosis is to remove the functional overlay which occurs in many cases suffering from extrapyramidal motor disorder. Unfortunately the success obtained has sometimes led to the mistaken view that the underlying organic disease has been helped. Hypnosis appears to be useful in the special instance of the minor functional disabilities of leucotomized patients. Relapse is common in this organic group, but the treatment is nevertheless economic, especially where other methods would not succeed at all or where life is likely to be shortened by the organic disease.

(e) *Cases of psychoneurosis unfit for psycho-analysis as judged by the usual criteria of selection for that method.*—These patients, on account of poor intelligence, personality type, or other constitutional disabilities, are unable to respond to any method dependent on their insight. In some of them it is, of course, unlikely that any permanent improvement in adjustment can be brought about by any method, and relapse is frequent.

(f) *Patients who have, as a defect of personality or as the results of organic nervous disease, a gross facilitation of the mechanism of dissociation of consciousness, motivated amnesia, and advantage-through-illness, and suffer from the*

so-called degenerative hysteria or are possessed of the hysterical character. While the results obtained are superficial enough, the relatively long periods of normal behaviour after treatment as revealed by follow-up studies make it appear that hypnosis is not only the most easily applicable treatment but that it is economic in terms of the patient's adaptation to life and of society's contribution to his welfare.

Conditions in which Hypnosis is One of the Methods which may be Used, the Choice of Method Depending on the Individual Patient

Abreaction Techniques.—Often the choice is between the use of drugs and of hypnosis. Examples are:

Patients with anxiety states in which exploration and abreaction may be achieved by the use of intravenous barbiturates. Hypnosis is at least as suitable, if it can be induced, and it allows the abreaction to be regulated and sustained far longer than is possible with drugs. It is not practicable to mix the two methods, as narcotics materially alter the response to hypnosis and make it difficult. If a satisfactory depth of hypnosis cannot be induced after two or three trials, abreaction can then be attempted with drugs.

Patients with hypertension and peptic ulcer who have been shown to be capable of normal function if given rest in bed and sedatives may also be suitable for treatment with hypnosis. It has the advantage that the patients can subsequently be taught to relax as a daily exercise and even to hypnotize themselves. This is not to say that hypnosis has anything to contribute to non-labile hypertension or non-intermittent ulcer.

In conditions such as nocturnal enuresis where the presence of the symptom induces anxiety which in turn makes it worse. Hypnosis can be used to break this vicious circle by removing the symptom for a few days by direct suggestion. A considerable number of enuretics recover in this way, and hypnosis is always a method that can be tried when others have failed. Similarly in dermatological states where scratching prevents healing of the lesion, a few days' relief from pruritus by means of hypnotic suggestion will give the skin a chance to recover. The results in generalizing dermatitis are often such as to suggest that other factors than cessation of irritation may be involved and that there is a more general calming of underlying anxiety.

Conditions in which Hypnosis is Occasionally Strikingly Successful and in which its Use is Worthy of Further Investigation

(a) *Habits.—Smoking.*—It is doubtful if hypnosis alone will permanently remove the desire for tobacco in a real smoker. It will, however, do so for a period of a day up to three weeks after a single session and will get the patient started on his abstinence if he wishes to give up the habit. Repeated hypnosis has been rather disappointing, and success must be judged against the fact that many people are able to give up smoking without its aid. *Alcoholism.*—Here again hypnosis may help if every other possible precaution is taken to reduce the desire for alcohol. Recovered alcoholics who have to report at intervals are apt to regard this essential contact as rather unnecessary, but if they are to be hypnotized they will usually come willingly enough. As it is at this stage, in the first months after "drying out," that suggestion is most necessary, it is well worth using in a suitable patient. The problem here, however, may become one of sheer boredom for the psychiatrist, and the use of a lay hypnotist to continue under his supervision may afford him welcome relief. *Obesity.*—Here the results may be quite good when there is to be a short period of reduced eating at the outset of treatment. The induction of a general distaste for food for short periods is possible in some subjects and may be used in the initial stage of dieting. The most useful objective, however, seems to be to leave the patient with the habit of ignoring certain articles, such as bread, butter, milk, potatoes, etc., once the initial reduction has been accomplished, by suggesting lack of interest in them.

(b) *Psychosomatic Disorders.*—In mucous colitis, generalizing eczema, hysterical vomiting, and hyperventilation results are often very good and there seems to be much

to be said, when underlying factors are very complicated, for preferring this approach to more time-consuming psychotherapy. I am not able to confirm the results claimed in peptic ulcer, malignant hypertension, ulcerative colitis, rheumatoid arthritis, psoriasis, etc. Others who make use of hypnosis seem to get better results than I can in these conditions. On the other hand, however it is accomplished, the evidence for the successful use of hypnosis in warts and xeroderma is very strong.

(c) *Inoperable Carcinoma and Intractable Pain.*—Patients who have prematurely been given morphine derivatives before pain is severe, or who have become agitated and anxious since being told that there is little prospect of recovery, have not infrequently been referred to me as possible subjects for prefrontal leucotomy. They have usually proved to be good subjects for hypnosis, and it has often been surprisingly easy to remove the panic attacks and also the anticipation of pain. In some cases it has been possible to stop giving analgesics or very materially to reduce them, and the patients' distress has then been seen to be due more to addiction than to pain. It appears that morphine or its equivalents has in such patients sometimes been given initially as much on the strength of the diagnosis as on their need for analgesia.

Certain Uses of Hypnosis in Psychologically Healthy Subjects

(a) *In Childbirth.*—There is a great deal to be said for the use of hypnosis as an analgesic. Not only is the pregnant woman usually an excellent subject, but in my experience it is always easier to induce deep hypnosis during labour than it is during pregnancy, so that there need be no fear of its failing during delivery. The only difficulty is the great amount of time one has to spend with the patient. Labour appears to be in no way held up by hypnosis, and the patient seems better able to co-operate, to relax, and to "use her pains" in the third stage. Certainly there is no danger of foetal anoxia when hypnosis is used to provide a painless labour, and it leaves the woman free to enjoy the ecstatic experience of labour well done and the arrival of a new child. If some means can be found for legitimately training in hypnosis someone who has to be there anyway, it would be an ideal way of having children. As it is, it can be available to few.

(b) *Anaesthesia.*—If inhalation anaesthesia had not been discovered hypnosis might by now be in common use, for a great deal of work had been done on it. I have used it at times for a variety of operations. In dental and nasal surgery it has the great advantage that the patient can be made to spit normally and the nasopharyngeal reflexes can be retained or removed at command. Only a minority of patients, however, can be given full surgical anaesthesia at the first attempt. Of these, young healthy people in the prime of life appear very frequently to be good subjects, and use was made of this in emergency operations in time of war. The hypnotic state, or the state of relaxation from which hypnosis develops, is an ideal one in which to receive an anaesthetic, and an anaesthetist with a soothing manner may unwittingly hypnotize his patient before he anaesthetizes him. There is something to be said for allowing trainee anaesthetists to learn the technique, if only because hypnotic phenomena occasionally appear uninduced in their patients. There is one type of operation in which hypnosis really seems to help in a unique way, and that is when the aged are operated upon for gangrene of the feet under refrigeration anaesthesia. Old people often make good subjects for hypnosis but easily become anxious when given local and spinal anaesthetics, so that, if time permits of a short period of initial instruction, hypnosis may be of great help in such patients.

(c) *Stammering.*—Reports on the treatment of stammering are conflicting, but my own experience, which resembles that of a number of medical hypnotists, is that it is disappointing. As a means of teaching the relaxation needed for

speech-therapy it is of value, and also for relaxing the mild stammerer on a special occasion; but the recovery, as the result of hypnosis, of a stammer which has come on in childhood must be uncommon. In the hysterical speech impediment of sudden onset in adult life, however, often in a former stammerer, hypnosis will usually remove the symptoms at once. One condition which is often helped by hypnosis is the dreaded "drying up" which may occur in public speakers and actors. Hypnosis beforehand is remarkably successful, and I have even allowed an actor with a dread of drying up to go on the stage in a state of hypnotic somnambulism. There was no outward evidence of his altered state of consciousness and he identified himself so fully with the part he was playing that there was some confusion with his own identity afterwards. Subsequent performances were given in a normal state without drying up, but, I am assured, they were lacking in the inspiration of his hypnotized display.

(d) *An Aid to Recall.*—An occasional use of hypnosis in normal individuals is to help to find lost articles which have been put somewhere and forgotten. If the individual is made to relive in detail the period during which the article was mislaid a very complete memory can sometimes be restored. Within a reasonable time-span hypnosis will thus allow of the recall of unclassified memories otherwise unavailable.

Conclusion

There is reason to think that in recent years the medical profession has taken a more liberal and objective view of hypnosis as a technique of psychotherapy and this has been given expression in the 1955 report of the British Medical Association. We are still being embarrassed by excessive claims and enthusiasms. Many of these were traceable to the public demonstrations, which are now much restricted by the Hypnotism Act. The subject is still surrounded by a good deal of mystery and magic in the minds of the general public. It has to be recalled, however, that hypnosis was the principal method of psychotherapy during the early part of the nineteenth century, and for much of this time its use and its results were taken for granted.

It seems almost impossible to make any reliable statistical assessment of the long-term results of psychotherapy, hypnotic or otherwise. In that patients have returned to their jobs and have been relieved of their symptoms it is likely that in general the results of using hypnosis in functional nervous disorders are comparable to those obtained by other techniques. In this connexion it may well be that there should be some sort of revision of our ideas of what is to be expected from psychotherapy. At present, in the analytically oriented schools the main interest is centred round full psycho-analysis. This method is, for both economic and psychiatric reasons, available to very few people, and the evidence is not strong that even if it makes these different it makes them better. Other treatments are usually regarded as falling short of classical analysis, although derivatives of Myerian distributive analysis, and "analytically oriented" and interpretative methods, account for an overwhelming proportion of the psychotherapy carried out within the Health Service.

There seems to be a place for a treatment that can remove the symptoms of which the patient complains, even if it is unsatisfactory to the therapist in terms of insight and psychopathology. If something is to be done about the enormous number of psychoneurotics who clog the wheels of civilized intercourse, it may be that our therapeutic sights should be lowered, and that we should, for the majority of patients, have a more concrete aim of relieving symptoms and making them more happy and less trouble to and less dependent on their fellows. If these are the objectives, shorter methods necessarily have a place, not as substitutes but as therapies in their own right, and in this briefer and more physician-dominated treatment hypnosis may have a considerable part to play.

SOME USES OF HYPNOSIS IN
GENERAL PRACTICE

BY

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Hypnosis is a form of therapy that has for many years been frowned on; nevertheless, in psychosomatic medicine and the psychoneuroses it has often produced beneficial results when more orthodox measures have failed. It is from precisely these two fields that many "problem patients" in general practice are provided—patients who have gone from consultant to consultant and from out-patient department to out-patient department and have ended with the label "incurable" or "functional," with a regular bottle of medicine or tablets. It was decided to try hypnotherapy on some of these patients to see if they would derive benefit from it; the results obtained are given below.

Method of Treatment

All patients were seen weekly for an average of 8–10 weeks for a period of from 30 to 50 minutes, the time varying with the therapeutic measures used after the hypnotic induction. The consulting-room was warm and quiet and the couch wide and comfortable. No special apparatus was required.

Before induction was started the patient was questioned for any doubts or misapprehensions about hypnosis, and any fears were allayed by a simple explanation and reassurance that the phenomenon is perfectly normal and physiological, and no harmful effects would arise.

The induction was then begun. The technique used in all cases but one was of eye fixation together with progressive relaxation and strong suggestions of sleep. This is a simple but very efficient method, and usually a trance state was induced in 5–15 minutes. At subsequent inductions the time of induction was much shorter—often instantaneously at a given signal. The one case that was an exception needed a more authoritative approach—that is, eye-gaze—as he felt unable to relax under the more soothing approach.

For this type of therapy, when analgesia or anaesthesia was not the aim of treatment, a light trance was sufficient to obtain therapeutic results (where they were obtainable). It was found that of the cases selected for treatment, 90% were able to be hypnotized, which agrees with the usually accepted figure that any one hypnotist will be able to hypnotize only 90% of his patients.

The decision on the type of treatment required when the patient was in the trance state depended on the nature of the case. Thus, in general, asthmatics were treated by suggestion, hysterics by emotional abreaction, and cases of anxiety by psychotherapy; but this was not a rigid framework, as in all cases a search for the emotional basis of the complaint was made. Experience and the "feel" of the patient gave the best guide to the approach required.

Duration of Treatment.—As stated above, the average number of sessions per patient was 8–10. Individual cases varied from one session, in which cure was achieved, to weekly sessions lasting over many months. It is, in fact, the length of treatment that makes hypnosis difficult to use in general practice.

Results

In the Table are recorded the results of treating 41 patients during the period May, 1954, to April, 1956. There were 12 cases of asthma, 7 of various skin diseases, 16 psychiatric cases, 2 of an anxiety state superimposed on an organic disease, a stammerer, an enuretic, and 2 cases of obesity.

Some working criterion for successful treatment had to be evaluated. Primarily, of course, the complete disappearance

Results of Treatment

Complaint	No. of Cases	Cure	Partial Cure	Failure
Asthma	12	9	2	1
Eczema	3	2	1	1
Psoriasis	1			1
Rosacea	1	1		
Warts	1			1
Cicatricial alopecia	1			1
Anxiety state	8	2	2	4
Hysteria	2	1	1	
Emotional shock (traumatic)	3	3		
Inferiority feelings	1	1		
Compulsion neurosis	1			1
Nail-biting	1	1		
Stammering	1		1	
Enuresis	1			1
Anxiety-tension on organic disease	2	2		
Obesity	2	1		1
	41	23	7	11

ance of the symptoms complained of, their non-reappearance over a period of time, and the failure of emergence of fresh symptoms would constitute complete success. Of the 41 patients treated, these criteria were fulfilled in 23. Partial success is claimed when the original condition had not disappeared but had considerably improved and no fresh symptoms had emerged. This occurred in 7 cases. Failure, of course, means no improvement at all, and this occurred in 11 cases. In no case was the patient made worse by treatment.

All cases have been followed up for periods varying from six months to two and a half years to see that the criteria listed above are fulfilled. Reports of some illustrative cases are given.

Asthma

Case 1.—A boy aged 12 had suffered from asthma since the age of 2 years. As a baby he had had infantile eczema. The asthma had severely incapacitated him, so that he was unable to participate in normal school activities, and indeed was backward from the loss of schooling. He was treated simply by hypnotic suggestion for 10 sessions and rapidly improved. He has been free of asthma entirely for 12 months, is capable of most physical exertions, and has lost no more schooling.

Case 2.—A clerk aged 17 had had asthma since an attack of pneumonia when aged 6 years. He had severe attacks only about four times a year, but he always wheezed on any undue exertion and was unable to play any games. He was treated by hypnotic suggestion for 10 sessions, and his symptoms cleared completely. There has been no relapse in 18 months.

Case 3.—A pharmaceutical chemist aged 37 had suffered from asthma since the age of 6 months, apart from a free spell between the ages of 15 and 23 years. He had attacks every night, and had tried every remedy in the *Pharmacopoeia*—all to no avail. He was treated by suggestion, together with psychotherapy under hypnosis, when his asthma restarted soon after the death of his mother, which he felt intensely. His attacks considerably lessened but did not cease altogether, and he was taught autorelaxation—to control an attack before it has developed, by breaking the vicious tension circle. This was reinforced by post-hypnotic suggestions, and after 10 sessions he has not had an attack that could not be cut short by this technique over the past two and a half years.

Case 4.—A photographer aged 58 had had asthma for six years. It started when he was cleaning a basement and had developed to daily or nocturnal attacks. No source of anxiety or guilt was uncovered, but hypnotic suggestion effected a complete cure in five sessions with no relapse over two and a half years.

Dermatology

Case 5.—A carpenter aged 71, a widower and keen amateur singer, had suffered from eczema on the glans penis

for two years that was resistant to all treatment. In addition, for the same period he experienced a tightness in the throat and chest which prevented him from drawing a deep breath, and thus his singing had deteriorated. He was in perfect health otherwise, and no cause could be adduced for his complaints when a normal history was taken. However, on questioning under hypnosis, the story emerged of sexual intercourse with a woman he believed to be a widow but who was nevertheless married. When he learnt this fact he had experienced tremendous guilt about his adultery, and anxiety that people would get to know. A couple of weeks later the eczema (guilt) and the tightness of the chest (anxiety) appeared. After unburdening his story he felt immediately relieved, and on being withdrawn from the trance he burst into a long joyous aria from *Don Giovanni*. After two more sessions the eczema and chest tightness had vanished, and two years later he remained cured.

Case 6.—A clerk aged 18 had suffered from asthma since he was five years old and an eczema of the hands and arms since starting work in a paper factory at the age of 15 ("industrial dermatitis"). In addition, for the past six months he had had warts on his hands. The asthma had caused his discharge from Army service. He was treated by hypnotic suggestion, as no emotional basis was easily to be found. The asthma cleared immediately, and after eight sessions the eczema had gone too. The warts remained and were accordingly curetted away, using hypnotic anaesthesia. He has had no recurrence of any complaint after two years three months. This case is of some interest since one complaint that is renowned for disappearance by suggestion—that is, warts—was not influenced at all by this most powerful form of suggestion.

Case 7.—A compositor aged 45 had suffered from a severe eczema for 20 years. It had a supposedly occupational aetiology and often covered most of his body. He had a very inadequate personality, feeling inferior to his workmates, lacking in initiative, and leading a solitary existence in lodgings. He was, of course, unmarried, and was afraid of women. He had received much treatment over the years, both dermatological and psychiatric, but he had not improved. He was treated by hypnotic suggestion to stop the irritation, and thus the scratching, and to allow healing to take place; in addition he was given a long course of psychotherapy extending over nine months. His skin condition improved rapidly and became 90% better, and in due course he developed a change in his personality and behaviour. He became much more aggressive at work, he developed a taste for music and poetry, lost his dreadful guilt about masturbation that made him feel dirty, and because of this he changed from a dirty, badly dressed man to a clean one with a fair degree of clothes-sense—that is, he no longer felt dirty, in both senses of the word. He terminated treatment at his own request, as he felt he no longer needed it. During the course of psychotherapy he had one relapse in his skin complaint, and that occurred when I went to hospital for an emergency appendicectomy. However, it rapidly cleared when treatment was restarted. For 18 months there has been no relapse in his skin or medical state since terminating treatment.

Psychiatric

Case 8.—A housewife aged 60 had suffered for 10 years from nervousness, lassitude, and insomnia. She never felt well, and a year before starting treatment she developed symptoms of diabetes mellitus—that is, loss of weight, polyuria, and polydipsia—but no evidence of this disease was found. The origin of her troubles was the severe emotional shock produced by the explosion of a land mine near 17 during the last war—that is, bomb-shock. She had been uninjured—physically—but some close friends and relatives had been killed. There was conscious memory of the event, but the emotional affect was missing. Under hypnosis she was abreacted to the explosion—a great emotional release obtained during the reliving of the episode. On awakening

from the trance she felt much better, and since that one session two and a half years ago she has had no further trouble and no symptoms.

Case 9.—A similar case to the above was that of a woman aged 39 who had been severely injured about the head during an air-raid. Her face and scalp were much scarred and she suffered from severe unilateral headaches on the side of the scarring, insomnia, and an inability to concentrate for long periods. She also was abreacted to the explosion with a similar vivid emotional release. After this session headaches greatly diminished in intensity and frequency, she was able to concentrate and could sleep without sedatives. Possibly the residual headaches were due to some underlying damage to the coverings of the brain which was not detectable clinically.

Case 10.—A housewife aged 54 had suffered from a partial loss of voice for six months—she was only able to whisper. This symptom had developed after a bad cold, and nothing could be found to account for this physically, since all investigations were normal. She was given a course of E.C.T. by the psychiatrists, as it was thought to be perhaps menopausal in origin; however, it did not help her. The only relevant history was the marriage of her daughter four months before the symptoms began. Under hypnosis she was taken back to the wedding and immediately began to sob and speak in her normal voice. The story emerged that she felt terribly guilty regarding the time of this marriage, since it associated with her own wedding, which had taken place when her father was dying. On emerging from the trance her voice went back to a whisper. At the next session the story continued that her father had had three strokes, and had lost his voice and been unable to speak to her. It was pointed out to her that she was identifying herself with her father, and on awakening this time her voice was perfectly normal and has remained so for the past 15 months.

Case 11.—A housewife aged 44 had been involved in a car accident six months previous to treatment and suffered from severe headaches, dizzy spells, and fits of depression. No injury apart from a little head bruising had been sustained. She was abreacted to the crash, and following this session has remained well and symptom-free for two years.

Case 12.—A male window-dresser aged 35 suffered from feelings of inadequacy and inferiority. He blushed when spoken to, and he felt unable to advance in his job as it entailed speaking at occasional company meetings, which he could not do. He was treated by simple suggestion under hypnosis for 12 sessions—no simple psychological origins being found. This resulted in a tremendous improvement in all his symptoms, and he became endowed with a strong comforting feeling of confidence in himself. This has continued with no relapse for 18 months.

Case 13.—A female cashier aged 21 had 18 months previously developed a severe tremor of the hands when holding a cup of tea. This had a sudden onset when having tea with newly married friends. This tremor was getting worse and was a source of great anxiety, and sedation would not help. There was no physical abnormality. She was a very self-conscious, awkward girl, but usually got on well with her friends. She was treated by direct suggestion under hypnosis, but some psychic probing eventually revealed that this newly married friend of hers had laughed at her for being "gawky" just before the onset of her symptoms and this had made her both very annoyed and very upset. In 12 sessions the tremor and anxiety had vanished completely, she moved with far more grace and dignity, and over the past nine months has had no recurrence.

Case 14.—A schoolgirl aged 16 had from the age of 7 years suffered from an inability to write in the normal manner. If she tried to hold a pen or pencil in the usual way the hand would jerk violently and uncontrollably so that nothing could be written. In order to write legibly—and she did attend a grammar school—the right hand had to be doubled up completely and the pencil would slope in the opposite direction from the normal. No cause had been found for this over the years. Under hypnosis she

very tearfully produced the story that at the age of 7 years, while writing on a card in the children's library to reserve a book, she saw the two librarians looking at her and laughing. She believed they were laughing at her, and from that time she had developed this abnormal hiding method of writing. On emergence from the trance she was able to write perfectly normally if the paper was sloping towards her, but she still wrote abnormally if the paper was horizontal. Further sessions revealed little fresh trouble, and no further improvement could be effected. However, she now feels, 18 months later, that, although she still cannot write perfectly normally, she no longer has any anxiety about it, as she appreciates the reason for it. Undoubtedly there is a far deeper emotional disturbance causing this symptom to persist partially, but it was not revealed during her sessions.

Case 15.—A social worker aged 27 had always picked and bitten her nails. She got worse when her fiancé was killed suddenly. Suggestion and abreaction to the death under hypnosis produced rapid results in two sessions, with no relapse after two years.

Organic Disorder with Superadded Anxiety

Case 16.—A reader's copyholder aged 52 had suffered from coronary thrombosis which occurred during an attack of pneumonia six months before treatment began. Since then he had complained of severe dyspnoea at rest, tiredness, insomnia, and an inability to do anything for himself, coupled with severe anxiety. His symptoms were out of all proportion to his cardiac efficiency, and nothing would help him. He was treated by hypnosis and immediately uncovered anxiety, not about his heart but his memory. He had always prided himself on his excellent memory, but with advancing years it had deteriorated. This caused him to fail a special examination concerning his occupation, and, even worse to him, he was unable to memorize various aspects of Freemasonry ritual and so failed to attain higher office. He felt much better after this, and his symptoms improved. A later session revealed guilt and anxiety at an episode of extramarital intercourse. He was soon back at work but unfortunately developed another coronary thrombosis, and a little later a third caused his death.

Case 17.—A printing manager aged 47 had developed disseminated sclerosis six months previously; he knew the diagnosis and prognosis. The complaint manifested itself with weakness of the face (unilateral) and legs, abdominal cramps, and various paraesthesiae. He became very tense and introspective into his complaint, lost his confidence, and was unable to work in spite of sedatives, tonics, etc. He was treated by hypnotic suggestion, as no particular anxieties were revealed apart from those associated with the disease. He rapidly improved, and within four sessions was back at work and feeling much better about his complaint. Treatment continued for nine sessions in all. He has maintained this improvement over the past 18 months apart from a spell of vertigo and facial anaesthesia caused by his complaint.

Obesity

Case 18.—A housewife aged 35 had become obese, her weight having risen from 9½ stone to 12 stone 5 lb. (60.8 to 78.5 kg.). She was unable to remain on a weight-reducing diet, even with amphetamines, as she felt a compulsion to eat the most fattening foods such as chocolates, sweets, and cream cakes, even after filling herself with a weight-reducing meal. She had had a most unhappy life: her mother had committed suicide, she was separated from a husband whom she despised, and had had two sons, one by the husband and another by a lover. She was deeply disturbed and felt that everyone was against her. Under hypnosis she had extreme emotional outbursts for the first three sessions, crying and shouting while pouring out the unhappy events in her life. After this she quietened down and was able to discuss her problems with some detachment. She was treated for six months, and at the end of this time had lost 2 stone (12.7 kg.) in weight and also her compulsion for

food: the necessary consolation and punishment was no longer necessary. Over the past nine months there has been no relapse.

Discussion

It must first be emphasized that this series of 41 cases does not allow of any statistical evaluation of the efficacy of hypnotherapy. The total number is too small and the type of complaint too varied to allow for this. The only possible significant result is obtained in the asthma group—9 out of 12 cases were completely cured and 2 partially cured. The other case relapsed soon after treatment ended and would not respond at all on a second attempt. However, the relief in individual human suffering cannot always be measured with a yardstick.

With regard to the actual therapy itself, a few points should be noted. Firstly, as previously mentioned, it is very time-consuming for the practitioner and a good deal of leisure must be forgone. This is counterbalanced, however, by the fact that successful treatment does remove the patient from continuous surgery attendance. Secondly, few unpleasant after-effects have been produced. Occasionally some light-headedness or dizziness was complained of after the first session, but this was easily countered by post-hypnotic suggestion. Thirdly, the patient does not become dependent on the therapist after treatment ceases. The dependency is a common misconception, but it did not occur to one patient in this series. However, as in orthodox psychotherapy, particularly when prolonged, a dependency relationship does develop during treatment, but this is no longer present after treatment is terminated. This point is well illustrated by Case 7.

The failures in treatment are listed in the Table, but again no conclusions can be drawn on inefficacy of treatment. These patients were all readily hypnotizable but did not respond to treatment in any form.

In addition to the 41 cases treated who were able to be induced into the trance state, five others had been selected for treatment but were un hypnotizable. This accords with the usual figure quoted (90%) for ability to induce hypnosis by any one therapist.

In this series the psychosomatic cases—that is, asthmas and eczemas—have responded well to suggestion and hypnotic psychotherapy. The teaching of autorelaxation to the asthmatics was very valuable to some of them. Among the psychiatric cases those with a history of a specific emotional trauma did particularly well after abreaction, and cures were rapidly obtained. In the pure anxiety states it was not so successful, as the deeper technique of hypnoanalysis was undoubtedly required and the time factor here became of greater importance. But in the relief of anxiety-tension complicating an organic disease, hypnosis was very useful and appears to have a wide application here, since in many organic disorders the anxiety grossly aggravates the organically determined symptoms.

Not everyone can or wants to practise medical hypnosis, but it is a valuable therapeutic measure when other methods have failed. It is only by further experience that its potentialities and limitations can be satisfactorily defined and ascertained.

Summary

A series of 41 patients have been treated by hypnosis, using varying techniques after induction. The results obtained are described and enumerated. No statistical conclusions can be drawn, but its value is suggestive.

The Medical Laboratory Technician, No. 57 in the new "Choice of Careers" series issued by the Central Youth Employment Executive, has been revised. This booklet includes chapters on work in hospital and other medical laboratories, professional training and personal qualities required, openings, and salaries. It is published by Her Majesty's Stationery Office, price 6d. net.

THE SCOPE FOR HYPNOSIS IN GENERAL PRACTICE

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The aim of this paper is to show what uses can be made of medical hypnosis in general practice; the types of cases which may and those which will not benefit from it; and its clinical effects.

Technique

If hypnosis is to be of use in general practice the technique must be simple and the sessions not too lengthy. It is surprising how good the results can be with very short sessions of 5 to 10 minutes each in cases of dysmenorrhoea, asthma in children, and insomnia. The psychoneurotic and psychosomatic cases require much longer sessions.

For the induction of hypnosis, the method using fixed gazing and verbal suggestion was found the most successful; this, however, had to be modified occasionally according to the individual case. No drugs were used to facilitate the induction. In most of the cases treated, the hypnoidal and light trance states were found sufficient to obtain satisfactory results. Deeper states, however, were required in obsessional and anxiety cases.

The degree of hypnosis of the cases was: unsuccessful, 14%; hypnoidal and light trance states, 63%; medium trance, 9%; deep trance, 14%. These figures compare with those given by Weitzenhoffer (1953): unsuccessful, 14.70%; hypnoidal and light trance, 40.34%; medium trance, 24.92%; deep trance, 20.04%.

Before treating a patient with hypnosis very careful history-taking and clinical examination are essential; any possible organic causes must be fully investigated and treated on conventional lines.

The first interview is very important, since the method of approach to the patient may influence the effect of the treatment. He should be given a full explanation, in as simple language as possible, of his condition, the form of the treatment to be carried out, and how it may help to overcome his difficulties and remove his symptoms. Most people view hypnosis with scepticism and apprehension: it is only human, after all, to regard with a certain fear anything that is mysterious and imperfectly understood. The patient must be reassured and convinced, so far as is possible, that he cannot be harmed by it, even though it may not help him. At the outset it is advisable not to mention the word "hypnosis," but to use another term to describe the proposed treatment—for example, "suggestive relaxation." Usually the patient loses his scepticism and apprehension after the first or second session.

In cases with no deeply rooted causes or conflicts, direct suggestion in a light hypnotic state is sufficient to remove the patient's symptoms. In the neurotics and psychosomatics it is necessary to probe deeper to find the causes of the trouble, or the "crucial incident." In such cases the deeper states are required. Neurotic cases which are treated only superficially with suggestion of symptom disappearance usually relapse and develop substitution symptoms. If, however, the root of their trouble is discovered and brought up from the subcon-

scious to the conscious level of their mind, such relapses can be avoided.

At first, the patient is seen once or twice a week. The intervals between the sessions can then be lengthened gradually according to the progress of the case. In some obsessional and anxiety cases, maintenance therapy may be necessary, and patients may have to be seen once a month or once in two or three months.

It is advisable to bring the patient out gradually from the hypnotic state. Sudden waking may cause headache, drowsiness, or numbness in the limbs; these, however, do not last very long. No difficulty has been experienced in arousing the patient from the hypnotic state.

Results

Hypnosis was used in the treatment of 120 unselected cases over a period of nearly two years. Some of the cases have been followed up for two to three years. The following are the diseases and conditions in which hypnosis was used; the aims of the treatment are noted in each group.

Anxiety Neuroses (20%).—Lessening tension, discovering the cause of the conflict, and instilling confidence and reassurance.

Obsessional Neuroses (11.7%).—Discovering the underlying cause, dealing with the phobias and obsessions, inducing relaxation, giving hope of recovery, and encouraging the resumption of full activity.

Cardiovascular (10%).—Lessening anxiety, promoting general relaxation, and removing distressing symptoms such as dyspnoea, insomnia, and depression.

Heavy Smoking (9.1%).—Lessening general tension, fostering a distaste for smoking, and giving a picture of better health in the future with the loss of most of the distressing symptoms.

Bronchial Asthma (7.5%).—Attempting to discover the primary cause, reducing anxiety and general tension, training the patients in autohypnosis and relaxation, thus enabling them to overcome their attacks themselves, and arousing in them the hope of finally mastering their disability.

Skin Cases (7.5%).—Inducing anaesthesia, relieving anxiety and tension, discovering the underlying factors, and instilling hope of recovery.

Dysmenorrhoea (4.2%).—Inducing analgesia, lessening tension; training in self-relaxation.

Enuresis (3.4%).—Relieving anxiety in patient and parents, instilling hope of losing the disability, and suggesting the gradual recovery of full bladder control.

Duodenal Ulcer (2.5%).—Removing anxiety and tension, analgesia, giving up smoking.

Malignancy (2.5%).—Analgesia suggesting a peaceful state of mind and the hope of recovery, if pre-operatively.

Petit Mal (2.5%).—Removing anxiety in patient and relatives, directly suggesting a gradual diminution of the number of the attacks and their final disappearance.

Small numbers in each of the following conditions were also treated: insomnia, migraine, anxiety hysteria, psychosis, pregnancy, stammering, ulcerative colitis, examination "jitters," behaviour problems in children, "dentist" phobias.

The predominance of the psychoneurotic and psychosomatic cases conforms to the usual pattern met with in general practice. The results of hypnotherapy in those cases were as follows:

Fourteen patients stopped attending after one or two sessions. This may have been due to their dislike of the treatment or to other psychological causes. Twenty-three cases were resistant to hypnosis. However, if more-prolonged attempts had been made some of them would have eventually responded. Twenty-six cases partially improved. These did not entirely lose their symptoms and anxieties, but they ceased worrying about them, became more relaxed, were able to resume or continue their normal work, and felt generally much better. Fifty-seven cases fully improved and had no relapses, in some cases for two or three years. These included 20 patients who had not responded well to other methods of treatment but were able to resume full work after being treated with hypnosis.

The obsessional cases were the most difficult to treat, and most of the failures were encountered in this group. The border-line psychotics previously treated in hospitals did not improve. Patients over 60 were particularly difficult, but children responded very well.

Twenty-four patients were able to stop or to reduce drastically the taking of hypnotic and analgesic drugs.

The various post-hypnotic effects manifested in the treated cases were marked relaxation, diminished depression, sounder and more natural sleep, increased self-confidence, improved appetite, marked physical improvement (especially in cardiac cases), antipruritic action, analgesia, greater feeling of contentment, and lessened anxiety.

The following case histories will illustrate the reactions to hypnotherapy, the clinical progress, and the results.

Case 1

Man aged 46. Anxiety neurosis for 10 years. Persistent pain in the head caused by worry, to which he was inclined. Slight stammer. Paraesthesia in left temporal region. Very erratic at work owing to poor concentration. Attacks of depression with feeling of inferiority. Six years ago he had a "nervous breakdown" and was absent from work for 11 months. He slept badly, and had to stay away from work very often. He had attended a psychiatric out-patient department five times a year ago, but did not improve. A history of unhappy childhood was obtained. After treatment twice a week for three weeks he lost his depression, and said that his head felt clear for the first time for 10 years. He took his wife to a show for the first time for many years. His employer became satisfied with his efficiency. He was treated for three months and finally lost all his symptoms. He was also able to give up smoking after indulging in it for 31 years. Two years later he remained well and was working regularly.

Case 2

Woman aged 36. Company secretary. Long-standing obsessional case with superimposed depression. Her recent attack started in the summer six months previously, and she attributed it to a heatstroke. She had had pain on the top of her head ever since. She complained of depression, palpitation, inability to concentrate, cancerophobia and various other fears, insomnia, and fear of being left on her own. She was very worried about herself, and had been away from work more than six months. She had had empyema at the age of 5, at which time her mother died; her father had died when she was 12. She had been brought up in a "home" and had had a very unhappy childhood.

She did not respond to sedation (amphetamine, chlorpromazine, etc.). She was referred to the psychiatric department of the local hospital, where she was given E.C.T. She had three treatments and became much worse. Her depression increased and she felt that she was going mad. She described with horror her experience with E.C.T., and the scene on coming round after the treatment; she refused to have any further treatment at the hospital. She was a good subject for hypnosis, and was able to recall under it the origin of her recent attack. She developed her pains in the head after exposure to the sun and too much sea-bathing, and felt dizzy. Her friends at work told her that she was probably undergoing the menopause, and as her mother died from cancer when she was 40, and she herself was nearing this age, she thought that her symptoms were probably those of cancer.

Her fears and all the other symptoms gradually resolved with hypnosis, and she became very much more relaxed. It was explained to her that the lack of security and the loss of her parents when she was a child had a good deal to do with her present state. She was able to resume part-time work after the sixth session, three weeks after the beginning of hypnosis. She became interested in her work and gradually came to like it more and more. Her fear of travelling on buses disappeared. She regained interest in her housework and began to have more social contacts, which she

had been avoiding before. Eventually she resumed full-time work and had no relapse. The intervals between the hypnotic sessions were gradually increased from twice a week to once a month. She has remained well ever since.

Case 3

Housewife aged 39. An obsessional type with severe agoraphobia. Her symptoms began 13 years ago following an unfortunate incident when a soldier made an attempt to assault her while she was waiting for a train. At the same time her first husband suddenly left her and she found herself alone, as her relatives had been evacuated to the country. She married again a few years later, had two children, and was quite happy, but the intense fear made it impossible for her to go out. Even when she used to ride with her husband in the car, she became panic-stricken if she went too far from home, and had to return. She had never been away with her children on holiday, had not been to a theatre or cinema for over five years, and she was very unhappy.

She had had two courses of treatment by psychiatrists. One was in 1943, for 12 months, at the rate of two or three sessions a week; the other in 1946 for eight months, at two sessions a week. She did not improve. She was again seen three years ago in consultation with another psychiatrist. In his opinion it was notoriously difficult to do much with such cases. He suggested that the patient should take amylobarbitone sodium and methylamphetamine half an hour before going out. If this should fail, he advised a trial of E.C.T. The prescribed drugs had no effect on her condition. It was then decided to give hypnotherapy a chance. The patient was a very good hypnotic subject and was able to reach a fairly deep state. She was abreasted under hypnosis; her problems were explained to her and she gradually improved. After the fifth session she was able to go to a theatre without experiencing any fear. She had two sessions a week during the first three months and one a week after that. She has not lost her phobia completely, but she is now able to lead a more normal life, and is no longer a "prisoner." She can go out anywhere, and has been to the seaside several times, which she had been unable to do since her illness started. All this made a remarkable impression on the patient's mental attitude. She is now able to enjoy life nearly as much as any normal person.

On one occasion the patient developed an attack of migraine with severe headache and vomiting. It came at a very inconvenient time, as she was busy with her son's birthday party. The symptoms completely disappeared after she was hypnotized, and she was able to carry on with her work within a very short time without the slightest trace of headache, nausea, or vomiting.

Case 4

Housewife aged 48. A severe obsessional, with a strong family history of mental ill-health. Very depressed, with a fear of insanity. Very tense and unable to relax. She used to get violent hysterical attacks, which were difficult to control. She had two courses of E.C.T. as an in-patient, but was no better. Several unsuccessful attempts were made to induce hypnosis. She had to be admitted later into a mental hospital, and after 12 months' treatment there she was still in the same state.

Case 5

Man aged 54. Senior fire officer. An obsessional type with depression and hypochondriasis. There was a five-years history of dyspnoea, generalized pruritus, poor concentration, depression, nosophobia (especially cancer), lack of self-confidence, and fear of making mistakes while carrying out his duties. He had been fully investigated in hospital. Psychiatrist advised E.C.T. and he had seven treatments. He improved for three weeks and then relapsed. With superficial analysis under hypnosis some past incidents were discovered, which gave him a feeling of guilt. This was

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dealt with and he soon began to improve. The hypnotic suggestions and analysis gradually disposed of some of his symptoms. He was able to resume full duties five months later, having previously been on part-time duties for eight months before treatment. He is still occasionally depressed and has feelings of guilt, but has been able to continue full duties without a break. He has been followed up for 2½ years.

Case 6

Housewife aged 46. A severe obsessional, with three years' history. She had suffered from migraine all her life, and had hysterectomy for fibroids two years ago. She developed "creepy" feelings all over, cancerophobia, severe depression, insomnia, and some agoraphobia. She had been an in-patient in a psychiatric teaching hospital for three months, and had E.C.T. She was told on discharge by a psychiatrist that she would "always have her pains in the head, as she was born with them."

She only slightly improved with hypnotherapy. She remained resistant and was not able to reach a deep state of hypnosis. The attempts were given up after two months' trial. For the last two years she has been attending a psychiatric out-patient department of a hospital and remains unchanged.

Case 7

A general practitioner aged 62. Angina of effort for 10 years. No history of coronary occlusion. He consulted a cardiologist five years ago, the electrocardiogram was negative, and a diagnosis was made of some left ventricular failure. The symptoms were precordial discomfort on exertion and after meals, with some mild pain. He had always been over-anxious and tense, and had "played hard and worked hard." He had been doing a good deal of communal work apart from his medical practice. Two of his brothers had coronary disease. He had been advised to take tab. "mycardol" four times a day and one tablet of trinitrin when required. His blood pressure was 180/110. When first seen he was unable to walk a few hundred yards without some discomfort in his chest.

The aim of hypnosis in this case was relaxation and reassurance. He felt much better after the first session, having no more discomfort after meals. After the third session he said that he could walk slowly for 2½ miles without any chest discomfort. He had seven sessions during 3½ months. As a result he said that he had more confidence in himself, and felt very much better generally. He no longer had to take trinitrin tablets, and when seen last he had discontinued taking the mycardol tablets as well. His blood-pressure reading remained the same, but subjectively he was very much better.

Case 8

A business man aged 48. In March, 1954, he had right-sided heart failure, auricular fibrillation with an incalculable ventricular rate, and inversion of the T-wave in chest leads V2-4. In 1949 he had been treated in hospital for ?endocarditis. In March, 1954, he was an in-patient in a teaching hospital for three weeks with heart failure. When first seen, six months later, he was very dyspnoeic and orthopnoeic, with considerable oedema of his feet and ankles. He had not had any proper sleep for over 12 months, because he was unable to lie down, and was having heroin injections for his sleeplessness. He was also a very tense and worrying type. He had already tried hypnotic treatment for six sessions, but did not benefit from it.

After a prolonged first interview he was hypnotized with a very good response. That same night he was able to go to bed properly, to lie down, and to sleep with a few small interruptions until 7 a.m. without heroin. He said that he felt fine the following morning. The oedema of the feet and ankles subsided after two days. He received treatment twice a week in the beginning, and after six weeks this was reduced to one. The consultant cardiologist saw the patient two weeks after hypnotherapy had begun, and was amazed with the result. According to him, there was

no more oedema of his ankles or engorgement of the veins in the neck, and the liver was no longer palpable. When he saw the patient again after three months he was well satisfied, and remarked that the electrocardiogram was "the best ever." The patient continued to keep well, except for some slight dyspnoea due to his excessive weight, which was very difficult to reduce. He was able to attend to his business regularly and to lead a fairly active life, including masonic duties. Eighteen months later he still remained well.

The consultant's final opinion was that "the patient, who became virtually resistant to any form of conventional treatment, would have died some months ago if he had not been treated in the way he was."

Case 9

A woman factory worker aged 20 had begun to smoke when 7 years old, and had smoked 10 to 20 cigarettes a day since the age of 13. When seen first she was smoking up to 80 cigarettes a day and spending nearly £4 a week on them. She had a craving for cigarettes which she could not control. She wanted to be able to break this habit, as it was ruining her financially. After only two sessions she was able to stop smoking entirely. When she was offered a cigarette subsequently, she refused it. When seen three months later she had not smoked a cigarette since she was treated.

Case 10

A builder's foreman aged 52. He had been a heavy smoker for 38 years, consuming on the average 40 to 50 cigarettes a day. He had chronic bronchitis, was emphysematous, and was a rather heavy beer-drinker. He expressed a wish to give up smoking. He was a very tense subject and found it difficult to relax; even light hypnosis could not be induced. No satisfactory results could be obtained after six sessions, as he proved very resistant. He was, however, able to cut down the number of cigarettes to 20 a day, but could not get any further. No other attempts at hypnosis were made.

Case 11

A very anxious girl aged 13. She had had bronchial asthma since the age of 18 months, and eczema in childhood. The onset of the asthma coincided with an accident, when she was scalded by an overturned teapot. The attacks sometimes lasted three to four days, and used to occur when she exerted herself or was emotionally upset. She was a good hypnotic subject. At the first session suggestions were given to her not to worry about the attacks, and to relax well. She was trained in autorelaxation by mild hypnosis, and told to use this when an attack occurred. It proved to be quite effective. When she had an attack of asthma she was able to relax, counting slowly up to ten and using autosuggestion, with the result that the spasm was very soon relieved. She was seen only three times. Six months later she was free from any attacks. This could be explained by her conviction that she had an effective remedy in her hands, and was able to make use of it when necessary.

Case 12

A garage proprietor aged 33 had had bronchial asthma since 2 years of age, which interfered with his schooling. He was the only child. His father died some years ago, and he was managing the business with his mother, who was a domineering type, and treated her grown-up son like a child. He had been using an inhaler for over 17 years. He had been in several hospitals, had undergone a sinus operation, and had had allergy tests, which were all negative. He was unmarried, was very shy, and did not have many friends. He was a very tense subject, difficult to relax. Several attempts were made to get him into a state of deep hypnosis, but without success. Any further attempts to alter his tension, the mother-son relationship, and his outlook had to be given up. He was treated altogether over a period of six weeks.

Case 13

A housewife aged 52 had pruritus ani and vulvae for five years, had a perineal repair four years ago, local x-ray treatment to the perineal region three years ago, and hysterectomy for severe metrorrhagia two years ago. The pruritus had resisted all treatments so far, and was worse when she became warm. She was very "nervy," tense, depressed, and anxious owing to her complaint. She could not sleep, because the itching was so intense. She could not take part in any social activities, and when she was talking to anybody she had to run off suddenly to relieve her itching by scratching. It was also upsetting her family life. There was no history of any possible psychological cause, and her urine was normal.

She was very sceptical when I first explained the proposed treatment to her. The first session was not very successful, but she began to feel better after the second treatment. The pruritus round the anus ceased completely, and there was only slight itching in the vulvar region. After the third session she was able to sleep throughout the night. The perianal skin, which was at first macerated and raw, gradually became darker and drier. After six sessions she had no more pruritus, felt remarkably better, was very happy, and was enjoying life fully. She could not believe that she was so relaxed. She ceased using any local applications, and stopped taking the sedatives and hypnotics, which she had done for the last five years. When followed up a few months later she remained symptom-free.

Case 14

A housewife aged 43. Ten years' history of cheilosis. There were deep cracks at both angles of her mouth, which were always moist and very sore. She had tried various treatments, including vitamins. Direct suggestion under hypnosis in two sessions cleared up her condition completely, and there was no recurrence. When seen six weeks later, she stated that she never felt so well. She stopped using any local applications. Six months later she remained free from cheilosis.

Case 15

A typist aged 25, with dysmenorrhoea for 11 years. The intense pain and incapacity usually lasted four to five days, and was interfering with her work. She had been treated on general lines with anti-spasmodics and analgesics, with poor response. She was referred in March, 1950, to a gynaecological department. The gynaecologist suggested trying tab. stilboestrol, 1 mg., at night and "synapoidin" injections. These had no effect. Her name was then put down for operative treatment. She had a D. & C. performed, after waiting two and a half years for the operation. The first subsequent menstruation was just as painful and incapacitating as the one before. Hypnotherapy was suggested to her, and she decided to give it a chance. She was treated with direct suggestions of analgesia and relaxation. When she came for the first treatment she was in agony; half an hour later she walked out free from pain. When seen again on the following day, she said that she was able to stop the pain by self-relaxation in the way she was taught at the first session. She said that as soon as she closed her eyes she imagined seeing the object which she was looking at when she was hypnotized, and her pain then soon disappeared. During her next menstruation she was seen three times, and during the following one twice only. She has had no further treatment since, and stopped taking any drugs for the relief of pain. Two years later she was still free from dysmenorrhoea.

Case 16

A boy aged 12 had a 12-months history of enuresis since he changed schools. At one time he was a sleep-walker and had nightmares. Amphetamine, etc., were tried without success, and no psychological cause could be found. Direct suggestion, under hypnosis, to stop worrying, and of

improved control of the bladder was very effective. He had a completely dry week after the first session, and stopped taking amphetamine after the third session. He was seen six times, and has since remained free from enuresis.

Case 17

An engineer aged 43 had had chronic duodenal ulcer since 1938. He had medical treatment in hospital for six weeks in 1939, and two further courses in 1942 and 1943. In 1944 he had a partial gastrectomy. He made a good recovery, and was told on discharge that he would have no further worry, would require no more special treatment or diet, except smaller and more frequent meals. He remained well for 12 months, and then the pain, nausea, and the rest of the symptoms recurred. The pain used to wake him up five to six times during the night, and he could not do his work regularly. Alkalis, belladonna, and anticholinergics had very little effect. A barium meal showed a constant fleck in the duodenal region, probably due to an ulcer. He was a worrying type, and this aggravated his condition. However, he agreed to try hypnosis, and was a very good subject. After the first session he said that he felt more relaxed than he had been for years. He slept well that night and was free from pain. He stopped his heavy smoking as a result of suggestion given to him during the first session. He had some slight pain the following night. After the second session he had his first real breakfast for years. Altogether, he was seen four times. He now stopped taking mixtures, tablets, etc., and was on a liberal diet. When seen three months later his weight had increased by over three stones (19 kg.). He remained free from pain, slept well, did not smoke, and felt fine. Three months later he said that he had never been so well for years. A year later he remained symptom-free and did not smoke.

Case 18

A man aged 78 had a partial oesophago-gastrectomy for carcinoma of the lower end of the oesophagus. He developed a secondary growth six months later in the left sternoclavicular region, and was deteriorating rapidly. He was taking methadone hydrochloride for the relief of his pain. Hypnosis was tried in order to make him more comfortable. He had three sessions, which were partially successful. He remained free from pain, did not need any more methadone, and felt much better generally. He died three weeks later. His relatives stated that he felt much better after hypnosis, and remained in a much more peaceful state of mind until his end.

Case 19

A housewife aged 21 had had petit mal since the age of 12. The attacks were aggravated by any emotional upset and by menstruation, and occurred mostly in the mornings. For about two hours she would look vacant, but was able to continue work and converse. She had four major attacks when pregnant, and one during labour. She was a tense and very excitable type. Her relatives were very anxious about her condition, which did not help matters.

She had been under continuous treatment since the attacks began, and had been fully investigated in different hospitals. Anticonvulsants and sedatives had little effect, except to make her feel drowsy. Lately she had been taking epanutin-and-phenobarbitone capsules. Her anxiety was increased by the fact that she had a young baby to look after. Her mother used to come early every morning to take care of the housework, as the attacks made it impossible for her daughter to do so.

She was a good hypnotic subject. Direct suggestions were used to lessen her anxiety and tension, and to control the number of the attacks. She felt much brighter after the first session; the attacks decreased from 40 to about 10 a day, and she said that she did not worry so much about them. She was more cheerful and hopeful, seeing a form of treatment that might help her. Until then, no one had encouraged her to believe she would ever lose the

attacks. Treatment was continued at intervals of two to three weeks, as she was living some distance away. Altogether she had nine sessions in five months. The attacks were finally reduced to only two or three a day, but on most days she was free from them. They used to be more frequent during menstruation, but towards the end even this did not affect them. She had also been suffering from dysmenorrhoea, which was treated with hypnosis at the same time, and after three months she was having completely painless menstruation. It is possible that the pain may have been responsible for the increased number of attacks. When seen a year later, she stated that she was feeling fine, and had hardly any attacks. She also reduced the number of the capsules she had been taking.

Case 20

A factory worker aged 19 with a history of nightmares and sleep-walking since childhood. Her mother was a very neurotic type. The patient had been treated in 1949 for 12 months as an out-patient in a psychiatric hospital. She improved for three years and then relapsed. When first seen, the mother stated that her screaming at night disturbed the other members of the household, as well as the neighbours. The girl was very tense. During the week following her first hypnotic session she had only one disturbed night, and she felt less tense. She was seen altogether five times at weekly intervals. As a result she was sleeping normally, and had no more disturbing dreams. When followed up two years later she was still sleeping normally.

Case 21

A 3-para aged 27 had labour under hypnosis. She was first seen when three months pregnant. She had eight sessions. She was trained in autorelaxation and to reach a hypnotic state by slow count up to 10, in deep breathing, and in autosuggestion. She responded well to the training. She was 10 days overdue. At 2 a.m. she began to have slight pains, which lasted till 7.30 a.m. At 2 p.m. the pains started again. At 3 p.m. they became stronger, and the patient gently clenched her right hand—a prearranged signal. She then became fully relaxed and felt no more pain. She was fully co-operative, and at 5 p.m. a 9½-lb. (4.3-kg.) infant was born without difficulty. There was no need for pethidine or gas-and-air analgesia. She was not seen until after the third stage was completed. She felt fine, and said that she would not mind having a few more babies in the same way. She had no after-pains at all. The perineum remained intact.

Discussion

Hypnosis used carefully and sensibly can be of great help in general practice. It may achieve results in cases which have resisted more conventional methods of treatment.

It is not suggested that hypnosis is a panacea which will cure every disease or disability, but far more can be done with it than has been supposed. Many conditions can be controlled by hypnosis alone, and in most conditions the patient can be made far more comfortable and more able to carry out his normal duties. It is also possible (Lloyd, 1934) to enhance the effects of other forms of treatment by appropriate suggestion under hypnosis.

It is difficult to change completely an obsessional personality, but it is possible with hypnotherapy to enable sufferers to lead a reasonably happy life. If hypnosis will not help a psychoneurotic, at least it will not aggravate his condition. The Subcommittee of the Psychological Medicine Group Committee of the B.M.A. stated in a report (*British Medical Journal*, 1955), that they "had no clear evidence upon the extent of the danger or the quality of the danger to a patient which some psychiatrists claimed inevitably followed the induction of hypnosis."

I did not encounter any deterioration in the patients' condition when treated with hypnosis. Kuhn and Russo (1947) make the following statement about any possible dangers of hypnosis: "Moral—there is no surrendering of the will,

there is only co-operation. Psychological—does not weaken the mind. Physical—there are none."

The possible use of hypnosis in alleviating pain in malignant conditions is worthy of study. Case 18 illustrates this well. Wolberg (1948) states that hypnosis can eliminate pain in incurable progressive fatal ailments and reduce or eliminate the necessity of analgesic drugs.

The value of hypnosis in skin affections is based on its effect on the emotional state of the patient. Bonjour (1929) maintains that the skin is a mirror of the mind. Some patients suffer from certain skin diseases which may be due to emotional disturbances—for example, erythroderma, hyperidrosis, urticaria, and eczema.

The removal of anxiety and other disturbing symptoms in psychosomatic cases by hypnotherapy offers great possibilities. The anxiety which follows a coronary occlusion or other cardiac affections is a particular example. Dr. Morgan Jones (1955) states that in cases recovering after a coronary occlusion there is often far more residual disability from fear than from myocardial damage. This fear can be dealt with by hypnosis.

The good results from hypnotherapy in cases of dysmenorrhoea, petit mal, migraine, and asthma should encourage its further use in such patients.

The possibility of helping heavy smokers, especially young people, to give up this habit through hypnosis may play an important part in the prevention of bronchial carcinoma.

The general practitioner is particularly well suited to use hypnosis, as he is usually familiar with the patient's background, and enjoys his confidence, which is so essential for successful hypnotherapy.

To enable patients who have been regarded as incurable to resume work, to regain their self-confidence, and to dispense with drugs for the relief of their symptoms is a worthy achievement, and should stimulate further application and research in the use of hypnosis.

It is hoped that this paper may stimulate research and interest in this branch of medicine, especially in its application to general practice, and it may help to overcome the prejudice and scepticism of some members of the medical profession.

Summary

A report is presented of 120 cases treated by hypnosis in general practice. The technique and clinical effects of hypnosis are briefly described. Twenty-three cases were resistant to hypnosis.

The largest group of cases were the psychosomatics and psychoneurotics: 57 cases fully improved and 26 only partially did so.

Most of the resistant cases were amongst the obsessional and adult asthmatics.

Cases of asthma in children, dysmenorrhoea, duodenal ulcer, petit mal, cardiac anxiety following an organic lesion of the heart, anxiety neurosis, and skin affection gave the best results.

Twenty patients who had resisted other methods of treatment recovered and were able to resume work after treatment with hypnosis.

Twenty-four patients were able to stop taking hypnotic, analgesic, and anticholinergic drugs, or drastically reduce their use, as a result of hypnotherapy.

Hypnosis, used carefully and sensibly, can be of great help in general practice, achieving results in cases which resisted more conventional methods of treatment.

Hypnotherapy compares favourably with psycho-analytical and physical methods in the treatment of psychoneuroses.

None of the treated cases showed any deterioration of their original condition as a result of hypnotherapy.

There is no evidence that any danger may arise from the use of hypnosis in medical treatment.

There is no special "gift" required to induce hypnosis.

The general practitioner is particularly well suited to use hypnosis as a method of treatment, as he is usually familiar with the patient's background and has his confidence, which is important for successful hypnotherapy.

REFERENCES

- Bonjour (1929). *Brit. J. Derm.*, 41, 324.
British Medical Journal, 1955, 1, 1214.
 Jones, A. Morgan (1955). *British Medical Journal*, 2, 1613.
 Kuhn, L., and Russo, S. (1947). *Modern Hypnosis*, p. 23. New York.
 Lloyd, B. Layton (1934). *Hypnotism in the Treatment of Disease*, p. 43. London.
 Weitzenhoffer, A. M. (1953). *Hypnotism*, p. 59. New York.
 Wolberg, L. R. (1948). *Medical Hypnosis*, 1, 411. New York.

FLUCTUATION OF ARTERIAL BLOOD PRESSURE IN ASTHMA

BY

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If the arterial pressure is measured by the ordinary auscultatory method during an attack of bronchial asthma, a few beats, usually two or three, will be heard at a higher level of pressure than the others. If the cuff pressure is kept at this level for several respiratory cycles, it will be noticed that these two or three beats of higher pressure occur at the beginning of each expiration. Usually the cuff pressure has to be lowered 20–30 mm. Hg before the point is reached where all the beats are heard. These fluctuations in the systolic pressure in bronchial asthma have been studied by Gauchat and Katz (1924), Katz and Gauchat (1924), Tinel and Jacquelin (1931), Rackemann (1931), Osgood (1943), Osgood and Ehret (1943). The following is a further study.

Material

The material comprises 33 patients (19 women and 14 men) with bronchial asthma. The diagnosis was clinically certain in all cases. Patients with other concurrent disease, or in whom severe emphysema or cor pulmonale had developed, were excluded. The mean age of the women was 47.8 years, and of the men 41.7 years.

On the basis of the severity of the clinical symptoms the cases were divided into three groups: (1) *Mild bronchial asthma*:—Only a few sibilant rales in the lungs; subjectively, no real dyspnoea; physical activity unrestricted. (2) *Moderately severe bronchial asthma*:—Sibilant rales throughout both lungs; subjectively, definite although not severe dyspnoea; auxiliary respiratory muscles not much used; hard exercise impossible. (3) *Severe bronchial asthma* (involving primarily an attack or status asthmaticus):—Wheezing heard without a stethoscope; numerous sibilant rales and noises; dyspnoea so severe that the patient had to sit upright or lean forward to secure maximum use of the accessory muscles of respiration; patient hardly able to move.

The fluctuations in arterial pressure were measured by the ordinary auscultatory method with a mercury sphygmomanometer. As the changes in systolic pressure proved much easier to detect than those in the diastolic it was decided to observe only the former in this part of the study. Measurement was effected by finding, in the usual

way, the maximum pressure at which the first beats began to be heard. As noted above, the one to three beats coinciding with the beginning of the expiration were heard, especially in cases of severe asthma, at a considerably higher pressure than the other beats. These few higher beats are easily overlooked unless each even-number pressure-reading near the maximum is observed long enough—for not less than two complete respiratory cycles. Subsequently the cuff pressure was lowered by 5 mm. Hg at a time until all the beats could be heard continuously irrespective of the phase of respiration; the difference in pressure between the few higher beats and this pressure was recorded. The lowest beats (two or three) were found at the end of expiration and/or at the beginning of inspiration. During the most severe attacks of asthma, however, it was sometimes impossible to obtain a reading at which all the beats could be heard continuously during the whole respiratory cycle: before the lowest beats at the end of expiration were heard the ones at the beginning of expiration had vanished. In these few cases the systolic pressures at the beginning and end of expiration were measured separately. However, this was much more inaccurate than the method of measuring described above.

Results

As can be seen from Table I, the fluctuation in systolic blood pressure due to respiration increased with the severity of the bronchial asthma. In cases where the fluctuations were

TABLE I.—Fluctuation of Systolic Blood Pressure Due to Respiration in Patients with Bronchial Asthma, Measured With a Mercury Sphygmomanometer

Severity of Bronchial Asthma	No. of Cases	Fluctuation of Systolic Blood Pressure Due to Respiration (mm. Hg)
Mild	19	4 ± 0.6
Moderately severe	9	13 ± 1.5
Severe	5	25 ± 1.7

recorded while the asthmatic symptoms were being relieved by adrenaline, there was a clear correlation between the range of pressure fluctuation and the severity of the symptoms. In three patients with severe bronchial asthma the fluctuation in systolic pressure was 25 (E. V.), 20 (A. N.), and 20 mm. Hg (L. E.). The corresponding pressure readings after the relief of symptoms by adrenaline were: E. V., 15 mm. Hg (symptoms still moderately severe); A. N., 5 mm. Hg (symptoms mild); L. E., 5 mm. Hg (symptoms nearly subsided). In two moderately severe cases of bronchial asthma the fluctuation in systolic pressure was 10 mm. Hg. After adrenaline had produced a nearly complete disappearance of the asthmatic symptoms none of the cases showed any demonstrable pressure fluctuation.

To investigate further the connexion between these fluctuations in arterial pressure and the degree of respiratory obstruction present, clinically healthy persons were asked to breathe through glass tubes of various diameters. The ratio of the resistance to respiration produced in this way (taken as corresponding to that during an attack of bronchial asthma) to arterial pressure was studied.

To start with, the intra-arterial pressure of the femoral artery of the test subject was followed during "tube respiration." The pressure was recorded by Sandborn's electromanometer. All the tubes through which respiration took place were 10 cm. long. The largest diameter was 10 mm.; the tubes then successively narrowed in diameter (see Table II). During respiration the nose was pinched and the tube, fitted with a special mouthpiece, was held between the lips. The results are shown in Table II, which gives only the variation occurring in the course of single respiratory cycles, as pressure recordings obtained over a longer period were not considered fully comparable; for when an ordinary pressure a change in its position in relation to the arterial walls may affect the results.

TABLE II.—Continuous Recording of Intra-arterial Pressure of Femoral Artery of Healthy Man Aged 30 During Respiration Through Tubes of Different Diameters. Blood Pressure Before Test, Measured by Mercury Sphygmomanometer, was 115/75 mm. Hg. The Maximum and Minimum Values are Given in Parentheses

Tube No.	Diameter	Fluctuation of Systolic Blood Pressure Due to Respiration (mm. Hg). Mean of Three Respirations	Fluctuation of Diastolic Blood Pressure Due to Respiration (mm. Hg). Mean of Three Respirations
1	10 mm.	5 (3–7)	4 (2–5)
2	8 "	8 (5–11)	6 (5–8)
3	6 "	13 (12–14)	10 (5–15)
4	4 "	47 (35–54)	33 (24–38)
5	2.5 "	78 (73–85)	59 (58–60)

As Table II shows, fluctuation due to respiration occurs in systolic, diastolic, and pulse pressure, and the fluctuations increase as the diameter of the tube used for respiration diminishes. The systolic pressure varied most. The lowest pressures were recorded at the end of expiration and at the moment of changing to inspiration. The highest values coincided with the beginning of expiration. The Chart illustrates samples of the pressure curves. They show, for example, that the three pulse waves coinciding with the beginning of expiration had the highest systolic pressure. The phenomenon was particularly clear when the narrow tubes were used. The pulse pressure, highest at the beginning of expiration, was sometimes reduced to nearly zero with tubes 4 and 5.

The fluctuations in arterial pressure due to respiration through the tubes were recorded also by mercury sphygmomanometer, as in cases of asthma. Only the fluctuation in systolic pressure was recorded, as this had proved much easier to detect than the diastolic in the asthmatic cases and because the intra-arterial measurements had shown that the changes in the systolic pressure were the larger. When tubes 4 and 5 were used, no pressure reading could usually be obtained at which all the beats could be heard continuously irrespective of the phase of respiration. The reason for this phenomenon—the same as that sometimes observed in severe bronchial asthma—is clear from the pres-

sure curves shown in the Chart. With tubes 4 and 5 the systolic pressure dropped at the end of expiration below the diastolic pressure recorded at the beginning of expiration. (In some cases the pulse pressure even dropped to zero at the end of expiration.) In these cases the systolic pressures at the beginning and the end of expiration were, if possible, measured separately as described. The results are given in Table III, which shows that the fluctuation of the systolic pressure increased with the resistance of respiration.

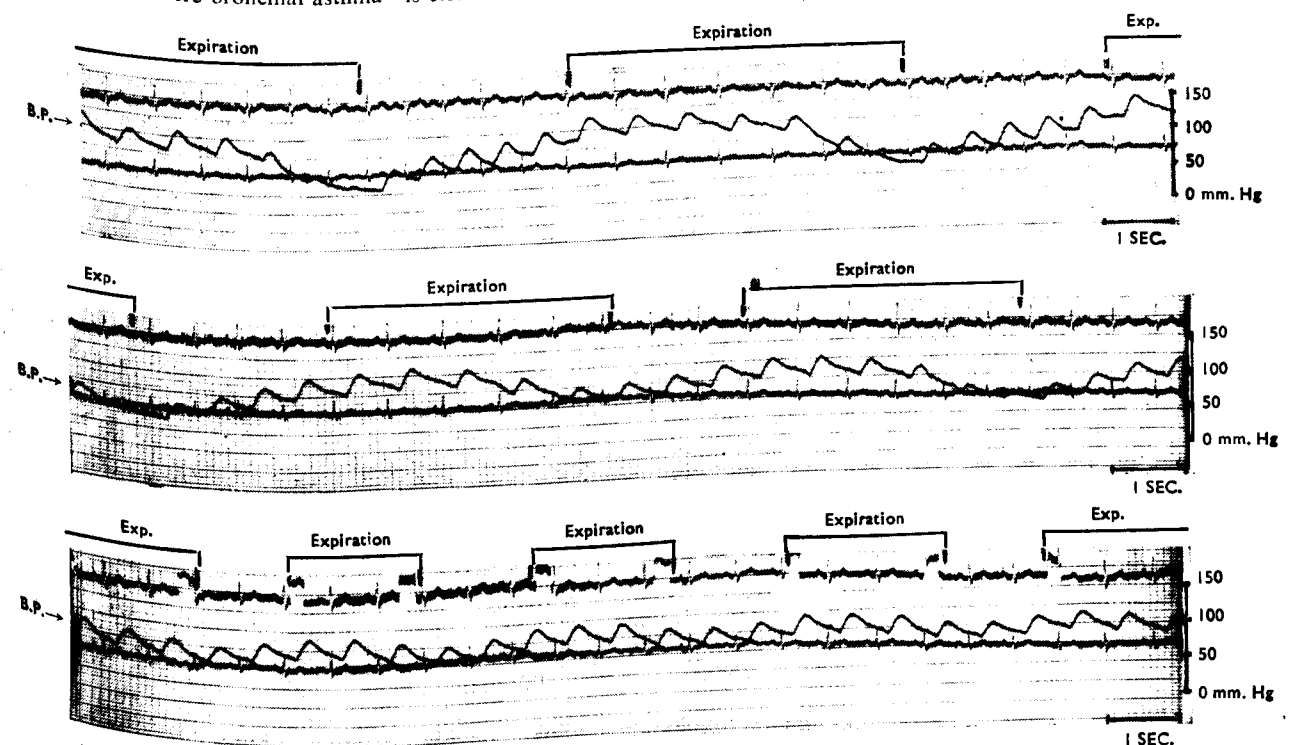
TABLE III.—Effect of Respiration Through Tubes of Different Diameter on Fluctuation of Systolic Blood Pressure as Measured with a Mercury Sphygmomanometer. The Six Test Subjects Employed, Aged 15 to 50, Were Clinically Healthy. They were Requested to Breathe as Calmly as Possible, Without any Forcing

No obstruction in airways	Difference in mm. Hg between Maximum Systolic Pressure Value at Beginning of Expiration and Minimum Systolic Pressure Value at End of Expiration. Mean Values. Maximum and Minimum Values are Given in Parentheses
Tube 1 (10 mm.)	0 (0–0)
" 2 (8 ")	0 (0–0)
" 3 (6 ")	4 (10–0)
" 4 (4 ")	17 (35–5)
" 5 (2.5 ")	30 (50–15)
" 5 (2.5 ")	40 (60–25)

Discussion

The results obtained in bronchial asthma for fluctuations of systolic blood pressure due to respiration corresponded closely to those reported by Osgood (1943). The method evolved in the present investigation to determine this fluctuation was also fairly similar to that used by Osgood. As I was not aware of Osgood's investigations until my own study was completed, this similarity deserves special emphasis.

Measurements of arterial pressure during respiration through tubes of varying calibre showed clearly the close correlation between the severity of obstruction to the respiratory tract and the degree of fluctuation in arterial pressure



Fluctuation of arterial blood pressure due to respiration. Recording by intra-arterial method. Samples of the pressure curves.—Top: Respiration through tube 5 (length 10 cm., diameter 2.5 mm.). Middle: Respiration through tube 4 (length 10 cm., diameter 4 mm.). Bottom: Respiration through tube 3 (length 10 cm., diameter 6 mm.). (E.C.G. changes apparently correspond to changes in the electrical axis.)

due to respiration. In practice, the degree of obstruction to the respiratory tract can be assessed from the fluctuation in arterial pressure in both asthma and other conditions. Although the intra-arterial pressure is a more accurate guide in such cases, its measurement even to-day places such a strain on the patient that I regard the corresponding fluctuation in systolic pressure easily obtainable with an ordinary sphygmomanometer, as adequate for practical purposes.

Although the severity of bronchial asthma can usually be readily assessed from the other clinical symptoms, the determination of this fluctuation in blood pressure may assist in the assessment; in addition, it may provide a clearer picture than the other symptoms of the extent of the respiratory obstruction. It also gives an idea of the extent, so important in bronchial asthma, of fluctuations in intrathoracic pressure during respiration. Fluctuation in arterial pressure due to respiration is considered to be closely correlated with the corresponding fluctuation in intrathoracic pressure. In strong expiration, increased intrathoracic pressure results in the blood from the lung-bed travelling at increased speed into the left side of the heart and from there into the systemic circulation. With the start of expiratory strain a transient rise in systolic and diastolic pressure is observable. If the venous return to the heart is obstructed, however, this is followed immediately by a reduction in the stroke volume of the heart and also by a drop in the systolic and diastolic pressures (Judson *et al.*, 1955; Jones *et al.*, 1956). The negative intrathoracic pressure associated with inspiration again increases the venous return to the heart, and as a result the systolic discharge of the left ventricle begins again to increase.

TABLE IV.—Effect of Respiration Through Tubes of Different Diameters on Fluctuation of Intra-oesophageal and Systolic Blood Pressure. Four Series of Measurements on the Same Clinically Healthy Test Subject Aged 38

No obstruction in airways	Difference, in mm. Hg, Between Rise of Intra-oesophageal Pressure Due to Expiration and Pressure Drop in Connexion with Inspiration. Maximum Values Obtained in Different Measurements	Fluctuation of Systolic Blood Pressure in mm. Hg. Maximum Values Obtained in Different Measurements
Tube 1 (10 mm.)	0-5	0-0
" 2 (8 ")	0-10	0-5
" 3 (6 ")	10-15	5-10
" 4 (4 ")	10-20	35-45
" 5 (2.5 ")	30-40	40-50
	30-50	55-60

Table IV gives an idea of the correlation between the fluctuations in the systolic blood pressure and the intrathoracic pressure when the respiratory tract is obstructed (respiration through the tubes). Observation of the intrathoracic pressure was effected by measuring the intra-oesophageal pressure. These pressures have been found to correspond closely. Intra-oesophageal pressures were obtained by means of a balloon (4 ml. capacity) on a 100-cm. length of polyethylene tubing (3 mm. in diameter) passed through the nose and into the oesophagus to a distance of 40 mm. from the nose. The system was air-filled, and the pressure was measured by a torsionmanometer.

In severe bronchial asthma even, the variations in systolic blood pressure were not nearly so extensive as the greatest noted on respiration through the tubes. This is attributed to the fact that in bronchial asthma a rise in intrathoracic pressure, while it forces air out of the alveoli, also constricts the bronchioli. There is, however, a certain limit above which the intrathoracic pressure interferes with expiration (Wyss, 1955).

Summary

The fluctuation in systolic blood pressure during respiration was studied in 33 patients with bronchial asthma by means of an ordinary mercury sphygmomano-

meter. In mild bronchial asthma the systolic blood pressure fluctuated by 4 ± 0.6 mm. Hg; in moderately severe asthma by 13 ± 1.5 mm. Hg; and during an asthmatic attack by 25 ± 1.7 mm. Hg. If the symptoms of bronchial asthma were relieved by adrenaline, the fluctuation in systolic blood pressure was reduced correspondingly.

The correlation between the degree of respiratory obstruction and the fluctuation of arterial pressure during respiration was studied. Test subjects breathed through tubes of fixed length but different diameter. The arterial pressure was recorded in six by a mercury sphygmomanometer and in one by intra-arterial measurement. In addition, changes in intrathoracic pressure were observed by measuring the intra-oesophageal pressure. It was found that the greater the obstruction to the respiratory tract the more extensive were the fluctuations in the arterial pressure. The same applied to intrathoracic pressure. The maximum arterial pressure readings were obtained at the beginning of expiration, during one to three beats, the lowest values (two to three beats) at the end of expiration. The systolic pressure fluctuated more than the diastolic. The maximum fluctuation recorded in a single subject, when breathing through the narrowest tube, was 78 mm. Hg by the intra-arterial method and 60 mm. Hg by mercury sphygmomanometer. The corresponding maximum fluctuation in the systolic blood pressure of six healthy persons aged 15-50 years, obtained by mercury sphygmomanometer, was 40 mm. Hg.

REFERENCES

- Gauchat, H. W., and Katz, L. N. (1924). *Arch. intern. Med.*, **33**, 350.
Jones, R. E., Helrich, M., and Eckenhoff, J. E. (1956). *Anesthesiology*, **17**, 325.
Judson, W. E., Hatcher, J. D., and Wilkins, R. W. (1955). *Circulation*, **11**, 889.
Katz, L. N., and Gauchat, H. W. (1924). *Arch. intern. Med.*, **33**, 371.
Osmond, H. (1943). *J. Lab. clin. Med.*, **28**, 927.
— and Ehret, F. E. (1943). *Ibid.*, **28**, 1415.
Rackemann, F. M. (1931). *Clinical Allergy*. Macmillan, New York.
Tinel, J., and Jacquelin, A. (1931). *Bull. Soc. méd. Hôp. Paris*, **47**, 440.
Wyss, F. (1955). *Asthma Bronchiale*. Thieme, Stuttgart.

The National Coal Board has published a report entitled "The Coal Industry in the U.S.S.R." The report is based on the observations of a technical mission which visited the U.S.S.R. in 1956, and includes a section on health and welfare. In the U.S.S.R. considerable importance is attached to industrial health services, especially in heavy industry; in 1956 24,000 doctors were stated to be employed as industrial medical officers. In 1955 some 1,300 in mining areas serve the whole population there. Large collieries had "health points" at the surface, and sometimes underground first-aid rooms. Each colliery visited had its own ambulance; and a strikingly high proportion of women doctors was noticed. All new entrants to the industry are medically examined; subsequently surface workers are examined yearly, and underground workers twice yearly. Efforts are made to screen the chest of all coal-miners annually, about 70-80% being so examined. In 1955, it was stated, 1.6% of underground workers were certified as suffering from silicosis (roughly equivalent to pneumoconiosis in British terminology). The Ministry of Health runs a large number of sanatoria, some of which specialize in the treatment of silicosis. Admission is granted according to both the medical need and the work record of the miner in question; an outstanding mining record entitles the patient to free treatment. The report is obtainable from the National Coal Board, Hobart House, Grosvenor Place, London, S.W.1; price 8s., post free.

EFFECT OF VITAMIN-B COMPLEX ON HEALTHY PEOPLE IN A WARM CLIMATE

BY

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AND

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The question whether there is an increased need for vitamins of the B complex among people living in a warm climate has not been clearly answered as yet, but such vitamins are often prescribed in the tropics and elsewhere to people who show no signs of vitamin deficiency and whose diets are apparently adequate. More thiamine is excreted in the urine during hot than during cold weather (Holt, 1943), and this could be interpreted to mean that increased amounts of the vitamin should be taken in warm climates; but sweating does not increase the losses of thiamine through the skin (Lugg and Ellis, 1954), and there is no evidence of any prevalence of anaemia in an equatorial climate when economic conditions are good (Wadsworth, 1952a, 1952b, 1954). Since, however, the deep body temperature of healthy people at rest tends to be a little higher in a warm than in a cool climate (Adam and Ferres, 1954), while the rise of the deep body temperature which takes place during exercise is also enhanced in a warm environment (Martin, 1930), it is possible that the increase in enzyme activity resulting from such a raising of the body temperature would increase the demands for various vitamins, especially those of the B complex, and that mild symptoms of lassitude would follow which could explain the syndrome of tropical fatigue (Macpherson, 1949).

Mild general symptoms associated with slight vitamin deficiencies were, indeed, observed among soldiers serving overseas during the last war (Glaser, 1953b). A further possibility is that some inhabitants of the tropics may be suffering from undiagnosed sprue-like conditions, and that they could thus benefit from vitamin-B supplements.

In the absence of conclusive findings, it seemed important to ascertain whether there was any need for the excessive prescription of vitamin preparations prevalent in many tropical and equatorial areas, so that wasteful therapy should be avoided if it was of value. Since the level of serum cholinesterase is a sensitive indicator of the state of nutrition (McCance *et al.*, 1948; Hutchinson *et al.*, 1951), it was of interest to estimate at the same time the levels of cholinesterase in the blood.

Methods

In order to assess whether vitamins altered the incidence of mild subjective symptoms, a technique was modified which had been previously shown to allow unbiased assessment of subjective responses and their variations (Glaser, 1953a; Glaser and Whittow, 1954; Glaser and Newling, 1955). A class of 79 medical students took part in the experiment. Their ages ranged from 19 to 23 years and nine of them were women. Two-thirds of the subjects were Chinese and the rest were Indians, Sinhalese, Malays, or Eurasians. About half the students lived in university hostels and the other half in their own homes. The diet taken

by the middle-class population of Singapore and by students living in hostels contains a variety of lightly cooked fresh vegetables as well as salads, fruit, fresh meat (mostly pork), and some vitamin-enriched bread, so that it is likely to be adequate in vitamins of the B complex, even though polished rice forms the basis of most meals.

The subjects were told nothing about the purpose or the design of the investigation, except that they would be given vitamins, that they should take one tablet daily, and that they should take no other vitamin supplements of any kind before and during the experiment. They were also casually told that lost or damaged tablets would be replaced and that mutual borrowing of tablets was not a good thing. Previous experience with similar classes of students has shown that Singapore students co-operate most conscientiously in such experiments (Glaser, 1953a; Glaser and Whittow, 1954; Glaser and Newling, 1955) and there was every evidence that they did so in the present investigation. The students were divided at random into two groups, and the experiment was conducted in two periods of eight weeks separated by an interval of six weeks. At the beginning of each experimental period every subject received one dummy tablet daily for 14 days, after which half the subjects continued to receive dummy tablets and the other half were given one vitamin-B complex tablet daily, so that each subject took vitamins for the last six weeks of one experimental period and dummy tablets throughout the other period.

The vitamin tablets were made by a well-established firm, and their composition was claimed to be:

Thiamine hydrochloride	..	..	..	2 mg.
Riboflavin	..	..	..	2 mg.
Niacinamide	..	..	..	10 mg.
Pyridoxine hydrochloride	..	..	..	0.1 mg.
Calcium pantothenate	..	..	..	3 mg.
Folic acid	..	..	..	0.2 mg.
Vitamin B ₁₂	..	..	..	1 µg.
Insoluble liver fraction	..	..	..	250 mg.

The dummies were indistinguishable and contained nothing but lactose. All tablets were sugar-coated and were stored in airtight containers at 21° C. They were issued weekly in screw-top bottles labelled with each subject's name. Known dummy tablets were available to us while all subjects were taking dummies, but when vitamins were being taken all issuing of tablets was done from coded containers, so that we did not know which were the vitamins until all the results had been calculated.

The sensations and illnesses of the subjects were assessed before each experimental period and at intervals of one week thereafter, always at the same time of the day. Questionnaires were similar to those described before (Glaser and Whittow, 1954), and they were designed to avoid errors so far as was possible. Questions were included about skin lesions and illnesses, both at the moment of filling in the questionnaires and during the preceding six days.

Estimations of Cholinesterase

At the end of the experiment 35 subjects were asked to provide a sample of finger blood. In order to obtain a homogeneous group, these subjects were selected at random from among the largest single group in the experiment, Chinese men. Thirty-three of these subjects agreed to participate, and after the results had been worked out it was found that 15 had been taking vitamins for the last six weeks.

The red-cell ("true") cholinesterase was estimated as acetylcholinesterase and the plasma ("pseudo") cholinesterase as butyrylcholinesterase on samples of whole blood. Preliminary tests had shown that 87% of the activity of whole blood with regard to acetylcholine perchlorate was due to red cells and 82% of the activity with regard to butyrylcholine chloride was due to plasma. For estimations of the acetylcholinesterase, samples of 20 µl. of blood were run from the finger into 0.98 ml. of a 0.01% solution of saponin, identical samples being used for duplicate and control determinations. To duplicate diluted blood samples,

Symptoms and Illnesses Reported After Taking Dummy Tablets and After Taking Vitamin-B Complex Supplements in a Crossed-over Experiment

	No. Completing Questionnaires	Minor Illnesses During Last 6 Days		Condition at Moment of Completing Questionnaires											
				At Least One Symptom		Unhealed Cuts or Abrasions		Sleepiness		Fatigue		Feeling Better		Feeling Worse	
				No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Two weeks on dummy tablets ..	79	8	10	49	62	8	10	31	39	34	43	7	9	2	3
Eight weeks on dummy tablets ..	70	2	3	28	40	2	3	19	27	19	27	7	10	3	4
Six weeks on vitamin tablets ..	73	8	11	49	67	6	8	21	29	28	38	6	8	1	1

1 ml. of 0.004 M acetylcholine perchlorate in 0.134 M phosphate buffer (pH 7.2) was added and the solutions were then thoroughly mixed and incubated in a water-bath at 30° C. ($\pm 0.1^\circ$ C.) for 10 minutes. A separate tube containing 1 ml. of the acetylcholine solution was incubated at the same time, and at the end of 10 minutes the control blood solution was poured into this tube.

The three solutions were now assayed for residual acetylcholine according to the method of Hestrin (1949), with the following modifications. Double the volume of the recommended reagents was used and the ferric chloride solution was 0.74 M. Protein precipitated in the final stages of the estimation was removed by filtration through Whatman No. 40 filter paper. Estimations were made in a Spekker photoelectric absorptiometer, using an OGI filter. The same technique was used for the estimation of butyrylcholinesterase, except that the substrate used was 0.004 M *n*-butyrylcholine chloride in 0.134 M phosphate buffer. Preliminary experiments had shown that no measurable non-enzymic hydrolysis occurred in the control tubes, that under the experimental conditions employed the amount of acetylcholine and butyrylcholine hydrolysed by the whole blood was linearly related to the time of incubation, and that in both estimations the results obtained with whole blood compared well with the summation of the results obtained when plasma and cells were separated in the normal way. The packed red-cell volumes were estimated from finger blood in duplicate heparinized haematocrit tubes and spun at 3,000 r.p.m. for 30 minutes. The results were expressed as μ M ester hydrolysed by 20 μ l. of whole blood in 10 minutes at 30° C. and at a pH of 7.2, and the values were corrected to a packed red-cell volume of 50%.

Results

There were no consistent differences between the incidence of subjective symptoms or of minor illnesses when the subjects were taking dummies and when they were taking vitamins. Indeed, slightly more symptoms and illnesses were recorded by the same subjects after taking vitamins than after taking dummies (see Table). It was impossible also to demonstrate any advantages of the vitamin supplements when comparisons were made between the responses of different subjects who had been taking vitamins and dummies at the same time. There were no illnesses involving hospital treatment, or absence from classes for more than one week. Mild symptoms were regularly reported, however (see Table), and this conforms with previous observations when subjects were given questionnaires but no pharmacologically active substances (Glaser, 1953a; Glaser and Whittow, 1954; Glaser and Newling, 1955). The incidence of symptoms gradually diminished when all subjects were given dummies only, and this also conforms with previous experience. Nevertheless, in the present investigation fewer symptoms were reported by subjects receiving dummies than in previous experiments, presumably because the subjects knew that they were to be given vitamins, whereas in the earlier experiments they were expecting to take drugs, so that they may have expected fewer symptoms in the present investigation than in previous ones. This aspect of the problem has been discussed elsewhere (Glaser and Whittow, 1957).

In 15 subjects who had been taking vitamins for six weeks the mean acetylcholinesterase level was 1.54μ M (S.E., ± 0.05)

of ester hydrolysed, and in 18 subjects who had had dummies for three months the mean figure was 1.55μ M (± 0.05). The mean butyrylcholinesterase level of the 15 subjects who had had vitamins was 0.74μ M (± 0.05) and that of the 18 subjects who had had no vitamins for three months was 0.54μ M (± 0.04), and the difference was statistically highly significant ($t=3.24$; $P<0.01$). Further control samples of 10 normal people working in the Faculty of Medicine of the University of Malaya gave average levels of 1.50μ M (± 0.05) for acetylcholinesterase and 0.60μ M (± 0.03) for butyrylcholinesterase.

Discussion

The results clearly show that supplements of vitamins of the B complex do not improve the health or enhance the subjective sense of well-being in normal people who do not know when they are taking vitamins. Since the method used to assess subjective responses is very sensitive, while the present results did not even indicate the possibility that the vitamins might have caused any improvement, it is improbable that larger doses of these vitamin supplements plasma cholinesterase level was significantly raised by the giving of a vitamin-B complex preparation are difficult to explain at the moment. Davis (1946) found that folic acid serum, both when these substances were given by injection *in vivo* or added to the serum *in vitro*, but Hawkins (1948) was unable to confirm this with regard to folic acid. It will be necessary to investigate in detail which of the components of the tablets given in the present investigation caused or aided the increase of the plasma cholinesterase level and what were the underlying mechanisms of action.

Summary

In a tropical climate supplements of vitamin-B complex and insoluble liver fraction produced no improvement of the subjective sense of well-being and no decline in the incidence of minor illnesses among apparently healthy people on an adequate diet. Such supplements of vitamins raised the serum cholinesterase level significantly above normal.

We are indebted to Messrs. F. E. Zuellig (Malaya) Ltd. for supplies of vitamin-B complex tablets and indistinguishable dummy tablets. Mr. Yap Tian Beng kindly coded the vitamin and dummy tablets.

REFERENCES

- Adam, J. M., and Ferres, H. M. (1954). *J. Physiol. (Lond.)*, **125**, 21P.
 Davis, J. E. (1946). *Proc. Soc. exp. Biol. (N.Y.)*, **63**, 287.
 Glaser, E. M. (1953a). *Brit. J. Pharmacol.*, **8**, 187.
 — (1953b). *J. roy. Army med. Cps.*, **99**, 25.
 — and Newling, P. S. B. (1955). *Brit. J. Pharmacol.*, **10**, 429.
 — and Whittow, G. C. (1954). *Clin. Sci.*, **13**, 199.
 — (1957). *J. Physiol. (Lond.)*, in press.
 Hawkins, R. D. (1948). *Arch. Biochem.*, **17**, 97.
 Hestrin, S. (1949). *J. Biol. Chem.*, **180**, 249.
 Holt, L. E., Jun. (1943). *Fenn. med. J.*, **46**, 451. Cited by H. H. Mitchell and M. Edman in *Nutrition and Climatic Stress*, 1951, pp. 85-86. Thomas, Springfield, Ill.
 Hutchinson, A. O., McCance, R. A., and Widdowson, E. M. (1951). *Spec. Rep. Ser. med. Res. Coun. (Lond.)*, No. 275, p. 216. H.M.S.O., London.
 Lugg, J. W. H., and Ellis, F. P. (1954). *Brit. J. Nutr.*, **8**, 71.
 McCance, R. A., Widdowson, E. M., and Hutchinson, A. O. (1948). *Nature (Lond.)*, **161**, 56.
 Macpherson, R. K. (1949). *Univ. Qd Pap.*, **1**, 1.
 Martin, C. J. (1930). *Lancet*, **2**, 673.
 Wadsworth, G. R. (1952a). *Nature (Lond.)*, **170**, 851.
 — (1952b). *Med. J. Malaya*, **7**, 104.
 — (1954). *British Medical Journal*, **2**, 910.

SALICYLATE INTOXICATION TREATED WITH INTERMITTENT POSITIVE-PRESSURE RESPIRATION

BY

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The returns of the Registrar-General for England and Wales (1950-2) indicate that in this country aspirin and its derivatives remain an important cause of death from poisoning in children. During the three years 1950-2, 21 children lost their lives in this manner. In the United States of America in 1952 there were 86 deaths from this cause in children under the age of 5 years (Committee on Toxicology, American Academy of Pediatrics, 1955). Many such cases are the result of accidental ingestion of the drug. In the experience of Heymann *et al.* (1954), however, the danger of intoxication following therapeutic administration of the drug is much greater. Holt (1954) has shown that the dose of salicylate administered does not bear a constant relationship to the resulting blood level and, furthermore, that the blood level at which toxic symptoms appear varies greatly from patient to patient.

Various therapeutic measures have been recommended for the condition, but there appears to be no previous report of the use of intermittent positive pressure respiration. This paper is presented in order to show that this procedure may have an important place in the treatment of salicylate intoxication.

Symptoms

Among the more common and important symptoms of salicylism is hyperventilation. Graham and Parker (1948) have shown that this is due to reflex stimulation of the central respiratory mechanism through the afferent fibres of the vagus nerve, and is independent of the blood acid-base relationship. As the reaction of the blood, however, depends to a large extent on the proportion of bicarbonate to carbonic acid in the plasma, the rapid elimination of carbon dioxide which occurs in hyperventilation quickly causes a state of respiratory alkalosis. This is the first disturbance of the acid-base equilibrium that occurs in salicylism. Thus the hyperventilation is the cause of the acid-base disturbance and not vice versa. Singer (1954) has shown that later, probably owing to the accumulation of unidentified organic acids, a true metabolic acidosis may supervene. The gross hyperactivity of the respiratory musculature may play a part in this. Hyperpnoea may also be a factor in the production of various other phenomena occurring in salicylism, including tachycardia, and a reduction of the cerebral blood flow (Kety and Schmidt, 1946).

As stated above, the hyperventilation is responsible for the state of alkalosis, and this in turn may be clinically manifest as tetany. This is believed to occur independently of the level of diffusible calcium in the blood (Wright, 1952), and is, in our experience, not affected by the administration of calcium gluconate.

Treatment

Apart from immediate withdrawal of the drug and washing out of the stomach, treatment has usually been directed towards the correction of the biochemical changes when these have become established. Most authorities (Williams and Panting, 1937; Barnett *et al.*, 1942; Heymann *et al.*, 1954) have recommended the use of appropriate intravenous infusions. The difficulty and uncertainty of such therapy, however, have led Heymann *et al.* (1954) and Done and Otterness (1956) to use exchange transfusion, and Doolan *et al.* (1951) have gone so far as to recommend the use of the artificial kidney.

In view of the fact that the electrolyte disturbances are secondary to the hyperpnoea, it would appear more rational to direct therapy towards a reduction of the respiratory exchange and of the hyperactivity of the respiratory musculature. One obvious means of obtaining this end is the use of drugs known to have a depressant effect on the central respiratory mechanism. In their experimental studies, Rapoport and Guest (1945) were able to limit the hyperpnoea and the secondary biochemical changes with barbiturates and opiates. They found, however, that salicylates appeared to sensitize their animals to the action of these drugs, and that their administration in doses normally well tolerated resulted in prolonged coma or in death. This would seem to preclude the use of such drugs in salicylism.

In order to limit the output of carbon dioxide, Harvie and Singer (1955) proposed that the patient be made to breathe a gas mixture with a high carbon dioxide content. Obviously in a patient with an active central respiratory mechanism this raises the blood carbon dioxide tension only when the patient is already ventilating at his maximum breathing capacity, or when carbon dioxide is administered in such high concentrations as to produce depression of the central nervous system. Our experiences, described below, illustrate the limitations of this therapeutic measure, in that any reduction of tetany occurs only at the expense of accentuated respiratory dysfunction. These limitations led us to consider the value of neuromuscular block in overcoming the respiratory and biochemical effects of salicylate poisoning.

Therefore, when we were presented with a case in which a child, as the result of salicylate poisoning, was comatose, hyperpnoeic, suffering from tetany, and clearly *in extremis*, this method of treatment was applied and its value is shown by the following case report.

Case History

A 6-year-old boy complained of sore throat early in January, 1956. One week later he developed painful swellings of both knees, and a patchy erythema with well-defined margins was noted on the upper parts of both arms and on the thighs. He was thought to be suffering from rheumatic fever, and sodium salicylate, $7\frac{1}{2}$ gr. (0.5 g.) was prescribed, to be given two-hourly, the total daily dose being 75 gr. (5 g.). He was not given any alkali. This was taken regularly up to the time of his admission to Alder Hey Children's Hospital 11 days later, on January 20. On the day preceding admission he had become a little drowsy and seemed somewhat irrational. That evening he vomited once and had two nose bleeds. The following afternoon his respiratory rate increased and he was admitted the same evening.

On admission he weighed only 35 lb. (15.9 kg.); he had thus received a little over 2 gr. of salicylate per pound (280 mg. per kg.) body weight per day for 11 days. He was conscious and co-operative and did not appear to be particularly ill, although his respiration was somewhat increased

in both amplitude and rate (50 a minute). The temperature was 97.8° F. (36.5° C.) and his pulse rate 148 a minute. There was no evidence of carditis or of any other manifestation of rheumatic fever.

He was given 10 mg. of vitamin K intramuscularly in view of the epistaxis and known capacity of salicylate to induce hypoprothrombinaemia. Drinks of orange juice with added sodium bicarbonate were offered and he was kept under observation overnight. No marked change was noticed during the night, but the next morning, January 21, it became obvious that he was deteriorating. He became deeply unconscious and began to sweat profusely. Muscular tetany then appeared; there was spasmodic arching of the back accompanied by marked stiffness of the limbs, the arms being extended at the elbows, the forearms pronated, the wrists flexed, the fingers flexed at the proximal interphalangeal joints, and the thumbs adducted; the hips and knees were extended and the feet plantar-flexed; the jaw was tightly clenched.

At this stage a report was received showing that the blood salicylate concentration of the previous evening had reached the extraordinarily high level of 66 mg./100 ml. Blood taken at 9.30 a.m. on January 21 showed the level of salicylate to have fallen to 40 mg./100 ml. while the alkali reserve was 30.9 vols./100 ml. (13.8 mEq/l.); serum chlorides, 529 mg./100 ml. (90.3 mEq/l.); blood urea, 36 mg./100 ml.; serum protein, 6.8 g./100 ml. (16.3 mEq/l.); serum potassium, 13.1 mg./100 ml. (3.3 mEq/l.); serum calcium, 9.3 mg./100 ml. (4.6 mEq/l.); serum calcium ions, 4.2 mg./100 ml. (2.1 mEq/l.); unfortunately neither serum pH nor carbon dioxide tension was estimated.

Despite the falling plasma salicylate concentration the patient's clinical condition continued to worsen during the day. Therapy at this stage consisted of an intravenous infusion of N/5 sodium chloride with 5% dextrose, given at the rate of 30 ml. an hour, and a gastric milk drip, containing 50 g. of glucose to the pint, at the rate of 1 pint (570 ml.) in 24 hours. Alkalinizing solutions were not used at this stage because the patient was still tetanic and therefore presumably still alkalotic. Intravenous injections of 0.3 g. and 0.4 g. of calcium gluconate failed to affect the tetany.

By 7 p.m. he was still comatose, tetanic spasm was almost constantly present, the temperature had risen to 102° F. (38.9° C.), and the respirations had increased to 70 a minute and were extremely deep.

In view of the gross clinical tetany, presumably due to respiratory alkalosis, it was decided to try to conserve and increase the patient's serum carbon dioxide concentration. Initially an attempt was made to encourage rebreathing through a length of corrugated rubber tubing, and after several minutes there was a slight fall in the respiratory rate and slight lessening of limb rigidity, but no notable beneficial effect. With a mixture of 5% carbon dioxide in oxygen the respiratory rate again fell somewhat after several minutes, but the respiratory effort was still very great. The respiratory rhythm changed, his expirations becoming more forceful. Within four minutes the limb rigidity had diminished until the arms were quite flaccid and convulsive spasms became infrequent. After 20 minutes, however, the limbs again became rigid and the spasms increased. The raising of the concentration of carbon dioxide to 10% produced a similar transient effect. Despite these manoeuvres respiration remained violent and exhausting and the severe tetany recurred.

Neuromuscular Block and Control of Respiration

It was then decided to try to reduce the respiratory excursion and effort by neuromuscular block. Five milligrams of suxamethonium was injected intravenously. The respiratory excursion diminished greatly and a "see-saw" type of rhythm developed, there being no change in respiratory rate. Two further injections of 5 mg. were given at intervals of five minutes. With these the respiratory excursion diminished until ventilation became quite ineffec-

tive. Despite this, however, the trismus persisted and difficulty was experienced in maintaining an airway. It was apparent that incomplete myoneural blockade would not be effective as a means of controlling hyperventilation. Therefore, at 11 p.m. on January 21, 27 hours after the patient's admission to hospital, the decision was taken to curarize the patient fully and to control his respiration.

The head was lowered and 10 mg. of D-tubocurarine was injected intravenously, while the patient was made to breathe oxygen. As the jaw relaxed accumulated secretions were aspirated from the pharynx. A No. 3 uncuffed McGill endotracheal tube was inserted and copious yellowish mucoid secretion aspirated from the trachea and bronchi. The tube was then connected to an Ayre T-piece and controlled intermittent positive-pressure respiration was instituted, with 3 litres a minute each of oxygen and nitrous oxide.

Progress

With this treatment sweating soon ceased, his pulse rate fell from 140 to 100 beats a minute and the temperature from 101 to 99.4° F. (38.3 to 37.4° C.). The patient was carefully observed and 3 to 6 mg. of D-tubocurarine was given intravenously at intervals as required, a total of 36 mg. being administered within the next 12 hours. One and a half hours after the last dose of D-tubocurarine artificial respiration was discontinued and the endotracheal tube was removed. A bronchoscope was passed and bronchial secretions were aspirated. He was then placed in an oxygen tent.

Soon after the cessation of intermittent positive-pressure respiration the patient's breathing was normal in rhythm and depth and settled at a rate of 24 a minute. His pulse was 110 a minute and the temperature had fallen to normal. His coma, however, persisted and the tone of his limbs was still slightly increased, but there were no further tetanic spasms. On examination of his eyes it was noticed that the arteries in the left fundus were constricted.

At this time (10 a.m. on January 22) his blood salicylate level was 29.5 mg./100 ml. Other values were as follows: alkali reserve, 32.8 vols./100 ml. (14.8 mEq/l.); serum chloride, 542 mg./100 ml. (92.4 mEq/l.); serum potassium, 10.2 mg./100 ml. (2.5 mEq/l.); serum sodium 310 mg./100 ml. (134 mEq/l.); blood urea, 39 mg./100 ml.; serum protein 7 g./100 ml. (16.8 mEq/l.); blood sugar, 120 mg./100 ml.

At 11.30 a.m. his intravenous infusion was changed from N/5 saline to 1/6 molar lactate, as at this stage he was thought to have entered the phase of metabolic acidosis. He was given a total of 300 ml. in the space of 10 hours. His gastric drip was continued at the rate of 1 pint (570 ml.) per 24 hours, and 2 g. of potassium was added to it in order to correct the deficiency of this electrolyte.

At 7 p.m. on that day his alkali reserve had risen to 53.8 vols./100 ml. (24 mEq/l.); his serum salicylate level was 24 mg./100 ml. Other blood levels estimated at this time were: serum chloride, 538 mg./100 ml. (93 mEq/l.); serum sodium, 326 mg./100 ml. (142 mEq/l.); serum potassium, 10.5 mg./100 ml. (2.64 mEq/l.); red-cell sodium, 64 mg./100 ml. (28 mEq/l.) (normal 36–58 mg./100 ml., 15.7–25.3 mEq/l.); red-cell potassium, 330 mg./100 ml. (84.6 mEq/l.) (normal 358–390 mg./100 ml., 98.1–100 mEq/l.).

On the following morning, January 23, 24 hours after the end of controlled respiration, consciousness returned, though he was still very listless and drowsy. His temperature had remained normal; his pulse rate was 100 a minute and his respirations 30 a minute. By then his blood salicylate level had fallen to less than 5 mg./100 ml.; serum chlorides were 542 mg./100 ml. (93 mEq/l.); serum potassium, 11.6 mg./100 ml. (2.9 mEq/l.); and alkali reserve 55.7 vols./100 ml. (25 mEq/l.). Thereafter he rapidly improved, and he was discharged home eight days after admission, having made a complete recovery from his salicylate intoxication. Clinically and radiologically his lungs were normal. The mixture of salicylate which he had been taking was analysed and found to contain the prescribed dose of the drug.

Comment

Apart from the successful control of hyperpnoea, the following points in the above case history are considered to be significant.

At the time when intermittent positive-pressure respiration was instituted copious mucopus was present in the trachea. With our form of treatment, however, tracheo-bronchial toilet could be performed with ease, and bronchial aspiration was prevented. Thus one of the major hazards of coma was eliminated. Another advantage was that intragastric feeding could be continued in safety.

Following the institution of our form of treatment, the raised temperature and pulse rate moved rapidly towards normal, suggesting that they were caused by the heightened respiratory muscular activity.

The response of this boy to the inhalation of carbon dioxide shows that it has no place in the treatment of salicylate intoxication.

Tetany in our patient was a manifestation of alkalosis, and was not related to the level of ionized calcium in the blood, as this was within normal limits. It is therefore not surprising that the administration of calcium gluconate had no beneficial effect.

Summary

Salicylate intoxication causes an appreciable number of deaths among children. Gross hyperpnoea is one of the more serious toxic effects of salicylate poisoning; it is caused by reflex stimulation of the respiratory centre through the afferent fibres of the vagus nerves. The hyperpnoea gives rise to respiratory alkalosis and this may be accompanied by tetany and convulsions.

A case is described in which the hyperpnoea of salicylate poisoning was treated successfully by neuromuscular block and manually controlled intermittent positive-pressure respiration. It is believed that this method of treatment contributed materially to the patient's recovery. In addition, the administration of intravenous fluids is essential in order to conserve the body's water balance; milk can be given by gastric drip with impunity, as aspiration of fluid is prevented by a cuffed endotracheal tube.

The inhalation of carbon dioxide and the administration of calcium gluconate were not found to be effective therapeutic measures.

We are indebted to Dr. R. W. Brookfield for permission to treat and publish this case; we thank him and Professor Norman B. Capon for their advice in the preparation of this paper. We are also grateful to Mr. J. T. Ireland for the biochemical estimations; and to Dr. K. M. MacWilliam, the resident students, and Sister Ismay and her staff for their part in the management of this patient.

REFERENCES

- Barnett, H. L., Powers, J. R., Benward, J. H., and Hartmann, A. F. (1942). *J. Pediatr.*, 21, 214.
Committee on Toxicology, American Academy of Pediatrics (1955). *J. Amer. med. Ass.*, 158, 831.
Done, A. K., and Otterness, L. J. (1956). *Pediatrics*, 18, 80.
Doolan, P. D., Walsh, W. P., Kyle, L. H., and Wishinsky, H. (1951). *J. Amer. med. Ass.*, 146, 105.
Graham, J. D. P., and Parker, W. A. (1948). *Quart. J. Med.*, 17, 153.
Harvie, F. H., and Singer, R. B. (1955). *Amer. J. Dis. Child.*, 89, 149.
Heymann, S., Javett, S. N., and Rudolph, A. M. (1954). *S. Afr. med. J.*, 28, 1092.
Holt, K. S. (1954). *Lancet*, 2, 1197.
Key, S. S., and Schmidt, C. F. (1946). *J. clin. Invest.*, 25, 107.
Rapaport, S., and Guest, G. M. (1945). *Ibid.*, 24, 759.
Registrar-General (1950-2). *Statistical Review of England and Wales for the Years 1950, 1951, 1952*. Tables. Part I. Medical. H.M.S.O., London.
Singer, R. B. (1954). *Medicine (Baltimore)*, 33, 1.
Williams, S. W., and Panting, R. M. (1937). *British Medical Journal*, 1, 550.
Wright, S. (1952). *Applied Physiology*, 9th ed., p. 1007. Oxford Univ. Press, London.

USE OF HYPOTHERMIA IN NON-VASCULAR INTRACRANIAL TUMOURS

BY

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During recent years the value of hypothermia as an aid to certain types of surgery has become established. In cardiac surgery when temporary occlusion of one or more of the great vessels is required, and in cerebral surgery when the main arteries supplying vital structures are occluded, or when a period of prolonged induced hypotension is desired, hypothermia has been found to be of undisputed value (Lougheed *et al.*, 1955; Botterell *et al.*, 1956).

One mechanism by which reduced body temperature safeguards vital organs is known to be that of metabolic depression with resulting reduced vulnerability to anoxia, and where arterial occlusion is practised this mechanism is clearly the prime one (Ralston *et al.*, 1955; Rosomoff, 1956). Where no deliberately induced ischaemia of this type is involved, however, hypothermia would still appear to have certain benefits, the exact mechanism of which is less clearly understood, although the basic theory of reduction of susceptibility to anoxia is still no doubt a major consideration (Lundberg *et al.*, 1956).

The use of hypothermia in the management of head injuries has had recent publicity and is an example of this "non-vascular" indication for a lowered body temperature. We have recently gained the impression that reduction of temperature is also of value when operative procedures involving the hypothalamus, diencephalon, and brain stem are contemplated, even though neither carotid occlusion nor prolonged hypotension is to be employed as part of the technique. Operative intervention in the brain-stem region is known to carry a high post-operative mortality, and the reasons for such deaths are not always clear. It is suggested that the commonly seen post-operative coma and hyperpyrexia are due, in part at least, to tissue-swelling resulting from trauma with consequent cellular damage, in which case it is probable that anoxia plays a not unimportant part. Indeed, such anoxia might conceivably result from operative retraction itself, as the arteries supplying the midline structures are often end arteries. It is not at all unknown for an actual thrombosis of the lenticulostriate artery to occur on one or other side during the course of such an operation.

Whatever the causes of such injury may be, however, whether they be anoxia or indirect or direct trauma, we have come to the opinion that hypothermia protects cells of the brain stem and diencephalon during operative procedures.

This is obviously a point which would require statistical proof, and such will not be possible until large numbers of cases are available; even then advances in other directions render a control series almost impossible. No further comment can therefore be made than to say that it is now our routine to use hypothermia in all cases

where operations on the brain stem are required, and that we have been favourably impressed with results. It has been our opinion that cases so managed have had fewer post-operative complications in the form of prolonged unconsciousness and hyperpyrexia. Some patients have survived who would, we think, have died without the method. The introduction of hypothermia has been the only change in method that we have made in the period in question.

Method

The hypothermia in this series has been induced by surface cooling, using the Birmingham hypothermia unit previously described (Inglis *et al.*, 1954). Briefly this unit consists of a pair of tubulated blankets through which refrigerated ethylene glycol is circulated by means of a pump. The temperature of the glycol can be predetermined and the patient can be rewarmed as soon as the vital operative period is over. Anaesthesia has been in all cases by means of nitrous oxide and oxygen with intravenous thiopentone and pethidine, while chlorpromazine has been used to facilitate the fall in temperature. Corticotrophin or cortisone has been employed as a routine, so maintaining a standard management for all such cases operated upon in the past five years.

Two cases of craniopharyngioma are described. They were two consecutive examples of the condition; both had a large craniopharyngioma completely removed under hypothermia, with survival. They serve as examples to show our present favourable impression, and to encourage others to try a method which may help in a rather difficult surgical field.

Case 1

A boy aged 5 was admitted in July, 1956. Three months previously a change in his personality had been noted—from a quiet, placid child he had become excitable, careless, dirty in his habits, and rather irritable. A month before admission he had begun to complain of headaches, and from that time to his admission he had occasional morning vomiting, with increasing apathy, which gradually progressed to drowsiness and finally to stupor. On examination he was found to be lightly stuporous. He could be roused temporarily to co-operate in examination, and it was then found he had an increase of tone with some spasticity in all four limbs and a frank left hemiparesis. Both plantars were abnormal, the left being more frankly extensor than the right. There was bilateral ptosis and the pupils reacted sluggishly to light, the right one being slightly larger than the left. No papilloedema was present.



FIG. 1.—Ventriculogram of Case 1 showing elevation of the floor of the third ventricle.

A ventriculogram showed gross elevation of the floor of the third ventricle by a mass protruding into it from the suprasellar position (Fig. 1). At operation under hypothermia to 29° C. a right frontal craniotomy was performed and the frontal lobe was elevated until the right optic nerve was seen. Medial to it a mass protruded forwards between the two optic nerves. This mass proved to be partially cystic, and 30 ml. of golden glistening fluid was aspirated. The base of the cyst was firmly fixed to the suprasellar region, but the superior wall was gently coaxed downwards and pulled off the hypothalamus by gentle blunt dissection and removed through the aperture below the chiasma. The solid portion of the tumour was now thoroughly scraped off the dura, and the diaphragma sellae and any vestiges of tissue in this situation were thoroughly treated with diathermy. The operation was completed and the patient was then gradually rewarmed to 36° C. over the course of four hours, when consciousness returned. Although he was drowsy for a few days, his post-operative progress was extremely smooth. From the day of operation he received corticotrophin in physiological doses; this was gradually changed to cortisone.

A fortnight after the operation he was shown to have a progressive anaemia. A blood transfusion was given and thyroid was added to the hormone medication. At this stage he made a dramatic improvement, and from being drowsy, somewhat spastic, tremulous, and rather irritable, he became in the course of a few days a normal boy for his age—intelligent, co-operative, with only a mild bilateral ptosis to be remarked upon in his general appearance. Histology had confirmed that the cyst was lined with squamous epithelium overlying collagenous fibrous tissue. In a few places the lining consisted of lipogranulomatous tissue infiltrated with chronic inflammatory cells. The solid nodule was composed of squamous epithelium. The appearances were those of a craniopharyngioma.

During the post-operative period there had been a fairly brisk diuresis to about two to three times the normal, with a corresponding increase in thirst; no special measures had to be employed to counteract this mild diabetes insipidus. His further progress has been satisfactory, and he was instructed to go back to school in October, as he did not require further hormonal treatment.

Case 2

A boy aged 15 was admitted in September, 1956, because of progressive and latterly alarming impairment of vision. In the month before his admission visual acuity fell from 6/9 to 6/60; he was obviously in great danger of losing his sight.

On examination he was obese, with small extremities and markedly tapering fingers, and the genitalia were



FIG. 2.—Ventriculogram of Case 2 showing upward displacement of the third ventricle.

IMMUNITY TO DIPHTHERIA EVALUATION OF SCHICK TEST AS A PRELIMINARY TO IMMUNIZATION

BY

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An investigation was carried out to determine the immunity to diphtheria of R.A.F. recruits, to assess the value of Schick-testing as a routine Service procedure, and to correlate the results of Schick tests with circulating antitoxin titres.

A total of 991 recruits from five recruit centres were Schick-tested in a survey which took place in March and April, 1956. Nearly all the men were 17½ to 18½ years old and belonged to the 5–6 years age group in 1943, when most children were immunized against diphtheria by local authorities. There was no geographical selection of the recruits at the different centres, though some selection by trade. It is just possible, therefore, that there may have been a slight social selection at the different centres. It is felt that the group as a whole was a reasonable cross-section of the young men of this country. Each volunteer had 5 ml. of blood taken by venepuncture and then a Schick test. All the Schick tests were performed and read by one person (P. J. S.).

The Schick Test

The materials used were Schick test toxin and Schick control fluid (a heated diluted toxin) prepared by Evans Medical Supplies, Limited. The dose of each was 0.2 ml., and this was administered intradermally, the test dose being put into the anterior aspect of the right forearm and control into the left. The Schick tests were read after 48–72 hours (first reading) and on the fifth, sixth, or seventh day (second reading). On each occasion the reactions to both test and control were recorded in the following way: 0=no visible reaction at all or merely a tiny red spot of 1–2 mm. marking the needle puncture. 1=a faint flush, barely discernible up to 15 mm. diameter. 2=a more definite flush

TABLE I.—Interpretation of First Schick Reading

Test	Control	Result
0	0	Negative (—)
1 or 2	0	Weak positive (w+)
3 or more	0	Positive (+)
1 or more	1 or more	Pseudonegative (ps—)
(both reactions equal)		
2 or more	1 or more	Pseudopositive (ps+)
(test reaction greater than control)		

TABLE II.—Interpretation of Both Schick Readings

First Reading	Second Reading	Schick Status
—	—	Negative
+	—	"
w+	—	"
w+	w+	Positive
+	w+	"
w+	w+	"
+	w+	"
—	+	"
—	+	"
Either or both ps+ or ps—		Pseudoreactor

Summary

A preliminary note is put forward to suggest an extension of the value of hypothermia in neurosurgical cases. In addition to the accepted advantages of lowered metabolism when arterial occlusion or prolonged hypotension is employed, there would appear to be a *prima facie* case for reducing the patient's body temperature when operations on the brain stem or diencephalon are contemplated.

Two consecutive cases are described of large craniopharyngioma completely removed; they illustrate the smooth post-operative course to be expected in operations under hypothermia.

We are indebted to Dr. Gilbert Hall, under whose care the second case was admitted, and to Mr. W. H. Biffen for technical help with the hypothermia.

REFERENCES

- Botterell, E. H., Loughheed, W. M., Scott, J. W., and Vandewater, S. L. (1956). *J. Neurosurg.*, 13, 1.
Inglis, J. McN., Biffen, W. H., and d'Abreu, A. L. (1954). *Lancet*, 1, 549.
Loughheed, W. M., Sweet, W. H., White, J. C., and Brewster, W. R. (1955). *J. Neurosurg.*, 12, 240.
Lundberg, N., Nielsen, K. C., and Nilsson, E. (1956). *Ibid.*, 13, 235.
Ralston, B., Rasmussen, T., and Kennedy, T. (1955). *Ibid.*, 12, 26.
Rossmoff, H. L. (1956). *Ibid.*, 13, 332.

The industrial advisory committee of the Ross Institute has issued a bulletin (No. 11) on iron-deficiency anaemia, prepared by Dr. R. FORD TREDRE, and its bulletin on tropical ulcer (No. 4) has been rewritten. These bulletins, and all other publications of the Ross Institute, may be obtained from the secretary, Mr. L. G. PONSFORD, London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1.

TABLE III.—Summary of Tests Performed

Recruit Centre	No. of Recruits Schick Tested	No. of Recruits whose Antitoxin was Estimated	Degree of Selection of Specimens for Antitoxin Estimation
1	202	193	No selection—all available specimens tested
2	198	184	Slight selection—some clear negatives and frank positives not titrated
3	191	159	
4	128	84	
5	272	79	Considerable selection—clear negatives and frank positives omitted
			Entirely selected—titrations confined to weak positives, pseudo-reactions, and discrepant first and second Schick readings
Total	991	699	

into which the fluid is injected cannot be guaranteed in the absence of great care and special training (Palmer and Edwards, 1953; Guld and Rud, 1953).

On the basis of the first reading a recruit was assessed according to Table I. Each recruit was similarly assessed at the second reading and then given a final reading of Schick status according to Table II. It will be noted that by this method of final assessment the first reading is ignored except for identification of pseudoreactors. The justification for this is discussed below.

Antitoxin Estimations

Diphtheria antitoxin titres were estimated at the Wellcome Research Laboratories by a modification of the Römer and

TABLE IV.—Summary of Schick-test Results

Schick Test Results																
Schick Status		Negative				Positive				Weak Pos.			Total All Pos.	Pseudo-reactors	Unsatisfactory	
1st reading	2nd	-	w +	+	Total	+	w +	+	-	Total	w +	-	Total	Total	Total	Total
..	..	-	-	-		+	+	+	+		w +	w +				
		579	22	2	603 (60%)	97	81	15	25	218 (22%)	32	22	54 (6%)	272 (28%)	103 (11%)	13 (1%)
																991

but less than 10 mm. or a faint flush over 15 mm. 3=a very definite erythema of 10 mm. or over, with or without some induration, brown pigmentation, or desquamation. 4=3 but larger.

It should be emphasized that the grading was a fairly quick assessment made in about 5 to 10 seconds. The exact size of reactions was not accurately measured. It was considered unnecessary to do so, since a reaction just less than the arbitrary minimum size usually required for a positive was noted as a grade 1 or 2 reaction and so not lost as a negative. Further, to attempt an exact measurement of such a reaction seems a waste of time and is apt to give results a false appearance of scientific accuracy, since the constant factors involved in the test are themselves inevitably inaccurate—for example, the size of the inoculum cannot be measured very accurately and the exact layer of dermis

TABLE V.—Summary of Schick-test Results Grouped According to Recruit Centre (Percentages are Expressed as Whole Numbers)

Centre	Neg.	Pos.	W. Pos.	Total Pos.	Pseudo-reactors	Unsatisfactory
1	60%	25%	4%	29%	9%	2%
2	59%	19%	7%	26%	12%	3%
3	61%	24%	6%	30%	8%	1%
4	55%	26%	4%	30%	15%	0%
5	65%	19%	5%	24%	10%	1%

TABLE VI.—Results of Specimens from No. 1 Recruit Centre

Schick Status	Readings 1st 2nd	No. of Men with Antitoxin Titres (units/ml.)													Total
		< 0.001	0.001-	0.002-	0.004-	0.01-	0.02-	0.04-	0.1-	0.2-	0.5-	1-	2-	5-10	
Negative	- -	0	1	7	27	12	10	18	14	9	6	5	1		110
	- w+	1		1	2										4
	- +	1		1	1										3
Positive	w+ w+	10	2	2	5	1									18
	w+ +	3													3
	+ +	25	1	1	1	1									29
Pseudo-reactors	ps+ +	1						1							1
	ps+ w+	1													1
	ps+ ps+	1		1	1										3
	ps+ -														1
	ps+ ps-														1
	ps- w+								1		2	1			3
	ps- -										1				1
Unsatisfactory	Not read					1									1
	ps- Not read														1
	Not read	1							1						2
Total		45	4	12	37	15	10	21	17	12	11	8	1	0	193

immunization campaign, as judged by the immunization returns of local authorities, was in 1943, and by 1945 there was a considerable falling off in its intensity. It is generally agreed that in recent years, for various reasons, there has been a marked decrease in the numbers immunized (Gray and Cartwright, 1952). Figures are given in the *Medical Officer*

The results, which show a Schick-positive rate of 28%, excluding pseudoreactors, seem to confirm this, particularly when it is remembered that this figure includes weak positives (20% of the total positives).

Goldsworthy and Wilson (1943) reviewed the literature up to 1942 and found Schick-positive rates varying between 30 and 80%, the majority being 50 to 60%. These surveys were almost all on young adults. Their own survey gave figures of 46% Schick-positive and was made on 335 young adults who had no history of either diphtheria or immunization. It is not stated what definition of a positive reaction was used. Cheever (1948) found an average of 34% Schick-positives among 18,000 U.S. naval recruits, but an analysis of these on a geographic basis indicated considerable differences between groups from different areas, ranging from 16 to 47%. Again, no details of the definition of a positive reaction were given. Thomas *et al.* (1940) found that 70% of university students from well-to-do families but only 36% of military youths from poor families were Schick-positive.

Liao (1954) recorded that among 3,000 U.S. military recruits in 1951 35% were Schick-positive (definition of positive was 10-mm. erythema with induration and negative was "no definite response"). Fraser (1952) tested 1,000 naval recruits aged 17-20 in this country, but gave no details of the definition of positive. He found 32% positive, 51% negative, and 17% pseudoreactors.

Antitoxin Titres and Immunity

The Schick level of circulating antitoxins has been variously regarded as being about 0.002 unit/ml. (Cameron, 1941), 0.004 unit/ml. (Greenberg and Roblin, 1949), and about 0.01 unit/ml. (Barr and Cunliffe, 1954). The workers quoted were not all using the same

(1946a, 1946b) for the percentages of children under 15 immunized during the years to 1945, and these vary between 50% and 67%.

Our survey has therefore been made upon a group of young adults who are likely to have had as good an immunization history as any similar group in recent years or any we shall have in the next 15 years at least.

Schick-testing materials. Our series would appear to support a level at about 0.004 unit/ml., since from Table VII 90% of 231 Schick-positives had titres of less than 0.004 unit/ml. and 91% of 359 Schick-negatives had titres over 0.004 unit/ml. Therefore if it is of value to divide a group of people into those who probably have less than 0.004 unit/ml. and those who probably have more than 0.004 unit/ml.

TABLE VII.—Total Collected Results from All Stations (Not Random Sample)

Schick Status	Readings 1st 2nd	No. of Men with Antitoxin Titres (units/ml.)													Total
		< 0.001	0.001-	0.002-	0.004-	0.01-	0.02-	0.04-	0.1-	0.2-	0.5-	1-	2-	5-10	
Negative	- -	9	1	17	63	43	30	46	49	40	24	13	1		336
	- w+	4			9	1	1				2	4	1		21
	- +	1													2
Positive	w+ w+	14	3	4	7	1									31
	w+ +	59	10	4	2	1		1							75
	+ +	8	5	2	1							1			14
Pseudo-reactors	ps+ w+	61	4	5	3										70
	ps+ +	9	4	5	3	1									22
	ps+ ps+	11	1	4	2										19
	ps+ -			1	1										4
	ps+ ps-	2					1								3
	ps- w+	1							2	2	4	2			12
	ps- -	1									2	1	3		20
Unsatisfactory	ps- ps-	1		1	1	5	1	2	3	5	9	2	6	1	34
	ps- Not read	1				1		2			4	2			20
	Not read														2
	ps- Not read														1
	Not read														1
	ps- Not read														1
	Not read	1													1
Total		185	28	42	93	55	33	54	61	62	46	26	12	2	699

ml., then the Schick test with the material used is a good one.

The value of a test giving the dividing line at as low a level as 0.004 unit/ml. has been discussed by Barr and Glenny (1951), and they gave it as their opinion "that before artificial immunization became general, when the population relied upon natural infection to stimulate immunity, the great majority of Schick-negative persons had high titres of antitoxin and most Schick-positives had none." A test, therefore, with a dividing line at 0.004 unit/ml. was quite satisfactory. They had found during recent years many people with antitoxin titres just around the Schick level, and to-day, therefore, Schick-negative reactors may nevertheless have titres the adequacy of which is doubtful.

The Chart indicates that our results agree with Barr and Glenny's findings. There are two peaks, and one is around the Schick level. Barr and Glenny were strongly of the opinion that a good level of circulating antitoxin as well as a good immunity were necessary for complete protection against diphtheria, and Barr and Cunliffe (1954) assumed that those with less than 0.01 unit/ml. were in need of boosting. Marshall (1950) discussed these points and suggested that the strength of the Schick-test toxin might be altered with advantage to give a positive reaction at a rather higher level.

Hartley *et al.* (1950) concluded, as a result of a study of outbreaks of diphtheria in two areas of Great Britain and its occurrence in non-inoculated and inoculated persons, that the incidence, mortality, frequency, and severity of complications bore a striking relationship to previous inoculation and to circulating antitoxin, though the correlation was not complete. They considered that unless "the proportion of the immunized population is kept up to the 75% level, protection against epidemic diphtheria cannot be reasonably assured," and they showed that clinical diphtheria could occur in those with as much as 0.02 unit/ml. of circulating antitoxin. Fanning (1947) described an outbreak in a community of children in which there was a 94% history of immunization and an 80% Schick-negative rate.

It is possible that a level of immunity such as we have found in R.A.F. recruits is adequate to prevent any major outbreak of diphtheria in this country, where the disease is now rare, but it must be remembered that our sample probably represents the peak of achievement of the immunization campaign. Furthermore, many overseas areas have a high diphtheria rate among the civilian population, and we believe it is important for the armed Forces to maintain immunity at a much higher level as a necessary part of their preparation for service anywhere in the world.

While use of test toxin at the present strength followed by immunization of positive reactors will leave some individuals imperfectly protected, our figures suggest that this practice will adequately increase the level of immunity to prevent epidemics. If it is assumed that immunization will raise the antitoxin level above 0.02 unit/ml., then after immunization of all Schick-positives, excluding pseudoreactors, only 55 (28%) of the 193 recruits at Centre 1 (Table VI) would have remained with less than 0.02 unit/ml., 6% with less than 0.004 unit/ml., and only 3 (1½%) with no circulating antitoxin. If in addition one takes into account the probability that the Schick test itself would stimulate a number of the 55 whose antitoxin titres were just less than 0.02 unit/ml. to produce more antitoxin (Barr and Parish, 1950), then probably approximately 80% of the recruits would be left with high titres (over 0.02 unit/ml.) and only 2 or 3% would be left without detectable antitoxin.

Weak-positive Reactors

It is important not to neglect the weak-positive reactions—that is, those we scored as 1 or 2. In our study of 53 weak-positive reactors—that is, first reading w+, second reading w+, or first reading —, second reading w+, 39 (74%) had less than 0.004 unit/ml., and from Table IV it will be seen that weak-positive reactors are 20% of our total positives. We strongly recommend that, with the reagents we used, the usual practice of defining a positive reaction as one at

least 10 mm. in diameter should be discontinued and that any flush extending beyond the needle puncture should be recorded as positive.

Comparison of First and Second Readings

Examination of Table VII shows that the second reading is a much more reliable index of immunity than the first. Of 41 who were negative at the first reading and positive or weak positive at the second, 34 (83%) had titres less than 0.004 unit/ml., whereas of 23 who were positive or weak positive at the first reading and negative at the second, only 5 (22%) had titres less than 0.004 unit/ml. We consider that these results justify the exclusive use of the second reading for the assessment of the Schick test apart from the recognition of pseudoreactors.

Pseudoreactors

It is well recognized that immunization of adults with the various preparations in current use is attended by undesirable reactions in a considerable proportion of cases and that a preliminary screening for sensitive subjects should be made by Schick-testing (Cockburn, 1947; Scheibel *et al.*, 1948; and many others). A study of the antitoxin titres of those recruits giving various pseudoreactions indicates that 70% of those showing a pseudopositive reaction at one or both readings and 79% of those showing pseudonegative reaction at one or both readings, were highly immune—that is, more than 0.02 unit/ml. There seems little point, therefore, in distinguishing between pseudopositive and pseudonegative.

It is true that consideration of both Schick readings may indicate pseudoreactors who have low titres of antitoxin. Those who were pseudopositive on each occasion and those showing a positive pseudoreaction followed by a strong positive all had low titres. That this is generally so is well recognized (Parish, 1954). In addition, there was a suggestion from our results that a pseudonegative of grade 3 or 4 at the second reading is associated with low antitoxin titres. There were four such cases in our series and all had low antitoxin titres (three were less than 0.001 unit/ml. and one between 0.001 and 0.002 unit/ml.). Though these points are of interest, they have little practical importance. The numbers are too few to worry about with regard to herd immunity, and in the event of an epidemic such people would be given a temporary passive immunity with antitoxin.

The possibility of inducing adequate immunity by minimal doses of antigen, insufficient to cause reactions even in sensitive subjects, is to be the subject of further work and a subsequent report. In the meantime we think that when concerned with herd immunity it is best to withhold immunization from all pseudoreactors. Here lies the importance of the first reading. Omission of the first reading would have missed 65 of the 102 pseudoreactors, and 11 of these would have been immunized, since they had become uncomplicated positive reactors at the second reading. Any administrative objection to conducting two readings should therefore be firmly opposed.

Summary

A total of 991 R.A.F. recruits were Schick-tested, and on 699 of them estimations of circulating diphtheria antitoxin were performed.

The comparatively low rate of Schick-positives (28%, comprising 22% "classical" positives and 6% weak positives) was in keeping with the fact that these recruits were schoolchildren when the diphtheria immunization of schoolchildren was at its height.

An analysis suggests that the herd immunity was below the desirable level for Service men, though possibly adequate for residents in this country.

Weak-positive reactions should not be ignored, since 74% of these reactors had less than 0.004 unit/ml. of circulating antitoxin.

It is strongly recommended that, with the reagents we used, any flush extending beyond the needle puncture should be recorded as positive.

To increase herd immunity only Schick-positives should be immunized, all pseudoreactors being treated as immune.

The second reading of Schick tests showed a closer correlation with the level of circulating antitoxin than the first, but the first must not be omitted owing to the danger of missing pseudoreactors.

It is possible, though of little practical value, to detect many of the pseudoreactors who have low antitoxin titres.

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REFERENCES

- Barr, M., and Cunliffe, A. C. (1954). *Monthly Bull. Minist. Hlth (Lond.)*, 13, 98.
— and Glenny, A. T. (1951). *J. roy. Army med. Cps.* 96, 77.
— and Parish, H. J. (1950). *Monthly Bull. Minist. Hlth (Lond.)*, 9, 97.
Brincker, J. A. H. (1945). *Ibid.*, 4, 214.
Cameron, G. D. W. (1941). *Canad. publ. Hlth J.*, 32, 412.
Cheever, F. S. (1948). *Amer. J. publ. Hlth*, 38, 374.
Cockburn, T. A. (1947). *Monthly Bull. Minist. Hlth (Lond.)*, 6, 131.
Fanning, J. (1947). *British Medical Journal*, 1, 371.
Fraser, P. K. (1952). *J. roy. nav. med. Serv.*, 38, 22.
Glenny, A. T., and Llewellyn-Jones, M. (1931). *J. Path. Bact.*, 34, 143.
Goldworthy, N. E., and Wilson, H. (1943). *Med. J. Aust.*, 2, 349.
Gray, P. G., and Cartwright, A. (1952). *Monthly Bull. Minist. Hlth (Lond.)*, 11, 26.
Greenberg, L., and Roblin, M. (1949). *Canad. J. publ. Hlth*, 40, 112.
Guid, J., and Rud, C. (1953). *British Medical Journal*, 1, 368.
Hartley, P., Tulloch, W. J., Anderson, M., Davidson, W. A., Grant, J., Jamieson, W. M., Neubauer, C., Norton, R., and Robertson, G. H. (1950). *Spec. Rep. Ser. med. Res. Coun. (Lond.)*, No. 272.
Liao, S. J. (1954). *Amer. J. Hyg.*, 59, 262.
Marshall, M. A. (1950). *J. Pediatr.*, 37, 620.
Med. Offr. 1946a, 75, 225.
Ibid., 1946b, 76, 64.
Palmer, C. E., and Edwards, P. Q. (1953). *British Medical Journal*, 1, 363.
Parish, H. J. (1954). *Antisera, Toxoids, Vaccines and Tuberculin in Prophylaxis and Treatment*. Edinburgh.
Römer, P. H., and Sames, Th. (1909). *Z. Immunforsch.*, 3, 344.
Scheibel, L., Tulinius, S., Rasch, G., Boijen, K., and Peterson, C. B. (1948). *Acta path. microbiol. scand.*, 25, 319.
Thomson, S., Glazebrook, A. J., and Green, C. A. (1940). *J. Hyg. (Lond.)*, 40, 115.

NEPHROTIC SYNDROME ASSOCIATED WITH RENAL VENOUS THROMBOSIS AND BRONCHIAL CARCINOMA

BY

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The recognition of an association between long-standing renal venous thrombosis and persistent albuminuria has existed for over forty years (Rowntree *et al.*, 1913; Shattock, 1913). Blainey *et al.* (1954) describe three cases of the nephrotic syndrome, in one of which renal venous thrombosis was confirmed at necropsy. They point out that, while in many cases the aetiology of the syndrome is obscure, it may be caused by interference with venous return from the kidney. Most cases—for example, Derow *et al.* (1939), Moschowitz (1948), and Bell (1950)—have shown involvement of the inferior vena cava.

Thrombophlebitis (often of migratory type) has been known to be associated with malignant disease since

Trousseau (1877) drew attention to its occurrence in visceral carcinoma. Williams (1954) describes three cases of thrombophlebitis migrans associated with bronchial carcinoma, and points out that up to 1951 Gross *et al.* found only nine such cases so associated.

The following case presents an association of the nephrotic syndrome, renal venous thrombosis, and bronchial carcinoma. The inferior vena cava was not involved.

Case Report

A fireman aged 39 was admitted to hospital on December 28, 1954, with a history of dull backache for a fortnight, followed a week prior to admission by marked swelling of

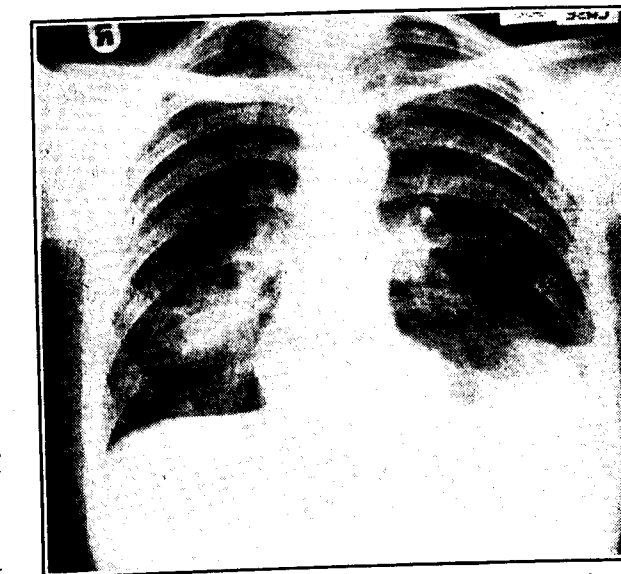


FIG. 1.—Chest x-ray film taken on January 28, after aspiration of chylopleurothorax.

the legs and feet, and moderate swelling of the face, hands, and abdomen. There had been oliguria, headache, and tightness of the chest for a similar period. His previous medical history was limited to chronic dyspepsia of about eight years' duration. A barium-meal x-ray examination in 1949 had shown chronic gastritis. There was no significant family history.

On examination his general condition was fairly good, with slight pallor and slight puffiness of the face, and marked pitting oedema of the whole of both legs. He had moderate ascites and the liver was just palpable and tender, but the spleen was not felt. There was no cardiovascular abnormality and his B.P. was 140/90. There were signs of fluid at the base of the left lung.

The following investigations were carried out during the week immediately following admission. Urine: protein + + +, with numerous hyaline casts and a few pus and red cells, and sterile on culture. Blood urea, 90 mg. per 100 ml.; urea clearance, 4.5% normal; total plasma proteins, 4.4 g. per 100 ml. (albumin 3 g., globulin 1.4 g.). A/G ratio 2.14:1; blood cholesterol, 310 mg. per 100 ml. A blood count showed: Hb, 119%; W.B.C., 11,400 per c.mm. (neutrophil polymorphs 87%, eosinophils 1%, lymphocytes 9%, monocytes 3%); E.S.R., 11 mm. at one hour (Wintrobe); normal morphology of red and white cells. Serum sodium 139 mEq/l.; serum potassium, 6.1 mEq/l.; serum chlorides, 101 mEq/l. Blood W.R. and Kahn tests negative.

He was given 2 pints (1,140 ml.) of dextran intravenously on January 3, 1955, with no diuretic effect, but repetition of a similar transfusion on January 8 resulted in a diuresis of 76 oz. (2.16 litres). A further 2 pints (1,140 ml.) of plasma was given on January 11, but caused no diuretic effect. In spite of these transfusions his total plasma proteins

never exceeded 4.4 g./100 ml., and in fact fell to 3.3 g. on January 13, with albumin 2.2 g. and globulin 1.1 g. (A/G ratio 2:1).

A chest x-ray examination on January 24 showed the appearances of a left hydropneumothorax, with some consolidation in the right mid-zone next to the hilum. Aspiration of the left chest showed that the condition was a chylopleurorrhoea, milky opalescent fluid being withdrawn. The stained deposit showed polymorphs, eosinophils, and lymphocytes in approximately equal proportions and a few endothelial cells, and also strongly sudanophilic isotropic droplets. No pyogenic bacteria or acid-fast bacilli were seen and cultures were sterile. The total protein content was 600 mg. per 100 ml. and the pH 7. A chest x-ray film taken on January 28 (Fig. 1) showed an increase in size of the tumour shadow in the right lower zone.

The blood-urea level gradually rose to 284 mg. per 100 ml. on January 31, and the patient died on February 3 at 2 p.m.

Post-mortem Findings

Necropsy was performed 22 hours after death. The changes of most interest were seen in the lungs and kidneys. The hilar region of the right lung was the seat of a white, partly necrotic tumour 4 cm. in maximum dimension, blocking all three lobar branches. There were obstructive infective changes in the peripheral parts, mainly in the lower lobe. Lymphatic spread to the right hilar, tracheal, and upper abdominal lymph nodes had occurred. Neither tumour involvement of the thoracic duct nor a bronchial fistula could be demonstrated. Blood-borne secondary nodules were present in the liver and left adrenal. A small serofibrinous effusion was present in the left pleural cavity, not now demonstrably chyliform.

Further, many pulmonary arterial branches in both lungs contained partly organized thrombi, apparently embolic in type. There was a solitary recent infarct in the left lower lobe.

The kidneys weighed 140 g. each. The capsules stripped easily from smooth pale surfaces. On the cut surfaces there was marked pallor and swelling of the cortical zones. The medullary areas were slightly congested. The tributaries of each renal vein and each main vein contained partly organized thrombus, the medial extremities of which projected slightly into the lumen of the inferior vena cava. The latter channel contained only post-mortem thrombus. The renal arteries and the pelves and ureters were macroscopically normal.

Other findings included fat necrosis of the pancreas and a small active peptic ulcer in the pyloric antrum.

Histologically, the lung tumour was composed of large, somewhat anaplastic, undifferentiated epithelial cells with eosinophilic cytoplasm. The appearances suggested a squamous growth. The stroma was scanty, and foci of necrosis and mitotic figures were numerous. The liver and



FIG. 2.—Hilar region of left kidney (x20). Elastic van Gieson. Normal renal artery. Medium-sized vein almost completely filled with well-organized thrombus.

adrenal deposits showed a similar structure. Microscopical study of the kidneys showed that thrombi were confined to extrarenal venous channels. Small eccentrically placed fibrin thrombi, not occluding the lumen completely, were seen in venules between 400 and 700 μ in diameter. They were of some duration, being encapsulated and partially penetrated by argyrophilic fibrils springing from the endothelium. In larger vessels (1–2 mm. diameter) the lumen was more severely occluded and more advanced stages of organization were observed, with pronounced condensation of the fibrin (Fig. 2). In the large tributaries and main renal veins, both partially organized and recently formed thrombus material was present, extensively but not completely blocking the lumen.

The cortical zones showed separation of the tubules due to oedema and fine fibrosis. A few pyramidal subcapsular scars with lymphocytic infiltration were present. The glomeruli were slightly swollen. Occasional capillary loops contained small hyaline thrombi, and in others small foci of polymorphs were present. Slight thickening of capillary basement membrane could be demonstrated by the periodic-acid-Schiff technique. The tubular epithelium was generally atrophic. Many tubules contained highly proteinous casts. A few contained granular debris and purulent material. The pelvis showed mild chronic inflammatory changes.

Thrombi were not found in the body apart from those in the renal and pulmonary vessels.

Comment

The occurrence in combination of the lesions described above is of interest on the basis of its rarity alone, as we are not aware of the existence of similar published examples.

A dogmatic opinion cannot be given regarding which lesion came first in time, but the probability is that this is another example of malignant disease presenting as a thrombotic state. The observation of Wright (1952) is important—namely, that a diagnosis of malignancy must be considered when thrombophlebitis persists, or is migratory, despite adequate anticoagulant therapy in adults over 30; or when unexpected bleeding occurs in such patients whose prothrombin times are within the therapeutic range. Although the presence of metastasizing bronchial carcinoma in the present case rendered the final outlook hopeless from the beginning, other cases not induced by any form of malignancy might respond to anticoagulant treatment. Early recognition of the pathogenesis of the nephrotic syndrome in such cases would be essential, if serious impairment of renal functions were not to preclude successful control of such treatment. Renal biopsy would have been of no positive value in establishing the underlying pathogenesis in this case, since thrombi were confined to extrarenal veins, but it might have served to exclude other causes. Further information on the value of this investigation, and of renal venography, would seem desirable. Possibly the process, the blood urea level rising quickly. The picture, we feel, was thus one of a "nephrotic" patient passing unusually rapidly into an azotaemic state.

Summary

A case of the nephrotic syndrome is presented, in which the underlying aetiology was bilateral thrombosis of the renal veins, associated with, and probably attributable to, bronchial carcinoma.

ADDENDUM.—Since the submission of this article for publication, Harrison *et al.* (1956) have recorded 11 cases with radiological or necropsy evidence of renal vein thrombosis. They described in detail two methods of radiological diagnosis. One case is reported in which biopsy showed a carcinoma distal to the orifice of the right upper-lobe bronchus, and in which a subacute glomerulonephritis has been diagnosed for two and a half years. Biochemical changes were typical of the nephrotic syndrome. Inferior caval venography demonstrated blockage of the lower end

of the vena cava, but not the upper limit. There was no necropsy. A case with great similarity to our own has been reported by Brumfitt and O'Brien (1956).

We are indebted to Mr. J. P. Napper for the photographs.

REFERENCES

- Bel, E. T. (1950). *Renal Diseases*. London.
Blainey, J. D., Hardwicke, J., and Whitfield, A. G. W. (1954). *Lancet*, 2, 1208.
Brumfitt, W., and O'Brien, W. (1956). *British Medical Journal*, 2, 751.
Derow, H. A., Schlesinger, M. J., and Savitz, H. A. (1939). *Arch. intern. Med.*, 63, 626.
Gross, F. B., Jachning, D. G., and Coker, W. G. (1951). *N.C. med. J.*, 12, 97.
Harrison, C. V., Milne, M. D., and Steiner, R. E. (1956). *Quart. J. Med.*, 25, 285.
Moschowitz, E. (1948). *Amer. J. med. Sci.*, 216, 146.
Rowntree, L. G., Fitz, R., and Geraghty, J. T. (1913). *Arch. intern. Med.*, 11, 121.
Shattock, S. G. (1913). *Proc. roy. Soc. Med.*, 6, Sect. Path., 126.
Trousseau, A. (1877). *Clinique Médicale de l'Hôtel-Dieu de Paris*, 5th ed., 3, 94. Baillière, Paris.
Williams, A. A. (1954). *British Medical Journal*, 2, 82.
Wright, I. S. (1952). *The Pathogenesis and Treatment of Thrombosis*. Grune and Stratton, New York.

INTRAHEPATIC CALCIFICATION

BY

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The finding of intrahepatic calcification on routine chest radiography is felt to be unusual enough to arouse interesting speculative discussion as regards aetiological factors. The following case is recorded in view of the relative rarity of the lesion, the absence of symptoms, and the associated diagnostic problem.

Case Report

A white man aged 37 attended for routine medical examination prior to re-enlistment in the Army. On questioning he was completely asymptomatic and admitted to no upset of any individual system. His appetite was good and his weight steady. In particular there were no symptoms referable to the gastro-intestinal system. He smoked 30 to 40 cigarettes a day and drank an average of 2 pints (1.1 litres) of beer a day.

His previous history revealed the following: B.T. malaria in 1943 while in Assam; treated with quinine; none since 1943. Amoebic dysentery and hepatitis in 1945, while in



Postero-anterior view of upper abdomen.

Assam; he was treated in hospital for one month and received two injections (? emetine) and made an uneventful recovery. He had never worked with dogs or other animals and had never been in Australia or abroad apart from Assam. He had no recollection of ever having jaundice save the attack in 1945, in Assam, and had never suffered from urticaria or skin rashes. The family and social histories revealed nothing relevant.

Clinical examination showed no abnormality in any of the systems; in particular there was nothing to suggest hepatic disease. A routine chest x-ray examination revealed multiple streaks of calcification under the right diaphragmatic leaf, these areas of calcification being arranged in an arcuate manner suggesting the wall of a cyst in the liver area.

A tentative diagnosis of a calcified cyst of uncertain aetiology in the right lobe of the liver was made and the following investigations were undertaken: haemoglobin, R.B.C., and E.S.R. normal; W.B.C., 5,400 (polymorphs 46%, lymphocytes 54%); W.R. and Kahn, negative; liver-function tests and serum protein values normal; M.S.U., normal; examination of stools for cysts, amoebae, ova, and pathogens, negative; Mantoux 1/1,000 positive; Cassoni test negative; complement-fixation test for hydatid disease was positive, titre 1:4.

X-ray examination of the upper abdomen, to show diaphragm and liver area, revealed a rounded calcified shadow about 3 in. (7.5 cm.) in diameter and clearly demarcated (see Fig.). Lateral views showed this to be situated in the posterior part of the right lobe of the liver. Screening added no further information, the lesion appearing solitary. There was no overlying deformity of the diaphragm, which moved equally on both sides, and the right lower zone of the lung fields was clear. Unfortunately it was not possible to perform tomography.

Discussion

Intrahepatic calcification is not common, and raises an interesting diagnostic problem. There are several possible explanations, although none is by any means common. Thus F. W. Konzelmann, in a series of 8,000 necropsies, detected hepatic calcification to any marked extent in only one case (Heilbrun and Klein, 1946).

Hydatid Disease.—This can often give rise to intrahepatic calcification, and is of two types. (a) Solitary, showing on radiography as a smooth, well-defined unilocular lesion, the calcium appearing as reticulated streaks or more solid areas throughout the cyst wall. (b) Alveolar hydatid disease (echinococcosis-bavaro-tyrolienne). This is far less well known, largely because of its fairly limited geographic distribution (South Germany, Switzerland, Czechoslovakia, Tyrol, and East Russia). Walshe (1954) reported what was probably the first case in Britain, occurring in a person who had never been abroad. Opinion is swinging towards the acceptance now that alveolar hydatid disease is due to the same parasite as the common hydatid lesion, the differing pathological process being due to the larval variant. This type of hydatid lesion is far commoner in the right lobe of the liver, and the original "mother" lesion does not encapsulate but evaginates, with the resulting formation of multiple minute cysts in the surrounding liver substance. Each lesion is surrounded by a zone of granulomatous reaction, and the lesion is progressive and of fatal outcome. Because of the progressive nature and its ill-defined limits, this form is not amenable to surgery. The reason for this "alveolar" form as distinct from the commoner hydatid lesion is thought to be its original failure to encapsulate, so allowing leakage of contents and infiltration into surrounding tissues. Spread may proceed via blood and lymphatic channels to any part of the body. In cases where calcification occurs, radiological appearances of the liver show multiple irregular calcified areas around the main original lesion.

Hepatic Abscess.—This may be of pyogenic origin, including subdiaphragmatic foci, or may follow on

amoebiasis. The appearances on radiography vary and may show single or multiple calcified areas, but rarely so clean-cut and regular as in cases of hydatid disease.

Gummatous Calcification.—This is rare, and shows as irregular area of calcification in association with stigmata of the disease process elsewhere.

Hepatic Cysts.—These are very rare, and it is uncommon for them to be calcified so as to be visible on radiography. They may be single or multiple, but are much smaller than the previously discussed lesions.

Haemangioma and Lymphangioma.—These may be large or small, single or multiple. There is often evidence of similar lesions elsewhere in the body; and those of the liver, when calcified, show as circumscribed areas in which fronds of calcium appear to radiate from a central point like the spokes of a wheel.

Calcified Tuberculosis.—This also is rare, and there is usually evidence of the disease process elsewhere. Radiologically it is revealed as a spherical shadow, dense in the centre, with a translucent surrounding zone or moat. Such lesions are usually small. Tiny multiple foci of calcification may appear in rare cases of "healed" miliary tuberculosis.

Primary Neoplasms of Liver.—These may occasionally show as irregularly calcified areas.

Secondary Deposits.—Occasionally metastases may calcify, but evidence elsewhere of the primary lesion points to the diagnosis.

Hepatic Calculi.—These are extremely rare and very minute. They may be multiple or single.

Other Causes.—Hodgkin's disease, chronic renal disease, diabetes mellitus, eclampsia, and disease with bony destruction have all been reported as giving rise to intrahepatic calcification on occasion, although in each case the appropriate diagnosis can be reached by concurrent signs of the disease elsewhere.

The case described is felt to be one of amoebic origin in view of the past history of amoebiasis and in the absence of evidence of venereological disease, reticulosis, neoplasm, tuberculosis, or hydatid disease. The size, shape, and configuration of the area of calcification do not conform with the typical appearances of haemangioma, and there was no evidence of such lesions elsewhere. The fact that the lesion was so large and solitary virtually rules out hepatic cysts and calculi. The finding of a positive hydatid complement-fixation test, titre 1:4, is not felt to be relevant in this case in view of the low titre, negative Cassoni test, and absence of any other evidence of hydatid disease. The complement-fixation test is said to give 83% reliable positive results in hydatid disease in which the embryo is alive. The case here recorded showed an apparently completely inert lesion of the liver, and, although it is appreciated that hydatid disease cannot be completely ruled out, on balance of available evidence calcification of an amoebic abscess appears the more likely.

Summary

A case of intrahepatic calcification thought to be subsequent to amoebiasis is reported.
The differential diagnosis is discussed briefly.

I thank Colonel J. D. P. MacPherson, O.C., B.M.H., Hamburg, for permission to publish this case, and R.A.M. College, Millbank, London, for the result of the hydatid complement-fixation test.

BIBLIOGRAPHY

- Aspray, M. (1945). *Amer. J. Roentgenol.*, 53, 446.
Astley, R., and Harrison, N. (1949). *Brit. J. Radiol.*, 22, 723.
Gray, E. F. (1944). *Amer. J. Roentgenol.*, 51, 336.
Guz, A., and Lea, P. A. W. (1956). *British Medical Journal*, 1, 385.
Hamburger, H. J. (1938). *Indian J. Pediat.*, 5, 98.
Heilbrun, N., and Klein, A. J. (1946). *Amer. J. Roentgenol.*, 55, 189.
Lingley, J. R. (1942). *Ibid.*, 47, 563.
Schlanger, P. M., and Schlanger, H. (1948). *Ibid.*, 60, 331.
Smallwood, W. C., Bishop, J. C., and Litchfield, J. A. (1955). *Lancet*, 2, 377.
Walsh, J. M. (1954). *J. Path. Bact.*, 67, 371.

THE DELAYED-ACTION STAB

BY

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The following cases are of interest if for no other reason than their medico-legal significance. The first two cases were seen in hospital practice, the third in private practice.

Case 1

It is customary for many Sydney housewives to leave on the doorstep the empty milk bottles and, beside them, payment for replacements. A youth in one of the northern suburbs was making quite a good thing out of this by doing rounds immediately prior to the milkman. One morning the milkman (aged 27) surprised him, and received for his intrusion a stab below the ninth left costochondral junction. He was admitted to a north-side hospital but was allowed to leave a few days later, when all, including chest x-ray film, was found to be normal.

One year later, on February 23, 1954, he was admitted to St. Vincent's Hospital under the care of Mr. Victor Kinsella. He complained of cramp-like epigastric pains of two days' duration. Upon admission the pain settled, but it recurred after 24 hours. X-ray examination of his chest revealed no abnormality. During the next week he had a number of similar attacks of pain.

An exploratory laparotomy was carried out on March 2. The greater curvature of the stomach, the splenic flexure, and a considerable quantity of omentum were found to have passed through a small opening in the diaphragm. They were adherent to the lung. After reduction of the viscera and closure of the diaphragmatic opening the patient made a good recovery.

Case 2

A native of Bogota aged 22 was involved in a fracas at a party in Surry Hills. He was stabbed in the left anterior axillary line between the eighth and ninth ribs. So far as could be ascertained the weapon was a pair of scissors. He was admitted to St. Vincent's Hospital on May 1, 1956. He complained of mild shoulder pain, but no significance was attached to this when it was found that his chest x-ray picture was normal. He was discharged on May 5.

Seven weeks later, on June 26, he presented at the casualty department complaining of pain in his left lower chest. His chest x-ray picture was again found to be normal and he was allowed to leave. He returned on June 29 complaining of vomiting and colicky pain in the left upper abdomen. A further chest x-ray film was taken. A number of small fluid levels could now be seen above the dome of the left diaphragm. A diagnosis of strangulated diaphragmatic hernia was made and left thoracotomy was performed at once.

Six inches (15 cm.) of transverse colon was found to have passed through an opening in the diaphragm $\frac{1}{2}$ in. (1.9 cm.) in diameter. They were adherent to lung and margins of diaphragmatic opening. The colon was reduced and the diaphragm repaired, following which the patient made a good recovery.

Case 3

Sheep crutching is largely carried out in the following manner. The sheep are herded into a yard, the operator arms himself with a pair of hand shears and takes up a position near the gate. With the shears held in the right hand he lunges at the back leg of the nearest animal, up-ends it, crutches it, and pushes it through the gate. He then successively repeats the manoeuvre until all have been treated.

A man aged 41 was doing this when he slipped, the shears penetrating his left lower chest below the ninth rib in the

mid-axillary line. After overcoming his initial surprise he went along and had two stitches inserted in the wound. Nothing further eventuated.

Seven months later, whilst on holiday in Sydney, he developed pains in the left upper abdomen and left chest. They were not particularly severe and allowed of a barium examination, which revealed large bowel in the left thoracic cavity.

A left thoracotomy was carried out on October 26, 1955. Transverse colon was found in the chest. It was densely adherent to the lung and margins of the opening in the diaphragm. This opening was not greater than $\frac{1}{2}$ in. (1.9 cm.) in diameter. The abdominal contents were replaced and the diaphragm was repaired. The patient made a good recovery.

Comment

These three cases have certain features in common. (1) The injury was relatively mild. (2) It was situated in the left lower thoracic region. (3) The suspicion of injury to the diaphragm did not arise at the time of the initial incident. (4) The x-ray picture of the chest following the initial injury in Cases 1 and 2 was quite normal. No evidence of pneumothorax or lung damage was to be seen. The history in Case 3 suggests that had an x-ray film of the chest been taken this would likewise have been normal. (5) The latent period. In the three cases, one year, two months, and seven months respectively elapsed between the original injury and the onset of intestinal obstruction. It is assumed that negative intrathoracic pressure and positive intra-abdominal pressure were the factors responsible for the gradual ascent of the bowel. (6) All cases did well following surgery. However, it is easy to imagine such cases having a fatal termination. The opening is small, the amount of bowel that can ascend is large, and irreversible damage to the bowel is quite likely. (7) The medico-legal aspects, combining as they do a minor injury, a latent period, and then a strangulated diaphragmatic hernia, are of obvious importance. It is felt that in each of these cases the opening in the diaphragm was due to trauma. In no case was it felt that the opening was of congenital nature.

Summary

Three cases of strangulated diaphragmatic hernia are presented. In each case the strangulation followed a latent period consequent upon an apparently trivial stab wound in the left lower chest. It is suggested that the question of thoracotomy should receive consideration following similar injuries.

Medical Memoranda

Posterior Dislocation of Shoulder-joint

This report is on a case of acute backward displacement of the head of the humerus, complicated by arterial and nerve involvement and followed by initial reduction to the sub-coracoid position. From all other sources it appears that this type of injury is unusual. Sir Astley Cooper (1842) recorded retroglenoid dislocation following a convulsion, while Malgaigne in 1855 made mention of 34 cases dating from 1804, only three of these being from his own practice. More recent reports add emphasis to the rarity of the injury. Thomas (1937) saw 4 cases in 6,000 and reports 3 other cases with which he was associated. Wood (1941) gives 3 cases in 115 from the Massachusetts General Hospital between 1930 and 1938. Hindenach (1947) reports one case, and Taylor and Wright (1952) six. McLaughlin (1952) finds a percentage of 3.8 amongst 581 dislocated shoulders, which corresponds with the 3 per 100 given by Fèvre and Mialaret (1938) from their series of cases.

CASE REPORT

A general labourer aged 48 was seen in the casualty department following an accident to his right arm. He had caught a large oxygen cylinder in the crook of the arm, and the sudden impact had forced the arm backwards. He was in intense pain, being unable to move the affected limb.

On examination his right arm was fixed in external rotation with 20 degrees of abduction; the shoulder sloped markedly downwards and was hollowed-out anteriorly. Palpation revealed an increased prominence of the acromion process, with a loss of the anterior prominence of the humeral head. Brachial, radial, and ulnar pulses were absent. Movement of the arm was completely lost, together with cutaneous sensation.

Radiographs showed that the head of the humerus was seated posteriorly to the glenoid fossa (see Fig.). No bony injury was evident.

Treatment was instituted immediately in order to restore the blood flow. Gentle traction was applied to the line of the abducted arm, some degree of adduction being given at the same time. A sudden internal rotation took place with a loud series of crepitations. It was then found that the humeral head had displaced forwards and was now in a subcoracoid position. There was relief from the agonizing pain immediately the posterior displacement had been rectified, while at the same time the blood supply was restored to the limb. The anterior dislocation was later reduced under general anaesthesia owing to the greatly increased degree of muscle spasm.

Subsequent treatment consisted in resting the shoulder by means of a sling for a period of three weeks. Hand and elbow exercises were started on the third day after the injury. When the three weeks had elapsed the patient was allowed to begin active shoulder movements with the proviso that he did nothing to produce pain in the affected shoulder and did not raise the arm above the line of the shoulder.

The follow-up proved uneventful. He began light work (painting and decorating) nine weeks after the accident, and by the twelfth week had progressed to heavier work, carrying out his normal duties using a pick and shovel. Seven months after the accident he had no complaints and stated that his shoulder gave no trouble whatsoever. On examination, movement was full, painless, and unrestricted. There were no crepitations, weakness, or disability. Whether the stability of the joint will be continued, and whether osteoarthritic changes will appear as the years go by, remain to be seen.

COMMENT

Taylor and Wright (1952) stated that the type of injury is generally the result of direct violence. This is confirmed from all sources. Hindenach (1947) reports the case of the injury done during physical training, while McLaughlin (1952) gives a number of cases associated with epilepsy, shock treatment, and strenuous sports. Congenital and developmental anomalies do not appear to figure prominently in the aetiology of the injury.

The prognosis is good except where the condition has remained untreated for any length of time. Of the 22 cases reported by McLaughlin, 6 first injuries which were diagnosed



Radiograph in the antero-posterior axis, showing the appearance of the humeral head in posterior dislocation.

soon after being incurred responded well, while the prognosis was poor in the 16 cases which had remained untreated for periods extending from weeks to years.

I wish to thank Mr. B. H. Burns, orthopaedic surgeon to St. George's Hospital, for permission to publish this paper.

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REFERENCES

- Cooper, Sir A. (1842). *A Treatise on Dislocations and Fractures of Joints*. London.
Févre, M., and Mialaret, J. (1938). *J. Chir. (Paris)*, 52, 156.
Hindenach, J. C. R. (1947). *J. Bone Jt Surg.*, 29, 582.
McLaughlin, H. L. (1952). *Ibid.*, 34A, 584.
Malgaigne, J. F. (1855). *Traité des fractures et des luxations*, 2, 454. Paris.
Taylor, R. G., and Wright, P. R. (1952). *Ibid.*, 34B, 624.
Thomas, M. A. (1937). *Amer. J. Roentgenol.*, 37, 767.
Wood, J. P. (1941). *Nav. med. Bull. (Wash.)*, 39, 532.

Diabetes Mellitus with Acute Polyneuritis

A true symmetrical polyneuritis is rare in diabetes mellitus (Hirson, Feinmann, and Wade, 1953). In the following case a symmetrical polyneuritis developed rapidly in a patient with recently stabilized diabetes.

CASE REPORT

A bus conductor aged 60 was discovered to have mild diabetes in September, 1954. The presenting symptoms were pruritus and a mild urethritis of about six weeks' duration. There was no relevant past or family history. Examination showed no abnormality except for obesity (weight 12 st. 7½ lb.—79.6 kg.) and slight hypertension (B.P. 180/100 mm. Hg). The knee- and ankle-jerks were present and vibration sense was normal in the legs. The diagnosis was confirmed by a glucose-tolerance test. (Capillary blood sugars:—fasting, 141 mg.; at half-hour intervals after 50 g. of glucose by mouth: 290 mg., 232 mg., 219 mg., 175 mg. per 100 ml.) Treatment was started with a reducing diet containing 120 g. of carbohydrate daily. His symptoms were relieved and his diabetes was easily controlled without insulin.

On December 2 he was admitted to Addenbrooke's Hospital under Dr. Leslie Cole, as an emergency, complaining of severe weakness of the legs, associated with pain and numbness, which had developed rapidly over the previous two days. There was no history of recent infection, sore throat, or alcoholism.

On examination he was found to have signs of a bilaterally symmetrical peripheral neuritis affecting the legs and to a less extent the arms. He was unable to walk. Voluntary movements in the legs were very weak in all muscle groups, particularly the dorsiflexors of the feet. Movements were severely ataxic. The knee- and ankle-jerks were absent. Plantar responses were flexor, but later became difficult to obtain, with occasional equivocal extensor responses. Vibration sense was absent at the knees and ankles. Position sense was grossly impaired in the toes. Sensation to light touch and pinprick was impaired over the feet and lower legs. The calf muscles were tender to deep pressure. Similar but less extensive signs were present in the arms. The abdominal reflexes were absent. The cranial nerves were normal. No other abnormal signs were found.

His mental state was good, and, although he later became depressed, he developed no signs of dementia. He had lost 10½ lb. (4.8 kg.) in weight. The cardiovascular system was normal (B.P. 160/90 mm. Hg). His diabetes appeared well controlled (fasting blood sugar 150 mg. per 100 ml.). His pulse rate was 80 a minute on admission. He later developed a persistent tachycardia (90–100 a minute). His temperature was 97.8° F. (36.6° C.), and he remained afebrile throughout his illness except for occasional spikes of fever during later episodes of intercurrent infection.

Lumbar puncture on December 8 was normal except for a raised protein (over 200 mg. per 100 ml.) in the cerebrospinal fluid with a practically normal cell count (4

lymphocytes per c.mm.); W.R. negative. Other investigations, including a full blood count, throat swab, blood W.R. and Kahn, examination of the urine for porphyrins, and x-ray pictures of the chest and lumbar spine, showed no significant abnormality.

His condition rapidly deteriorated. Paraesthesiae in the legs became intensely painful. Light pressure on the legs was enough to cause pain. He developed severe abdominal pain, constipation, and abdominal distension. Within one week of admission he had developed an almost complete flaccid paralysis of the limbs. He had a bilateral facial weakness of lower motor neurone type. He could not sit up or turn over in bed. He had retention of urine and needed catheterization.

During the second, third, and fourth weeks (December 9–30) his condition deteriorated still further and at times appeared hopeless. Respiration became embarrassed. Swallowing was difficult and nasal regurgitation of fluids occurred. He developed a right basal pneumonia and a urinary infection. Adequate relief of pain was difficult and required frequent injections of pethidine hydrochloride (50–100 mg.).

A gradual improvement was noticeable during the fifth week. By the sixth week he had regained a considerable amount of muscular power but still suffered a good deal of pain in the legs. Catheterization was no longer needed.

He was able to start walking with assistance in the seventh and eighth weeks (January 14–27, 1955) and was discharged home, to continue physiotherapy as an out-patient, on February 2, nine weeks after admission.

He had made an almost complete recovery six months later. He was able to walk easily and had returned to work. The knee- and ankle-jerks were absent.

Treatment was largely symptomatic and involved extremely careful nursing and physiotherapy. His diabetes was easily controlled with a small amount of insulin (I.Z.S. 20 units) and a diet containing about 120 g. of carbohydrate daily. Frequent courses of antibiotics were needed to control intercurrent infection. He was also given vitamin B₁₂ in large doses (500 µg. daily), parenteral aneurine hydrochloride (100 mg. daily), and nicotinamide (10 mg. daily) during most of the first six weeks of his illness.

COMMENT

Muscular paralysis is relatively rare in diabetes (Martin, 1953). It is usually asymmetrical and often involves one limb or muscle group only. A bilaterally symmetrical polyneuritis involving motor and sensory fibres, similar to that occurring in diphtheria, alcoholism, or infective polyneuritis, is extremely rare (Kraus, 1920), but occasional cases have been reported. Buzzard (1890) described a case of this type with a prolonged course. More severe cases with a relatively acute onset were described by Pitres and Marchand (1917) and Root (1922).

Particularly unusual features in the present case were the rapidity of onset and severity of the paralysis, the involvement of muscles of respiration and swallowing, the involvement of the bladder, and the bilateral facial weakness.

The polyneuritis in this case was not necessarily diabetic in origin, although no other cause was apparent. The clinical features were similar to those of infective polyneuritis in practically all respects except the absence of fever. This disease, or some unknown factor, may have been the cause of the symptoms.

I thank Dr. Leslie Cole for permission to publish this case.

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REFERENCES

- Buzzard, T. (1890). *British Medical Journal*, 1, 1419.
Hirson, C., Feinmann, E. L., and Wade, H. J. (1953). *Ibid.*, 1, 1408.
Kraus, W. M. (1920). *Med. clin. N. Amer.*, 4, 225.
Martin, M. M. (1953). *Brain*, 76, 594.
Pitres, A., and Marchand, L. (1917). *Progr. méd. (Paris)*, 36, 295.
Root, H. F. (1922). *Med. clin. N. Amer.*, 5, 1433.

Reviews

RADIOISOTOPES IN MEDICINE

Medical Sciences. Volume I in Series VII of *Progress in Nuclear Energy*. Edited by J. C. Bugher, J. Coursaget, and J. F. Loutit. (Pp. 165+xii. 42s.) London: Pergamon Press Ltd. 1956.

The 1955 Geneva Conference on the Peaceful Uses of Atomic Energy has been described as a landmark in the progress of science and human affairs. It was an occasion for a general release of information, particularly in physical and engineering science, and an exchange of views by the major nations participating. Exchange of medical information, especially on radiotherapeutic methods, had, however, been virtually unrestricted, so that from the medical aspect the conference was a time for review and assessment rather than an occasion for the publication of new and major advances. An important new series of books on "Progress in Nuclear Energy" was already planned before the Geneva Conference, but because of the amount of material presented and "declassified" at the conference it was decided that the first volumes should deal with the papers given there. Of the eight series, Series VII deals with "Medical Sciences," and the first volume presents an admirable review of the latest applications of nuclear science to medicine. A vast field is surveyed, and the topics include the diagnosis and investigation of disease with radioactive isotopes, the use of nuclear radiations from external and internal sources in therapy, the principles and practice of radiation protection, and radiation dosimetry. In each chapter, by an international authority, the status of the techniques is reviewed with particular reference to the relevant conference papers. The uses of radioisotopes in diagnosis and investigation have become almost bewildering in their potentialities. Scientists from seven nations gave accounts of the application of radioisotopes to such diverse subjects as the intermediary metabolism of carbohydrates in normal and diabetic subjects; the localization of tissue antibodies; thyroid function; dynamic aspects of erythropoiesis; the dispersal and flight range of cockroaches, flies, and mosquitoes; food sterilization; and the pharmacology of antilepromatous drugs.

In the radiotherapeutic chapters it is pointed out that throughout the world the largest use of radioisotopes in radiotherapy is for gamma-ray sources, and from the practical viewpoint this is a far-reaching achievement. Internally administered radioisotopes are regarded as of more fundamental interest, the problem being to develop effective methods of selective localization in malignant tumours—at present limited to the use of a few isotopes in inorganic form. It is of interest to compare the papers originating in Russia with those from the Western Hemisphere. While ostensibly the materials and methods are similar, there are two statements in the Russian papers which reveal great differences of orientation. One paper states that bilateral one-stage ligation of the external carotids proved most effective in reducing local manifestations of radiation reaction in tumours of the mouth, jaws, and lower lip; observation of 340 patients revealed no complications, and the skin resistance to irradiation increased by an average of 50%. It is claimed that the impaired blood supply of the tumour caused its degeneration, making it more susceptible to injury during irradiation. In the West, however, and particularly in this country, every effort is made to conserve the integrity of the tumour bed, as both clinical and experimental evidence indicates that adequate blood supply and high oxygen tension increase the radiosensitivity of tumours. Again, with regard to the treatment of haemangioma in children it is stated that treatment with telecobalt of 450 children with cavernous angioma was effective in 92% of cases; the treatment was administered in fractions, with daily doses of 400–500 r and a total dose of 2,000–3,000 r depending on the age of the child. These are considerable doses, and because of possible late sequelae the tendency in this country is to reduce to a minimum the dose of radiation for a non-malignant condition in childhood.

A remarkable amount of information is contained within seven chapters, and the lists of references make this volume a ready key to the world literature of radioactive isotopes in medicine. The editors and authors are to be congratulated on this compact presentation of such comprehensive and varied reviews.

ARTHUR JONES.

FEMALE FERTILITY

Human Ovulation and Fertility. By Edmond J. Farris, Ph.D. (Pp. 159+xiii; illustrated. 50s.) London: Pitman Medical Publishing Co. Ltd. 1956.

A previous volume by Dr. Farris on male fertility collected much of the author's researches which had been published in various scientific and medical journals. The present volume, which may be regarded as a companion to the former, does much the same thing for his work on female fertility. His earlier book was concerned mainly with the elaboration of techniques and criteria whereby the fertility of men might be classified with precision; the work published in this volume represents a comparable quest for precision in the diagnosis of the occurrence of ovulation, and especially the close timing of that event—a matter of much importance for determining the success or failure of both natural and artificial insemination. For this purpose Dr. Farris has made extensive use of his "rat ovary hyperaemia test," which he first reported in 1946. Essentially, the test consists in the injection of 2 ml. of first morning urine into immature female rats of the Wistar strain, killing the animals two hours later with coal gas, and comparing the colours of the ovaries with a set of standards. In normally ovulating women a positive colour response is produced for four or five consecutive days, at the end of which time ovulation occurs. An impressive array of evidence of various kinds, detailed in the book, has been collected by Farris to substantiate this statement. Having had the privilege of observing the test in operation in Farris's laboratory, I have no doubt that the responses mentioned do occur in the author's hands; but, for reasons which remain largely obscure, few other workers have been able to duplicate Farris's findings. From the point of view of practical application, it has also to be borne in mind that, without a very large breeding colony such as exists at the Wistar Institute, the supply of suitable rats is unlikely to meet the demands which the attempt to apply the test clinically on any scale would make. And then, of course, there is the question of expense.

Apart from the material mentioned above, the book contains much else that is original. Farris has devised a formula, based on his experiences with the rat test, for determining the optimum time of conception, and another which he considers to be an improvement on the usual methods of determining the "safe period" for contraceptive purposes. Data are provided on the effects of thyroid medication and of pituitary irradiation on the ovulation response as reflected by the rat test; and a simple pregnancy diagnosis test is described, depending upon matching the colour of the cervix with a series of standards. Undoubtedly the book contains much of interest for anyone concerned with problems of human reproduction.

G. I. M. SWYER.

CANCER OF FEMALE GENITALIA

Gynecologic Cancer. By James A. Corscaden, Ph.B., M.D. Second edition. (Pp. 546+ix; illustrated. 80s.) London: Baillière, Tindall and Cox Ltd. 1956.

Dr. J. A. Corscaden, a well-known New York gynaecologist, attributes the success of the first edition of his book to the fact that it represents "the conclusions of an individual." Certainly it is the personal approach, based on an extensive clinical experience and a judicious sifting of the literature (mainly North American), which makes the work unusually attractive. Each organ of the female genitalia is considered separately, and emphasis is placed on the aetiology, diagnosis, and treatment of cancer rather than on its pathology. The details of irradiation as well as of

surgical techniques will be especially welcome to practising gynaecologists. Incidentally, it is of interest to note that Dr. Corscaden favours radiotherapy rather than surgery in practically all cases of invasive cancer of the cervix, while for cancer *in situ* in the young woman he advises very conservative surgery. There is a particularly interesting introduction containing a wealth of statistical information on the incidence of various growths, on the expectation of an individual developing such growths, on delays in diagnosis, and on the effect of educating the public in cancer. Indeed, statistics abound in all chapters. This is not to say that the interests of individual patients become lost in figures. On the contrary, considerable attention is paid to the general care of the afflicted woman; particularly to the management of the woman whose tumour has defeated medical science, of the woman who has had to sacrifice ovarian function in the struggle, and of the woman who is afraid of cancer.

Dr. Corscaden is something of a crusader who aims to conquer defeatism amongst the medical profession faced with the problem of cancer. He sets out to show what can be done—to prolong life if not to cure—if the disease is tackled courageously and early. His motto is, "Fight cancer with knowledge," and in this book, by disseminating rather than by adding to knowledge, he fights the good fight. I have looked at Fig. 51 many times and am still uncertain whether it is intended to be upside down or not; otherwise the production is excellent.

T. N. A. JEFFCOATE.

CONSERVATIVE GYNAECOLOGY

H. Kahr: *Konservative Therapie der Frauenkrankheiten*. By H. A. Müller. Foreword by H. Huber. Eighth edition. (Pp. 425+xii. 54s. 6d.) Wien: Springer-Verlag. 1956.

Kahr's "Conservative Gynaecology," for twenty years the standard work of this kind in German, now reappears in an enlarged ninth edition, this time under the directorship of Müller of Marburg. This transfer from Vienna to Germany has resulted in the dropping of some of the more romantic aspects of Austrian treatment, such as vaginal ultraviolet light, "hot air" therapy, and the double water circulator so dear to Kahr himself. A few anachronisms, like valerian and *Bauchdeckenhyperästhesie*, survive, but on the whole the highly theoretical dead wood of earlier editions has been eliminated. The style is also more succinct and the phraseology clipped, a welcome change from the interminable sentences and complicated phraseology usual to German textbooks. It must be admitted that most British and American gynaecologists show little enthusiasm for purely medical treatment, and that many useful non-operative methods are largely neglected here. This may be partly the fault of training, which remains basically surgical, or the national suspicion of theory. But it denies many new ideas a reasonable trial and deprives many women of the chance of non-operative relief. Conservative gynaecology remains for many specialists a relatively closed chapter, and this textbook, ranging through all aspects of the subject, makes salutary reading.

A. DAVIS.

UROLOGY

Textbook of Urology. By Victor F. Marshall, M.D., F.A.C.S. (Pp. 268+x; illustrated. \$5.50.) New York: Hoeber-Harper. 1956.

This textbook is primarily written for medical students and practitioners who have not specialized in urology. It has been evolved from a series of lectures for third-year students and reflects the experience gained thereby. It is restricted to fundamental principles and to accepted theories and methods of treatment. The need for an accurate history and a thorough clinical examination before starting the more elaborate radiological and biochemical investigations is emphasized throughout the book. All the methods of urinary investigation are described, but in some cases so briefly that most students would have to refer to other textbooks in order to understand them and their application. The main emphasis is placed upon the occurrence and

importance of obstruction and the resulting infection in many of the diseases of the urinary tract. This is followed by chapters on malformation, tuberculosis, trauma, inflammation, and neoplasms as they affect each portion of the genito-urinary tract. The last chapter is devoted to a description of urological operations. The chapters on neurogenic bladder and male infertility are particularly clear and helpful. The author has deliberately omitted all radiographic illustrations, and advocates that the reader should use a large radiological atlas when reading the book. Unfortunately I feel that this is a counsel of perfection; one may not always be readily available. There are a number of illustrations graphically showing the symptoms, investigation, and treatment in a most amusing manner. But the author has tried so hard to be concise that some aetiology, pathology, and methods of treatment which would be required in the final examination have been omitted or so briefly mentioned that reference to other textbooks would have to be made if these omissions are to be rectified. Nevertheless this textbook is very pleasant to read, and the more complicated urological problems are explained in a simple manner, so that many will find this a very helpful book.

J. E. SEMPLE.

FIRST AID

Fundamentals of First Aid. By Robert A. Mustard, B.A., M.D., F.R.C.S.(C.). (Pp. 116; illustrated. No price.) Toronto: The Priory of Canada of the Most Venerable Order of the Hospital of St. John of Jerusalem. 1955.

This is an interesting and courageous attempt to provide a short manual of first aid which shall be more in line with modern teaching and with the increased facilities now available. There is even a section on how to avoid damage from the atom or hydrogen bomb and from bacteriological and chemical weapons. In places the statements are provocative. Those who have been brought up in the older school of first aid may shake their heads when they find all mention of pressure points omitted and the tourniquet frowned upon; they may have to refer to a medical dictionary when they come across the word "atrium," which displaces the time-honoured word "auricle"; they may even refuse to accept the teaching that "iodine and other antiseptics should not, under any circumstances, be poured into or on a wound"; but they will find the main doctrines of first aid clearly stated and illustrated. Most doubt will be expressed about the complete omission of "shock" as a symptom. The reasons adduced for this are that it is imperfectly understood, difficult to define, and that its omission greatly simplifies teaching and does not in any way reduce the effectiveness of first-aid measures. It is stated that common sense will induce the first-aid-er to institute the first-aid measures required "without recourse to the bogey of shock." It might be answered that the person who has enough common sense (which is undefined) to carry out all these measures is likely to be sufficiently intelligent to understand an elementary description of the main circulatory changes which occur in shock. In spite of this, as we think, unnecessary omission, the teaching given is sound and practical. The writing is pithy, the illustrations are numerous and apposite, and the manual can easily be put into the pocket.

ZACHARY COPE.

Messrs. Eschmann Bros. and Walsh, the wholesale surgical instrument manufacturers, whose experience extends back for over a century, have produced a new catalogue of their products which will be found both interesting and instructive to surgeons. It is exceptionally well produced, fully illustrated throughout with half-tone blocks, and the information provided on materials, sizes, and so on of the various instruments is all that can be required. There is also a good index which enables any particular instrument to be found easily. In addition to metal instruments the products of this firm include appliances made of gum elastic, latex rubber, and plastics, and for these separate illustrated catalogues are available. In this connexion it is interesting to note the increasing use of the more modern plastics such as "nylon" and "terylene" in the manufacture of bougies, catheters, and other flexible appliances, all of which can be safely sterilized by boiling.

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TO-DAY AND TO-MORROW

The Conference of Local Medical Committees met on Thursday this week, the day after this issue of the *Journal* went to press. A special meeting of the Representative Body will be held on Wednesday next week, as well as special meetings of the Council. Addressing the Annual Conference of Honorary Secretaries of Branches and Divisions on May 10, the Chairman of Council, Dr. S. Wand, said that opinion in the profession on what action to take was divided, but that there was complete unanimity on the objective to be achieved—agreement on ends but disagreement on means. He admitted that the Government "had succeeded in its purpose of dividing and confusing the profession"; unfortunately it has seemed all too easy to do this. But the Government has retreated from its position in refusing to consider the claim for increased pay; junior hospital staff have received an increase of 10% and the rest of those working in the Health Service 5% pending the final report of the Royal Commission. Certainly these advances would not have been made if the G.M.S. Committee had not at the outset taken a firm line and if the Guild machinery had not been set in motion. The lamentable thing was that the Government made the increases in a completely arbitrary manner and without consulting the profession. The profession in the coming months must never forget that the Government refused to use the customary methods of consultation, conciliation, and negotiation, or to allow, in the event of failure of these, arbitration. If the Royal Commission completes its task we may hope there will not be a repetition of this pattern, and that the full consultation promised will be such as to restore part of the trust the Government has so regrettably forfeited. But the decision to give evidence has yet to be made, and, as Dr. Wand said (*Supplement*, May 25): "Even if we decide to give evidence the struggle clearly might come in the next few months after the Royal Commission has reported." Our correspondence columns suggest that at least many doctors would be reluctant to withdraw from the N.H.S. simply to enforce a wage claim, with the intention of rejoining the Service when the claim had been met. Many think that the proposition if it

were to withdraw on a matter of principle unmixed with a pay claim. As Dr. Wand reiterated on May 10, "The time is coming when we have seriously to consider not whether we withdraw from the Service for a short time, but whether we can continue to serve in such a Service at all"—a statement that was received with applause. Apart altogether from the present conflict, it is plain that a root-and-branch investigation into the Health Service as a whole is much needed, and the decision of the B.M.A. to institute such an inquiry under an independent chairman is being widely welcomed.

In the meantime the Conference and the Representative Meeting have to decide whether or not to give evidence to the Royal Commission, the Royal College of Physicians and the C.C.&S. Committee of the B.M.A. having already decided to do so. The onlooker may be surprised to see an autonomous committee of the B.M.A. decide on a course of action before any similar decision has been reached either by the Council or by the Representative Body, and a correspondent, Mr. N. Ross Smith, last week drew attention to "the lamentable weakness of multiple representation." "It cannot be said," he wrote, "that though illogical it works, because it is obvious that it does not." Whether or not everyone agrees with this view, no one can feel happy at the way events have unfolded. All these things—including the dispute itself—are symptomatic of the faulty structure of the N.H.S. and of the consequent unsatisfactory relationship between doctors working in it and those who administer it. Whatever decision may be reached about giving evidence to the Royal Commission, the Association has two big tasks in front of it: the inquiry into the N.H.S., and the reform of its own constitution, and on this there will be a whole day debate at the Annual Meeting of the B.M.A. at Newcastle in July. Whatever may be the outcome of the latter, it is much to be hoped that in the future there may be evolved a more satisfactory way of co-ordinating policies and decisions between various medical bodies without there being any sacrifice of independence.

SOCIETY AND MENTAL DISORDER

Two beliefs stand as foundations to the Report of the Royal Commission on the Law Relating to Mental Illness and Mental Deficiency, now published¹ after three years' deliberations. The first is that mental disorder of all kinds must be viewed primarily as a matter of the sufferer's health and well-being and not as a matter of protecting society; in other words, it is largely a medical rather than a legal concern. The second is the need for decentralization, for increasing

the links between mental hospitals and the communities they serve, and especially for local authorities to play a much larger part in the mental health services. The report recommends the complete repeal of the Lunacy and Mental Treatment Acts and the Mental Deficiency Acts, and the abolition of the Board of Control. These Acts are in the main a complicated patchwork of nineteenth-century ideas which appeal neither to the general public, who find them incomprehensible, nor to psychiatrists, whose views have changed so greatly since then; nor do they agree with administrative realities since 1948, when mental hospitals became a part of the National Health Service. The report recommends that admission to a mental hospital, and discharge from it, should be as informal as with a general hospital; compulsory powers, with somewhat improved legal safeguards, should be reserved for the very few cases in which they are essential. How few these are is shown by the experience of Mapperley Hospital, which serves Nottingham. On March 1 this year out of a total of 1,054 in-patients only one was certified, and four more were held for observation on three- or fourteen-day orders; the rest were voluntary or non-statutory (informal) patients. The report points out that mental deficiency hospitals could drop all formalities for admission straight away. Changes in terminology are also among its suggestions—the abolition of “certified” and “mental deficiency,” while “duly authorized officer” should be “mental welfare officer.”

Three categories of mental disorder are envisaged—mental illness, severe subnormality (or mental deficiency), and psychopathy. Under the concept of psychopathy the report makes official recognition of the existence of people with grossly abnormal personalities who drift from job to job, have a general inability to take an interest in any form of occupation, and are guilty of ill-considered sexual behaviour, pathological lying, or poorly controlled aggression, even though intellectually normal. These psychopaths should be offered mental hospital treatment or training, or even compulsorily admitted for a maximum of four weeks. The intention is that the law should not try to include them among those “of unsound mind” or “feeble-minded” (both of which terms are to be abolished). The principle here is excellent, but the practice may prove difficult. The humour of the remark that “a psychopath is anyone a psychiatrist doesn’t like” lies precisely in its element of truth. There is no problem in recognizing the extremes of aberrant behaviour, but in deciding on the boundary between amiable eccentricity and pathological deviation. The judgment is subjective, and

determined in part by the norms of conventionality and the organization of the society in which both patient and doctor live. If psychiatrists find difficulty in the diagnosis and treatment of psychopaths, how much more difficult it must be for prison medical officers and general practitioners who will also be called upon to recognize them. This draws attention to the need for a wider training in psychiatry for medical students and for the provision of refresher courses in the subject for general practitioners.

Many will welcome the proposals that compulsory admission, when it has to be used, will not require a magistrate unless the nearest relative as well as the patient object, and that the duly authorized officer will always need the approval of at least one doctor before removing a patient for observation. This implies, though the report does not say so, the further development of domiciliary psychiatric services. Since there is at present a shortage of psychiatrists, the alternative is to develop more psychiatric treatment in general practice. Where there is compulsion, however little, there must also be safeguards. Those provided by the magistrates and by the Board of Control the Commission thinks are inadequate, and it proposes instead the creation of regional appeal tribunals which could investigate on the spot patients’ complaints of unjustified detention. The aim here is to forge a local link and use local knowledge, but clearly the risk is a judgment biased by local prejudice, in appearance if not in fact; it might be wiser, especially since the number of cases should be small, to have a central but peripatetic tribunal. With the removal of all its legal work, the Board of Control no longer need exist, its administrative functions and the collection of statistics becoming part of the work of the Ministry of Health. Likewise, in the hospital the special legal function of the medical superintendent vanishes, and his duties will come to resemble closely those of the superintendent of a general hospital.

The Royal Commission recommends “a general re-orientation away from institutional care in its present form and towards community care.” By this it means the expansion of local authority services under medical officers of health to provide occupational or training centres, sheltered workshops, social centres, and hostels for patients with some residual disability, as well as for children and young people who cannot benefit from the ordinary schools and colleges. It suggests this expanded work should be a positive duty of county and county borough councils, and be carried out in close collaboration at all levels with the hospital service. This would restore to local authorities some of the important welfare functions they lost in

1948, and would do something to redress the balance between the three divisions of the Health Service, provided the new projects can be adequately financed. But ratepayers may not be so enthusiastic about this. In general, the report will be warmly welcomed in medical circles. Many of its recommendations give expression to the suggestions put before it by the Psychological Medicine Group Committee of the B.M.A.² It is gratifying to find the legal and lay members of the Commission unanimously adopting an up-to-date medical viewpoint, and it is to be hoped that the Government will accept the substance of the recommendations.

CONGESTED CURRICULUM

Last week the General Medical Council published one of its periodical reviews of the medical curriculum.¹ The previous review took place in 1947, and the recommendations then made were the most detailed ever issued by the Council. Because they were so detailed they have been criticized as a hindrance rather than a help to those licensing bodies and medical schools prepared to make experimental changes in the curriculum. The B.M.A.’s Committee on Medical Education described the recommendations as too rigid and too detailed and emphasized that they should state objectives, not prescribe means.² The General Medical Council has taken these criticisms to heart, for the new recommendations are shorter and more flexible, and will allow the medical schools more scope to make reforms on their own initiative.

After passing a preliminary examination in general education and examinations in physics, chemistry, and biology, the student must still face a minimum period of professional study of five years. The General Medical Council considered the possibility of reducing this minimum period, but decided that the time was not opportune for this.³ By “lightening” the recommendations and keeping to the minimum of five years for the period of professional study the General Medical Council felt that it was performing its primary task, at the present time, of reducing the congestion in the curriculum. The recommendations encourage the extension of interdepartmental teaching throughout the whole period of professional study. It is no longer a requirement that the student should

dissect the whole body. In the section devoted to “medicine,” the stress on preventive medicine is notable, and it is stated as desirable that “the student should be given opportunities to learn something of the work of the general practitioner.” The B.M.A.’s Committee on Education specially drew attention to the excessive detail in the old recommendations concerning midwifery and gynaecology. These are now much shorter and less rigid: though the student has still to spend a set period (“not less than two months”) in residence while receiving clinical instruction in midwifery, he has to conduct only an “adequate number of cases of labour,” compared with the “not less than 12 cases” laid down in the old recommendations. A modern note appears in the suggestions that the student should be given ample opportunity to attend clinico-pathological conferences and should be acquainted with the principles governing the design and interpretation of clinical trials. As to examinations, the General Medical Council now specifies ten subjects, five less than ten years ago, and has refrained from designating subjects in which separate examinations should be held.

Now they are freed from some ancient shackles, how will the medical schools put into effect the G.M.C.’s exhortation “to instruct less and to educate more”?³ There is no shortage of suggestions. The Royal College of Physicians has issued reports⁴ on the subject, and the *Proceedings of the First World Conference of Medical Education*⁵ contains a mass of information about the experiments in medical education going on all over the world—except in Britain, which, as an American observer remarked, has produced many wise reports on the improvement of medical education, yet has done little about it. In his thoughtful and constructive paper on the “Aims and Content of the Medical Curriculum” in the Education Number last year, Dr. A. Morgan Jones⁶ stressed the need for a really thorough reorganization of the medical curriculum: the danger is, as he sees it, that only details will be changed, leaving the antiquated structure basically unaltered. Though the new recommendations of the General Medical Council are not revolutionary—their main purpose, as has been stated, is to relieve congestion—they are certainly to be welcomed for removing some of the obstructions in the way of reform.

THERAPEUTIC HYPNOTISM

The place of hypnotism in medicine is still somewhat ambiguous. It may have become more respectable since the 1955 report of the British Medical Association¹ encouraged its use by doctors and the Hypnotism Act of 1952 discouraged its use by charlatans. But it remains

¹ Cmd. 169. H.M.S.O., 1957, price 10s. 6d. See p. 1355 for summary.
² *British Medical Journal Supplement*, 1955, 1, 211.

³ See Supplement, p. 327.

⁴ See *British Medical Journal Supplement*, 1956, 1, 190.

⁵ General Medical Council. “Introduction to the Recommendations as to the Medical Curriculum.”

⁶ Royal College of Physicians. Committee on Medical Teaching: second and third interim reports.

⁷ *Proceedings of the First World Conference on Medical Education*, 1954, Oxford University Press.

⁸ Jones, A. Morgan, *British Medical Journal*, 1956, 2, 494.

an inescapably personal method of treatment; in fact, the personalities of two people are engaged. Some patients can be easily hypnotized and carried on to almost any degree of dissociation; others prove more difficult or even impossible to influence. Some physicians have a particular interest and a particular gift; others find that hypnotism lacks all appeal and could not easily employ it. Most patients are fairly good subjects; and it is probably true that most medical men, perhaps with the aid of a little training, could acquire a competent facility. Naturally doctors prefer to use methods whose rationale is explicable and whose results are as independent as possible of the personal factor—at least on the physician's side—but we cannot afford to ignore any methods if in practice they give promise of benefit.

Since most patients can be hypnotized, the question arises which are the cases most likely to benefit from it. The three articles which we publish in the *Journal* this week show that the range of conditions in which something worth while can be achieved is remarkably wide. Professor Alexander Kennedy gives a helpful analysis of the indications for treatment by hypnosis (p. 1317). His first class of cases, in which hypnosis is often the treatment of choice, consists of those hysterical or psychogenic cases which are commonly regarded as the province of the psychiatrist. The fact that in his experienced judgment hypnosis is often the treatment of choice in such states suggests that more use should be made of it than actually is in our psychiatric clinics and hospitals. This does not mean that the family doctor should not also treat such cases by hypnosis in the first place. There appears to be only one serious danger in the therapeutic use of hypnosis—that the patient may be relieved of an organically determined symptom as a result of the suggestion applied, and that organic disease may accordingly be missed. As this is a danger of all symptomatic treatment, it is one which is familiar, but the possibility of it in this rather unusual context may be worth bearing in mind. Professor Kennedy goes on to list conditions in which hypnosis is particularly beneficial, and some in which it can claim occasional striking successes. These include conditions in which habit formation is defective, such as enuresis, smoking, and alcoholism; diseases in which emotional tension plays a part, such as hypertension, peptic ulcer, mucous colitis; a heterogeneous mixture of conditions of unknown pathogenesis, such as warts and certain dermatoses; and normal persons in whom for some specific purpose, such as anaesthesia, the temporary production of a hysterical symptom is desired. This great variety of states in which, at least on occasion, valuable results have been obtained by hypnosis is further illustrated in abundant detail in the papers by Dr. A. Fry (p. 1323) and Dr. H. Stewart (p. 1320) describing their experience in general practice.

In the treatment of some conditions, such as warts, the undoubted, though not invariable, success of hypnosis is impossible to explain. R. Asher² cured some patients after simple suggestion had already failed, and

he got better results in patients who were brought to a deep trance than in those who were only lightly hypnotized. This points to the unsolved problem of what the hypnotic state is in neurophysiological terms. Asher says that at least it is not sleep; but, as we still do not know what sleep is, even this small definition by exclusion is of little help. Hypnotism apparently produces its results mainly by suggestion, whatever that may be, and therapeutic trials including inert drugs have shown in recent years how potent a force it sometimes is. Yet the results of hypnotism are apt to be much better than those obtained by ordinary suggestion. Dr. Fry proposes as an alternative name for hypnotic therapy the term "suggestive relaxation," and this emphasizes what is probably an important element in the favourable effects of hypnotism. It may well be the main factor in the management of childbirth. Hypnotism may also be applied in abreactive therapies, but is then a means to an end. We are faced with a number of riddles, some of which will need systematic neurophysiological study for solution, while others may be clarified by further clinical experience.

Asher has expressed the views of many medical men that there is no need for "specialists" in hypnotic therapy, but it might be of value to the public if there were more therapeutic clinics specially organized for giving this treatment in conjunction with general medical and psychiatric out-patient services. Psychotherapy as conducted by the analytic schools is economically out of the question for all but a small handful of patients; nevertheless, psychotherapy of some reasonably effective kind is required by very many. Professor Kennedy makes the important point that it is the first duty of doctors to relieve illness, and in this the shorter methods, including hypnotism, have a rightful place.

POLIOMYELITIS AND PREGNANCY

In 1941 W. L. Aycock¹ suggested that pregnant women are more likely to contract poliomyelitis than women of similar ages who are not pregnant. Evidence in support of this hypothesis has appeared from time to time, and some more has recently been published. By inserting a question about the date of the last menstrual period on the record form of every case of poliomyelitis occurring in Connecticut since 1951, M. E. Rindge² was able to show that 17.3% of women over 15 years of age were pregnant when they became ill. She compares this with an estimate that 7% of women aged 20–40 are pregnant at any one time. In addition she has pointed out certain other factors which confirm the findings of previous workers, notably those of M. Siegel and M. Greenberg.³ She reports that women were apparently more susceptible in the second trimester of pregnancy, and par-

¹ Aycock, W. L., *New Engl. J. Med.*, 1941, 225, 405.

² Rindge, M. E., *ibid.*, 1957, 256, 281.

³ Siegel, M., and Greenberg, M., *ibid.*, 1955, 253, 841.

⁴ *Wld Hlth Org. techn. Rep. Ser.*, No. 81, p. 10, 1954, Geneva.

⁵ Bradley, W. H., and Gale, A. H., *Monthly Bull. Minist. Hlth (Lond.)*, 1948, 7, 56.

⁶ *Registrar General Statistical Reviews of England and Wales for the Year*

1946–7, Text Vol. 1, Medical, 1951, H.M.S.O.

⁷ *Ibid.*, 1948–9, Text, Medical, 1953, H.M.S.O.

⁸ *Ibid.*, 1950, Text, Medical, 1954, H.M.S.O.

⁹ *Ibid.*, 1953, Text Vol. 1, 1956, H.M.S.O.

ticularly so if they were multiparae; and she agrees with Siegel and Greenberg that this increased incidence might be due in part to increased contact with young children in the household who are themselves highly susceptible to the disease. But this does not seem likely to provide the complete explanation, and probably endocrine factors come into it. The World Health Organization's Expert Committee on Poliomyelitis⁴ has stated that it is reasonably well established that poliomyelitis during pregnancy may run a severe course, and suggests that this may be an example of the effect of endocrine factors in increasing susceptibility just as cortisone increases the susceptibility of experimental animals. Siegel and Greenberg laid stress on the fact that the paralytic cases included an unusual number of the spinal type of disease, the lower limbs being chiefly affected. They use this fact to explain the low death rate in their series, since deaths are commoner among bulbar cases. Against this, in Rindge's series 7 patients out of 79 died, all with the bulbar form of the disease.

Evidence from Great Britain is scanty. W. H. Bradley and A. H. Gale⁵ found in 1949 no evidence of a high incidence of the disease among pregnant women. Mortality figures culled from the Registrar-General's publications^{6–9} show that during 1947–53 14 deaths were assigned to poliomyelitis associated with pregnancy; the disease caused 1.05% of the deaths of pregnant women aged 15–44. On the other hand, deaths from poliomyelitis among non-pregnant women of the same age numbered 699 and comprised 0.64% of their deaths. Such figures are open to some objections, not least that of being proportional mortality rates, but they are suggestive of either a high incidence or an increased mortality from the disease among pregnant women. Owing to the comparative rarity of poliomyelitis in adults its association with pregnancy is difficult to study. Much work remains to be done. Meanwhile the problem arises of whether pregnant women should have prior claim on poliomyelitis vaccines.

THE WORLD'S HEALTH

"The Work of W.H.O." is the apt title for the Annual Report for 1956 of the Director-General of the World Health Organization,¹ for it describes at length the strikingly varied activities of this truly international body. In its efforts to promote world health the eradication of communicable diseases plays a leading part—such diseases as malaria, poliomyelitis, rabies, leprosy, endemic syphilis, yaws, and smallpox. But the recent developments in the field of atomic energy, the study of nutritional and mental health problems, the prevention of endemic goitre, and many aspects of public health have continued to receive close attention. New drugs and vaccines have improved the prospects of controlling many communicable diseases, such as the sulphone drugs for leprosy, vaccines for poliomyelitis, hyper-immune serum for rabies, and B.C.G. vaccine for tuberculosis. For the completion of all these and many other

projects, however, the essential need is research, the stimulation and co-ordination of which "constitutes the real backbone" of W.H.O.'s many activities.

The expert committees have a primary role; here they either initiate a research programme or work in consultation with the Organization's technical staff. An example of their approach to a problem is the attempt to counteract the development of resistance to insecticides, particularly with regard to malaria. It has been shown that when anopheles become resistant to insecticides of the D.D.T. group they can sometimes be controlled by those of the B.H.C. group, but in Greece they were resistant to both. The fundamental facts about insecticide resistance had therefore to be further studied before the control and eradication of malaria, as of other communicable diseases, could be completed. The problem was submitted to an expert committee, whose members considered the results of a survey carried out by consultants in 1955; they were able to draw up a plan for additional research programmes, which, with the help of several scientific institutions, have developed methods of measuring susceptibility or resistance of disease vectors. The results of these studies have enabled W.H.O. to give information to the governments concerned on the best methods for controlling typhus fever in resistant areas, and to establish an extensive system of exchanging information on problems of resistance in general.

The field of activity of W.H.O. is divided into six regions—Africa, the Americas, South-east Asia, Europe, Eastern Mediterranean, and Western Pacific—with certain problems specific to each region. In the African region, for example, malaria, treponematoses, leprosy, tuberculosis, and malnutrition have received special attention, while in the European region the effort to achieve complete control of trachoma by means of antibiotics has been greatly assisted by schoolchildren serving on "health committees" with duties which include the regular treatment of their infected classmates. The report contains some interesting maps showing the various stages in control and eradication of communicable disease in the different regions, and some excellent photographs illustrating the way in which the work of this very human organization ministers to the needs of individuals belonging to every nationality.

COHORT ANALYSIS

A golden rule in statistics is to "compare like with like." As is the way with golden rules, it is difficult to interpret, and even when interpreted difficult to follow. In practice we usually have to set up a more or less arbitrary scale of likeness. If, for example, we wish to study the changing trends of mortality, the first step is to count the number of people dying in one period of time, relate this number to the number alive, and compare the death rate so calculated with a death rate calculated in the same way for another period. As a refinement we take into account the different age distributions by calculating standardized death rates or by studying the death rates

¹ Case, R. A. M., *Brit. J. prev. soc. Med.*, 1956, 10, 159.

² Springett, V. H., *J. Hyg. (Lond.)*, 1950, 48, 361.

³ Case, R. A. M., *Brit. J. prev. soc. Med.*, 1956, 10, 172.

⁴ *The Work of W.H.O. 1956*, World Health Organization, Geneva, 1957. Price 10s.

¹ *British Medical Journal Supplement*, 1955, 1, 190.

² Asher, R., *British Medical Journal*, 1956, 1, 309.

for separate age groups. This method assumes a fundamental likeness in certain chosen respects between people dying, or at risk of dying, at a particular period of time. But, unless we are concerned with mortality due to epidemics or wars, it is often more fruitful to take account of the similarities between people born in the same year than of those between people dying in the same year. It is possible to calculate the death rates at various ages of people born in a five- or ten-year period, and to compare them with the death rates of people born in a subsequent period. This method has come to be known as cohort analysis, a possibly rather pretentious name for an approach which, as R. A. M. Case¹ points out in a recent review of the method, is one which would be used unhesitatingly, if unwittingly, by any experimental biologist working with animals.

Case has performed a useful task in setting out the method in its proper perspective. For its introduction into medical fields it is clear that much of the credit must go to the Scandinavians such as R. Korteweg and to V. H. Springett in Great Britain. Case draws on Korteweg for a striking example: if conventional age-specific death rates for cancer of the lung in men are studied, it appears that mortality reaches a peak between the ages of 60 and 70 and then falls off. In fact mortality due to lung cancer has recently been increasing in such a way that the death rate of men in the 70-79 age group has been higher than the rate, recorded ten years earlier, for those in the 60-69 group. Thus the cohort method shows a continuous increase with age; in terms of the individual's chance of dying from lung cancer as he grows older, this is clearly a more realistic picture. Springett² has studied the opposite problem, the effect of the sharply falling death rate due to pulmonary tuberculosis on the age distribution of mortality.

In a second paper Case³ has applied the method in an analysis of mortality in England and Wales for 21 sites of cancer over the years 1911-1954. This study admirably shows the value of the method in extracting the maximum of information from past records, and the results should be examined by anyone interested in the epidemiology of cancer. Even so, no method of analysis can compensate for faulty data. Conclusions drawn from a cohort analysis are equally subject to error due to inaccurate or changing methods of death certification as are those from any other method. Nor can cohort analysis supplant the conventional methods of presenting current statistics—any more than the methods of the historian can supplant those of the journalist.

PSORIASIS AND RHEUMATISM

Rheumatism, from its christening by Galen, has been gradually differentiated over the centuries so that the word is now almost meaningless except as an indicator of pain or discomfort. In its place we have a series of nosological entities, each laboriously separated from the matrix and given a separate name and "existence." Rheumatoid arthritis has emerged only in recent times, being finally distinguished from osteoarthritis in the early years of this century, and there is no guarantee that

it will not be split again. A nearly specific test, the differential sheep cell agglutination test¹ (known as the Rose-Waaler test, from Waaler who first noticed the phenomenon in 1940 and from Rose who rediscovered it and realized its importance in 1948), has allowed us to take stock afresh of many rheumatoid conditions, such as Reiter's syndrome or ankylosing spondylitis, and surprisingly has shown that most of the patients with such conditions differ from those with rheumatoid arthritis in giving a negative response to the test. One of the most interesting of these conditions is psoriatic arthropathy, a rheumatoid-like syndrome occurring in about 5-7% of psoriatic patients.

V. Wright² has recently surveyed this field and reported on 42 patients with psoriasis and arthritis seen at the rheumatism unit at Stoke Mandeville Hospital. He wisely uses the term "erosive arthritis" in preference to rheumatoid arthritis in order not to prejudge the issue, and found this change in 34 of the 42 patients (the other 8 having gout, rheumatic fever, or degenerative joint disease). All except two of these 34 patients had a negative response to the Rose-Waaler test; one of the two exceptions was the only patient with subcutaneous nodules, probably representing coincident rheumatoid arthritis. Thus either the arthritis may be a distinct entity or the psoriasis may considerably modify the expression of rheumatoid arthritis. Other interesting findings were the often good prognosis and the clear association of disease in the terminal interphalangeal joint with nail changes rather than with skin changes. A parallel study of the radiological changes³ emphasizes this point again. Disease of the terminal joint was much more common in the psoriatics (52%) than in patients with rheumatoid arthritis alone (11%), and in addition another feature was present (remarked previously only by J. F. Brailsford⁴), erosion of the tips of the terminal phalanges. Ankylosing spondylitis was present by clinical criteria in only three patients of the series, but radiological changes in the sacro-iliac joints were found in 20%. In a more recent survey of atypical spondylitis, J. Sharp⁵ has found that 16 out of 66 patients with psoriasis and polyarthritis had a painful back with limited movement, but the sacro-iliac joints in these patients with clinical spinal symptoms, contrary to Wright's findings, were often radiologically normal. It appears possible, as various people have claimed, that ankylosing spondylitis, as well as rheumatoid, may yet be differentiated into various groups; if the prognosis of these groups with or without treatment differs, as Sharp claims, this splitting may be useful. But differential diagnosis is of practical value only when aetiologicaly founded or there is a difference in treatment or prognosis.

We record with regret the death on June 3 of Dr. George F. Buchan, for many years medical officer of health of Willesden and a past president and treasurer of the Society of Medical Officers of Health.

¹ Dressner, E., *Postgrad. med. J.*, 1957, 33, 170.

² Wright, V., *Ann. rheum. Dis.*, 1956, 15, 348.

³ ———, *Brit. J. Radiol.*, 1957, 30, 113.

⁴ Brailsford, J. F., *Radiology of Bones and Joints*, 1953, London.

⁵ Sharp, J., *British Medical Journal*, 1957, 1, 975.

LAW ON MENTAL ILLNESS AND MENTAL DEFICIENCY

ROYAL COMMISSION'S REPORT

The Royal Commission on the Law Relating to Mental Illness and Mental Deficiency presented its report* last week. The Commission was appointed four years ago under the chairmanship of Lord PERCY OF NEWCASTLE, and included four medical members†—Sir RUSSELL BRAIN, Dr. T. P. REES, Dr. D. H. H. THOMAS, and Dr. J. GREENWOOD WILSON. It met on 44 full days and 13 half-days and cost nearly £27,000 gross. It received written evidence from 68 and oral evidence from 42 interested bodies, including the B.M.A.‡ In addition, numerous individuals submitted evidence, four of whom are anonymous, being either former mental hospital patients or spokesmen for such patients. Except for these four last witnesses, all the oral evidence was heard in public, the minutes being published daily.§ No formal visit by the Commission as such was paid to any hospital or local authority establishment, but its members, singly or in small groups, visited hospitals and other centres informally.

Form of the Report

The Commission's report runs to 302 pages and four appendices and carries a short index. Immediately after the formal introductory matter come the Commission's main conclusions and recommendations, summarized in 18 pages. We record the principal ones below. There was no minority report. Then follow the seven parts of the report as follows: (1) Introductory survey of the present mental health services. (2) The need for new legislation and the general form it should take. (3) Distinctions between various groups of patients, and recommendations for new terminology. (4) The procedures applied to individual patients (this is much the longest section of the report—123 pages). (5) The local administration of the mental health services. (6) Powers and duties of the central Government. (7) Hospitals and homes outside the National Health Service and other private care. The four appendices deal respectively with procedure and sources of evidence and information; procedures applied to patients under the present law (summarized in a large table); the Commission's proposals for when compulsory powers are used in future (in a similar table); and statistics on the incidence of mental disorder in England and Wales and on its treatment, mostly provided by the Ministry of Health and the General Register Office.

Since the turn of the century two previous Royal Commissions have inquired into various aspects of our mental health legislation and administration—the Royal Commission on the Care and Control of the Feeble-minded (1904-8) and the Royal Commission on Lunacy and Mental Disorder (1924-6).

Commission's General Approach

Great progress has been made during the present century in developing methods of treatment for many forms of mental disorder, states the Commission. In some cases treatment could quite well be given without powers of detention if the law allowed mental and mental deficiency hospitals, like all other hospitals, to admit patients informally. In other cases, however, the patients' judgment might be so affected that they did not appreciate their need for care, and they might be positively unwilling to receive it;

*Cmd. 169, H.M.S.O. Price 10s. 6d. net.

†The other members of the Commission were Sir Cecil Oakes, Lady Adrian, Mr. Claude Bartlett, Mrs. E. M. Braddock, M.P., Sir Harry Hylton-Foster, Q.C., M.P. (until October, 1954), Mr. R. M. Jackson, and Mr. J. E. S. Simon, Q.C. (from October, 1954, to January, 1957).

‡The B.M.A.'s written evidence to the Royal Commission is set out in the *Supplement* of May 7, 1955, p. 211. The oral evidence was given before the Commission by Dr. N. H. M. Burke, Dr. H. M. Cohen, Dr. M. J. Brookes, Dr. Doris Odium, and Dr. S. Wand on April 27, 1955.

§See *Index to Minutes of Evidence* (H.M.S.O., price 2s. net) and *Minutes of Evidence Taken in Private* (H.M.S.O., price 3s. net).

and some might be dangerous to themselves or others, or incapable of protecting themselves. If proper care was to be provided for these patients, it could only be done by using compulsory powers.

The Commission recommends, therefore, that the law should be altered so that, whenever possible, suitable care may be provided for mentally disordered patients with no more restriction of liberty or legal formality than for other types of patient. Compulsory powers should be used only if "positively necessary" to override the patient's or his relatives' unwillingness. For such cases there must be special procedures and safeguards. The Commission would like to see the term "certification," and the ideas associated with it, fall completely into disuse.

Classification of Mental Patients

For many centuries a broad distinction had been drawn between patients described as "mentally ill" and "mentally defective." Each term covered a wide range of types and degrees of disorder and there was no clear-cut medical distinction between the two; the terms were legal and administrative rather than clinical.

Most defectives did not require admission to hospital but lived in the general community, many of the feeble-minded earning their living in simple forms of employment. But, while the Mental Deficiency Acts authorized detention of defectives, no explicit provision was made for their admission on a voluntary or informal basis. In practice, however, they were now admitted for short periods without legal formality. The majority of mentally ill patients also did not need in-patient treatment. A few hospitals now provided in-patient treatment quite informally, but hospitals "designated" under the Lunacy and Mental Treatment Acts, 1890-1930, could admit in-patients only through the procedures laid down in these Acts. Since the passing of the first Mental Deficiency Act in 1913, it had become usual for mentally defective patients to be admitted to mental deficiency hospitals only, leaving the mental hospitals for the treatment of mentally ill patients only.

Medicine also recognized a group of mental disorders known as psychopathic states, for which the law made no special provision. Some patients certified as feeble-minded or moral defectives under the Mental Deficiency Acts were medically very similar to some psychopaths at present uncertifiable as either mentally defective or of unsound mind. But the latter could only be compelled to submit to medical treatment if after conviction of a criminal offence this was made a condition of probation.

In the Commission's view the administrative distinction between mental illness and mental deficiency had a sound practical basis, but the rigidity with which it had been enforced through two separate legal codes had had some unfortunate results. There were also unnecessary differences between the procedures applied to the two types of patient under the present law.

Commission's Terminology

The Commission recommends that three main groups of patients should be recognized in future for legal and administrative purposes:

(a) *Mentally Ill Patients*.—The term "mental illness" would be used in the same sense as at present, including the mental infirmity of old age. The term "person of unsound mind" would no longer be used.

(b) *Psychopathic Patients, or Patients with Psychopathic Personality*.—The term "psychopathic personality" is used in a wider sense than usual. It was intended to include any type of aggressive or inadequate personality which did not render the patient severely subnormal in the sense of group (c) below but which was recognized medically as a pathological condition. The term "feeble-minded psychopath" is used to denote psychopaths whose disorder included a marked limitation of intelligence but still did not bring them into group (c).

(c) *Patients of Severely Subnormal Personality*.—This term would be used when the general personality was so severely

When he married, like all wise physicians Harvey chose the daughter of a successful physician, Dr. Lancelot Browne, physician to Queen Elizabeth, and they had on display at the College two newly discovered letters written by Dr. Browne to Robert, first Earl of Salisbury, in 1605, soliciting a post for his son-in-law, William Harvey, at the Tower of London. In 1616, the year in which Shakespeare died, Harvey wrote his famous book. The work was not published until 1628, however, and when it did appear it was produced by a printer who was nearly bankrupt and who used all sorts of scraps of paper to make it, so that the thickness of the book varied greatly from copy to copy. Costing only 6s. 2d. on publication, a first edition was worth now at least £5,000. Copies of Harvey's works, including a first edition of the *De Motu Cordis*, were on view at the College.

New Portrait of Harvey

But they were also fortunate in having on view a hitherto unknown picture of Harvey, continued Mr. Dickson Wright, which had been discovered at Berkeley Castle, Gloucestershire, and had been lent to them specially for the occasion. [The portrait, which was discovered by Dr. STUART W. HINDS, reader in public health at the London School of Hygiene and Tropical Medicine, is an oil painting about 24 in. by 30 in., inscribed at the top right-hand corner: "Dr Harvey famous physition that found out of circulation of the blood." Its subject is shown at half-length seated, wearing a black gown fastened with black buttons from neck to waist. He has a plain white collar with small tassels at the neck. The portrait has suffered from considerable overpainting and restoration, but in a descriptive note Dr. Hinds states that the Curator of the Bristol City Art Gallery believes it to have been painted about 1640 by a follower of Van Dyck. However, inquiries about the portrait are still far from complete. It is on loan to the Congress by courtesy of the owner, Mr. R. G. Berkeley, of Berkeley Castle.]

From Harvey's initial discovery a wonderful field had opened up, went on the president. Even now there was no end to what could be discovered about the circulation; we still did not fully understand it. "Could Harvey come back to-day," said the president, "I am sure he would think of some crucial experiments which would help us greatly."

Harvey's Latest Translator on His Work

Following the president's opening address, four papers were presented on the general topic of the "Knowledge of the Circulation of the Blood from the 17th to the 20th Centuries." In the first of these, Professor K. J. FRANKLIN, F.R.S., of St. Bartholomew's Hospital Medical College, suggested that for Harvey's discovery to be made a number of preparatory events had to take place. In particular, the University of Padua had to develop into the leading medical and teaching centre in the world. There Vesalius had fostered an atmosphere favourable to modern anatomy and experimental physiology, and had drawn attention to the cardiovascular system. In his notes for his Lumleian Lectures to the College of Physicians in April, 1616, Harvey, a student of Padua, wrote that it "was plain from the structure of the heart that the blood passed continuously through the lungs to the aorta as by the two clacks of a water bellows to raise water." His next reference to the matter came in his book *De Motu Cordis*, published in 1628 when he was 50.

Professor Franklin then referred to his own new translation of *De Motu Cordis*. His aim while making it, he said, had been to approach as closely as he could to the account Harvey himself would have given had he written in English. He found it rather exciting to think that three hundred years after Harvey's death it might be possible to get a better insight into his thought simply by a more painstaking translation of his Latin script, but that did indeed seem to have been the case.

Until his present venture, said Professor Franklin, he had left direct dealings with Harvey and his work to others.

because he felt there were so many more competent than himself in that rather congested field. Now, however, he wished to pay tribute to one whom he had got to know so much better through the labour of translation. He had been astonished at the insight and competence with which Harvey must have seen what was needed to be done at Padua in 1600-2, and by the celerity with which he had carried out the essential task. Personally he had found Harvey serene, appearing effortlessly great, dedicated, and sure, even with final anatomical proof of his thesis still, in 1628, to come. The royal dedication of the book was completely apposite, because Harvey's qualities were so above those of ordinary folk that he had much in common with his royal master.

The Confirmation of Harvey's Work

Professor J. F. FULTON, of Yale University, then spoke on "The Reception of the Harveian Discovery in Europe." Harvey's work, for its completion, needed the discovery of the capillaries, said Professor Fulton. Harvey himself had realized that his observation on the flow of the blood in the arteries and veins did not constitute a final proof of the circulation, and it had remained for three of his followers to provide the confirmatory evidence—Malpighi, Leeuwenhoek, and Hales.

The first of these—Malpighi—said Professor Fulton, had started using the microscope for his anatomical work and demonstrated the flow of blood through a frog's lung. Leeuwenhoek, the Dutch linen-draper from Delft with a passion for grinding microscope lenses, made possible the discovery of the capillaries; while Hales, an English parson, offered the final proof and demonstrated the existence of the capillaries. His work on the determination of the blood pressure came later.

Harvey as a Physician

SIR CHARLES DODDS, F.R.S., speaking on Harvey as a scientist and physician, said that Harvey's discovery of the circulation was the foundation of the modern idea of medicine.

Harvey's period was very fully documented, said Sir Charles Dodds, and it was easy to get a picture of how medicine was practised in his day. Conditions in town and country were quite different. The College of Physicians existed largely to license physicians to practise in London. In the country, the great houses, by reason of the poor roads, were largely cut off from the villages and the towns, and to these houses the physician only went if specially called. The physician having made his diagnosis passed his instructions for treatment to the apothecary, who made up the medicine and carried out the treatment. There were also lists of recommended treatments, "pharmacopoeias," which the officers of the great houses in the country could consult in cases of illness. Medical teaching of the day considered the body to be controlled by four humours and a lack of balance between these four was believed to be the cause of all illness. The treatment prescribed sought to restore the balance.

At St. Bartholomew's Hospital were preserved a number of prescriptions that Harvey had written, and all of them were in accord with the practice of his day. Faced with the picture of that penetrating intelligence still practising medicine as it had survived since the days of Galen, one could not help but ask what was the reason for the paradox. It appeared from a study of Harvey's discussions with his contemporaries that Harvey did not associate his discovery of the circulation with the practice of medicine, but regarded it as an entirely disconnected study in no way related to treatment. That was not perhaps so surprising considering the centuries of indoctrination in the Galenical tradition. There was also another reason: the pharmacopoeia of Harvey's day did not contain any active substance other than opium and a few purgatives. One had to wait for a hundred years after Harvey's death before digitalis was added. No progress could really be made in therapeutics

until the causes of disease had begun to be established at the end of the last century. What was surprising, however, was that the use of the ancient cures continued up to the eighteenth century and even into the nineteenth. Some maintained that a little of the old practices had lingered on into the present century.

Debts to the Past

The final address of the morning, prepared by Dr. F. A. WILLIUS, of the Mayo Clinic, was delivered by Dr. T. F. COTTON, as ill-health prevented Dr. Willius from attending the Congress.

In his paper, Dr. Willius declared that Harvey's work had opened the door for all subsequent studies dealing with the cardiovascular system. It remained a matter for astonishment that Galen's fallacious concept of the heart and circulation was almost universally accepted for nearly fourteen and a half centuries. That protracted reverence had had a profound effect in retarding knowledge of the heart and circulation. But, following the publication of Harvey's monumental work, the record showed an ever increasing amount of observation, and to-day many conditions, described long ago, were now being recognized and classified as diseases. Dr. Willius gave as examples of this the tetralogy of Fallot, first described by Niels Stensen in 1673 and redescribed by Fallot in 1888; coarctation of the aorta, first described by Morgagni in 1761 but only correctly classified in 1903 by Bonnet; patent ductus arteriosus, first described by Giulio Cesare Aranzio (1530-89); a Boston surgeon, John C. Munro, had predicted in 1907 that this condition could be treated surgically, but it was not until 1939 that an operation was successfully performed along the lines he suggested.

It was evident, said Dr. Willius, in conclusion, that our medical forebears had built wisely and well. Without that foundation of knowledge present-day scientists could not possibly have achieved the amazing progress of the last two decades.

Nova et Vetera

LINNAEUS

NATURALIST AND DOCTOR, 1707-78

There are few men in history whose fame is so universally recognized as that of Linnaeus. The significance of the single letter L which follows so many botanical and zoological names is quickly learnt by the youngest students of biology. They are soon told that Linnaeus was one of the greatest naturalists of all time. As readers of this *Journal* were reminded about a year ago, "he was also a physician with a remarkably wide range of interests, including pathology, chemistry, pharmacology, surgery, gynaecology, zoology, mineralogy, anatomy, physiology, veterinary medicine, and farming." It sounds a formidable list, but is perhaps merely the modern way of saying that he was a good all-round doctor with a love of country life. It is for his fundamental contributions to botany and not to medicine that during the past two weeks the 250th anniversary of his birth has been celebrated by the learned and noted by the newspapers throughout the world.

Carolus Linnaeus, whose Latin name is more familiar than the Swedish Carl von Linné which he adopted after he was ennobled, was born at the little village of Stenbrohult in southern Sweden on May 23, 1707. He was the eldest child of a country parson, Nicolaus Linnaeus, whose own family was of poor peasant stock but whose wife's included a number of learned theologians. He first learned to walk in his father's garden, which was celebrated throughout the district for the number and variety of its flowering plants, over two hundred of which were imported, and it was in this garden that his father taught him the names of all the plants to be found in it. At the age of 7 he left home for school in Wexjö, and there soon met a certain

Dr. Rothman, a friend of the headmaster, who persuaded the boy that he should train for a career in medicine, a profession that was not particularly lucrative in Sweden at that time. In spite of their disappointment, for they had intended him for the Church, his parents allowed him to become Rothman's private pupil, and by the time he left school at the age of 19 he was already acquainted with the writings of the great Boerhaave and had acquired some knowledge of physiology and a greater knowledge of botany, then an important part of medical studies. After a year at the university at Lund, where he lived with the professor, Dr. Kilian Stobaeus, but found little otherwise to attract the student, he transferred to Upsala, 300 miles away. There, too, the medical teaching left much room for improvement. In order to see an anatomical demonstration he had to make the journey to Stockholm, where the cadaver of a woman who had been hanged was being dissected. In 1729, at a time when poverty and actual hardship threatened to end his studies, he had the first of those many lucky encounters which played such an important part in his life.

Fair Botanist

It seems that he had great personal charm, which, combined with his unusual knowledge and earnest enthusiasm, attracted the interest of rich and powerful patrons. Rothman had first turned his steps towards medicine, but now the well-known Professor Olof Celsius, who found him studying specimens in the botanical gardens and who was astonished to learn that the shabby youth possessed his own collection, took him under his wing. Grants were obtained for him to complete his studies, and before long he was earning money by demonstrating the collections to students and conducting botanical excursions into the surrounding country. Teaching in the day, he spent his nights studying and writing, and in particular in developing his ideas on the sexual system of plants, work which he completed before he was 24, but had first approached two years earlier in an essay entitled *Nuptia Plantarum*. Admitting that he was "not a poet born, but a fair botanist," he yet wrote in terms which are no longer associated with scientific exposition. After arguing the analogy between animals and plants, he goes on:

"From this we conclude that even with plants there exist organs of generation. That these organs are to be found in the flowers is proved by the fact that when there is no fruit there was previously no flower. The petals contribute nothing to generation but serve only as bridal beds which the great Creator has arranged so beautifully, with the purest bed curtains, and perfumed with such delicious fragrance that the bride and groom may there celebrate their nuptials with so much greater ecstasy."

Phrases such as this gave the tone for one of the few public opponents of Linnaeus's new sexual theory, Professor Siegesbeck, of St. Petersburg, who wrote:

"God would never permit, in the kingdom of plant life, such detestable unchastity as that of several men [stamens] owning a common wife [pistil]; or that married men would [as in certain plants], besides their legitimate wife, have additional legitimate ones in neighbouring flowers. Such an unchaste system could never be presented to young students without causing righteous indignation."

Far from causing "righteous indignation" the new theory aroused the greatest enthusiasm, and Linnaeus found himself lecturing to audiences of 400 while the senior professors had difficulty in mustering their normal 80.

Visit to Lapland

Still mindful of his ultimate aim to obtain a medical degree, he studied therapeutics under Nils Rosen at Upsala and he spent the summer of 1731 in the pharmaceutical laboratory at Stockholm, but quite a different project now captured his imagination and further postponed his formal enrolment as a physician. He had been living at Upsala with the professor of medicine, Olof Rudbeck, jun., who often talked of his journey into Lapland in 1695 and spoke of the wealth of material for the naturalist to be found in that almost unknown region of Europe. Fired with



Linnaeus in his Lapp costume. Painted by M. Hoffman about 1737. By courtesy of the Wellcome Historical Medical Library.

enthusiasm, Linnaeus worked out proposals for an expedition, which received official sanction and secured a modest grant from the Government. This journey, carried out in 1732, occupied four months and took him great distances, a feat of endurance which was remarkable for one whose health was never robust. From the notes and records which he kept he produced his *Flora Lapponica* as well as a pioneer work on the life and customs of the Lapps entitled *Iter Lapponicum*. One of his souvenirs of this journey which he always treasured was the Lapp costume which he wore for the portrait painted after his return.

For another two years he continued to combine study and teaching at Upsala with excursions, one of which took him to the old mining town of Falun, where he fed his new interest in mineralogy by exploring the famous old copper mine, and where too he met his future wife, Sara, daughter of Dr. Johan Moraeus, one of the best-known practitioners in Sweden. He was still as far as ever from obtaining a medical degree, but this meeting resulted in his deciding to travel abroad and to graduate at one of the Dutch universities.

Leaving Sweden in February, 1735, he travelled first to Hamburg and then to Amsterdam and Harderwijk, taking with him a number of manuscripts for which he hoped to find publishers, a mounted collection of nearly a thousand insects from Lapland and Dalarne, and his famous Lapp costume with its curious ornaments. The impression he created is reported in contemporary accounts and was everywhere most favourable. The small university at Harderwijk had many links with Swedish doctors who went there for their medical degrees as English practitioners of the time went to Aberdeen or St. Andrews, to pay a comparatively low fee, to pass a short examination, and to return within a few days with the long-desired M.D. Linnaeus was asked some questions in general medicine, explained the diagnosis and treatment of jaundice, wrote a review of the aphorisms of Hippocrates, and submitted a thesis (already written in Sweden) on the cause of intermittent

fever. His bearing and knowledge impressed not only his examiners, chief of whom was Johan de Gorter, but all who were present when he successfully defended his thesis, and he made many new friends. Among them was Dr. J. F. Gronovius, one of the greatest collectors of plants in Holland, who, when he was shown the manuscript of the *Systema Naturae* immediately offered to bear the expense of publication, an offer in which he was joined by a rich Scot named Lawson. The slim atlas folio, filled with tables of classification, now one of the treasures of scientific literature, appeared in December, 1735. It went through 16 editions during the lifetime of Linnaeus, being improved and enlarged each time.

Binomial Nomenclature

Its importance lies in the fact that it established the universal application of the binomial system of nomenclature to all animals and plants, the generic name being followed by the descriptive epithet which singles out the species within the genus. Previously suggested by Joachim Jung, Bauhin, and Ray, it required the industry and learning of Linnaeus to demonstrate its value on the scale necessary to secure its general acceptance. Modern zoological nomenclature is regarded as beginning with the tenth edition of this work, published in 1758, just as botanical nomenclature dates from his *Species Plantarum* of 1753.

The *Systema Naturae* was the first of many important works which Linnaeus published during his three years in Holland. Leisure and opportunity for carrying out his labours were afforded him by the outcome of his meeting with Boerhaave, who warmly recommended him as personal physician and botanist to the wealthy director-general of the Dutch East India Company, Dr. George Clifford, former burgomaster of Amsterdam, who had a large and important private botanical and zoological garden situated between Leyden and Haarlem. Linnaeus lived like a lord on Clifford's grand estate, making every use of the fine library and museum, as well as of the gardens, with their plants from every part of the world and their extraordinary collection of birds and rare animals. In 1736 he paid a short visit to England, bringing with him a letter of intro-



Linnaeus in 1774. Portrait after Per Krafft the Elder. By courtesy of the Wellcome Historical Medical Library.

Correspondence

Coal-gas Poisoning

SIR,—The report of the British Medical Association's sub-committee on coal-gas poisoning has received considerable publicity. The medical officers in the industry have considered this report and feel that there are some parts of it in which the emphasis has been misplaced, so that people ignorant of the hazards of carbon monoxide might easily be misled. I am therefore sending this letter on behalf of the chief medical officers of the area gas boards.

The report says: "An air-line or oxygen breathing apparatus is the only safeguard for *more than short exposures* [to gas]" (my italics). This would seem to imply that, if the exposure to gas is short, no air-line or other breathing apparatus is necessary. Scientifically this is a true statement, but it is an extremely bad working rule, because a man working with gas can very rarely know when the exposure is going to be so short that he will not need to take precautions.

"A canister gas mask is of strictly limited benefit." This sentence is also open to criticism, because it implies that there are certain circumstances in which it is a safe appliance. Such appliances are not approved by the factory department of the Ministry of Labour, and for very good reason. They are dangerous because: (1) the catalyst wears out and there is no means of knowing when it is worn out; (2) if the catalyst breaks down the wearer is likely to come to serious harm without finding this out; (3) they are, of course, quite useless in an atmosphere which contains less than the amount of oxygen necessary to maintain life.

"This process of elimination is hastened by the administration of pure oxygen: if the patient's breathing is weak the oxygen administration should be supplemented by some form of artificial respiration." This again is an accurate statement, but it places the emphasis upon the administration of oxygen and not of artificial respiration. A man who needs oxygen may well recover without it: a man who needs artificial respiration *must* be given this treatment. Undue emphasis on the administration of oxygen might well lead to artificial respiration being delayed in order to fetch an oxygen apparatus, or even omitted while oxygen is being given.

It is unfortunate that the recommendations of the committee make no mention of the importance of manual artificial respiration or the importance of training in this. It is a pity that the compressed air breathing apparatus is not mentioned in the report.—I am, etc.,

G. O. HUGHES,

Convener,

Medical Officers Committee
of the Gas Council.

Macroglobulinaemia

SIR,—We are indebted to Dr. D. W. Oxbrow for his comments (*Journal*, March 30, p. 759) on our paper (*Journal*, March 9, p. 561). The presence of high-molecular-weight globulins has been described in serum unassociated with lymphoma or with the recognized features of macroglobulinaemia; nevertheless, in all our cases the syndrome of macroglobulinaemia had an intimate relationship to malignant lymphocytic proliferation.

Lymphosarcoma was, without doubt, the histological diagnosis in our cases 1, 2, and 4. Case 3, in whom lymphosarcoma had been diagnosed by splenic biopsy, has subsequently, on the advice of Professor L. J. Witts, had a splenectomy for anaemia and gross splenomegaly; sections of spleen and abdominal lymph nodes corroborated the diagnosis. Three further cases have now come to our attention; one of these has a proved lymphosarcoma, and in two others this diagnosis is likely but unconfirmed. We omitted detailed microscopic descriptions from our paper, because the histology was that of lymphocytic lymphosarcoma.

duction from Boerhaave to Hans Sloane. He also visited Oxford, where he saw the physic garden and met the naturalist Dillenius.

After a severe attack of cholera in the spring of 1738 he decided to return home, and, after a short visit to Paris, where he was urged to remain, he arrived in Stockholm in September. There, after the usual discouraging start, he soon built up a flourishing practice, and, through the support of a new friend and admirer, Count Carl Gustaf Tessin, one of the most important men in Sweden, secured several profitable official appointments. In 1739, with four others, he founded the Swedish Royal Academy of Science and became its first president. Thus well established at the age of 32, he was married in June of the same year to Sara Moraeus, of Falun, and for the next two years he was probably the busiest practitioner in Stockholm. Yet he lectured as well as practised and found time to establish a physic garden. He was given official permission to carry out post-mortem examinations and is regarded in Sweden as that country's first morbid anatomist.

Professor of Medicine

When, in 1741, the chance came of succeeding to the post of professor of medicine and botany at Upsala, it was eagerly seized, for he still regarded botany as his life-work. He held this post until he died in 1778. His death was announced in Parliament by the King of Sweden and his body was buried in the cathedral of Upsala. The house which he occupied as professor, the same house which he had first known as a poor student, is still kept as a memorial to Linnaeus, and so too is his country home at Hammarby, six miles away, where he spent the last 20 years of his life. But his finest memorial is probably the wonderful collection of his correspondence and manuscripts: his heirs sold it to a medical student, James Edward Smith, for 1,000 guineas in 1784, and it is now the most valued treasure of the Linnaean Society of London, which Smith founded.

It is as the unrivalled systematist that he will always be remembered in the history of the natural sciences. His sexual system, of the greatest importance in its time, has now given place to other systems which express more clearly the facts as we now know them, but we cannot put too highly the debt we owe him for our system of biological nomenclature. His genius for classification extended even to diseases—he published a *Genera Morborum* in 1763—and, as Dr. Henry Viets recently pointed out, we are indebted to him also for the original description of aphasia. It is fitting, then, that he should be commemorated in this *Journal* not only as a naturalist but also as doctor.

F. N. L. POYNTER.

THE VACANT CHAIR

"January 14th, 1851.—To Windsor, and walked up to the Castle. . . . I had a few words with the Prince about the Regius Professorship of Medicine at Cambridge now vacant by Haviland's death. I remarked that it was impossible to make either Oxford or Cambridge a great medical school. He said, truly enough, that Oxford and Cambridge are larger towns than Heidelberg, and yet that Heidelberg is eminent as a place of medical education. He added, however, something which explained why this was. There was hardly, he said, a physician in Germany, even at Berlin, even at Vienna, who made £1,000 a year by his profession. In that case a professorship at Heidelberg may well be worth as much as the best practice in the great cities. Here where Brodie and Bright make more than £10,000 a year, and where if settled at Cambridge or Oxford, they probably could not make £1,500 there is no chance that the Academic chairs will be filled by the heads of the profession."—From Sir G. O. Trevelyan's *Life and Letters of Lord Macaulay*, Vol. II, page 290.

¹ Lillingston, C., *British Medical Journal*, 1956, 1, 1041.
² Viets, H., *Bull. Hist. Med.*, 1943, 13, 328. (Facsimile reproduction of an English translation of a case report published in

The course of macroglobulinaemia is not "comparatively benign" as Dr. Oxbrow states—two of our patients (cases 2 and 4) have died of the disease, and one (case 1) is now very ill. We know that some lymphosarcomata may run quite a protracted course, and indeed it is in such cases that the greatest opportunity for mutations will occur. The clinical picture is quite consistent with a slow-growing lymphosarcoma complicated by effects produced by the circulating abnormal protein, the synthesis of which represents an activity just as autonomous and "purposeless" as malignant cell proliferation itself.—We are, etc.,

IAN R. MACKAY,
L. I. TAFT.

Melbourne, Australia.

Adder Bite

SIR,—There has recently been reported an increase in the numbers of the British adder, probably due to the very mild winter we have just experienced. The following personal incident may therefore be of some interest.

After picnicking this month in a Worcestershire forest with my family I was walking up a sunny woodland path when I was struck from behind over the lower third of my tendo achillis by an adder. The immediate pain precluded any attempt to kill the snake. After contemplating the situation for about half an hour I decided to try and drive my car the 20 miles to home. By the time I had done four miles the ankle was grossly swollen, there was some pain in my loins, and shortly afterwards I had to be helped out of the car in a very shocked and dyspnoeic condition. My admission to a general hospital was quickly arranged, and there the bite was opened by cruciate incision, the wound irrigated with potassium permanganate solution, and repeatedly dry-cupped with a preheated bottle. Polyvalent antivenin, together with antitetanic serum, was given subcutaneously. The next day the whole limb was grossly swollen and there were large perilymphatic haemorrhages up to the groin. Despite a week's treatment with oral antihistamines, serum sickness developed on the eighth day and was only controlled by subcutaneous injections of adrenaline.

My conclusions from this experience are that this snake's proteolytic venom can cause severe systemic effects in an adult, and that, unless attention were promptly given, could easily prove fatal to a child.—I am, etc.,

Birmingham, 6.

K. W. BREWSTER.

Appendicitis in Young People

SIR,—In his article (*Journal*, May 25, p. 1217) Dr. J. A. H. Lee contrasts the high rate of appendicectomies in young women with the low death rate from appendicitis in that group. I have seen a number of cases recently in which the possibility of ovarian pain was overlooked in the differential diagnosis of pain in the right iliac fossa. Such pain is very common in young women, and may be due to physiological congestion in a healthy ovary (1) at the time of ovulation, or (2) when sexual excitement is unrelieved.

The ovarian origin of this type of pain is presumably overlooked so often because it would be expected to be bilateral. One can explain the predominance of right-sided pain by postulating some "appendix-consciousness" in most intelligent young people to-day. Several of the cases I have seen were in nurses and ex-nurses, who could be expected to give first preference to the appendix in their search for the culprit-organ when experiencing low abdominal pain.—I am, etc.,

Maidstone, Kent.

R. SANDER.

Scapulo-thoracic Crackling in Youth

SIR,—This is not uncommon, and occurs, as Dr. F. Parkes Weber says (*Journal*, May 18, p. 1181), usually in late adolescence, more in the female. There is no pathological change, but it is usually assumed by the patient to be a precursor of arthritis. It is due to hypermobility of the scapula and is associated with faulty posture such as thoracic

kyphosis and scoliosis, and attempts at self-adjustment haul the scapula through an abnormal range.

The treatment, after the correction of the mechanical disabilities by manipulation, as far as this is possible, is to give shoulder girdle exercises combined with deep breathing, and as long as these are done meticulously recurrence is rare. The patient, of course, should be persuaded that there is no point in producing the grating. It was, I think, Smith-Petersen who said to a mutual patient, "This is a disagreeable noise, neither amusing nor useful, and we do not have to do it."—I am, etc.,

London, W.1.

GUY BEAUCHAMP.

The H-bomb

SIR,—I wish to support Mr. N. Capener's plea for the ending of nuclear-bomb tests (*Journal*, May 25, p. 1246). Like him, "I have failed to observe any serious move by the B.M.A." or any other influential medical body in this matter. Several years ago (*Journal*, February 13, 1954, p. 394) I expressed the opinion that the control of nuclear weapons was the urgent concern of preventive medicine. But though there have been informative articles in the medical press on the pathological effects of bomb tests, these must be supplemented by purposive action (as in every branch of preventive medicine) if any result is to be expected. Could not the B.M.A. point the way at its annual meeting in July?

It is the duty of the medical world to be constantly reminding politicians of two salient facts about nuclear weapons: (1) that continuous nuclear tests will damage world health, and (2) that actual nuclear warfare would produce a catastrophe which no medical organization could cope with. Medical leadership in each country should "bombard" their respective governments with these doctrines at regular intervals, until international control is achieved. Unless we bestir ourselves in such ways we shall fail in our duty as guardians of the public health.—I am, etc.,

Hove.

W. V. CRUDEN.

SIR,—I am sure I am only one among many who welcome Mr. Norman Capener's letter (*Journal*, May 25, p. 1246) with its appeal to the medical profession to make a protest against the continuation of nuclear bomb tests. Unlike physicists and engineers, we are not burdened with the heavy responsibility involved in having had a direct part in the making and testing of these weapons of mass destruction. We must accept responsibility for "public health" in the widest sense of the term, and we are neglecting our duty if we fail to appeal to those in authority to end these tests. The degree of dangerous radiation can only be measured by damage to human life, not to volunteers in laboratory tests but to chance victims. In this case we must not wait for the collection of results before we act. Can we refuse to make our position clear when so much is at stake?—I am, etc.,

Loughton, Essex.

RACHEL HUNTER.

Is This a Record?

SIR,—On Wednesday a boy aged 3 was thought to have swallowed a screw which was found to be missing from something which he was playing with in the garden. He said, "Hurt," and pointed to his throat, but was otherwise quite unconcerned. An hour or two later I examined his throat quite easily and could see no sign of any abrasion. He remained well on the Thursday, Friday, and Saturday, with a good appetite, no abdominal pain, and passing a regular motion each morning, which was carefully searched. On Sunday, to quote from his grandmother's letter, "the screw reappeared from C's inside. . . . He complained of pain as it came out, but only for a moment and no scratching is apparent. I underestimated the length: it measured just over 2½ in. (5.4 cm.)—not quite 2½ in. (5.7 cm.), and was ancient and rusty and stout to match its length. I feel we have had a wonderful escape."

I wonder if your readers would agree with my line of reasoning. In keeping with my habit of limiting the amount of x-radiation to which my patients are exposed, particularly children, I refrained from asking for a radiological search for the screw, knowing full well that if any untoward symptoms occurred such an examination would then be necessary. If an x-ray had been taken in the absence of symptoms, parental anxiety would have been increased rather than otherwise. In these cases, which are not infrequent in general practice, the important thing seems to be the examination of all faeces passed for at least a week. What is the largest solid body which has passed unscathed through the intestine of a child of 3, and what is the longest that a foreign body has remained hidden from view before ultimately being evacuated?—I am, etc.,

Peaslake, Surrey.

G. I. WATSON.

Pseudomonas pyocyanea in Cetrimide

SIR,—Referring to your recent correspondence regarding the growth of *Pseudomonas pyocyanea* in cetrimide solution, I have had some experience of this while serving as a pharmacist with the Royal Air Force at Halton in 1953. It was first discovered in wounds in the surgical wards. On this discovery the pathological laboratories also took samples from ward and theatre antiseptics used for preparing and cleaning the skin pre- and post-operatively. Cultures of *Pseudomonas pyocyanea* were obtained from stock solutions of 1% cetrimide from both ward and theatre. Our stock solution of 10% cetrimide in the dispensary from which these solutions had originally been prepared was then tested, and found also to be infected. It was noticed that some of the containers were closed with corks, including those in the dispensary, and it was suggested that the corks were the source of the infection. When demobilized the wards, theatre, and dispensary were all changing to containers with ground-glass stoppers for all such antiseptics. Unfortunately I did not have the opportunity of following this experiment to its conclusion.—I am, etc.,

Hillingdon, Middlesex.

P. J. KEEN,
Pharmacist.

Pharmaceutical Research

SIR,—I have awaited with impatience the expected protest from those better qualified to speak than am I against the implications contained in the sentence which I quote from your leading article (*Journal*, May 11, p. 1107): "This being so, the question arises whether more in the way of useful as distinct from academic research could be done in the universities." Do you consider that fundamental research is "of no use," or is this just a singularly unhappy choice of words?—I am, etc.,

Cardiff.

J. D. P. GRAHAM.

**The O.E.D. defines "academic" as: "Not leading to a decision; unpractical." The word "practical" might have been more apt than the word "useful."—ED., *B.M.J.*

Antibiotic Combinations

SIR,—The appearance of two leading articles on antibiotics within the past few months—namely, "Antibiotics Galore" (*Journal*, January 19, p. 150) and "Fourth Symposium on Antibiotics" (*Journal*, May 4, p. 1050)—has prompted us to write this letter, since it seemed to us that only one side of an important research and therapeutic problem has been presented.

The use of combinations of antibiotics is a subject over which there is much controversy, but there are nevertheless two fundamental facts about which there is no disagreement. These are that (1) combinations of drugs have become the logical approach to the treatment of tuberculosis; (2) the widespread use of antibiotic drugs has in some cases resulted in the emergence of a bacterial population resistant to certain antibiotics. Combined antibiotic therapy is a positive attempt to deal with the problem of resistance.

Finland¹ has not questioned the fundamental theoretical validity of antibiotic synergism, but questions whether such synergism can be optimally obtained with fixed combinations. While the practising physician may be desirous of using two different antibiotics simultaneously in the treatment of any case, it is unlikely that he will be in a position to decide what proportions of antibiotics would be likely to give the best results. In hospitals where laboratory facilities are available, the proper combination to use can be determined by performing sensitivity tests with the infecting organisms. The delay in waiting for these results, however, means that time is lost in the treatment of the patient, and the use of a combination which has been shown to be effective eliminates this difficulty; further, the general practitioner is usually not in a position to perform sensitivity tests.

On the basis of intensive bacteriological research it was found that the combination of tetracycline and oleandomycin in a certain proportion exhibited the phenomenon of synergism.² As a result of this discovery it was decided to make available to physicians a fixed combination comprising these two antibiotics. Such a combination is also shown to delay the emergence of resistant strains in much the same manner in which streptomycin and I.N.H. are used in combination in tuberculosis. It may be argued that fixed proportions are undesirable and that the physician may wish to vary the doses, but, though this may be so in many cases, it certainly is not a practical possibility in all,^{3,4} and once again the question is posed: Who is in the position to decide on these relative dose recommendations? While there has been much adverse criticism against fixed combinations of antibiotics, there has been no published work to show that these combinations are undesirable, and the criticism has been evolved on theoretical considerations. The ultimate verdict on fixed combinations is surely the clinical effectiveness of the compound. The practising physician himself will decide in the light of experience whether antibiotic combinations are of value or not.—We are, etc.,

A. M. BRUNTON,
R. H. GOSLING.

Medical Department, Pfizer Ltd.,
Folkestone.

REFERENCES

- Finland, M., *Antibiot. Med.*, 1957, 4, 17.
- English, A. R., McBride, T. J., Van Halsema, G., and Carlozzi, M., *Antibiot. and Chemother.*, 1956, 6, 511.
- Winton, S. S., and Cheserow, E. G., *Antibiotics Annual*, 1956-7, p. 55. New York.
- Shubin, H., *Antibiot. Med.*, 1957, 4, 199.

Acute Immediate Reactions to Penicillin

SIR,—I was most interested in Dr. G. W. Lewis's careful and painstaking study of penicillin reactions (*Journal*, May 18, p. 1153). I am, however, unable to agree with his and other workers' conclusions that accidental intravenous injection or seepage of penicillin is an important cause of anaphylactic episodes. Once an individual has become sensitized against a certain substance it does not matter how the offending substance (chemical or serum or any other protein) is reintroduced—e.g., the very alarming reactions after tetanus or diphtheria serum, or after hay fever desensitization—when reactions may occur with almost homeopathic dilutions injected subcutaneously or intradermally.

Venereologists will agree that in the days of intravenous salvarsan therapy one of the most common causes of sensitization against this chemical was an imperfect intravenous technique (paravenous, subcutaneous infiltration). This fact was well illustrated in the studies of Frei¹ and Nathan, Munk, and Grundmann² (experimental salvarsan sensitization), when it could be shown that with an intradermal injection of 1 ml. of a 1:100 solution of a primary non-toxic salvarsan derivative—e.g., myosalvarsan—approximately 30% to 35% of tested subjects could be sensitized, whereas spontaneous sensitization occurred only in 3% to 5% of patients during antiluetic treatment.

From these considerations I am almost sure that if cutaneous contamination with penicillin could be avoided

(injecting $\frac{1}{2}$ ml. or so of normal saline through the needle at the end of the penicillin injection) the number of penicillin sensitizations could be appreciably reduced. Perhaps it is worth trying.—I am, etc.,

Sheffield, 10.

H. GRUNDMANN.

REFERENCES

- Frei, W., *Klin. Wschr.*, 1928, 7, 539.
- Nathan, E., Munk, A., and Grundmann, H., *ibid.*, 1929, 8, 1714.

Hospital Confinement

SIR,—I have no desire to engage in controversy with Dr. F. Stabler (*Journal*, May 18, p. 1182) on the relative safety of hospital versus domiciliary confinement. I have the greatest respect for people who can perform good work with the poor facilities afforded by the average home, but it should be apparent that this work could be done with greater safety for mother and baby under the optimum conditions of a modern delivery room. It would be discourteous to a senior colleague to elaborate this point any further. The object of my original letter (*Journal*, April 20, p. 947) was merely to point to an obvious solution of the maternity bed shortage in this country—namely, early ambulation and early discharge from hospital. May I add that, not being in the National Health Service, my interest in the matter is entirely academic?—I am, etc.,

Pinner, Middx.

J. P. O'DWYER.

Budgerigars in Wards

SIR,—As a breeder of budgerigars for the past twenty years, I was interested in Dr. N. A. Thorne's letter in the *Journal* of April 27 (p. 1008). I agree with Dr. Alex. Watt (*Journal*, May 18, p. 1182) that these birds should not be kept in wards. They do, as he says, create a fine dust in and around their cages which could adversely affect any patient allergic to such dusts. Also, I am strongly opposed to budgerigars being kept in cages unless they have free egress to fly about the room throughout the daylight hours. In my opinion it is little short of cruelty to keep a budgerigar shut up in a small cage. Budgerigars are essentially gregarious birds, and the only place for them is in an aviary (which could face the ward windows), the flights being at least 14 ft. (4.2 m.) long by 6 ft. (1.8 m.) high.

Dr. Thorne may be interested to know that a proved case of psittacosis in an aviary-bred budgerigar has never been known.—I am, etc.,

Fairford, Glos.

S. B. S. SMITH.

Televised Operations

SIR,—In your issue dated May 25 (p. 1252) it is reported, in connexion with demonstrations of operative technique, relayed from St. Bartholomew's Hospital on closed-circuit colour television: "This is stated to be the first occasion in Britain on which colour television has been used for a medical programme of this sort." You may be interested to know that in 1950 Pye Limited, of Cambridge, installed equipment at St. Thomas's Hospital, London, for a five-week series of operations, televised in full colour to audiences which included an international convention of ophthalmic surgeons. This successful demonstration of the value of colour television excited considerable interest and was, in fact, the first time that colour television had been put to such a use in this country.—I am, etc.,

Cambridge.

J. M. GORST,
Public Relations Officer,
Pye Limited.

Range of Movement of Testicle

SIR,—I read the article on range of movement of testicle (*Journal*, May 18, p. 1165) with interest. For years I have been teaching house-surgeons about Mr. Denis Browne's superficial inguinal pouch. Mr. Browne complains that the anatomists have not described any cavity into which the testes can go when they are retracted upwards out of the scrotum. The reason for this is that there is no "cavity." If an account

of the anterior abdominal fasciae¹ be studied it will be obvious that there is no cavity. The superficial inguinal pouch is a clinical entity. When the testicle is retracted, I agree, it cannot and does not enter the inguinal canal. It cannot pass medial to the external ring because the fascia of Scarpa is firmly fixed to the linea alba. It cannot pass downwards and laterally into the thigh because Scarpa's fascia fuses with the inguinal ligament at its attachment to the pubic tubercle—i.e., the medial end of Holden's line. It can only pass upwards and lateral to the external ring where it is allowed to do so by the loose areolar tissue that binds Scarpa's fascia to the external oblique aponeurosis. The size of the superficial inguinal pouch into which the testis is retracted is determined solely by the size of the testis.

The description by Mr. Browne of the findings at operation in an infant with inguinal hernia is perfectly accurate. However, when the testis is allowed to return to the scrotum the loose areolar tissue space disappears. The superficial inguinal pouch is therefore an accommodation space allowed by the laxity of the areolar tissue deep to Scarpa's fascia. This loose areolar tissue is designed to permit a considerable mobility between the skin and superficial fascia and the deep fascia and muscles.² I would say that the proper place for a description of the superficial inguinal pouch is a manual of surgical anatomy and not a textbook of topographical anatomy.—I am, etc.,

Middlesbrough.

S. MOTTERTHEAD.

REFERENCES

- Buchanan's *Manual of Anatomy*, 1949, 8th ed., p. 708. Baillière, Tindall and Cox, London.
- Jones, F. W., *The Principles of Anatomy as Seen in the Hand*, 1941, 2nd ed., p. 78. Baillière, Tindall and Cox, London.

SIR,—Mr. Denis Browne (*Journal*, May 18, p. 1165) raises some interesting points. The continuity of what we now call the membranous layer of the superficial fascia of the abdomen (Scarpa's fascia) with the superficial fascia of the scrotum, and the very loose texture of the areolar tissue deep to it, were described by "the laborious and indefatigable M. Winslow."¹ I suppose, however, that it is Abraham Colles² that English textbooks of anatomy are saluting in their descriptions. A glance at the 30th edition of *Gray's Anatomy*³ will convince most readers that anatomists have not failed to describe a loose areolar tissue—continuous with the cavity of the scrotum—anterior to the lower part of the external oblique. It is true, however, that the accounts of the anatomy of the region have not been influenced by Browne's paper of 1938,⁴ for they have been substantially the same for a hundred years. "The deep layer of superficial fascia should be divided . . . separated from the aponeurosis of the External Oblique, to which it is connected by delicate areolar tissue. . . . It is thin and aponeurotic in structure. . . . It forms a thin tubular prolongation around the outer surface of the cord . . . and is continuous with the dartos of the scrotum"—thus *Gray's Anatomy* in 1858.⁵ There is also a figure illustrating the anatomy.

Textbooks of embryology describe the position of the genital folds (labio-scrotal folds) correctly and demonstrate that the skin and superficial fascia at the side and slightly headward of the penis are embryologically of the same origin as the scrotum. The illustrations in Mr. Browne's clinical memorandum could be interpreted as an instance of the testis being pushed from a lower to a higher position in the scrotal fold.

As for the mobility of the testis, it can be moved in three ways: (1) by the cremaster, (2) by the dartos, (3) by hand. The cremaster was described in Charles Bell's *Anatomy of the Human Body* in 1803⁶: "Its use is to suspend the testicle and prevent it from dragging on the vessels of the chord . . . sometimes this muscle draws the testicle spasmodically to the groin." Not many would quarrel with this description to-day. The cause of Mr. Browne's philippic is the belief that the cremaster may draw the testicle back into the inguinal canal. It is indisputable that contraction of the cremaster must shorten the cord, must pull the testis towards the superficial inguinal ring. Whether the testis is

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pulled back into the canal, the cord preceding it, will depend on the relative sizes of testis and superficial ring, and on the relative lengths of the parts of cremaster inside and outside of the inguinal canal. It is plain that in normal circumstances, in man, conditions will be right only for a short time during the later stages of descent of the testis—that is, in some infants and in children in whom descent is occurring late. I believe I have seen such cases. Mr. Browne says I have not. The dartos and hand can move the testis in its subcutaneous position and cannot push it into the superficial because that structure is occupied by the cord and protected by the reflection of external spermatic fascia on to the cord. It is rather like trying to pot the black when the pink is in the jaws of the pocket. The little experiment described in Mr. Browne's second paragraph proves that the experiment can be performed but does not test the action of the cremaster as he claims. In medicine, as in physics and chemistry, it is desirable to test hypotheses only by properly designed experiments.—I am, etc.,

JOHN GRAY.

Newcastle upon Tyne, 1.

REFERENCES

- Winslow, J. B., *An Anatomical Exposition of the Structure of the Human Body*, 1733, translated by G. Douglas. N. Prevost, London.
- Colles, A., *A Treatise on Surgical Anatomy*, 1811. Gilbert and Hodges, Dublin.
- Gray's Anatomy*, 1949. Longmans, London.
- Browne, D., *British Medical Journal*, 1938, 2, 168.
- Gray, H., *Anatomy Descriptive and Surgical*, 1858. J. W. Parker and Son, London.
- Bell, J., and Bell, C., *The Anatomy of the Human Body*, 1803. T. N. Longman and O. Rees and T. Cadell and W. Davies, London.

Trichomonas Vaginitis

SIR,—Dr. Josephine Barnes (*Journal*, May 18, p. 1160) and her colleagues show that there is still no effective oral treatment for trichomonas vaginitis. Their findings are similar to those obtained by Dr. P. A. Manolis in the Saint Mary's Hospitals for Women and Children (*Journal*, March 2, p. 517) a detailed report of which is being prepared.

I would, however, like to comment on their remarks concerning the culture of *T. vaginalis*. For some years now we have been able to grow trichomonads and maintain subcultures for several months. We use a medium based on that of Feinberg¹ but considerably modified to make use of readily available constituents. Batches of medium vary in their ability to support growth, and strains of *T. vaginalis* also vary in their ability to grow well in primary cultures, but after several subcultures at three-day intervals growth is usually abundant. All specimens of vaginal discharge for culture are collected in pipettes and inoculated into 10 ml. of the media without the addition of saline. The medium used by Dr. Barnes was autoclaved twice during preparation, and we have found that over-heating is an important factor in the failure of any batch of our medium.

While I would agree that the carefully examined wet preparation is as useful as a culture in routine work, for tests of cure following the use of trichomonocidal drugs the addition of a cultural technique is most valuable. Similarly in the examination of males, when specimens are scanty and are likely to contain very few protozoa, a cultural technique is essential, and at the time of writing by using our medium Dr. Leslie Watt and I have isolated trichomonads from more than half of the male consorts of women with trichomonas infection. This investigation is still proceeding and will be published in due course.—I am, etc.,

R. F. JENNISON.

Manchester, 13.

REFERENCE

- Feinberg, J. G., *Nature*, 1953, 171, 1165.

SIR,—I would like to make some comments on the article on *Trichomonas vaginalis* by Dr. Josephine Barnes *et al.* (*Journal*, May 18, p. 1160). These writers say that their "second object was to test the use of the simplified trypticase serum medium for the culture of *Trichomonas vaginalis*." All the medium used in their work was supplied by myself (though this is not stated), half a batch being kept for our use and half sent to the Garrett Anderson Laboratory. The trypticase (pancreatic digest of casein), unobtainable in this

country, was generously given by Ortho Pharmaceuticals Ltd. We had the most satisfactory results, both with direct culture, subculture, and keeping cultures at bench temperature and in the refrigerator for several days. I can only suppose that the Garrett Anderson incubator, which was known to be at too high a temperature, was never successfully lowered to 35–37° C., which is the optimum for growing *Trichomonas vaginalis*.¹

Hearing of Dr. Haram's (the pathologist's) difficulties, I rang her up and offered any help that we could give, and I think it is unfortunate that this was not accepted, as it might have brought her results into line with the other workers. I could also have told her that the medium we were supplying was modified both in constituents and preparation from Kupferberg's original medium,² which she claims to have been using and describes in her paper. I feel that, as a test of simplified trypticase serum medium, this work should be ignored.—I am, etc.,

High Wycombe, Bucks.

BARBARA M. WILKINSON.

REFERENCES

- Johnson, G., and Trussell, M. H., *Proc. Soc. exp. Biol. Med.*, 1944, 57, 252.
- Kupferberg, A. B., *Internat. Record of Med. and Gen. Pract. Clinics*, 1955, 168, 709.

SIR,—Since reporting (*Journal*, May 18, p. 1160) a trial of culture medium for *Trichomonas vaginalis*, I have had the opportunity of meeting Dr. A. B. Kupferberg, who formulated the simplified trypticase serum medium which has been widely used in America with great success over a number of years. Dr. Kupferberg finds that the medium with which I was supplied for the trial had been considerably modified and not prepared as indicated in the report. This may well account for the disappointing results achieved.—I am, etc.,

London, N.W.1.

B. JOAN HARAM.

Sir Ronald Ross

SIR,—Observing your leading article (*Journal*, May 11, p. 1108) on malaria control, in which you refer to Sir Ronald Ross as one of the great benefactors of mankind, prompts me to ask why the centenary of this great man is not being officially commemorated this year. I recall that the issue of *The Times* published the day after Sir Ronald Ross died in 1932 stated in a leading article that by his death the greatest figure in contemporary British medicine had passed away. That being so, one would have thought that in this centenary year of his birth special celebrations would have been held to remember the man and his work. These would have included a church service at which his hymns—for he was a hymn-writer—could have been sung. Perhaps the Ross Institute of the School of Tropical Medicine and Hygiene has something in mind.

If the tercentenary of the death of William Harvey is to be elaborately celebrated, as it is this year, surely Ross's work ought to be remembered too. After all, the conquest of the scourge of malaria was as epoch-making as was the discovery of the circulation of the blood. One hopes something will be done to show that Ross's name and his work are not forgotten. His discovery certainly ranks as famous as that of Simpson's in connexion with anaesthesia and Lister's in connexion with antiseptics.—I am, etc.,

J. B. GURNEY SMITH.

Redhill, Surrey.

Notification of Infectious Diseases

SIR,—We should like to lend our support to the suggestion by Drs. R. M. Emrys-Roberts and E. O. Gibson (*Journal*, May 25, p. 1241) that measles, whooping-cough, scarlet fever, and acute pneumonia should cease to be notifiable diseases, and to add the suggestion that rubella should replace them. As the one known cause of congenital defects in man where a definite aetiological relationship can

be established in an individual case, the notification of this disease becomes vitally important at a time when the effects of increased background radiation due to thermonuclear explosions remain to be determined. The possession of these statistics would provide at least some semblance of a base line of variations due to other causes in the incidence of these conditions.—We are, etc.,

London, S.W.11.

J. F. ROBINSON.
J. FERGUS KING.

Calcium Chloride for Scorpion Bites

SIR.—Being a private practitioner in a slum area of Calcutta, I have been coming across a large number of scorpion-bite cases every year, especially during the monsoons. I have tried all the standard treatments for this condition, but the results have been far from satisfactory. Local infiltration with procaine hydrochloride and adrenaline almost always brings the patient back within a few hours. This was my experience in the emergency room of the hospital also.

Recently I tried in four cases of scorpion bites a very unorthodox method of treatment. I injected 5 ml. of a 10% solution of calcium chloride intravenously, and in each of the four cases the relief was dramatically quick, complete, and permanent. The pain and burning sensation disappeared by the time the feeling of warmth due to the injection subsided. All these four patients were adults between the age of 24 and 48 years. All of them were in great agony and extremely restless when they came for treatment. All of them were able to go about their business within a few hours of the treatment, and one of them attended a whole-night entertainment just three hours after having the injection.

I admit that the treatment is absolutely empirical at this stage. It seems that calcium chloride has some chemically neutralizing effect on the scorpion venom. It will be very interesting to see whether it is also effective in cases of other insects' bites and stings—and even perhaps in some cases of snake poisoning. Light thrown on this subject by other colleagues will be most welcome.—I am, etc.,

Calcutta.

SYED ABDULLAH.

Psycho-endocrine Association

SIR.—May I claim the hospitality of your columns to make an announcement which may be of interest to a number of your readers? On May 21, at a meeting of the Psycho-endocrine Research Group, a Psycho-endocrine Association was formally constituted. The aims and objects of the association are to promote the study of the relationship between the endocrine system and mental functions, normal and disordered; to apply the knowledge of these principles to psychological medicine; and to provide a forum for the discussion of psycho-endocrinological and related knowledge.

Will any reader, at home or abroad, who is interested in these aims and objects, and who would like to apply for membership, please write to the Hon. Secretary, Psycho-endocrine Association, St. Ebba's Hospital, Epsom, Surrey. The annual subscription has been provisionally fixed at 10s.—I am, etc.,

London, W.1.

E. B. STRAUSS.

POINTS FROM LETTERS

A Disclaimer

Professor R. A. GREGORY (Liverpool) writes: In a recent issue of a local newspaper there appeared an article describing the work in the department of physiology, University of Liverpool, including research in which I am concerned and which may have eventual application in regard to the problem of peptic ulcer. This article was based on an interview given some months ago to a representative of the newspaper concerned at the suggestion of the university authorities. I should like to make it known that several statements in this article referring to possible therapeutic applications of the research concerned were altered without my knowledge or permission after the interview, and I therefore wish to disclaim any responsibility for them.

Obituary

A. G. MAITLAND-JONES, O.B.E., M.C., M.D.,
F.R.C.P.

Dr. A. G. Maitland-Jones, consulting physician to the children's department of the London Hospital, was drowned on May 17 while salmon fishing in the river Usk. He was 67 years of age.

Arthur Griffith Maitland-Jones was born on March 8, 1890, the son of the Rev. Joseph Maitland-Jones, and was educated at Taunton School and at the London Hospital. He qualified M.R.C.S., L.R.C.P. in 1914, and then joined the R.A.M.C. for service in the first world war. Twice mentioned in dispatches, he was awarded the Croix de Guerre in 1917, and the Military Cross in 1918, the official citation covering the latter award reading as follows: "During the operations he repeatedly reconnoitred the roads under heavy shell fire. By his example and leading he established communication with the most forward dressing stations, and succeeded in bringing up his ambulances and rapidly evacuating the wounded from very exposed positions." He was appointed O.B.E. in 1919 as a further recognition of his war services.

Returning to the London Hospital after the war, Maitland-Jones held various house appointments there before becoming second assistant in the medical unit. After holding a research fellowship at Johns Hopkins Hospital, Baltimore, he became first assistant in the medical unit at "The London." During this period he took the M.R.C.P., graduated M.B., B.S. with honours, and distinction in medicine, from London University in 1921, and proceeded to the M.D. in 1922. He was admitted F.R.C.P. in 1933. Maitland-Jones was appointed physician to the children's department at the London Hospital in 1925, becoming consulting physician 20 years later, and from 1928 to 1931 he was assistant physician to the Infants Hospital (now the Westminster Children's Hospital), Vincent Square, and thenceforward was physician to the hospital until he retired in 1945. For a time he served as chairman of the hospital medical committee. He was also consulting physician to Dr. Barnardo's Homes, the Royal Merchant Navy School, and the National Adoption Society. He was the author of sections on the diseases of children in a number of textbooks; and in the years before the second world war he was a member of the expert committee on infant and child nutrition of the League of Nations. Maitland-Jones was president of the Section for the Study of Disease in Children of the Royal Society of Medicine from 1940 to 1942, having been honorary secretary of the section from 1929 to 1931. A member of the British Paediatric Association, he was its secretary from 1934 until the end of the second world war, and in 1949-50 its president.

In 1926 Dr. Maitland-Jones married Miss Miriam Ritchey, daughter of Dr. John Ritchey, of Oil City, Pennsylvania. They had a son and a daughter.

Dr. KENNETH TALLERMAN writes: I should like to pay a tribute to Arthur G. Maitland-Jones, a dear and respected friend for more than 30 years, during most of which time I was associated with him professionally at the London Hospital and elsewhere. As physician in charge of the children's department at the London Hospital, and a member of the staff of the Infants' Hospital, he showed himself an able and wise paediatrician, and his opinion, based on wide training and extensive clinical experience, was always greatly valued. His election to the presidency of the British Paediatric Association and of the Paediatric Section of the Royal Society of Medicine was a recognition of the position which he had achieved. It is, however, of the man himself that most of us, who are saddened by his sudden and tragic loss, must be thinking, and it is in this connexion that I would like to say something.

Integrity and courage were always treated by Arthur with high regard, and these are two characteristics which he himself exhibited. During the first world war, in which he served with distinction in the R.A.M.C., he was not only twice mentioned in dispatches, but was awarded the Military Cross, the Croix de Guerre, and finally the O.B.E. During the second world war he held the position of a sector officer in the E.M.S., and was also attached to the Southern Command of the Army. This gave scope for his administrative talents, and he exercised his authority, which he enjoyed, with tact and success.

He was always loyal to his juniors, rendering them unstinting support, and he was generous to a degree. Never would he consider taking credit for any work which was not wholly his own, and he encouraged those who worked with him and gave them open-handedly every possible assistance. He stood out at all times for what he thought to be right, but showed consideration for the opinions and feelings of others. He had a great love for the London Hospital, with which he had been associated since his student days, and he took the greatest interest in all its activities, and pride in its achievements. He was a most congenial and popular person, with a wide circle of friends. He was fond of open-air games and sports, and was good at them himself; until his eyesight troubled him he was a keen shot, but particularly he was an enthusiastic fisherman and a very knowledgeable one. He especially enjoyed the country, and took the greatest interest in his garden and in the farm which occupied his time for some years after his retirement. He liked the good things of life as much as anyone, but he was a home-loving man, and his family was an exceedingly happy one.

All of us have our foibles, but in Arthur's case his small mannerisms and prejudices only helped to enhance the warmth of feeling towards him of those who knew him well. He will be deeply missed by his many friends, who regarded him with great affection.

CHRISTOPHER ELLIOTT, M.R.C.S., L.R.C.P.

Dr. Christopher Elliott, who died at his home at Bidborough Ridge on February 16 at the age of 76, had had a long association with Tunbridge Wells, where he joined his father in practice some fifty years ago.

Christopher Elliott was born at Mansfield, Nottinghamshire, the eldest son of Dr. Thomas Elliott, and was educated at Tonbridge School and at St. Bartholomew's Hospital. Qualifying M.R.C.S., L.R.C.P. in 1905, he worked as a house-surgeon at the Leicester Royal Infirmary before beginning practice at Tunbridge Wells. He remained there until his death, except for the period of his service as a temporary captain in the R.A.M.C. in the first world war. He was honorary anaesthetist to the Tunbridge Wells General Hospital (now the Kent and Sussex Hospital) from 1921 to 1940, when he was appointed honorary consulting anaesthetist, but continued active work until 1946. He also held part-time appointments as deputy medical officer of health for the district, assistant school medical officer, and police surgeon from 1920 to 1933. A member of the British Medical Association for over forty years, he represented the Tunbridge Wells Division on the Kent Branch council for a number of years, and was chairman of the Division in 1923-4. His Christian faith meant much to him and he took an active part in evangelical work. He is survived by his widow, two daughters, and one son.

HELENA M. J. McQUAID, M.R.C.S., L.R.C.P.

Dr. Helena McQuaid, who was in general practice at Putney for more than twenty-five years, died suddenly in Dublin on May 12. She was 62 years of age.

Helena Mary Josephine McQuaid was born on August 20, 1894, and came of a medical family, her father, brother, uncle, and several cousins being in the profession. She joined the London School of Medicine for Women, where

she did the early part of her training, and went to St. Mary's in 1920. After qualifying M.R.C.S., L.R.C.P. in 1925 she was obstetric house-surgeon to Mr. T. G. Stevens at St. Mary's. She began in general practice at Fulham, and after about five years joined Dr. Grace D. Chambers and Dr. Dorothy M. Stewart in a practice in Putney, where she stayed until her retirement in 1955. She then went to live with her family in Dublin.

O. J. E. G. M. writes: Despite a very busy and exacting practice, Dr. Helena McQuaid worked as a part-time school medical officer under the L.C.C. for twenty-five years. She was a very fine physician, with a marvellous clinical instinct. She spent herself unsparingly for her patients and brought with her warm and friendly personality comfort and help to innumerable people. She was excellent company and had many friends who loved to listen to her charming Irish voice, with its infectious chuckle, telling stories grave and gay in her own inimitable fashion. She was one of those exceptional people who had no enemies, only friends. Hundreds of people will feel her death as a personal loss and sorrow. As one of her patients put it, "All Putney is mourning her."

P. V. HARDWICK, M.B., Ch.B.

Dr. P. V. Hardwick, who was in practice at Kirton, near Boston, Lincolnshire, for nearly thirty years, died at Woodlands Court Hospital, Kirton, on May 17 at the age of 62.

Philip Vincent Hardwick was born at Bournemouth on February 20, 1895, and, after service in the first world war in the Hampshire Regiment, entered the medical school at Leeds, graduating M.B., Ch.B. in 1925. After house appointments at the General Infirmary and Maternity Hospital in Leeds he entered general practice, first at Hovingham and Filey, until, in 1928, he settled in Kirton. He was an assistant anaesthetist to the Boston group of hospitals and medical officer of Woodlands Court, Kirton. He was chairman of the Holland Division of the British Medical Association in 1932-3. His medicine was sound and practical and he showed the same qualities in his everyday life. Few general practitioners can have given more to the village in which their work lay. He was as generous with the little leisure a widely scattered agricultural practice allowed him as he was attentive in times of illness. He was chairman of the parish council, and, among many other public appointments and offices, was chairman of the football club, president of the tennis club, and a vice-president of the cricket club and of the British Legion. He took a special interest in the fine old parish church, of which he was vicar's warden. His village was devoted to him and he to it. He married in 1938 Rosalind Mary, daughter of the late Dr. C. W. Pilcher, and he leaves a widow and two daughters.—R. E. M. P.

P. F. COOPER, M.R.C.S.

Dr. Peter Cooper died suddenly on May 28 while sailing at Falmouth. He was 42 years of age.

Peter Francis Cooper was born on September 29, 1914, and was educated at Brighton College and at St. George's Hospital Medical School. Qualifying in 1942, he held the posts of house-physician and resident anaesthetist at St. George's Hospital and was later house-physician at Slough Emergency Hospital. After the war he went into private practice in London and became medical officer to a number of large businesses and insurance companies. As a young man Peter Cooper had been a keen Rugby footballer, and had captained Rosslyn Park and played for Middlesex. In recent years he had become well known as a referee at international matches and other important games.

A colleague writes: The sudden and unexpected death of Dr. Peter Cooper while on holiday will have come as a profound shock to his many friends and acquaintances. His medico-legal work brought him into contact with many doctors in and around London and with others in all walks of life. He had another great circle of friends connected

with his many sporting activities; he was a good golfer, but his main love was Rugby football, and he did much to encourage younger players. Peter Cooper possessed an enormous zest for life; he was always cheerful and could never bear to be inactive. His death from a heart attack at a time when he appeared to be in the best of health and in the prime of his life has been a very great loss.

E. T. H. DAVIES, M.D., M.S., F.R.C.S.

The obituary of Mr. E. T. H. Davies was printed in the *Journal* of May 25 (p. 1248).

H. G. D. writes: There is no doubt that Mr. E. T. H. Davies would have obtained a surgical registrarship at St. Mary's Hospital, and would later have been a strong candidate for a surgical vacancy there, but economic factors prompted him to leave the metropolis. He was appointed consulting surgeon to the Tredegar Medical Aid Society, then in its infancy. Mr. Aneurin Bevan was closely associated with the society, which under Dr. Davies's guidance was to become an embryonic State medical service in 1924. At Tredegar, under the terms of his appointment, Mr. Davies was in sole charge of the hospital, an institution of 52 surgical beds, and was available in a consultative capacity to the general practitioners in the area who worked under the scheme. In addition to what is now known as general surgery, he did all the ear, nose, and throat, ophthalmic, gynaecological, and orthopaedic surgery of the area, and showed the same skill, deftness, and gentleness in his abdominal surgery as he did in his ophthalmic work. It was, indeed, an edification to see him wiring, pinning, and plating the atypical fractures inseparable from the dangerous industry of coal-mining, and to watch him make the "no-touch" technique appear so simple. During the years from 1926 to 1932 it was my privilege to be associated with him in his hospital work. In addition to all this work in surgery he was his own radiologist in the days when x-ray equipment was not so easy and safe to handle as in later years. Beneath an apparently frail physique and quiet manner there was, when occasion demanded, speed, courage, and boldness. He brought to a colliery district of some 30,000 inhabitants surgery of a teaching hospital standard, and his retirement was a great loss to the community which he had served so well. His death removes from our midst one of the last of the truly general surgeons. To his wife and son, a consultant anaesthetist, we offer our deep sympathy in their loss.

Medical Notes in Parliament

Radiostrontium in a Stillborn Child

Mr. D. HOWELL (Birmingham, All Saints, Lab.) asked the Prime Minister on May 30 what advice he had received from his medical and scientific advisers about the fact contained in the report of the Atomic Energy Research survey that the bones of a stillborn child in Carlisle contained about seven times as much radiostrontium as that found in older people examined about the same time. Mr. H. MACMILLAN stated in reply that the heavier concentration of radiostrontium in the bones of children compared with adults was fully considered in the Medical Research Council's report. It was for this and other cognate reasons that the maximum permissible level of radiostrontium in the human skeleton accepted by the International Commission on Radiological Protection was regarded as being too high for the general population. The Medical Research Council considered that the maximum concentration of radiostrontium in the bones of the general population, with its proportion of young children, should not be greater than a tenth of the maximum permissible level for adults in special occupations. He added, when Mr. Howell pressed for further very careful scrutiny by the Government's advisers, that the figure in the case mentioned was 0.45 unit, which was still 100 times less than the average allowable level of radiostrontium in bones. Mr. H. GAITSKELL (Leeds, South, Lab.) renewed the pro-

posal for a further report from the Medical Research Council. Mr. MACMILLAN: "Yes, and when it comes I hope that it will be given the weight that is due to it."

Protection for Radiographers

Mr. SOMERVILLE HASTINGS (Barking, Lab.) asked the Minister of Health on May 27 to what extent the shortage of radiographers in Health Service hospitals had resulted in overtime working; and if he was satisfied that this would not be deleterious to the health of those concerned. Mr. D. VOSPER said the information was not available. Health hazards did not necessarily depend on the number of hours worked, but on the protection arrangements made by hospitals. If evidence was produced that radiographers were suffering excessive exposure he would be glad to investigate the matter.

Vaccination of Troops

Mr. S. P. VIANI (Willesden, West, Lab.) asked the Secretary of State for War on May 28 why the soldiers at the Tidworth Camp were vaccinated during the recent smallpox outbreak, seeing that the majority of them had already been recently vaccinated. Mr. JULIAN AMERY, the Under Secretary, stated that vaccination of all presumptive contacts of a case of suspected smallpox, irrespective of previous vaccinations, was a protective measure which conformed with accepted public health practice. At Perham Down and Tidworth it was offered to those who had not been vaccinated within the previous month. He stated in another reply that troops were revaccinated in the United Kingdom and North-west Europe every three years, in other areas every two years or at shorter intervals; and on medical advice in an epidemic or undue prevalence of smallpox.

Mental Health Report Welcomed

The MINISTER OF HEALTH was asked on June 3 for a statement on the report of the Royal Commission on the law relating to mental illness and deficiency. He said he welcomed this valuable and comprehensive report, and was studying the many recommendations made in it. He must have time to consider them before making any further statement. Dr. DONALD JOHNSON (Carlisle, Con.) asked if the Minister would take some action before legislation, which it was realized must take time, on the regulations which did not require legislation, particularly the review of patients at present in hospital. Mr. VOSPER said that he would certainly consider what could be done by administrative means in advance of any legislation. Mr. A. BLENKINSOP (Newcastle upon Tyne, East, Lab.) expressed the welcome of the Opposition for the report. Mrs. E. BRADDOCK (Liverpool, Exchange, Lab.), a member of the Commission, thanked the Minister for his kind words about the Commission's work. She said there seemed to be a great amount of agreement on both sides of the House about the report, and a full debate would be much appreciated. Mr. KENNETH ROBINSON (St. Pancras, North, Lab.) commented that as a result of the recommendations the present procedures would give rise to increased anxiety and frustration on the part of parents, psychiatrists, and patients. This was an added reason for early action. Mr. VOSPER said that was certainly true, but the legislation would be of a very complicated and prolonged nature, and must receive adequate consideration before it was introduced.

N.H.S. Facilities for Private Patients

Mr. JOHN HALL (Wycombe, Con.) asked the Minister of Health if he would amend the National Health Service Act, 1946, so as to allow those who elected to become private patients to utilize the other facilities provided by the Act. He also asked if the Minister would amend the Act to allow the provision to all private patients, free of charge, other than the prescription charge, of a selected list of preventive and life-saving drugs, and drugs designed for the alleviation and treatment of lethal diseases. Mr. VOSPER replied that the private patients of general practitioners had full access to all the facilities of the Health Service, other than the supply of drugs, as part of the general medical services.

The provision of a selected list of drugs for private patients would raise many problems of great difficulty.

Mr. HALL said that all insured persons paid for the Health Service through their contributions, rates, and taxes. Should they not be entitled to the benefits for which they had paid, even though they may opt to be private patients and pay the doctor out of their own pocket? Mr. VOSPER said that it raised many problems of great difficulty, one being that it would require legislation, and, secondly, that it would require some form of control of doctors not at present in the Health Service. His predecessor invited the British Medical Association to discuss this matter with him, and those discussions were about to take place.

Dr. EDITH SUMMERSKILL (Warrington, Lab.) said that if an amendment of this kind were made it would create an especially privileged category of Health Service patients. Furthermore, it would tend to encourage overprescribing. Mr. VOSPER: I am not prepared to accept these allegations. The matter is to be discussed with the British Medical Association, who have some proposals to make.

Mr. W. M. F. VANE (Westmorland, Con.) asked the Minister not to be diverted from his purpose by Dr. Summerskill. He should assure himself that these difficulties were real and not just imaginary bureaucratic difficulties. Why should not those who had paid the full contribution towards the Health Service be allowed just part of the benefits for them? Surely it would be in the national interest, instead of forcing them to have the whole or none? Mr. VOSPER repeated that the difficulties were very real. He would examine the suggestion.

Reasons for Higher Prescription Costs

Mr. VOSPER informed Mr. R. W. SORESENSEN (Leyton, Lab.) that examination of a sample of prescriptions dispensed in December had shown that the increase in the average cost of about 5d. was probably due almost entirely to doctors prescribing larger quantities. The trend since December suggested that this had continued. The number of prescriptions had also been much lower than a year ago, but this must be partly due to the low incidence of sickness. Mr. A. BLENKINSOP asked whether the Minister did not recognize the real danger and waste involved in prescribing larger quantities, which he was encouraging. Mr. VOSPER said he could not accept that, and it suggested that the general practitioner was not competent to exercise his discretion. The ordering of larger quantities was not wasteful if there was a continuing need. It helped people with chronic or continuing illness, and that was what he believed to be happening. He also informed Mrs. EIRENE WHITE (East Flint, Lab.) that suggestions for multiple packs were received from the B.M.A. a fortnight before and were being studied.

Greater London Survey.—The report on the survey of hospital facilities in Greater London recently made by officers of the Ministry of Health will be an administrative document for the Minister's information, which it is not intended to publish.

Ambulance Service.—The average number of miles travelled per patient by the ambulance services in 1950-1 was 9, and the cost 15s. 1d. In 1955-6 the mileage was 6.8 and the cost 15s. 5d.

Factory Inspections.—Since June 1, 1956, there have been at least 300 inspections of factories working with radioactive materials such as radium or radiothorium. Most of these factories are covered by the Factories (Luminizing) Special Regulations, 1947, and in most cases the standard of compliance with the regulations is good.

Statistical Urge.—Statistics sought by M.P.s on May 27 and 28 included the following: There were about 17,250,000 visits made by district nurses in 1949, and about 24m. last year. There were 5,592 domiciliary psychiatric visits in 1950, and 11,224 in 1955. The attendances at mental-illness and mental-deficiency out-patient clinics at hospitals numbered 523,218 in 1950, and 714,014 in 1955. In 1949 there were 1,787 local authority ante-natal clinics, and 1,955 last year. Local authority domestic help was provided in 139,816 instances in 1949, and 235,132 last year. There were in 1949 about 137,000 whole-time and 27,000 part-time nursing and midwifery staff in the Health Service; in 1956 the numbers were 160,000 and 41,000.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending May 18 (No. 20) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1957					1956				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	4	1	2	0	3	6	0	4	0	3
Dysentery	750	41	264	12	4	1,662	223	173	9	4
Encephalitis, acute	1	0		0		5	0		0	
Enteric fever: Typhoid	2	0	2	0		1	1	0	0	1
Paratyphoid	1	0	3 (B)	0		27	4	1 (B)	0	
Food-poisoning	226	31	21	0		311	64		0	
Infective enteritis or diarrhoea under 2 years				17	34				15	19
Measles *	16,665	869	181	317	148	3,369	206	278	95	259
Meningococcal infection	25	5	13	0	3	30	2	8	1	
Ophthalmia neonatorum	31	3	8	0		41	3	2	0	
Pneumonia †	374	20	177	16	4	363	18	146	3	4
Poliomyelitis, acute: Paralytic	48	4	2	2	2	14	1		3	3
Non-paralytic	18	2				12	0			
Puerperal fever §	193	30	8	3	1	243	35	8	1	
Scarlet fever	664	46	55	38	19	690	53	91	27	12
Tuberculosis: Respiratory	622	73	344	41		685	100	130	28	
Non-respiratory	93	5	22	12		94	10	22	6	
Whooping-cough	2,258	101	229	9	87	1,561	77	170	59	116

DEATHS in Great Towns	1957					1956				
	Eng. & Wales	London	Scot.	N. Ire.	Eire	Eng. & Wales	London	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	0	0		0		0	0		0	
Encephalitis, acute		0		0			0			0
Enteric fever	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	7	0	0	1	1	10	0	0	0	1
Influenza	7	0	1	0	1	4	0	0	0	0
Measles		1	0	0	2		0	0	0	1
Meningococcal infection		0	0				0	0		
Pneumonia	228	40	15	7	13	207	28	17	7	9
Poliomyelitis, acute	1	0			0	0	0			0
Scarlet fever		0	0	0	0		0	1	0	0
Tuberculosis: Respiratory	57	3	5	2		45	8	9	1	4
Non-respiratory		1	0	1			2	0	0	0
Whooping-cough	2	0	0	0	0	2	1	0	0	0
Deaths 0-1 year	216	33	22	11	13	217	28	27	6	10
Deaths (excluding stillbirths)	5,276	718	562	103	183	4,890	700	556	94	182
LIVE BIRTHS	8,723	1,256	990	234	483	8,431	1,185	983	243	471
STILLBIRTHS	241	42	24			234	23	33		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

§ Includes puerperal pyrexia.

Vital Statistics

New Influenza Strain

Outbreaks of influenza due to the new strain of virus A continue to be reported in the Far East, and some mild cases have also occurred in Australia among aircraft passengers who travelled from Europe via Singapore. The disease has not yet been identified in Europe. Investigations are being concentrated particularly at Rotterdam, where a ship recently arrived from the Far East. About 30% of the passengers had influenza on the voyage, but by the time they reached port the disease had died out. The symptoms remain mild and only relatively few deaths have been reported.

Industrial Accidents and Diseases

The number of workpeople (other than seamen) in the United Kingdom whose deaths from accidents in the course of their employment were reported in April was 142, compared with 123 in the previous month and 90 (revised figure) in April, 1956.

The numbers of cases of industrial diseases in the United Kingdom reported during April, 1957, were as follows: lead poisoning 3, aniline poisoning 1, anthrax 2, epitheliomatous ulceration 24, chrome ulceration 26; total 56. There were no deaths.—*Ministry of Labour Gazette*, May, 1957.

Week Ending May 25

The notifications of infectious diseases in England and Wales during the week included: scarlet fever, 618, whooping-cough 2,019, diphtheria 3, measles 19,513, acute pneumonia 349, acute poliomyelitis 52, dysentery 773, paratyphoid fever 2, and typhoid fever 4.

Infectious Diseases

The largest variations in the notifications of infectious diseases in England and Wales during the week ending May 18 were decreases of 1,600 for measles, from 18,265 to 16,665, and 104 for whooping-cough, from 2,362 to 2,258, and increases of 167 for scarlet fever, from 497 to 664, and 81 for dysentery, from 669 to 750.

66 cases of acute poliomyelitis were notified during the week, and these were 9 more for paralytic and 12 fewer for non-paralytic cases than in the preceding week. The largest returns were Essex 9 (Colchester M.B. 6), London 6 (Islington 2, Wandsworth 2), Warwickshire 6 (Coventry C.B. 4), and Glamorganshire 6 (Cardiff C.B. 2).

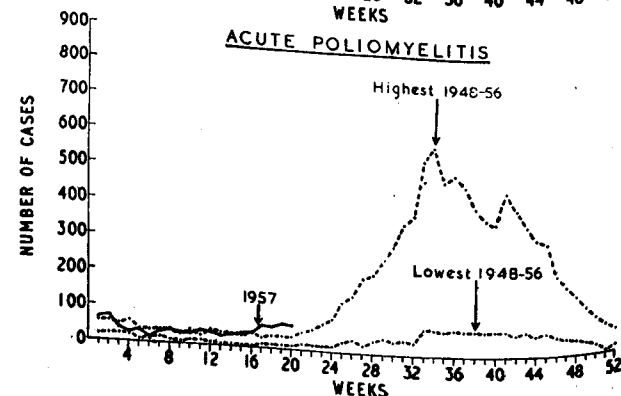
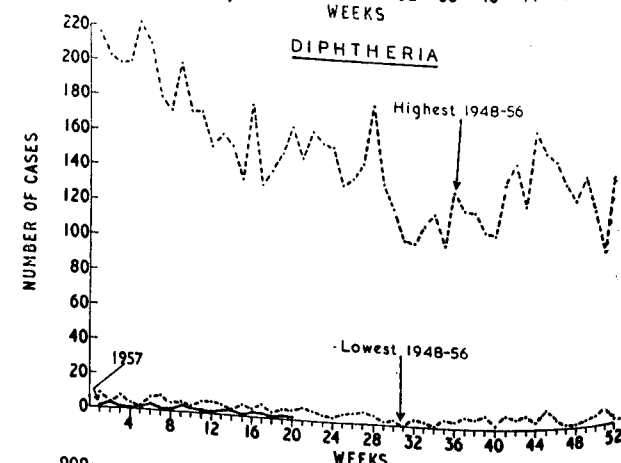
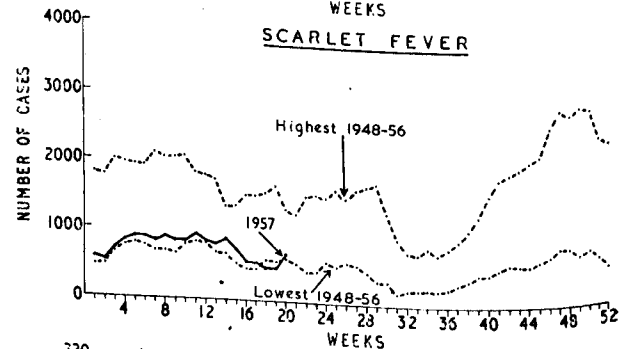
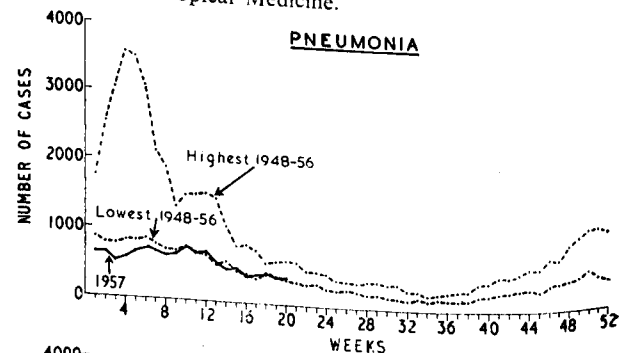
The incidence of measles fell in ten counties by 100 or more, the largest fall in notifications being 300 in London, from 1,169 to 869. The chief exceptions to a falling incidence were rises of 463 in Yorkshire West Riding, from 1,816 to 2,279; the largest rises in this county were 124 in Leeds C.B., from 204 to 328, and 81 in Sheffield C.B., from 243 to 324. Notifications of measles also rose 140 in Kent, from 528 to 668, and 89 in Cornwall, from 35 to 124, mainly owing to rises of 70 in Saltash M.B., from 0 to 70, and 30 in Liskeard R.D., from 8 to 38. The largest rise in the notifications of scarlet fever was 31 in Yorkshire West Riding, from 53 to 84, and was due to a small rise throughout the county. The largest fall in the incidence of whooping-cough was 46 in Sussex, from 98 to 52. 4 cases of diphtheria were notified, being 1 more than in the preceding week.

The chief centres of dysentery were Lancashire 156 (Liverpool C.B. 33, Blackpool C.B. 18, Manchester C.B. 17, Ashton under Lyne M.B. 14, Salford C.B. 11), Yorkshire West Riding 117 (Leeds C.B. 40, Bradford C.B. 19, Sheffield C.B. 14, Rotherham C.B. 12), Cheshire 46 (Dukinfield M.B. 22, Hyde M.B. 12, Stalybridge M.B. 10), London 41, Durham 35 (South Shields C.B. 15), Nottinghamshire 31 (Nottingham C.B. 19), Bedfordshire 30 (Luton M.B. 21), Warwickshire 29

(Birmingham C.B. 24), Northumberland 27 (Newcastle upon Tyne C.B. 17), Shropshire 26 (Oswestry R.D. 19), Southampton County 25 (Southampton C.B. 20), and Glamorganshire 21 (Penybont R.D. 20).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1948-56 are shown thus ----, the figures for 1957 are shown as a solid line. Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



Medical News

Ross Centenary Luncheon.—The Ross Institute of Tropical Hygiene is holding a centenary luncheon on June 13 to celebrate the birth of Sir Ronald Ross, the discoverer of the role of anopheline mosquitoes in the transmission of malaria. The luncheon will be held at the London School of Hygiene and Tropical Medicine, and Dr. M. G. CANDAU, director-general of W.H.O., will propose the toast to Ross's memory. Among those who have accepted invitations are the Minister of State for Colonial Affairs and the High Commissioners for India, Ceylon, and the Union of South Africa. Sir Ronald Ross was born on May 13, 1857, in India, where 40 years later he made his discovery.

Tribute to Sir Robert Jones.—The current issue of the *Journal of Bone and Joint Surgery* (May, 1957) appears as a "Robert Jones Centenary Volume." Sir Robert Jones was born at Rhyl in North Wales on June 28, 1857. He came of a long line of unqualified bone-setters who had practised thereabouts, serving his apprenticeship under his uncle, Hugh Owen Thomas, the first of the family to become medically qualified. Successively founder, president, and president-emeritus of the British Orthopaedic Association, Sir Robert Jones is known to-day as the "founder of modern orthopaedic surgery." On the cover of the commemorative volume is a reproduction of the gold medal he established for postgraduate orthopaedic students at Liverpool University; within are personal tributes from those who knew and worked with him. His life is briefly sketched by Sir REGINALD WATSON-JONES, one of his distinguished pupils. Others who record their recollections of him include LORD MALVERN, LORD COHEN of BIRKENHEAD, Sir THOMAS FAIRBANK, Dr. JOEL E. GOLDTHWAIT, "doyen of orthopaedic surgery in the United States of America," and Dr. W. E. GALLIE, of Toronto.

Wellcome Harveian Exhibition.—On Monday Sir RUSSELL BRAIN opened the exhibition at the Wellcome Historical Medical Museum, London, illustrating Harvey's life and the growth of the ideas that led up to his discovery. His early days at Folkestone and Canterbury, Cambridge and Padua, are illustrated by means of photographs and documents. One exhibit depicts the "new anatomy" at Padua, and there is a scale model of the famous anatomy theatre there; another exhibit is concerned with Harvey's teacher Fabricius. There is a collection of textbooks current in Harvey's student days, and portraits of his supporters and opponents are shown. Nor is Harvey's embryological and obstetrical work overlooked. There are also exhibits on the medicine, surgery, pathology, and materia medica of his times. A map traces his travels through Europe. Finally there is a reminder of the later work on the cardiovascular system made possible by Harvey's discovery and still continuing. The books displayed include all editions of the *De Motu Cordis* and various editions of the *De Generatione Animalium*. The exhibition stays open for about a month.

Colour Television at R.C.S.—A large audience of French and British surgeons watched from the College last week a demonstration on colour television of operations being performed at St. Bartholomew's Hospital. The occasion was the joint meeting of the Royal College of Surgeons of England with the Académie de Chirurgie de Paris. The demonstration was sponsored by Messrs. Smith Kline and French Laboratories Ltd., who provided the television unit. One camera in the theatre covered the operation, the surgeon being equipped with a microphone under his mask; another camera photographed a panel of experts watching, in the nurses' home, a telecast of the operation. At the College of Surgeons the moderator of the meeting could cast on the screen at will the picture of either the operation or the expert panel. The panel answered questions put to them from the meeting. Operations were demonstrated by Mr.

H. T. SIMMONS, Mr. BASIL HUME, Mr. F. B. COCKETT, Mr. C. NAUNTON MORGAN, Mr. B. W. RYCROFT, Mr. R. G. PULVERTAFT, Mr. E. W. RICHES, Mr. NORMAN TANNER, Sir ARCHIBALD MCINDOE, and Sir RUSSELL BROCK.

Lord Adrian Nominated for Vice-Chancellorship.—On June 8 members of the Regent at House at Cambridge will elect the University's Vice-Chancellor for the coming academic year. Lord ADRIAN, O.M., F.R.S., Master of Trinity, is one of the two persons nominated for the office by the council of the Senate. The other is Professor H. BUTTERFIELD, Master of Peterhouse, the professor of modern history.

British Cardiac Society.—The thirty-sixth annual general meeting was held at Adam House, Edinburgh, under the chairmanship of Dr. RAE GILCHRIST on May 16. In the morning there was a symposium on coronary artery disease, which was followed in the afternoon by demonstrations and short communications. Dr. SAMUEL LEVINE, of Boston, who is a corresponding member of the society, was among the distinguished speakers invited to take part in the symposium. The annual dinner was held at the Royal College of Physicians, Edinburgh.

Heberden Society.—Dr. J. J. R. DUTHIE gave the Society's annual Heberden Round at the Northern General Hospital, Edinburgh, on May 16. The theme was "Haematological Complications of Rheumatic Diseases." Subsequently six papers on subjects related to the rheumatic disorders were presented.

Diagnosis of Phenylketonuria.—The Hospital for Sick Children, Great Ormond Street, London, W.C.1, has prepared a card (8 by 10 in.—20 by 25 cm.) describing a simple urine test for phenylketonuria. A limited supply of these cards is obtainable from the secretary of the hospital, price 6d. The test consists simply in adding a little 5% ferric chloride to a fresh specimen of urine, and could quite well be performed in the surgery. The importance of the test is that it is diagnostic of a liability to a preventable type of mental defect. "Every child," states the test card, "should have his urine tested at the age of 21 days, or as soon as possible after. If the test is positive, dietary treatment can be started at once with the object of preventing the mental deterioration that is otherwise inevitable." Last week we printed a letter appealing for phenylketonuric infants under 3 years of age (see *Journal*, June 1, p. 1307) for admittance to a clinical trial of 5-hydroxytryptophan.

F.R.C.O.G.—At a council meeting of the Royal College of Obstetricians and Gynaecologists on May 25 the following were admitted fellows: P. C. Barkla (Nottingham), T. S. M. Barnett (Portsmouth), F. A. Bellingham (Australia), N. B. Capon (Liverpool), D. W. C. Chun (Hong Kong), A. Culiner (California), W. D. Cunningham (Australia), J. P. O. Erskine (Helensburgh, Dunbartonshire), M. Evans (Manchester), W. R. Foote (Canada), F. D. Johnston (Canada), K. T. Macfarlane (Canada), T. A. Macfarlane (New Zealand), G. B. Maughan (Canada), D. Y. May (Burma), W. G. Mills (Birmingham), K. N. Mitra (India), J. G. O'Donoghue (Australia), H. E. Pellew (Australia), P. I. Peltz (South Africa), D. A. Ranasinghe (Ceylon), W. J. Rawlings (Australia), R. McK. Rome (Australia), D. W. Sparling (Canada), D. M. Stewart (New Zealand), J. Walker (Dundee), and J. F. B. Wyper (Aberdeen).

U.S. Scientists and Nuclear Explosions.—Dr. LINUS PAULING, 1954 Nobel laureate in chemistry, announced on Monday that 2,000 U.S. scientists had signed an appeal for an international agreement to stop the testing of nuclear bombs. According to agency reports, the signatures were collected in four days, and included those of two other Nobel prize winners—Professor H. J. MULLER, of Indiana, who discovered that penetrating radiations produce mutations in plants and animals, and Emeritus Professor JOSEPH ERLANGER, of Washington University, St. Louis, who won the 1944 prize in physiology and medicine.

Family Planning Association.—At the annual general meeting of the Family Planning Association on June 1 the principal speaker was Mrs. MARY STOCKS, Vice-chancellor of Liverpool University, who compared the public attitude to the work of the association to-day with that at its foundation in 1930. The association now has 250 clinics in England, Scotland, and Wales. Advice is given on family planning, and many clinics also advise on infertility, sex education, and sex difficulties in marriage. During 1956 about 300,000 patients visited these clinics. The first clinic in Britain for the investigation of male infertility, states the association, was the F.P.A. Centre in London, which has now dealt with some 24,000 cases. The association has a pregnancy diagnosis laboratory at its headquarters at 64, Sloane Street, London, S.W.1, and also maintains an approved list of proprietary contraceptives.

Rumania and W.H.O.—The Government of Rumania has decided to resume active membership of the World Health Organization as from this year. This follows similar announcements by Albania, Bulgaria, Poland, and the U.S.S.R. earlier this year.

Professor F. A. E. Crew, F.R.S., has declined an invitation to resume teaching at present at Ein Shams University, Cairo, where he was professor of preventive and social medicine. Instead he is going, under the auspices of W.H.O., to a similar post at Rangoon University.

COMING EVENTS

Harveian Exhibition at R.C.P.—An exhibition of books and manuscripts illustrating Harvey's life and work will remain on view in the library of the Royal College of Physicians of London until the beginning of July. It may be seen by arrangement with the library staff.

"Radiations and Their Effects on the Individual."—Open lecture by Dr. F. G. SPEAR, June 12, 2.30 p.m., at the Royal Society of Health, 90, Buckingham Palace Road, London, S.W.1.

"Perspectives in Endocrinology."—Discussion on research, B.B.C. Third Programme, June 12, 7.45 p.m., repeated June 17. Among the speakers are Professor G. F. MARRIAN, F.R.S., and Professor F. G. YOUNG, F.R.S.

Maternal and Child Welfare.—Annual conference of the National Association for Maternal and Child Welfare, June 26–28, at Church House, Westminster, London, S.W.1. Details from the Secretary, N.A.M.C.W., Tavistock House North, Tavistock Square, London, W.C.1.

Hospitals' Symphony Orchestra.—Concert, June 26, in St. Mary's Hospital Medical School Library, Paddington. Works by Wagner, Verdi, Sibelius, and Beethoven; tickets (7s. 6d., 5s., 3s. 6d.) obtainable from Miss M. WHIPP, South Western Hospital, Landor Road, Stockwell, London, S.W.9.

British Tuberculosis Association and Tuberculosis Society of Scotland.—Annual conference, Glasgow, June 26 to 29. Details from the administrative secretary, British Tuberculosis Association, 59, Portland Place, London, W.1, before June 24.

Institute of Social Psychiatry.—Course on "Social Approach to Mental and Emotional Difficulties," July 26–28, at Moor Park College, Farnham, Surrey. This course replaces the one announced in this column on April 20 (p. 959). Details from Institute of Social Psychiatry, 9, Fellows Road, London, N.W.3.

NEW ISSUES

Abstracts of World Medicine.—Issued in the first week of each month, this journal contains abstracts of important papers selected from the current medical literature of the world. Annual subscription £4 4s., single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Tuesday, June 11

INSTITUTE OF CHILD HEALTH.—5 p.m., Professor T. P. Magill (New York): Recurrence of Epidemic Disease.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. H. Meara: Less Common Skin Diseases of Infancy and Children.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Joseph Henry Lecture by Mr. L. W. Plewes: The Orthopaedic Surgeon and Industry.

Wednesday, June 12

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. Haber: Histopathology of Some Rare Skin Conditions.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. W. D. W. Brooks: Prevention of Pulmonary Tuberculosis.
LONDON UNIVERSITY.—At Westminster Medical School, 5 p.m., special university lecture in medicine by Professor André Cournaud (New York): Syndrome of Alveolar Hypoventilation: Its Causes, Complications, and Treatment.
OXFORD UNIVERSITY.—At Radcliffe Infirmary, 5 p.m., Litchfield Lecture by Professor H. de Waele: Nutritional Deficiencies During Pregnancy and Their Influence on Foetal Development.
ROYAL SOCIETY OF HEALTH.—At 90, Buckingham Palace Road, S.W., 2.30 p.m., Dr. F. G. Spear: Effects of Radiation on the Individual.

Thursday, June 13

HILL END HOSPITAL MEDICAL SOCIETY, ST. ALBANS.—8.45 p.m., lecture by Mr. E. Stanley Lee.
HONYMAN GILLESPIE LECTURE.—At Anatomy Theatre, University New Buildings, Edinburgh, 5 p.m., Dr. J. G. MacLeod: Unsuspected Thrombosis.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. C. D. Calnan: Haemangiomas—Classification and Treatment.
ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Hunterian Lecture by Professor M. Makin: Surgical Management of Friedrich's Ataxia.
ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION, PSYCHOTHERAPY AND SOCIAL PSYCHIATRY SECTION.—At 11, Chandos Street, W., 8 p.m., Miss Anna Freud: Termination of Treatment in Child Analysis. (Open to members and guests.)

Friday, June 14

COLLEGE OF GENERAL PRACTITIONERS: YORKSHIRE FACULTY.—At Littlewood Hall, General Infirmary at Leeds, 8.30 p.m., clinical lecture and discussion: Breast Cancer at the Crossroads. Speakers, Mr. H. S. Shucksmith, Dr. Georgiana M. Bonser, and Dr. J. R. MacLeod.
● INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. G. C. Wells: clinical demonstration.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. F. H. Young: clinical demonstration.
● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—3 p.m., Dr. Elizabeth Tylden: Psychiatric Problems in Pregnancy.
MIDLAND CENTRE FOR NEUROSURGERY, HOLLY LANE, SMETHWICK, NR. BIRMINGHAM.—8 p.m., Professor K. J. Zülch (Cologne): Clinical Value of the Morphological Classification of Cerebral Tumours.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—10 a.m., Professor D. M. Douglas and Dr. K. G. Lowe: Some Aspects of Patent Ductus Arteriosus, 4 p.m., Dr. J. D. N. Nabarro: Modern Methods of Assessing Adrenal Cortical Function.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Mr. Aleck Bourne: Physiology of Menstruation.

Saturday, June 15

● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—11.15 a.m., Mr. K. V. Bailey: Utero-vaginal Prolapse.

Sunday, June 16

PADDINGTON GENERAL HOSPITAL.—11 a.m., clinical meeting for general practitioners.

APPOINTMENTS

SOUTH-WESTERN REGIONAL HOSPITAL BOARD.—J. A. Cosh, M.D., M.R.C.P., Consultant Physician to Bath Clinical Area; M. S. I. Chandra Sekaram, M.B., B.S., D.L.O. (Part I), Registrar in Ear, Nose, and Throat Surgery to Bath Group of Hospitals; B. N. Foy, M.B., B.S., Registrar in Obstetrics and Gynaecology at Gloucestershire Royal Hospital, Gloucester; J. K. Trotter, F.F.A.R.C.S., M.R.C.S., L.R.C.P., Dr. A. Consultant Anaesthetist to West Cornwall Clinical Area; John Crossley, M.B., B.Chir., F.R.C.S., M.R.C.O.G., and Mrs. Marjorie O. Bennett, M.D., Ch.M., logists in Bristol Clinical Area; B. S. Dhillon, M.B., B.S., F.R.C.S., F.R.C.S.Ed., Senior Surgical Registrar to Thoracic Unit at Hawke Moor Chest Hospital, Bovey Tracey; John Ferguson, M.B., B.S., Medical Registrar at Gloucestershire Royal Hospital, Gloucester; M. C. R. Solling, L. J. H. Arthur, M.B., B.Chir., M.R.C.P., D.Obst.R.C.O.G., Registrar in Paediatrics at South Devon and East Cornwall Hospital, Plymouth (joint appointment with United Bristol Hospitals).

BIRTHS, MARRIAGES, AND DEATHS

DEATHS

Davison.—On May 20, 1957, Hubert Davison, M.B., B.S., of Nuneston, Warwick, formerly of Newcastle upon Tyne, aged 31.
Dunning.—On May 21, 1957, at Wootton, Isle of Wight, Matthew Dunning, D.S.O., T.D., M.B., C.M., Lieutenant-Colonel, R.A.M.C., T.A. retired.
Mackintosh.—On May 22, 1957, in London, George Seymour Munro Mackintosh, M.B., Ch.B., of The Little House, Seer Green, Bucks.
Mogoveny.—On May 25, 1957, at Willowgarth, Pool-in-Wharfedale, Yorks.
Marshall.—On May 20, 1957, Claude Herbert Marshall, M.B., F.R.C.S.Ed., of Mombasa, Kenya, late of Uganda.
Stevens.—On May 20, 1957, at Little Mead, St. Saviour, Jersey, Channel Islands, Alfred Edward Stevens, M.D., aged 84.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Incidence and Diagnosis of Mumps Orchitis

Q.—How often is orchitis the sole clinical manifestation of mumps? Is there any rapid way of clinching the diagnosis in such cases?

A.—In young males orchitis occurs in about 20% of cases of mumps: it is impossible to say how often it occurs without preceding parotitis, but this is certainly not a rarity. In venereal diseases clinics during the last world war one had constantly to keep this possibility in mind, especially in men who had no history of urethral discharge but who had recently been home on leave and possibly in contact with children suffering from mumps.

Antibody is probably present in most patients by the time orchitis develops, but a rise in antibody is of more value than a single titration, so that a second specimen of blood in a fortnight's time is required to clinch the diagnosis. If a hydrocele is present, antibody may be present in large amounts in the fluid, and it might be of value to have this estimated by the laboratory. Estimations of serum lipase have proved disappointing; a high level would be of some value, but the levels even in patients with bilateral parotitis are often normal.

Borborygmi

Q.—What is the explanation of periodical attacks of abdominal distension and "rumbling" in a patient whose alimentary function appears otherwise perfectly normal? The symptoms are most troublesome in the evenings, and no association with any dietary habit has been observed. What treatment is advised?

A.—Gurgling or rumbling noises coming from the abdomen (borborygmi) are commonly of little clinical significance, but occasionally are an indication of gross organic disease. They are noises caused by the agitation of a mixture of gas and liquid in the intestines, usually in the colon, but sometimes in the small intestine. Any condition which causes an excess of gas and liquid or increased intestinal activity may bring them about.

It is a commonplace that a person who is shy in society may find his embarrassment further increased by his developing borborygmi. This is an example of emotion increasing intestinal motility which is seen in an extreme form among those public performers such as athletes or boxers who suffer from diarrhoea before an important event. Certain foods may bring on the trouble, and peas and beans have a bad name for their gas-producing powers. Merely eating a large or indigestible meal may do the same. Yet again there may be a specific sensitivity to some item of food. In all these dietary disturbances there may be some abdominal distension as well as borborygmi. However, the questioner already appears to have considered the diet as a possible source of the trouble.

But the combination of abdominal distension and borborygmi also occurs with mechanical obstruction of the intestine, such as is found in diseases such as carcinoma of the colon or regional ileitis. It may occur if both absorption and motility of the intestine are disturbed as in steatorrhoea from any cause. Increased intestinal motility may result as a reflex manifestation of disease elsewhere in the gastrointestinal system—for example, in chronic cholecystitis or appendicitis. It is occasionally the first symptom of carcinoma of the stomach. It may be a manifestation of amoebiasis.

If these symptoms are of recent origin it might therefore be wise to investigate the gastrointestinal tract fully in

order to be sure that they are not the first evidence of serious disease, especially if the patient is middle-aged or elderly. The haemoglobin level, erythrocyte sedimentation rate, examination of the stools for occult blood and parasites, complete barium studies, and possibly sigmoidoscopy should be done. If these are negative, or if the symptoms are of long standing and the general health is excellent, it will probably be sufficient to see that the evening meal is eaten fairly dry and is not rich in gas-forming foods or roughage. If necessary, these measures can be supplemented with a sedative such as phenobarbitone or an agent which diminishes gastrointestinal motility, such as atropine, gr. 1/100 (0.65 mg.) three times a day, or propantheline bromide, 15 mg. four times a day. Yet another approach to symptomatic relief would be the use of activated charcoal as an absorber of gas, and this could be given as charcoal biscuits or as tablets of medicinal charcoal.

Olive Oil and Fried Fish in Ulcer Diets

Q.—How is it that people on a gastric ulcer diet may be given olive oil to take before meals, but are forbidden fish fried in olive oil?

A.—The taking of olive oil before meals in patients with gastric ulcer was advised, in the past, in the forlorn hope that it would coat the gastric mucosa and ulcer crater with an impervious layer, and so protect the crater against the action of the acid gastric contents. A further rationalization of its use in both gastric and duodenal ulcer was that fat entering the small gut would release enterogastrone, which would inhibit both gastric secretion and motility. Both arguments seem to have been based more on theoretical than on practical grounds, and the treatment is probably of little value in ulcer therapy.

Fried food of all types is poorly tolerated by most dyspeptics, and this has led to the omission of fish fried in oil from most dietary regimes.

Effect of Artificial Menopause on Sexual Life

Q.—Are the physical changes from an artificial menopause induced by radiotherapy more pronounced than with a natural menopause, and is there likely to be any appreciable change in libido?

A.—There is some difference of opinion about this because the number of adequately controlled investigations which have been reported are few. Such as there are deal almost entirely with the effect of intracavity radium rather than of deep x-ray therapy to the ovaries. H. C. McLaren^{1,2} concluded that the radiation menopause often precipitates menopausal symptoms, is followed by sudden loss of sex desire, and sometimes results in dyspareunia because of stenosis of the upper vagina. A more recent and possibly better controlled study is that of A. C. Turnbull.^{3,4} His reports, which also review the literature, go to show that the effects of a radiation menopause are little different from those of the natural climacteric.

Turnbull found that libido was decreased before the menopause in 60% of all women, and half of them showed a further reduction after the menopause. Of those women retaining a normal urge up to the menopause, 50% experienced a decrease immediately afterwards. The findings were the same irrespective of whether the menopause was natural or induced with radium. With regard to dyspareunia, the incidences in the treated and the controls were again similar—suggesting that radiation did not cause significant structural change. Libido is determined as much by the psyche as by the endocrine system, and, in regard to the latter, the adrenal cortex is probably more important than the ovary. Turnbull's results tend to confirm what has been generally recognized on other evidence, that sex urge decreases with advancing years rather than with the cessation of ovarian function. It may be added that the effect on libido of either the natural or the radiation menopause depends a good deal

on a woman's outlook. If she expects the menopause to decrease libido, her expectation is likely to be realized; if she does not, however, libido will probably be retained.

REFERENCES

- 1 McLaren, H. C., *J. Obstet. Gynaec. Brit. Emp.*, 1941, 48, 1.
2 ———, *British Medical Journal*, 1950, 2, 76.
3 Turnbull, A. C., *J. Obstet. Gynaec. Brit. Emp.*, 1955, 62, 176.
4 ———, *ibid.*, 1956, 63, 179.

Amphetamine Inhalers

Q.—In the past a man in a responsible position involving considerable mental strain made habitual use of amphetamine inhalers, which he says helped him greatly. Now they are no longer available, he misses them greatly and has been given instead amphetamine by mouth in the usual doses. He says, however, that he does not experience the same beneficial effect. (1) Is there a pharmacological explanation for this failure to respond? (2) What advice should be given to this patient?

A.—In the normal course of events the systemic administration of amphetamine has a greater effect upon the central nervous system than that obtained when the drug is inhaled. It is well known, however, that patients may develop a considerable degree of tolerance for amphetamine, and this patient has obviously been accustomed to using it for a long period of time. It may be, therefore, that he will not respond to an average dose of oral amphetamine, but will require an unusually heavy dosage to obtain a satisfactory result. Since, however, the amount of amphetamine absorbed from an inhaler is usually small, this explanation of the failure to respond to oral medication seems improbable. It would appear more likely that the benefits obtained from inhaled amphetamine were in part of purely psychological origin connected with the use of the inhaler itself.

If the patient has actually developed a mild degree of addiction to amphetamine, it is important that the drug should be withdrawn. During the process of withdrawal small doses of caffeine might possibly be of some benefit. If on the other hand the problem is mainly a psychological one, reassurance, coupled if necessary with the administration of a suitable placebo, would be the best form of management.

Unilateral Neuroretinitis

Q.—What is the differential diagnosis of a unilateral neuroretinitis? There is no known aetiological factor.

A.—It all depends on what is meant by "neuroretinitis." This term is rarely used nowadays, as it could be used to cover a variety of different pathological processes. Presumably the writer implies oedema of the optic disk, with evidence of retinal involvement (oedema, haemorrhages, exudates), confined to one eye.

Syphilitic neuroretinitis has been described in the secondary stage of syphilis, but is very rare. Unilateral papilloedema, due to intracranial tumour or some other cause of raised intracranial pressure, is by no means uncommon, and on occasion the oedema may spread beyond the optic disk on to the surrounding retina, and be accompanied by haemorrhages around the disk and even macular oedema and macular fan. Vision is usually little affected in the early stages. Papilloedema associated with malignant hypertension and chronic nephritis is almost always bilateral. A glioma of the optic nerve may be associated with papilloedema (more usually optic atrophy) and severe loss of vision.

Unilateral retrobulbar neuritis may be associated with swelling of the optic disk (papillitis), usually slight but occasionally severe, and macular oedema and even a macular fan have been known to occur. Gross visual loss, usually with a central scotoma, is the rule. The common cause of unilateral retrobulbar neuritis is a plaque of multiple sclerosis in the optic nerve, and, if this is just behind the nerve head, swelling of the disk may occur. Recovery to almost normal vision occurs in most cases, though a small percentage of

cases are left with a permanent central scotoma and optic atrophy. There may be no other signs of disseminated sclerosis on general neurological examination.

Other conditions causing oedema of one optic disk with some retinal oedema include localized choroiditis (Jensen's juxtapapillary choroiditis), the pathogenesis of which is unknown; partial occlusion of the central retinal vein, usually with scattered retinal haemorrhages along the course of the dilated retinal veins; and the papilloedema which occasionally accompanies acute iritis. The vitreous haze in the last instance may give rise to a misleading appearance of abnormality in the optic fundus.

Hormone-dependence in Breast Cancer

Q.—In the treatment of cases of cancer of the breast, besides surgery and radiotherapy, should steps be taken routinely to determine whether the growth is hormone-dependent? If so, how should this be done and what further therapy is advised should the growth prove hormone-dependent?

A.—There is unfortunately no fully satisfactory way of discovering whether a growth of the breast is hormone-dependent, although there are some interesting researches going on at the moment into this matter. Certainly the histological picture of the growth is no guide. This difficulty does not matter very much, however, when it comes to the question of administering more or less innocuous hormones by mouth or by injection, because it is a relatively simple matter to try the hormone and see if it works, very little harm being done if it fails to do so. The real problem arises in connexion with adrenalectomy and hypophysectomy, because here clearly a criterion of hormone-dependence would be of the greatest possible value. It is for this reason that the biochemical researches now being prosecuted on the urine of these patients are being followed with such great interest.

Your questioner's query therefore hardly arises as a practical problem at the moment; but, even if in the future hormone-dependency can be diagnosed other than by the method of trial and error, it would probably prove wise to defer treatment based on it until recurrences occur.

Treatment of Iron-deficiency Anaemia

Q.—Is the use of liver extract or cyanocobalamin (vitamin B₁₂) ever justified in cases of simple iron-deficiency anaemia? In some countries these agents are used indiscriminately.

A.—The use of liver extract or cyanocobalamin is never justified in cases of simple iron-deficiency anaemia.

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 15 1957

THE PROGNOSIS OF ATRIAL SEPTAL DEFECT

BY

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[WITH SPECIAL PLATE]

Physical Signs

Atrial septal defect as an entity that could be recognized clinically was first described in this country by Bedford *et al.* (1941). Since then the diagnosis has been made with confidence and increasing frequency. The patients of earlier series were mostly between 20 and 40 years old, an age incidence very different from that of most congenital lesions: many in early life had noticed few symptoms, and often the physical signs had not even drawn attention to their hearts. We were therefore surprised when we began to see so many young patients with the classic picture, and thought that children with such large hearts, even when they had few symptoms, must have a more severe type of defect and a worse prognosis than patients seen in adult life. But this has not proved so, and hardly a child in this group has lost ground over the subsequent ten years. We have, of course, seen patients becoming worse during this time, but they were older, generally over 30 or even 40 years of age.

In view of the progress of surgical treatment, we wish to consider the natural prognosis of atrial septal defect. We have included some cases where the diagnosis was made on clinical grounds alone, as this gives a more balanced picture. If we include only those where it has been proved by catheterization there is a bias of selection, as most physicians do not advise this without some special reason, or did not until recently when surgical treatment became more practicable. We have included all patients where catheterization proved a left-to-right shunt into the right atrium, even if the shunt was partly due to anomalous pulmonary veins or if there was some degree of pulmonary stenosis (see Table II).

Diagnosis

The contrast between the paucity of symptoms and the large heart is characteristic of atrial septal defect. Nearly all the children are thin and slightly built, with a long, narrow chest and long limbs (the gracile habitus), but true arachnodactyly is rare. They often have a pigeon-chest with more prominence of the left side, and the more severe this deformity the greater the likelihood of a large heart and a large shunt.

A good account of the auscultatory signs has been given by Leatham and Gray (1956). The most characteristic sign is the discrepancy between the small pulse and the widespread overactive precordial pulsation, seen all the more easily because of the thin chest. The excessive pulsation has three components: (1) an apex beat that is tapping in character and displaced outwards; (2) a right ventricular thrust or lift that is usually visible and almost always palpable in the third left intercostal space; and (3) a large pulmonary artery that may give rise to visible systolic pulsation in the second space and may be felt to thrust against the hand. A precordial thrill is frequently felt, but a striking "cat's purr" thrill is uncommon in atrial septal defect.

The radial pulse is small. The pulse pressure is rarely more than 40 mm. Hg and the systolic pressure usually 120 mm. or less, with lower levels in children. The jugular venous pressure is increased only if cardiac failure supervenes, but Reinhold (1955) has noted that in the jugular venous pulse there are often large v waves, frequently exceeding the a waves in amplitude.

The first sound may be abrupt and loud. The second sound is widely split and is slightly, but not much, louder than normal; it is not easily palpable unless the pressure is high. Wood (1950) and Barber *et al.* (1950) described wide splitting of the second sound as an important physical sign, and we have found it most valuable, but it is not common in children under 3 years of age or in patients with much pulmonary hypertension.

The systolic murmur of atrial septal defect is often heard first some months after birth rather than from birth; it is generally heard best in the second or third left spaces, but may be difficult to localize sharply. It is blowing rather than rasping, soft rather than loud. Considering how soft it is, it is well heard in the interscapular region at the back (Taussig, personal communication), perhaps owing to backward conduction through the large left pulmonary artery, as well as to the large heart and thin chest.

A blowing murmur in early diastole was heard at and below the pulmonary area in about one-eighth of our

patients, more often in older ones but once in a woman aged 20; it was thought to indicate pulmonary regurgitation. A short diastolic murmur at the apex was heard in half our patients, and more frequently in those who were seen several times and in those with a large shunt and a large heart. When this murmur becomes prolonged and continues to the first heart sound it is hard to exclude associated mitral stenosis, but this is less common than was thought, and cannot be diagnosed with certainty in life unless the catheter confirms a gradient across the mitral valve.

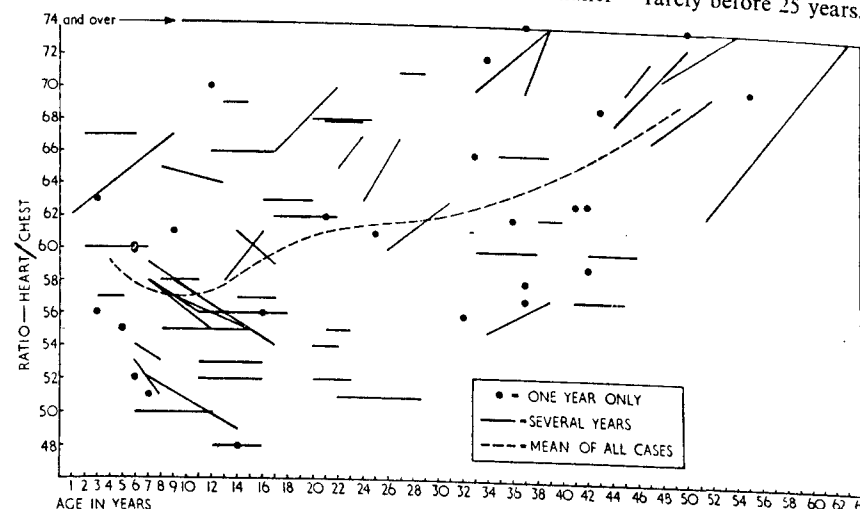
The physical signs are altered if severe pulmonary hypertension develops. The systolic murmur is softer and the second sound louder and easily palpable; the patient may be cyanotic and is more likely to have a pulmonary diastolic murmur. It may then be difficult to decide the site of the shunt, sometimes even after catheterization.

Radiology

This shows the triad of a large right side of the heart, large pulmonary arteries, and a hilar dance with expansile pulsation spreading to the smaller branches—features that were emphasized by Bedford *et al.* (1941). The negative findings on radiography—namely, absence of enlargement of the aorta, of the left ventricle, and of the left atrium—are equally important for diagnosis. The pulmonary arteries may become aneurysmal; later if they become thrombosed the pulsation may diminish.

As in most conditions, no heart shape is pathognomonic, though a film with the above features should suggest the possibility of an atrial septal defect, but can be due to mitral stenosis or other left-to-right shunts with secondary pulmonary hypertension. Typical examples are shown in the Special Plate: in Fig. 1 for children, in Fig. 4 for adults, and in Fig. 2 for those where the large right atrium is more prominent than in Fig. 1. The pulmonary trunk is often large before there is any rise of pulmonary arterial pressure (P.A.P.). The heart is sometimes smaller with the same prominent pulmonary arc, presumably when the left-to-right shunt is smaller.

Some less usual shapes are shown in Special Plate, Figs. 3 and 5. The heart is very large with a straight left border in Fig. 3 A, the pulmonary artery is so large that the heart looks rectangular in Fig. 3 B, and the right-sided enlargement is enough to make the heart appear tilted in Fig. 3 C. The pulmonary artery is often very large—in Fig. 5 A with a large heart and in Fig. 5 B with a heart that is smaller



GRAPH 1.—Diagram showing changes with age in the cardio-thoracic ratio of hearts in atrial septal defect, and the average curve for all our patients. Some decrease is more common than an increase in the school period, and the average figure, after dipping from 59%, returns to this at 17 and is no more than 62% at 30 years. After this it increases more rapidly, but patients seen then are not likely to be doing well and others may not show this rise.

than usual, from a woman, now aged 43, who has been under observation with a large pulmonary artery for 30 years. Aneurysmal dilatation of the right atrium is seen in Fig. 5 C; the positions of the catheter on two separate films are both included to show that all this enlargement was the right atrium.

The Size of the Heart

At first we were surprised to see children with such large hearts, often with cardio-thoracic ratios (C.T.R.) of 60%, and thought that they must have unusually large defects and a poor prognosis, but this is not so. Large hearts are common at all ages, and the only striking difference is that hearts that are not very large (C.T.R. below 55%) are seen in about one-quarter of the patients under 30 but rarely after this age; and that enormous hearts (C.T.R. 70%) become common after 30 but not before. This might suggest that the heart increases slowly but progressively throughout life, but this does not happen for a long time. Generally it is large in infancy and childhood (C.T.R. 55-64%), and, having reached a position of equilibrium, remains about this size for 20 or 30 years, and only then starts getting larger as the patient gets more severe symptoms. The size of the heart as measured by the cardio-thoracic ratio at various ages is shown in Graph 1; the average is about 58% in the first decade, and does not pass above 62% till the start of the fourth decade. It was under 60% in two-thirds of those under 20 years, but over 60% in more than two-thirds of those over 30 years (Table I).

TABLE I.—Heart Size with Age in Atrial Septal Defect

Age (Years)	Cardio-thoracic Ratio				
	Up to 54%	55-59%	60-64%	65-69%	70% and Over
0-19	25	42	20	11	2
20-29	22	10	30	30	8
30-39	0	31	23	16	30
40-59	0	14	20	20	46

Many of the children have been followed up for five to ten years, and generally the heart size has remained the same during this time. In fact it has more often become smaller than larger. The only exception in the first decade in Graph 1 is wrongly included, as a clinical diagnosis of ventricular septal defect was wrongly changed to one of atrial septal defect after the first catheterization (see Case 2 below). There were, however, two exceptions in the second decade—two girls aged 13 and 18—where it increased during five years (C.T.R. 57-61% and 65-70% respectively). Otherwise an increase was never seen before the age of 18 and rarely before 25 years.

Against this there were several cases, all in schoolchildren under 17, where the heart became smaller. This is too late for the change that takes place normally with growth when the heart assumes a lower and more vertical position; perhaps it becomes accustomed to the large flow when the children are not allowed to play energetic games, though leading a normal life otherwise.

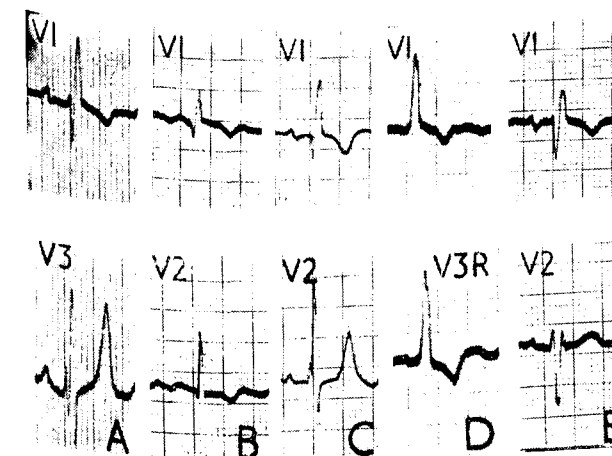
To sum up, the heart is very large in infancy and childhood and remains the same until about 25 or 35, when, with the onset of increasing symptoms, it may become still larger.

The Electrocardiogram

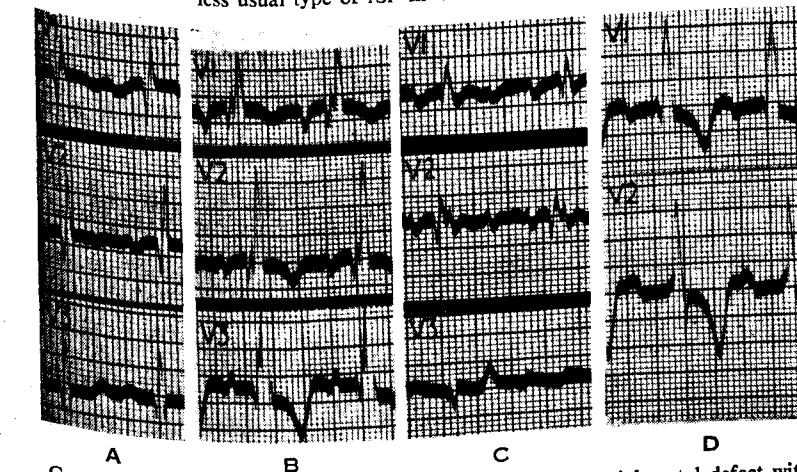
Bedford *et al.* (1941) found the P wave large or bifid in a quarter of their cases and the P-R interval prolonged in a third, but in our series of, in the main, younger subjects these changes have been less

common; they found the QRS width over 0.10 sec. in more than half. Barber *et al.* (1950) thought that "partial or complete bundle-branch block" was present in 95% of cases, and that the diagnosis should not be made without this unless proved by catheterization. The validity of this has been widely accepted, but it depends on the meaning to be attached to the term, and this has rarely been defined. We think the term should be avoided and a direct statement made about the presence of primary and secondary R waves and the width of QRS, for the pattern is one that is easy to accept at sight but more difficult to define. We define a primary R wave as one visible to the naked eye where the downstroke returns to or below the isoelectric line. Even the width of the QRS complex can be difficult owing to uncertainty about the exact end-point, especially with direct-writing machines; there may be an error of at least 0.10 sec. where R or S is slurred as it reaches the isoelectric line. When there has been any doubt we have taken the shorter estimate.

In 47 of our cases where the diagnosis was proved by catheterization or by necropsy the QRS width was no more than 0.09 sec. in 13, 0.10 sec. in 11, 0.11 in 8, and 0.12 sec. or over in 15. Where the QRS width was 0.10 sec. or less, there was neither a primary r wave nor notching of the R wave in four cases (Graph 2 B; Graph 3 A); there were



GRAPH 2.—Five electrocardiograms from proved cases of atrial septal defect showing less usual patterns. In each case the upper figure is Lead V1. (A) The primary r wave is very small in V1 but larger in V3. (B) Both leads V1 and V2 show only a qR complex. (C) qR complex only in V1, but enough notching of R in V2 to signify primary and secondary R waves. (D) Right ventricular hypertrophy due to pulmonary hypertension where the notching of R is shown in V3R but hardly in V1. (E) qR only or perhaps rSR', with a very minute primary r in V1 and a less usual type of rSR' in V2.



GRAPH 3.—Four electrocardiograms from proved cases of atrial septal defect with less usual patterns. In A there are QR waves only in V1 and V2. In B there is an unusual notched R wave preceded by a small q, and in C only qr waves, but in B and C the QRS width is 0.12 sec. In D there are only a very minute r and a small s before a large R, but again the QRS is nearly or quite 0.12 sec. in width.

only notched R waves in six (Graph 2 C and D), and in the remaining 14 there was a primary r wave with or without notching of R in addition, most often in V1 but sometimes in other chest leads. The primary r wave was generally small, often only 1 or 2 mm., and sometimes so minute that it was difficult to be sure about its presence (Graph 2 A, C, and E). Where the QRS was 0.11 sec. or more there was almost invariably a primary r wave, and when the QRS was 0.12 sec. or more it was generally fairly large. Of the 40 examples of V1 illustrated by Barber *et al.* (1950), 17 had moderate or large primary and secondary R waves often with some widening of the QRS complex, and 14 had a small primary r wave, but in our opinion three had only qr waves and six had only notched R waves, figures very similar to those in our series.

We agree that the emphasis on this rSR' pattern often with a wide QRS is valuable, and that in its absence the diagnosis should be made only after careful consideration; but some cases even with a large defect do not show features (Graph 2, B and C; Graph 3, A and C). Although a distinction has been made between true primary r waves and notching of R, the presence of either, however small, can help when there is doubt about the site of the defect; both may occur without any increase in the QRS width in normal hearts (Sokolow and Friedlander, 1949) and in other forms of congenital heart disease—perhaps in one-tenth of the cases—but are not so common in ventricular septal defect. Notching of the S wave alone is uncommon in atrial septal defect, and if this is the only change the diagnosis should be reconsidered in favour of a ventricular septal defect.

Neither the height of the primary r wave nor the degree of notching of R is closely related to the size of the heart or to the size of the shunt. Nor do they seem to have increased during the time many of these cases have been under observation. We do not know at what age these changes first appear, but it is early in childhood, and thereafter they remain static until progressive myocardial disease changes the pattern.

S-T depression and T-wave inversion occur in the older patients, especially where auricular fibrillation or cardiac failure supervenes. In younger patients such changes are uncommon in uncomplicated atrial septal defect, but occurred in one boy aged 18 without, and in one girl aged 16 with, pulmonary hypertension. They were, however, found in 3 of 6 patients with anomalous pulmonary venous drainage, all under 20 years of age. The greater frequency of S-T depression and T inversion was the only difference in the cardiograms of the two groups.

Differential Diagnosis

Failures to diagnose mild pulmonary stenosis or to recognize that a large septal defect might be ventricular were the most frequent errors. Now that surgical closure is possible, recognition of a left-to-right shunt at atrial level is not enough, for this may be partly or entirely from anomalous pulmonary veins or through a more primitive defect such as an ostium primum or a common A-V canal.

Ostium primum is important since severe symptoms may develop early, but it is fortunately uncommon after infancy. The defect extends downwards to the A-V valve and complete surgical closure may be impossible. A jet of blood from the left ventricle into the right atrium may be felt at operation, and this suggests the clues to a correct clinical diagnosis. The patient has all the signs and catheter findings of an atrial defect, but in addition there may be a pansystolic murmur due to mitral regurgitation, an enlarged left ventricle on screening, and a bizarre electrocardiogram showing left ventricular hypertrophy as well as the rSR' pattern.

Anomalous pulmonary venous drainage is discussed later with the cases included in our series.

Ventricular septal defect is differentiated by the harsher and longer systolic murmur and the more purring thrill, maximal lower down the left sternal border. The second sound in the pulmonary area is not widely split, and this was the only sign militating against the defect being atrial in two cases where catheterization proved it to be ventricular. Where there was difficulty in deciding the site before catheterization, any suggestion of left ventricular hypertrophy on screening or electrocardiography was found to be a correct guide. A little apparent fullness of the left ventricle may be due to the heart's being pushed over by a large right ventricle, but if both seem about the same size the defect is almost certainly ventricular.

Simple pulmonary stenosis with a closed ventricular septum gives rise to a more rasping systolic murmur and thrill in the pulmonary area. We have confused these on occasion, before we realized how much pulsation there might be in the left pulmonary artery beyond the stenosis; this, however, rarely applies to the right pulmonary artery. In any case, there is no difficulty unless the pulmonary stenosis is slight or the atrial septal defect small, when the differentiation is not of so much practical importance.

General Difficulties

Even after investigations the diagnosis may still be difficult. In three cases the increase in oxygen saturation suggested a ventricular as well as an atrial septal defect; in one of these the clinical diagnosis of atrial septal defect alone was confirmed by necropsy, so well-mixed blood that included the flow through the defect was not obtained in the atrial sample, but only in the ventricular one; in the other two cases samples were obtained from the superior but not from the inferior vena cava, and this led to a wrong deduction that there was an atrial as well as a ventricular septal defect.

Generally, when there is pulmonary hypertension the left-to-right shunt persists, but may not do so always. In two patients who we feel sure have an atrial septal defect and pulmonary hypertension, catheterization confirmed the latter but showed no shunt. We think we have seen patients with a small atrial septal defect and with less distinctive signs, comparable with the *maladie de Roger*, but a shunt cannot be proved by catheterization unless it is 2 or 3 litres a minute. Cases of these two groups have been excluded.

No patients with cyanosis from infancy have been included, for we do not think that any of these had a reversed shunt secondary to pulmonary hypertension from an uncomplicated atrial septal defect. Of two cases where the final answer is known, one had a common A-V canal (Campbell and Missen, 1957), and a second had a left-to-right shunt into the atrium from anomalous pulmonary veins and a right-to-left shunt through the atrial septal defect owing to the presence of pulmonary stenosis (Case 1, Deucher and Zak, 1952).

TABLE II.—Age and Sex Incidence of Atrial Septal Defect

	Sex	Age (Years)						Total
		0-4	5-9	10-19	20-29	30-39	40 and Over	
A.S.D. proved by catheter or necropsy*	M	3	6	4	1	4	0	18
	F	1	8	2	4	14	11	40
A.S.D. clinical diagnosis	M	1	2	3	1	0	0	7
	F	3	5	7	8	2	2	27
A.S.D. and P.V.S. (proved by catheter)	M	0	2†	1	0	0	0	3
	F	0	2	2	1†	0	0	5
Total	M	4	10	8	2	4	0	28
	F	4	15	11	13	16	13	72
Total both sexes		8	25	19	15	20	13	100

* Includes 7 cases with anomalous pulmonary venous drainage.

† One case in each of these groups has been omitted because the shunt was small and the stenosis dominant.

Sex and Age Incidence

We have 66 cases where the diagnosis was proved by catheterization or necropsy, including seven with added anomalous pulmonary venous drainage and eight others with pulmonary valvular stenosis in addition. To these we have added the first 34 where the diagnosis seemed certain on clinical grounds, to make 100 in all (Table II).

Sex Incidence

There were 72 girls and women and 28 boys and men, a proportion of 2.5:1. The female preponderance was less among those with additional pulmonary stenosis or with anomalous pulmonary venous drainage, but these numbers are small. Taking all ages together, however, hides an interesting difference, for in those under 20 the sex incidence was more equal (30 girls and 22 boys), while in those over 20 it was very unequal (42 women and only 6 men). The mortality seems, therefore, to be more serious in men, though we have no direct evidence of this and the following figures are against it.

Brigden (1956), among patients referred to him after mass radiography, saw 52 where the diagnosis seemed certain after full clinical examination; their ages ranged from 17 to 65 years. The female preponderance (1.5:1) was not so high as in our series; it was the same in those under 30 and those over 30, and if they were divided into those under and over 35 it increased from 1.35:1 to 1.75:1 only. This is against any heavier mortality among men and makes our figures difficult to explain.

Age Incidence

Patients who have and those who have not had catheterization have been combined, since most of the former were children under 10 or women over 30, while more of the latter were 20 to 29—an age when most patients are too well to need investigation. Those who had pulmonary stenosis as well were, however, all under 14, except one woman, aged 22. Combining the figures, 33 were 9 years of age or less, 19 were between 10 and 19, 15 between 20 and 29, and 33 over 30, 13 of these being over 40—a much older age incidence than for most congenital diseases, although many more children were seen than in most previous series of atrial septal defect.

Course and Prognosis

Infancy

Many small children with a large shunt and a large defect suffer from recurrent respiratory infections and a slow gain in weight; often they show less dyspnoea, less susceptibility to infection, and less difficulty in gaining weight, after 2 years of age. Occasionally a large defect seems to be the cause of death in an infant; the reason is not obvious, as most patients survive without difficulty. Brinton and Campbell (1953) included two such infants, aged 2 and 7 months, among 55 necropsies of patients with congenital heart disease, and Bonham-Carter informs us that he has seen several examples. Apart from these we have seen no deaths from uncomplicated atrial septal defect before the age of 27 years, though two children with anomalous pulmonary venous drainage in addition have died.

First Decade

We have seen 33 children between 2 and 9 years of age and many have been followed up for six to ten years; 22 have had catheterization. With two exceptions all these have done well, without any loss of ground, without a raised pulmonary arterial pressure, and without any further increase in the size of the heart. The first exception, a girl aged 5, was admitted for attacks of cyanosis in three of which she had been semiconscious, and had a pulmonary arterial pressure of 74/10 mm., so that her outlook is uncertain. The second, a girl aged 8, with anomalous pulmonary venous drainage and probably an atrial septal defect in addition, seemed well, but had a large heart (C.T.R.

70%) and a P.A.P. of 100/65 mm.; she was not cyanosed and not much disabled, but died a year later at home with "bronchitis" which may really have been pulmonary arterial thrombosis (Case 1*).

A third patient whose septal defect had been thought to be ventricular was included because catheterization seemed to show that it was atrial; during eight years he was often in hospital and his heart became larger (C.T.R. 62 to 68%), but recatheterization when his parents agreed to operation confirmed the original clinical diagnosis (Case 2).

Nearly all these patients have large hearts (C.T.R. generally 54-65%; one-third over 60%), but two have hearts of normal size and one of these had a large shunt.

Second Decade

Most of these patients were children under 15, and had been referred to hospital because of a murmur heard at school rather than because of symptoms; 9 of the 19 had catheterization. All but one are leading normal, quiet lives without increasing symptoms, and their pulmonary arterial pressures are normal although they have large shunts. All but three have large hearts (C.T.R. 56-68%).

The exception, a girl aged 12, had a very large heart, signs of mitral incompetence, and right-sided failure. Investigations showed a large atrial septal defect, at least one pulmonary vein entering the right atrium, and a pulmonary arterial pressure of 85/25 mm., that was due to the large flow and not to a raised resistance. She died after operation, and veins from the upper and middle right lobes drained into the right superior vena cava near its junction with the right atrium; opposite this there was a large atrial septal defect, and there was also slight mitral stenosis (Ross, 1956) (Case 3).

Third Decade

Even at this age, 10 of the 15 patients were sent to hospital because of a murmur and had few symptoms. Most of them had a large heart (C.T.R. 60-70%), though in three it was still no more than 54%. Five of the six who had catheterization, however, were increasingly dyspnoeic, three so much so that they had to give up work. Two had pulmonary hypertension severe enough to produce some reversal of the shunt and central cyanosis, one had a raised pressure of 87/27 mm., and the other two had right-sided failure soon after the onset of fibrillation, at 22 and 24 years. One of these died when she was only 27; true, this was after operation, but she had been in congestive failure for two years and would not have lived long (see Table III). One girl with a large heart (C.T.R. 68%) already had pulmonary regurgitation when she was 20, and a central cyanosis (arterial oxygen saturation 84%) from a partially reversed shunt before she was 25; she said she felt well, but her pulmonary arterial pressure was 115/35 mm., and it is remarkable that she was able to do so much (Case 4).

These are the earliest ages at which we have seen auricular fibrillation, pulmonary regurgitation, or a reversal of the shunt in uncomplicated atrial septal defect, but cyanosis became apparent in three others near the end of this decade, and one of these died when 29 with extensive pulmonary thrombosis.

One-third of our patients lost ground seriously during the third decade, but the true proportion is certainly less, for there are others who had few symptoms till the next decade and those who were too well to seek medical advice at any time.

Fourth Decade

Of the 20 patients, 15 have had catheterization. Their hearts were very large, with cardio-thoracic ratios of 62-79%, and only two, both still well, had figures as low as 56%. Nine had little increase in their symptoms when they were seen, and the pulmonary arterial pressure seemed normal in two and was proved to be so in seven. The other 11

*Five patients are numbered as Cases 1-5 to save repetition when they are referred to again.

became severely disabled during this decade. Six of the 11 died: one with pulmonary embolism after pregnancy, one with acute pulmonary oedema, one with right-sided heart failure, and three with central cyanosis and pulmonary hypertension. The first two will be discussed later (see p. 1380); the third died with heart failure three years after the onset of fibrillation; and the other three, who died within four years of the onset of severe symptoms, had pulmonary hypertension and a reversed shunt. One of them, a man aged 34 with anomalous pulmonary venous drainage, had the usual picture of atrial septal defect and carried on his work till he was 32; he then became increasingly cyanosed and disabled and died with extensive pulmonary arterial thrombosis (Trounce, 1953) (Case 5). Of the remaining five, two had pulmonary hypertension with a reversed shunt and also right-sided heart failure, but in one of these the cyanosis was slight. The other three were handicapped by severe dyspnoea and right-sided failure; the pulmonary pressure was still normal in two, and was 72/18 mm. in the third, who has had a successful operation.

Fifth and Sixth Decades

Among the 13 patients, only two, aged 42 and 46, are still without severe symptoms, but both have large hearts and one has paroxysms of fibrillation.

Of the eight who had catheterization, two have pulmonary pressures at about the systemic level, and both have reversed shunts and are severely disabled, though one, now 45, had remained well without any mention of her heart till she was 40. Four had pulmonary systolic pressures between 56 and 80 mm.; in one of these the disability followed "pneumonia" which may have been pulmonary arterial thrombosis, but in the others it seemed due to the onset of auricular fibrillation rather than the rise of pulmonary pressure. Of the remaining two, one was still well and one was disabled by right-sided failure.

Of the five who did not have catheterization, one was well and one was still working with failure that had started soon after the onset of fibrillation. This was followed closely by severe symptoms in two others, but not for 10 years in the fifth. In the last of these we have no doubt that the pulmonary pressure was high and the shunt reversed (she has since died), but in the others cyanosis was no more than terminal.

Of the four patients who died, two died within a few years of the onset of severe symptoms, but the third lived for 10 years, and the fourth was well till she was 46, developed fibrillation at 56, and lived till she was 63. She was the oldest patient in our series, but since then we have seen a typical case in a woman, aged 66, who came to hospital only because of a urinary infection and was still leading an active life as manageress and was on her feet most of the day. She looked younger and was doing more work than most people of her age.

Coulshed and Littler (1957) have reported five typical cases of atrial septal defect in elderly patients: a woman aged 79, who was unaware of any cardiac defect till she was 54; two men aged 68 and 67, one of whom was still working as a fitter; and two younger patients, aged 58. Some of these were getting congestive failure, but all had been well and active during the greater part of their lives. Similarly, four of the patients of Brigden (1956) seen at mass radiography were over 55 and two were over 60 years of age.

Mode of Heart Failure and Death

In what ways do these patients become worse? We have taken all age groups together, and, including those with anomalous pulmonary venous drainage, 31 patients have reached a stage of incapacity that suggests how the heart is likely to fail or have already died. The most common cause is right-sided heart failure, and the next pulmonary hypertension with central cyanosis and some reversal of the shunt. Where a necropsy was available, some results are given in Table III.

With Right-sided Heart Failure (13 Patients)

Underdevelopment and recurrent respiratory infections had been present in five of the ten patients with large shunts, but not in the two with dominant pulmonary stenosis. In all ten the cardiac murmur was typical of pulmonary stenosis, even when the stenosis was mild with a pressure gradient of only 20–40 mm.; the harsh grating murmur and thrill maximal in the second left space, produced by the narrowed valve, might indeed be expected to obscure the more diffuse and fainter murmur typical of atrial defect. The pulmonary component of the second sound was diminished in the five with more severe stenosis, and was widely split in four of the seven with a large shunt and mild stenosis.

The physical signs were thus predominantly those of pulmonary stenosis, even where this was the minor lesion. Screening, however, revealed increased pulmonary arterial pulsation seen farther out in the lung fields than in pulmonary stenosis, though only in three a hilar dance. The discrepancy between physical signs and radiology was the usual reason for catheterization. The cardio-thoracic ratio ranged from 52 to 65% in those with a large shunt, but was normal in the two with dominant stenosis.

The electrocardiogram showed the usual rSR' pattern in VI in eight patients, but in three of these the tall secondary R wave and slight S–T depression or T inversion indicated more right ventricular preponderance than in most children with uncomplicated atrial septal defect. The case of the child with infundibular stenosis was unusual and had dominant S waves all across the chest leads. The usual picture of right ventricular preponderance was found in the two patients with dominant stenosis and in one of the three with a large shunt and moderate stenosis.

Only three of the group were over 20 years of age, but during the three to nine years they have been followed up they have shown no progressive symptoms and, with one exception, no increase in heart size.

Haemodynamic Findings

We have adequate data of cardiac catheterization in 46 patients, excluding those with added pulmonary stenosis. A large left-to-right shunt and a large pulmonary flow without any rise in pulmonary arterial pressure or resistance were found in nearly all the children and in nearly half the adults (Group A). In the remainder the haemodynamic findings were different: instead of being normal, the pulmonary arterial pressure was increased, the systolic pressure being at least 50 mm. and generally much more, and often the resistance also was increased. These can be divided into two groups: eight who still had a large left-to-right shunt and were clinically acyanotic (Group B), and nine who had a pulmonary pressure high enough to make the left-to-right shunt smaller, though sometimes still large, and to cause a right-to-left shunt and varying degrees of central cyanosis (Group C).

Group A: With a Large Left-to-right Shunt but no Increase of Pulmonary Arterial Pressure or Resistance (29 Patients).—This group included 17 of the 19 children and 12 of the 27 adults. The children were all between 6 and 13 except one boy aged 17, since we have had little occasion to investigate, or even to see, patients between their leaving school and reaching 25 years of age. Only two of the adults were under 30, and the average age was 36 years.

Most of the physiological data were normal, including the systemic flow and the pulmonary arterial pressure and resistance. Clinically, the patients were without central cyanosis, and the arterial oxygen saturation was always 94% or more. The systemic flow was normal, averaging 4.7 litres a minute in the adults and 4.0 litres a minute in the children, and the cardiac index (cardiac output per unit of surface area) was normal in the children but lower, and sometimes a little below normal, in the adults. Naturally the pulmonary flow was greatly increased. In the children it was generally between 8 and 12 litres and averaged 10 litres a minute, and in the adults it was generally between 10 and 16 litres and averaged 13.3 litres a minute. This means the shunt was large, and on the average 62% (generally between

50 and 75%) of the blood that reached the left atrium from the lungs passed to the right atrium and back to the lungs, and only 38% passed to the left ventricle. The pulmonary resistance was always normal or reduced; it averaged 1.1 units and was never above 2.0 units. Thus in spite of the very large flow the pulmonary arterial pressure was normal or only slightly raised, the highest figures being 44/10, 42/7, and 40/12 mm. Hg; it averaged 30/11 mm. in the children and 30/10 mm. in the adults.

All the children and several of the adults were still leading a fairly active life, but four of the latter had suffered from congestive failure. Clearly, congestive failure can occur, and it seems likely that it can prove fatal, before there is any great rise of pulmonary arterial pressure or any great reduction in the large left-to-right shunt.

Group B: With a High Pulmonary Arterial Pressure, but Still with a Large Left-to-right Shunt and no Right-to-left Shunt (8 Patients).—Five of these were adults with an average age of 39 years, but a boy aged 19, and two girls aged 5 and 12, reached this group earlier in life. We do not know why they behaved in this way—unusual for their age—but patients with a large pulmonary flow vary greatly in the length of time needed to develop any progressive rise of pulmonary arteriolar resistance, depending perhaps on the degree of intra-arterial thrombosis. Some have not done this after 50 years; about half our patients did so after 25–40 years, and a few did so sooner. These differences are the same as those we have found in cases with a large left-to-right shunt through a persistent ductus arteriosus where the tendency to develop increasing pulmonary resistance seems even less. In one girl who also had anomalous pulmonary venous drainage (Case 3) the flow was so large that the pulmonary pressure was 85/25 mm. though the resistance was only 2.0 units; in the other girl it was 3.5 units and the pressure (in the right ventricle) 74/4 mm.

In these eight patients the systemic flow was only a little lower than in the first group—3.9 instead of 4.7 litres. There was as yet no change in the size of the left-to-right shunt or of the pulmonary flow, which averaged 12.3 litres a minute. This means that 68% of the inflow to the left atrium shunted through the atrial septal defect—at least as high a proportion as in the first group. The pulmonary arterial pressure had increased to an average figure of 82/30 mm., but in spite of this the pulmonary resistance was normal or only slightly increased. Clinically, most of these patients were acyanotic, but two showed the degree of cyanosis that may be seen with mitral stenosis when the heart is failing. The arterial oxygen saturation was always between 90 and 95%, so a small right-to-left shunt may have been developing although the shunt was still predominantly left-to-right.

Group C: With a High Pulmonary Vascular Resistance, a Diminishing Left-to-right Shunt, and Increasing Right-to-left Shunt (9 Patients).—All these were between 33 and 52 except two, aged 24 and 27 years. Most of them were developing a tinge of cyanosis, and many showed deep central cyanosis. The arterial oxygen saturation averaged 86%; it was between 72 and 88% in all but three, where it was between 91 and 93%.

The systemic flow was further reduced; it averaged 3.4 litres a minute, and was above 4.0 litres in one patient only. The pulmonary flow was larger than the systemic, but small compared with the previous groups; it averaged 5.2 litres a minute and was never above 7.0 litres. The shunt was more difficult to calculate because of the additional right-to-left shunt, but, except perhaps in two patients, it was always present, and on the average 34% of the blood reaching the left atrium from the lungs shunted to the right atrium.

The pulmonary arterial pressure was always high, generally about the same as the systemic pressure; it averaged 104/39 mm., but once it was lower and once a good deal higher (140/62 mm. against 120/85 mm.). The pulmonary resistance was greatly increased, generally to 5–10 units and once much more than this.

The Pressures in the Atria

Generally the pressure in the left atrium is a little, if at all, above that in the right to account for the large left-to-right shunt. We agree with the view of Barger *et al.* (1948) and Dexter (1956) that the atria act as a single chamber, the flow depending on the resistance in the two ventricles and their circuits.

We did not find any significant difference between the pressures in the right and left atria. In no case was the difference in the systolic pressure more than 3 mm., and sometimes it seemed slightly higher in the right. On the average the pressure was 10.1/3.2 mm. in the left atrium and 9.6/2.4 mm. in the right, and, where only mean pressures were measured, 5.7 mm. in the left and 5.5 mm. in the right—figures that are substantially the same. The left atrium was entered in 25 of our 46 cases, but the pressure was measured in only 18 of these. There was no difference as between the children and adults except that the left atrium was entered more often in adults.

Changes Found on Recatheterization

The occasion to repeat catheterization in the same patient does not often arise, but there are five cases where, for various reasons, this was done. In the first, a boy aged 5, the right ventricular pressure five years later had fallen from 34/11 to 22/1 mm.; the only conclusion to be drawn is that a small rise does not always mean that it will be progressive. The second patient had a very large shunt when she was 47 and was verging on congestive failure, but was not much worse seven years later; her right ventricular pressure had risen from 33/5 to 56/5 mm. without any change in the large left-to-right shunt. Both these patients were acyanotic and in both the arterial oxygen saturation was over 95%. The third patient, aged 44, with congestive failure and slight cyanosis (arterial oxygen saturation 91%), had a P.A.P. of 59/25 mm., and two years later it had risen to 68/26 mm. without any great change in her general condition. The fourth, aged 34, had congestive failure and gross tricuspid incompetence, and during the next year her pressure rose from 95/30 to 110/45 mm., but she was still acyanotic and still had a large left-to-right shunt. The fifth patient had reached a later stage with a right-to-left shunt and an arterial oxygen saturation of 86% when she was first catheterized at the age of 33; four years later she was more disabled, more persistently cyanotic, and the left-to-right shunt had fallen from 3.5 litres to under 1 litre per minute, but the pulmonary pressure was unchanged (100/36 mm.).

Summary and Conclusions

We have discussed the physical signs and radiology of 100 patients with atrial septal defect, in two-thirds of whom the diagnosis was proved by catheterization or necropsy. We have tried to assess the course and prognosis from their history and from the progress of those who have been observed for several years.

After infancy has been passed, the first two decades are a good period when the patients lead a life that is nearly normal but generally without active games. We think that 95% are still doing well when they are 20, and 85% when they are 30 years of age. The prognosis in the fourth and fifth decades is much less good, and only about half of those seen at hospital are still well at 40 and less than a quarter at 50 years. The children are, we think, a representative sample, but adults are less likely to be seen unless they have symptoms, so the real prognosis is better; this is supported by the chance finding of older patients with atrial septal defect at mass radiography and elsewhere.

Usually in early childhood the electrocardiogram already shows the rSR' pattern; the QRS is widened to more than 0.10 sec. in only about half, and a

quarter do not show real primary and secondary R waves, though often these show some notching of the R wave. Usually the heart is large, often with a cardio-thoracic ratio between 55 and 65%—a size that would generally indicate a poor prognosis—but nearly all patients who survive the first year or so do well without the heart becoming any larger till 25, and more often 35, years of age. Then in an increasing number, but not in all, the strain of the large right ventricular output produces increasing dyspnoea, sometimes made worse by the onset of auricular fibrillation, and ultimately right-sided heart failure. This may happen while the pulmonary arterial pressure is still normal in spite of the large pulmonary flow. In others, however, though rarely before 30, the pressure gradually rises, sometimes high enough to reverse the shunt and produce central cyanosis. Such patients have a higher incidence of pulmonary arterial thrombosis, which may be extensive; it may be the cause of the rising pressure rather than the consequence.

Nearly always for 25 years, and sometimes for 50 years, the shunt through the atrial septal defect remains large, so that the pulmonary flow is between 10 and 16 litres with a normal systemic flow of 4 or 5 litres a minute. In the smaller number where the pulmonary arterial pressure rises to about systemic level, the left-to-right shunt may gradually be mixed with a smaller right-to-left shunt and may in the end become quite small.

About one-tenth of patients with an atrial septal defect have some pulmonary veins from the right lung draining into the right atrium or large veins. Nearly the same proportion have some degree of pulmonary valvular stenosis as well as the atrial septal defect, still with a large left-to-right shunt and its characteristic features. In some of these reversal of the shunt seems likely, though we have not seen this happening.

We have not discussed the surgical treatment of atrial septal defect; at present several methods are in use and a standard perfected method is still being developed. In general, although there is no risk of bacterial endocarditis, the disability and the course and prognosis are not very different from, but rather worse than, those of persistent ductus arteriosus. Surgical treatment is, therefore, likely to become a routine procedure.

REFERENCES

- Barber, J. M., Magidson, O., and Wood, P. (1950). *Brit. Heart J.*, **12**, 277.
Barger, J. D., Edwards, J. E., Parker, R. L., and Dry, T. J. (1948). *Proc. Mayo Clin.*, **23**, 182.
Bedford, D. E., Papp, C., and Parkinson, J. (1941). *Brit. Heart J.*, **3**, 37.
Brinton, W. W. (1956). Personal communication.
Bridgen, W. D., and Campbell, M. (1953). *Brit. Heart J.*, **15**, 335.
Burrett, J. B., and White, P. D. (1945). *Amer. J. med. Sci.*, **209**, 355.
Campbell, M., and Missen, G. A. K. (1957). *Brit. Heart J.*, **19**, 403.
Coulshed, N., and Littler, T. R. (1957). *British Medical Journal*, **1**, 76.
Deuchar, D. C., and Zak, G. A. (1952). *Guy's Hosp. Rep.*, **101**, 1.
Dexter, L. (1956). *Brit. Heart J.*, **18**, 209.
Gardner, F., and Oram, S. (1953). *Ibid.*, **15**, 305.
Gott, V. L., Lester, R. G., Lillehei, C. W., and Varco, R. L. (1956). *Circulation*, **13**, 543.
Hickie, J. B., Gimlette, T. M. D., and Bacon, A. P. C. (1956). *Brit. Heart J.*, **18**, 365.
Leatham, A., and Gray, I. (1956). *Ibid.*, **18**, 193.
Métiéu, C., and Durand, M. (1954). In Donzelot, E., and d'Allaines, P.: *Traité des Cardiopathies Congénitales*. Masson, Paris.
Reinhold, J. (1955). *British Medical Journal*, **1**, 695.
Roesler, H. (1934). *Arch. intern. Med.*, **54**, 339.
Ross, D. N. (1956). *Guy's Hosp. Rep.*, **105**, 376.
Snellen, H. A., and Albers, F. H. (1952). *Circulation*, **6**, 801.
Soklow, M., and Friedlander, R. D. (1949). *Amer. Heart J.*, **38**, 665.
Trousseau, J. R. (1953). *Guy's Hosp. Rep.*, **102**, 140.
Whitaker, W. (1954). *Brit. Heart J.*, **16**, 177.
Wood, P. (1950). *Diseases of the Heart and Circulation*. Eyre and Spottiswoode, London.

BRAIN-STEM ENCEPHALITIS* FURTHER OBSERVATIONS ON A GRAVE SYNDROME WITH BENIGN PROGNOSIS

BY

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[WITH SPECIAL PLATE]

In 1951, in collaboration with Professor P. C. P. Cloake and under the title "Mesencephalitis and Rhombencephalitis," I published three examples of a syndrome the exact counterpart of which I had failed to find previously described. In these cases, after a prodromal period of general malaise and mild pyrexia, there developed gradually signs of mid-brain disturbance, followed by a progression suggesting downward extension of the disease until, in two cases, there was almost total suppression of all functions having brain-stem innervation, but no respiratory or cardiac embarrassment. After a stationary period, in which two of the cases appeared moribund, there was a gradual recovery, the patients finally attaining total and absolute normality. The condition was thought to be a virus encephalitis, but without any pathological support for this view. From correspondence in the press, personal communications, and discussions following this paper it became apparent that other physicians and neurologists had seen rare isolated cases almost exactly similar, and having had an equally favourable outcome so that no pathological studies have become available. Two of the cases described by Espir and Spalding (1956) and given the diagnosis of encephalitis lethargica were very comparable at one stage, but their subsequent course differed.

In the last three years I have seen four further examples of this clinical syndrome, and have kindly been allowed to refer to another under the care of Dr. William Gooddy and Dr. J. Hamilton Paterson (Paterson, 1953). My last patient died at the height of the attack and pathological study was possible. Though no claim to be describing a specific disease entity is made, it seems justifiable to group together cases of such great clinical similarity and to draw attention again to this grave condition, from which total recovery is possible.

Reports of Cases

In order to give a complete picture of the group as a whole, the clinical histories already published *in extenso* are briefly summarized as Cases 1 to 3.

Case 1

Female aged 24. In January, 1949, two weeks of headache and muscular pains were followed by drowsiness, ptosis, left facial paralysis, and ataxia developing over one week, and succeeded by diplopia, dysarthria, dysphagia, and numbness down the left side of the body. The patient was easy to rouse, but dozed on cessation of stimulation. Conjugate eye movements were impaired, with coarse nystagmus; masseters and facial muscles were weak; hearing was impaired; there were left hemihypalgesia, a left extensor plantar response, and left cerebellar ataxia. Cerebrospinal fluid (C.S.F.) contained 26 lymphocytes per c.mm. and gave a paretic Lange reaction. For four weeks the signs extended

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until there was complete ptosis and total bilateral ophthalmoplegia, with total paralysis of jaw muscles and facial muscles, gross deafness, total aphagia, aphonia, and inability to lift the head or move the tongue. The remainder of the body was unchanged.

After three weeks a recovery began which was rapid at first, but later typical Parkinsonism of the head and limbs developed and lasted two months. This, in common with all other signs, totally and completely recovered, so that in ten months the patient was normal in all respects and has remained so for eight years.

Case 2

Male aged 36. In March, 1950, one week of malaise and headache was followed by drowsiness, ptosis, diplopia, and ataxia. Four days later bilateral ptosis, fixed dilated pupils, and weakness of eye movements developed. He was drowsy but easily roused, rapidly dozing again. In another three days there were gross bilateral ptosis, total palsy of all but downward eye movements, bilateral ataxia of limbs, and absent reflexes. One week later total right and partial left facial palsy developed. The C.S.F. contained 77 mg. protein per 100 ml. and showed a mildly paretic Lange reaction. Recovery began three days later, and was total and complete in two months. The patient has remained entirely normal for seven years.

Case 3

Female aged 24. Admitted in June, 1950, for ovarian cystectomy. Had headache for one week, followed by transient loss of consciousness; operation then performed, but patient remained drowsy afterwards with mild pyrexia and developed diplopia and dysarthria. Drowsiness increased for one week, then a major convulsion occurred. C.S.F. contained 153 mononuclear cells per c.mm. and gave a paretic Lange reaction. Gradual deterioration over three weeks to severe drowsiness, bilateral ptosis, total bilateral ophthalmoplegia, bilateral paralysis of jaw muscles, palate, pharynx, and tongue. There were slight deafness and slight ataxia in arms and legs. Recovery began after one week and continued over two months, accompanied by a maniacal psychosis. This last feature and all other signs completely recovered, and the patient has been entirely normal for seven years.

Case 4

(Under the care of Dr. William Gooddy and Dr. J. Hamilton Paterson)

A female aged 47 developed numbness of the left side of the body, followed three days later by vertigo, vomiting, ataxia, and weakness of the left side. After a stationary period of approximately three weeks, vomiting recurred, blurred vision developed, and left-sided ataxia increased. A week later there was further deterioration, and over the space of two weeks she progressed to a state in which she was very drowsy, there was total bilateral ophthalmoplegia, her jaw and facial muscles were paralysed, she was unable to speak or swallow, and there was a gross flaccid weakness of all limbs. The C.S.F. was normal throughout the illness.

After one week in this state she began to move her eyes and monosyllabic speech returned; two weeks later speech, swallowing, and eye movements were normal, but tremor of the head and a myoclonic tremor of the palate had developed. She then made a steady recovery except for some emotional lability, and twelve weeks after admission was able to return home. She remained entirely well, and on examination by Dr. Gooddy four years later the only abnormality found was a dubious plantar response on the left side.

Case 5

A boy aged 11 had mumps in the spring of 1954, and on getting up was giddy and unsteady for a few days. He recovered from this and throughout the summer was well except for some emotional lability. In November, 1954, he complained of headache and general malaise, which persisted for four days, when he became drowsy and confused.

One day later the drowsiness increased and gross slurring of speech and marked weakness of facial muscles developed. For three further days his condition deteriorated, and when seen at the height of the illness he was drowsy but easily rousable; there was gross paralysis of conjugate ocular movement in all but a downward direction; the jaw muscles were paralysed and there was a bilateral facial paralysis. He was unable to swallow or speak, but the tongue movement appeared little affected. There was a flaccid weakness—but not paralysis—of all movements of arms and legs, with absent tendon reflexes, equivocal plantar responses, and bilateral ataxia of limbs. His C.S.F., at normal pressure, contained 12 mononuclear cells per c.mm. and 80 mg. protein per 100 ml.

He remained in this state for about five days. Speech then began to return, followed by swallowing and later—over a period of about two weeks—by normal ocular movements. Three months after the onset there was only very slight ataxia of the legs as a residual physical sign, but there had been considerable emotional lability, and during the next year he showed marked impairment of learning capacity and had several bouts of aggressive and violent behaviour. Examination in November, 1955, a year after the onset, showed a very slight ataxia of the legs, but no other abnormal sign, and he is known to have remained physically normal for two and a half years.

Case 6

In November, 1954, a boy of 10 developed slight general malaise, which lasted for three weeks and was followed by headache and, after two days, by fever, photophobia, and vomiting. He was found then to have a mild pyrexia, minimal neck stiffness, but no abnormal neurological signs. His C.S.F. contained 28 lymphocytes per c.mm.; biochemistry normal. There was apparent improvement for six days, and then over a period of 24 hours he became drowsy, developed paralysis of facial muscles on both sides, and was apparently unable to swallow or speak or to sit up. This state of affairs persisted for four days, when he became less drowsy, facial movements, swallowing, and speech began to return, and the rigidity of arms and legs decreased. *Pari passu* with this, however, there developed a Parkinsonian tremor of the right hand and arm and slight tremor of the head, which persisted in diminishing degree for two weeks. By the beginning of February, 1955, he was entirely normal, and has remained so for two and a half years.

Case 7

In early November, 1954, a boy of 10 developed frontal headache and general malaise, which persisted for two weeks and was accompanied by some abdominal pain. He then began vomiting, his headache increased, and he became drowsy and suffered intermittent delirium. Three days later the drowsiness increased, diplopia developed, the eyelids drooped, and he had difficulty in swallowing. His C.S.F. at this stage contained 65 leucocytes per c.mm. (mainly polymorphonuclear) and 60 mg. protein per 100 ml. Over the next three days there was general deterioration, the eye movements became more restricted, the speech slurred, facial muscles weak, and swallowing more affected. Examined after a further 24 hours, he was very drowsy but easily roused, dozing off again when stimulation ceased. There was bilateral ptosis, and almost total ophthalmoplegia in all but a downward direction. The jaw muscles were very weak, the facial muscles weak on both sides, and the palate and pharynx weak. Speech was grossly slurred, and there was generalized hypotonia with absent tendon reflexes and bilateral extensor plantar responses.

Two days later total ophthalmoplegia, total facial, palatal, and pharyngeal paralysis, and complete aphonia had developed. After two further days he improved; swallowing and ocular movements returned, and speech became intelligible. Over the next two weeks there was steady recovery, and by the end of December he was neurologically entirely normal. He showed at this time, and for

some weeks afterwards, undue lability of emotions and some impairment of intellectual capacity. The former has persisted, but otherwise he has been entirely normal for two and a half years.

Case 8

In early March, 1956, a boy of 14 developed vague muscle pains and general malaise and became drowsy; three days later he complained of headache, some abdominal pain, and vomiting. The next day the headache increased and the drowsiness became profound; he had periods of restlessness and confusion and was incontinent of urine. The C.S.F. at this time contained 70 mg. protein per 100 ml., but showed no other abnormality. His condition slowly deteriorated over the next two days, his conscious level fluctuating according to the degree of stimulation; there were slight weakness of facial muscles, gross slurring of speech, difficulty in swallowing, and ataxia of the arms and legs with marked reduction of tendon reflexes. The C.S.F. contained 10 mononuclear cells per c.mm. and 70 mg. of protein per 100 ml.

At this stage he developed an extrapyramidal tremor of the head, neck, and right arm, which disappeared as further deterioration occurred in the next 24 hours; by then he was drowsy but could easily be roused, and there was bilateral ptosis and almost total bilateral ophthalmoplegia. Jaw muscles were paralysed on both sides, and there were bilateral deafness and marked paralysis of palate, pharynx, and tongue. He was unable to speak, to swallow, or to raise his head. There was abolition of tendon reflexes, but it was impossible to get sufficient co-operation to test other functions of the nervous system. Twenty-four hours after this examination he had a sudden fit, which was said to consist of extreme rigid extension of all four limbs, and in this he died.

Necropsy was carried out next day by Dr. E. W. N. Trounson. The brain was removed and fixed. No abnormality was seen with the naked eye in the brain or any other organ. The brain and portions of liver, kidney, spleen, and suprarenals were examined histologically by Dr. A. L. Woolf, who reported as follows.

In the liver there were marked periportal accumulations of lymphocytes (Special Plate, Fig. 1) with some pyknosis of adjacent liver cells. The spleen, kidneys, and suprarenals were normal.

Abnormalities in the brain were remarkably scanty. In the brain-stem there was widespread swelling and ballooning of the myelin sheaths in the less compact fibre tracts as is seen in cerebral oedema; these are illustrated in Special Plate, Fig. 2, taken from the ventral tegmental decussation through which pass the oculomotor fibres. Also in the brain-stem there was astrocytic hyperplasia (Plate, Fig. 3), the astrocytes showing "twinning" and bulkiness of cytoplasm—also seen in cerebral oedema. The nerve cells were not strikingly affected in any part of the brain, but an occasional nerve cell in the third-nerve nucleus showed a wrinkling of the nuclear membrane and commencing cytolysis. In the cerebellum there was a diffuse but slight loss of Purkinje cells, though some folia were completely devoid of these cells. The blood vessels were distended in all areas, but in the frontal lobes, around some of the vessels, there were eccentrically placed perivascular aggregations of lymphocytes.

The Clinical Syndrome

Geographical Distribution.—The number of cases is too small to attach any real importance to this, but the 1949–50 cases all occurred in Birmingham, and Cases 5, 6, and 7 all in the same month of 1954 in closely neighbouring districts of Shropshire and Herefordshire at a time when various presumed systemic virus infections were abundant amongst the local children.

Age.—One patient, with the longest course, was 47, and another 36, but all the remaining patients were below 25 years of age.

Sex.—There were five males and three females.

Prodromal Symptoms.—There was a period of from one to three weeks of general malaise and headache in all cases, and of muscular aching in some.

Onset of Central Nervous Involvement.—This was gradual in each case, and in six cases drowsiness was the first symptom. Vomiting and ataxia were presenting symptoms in the remaining two.

Early Symptoms and Signs.—Headache, present in all cases, was mild, but drowsiness was marked. Six cases had double vision and six vomiting, while five complained of unsteadiness of gait. Drowsiness was present in all cases. The patients appeared to be asleep, but were easily roused to full co-operation, though if stimulation was relaxed they would quickly slip back into sleep again. Ptosis and defective conjugate eye movements were present in all cases, while attempts at lateral or upward eye movement resulted in a coarse large-amplitude nystagmus. Downward movement was usually normal. Dysarthria was marked in six cases. Seven cases ran a low-grade pyrexia.

Period of Progression.—The time from the earliest signs to maximal disability varied: it was one week in two cases, two weeks in two cases, three to four weeks in three cases, and eight weeks in one case. In all except one the progression was slow and unremitting, and in none was it abrupt.

Signs of Maximal Disability.—In seven of the eight cases there was a total or almost total ophthalmoplegia, and in the eighth a partial ophthalmoplegia. If any eye movement remained, it was in a downward direction. Six cases had total bilateral paralysis of the motor supply of the fifth nerve, and all had total bilateral facial paralysis at some stage. Deafness was present in six; six had a total or gross paralysis of the ninth, tenth, eleventh, and twelfth nerves, and six had complete anarthria. There was loss of tendon reflexes in five cases, but with extensor plantar responses. Long-tract sensory signs were present in four.

It was striking that in no case was cardiac or respiratory distress present; muscle tenderness and signs of meningeal irritation were found only to a minimal degree in one.

Period from Maximal Disability to Total Recovery.—Excluding the fatal case, this lasted one month in three cases, three months in one, ten months in two, and seventeen months in one.

New Signs During Recovery.—Five patients developed an extrapyramidal type of rigidity and four a typical Parkinsonian tremor. In all except one case these developed during the stage of return of neurological function, but in the fatal case the signs were apparent just preceding maximal disability. Six cases, during recovery, showed emotional lability, particularly the tendency to spontaneous, inappropriate laughing and giggling. Two showed aggressive and violent behaviour.

Sequelae.—It is notable that neurological recovery has been total in six cases, the seventh having a minimal ataxia. Any extrapyramidal or Parkinsonian features have also totally disappeared. In two cases there has been some intellectual deficit, which was severe enough to interfere with education in one.

Laboratory Investigations.—These gave comparatively little information. Negative findings are not listed, but all available agglutination tests were carried out in all except one patient, with no positive result. The C.S.F. pressure was normal in all cases; there was a pleocytosis, predominantly lymphocytic, of 10–153 cells per c.mm. in five cases; the protein content was over 60 mg. per 100 ml. in four cases, the maximum being 80 mg. Three showed a paretic Lange reaction, but no abnormality in the level of sugar or chlorides was found. A blood leucocytosis of 12,000 to 16,000 cells per c.mm. was present in four cases.

Electroencephalography was performed in two cases only (Cases 1 and 3); this showed widespread delta and theta abnormality in all leads, appearing in bursts, and in the first case predominantly in right temporal leads.

Discussion

The outstanding feature of these cases has been the sub-acute development of disturbed brain-stem function so gross that at some stage in all except one case survival for even a few days seemed impossible. It is difficult in a scientific communication to convey the gravity of the patients' condition when at its worst and the drama of the degree of recovery possible.

In our original communication (Bickerstaff and Cloake, 1951) we employed the term "mesencephalitis and rhombencephalitis" in default of anything which better indicated the part of the central nervous system bearing the main brunt of the abnormality. The disease process, however, is probably widespread throughout the brain, the clinical manifestations of brain-stem involvement being so much more dramatic than other features tend to be obscured. We discussed previously the differential diagnosis and the reasons for excluding many well-known conditions capable of producing transient brain-stem disturbance. These reasons have not changed and they will not be repeated.

The pathological process must be one capable of producing suppression of function without destruction of tissue—for recovery has taken place so rapidly and so completely. It is therefore not very surprising that histological examination of the fatal case has shown so little demonstrable abnormality. It seems probable that the loss of Purkinje cells was an anoxic, terminal manifestation. The vascular distension was certainly referable to the fit in which the boy died. However, the beading and swelling of the myelin sheaths and the "twinning" and swelling of the astrocytes are of greater significance, for if such a process of oedema were widespread throughout the stem function could be suppressed, but not destroyed, and could remain in abeyance until such time as the oedema receded, when rapid recovery would be possible.

Whether or not a process of brain-stem oedema is responsible for the neurological manifestations in this condition, the fundamental cause of the syndrome remains obscure. It has always been attractive to incriminate some unknown neurotropic virus, and the similarity to some cases of encephalitis lethargica has been mentioned several times since our original paper, but the pathological details available now, though scanty, give little direct support for this view and reveal practically none of the perivascular cuffing considered so typical of virus infections of cerebral tissue. An alternative possibility is that the cerebral changes may be a secondary effect—perhaps allergic in nature—to some systemic disease. No overt clinical evidence of generalized disease was manifest to support this in these cases, but the marked periportal round-cell infiltration in the liver of the fatal case was at least suggestive of virus infection.

Taking the clinical pattern of this syndrome as a whole, there are certain similarities to the course of the so-called infective polyneuritis—the mode of onset and progression, the stationary state at maximal disability, and the rapid recovery of gross paralysis with slower final extinction of all abnormality. Indeed, several patients had lost all tendon reflexes even at a time when neither hypotonia nor paralysis of the limbs was marked. There is growing support for the view that infective polyneuritis results from an allergy or hypersensitivity to some agent or variety of agents, as yet undetermined, and the cases considered here may equally well be the clinical end-result of a variety of causal factors rather than a specific disease caused by a specific organism. This fact does not minimize the importance of recognizing the syndrome, for in view of its potentially benign outcome no effort should be spared to maintain the patient's general condition, to control fits, and to prevent inhalational bronchopneumonia, even at a stage when it appears that death must inevitably follow within a matter of hours.

The burden of care will fall upon the nursing staff. Their efforts will be even further stimulated if they realize the probability of a favourable outcome, and for the parents and relatives of the patient the hope sustained by the

medical attendants during the intensely distressing period of maximal disability is invaluable. Once deterioration appears to be checked a reasonably confident prognosis can be given—though a warning should be issued of the possibility of personality changes during the convalescence and the rather more remote danger of permanent impairment of intellectual capacity.

Summary

A description is given of eight examples of a clinical syndrome of gradual onset in which develops almost total paralysis of all motor function, originating first in the mid-brain and later in the whole brain-stem, accompanied by only mild pyramidal or long-tract sensory disturbance, and no cardiac or respiratory abnormality.

From a stationary stage of extreme gravity, dramatic total recovery has occurred in seven cases, with no neurological sequelae.

The pathology of the fatal case is described, and a state of transient cerebral oedema, possibly related to a systemic virus infection, is suggested as the basic cause.

I wish to express my thanks to Dr. William Goody and Dr. J. Hamilton Paterson for allowing me to refer to Case 4; to Drs. Hugh Fisher, J. Macaulay, and A. C. Kendall, consultant paediatricians, for referring to me Cases 5–8; and to Dr. A. L. Woolf and Dr. E. W. N. Trounson for the pathological studies on Case 8.

REFERENCES

- Bickerstaff, E. R., and Cloake, P. C. P. (1951). *British Medical Journal*, 2, 77.
Espir, M. L. E., and Spalding, J. M. K. (1956). *Ibid.*, 1, 1141.
Paterson, J. H. (1953). *Proc. roy. Soc. Med.*, 46, 726.

RETICULOHISTIOCYTOSIS (LIPOID DERMATO-ARTHRITIS)

BY

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[WITH SPECIAL PLATE]

This paper describes four patients with a similar and unusual syndrome of a widespread papular and nodular eruption and multiple arthritis. Circumscribed areas of destruction in bone were present, and in two cases this progressed to a "concertina" deformity of the fingers. Tendon-sheath swellings and patches of xanthelasma palpebrarum occurred in two of the cases. Histological examination of all involved tissue in every case showed the same type of giant cells, the cytoplasm of which appeared granular and in places finely "foamy." An unusual type of lipid has been demonstrated in these cells. Two patients died, and in both, apart from widespread infiltration of tissues by the giant cells, a fibrinous pericarditis was present.

Twelve cases showing a similar clinical picture and histology have been described in the literature under various headings, and are summarized in the Table.

Personal Cases

Case I

Mrs. E. P., a housewife. Apart from a hysterectomy for fibroids when aged 40 she had not had any previous illnesses of note. No relevant condition had occurred in the family, and her only brother and sister were alive and well. The patient had been married for 25 years, but was childless. In December, 1949, at the age of 49, she developed painful swelling of the finger, shoulder, and knee joints. At the same time an eruption appeared on the fingers, elbows, both pinnae, the radial aspects of both forearms, and over the manubrium sterni. She came under our observation in July, 1950, and was seen at regular intervals until she died in 1952. When she was first seen there was a widespread papulo-nodular eruption, sheets of yellow-brown papules 0.2–2 cm. in diameter and associated with erythema being present over the forehead, ears, neck, naso-labial furrows, outer aspects of forearms and upper arms, the nail folds, the sacral region, and the anterior aspects of the thighs and lower legs. At the periphery of the involved patch of skin they were occasionally in linear distribution. The larger nodules were present on the scalp, both pinnae, bridge of nose, chin, elbows, dorsum of most fingers, sacral area, and knees. These tended to be purplish in colour. They were well raised from the skin surface and some were confluent (Fig. A). Local heat and pressure did not increase or decrease the number or size of the nodules. The teeth were healthy, but a few papules were present on the lips and gingival margins (Fig. B), the fraenum and posterior part of the tongue, and extending into the tonsillar recesses. There was widespread involvement of the joints associated with moderate pain and often considerable swelling and limitation of movement. Shoulders, elbows, wrists, finger-joints, knees, and ankles were involved. The axillary and inguinal lymph nodes were slightly enlarged. Blood pressure 180/100 mm. Hg.

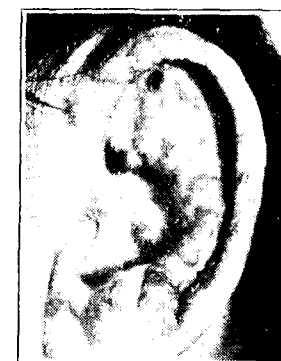


FIG. A.—Case I. Nodules and papules on ear.

Clinical Course.—Many of the larger nodules remained unchanged, but a few new ones appeared. At times the sheets of papules became less prominent and the erythema faded, but for periods of a few weeks they were more marked and itching occurred. Seven months after the onset four or five large, typical xanthelasma palpebrarum patches were observed. In 1951 an irregular swelling developed in front of the wrists and appeared to be arising from the tendon



FIG. B.—Case I. Papules on upper lip.

sheaths; it remained for six months. The joints became worse and new ones were involved, including the hip, shoulder, sacro-iliac, vertebral, and temporo-mandibular joints. The finger and toe joints became unstable and the fingers shorter, causing wrinkling of the skin. A general kyphosis developed. The patient lost 3 stones (19.1 kg.) in weight, chiefly during the first year of the illness. There were long periods of intermittent moderate pyrexia usually coinciding with the exacerbations of the joint and skin lesions. The general condition steadily deteriorated, and in December, 1952, she developed fever and a cough and died after a few days.

Treatment did not appear to have any effect, and included A.C.T.H. (12.5 mg. twice daily for three weeks) and a low-fat diet over a period of two months. X-ray treatment (a single dose of 400 r at 85 kV) had no effect on the cutaneous nodules.

Investigations.—Blood Wassermann and Kahn reactions negative. Erythrocyte sedimentation rate (Westergren) varied from 5 to 41 mm. in one hour. Blood cholesterol 125–180 mg. per 100 ml. Serum calcium and plasma protein levels, blood counts, glucose tolerance curve, and liver function tests were within normal limits. The bone marrow showed an unusually high number of monocytes, of which a few contained a slightly foamy cytoplasm. The electrocardiograph showed a low T_2 and inverted T_3 . Mantoux reaction: 1 in 1,000 negative; 1 in 100 positive. Analysis of an excised nodule showed 8% total ether-soluble lipids.

X-ray Examination.—On chest radiography calcified lesions were present in the right apex and some pleural adhesions in the right costophrenic angle. At the first

examination of the bones (August, 1950) a generalized osteoporosis was apparent, with numerous small marginal zones of subcortical destruction of bone adjoining the interphalangeal and midcarpal joints. These small zones of bone destruction gradually increased in size; new ones appeared, and by December, 1950, the hands, wrists, shoulders (Special Plate, Fig. 1), knees, and hips were extensively involved. Zones of bone destruction were also present in the posterior articular facets of the spine, the costo-transverse joints, the greater and lesser trochanters of the femora, the ischial tuberosities, and by May, 1951, in the anterior angles of the vertebral bodies. The skull showed no change.

Post-mortem Findings and Histology.—The body fat in general was reduced in amount and deep yellow-brown in colour. Submucous nodules were present on the posterior third of the tongue and in the larynx. The thyroid appeared normal. There were recent small bilateral pleural effusions. The lungs were congested, with collapse of the left lower lobe. A fibrinous pericarditis was present with an accumulation of some 300 ml. of heavily blood-stained exudate. The heart was enlarged, with dilated chambers and a soft, flabby myocardium. Valves and coronary arteries showed only moderate atheroma. Scattered peritoneal adhesions were present, including some recent ones over the anterior surface of the liver and enveloping the spleen. The liver, of normal size, showed on section a typical "nutmeg" appearance. The gall-bladder, kidneys, suprarenals, stomach, intestines, and right ovary were normal; the uterus and left ovary had been previously removed. There was widespread destruction of the articular cartilages; areas of firm granulation tissue extended into the underlying cancellous bone.

Details of Twelve Similar Cases Recorded in the Literature

Serial No.	Authors	Title Given	Sex and Age	Joints Affected	Skin Lesions	Other Clinical Findings	Course	Comments
1	Targett (1897)	—	F 65	"Rheumatic and gouty habit"	Small tumours on fingers	—	—	—
2	Parkes Weber and Freudenthal (1937); Parkes Weber (1943, 1944, 1948, 1955)	Non-diabetic cutaneous xanthomatosis with hypercholesterolaemia and atypical histological features	M 35	Knees and other joints	Widespread, chiefly on hands, face, elbows, and buttocks	Loss of weight and intermittent fever. Tendon-sheath tumours on back of wrists	Gradual improvement over period of 10 years; many nodules disappeared	Blood cholesterol 350 mg.% (one occasion). Improvement followed fat-poor diet
3	Portugal et al. (1944)	Histiocytomatosis gigantocitaria generalizada	M 44	Widespread joint involvement	Widespread papules and nodules	Tendon-sheath tumours	Some papules and nodules disappeared	—
4	Graham and Stansfield (1946)	A case of hitherto undescribed lipoidosis simulating rheumatoid arthritis	M 20	Widespread joint involvement of rheumatoid arthritis pattern	Nodules and papules on scalp, face, elbows, wrists, fingers, and back	Kyphosis and depression of sternum	A sarcoma developed in the axilla, from which the patient died	At necropsy giant-cell infiltration found in muscle, periosteum, synovial membrane, and bone
5	Caro and Senear (1952)	Reticulohistiocytoma	M 50	Hands, feet, spine, and jaws	Papules and nodules on hands, elbows, face, and ears	—	Some papules and nodules disappeared, but new ones developed	—
6	Caro and Senear (1952)	Reticulohistiocytoma; but prefer the term "reticuloendothelial granuloma"	F 36	Hands, wrists, and knees	Papules and nodules on face, ears, neck, forearms, and fingers	—	After 4 years skin lesions were smaller	—
7	Montgomery (1952; in discussion following presentation of Cases 5 and 6)	Reticulohistiocytoma	M 30	Nil	Papules on face, arms, and trunk	—	Papules later disappeared	—
8	Montgomery (1952; in discussion following presentation of Cases 5 and 6)	Reticulohistiocytoma	F 24	Fingers and other joints swollen	Papules on scalp, forehead, nose, neck, and arms	—	—	—
9	Allington (1950; and in discussion following presentation of Cases 5 and 6)	Reticulohistiocytoma	F 66	Chronic rheumatoid arthritis	Nodules on face, ears, forearms, and ankles	Thyroid adenoma	After 4 years most nodules had disappeared and joints had improved	Improvement followed thyroidectomy
10	Laymon (1952); also Goltz and Laymon (1954)	Reticulohistiocytoma and multicentric reticulohistiocytosis of skin and synovia	M 52	Back, fingers, knees, and shoulders	Papules over fingers, hands, ears; nodules over knuckles	Tendon-sheath tumours of wrists	Skin cleared after 6 months; died one month later of carcinoma of colon	Condition began 4 months after resection of adenocarcinoma of colon
11	Goltz and Laymon (1954)	Multicentric reticulohistiocytosis of skin and synovia	F 40	Neck and limb joints	Papules over forehead, scalp, shoulders, chest, and on fingers	Tuberculous lymph node in axilla	—	—
12	Davies and Wood (1955)	Reticulohistiocytoma	F 47	Rheumatoid type of arthritis affecting hands, knees, and other joints	Papules over fingers, neck, ears, and scalp	—	In 3½ years joints became worse, but papules retrogressed and became minimal	This is Case 1 of these authors; their Case 2 is of a solitary nodule and not included here

The changes were most prominent in the knee and shoulder joints.

Histologically, the epidermis was normal. The nodules situated in the upper half of the dermis consisted of an aggregation of large rounded or oval multinucleate cells enveloped in a scanty fibrillary stroma. The cells varied in size up to 50 μ in diameter, and contained from one to twenty or more nuclei, small, compact, and irregularly disposed within the cell. The abundant cytoplasm was eosinophilic, and in most of the cells of homogeneous texture; a faint granularity was discerned in some, and in a few there was a very fine foamy appearance. The submucous laryngeal nodule showed the same appearance. In contrast with the nodules, the xanthelasma palpebrarum lesions showed typical lipid cells, coarsely vacuolated and staining readily with Scharlach R. The granulation tissue from the eroded areas of bone consisted of large, sometimes multinucleate, cells with abundant eosinophilic slightly granular cytoplasm, closely packed in a scanty stroma which was free from inflammatory cells (Special Plate, Fig. 2). The cells were essentially similar to those found in the skin lesions. In some areas distant from the giant-cell accumulation, connective-tissue cells were swollen and interspersed with larger rounded cells similar to those constituting the main bulk of the "tumour." Transitional forms were seen, suggesting that the giant-cell aggregations were derivatives of the synovial fibrocyte. Apart from the skin nodules and joints, the same large cells were found scattered through the dermis and subcutaneous tissues, in bronchial lymph nodes and endocardium. No similar change was demonstrated in kidney, ovary, or spleen.

Histochemical Investigations.—Examination of frozen sections of skin and a subcutaneous nodule with the usual series of Sudan stains failed to demonstrate any lipid except for a faintly positive result with the periodic-acid-Schiff (P.A.S.) technique. The Sudan dyes (chiefly Sudan IV) were originally used, either as a saturated solution in 70% ethanol or in Herxheimer's fluid. Later it was found that a more complete dye transfer from solvent to lipid phase of the section was obtained by the use of the dye as a saturated solution in pyridine (50%) solvent. With this technique, sudanophilic material (S.M.) was found in considerable quantities, mainly in regions of compact collagen fibres, either related to groups of the giant cells or lying free between the fibres. In addition it was present in fibrocytes deeply placed in sheets of apparently normal capsular collagen fibres and in certain chondrocytes. The intracellular and extracellular globules of S.M. were of fairly uniform size (0.7–1.6 μ); they showed birefringency of a low order, and notably in synovial cells and chondrocytes were circumferential.

Further histochemical investigations were made on serial frozen sections to detect any sudanophilic lipid which might be "masked" by virtue of chemical combination with proteins, polypeptides, or mucopolysaccharides. No proteolytic dissociation was demonstrated after incubating sections in a solution of papain for one hour at 37° C. No change was noted after alkaline hydrolysis, but acid hydrolysis with 10% acetic acid for one hour at 37° C. or N/1 hydrochloric acid for eight minutes at 56° C. gave a moderate increase in the amount of both intra- and extracellular S.M. There was no increase in S.M. after incubating sections in hyaluronidase solution for 19 hours at 37° C., although certain structures formerly P.A.S.-positive became P.A.S.-negative. Prolonged attempts at defatting sections (ether, chloroform, xylol, di- and tri-chlorethylene) for periods up to five days reduced only slightly the fine diffuse pinkish sudanophilia of the cytoplasm of the aggregated giant cells, but completely eliminated the larger intra- and extracellular globules of S.M. and the neutral fat of tissue lipocytes.

The results of these investigations did not reveal the presence of lipid in combination with either protein or mucopolysaccharide. The moderate increase in S.M. after weak acid hydrolysis may indicate the presence of some polypeptide-lipoid complex which was mainly intracellular

in site. Furthermore, the results obtained would suggest that the intra- and extracellular S.M. was probably chemically similar.

Case II

Mrs. F. M. G., a housewife. There had been no previous significant illness and there was nothing relevant in the family history. In September, 1947, when aged 50, the patient noticed some yellowish marks on the left upper eyelid, and in March, 1949, slightly itching papules appeared on the face, ears, and arms. She came under our observation in September, 1949, when examination revealed sheets of closely set, shiny reddish-brown papules, varying in diameter from 1 to 3 mm., over the pinnae, behind the ears, in the eyebrows, on both cheeks, the sides and bridge of the nose, the extensor



Fig. C.—Case II. Papular eruption on forearms.

surfaces of both arms (Fig. C), and over both shins. The areas so affected were slightly erythematous. Five or six xanthelasma palpebrarum lesions of 0.5–1 cm. diameter were present on both upper eyelids. No lesions were apparent on the buccal mucous membrane.

Clinical Course.—By March, 1950, the papules round the ears and on the cheeks had almost disappeared and those on the forearms had become flatter; the xanthomatous plaques on the upper eyelids were less noticeable. However, by September, 1951, the nodules had again become more prominent and then involved the V of the neck. Only one of the xanthelasma palpebrarum lesions remained. In October, 1952, she complained of pain in both knees, and later in the shoulders and ankle-joints. From 1952 to 1954 the sheets of papules cleared in some areas, but fresh lesions appeared, usually at the edge of the fading patches.

When seen again in 1956 the eruption was widespread, with clear areas of skin on the points of the elbows and knees, in the axillae, behind the knees, and on thighs and buttocks. In many places these clear areas were ringed by a continuous edge of fused papules. Papules were also present on the lips. Certain areas where nodules had been noted previously were now clear, but had an atrophic wrinkled appearance. There was no sign of the xanthelasma palpebrarum patches. A tendon-sheath swelling was present on the front of the left wrist. She complained that the joints had gradually become stiffer, being worse in the hot weather. The spleen and liver were easily palpable. Enlarged lymph nodes were present in the right axilla.

Investigations.—Wassermann and Kahn reactions negative. Blood cholesterol 130–250 mg. per 100 ml. Plasma protein level, blood count, glucose tolerance curve and liver function tests within normal limits.

X-ray Examination.—A progressive change was noted starting in June, 1952, with small areas of decalcification in one phalanx, the left os magnum and scaphoid. Further erosions developed on the phalangeal margins in both hands and feet, and on the right scapula at the site of insertion of the supraspinatus tendon. By January, 1956, new areas of bone destruction were demonstrated in the right scaphoid and os magnum.

Histology.—Sections from a skin nodule showed essentially the same picture as in Case I. In addition some smaller elongated cells with similar cytoplasm appeared to represent transitional forms between the stroma fibrocytes and the fully developed giant cells.

Case III

Mrs. J. L., a housewife. In 1950, when aged 48, she had complained of itching, followed three months later by pain in the joints and shining brown papules on the hands. Papules then gradually developed on nail folds, backs of fingers, hands, arms, face, neck, buttocks, thighs, and lower legs. Larger nodules appeared over elbows and knees. Papules were present on the tongue and mucous membranes of the mouth and pharynx down to the level of the thyroid cartilage. The joints became more swollen and stiffer until the patient was almost immobile. Her general condition gradually deteriorated; she lost weight, and finally died in April, 1954.

X-ray Examination.—Sharply defined and rounded areas of osteoporosis without evidence of bone reaction were present in outer ends of clavicles, bones of hands and fingers, and to a less extent in legs, feet, and upper part of right radius.

Post-mortem Findings and Histology.—Dr. R. B. T. Baldwin has kindly furnished us with the necropsy report and material for histological examination.

A diffuse thickening was present round the vocal cords, with pea-sized nodules on the right side. The lungs showed a purulent bronchitis and a small infarct at the right base. There was an acute fibrino-purulent pericarditis. The heart chambers were dilated and the muscle was soft and pale. The bronchial and hilar lymph nodes were enlarged; there was a severe cardiac cirrhosis of the liver and the spleen was moderately enlarged.

Histologically, the skin nodules showed essentially the same appearances as in Case I. The giant cells were particularly large, being up to 100 μ in diameter (Special Plate, Fig. 3). The bronchial lymph nodes showed large aggregations of the same type of giant cell as seen in the skin nodules. An incidental and unexpected finding was infiltration of the hilar lymph nodes by carcinoma suggestive of a bronchial origin, although no primary growth was discovered in the lungs or elsewhere.

Case IV

Mrs. E. H., a housewife. In October, 1944, when aged 25, she complained of itching over the abdomen, and a month later had pain, swelling, and stiffness in the wrists, fingers, ankles, and shoulders. She was given a course of intramuscular injections of gold in January, 1945, and during this treatment papules developed on the ankles, face, eyelids, external auditory meati, and central upper back. The condition gradually progressed, and in May, 1945, she was admitted to the Radcliffe Infirmary, Oxford, under the care of Dr. A. B. Carleton; and in 1947 to the Leeds General Infirmary under Dr. J. T. Ingram, where she was seen by one of us (R. P. W.). At this time the eruption was chiefly present over the outer upper arms, front and outer aspects of the thighs, lower abdomen, ears, neck, cheeks, and forehead. It consisted of dusky brown-red shining papules, often follicular and in some areas linear in distribution. The mouth and tongue were clear. She was unable to walk, and the fingers showed concertina type of deformity.

Investigations.—Blood total cholesterol 98-190 mg., free cholesterol 63 mg., and cholesterol esters 127 mg. per 100 ml. Serum calcium plasma protein, blood Wassermann and Kahn reactions, and E.S.R. all normal; Mantoux reaction positive to 1 in 10,000.

X-ray Examination.—Punched-out defects involving carpal bones and terminal phalanges of both thumbs and fingers were reported in 1945. By April, 1948 (Dr. G. H. Illingworth), there was extensive destruction of the proximal and distal interphalangeal and metacarpo-phalangeal joints, and of the wrist joints, leading to telescoping of the fingers (Special Plate, Fig. 4). There were similar changes in the metatarso-phalangeal, tarsal, ankle, and elbow joints. Areas of decalcification were also present in the shafts of the radius and ulna on both sides. A chest skiagram in April, 1957, showed diffuse mottling throughout both lungs.

Histology (Professor D. H. Collins).—In the corium were ill-defined cell groups containing giant cells with up to a score of nuclei and an abundant slightly "foamy" cytoplasm. A few histiocytes, lymphocytes, neutrophils, and eosinophils were also present. Scharlach R stained a small amount of lipid in the giant cells a rusty colour. The appearances were essentially similar to those of the section from Case I.

Discussion

Clinical Features

The average age of onset was 42, with extremes of 20 and 66 years. There were ten females and six males. One patient had a sister with widespread joint disease, but apart from this there was no family history of similar complaints, nor was there any significant past history. In eight cases the onset of the eruption and the joint symptoms coincided. In five cases the joint symptoms preceded the eruption, respectively by two months, six months, one year, four years, and several years. In Case II the rash developed two years before the involvement of joints. The papules and nodules were from 0.2 to 2 cm. in size. The smaller ones, shining and yellow-brown in colour, were chiefly in patches to one or two areas, but in some became widespread. The commonest areas involved were the backs of the hands and fingers, outer aspect of the forearms and upper arms, forehead, margin of the nose, ears, and on the fronts and sides of the neck, including the V. The larger nodules were more purple and present over bony prominences, including the elbows, knees, scalp, bridge of nose, chin, sacral area, and prominent and occasionally disappeared. Papules were present on mucous membrane in four cases. All cases except No. 7 (see Table), about which very few clinical details are available, had pain and often swelling of numerous joints, often involved, and the clinical picture was that of rheumatoid arthritis with in some cases severe crippling. Tendon-developed plaques of xanthelasma palpebrarum, which after a period of one to two years gradually faded. Two cases had enlarged lymph nodes, and in one of these the spleen and liver became palpable. Bouts of pyrexia occurred and there was considerable loss of weight in Case I.

Of 11 cases where the clinical course is known, the eruption retrogressed in seven and completely disappeared in two of these. The joint condition gradually progressed in three of these cases, but in one it improved and in one other, after a period of seven years, the active process appeared quiescent. Four patients died 4 years, 11 months, 3½ years, and 3 years after the onset, the cause of death being malignant neoplasm in the first three and undetermined in Case I. Case II improved following a fat-poor diet. Other cases improved after a similar period without such a diet, and in Case I two months on a low-fat diet while in hospital had no apparent effect.

Pathological Features

Case II had a raised blood cholesterol level (350 mg. per 100 ml.) and Cases II and III each on one occasion had readings of 250 to 235 mg. per 100 ml. respectively. The histological picture of all the material examined was dominated by the presence of a varying number of the same type of unusual large cell. Apart from the aggregations in the skin and synovia, similar isolated cells were demonstrated in the marrow, lymph nodes, endocardium, voluntary muscle, perimorphological grounds it seems likely that these abnormal cells were neoplastic. Transitional cells between fibrocytes and the giant cells suggest that the latter were derived from the fibrocytes of the skin, synovial membrane, and elsewhere. The cytoplasm of the giant cells did not show the usual staining reactions of lipid, and it is suggested that the material may be a polypeptide-lipoid complex. The fact that this material was shown to be present in small

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M. CAMPBELL, C. NEILL, AND S. SUZMAN: ATRIAL SEPTAL DEFECT

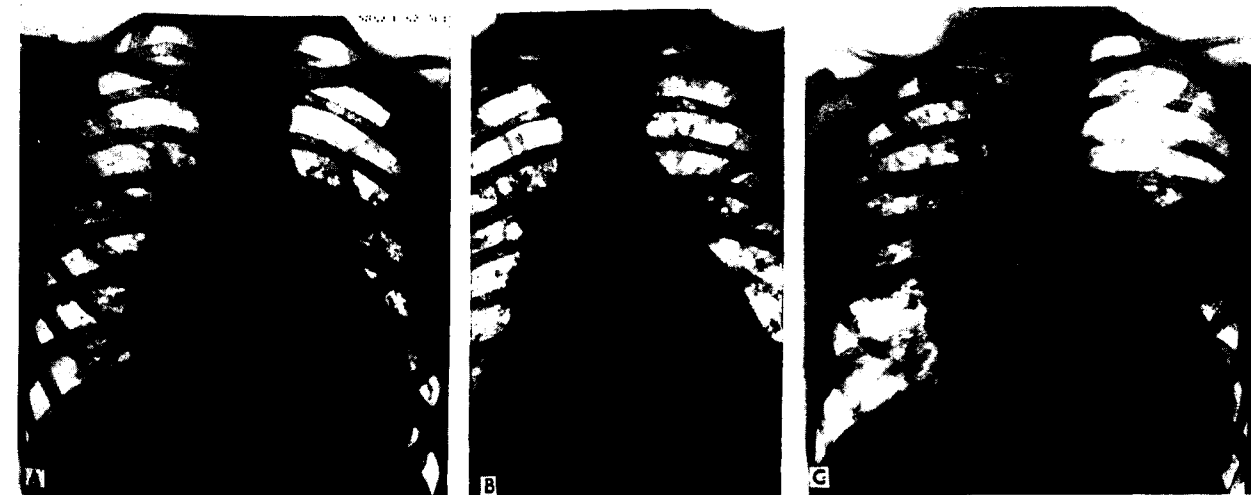


FIG. 1.—Characteristic teloradiographs from children with atrial septal defect. (A) From a girl aged 10 (C.T.R. 55%; P.A.P. 39/0 mm. Hg.). (B) From a girl aged 10 (C.T.R. 55%; P.A.P. 42/5 mm.). (C) From a girl aged 14 (C.T.R. 67%). All three patients in good health six years later.

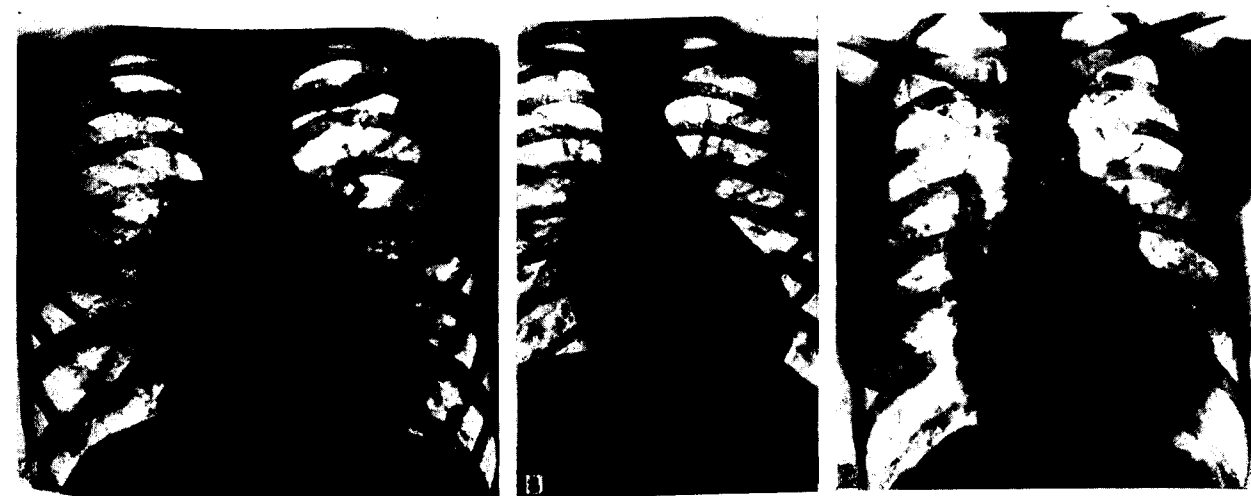


FIG. 2.—Teloradiographs characteristic of atrial septal defect with greater prominence of right atrium. (A) From a girl aged 9 (C.T.R. 60%; P.A.P. 40/2 mm.). (B) From a boy aged 11, whose heart has since become smaller (C.T.R. 60%; P.A.P. 35/2 mm.). (C) From a woman aged 48 (C.T.R. 70%; P.A.P. 33/12 mm.).



FIG. 3.—Three large hearts with shapes that are less usual in atrial septal defect. (A) A very large heart from a man aged 27 (C.T.R. 66%; P.A.P. 64 mm. mean). (B) A very rectangular heart owing to the large pulmonary trunk, from a boy aged 16 (C.T.R. 63%; P.A.P. 74/56 mm.). (C) A heart that appears lop-sided from the very large right atrium, from a woman aged 26 (C.T.R. 63%; P.A.P. 87/27 mm.).

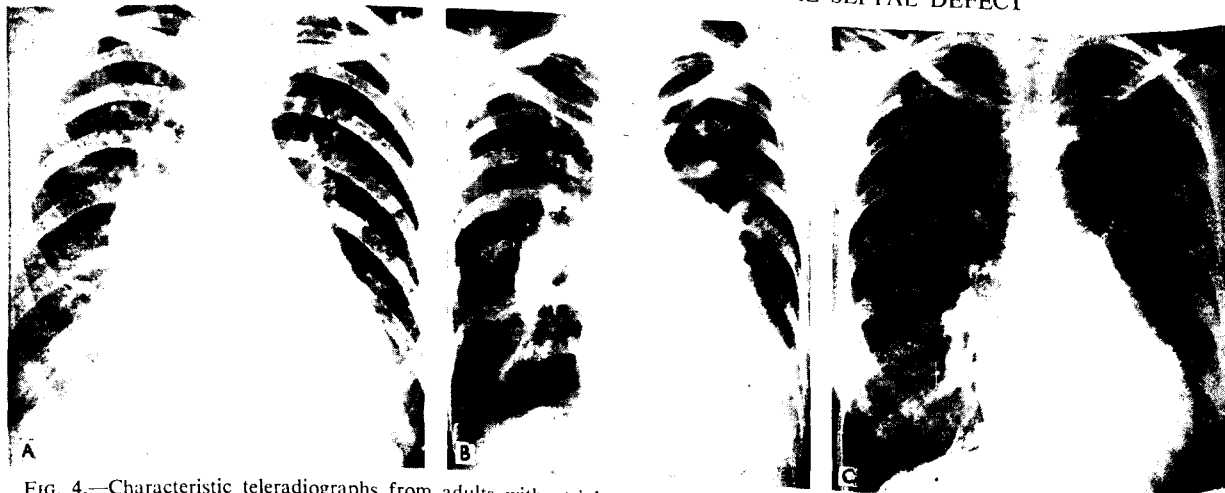


FIG. 4.—Characteristic teleradiographs from adults with atrial septal defect. (A) From a woman aged 37 (C.T.R. 63%; P.A.P. 30/13 mm.). (B) From a woman of 33 (C.T.R. 60%; P.A.P. 100/40 mm.). (C) From a woman aged 37 (C.T.R. 57%; P.A.P. 27/7 mm.).



FIG. 5.—Three more hearts of unusual shape, all from adults with atrial septal defect. (A) From a woman aged 20, the youngest example of pulmonary regurgitation from hypertension (C.T.R. 68%; P.A.P. 115/35 mm.). (B) Unusual prominence of pulmonary artery which has been noted for 30 years without gross enlargement of heart, from a woman now aged 43 (C.T.R. 56%). (C) Aneurysmal dilatation of right atrium as demonstrated by two positions taken up by the catheter, from a nurse aged 37, who is still doing some work four years later (C.T.R. 79%; P.A.P. 11 mm. mean).

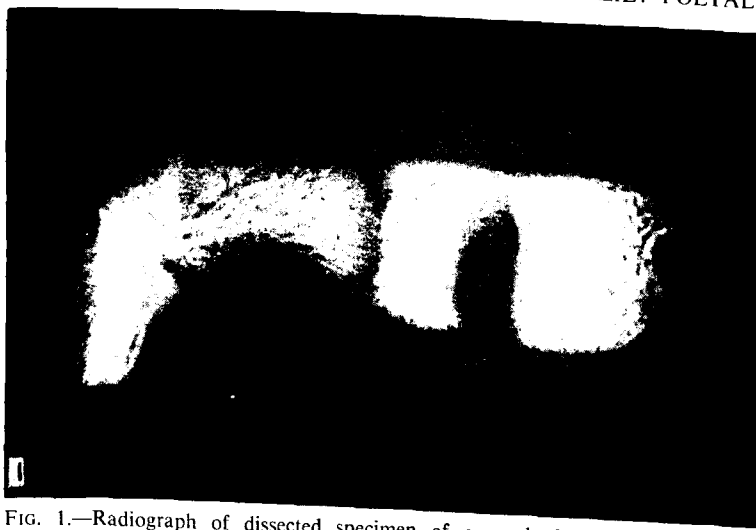


FIG. 1.—Radiograph of dissected specimen of coronal cleft vertebra showing typical defect. (x6.)

FIG. 2.—Postero-anterior radiograph of intrauterine foetal spine demonstrating almost complete coronal cleft of LV 2 and partially closed cleft of LV 3 and 4.

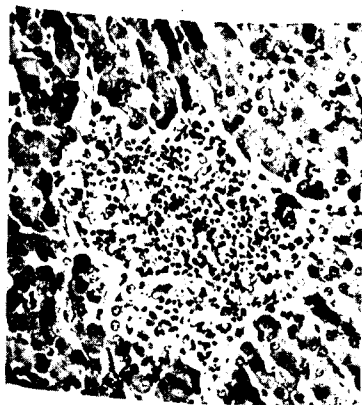


FIG. 1.—Case 8. Section of liver, showing marked round-cell infiltration of portal tract with commencing pyknosis of adjacent liver cells. (Stained haematoxylin and eosin. x158.)

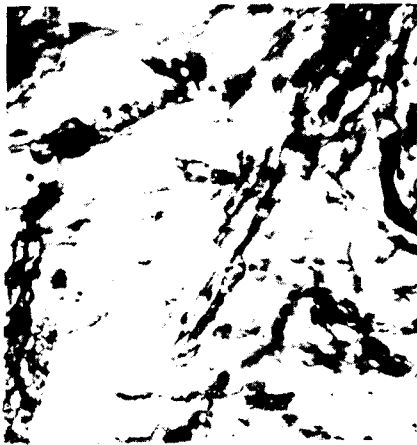


FIG. 2.—Case 8. Section from mid-brain, showing swelling and beading of myelin sheaths. (Weelcker stain. x565.)

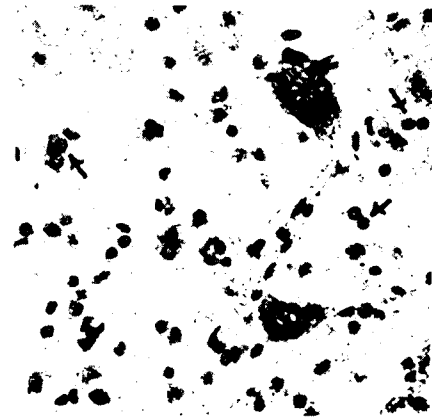


FIG. 3.—Case 8. Section from region of third-nerve nucleus, showing swelling and "twinning" of astrocytes (arrowed). (Nissl stain. x264.)



FIG. 1.—Case I. Head of right humerus, showing progressive destruction: (A) January, 1951; (B) August, 1951. (C) Post-mortem section showing replacement of spongiosa by swollen synovial tissue.



FIG. 2.—Case II. Photomicrograph taken from the edge of an eroded area in the head of the humerus, showing replacement by synovial granulation tissue packed with giant cells similar in morphology to those of the skin lesions. (x200.)

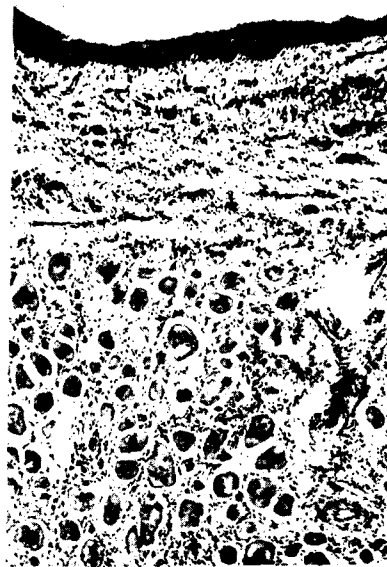
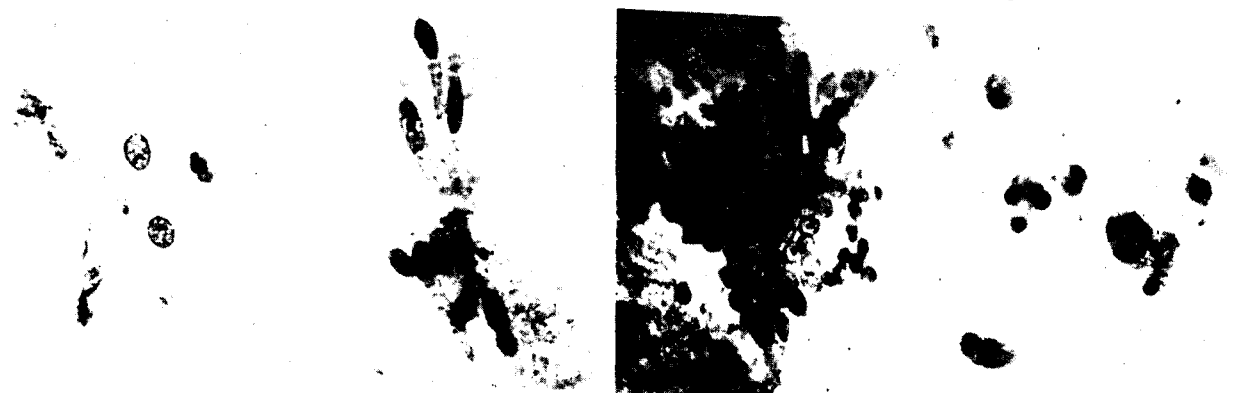


FIG. 3.—Case III. Photomicrograph of skin nodule, showing abundant multinucleate giant cells. (x40.)



FIG. 4.—Case IV. Radiograph of hand, showing gross bony destruction.

D. J. OAKLAND: EXFOLIATIVE CYTOLOGY OF COLON AND RECTUM

FIG. 1.—Squamous cells with halos around nuclei. ($\times 840$.)FIG. 2.—Columnar epithelial cells. ($\times 480$.)FIG. 3.—Columnar epithelial cells viewed end on. ($\times 240$.)FIG. 4.—Degenerate cells ($\times 225$.)FIG. 5.—Exfoliated malignant cells (carcinoma of rectum). ($\times 1050$.)FIG. 6.—Exfoliated malignant cells (carcinoma of sigmoid). ($\times 300$.)FIG. 7.—Abnormal columnar epithelial cells (case of proctitis). ($\times 300$.)

D. G. COTTOM AND N. A. MYERS: CONGENITAL LOBAR EMPHYSEMA

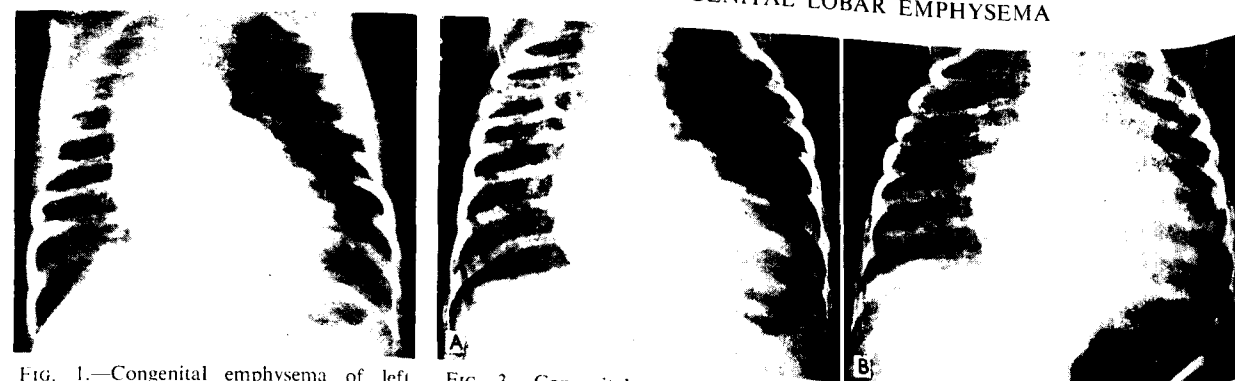


FIG. 1.—Congenital emphysema of left upper lobe (Case 1).

FIG. 3.—Congenital emphysema of left upper lobe associated with patent ductus arteriosus (Case 5): (A) pre-operative; (B) post-operative.

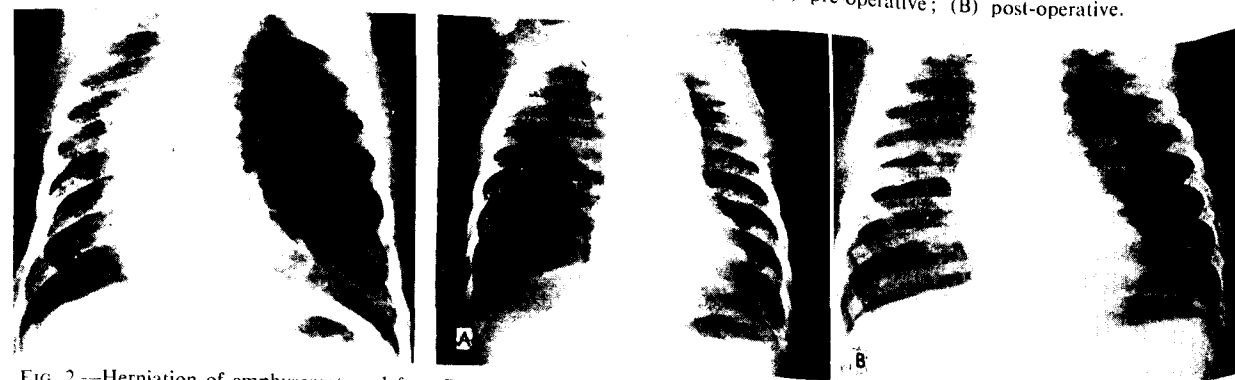


FIG. 2.—Herniation of emphysematous left upper lobe (Case 2).

FIG. 4.—Congenital emphysema of right middle lobe showing considerable tension: (A) pre-operative; (B) after right middle lobectomy.

amounts in cells in a relatively isolated position argues strongly in favour of an intracellular origin rather than histiocytic phagocytosis.

Radiological Features

The radiological appearances show many features resembling rheumatoid arthritis, but differ in a number of ways: the bone is destroyed rapidly, whereas the destruction of articular cartilage proceeds more slowly; involvement of the terminal interphalangeal joints is extensive; some unusual joints, such as the posterior articulations of the lumbar spine and the costotransverse joints, are affected; some bony sites other than joints are involved—for example, the connective-tissue attachments on the femoral trochanters, ischial tuberosities, anterior angles of vertebral bodies, and the shafts of long bones such as the radius and ulna.

Relationship to Allied Conditions

Although cases similar to those here presented cannot be found in the literature of the xanthomatous disorders, certain features, notably the multiple xanthelasma palpebrarum and presence of giant cells laden with sudanophilic material, indicate a connexion. There is a histological resemblance to the giant-cell synovioma of tendons and joints, and, although clinically the conditions are not clearly related, it is to be noted that five of the cases in the series developed tendon sheath tumours. Granular-cell myoblastoma also has a similar histological appearance. Such tumours are usually solitary, although a few cases of multiple myoblastomata have been described (Bloom and Ginzler, 1947; Powell, 1946). None of these has a close clinical resemblance to the cases included here, and no similar bone and joint changes are described. It is interesting that Pearce (1950) has shown that the cytoplasm of the granular-cell myoblastoma contains a lipid probably in combination with protein and sugars or amino-alcohols. Subcutaneous nodules in rheumatoid arthritis may be widespread, but never approach the dissemination and the papular appearance of the cases described here, nor is the histology similar. Fletcher (1946) reported a case of severe rheumatoid arthritis in which after 4½ years extensive subcutaneous nodules developed. These showed an appearance more like the necrobiotic nodule of rheumatoid arthritis, but numerous "foam cells" and many multinucleated giant cells were present. Presumably this case is closely related to the series under discussion.

It is suggested that the condition is due to an abnormality in connective-tissue metabolism probably akin to that which occurs in rheumatoid arthritis. However, in the series of cases now described the histochemistry of this change and the resulting histology are different.

Recently cases of this condition have been reported under the heading of reticulohistiocytoma or reticulohistiocytosis. This title does not seem adequate to describe the clinical condition or the underlying disordered connective-tissue cell biochemistry. The term "lipoid dermatitis" is preferred.

Summary

Four patients having an unusual eruption and arthritis are described. Twelve cases with a similar clinical and histological picture have been recorded in the literature under various titles. The eruption consists of sheets of yellow-brown papules over the backs of the hands and fingers, the face, forearms, and other areas, being widespread in some cases. Purple nodules are also present. Xanthelasma palpebrarum and tendon-sheath swellings may occur. The joint condition resembles a severe rheumatoid arthritis, with a number of minor differences and marked bone destruction. The histology of all involved tissue shows the same type of giant cell with an abundant granular cytoplasm which probably contains a lipid-polypeptide complex.

We should like to thank the numerous clinicians, pathologists, and radiologists who have been concerned in the management

of these cases. In particular we would like to thank Dr. J. T. Ingram and Dr. E. Ritter for permission to include Case III, and Dr. J. T. Ingram to include Case IV. Professor C. B. Perry has very kindly given us helpful advice in the preparation of the paper. Our thanks are also due to Mr. J. E. Hancock for the photomicrographs.

REFERENCES

- Allington, H. V. (1950). *Arch. Derm. Syph. (Chicago)*, 62, 452.
Bloom, D., and Ginzler, A. M. (1947). *Ibid.*, 56, 648.
Caro, M. R., and Seneac, F. E. (1952). *A.M.A. Arch. Derm. Syph.*, 65, 701.
Davies, B. T., and Wood, S. R. (1955). *Brit. J. Derm.*, 67, 205.
Fletcher, E. T. D. (1946). *Ann. rheum. Dis.*, 5, 88.
Goltz, R. W., and Laymon, C. W. (1954). *A.M.A. Arch. Derm. Syph.*, 69, 717.
Graham, G., and Stansfield, A. G. (1946). *J. Path. Bact.*, 58, 545.
Laymon, C. W. (1952). *A.M.A. Arch. Derm. Syph.*, 66, 647.
Montgomery, H. (1952). *Ibid.*, 65, 708.
Parkes Weber, F. (1943). *Brit. J. Derm.*, 55, 1.
— (1944). *Ann. rheum. Dis.*, 4, 3.
— (1948). In McKenna, R. M. B.: *Modern Trends in Dermatology*. Butterworth, London.
— (1955). *Lancet*, 2, 395.
— and Freudenthal, W. (1937). *Proc. roy. Soc. Med.*, 30, 522.
Pearce, A. G. E. (1950). *J. Path. Bact.*, 62, 351.
Portugal, H., Fialho, F., and Miliano, A. (1944). *Rev. argent. Dermatol.*, 28, 121.
Powell, E. B. (1946). *Arch. Path. (Chicago)*, 42, 517.
Targett, J. H. (1897). *Trans. path. Soc. Lond.*, 48, 230.

EXFOLIATIVE CYTOLOGY OF THE
COLON AND RECTUMPRELIMINARY REPORT ON THE RECTAL
WASHING TECHNIQUE

BY

D. J. OAKLAND, M.B., Ch.B., F.R.C.S.

(From the Surgical Research Laboratories, Queen Elizabeth Hospital, Birmingham)

[WITH SPECIAL PLATE]

Earlier reports on the cellular content of rectal discharges were made by those concerned with the diagnosis of specific inflammatory disease of the colon—that is, bacterial and amoebic dysentery (Dutcher, 1903; Jurgens, 1907; Anderson, 1921; Callender, 1925). Their interest was necessarily confined to the bacterial and parasitic content of the rectum and colon. In recent years there have been several papers in the American literature on the cytological content of the rectum and colon and the recognition of exfoliated malignant cells in cases of neoplastic disease of the large bowel. One of the problems for the cytologist working in this field is the difficulty of obtaining suitable specimens from such a large organ as the colon. A variety of techniques have been described, but none is entirely satisfactory, particularly where the lesion is situated in the proximal colon.

Previous Investigations

Bercovitz (1941) examined the cellular content of bowel discharges in a very large number of patients with normal and diseased large bowel and described the cellular flora, but did not report the presence of malignant cells in his cases of large-bowel tumour. In 1947 Wiseman *et al.* made a brief report on the diagnosis of carcinoma of the colon at various locations from the splenic flexure down to the rectum by the examination of smears prepared from the rectal contents obtained during proctoscopy. Wiseman *et al.* (1949) later reported their experiences with smears taken during sigmoidoscopy as well as proctoscopy with reference to the diagnosis of malignant epithelial tumours. The accuracy of cytological diagnosis of malignancy in the latter series was 76%, as compared with 79% by x-ray examination and 67% by sigmoidoscopic examination. Ayre (1950) described one case in which carcinoma of the rectum had been successfully diagnosed by cytology with a smear

technique. Blank and Steinberg (1951), also using the smear technique, examined a series of patients, including 45 with malignant disease of the rectum and sigmoid colon. They found malignant cells in 65% of cases when the smear was taken from the surface of the growth, but in only one out of 19 cases when it was taken from the bowel wall below the site of the lesion. They concluded that cytological examination of rectal and sigmoidal discharges had no advantage over the classic methods of investigation and diagnosis of carcinoma of the rectum and sigmoid colon.

Loeb and Scapier (1951) described a new method of obtaining specimens of exfoliated cells from the rectum and colon during sigmoidoscopy. Bader and Papanicolaou (1952), using Loeb's rectal washing apparatus, studied a series of 200 cases with symptoms suggestive of malignant disease of the lower alimentary tract. Of these cases 19 were proved to be malignant by surgery and biopsy, and 18 of these had positive or suspicious smears. Rubin *et al.* (1953) reviewed the value of cytology in gastroenterological diagnosis. They examined 33 patients with proved malignant disease of the colon by collecting the returned fluid after an enema of Ringer's solution, and found malignant cells in 27 cases. Of this same group, a radiological diagnosis of carcinoma had been established in only 18 cases.

Most recently Galambos and Klayman (1956) reported a series of 68 patients, 26 of whom had malignant lesions confirmed at operation. The correct diagnosis was established in 16 of these cases by exfoliative cytology. They concluded that colonic exfoliative cytology in experienced hands was a valuable technique in the diagnosis of colonic lesions.

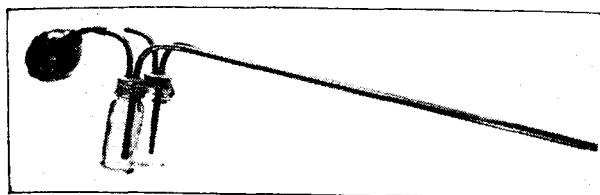
Present Investigation

The purpose of this report is to describe my experience and findings with exfoliative cytology of the colon and rectum at the Surgical Research Laboratories, Queen Elizabeth Hospital, Birmingham. The 86 patients examined were composed of three groups: (A) patients with normal lower alimentary tracts; (B) patients with known carcinoma of the rectum; and (C) patients with suspected malignant disease of the colon. The rectal washing technique of Loeb and Scapier (1951) was used to obtain specimens in all cases.

Technique

In the series of patients without disease of the alimentary tract (Group A) the apparatus described by Loeb and Scapier (1951) was used, sigmoidoscopy being performed in the theatre just before or after the induction of anaesthesia. All patients in this series had an enema the day before sigmoidoscopy. Rectal washings from the patients with known carcinoma of the rectum (Group B) and suspected carcinoma of the colon (Group C) were collected by means of a modification of Loeb and Scapier's apparatus. This consisted of a similar long double-lumen brass tube, the proximal ends of which were led through and soldered to small metal disks which fitted beneath the screw-on caps of small glass specimen jars, a watertight joint being ensured by a rubber washer. Two further brass elbows were soldered to the metal disks, the atomizer bulb being attached to the one and the pump to the other. This apparatus (illustrated herewith) proved more rigid and easier to handle during sigmoidoscopy.

About 20 ml. of normal saline was used to wash the bowel wall, and an equal quantity of 90% alcohol was added to the aspirated specimen to delay autolysis of the cellular content. This fluid (together with a few drops of



Modified rectal washing apparatus.

Meyer's egg albumen) was then centrifuged at 2,000 r.p.m. for ten minutes. Smears were prepared from the deposit, fixed in an ether-alcohol mixture, and stained with the Papanicolaou stain EA 65. The smears were scanned on a moving stage of a microscope, using the high-power objective. Groups of cells of interest were marked with a diamond object-marker, and the position was further noted by reference to the Vernier scale of the moving stage.

Group A

Rectal washings were obtained from 50 patients admitted to hospital for surgical treatment of a condition unrelated to the large bowel. So far as could be ascertained by clinical examination none of them had malignant disease of the alimentary tract; however, x-ray studies were not performed to confirm this. Of the 50 cases, 34 had a non-malignant condition unrelated to the alimentary tract, such as thyroid adenoma or varicose veins; 11 had malignant disease other than in the alimentary tract, and most of these cases were of carcinoma of the breast; and a small group of five cases had chronic peptic ulcer. One washing was taken in each case either just before or just after the induction of anaesthesia.

Results.—Of the 50 smears prepared in this series, three were acellular, but the remainder contained a small variety of cells which varied in number, but were uniform in appearance throughout the series.

Squamous cells were seen in 64% of cases; they were the largest cell observed and had an average diameter of 32 μ . The nuclei were small and pyknotic in some of these cells, and in others they were larger and well defined. The cytoplasm, which was always plentiful, was occasionally laminated, and clear rings or halos were observed around some of the nuclei (Special Plate, Fig. 1).

Columnar epithelial cells and goblet-shaped mucous cells originating from the mucous membrane lining the large bowel were seen in 24% of cases. Clumps of columnar epithelial cells had a typical palisade appearance, but more often these cells were seen end on as a mosaic of regular round cells with centrally placed nucleus (Special Plate, Figs. 2 and 3).

Degenerate and unidentifiable cells were seen in 26% of cases. Many of these cells had the appearance of distended columnar epithelial cells and the nucleus was undergoing karyorrhexis (Special Plate, Fig. 4).

Macrophages were present occasionally, usually containing numerous dark-staining droplets. Polymorphonuclear leucocytes were seen in only 12% of cases, and in only one smear were they present in any number. Red blood cells were never seen, probably owing to the occurrence of haemolysis when alcohol was added to the aspirated specimen.

There appear to be three types of exfoliated cell in the normal colon and rectum: (1) Squamous cells; (2) columnar epithelial cells and mucous cells; and (3) degenerate cells of unknown origin. White blood cells and macrophages are also seen occasionally.

Group B

Rectal washings were taken from 19 patients with carcinoma of the rectum, the diagnosis being confirmed by either biopsy or operation. The object in including this series was to gain experience in the recognition of exfoliated malignant cells and compare them with the individual cells of the actual carcinoma after removal or biopsy. All the washings were taken from a point immediately below the growth.

Results.—Exfoliated malignant cells were observed in 79% of the smears. The cellular content of the smears varied considerably, and some normal cells were seen in all of them. Squamous cells formed the majority of the normal cells in this series, and polymorphonuclear leucocytes were always present but varied greatly in numbers. The exfoliated malignant cells were quite different in appearance from any cell seen in Group A. They had large,

dark-staining nuclei with thickened nuclear membranes and scanty cytoplasm which was difficult to see and stain. There was great variation in size and shape of the nuclei, which had two or more nucleoli (Special Plate, Figs. 5 and 6). The appearance was similar to that of the individual tumour cells.

Group C

Rectal washings were collected from 27 patients with signs and symptoms suggestive of malignant disease of the large bowel. In 12 cases in this series the diagnosis of carcinoma of the colon was confirmed at operation. In two further cases the diagnosis could not be established even after laparotomy and biopsy, one of these having a fixed mass in the ileo-caecal region and the other carcinomatous peritonei. Of those 12 patients with proved carcinoma of the colon, two had carcinoma of the caecum, two carcinoma of the transverse colon, and eight carcinoma of the sigmoid colon.

Results (see Table).—The correct diagnosis was established in nine of the cases by cytological examination, and in one further case malignant cells were identified, but, although laparotomy revealed a fixed mass in the ileo-caecal

Analysis of Cytological and Radiological Findings in Suspect Cases of Carcinoma of the Colon

	No. of Cases	No. of Cases
Total suspected of having carcinoma of colon examined	27	
Diagnosis of carcinoma confirmed	12	
Correct cytological diagnosis	9 (75%)	
Site of lesion:		
Caecum	2	
Transverse colon	2	
Sigmoid	8	
False positive cytological diagnosis	1	
Unconfirmed diagnosis of carcinoma of colon	2	
False positive cytological diagnosis	1	
Barium enema studies performed	9	
Correct radiological diagnosis	7 (78%)	
False negative radiological diagnosis	2	

region with the macroscopic features of carcinoma, biopsy did not confirm the diagnosis. In one case a false diagnosis was made, malignant cells being identified in the smears, but two barium enemas, sigmoidoscopy, and examination under an anaesthetic revealed procto-sigmoiditis with no evidence of malignant disease. In the nine cases where the cytological diagnosis was correct the lesion was in the caecum in one, splenic flexure in one, and sigmoid colon in seven cases.

Barium enema studies were carried out in nine of the 12 patients with proved carcinoma of the colon, giving a correct diagnosis in seven cases (see Table). A diagnosis of carcinoma was queried by the radiologist in three further cases, but in two of these laparotomy refuted the diagnosis, and in one, in which an ileo-caecal mass was present, the diagnosis was not proved. In three cases the results of the barium enema studies of the colon were reported as normal, but laparotomy revealed carcinoma of the sigmoid in two and carcinomatous abdomini in the other.

In this series carcinoma of the colon was successfully diagnosed by cytology alone in one case, and the history is reported below.

Case Report.—Female aged 70 with one month's history of bleeding per rectum but no alteration in bowel habit. No abnormalities detected on clinical examination. Sigmoidoscopy showed a mild degree of granular proctitis and a small adenoma of the rectum. At 7 in. (18 cm.) from the anus there was an area of stenosis through which the sigmoidoscope could not be passed. A rectal washing was collected at this site and a specimen taken for biopsy. Two smears were prepared from the rectal washings; several groups of malignant cells were seen in both of them. The biopsy material was reported as showing chronic inflammatory changes with no evidence of malignancy. Barium enema investigation showed many diverticula in the sigmoid colon with a narrowed segment at the junction of the descending and sigmoid segments, but no characteristic features of malignancy were seen radiologically. Laparotomy revealed a carcinoma at the junction of the sigmoid and descending colons, and the pathologist reported adenocarcinoma of the colon with no invasion of the regional lymph nodes.

In this series abnormal columnar epithelial cells were frequently seen, particularly in those patients with proctitis,

colitis, or diverticulitis. The columnar epithelial cells had enlarged nuclei with an increase in chromatin content, and the amount of cytoplasm was decreased (Special Plate, Fig. 7). These changes are similar to those reported by Boddington and Truelove (1956) in ulcerative colitis. In one patient cells of this type were interpreted as malignant cells, but subsequent investigation by barium enema, contrast enema, and sigmoidoscopy under anaesthesia revealed only proctitis. This patient is being carefully followed up, but up to now, after ten months, has had no further symptoms.

Conclusions

The apparatus for collecting rectal washings was found to be satisfactory in use and good specimens were obtained by this technique. It was found that adequate cleansing of the bowel was important, since any excess of faecal material in the aspirated specimen resulted in a smear too thick to interpret microscopically. Cleansing was effected by soap enema, and purgatives were not given by mouth. Although in this investigation malignant cells were observed in one case of carcinoma of the caecum, the saline enema technique described by Rubin *et al.* (1953) and Galambos, Massey, Klayman, and Kirsner (1956) is more likely to collect cells exfoliated from lesions in the right side of the colon.

The mucosa of the large bowel is lined by columnar epithelium with many goblet-shaped mucous cells. Only two types of cell can be exfoliated from this surface which, together with the squames of uncertain origin and degenerate cells, form a constant cytological content of the normal rectum and colon. The findings in the patients with normal alimentary tracts were in accord with those of Bader and Papanicolaou (1952) and of Wiseman *et al.* (1949). However, Bercovitz (1941), examining 2,158 specimens obtained from 1,123 patients with normal alimentary tracts, found cells in only 11 cases, most of them polymorphonuclear leucocytes. He claimed that the discharges from the normal healthy bowel did not contain cells, and that a marked cellular content was one of the earliest evidences of pathological change in the lower bowel.

Carcinoma of the rectum was successfully diagnosed after one washing in 79% of cases. Three of the five false negative results occurred early in the series and were due to gross faecal contamination of the smear, making cellular identification impossible. The cytological diagnosis of malignant lesions within reach of the sigmoidoscope appears to be a practical proposition, but it is doubtful if this technique has any advantage over biopsy.

Carcinoma of the colon was diagnosed correctly by cytology in 75% of cases. Although the series is small, the results are encouraging, and a larger series of cases are being investigated by both the rectal washing and enema techniques. The one false positive case in the series draws attention to the problem discussed by Galambos and Klayman (1956) and by Boddington and Truelove (1956) of differentiating exfoliated malignant cells from cells exfoliated from an inflamed colonic mucous membrane. In the present series abnormal cells were seen in all the smears prepared from patients with inflammatory disease of the colon. Many of the cells bore some resemblance to exfoliated malignant cells in that the nuclei were enlarged and heavily stained, but they did not show wide variation in contour and the cytoplasm was usually easily recognized.

As McAmmond (1955) points out, cytological investigation requires team-work. The scanning of smears is time-consuming and is not a practical proposition for the clinician. Any cytological service for the diagnosis of malignancy of the colon and rectum would require a trained technician to prepare and scan the smears and a cytologist to give an opinion on the nature of the cells identified.

Summary

In a study of the cytology of the colon and rectum the rectal washing technique of Loeb and Scapier was used on a group of 86 patients, and a modification of

their apparatus is described. The cytological content of the normal lower alimentary tract was found to be constant and composed of three groups of cells: (1) squamous cells; (2) columnar epithelial and mucous cells; and (3) degenerate cells together with occasional white blood cells and macrophages. Exfoliated malignant cells were found in 15 of 19 patients with carcinoma of the rectum, but it is felt that this technique has no diagnostic advantages over biopsy.

Of 27 patients with suspect malignant disease of the colon, a correct diagnosis was obtained cytologically in nine, and 12 were subsequently proved to have carcinoma. The rectal washing technique appears to be most successful in the diagnosis of carcinoma of the descending and sigmoid colons.

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REFERENCES

- Anderson, J. (1921). *Lancet*, 2, 998.
 Ayre, J. E. (1950). *Amer. J. Surg.*, 80, 316.
 Bader, G. M., and Papanicolaou, G. N. (1952). *Cancer*, 5, 307.
 Bercovitz, Z. (1941). *Ann. intern. Med.*, 14, 1323.
 Blank, W. A., and Steinberg, A. H. (1951). *Amer. J. Surg.*, 81, 127.
 Boddington, M. M., and Truelove, S. C. (1956). *British Medical Journal*, 1, 1318.
 Callender, G. R. (1925). *Milit. Surg.*, 56, 686.
 Dutcher, T. B. (1903). *J. Amer. med. Ass.*, 41, 480.
 Galambos, J. T., and Klayman, M. I. (1956). *Surg. Gynec. Obstet.*, 101, 673.
 — Massey, B. W., Klayman, M. I., and Kirsner, J. B. (1956). *Cancer*, 9, 152.
 Jurgens (1907). *Z. exp. Path. Ther.*, 4, 769.
 Loeb, R. A., and Scapier, J. (1951). *Amer. J. Surg.*, 81, 298.
 McAmmond, E. N. C. (1955). *Proc. roy. Soc. Med.*, 48, 919.
 Rubin, C. E., Massey, B. W., Kirsner, J. B., and Palmer, W. L., and Stonecypher, D. D. (1953). *Gastroenterology*, 25, 119.
 Wiseman, C. L., Lemon, H. M., and Lawrence, K. B. (1947). *Bull. Amer. Coll. Surg.*, 32, 243.
 — (1949). *Surg. Gynec. Obstet.*, 89, 24.

CONGENITAL LOBAR EMPHYSEMA

BY

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[WITH SPECIAL PLATE]

Breathlessness in babies may provide much diagnostic difficulty. Frequently it is due to respiratory infection, occasionally to cardiac failure, and rarely to other conditions, one of which is congenital emphysema of the lung. The purpose of this paper is to report six cases and to draw attention to a syndrome which, if recognized, allows of surgical correction. Details of the six cases are set out in the accompanying Table. All the patients were under the age of 4 months, all were dyspnoeic, and, in addition, four had failed to thrive. The left upper lobe was most frequently affected, and in four cases a congenital anomaly of the heart accompanied the pulmonary lesion. Other common symptoms were cough, stridor, and difficulty in feeding due to breathlessness, but cyanosis was observed in only two cases and in neither was it present continuously.

All cases were not of equal severity, and in two the condition became extremely urgent. In the first of these

pulmonary valvotomy had been performed, but 24 hours after operation the baby's condition deteriorated and a chest radiograph (Special Plate, Fig. 1) showed gross emphysema of the left upper lobe with displacement of the mediastinum to the right. A left upper lobectomy was performed, but the baby died shortly after the end of the operation. In the other case a patent ductus arteriosus was ligated in a female baby aged 7 weeks. At this operation the left upper lobe was noticed to be emphysematous, but its removal was not thought to be necessary. Four hours after operation she became extremely dyspnoeic and appeared likely to die. A second thoracotomy was undertaken urgently and the left upper lobe, now grossly emphysematous, was removed. Following this she was much better, and she subsequently made an uneventful recovery. In both of these cases emphysema of the left upper lobe was known to coexist with the congenital heart lesion, and they illustrate the fact that correction of the cardiovascular defect is insufficient to relieve breathlessness in the presence of congenital emphysema.

Clinical Features

All the babies in this series were born at full term after a normal pregnancy, and in only one case was resuscitation difficult. Tachypnoea amounting to dyspnoea is the cardinal symptom, and it is most noticeable when the baby is being fed. A dry cough is often present and stridor is sometimes a prominent feature. Cyanosis is rare and is probably an indication for urgent treatment. Mediastinal displacement is usually present, and over the involved area of lung the chest wall is prominent and relatively immobile. The breath sounds are diminished and typically the percussion note is hyperresonant, but there are no adventitious sounds. Over the rest of the lungs there may be no abnormal physical findings or there may be evidence of collapse or infection.

X-ray Findings

The diagnosis of congenital emphysema may be suspected on clinical grounds, but it can be established only by radiography. The radiograph will show an area of increased translucency with bronchovascular markings still present. There will be downward displacement of the diaphragm on the same side, and there may be a herniation of the over-distended lung across the midline (Special Plate, Fig. 2). The films should be supplemented by screening, and this will show some or all of the following features: (1) relative immobility of some part of the lung fields; (2) lack of variation in the degree of translucency of the emphysematous part; (3) mediastinal displacement with phasic respiratory activity—namely, shift to the affected side with inspiration and the reverse with expiration.

Diagnosis

The possibility of congenital emphysema of the lung should be considered when a previously well infant begins to have attacks of difficulty in breathing. It is primarily necessary to distinguish it from bronchopneumonia or cardiac failure, either of which may coexist with congenital emphysema. In neither of those conditions, although there may be cyanosis together with a raised pulse and respiratory rate, is it likely that the mediastinum will be displaced. The dyspnoea in cardiac failure may be episodic, coming on only with the exertion of feeding; there may be a murmur which directs attention to the heart; and the liver may be enlarged and tender. This last sign, while frequently indicative of cardiac failure, may also occur when the right hemidiaphragm is displaced downwards, and is therefore suggestive but not diagnostic. The presence of altered breath sounds associated with hyperresonance is found in emphysema, while in pneumonia the affected side tends to be dull to percussion.

Bronchospasm severe enough to produce respiratory distress causes bilateral physical signs in the chest, and in the same way it is unusual for fibrocystic disease of the pancreas to lead to difficulty in diagnosis. The aspiration of a foreign body in the first few months of life is a very rare event, and there will usually be a history of the object being taken into the mouth and the sudden onset of dyspnoea.

Four other conditions may, on occasion, cause diagnostic difficulty, and they may be differentiated with the aid of a straight radiograph of the chest. Atelectasis or collapse of lung is most apt to be confused with congenital emphysema, since the diagnosis depends on the comparison of one side with the other. In both conditions one side appears more translucent than the other; in congenital emphysema this is due to pathological overdistension of the lung, whereas in collapse the clarity of one side is purely relative, although in part it may be increased by some compensatory emphysema. With collapse the diaphragm is raised on one side; in congenital emphysema there is no suggestion of elevation of the diaphragm on either side. Reverting to physical signs, it is true that in collapse one side of the chest is duller to percussion than the other, and in emphysema one side is hyperresonant. However, these signs are only of comparative value, and differentiation of the two conditions requires fluoroscopy. With this in emphysema the oesophagus moves towards the clearer side with each inspiration, while in collapse it moves away from the clearer side. In agenesis of the lung there is mediastinal displacement with elevation of the diaphragm on the affected side, but no lung markings can be discerned in that hemithorax unless there is herniation of the opposite lung. Both spontaneous pneumothorax and a large congenital diaphragmatic hernia with abdominal viscera in the chest may be confused with congenital emphysema on clinical examination, but both have characteristic x-ray appearances.

Treatment

The aim of treatment is to remove that portion of the lung which is not functioning and which at the same time is interfering with the function of the remainder of the lungs. Only one therapeutic measure will satisfy this aim, and that is lobectomy. All six cases in this series were treated by removing the affected lobe. In two cases a patent ductus arteriosus was ligated, one at an operation 24 hours before lobectomy (Case 3) and the other at the same time as lobectomy (Case 1).

For the most part, induction of anaesthesia presents no problems, but at this stage the patient must be watched carefully, and, should urgent signs of tension appear, thoracotomy should be performed without delay to allow the obstructed lung to escape from the chest.

At thoracotomy the affected lobe is voluminous and pale. Furthermore, there is no tendency for this lobe to collapse.

when the chest is open, and this is the most striking operative finding. When there is collapse of the other lobes of the ipsilateral lung the recognition of the extent of the disease presents no problem. When more than one lobe is involved, recognition of its extent may be more difficult.

Another problem is the management when the dual condition of emphysema and a cardiac anomaly is present (Special Plate, Fig. 3). Wherever possible both conditions should be treated at the one operation, and if this is impossible it is advisable to treat the congenital emphysema first and then, at a later date, deal with the cardiac lesion.

Discussion

In 1938 Royes reported the case of a man of 28 who was killed in a motor-cycle accident and at necropsy was found to have a localized emphysema of the right middle lobe. Since that time a number of cases of regional emphysema in adults have been reported, but they have usually been discovered incidentally on radiological examination and have been symptomless. Very different is the picture of acute dyspnoea seen in this condition in infancy. Nelson in 1932 was the first to draw attention to the serious nature of emphysema occurring in early infancy when he reported a fatal case in a baby aged 5½ months. This syndrome has been given a variety of names, the best of which is probably "congenital lobar emphysema." That the basic pathology is an overdistension of the alveoli confined to certain segments or lobes is not disputed. Whether the condition is actually congenital or whether it is acquired very early in life is less easy to determine.

It has been suggested that the emphysema may result from over-vigorous attempts at resuscitation, and particularly from the use of oxygen under positive pressure. If this were so, it is difficult to see why it should be localized to one particular lobe, and why it should persist and yet sometimes fail to cause symptoms until the age of 3 months or more. In only one of our cases was there any difficulty in establishing respiration at birth. The possible role of infection is more difficult to assess. That it is not by itself a major factor is clear, since examination of the bronchi and lungs fails to show any evidence of widespread inflammation. On the other hand, it may be an ancillary factor in producing oedema of the bronchial mucosa in the presence of pre-existing abnormalities.

The basic pathology is some form of valvular obstruction which allows the entry of air on inspiration but does not permit it to escape when the baby breathes out. This might be provided by two developmental abnormalities: either by unusually flaccid bronchi, with abnormal or malformed cartilaginous rings, which collapse on expiration, or by flaps of bronchial mucosa which block the return of inspired air. Both these anomalies have been found. Gross and

Details of Six Cases of Congenital Lobar Emphysema

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Family history						
Birth weight	2nd child 8 lb. 4 oz. (3.742 kg.)	2nd child 9 lb. 12 oz. (4.422 kg.)	1st child 7 lb. 4 oz. (3.288 kg.)	1st child 6 lb. 11 oz. (3.033 kg.)	2nd child 6 lb. 8 oz. (2.949 kg.)	3rd child 5 lb. 2 oz. (2.324 kg.)
Neonatal history	Wheezing from birth	Clear	Cough from birth	Clear	Difficult resuscitation; shocked; dyspnoea	Clear
Presenting symptom	Cardiac bruit, cough, wheeze	Cough	Breathlessness	Failure to thrive	Cardiac bruit	Cough and wheeze
Age at onset of symptoms	Birth	6 weeks	Birth	5 days	Birth	5 weeks
Cyanosis	On crying	Not continuous	Absent	Absent	Absent	Absent
Dyspnoea	++	Variable	++	+	++	++
Stridor	++	—	+	++	—	+
Cough	++	++	—	+	—	+
Feeding difficulty	+	—	—	+	—	+
Failure to thrive	+	—	—	+	—	+
Appearance	Puny, wasted	Well nourished	Well nourished	Thin. Not very ill	Pale and thin	Ill and underweight
Cardiac lesion	Ventricular septal defect + pulmonary stenosis	—	Patent ductus + ventricular defect	—	Patent ductus	Ventricular septal defect
Other congenital anomalies	Aplasia, left kidney	—	—	—	Cleft palate, supernumerary thumb	Sacral anomaly
Zone involved	L.U.L.	L.U.L.	L.U.L.	R.U.L.	L.U.L.	R.M.L.
Treatment	Pulmonary valvotomy; lobectomy	Lobectomy	Lobectomy; ligation of ductus arteriosus	Lobectomy	Lobectomy; ligation of ductus arteriosus	Lobectomy
Result	Died	Alive and well	Alive and well	Alive and well	Alive and well	Alive and well

Lewis (1945) described the findings in a 4-year-old girl who developed emphysema of the right upper lobe with herniation across the mediastinum into the left side of the chest. She was treated by lobectomy, and examination of the specimen showed the bronchial cartilages to be absent. One of the five cases reported by Ferguson and Neuhauser in 1944 was diagnosed by bronchoscopy when it was noted that the bronchoscope entered with exceptional ease, but when it was withdrawn the bronchus collapsed and its lumen became occluded with each expiration. In one case in the present series histological examination revealed gross deficiency of cartilage in all bronchi in the affected lobe (see accompanying photomicrograph).



Photomicrograph of right upper lobe (Case 4), showing large intralobar bronchus with minute islet of cartilage in its wall (centre of picture). Smooth muscle also poorly represented; hypoplasia of bronchus. (x55.)

Robertson and James (1951) described two cases in which the obstruction appeared to be due to redundant folds of bronchial mucosa, and they point out that such folds may not be found when the operative specimen is examined, since it is frequently near the midline and may therefore be included within the divided stump of the bronchus. It is likely that both these forms of valvular obstruction are the result of congenital malformations, and they are often found in association with congenital abnormalities affecting other systems. This close association with other congenital abnormalities, particularly those of the cardiovascular system, is further evidence that the emphysema itself is of developmental origin. Four of our six cases had congenital heart lesions, and it has been suggested (for example, by Sloan in 1953) that intermittent occlusion of the bronchus is brought about by "extrinsic pressure." It is conceivable that a dilated pulmonary artery could act thus, but such a causal relationship could not be substantiated in all our cases. Nevertheless, it is of interest that the congenital heart lesions seen were of the type associated with dilatation of the pulmonary artery—dilatation which either was due to increased pulmonary blood flow or was of the post-stenotic variety. However, since many cases of congenital heart disease have grossly dilated pulmonary arteries without emphysema, it seems probable that there must be an associated abnormality of the bronchus for it to occur.

The condition appears to be most common in the left upper lobe. Apart from the possibility that pressure exerted by an enlarged left pulmonary artery plays some part in the development of the disease, there is no obvious reason for such a distribution. It seems probable, therefore, that in a larger series the distribution would be more equal.

In some instances congenital emphysema may be a benign lesion, and in one of the cases reported by Holzel *et al.* (1956) remission of symptoms occurred. However, this would appear to be unusual, and when the condition is severe enough to produce symptoms, then treatment is essential. Thoracentesis has been advocated when severe intrathoracic tension develops, but it is our belief that urgent thoracotomy is always the treatment of choice, because needling in this condition carries with it a definite risk of

producing a tension pneumothorax. Once recognized, considerable tension exists within the affected area, and therefore lobectomy should never be unduly delayed. In some cases it may be a matter of extreme urgency (Special Plate, Fig. 4), and our experience shows that thoracotomy without lobectomy can be a dangerous procedure when congenital emphysema is present, as there may be a post-operative increase in tension.

Summary

Six cases of congenital lobar emphysema are reported, and their association with congenital heart disease is noted.

The difficulties of diagnosis are considered, and the importance of x-ray examination of the chest in any baby who has respiratory symptoms is stressed.

Treatment of the condition is by the removal of the affected lobe and the consequent relief of intrathoracic tension.

It is a pleasure to record our thanks to Dr. R. E. Bonham-Carter and to Mr. D. J. Waterston for their stimulating help and advice. We also wish to thank the other members of the consultant staff of the Hospital for Sick Children, under whose care some of the cases were admitted to hospital, and Dr. Bodian, who provided the photomicrograph. Finally, we wish to record our indebtedness to Mr. Derek Martin, for the illustrations.

REFERENCES

- Ferguson, C. F., and Neuhauser, E. B. D. (1944). *Amer. J. Roentgenol.*, 52, 459.
Gross, R. E., and Lewis, J. E. (1945). *Surg. Gynec. Obstet.*, 80, 549.
Holzel, A., Bennett, E., and Vaughan, B. F. (1956). *Arch. Dis. Childh.*, 31, 216.
Nelson, R. L. (1932). *J. Pediatr.*, 1, 233.
Robertson, R., and James, E. S. (1951). *Pediatrics*, 8, 795.
Roses, K. (1938). *British Medical Journal*, 2, 659.
Sloan, H. (1953). *J. thorac. Surg.*, 26, 1.

A POSSIBLE METHOD OF FOETAL SEX DETERMINATION

BY

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[WITH SPECIAL PLATE]

The prenatal determination of the sex of the infant has always aroused considerable interest. A number of scientific methods have been suggested without much success, and it is only in recent years that a relatively reliable technique has been evolved (Rosa and Fanard, 1951; Serr *et al.*, 1955; James, 1956; Dewhurst, 1956).

Basis of Method

An unusual form of foetal vertebral body ossification was observed in the course of routine obstetrical radiography during the past year. The variation consisted in a ventral and a dorsal centre of ossification with an intervening oval or linear translucency. It was commonly observed in the lumbar region, involving one vertebra, or more often a number of vertebrae. The two centres were of unequal size, the ventral segment being larger than the dorsal in the antero-posterior diameter, the vertical translucency or cleft being situated nearer the dorsal aspect of the centrum. The translucency cleft may be complete or partially closed by a buttress of ossified tissue bridging the two centres above and/or below. When complete bridging was present the radiological appearances suggested a cavity within the vertebral body. The outlines of the cleft were relatively clearly defined, being

wider in the centre than at the upper and lower margins. Measurement of the ossified centrum of the affected vertebrae showed that, compared with the normal vertebra, there was a definite increase in the antero-posterior diameter. This increase in depth was of some importance when the cleft was almost completely obliterated. It may be the most obvious feature on the radiograph. This cleft must be carefully distinguished from the synchondrosis between the ossified neural arch and the centrum, which lies further dorsally. It was also observed that the translucency corresponding to this synchondrosis was narrower in the cleft vertebrae than in the normal ones, suggesting an advance of ossification posteriorly at the expense of the synchondrosis, and that in fact the bodies of the involved vertebrae are of normal size (Special Plate, Fig. 1).

As this defect lies in the coronal plane it is visualized on the radiograph only when the incident beam passes through the plane of the cleft—that is, when the foetus is in the true lateral position, a posture which is only infrequently seen in the standard postero-anterior and lateral radiographs of the pregnant abdomen. In our experience it is more generally visualized in the prone postero-anterior projection. Radiographs of the highest quality are essential, and by employing momentary compression to the maternal abdomen foetal movement is restricted and the exposure factors are reduced to a minimum.

The term "coronal cleft vertebra" has been employed to distinguish the defect from the more widely recognized one in the sagittal plane. The appearance was observed on ten occasions during 1956, representing 1.3% of all pregnancies referred to the radiology department. In nine instances the defect was present in the lumbar segment only, and in the tenth case the lower two dorsal vertebrae and the first lumbar vertebra were involved (Special Plate, Fig. 2). In two of the foetuses one vertebral body only was affected. Radiography of some of the infants after birth showed that the cleft gradually disappeared but the antero-posterior diameter of the centrum remained larger, at least in infancy. (The results of the long-term follow-up will be the subject of a separate communication at a later date.) The most significant feature of the investigation was that in every instance the child was a male.

Stimulated by the finding of coronal cleft vertebrae on antenatal radiographs, we x-rayed 73 stillborn foetuses of over 28 weeks' gestation and 65 foetuses of less than 28 weeks' maturity. In the first group there was additionally a male infant of about 30–34 weeks' maturity where a solitary lumbar body was involved. In the latter group 21 specimens showed evidence of a ventral and dorsal ossification centre, usually in the lumbar area, but occasionally extending to involve the lower dorsal region. The sex incidence in this group was 13 males to 8 females.

Discussion

The development of the vertebral column proceeds along well-defined lines. Two centres of chondrification of the vertebral body appear at about the seventh week of intrauterine life, and soon fuse with the centres for the arch and costal process to form the cartilaginous model. Ossification of the vertebral arch begins shortly afterwards, and by the tenth week ossification of the centrum has started. Usually there is a solitary centre of ossification in the body, but a paired centre may appear (Arey, 1946). The occurrence of two lateral centres is well recognized (Gray, 1949), but the appearance of a dorsal and a ventral centre is considered unusual. Cohen *et al.* (1956) found that such a variant can occur in 5% of instances. Fusion of the centres with disappearance of the hyaline cartilage cleft takes place at approximately the 16th to 18th week. Rowley (1955) in an analysis of 28 cases of coronal cleft vertebrae found no involvement in either cervical or sacral segments of the spine.

There is some difference of opinion on why this variation in normal development should occur. Two main theories are advanced. In the first the possible persistence

of the notochord, which normally occupies the position of the cartilage cleft, is blamed. However, in no instance have notochordal cells been clearly demonstrated histologically in the cartilage. This is hardly surprising, because during chondrification of the vertebral body the great majority of notochordal cells are displaced into the disk region (Ehrenhaft, 1943). The second, and more plausible, theory is concerned with the invasion of the cartilage body by vessels anteriorly and posteriorly with subsequent ossification in the vicinity of their terminal ramifications. Ventral and dorsal ossification centres rapidly appear with an intervening unossified septum. The persistence of this unusual but quite normal method of ossification beyond the usual time of fusion constitutes the typical coronal cleft vertebra.

The high preponderance of male infants with persistent coronal clefts is as yet inexplicable. Rowley (1955), who first described the radiological appearances in the English literature, also remarked on the high male incidence. Of his 34 cases, only 3 were females, and one of these showed radiological evidence of osteochondrodystrophy. Including our own series, there are now on record examples of coronal cleft vertebrae in 45 viable infants. Thus if the defect is seen on a radiograph of an infant of 28 weeks' gestation or more, there is a 93% probability that the unborn child will be a boy. The percentage will rise proportionately with the advance in maturity, and by 35 weeks the probability reaches 98%.

The proportion of cases exhibiting this anomaly is small. In Rowley's series the incidence on antenatal radiographs was "slightly less than 1%," and in our series 1.3%. This small number of cases can be accounted for in part by the position of the foetus on the radiograph. As has already been pointed out, it is only when the foetus occupies the true lateral position that the cleft is visible. The number of actual cases is probably greater than the above figures would suggest.

The proportion (33%) of double vertebral body centres in foetuses of under 28 weeks' gestation points to a higher incidence of this variant than has already been reported (Cohen *et al.*, 1956). At this stage the sex ratio shows no obvious male bias. Appearance of centres and fusion of epiphyses normally occur at an earlier date in the female, and this tendency holds good in our series of non-viable foetuses where the greater incidence of double centre in the male was at four months and in the female at three months. The increase in antero-posterior diameter of the ossifying centrum may be of importance. This feature, associated with a narrowing of the neurocentral junction, was observed in the prenatal radiographs in three additional instances, where in each case the sex was male. These features were also present in nearly every instance of double centres in our series of non-viable foetuses.

Recent work by Dewhurst (1956) has shown a remarkably high percentage of accuracy in antenatal sex determination by the demonstration of the typical arrangement of chromatin in the cells of a centrifuged specimen of liquor amnii. Obtaining liquor amnii by paracentesis is accompanied by a certain risk of labour induction and damage to the placenta or foetus. Dewhurst considers that the method is unsuitable for general use.

Before the male preponderance in coronal cleft vertebrae in infants after 28 weeks' gestation can be of statistical importance, a study of a larger series than is at present available is required. With this object in view we have considered it important to bring the phenomenon to the notice of obstetricians and paediatricians. A very careful scrutiny of the foetal vertebral column should be made in all radiographs of the pregnant abdomen. It is emphasized that the coronal cleft vertebra is a normal process of ossification and does not indicate a pathological condition.

Summary

The radiological appearance of coronal cleft vertebrae in the foetus *in utero* is described. This was observed

in ten instances representing 1.3% of all pregnancies referred to the radiological department during 1956. The cleft is usually confined to the lumbar region. One further specimen was found in a series of 73 viable stillbirths. In every instance the child was a male. The normal proportion of ventral and dorsal ossification centres in fetuses before the 28th week of gestation is 33%, with no obvious male bias. It is suggested that the presence of the condition, which has no pathological importance, may be used as an aid in determining the sex of the foetus.

We are indebted to Professor D. Baird, Professor R. D. Lockhart, Dr. D. P. Levack, and the staff of Aberdeen Maternity Hospital for permission to publish this article. Our thanks are due to Miss Isobel M. Hunter for the stillbirth radiographs and to Mr. R. Drummond for the illustrations.

REFERENCES

- Arey, L. B. (1946). *Developmental Anatomy*, 5th ed., p. 374. Saunders, Philadelphia and London.
- Cohen, J., Currarino, G., and Neuhauser, E. B. D. (1956). *Amer. J. Roentgenol.*, 76, 469.
- Dewhurst, C. J. (1956). *Lancet*, 1, 471.
- Ehrenhaft, J. L. (1943). *Surg. Gynec. Obstet.*, 76, 282.
- Gray, H. (1949). *Gray's Anatomy*, 30th ed. (ed. T. B. Johnston and J. Whillis), p. 234. Longmans, Green, London.
- James, F. (1956). *Lancet*, 1, 202.
- Rosa, P. A., and Fanard, A. E. (1951). *Int. J. Sexol.*, 4, 160.
- Rowley, K. A. (1955). *J. Fac. Radiol. (Lond.)*, 6, 267.
- Serr, D. M., Sachs, L., and Danon, M. (1955). *Bull. Res. Coun. Israel*, 5B, 137.

RHEUMATOID ARTHRITIS OF THE CRICO-ARYTENOID JOINTS*

BY

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Rheumatoid arthritis has been described affecting almost every diarthrodial joint in the human body. This process must almost certainly sometimes include the crico-arytenoid joints, which although small are extremely mobile and are used not only in phonation but also in normal full respiration. It is strange, therefore, that no article in the English language appears to have been written on this subject, although isolated reports, mostly in European journals, exist, and casual reference to such a condition can be found in some otolaryngological textbooks.

The Crico-arytenoid Joints

The cricoid cartilage is the uppermost ring of the trachea. This, unlike its fellows, has a flat expansion posteriorly which is called the lamina, which makes it similar in shape to a signet ring. On each of the two upper and outer curved edges of the lamina is situated a pyramid-shaped cartilage—the arytenoid—which looks rather like a miniature adrenal gland standing on its kidney. The joints by which these structures are attached to the laminal facets are surrounded by a fibrous capsule with ligamentous reinforcement posteriorly and are lined with a normal synovial membrane.

The vocal cords are attached from the outer side of each of the arytenoid cartilages to a common insertion on the internal surface of the thyroid cartilage where this overlaps the front of the cricoid cartilage. Voluntary variation in the position of the vocal cords is produced by the various

*Abstract of a paper read before the Faculty of Medicine, University of Lisbon, November, 1956.

movements of the crico-arytenoid cartilages. Their repertory includes rotation and gliding movements both forwards and backwards as well as medially towards their fellow. Involuntary widening of the aperture between the cords occurs during full inspiration, and the reverse in expiration.

The muscles which control the movements of the crico-arytenoid joints, and so of the vocal cords, are all innervated by the recurrent laryngeal branch of the vagus nerve. Unilateral paralysis of this, which is not very uncommon from both local and general infections or traumata, leads to hoarseness but not to loss of voice, as the normal cord moves across towards the one affected to compensate. If the nerve on both sides is paralysed, however, the vocal folds remain fixed in the half-way position, causing loss of voice and stridor on deep inspiration. The crico-arytenoid joints, since they are not structurally affected, can generally, in these circumstances, be moved passively with a laryngeal spatula without pain.

Symptomatology

It has been observed that in certain cases of rheumatoid arthritis acute exacerbations of the general joint disease are associated with a period of hoarseness and a feeling of tension in the throat which is often increased by swallowing, speaking, or coughing. Local tenderness on pressure over the larynx between the thyroid and cricoid cartilages, laterally or centrally, is also sometimes present. These attacks pass off when the general activity of the arthritis lessens, and are generally ascribed to intercurrent colds or laryngitis. When in the course of time the disease becomes chronic a permanent huskiness of the voice may remain.

It seems reasonable in retrospect to suspect that there may exist some causal relationship between the variations in the general joint condition and these laryngeal abnormalities.

There appears to be no reason why rheumatoid disease may not affect the crico-arytenoid joints in similar fashion to other larger diarthrodial joints of the body. If this is so we should expect to observe cases which exhibit phases of recurrent acute or subacute inflammatory reaction either confined to these joints or, more probably, as part of a generalized arthritic process. In the later chronic stages of the disease, and usually as the sequel to recurring episodes of this nature, more permanent impairment of movement or even ankylosis of the crico-arytenoid joints might occur.

The following cases of rheumatoid arthritis have been selected as probable examples of these three phases of crico-arytenoid joint involvement.

Case 1

Acute recurrent attacks of hoarseness and slight dysphagia which were associated with recurrent exacerbations of generalized polyarthritis.

The patient was a colonial bishop, aged 60, who spent much time travelling through difficult tropical country under conditions involving considerable privation and great fatigue. Five years previously these periods of exhaustion had become associated with painful swelling of the fingers and wrists, and later considerable pain and stiffness in the cervical spine. All this would at first die down after a few days' rest, but the free intervals between these episodes became progressively shorter. For the last three years permanent changes in the hands, typical of rheumatoid arthritis, had been unmistakable. Associated with these periods of active arthritis for the past two years had been temporary hoarseness of voice, without sore throat, although sometimes with dysphagia, which would get worse towards evening. He would then sometimes lose his speaking voice. He received no special treatment for the arthritis except aspirin in rather large dosage. Penicillin and other antibiotics were administered on several occasions for the "laryngitis," but proved ineffective. On one occasion he developed a mild upper respiratory infection which much exacerbated this condition, and stridor temporarily developed which almost necessitated tracheotomy. These attacks of hoarseness

eventually became very frequent and speaking loudly was painful. It thus became impossible for him to preach, and he returned to England.

When seen he showed unmistakable signs of chronic rheumatoid arthritis of moderate intensity. There was tender fusiform swelling of most of the fingers, early ulnar deviation of the hands and wrists, whilst flexion of the neck produced considerable pain. There was loss of weight, but there were no signs of disease of other systems, and the chest x-ray picture was normal. His haemoglobin was 70%, E.S.R. 50 mm., and all agglutination reactions and the Wassermann reaction were normal. Hoarseness of voice was still present, but not marked in ordinary conversation.

On direct laryngoscopy the left vocal cord was reported as not moving well. A periartritic reaction was seen to be confined to the arytenoid and post-cricoid region with secondary muscle implication. Pain was elicited on the attempt to manipulate the left arytenoid cartilage, but not on the right. The patient's general condition and polyarthritis during the next six weeks responded well to rest, splintage, analgesics, and injections of gold salts; local short-wave diathermy had been applied to the crico-thyroid region. The appearance of the larynx was then reported as normal, no pain being elicited on forced movement of the crico-arytenoid joints on either side.

He wrote nearly two years later stating that no further attacks of hoarseness had occurred although the arthritis of his peripheral joints remained periodically mildly active.

Case 2

Mild attacks of hoarseness in the course of exacerbations of a rheumatoid arthritis of moderate intensity.

The patient, a woman aged 54, had suffered for seven years from rheumatoid arthritis affecting the hands, wrists, feet, knees, and cervical spine. During the last two years she had complained of attacks of hoarseness with slight cough every few months and lasting one to three weeks. On exertion she suffered slight dyspnoea also and sometimes some stridor. These were usually diagnosed as "laryngitis" until she herself noted their association with the periodical increased pain in the affected peripheral joints. An x-ray examination of her chest showed nothing abnormal, and no glandular enlargement or other signs or symptoms of disease of other systems were found. She had not received metallic therapy. Her haemoglobin was 78%, E.S.R. 25 mm., and white-cell count normal.

Laryngological examination during one of the periodical attacks of hoarseness was reported as showing oedema of the pre-arytenoid area. The left vocal cord was fixed in the position of abduction. The crico-arytenoid joint on that side, but less so on the other, was painful on gentle manipulation and probing with a spatula.

Case 3

Probable ankylosis of both crico-arytenoid joints in a patient with long-standing chronic rheumatoid arthritis.

A woman aged 70 had suffered with rheumatoid arthritis of varying intensity over a period of twenty-five years. The arthritic condition had been much exacerbated after a road accident ten years previously in which, however, she had not herself been physically injured. Soon after this, hoarseness of voice developed, at first intermittently and for the last four years permanently. She spoke in a husky whisper, and slept propped up, as inspiratory stridor developed when lying flat. There was occasional pain on swallowing. At first hysteria was suspected, but later, when pain began to be referred behind the ears, she was examined laryngoscopically, the report stating that marked redness but very little swelling was noted in the crico-arytenoid area. The vocal chink was narrowed, and only slightly increased widening, due to bowing of the cords, occurred with full inspiration. The arytenoid cartilages were both fixed, and attempts to move them in any direction were unsuccessful and very painful. The aryepiglottic folds appeared

lengthened, and there was tenderness on lateral pressure over the cricoid space.

Ultimately the patient became bedridden. The condition of the larynx remained unchanged subsequently in spite of considerable temporary improvement in many of the peripheral joints which took place as the result of the administration of cortisone for a few weeks.

Differential Diagnosis

The differential diagnosis in these and similar cases would appear to lie only between rheumatoid arthritis involving the crico-arytenoid joints and paralysis of the recurrent laryngeal nerves in rheumatoid subjects due to some unknown local or general cause of which no evidence can be found. The distinction, which can finally be made only by a laryngologist of experience, remains difficult and perhaps uncertain. Recurrent paralysis of other peripheral nerves in association with exacerbations of rheumatoid arthritis has not, however, been recorded. It seems therefore probable that the local laryngeal signs and symptoms in such cases are evidence of implication of the crico-arytenoid joints in the generalized rheumatoid inflammatory reaction which is affecting other joints in the body.

Summary

It is suggested that in the course of rheumatoid arthritis involvement of the crico-arytenoid joints may sometimes occur as an integral part of the polyarthritic process.

Three cases are quoted which are believed to demonstrate varying stages in this syndrome—namely, acute and subacute recurrent laryngeal episodes, and complete ankylosis of both crico-arytenoid joints in the final stage of rheumatoid disease. Operative procedures did not prove necessary in these cases.

ADDENDUM.—Since the above was written Pearson (1957) has described a case of rheumatoid arthritis of 30 years' duration in a patient who developed increasing huskiness and dyspnoea on exertion. This became worse, and laryngeal obstruction was diagnosed, for which tracheotomy was performed. The patient died later, and necropsy showed changes in the crico-arytenoid joints characteristic of rheumatoid arthritis.

BIBLIOGRAPHY

- Montgomery, W. W., Peronc, P. M., and Schall, L. A. (1955). *Ann. Otol.*, 64, 1025.
- Pearson, J. E. G. (1957). *British Medical Journal*, 1, 1047.
- Rateau, J. (1952). *Rev. Laryng. (Bordeaux)*, 73, 181.
- Rehak, P. (1935). *Mtschr. Ohrenheilk.*, 69, 152.
- Scott-Brown, W. G. (1952). *Diseases of Ear, Nose, and Throat*, 1, 615. Butterworth, London.
- Tarneau, J. (1948). *Nord. Med.*, 38, 1261.
- Watkin-Thomas, F. W. (1953). *Diseases of Throat, Nose, and Ear*. Lewis, London.

Discussing changing attitudes to the handicapped child, Dr. J. D. KERSHAW (*Public Health*, May, 1957, p. 57) remarks that few individual special schools are big enough to offer training for more than three or four crafts, and he advocates centralization of vocational training in large residential technical schools, where the range of training could be wider. Another point stressed by Dr. Kershaw is that there is still a failure of co-operation between the hospital and school health services over handicapped children. It is the exception to find the hospital physician or surgeon and the school medical officer planning together for the child's future. Often the hospital makes no contact with the school health service until the child's treatment has been completed. By contrast, Dr. Kershaw writes, there are some areas where the hospitals have voluntarily adopted what almost amounts to notification to the school health service of all potentially handicapping defects as soon as they are detected.

LARYNGEAL STRIDOR IN RHEUMATOID ARTHRITIS DUE TO CRICO-ARYTENOID JOINT INVOLVEMENT

BY

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The following brief notes record an unusual but
important manifestation of rheumatoid arthritis, with
severe attacks of suffocation.

Case Report

A housewife aged 42, with classical rheumatoid arthritis for four years, showing symmetrical polyarthritis (including finger involvement), bone erosions, subcutaneous and cutaneous nodules, and a positive Rose-Waaler test (1:128), was being treated with salicylates.

On September 1, 1956, she was brought to hospital as an emergency by her general practitioner; she was in marked distress and had great difficulty in getting her breath. "Omnopon" 1/6 gr. (11 mg.) had been given at home. After an hour her breathing was comfortable. For two months before this she had suffered discomfort in the region of her larynx and pain on swallowing, and had lost 10 kg. in weight. She had had no difficulty in breathing before this attack.

By September 7 she had no pain on swallowing and was breathing comfortably. Though still febrile (temperature 100-101° F.—37.8-38.3° C.), she felt much better. Examination with a laryngeal mirror showed localized redness on the posterior aspect of the left arytenoid and oedema of the left aryepiglottic fold. The larynx appeared otherwise normal, and the vocal cords were white and moved equally.

On September 15 (one week later) exertional dyspnoea was present; the oedema was unchanged, but there was some loss of abduction of the left cord. The oedema and redness cleared up during the next 10 days, but the left cord became fixed in a position of adduction and the right cord showed progressive loss of abduction; slight exertion produced inspiratory stridor.

X-ray examination revealed that swallowing was normal and showed no evidence of neoplasm in the chest or neck. Bronchoscopy and oesophagoscopy under a general anaesthetic on September 28 showed no abnormality and the patient made an uneventful recovery from the anaesthetic. The neurologist, Dr. C. H. Edwards, found no evidence of any central or peripheral nerve lesion affecting the larynx. About this time she had three minor attacks and one severe attack of dyspnoea with stridor. A tracheotomy set was kept ready in the ward.

On transfer to the Special Unit for Juvenile Rheumatism on October 19 she appeared thin, anxious, and frightened: some tenderness was noted externally at the mid-point of the right sternomastoid, and her voice was hoarse and her cough "blowing." Exertion of mild degree brought on a severe and frightening attack of dyspnoea and laryngeal stridor, relieved by oxygen (given by B.L.B. mask) in about seven minutes. She was started on delta cortisone at a dosage of 50 mg. a day with an alkaline mixture over the next two weeks, gradually reduced to 15 mg. a day by the seventh week. A dramatic improvement occurred

in her general well-being and in the local condition. Her functional capacity improved to normal and joint movement became painless.

On November 19 indirect laryngoscopy showed marked improvement. Her right arytenoid was mobile, with abduction of her vocal cord up to 60-70% of normal. Her left arytenoid was almost fixed; there was some adduction from the cadaveric position, but no abduction. Her cords approximated well and her voice was strong.

On February 6, 1957, indirect laryngoscopy showed the left arytenoid to be quite immobile and fixed in a slightly anterior plane to the right one. The right arytenoid moved freely but lacked full abduction, the space between her cords on full inspiration being 5-6 mm. She was then able to move freely on her household duties and managed the stairs without dyspnoea on 15 mg. of prednisone a day.

In retrospect, the laryngeal picture resembled that of bilateral abductor paralysis. At no stage was any redness or oedema seen around the right arytenoid and at no stage was oedema observed to cause any direct obstruction to respiration—her difficulty in breathing was essentially due to loss of abduction.

Discussion

The differential diagnosis is fully discussed by Montgomery *et al.* (1955). Although the patient had had a partial thyroidectomy nine years previously, there was evidence neither of neoplastic nor of ischaemic nerve damage, despite evidence elsewhere in this patient of vascular lesions associated with rheumatoid arthritis (nail-fold thrombosis and nail-edge lesions). The presence of a few genuine L.E. cells from time to time, of cold agglutinins, of a leucopenia over 10 weeks of observation (2,150 per c.mm. with 26% polymorphs at the lowest), and of one positive Coombs test out of six, led us to think of systemic lupus erythematosus, in which peripheral nerve palsy sometimes occurs on a vascular basis (Heptinstall and Sowry, 1952), but this appeared to be primarily a local lesion due to crico-arytenoid joint inflammation.

The left crico-arytenoid joint is now ankylosed, but the acute lesion on the right side responded to delta cortisone like the rest of her joints. It is interesting to note that two of the cases recorded by Montgomery *et al.* got worse and developed stridor on cortisone. The lesser salt-retaining properties of the delta analogues compared with cortisone make them potentially more valuable in this situation, and by this means tracheotomy, which would have been necessary otherwise, was avoided.

We are grateful to Dr. Philip Willcox for referring this patient and for the use of his notes.

REFERENCES

- Heptinstall, R. H., and Sowry, G. S. C. (1952). *British Medical Journal*, **1**, 525.
Montgomery, W. W., Perone, P. M., and Schall, L. A. (1955). *Ann. Otol. (St. Louis)*, **64**, 1025.

The second annual meeting of the British Section of the Louis Rapkine Association was held at the Ciba Foundation on Monday, May 6, under the chairmanship of Professor A. V. HILL, F.R.S. The eminent French archaeologist, the Abbé BREUIL, gave a talk on the cave paintings of Rouffignac in the Dordogne, illustrated by slides of the magnificent paintings and rock carvings of mammoths, horses, ibexes, and rhinoceroses found in the caves. The association was founded last year in memory of the French biochemist, Louis Rapkine. Membership is open to British and French doctors and research workers in the biological sciences who have been awarded scholarships or bursaries to enable them to visit the other country and study recent developments in their special subject. Information about the association can be obtained from Dr. G. E. WOLSTEN-HOLME, Ciba Foundation, 41, Portland Place, London, W.1, or Miss A. M. VIDAL-HALL, Scientific Office, French Embassy, 22, Wilton Crescent, London, S.W.1.

CHOLEDOCHUS CYST

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Choledochus cyst is a rare cause of jaundice in which a part or the whole of the extrahepatic biliary tract shows gross dilatation, usually of a saccular type. The anatomy of this congenital anomaly was first described by Vater in 1723, and fewer than 200 cases have since been reported (Gross, 1933; Walton, 1939; Shallow, Eger, and Wagner, 1946). Sir James Walton was one of the few authors to describe more than two cases of his own, and he states that these were the only two seen among 23,048 necropsies at the London Hospital in the 32 years prior to 1938. Likewise, Judd and Greene (1928) found only one case of choledochal cyst in 17,381 operations on the biliary tract.

Most authors believe the lesion arises from a congenital weakness of a localized portion of the wall of the common bile or hepatic ducts, this defect probably occurring at the site of a diverticulum or an incompletely developed accessory hepatic duct. Moreover, once the cyst attains a certain size a vicious circle is created, for drainage into the last portion of the common bile duct is further impeded by the pressure of the eccentrically lying cyst.

Pressure of the cyst on surrounding structures, including the extrahepatic biliary system, accounts for much of the symptomatology of the condition. Although the cyst may vary greatly in size, the majority are 10-15 cm. in diameter and usually contain bile, although sometimes the fluid is clear. Gall-stones may be present, and in a case described by Irwin and Morison (1945) a squamous-celled carcinoma was found in the wall of the sac. The dilatation of the common bile duct often extends into the common hepatic duct, but the gall-bladder and cystic duct are usually of normal size. The terminal portion of the common bile duct is often narrowed, and sometimes cannot be found even when obstruction is incomplete (Walton, 1939).

The Clinical Syndrome

The lesion occurs predominantly in females, and symptoms frequently arise between the ages of 5 and 25 years. Shallow, Eger, and Wagner (1943) found that 75% of cases described in the literature were diagnosed before 25 years of age, and Lichtman (1949) reports that 80% of cases have occurred in females. Hertzler and Maguire (1951) state that in 80% of the reported cases congenital cysts of the common duct occur in patients under 25 years of age and 60% of cases occur in children under the age of 10 years. The most usual presenting symptoms are recurrent jaundice, upper abdominal pain which often resembles biliary colic, and a tumour in the right hypochondrium. Pregnancy has often appeared to be a precipitating factor in the onset of these symptoms. In many cases in which the cyst was not palpable the clinical syndrome was identical with that of gall-stone obstruction of the biliary tract, this being the diagnosis most often made. Cholecystectomy has even been performed, the true diagnosis and the presences of the cyst

being missed at laparotomy. Neoplasm is seldom considered on account of the youth of many of the patients.

Demonstration of the cyst directly by cholecystography is usually not possible, but the gall-bladder is often distorted so that it appears comma-like. Calcification may occur in the cyst wall, so that its presence may be confirmed on a plain radiograph of the abdomen, and distortion of the duodenum or colon may on occasion be shown by barium studies.

Few studies have been reported in patients with this condition owing to the infrequency with which the diagnosis was made pre-operatively. The following case is of interest because of the typical features of the clinical syndrome as it presented and the studies that were made possible by the pre-operative diagnosis.

Case Report

A married woman aged 19 had suffered five intermittent attacks of mild jaundice, each lasting a few days, during the two years before admission; these had been unassociated with abdominal pain or any symptoms referable to the alimentary tract. The attack of jaundice which precipitated her admission to a maternity hospital began three months previously, during the sixth month of her first pregnancy. Following a premature delivery at the seventh month, the jaundice largely resolved, but increased again ten days later after the patient had returned home. She was readmitted to hospital deeply icteric and suffering from a mild diarrhoea with three or four pale semi-formed stools daily. A mass in the right hypochondrium, at this time thought to be the liver, was palpable. Cholecystography revealed no abnormality of the gall-bladder, and liver-function tests showed a predominantly obstructive pattern.

She was transferred to the medical unit, Queen Elizabeth Hospital, one week later, on March 4, 1954. She was slightly icteric and rather pale, but there were no abnormal physical signs other than a firm rounded tumour in the right hypochondrium, about 10 cm. in diameter. The liver and spleen were not palpable and a diagnosis of choledochus cyst seemed to be justified. Laboratory investigations showed a normal blood count, but the erythrocyte sedimentation rate was 45 mm. in one hour (Wintrobe corrected). Radiography of the chest and soft abdominal tissues showed nothing abnormal, but barium studies demonstrated a narrowing of the second part of the duodenum with dilatation of its proximal portion. There was a moderate excess of fatty-acid crystals in the stools, and fat-balance studies on a daily intake of 50 g. of fat revealed a moderately severe degree of steatorrhoea with only 72% absorption of ingested fat. Occult blood was not found in the stools. Liver-function tests were normal except for a raised serum bilirubin (5 mg./100 ml.), a raised serum alkaline phosphatase (29 units/100 ml.), and a prothrombin value of 48% by Quick's method. The urine contained urobilin, bilirubin, and bile salts in detectable quantities.

At operation a large ovoid cyst was found arising from the common bile duct. It measured 20 by 10 cm. and contained about one litre of dark green bile. The gall-bladder and cystic duct were normal. The cyst was adherent to many of the surrounding structures, prohibiting its complete resection. It was therefore drained into the jejunum by means of a Roux-en-Y anastomosis.

The patient made a satisfactory post-operative recovery until the 11th post-operative day, when she developed diarrhoea with three to six stools a day. The stools were semi-fluid, pale, rather bulky, and offensive, and fat-balance studies again showed a severe degree of steatorrhoea with only 64% absorption of ingested fat. This fatty diarrhoea continued up to the time of discharge on the 37th day after operation. During the five weeks following operation the biochemical liver-function tests remained normal, and although the serum bilirubin and prothrombin values gradually returned to normal the serum alkaline phosphatase remained persistently elevated at 30-50 units/100 ml.

Intestinal intubation showed the duodenal contents contained normal amounts of pancreatic enzymes, but there was a complete absence of bile from the small intestine as far as the jejunum. It appeared likely, therefore, that the anastomosis between the cyst and the small intestine was not sufficiently proximal to ensure adequate mixing of the pancreatic enzymes and their biliary activators during the processes of digestion. However, before further surgery could be carried out the patient requested discharge, and since that time has refused review. During her stay in hospital the patient showed no significant weight loss, haematological change, or any other clinical manifestations of a general malabsorption syndrome.

Discussion

This patient had many of the clinical features usually associated with this anomaly. She was a young woman with recurrent attacks of mild jaundice and a tumour in the right hypochondrium. The most severe attack of jaundice was associated with pregnancy and resolved following delivery. Laboratory investigations were helpful diagnostically only in so far as they confirmed the presence of an obstructive biliary lesion, and contrast radiography was of value in excluding a tumour of intestinal origin. The treatment of congenital cystic dilatation of the common bile duct is surgical, and there is no doubt that the most satisfactory procedure is choledochojejunostomy using a Roux-en-Y loop. Choledochoduodenostomy has often given satisfactory results initially, but ascending cholangitis and hepatitis have been a frequent sequel to this type of operation.

Of particular interest in the present case was the unexplained steatorrhoea observed before operation, and there is no report in the literature of this abnormality in association with choledochus cyst. A possible explanation is that distension of the upper gastro-intestinal tract with food caused intermittent but complete occlusion of the biliary tract by displacement of the cyst, so that the biliary activators of the pancreatic enzymes were absent at the most crucial phase of digestion in the upper intestine. At other times during the post-absorptive phase, biliary flow was relatively free. A further possibility is that the two conditions are entirely unrelated, the steatorrhoea being due to an idiopathic malabsorption syndrome. Although this latter possibility cannot be entirely ruled out, it is unlikely in view of the normal intestinal mucosal pattern seen on the barium-meal examination and the absence of haematological abnormality.

In spite of the relief of the obstructive element in the syndrome, the steatorrhoea continued unchanged and after operation the patient was excreting 36% of her total ingested fat. The pancreatic secretions were known to be normal in quantity and activity, and it is possible that this malabsorption was due to defective mixing of the food with the pancreatic enzymes and bile.

Summary

A case of choledochus cyst is described. Metabolic studies, with particular reference to fat absorption, were made before and after operation. The pre-operative steatorrhoea persisted after an operation which relieved the biliary obstruction.

We thank Professor W. Melville Arnott and Mr. B. N. Brooke, under whose care this patient was admitted, for their help and encouragement in the preparation of this paper. We also thank Dr. C. F. J. Cropper, of Worcester Royal Infirmary, who referred this case initially, and Mr. Garfield Thomas, who was responsible for the biochemical investigations.

REFERENCES

- Gross, R. E. (1933). *J. Pediatr.*, 3, 730.
Hertzler, J. H., and Maguire, C. E. (1951). *A.M.A. Arch. Surg.*, 62, 275.
Irwin, S. T., and Morison, J. E. (1945). *Brit. J. Surg.*, 32, 319.
Judd, E. S., and Greene, E. I. (1928). *Surg. Gynec. Obstet.*, 46, 317.
Lichtman, S. S. (1949). *Diseases of the Liver, Gall Bladder, and Bile Duct*, 2nd ed. Kimpton, London.
Shallow, T. A., Eger, S. A., and Wagner, F. B. (1943). *Ann. Surg.*, 117, 355.
— (1946). *Ibid.*, 123, 119.
Walton, Sir J. (1939). *Brit. J. Surg.*, 27, 295.

Medical Memoranda

Bilateral Rupture of Rectus Femoris Tendons in Chronic Nephritis

The following case is rare enough to warrant recording, particularly in view of the young age of the patient and the associated general disease. Rupture of both quadriceps tendons has been recorded before, but these cases have been in elderly people (Lloyd, 1949).

CASE REPORT

A man of 34 was admitted to hospital on March 17, 1956, having fallen on to his knees while going down some steps. On attempting to stand his knees gave way. He stated that for some months he had been feeling rather tired and that this came on after a bout of influenza. He had, however, been able to carry on his work.

On examination he was rather pale, with a blood pressure of 160/80 mm. Hg. He was almost completely bald, and this made him appear much older than his years. Both knees were swollen and clinically resembled a haemarthrosis. He was very tender over the upper margin of both patellae, but there was no palpable defect in the extensor apparatus. He was just able to maintain full extension, but this caused him considerable pain. He had sustained an injury to the left ankle which proved to be a first-degree external rotation fracture of the fibula. X-ray examination of the knees showed that both the upper margins of the patellae were tilted forward and there was a calcified plaque in the soft tissues immediately above. It was thought that there was a tear of the rectus femoris tendon alone without involvement of the lateral expansions, and exploration of the knees was advised.

Operation.—The lesion was found to be almost identical on both sides, that on the right being slightly more extensive. A 2-in. (5-cm.) crescent of rectus femoris tendon had been torn off the top of the patella along with a sliver of bone. There was no evidence of calcification in the tendon itself. The lateral expansions were intact, the tear being much less extensive than in the usual quadriceps rupture. The patellae were displaced forward at the site of injury and the rectus femoris tendons tucked in behind. A repair was easily accomplished with silk mattress sutures.

The patient was rather lethargic after operation, but his condition did not cause any concern until the third day, when it became obvious that there had been a sudden serious deterioration in his condition. Investigation showed: blood urea, 312 mg. per 100 ml.; CO₂-combining power, 11.2 mEq/l.; Hb, 50%; serum phosphate, 12.2 mg. per 100 ml. He was passing normal quantities of urine, the specific gravity of which was 1010, with an albumin estimation of 70 mg. per 100 ml. On going into his previous history it was discovered that he had been rejected by the Army during the war because of albuminuria. He was regarded as a case of chronic nephritis, probably in the terminal phase. He shortly developed a pericarditis and died in uraemic convulsions on March 26.

Post-mortem Examination.—Both kidneys were found to be small and sclerotic. Sections of the rectus femoris tendons at the site of rupture showed no evidence of calcification or of degenerative changes.

COMMENT

It is felt that simultaneous rupture of both rectus femoris tendons in so young a patient must be an almost unique occurrence. The severe debility from his renal failure may have been a contributory cause, although there was no evidence of degenerative changes in the tendons. It is interesting to note the very limited extent of the lesion, distinguishing it from the more common form of quadriceps rupture. In the latter injury it is most unusual for the

patient to be able to hold the knee fully extended against gravity, a sign which was absent in this case. The unusual tilt of the patellae therefore proved a useful guide in making the diagnosis.

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REFERENCE

Lloyd, E. I. (1949). *Brit. J. Surg.*, 36, 94.

Fatal Reaction Following the Intravenous Injection of Congo Red

While the Congo-red test for secondary amyloidosis is not now extensively used, it is advised as a helpful diagnostic procedure in primary systemic amyloidosis (Rukavina *et al.*, 1956) and for the detection of amyloidosis in association with rheumatoid arthritis (Fearnley and Lackner, 1955). In view of this, it is considered of importance to record a death following the intravenous injection of Congo red.

CASE REPORT

A 47-year-old man underwent a right pneumonectomy for carcinoma in 1943. This was followed by an empyema which did not finally heal till 1950, during which time several plastic operations were required. Since 1950 he had experienced increasing shortness of breath and progressive reduction in his exercise tolerance. Three weeks before admission to hospital he developed marked swelling of his feet.

On admission he was cyanosed and dyspnoeic at rest. There was no increase of jugular venous pressure. Signs of bronchospasm were present over the left chest. Obvious oedema of the feet was noted. A heavy albuminuria was found without casts or red blood cells. The blood urea was 23 mg. per 100 ml.; plasma protein, 5.3 g. per 100 ml. (albumin 3.4 g.; globulin 1.9 g.); blood cholesterol, 148 mg. per 100 ml. Secondary amyloidosis following the empyema was suspected, and it was decided to perform a Congo red test.

Ten millilitres of a 1% solution of Congo red in normal saline was prepared at the bedside from a sealed ampoule of the powder. This solution was injected intravenously immediately afterwards. About two minutes later the patient complained of severe difficulty in breathing. Respiration ceased within seconds, and unconsciousness with deep cyanosis rapidly ensued. The radial pulse became palpable soon after the loss of consciousness. Approximately five minutes after the loss of consciousness ventilation was started through an endotracheal tube and the chest was opened for cardiac massage. After one hour spontaneous respiration and heart beat were restored, but after a further three-quarters of an hour he collapsed and died without fully regaining consciousness.

At necropsy the empyema was soundly healed. There were approximately 30 oz. (850 ml.) of blood in the left chest, clotted blood in the pericardium, and bruising of the myocardium. No evidence of amyloidosis was found.

COMMENT

Reactions to intravenous Congo red in the form of "chilly sensations" have been described by Keith *et al.* (1915), Strasser (1927) mentioned the occurrence of chills and fevers, and Rossak (1933) noted abdominal pain, flushes, palpitation, and malaise. More recently Discombe (1949) reported severe reactions following its injection—for example, nausea, sweating, headache, and vomiting—and mentioned knowledge of at least one death.

Hallgrims (1939) described a death due to the injection of Congo red. The patient developed symptoms and signs suggestive of damage to the nervous system during the course of the injection and died the same day without regaining consciousness. Selikoff and Bernstein (1946) published an account of six cases with severe systemic reactions following injection. Two of these patients died. These reactions occurred within a few minutes of completing the injection and the manifestations were neurological—that is, intense headache, unconsciousness, and hemiplegia. Congo-red tests had been performed previously in all six patients and none gave a history of allergy.

Macht and Grumbein (1938) showed experimentally that Congo red had a depressant effect on the circulatory and respiratory systems, and this was confirmed by Richardson and Dillon (1939). The latter felt, however, that the dose used in clinical work left a wide margin of safety. There would appear to be four factors, all or one of which may have contributed to the severity of the reaction in the present case.

1. *The Solution was prepared with Normal Saline.*—Richardson and Dillon (1939) found that solutions of Congo red in saline were much more toxic for experimental animals than those prepared in water. Such saline solutions were stable for 24 hours only. This increased toxicity appeared to be due to flocculation which occurred in the saline solution. Somers and Whittet (1956) were able to confirm the greater danger with saline solutions. It is customary to use sterile water in clinical practice, and we were unaware of this increased toxicity at the time.

2. *Incomplete Solution of the Powder.*—The Congo-red powder may not dissolve readily, and incomplete solution is not easily detected. Discombe (1949) claims that reactions following injection of Congo red are due to the presence of particulate material, and Somers and Whittet (1956) found that solutions injected into mice before the powder is completely dissolved were highly toxic. The experience of the latter also suggests that batches of the powder vary as regards solubility. This danger would appear to be a strong argument against the use of freshly prepared solutions, which are usually advised on account of the instability of dissolved Congo red. Incompletely dissolved material could be removed by filtration, and, indeed, Somers and Whittet (1956) have shown how solutions of Congo red may then remain stable for several months—a much longer period than previously accepted. From this it seems that previously prepared filtered and autoclaved solutions may be safer.

3. *Variation in Batches of the Drug.*—Macht *et al.* (1939) found striking differences in toxicity between various batches of the dye, and this was greatly increased by the presence of impurities. A similar experience was reported by Somers and Whittet (1956). It is impossible to say what part this factor played in the reactions in the present case, but it later transpired that the ampoule of powder used had been in the ward for a considerable period of time, and possibly several years.

4. *Anaphylaxis.*—Selikoff and Bernstein (1946) believed that anaphylaxis was the basis of the reactions which occurred in their cases. They suggest that the Congo red, being an azo-dye, combined with the patients' own serum to form an azo-protein to which they became sensitized.

Clinical Pathology Notes (University College Hospital Publication) contains a warning regarding the danger of the Congo-red test in the presence of allergy. In the experience of the authors of this handbook, reactions have occurred where this test has been performed in patients with allergic disease (F. V. Flynn, 1956, personal communication).

The presence of bronchospasm in this patient suggested that he was an allergic subject, and it may well be that the train of events was a manifestation of acute sensitivity to the Congo-red dye.

I am indebted to Mr. G. A. Mason for permission to publish this case.

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REFERENCES

- Discombe, G. (1949). *British Medical Journal*, 2, 1230.
Fearnley, G. R., and Lackner, R. (1955). *Ibid.*, 1, 1129.
Hallgrims, M. (1939). *Ugeskr. Læg.*, 101, 996.
Keith, N. M., Rowntree, L. G., and Geraghty, J. T. (1915). *Arch. Intern. Med.*, 16, 547.
Macht, D. I., and Grumbein, M. L. (1938). *Amer. J. Physiol.*, 123, 136.
— Harden, W. C., and Grumbein, M. L. (1939). *J. Amer. pharm. Ass.*, 28, 495.
Richardson, A. P., and Dillon, J. R. (1939). *Amer. J. med. Sci.*, 198, 73.
Rossak, M. (1933). *Zbl. Gynäk.*, 57, 219.
Rukavina, J. G., Block, W. D., Jackson, C. E., Falls, H. F., Carey, J. H., and Curtis, A. C. (1956). *Medicine (Baltimore)*, 35, 239.
Selikoff, I. J., and Bernstein, I. J. (1946). *Quart. Bull. Sea View Hosp.*, 8, 131.
Somers, G. F., and Whittet, T. D. (1956). *British Pharmaceutical Conference, Dublin*.
Strasser, U. (1927). *Wien. Arch. inn. Med.*, 14, 97.

Reviews

WAR MEDICAL HISTORY

Medical History of the Second World War. The Army Medical Services. By F. A. E. Crew, F.R.S. *Campaigns—Volume I.* 1939–1942. Europe, Battle of Britain, Mediterranean, Middle East, Madagascar. (Pp. 637+xlii; illustrated. 75s.) London: H.M. Stationery Office. 1956.

We are all well accustomed to expect that any publication from the pen of Professor Crew will attain a high literary standard. In this massive volume of 637 pages our expectations are not disappointed. Professor Crew has managed very skilfully to combine a fascinating story of the various campaigns from the outbreak of war in 1939 up to 1942 with a mass of detail regarding the medical and fighting units involved, without spoiling the narrative and yet most cleverly presenting the many and complex problems which faced the medical services "in the field." To keep this volume to a reasonable size it was necessary to curtail the story of the Libyan campaign, which ends at the unfortunate yet glorious retreat of the Eighth Army to Alamein. All students of these histories will look forward with interest to the "continued in our next."

The value to posterity of a war history of this nature lies not so much in the accuracy of the description of the facts of the campaigns as in a correct representation of the lessons learnt. The author has illustrated the difficulties which the medical services had to face when confronted with a highly mobile form of warfare for which their field medical units were hopelessly under-trained and under-equipped, lacking essential transport and thus mobility. These deficiencies, partially overcome by skilful improvisation, demonstrated once again that if the Regular Army field medical units are to be able to take their full place in support of their combatant brethren they must be equipped with every available facility and given an opportunity to train with the fighting forces in peacetime. Graceful acknowledgment is made, however, to the Territorial Army field medical units, which at the outbreak of the Second World War, as in 1914, were the only field medical units with any semblance of field training.

During the Libyan campaign the fantastic distances over which our wounded had to travel by sea, road, and rail to receive definitive treatment in a base hospital are constantly mentioned, but no reference is made to the struggle to persuade the Government to order the R.A.F. to supply air ambulances—a controversy which started in the Middle East before the outbreak of war. Volume I—*Administration of the Medical History of the Second World War* describes the situation. There are numerous sketch maps, many printed with such small lettering that they are difficult to read; it would have helped if reference had been made in the text itself to the particular map of the area being dealt with. The index is perhaps the weakest part of the history, which assuredly will be used as a book of reference, where a comprehensive index with cross-reference to other volumes of the series is of importance.

Campaigns—Volume I combines interesting reading with historical fact, in itself a triumph for any historian to achieve.

J. C. A. DOWSE.

AVIATION MEDICINE

Doctors in the Air. By Wing Commander Robert Maycock, A.F.C. (Pp. 145; illustrated. 15s.) London: George Allen and Unwin Ltd. 1957.

This is not a novel, and should not be associated with any other books bearing a similar title; it is a record of aviation medicine in an "easy-to-read" edition. Wing Commander Maycock was one of the first two R.A.F. medical officers to pass a full wartime pilot's training, and he gives a very impressive account of the doctors who worked and experimented in laboratories, in the field, and

in aircraft. To stimulate the reader's interest he presents a concise and informed review of aerial endeavours from 1500 B.C. to the recent "Berlin airlift." Although it is recorded that a "physician of the Scottish Court" attempted to fly in 1607, it was not until 1912 that Service doctors in the R.N.A.S. and R.F.C. really took to the air and gave serious thought to the physical problems of flying. The records of anoxia, fatigue, and exposure are well illustrated both in the R.A.F. Physiological Laboratory at Farnborough and "on test flight"—the most dramatic story being of the Fortress that flew into the top of a thundercloud at 32,000 feet (9,750 m.), and one doctor, the sole survivor of a crew of eight, was awarded the Air Force Cross. The courage of the research medical officers and the extremes to which they submitted themselves are well illustrated by the experiment of floating in a flying-suit in the sea off the Shetlands in mid-winter; and again when anaesthetized "the doctor" sank in a special water-tank in order that "observers could note how the particular life-jacket behaved on trial and whether it brought the subject to the surface in the correct floating position." There are many interesting records of the R.A.F. Medical Branch in all commands at all levels, with special tribute to the flying personnel medical officers, the parachute medical teams, and air ambulance orderlies. Those readers who served in the R.A.F. during the war should enjoy "spotting" old colleagues in the narrative. I would especially recommend this book to all doctors who contemplate joining the Royal Air Force as a career or for their National Service, in order that they may know, understand, and appreciate what has been done by "some of the few" who did so much for "the Immortal Few" and those that followed.

J. HOPE POOL.

TERRAMYCIN AND AUREOMYCIN

Terramycin (Oxytetracycline). By Merle M. Musselman, M.D., with the collaboration of H. L. Davis, Ph.D., and H. W. McFadden, Jr., M.D. Foreword by Henry Welch, Ph.D., and Felix Marti-Ibanez, M.D. (Pp. 144. 54s.) New York: Medical Encyclopedia, Inc. London: Interscience Publishers Ltd. 1956.

Aureomycin (Chlortetracycline). By Mark H. Lepper, M.D. Foreword by Henry Welch, Ph.D., and Felix Marti-Ibanez, M.D. (Pp. 156. 54s.) New York: Medical Encyclopedia, Inc. London: Interscience Publishers Ltd. 1956.

This series now comprises seven completed and eight projected volumes. To devote a small (though not inexpensive) monograph to each antibiotic has something to be said for it, and this policy has been applied even to the three tetracyclines; that on tetracycline by Dowling has been in print for some time, and here are the other two. On the other hand, very cogent reasons could have been advanced for dealing with them together in a single volume, if anyone could have been persuaded to undertake this task. To deal piecemeal with such closely similar drugs involves repetition, and one would like to read a considered opinion, first of the indications for the group as a whole, and secondly of their relative individual merits. They differ somewhat in antibacterial activity: chlortetracycline is the most active against pneumococci and staphylococci, oxytetracycline against *Pseudomonas pyocyanea*, and tetracycline against *Proteus*. These differences are not made evident by comparing the separate lists of bacterial sensitivities in the two volumes. Indeed, two of the three are actually contradicted by the figures given (for the respective minimum inhibitory concentrations). Nor is it possible by comparing data in the two books to conclude that the blood levels produced by a given dose are higher from oxytetracycline than from chlortetracycline.

Both authors have conscientiously carried out the task of digesting an extensive literature; the respective bibliographies contain 769 and 664 items with titles, and could in themselves be of much value to the seeker after obscure information. Apart from their acknowledged efficacy in many specific infections due to susceptible micro-organisms, chlortetracycline is credited with a curative action in leprosy,

Haemophilus influenzae arthritis, rat-bite fever, and stomatitis, and oxytetracycline in asthma, cat-scratch fever, molluscum contagiosum, and vaginal trichomoniasis. Both books, like the rest of this series, have the titles of the series and of the book itself as page headings, which is unhelpful, since the reader may be presumed to know what book he is reading, and would prefer to be told what section of it the page is in. Musselman's is well subdivided by text headings. Lepper's has none; the 21-page chapter on Gram-negative infections is an expanse of text with no indication of the many subdivisions of this subject. Each of these volumes may be commended as a source of information in its limited sphere, and for the opinions within this of its authors, which must command respect; but it has been left to someone else to survey this group of drugs as a whole, to define their merits in relation to other antibiotics, and to distinguish between the merits of each of them. Anyone adjudicating on this last question might possibly have a hard task in deciding whether it is therapeutically necessary that all three should continue to exist.

L. P. GARROD.

PERSPIRATION

Human Perspiration. By Yas Kuno, M.D. (Pp. 416+xv; illustrated. 72s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1956.

Professor Kuno's previous monograph, *The Physiology of Human Perspiration*, has for long been a standard work, but 23 years have passed since it appeared, and in that time very considerable advances have been made in this field of physiology. The publication of the present volume therefore becomes an event of some importance. In the foreword the author states that it is "an account of the present knowledge of perspiration," but he adds: "Instead of presenting a cumbersome review of the literature we have drawn extensively on personal observation." Some may feel that the conflict of these two aims has led to a certain lack of balance in that, although no important aspect of the subject is neglected, in the presentation of each topic the views and findings of the Japanese school are emphasized. Whether undue weight has been given to these views must remain a matter of opinion—it is perhaps a valuable corrective of the Western tendency to think mainly in terms of work done in the West. Be this as it may, the book does have a serious defect in a work of this nature. On the grounds that the 500 or so references in the previous volume provided an exhaustive bibliography, the present work contains only 37 "selected references," with the result that one finds many references in the text which appear in neither list. One minor blemish may be mentioned. The index, though effective, is somewhat clumsily arranged, and it is marred by a few misspellings. Despite these shortcomings, the book remains worthy of its predecessor—a most important work that every physiologist will wish to read. The book itself matches the importance of its subject-matter: paper, printing, and binding are excellent.

R. K. MACPHERSON.

SURGICAL PATHOLOGY

A Textbook of Surgical Pathology. By Charles F. W. Illingworth, C.B.E., M.D., Ch.M., F.R.C.S.Ed., and Bruce M. Dick, M.B., F.R.C.S.Ed. Seventh edition. (Pp. 730+viii; illustrated. 63s.) London: J. and A. Churchill Ltd. 1956.

A seventh edition of this book, now in its twenty-fifth year, is welcome and indicates its continued popularity. This is well deserved, as we are given not only an authoritative and condensed account of modern surgical pathology in which principles, so important to the student, are emphasized, but a book which is well and clearly printed, appropriately illustrated, and of convenient size to be a working manual. In this latest edition there are new sections dealing with those aspects of water balance and blood chemistry which are important to the surgeon. Such subjects also as hormones and cancer, radioisotopes, hypothermia and refrigeration,

and the crush syndrome are considered concisely and clearly. The illustrations have also been revised, some of the older ones having been replaced while others have been added; many are of specimens in the Museum of the Royal College of Surgeons of Edinburgh. Reproduction has been good and all are admirable. Appropriate references to important contributions to the subject with which each chapter deals are given at the end of it. There is little to criticize, but there is no mention of mycotic aneurysms, which, now that infective endocarditis is controlled with antibiotics, sometimes concern the surgeon. The authors express the hope that the book will continue to prove of value to senior students and those preparing for senior qualifications; there can be little doubt that this hope will be abundantly fulfilled.

LAMBERT ROGERS.

CONGENITAL HEART DISEASE

Cardiopathies Congénitales. By P. Soulié. Preface by Robert Debré. Second edition. (Pp. 448; illustrated. No price.) Paris: Expansion Scientifique Française. 1956.

The second edition of "Congenital Heart Lesions" appears five years after the first. The preface points out that the time is ripe for a new review of the subject, for the surgical technique has made great advances lately; hypothermia and an artificial circulation give possibilities of a bloodless field of operation, and enhance still further the need for medical diagnosis, based on the fullest study of all available data. This book does not claim to be a full treatise on the subject with complete bibliography. There are new sections on electrovectorcardiography, aorto-pulmonary fistulae, aortic stenosis, and pulmonary angiomata. In the first section the account of definite development of the bulbus cordis is very clear. The technique and value of cardiac catheterization and angiocardiology are fully described. The next section describes the various lesions. The tetrad of Fallot occupies the first place, as is logical enough; and then the trilogy. Should not this, more uniformly, be "triad"? Throughout the expression is clear and economical. The illustrations are excellent, particularly the cardiograms and pressure curves. In each instance all the information is well marshalled and co-ordinated in a well-integrated whole. This is a fine work and a mine of practical information. The question of anaesthesia and surgical operation comes rather shortly at the end, but there is a quite adequate account for a physician reader. No fewer than 27 collaborators have produced this book, with a well-blended authority that is a great credit to French cardiology.

TERENCE EAST.

SHAW'S GYNAECOLOGY

Shaw's Textbook of Gynaecology. Revised by John Howkins, M.D., M.S., F.R.C.S., F.R.C.O.G. Seventh edition. (Pp. 704+vii; illustrated. 32s. 6d.) London: J. and A. Churchill Ltd. 1956.

What has long been one of the most popular undergraduate textbooks in this country requires no introduction. Moreover, it requires little more than a glance to understand its popularity. It is a model of clarity and conciseness, well illustrated, and conforming in layout with a long tradition of gynaecological textbooks. Mr. John Howkins is responsible for this new edition, and has succeeded in making a number of improvements without destroying the original author's imprint. He has also had the happy thought of dedicating it to Wilfred Shaw himself. No British gynaecologist is more deserving of posthumous tribute, and none could have wished for better. One can appreciate Mr. Howkins's reluctance to discard too much of the master's work, but Shaw's classification of ovarian tumours would appear to have outlived its usefulness; it is more likely to confuse than help the student of to-day. However, Mr. Howkins will surely not have to wait long for an opportunity to re-examine this matter, for the many other good qualities of this edition promise a quick sell-out.

T. N. A. JEFFCOATE.

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QUARANTINABLE DISEASES

A little more than one hundred years ago the first International Sanitary Conference was held and the first International Sanitary Convention was drafted. The early conferences were concerned with cholera, plague, and yellow fever, and it was not until 1926 that smallpox and louse-borne typhus were added to the list, which was further enlarged in 1951 by the inclusion of louse-borne relapsing fever. Such vast changes have occurred in the incidence of these infections during the last hundred years as a result of advances in epidemiology and methods of control that few people now living under western conditions can appreciate the ravages of widespread pestilential disease in a community. A brief survey of the present position has been made by the World Health Organization,¹ and it is clear that, though all the quarantinable diseases still exist endemically in various parts of the world, their spread from these centres has been controlled by international action and the incidence in them has been reduced by rising standards of living and the introduction of preventive measures.

Cholera, which was pandemic as recently as the early years of this century, is now virtually contained within a limited area. Since the second world war the disease has only once spread outside Asia (to Egypt in 1947), and even within that continent spread has been greatly limited. During the last six years cholera has been confined to its endemic foci and immediately adjacent areas in India and Pakistan with a few cases in Indo-China. The present position of plague differs from that of cholera because it is enzootic in wild rodents in Asia, Africa, and the continent of America, and there is little probability of the eradication of these hosts or of the disease in them. The transmission of plague to man, however, has steadily declined, certain endemic foci have been eliminated, and international spread has virtually ceased. This has resulted from control of the flea vector by modern insecticides and from improved hygiene in towns, ships, and ports. Attack on the domestic rat with new and more efficient poisons is being intensified. Plague can no longer be regarded as a serious menace, and, though outbreaks may con-

¹ Gear, H. S., and Deutschman, Z., *Disease Control and International Travel*, 1956, Geneva.

tinue to occur, they can be rapidly brought under control.

The incidence of louse-borne typhus during the two world wars makes an interesting contrast. Millions of cases occurred during and after the first, but in the second, although serious epidemics occurred, they did not spread and devastate whole communities or countries. The factors responsible for the reduced incidence were improved general hygiene, modern insecticidal control of lice, and possibly typhus vaccine. Even in the endemic areas the incidence of typhus is declining, and there has been no outbreak in the last ten years resulting from international travel. It is unlikely that in future any serious epidemic will occur in times of peace and security: control measures have been so successful that it was suggested that typhus should be omitted from the list of quarantinable diseases, but this was thought to be premature and louse-borne relapsing fever was added to the list. Though widespread and international epidemics of relapsing fever have occurred it has never been a serious problem of international travel, and since it is easily controllable by insecticides it may be classed with typhus as a disease of rapidly decreasing importance.

The incidence of smallpox still remains high in the endemic centres, although it has shown a slight decline in the last five years. Some 55% of all cases were notified from India and Pakistan and a further 23% from other Asian countries. The disease usually appears only in sporadic form in communities in which the bulk of the people are vaccinated. Smallpox, nevertheless, is the disease most commonly reported as infecting ships, and it will remain an international problem until improved health services throughout the world have raised herd immunity by vaccination. As to yellow fever, the main reservoir is now proved to be the monkey population in endemic areas. This reservoir cannot be eliminated, but control of the urban vector, *Aedes aegypti*, has advanced to a point where outbreaks in towns can be rapidly terminated. Sporadic cases continue to occur in human populations living in the forest in the vicinity of infected monkeys. Jungle yellow-fever has extended in Central America and Trinidad, but preventive measures have been applied and human infection has been limited. Until control by vaccination of the human population has been sufficiently widely applied in jungle-yellow-fever areas the threat of spread to receptive countries such as Egypt and India will remain.

The quarantinable diseases now no longer represent the international menace they were fifty years ago, and the threat grows less as the means of control are applied in the countries which still contain endemic

and enzootic reservoirs of infection. As standards of hygiene rise throughout the world and as the poorer countries improve their economy and social services, quarantine as a means of control of the pestilential diseases will become less and less necessary in times of peace and security. The world can now contemplate in the not too distant future the deletion of several of the quarantinable diseases from the list. This does not necessarily mean that all international barriers to the spread of disease will be removed. There may be a demand for the control of spread from their endemic foci of certain diseases which at the present time are widespread in some parts of the world but strictly controlled in others. Malaria might become the subject of international regulations, and, as ability to diagnose poliomyelitis improves and understanding of its epidemiology grows, attempts may be made to limit its introduction into countries with high standards of hygiene from tropical and subtropical countries in which the infection is almost universal. Quarantine as such is likely to disappear, but other measures directed towards preventing the importation of communicable diseases of major importance may be elaborated to replace it.

LEUKAEMIA, ANKYLOSING SPONDYLITIS, AND RADIOTHERAPY

Leukaemia is still an uncommon disease, but its incidence has shown a steady increase in the last twenty years. As R. Bodley Scott¹ pointed out in his Lettsomian Lectures for 1957, although more precise diagnosis may explain part of the increase it does not account for all of it; and L. J. Witts,² in a paper published last month in this *Journal*, emphasized that the search must go on for factors in our greatly changed environment which may have contributed to this increase. Evidence implicating exposure to ionizing radiations was mainly experimental and circumstantial until the reports of increased mortality from leukaemia in Nagasaki and Hiroshima after the atomic bomb explosions of 1945. When an increased incidence of leukaemia was suspected among patients given x-ray treatment for ankylosing spondylitis the Medical Research Council sponsored an investigation, and the results, reported by W. M. Court-Brown and J. D. Abbott,³ confirmed that there was in fact a somewhat increased mortality from leukaemia among these patients. Little evidence was available on the delayed effects of small doses of radiation, and the Medical Research Council therefore initiated an extended survey. This was carried out by W. M. Court-Brown and R. Doll, who investigated the records of patients with ankylosing spondylitis treated with x rays, assessing the death rate among them from

leukaemia and aplastic anaemia, and attempting to determine the relationship between the doses of radiation given and the later incidence of these diseases. The results have now been published⁴; they represent, in the introductory words of the report, "the most substantial contribution to date on the increasingly important subject of the relationship between exposure to radiation and the occurrence of ill effects."

To determine the incidence of leukaemia and aplastic anaemia, Court-Brown and Doll analysed the records of 13,352 patients presumed to have ankylosing spondylitis and given x-ray treatment for this at 81 British radiotherapy centres between 1935 and 1954. On the death certificates of 46 who had died by December, 1954, a diagnosis was recorded of leukaemia, aplastic or hypoplastic anaemia, or myelofibrosis, and in addition three patients still alive were found to have leukaemia. In 28 of the patients death was certified as due to leukaemia and in 12 to aplastic anaemia. The number of deaths from leukaemia which might have been expected in the series, in the absence of any unusual leukaemogenic stimulus, was estimated from the national vital statistics, and the figures up to December 31, 1955, were 2.9 for leukaemia and 0.3 for aplastic anaemia. There was thus a highly significant increase in mortality from leukaemia and aplastic anaemia among the patients in the irradiated series.

For detailed analysis it was necessary to reclassify the patients according to what was later thought to be the most accurate diagnosis, after review of full clinical and pathological data. Of the cases stated to have died from aplastic anaemia, half were probable cases of leukaemia, and of the remainder the diagnosis of aplastic anaemia could be confirmed in only four (only one of which was clearly due to irradiation alone). In addition to the cases of leukaemia occurring in the series, particulars were available of 23 cases of leukaemia and aplastic anaemia occurring in patients with ankylosing spondylitis outside this survey, and 15 of these were known to have been irradiated. Court-Brown and Doll included the data from these cases in their discussion of the latent period and cell type of the leukaemia. The number of cases available to provide information on the latent period was small, since the majority of the patients with leukaemia had received two or more courses of treatment and it was not possible to decide which course was relevant. It seems likely, however, that the latent period for leukaemia after irradiation is seldom less than two years,

¹ Bodley Scott, R., *Lancet*, 1957, 1, 1053.

² Witts, L. J., *British Medical Journal*, 1957, 1, 1197.

³ Court-Brown, W. M., and Abbott, J. D., *Lancet*, 1955, 1, 1283.

⁴ Court-Brown, W. M., and Doll, R., "Leukaemia and Aplastic Anaemia in Patients Irradiated for Ankylosing Spondylitis," *Spec. Rep. Ser. med. Res. Coun.* (London), No. 295, 1957, H.M.S.O., London.

⁵ Abbott, J. D., and Lea, A. J., *Lancet*, 1956, 2, 1317.

more often three to five years, and that longer periods are less common. The mortality from leukaemia among patients treated with x rays for ankylosing spondylitis was about ten times greater than the mortality in a normal population of the same age and sex distribution. Could this have been in part due to an association between leukaemia and ankylosing spondylitis itself? The authors thought this unlikely, for three reasons: the differing distribution of cell types among the irradiated and unirradiated cases; the previous findings of J. D. Abbatt and A. J. Lea,⁵ who in a statistical investigation had compared irradiated and unirradiated cases of spondylitis; and the later finding that a relationship exists between the dose of radiation and the incidence of leukaemia.

In their investigation of the relationship between the dose of x rays and the occurrence of leukaemia, Court-Brown and Doll found it impracticable because of the large numbers to calculate for each individual the amount of radiation received, and therefore used a sampling procedure. Details of x-ray dosage were obtained for about one in six of the patients, and the doses were expressed in terms of the dose to the spinal bone marrow (in roentgens) and also in units of whole-body integral dose (megagramme-roentgens). The spinal-marrow dose was estimated in two ways—as the mean dose to the marrow throughout the whole length of the spine, and as the maximum dose at a point in the spinal marrow. The mean spinal-marrow dose was also separately estimated for those patients receiving only spinal irradiation. (Cases used for this particular study included 32 with an established diagnosis of leukaemia, and five probable cases of leukaemia; 18 of the 37 had received only spinal irradiation.) In interpreting their findings, Court-Brown and Doll suggest as a working hypothesis that, for low doses, the incidence of leukaemia bears a simple proportional relationship to the dose of radiation, and that there is no threshold dose for the induction of the disease. Their calculations based on this, and on the figures for cases of leukaemia given only spinal irradiation, show that the dose to the whole marrow which would have doubled the expected incidence of leukaemia may be between 30 and 50 r (for irradiation with x rays of the same average energy as those used in treating ankylosing spondylitis.)

The importance of this report is threefold. It establishes the extent of a therapeutic hazard and thus helps the clinician to determine the treatment needed by his patient. The fact that a hazard has been demonstrated does not necessarily preclude the use of a method of treatment; but the probable benefits from its use have to be weighed against the risks entailed for the individual patient, after considering the possible alternative treatments and the prognosis

if the one method is omitted. Ankylosing spondylitis may be a crippling disorder, and there is no doubt of the benefit in relief of pain and increase of mobility which may be obtained from judiciously applied radiotherapy. As Witts² pointed out, although the death rate of 3 per 1,000 from leukaemia after radiotherapy for spondylitis is ten times as high as the usual incidence of leukaemia in this age group, it is lower than the mortality of 13 per 1,000 for interval partial gastrectomy for peptic ulcer in the best hands. The second point is of more far-reaching importance. The hypothesis that the incidence of leukaemia is proportional to the dose of radiation, and that there is no threshold dose for inducing the disease, would imply that in some cases of leukaemia the disease will have been induced by natural background radiation; and also that any exposure to radiation over and above that from the natural background must increase the risk of the disease developing, so that attention has to be given to the growing use of diagnostic radiology. The increased risk of leukaemia associated with any one x-ray examination in any one patient is very small indeed, but the population undergoing such examinations is very large. Nevertheless it seems unlikely that radiation alone can account for the whole of the increased mortality from leukaemia in the last two decades. Finally, the report is important as a model of the way in which an immense problem of medical research can be handled by a team of workers with varied interests and reduced to manageable proportions. Court-Brown and Doll state that a number of approximations have been necessary to arrive at the estimate of the relationship between radiation dose and the incidence of leukaemia, and that the estimate may be subject to appreciable error. Moreover, their hypothesis that there is no threshold dose, though a reasonable deduction, is not the only one compatible with the data, and they stress that until much more work has been done it will not be possible to decide between the alternative hypotheses.

N.H.S. DRUGS FOR PRIVATE PATIENTS

"All the service, or any part of it, is to be available to everyone in England and Wales. The Bill imposes no limitations on availability—e.g., limitations based on financial means, age, sex, employment or vocation, area of residence, or insurance qualification."

This statement appeared in a White Paper issued by the Labour Government in 1946¹ which described the provisions of the N.H.S. Bill. In 1949 the Conservative Party declared it was their policy to allow private patients to obtain drugs free of charge as one of the benefits available under the N.H.S. With un-

¹ See *British Medical Journal*, 1946, 1, 461.

failing regularity the Representative Body each year passes a resolution in favour of the same thing. Sub-committees are set up to consider the matter. Deputations go to Ministers of Health. Yet nothing happens. There is enough frustration in the medical profession as it is, but this failure on everyone's part to press home promises made to patients by both major parties is baffling in the extreme. Fresh support for the measure now comes in a welcome leading article in *The Times* of June 5: "And even though," the article states, "the doctors wanting the change frankly admit their wish to stimulate fee-paying, it is hard to see why the patient who genuinely wants to pay his doctor should be denied the right to get his drugs through the Health Service."

It is indeed hard to see why—and hard to understand why Governments and political parties will not keep their promises. The profession's representatives must continue to press the Government to do what its predecessors have said they would do. If one of the effects of providing drugs free for private patients were an increase in private practice, so much the better. The B.M.A. is pledged to protect the interests of private practice. Many patients, we believe, would become private patients if secured against the unexpected heavy cost of "life-saving" drugs in a severe illness. Many doctors are temperamentally averse to working in a State service. To attempt to force by one measure or another all into the one State service does more harm than good and goes against the grain of the British character. The more variety there is the better, and a bigger element of private practice would encourage this. Recent correspondence in the *Supplement* is a sign of a growing desire for this. The Minister of Health might have a look at some of the ways of providing drugs to the insured population in other countries. No doubt the profession's representatives would be prepared to consider for private patients the introduction of such modifications as exist in Australia and Norway, for example. This would give the Government the opportunity of an experimental trial of a different system. And the N.H.S. is badly in need of such experiments.

DIFFUSE PULMONARY FIBROSIS

Some 700 deaths are attributed to non-occupational fibrosis of the lungs in England and Wales every year. The figure for occupational fibroses is only slightly greater than this. Within the occupational group the fundamental cause of the fibrosis is rarely in doubt, but, if there is no history of industrial exposure, morbid anatomical studies often reveal no more than the fibrotic

end-result of some indeterminate inflammatory process. The complexities of this problem, particularly in relation to the collagen diseases, were reviewed by a clinician, a pathologist, and a radiologist at the Annual Congress of the British Institute of Radiology in 1955.¹⁻³ From the pathological standpoint most of the collagen diseases may be associated with pulmonary fibrosis, though not necessarily in a characteristic form. Scleroderma may produce irregular masses of scarring or diffuse fibrosis with cyst formation. Lupus erythematosus is ordinarily associated with non-specific changes, such as bronchopneumonia and oedema, but fibrinoid necrosis has been recorded. Polyarteritis nodosa is one of the few diseases within this group which causes identifiable pulmonary changes, but other causes of necrotizing arteritis need to be remembered. Rheumatoid arthritis may yield specific pulmonary nodules in addition to diffuse fibrosis. Despite these seemingly typical changes the diagnosis of individual collagen diseases is almost invariably determined by extrapulmonary features. Indeed, if the lungs alone are affected a firm diagnosis may be impossible, and if proliferation of bronchial epithelium or smooth muscle coexists an entirely different aetiology may be suspected.

To clinicians and radiologists the problem presents in a different way, and the whole range of processes which may give rise to diffuse reticular or nodular pulmonary opacities needs to be considered. Thus, the radiological diagnosis of diffuse fibrosis is by no means easy. Patterns indistinguishable from fibrosis may be produced by such unrelated conditions as carcinomatosis and the vascular congestion of mitral stenosis. Fortunately most of the causes of diffuse pulmonary opacities can be recognized by their associated extrapulmonary manifestations or by special investigations.

The occupational history may give a lead to diagnosis, as may former residence in a particular part of the world (for example, histoplasmosis⁴). High on the list of differential diagnoses come tuberculosis and sarcoidosis, which can usually be identified by laboratory procedures. Less common general disorders include the xanthomata (Hand-Schüller-Christian disease, Letterer-Siwe disease, eosinophilic granuloma) and the mesodermal dysplasias of the tuberous sclerosis group, which radiologically often give a characteristic honeycomb appearance throughout both lungs; their diagnosis is confirmed by extrapulmonary features. The pulmonary changes in the collagen diseases rarely constitute a diagnostic problem; they are more in the nature of curiosities in patients who show obvious signs of the various diseases elsewhere; their radiological patterns are as would be expected from the pathological changes already described.

Diffuse fibrosis having been accounted for in the great majority, a hard core remains in which the nature of the fibrosis remains obscure. Within this group there are many, mostly men between the ages of 40 and 60, who give a history of increasing breathlessness over the previous few months or years, and whose radiographs

¹ Seadding, J. G., *Brit. J. Radiol.*, 1956, 29, 633.

² Gough, J., *ibid.*, 1956, 29, 641.

³ Lodge, T., *ibid.*, 1956, 29, 645.

⁴ Symmers, W. St. C., *British Medical Journal*, 1956, 2, 786.

show a diffuse reticulation in both lungs, particularly in the lower halves. The sputum may be mucoid or purulent, and often the fingers are clubbed. A few respond to steroid therapy, but the majority eventually die from right heart failure. Post-mortem examination reveals a chronic diffuse interstitial fibrosis of undetermined origin. This disease, whatever it may be, is quite common, and appears to be some form of hitherto unidentified infection.

In summary, perhaps clinicians are in the strongest position to determine the cause of an obscure pulmonary fibrosis. They have the advantage of the history, physical examination, and special investigations, and few such cases cannot eventually be classified more or less satisfactorily. Indeed, the thoroughness with which these three methods of investigation are pursued determines to a large extent the chances of success.

PITOCIN DRIP

Since G. W. Theobald advocated the continuous intravenous administration of oxytocin in obstetrics in 1948,¹ the pitocin drip has achieved a prominent place, in hospital practice, in the induction of labour and the treatment of inefficient uterine action. This has been evident from the many reports published since 1950; while in the last 18 months synthetic oxytocin, synthesized by V. du Vigneaud in 1953,² has been found on clinical trial to be no different qualitatively or quantitatively in its action from the natural product.³⁻⁶ Most reviews of the value of the pitocin drip have given prominence to its supposed risks and drawbacks. These are the danger of causing uterine rupture in women who have previously undergone caesarean section, or who are of high parity, or in whom disproportion may be present; the inadvisability of giving it to toxæmic patients; the illogicality of administering it for incoordinate uterine action; and the necessity for the doctor to remain with the patient the whole time the drip is running. In a new account of his own experience, Theobald⁷ protests that the laying down of these limitations, which seriously lessen the usefulness of the pitocin drip, arises from disregard of his fundamental concept of the use of oxytocin "in physiological amounts" and not as a pharmacological substance. Theobald and his colleagues believe that labour occurs as a result of an enormous increase in the sensitivity of the myometrium to oxytocin, an increase normally effected over days or hours at or near term but possibly taking place any time during pregnancy. They advise that the pitocin drip should be started in a concentration of 1:10,000 or at most 1:5,000, and that

the strength should never exceed 1:2,500, because the sensitivity of the uterine muscle may increase during the administration. This is an important statement, for the dilution of pitocin most commonly reported as used is 1:1,000, while in the fatality reported by M. Lesser and G. A. Eason⁸ the concentration was much higher. Theobald and colleagues find that the obstetrician is required to be present only for the initial half-hour in order to observe any untoward alteration in the rate or rhythm of the foetal heart. Thereafter the foetal heart is recorded at frequent intervals.

The body of this latest paper reports the results of Theobald and his colleagues in the induction of labour and in the management of inertia.⁷ For the former purpose the first step is to sweep the membranes widely and then rupture them, allowing as much liquor as possible to escape. For this procedure the cervix must be soft and taken up and the os admit at least one finger. If, as happens in only 20% of cases, labour has not started within 24 hours, a 1:5,000 pitocin drip is set up. If labour then begins, the drip is continued until the end of the third stage of labour in order to minimize post-partum haemorrhage. If labour does not follow, a solution of 1:2,500 is substituted, and if this proves ineffectual the drip is taken down but started again the next day. The standard rate of infusion is about 40 drops per minute, and if at any time contractions are too frequent or prolonged Theobald prefers to change to a weaker solution rather than reduce the drip rate. Of 1,030 women induced in 1952-4, 222 required a pitocin drip. There were 7 avoidable foetal deaths among these cases, but only one was ascribed to the pitocin. Twenty of the 222 patients were delivered by caesarean section, mostly because of disproportion or severe toxæmia. Toxæmia was not regarded as a contraindication to intravenous pitocin, but when oedema was considerable a dilution of 1:2,500 was used at less than 20 drops per minute and for not more than a few hours. It was found a rewarding routine to give all patients 500,000 units of penicillin intramuscularly 8-hourly from the time of rupture of the membranes until delivery was completed.

In 600 cases of uterine inertia, including an unstated number with incoordinate uterine action, Theobald and colleagues employed wide sweeping and low rupture of the membranes followed by deep sedation, usually with morphine and scopolamine. In about 60% of cases labour was well established thereafter. In the remainder, 216 of the 600, a pitocin drip was necessary to reinforce these procedures, with some increase in the forceps rate (35%), a low section rate (4%, and almost all for disproportion), and an avoidable foetal mortality of 3%. Theobald holds that irregularity of the foetal heart in inertia is usually due to incoordinate uterine action, and that both are best countered by deep sedation rather than resort to caesarean section. This is because he regards incoordinate action as due to activity superimposed on the normal contractions following the excessive liberation of noradrenaline at uterine motor nerve endings. Once this superimposed activity has been obviated by adequate sedation, the pitocin drip can be

used to advantage. Theobald sums up by claiming that the procedures he advocates are effective; that they reduce the caesarean section rate; that they involve no serious hazard to the mother; and that the associated foetal mortality is not unreasonable. His views, set out in his usual forthright manner, may not command universal acceptance, but his arguments and his results merit close study by all obstetricians.

SUDDEN DEATH IN INFANCY

Detecting the cause of an infant's death can be surprisingly difficult, as several contributors to our columns have pointed out in the last few months. In any series of cases a residue commonly remains in which the cause of death is a matter of speculation. J. B. Arey and J. Sotos¹ have reviewed the records of 103 children who were either dead on reaching hospital or who died within 24 hours. The series included cases in which a severe disease or congenital anomaly was known to have existed for some time, cases of rapid deterioration superimposed on an apparently minor infection, and cases in which death suddenly overtook an apparently healthy infant. This last group included deaths similar to those recently discussed in this *Journal* by J. L. Emery and E. M. Crowley²—namely, babies unexpectedly found dead in their cots. The histories of 50 cases referred from a coroner's office to a hospital showed that 49 had had an immediately antecedent illness.

Cot deaths are a worry to the paediatrician and forensic pathologist alike. The old diagnosis of "status lymphaticus" is no longer tenable. "Accidental suffocation" does sometimes occur—for example, when a baby is caught in a twisted pram-harness or is left lying with his feeding-bottle in his mouth—and it may occur more easily in babies who are already ill or mentally defective. But suffocation is unconvincing as the main diagnosis unless the circumstantial evidence is strong. In recent years the theory has gained support that cot deaths are usually due to infection, and the work of Emery and Crowley is in accord with this view. The search for the evidence of infection has produced contradictory results. Many pathologists³⁻⁵ have found a low-grade pneumonia or pneumonitis with a mononuclear reaction. This change is seldom severe and is not in itself sufficient to have caused death, but it may possibly represent a site from which some virulent organism, so far unidentified and almost certainly not bacterial, may have gained entry to the body. On the other hand Arey and Sotos found that six of their ten cases of sudden death had septicaemia due to virulent bacteria. A. M. Barrett⁶ analysed twenty-eight cases of unexpected death after a short,

mild illness, and 23 cases of cot death. He attributed seven cases in the first group to respiratory disorders, five to cardiac disorders, five to inhaled food or vomit, four to "convulsions," three to gastro-enteritis, and one to meningococcal septicaemia, leaving three unclassified. Seventeen of the cot deaths were of uncertain cause.

Among 150 necropsies performed in 1955 in a British hospital,⁷ 66 were on children who died within 24 hours of admission. Fifty-six of the 66 were under 1 year old. Twenty-one of the 66 were babies less than a week old, in whom death was due to prenatal or perinatal factors. Of the remaining 45, 31 had shown some sign of illness for more than 24 hours before death, leaving 14 in whom death occurred within 24 hours of the onset of symptoms. None of these were cot deaths. The causes of death were as follows: septicaemia (with Waterhouse-Friderichsen syndrome), two; volvulus, two; miliary tuberculosis, one; intracranial haemorrhage, one; bronchopneumonia, one. In seven cases no exact cause of death was established. Of these last seven cases, one had a septicaemia without obvious foci, one showed "toxæmia," and the others showed histologically minor infection in lung or bowel. So far, then, it appears that most pathologists can at least find common ground in agreeing that sudden death in infancy is usually the result of infection.

The clinician would probably support this view. He remembers fulminating cases of gastro-enteritis, meningococcal septicaemia, and even "streptococcal pneumonia." Many an apparently mildly infected child has died suddenly in hospital without being suffocated. The infant with "viral bronchiolitis" sometimes shows nothing but severe apnoeic attacks for 48 hours before the chest signs appear. Cot deaths reach a peak at the age of 3 or 4 months, and if they had been due to suffocation the peak might be expected to come earlier. P. V. Woolley⁸ has shown that babies are more comfortable when covered entirely by blankets than might be thought. Remembering these points, the physician must often have thought that had a particular child not died in hospital it would have been classed as a cot death. It is interesting therefore to find that Barrett, after comparing the pathology in known cases of suffocation with that found in his 23 cases of cot death, concluded that the pathological features of deaths "of uncertain cause" were at least consistent with those of suffocation.

The main cause of cot deaths is still undetermined. The reasons for this are several. First, the material studied by the hospital pathologist differs from that studied by the forensic pathologist. Secondly, the pathological differences between asphyxia, infection, and non-specific agonal changes in the lungs are not always clear-cut. Thirdly, evidence of infection is not necessarily proof of the cause of death. The full explanation of these deaths may have to wait, as E. S. Duthie and R. A. Goodbody have said,⁹ "until new methods of examination for virus infections become available to the routine pathologist." Meanwhile there is evidently need for close collaboration between the pathologists and clinicians if all sides of these puzzling cases are to be studied.

¹ Theobald, G. W., Graham, A., Campbell, J., Gange, P. D., and Driscoll, W. J., *British Medical Journal*, 1948, **2**, 123.

² Du Vigneaud, V., Ressler, C., Swan, J. M., Roberts, C. W., Katsoyannis, P. G., and Gordon, S., *J. Amer. chem. Soc.*, 1953, **75**, 4879.

³ Bösch, K., and Käser, O., *Schweiz. med. Wschr.*, 1956, **86**, 229.

⁴ Bainbridge, M. N., Nixon, W. C. W., Schild, H. D., and Smyth, C. B., *British Medical Journal*, 1956, **1**, 1133.

⁵ Francis, H. H., and Francis, W. J. A., *ibid.*, 1956, **1**, 1136.

⁶ Mayes, B. T., and Shearman, R. P., *J. Obstet. Gynaec. Brit. Emp.*, 1956, **63**, 812.

⁷ Theobald, G. W., Kelsey, H. A., and Muirhead, J. M. B., *ibid.*, 1956, **63**, 641.

⁸ Lesser, M., and Eason, G. A., *British Medical Journal*, 1954, **2**, 79.

¹ Arey, J. B., and Sotos, J., *J. Pediatr.*, 1956, **49**, 523.

² Emery, J. L., and Crowley, E. M., *British Medical Journal*, 1956, **2**, 1518.

³ Carroll, J. G., *J. Pediatr.*, 1954, **45**, 401.

⁴ Gruenwald, P., and Jacobi, M., *ibid.*, 1951, **39**, 650.

⁵ Werne, J., and Garrow, I., *Amer. J. Path.*, 1953, **29**, 833.

⁶ Barrett, A. M., in *Recent Advances in Paediatrics*, ed. Gairdner, D., 1954, p. 301, London.

⁷ Results unpublished.

⁸ Woolley, P. V., *J. Pediatr.*, 1945, **26**, 572.

⁹ Duthie, E. S., and Goodbody, R. A., *British Medical Journal*, 1957, **1**, 285.

FAR EAST INFLUENZA

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The current influenza epidemic in the Far East has received world-wide and sometimes alarmist newspaper publicity. No account of the Hong Kong epidemic, from which the Malayan one presumably derived, has yet appeared in any of the medical journals to reach us. The following outline of the main aspects of the epidemic in the Federation of Malaya is therefore presented for the information of the medical profession in countries to which it may spread.

Peak Being Reached

Influenza was made a notifiable disease in the Federation on May 4 as soon as news of the epidemic in Singapore was received. The first notification in Kuala Lumpur was on May 6, and virus isolated from this patient was dispatched, after preliminary identification, to London and Washington on May 17. Although there are various defects in the figures, the notifications demonstrate the main features of the spread of the disease. By May 10 notifications were being received from most of the large towns; but the rural areas were not widely affected until about two weeks later and in many the peak is only now being reached. In each town the incidence has risen sharply during the first four or five days and has then been maintained for about three weeks. The spread in town and country is illustrated in the Table, which shows the notifications in the Perak North District, which contains one large town, Taiping, and a heavily populated rural area.

In Kuala Lumpur the majority of patients early in the epidemic were poorer people living in the most crowded and least healthy environments. Since then the disease has progressively affected those living in better circumstances, so that in the fourth and fifth weeks of the epidemic more and more patients from the upper class of Asians and among the Europeans have been seen. Asian military units have so far been much more heavily affected than the British, although in one small mixed unit the difference in rate was not marked. The apparent racial difference in incidence seems therefore more likely to be due to differences in degree of exposure and general environment and health than to immunity; influenza, after all, is not uncommon in Malaya and A-prime virus was isolated during an outbreak around Kuala Lumpur as recently as 1953.

Clinical Features

The clinical severity of the disease has varied widely, but a typical attack has the following course. Especially in children, the first complaint is usually of thirst followed in

6-12 hours by a very sore throat. On examination, a bright red velvety inflammation is characteristically confined to the posterior pharyngeal wall. About this time the temperature is around 102° F. (38.9° C.) and the pulse about 120 per minute. A generalized headache develops 3-6 hours later and in adults and adolescents is often accompanied by aching, particularly in the lower chest and lower back. Aches are uncommon in children, whose main discomforts are the sore throat and a "floating," "bloated" headache. Tonsillar enlargement without suppuration may occur during the next 24 hours, usually in patients with chronic tonsillitis. Dry cough is common at this stage, but no crepitations have been detected in the lungs of uncomplicated cases. By the third day the cough is brassy and associated with tracheitis. During the second 24 hours the fever is maintained, but the sore throat disappears and the headache and muscular aches diminish. Recovery is usual by the fourth day, and most patients return to work after about five days' absence. Vomiting has not been marked except in those intolerant of salicylates or given solid food during the first 24 hours.

Although the incidence of influenza has been very high the number of deaths attributable to it has been very small. Most patients have been able to go to clinics for treatment, but some have been too weak to stand—about 10% in a children's clinic—and several fainted while awaiting treatment. Several young children have shown meningism, and this has been noted in three fatal cases,* which had terminal convulsions and coma. These cases were not proved virologically.

About 10% of patients return to the clinic after the third or fourth day with secondary bronchitis, tonsillitis, etc. A few patients have had a short recurrence of fever about the seventh or eighth day.

Symptomatic treatment with salicylates has been very effective when combined with strict bed rest for two to three days, a bland diet, and copious fluids. Intramuscular chloramphenicol has been given to a number of severe cases with apparent benefit, but controlled evaluation of this observation has not been possible.

Virus Strains

Several strains of virus have been isolated in this Institute by us and by the United States Army Medical Research Unit working here. Four of them have so far been sent to the World Influenza Centres in London and Washington for detailed study. Haemagglutinin-inhibition tests with the first three strains isolated at once showed that they were unrelated to strains for which antisera were available to us (i.e., A: PR8; A-prime: FM-1, FW/1/50, FLW/1/52; B: LEE, IB-1, B/Malaya/5/55). Subsequently, A/Nederlands/56 antiserum and virus were received from Dr. C. H. Andrews (World Influenza Centre, London) and our new isolates were shown to be unrelated to it. A complement-fixation test with a representative strain has shown that the new isolates belong to type A. Paired sera (acute and convalescent phases) of patients from several parts of the Federation were tested by haemagglutinin-inhibition against the newly isolated strains and against the reference strains listed above, and significant rises in the antibody titre were found only against the new strains.

*Reported by Dr. Saraswathy, General Hospital, Kuala Lumpur.

Table Showing Notifications of Influenza in Perak North District of Malaya*

	Estimated Population, 1957	Dates: May, 1957																															
		10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31										
Urban	60,000	41	23	35†	83	335	310	488	665	351	295†	869	861	771	663	603	604	144†	640	528	551	423	304										
Rural	230,000	22				10	39	66	76		42†	73	59	222	341	76	158	37†	274	269	251	287	110										

* We are greatly indebted to Dr. S. P. Maurer, Health Officer, Perak North, for the careful daily records of notifications. † Sundays.

PRESENT KNOWLEDGE OF
THE CIRCULATION

HARVEY TERCENTENARY CONGRESS

Having at its first session reviewed the knowledge of the circulation in earlier centuries (see our last issue, p. 1357), the Harvey Tercentenary Congress then turned to the present.

Role of the Heart

For the afternoon of Monday, June 3, Professor G. W. PICKERING (Oxford) took the chair.

Dr. L. N. KATZ (Chicago) spoke on the regulation of the heart. The function of the heart was to pump blood and to adjust the amount to the need. He went on to describe a new type of intact heart-lung preparation which permitted the measurement of coronary flow and other parameters. When heart rate or work was made to increase, after a time there was a sudden drop in oxygen consumption and a decrease in the coronary arterio-venous oxygen difference—that is, the heart's efficiency increased. It was as if the heart had suddenly shifted into a higher gear.

Professor K. MATTHES (Heidelberg) said that the function and structure of the right and left ventricles differed in certain important respects. The pressure and the vascular resistance were relatively steady in the pulmonary compared with the systemic circulation, and this was reflected in the different anatomical features of the two ventricles. The pressure/volume elasticity ratio was different on the two sides, the right ventricle being more distensible than the left. Hence with an equal inflow the filling pressure was lower on the right than on the left. The central and pulmonary venous pressures belonged to a low pressure system regulated by renal mechanisms and the intra- and extra-cellular fluid.

Dr. S. WEIDMANN (Berne) described the electrical events underlying cardiac contraction. The use of a glass electrode 0.2 μ in diameter made it possible to record the changes in electrical potential in a single cardiac muscle fibre. Recordings showed a monophasic action potential. The changes in potential difference were probably produced by ion migration: during depolarization sodium entered the fibre and during repolarization potassium left it. The concentration of ^{42}K in the coronary outflow increased greatly at the time of the action potential.

Dr. PAUL WOOD (London) showed a film on the jugular venous pulse. The normal venous pulse was described and the genesis of its two peaks and two troughs—*a* and *v*, *x* and *y*—were explained. A giant *a* wave was found in tricuspid stenosis and in right ventricular hypertension. Arrhythmias gave distinctive changes in the venous pulse. "cannon" waves occurring in heart block, whilst in atrial fibrillation the *a* wave and *x* descent were absent. With tricuspid incompetence a giant *v* wave was found and in constrictive pericarditis a sharp *y* descent was typical but not pathognomonic, since it occurred also in any form of congestive failure. Tricuspid stenosis was characterized by a slow *y* descent and absent *y* trough.

Haemodynamics

On Tuesday morning Professor ROBERT PLATT, P.R.C.P., took the chair. Professor C. HEYMANS (Ghent) discussed the role of the aortic and carotid sinus baroreceptors. These baroreceptors were connected to the vasomotor centre in the brain and thus reflexly controlled heart rate and output, arterial and venous tone, and adrenal medullary secretion. They thus maintained a set level of blood pressure. It was possible experimentally, however, to increase the tension in the wall of the carotid sinus by local noradrenaline and so "reset" the baroreceptor, with a consequent fall of systemic pressure. Professor Heymans suggested that "resetting" of the baroreceptor threshold in the opposite direction might be a component of hypertension in man.

Professor G. NYLIN (Stockholm) then described his studies of blood flow, made with the aid of red cells labelled with

either ^{32}P or thorium B. Dilution curves reflected both circulation time and cardiac volume, and were therefore an indication of heart size. Professor Nylin had found the minute volume of the heart to be 6-7 litres, and the thoracic pool volume to be 2 litres in 32 normal subjects. In 62 patients with heart disease, the thoracic volume was increased: 3.3-4 litres, reflecting the degree of cardiac enlargement. The same technique was now being used for the study of cerebral blood flow, which had been found to be 1-1.3 litres a minute, with a cerebral pool of 130-150 ml.

Dr. G. S. DAWES (Oxford) discussed the changes in the circulation at birth. Although the foramen ovale was usually considered to lie between the atria, he had shown that functionally it lay between the inferior vena cava and left atrium. Consequently most of the venous return from the foetal inferior vena cava passed to the left atrium. At birth, cessation of umbilical blood flow reduced the venous pressure, whereas the increased pulmonary flow raised left atrial pressure and the valvular foramen was thus closed. Cessation of umbilical blood flow also reduced the foetal cardiac output by half, with a consequent rise of systemic resistance. The onset of ventilation produced a fourfold increase in pulmonary blood flow with a fall in pulmonary vascular resistance. Thus the foetal flow of blood through the ductus arteriosus was reversed and a left to right shunt ensued. Constriction of the ductus began immediately, but closure took seven to ten days in man.

Coronary Circulation

Dr. CLAUDE S. BECK (Cleveland, Ohio) chaired the symposium on Tuesday afternoon.

Dr. DONALD E. GREGG (Washington, D.C.) described the experimental work which he has carried out over the last 20 years on coronary flow. He has shown that, contrary to earlier views, coronary sinus blood is mainly derived from the left coronary artery. If the heart was arrested by vagal stimulation, there was an increase of blood flow in the left coronary artery and in the coronary sinus, thus demonstrating that the contracting myocardium impairs the blood flow during systole.

Dr. Gregg pointed out that the retrograde flow in a ligatured coronary artery was quite considerable, although it could not maintain function. In the dog it only required to be doubled to maintain viability. The collateral circulation restored the flow to normal levels in about four weeks. The problem was how to make these anastomoses develop in man in the absence of obstruction.

Dr. CLAUDE S. BECK (Cleveland, Ohio) described his work on the role of oxygen differentials in causing ventricular fibrillation. The well-oxygenated heart, or the completely cyanotic heart, was in a state of electrical stability and would not fibrillate. If in an oxygenated heart coronary branches were ligated so that an area became anoxic, ventricular fibrillation ensued. The same phenomenon was seen in a cyanotic heart, if one arterial branch was perfused with oxygenated blood so that one area was not cyanosed. Thus the even distribution of blood within the heart was more important than the total coronary flow. After a coronary occlusion the patient's fate depended on the amount of blood available for the ischaemic heart beyond the occlusion; and this could be augmented by operation. The operation, consisting in partial ligation of the coronary sinus, abrasion of the pericardium, and powdering it with asbestos, was then shown in a beautifully produced and highly convincing film. Dr. Beck has now operated on 172 patients, with only two deaths.

Mr. G. A. MASON (Newcastle upon Tyne) had concentrated on operations which would produce an anastomosis with extracardiac vascular tissues. Lung or muscle could be grafted on to the heart, or the Vineberg operation of implanting the internal mammary artery in the myocardium could be used. He had operated on 30 severe cases between 1937 and 1950. There was a 30% mortality, but good results were obtained in 50%. Since 1951, however, he had used the original Beck operation of aorto-coronary sinus shunt in 15 patients. There were two deaths in the first months

after operation, and three patients were no better, but 10 had gained appreciable benefit. He thought external collaterals were more important than intercoronary anastomoses.

Pulmonary Circulation

Professor J. McMICAHEL, F.R.S., took the chair for the Wednesday morning session.

Dr. ANDRÉ Cournand (New York) discussed the role of mechanical and vasomotor factors in the control of the pulmonary circulation in normal man. By means of simultaneous bronchspirometry and cardiac catheterization the effects of unilateral hypoxia had been studied. Resistance to flow usually increased if the alveolar oxygen tension was less than 35 mm. Hg, but infusion of acetylcholine caused a fall in the resulting pulmonary hypertension. Although mechanical factors such as the pulmonary blood flow and the left atrial pressure played the dominant role in controlling the pressures in the pulmonary vessels under normal conditions, changes in vascular tone were also important. The studies with acetylcholine had shown that the pulmonary vessels could vary their tone independently of sympathetic activity.

Professor C. V. HARRISON (London) described the post-mortem findings in pulmonary hypertension. In mitral stenosis the pulmonary artery and its main branches were usually dilated, while the segmental branches were of normal size or dilated in the upper zones and narrowed in the lower zones, sometimes showing local constrictions. Histologically, muscular hypertrophy was found in the narrowed vessels, but was always much more pronounced in the lower zones; the areas of local constriction were due to deposits of fatty material in the vessel wall. In congenital heart disease with a left to right shunt the main pulmonary arteries and all vessels down to the smaller segmental branches were dilated, but the finer branches were narrowed and histologically showed moderate muscular hypertrophy, without the zonal difference seen in mitral stenosis. He concluded that the vascular narrowing in the pulmonary vessels in the majority of cases of mitral stenosis was spastic and reversible. The zonal differences were probably due to the effect of gravity.

Dr. STIG RADNER (Lund) described a new method of obtaining the pressures in the aorta, pulmonary artery, and left atrium by the technique of suprasternal puncture. This procedure had been carried out in 232 cases, with one death from cardiac tamponade, but he regarded it as simple and safe. From pressure pulses obtained in this way he described the mechanical events in the normal left heart cycle. In mitral incompetence he thought that retrograde propagation of the left atrial *v* wave occurred, causing a late systolic hump in the pulmonary arterial pressure curve. A high amplitude *v* wave indicated mobility of the mitral valve, whereas equality of *c* and *v* was evidence of a rigid valve.

Results of Cardiac Surgery

In the afternoon Sir CLEMENT PRICE THOMAS presided at a session made memorable by a most successful experiment in transatlantic communication. A panel of experts present at the American Medical Association's meeting in the Carnegie Hall, New York, joined in the discussions, their voices being transmitted by the new transatlantic cable. The voices were heard as clearly as those of the panel in the Great Hall of the College of Surgeons. Large photographs of the panel members were displayed in the hall, and as each spoke a red light was seen beneath his portrait. Dr. MICHAEL DE BAKEY (Houston, Texas), chairman of the panel in New York, opened the discussion by reading a message of greeting from the President of the United States to the A.M.A. meeting and the Harvey Tercentenary Congress. The members of the American panel were: Dr. ALFRED BLALOCK (Baltimore), Dr. FRANK GERBODE (San Francisco), Dr. JOHN H. GIBBON, Jun. (Jefferson Medical College), and Dr. GEORGE E. BURCH (Louisiana).

Earlier, a series of papers on the results of cardiac surgery were given. Professor G. D'ALLAINES (Paris) reported the results in 551 cases of mitral stenosis submitted to operation. The mortality was 6.9%. He used instrumental valvotomy in 57% of cases. Cases with mild regurgitation mostly did well, but all cases of severe regurgitation were unchanged or worse. Seventy-one patients had been followed for from 1-6 years. A good functional result was found in 70%, and pulmonary hypertension was greatly reduced in 90%. The functional result was unaffected by the presence of calcification or slight regurgitation, but the result was not so good in patients with atrial fibrillation. The most important factor was a good valvotomy.

Professor A. G. BROM (Leiden) spoke on 119 cases of atrial septal defect treated by direct suture under hypothermia. He attached great importance to the maintenance of alkalosis by hyperventilation. He thought electrocardiographic evidence of anticlockwise rotation good evidence of a septum primum defect. The ostium primum could be closed only by using an extracorporeal circulation and inserting a prosthesis. He advised operation if there was an ostium secundum with a pulmonary flow twice the systemic flow and a pulmonary systolic pressure less than 70 mm. Hg. There were 11 operative deaths, but only one in the last 70 cases. Of 29 patients who had been recatheterized, 26 had no shunt, but a small defect was present in three as a result of the use of interrupted sutures.

The treatment of pulmonary stenosis was discussed by Sir RUSSELL BROCK (London). He reviewed 436 cases, which included 268 cases of Fallot's tetralogy and 128 cases of pure pulmonary valve stenosis. In pulmonary valve stenosis, although open operation under hypothermia was better in principle, the end result was not necessarily better than in a closed operation. In 19 open valvotomies there had been only one death. With Fallot's tetralogy he found the late mortality twice as high after the Blalock operation as after pulmonary valvotomy, and twice as many required reoperation. There was also a high rate of cerebral complications after the Blalock operation.

Dr. MAURICE CAMPBELL (London) reviewed 130 cases of aortic coarctation. Under the age of 30 the treatment was surgical, but older patients needed careful review, as secondary changes might prevent any benefit. Of 56 cases operated on, three had not improved. The blood pressure fell but not quite to normal, and this was probably due to a renal factor. In pulmonary stenosis, even if the pressure change at operation was not satisfactory, it often became so later. He thought the anastomosis operations compared well with direct operations for Fallot's tetralogy because the operative mortality was lower. In the long run the late deaths might be the same in both groups.

Transatlantic Hook-up

In the two-way transatlantic discussion afterwards Dr. BLALOCK said that the cases of Fallot's tetralogy which Taussig had followed showed similar results from anastomosis or closed resection. Dr. GERBODE thought that mitral valvotomy should be used in pregnancy, whereas Professor D'ALLAINES preferred to wait till after delivery. Dr. GERBODE did not advise carotid occlusion during mitral valvotomy. He favoured instrumentation by the ventricular route. Dr. GIBBON used an extracorporeal circulation for all cases of atrial septal defect. It allowed more time, which was useful for complicated defects. Dr. BURCH thought older cases of coarctation could now be operated on with greater success. Sir CLEMENT PRICE THOMAS asked what was the optimum age for operation on coarctations. Dr. BLALOCK thought 8-12 years. Dr. GERBODE emphasized the high death rate from untreated coarctation in infants. Sir RUSSELL BROCK thought 4-5 years the optimum age.

Dr. GIBBON asked what was the best route for operating on aortic stenosis. Professor P. R. ALLISON (Oxford) thought that the aortic route under direct vision was the best since one could divide the three commissures, and this should give good results even in calcified valves.

Sir RUSSELL BROCK favoured open operation for non-calcified valves, but the closed ventricular route for calcified valves.

Cerebral Circulation

Dr. MACDONALD CRITCHLEY took the chair on Thursday morning. Dr. SEYMOUR S. KEY (Bethesda) said that studies over the past 10 years failed to support the doctrine of Monro (1783) that rigid enclosure of the brain prevents any variation in cerebral circulation, or that all the changes in the cerebral circulation were secondary to changes in the general circulation, as Hill (1896) believed. It would appear that, although arterial and venous pressures played important roles, the greater control was exerted by such factors as intracranial pressure, blood viscosity, and the humoral and neurogenic control of the vessels themselves. In normal man the cerebral circulation accounted for about 16% of the resting cardiac output, and the oxygen consumption of the brain represented 20% of the total basal metabolism. Pharmacological studies in man indicated that carbon dioxide was a most potent vasodilator in the brain and might be the most important physiological regulator of the cerebral circulation.

Professor T. ALAJOUANINE (Paris), in collaboration with Dr. P. CASTAGNE and Dr. F. LHERMITTE described a study of cerebral vascular occlusion by post-mortem arteriography of the carotid and vertebral vessels. This not infrequently revealed obstruction of one or more of these arteries. The arterial supply had also been studied by injecting the cerebral vessels (after removal of the brain) with coloured radio-opaque substances. By these methods it had been possible to demonstrate an arterial obstruction in every case of cerebral infarction.

Dr. E. H. BOTTERELL (Toronto) emphasized the importance in cases of subarachnoid haemorrhage of cerebral injury by intracerebral clot, subdural haematoma, infarction, and hydrocephalus. He then described his results using hypothermia, advocating arteriography as soon as possible after the bleed and early surgery.

Splanchnic Circulation

The afternoon session was under the chairmanship of Sir JAMES LEARMONTH.

Dr. STANLEY BRADLEY (New York) said that direct measurements of the splanchnic blood flow in animals had confirmed the validity of the indirect bromsulphthalein technique which is applicable to man. Variation in the splanchnic volume was an important factor in circulatory homeostasis. Following haemorrhage in the dog decrease of splanchnic volume served to maintain cardiac output, but the reduction in flow through the splanchnic bed was not so marked as through the kidney, where the ischaemia could be sufficient to produce tissue damage.

Dr. SHEILA SHERLOCK (London) discussed the measurement of the portal pressure. At the present time determination of the pressure in the splenic pulp or occluded hepatic vein appeared the most reliable, both correlating well with results obtained by direct measurement in the portal vein. Comparison of the results of splenic venography with those of splenic pressure measurement had shown that portal hypertension could occasionally exist without demonstrable portal-systemic collaterals. A large collateral circulation could also exist without portal hypertension, which suggested that the collateral vessels might be effective in relieving the increased pressure.

Professor R. MILNES WALKER (Bristol) said that the serious consequence of portal hypertension was haemorrhage from varices, although encephalopathy might arise from a large portal-systemic shunt and occasionally "hyper-splenism." There was no direct relation between the amount of fibrosis in the liver and the degree of portal hypertension it caused by intrahepatic obstruction. The most effective treatment for portal hypertension was the production of an efficient shunt, preferably by portacaval anastomosis. There was no evidence that deviation of the portal blood from the liver impaired its function. A satisfactory portacaval anastomosis would practically guarantee freedom from fur-

ther haemorrhage and in selected patients usually resulted in return to a normal existence. Approximately 15% of his patients showed some sign of portal-systemic encephalopathy post-operatively.

Peripheral Circulation

On Friday morning Professor A. KEKWICK was chairman.

Professor HENRY BARCROFT (London) described recent British work on the limb circulation. The introduction of adrenaline by iontophoresis into the skin of the forearm produced a "physiological skinning" by vasoconstriction. Heating the subject then caused no increase in the limb blood flow, showing that the increase which normally occurs takes place in the skin. The usual vasodilatation had been shown to be an active one mediated by cholinergic fibres. Salivary glands were known to produce an enzyme which breaks down protein to produce bradykinin, which causes vasodilatation. Bradykinin had been found in sweat, and in increased amounts in the tissues around sweat glands after heating of the body. The forearm blood flow also increased in a recumbent subject on raising the legs. This had been shown to be mediated by the sympathetic and took place in the muscles. It was due to variation in vasoconstrictor tone.

Professor W. D. M. PATON (London) discussed ganglion-blocking agents and their effects on the blood vessels. They reduced autonomic activity and caused little change in blood flow. In contrast, in shock and haemorrhage, there was sympathetic overactivity, capillary damage, and a diminution in blood flow, leading to irreversible shock. The autonomic reactions in shock could be harmful, and ganglion-blocking agents conferred protection against them. He had also found that the idea of sympathetotonic and parasympathetotonic individuals was a myth. Studying various manifestations of activity in both systems in students, he had found that each person had his own highly specific autonomic pattern—an "autonomic fingerprint." This explained the variability of response of hypertensive patients to ganglion-blocking agents.

Professor J. H. DIBLE (London) dealt with the pathology of obliteration of peripheral vessels. Peripheral ischaemia causing gangrene was rare—the trouble was usually due to atherosclerotic narrowing of the main vessels. Professor Duguid had revived Rokitansky's idea that thrombotic encrustation of vessel walls led to infiltration of the thrombus with lipid, and Professor Dible thought this was often the case.

Professor C. G. ROB (London) discussed the surgery of occlusive vascular disease. He thought surgery was useful only in the minority of cases in which local manifestations were predominant. He had performed direct vascular operations in 38% of diseased aortic and iliac vessels and 15% of femoral vessels. One feature demanding treatment in aortic occlusions was hypertension, which might be due to partial occlusion of a renal artery and could be cured by surgical treatment of the diseased vessel. In some cases aortic or iliac occlusion involved only a small segment—these were very suitable for operation. Gangrene was a strong indication for surgical treatment of the diseased vessel. He gave long-term anticoagulant therapy to all these patients post-operatively. Of 145 cases involving the lower limb, 30 had undergone reconstructive operations and 20 of these were successful. He had also operated on 26 cases of internal carotid occlusion, with 2 deaths. Six were now asymptomatic, and in 13 a good flow had been established.

Concluding Address

The concluding address was given by Sir RUSSELL BRAIN (London). He discussed Harvey as a scientific philosopher, and demonstrated with quotations from his works how much Harvey's thought was ahead of his time, so that contemporary terminology had been inadequate for him. Sir Russell Brain analysed Harvey's profound conception that the microcosm mirrors the macrocosm, explaining that his use of analogy was a current method of reasoning in his time. Finally he compared Harvey with Sherrington. *The Integra-*

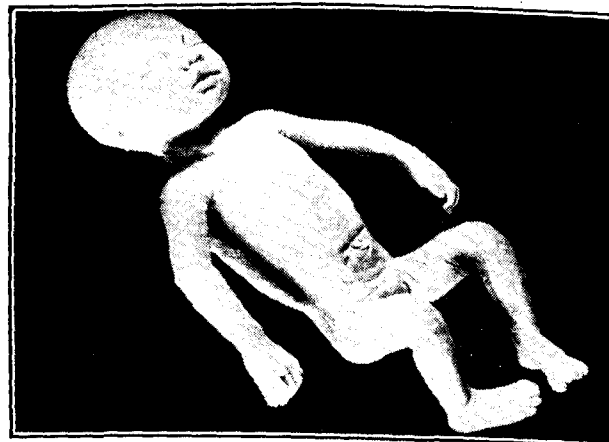
ive Action of the Nervous System had close affinities with *De Motu*, and so had *Man on His Nature* with *De Generatione*. Sherrington was a poet, and, although Harvey had not written poetry, nevertheless he still had a poet's delight in words.

During the Congress there were a number of excellent demonstrations on colour television. In the first the uses of dye dilution curves in circulatory studies were shown. The other two dealt respectively with respiratory techniques for investigating the pulmonary circulation, and with the heart-lung machine and cardiac arrest.

Preparations and Appliances

A FOETAL DOLL FOR OBSTETRIC TEACHING

Dr. F. E. HYTEN, Obstetric Medicine Research Unit (Medical Research Council), Midwifery Department, University of Aberdeen, writes: There is a need in obstetric teaching for a realistic foetal doll; ideally, it should look and feel like a real foetus and be capable of no more than the normal



range of body and limb movements. The doll here illustrated has been developed by the Chad Valley Co. to these requirements, in association with this Unit. The basic mould was made in plaster-of-Paris of an anatomically normal 6½-lb. (3,000-g.) stillborn infant. The doll is cast in a firm foam latex and incorporates a metal skeleton and a hard composition skull. Only normal joint movements are possible; for example, the knee cannot be overextended, and manipulative procedures can be accurately demonstrated.

The doll weighs about 1½ lb. (700 g.), and a prototype which has been used extensively for the past six months shows little signs of wear.

The dolls are manufactured by the Chad Valley Co. Ltd., Wellington, Shropshire, price £10 10s. each, or £5 5s. without the metal skeleton.

Nova et Vetera

CENTENARY OF LEPRO HOSPITAL IN BERGEN

The old leper hospital in Bergen having been burnt down on Christmas Eve, 1853, its place was taken by the present building, which opened its doors to its first patient on June 12, 1857. Housing some 270 lepers at a time, and a total of 2,031 in the past hundred years, the number of its inmates is now reduced to 5. Its present chief, Dr. R. Melsom,¹ has celebrated this centenary in a publication in which he has traced the history of his hospital. The two men, Dr. D. C. Danielssen and Dr. Gerhard Henrik Armauer Hansen, who did much for its high reputation were outstanding, forceful personalities. Danielssen, the senior, acquired horrified awe in the minds of his patients by his passion for post-mortem examinations. He was inquisitive also about his patients' reactions in their lifetime, and on several occasions he tried to inoculate himself and members of his staff with leprosy material—always with negative results according to Professor T. M. Vogelsang.² To which Danielssen presumably remarked: "I told you so!" For he regarded leprosy as a non-infectious disease—"hereditary dyscrasia sanguinis." This diagnosis hinged on much laborious pathological and anatomical research, and on quantitative analyses of the albumin and globulin content of the blood of lepers. When Rudolf Virchow visited Bergen in 1859, Danielssen demonstrated the brown nodules which he had learnt to regard as characteristic of leprosy, and which are now known to be conglomerations of leprosy bacilli. Virchow pooch-pooched the notion of some causal relationship, dismissing these nodules as mere clumps of degenerated fat. To his dying day Danielssen fretted over having meekly deferred to the great Virchow on this occasion.

Hansen spotted the unstained bacillus of leprosy in 1873, reporting his discovery at a medical meeting in Oslo in 1874. It was some time later that this bacillus was successfully stained for the first time. Danielssen might well have been forgiven had he resented the refutation of his pet theory by his junior, but as a matter of fact he was furious with Hansen for not having pushed his claim to his discovery with sufficient energy. Hansen also was addicted to incursions into the field of experimental pathology. In 1879, several years after his discovery of the bacillus of leprosy, he attempted to inoculate the eye of a patient suffering from the smooth form of leprosy with material taken from a patient suffering from the nodular form of the disease. The inoculation proved negative as such, but the patient's mental reaction was "markedly emotional." The storm which now blew up was so violent that Hansen was relieved of his appointment as chief of the hospital. But a grateful country refused to dismiss him as the chief medical officer for leprosy for the whole of Norway, and his brief lapse from good taste in the matter of vivisection was well-nigh forgotten when he died in 1912, the acknowledged discoverer for the first time of the microbic origin of a chronic disease.

CLAUDE LILLINGSTON.

¹ Melsom, R., *Norske Lægeforen.*, 1957, 77, 413.
² Vogelsang, T. M., *Medd. Gade's path.-anat. Lab.* 1942-5 Bergen.

The Gemmological Society of Great Britain has dedicated a library to the memory of Sir James Walton, F.R.C.S. The library contains some 1,000 volumes on gemstones and minerals; some of the books were previously part of Sir James's library. Sir James Walton, besides being a vice-president of the Royal College of Surgeons, was also an expert on the lattice-structure of minerals and a well-known collector of gemstones.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Vaccine Against Poliomyelitis

SIR,—Your issue of June 1 may be kept in gilded covers, for in it the report of the Poliomyelitis Vaccines Committee of the Medical Research Council is published (p. 1271), and, with the cool objectivity of a scientific survey of this nature, the dawn is announced of the day which will see new epidemics of paralytic poliomyelitis no more. Among the 148,684 children from 1 to 9 years of age who received two injections of the British-prepared (Glaxo) vaccine within less than three weeks 2.7 per 100,000 suffered from paralytic poliomyelitis, whereas among the non-vaccinated over 14 per 100,000 were affected.

These figures from the well-planned trial may be compared with those included in the report on the 1956 poliomyelitis outbreak in Chicago¹ submitted by the Chicago Board of Health. Both the British and the Chicago analyses show that no paralytic poliomyelitis occurring in vaccinated children had any connexion with the vaccination, as paralysis did not occur in the inoculated limb. From June 28 to October 4, 1956, Chicago had 1,111 cases of confirmed poliomyelitis of which 835 were paralytic. During the spreading of the epidemic vaccination was intensified, and by the first week of October, of the 1,150,000 children in Chicago up to 19½ years of age, 125,000 had had no inoculations of Salk vaccine, 125,000 had received but one inoculation, 600,000 had had two inoculations, and 300,000 children had received three inoculations. It is impressively convincing of the effectiveness of the vaccine that in the non-vaccinated group of children the paralysis attack rate per 100,000 population was 358.4, in the children who had had one inoculation 154.4, in those who had received two inoculations 14.2, and in the children who had obtained the full course of three injections 0. Even though if not absolutely certain it also appears that the intensive inoculation during the epidemic contributed to the unexpected short duration of the outbreak.

On the basis of these two experiences we seem to be well on the way, given sufficient vaccine, to eradicate the outbreak of the most severe, extensive, and expensive of the crippling diseases. But a serious effort must be made at the present to rescue as many as possible of those who, like the hero in Remarque's famous novel *All Quiet on the Western Front*, may be struck the day the war ended.

As you well said in your leading article of May 25 (p. 1229), until our production of vaccine is sufficient to cover all the urgent requirements, there is certainly a strong argument for importing the best brands of American vaccine if that is possible. If such vaccine was available in sufficient quantity—and I am told that it is—only an unsound financial reason may prevent its importation, but this should not deter the authorities, as if this year we were to have, say, 5,000 paralytic cases without vaccine and only 1,000 after appropriate inoculation, the reduction in expenditure for hospital bed occupation, treatment, and instrumentation will be a profitable investment, as many of these patients cost the taxpayer more than £1,000 each year until they are—if they ever are—beyond the responsibility of the Health Service. After nearly 100,000,000 inoculations without mishap in America and Canada of the Salk vaccine since the Cutter incident, no one could object as to the safety of the American vaccine as prepared by the best drug firms. I do not see any other reason which could be adduced against the immediate use of the American Salk vaccine, as in matters such as these national pride is not involved, the virus being an international aggressor and the vaccine being prepared with the same virus. The only thing which here would be national would be the victims.

Being in daily contact with the present ravages of the disease I have had my grandchildren vaccinated with three inoculations of the American (Parke, Davis) vaccine sent to me by a kind American colleague. It would be dishonest that we, the medical men who know, protected our families and that the bulk of the population was left waiting until enough vaccine is produced in our laboratories. If that was to occur the National Health Service would not be a service but a liability.—I am, etc.,

Oxford.

J. TRUETA.

¹ Bundesen, H. N., Graning, H. M., Goldbetr, E. L., and Bauer, F. C., *J. Amer. med. Ass.*, 1957, 163, 1604.

Choledochoduodenostomy

SIR,—The paper on this subject by Mr. J. P. Hosford (*Journal*, May 25, p. 1202) will be of considerable interest to all those who have to carry out bile duct surgery. It may not be inappropriate, therefore, to consider the history of this operation, and previous experiences of its results. This may serve to emphasize some of the points raised in the paper.

Riedel was probably the first to do the operation (1890). Finsterer¹⁻⁴ in 1952 reported 233 cases where the operation had been carried out, largely for a suppurative cholangitis, or where white bile was present. His immediate mortality was 8%. No ascending infection was observed in any of his cases when followed up from 5 to 25 years. Three were reported not cured and eight had continued "slight" symptoms. In two of the three cases which were not cured, the stoma had become closed. He insisted that troubles arising after this operation were due to a small stoma, which must be bigger than 2 cm. Plenk⁵ reported on 95 cases he had treated privately, with one post-operative death. Seventy-one of these cases had a frankly purulent cholangitis. He also described 293 hospital cases and he states that no case of ascending cholangitis had been encountered in any of these. He said that purulent cholangitis would be cured if the stoma was large enough, as the most important thing was drainage. Becker,⁶ in reporting a number of other cases, put forward the theory that purulent cholangitis is not an ascending infection, but descending, and that all such cases were rapidly improved when the bile could escape freely into the duodenal lumen. Waltman Walters⁷ states that in choledochoduodenal anastomosis cholangitis is not the result of duodenal reflux into the biliary tract. Recurring pain, with or without jaundice, chills, or fever are the result of varying degrees of obstruction at the anastomosis. Kjaergaard⁸ carried out the operation for 12 cases of the "post-cholecystectomy syndrome," where severe colic, in the absence of common duct stone, occurred after cholecystectomy. Six of them were much improved, and none had any complications from the operation.

Professor Milnes Walker first called my attention to the possibilities of this operation in 1947, since when I have carried it out in 31 cases. I have followed up another 19 cases, with the kind permission of surgeons in this area. The only case where there has been evidence of cholangitis is one where a stoma of 1 cm. in size was made. Apart from this case, all have a patent stoma as shown by barium meal, or by gas in the biliary tree. In some cases considerable pressure has to be exerted in order to get the barium up the duct. Three cases have persisted with what appears to be biliary pain, and in one of these a small filling defect can be seen on the skiagram—presumably a stone just above the ampulla of Vater. The patient does not wish any further surgery to be done, as the attacks of pain are infrequent and do not seriously inconvenience her.

I have found the results following this operation to be better than those after dilatation of the ampulla, or of transduodenal section of the sphincter—i.e., internal choledochoduodenostomy. The anastomosis should never be done unless the common bile duct is obviously dilated, and the best results will occur where the wall is thickened and white in colour. It has been my practice to fold back the duodenum covering the common bile duct until pancreatic tissue is

reached, in order to divide the common bile duct as low as possible. The stoma should be at least an inch (2.5 cm.) in size, and so far I have not had any biliary leak. The gallbladder, of course, must always be removed. The pressure in the common bile duct even after cholecystectomy is much higher than that in the duodenum, and it is probable that there is no reflux of food through the stoma under ordinary conditions. This is in contradistinction to a cholecysto-gastrostomy, where pieces of food debris have not infrequently been found in the gallbladder at a later operation. A small but definite percentage of these biliary cases have an achlorhydria,¹⁰ so it must not be presumed that the duodenal contents are necessarily sterile. One of my cases developed a severe infective hepatitis; it is problematical whether this was due to the degree of ascending infection or was merely fortuitous.

In any biliary operation it is impossible to draw firm conclusions until many years have passed, but from my observations it does appear that the operation may be of real value in cases of common duct stones, especially if a purulent cholangitis or any degree of stenosis is present, or if the pancreas is harder than normal. The convalescence in these cases is surprisingly rapid. I must thank a number of surgeons in this area who have permitted me to review their cases.—I am, etc.,

Bristol.

W. M. CAPPER.

REFERENCES

- Finsterer, H., *Mém. Acad. Chir. (Paris)*, 1952, 78, 499.
- *Zbl. Chir.*, 1942, 69, 1290.
- *ibid.*, 1942, 69, 1408.
- *Verh. dtsh. Ges. Chir.*, 1932, 685.
- Plenk, A., and Hartl, H., *J. Int. Chir.*, 1949, 9, 421.
- Hartl, H., and Raindl, W., *Wien. med. Wschr.*, 1951, 101, 444.
- Becker, B., *Brun's Beitr. klin. Chir.*, 1950, 180, 45.
- Walters, W., *A.M.A. Arch. Surg.*, 1954, 68, 12.
- Kjaergaard, S., *Acta chir. scand.*, 1952, 104, 97.
- Butler, T. J., personal communication.

SIR,—Mr. John Hosford (*Journal*, May 25, p. 1202) advocates this operation for stones in the common bile duct under certain circumstances, and records his experience in 21 cases. Some years ago I took a similar view, and I expressed it in a Hunterian lecture at the Royal College of Surgeons in 1940, by which time I had carried out the operation 17 times. I also thought that the regurgitation of duodenal contents into the biliary tree, which could be demonstrated by x-ray examination, was a matter of no importance in the presence of free drainage through the choledochoduodenostomy. As time went on I began to see these patients returning with attacks of fever, rigors, and transient jaundice, and I came to the conclusion that recurrent cholangitis occurred too frequently to make the operation one to carry out except under very exceptional circumstances. I also think that a widespread adoption of this procedure would result in an increased operative mortality, although the rate is low in Mr. Hosford's capable hands. If the operation is to be done I agree that the opening should be reasonably large, and to achieve this I made an oblique opening in the duct.

In the last five years I have performed this operation only once, and I have relied on careful exploration, washing out the duct, and drainage as a routine for stones whether multiple, recurrent, or associated with infection.—I am, etc.,

Leeds.

DIGBY CHAMBERLAIN.

Examination of Immigrants

SIR,—I regret that my work often entails delayed contact with the *Journal*. In "Medical Notes in Parliament" (*Journal*, April 6, p. 826) under the heading "Tuberculosis Among Immigrants," it is reported that Mr. T. Iremonger (Ilford, North) asked what examination of immigrants into the United Kingdom was made to determine whether they were suffering from tuberculosis or other communicable diseases. I was astonished at the reply as reported in the paragraph.

Mr. J. K. Vaughan-Morgan, Parliamentary Secretary, replied (I quote the *Journal*) that "any alien immigrant might be subjected to a general medical examination before

he was permitted to land. Where tuberculosis was suspected in any person, British or alien, coming to this country the port medical officer notified the medical officer of health of the district to which the person was proceeding, so that he might be brought under observation. The port medical officer had power to examine any person if he had reason to think he was suffering from any other infectious disease, apart from venereal disease."

It is impossible to accept such a reply, for, although each statement may be theoretically true, it has no relation whatever to actual practice. The port medical officer receives from the ship surgeon a notification of all readily diagnosable infectious diseases, and an occasional doubtful one, but when it is considered that the ship surgeon sees only a small proportion of the passengers, and the port health officer none at all (other than those above drawn to his attention), there can be no reason for suspicion, and indeed no chance of it. As a surgeon for more than eight years on ships bringing to one of our largest ports thousands of passengers annually, I have, to the best of my recollection, called attention to one case only, that of an Indian woman who had phthisis, and knew it. The surgeon, and through him the port officer, were the last persons she would wish to see but that she became afraid of continued and serious haemoptysis. One crew member also had a haemoptysis, and was sent home at the beginning of the voyage. In effect, as I have seen it, there is no check whatever.

Many countries, including Commonwealth countries, insist that, for certain types of immigrant at least, there must be produced a chest x-ray film and report before they will be at all considered as immigrants. There can be no doubt that, while we are attempting to stamp out the disease, we are allowing into the country fresh centres of infection; we have been informed also that in certain parts of the country, probably due to immigration, there has been a remarkable increase in venereal diseases.

All this tempts one to a comment on a broader situation with which every ship surgeon of experience will be familiar. A considerable number of visitors, often from countries better off financially than our own, and however welcome, "save up" operations, chronic ailments, dentures, appliances, etc., for payment, in whole or in part, by the British taxpayer. This same taxpayer is informed on high authority that he cannot afford luxuries; he can see also for himself that he can scarcely afford the present, even underpaid, Health Service. In the light of this it might be well to consider that, while liberality is a fine quality, a man whose family is on the verge of want deserves no credit for scattering largesse on the broad highway.—I am, etc.,

Sutton, Surrey.

JNO. CRAWFORD.

Thrombocytopenic Purpura Following Quinidine

SIR,—The report of a case of thrombocytopenia due to quinidine by Drs. Stanford Bourne and Denis J. O'Sullivan (*Journal*, May 4, p. 1046) prompts us to place on record a further case.

A man of 55 had been suffering for many years from occasional attacks of paroxysmal auricular fibrillation. He had taken quinidine intermittently for six years. An attack developed on April 8, 1957, and clinically he appeared to have auricular fibrillation. He was given phenobarbitone 1 gr. (65 mg.) that night and the attack had subsided by morning. He was advised to take regular prophylactic quinidine, and on April 10 he took quinidine hydrochloride 3 gr. (0.2 g.) at 9 a.m. Later that morning he went by car to Cambridge, where he became ill with nausea and shivering. At 1 p.m. his temperature was 101° F. (38.3° C.) and he was admitted to hospital. No abnormal physical signs were found. His temperature was normal the next day and he was discharged. It was considered possible that this attack was due to quinidine, and he took no further dose until April 15, when he was given ½ gr. (32 mg.). He took the same dose the next morning with no ill effect. He took nothing on April 17, but on April 18 took 1 gr. (65 mg.). He was well in the morning and played golf but developed

shivering and nausea in the afternoon and his temperature rose to 102° F. (38.9° C.). He sweated that night, and, because of headache, took 7½ gr. (0.5 g.) of aspirin. The next morning he awoke to find blood in his mouth and a rash on his body. On examination there were large haemorrhagic vesicles on the tongue and palate and numerous petechial spots on the trunk and limbs. He was afebrile.

He was admitted to the West Suffolk General Hospital. His blood count was normal, but the platelets numbered 140,000 per c.mm.; bleeding-time 21 minutes (Ivy); clotting-time 14 minutes (modified Lee and White). The following day the platelet count had fallen to 52,000, but no fresh lesions had appeared and the oral lesions were resolving. The purpura gradually cleared without specific treatment. On the fourth day the platelets numbered 51,000, and the next day had risen to 112,000. By the seventh day the platelet count was normal, 276,000 per c.mm. Clinically, he appeared to have made a complete recovery and he was discharged from hospital.

This case is of interest because the patient had taken quinidine intermittently for six years before becoming sensitized to the drug, and because of the extremely small dose, 1 gr. (65 mg.), which precipitated thrombocytopenic purpura.—We are, etc.,

R. ARDEN JONES.

K. M. MACKENZIE.

Bury St. Edmunds, Suffolk.

Women's Footwear

SIR,—I could not agree more with Mr. Reginald T. Payne's letter (*Journal*, May 18, p. 1180) on women's footwear and its appalling effects. Why we should have to give these wretched sufferers free treatment for their feet in the future I cannot see. I suggest that the B.M.A. draw the attention of Her Majesty's Government to the position forthwith. We should be able to save much more than the cost of one requested increase in pay by so doing.—I am, etc.,

London, N.1.

MARGARET O. THORPE.

SIR,—The trouble with women's shoes is twofold: (1) the high heel; (2) the short, narrow toe, with the point opposite the third toe, resembling a gothic arch, and so cut that there is not room enough between the sole and the upper. The consequences are that the body weight falls on the metatarsal heads, normal movements of the knee, ankle, and foot are abolished, and the foot slides on a more or less steep slope down into the toe of the shoe; the anterior arch spreads and becomes convex downwards, the great toe is pushed into the valgus position and the smaller toes are crowded together into an ungainly heap, and all the extensor tendons become contracted. Furthermore, though a woman would not be surprised at her waist measurement increasing as years go by, few in my experience change the size they buy in shoes. It is quite common to find that if you run a pencil round the stockinged foot you can stand the shoe inside the outline. It is quite true that it is difficult to buy shoes for women which do not grossly deform the foot, but the blame for that does not lie wholly with the makers—the customer must bear her share.—I am, etc.,

Hove.

C. M. OTTLEY.

Myringoplast

SIR,—With the advent of tympano-plastic procedures, the treatment of chronic suppurative conditions of the ear has entered on a new and exciting era. New instruments for these procedures are being designed. The myringoplast designed by Dr. R. France Rohan (*Journal*, May 25, p. 1240) is one of these. It is an ingenious device for putting a patch on the drumhead for testing purposes. Perhaps it would have been more comfortable to use if the trigger were below, rather than above, the shaft. Dr. Rohan is correct in his criticism of the acoustic probe. It is uncomfortable for the patient, takes up too much time, and the results have to be very carefully assessed.

A plaque of moistened cotton-wool applied to the drum-head to close the perforation will quickly demonstrate the improvement in hearing. In cases where the drum is completely destroyed, the effect of baffling the round window is easily tested by occluding the round window niche with a small ball of moist cotton-wool. A thin sheet of moistened wool placed to cover the whole middle ear and the baffle already in position in contact with the remains of the malleus, or in contact with the head of the stapes, will imitate the operative methods that are used. If the hearing improvement is definite and clear cut, operation and the operative procedure are demonstrated.—I am, etc.,

Liverpool.

G. A. MOULDEN.

The H-bomb

SIR,—The views expressed by Mr. Norman Capener (*Journal*, May 25, p. 1246) deserve the utmost support. Despite the number of important leading articles and annotations in the *B.M.J.* and *Lancet* underlining the hazards arising from the continued testing of nuclear weapons, the medical profession has been slow to take action on this issue. This may in part be due, as he suggests, to a certain reluctance to adopt an attitude in opposition to official Government policy. Nevertheless the possibility that disease may be caused by radioactive fall-out is surely a matter of very proper concern to doctors. For those of us who take leave to differ from Lord Cherwell's assumption that war becomes less likely when the great powers are brandishing H-bombs at one another, our responsibility is clear: we must do all we can to prevent further tests by any Government in any part of the world.—I am, etc.,

Bristol.

ALLAN HULME.

Slippery Hospital Floors

SIR,—As one who has recently become dependent on walking-sticks, I have come to realize how slippery are most hospital floors. The polished linoleum in the wards forms quite the most treacherous walking surface which one normally encounters. I trust hospital furnishers will bear this in mind.—I am, etc.,

Cambridge.

R. A. SPALDING.

Acute Immediate Reactions to Penicillin

SIR,—Having read Dr. M. O. Raven's letter (*Journal*, June 1, p. 1305) I should like to say that I entirely agree with his remarks on the subcutaneous injection of crystalline penicillin. I have used his method for the past 6½ years, and so far have not seen any reaction. I employ a No. 1 hypodermic needle for injecting into and withdrawing from the vial, and then change to a No. 18 for the actual injection, which is done so quickly that the patient barely notices it.—I am, etc.,

Broadstairs.

CASSIE E. WILLIAMS.

Allergic Response to Hyaluronidase

SIR,—The letters from your correspondents Dr. P. J. Joubert (*Journal*, January 5, p. 46) and Dr. Kathleen Barber (*Journal*, January 19, p. 166), reporting allergic reactions to hyaluronidase injection in two patients, have prompted me to review the toxic effects observed following 4,800 injections of this substance given to out-patients at Guy's Hospital over the past three years. These injections were given for a variety of skeleto-muscular disorders by intra- and per-articular, intramuscular, and subcutaneous injections; in each case 1,000 units of hyaluronidase were combined with either hydrocortisone, 2% procaine, or normal saline. The incidence of side-effects was remarkably low apart from the occurrence of local sepsis, with which hyaluronidase cannot be implicated. There were three cases of urticaria, one case of purpura, and one of bronchospasm associated with itching of the scalp and oedema of the eyelids. This latter appears

similar to the event reported by Dr. Joubert, but the symptoms were of far less severity than in his case.

Holborow and Keech¹ showed that, although hypersensitivity developed rapidly in their patients subjected to repeated hyaluronidase administration, this sensitivity could probably be ascribed to the protein impurities in the enzyme preparations used by them. Certainly, many hundreds of cases in the present series have been subjected to repeated injection with a very pure preparation of hyaluronidase and this hypersensitivity has not been observed. Is it not possible in such combined injections that the active agent introduced with the hyaluronidase has had an antigenic effect? Seifter,² after repeatedly administering doses of 200,000 times the maximum therapeutic dose of hyaluronidase, observed no signs of local or systemic injury and concluded that it was a non-toxic material.

While I agree with Dr. Barber that there is possibly a danger of severe reaction from this agent, and this must be constantly borne in mind, it would seem that the incidence of 0.09% of allergic side-effects seen in this series is so small that it should not be regarded as a deterrent to the use of so valuable a therapeutic agent.—I am, etc.,

P. HUME KENDALL.

London, S.E.1.

REFERENCES

- ¹ Holborow, E. J., and Keech, M. K., *British Medical Journal*, 1951, 2, 1173.
- ² Seifter, J., *Ann. N.Y. Acad. Sci.*, 1950, 52, 1141.

Myeloblastic Anaemia Following Chloramphenicol

SIR,—We have read with interest the medical memorandum by Dr. P. S. Mukherji (*Journal*, June 1, p. 1286) in which it is suggested that an acute myeloblastic leukaemia was caused by chloramphenicol therapy. In our opinion this is another example of the tendency to incriminate chloramphenicol as a toxic agent on the flimsiest of circumstantial evidence.

The case report shows that the patient's haemoglobin level fell from 94% in September, 1953, to 74% in August, 1954, before chloramphenicol had ever been given. Surely this is of some significance in the absence of demonstrable haemorrhage? Further, there is no record of a full blood examination having been made in October, 1954, when the haemoglobin was 72% pre-operatively. The marked drop in the haemoglobin level post-operatively was presumably largely the result of haemorrhage. The reasons for administering chloramphenicol post-operatively are not given. We would prefer to assume that this patient was suffering from some form of blood disorder for at least one year prior to the operation, which merely precipitated his inevitable end. In any case, it would seem unwise to administer chloramphenicol to a patient already suffering from an undiagnosed anaemia. Should this anaemia worsen following chloramphenicol therapy, it is still unjustifiable to attribute the ultimate diagnosis of acute myeloblastic leukaemia to this therapy.

On the author's own admission, the possibility of the condition existing prior to the administration of chloramphenicol cannot be excluded. In British justice, any element of doubt regarding the guilt of a criminal compels a verdict of "Not guilty," which we feel should apply in this case.—We are, etc.,

J. MCC. MURDOCH.
A. H. IOANNIDIS.

Edinburgh, 3.

Pseudomonas pyocyanea in Cetrimide

SIR,—With regard to Dr. G. L. Robinson's letter (*Journal*, May 25, p. 1242) the difficulty is easily resolved. Some 30 years ago I began to use 1% acriflavine (now proflavine) in substitution for tincture of iodine (the solubility is not quite so great but near enough). I have never found this "irritating." The water in this area is apt to be very hard at times. A few years ago, finding the flavine solution did not "run" into the skin, I mixed it in equal parts from a bottle of 1% cetrimide ("cetavlon") near by. This makes a very elegant preparation of low viscosity, very agreeable to the skin, and presumably it would be very disagreeable

to the *Pseudomonas*. It will also clear up a pyoderma and is very useful in prophylaxis and treatment of varicose veins of the leg liable to phlebitis. I have found cetrimide cream 1% very good for the gravitational ulcer itself.—I am, etc.,

Dagenham, Essex.

M. MELGRAVE.

Hospital Confinement

SIR,—Some people may find it a little difficult to decide from Mr. F. E. Stabler's admirably terse letter (*Journal*, May 18, p. 1182) whether or not he is in favour of continuing with some measure of domiciliary confinement. Aware of the immense success of the Newcastle experiment begun about 20 years ago, and since embodied in what later became known throughout the country as the "obstetric flying squad," it may be presumed that he is still lending the weight of his authority as a teacher and examiner in favour of its continuation. I doubt if Dr. J. P. O'Dwyer (*Journal*, April 20, p. 947) will be able, readily, to produce the facts on which his comparatively innocuous statement was made, though with much effort he might be able to present "irrefutable statistical evidence," nowadays almost synonymous with facts.

Conditioned by many years of propaganda from various sources, if for no other reasons, the parturient now seems to favour hospital confinement. In the Liverpool region the percentage of these confinements to total births varies from 60% to 90%. Clearly this is a matter that must to some extent be permitted to sort itself out. It can scarcely be doubted that the next generation of obstetricians, both practitioner and consultant, will have come to regard a fully institutionalized maternity service as a commonplace.—I am, etc.,

Liverpool, 1.

H. VINCENT CORBETT.

Fish in Wards

SIR,—I should like to support Dr. Alexander Watt (*Journal*, May 18, p. 1182) in his rejection of budgerigars as ward pets. Their noise may be a "cheerful chatter" to the fit, but it can be a "non-stop, nerve-fraying racket" to a sick person. A well-set-up and efficiently lighted tropical aquarium is the best type of ward pet, being colourful and decorative to the women patients, and interesting to the men, most of whom have tried keeping fish at some time or other. Regular servicing is, however, necessary to keep a tropical aquarium at its best, and if the hospital finance committee will not pass the necessary sum to pay a professional retainer, then the secretary of the local aquatic society should be contacted. Usually such a society will be only too pleased to arrange a rota of "expert" amateurs who will call in and attend to the aquarium and who will replace any casualties with their own surplus fish.—I am, etc.,

London, W.C.1.

C. V. WESTON.
Assistant Secretary,
The Tail-walkers' Club (Great Britain) Ltd.

Range of Movement of Testicle

SIR,—Mr. Denis Browne (*Journal*, May 18, p. 1165) is, I suggest, a little hard on the professors of anatomy who have not incorporated all his ideas into their teaching. When so many dissenting voices were raised in answer to his views¹ anatomists might be permitted to consider the matter themselves, and, like Mr. Browne's surgical colleagues, make up their own minds on a controversial matter.

Although I would agree with Mr. Browne that the normal adult testis will rarely, if ever, pass through the normal external inguinal ring, I would not agree with him in the case of the pre-pubertal testis. I have passed histologically normal testes through the external ring quite easily at necropsy and also at operation. In the correspondence following Mr. Browne's paper Mr. John Hosford² stated that the testis can be drawn into the inguinal canal and shown to be there at operation, a fact that Mr. Browne admitted in

certain cases. It is not sufficient therefore merely to say that "the normal testicle is far too big to go into the normal external ring at any age," implying that it goes instead into the "superficial inguinal pouch" in all cases of physiological retraction.

We know, therefore, that in some cases the pre-pubertal testis will pass from the scrotum into the inguinal canal, and there is no reason to doubt (as Mr. Browne does) that this is due to the activity of the cremaster muscles. If the cremaster muscles can carry the testis into the "superficial inguinal pouch" with the power suggested in Mr. Baty's paper,³ and with which Mr. Browne seems in full agreement, I see no reason why these muscles (in view of their morphology) should not be even more effective at bringing the testis at least to the external ring, if not through it. The medial and lateral cremasters of man do not run down directly to the testis as in ungulates, but encircle the testis, ending in a dorsal raphe much as they do in rodents. In rodents the cremasters can be shown to squeeze the testis into the inguinal canal, and the mechanism seems to be basically the same in man, though the human muscles are less powerful. Needless to say, the cremasters are often too weak to do this in man, especially when the medial cremaster is absent.

The question of withdrawal of the testis during sexual excitement is well enough known. Seiler⁴ described it and considered it in relation to the cremaster muscles in his work on the descent of the testis. It is probably simply a manifestation of testicular withdrawal during emotional stress—e.g., fright, or a doctor's cold hands.

If the testis will not pass through the external inguinal ring, it does come to lie outside the external oblique aponeurosis in the position indicated by Mr. Browne and called by him the "superficial inguinal pouch." The attachment of Scarpa's fascia to the external inguinal ring is firm except in the supero-lateral quadrant, where it is loose. Naturally, as this fascial laxity is in the line of the ascending testis, the testis tends to bulge into this loose fascia and to give the impression of a pouch. But Scarpa's fascia is attached to the margins of the ring, so that the "pouch" has no mouth and its extent would be very difficult to delineate. It would be much more accurate to avoid the term "pouch" and to describe a region of loose attachment of Scarpa's fascia to the external inguinal ring.—I am, etc.,

London, W.C.2.

K. M. BACKHOUSE.

REFERENCES

- ¹ Browne, D., *British Medical Journal*, 1938, 2, 168.
- ² Hosford, J., *ibid.*, 1938, 2, 318.
- ³ Baty, J. A., *ibid.*, 1956, 1, 1014.
- ⁴ Seiler, B. G., *Observationes nonnullae de testiculorum ex abdomine in scrotum descensu et partium genitalium anomalis*, 1817. Leipzig.

Prevention of Recurrences of Rheumatic Fever

SIR,—In their article "Prevention of Recurrences of Rheumatic Fever" (*Journal*, May 25, p. 1234), Dr. E. G. L. Bywaters and his colleagues draw attention to the comparative cost of the daily administration of a number of penicillin and sulphonamide preparations. Crystalline penicillin G in a dosage of 200,000 units twice daily is compared with phenoxymethyl penicillin (penicillin V) 120 mg., twice daily. It has been demonstrated by a number of investigators who have contributed to the extensive literature on penicillin V that considerably higher blood levels result from its use than from an equivalent dose of penicillin G by mouth. These findings are supported by cumulative urinary excretion levels. I do not wish to occupy your space by quoting a lengthy bibliography, but there is much evidence to show that 120 mg. of penicillin V may be expected to give blood and urinary excretion levels approximately double those following the administration of 200,000 units of penicillin G by mouth.—I am, etc.,

London, S.W.3.

C. N. BROWN.

Gonadal Dysgenesis

SIR,—I am greatly interested by the paper of Drs. R. Hoffenberg and W. P. U. Jackson (*Journal*, June 1, p. 1281) in which they describe a female patient with gonadal dysgenesis resembling in many ways the two patients I reported in 1955,¹ and in which they comment on my description of these two patients as "male pseudohermaphrodites" of a

"hitherto undescribed form." I find their conclusion that my patients were also examples—albeit unusual variants—of the gonadal dysgenesis syndrome entirely reasonable; though perhaps I might be pardoned for feeling that the tone of their paper is just a little hypercritical. Moreover, I think that their genetic hypothesis to account for the syndrome and for male pseudohermaphroditism is a very valuable suggestion.

It might well be argued that the matter of terminology is not one of great importance, since male pseudohermaphrodites of the classical varieties and male examples of the gonadal dysgenesis syndrome are all varieties of intersex males. Furthermore, in their genetic scheme, Hoffenberg and Jackson regard the type of patient which they and I described as due to gene "1" (the gene for intrauterine hypogonadism) acting alone, and male pseudohermaphroditism as due to the same genetic situation. By their own scheme, therefore, they class male pseudohermaphrodites and this variety of the gonadal dysgenesis syndrome together—though obviously this is true only for the male patients in the latter group.

The description of genetic females with the same features as those of the genetic males which I reported undoubtedly makes a term which will include both more desirable than one which is applicable to one sex only. And if only the histology of the gonads of my patients were known, it might indeed leave no alternative but to regard them as belonging to the gonadal dysgenesis group. Therefore, while I feel I do not need to apologize for having described my patients as male pseudohermaphrodites, I am entirely willing to concede the point of view expressed by Drs. Hoffenberg and Jackson in their excellent paper.—I am, etc.,

London, W.C.1.

REFERENCE

- ¹ Swyer, G. I. M., *British Medical Journal*, 1955, 2, 709.

G. I. M. SWYER.

Intestinal Lipodystrophy

SIR,—In your annotation (*Journal*, April 27, p. 998) on Whipple's disease (intestinal lipodystrophy) you direct attention to the possible susceptibility of this condition to steroids and you stress the role of mesenteric node biopsy in diagnosis. The presence of characteristic lesions in extra-abdominal nodes has been reported by several writers since Korsch first described them in 1938.¹ Writing in 1955 Puite and Tesluk² confirmed the presence of Schiff-positive macrophages in peripheral nodes in three cases of the disorder. It is of further interest that this paper suggests a possible familial element in the aetiology, with an apparent predilection for males.—I am, etc.,

Detroit, Michigan, U.S.A.

REFERENCES

- ¹ Korsch, H. J., *Zbl. allg. Path. path. Anat.*, 1938, 71, 337.
- ² Puite, R. H., and Tesluk, H., *Amer. J. Med.*, 1955, 19, 383.

William Harvey

SIR,—I feel this is a fitting time to write regarding my investigations into the paternal ancestry of Dr. William Harvey whose tricentenary celebrations are now taking place. There is little doubt his family originated in the county of Lincoln. Although universally accepted as belonging to an old Kentish race, no evidence has ever been produced supporting this theory. From my personal researches during the past twelve years it would appear his father, Thomas Harvey, was a son of a certain William Harvey or Harby, yeoman at Thurlby, near Bourne, Co. Lincs. This family was descended from Sir Bryan de Hardeby of Evedon, who married Avicia, daughter and heiress of Sir Hugo de Sancto Vedasto, feudal Lord of Evedon in 1283. Sir Hugo was of pure Norman noble descent. Dr. William would probably inherit his olivaster complexion through this ancestry. As my investigations are still continuing, I would appreciate any help from others interested in Dr. William Harvey.—I am, etc.,

Rutherglen, Glasgow.

ARTHUR JAMIESON.

Obituary

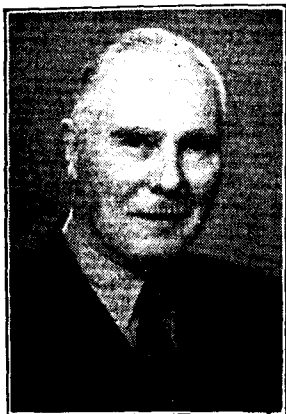
G. F. BUCHAN, M.D., F.R.C.P., D.P.H.

Dr. G. F. Buchan, formerly medical officer of health for the Borough of Willesden, died at his home there on June 3 at the age of 78. He was for many years one of the most prominent workers in the public health service.

George Frederick Buchan was born at Kilmaurs, near Kilmarnock, on November 18, 1878, the son of Dr. George Buchan. As a student at Glasgow University he had a brilliant career, gathering award after award, including the first prize in natural philosophy, the prize in mathematics, the junior Arnott prize, the Alexander Donaldson scholarship, the James A. Paterson bursary, the Joseph Black medal in chemistry, and the William Hunter medal in medical jurisprudence and public health. He graduated M.B., Ch.B. in 1901, with distinctions in several subjects, including clinical medicine. With a career in preventive medicine in view, he took the Cambridge D.P.H. in 1902, and then worked for a time in infectious diseases hospitals in London under the old Metropolitan Asylums Board. Moving to Birmingham, he was appointed assistant medical officer of health under Sir John Robertson, and later he held a similar post under the Essex County Council. In 1909 he was appointed medical officer of health and school medical officer of Heston and Isleworth.

Buchan began his career at Willesden in 1912, when he became medical officer of health there, and he held the post for the long period of thirty-five years. During that time he was the inspiration behind many new developments in the work of the public health department, and his fame as a leading worker in the field of preventive medicine attracted foreign visitors to Willesden to find out at first hand how he put his methods into practice. He was an excellent teacher, and lectured on public health at Guy's Hospital and St. Mary's Hospital medical schools and at the London School of Hygiene and Tropical Medicine. Many who took the D.P.H. at that school will remember George Buchan's enthusiastic demonstrations of field work in Willesden. He himself examined for the D.P.H. of the London Conjoint Board and in State medicine and in hygiene and forensic medicine for London University. Elected a Member of the Royal College of Physicians of London in 1927, he became a Fellow of the College six years later.

The Society of Medical Officers of Health owed a great deal to Buchan, who became a member in 1908. Within four years he was elected honorary secretary of the Home Counties branch and to the council of the society. He was honorary treasurer of the society from 1919 to 1946, except for the session 1925-6 when he was president, and in 1946 he became the first chairman of the council. To him must go a great deal of the credit for the great increase in the membership of the society during the years he was treasurer. He took a leading part in the campaign for adequate salaries for medical officers of health, and he did much to bring about the Askwith agreement of 1929. The society's memorandum on local government areas, adopted by the society in 1932, was largely a product of his brain. He received the honorary fellowship of the society in 1947: he was also an honorary fellow of both the American and



(Elliott & Fry)

Canadian Public Health Associations. A vice-president of the Royal Sanitary Institute (now the Royal Society for Health), he had served on its council, of which for a time he was chairman.

A member of the British Medical Association for over forty-five years, Buchan was a member of the Council from 1924 to 1930 and a representative at the Annual Representative Meetings from 1942 to 1951. For varying periods since 1919 he had served on a remarkably large number of committees, including the maternity and child welfare subcommittee (1919-39); the public health committee (1924-50); the special committee on Poor Law reform (1925-9); the advisory committee on the salaries of whole-time public health medical officers (1932-40); the nutrition committees (1933-4 and 1947-51); the negotiating committee (1944-9); and the compensation and superannuation committee (1944-52). He was a prominent member of the Medical Planning Commission, which issued an interim report in 1942. When the Association held its Annual Meeting at Edinburgh in 1927 he served as a vice-president of the Section of Preventive Medicine, and he was president of the same Section at Cambridge in 1948. In the days before the second world war he was a member of the Advisory Committee on Nutrition, and in more recent years he was chairman of the Central Middlesex Group Hospital Management Committee.

Dr. George Buchan is survived by his wife and daughter, and by his brother, Dr. John J. Buchan, formerly medical officer of health of the city of Bradford.

Dr. F. HALL writes: When a great and loved headmaster dies, his passing gives a feeling of personal loss to all who have benefited from his administration. It is in this sense that the public health service and especially the Society of Medical Officers of Health mourns the death of George Frederick Buchan. In the service to which he devoted his professional career he was an outstanding figure, and "Buchan of Willesden" was long recognized as an authority on all matters pertaining to the public health, for in this field of work he attained a national eminence noted for his practical knowledge and discerning judgment. Valuable as his services have been to Willesden and indirectly to the nation, it is as a member of the Society of Medical Officers of Health that his memory will be long preserved. For many years he was a trusted leader, and both as president and as chairman of council guided the policy of the Society and at all times maintained its prestige and authority. Of commanding presence and forceful in debate, he brought to bear the critical powers of a brilliant intellect on an immense number of subjects which came before that body, and by his detailed work in the various committees was the main author of numerous memoranda which were submitted to the Ministry of Health and other Government departments.

What honours the Society could confer were gladly bestowed on George Buchan, for all who worked with him recognized that no personal considerations prevented him from stating, forcibly, what he believed to be in the interests of the public health and of the Society, which to him existed only for the promotion of the public health. Older members of the Society will remember him in this character of a strong yet courteous personality, winnowing the wheat from the chaff of verbiage in documents official and unofficial, and presenting the results in clear and practical terms. He will also be remembered for his qualities of friendship; he was a fine character, a man good to know, and the Society has lost one of its most famous members.

Sir COURTENAY MANIFOLD, K.C.B., C.M.G.
M.B., C.M.

Sir Courtenay Manifold, who had had a distinguished career in the Indian Medical Service, both in the field and as an administrator, died at Kyrenia, Cyprus, on June 7. He was 93 years of age.

Courtenay Clarke Manifold was born at Sitapur, India, on April 3, 1864, the second son of Surgeon-General M. F.

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Manifold, who died in 1897, and was educated at Clifton College and at Edinburgh University, where he graduated M.B., C.M. in 1886. He entered the Indian Medical Service in the following year and was attached to the Central India Horse until 1893. During the subsequent six years he was in charge of the medical administration of Rampur State, except for an interval in 1897, when he was on active service in the Tirah campaign. For his work in the campaign he was mentioned in dispatches and awarded the medal and clasp. In 1899 he was sent on a mission to Western China and for his services received the thanks of the Commander-in-Chief in India. He was again on active service as a member of the headquarters staff at the relief of Peking in 1900, being mentioned in dispatches and receiving the medal and clasp, as well as special promotion to the rank of lieutenant-colonel. Another mission into Central and Western China in 1900-1 earned him the thanks of Lord Kitchener. In 1903 he was awarded the MacGregor silver memorial medal, being the only medical officer up to that time to receive the distinction, which was given annually for good work in exploration. In 1904-5 he was in command of a special mission to Tsu-chuan and again he received official thanks for his work. Papers describing the results of his explorations in China were published by the Royal Geographical Society.

From 1910 to 1915 Manifold was Inspector-General of Civil Hospitals in the United Provinces and a member of the Legislative Council. He was appointed C.B. in the 1914 Birthday Honours. During the first world war he was Director of Medical Services of the 1st Australian and New Zealand Army Corps, and was appointed C.M.G. in 1917 for services rendered in connexion with military operations in the field. In 1918 he became Director of Medical Services at Anzac headquarters in France. In the same year he was appointed Honorary Physician to the King, and had the Belgian Croix de Guerre conferred upon him for distinguished service during the campaign. During the war he was also twice mentioned in dispatches. He retired from the I.M.S. in 1923 with the rank of major-general, having been promoted K.C.B. in the previous year. The Secretary of State for India approved the grant to him of a Good Service Medal in 1930.

After retirement Manifold lived at various places abroad until he settled at Kyrenia, in Cyprus, in 1935. A member of the British Medical Association since 1891, he was president of the Cyprus Branch in 1936-7. During the second world war he served as deputy commissioner for Cyprus for the War Organization of the British Red Cross and the Order of St. John. He was twice married: first, in 1904, to Miss Josephine B. Montagu, who died in 1941, and, secondly, in 1944, to Miss Christine F. Scott.

ARTHUR ZANKER, M.D.

Dr. Arthur Zanker, who died suddenly at his Croydon home on April 30 at the age of 66, was the physician in charge of the Croydon child guidance clinic and a medical officer at Warlingham Park Hospital, the parent hospital of the unit.

Arthur Zanker was born at Bohumin in Czechoslovakia (at that time part of Austria) on July 22, 1890, and studied medicine in Vienna, where he graduated M.D. in 1914. Almost at once he was called into the Austrian Army Medical Service and in 1915 was captured by the Russians. Then followed three years of captivity, during which he was moved from one camp to another before he was finally sent to a typhus-fever camp in Siberia. Throughout his imprisonment he continued his medical work, and with the aid of the Swedish Red Cross he was able to get away from the Russians, taking with him the invalid soldiers under his care.

In Vienna, after the war, Dr. Zanker turned to paediatrics and by 1923 was established as a specialist, with an appointment at the Mutterberatungsstelle (child welfare

centre). He was now a pupil of Alfred Adler and worked voluntarily at the *Erziehungsberatungsstelle*, a clinic devoted to the guidance of maladjusted children. He contributed two chapters to Adler's book, *Guiding the Child*, in addition to contributions to the medical press. In 1938 he was forbidden by the Nazis to practise in Austria, and his appointments were terminated. He was able to come to England with his wife and daughter in 1939 through the intervention of an acquaintance living in Croydon and then settled in the borough with his family.

As soon as he was given permission to resume his medical work Dr. Zanker became attached to the Warlingham Park Hospital. His skill with children was quickly recognized and gradually his duties became more and more in the child guidance clinic, although he never discontinued his work with adult patients, in particular with the elderly. He was a pioneer of music therapy for the mentally ill, publishing many papers on that subject, as well as on psychiatric problems of old age and those associated with spastic children. He formed the social club for elderly ex-patients and conducted the patients' choir and instigated its orchestra. Outside the hospital his interests included music and poetry. He was an accomplished performer on the violin and viola and had been a member of the Croydon Philharmonic Orchestra. He also translated the works of Keats and Shakespeare into his native language, and collected anthologies of his own verse have been published in Austria, where even now one volume is in print.

He was a skilled child psychiatrist, a musician of some standing, and a poet of far more than usual talent, and yet it will not be chiefly for these qualities that he will be remembered by his friends, colleagues, and patients. Everyone who came into contact with him was touched by his overwhelming kindness. He was surely a man who would "turn the other cheek" whatever hardship he endured, he never bore malice nor spoke a cross word, and his modesty and quite unassuming goodness were outstanding characteristics in one who had endured so much and lost so much. He would often talk to his friends about his native land and of his early life, but always he saw the good in life and tried to minimize or excuse the bad. Of his capture by the Russians he used to describe the confiscation of his own fine chestnut horse and remarked on how well the Russians looked after it. In an appreciation broadcast by the Austrian programme of the B.B.C. on May 3 the author quoted Zanker's own prophetic words from one of his writings many years ago. "As a young doctor," he wrote, "I was always struck, on leaving the hospital at night, how abrupt could be the meeting of life and death." He married in 1923, and his wife survives him with their only daughter.

Medical Notes in Parliament

NUCLEAR FALL-OUT

A short statement by the PRIME MINISTER about the British nuclear explosion in the Pacific on May 31 set off another disturbance in the Commons on June 4. Mr. MACMILLAN said (as he had done of the first explosion) that the fall-out was insignificant. Mr. H. GAITSKELL, Leader of the Opposition, directed attention to the reported protest of 2,000 U.S. scientists as showing the real concern felt in informed quarters about the danger of the continuation of these tests. Mr. MACMILLAN replied that the reports did not show that the scientists' appeal was supported by any new evidence. The Government, he said, had made proposals for a method by which these tests could be limited or controlled, and they were also ready and anxious to discuss from the most favourable point of view any other proposals that might develop during the deliberations of the Disarmament Subcommittee.

Mr. ANEURIN BEVAN (Ebbw Vale, Lab.) provoked the Prime Minister's resentment by an interjection, "Don't be

so bloodthirsty," which he threw at Conservative members who voiced their dissent from his assertion that there was universal agreement that some deaths would be caused by these tests. Mr. MACMILLAN dismissed as "unlikely" and "impossible" the hypothesis that new nations would embark on tests before the British series was finished; and Mr. BEVAN in turn derided this as nonsense.

Mr. J. STRACHEY (Dundee, West, Lab.) took up the point about there being no new evidence in the U.S. scientists' appeal, and asked, "Is the Prime Minister really telling us that new evidence is necessary before we even support the all-round abolition of tests by all countries?" Mr. MACMILLAN: "I think that new evidence is necessary before I altogether overthrow the evidence given to me by the greatest experts in the country, who serve all Governments in turn."

M.R.C. Assurance

Rejecting two other suggestions that the effect of radioactive fall-out on health and genetics should be investigated by a royal commission or a select committee, Mr. MACMILLAN said that the Medical Research Council was the best instrument at the Government's command. Mr. GAITSKELL asked when the House might expect a further report from the council. Mr. MACMILLAN repeated his previous statements that he was considering that. He pointed out that the council had a number of standing committees which advised it on particular parts of the subject. Every item of new evidence that came to hand was considered by the committees and by individual experts advising the council, as well as by the council's officers. He was informed that the result of this continuous process of review was to make the council confident that there was as yet no new evidence that would lead to a modification in any respect of the conclusions in their published report. The council had, however, assured him that if and when important new evidence became available it would make immediate arrangements for calling the whole council and making a similar review as was made before.

Test of Samples

Mr. F. ALLAUN (Salford, East, Lab.) asked on June 5 for tests to be made by the Medical Research Council of the degree of rate of fall-out of strontium-90 in Lancashire, because of the heavy rainfall and the density of population there. Mr. DUNCAN SANDYS, Minister of Defence, replying for the Prime Minister, stated that the Medical Research Council was obtaining samples of soil, vegetation, milk, and bone from widely distributed parts of the country; and their content of radio-strontium was being analysed. The choice of the particular sites was a matter for expert decision, and would be designed to give a representative indication of levels in the United Kingdom. The results would be published.

Influenza in Asia

Sir FRANK MEDLICOTT (Norfolk, Central, Nat. Lib. and Con.) asked the Minister of Health on June 5 what steps were being taken to deal with the possibility that the new form of influenza raging in the Far East might spread to Europe and reach Great Britain. Mr. D. VOSPER stated that the outbreaks of influenza in the East were being caused by a new variant of the virus, but all reports were that the illness was clinically mild in character. There were standing arrangements for information to be supplied about outbreaks of influenza in this country through general practitioners, industrial medical officers, and others, and port medical officers reported epidemic influenza among persons arriving in this country. As a precaution, practitioners were being reminded of these arrangements. The characteristics of this new strain of virus were being investigated at the World Influenza Centre and in other research departments.

Tuberculosis in Hong Kong

Mr. S. AWBERY (Bristol, Central, Lab.) was informed by Mr. J. PROFUMO, Under Secretary for the Colonies, that 12,000 cases of tuberculosis were notified in Hong Kong in 1956, and it was believed that rather more than this number were treated privately without official notification. Examinations of employed adults showed that roughly 2% had the disease actively. Treatment of cases during 1956 included 456,000 attendances at Government clinics. With the opening of a new hospital on June 6 there would be 1,440 beds for tubercular patients; 29,000 persons received B.C.G. vaccination in 1956; 131,000 persons were rehoused in 1956, and it was estimated that nearly 110,000 more would be rehoused this year.

Leprosy

Dr. BARNET STROSS (Stoke-on-Trent, Central, Lab.) asked the Minister of Health on June 3 for a statement on the work conducted by the World Health Organization towards the eradication of leprosy. Mr. J. K. VAUGHAN-MORGAN, Parliamentary Secretary, stated that the Organization's programme and regular budgets for 1957 and 1958 provided for assistance to leprosy control in several countries. The Director-General had recently reported on improved prospects for control with the use of sulphone drugs, but had pointed out that many technical problems remained. The money available to the Organization, and its general activities, were determined by member countries at the World Health Assembly.

Dr. STROSS asked what would be the approximate cost of sulphone drugs required for the treatment of a case of leprosy for a period of two years. Mr. VAUGHAN-MORGAN said that, if given in tablet form, it would be about 12s. If given by injection the cost would be at least 50% more. Dr. STROSS commented that the Government should, as in the past, set an example to other member countries and find as much finance as possible so that everyone would be able to get treatment. Mr. VAUGHAN-MORGAN pointed out that there were other diseases with which the World Health Organization had to deal. They should leave it to the Organization to work out the priorities.

Nerve Gas Antidote

Mr. PHILIP NOEL-BAKER (Derby, South, Lab.) asked the Minister of Supply whether his department had found an antidote to the group of poison gases known as nerve gases or "tabun." Mr. AUBREY JONES stated that an antidote was available to protect against moderate doses of nerve gases. Considerable progress had been made towards finding an antidote which was effective against more severe doses.

Local Co-operation

Sir KEITH JOSEPH (Leeds, North-east, Con.) asked whether the Minister of Health would consider asking the Central Health Services Council to review the subject of co-operation between hospital, local authority, and general practitioner services, on which they reported to him in 1952, in the light of subsequent developments. Mr. VOSPER replied that a number of committees had studied the subject since 1952, notably the Guillebaud Committee, which reported last year. Although he had this subject very much in mind, he was reluctant to ask the Central Health Services Council to make yet another review. Sir KEITH JOSEPH asked if the Minister was satisfied that co-operation between the various bodies gave the best service conceivable to the public. Mr. VOSPER said he was by no means satisfied that the highest possible degree of co-operation had been reached. He thought it was more a matter of the attitude of mind of those concerned than a need for new machinery.

Prescription Costs Inquiry

The committee to investigate prescription costs has been established. The chairman is Sir HENRY HINCHLIFFE, a

governor of Manchester University and a member of the management committee of St. Mary's Hospital, Manchester. He is a former president of the Association of British Chambers of Commerce, and was a member of the Advisory Council of the Department of Scientific and Industrial Research from 1949 to 1954. The other members are:

Dr. WILLIAM BROCKBANK, honorary physician, Manchester Royal Infirmary; dean of clinical studies and lecturer in medicine, Manchester University. Dr. K. E. CAPPER, editor, *British Pharmaceutical Codex*; joint secretary, National Formulary Committee. Dr. H. C. FAULKNER, member of General Medical Services Committee of B.M.A.; assistant M.O.H., London County Council. Dr. F. E. GOULD, member of G.M.S. Committee; secretary, Birmingham Local Medical Committee. Dr. D. V. HUBBLE, physician, Derby Royal Infirmary. Professor C. A. KEELE, professor of pharmacology and therapeutics, London University. Professor M. G. KENDALL, professor of statistics, London University. Dr. A. M. MAIDEN, a rural practitioner; member of G.M.S. Committee; honorary secretary, Lincolnshire (Lindsey) Local Medical Committee. Dr. A. D. STOKER, a rural practitioner; member of G.M.S. Committee; secretary, Derby Local Medical Committee. Professor A. P. THOMSON, dean of faculty of medicine, professor of therapeutics, Birmingham University. One appointment is outstanding, and will be filled by another general practitioner, probably from Wales.

The Minister of Health, announcing these names on June 7, stated also the terms of reference, which are: "Having regard to the increased cost of prescriptions in the National Health Service, to investigate the factors contributing to this cost, and to make recommendations."

Rehabilitation and Re-employment

The House of Commons, before adjourning for Whitsun, discussed briefly the training and resettlement of disabled persons, and multiple sclerosis.

Sir KEITH JOSEPH (Leeds, North-east, Con.), dealing with the first of these subjects, drew attention to the large gap between the ability of a man to return to work after rehabilitation and the availability of work for him.

Mr. ROBERT CARR, Parliamentary Secretary, Ministry of Labour and National Service (Mitcham, Con.), said the Government welcomed the report of the Percy Committee on this subject and intended to press on wherever possible with the implementation of their recommendations. The Minister of Health would shortly be sending out advice to the hospital authorities on these matters, and would be asking them to consider the committee's recommendation for a rehabilitation committee to be set up by each hospital board to further the suggestions the report made. Another recommendation that would be taken up would be the setting up in every major hospital of a resettlement clinic to review difficult cases of disablement. The Government proposed to accept a recommendation suggesting that the minimum age for industrial rehabilitation should be reduced from 16 to school-leaving age. The committee's recommendations about district rehabilitation officers had also been accepted, and plans were being worked out for a longer initial training period, which it was hoped would be a substantial increase over the present period. The Government regarded the Percy Committee's report as an important and valuable one, and, subject to the needs of economy, they intended to maintain the progress already made in the six months since its publication.

Multiple Sclerosis

Mr. D. KEENAN (Nottingham, South, Con.) raised the subject of multiple sclerosis. Mr. J. K. VAUGHAN-MORGAN, Parliamentary Secretary, Ministry of Health, who replied on this, said there were about 1,500 deaths a year due to either multiple sclerosis or its complications, but so far the cause of the disease was entirely unknown. Much was being done under the auspices of the Medical Research Council and otherwise to try to find the cause. Social and geographical studies had suggested there was a variance in the incidence of the disease, but the reason was not known. Fortunately

there was no change in the incidence in recent years; it was not increasing, but it was not diminishing. The main effort was being concentrated on fundamental work in shedding more light on the nature and causes of the form of degeneration of the nervous system which led to the appearance of symptoms in this disease. The need for further research was fully realized, but the intractable nature of the problem rather than the lack of funds hampered progress at present; it was lack of bright ideas, and not cash, which was holding back progress.

Health Records.—The statistical branch of the Ministry of Health has been increased, and is carrying out an extensive review and reorganization of records and returns with a view to providing a speedier and fuller service.

Electricity Accidents.—There were 39 fatal electrical accidents in 1955, and 55 in 1956.

Ionizing Radiations.—A Code of Practice for the protection of all hospital workers exposed to ionizing radiations has been prepared by the Radioactive Substances Advisory Committee and will be published shortly.

Vital Statistics

Week Ending June 1

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 691, whooping-cough 1,807, diphtheria 1, measles 21,613, acute pneumonia 320, acute poliomyelitis 67, dysentery 740, paratyphoid fever 9, and typhoid fever 6.

Infectious Diseases

The largest variations in the notifications of infectious diseases in England and Wales during the week ending May 25 were increases of 2,848 for measles, from 16,665 to 19,513, and 23 for dysentery, from 750 to 773, and decreases of 239 for whooping-cough, from 2,258 to 2,019, 63 for food-poisoning, from 226 to 163, and 46 for scarlet fever, from 664 to 618.

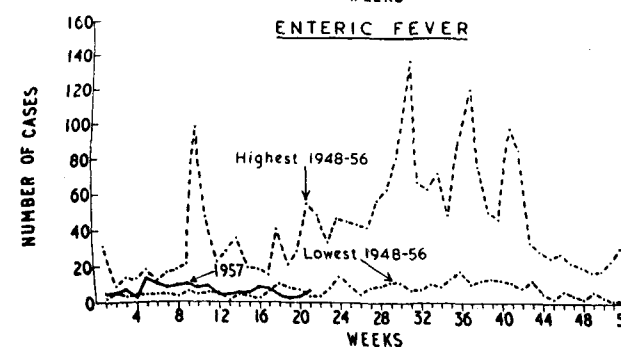
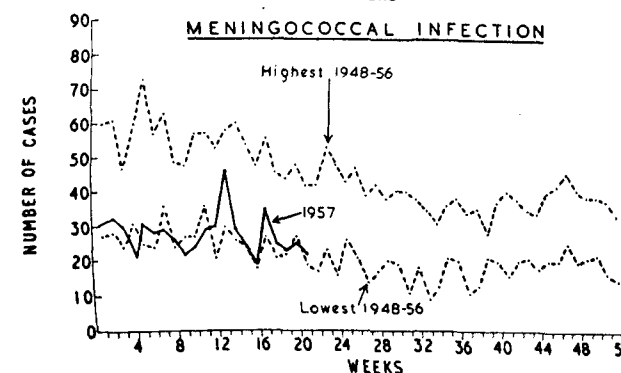
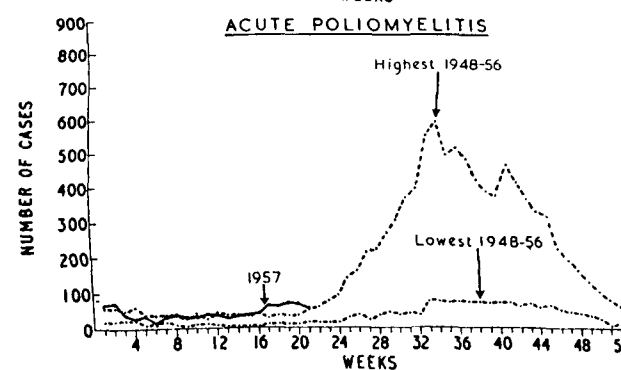
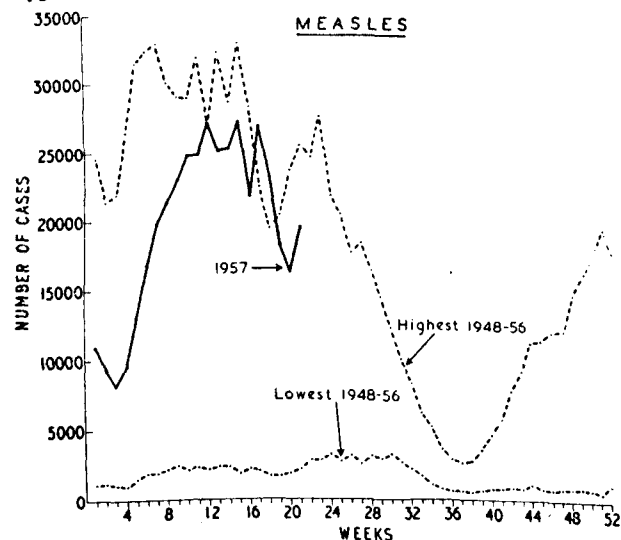
52 cases of acute poliomyelitis were notified during the week, and these were 18 fewer for paralytic and 4 more for non-paralytic cases than in the preceding week. The largest returns were Essex 10 (Lexden and Winstree R.D. 4, Colchester M.B. 3), London 9 (Wandsworth 3), and Gloucestershire 7 (Bristol C.B. 7).

Increases in the number of notifications of measles of 100 or more were reported from 17 counties; the largest rise was 371 in Warwickshire, from 1,352 to 1,723. Towns with large rises in the notifications of measles included 267 in Birmingham C.B., from 694 to 961, 116 in Swindon M.B., from 69 to 185, 114 in Bristol C.B., from 263 to 377, 114 in Sheffield C.B., from 324 to 438, and 92 in Woolwich, from 51 to 143; the largest falls in the towns were 135 in Leeds C.B., from 328 to 193, and 81 in Birkenhead C.B., from 111 to 30. Only small variations were recorded in the local trends of scarlet fever. The largest falls in the incidence of whooping-cough were 42 in Glamorganshire, from 71 to 29, 33 in Hertfordshire, from 90 to 57, and 33 in Lancashire, from 213 to 180. 3 cases of diphtheria were notified, 1 fewer than in the preceding week, and 2 of these cases were notified in Liverpool C.B.

The chief centres of dysentery were Lancashire 153 (Fylde R.D. 49, Manchester C.B. 21, Blackburn C.B. 13, Blackpool C.B. 13, Liverpool C.B. 10), Yorkshire West Riding 141 (Bradford C.B. 25, Leeds C.B. 23, Sheffield C.B. 21, York C.B. 16), London 77 (Bethnal Green 42), Yorkshire East Riding 47 (Kingston upon Hull C.B. 33), Cheshire 41 (Dukinfield M.B. 13), Northumberland 36 (Newcastle upon Tyne C.B. 17), Durham 33 (South Shields C.B. 13, Warwickshire 29 (Birmingham C.B. 17), Nottinghamshire 25 (Nottingham C.B. 18), Bedfordshire 22 (Bedford M.B. 17), and Shropshire 20 (Oswestry R.D. 14).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases of certain diseases notified weekly in England and Wales. Highest and lowest figures reported in each week during the nine years 1948-56 are shown thus -----, the figures for 1957 -----. Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.

INFECTIOUS DISEASES AND VITAL STATISTICS
Summary for British Isles for week ending May 25 (No. 21) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	3	1	0	0		8	1	9	0	5
Dysentery ..	773	77	211	9	6	1,146	180	265	5	1
Encephalitis, acute	9	2		0		1	1		0	
Enteric fever:										
Typhoid ..	4	0	1	0	1	3	1	0	0	0
Paratyphoid ..	2	0	1(B)	0		9	3	1(B)	0	
Food-poisoning ..	163	23	17	0		269	51		1	
Infective enteritis or diarrhoea under 2 years ..				14	19				5	23
Measles*	19,513	1071	118	213	224	3,234	249	272	111	243
Meningococcal infection ..	22	3	8	1	1	32	2	7	1	2
Ophthalmia neonatorum ..	33	1	11	0	1	25	2	3	0	1
Pneumonia†	349	25	129	11	5	339	10	167	14	3
Poliomyelitis, acute:										
Paralytic ..	30	2	7	6	1	16	0	8	0	1
Non-paralytic ..	22					9	0			
Puerperal fever§	210	34	11	0		170	26	6	0	
Scarlet fever ..	618	64	78	34	14	553	41	63	24	18
Tuberculosis:										
Respiratory ..	692	82	302	24		559	62	125	33	4
Non-respiratory ..	84	7	11	4		81	1	17		
Whooping-cough	2,019	95	232	9	45	1,351	68	217	73	123

DEATHS in Great Towns	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	0	0				1	1		0	
Encephalitis, acute		0			0		0			0
Enteric fever ..	0	0	0			0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	4	0	0	0	0	6	0	2	0	0
Influenza ..	5	0	0		1	3	0	0	0	0
Measles ..		0	0		0		0	0	0	0
Meningococcal infection ..		0	0				0	0		
Pneumonia ..	195	32	13		8	205	30	13	12	8
Poliomyelitis, acute	0	0			0	2	0			0
Scarlet fever ..		0	0		0		0	0	0	0
Tuberculosis:										
Respiratory ..	51	6	5	3	2	52	6	6	1	3
Non-respiratory ..		0	1				1			
Whooping-cough ..	0	0	0		0	2	0	1	0	0
Deaths 0-1 year ..	216	30	29	15	202	27	36	6	6	
Deaths (excluding stillbirths) ..	4,881	712	591	160	4,909	668	573	88	145	
LIVE BIRTHS ..	8,496	1246	976	439	7,321	1087	996	219	415	
STILLBIRTHS ..	209	31			212	26	21			

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenza pneumonia.
§ Includes puerperal pyrexia.

Medical News

Harvey Congress Banquet.—Sir HENRY DALE, O.M., proposed the toast "The Harvey Tercentenary Congress" at the banquet held last week. He congratulated the organizers on the brilliant success of the occasion. Harvey, said Sir Henry, had early become a member of what was then the fully international community of science. This was the third tercentenary commemoration of Harvey and his work to be held in his, Sir Henry's, lifetime. The first, when he was 3 years old, was in 1878, at Folkestone, when Sir Richard Owen unveiled the statue of Harvey in that town: to celebrate the three hundredth anniversary of his birth. At that time there still seemed to be a wide breach between the experimental and practical aspects of medicine which had only just begun to show signs of closing at the end of the nineteenth century when he, Sir Henry, as a student entered the wards of St. Bartholomew's Hospital. When the Royal College of Physicians commemorated the tercentenary of *De Motu Cordis*, there were already signs of a notable change. "And now in this present, third commemorative congress, we find ourselves faced with what I suppose we imagine to be a pretty full development of the scientific age of both medicine and surgery." Physicians and surgeons were using the latest resources of experimental science to make their work ever more certain and effective, to the very great benefit of their patients. After the President of the Congress, Mr. A. DICKSON WRIGHT, had responded, Professor ROBERT PLATT, president of the Royal College of Physicians, proposed the health of the visitors, and the LORD CHANCELLOR replied.

Harvey Congress at Folkestone.—On Saturday and Sunday the Harvey Tercentenary Congress moved to Folkestone. William Harvey's birthplace, for the conclusion of its commemorations. On the Saturday morning Sir GEOFFREY KEYNES presided over a symposium in the Leas Cliff Hall at which seven speakers discoursed on Harvey's birthplace, Harvey at Cambridge and Padua, Harvey's influence on French medicine, and "Harvey the Scientist." In the afternoon there was a special service at Canterbury Cathedral, at which the address was given by the headmaster of the King's School, Canterbury. In the evening, by courtesy of the civic authorities and Messrs. Pfizer Ltd., a banquet in Elizabethan style was held at the Hotel Metropole. Royal sturgeon and swab pie were the chief dishes, and madrigals or "chaunts" were sung by the Pfizer singers. Sir GEOFFREY KEYNES proposed the toast of "Folkestone," the Mayor, Councillor L. VICTOR FOWLER, responding. Professor D. M. DUNLOP had the task of proposing "William Harvey" and Mr. A. DICKSON WRIGHT, the Congress president, replied. On the Sunday, Matins was held at Folkestone parish church and afterwards there was a civic procession to Harvey's statue.

Harveian Society of London.—The Harveian Society of London welcomed many guests from Britain and abroad at the Buckston Browne-Gray Hill reception held on June 6 in Gray's Inn Hall. Mr. and Mrs. A. DICKSON WRIGHT received the guests, who enjoyed the privilege of being entertained in the stately and beautiful sixteenth-century hall, now restored after being nearly destroyed by bombs. Music played during the reception was by sixteenth- and seventeenth-century composers.

B.E.L.R.A.—The annual meeting of the British Empire Leprosy Relief Association was held at the Colonial Office on June 4, and was followed immediately by an extraordinary general meeting at which it was resolved to drop the word "Empire" from the association's title. After Sir ALAN BURNS, the chairman, had moved the adoption of the annual report, the association's new medical secretary, Dr. J. ROSS INNES, spoke of his experiences in the field, "An idea has grown up," he said, "that the leprosarium should

be abolished, and that we should turn our backs on it and put all our efforts into out-patient and home segregation work. I wish to state from my experience abroad that this is nonsense." It was a mistake to rely too much on the sulphone drugs, Dr. Innes continued; all public health measures, from leprosarium to teaching and propaganda, were needed to conquer leprosy. More full-time doctors, nurses, laboratory workers, and others were still wanted. Last year, according to the report, B.E.L.R.A. had 29 overseas workers, who included one doctor and seven nurses, and for the first time the association's income exceeded £100,000. The main fields of the association's activity were Nigeria, Tanganyika, and Uganda.



Berkeley Castle Portrait.—Above, by kind permission of the owner, Captain R. G. BERKELEY, we reproduce the portrait of William Harvey from Berkeley Castle. The portrait was brought to light recently by Dr. STUART W. HINDS, of the London School of Hygiene and Tropical Medicine, and was shown publicly for the first time at the Harvey Tercentenary Congress in London last week (see this *Journal*, June 8, p. 1358). As yet the authenticity of the portrait remains to be established. It bears the inscription "Doctor Harvey famous phisition that found out ye circulation of the blood." Dr. Hinds, with the collaboration of Dr. J. R. BROWN of the London School of Hygiene and Tropical Medicine, is submitting the picture to scientific examination and making other inquiries about it. When these investigations are complete they hope to publish their findings.

Storage of Poliomyelitis Vaccine.—Messrs. Glaxo Laboratories Ltd. now state that their poliomyelitis vaccine ("poli-virin") will remain potent for six months if stored properly. The previous limit was four months. Although storage in a refrigerator is necessary, the range of temperature in a properly regulated domestic refrigerator (2-10° C.—36-50° F.) has been found satisfactory for the purpose. Exposure to higher temperature for a few hours during an immunization session or during transit is not harmful, though temperatures over 20° C. (68° F.) should be avoided, as also should exposure to sunlight.

Lord Adrian Elected.—On June 8, Lord ADRIAN, O.M., Master of Trinity College, was elected Vice-chancellor of Cambridge University for the academic year 1957-8.

B.M.A. Film Index.—The catalogue of the Association's film library is now available in the form of a card index. It comprises 166 cards, with guide cards. Each card gives a brief synopsis of a film, an appraisal, and an indication of the type of audience for which the film is suitable. In addition, the titles of 153 other films still available from the film library are listed. As new films are added to the Library, supplementary cards, up to twenty in number, will be issued free of charge to all holders of the index. The price of the index is 15s. (post free), and a cardboard container for it is available at 4s. The index and container are obtainable on application to the Secretary of the Association, B.M.A. House.

United Hospitals Choir.—This choir, previously known as the United Hospitals' Festival Choir, is pursuing a new policy. Most of the large teaching hospitals have formed their own music societies, so the choir now intends to provide mainly for those medical and hospital personnel in London with no facilities of this sort—for example, those working in the smaller hospitals and general medical and dental practitioners and their staffs. A good proportion of the choir's membership continues to be drawn, however, from among the students and nurses of the big hospitals. Musically it has been decided not to concentrate so exclusively on a small handful of over-exploited favourites. A recent performance of Mozart's Requiem Mass has encouraged the choir to prepare choral and orchestral works by Purcell, Britten, Schubert, and Handel. The first concert will take place in October. The choir rehearses on Thursday evenings from 7.30 to 10 p.m. at a school in Soho. Further details may be obtained from the secretary, Miss J. MAGRATH, 18, West Side, Clapham Common, London, S.W.4.

Index Ophthalmologicus.—A new edition of the *Index Ophthalmologicus*, which includes a world list of ophthalmologists, will be issued on the occasion of the Eighteenth International Congress of Ophthalmology in Brussels next year. Any ophthalmologist in Great Britain or Northern Ireland who is not a member of the Faculty of Ophthalmologists or of the Ophthalmological Society of the United Kingdom, and who wishes to have his name included in the list, is asked to communicate with the hon. secretary, Ophthalmological Society of the United Kingdom, 45, Lincoln's Inn Fields, London, W.C.2, before July 31.

M.R.C.O.G.—At a council meeting of the Royal College of Obstetricians and Gynaecologists on May 25 the following were admitted members: D. C. Aird, G. B. Batchelor, R. A. T. Boland, G. D. D. Cable, M. I. Cassimjee, J. S. W. Chambers, P. K. Choudhuri, C. A. B. Clemetson, K. I. Digwood, A. Freier, W. J. Garrett, W. Gault, W. Gavin, L. Goldman, C. J. Goosen, B. Kirsch, M. A. Lakeman, E. W. Lillie, H. H. McCrostie, J. G. Markus, A. E. B. Matthews, T. T. E. Michael, A. B. Miller, A. K. Mitra, J. M. B. Muirhead, A. C. C. Pinion, L. J. Rice, R. Richards, T. J. Ryan, G. J. W. Stump, S. M. Thanevela, K. F. G. Wilson, and R. Yule.

London University.—At the Foundation Day ceremony on November 22 Sir CHARLES LOVATT EVANS, F.R.S., formerly Jodrell professor of physiology at University College, London, and now an emeritus professor of the University, is to receive the honorary degree of Doctor of Laws. The title of university reader in histochemistry has been conferred on Dr. A. G. E. PEARSE in respect of his post at the Postgraduate Medical School of London.

Aviation Medicine Award.—Colonel J. P. STAPP, a physician of the U.S. Army Air Force, has received the first Liljencrantz Medal, an annual award for outstanding research into medical aspects of acceleration and high altitude flight. The medal, presented by the Pfizer Laboratories, was awarded by the U.S. Aero Medical Association. Colonel Stapp rode a rocket-powered sled in which he decelerated from 632 m.p.h. to a full stop in 1.4 seconds, thus subjecting himself to a force 40 times greater than the pull of gravity.

COMING EVENTS

Symposium on Mucoproteins.—Joint meeting of the Association of Clinical Biochemists and the Biochemical Society, June 29, 11 a.m., Royal Victoria Infirmary, Newcastle upon Tyne.

Institute of Dermatology.—Course for general practitioners, particularly for those working in dermatological clinics, September 16 to 20. Apply before July 8 to the dean, Institute of Dermatology, St. John's Hospital, Lisle Street, London, W.C.2.

Autoradiographic Techniques.—Short courses for biologists at the Atomic Energy Research Establishment, Harwell, July 22–26. Details from the Isotope School, Atomic Energy Research Establishment, Harwell, near Didcot, Berks. Fee £10 (excluding accommodation).

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, June 17

● INSTITUTE OF OBSTETRICS AND GYNAECOLOGY.—3 p.m., Professor W. C. W. Nixon: Disordered Uterine Action. 4.30 p.m., Professor J. Walker: Foetal Anoxia.
LIVERPOOL UNIVERSITY: FACULTY OF MEDICINE.—At Surgery Theatre, Old Medical School, 5.15 p.m., Professor E. Sachs (Washington): Sir Victor Horsley—Pioneer of Neurosurgery.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. William Evans: Pulmonary Heart Disease.

Tuesday, June 18

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. H. T. H. Wilson: Erythroderma.
SOUTH-WEST LONDON MEDICAL SOCIETY.—At Bolinebroke Hospital, Wandsworth Common, S.W., 8.30 p.m., Dr. J. C. McI. Matheson: Prisons.

Wednesday, June 19

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. A. Tickner: Epidermal Proteins.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. R. V. Gibson: Pulmonary Heart Disease.

Thursday, June 20

HYPNOTHERAPY GROUP.—At Royal Society of Medicine, 8 p.m., Brains Trust. Question Master, Mr. E. E. Wookey, L.D.S.; Members, Drs. George Newbold, Denys Kelsey, Gordon Davies, and Gordon Ambrose.
INSTITUTE OF NEUROLOGY.—5.30 p.m., Professor Kendall B. Corbin (U.S.A.): Analysis of 100 Cases of Protruded Cervical Disks with Compression of a Single Root.

LONDON JEWISH HOSPITAL MEDICAL SOCIETY.—At Medical Society of Aspects of Treatment of Rheumatoid Arthritis.
NORTH-EAST LONDON CLINICAL SOCIETY.—At Prince of Wales's General Hospital, Tottenham, N., 2.30 p.m., summer meeting.

NUFFIELD ORTHOPAEDIC CENTRE.—At Wingfield-Morris Orthopaedic Hospital, 8.30 p.m., Mr. H. Jackson Burrows: West Indian Orthopaedics from the Touchline.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.—7.30 p.m., annual general meeting. Talk by Dr. A. J. Haddow: Work of the Virus Research Institute at Entebbe.

Friday, June 21

● INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. F. R. Bettley: clinical demonstration.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. Philip Ellman: clinical demonstration.

POSTGRADUATE MEDICAL SCHOOL OF LONDON.—10 a.m., Mr. G. H. MacNab: Intestinal Obstruction in the Neonatal Period. 4 p.m., Dr. M. Thompson: Principles and Practice in the Management of Rheumatoid Disease.

ROYAL SOCIETY OF HEALTH.—At Guildhall, Cambridge, 10.30 a.m., Dr. A. G. Kitchell, Ph.D.: Nature of the Agents which Attack Food: With Special Reference to Meat; Mr. W. M. Whiteman, M.A.: Caravan Users and Their Needs.
ST. MARY'S HOSPITAL MEDICAL SCHOOL.—At Wright-Fleming Institute Theatre, 5 p.m., Sir Heneage Ogilvie: Shock.

BIRTHS, MARRIAGES, AND DEATHS

DEATHS

Bulleid.—On May 26, 1957, at Guy's Hospital, London, S.E., Arthur Bulleid, M.R.C.S., L.R.C.P., F.D.S.
Gaffney.—On May 24, 1957, at his home, Ashleworth, Gloucester, Edward James Gaffney, M.R.C.S., L.R.C.P., L.D.S., late of Streatham, London, S.W., aged 80.
James.—On May 26, 1957, at South Perth, Western Australia, Geoffrey Alfred James, M.D., D.C.H., aged 37.
Jones.—On May 27, 1957, at Wrexham War Memorial Hospital, Gladys Mary Thurlow Jones, M.R.C.S., L.R.C.P., of Glanrhyd, Llanelli, Dolgellay, Merionethshire.
Mulligan.—On May 22, 1957, at Golden Acre, Wvndham Road, Walford, Hants, Ulrick John Gordon Mulligan, M.B., B.Ch.
Ponton.—On May 25, 1957, John Alfred William Ponton, M.D., of "Sunnymede," Bude, Cornwall.
Rossiter.—On May 27, 1957, at "The Hawthorns," Sea View Road, Sunderland, Co. Durham, Charles Benjamin Rossiter, M.D., F.R.C.S. Ed., late of Auckland, New Zealand.
Routledge.—On May 25, 1957, at Huddersfield, Yorks, Agnes Petrina Routledge, M.B., Ch.B., of Port William, Wigtownshire, aged 61.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Do Corpses Sink or Float?

Q.—What determines whether a body floats or sinks after drowning? Is it true that it generally sinks, but comes to the surface again after about a week?

A.—The specific gravity of the human body approximates to that of fresh water. Water itself forms almost 75% by weight of the human body. Fat is the lightest constituent and bone the heaviest. A living person can float in fresh water with his lungs expanded but will sink on expiration; in sea-water, which has a specific gravity of 1026, the same person will float irrespective of the state of the lungs. The balance between floating and sinking is obviously delicate, and the amount of air trapped into the voluminous clothing of a fat woman has been known to keep her afloat in sea-water, though dead, for 45 minutes.

Persons dying from shock of immersion where the lungs are not waterlogged will tend to float immediately. It is generally true, however, that drowned bodies tend to sink after a few minutes owing to the displacement of the air in the lungs by water. The development of gases of decomposition cause the body to rise again. The time taken for a body to float after submersion depends on the speed of putrefaction. This in turn will depend on a variety of causes, e.g., temperature of the water, purity of the water, post-mortem injuries by passing craft, etc. The temperature of the water varies with the time of the year and the tide, if any. The purity of the water will depend on whether it is stagnant (a rarity) or contaminated by sewage or effluent from factories. Such contamination is particularly marked in estuaries such as the Thames below Teddington. Post-mortem injuries from the propellers of passing craft or from barges settling down at low tide will generally accelerate decomposition. The time taken for a body to float in sea-water is difficult to assess, since such bodies are generally washed ashore. In the brackish waters of estuaries in summer weather bodies will often come to the surface in two or three days, but in winter it is more usual for them to remain submerged for two or three weeks. In the purer water of rivers, lakes, and gravel pits bodies commonly remain submerged for a week in hot weather, but may remain below the surface as long as six weeks in the depth of winter.

Timing of Intravenous Ergometrine

Q.—Should intravenous ergometrine be given before or after the expulsion of the placenta? If before, precisely when?

A.—If ergometrine is given before the delivery of the placenta it is best given intravenously in a dose of 0.5 mg. either as the head is crowned and about to be delivered, or with the delivery of the anterior shoulder. In the writer's view, the former is better. The delivery of the trunk should then not be hurried, the theoretical idea being that strong retraction of the uterus separates the placenta, which passes into the lower segment and through the cervix, following the foetal buttocks so closely that it is not trapped by the contracting cervix. Once the baby is born and the cord divided, the placenta is then immediately delivered by cord traction aided by suprapubic (rather than fundal) pressure. Sometimes it is better to lift the fundus upwards off the placenta rather than to press downwards with the abdominal hand. The effect of ergometrine given intravenously is short-lived, so once the placenta is delivered a further 0.5 mg. should be given intramuscularly to avoid delayed post-partum haemorrhage.

By this technique the incidence of third-stage and post-partum haemorrhage is reduced to one-tenth of that which is unavoidable if an oxytocic is given only after the delivery of the placenta. Many obstetricians, however, do not adopt the new method because they fear that the placenta may be imprisoned within the uterus. This fear is misplaced; at least no reported controlled series of cases shows that the giving of ergometrine increases the need for manual removal of the placenta. Nevertheless, if the technique is to work well, it does need accurate timing, and this means that, in addition to the accoucheur, there must be present someone who can give an intravenous injection. It is a method which is not suitable for the single-handed obstetrician.

Opinion and practice still vary a good deal, but even those obstetricians who do not give ergometrine as a routine at the end of the second stage of labour agree that it should be used in those cases in which the patient is delivered under general anaesthesia, and in those in which there is some other reason for believing that the occurrence of third-stage or post-partum haemorrhage is more likely than usual. It may be added that those obstetricians who work without an expert assistant sometimes resort to giving ergometrine (with or without hyaluronidase) intramuscularly at the end of the second stage of labour. This is not so efficient as giving it intravenously.

Treatment of Lichen Planus

Q.—What is currently regarded as the most useful treatment for lichen planus? Have there been any recent advances in our understanding of this condition?

A.—Until recently most dermatologists gave arsenic or mercury by the mouth in the treatment of lichen planus. However, the recent work of P. D. Samman¹ has cast considerable doubt on the efficacy of this treatment. He followed cases of lichen planus over a long period and was unable to show any difference between those that were treated with these drugs and those that received no internal treatment. For this reason many dermatologists are now inclined to give no internal treatment for this condition.

It is generally agreed that local treatment makes little difference except for the relief of irritation. For this purpose anti-pruritic creams or lotions are prescribed if irritation is troublesome. They probably have no curative effect.

In the worst cases, systemic treatment with steroids may be given.² A short course of ten or fourteen days will often completely remove the eruption and relapse is not usual. This treatment is reserved for the worst cases, since it usually requires admission to hospital and is of course subject to the usual reservations attendant upon steroid therapy in general.

Our understanding of lichen planus has not improved.

REFERENCES

- Samman, P. D., *Brit. J. Derm.*, 1956, **68**, 175.
- Meara, R. H., *Trans. St. John's Hosp. Derm. Soc. (Lond.)*, 1955, **34**, 17.

Reliability of Paul-Bunnell Test

Q.—Under what circumstances may the Paul-Bunnell test prove misleading? Is it possible to get a false positive in leukaemia or other conditions if the serum is absorbed by guinea-pig kidney and ox red cells?

A.—Although it is generally held that, in the absence of serum sickness, the presence of agglutinins for sheep red cells to a titre of 1 in 200 or over is diagnostic of infectious mononucleosis, much confusion can be avoided if the Paul-Bunnell¹ reaction is only regarded as positive if confirmed by the ox red cell and guinea-pig kidney differential absorption test developed by Davidsohn.² If this is always done, not only will the antibodies for sheep red cells that occur in most normal human sera and those arising during the course of serum sickness be easily identified, but it will often be possible to diagnose infectious mononucleosis with confidence when the Paul-Bunnell reaction itself has not reached the arbitrary level of 1 in 200.

There is no evidence, at present, that antibodies characteristic of infectious mononucleosis ever arise during the course of any other disease.³ In fact, if the differential absorption test is always performed the possibility of a false positive result will be limited to those very rare occasions when antibodies persisting from a previously undiagnosed attack of infectious mononucleosis are found for the first time during the investigation of some other condition.

REFERENCES

- ¹ Paul, J. R., and Bunnell, W. W., *Amer. J. med. Sci.*, 1932, 183, 90.
² Davidsohn, I., *Amer. J. clin. Path.*, 1938, 8, Tech. Suppl. 56.
³ — Stern, K. A., and Kashiwagi, C., *ibid.*, 1951, 21, 1101.

Tumour Differentiation and Infiltration

Q.—Why should an undifferentiated tumour exhibit a greater capacity for infiltration than one that is better differentiated?

A.—The power to infiltrate is related to the average rate of growth of the cells of a tumour—that is, the average number of mitotic divisions which take place in these cells in unit time. If this rate is high there will be no time for the average cell to grow in size and to differentiate between mitoses—that is, the growth rate is inversely proportional to the degree of differentiation observed, and rapid growth is associated with the formation of small cells, all of which are spherical in shape.

A slowly growing tumour tends to be compact, and as it expands it exerts steady, uniform, and increasing pressure on the capillaries and cells of the connective tissue immediately surrounding it. The cells and fibre of this connective tissue die. The connective tissue further away and not subjected to this pressure reacts to the products of autolysis produced in the zone of cell death and a mild inflammatory response is produced. The inflammatory zone is replaced by the formation of granulation tissue in which fibroblasts proliferate and are responsible for the deposition of collagenous connective tissue which eventually forms a capsule. If, however, mitosis is unusually rapid the cell mass is no longer compact and can exert no sustained expansile pressure on the surrounding connective tissue. The protection of a capsule is lost and groups of tumour daughter cells insinuate themselves between the normal cells of the tissue of origin.

Thrombophlebitis Migrans

Q.—What is the modern treatment and prognosis of thrombophlebitis migrans? My patient has the condition in a superficial vein in his thigh.

A.—It is necessary to distinguish between primary idiopathic thrombophlebitis of a single vein and thrombophlebitis migrans, which is essentially recurrent and multiple in distribution. In the first type, which fits the description of the case in question, the prognosis is good, particularly if the vein involved is a superficial one. The treatment is local immobilization by strapping the vein with a strip of elastic adhesive bandage laid along its course, together with ambulation to discourage stasis and thrombosis in deep veins.

In true thrombophlebitis migrans the prognosis is not so good. The limb or life of the patient may be endangered in the severe cases with extensive recurrent involvement of superficial and deep veins. The pathology of the venous lesions is the same as that found in thromboangiitis obliterans, of which it may occasionally be the precursor. Severe cases require treatment in hospital with full anticoagulant treatment under laboratory control. Less severe cases may be treated by support to the limb by elastic stockings or bandages together with anticoagulant treatment of a less intensive kind.

A compromise must be reached between the difficulties of regular laboratory control of blood coagulability and the possibility of reaching dangerously low levels of blood coagulability without it. For this purpose the drug phenylindanedione is useful to maintain a stable reduction in prothrombin percentage over prolonged periods of time. Initiation of treatment with daily doses of 100–150 mg. under laboratory control is best, with later maintenance

on 50–75 mg. daily according to the response. For short periods of intensive therapy a prothrombin percentage of the order of 25% is necessary, but for prolonged treatment somewhat higher levels may have to be accepted.

Garlic in Hypertension

Q.—Does garlic contain any hypotensive substance? I have twice come across patients on the Continent who have reacted favourably to "garlic therapy" for hypertension.

A.—Extracts of garlic are reputed to owe their action to volatile oils containing organic sulphides and allyl aldehyde. These substances in fairly large doses are toxic. With reasonable doses no action leading one to suspect a possible usefulness in hypertension has been described. The use of garlic dates back at least to Culpeper, who described it as "the poor man's treacle, it being a remedy for all diseases and hurts (except those which it does breed)." A feeble fungistatic and bacteriostatic effect by garlic preparations has been demonstrated in recent years. Although it is difficult to exclude some mild hypotensive action, it would be necessary with a disease like hypertension to ensure that evidence for the effectiveness of garlic was carefully controlled by the use of some other inert but equally odoriferous principle.

Sensitivity to Penicillin in Congenital Syphilis

Q.—What course of treatment is advised for a congenitally syphilitic child (now aged 6) who is sensitive to penicillin?

A.—The questioner gives no indication as to symptoms, treatment already administered, or the results of laboratory investigations. Antibiotics other than penicillin have been used successfully in the treatment of syphilis: chlortetracycline, oxytetracycline, chloramphenicol, and erythromycin, for instance, are all effective antisyphilitic agents. A course of oxytetracycline in doses of 60 mg. per kilogramme of body weight daily for ten days is suggested. This should be followed by a ten weeks' course of intramuscular injections of bismuth (injection bismuthi B.P., 1 ml., once a week).

Serological follow-up is essential, and failure of the titre to decrease demands an examination of the cerebrospinal fluid.

Gastric Analysis in Suspected Cancer

Q.—Is the presence or absence of free acid in the gastric juice of any value in the diagnosis of cancer of the stomach?

A.—In established cancer of the stomach x-ray examination, supplemented if necessary by gastroscopy, is so exact as to make other investigations superfluous. In early cancer the findings of gastric analysis are so variable as to be positively misleading. As a diagnostic measure, whether for cancer or other digestive disorders, the test meal technique is quite obsolete and even such modifications as the augmented histamine test have only a limited application.

Correction.—Dr. H. Grundmann, in his letter on acute immediate reactions to penicillin (*Journal*, June 8, p. 1363), in the paragraph referring to experimental salvarsan sensitization, mentions intradermal injection of 1 ml. of a 1:100 solution of a primary non-toxic salvarsan derivative—e.g., myosalvarsan. He should have written 0.1 ml. of a 1:100 solution.

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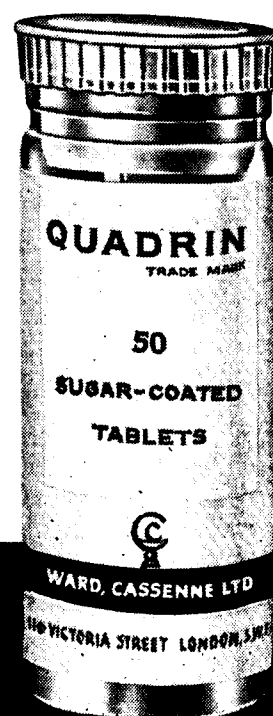
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CLAUDE BERNARD AND THE DISCOVERY OF GLYCOGEN

A CENTURY OF RETROSPECT*

BY

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On March 21, 1857, Claude Bernard communicated to the Société de Biologie in Paris a description of the isolation of glycogen from liver tissue and of the chemical and physical properties of the isolated substance. Two days later he delivered a communication on the same subject to the Académie des Sciences in Paris (Bernard, 1857).

Almost exactly a hundred years afterwards, I believe that it is appropriate to consider once again the significance of Bernard's discovery and to review briefly what has been learned about glycogen since that time. I propose also to outline the observations which led to the discovery of glycogen and the glycogenic function of the liver. I shall recall the heated controversy between Pavy and Bernard, since we can undoubtedly often learn something to-day from the mistakes of the past.

In his excellent biography of Claude Bernard the late Professor J. M. D. Olmsted (1939) states that, according to Bernard's views, carbohydrate is stored as glycogen in the liver (p. 202). This statement is not entirely correct, as I shall hope to show; and because misstatements have been made from time to time about Bernard's views on the significance of liver glycogen I shall quote in a number of instances what Bernard actually wrote. The translations from the French are my own.

When Bernard began his researches on the metabolism of carbohydrate almost nothing was known about the fate of dietary sugar in the animal body. The excretion of glucose in the urine in the disease diabetes mellitus had long been recognized, while in 1826 Tiedemann and Gmelin had found that fermentable sugar is formed from starch during the course of alimentary digestion. But what happened to this sugar was unknown. In agreement with the dominating views put forward by Dumas and others, according to which green plants alone form complex substances while animals always break them down, it was tacitly assumed that sugar was broken down to smaller molecules by the animal body.

Glycogenic Function of the Liver

In his thesis for the Doctorate of Medicine Bernard (1843) describes how cane sugar which is injected into the veins of an animal is eliminated in the urine, whereas preliminary treatment with digestive juices renders

*Based on a lecture given in the University of Cambridge on March 7, 1957.

this sugar capable of complete assimilation in the animal body when it is introduced by this route. This important observation made him decide to find out what happened to the sugar which was absorbed into the blood stream during the normal course of digestion. As he said many years later, he decided to follow the metabolic fate of all absorbed foodstuffs step by step and to study the various transformations which these substances underwent. "I proposed," he wrote, "to apply these methods successively to different substances—the proteins, sugars, and fats. I began with the sugars because their study seemed to me to be the most simple. But this plan of investigation was too big; to-day, after 30 years of research which has not been wholly sterile, I am still engaged in studying the metabolism of the sugars" (Bernard, 1879, pp. 40–41). There are few engaged in original investigation who have not experienced Bernard's feeling that any research problem is too big to be completely solved.

In his thesis for the Doctorate of Science, published in 1853, Bernard wrote: "My aim was to follow closely the sugar, which was absorbed from the food, in its passage along the blood stream first to the liver, then to the lungs, and finally to all the other tissues of the body. I wanted to know if the sugar was destroyed in traversing the liver, which is the first organ through which it passes after being absorbed into the tributaries of the portal vein. For this purpose a dog which had been fed on carbohydrate food for seven days was killed during the digestion of a meal, by section of the spinal bulb. As quickly as possible I opened the thorax and abdomen in order to discover if sugar was present in the blood which had passed through the liver. Now it was easy to show quite clearly that the blood of the hepatic veins, where they joined the inferior vena cava, contained a large amount of glucose" (Bernard, 1853, pp. 10–11). This experiment seemed to indicate that the liver did not absorb or destroy the sugar passing to it in the blood flowing from the gut, but Bernard did not draw this conclusion without further experiment. He decided that he must ascertain whether or not the sugar present in the blood of the hepatic veins was similar to that absorbed from the gut. For this purpose he performed a similar experiment on a dog fed on a diet which consisted of meat only, and which was therefore apparently free from carbohydrate. To his surprise he again found that the blood of the hepatic veins

contained a large amount of sugar, although he was quite unable to detect sugar in the contents of the stomach and intestines. Moreover, he found that the blood of the portal vein contained no sugar before it entered the liver, whereas the blood leaving the liver in the hepatic veins contained much glucose. He therefore concluded that the liver possesses the power to produce sugar. He repeated this type of experiment under all sorts of different conditions but always with the same result—namely, the blood of the hepatic veins was always found to contain an abundance of sugar while that of the portal vein contained none unless the animal had received sugar in its diet.

He found, moreover, that when an animal which had fed on meat alone for two weeks was killed, an aqueous extract made of the liver tissue contained much sugar, although none could be detected in similar extracts made from other organs. By fermentation with yeast, and by means of other tests, the sugar in the extract of the liver was identified as glucose. It was clear, therefore, that sugar could be present in the body when no carbohydrate food was being absorbed and that this sugar was formed by the liver. When, as he wrote in 1853, "sugar is manufactured in the liver, which must therefore be considered as an organ which produces or secretes sugar" (Bernard, 1853, p. 54), he was introducing an important new idea—namely, that substances may be secreted directly into the blood stream. Moreover, the ideas of Dumas, Boussingault, and others that animals always destroy or decompose complex substances had to be modified, since the liver was capable of producing a substance as complex as sugar when this substance was not present in the diet.

Having discovered that glucose could be produced in the body, Bernard abandoned his original intention to investigate the site of destruction of the sugar absorbed as food from the intestine. He set out to discover the origin of the sugar newly formed in the liver.

Discovery of Glycogen

At this time Bernard's estimations of the sugar content of extract of liver tissue were made in duplicate by titration with the copper reagent of Barreswil, a modified Fehling's solution. He relates (Bernard, 1865, pp. 291–295) how one day he was pressed for time and was unable to make his duplicate determinations simultaneously. He made one estimation immediately after the death of an animal and postponed the other until the following day. The second estimation gave a value very much higher than the first, and the difference was so great that Bernard investigated the reason for this discrepancy. Hitherto he had not ascribed significance to the length of time which elapsed between the death of an animal and the determination of the sugar content of the liver tissue. He now found that time was of great importance. Immediately after the death of an animal the liver was found to contain very little sugar, but within only a few minutes the amount of sugar had substantially increased, and at the end of two hours a large quantity had usually made its appearance. By forcibly injecting a current of water through the blood vessels of a freshly excised liver he was able to free the tissues from sugar. When such a washed, sugar-free liver was allowed to remain at a moderate temperature for a few hours large quantities of sugar appeared (Bernard, 1855b). This conclusively showed that the sugar was formed, not from substances in the blood as had previously seemed possible, but from materials in the liver tissue itself.

A cold aqueous extract rapidly made from liver tissue immediately after the death of the animal contained no detectable reducing sugar, but after two days at room tem-

perature much sugar had appeared. If, however, the fresh extract were boiled no sugar subsequently made its appearance. These results and many other similar ones showed that the liver contained an extractable substance which did not give the ordinary tests for reducing sugar but which could give rise to reducing sugar by the action of a "ferment" in the liver (Bernard, 1855a).

The fact that the liver could produce sugar from a substance within itself was published in 1855 by Claude Bernard, but it was not until 1857 that he was able to describe the isolation of the sugar-forming substance, or "la matière glycogène" as he named it.

After Bernard's announcement in 1855 of the ability of the liver to produce sugar, many investigators attempted to isolate the precursor, and it has been claimed that Hensen independently isolated glycogen. Many years later Pflüger repeated Hensen's observations, and concluded that Hensen had in fact obtained a mixture of protein and glycogen, and not pure glycogen. Nevertheless Hensen must be given some credit for his work, although Bernard makes no reference to it in his own writings.

Criticisms of Bernard's Early Experiments

For many years Bernard insisted, in spite of contradiction, that the blood of the portal vein of a dog fed on meat contained no sugar. Among those who disagreed, Figuier was so insistent that a special committee of the Académie des Sciences was set up to report on this important matter of controversy. The committee's report completely vindicated Bernard, agreeing with him that no trace of fermentable sugar was present in the blood of the portal vein of an animal fed on meat. Figuier was unconvinced, however, and he was later joined in his contentions by Chauvau, Pavy, and others. Although in 1859 Bernard was still insisting on his mistaken assertion, I have been unable to find any mention of this point thereafter until he admitted in 1877 that his earlier findings in this respect were incorrect (see Young, 1937).

The young English doctor, Frederick William Pavy, criticized Bernard's experiments on much wider grounds. In 1852 Pavy worked for a year in Bernard's laboratory in Paris, returning to become lecturer in physiology at Guy's Hospital and assistant physician. Pavy was apparently uncertain that in the experiments which he had seen performed in Bernard's laboratory the withdrawal of blood from the dying dog provided material that was characteristic of the conditions in the living animal. When he returned to England he therefore passed a catheter down the jugular vein of the living unanaesthetized dog and withdrew blood from the right heart (Pavy, 1854–5, 1860). His original intention was to investigate the disappearance of the sugar from this blood when it was perfused through the lungs of another animal. He was astonished to find, however, that there was almost no sugar at all present in the blood of the right heart obtained in this manner. He found, however, that if the animal was killed and the blood then collected from the right heart, much sugar was present therein, although sugar could not be detected in the blood obtained from a heart which had been rapidly removed from the living animal. Pavy then began to suspect that the production of sugar by the liver might be a post-mortem phenomenon, and was led to conclude that inferences about the ante-mortem state that had been drawn from post-mortem investigations of this sort must be abandoned.

In 1860 Pavy consolidated his position as a critic of Claude Bernard's views. He stressed that, on the whole, his experimental results did not disagree with those of Bernard, although in two important respects they did. First, Pavy agreed with Figuier and others in finding that portal vein blood did contain sugar. Pavy said that the amount present was indistinguishable from that found in other parts of the circulating blood of the living animal. Second, he did not agree with Bernard that blood removed from the right heart of the living animal is strongly reducing. Far from accepting the view that the liver secreted

sugar, Pavy believed that it absorbed it and stored it as glycogen in a sort of detoxication process. Only under pathological conditions did the sugar escape from the liver into the circulation, where it could produce undesirable effects, such as those found in diabetes mellitus. After death, or in the diabetic condition, the liver lost its power to form or hold glycogen and the organism was flooded with sugar. Bernard's gibe, that if Pavy considered the production of sugar by the liver to be a post-mortem phenomenon he must consider "a diabetic person to be a walking corpse—a very queer idea" (Bernard, 1877, p. 349), was really irrelevant.

In 1860 Pavy described his finding that restlessness or struggling of an unanaesthetized animal in which a catheter had been introduced into the jugular vein resulted in a substantial increase in the sugar content of the blood. He further observed that "obstruction of the breathing determines an unnatural increase of sugar in the circulation and a strongly diabetic state of the urine may be induced in this way" (Pavy, 1860). Pavy is not usually credited with these early observations of emotional hyperglycaemia and of asphyxial hyperglycaemia and glycosuria. Pavy was also aware many years before Bernard that glucose rapidly disappears from blood after it is shed (Pavy, 1854–5) and, finding that the blood became acid as the glucose vanished, made the pertinent suggestion that the disappearing sugar had been converted to lactic acid.

Although Pavy's criticisms of Bernard's investigations met with some support, the prestige of the discoverer of glycogen was such that they were comparatively ineffective. In 1877 Pavy again returned to the problem with a vigorous criticism of the methods used by Bernard for the estimation of blood sugar, at the same time describing a new method of his own. The application of his own method, he believed, demonstrated that there was no significant difference between the sugar contents of arterial and venous bloods. In his book *The Physiology of the Carbohydrates*, published in 1894,* Pavy presents evidence to show that the "blood of the general circulation contains a standard or definite amount of sugar which, under natural and ordinary conditions, may be stated to range from about 0.6 to 1.0 or a little over 1.0 per 1,000 and which presents no evidence of any essential variation in the different parts of the system spoken of," although after the ingestion of carbohydrate food the portal vein blood sugar was considerably greater than that of the hepatic veins, showing that the liver was absorbing the sugar and presumably converting it to glycogen. After a long and fruitful life, Pavy died in 1911 at the age of 82, still convinced that Claude Bernard was wrong in his belief that the liver normally secretes sugar.

Surgical removal of the liver obviously provided a crucial experiment by which a choice could be made between the views of Bernard and Pavy, and although Minkowski in 1886 and Seegen in 1890 removed the liver from geese, in which the vascular arrangement permits this without undue difficulty, Pavy (1894) had no difficulty in rejecting the relevance of this evidence to the mammal. It was indeed not until 1922, when F. C. Mann and T. B. Magath (1922) accomplished hepatectomy in the dog and observed that the blood sugar then rapidly falls, that Bernard was finally proved to be right, and Pavy wrong.

Fate and Origin of Sugar in the Liver

Bernard's early belief about the fate of the sugar liberated by the liver was that it diffuses over the entire organism by way of the circulation, the amount of sugar steadily diminishing the further the blood flows from the liver, which is the origin of the sugar (Bernard, 1885a, p. 470). By 1877 he had found, in confirmation of Chauvau and others, that arterial blood generally contains more sugar than venous blood. At the same time he corrected his previous mistaken belief that no sugar was present in the blood of the portal vein. Nevertheless, he reaffirmed, there is normally more sugar in the blood leaving the liver than in the blood entering that organ.

*The criticism, and its trenchant attempted rebuttal, evoked by Pavy's book, I have discussed elsewhere (Young, 1937).

Soon after Bernard's discovery of glycogen in the liver, Sanson found that muscular tissue also contains glycogen, while, later, Nasse and Weiss and others showed that this glycogen diminishes in amount during muscular contraction. Bernard thought it possible that this glycogen in the muscles might be transported to them from the liver by the way of the blood. He found that the glycogen in the muscles never gave rise to glucose. "Muscle glycogen always undergoes a lactic acid fermentation, and this is the only change that muscle glycogen ever undergoes, either in the living animal or after death" (Bernard, 1877, p. 428). Taking into account the fact that the muscles continuously absorb glucose from the blood, Bernard concluded that in the living animal sugar is destroyed in the muscles, and not formed there. These ideas provided the basis of what is generally known as Claude Bernard's theory of the glycogenic function of the liver, although Bernard does not define it precisely as such. According to this theory, production of sugar by the liver is closely related to the rate of utilization of sugar by the tissues in general, the glycogen in the liver being the immediate source of the secreted sugar.

According to Bernard's views, liver glycogen is formed largely from nitrogenous material in the food. He could find no evidence that the glycogen content of the liver rose after the administration of fat to an animal. The question of whether liver glycogen is ever directly formed from carbohydrate in the food was a tricky one. Although Bernard contradicts himself a number of times on this point, his view, on the whole, appears to be that the glucose which arrives at the liver from the gut is not directly converted into glycogen. Let me quote his words from *Leçons sur le Diabète* (1877, pp. 321–322). "Is the large amount of glycogen formed in the liver after the ingestion of carbohydrate, the result of a direct conversion, a recession of sugar to glycogen, or does the sugar play only the role of a powerful nutritive stimulant which increases the glycogenic function to a marked degree? I have attempted to test the hypothesis that cane sugar is directly converted to liver glycogen. If this conversion really occurs, if it has as its end the preservation of the substance until such time as it is to be utilized, it is reasonable to suppose that when this time comes the substance will resume its previous form, that is it will undergo the converse of those changes to which it had previously been subjected, and that invert sugar will be re-formed from glycogen."

Bernard found that the glycogen formed in the livers of rabbits which had been fed on sucrose did not give a laevorotatory sugar on hydrolysis. In fact, he records that the sugar formed seemed to be more dextrorotatory than glucose. As the result of these experiments Bernard wrote: "The indisputable fact is that the administration of cane sugar considerably increases the liver glycogen content; but how does the sugar act in this case—as a nutritive stimulator or as a substance which is directly converted to glycogen? I am inclined to believe, I must confess, that the first suggestion is the more correct" (Bernard, 1877, pp. 322–323). When he fed a dog on starch the liver was found to contain less glycogen than the liver of a dog fed on fibrin. "This result seems to indicate," he wrote, "that the animal body cannot form glycogen with a ternary body alone, but that it can with a more complex substance such as fibrin" (Bernard, 1877, p. 542). Apparently Bernard regarded the secretion of glycogen by the liver as a complicated process and considered that it would therefore require a complex substance for its stimulation. Since starch contains only three elements—carbon, hydrogen, and oxygen—it was not suitable, but fibrin, being the more complex substance altogether, was able to stimulate the process of sugar formation. It is clear, therefore, that the statement which is so often made to-day about Bernard's work is wrong. He did not believe that the liver absorbed sugar from the blood and converted it directly into glycogen. He was uncertain (see Young, 1937), but inclined to the view that the glycogen which appears in the liver during the absorption of carbohydrate food is not derived from exogenous sugar but secreted, newly formed, by the tissues of that organ.

Bernard's Measurement of Blood Sugar

It is of interest to know how it was that Bernard failed to detect sugar in blood—for instance, in that of the portal vein—at a time when other workers using similar methods succeeded. One reason is clear. In many of his early experiments he did not test the blood until some time after its removal from the body and so much of the sugar in the blood was lost by glycolysis. In one of his earlier publications he describes a method for the detection of sugar in "old blood." Pavy, who had worked in Bernard's laboratory, suggested that another cause of failure arose from the fact that Bernard did not allow his test mixture (Fehling or Barreswil solution plus protein-free blood filtrate) to stand for a sufficient length of time after boiling. The detection of sugar by the relatively insensitive method of fermentation was in any case not very satisfactory.

In his early experiments, carried out on a dying or dead animal, Bernard must have stimulated the breakdown of glycogen in the liver to a very substantial extent, so that the blood of the hepatic veins contained abnormally large amounts of sugar, amounts which Bernard could easily detect even with his inadequate methods. If, like Pavy, he had carried out his experiments under physiological conditions so that a stimulation of the breakdown of liver glycogen was not induced, it seems extremely probable that he would have been unable to detect sugar in the blood of the hepatic veins at all. For we know to-day that in the post-absorptive state the blood of the hepatic veins contains only about 20 mg. per 100 ml. more sugar than that of the portal vein. Since Bernard was unable, in his early experiments, to detect any sugar at all in the blood of the portal vein, the blood of the hepatic veins would almost certainly, under physiological conditions, have yielded negative results. Pavy was nearer to the truth in his statement that the blood of the portal vein and hepatic veins contained indistinguishable amounts of sugar than was Bernard in his assertion that portal vein blood contained no sugar while the blood of the hepatic veins contained an abundance. The curious paradox therefore arises that if Bernard had been more careful with his experimental conditions he might never have discovered glycogen and the glycogenic function of the liver, while if Pavy had been a little less rigid in his determination to use strictly physiological conditions he might not have been led to an incorrect theory of carbohydrate metabolism, based on very carefully determined experimental results.

Although Bernard's experimental findings were occasionally at fault and at times influenced by preconceptions, such as the importance of nervous control of secretion of sugar by the liver (see Young, 1951), his strength appears to lie in his ability to discard a theory once its experimental basis had been undermined. Even though he was apt not to state frankly that he had been wrong, he nevertheless did change his ideas. This ability Pavy did not share to such a marked degree.

Formation of Liver Glycogen from Carbohydrate

This problem, which Bernard never definitely solved, was examined critically by J. Otto, a pupil of C. Voit. On the basis of experiments by Bernard and others, Otto decided that liver glycogen could not be formed from fat. Therefore, he argued, if the glycogen content of the tissues of a sugar-fed animal rises it follows that the glycogen has been formed either from protein in the body of the animal or from ingested sugar. From the weight of the nitrogen excreted during a given time, the weight of protein carbon metabolized during this period could be calculated. If this weight of carbon from protein was less than the weight of carbon in the glycogen deposited then some part of the glycogen must have been formed from the ingested sugar. The results of experiments on these lines were published in 1891 after the early death of Otto (Otto and Voit, 1891) and demonstrated that liver glycogen could indeed be formed from ingested glucose and fructose and from any di- and poly-saccharide which could be hydrolysed in the alimentary

tract to form these sugars. Once the direct conversion of ingested sugar to liver glycogen was admitted, the process of sugar secretion by the liver lost its former significance. The secretion of sugar by the liver could indicate that exogenous sugar, which had been temporarily stored as liver glycogen, was being liberated for use in other parts of the body and not that sugar was being manufactured from other sources.

In the early years of the twentieth century Pflüger denied the validity of all the evidence which had accumulated up to that time that protein could be converted to sugar in the body. He was justified in his criticism that in experiments designed to prove this the preliminary period of fasting had been too short, so that a considerable but unknown amount of glycogen was present in the body when the feeding of protein began. Nevertheless, his continued declaration that any increase in the amount of glycogen in the body which had been found as a result of feeding protein food was within the experimental error of the investigation appears to be too sweeping. Indeed, he was quite frank in his statement that his investigations on carbohydrate metabolism were begun with a prejudice. As Pflüger wrote (1907, p. 377), "My aim has been to find the origin of sugar in sugar itself and not in any other substance."

Pflüger (1905) was apparently impressed by the fact that the ingestion of certain sugars—for example, pentoses—did not result in a rise in the amount of glycogen in the liver. He considered that "as the liver cells are unable to form glycogen from such carbohydrates, it would be an extraordinary thing if they were able to do so from substances whose constitution is quite different from those of sugars," and with this argument supported his view that proteins are not converted to sugar in the body. This reasoning led him to believe that glycogen might be formed from fat, particularly since the formation of carbohydrate from fat had been rigorously proved to take place in the plant world; for instance, in the germinating castor-oil seed. Pflüger had shown experimentally that sugar could be converted to neutral fats in the animal body. Therefore, he argued, the reverse process was most likely to occur—that is, that neutral fats could give rise to sugar and so to glycogen (see Young, 1937).

Most of the evidence put forward by Pflüger to support the belief that fat is converted to sugar in the animal body was not of a positive type. It consisted mainly of arguments designed to demonstrate the improbability of the belief that sugar came from sources other than fat, and in particular that it could not be produced from protein. In his old age, however, Pflüger did become convinced that liver glycogen could arise from protein (Pflüger and Junkersdorf, 1910). The amount of glycogen in the liver and muscles of a fasting dog was reduced to a low level by the administration of phlorrhizin. The feeding of codfish to such a dog led to a substantial increase in the amount of glycogen, both in the liver and in the muscles. Since the codfish contained only a very small amount of glycogen and no appreciable amount of protein-bound carbohydrate, and since under these conditions the feeding of fat did not increase the glycogen content, Pflüger at last accepted the conclusion that liver glycogen could be formed from protein. The acceptance of this conclusion meant that most of Pflüger's work on carbohydrate metabolism had to be reinterpreted. The result of this was the general rejection of Pflüger's belief that sugar could be formed from fat; but because of all the confusion that had been brought about by the promulgation of Pflüger's ideas, Bernard's views about the formation of liver glycogen had been obscured. What is said about them to-day is often coloured by Pflüger's belief that carbohydrate must itself be the main source of liver glycogen.

Glycogen Since the Time of Pflüger**(a) The Cori Cycle**

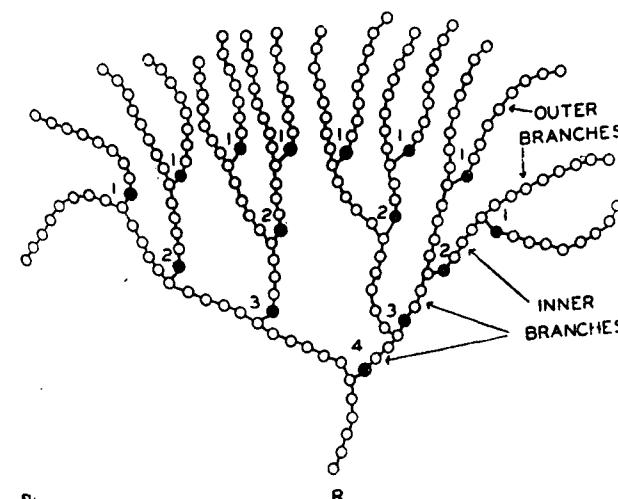
The important researches of Meyerhof and others into the role of glycogen breakdown in muscle and in yeast carried out during the inter-war period cannot be discussed

here. But what came to be known as the "Cori cycle" during the late 1920's is of particular relevance. Carl and Gerty Cori showed that lactic acid liberated by the muscles of a mammal was largely re-converted into glycogen, not in the muscles but in the liver (see Cori, 1931). Thus glucose could pass through a cyclical process in being successively converted from liver glycogen to blood sugar, to muscle glycogen, to lactic acid, and back to liver glycogen. In this process, energy was released in the muscles and absorbed in the liver.

(b) The Chemical Structure of Glycogen

That on complete hydrolysis, glycogen yields glucose alone was established by Claude Bernard. Although this finding has been challenged from time to time, its validity has never been generally doubted. The fact that maltose is formed by the hydrolysis of glycogen under the influence of amylases was demonstrated by Claude Bernard. Maltose possesses a 1:4- α -glucosidic linkage (Haworth, 1929), and if one postulates a repetition of such a linkage one can imagine a straight chain of n glucose molecules joined with 1:4- α -glucosidic linkages—an amylose structure, as it is called. In such a molecule, if n is large then the empirical formula for glycogen of $(C_6H_{10}O_5)_n$, first established by Kekulé in 1858, is applicable. But this applies only if n is more than about 30, since in the formation of glycogen from a straight chain of n molecules of glucose only $n-1$ molecules of water are abstracted. The formula for glycogen will therefore be $(C_6H_{10}O_5)_n - (n-1) H_2O$, which approximates to $(C_6H_{10}O_5)_n$ only when n is large. The fact that glycogen is a non-reducing polysaccharide agrees with the view that n is large.

In 1932 Haworth and Percival showed that n was only 12 for the preparations of liver glycogen then examined, this figure being deduced from the amount of 2:3:4:6-tetramethyl glucose liberated when fully methylated glycogen was hydrolysed. This tetramethyl glucose represented the non-reducing end of the chain and therefore provided a measure of chain length. Other workers subsequently assessed n at figures between 12 and 18 for glycogen, and a figure of 14 and 15 may be regarded as representing the average (see Cori and Lerner, 1951). The upper limit for glycogen may be taken as 17, a continuous series ranging between $n=12$ and $n=17$ (Cori, 1954). When n is greater than 17 the substance is not glycogen but amylopectin, the branched polysaccharide which constitutes about 80% of most natural starches. Since, for reasons we have already considered, n for the whole molecule is probably larger than



Structure of glycogen. The segment of glycogen pictured has a molecular weight of 38,000. The open circles represent the glucose units in α -1:4 linkage, the black ones those in α -1:6 linkage. Reproduced, by permission, from Gerty T. Cori's "Glycogen Structure and Enzyme Deficiencies in Glycogen Storage Disease." (The Harvey Lectures, 1952-3, 48, 146. Academic Press, Inc., New York.)

this, it was likely that these short chains must be joined by lateral linkages (See Diagram).

In their investigations on glycogen, Haworth and Percival found that fully methylated glycogen had a minimum molecular weight in molten camphor corresponding to that of a dodecasaccharide—that is, about 2,400. This indicated that any bonds joining the units of methylated dodecasaccharide were easily broken when the substance was dissolved in molten camphor, and were therefore unlikely to be co-valent bonds. I was unable myself at this time to reproduce this observation of the solubility of methylated glycogen in molten camphor, and Oakley and I (Oakley and Young, 1936) found from measurements of osmotic pressure that the molecular weight of both glycogen and fully methylated glycogen was of the order of 1,000,000.

As the result of their investigations, Haworth and his colleagues put forward a laminated structure for the molecule of glycogen, while, on the basis of physical measurements, Staudinger (1937) suggested a "comb" structure, and Meyer and Bernfeld (1940) a "tree" structure. In the early investigations the nature of the linkages between the chains of 12-17 glucose units was not specified. In 1937 D. J. Bell (1937) isolated dimethyl glucose from the products of hydrolysis of fully methylated muscle glycogen in an amount about twice that of the tetramethyl glucose found. Subsequently, Barker, Hirst, and Young (1941) identified 2:3-dimethyl glucose among the hydrolytic products of fully methylated starch. This suggested the possibility that the inter-chain link was attached to the 6 position of certain glucose residues, and since the link could easily be hydrolysed it was very likely a 1:6 linkage. With the isolation of isomaltose or brachiose (6-[α -D-glucopyranosyl]-D-glucose), which is a disaccharide with an α -1:6 linkage between two glucose units, from the products of the acid hydrolysis of glycogen by Wolf from and O'Neill (1949) and with the isolation of the same disaccharide from the products of enzymic hydrolysis of starch by Montgomery *et al.* (1949), it seemed very probable indeed that the links between the chains would be 1:6 α -glucosidic bonds. Further evidence that this was so came from studies with enzymes, although the existence of other types of linkage has not been completely excluded.

(c) Enzymic Breakdown of Glycogen

In 1936 it was shown (Cori and Cori, 1936; Cori, Colowick, and Cori, 1937) that glucose-1-phosphate was the product of the breakdown of glycogen by an enzyme, present in mammalian muscle and acting in the presence of inorganic phosphate, which they named "phosphorylase." Later, they were able to demonstrate (Cori, Cori, and Schmidt, 1939) that the action of phosphorylase on glucose-1-phosphate *in vitro* could, under suitable conditions, produce a polysaccharide which resembled glycogen in many respects, though it yielded a blue colour with iodine (like starch) and not a brownish-red colour as glycogen does. Independently, in this country, Hanes (1940) showed that potato-phosphorylase would produce a starch-like polysaccharide from glucose-1-phosphate *in vitro*. Much of the subsequent enzyme researches were carried out in parallel on glycogen by Cori and Cori, and on starch by Hirst, Peat, Bourne, and others. I must confine my attention to glycogen.

In 1943 Cori and Cori showed that highly purified crystalline muscle phosphorylase gave, with glucose-1-phosphate *in vitro* under suitable conditions, only a straight chain polysaccharide (amylose) of a greater chain length than that of glycogen. But they also found that muscle extract contained another enzyme, branching enzyme, which could convert the straight-chain polysaccharide into a branched one.

Swanson (1948), in Cori's laboratory, showed that the colour with iodine yielded by these glucose polysaccharides varied with the mean chain length. With 8-12 glucose units in a chain the colour developed with iodine was red. With 30-35 it was blue. Intermediate chain lengths gave intermediate colours. I should like to recall here what Claude Bernard recorded (1877, p. 553): "I have found that if the

muscles of a rabbit are paralysed and thus forced to rest, the glycogen content rises. I have observed in this case that the glycogen gives a blue colour with iodine, just like that with starch." Presumably the outer chains of the molecule grow as the glycogen content of the muscles increases under these conditions.

In 1951 Cori and Larner showed that the complete degradation of glycogen in animal tissues required two enzymes: (a) phosphorylase, for the breaking of 1:4 linkages by the introduction of phosphoric acid (phosphorylation) with the production of glucose-1-phosphate; and (b) debranching enzyme (or amylo-1:6 glucosidase) for the hydrolytic fission of the 1:6 linkages, with the production of free glucose. This enzyme appeared to be specific for α -1:6-glucosidic linkages. The ratio of free glucose to free + phosphorylated glucose formed when both enzymes acted upon glycogen was a measure of the degree of branching. In all instances it was found for glycogen that the outer chains of glucose residues ("the peripheral tier") was longer than the inner branches (see Cori, 1954). In a typical glycogen with a mean chain length (n) of 15, the length of the outer chains is 8 or 9 glucose units, with 3-5 glucose residues in the inner branches—that is, between branching points.

In their experiments Cori and Larner (1951) found that, as might be expected from the action of debranching enzyme, the stimulation of muscle results in the release of small amounts of free glucose, as well as of lactic acid. Thus, Bernard's belief that glycogen in muscle always undergoes a lactic acid fermentation was not quite correct. According to the present formulation of glycogen, about 6% of the glucose residues can yield free glucose, and about 94% lactic acid or other molecules, when glycogen is broken down in muscle.

By applying enzymic methods of molecular analysis to the glycogen in the liver and muscles of patients with glycogen-storage disease, Illingworth and Cori (1952) and Illingworth, Cori, and Cori (1956) have distinguished several types of this disease. In the liver-kidney type, first described by von Gierke, other organs are not affected and the specific lesion appears to be a deficiency of glucose-6-phosphatase in liver and kidney cortex. In generalized glycogenosis, some cases possess glycogen with abnormally short outer chains and a deficiency of debranching enzyme (amylo-1:6-glucosidase), and their disease can be attributed to the deficiency of this enzyme; others do not exhibit these abnormalities, and the aetiology of their condition is still obscure.

Cori (1954) has observed that the nutritional state has a marked effect on the degree of branching of the glycogen molecule. Glycogen deposited in the liver when glucose or fructose is fed to fasting rabbits is less branched than the liver glycogen from well-fed rabbits. Glycogen from the livers of embryonic guinea-pigs is more branched than the glycogen obtained from the livers of newly born or adult animals (Cori, 1954). As Cori has pointed out, the length of the outer chains is very important in the characterization of glycogen. It varies more than the length of the inner chains and largely determines the average chain length of the entire molecule.

(d) Enzymic Synthesis of Glycogen

The debranching enzyme (amylo-1:6 glucosidase) is apparently purely a hydrolytic enzyme and almost certainly plays no part in the synthesis of glycogen from glucose-1-phosphate. The presence of a branching enzyme in muscle was revealed by the researches of Cori and Cori (1943), as has already been pointed out. Larner (1953), in Cori's laboratory, has observed that when this enzyme acts upon glycogen containing radioactive labelled glucose in its outer chains 1:6 linkages are formed between radioactive glucose units previously linked by 1:4 bonds. This enzyme has been described as amylo-(1:4→1:6) transglucosidase. The enzyme from the liver needs an outer chain length of more than 6 glucose units before it will induce branching. The reverse process—that is, the formation of 1:4 linkages at the expense of 1:6 linkages—has not been demonstrated.

(e) Formation of Glycogen in vivo

The enzymes that together can catalyse the conversion of glucose to glycogen are, in accordance with the studies we have considered above and other relevant investigations, hexokinase (glucose to glucose-6-phosphate), phosphoglucomutase (glucose-6-phosphate to glucose-1-phosphate), phosphorylase (glucose-1-phosphate to amylose), and branching enzyme (amylo-(1:4→1:6)-transglucosidase) (amylose to glycogen). Although these enzymes exist in liver and muscle tissues and can together catalyse the transformation of glucose to glycogen, it is not certain that the pathway thus made possible—glucose → glucose-6-phosphate → glucose-1-phosphate → glycogen—is the main one followed in intact tissue. Beloff-Chain *et al.* (1955) believe that oligosaccharides may be involved in the formation of glycogen from glucose in diaphragm muscle.

It is true that in liver tissue the increase in phosphorylase activity associated with the action of glucagon or adrenaline is always associated with a greater breakdown of glycogen and not with increased formation of this substance. But, of course, the conditions prevailing in the cell when phosphorylase activity rises under the influence of adrenaline and glucagon may be specifically appropriate for the lytic action of phosphorylase, as opposed to the reverse effect. Be that as it may, the direct conversion of glucose to glycogen in the liver, about which, as we have seen, Claude Bernard had some doubts, has been clearly demonstrated within recent years with the aid of isotopes. Using deuterium as a labelling isotope, Stetten and Boxer (1944) found that dietary glucose can indeed be converted directly to liver glycogen, although their studies showed that only a small proportion was so directly transformed, the major part of the liver glycogen being formed from smaller molecules, perhaps lactate in part, when glucose was fed to a rat.

According to Stetten and Boxer only about 3% of the dietary glucose is converted to glycogen, about 30% being transformed to fat. The rest is presumably oxidized through other routes. De Duve and his colleagues (Berthet *et al.*, 1956), using radiocarbon-labelled glucose, have recently also demonstrated the direct conversion of glucose to liver glycogen, as well as to muscle glycogen, this process being stimulated by insulin.

Stetten and Stetten (1954, 1955) have found that when glucose labelled with radiocarbon is given to normal rats, and the structure of the liver and carcass glycogens analysed by the enzymic method, the administered glucose is found first to enter the peripheral chains of glycogen and then move down the molecule. The process of the inward movement of the radioactive glucose in the molecule of glycogen is more rapid with glycogen in the liver than with muscle glycogen. Subsequent studies (Stetten, Katzen, and Stetten, 1956) have shown that the radioactive glucose preferentially enters the glycogen molecules of smaller size than average in the liver, and of larger size than average in the muscles. These observations, and the earlier ones of Cori and Cori, emphasize the metabolic inhomogeneity of the glycogen molecule.

During the past ten years the use of isotopes has confirmed that carbon atoms from certain amino-acids, contained in protein, can be transferred to liver glycogen. Although it has also been demonstrated in a similar manner that carbon can be transferred from fatty acids to liver glycogen, it is still doubtful whether a net synthesis of glycogen can occur at the expense of the breakdown of fatty acids.

Conclusion

During its first century of recognition glycogen has passed from a starch-like material of unknown constitution, the immediate precursor of the sugar secreted by the liver, to a substance whose molecule can be enzymically dissected, much as Claude Bernard dissected an animal. Already this power to effect such molecular analysis of glycogen by means of enzymes has differen-

tiated glycogen-storage disease into a number of different types, and has revealed that the peripheral part of the glycogen molecule can undergo metabolic change independently of the central part. What light these new observations will throw on medicine will become clear early in the second century of glycogen. I believe that we can confidently assume that Claude Bernard would have given his interested approval to the many investigations into the structure and biosynthesis of glycogen which have taken place during the last twenty-five years of the first century of this substance.

REFERENCES

- Barker, C. C., Hirst, E. L., and Young, G. T. (1941). *Nature (Lond.)*, 147, 296.
 Bell, D. J. (1937). *Biochem. J.*, 31, 1683-1691.
 Beloff-Chain, A., Catanzaro, R., Chain, E. B., Masi, I., Pocchiari, F., and Rossi, C. (1955). *Proc. Roy. Soc. B*, 143, 481-503.
 Bernard, C. (1843). *Du suc gastrique et de son rôle dans la nutrition*. Baillière, Paris.
 — (1853). *Nouvelle fonction du foie*. Baillière, Paris.
 — (1855a). *Leçons de physiologie expérimentale appliquée à la médecine*, vol. 1. Baillière, Paris.
 — (1855b). *C.R. Acad. Sci. (Paris)*, 41, 461.
 — (1857). *Mem. Soc. Biol. (Paris)*, 9, 1-7; *C.R. Acad. Sci. (Paris)*, 44, 578-586, 1325-1331.
 — (1865). *Introduction à l'étude de la médecine expérimentale*. Baillière, Paris.
 — (1877). *Leçons sur le diabète*. Baillière, Paris.
 — (1879). *Leçons sur les phénomènes de la vie communs aux animaux et aux végétaux*, vol. 2. Baillière, Paris.
 Berthet, J., Jacques, P., Hers, H. G., and de Duve, C. (1956). *Biochim. biophys. Acta*, 20, 190-200.
 Cori, C. F. (1931). *Physiol. Rev.*, 11, 143-275.
 — Colowick, S. P., and Cori, G. T. (1937). *J. biol. Chem.*, 121, 465.
 — and Cori, G. T. (1936). *Proc. Soc. exp. Biol. (N.Y.)*, 34, 702.
 Cori, G. T. (1954). *Experimental Diabetes*, edited by J. F. Delafresnay and G. H. Smith, pp. 185-193. Blackwell, Oxford.
 — and Cori, C. F. (1943). *J. biol. Chem.*, 151, 57-63.
 — Cori, C. F., and Schmidt, G. (1939). *Ibid.*, 129, 629.
 — and Larner, J. (1951). *Ibid.*, 188, 17-29.
 Hanes, C. S. (1940). *Proc. roy. Soc. B*, 128, 421; 129, 174.
 Haworth, W. N. (1929). *The Constitution of Sugars*. Arnold, London.
 — Hirst, E. L., and Isherwood, F. A. (1937). *J. chem. Soc.*, p. 577.
 — and Percival, E. G. V. (1932). *Ibid.*, pp. 2277-2282.
 Illingworth, B., and Cori, G. T. (1952). *J. biol. Chem.*, 199, 653-660.
 — and Cori, C. F. (1956). *Ibid.*, 218, 123-129.
 Larner, J. (1953). *Ibid.*, 202, 491-503.
 Mann, F. C., and Magath, T. B. (1922). *Arch. intern. Med.*, 30, 73.
 Meyer, K. H., and Bernfeld, P. (1940). *Helv. chim. Acta*, 23, 875.
 Montgomery, E. M., Weakley, F. B., and Hilbert, G. E. (1949). *J. Amer. chem. Soc.*, 71, 1682-1687.
 Oakley, H. B., and Young, F. G. (1936). *Biochem. J.*, 30, 868-876.
 Olmsted, J. M. D. (1939). *Claude Bernard, Physiologist*. Cassell, London.
 Otto, J., and Voit, C. (1891). *Z. Biol.*, 28, 243.
 Pavy, F. W. (1854-5). *Proc. roy. Soc.*, 7, 371.
 — (1860). *Phil. Trans.*, 150, 595; *Lancet*, 2, 555.
 — (1877). *Proc. roy. Soc.*, 26, 314.
 — (1894). *The Physiology of the Carbohydrates*. Churchill, London.
 Pfleger, E. F. W. (1905). *Das Glykogen und seine Beziehungen zur Zuckerkrankheiten*. Hager, Bonn.
 — (1907). In *Dictionnaire de Physiologie*, edited by C. R. Richet, 7, 377. Baillière, Paris.
 — and Junkersdorf, P. (1910). *Pflügers Arch.*, 131, 201.
 Staudinger, H. (1937). *Naturwissenschaften*, 25, 673-681.
 Stetten, D., jun., and Boxer, G. E. (1944). *J. biol. Chem.*, 155, 231-236.
 Stetten, M. R., Katzen, H. M., and Stetten, D., jun. (1956). *Ibid.*, 222, 587-599.
 — and Stetten, D., jun. (1954). *Ibid.*, 207, 331-340.
 — (1955). *Ibid.*, 213, 723-732.
 Swanson, M. A. (1948). *Ibid.*, 172, 825-837.
 Wolfson, M. L., and O'Neill, A. N. (1949). *J. Amer. chem. Soc.*, 71, 3857-3858.
 Young, F. G. (1937). *Ann. Sci.*, 2, 47-83.
 — F. G. (1951). *British Medical Journal*, 2, 1535.

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TREATMENT OF ULCERATIVE COLITIS WITH LOCAL HYDROCORTISONE HEMISUCCINATE SODIUM

BY

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A previous article (Truelove, 1956) dealt with the treatment of mild and moderate cases of ulcerative colitis by means of a rectal drip of hydrocortisone. The result of 21 treatments was complete symptomatic relief within a few days in 14 instances, and it was concluded that this method was a useful addition to therapy. However, although clinical remission was accompanied by much-improved sigmoidoscopic appearances, it was found that the histological appearances of biopsy specimens of the colonic mucosa did not in general show a corresponding improvement.

Various possibilities which might have accounted for this discrepancy were considered. One was that the actual preparation of hydrocortisone used was not entirely harmless to the inflamed mucosa. Hydrocortisone in the form of its free alcohol is only slightly soluble in water, and it was therefore supplied by the manufacturers in solution in 50% ethyl alcohol. This concentrated solution was diluted 10 times in normal saline for actual instillation into the rectum, but nevertheless it seemed possible that even a 5% solution of ethyl alcohol might damage, or at least prevent from healing, a mucosa which was already diseased. This possible source of failure to induce mucosal healing can be eliminated if one uses a form of hydrocortisone which is freely soluble in water. Such a substance—hydrocortisone hemisuccinate sodium—has recently been synthesized, and Glaxo Laboratories kindly made supplies of it available for clinical trial.

Hydrocortisone Hemisuccinate Sodium

This is a white crystalline powder highly soluble in water, with which it forms a clear, colourless solution. There are as yet only scanty references in the literature to its use in man. The first account appears to be that of Orr *et al.* (1955), who used it intramuscularly to treat conditions such as disseminated lupus erythematosus, acute bronchial asthma, and the crisis of Addison's disease, and for replacement therapy after bilateral adrenalectomy; the results were comparable to those obtained by corresponding doses of hydrocortisone. The same authors also studied the effect of injecting it intravenously into a human being without adrenals and found evidence of an exponential decay curve characterized by a half-life of four to five hours, which agrees well with data obtained for hydrocortisone itself by Hellman *et al.* (1954), making use of a preparation labelled with radioactive carbon. These and other facts suggest that the two compounds are metabolized by the liver and excreted by the kidney in a closely similar fashion. Orr *et al.* suggested that the hemisuccinate would be valuable in the treatment of severe emergencies in which a "shock-like" state occurs, by virtue of its

high solubility in water, so that the equivalent of 100 mg. of hydrocortisone can be given in a volume of 2 ml. by simple intravenous injection from a syringe without the use of infusion apparatus. This use has also been suggested by the Council on Pharmacy and Chemistry (1956) in a brief account of the substance.

Its use for local application to the skin has been described by Robinson *et al.* (1956), who found it valuable in the treatment of those skin diseases, such as atopic dermatitis, contact dermatitis, seborrhoeic dermatitis, and pruritus ani, which are improved by local treatment with ordinary hydrocortisone. The hemisuccinate appeared to be efficient in a lower concentration than the preparations of less soluble hydrocortisone. Coste *et al.* (1955) have studied the action of hydrocortisone hemisuccinate sodium when injected into inflamed joints, and find that symptomatic relief is obtained comparable to that experienced with other preparations of hydrocortisone.

So far as is known, therefore, the biological actions of hydrocortisone hemisuccinate sodium are identical with those of hydrocortisone itself except in so far as they may be modified by the much greater water solubility of the hemisuccinate.

Present Investigation

Hydrocortisone hemisuccinate sodium was supplied for trial by Glaxo Laboratories in bottles containing the molecular equivalent of 100 mg. of hydrocortisone. For therapeutic use the contents of one of these bottles was transferred to a standard blood-transfusion bottle and dissolved in 120 ml. of normal saline. (The volume of 120 ml. was selected purely because bottles of sterile normal saline of this size are prepared in this hospital for routine use and could therefore be supplied to the patients without the need of special arrangements. Any volume of saline up to about 250 ml. would appear to be suitable.) The solution of hydrocortisone hemisuccinate sodium must be prepared shortly before its use because slow hydrolysis of the hemisuccinate occurs with standing in solution, and the resulting free hydrocortisone goes out of solution.

The patients treated were all in a stage of mild or moderate symptoms. As in the previous study, patients severely ill with the disease have been excluded from this study and have been treated as in-patients along conventional lines. No other treatment was employed while the local hydrocortisone was in use. The patients carried out treatment entirely in their own homes, with the exception of two who were already in hospital and who began treatment as in-patients, going home after three days to complete it there. No difficulty has been experienced by the patients in carrying out the treatment.

The treatment is carried out nightly when the patient would normally be going to bed. The solution of hydrocortisone is prepared in the infusion bottle. The giving apparatus with its attached rubber catheter is plugged into the infusion bottle, which is then hung up close to the patient's bed. The patient lies in bed, inserts the catheter well into the rectum, turns on the screw-clip to start the solution running and adjusts the rate to 1-2 drops a second. As was found in the previous study, this slow rate prevents the instillation acting as an ordinary enema and causing defaecation. When the solution has run in, the catheter is removed and allowed to drop down into a bowl or basin beside the bed, where it is left until the next day. Thus the patient is able to settle down to his night's sleep as soon as the instillation is completed.

Treatment consisted at first of 10 nightly treatments, but later this was increased to 14 as the supplies of hydrocortisone hemisuccinate sodium increased.

Assessment of the Therapy

All patients were seen on the day on which treatment was to begin at night. Sigmoidoscopy was carried out and the appearances were recorded. In all cases a biopsy specimen was taken from the lower colon, between 15 and 20 cm. from the anal margin, by means of an improved version of a special colonic biopsy instrument (Truelove *et al.*, 1955). Specimens were taken for cytological examination by the Papanicolaou technique by means of a special instrument described previously (Boddington and Truelove, 1956).

The patients were examined again on the day after their last night of treatment and corresponding observations were made.

Results

Eighteen courses of treatment have been given to 15 patients, three of them having received two separate courses. The response to treatment of the individual patients is given in Table I, together with brief details of their previous history and their subsequent progress.

The clinical response to treatment was as follows: rapid remission, 11; improved, 1; no change, 6. This corresponds with what was found in the previous study, using ordinary hydrocortisone, when there were 14 remissions out of 21 treatments. Clinical remission was almost always very rapid in those patients who showed a favourable response, usually occurring in the first few days of the beginning of treatment; there was often marked improvement after the first night's treatment. In some patients the effect was dramatic in that the patient became symptom-free after the first instillation. For example, in Treatment No. 17, the patient had suffered from diarrhoea for the previous two weeks with six loose motions a day containing much blood. His haemoglobin value had fallen from 102% to 81% in that period and he felt ill. On the day following the first instillation he passed two formed stools not containing blood, and continued to do so.

Sigmoidoscopic Appearances

The sigmoidoscopic changes corresponded closely to the clinical response, all those patients going into clinical remission showing a marked improvement in the sigmoidoscopic picture. In these patients the abnormal fragility of the colonic mucosa, which manifests itself as "contact bleeding" and is largely or entirely responsible for loss of blood in this disease, was conspicuously absent. This was evident when taking "smears" from the colonic surface for cytological examination, because no obvious blood could be seen on the instrument when this was done and only a small quantity of mucoid material resulted. When the colonic mucosa is inflamed, as it is in an active phase of ulcerative colitis even when symptoms are very slight, the specimen must be taken with delicacy, for otherwise the epithelial cells are deluged by red blood corpuscles and the examination is rendered useless. By contrast, the special "smear-taking" instrument can be used with much more vigour on a normal mucosa without causing bleeding.

In this respect the patients in remission after hydrocortisone hemisuccinate sodium were normal or close to it. The patients who were classified as showing "near-normal" appearances at the end of treatment displayed a particular type of fine granularity of the mucosa as the only abnormal finding. The abnormality revealed itself as the reflection of numerous "pin-heads" of light. It is believed that each point of light arises where the mucosa has a tiny bulge on its surface due to the presence of a large lymphoid follicle in the substance of the mucosa itself. Lumb and Protheroe (1955) described the frequent occurrence of these big follicles in the mucosa of ulcerative colitis as occurring during a phase of healing, a view from which I have no reason to dissent. In any event, large lymphoid follicles were commonly found in the biopsy specimens taken from patients who showed this special form of granularity.

TABLE I.—Summary of Clinical History and the Response to Treatment with Local Hydrocortisone Hemisuccinate Sodium. (The length of treatment was 10 days for the first three patients and 14 days for the remainder)

Treatment No.	Previous History	Immediately Before Treatment	Response to Treatment	Subsequent Progress
1. Female aged 46	Attacks of blood and mucus per rectum with diarrhoea since 1944, admitted 4 times, the last occasion being in 1948. During admissions sigmoidoscopy showed inflamed mucosa of rectum and lower colon and barium-enema examination showed appearances of ulcerative colitis affecting rectum and sigmoid colon. After last admission remained comparatively well, although subject to mild attacks of passing blood and mucus for a few days at a time. Two weeks ago suddenly developed abdominal pain and diarrhoea with 4 loose motions a day containing blood. These symptoms persisted and she felt unwell.	<i>Clinical:</i> 4 loose motions a day with much blood and mucus present. Hb 79%. General malaise. <i>Sigmoidoscopic:</i> Hyperaemia and granularity of rectum with increased fragility. These appearances become less severe above the recto-sigmoid junction.	<i>Remission:</i> Immediate response. No diarrhoea after 1 day. No discharge of blood after 2 days. Thereafter passed 2 formed motions a day. Feeling of malaise disappeared. <i>Sigmoidoscopic:</i> Near-normal. Slight granularity only. No increase in fragility, no hyperaemia.	Remained symptom-free (10 months' follow-up)
2. Female aged 31	Developed ulcerative colitis in Feb., 1954. Admitted May, 1954, because symptoms had become worse and 8-10 loose bloody motions a day were passed. Barium enema showed evidence of ulcerative colitis affecting sigmoid colon. Sigmoidoscopy showed sharp inflammation of colonic mucosa. Treated with systemic corticotrophin and made excellent response. After a year became subject to intermittent diarrhoea with occasional gross blood, but was not badly affected until 1956, when attacks became more severe with 7-8 loose stools a day containing blood and with symptoms becoming more or less continuous.	<i>Clinical:</i> 7-8 loose stools a day containing small amounts of blood. Hb 71%. E.S.R. 37 mm. <i>Sigmoidoscopic:</i> Marked hyperaemia and granularity with free bleeding on contact. Much purulent exudate present.	<i>Little change:</i> Some improvement but not symptom-free. Bleeding almost ceased, but still had 4 stools a day, rather loose. Hb 76%. E.S.R. 32 mm. <i>Sigmoidoscopic:</i> Improved, but mild hyperaemia and granularity persisted.	Gradual improvement but mild symptoms persisted.
3. Female aged 34	In 1953 suddenly began to pass blood and mucus in motions and then developed diarrhoea with 4-5 motions a day. These symptoms lasted for 2 months. Thereafter stayed well until June, 1956, when diarrhoea suddenly developed with 5-6 motions a day, loose and with some blood present. Felt ill.	<i>Clinical:</i> 6 loose motions daily with small amounts of blood present. Barium enema showed evidence of ulcerative colitis in descending and sigmoid colon. <i>Sigmoidoscopic:</i> Marked hyperaemia and granularity with greatly increased mucosal fragility. These changes extended as far up as could be seen.	<i>Remission:</i> Immediate response to treatment with one motion not containing blood on day following first rectal drip. <i>Sigmoidoscopic:</i> Much improved. Mild hyperaemia and granularity up to 12 cm. from anal margin, with normal appearances above that.	Remained symptom-free and was sigmoidoscopically normal at end of study. Hb 93%. E.S.R. 14 mm. (9 months' follow-up)
4. Female aged 45	20 years ago had severe attack of ulcerative colitis, in hospital 3 months. Attack lasted for more than a year. Thereafter was entirely symptom-free until 1955, when diarrhoea developed with much blood in stools. Barium enema showed changes of ulcerative colitis in descending and sigmoid colon. Sigmoidoscopy showed evidence of mild ulcerative colitis. Treated with cortisone as out-patient, becoming symptom-free in 3 weeks. Sigmoidoscopic appearances became normal. Thereafter remained in clinical remission, although E.S.R. was raised, until June, 1956, when she again began to pass blood in motions. After 3 weeks of these symptoms local hydrocortisone hemisuccinate started.	<i>Clinical:</i> 2 poorly formed motions a day with blood present. <i>Sigmoidoscopic:</i> Marked hyperaemia and granularity as far as could be seen, with many petechiae and increased mucosal fragility.	<i>Little change:</i> 3 formed motions a day still containing a little blood. <i>Sigmoidoscopic:</i> Little change.	Treated with oral cortisone and rapidly became symptom-free with near-normal sigmoidoscopic appearances (9 months' follow-up)
5. Female aged 30	For past 5 years has had bouts of diarrhoea with as many as 10-12 stools a day which are loose, offensive, and contain blood and mucus. Has felt tired and has lost weight. In May, 1956, admitted to hospital because of a severe attack. At that time had gross bloody diarrhoea. Hb 81%. Barium enema showed changes of ulcerative colitis extending from middle of transverse colon to rectum. Sigmoidoscopy showed evidence of severe ulcerative colitis. Treated with systemic corticotrophin and went into remission. However, soon relapsed and began to get diarrhoea with blood in stools. These symptoms continued and by Aug., 1956, was having gross bloody diarrhoea. Local treatment then begun.	<i>Clinical:</i> Bloody diarrhoea with 7-8 loose stools a day containing moderate or large amounts of blood. <i>Sigmoidoscopic:</i> Marked hyperaemia and granularity. Fragility greatly increased. Purulent exudate present and ulceration. These changes extend up as far as could be seen.	<i>Little change:</i> Noticed slight improvement but nothing marked. <i>Sigmoidoscopic:</i> No change.	Treated with oral cortisone but she became worse and this was stopped. Then treated with "salazopyrin" with slight improvement, but symptoms, though less severe, persisted at end of follow-up.
6. Female aged 39	In Feb., 1955, had sudden attack of diarrhoea with blood, lasting 5 months. Thereafter was fairly well but would often pass blood and mucus per rectum although without diarrhoea. In Sept., 1955, diarrhoea recurred with 5 motions a day containing blood. This settled down to 2 motions a day with blood and mucus. In Oct., 1955, treated with local hydrocortisone and rapidly became symptom-free. Remained symptom-free for 8 months, then suddenly relapsed with diarrhoea and gross blood in stools. After 5 weeks of these symptoms, again treated with local hydrocortisone, becoming symptom-free in a few days. Remained well for 2 months, but then began to pass much blood and mucus per rectum several times a day.	<i>Clinical:</i> Passing much blood and mucus per rectum several times a day. <i>Sigmoidoscopic:</i> Marked inflammation as far up as could be seen.	<i>Remission:</i> Blood stopped after 2 days. Passed some mucus for a few more days and then became entirely normal. <i>Sigmoidoscopic:</i> Near normal.	Remained symptom-free for 3 weeks, then began to pass blood and mucus. After one week of these symptoms she was again treated with local hydrocortisone hemisuccinate (see Treatment No. 10).
7. Male aged 43	In Oct., 1955, first noticed blood in stools, then symptoms gradually became worse. At first had 2-3 motions a day, always with blood present; he gradually worsened, and was admitted to hospital in Sept., 1956, with 4-5 motions a day containing blood. Barium enema showed mild changes of ulcerative colitis.	<i>Clinical:</i> 3-5 motions a day with much mucus and blood present. <i>Sigmoidoscopic:</i> Marked hyperaemia and granularity of mucosa as far up as could be seen. Fragility increased. Purulent exudate present. No gross ulceration seen.	<i>Remission:</i> Immediate response to treatment and was symptom-free in 3 days. <i>Sigmoidoscopic:</i> Much improved. Mild inflammation only.	Remained in clinical remission, but sigmoidoscopically showed some relapse after one month. At end of study was still symptom-free, but sigmoidoscopy showed definite inflammation. Hb 97%. E.S.R. 5 mm. (7 months' follow-up)

[continued overleaf]

TABLE I.—Continued

Treatment No.	Previous History	Immediately Before Treatment	Response to Treatment	Subsequent Progress
8. Male aged 35	In March, 1955, gradual onset of diarrhoea with 5-10 motions a day, occasionally containing blood. In Oct., 1955, was treated with local hydrocortisone, with rapid remission. Remained symptom-free regarding bowel action for 11 months, although 2 months after end of treatment ischio-rectal abscess developed; this was treated by surgical drainage and healed well. After 11 months bowel symptoms returned and after one week hydrocortisone hemisuccinate was given	<i>Clinical:</i> 6 unformed motions a day containing small amounts of blood <i>Sigmoidoscopic:</i> Well-marked hyperaemia and granularity extending as far as could be seen	<i>Remission:</i> Became symptom-free in 1 week <i>Sigmoidoscopic:</i> Much improved. Mucosa still rather hyperaemic but no increased fragility	Remained symptom-free for 2 months, then symptoms recurred with 6 loose motions containing gross blood and with fall of Hb from 102% to 81%. Treated again with hydrocortisone hemisuccinate (see Treatment No. 17)
9. Male aged 47	In Oct., 1955, had dull abdominal pain with fever and sweating for about a week. He then passed 2 stools a day, watery with much mucus and occasional blood. Barium enema showed evidence of ulcerative colitis in rectum and sigmoid colon. Sigmoidoscopy showed ulcerative colitis of marked severity. In Jan., 1956, had local hydrocortisone, with rapid remission. Remained symptom-free for 3 months, then relapsed and was again treated with local hydrocortisone with excellent response, becoming symptom-free after first instillation. Remained well for 3 months, then began to pass 3 loose stools a day containing much mucus. At this stage local hydrocortisone hemisuccinate given	<i>Clinical:</i> 2 liquid motions a day with much mucus present <i>Sigmoidoscopic:</i> Marked hyperaemia and granularity stretching up as far as could be seen. Fragility increased	<i>Remission:</i> Immediate response to treatment with 1 formed normal motion a day after the first instillation <i>Sigmoidoscopic:</i> Very mild hyperaemia only. No increase in fragility	Remained symptom-free for 2 weeks and then again developed very loose motions with much mucus and small amounts of blood present and was again treated with hydrocortisone hemisuccinate (see Treatment No. 14)
10. Female aged 39	See Treatment No. 6	<i>Clinical:</i> Passing blood and mucus per rectum several times a day <i>Sigmoidoscopic:</i> Severe inflammation up to 15 cm. from anal margin, mucosa becoming normal above this. Rectal mucosa very hyperaemic and granular, with mucopus present. Mucosa oozes blood with slight trauma	<i>Remission:</i> Bleeding stopped after first night. Normal motions after second night. Thereafter symptom-free <i>Sigmoidoscopic:</i> Near normal	Remained symptom-free with normal haemoglobin and E.S.R. (6 months' follow-up)
11. Female aged 44	In 1953 developed bouts of diarrhoea lasting 2-3 weeks. In 1955 had severe attack of diarrhoea with 8-12 liquid motions a day containing much blood and mucus. Lost 5 kg. in weight and was anaemic. Barium enema showed changes of ulcerative colitis throughout almost whole colon. Sigmoidoscopy showed typical changes of ulcerative colitis. Treated in hospital with cortisone and general medical measures. Treatment complicated by deep vein thrombosis, first of right leg and later of left, for which anticoagulant therapy given. However, colitis responded and she was in clinical remission on discharge. After 2 months' remission colitis recurred, and as an out-patient she was given oral cortisone; again went into remission. On stopping cortisone diarrhoea recurred with 6 loose motions a day though with very little blood. Further course of oral cortisone as out-patient brought improvement without her being entirely symptom-free. Reasonably well until Oct., 1956, when diarrhoea returned with 10-12 liquid motions a day containing small amounts of blood. At this stage local treatment given	<i>Clinical:</i> 10-12 liquid motions a day with small amounts of blood present. Much abdominal pain <i>Sigmoidoscopic:</i> Severe inflammation. Fragility greatly increased. Exudate present. Ulceration	<i>Little change:</i> 10 unformed motions a day, although with no blood present, and with abdominal pain <i>Sigmoidoscopic:</i> Improved. Fragility normal but still hyperaemic	Treated with salazopyrin; response being excellent. One normal formed motion a day after 4 days' treatment (6 months' follow-up)
12. Male aged 31	In 1950 developed diarrhoea, with bowels usually open 3-5 times daily; occasionally more severe bouts, when bowels were opened 8-10 times daily. Small amounts of blood and mucus present. Symptoms were continuous. In 1954 admitted to hospital without much benefit. In 1955 readmitted with 8 motions a day containing blood. Barium enema showed evidence of mucosal damage throughout whole of colon and terminal ileum. Sigmoidoscopy showed appearances of ulcerative colitis. Moderately anaemic. Treated with oral cortisone with much improvement. Thereafter continued on cortisone as out-patient but still had moderate diarrhoea. In Nov., 1956, symptoms became worse while still on cortisone, with 6-8 loose motions a day but without blood. At this stage local treatment given	<i>Clinical:</i> 6-8 loose motions a day not containing blood <i>Sigmoidoscopic:</i> Moderate inflammation stretching up as far as could be seen	<i>No change</i> <i>Sigmoidoscopic:</i> No change	Treated with oral cortisone combined with salazopyrin with gradual improvement
*13. Female aged 40	In Aug., 1956, developed diarrhoea with up to 10 loose motions a day containing blood and mucus. In Oct., 1956, seen as out-patient at Radcliffe Infirmary by colleague. Hb 92%. Barium enema showed changes suggesting ulceration in rectum only. Following barium enema had exacerbation of symptoms with 18 or more loose stools a day containing blood, with generalized abdominal pain. Hb fell to 79%. At this stage transferred to me and local treatment started	<i>Clinical:</i> 18 or more loose motions a day with blood and mucus present. Hb 79%. Generalized abdominal pain <i>Sigmoidoscopic:</i> Severe inflammation extending as far up as could be seen	<i>Remission:</i> Immediate improvement, but had mild symptoms for 18 days, when she became entirely symptom-free with 1 formed stool a day; no abdominal pain and feeling well. Hb had risen to 91% <i>Sigmoidoscopic:</i> Slight hyperaemia and granularity affecting rectum only. Normal appearances above 5 in. (12.5 cm.) from anal margin. Mucosal fragility not increased	Remained symptom-free with normal sigmoidoscopic appearances (6 months' follow-up)

* This patient immediately showed marked improvement, but she still had mild symptoms at the end of 14 days' treatment. Treatment was therefore continued for a further seven days, in the course of which she became entirely symptom-free.

TABLE I.—Continued

Treatment No.	Previous History	Immediately Before Treatment	Response to Treatment	Subsequent Progress
14. Male aged 46	See Treatment No. 9	<i>Clinical:</i> 2 very loose motions a day with small amounts of blood and much mucus present <i>Sigmoidoscopic:</i> Severe inflammation extending as far as could be seen, with much increased mucosal fragility causing free bleeding on contact	<i>Remission:</i> 1 normal stool a day after 3 days' treatment <i>Sigmoidoscopic:</i> Mild hyperaemia and slightly increased fragility of mucosa	Remaining symptom-free (6 months' follow-up)
15. Male aged 28	In 1949 had left pleural effusion followed by iridocyclitis. In 1951 tuberculous pulmonary lesion of left upper lobe found on x-ray examination. Treated in sanatorium. June, 1951, early tuberculous caries of spine. Thereafter well until Jan., 1956, he had short episodes of diarrhoea with blood and mucus. In Aug. developed severe bloody diarrhoea with constitutional disturbance. Attack became very severe. Treated with systemic corticotrophin, salazopyrin, and antituberculous drugs. On this regime improved but developed toxic anaemia with Heinz bodies. By Dec., 1956, was improved but still getting 6-7 motions in 24 hours, loose and sometimes liquid but without gross blood. At this stage given local treatment	<i>Clinical:</i> 6-7 loose or liquid motions a day with mucus present but no gross blood <i>Sigmoidoscopic:</i> Well-marked hyperaemia and granularity extending up as far as could be seen. No gross ulceration. Fragility moderately increased. Mild polypoid changes at 15 cm. from anal margin	<i>Slight improvement:</i> 5 partly formed motions a day not containing blood or mucus. Gaining weight <i>Sigmoidoscopic:</i> Improved, but still hyperaemic and slightly granular	Gradual improvement and became symptom-free (6 months' follow-up)
16. Male aged 23	In 1954 began to pass bright red blood per rectum and much mucus. Bowel action usually regular but occasional diarrhoea. Barium enema normal, but following this had diarrhoea with 6 unformed stools a day containing blood. Transferred to me for treatment, by which time diarrhoea was easing off with 2 loose stools a day containing blood and mucus	<i>Clinical:</i> 2 loose stools a day containing blood and mucus <i>Sigmoidoscopic:</i> Marked hyperaemia and granularity with much increased mucosal fragility. These changes extended up to 17 cm. from anal margin and had become mild	<i>Remission:</i> Symptom-free after 4 days <i>Sigmoidoscopic:</i> Mild hyperaemia and granularity in lower half of rectum only. Within normal limits above	Remaining symptom-free (4 months' follow-up)
17. Male aged 34	See Treatment No. 8	<i>Clinical:</i> For past 2 weeks had had 6 loose motions a day with gross blood present. Hb 81%, having previously been 102%. General malaise <i>Sigmoidoscopic:</i> Mild hyperaemia and granularity, with increased mucosal fragility stretching up as far as could be seen	<i>Remission:</i> Immediate response to treatment with 2 formed stools a day not containing blood. Feeling well <i>Sigmoidoscopic:</i> Very slight hyperaemia and fine granularity. Appearances near normal. Mucosal fragility not increased	Remaining symptom-free (4 months' follow-up)
18. Male aged 26	In 1955 began to pass blood with motions. Few small haemorrhoids injected but trouble continued. Seen by me in July, 1956, when sigmoidoscopy showed hyperaemia, oedema, and petechiae of rectum with the mucosa gradually becoming normal above 6 in. (15 cm.) from anal margin. Treated with "i-so-gel," symptoms became negligible. In Dec., 1956, symptoms recurred. Blood passed every day and much mucus, but motions firm	<i>Clinical:</i> 2 formed stools a day but with blood and much mucus <i>Sigmoidoscopic:</i> Marked inflammation up to 15 cm. from anal margin, thereafter fading off and becoming normal about 17 cm. from anus	<i>Little change</i> <i>Sigmoidoscopic:</i> Marked inflammation from anal margin up to 12 cm., thereafter fading off and becoming normal about 17 cm. from anus	Treated with salazopyrin, became symptom-free in 3 weeks (4 months' follow-up)

The close agreement between the clinical and sigmoidoscopic findings in the present study can be seen if the data are arranged in the form of a simple contingency table (Table II).

TABLE II.—Correlation Between the Clinical Response to Treatment and the Sigmoidoscopic Findings

Clinical Response to Treatment	Sigmoidoscopic Findings at End of Treatment		
	Normal or Very Mild	Improved, but Definite Inflammation	Unchanged
Remission	11	1	
Improved		2	4
No change or slight improvement only			

Histological Findings

Biopsy specimens were taken from all patients on the day on which treatment was begun, and all showed evidence of severe or moderate inflammation, using the criteria employed by my pathologist colleague, Dr. W. C. D. Richards, in a previous joint study (Truelove and Richards, 1956). On the day following the last night of treatment another specimen was taken from all patients except one. Thus there are 17 pairs of specimens for comparison.

The histological response showed a close agreement with the clinical response, as can be seen from Table III. In some of the specimens classed as showing improvement there was

TABLE III.—Correlation Between Clinical and Histological Response to Treatment

Clinical Response to Treatment	Histological Response to Treatment	
	Improved	No Change
Remission	9	1
Not in remission	1	6

little or no inflammation in the specimen taken at the end of treatment, although the glands might be stunted and reduced in number and large lymphoid follicles were often present in the lamina propria. In the other specimens classed as showing improvement there were still some inflammatory changes remaining at the end of treatment, but they were clearly less marked than at the beginning. An example of a good histological response is shown in Figs. 1 and 2.

Cytological Findings

In a previous study (Boddington and Truelove, 1956) it was found that the colonic epithelial cells are frequently abnormal in ulcerative colitis. Compared with normal colonic epithelial cells, many of those seen in active ulcerative colitis are much enlarged, with big nuclei having nucleoli and a disturbed chromatin pattern. Similar findings have been reported independently by Galambos *et al.* (1956). In view of the fact that a correlation was found to exist between the clinical and sigmoidoscopic evidence of active disease on the one hand and the degree of abnormality



FIG. 1.—Histological appearances before treatment, showing heavy infiltration of the mucosa with inflammatory cells. (H. and E. $\times 150$.)

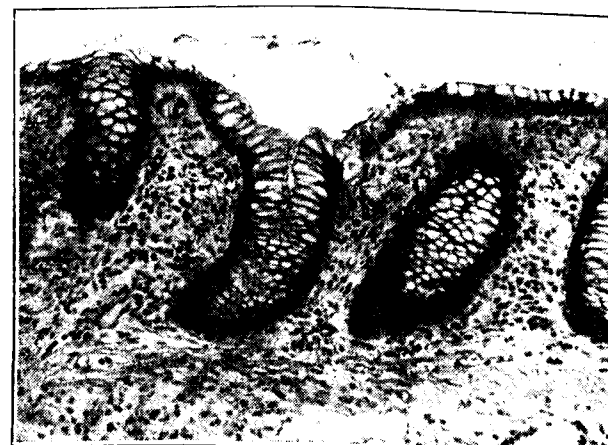


FIG. 2.—Histological appearances in the same patient after 10 days' treatment with local hydrocortisone hemisuccinate sodium. (H. and E. $\times 150$.)

shown by the epithelial cells on the other, it is probably valid to regard the state of the epithelial cells before and after treatment as an index of tissue response.

Making use of this index, it has been found that clinical remission with local hydrocortisone hemisuccinate sodium is accompanied by a change in the colonic epithelial cells towards normal appearances. The close correlation that exists is shown in Table IV, which has been constructed from data supplied by my cytologist colleague, Mr. M. M. Boddington, who has classified the cells as showing improvement, no change, or deterioration. Some patients are not included, for in them the specimens taken before or after treatment were not sufficiently rich in epithelial cells to permit him to form a satisfactory judgment of any changes that had occurred.

By contrast with this finding, the number of pus cells present in the colonic smears does not show any positive correlation with clinical response, as is shown in Table V. Although based on a somewhat rough-and-ready estimate, the complete discrepancy between clinical response and

TABLE IV.—Correlation Between Clinical Response and Changes in the Colonic Epithelial Cells

Clinical Response to Treatment	Appearance of Colonic Epithelial Cells after Treatment Compared with Appearance Before Treatment	
	Improved	No Change or Worse
Remission	5	1
Not in remission	1	4

diminution in pus cells should not be ignored, especially as we know that smears made from a healthy colon show either a complete absence of pus cells or only very occasional ones. This finding raises the possibility that infection is playing a part in many cases of ulcerative colitis and that such infection is not improved by local treatment with hydrocortisone. Nor would one expect it to be, for it is generally accepted that hydrocortisone encourages the spread of infections. It was indeed this possibility which caused me to exclude from this and the previous study those patients who were severely ill with ulcerative colitis, because of the risk that local hydrocortisone might cause extensive spread of a secondary, pyogenic infection.

TABLE V.—Lack of Correlation Between Clinical Response and Lessening of Pus Cells Seen in Colonic Smears

Clinical Response to Treatment	Change in Pus Cells in Colonic Smears	
	Pus Cells Clearly Less Frequent After Treatment	Pus Cells as Numerous After Treatment as Before
Remission	3	5
Not in remission	3	5

Discussion

The main interest of the present study has been the evidence of histological improvement in the colonic mucosa of those patients who pass into clinical remission with local treatment. In terms of clinical response, there is nothing to choose between the hemisuccinate sodium and ordinary hydrocortisone. We may therefore deduce with a reasonable degree of confidence that the improvement in histological response obtained by the use of hemisuccinate is to be attributed solely to its being freely soluble in water and thus able to be used without the disturbing presence of ethyl alcohol in the diluent. Nevertheless, on general principles it seems wise to prefer an agent with which the actual diseased tissue shows improvement, and therefore the hemisuccinate is recommended for future local use in the colon.

Taken in conjunction with the previous study (Truelove, 1956) the present findings constitute a *prima facie* case for regarding local hydrocortisone as a useful form of treatment in ulcerative colitis, at any rate in a proportion of the patients with the disease. This opinion is reinforced by the finding that a patient who has once responded to local hydrocortisone is likely to do so again if symptoms recur. There is now a small group of patients who have repeatedly responded swiftly to local treatment, one patient having been treated twice, one patient three times, and two patients four times. So far only a single patient has failed to respond to a second course of treatment after going into remission with the first. In view of the episodic nature of the disease in many patients, an occasional exception of this sort need not be taken as invalidating the general principle that one successful treatment means that future treatments will also be successful.

However, the view that local hydrocortisone is a useful treatment is based only on a personal judgment that rapid remission would not occur in as many as two out of every three instances unless the treatment was having some positive effect. In view of the variable course of ulcerative colitis, and especially in view of a widely held opinion that the disease is a psychosomatic disorder, it would be unwise to pay too much attention to clinical impressions. It is therefore essential that new forms of treatment should be the subject of comparative study. Perhaps the wisest view is to regard the present findings as encouraging enough to justify the initiation of controlled trials.

If we assume for the moment that the hydrocortisone was indeed responsible for the rapid remissions experienced by the patients who did well with this form of treatment, there are various practical and theoretical issues which arise. One concerns the fact that patients either respond swiftly to the treatment or show little or no change: in this respect the

findings resemble what has been found for skin diseases (Sulzberger and Witten, 1954). However, it may have some bearing on the aetiology of ulcerative colitis. Numerous theories have been put forward to account for this condition, such as that it is an expression of allergy, dietary deficiency, damage from bacterial dysentery, overproduction of lysozyme, parasympathetic overactivity, or emotional stress.

Some workers regard "ulcerative colitis" as no more than a non-specific response of the colon to one or more of these factors (Brooke, 1954). Others seek, so far in vain, to explain the condition on the basis of a single causal mechanism and regard other apparently provoking factors as irrelevant. Yet others regard it as a specific response of the colon but conceive that any one of a number of factors may act as a "trigger" and fire off the disease in its overt form. Presumably a consistent difference of response to a local treatment such as hydrocortisone might indicate that different mechanisms are responsible for ulcerative colitis in different patients. In other words, such a variable response from one patient to the next might imply that in ulcerative colitis we are dealing not with a single disease but with a family of diseases.

However, there is another possible explanation of the failure of some patients to respond to treatment. Although students of the disease are now almost unanimous in regarding it as not being primarily an infective condition, secondary infection undoubtedly plays a dominant part in many of its complications. In view of the contents of the colon, it would be surprising if the mucosa, once being abnormal, were not liable to infection. The cytological findings of the present study lend some support to this idea. The situation may therefore be analogous to what occurs when an atopic dermatitis becomes secondarily infected. It is then commonly found that local treatment with hydrocortisone is useless, because hydrocortisone encourages the spread of most infective processes. It has been shown that in these circumstances a combination of hydrocortisone with an appropriate antibiotic will bring about healing, for there is no mutual interference, either chemical or biological, between hydrocortisone and antibiotics (Robinson *et al.*, 1956). It therefore seems important to test the effect of combining hydrocortisone with antibiotics for local use in ulcerative colitis. So far I have not used this combination, as it was considered essential to assess first the direct action of hydrocortisone alone.

Problems also arise in connexion with the exact details of treatment in those patients who show a beneficial response to local hydrocortisone. One way of using this agent is to give a short course of treatment whenever symptoms recur and hope that a reasonably long remission will follow each course; this is the approach which has been made so far. However, it is possible that patients should have a much longer course than has been used in the present study in the hope that a longer period of remission will follow. Another possibility is that treatment carried out once or twice a week might hold a patient in permanent remission. These are issues which will require further study under controlled conditions.

Summary

In a previous study it was found that about two out of every three patients with mild or moderate attacks of ulcerative colitis went into rapid remission when treated with a slow rectal drip of hydrocortisone dissolved in 5% ethyl alcohol. However, it was found that biopsy specimens of the colonic mucosa did not show a corresponding improvement.

A substance soluble in water—hydrocortisone hemisuccinate sodium—has now been used in place of hydrocortisone itself to determine whether the previous failure to obtain mucosal response was due to the weakly alcoholic solution which acted as a vehicle for the ordinary hydrocortisone.

Local treatment with hydrocortisone hemisuccinate sodium brought about rapid remission of symptoms in 11 out of 18 courses of treatment. The clinical response was therefore closely comparable to what was previously found for hydrocortisone itself.

The sigmoidoscopic appearances in those patients going into remission showed marked improvement and were only slightly abnormal at the end of 10–14 days.

The histological appearances of small biopsy specimens of the colonic mucosa in general showed improvement corresponding with the clinical and sigmoidoscopic appearances. It seems likely that the lack of histological improvement in the previous study was due to the presence of 5% ethyl alcohol in the rectal infusion.

Cytological study of colonic smears before and after treatment revealed a close correlation between clinical remission and a change of colonic epithelial cells towards a normal appearance. However, numerous pus cells were still present after treatment, even in those patients in remission, and suggest the possibility that an infective element is often present, which, as would be expected, is not improved by hydrocortisone.

The theoretical and practical implication of the findings are discussed with special reference to the issues which need to be settled by further studies. In particular, it is suggested that the present results are sufficiently encouraging to justify controlled trials.

I am grateful to Glaxo Laboratories for making a gift of the hydrocortisone hemisuccinate sodium; to Miss Shirley Thomas, who assisted at the sigmoidoscopic examinations and also prepared the histological sections; to my colleague, Mr. M. M. Boddington, for permitting me to use the cytological findings which are part of a study we are jointly making; to Mrs. B. Humphreys for keeping the records of the patients; and to Dr. Jean Grant for supplying me with blood transfusion sets already modified to carry a soft rubber catheter instead of an intravenous needle. I am indebted to the Medical Research Council for a personal grant in support of this and other studies into ulcerative colitis. It is fitting to pay a tribute to the patients themselves and especially to the way in which they have submitted to repeated sigmoidoscopic examinations even when symptom-free.

REFERENCES

- Boddington, M. M., and Truelove, S. C. (1956). *British Medical Journal*, 1, 1318.
 Brooke, B. N. (1954). *Ulcerative Colitis*. Livingstone, Edinburgh and London.
 Coste, F., Antoine, B., and Rampon, S. (1955). *Rev. Rhum.*, 22, 657.
 Council of Pharmacy and Chemistry (1956). *J. Amer. med. Ass.*, 160, 389.
 Galambos, J. T., Massey, B. W., Klayman, M. I., and Kirsner, J. B. (1956). *Cancer*, 9, 152.
 Hellman, L., Bradlow, H. L., Adesman, J., Fukushima, D. K., Kulp, J. L., and Gallagher, T. F. (1954). *J. clin. Invest.*, 33, 1106.
 Lumb, G., and Protheroe, R. H. B. (1955). *Lancet*, 2, 1208.
 Orr, R. H., Di Raimondo, V., Flanagan, M. E., and Forsham, P. H. (1955). *J. clin. Endocr.*, 15, 763.
 Robinson, H. M., Robinson, R. C. V., Strahan, J. F., and Cohen, M. M. (1956). *U.S. Armed Forces med. J.*, 7, 963.
 Sulzberger, M. B., and Witten, V. H. (1954). *Med. Clin. N. Amer.*, 38, 321.
 Truelove, S. C. (1956). *British Medical Journal*, 2, 1267.
 — Horler, A. R., and Richards, W. C. D. (1955). *Ibid.*, 2, 1590.
 — and Richards, W. C. D. (1956). *Ibid.*, 1, 1315.

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TOXIC EFFECT OF STREPTOMYCIN UPON BALANCE AND HEARING

BY

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The curious and damaging affinity of streptomycin for the eighth-nerve system was recognized by Hinshaw and Feldman (1945) soon after its introduction into clinical practice. They found that the earlier compounds, the calcium and sulphate salts, affected mainly the vestibular part of the eighth-nerve system, causing a disturbance of balance, though it was noted that sometimes deafness also followed prolonged use of the drug owing to intoxication of the cochlear system as well.

The disturbance of balance caused by intoxication of the vestibular system was often so inconvenient and disabling that a search was made for a compound of streptomycin without these undesirable toxic effects. This led to the introduction of dihydrostreptomycin. Unfortunately this compound proved to have a selective and destructive action upon the cochlear system, causing deafness, though in large enough doses it also affected the vestibular system. It was soon found that deafness was even more inconvenient than giddiness from loss of vestibular sense, and in consequence there has been a retreat from the cochleo-toxic dihydrostreptomycin in favour of the vestibulo-toxic sulphate preparation of streptomycin, though some prefer to use a mixture of the two in what is believed to be subtoxic doses. Nevertheless, instances of disturbed equilibrium and of deafness have been reported after using the mixture.

As we have seen a number of patients crippled by streptomycin therapy, some after small doses, we feel that the time has come to reconsider the toxic properties of streptomycin, with special reference to its effect upon the vestibular system, particularly as many of our patients have been middle-aged or elderly, when the effect of a disordered vestibular system is not easily overcome.

Eighth-nerve System and Streptomycin

The eighth-nerve system consists of two sensory receptors—one for balance and the other for hearing—both of which are housed in the labyrinthine spaces of the internal ear in each temporal bone. The nerve fibres from each set of end-organs are collected within the temporal bone into two nerves—the cochlear, on which lies the spiral ganglion, and the vestibular, on which lies the ganglion of Scarpa. These two nerves leave the temporal bone together as the eighth cranial nerve and after a short course enter the brain stem, where again they separate, the vestibular fibres going to nuclei in the brain stem and cerebellum on the same side, and the cochlear to nuclei on both sides. Thence each is relayed to appropriate motor nuclei in the brain stem and spinal cord, and to higher centres in the temporal lobe.

There has been much discussion about which part of the eighth-nerve system is affected by streptomycin. Earlier workers, Hinshaw and Feldman (1945), Fowler and Glorig (1947), and Winston *et al.* (1948), favoured the nuclei in the brain stem, but more recently it has been held that the end-organs or peripheral ganglia bear the brunt of the toxic effect. Causse (1949), Ruedi *et al.* (1951), and Hawkins and Lurie (1954) believe that the drug acts peripherally. If

sufficient streptomycin is given both central and peripheral parts of the system can be affected.

Effect of Loss of Vestibular Function

At this stage it will be convenient to consider the effect of loss of vestibular function, as this is the part of the eighth-nerve system usually affected, and the effect and process of compensation are not always fully appreciated.

Balance is governed by impulses received from the vestibular end-organs in the labyrinth. These are aided by visual impressions which often give advance information about a change in balance (for example, uphill, downhill, steps, uneven ground, etc.), while kinaesthetic impressions from the skin, muscle, and joints also aid balance. In fact, man, accustomed as he is to walking with his feet firmly on the ground and in daylight or well-lighted surroundings, is able to do much of his balancing with his eyes and his skin-muscle-joint sense, being quite unaware, except when something goes wrong with it, that he is possessed of a special balancing sense.

The effect of losing vestibular function is governed by the suddenness and degree of the failure. In its acutest form the vertigo, nystagmus, and vomiting can reduce the sufferer to a state of helpless misery. As central control is gradually established these symptoms and signs subside in the course of about three weeks, leaving a residual difficulty in balancing when up and about, and a tendency to momentary dizziness with sudden head movements. Balancing at first is not easy, and even the most adept will walk with a wide base and will need a stick for some time and will have to turn slowly. They will also have to go cautiously on uneven ground or up and down stairs and will have to avoid walking in the dark. Furthermore, they will find that all movements must be planned beforehand and executed deliberately, otherwise they will tend to overbalance. The rate of recovery depends upon the age and also upon temperament. The young make a quick recovery and can adapt themselves well to the loss of the vestibular sense, though they cannot manage if deprived of either of the other aids to balance. On the other hand, patients over 40 usually find it difficult to walk unaided after losing the vestibular sense, and some may be positively crippled. Much, however, depends upon temperament and training, and the following case record shows what a good recovery can very occasionally take place.

Mrs. A. S., aged 58, had 2 g. of streptomycin sulphate daily for 10 days for bronchiectasis. After this each vestibular labyrinth remained unresponsive to caloric stimulation, but the patient was a woman of great determination who had fought against chronic ill-health for many years; and within two months she was able to resume her household duties and go out shopping unaided.

When the loss of vestibular function is less sudden and incomplete the clinical picture is less dramatic and less obvious. Nevertheless, if it is not recognized as such it can be disabling, and we have always found that demonstrating a definite organic cause for the symptoms is the first stage in the management of disturbed vestibular function. Patients are encouraged to walk and balance, using the special head and balancing exercises devised at King's College Hospital by Cawthorne (1946) and Cooksey (1946). Most patients are able to get about again within a few weeks, though the older among them have to use one or even two sticks. The young are usually able to adapt themselves to altered conditions of balance sufficiently well to be able to get about unaided and to do most forms of work. Older patients, however, find it very difficult to readjust. If their plight is not appreciated and vigorous measures are not undertaken to get them moving again, they may well remain in bed or at any rate be chair-ridden.

For these reasons we feel that loss of vestibular function can be a serious disability and that all who use streptomycin should be fully aware of its potentially disabling properties even, at times, after a dose as small as 3 g. given in three days.

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Sometimes the vestibular disturbance seems to be more than usually disabling, as the following case record shows.

Mrs. S. M., aged 26, lost vestibular function on one side only after 29 g. of streptomycin sulphate given over a month for tuberculous salpingitis. With one normally acting labyrinth she was in the same state as those patients who have one labyrinth destroyed on account of Ménière's disease. Such patients invariably respond well to balancing exercises and are able to return to an active life after a month. However, despite the fact that she was young, of a cheerful disposition, and keen to recover, she was unable to walk unaided after six weeks of balancing exercises. This we feel may well be due to damage to the central vestibular system in the brain stem as well possibly to the labyrinth. In such an event it is likely that the normal compensating processes which are believed to be due to the tonic action of the vestibular nuclei are interfered with, thus delaying recovery.

Properties of Streptomycin

Streptomycin is prepared from *Streptomyces griseus* and is second after penicillin in the antibiotic hierarchy. It is available as the sulphate or dihydro salt and is usually given by intramuscular injection, though it can be used in addition intrathecally, injected into the pleural or peritoneal cavity, or given by inhalation. Orally it is effective only within the gastro-intestinal tract, and locally on the skin or in wounds it is apt to cause local reaction. Like penicillin it is bacteriostatic and in large doses is bactericidal, and is particularly useful in combating infections caused by *Mycobacterium tuberculosis*, *Escherichia coli*, *Pseudomonas pyocyanea*, *Proteus vulgaris*, and certain other Gram-negative organisms as well as many of the Gram-positive. It is used for tuberculous infections and, because of its action on Gram-negative organisms, for infections of the gastro-intestinal tract and the genito-urinary tract. It is also used for certain infections by Gram-positive bacteria which are resistant to penicillin, and sometimes it is given in combination with penicillin.

Unlike penicillin, which is excreted by the renal tubules, it is excreted by glomerular filtration. With each antibiotic the serum level cannot normally reach more than a certain height despite the dosage, owing to the filtering-off action of the kidney. If renal excretion is impaired then the level of the antibiotic in the serum may reach a higher level than in the normal subject. This is one reason why some cases of toxic manifestations following even a small dose of streptomycin have been reported; and is illustrated by the following cases.

Mrs. A. H., aged 65, who was suffering from pyelonephritis in her only functioning kidney, lost all vestibular function after a total dose of 3 g. of streptomycin sulphate, 1 g. being given on each of three successive days.

Mr. B. S., aged 25, had pyelitis in his only kidney, the other having been removed five years previously. He was given only 0.5 g. of streptomycin sulphate daily for one month, and at the end of this time he had lost all vestibular function.

Thus streptomycin should be given only in small doses and with great caution to patients with renal dysfunction.

It is generally believed that as much as 1 g. a day of streptomycin is well tolerated for several weeks, and the toxic effects are usually noticed only when more than 1 g. a day is given for at least a fortnight.

Glorig (1950), however, has found that intoxication is by no means uncommon with smaller doses than 1 g. a day, and this has also been our experience, as the following case shows.

Mrs. R. G., aged 72, who was suffering from recurrent bronchitis following coronary thrombosis, was given a course of injections of streptomycin sulphate, 1 g. each day. After three days she noticed some dizziness, and as this seemed to get worse the streptomycin was discontinued after five days, when 5 g. in all had been given. Despite this she was so disabled by a disturbance of balance that she could not leave her bed for over three months and then she could walk only a short way with a companion, and with the aid of a stick after a further two months. Examination revealed a severe impairment but not complete loss of response to caloric stimulation of the vestibular labyrinths, and this defect has remained unchanged for one year.

Generally the toxic effect of streptomycin on the eighth-nerve system is irreversible; though in a fortunate few some recovery of function takes place if the drug is withdrawn soon after symptoms have appeared, as the following example shows.

Mrs. T. K., aged 63, was given 1 g. of streptomycin sulphate daily for four days following resection for carcinoma of the rectum. She became very giddy and gave no response to caloric stimulation of each labyrinth. When tested four years later the right labyrinth responded normally to caloric stimulation though the left was still unresponsive.

No doubt the ability to compensate in part for loss of vestibular function has led to the belief that return of function after the drug has been stopped happens much more often than is really the case.

On the other hand, it has been suggested that vestibular function can continue to deteriorate after the withdrawal of the drug, though we do not believe that such an unfortunate state of affairs can be very common.

Progressive loss of hearing after the withdrawal of dihydrostreptomycin is also reported, and the following case shows how disturbing this can be.

A professional man aged 39 received daily 1.5 g. of dihydrostreptomycin by intramuscular injection, and 0.1 g. intrathecally for six weeks, because of tuberculous meningitis. He recovered from the infection, but lost the function of one vestibular labyrinth and some of the hearing in each ear. After the drug had been stopped the hearing continued to deteriorate for three months. A hearing-aid gave him but little assistance, and despite great efforts he was unable to keep up his profession. He became more and more depressed and finally took his own life.

Another effect of streptomycin which can be distressing, though fortunately it is reversible, is upon the skin. Skin reactions may vary from a mild dermatitis to a severe and extensive exfoliative dermatitis, and the following case is an example of this and of vestibular destruction.

P. M., a boy aged 13, developed an aching left ear after a head cold, and two days later the ear began to drip clear fluid at the rate of half a teacupful in three hours. He was admitted to hospital and given systemic penicillin pending further investigations. Two days later the ear discharge became purulent and signs of meningitis appeared. Pus from the ear grew *Ps. pyocyanea*. He was given streptomycin, 0.9 g. daily intramuscularly and 0.1 g. daily intrathecally. After 10 days the left mastoid was opened and two days later the streptomycin was stopped because of generalized exfoliative dermatitis. Within a week the dermatitis had almost entirely cleared and the cerebrospinal fluid was normal. The boy made a complete recovery except for loss of vestibular function. He soon adjusted to this, and when last seen, eight years after his illness, he had been in employment as a tractor driver for three years. Despite absence of vestibular function his disability was noticeable only when he tried to walk with his eyes closed, and he volunteered the information that he was unable to swim and in fact was afraid of the water, this of course being due to loss of visual and kinaesthetic aids upon which he had to rely for maintaining balance.

Ménière's Disease

It has been suggested that the toxic effect of streptomycin upon the vestibular system should be turned to advantage in the treatment of Ménière's disease, where the disordered vestibular system can be ablated without any harm to the hearing.

Unfortunately, streptomycin can act equally upon each vestibular system whether diseased or not, so that when Ménière's disease is unilateral and the patient is over 40, to abolish both sides of the vestibular system may well end up by the cure being worse than the disease, as the following case record shows.

Mr. W. W., aged 56, had been troubled with bouts of severe vertigo and vomiting for three years. Before each attack the slight but persistent noise in his left ear increased and the hearing in that ear was also affected. In between attacks, however, he was quite well and the hearing in the left ear was only slightly affected. A caloric test of vestibular function revealed a moderate impairment of response on the left side only. Nothing influenced the frequency and severity of the attacks, so, in view

of the good hearing on the left side, it was decided to try the effect of a course of injection of streptomycin. He was given 2 g. daily for four weeks, after which there was no evidence of any remaining vestibular function on either side. When we first saw the patient a year later he was still unable to walk at all. After a course of special balancing exercises he was just able to get about with the help of a companion and a stick, but it was an effort both for him and for his companion and he could not venture up or down stairs or beyond his own small garden; he was quite definite that if he could he would change back to his attacks and good balancing between-whiles.

There are, however, occasions when the deliberate intoxication of the vestibular system in cases of bilateral Ménière's disease is justified.

The two cases just described illustrate very well how much more disabling loss of vestibular function is in older as compared with younger persons such as the boy P. M. Ruedi (1951) and others have hoped that in Ménière's disease function in the affected labyrinth is more readily destroyed than that in the healthy labyrinth. This has not been our experience, though this is not to say that the toxic effect is always bilateral and symmetrical, and we have seen several patients in whom only one side was affected. The case of one of these, Mrs. S. M., has already been described.

Increased Incidence of Vestibular Damage

We seem to have seen more patients recently with absence of or disordered vestibular function following the administration of comparatively small quantities of streptomycin; and the Table includes all those patients listed in years since 1951 who have shown symptoms and signs of intoxication after a total dose of less than 20 g. of streptomycin.

Patients Exhibiting Toxic Effects of Streptomycin Where the Total Dose has been Less than 20 g., 1951-6

Name	Age	Daily Dose (g.)	Total Amount (g.)	Condition for which Given	Hearing	Vestibular Function
1951: Mrs. M. B. Mr. P. D.	48 62	2 1	10 11.5	Cystitis Fistula in ano	Unaffected "	R. lost L. lost, R. impaired
1952: Mrs. T. K. Mrs. H.	63 50	1 2	4 9	Resection of colon Nephrectomy	" Slight high tone loss. Both	Both lost Both slightly impaired
Mrs. L.	44	1	16	Tuberculosis in solitary kidney	Severe deafness. Both	Normal
1953: Mrs. S. M. Mr. C. W.	50 66	1 2	5 8	Renal calculi Retention of urine	Unaffected "	Both impaired L. lost, R. impaired
1954: Mr. L. D. Mr. B. S.	68 25	1 0.5	12 15	Pulmonary tuberculosis Pyelitisolitary kidney	" "	Both lost " "
1955: Mrs. P. Mrs. F. P. Mr. S. H.	63 50 41	2 1 1	11 16 12	Resection of colon Pulmonary tuberculosis Bazin's disease	" " Moderate deafness. Both	L. lost Both impaired Normal
Mrs. A. H.	65	1	10	Pyelitis	Unaffected	Both lost
1956: Mrs. A. W. Mrs. C. R. Mrs. K.	61 56 46	1 1 1	5 7 8	Arthrodesis of toe Hernia Nephrectomy	" " "	" " R. lost " "
Mrs. G. G.	47	1	14	Pulmonary tuberculosis	"	" "
Mrs. M. P.	63	2	16	Broncho-pneumonia	"	" "
Mrs. A. K. Mrs. F. S.	42 50	1 1.5	3 15	Laparotomy Perianal abscess	" "	R. impaired Both lost
Mrs. R. G.	72	1	5	Bronchitis	"	Both impaired
Mrs. J. A.	40	2	10	Nephrolithotomy	"	R. lost

We think that this increasing incidence may be due to a more general adoption of the custom of carrying out tests of sensitivity to different antibiotics on infected material. Streptomycin is usually one of the antibiotics tested, and if the infection is found to be more susceptible to streptomycin than to any other antibiotic, the clinician may decide to use it in preference to the others. Although he may be aware of the toxic effect of streptomycin upon the eighth-nerve system, we have the impression that a dose of 1 g. a day for two weeks is generally regarded as being a safe dose. Many of the infections tested for antibiotic sensitivity are particularly sensitive to streptomycin, and this applies especially to infections of the lower respiratory, the lower digestive, and the urinary tracts.

It may well be that the incidence of vestibular damage when the dosage of streptomycin does not exceed 1 g. a day for two weeks is low; but it is there, and we are finding it to be on the increase. For these reasons we believe that all clinicians should be aware of the possible consequences of the use of streptomycin even in small doses over a short period of time.

Reports that the pantothenate salts of streptomycin reduce ototoxicity have not been confirmed, but work is still continuing on the development of other preparations of the drug. Thus it seems that there is some hope that a less toxic form of streptomycin may soon appear.

For the present, however, until we are sure of this it behoves all who use streptomycin to do so as sparingly as the infection will allow, and to be prepared to withdraw it at the first symptom of ototoxicity.

Finally, if the daily dose does not exceed 0.5 g. toxic symptoms are unlikely to occur, except when there is renal insufficiency, and in such an event streptomycin should, if possible, be avoided. It is, of course, appreciated that to control certain serious infections such as tuberculosis a daily dose of 1 g. may be necessary.

Summary

The ototoxicity of streptomycin is discussed and the effect of intoxication of the vestibular part of the eighth-nerve system is described.

Though it is generally believed that toxic symptoms are unlikely to appear so long as the daily dose does not exceed 1 g., several instances are given in which intoxication occurred even though this dosage was not exceeded.

The number of cases of intoxication is on the increase, and this may be due to a wider use of streptomycin as the result of sensitivity tests.

Renal insufficiency, by permitting a high concentration of streptomycin in the blood, renders a patient unduly susceptible to the drug.

It is concluded that symptoms of intoxication are unlikely to occur so long as the daily dose of streptomycin does not exceed 0.5 g.; though it is appreciated that in serious tuberculous infections as much as 1 g. a day may be needed.

We would like to thank all our colleagues at the National Hospital for Nervous Diseases, Queen Square, the Middlesex Hospital, King's College Hospital, the London Chest Hospital, and elsewhere for referring their patients to us, and to Dr. H. M. Walker for the help he has given.

REFERENCES

- Causse, R. (1949). *Ann. Oto-laryng. (Paris)*, 66, 518.
Cawthorne, T. (1946). *Proc. roy. Soc. Med.*, 39, 270.
Cooksey, F. S. (1946). *Ibid.*, 39, 273.
Fowler, E. P., jun., and Glorig, A. (1947). *Ann. Otol. (St. Louis)*, 56, 379.
Glorig, A. (1950). *J. Speech Hear. Dis.*, 15, 124.
Hawkins, J. E., jun., and Lurie, M. H. (1954). *Ann. Otol. (St. Louis)*, 61, 789.
Hinshaw, H. C., and Felman, W. H. (1945). *Proc. Mayo Clin.*, 20, 313.
Ruedi, L. (1951). *Laryngoscope*, 61, 613.
Furrer, W., Graf, K., Nager, G., Tschirren, B., and Luthy, F. (1951). *Rev. Laryng. (Bordeaux)*, 72, Suppl. 238.
Winston, J., Lewey, F. H., Parenteau, A., Marden, P., and Cramer, F. B. (1948). *Ann. Otol. (St. Louis)*, 57, 738.

MYXOMA OF THE LEFT ATRIUM SUCCESSFUL SURGICAL REMOVAL UNDER HYPOTHERMIA

BY

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Myxoma of the atrium generally occurs as a polypoid tumour attached to the left side of the atrial septum in the region of the fossa ovalis. Pathologically it is smooth and shiny, with a soft, gelatinous consistency, and microscopically is seen as a structureless matrix with scanty scattered cells, usually lying singly. The histology of the tumour removed from our case showed the following characteristics. It was composed of a mucoid matrix containing much old and recent haemorrhage and areas of structureless fibrin. Lying in groups and strands, and especially in association with thin-walled blood vessels, were "lepidic," stellate, and fusiform cells of a myxoma. This contained much intracytoplasmic foamy material giving the histochemical reactions of a mucin. The tumour weighed 60 g.

Myxomata may arise as a result of myxomatous degeneration in a thrombus, or they may represent true new growths. A review of recent observations on their pathology and varying clinical picture has been published by Brewin (1948).

It is inevitable that a significant number of myxomata will be encountered in the course of the many hundreds of mitral valvotomies performed yearly, and it is important that the surgeon should have a precise knowledge of the problems and steps involved in their successful removal. At the same time, every effort should be made to diagnose these cases pre-operatively, when a planned operation for removal of the myxoma can be carried out with reduced hazard of dissemination of tumour emboli.

Case Record

A man aged 25 was admitted to hospital under the care of Dr. R. O'Meara, in August, 1956. He then had a right-sided hemiplegia. This cleared quickly. Though auricular fibrillation was not present it was felt that an embolus was responsible.

Examination at that time showed a thrill and a short, rather sharp apical systolic murmur, and a split-second sound was audible at the apex; a diastolic murmur was heard with difficulty only after the patient had been exercised. Screening showed moderate enlargement of the left atrium, and the heart shape suggested mitral stenosis. He was referred to the cardiac clinic of Southampton Chest Hospital for an opinion regarding surgery and, indeed, whether this was a case of mitral stenosis at all.

When seen in October, 1956, by Dr. W. Somerville, he had signs which suggested mitral stenosis. A diastolic murmur with pre-systolic accentuation was present. The mitral first sound was classified as grade III. An opening snap was evident. A short systolic murmur was heard. He was in regular rhythm. Serial x-ray films showed that the cardio-thoracic ratio had increased from 52% to 57% over the course of a year. In view of these findings and the history of an embolus, cardiomyopathy was advised.

At operation, on December 4, the lungs had the appearance and the feel of typical "mitral lungs." The carotid vessels were taped and the pericardium was opened, reveal-

ing pericardial fluid in excess. The atrial appendage was opened without clamps. Exploration of the mitral valve showed it to be perfectly normal, but in the region of the medial commissure a plunging soft tumour was felt. It was thought to arise from the atrial septum, but no detailed assessment was attempted for fear of dislodging some tumour or clot. The atrium was closed and the patient was returned to the ward. Heparin was given immediately in an attempt to prevent a clot embolus, though it was realized that this would in no way prevent a tumour embolus. Heparin was continued for three days, and then was changed to phenindione ("dindevan").

Open cardiac surgery, under hypothermia, was planned for December 15. This time interval was decided upon to allow the patient to recover as fully as possible from the previous cardiomyopathy, and to have an operative field not too obliterated by adhesions. The patient was well until the ninth post-operative day, when he suddenly developed a left facial paresis. At this time his prothrombin index was 37%. It was felt that this was a tumour embolus, but of course dislodged clot was also a possibility. It must have been very small, as the paresis had gone by the following day.

The second operation was undertaken, as planned, on December 15. The temperature was brought down to 83.3° F. (28.5° C.) by surface cooling (Dr. E. S. Machell). The patient was placed in the supine position and a bilateral approach was used through the bed of the fourth rib on both sides, with transection of the sternum. The right innominate and the left common carotid vessels were encircled with rubber slings for compression when the circulation was restored at the conclusion of operation. The superior and inferior venae cavae were occluded, and after 30 seconds a clamp was placed across the transverse sinus, occluding the aorta and pulmonary artery. The right atrium was opened widely.

With the right atrium open, the septum was seen to be bulging to the right. It was obvious that this was due to the tumour mass. Entry into the left atrium was effected by stabbing through the fossa ovalis, then cutting down to its lower margin and extending this incision upwards just beyond its rim. The finger was then slipped in and the incision extended upwards.

The tumour, having a gelatinous consistency, flowed through the defect. Portions of the tumour which presented at the septum were sucked away. It was found that a sucker was the most effective way of picking up the tumour. A finger was then slipped through the septum around the pedicle of the myxoma. At this stage it was too big to deliver itself into the right atrium, but when the presenting portion of the tumour had been removed it slipped through into the right atrium, and the pedicle could be held between the fingers. The pedicle, with a small surrounding portion of the septum, was excised. The left atrium was sucked out, and one additional large fragment of the tumour was obtained. It was then explored with the finger and no remaining tumour or clot could be felt. The cavity was flushed out with saline and this was aspirated. There appeared to be no remaining particles of tumour or clot, and the septal closure was completed under saline to exclude air.

On completion of the septal closure a clamp was applied across the atrial incision and the superior vena-caval sling was removed. The carotids were occluded and the transverse sinus clamp was removed. The inferior vena-caval sling was then released, after which carotid occlusion was maintained for 20 seconds. The total occlusion time had been nine minutes, at a temperature of 83.3° F. (28.5° C.).

During the closure of the septum marked bradycardia was present, but the rhythm was regular. Just as the atrial closure was being completed, ventricular fibrillation supervened. Cardiac massage was instituted immediately and adrenaline was injected into the left atrium. When the heart was pink it was defibrillated, but for the next hour it had to be assisted by massage almost continuously. In spite of repeated electrical defibrillation and injection of adrenaline, calcium

chloride, methylamphetamine hydrochloride, and atropine, cardiac rhythm was not permanently restored until the temperature had reached 86° F. (30° C.), as a result of continuous irrigation of the pleural cavities with warm saline. At this level the E.C.G. showed sinus rhythm. The pericardium was then closed and the heart was observed for a further 40 minutes. During this time the rhythm remained regular, and this was confirmed by the E.C.G. Two hours later the patient was fully conscious and co-operative, with no sign of cerebral damage. The pulses were all present post-operatively.

Discussion

Clinical discussions tend to emphasize a history of multiple peripheral emboli, and although there was only one embolic episode in our case, its presence, in the absence of established atrial fibrillation, should have raised suspicion of a myxoma. The diastolic murmur is not surprising in association with a pedunculated tumour arising from the septum. On the other hand, syncope from obstruction of the mitral orifice, as in ball-valve thrombus, is unlikely, since the tumour is jelly-like and can easily be forced through the mitral orifice.

When a tumour of this nature is encountered during the exploration of the mitral valve it is important, in view of the friable nature of the mass and the hazards of a cerebral embolus, that a minimum of intra-atrial manipulation be

carried out. In addition, it is desirable that the tumour should be removed immediately, since in the cases described by Brock (1956) there was bilateral cerebral embolism by the time of the second operation. In our case a further cerebral embolus occurred on the ninth day in spite of post-operative heparinization. Heparin was used in view of the finding of massive clot adherent to the tumour in Brock's case, and the danger of clot embolus was again confirmed in our case, as patches of clot were intermingled with the tumour (Fig. 1).

The correct approach to the tumour as it lies against the atrial septum is through the right atrial chamber (Brock, 1956): the successful outcome fully justifies the validity of this concept (Fig. 2).

The right atrial chamber lies above and to the right of the left atrium, which is inaccessible

placed between the right atrium and the vertebral column. On the other hand, recent experiences with right atrial surgery in the closure of atrial septal defects has emphasized the safety and ease of approach to the dependent left atrium through an incision in the septum.

Since most cases of mitral stenosis are operated upon in the antero-lateral or lateral position, it is necessary to turn the patient on his back and extend the incision across the sternum along the fourth right rib bed. However, it is reasonable to dissect out and snare the cerebral vessels, which are accessible in the lateral position, in order to avoid a tumour embolus during subsequent surgical manipulations.

The safest approach through the septum is via the fossa ovalis, and this should be opened by plunging the point of the scissors through it. The upward extension of the incision must be done with great care, and before this is completed the fingers should be slipped through the septum to assess how far cephalad it can be carried. If carried too far the transverse sinus will be opened and an uncontrollable haemorrhage will result. The tumour may be too large to deliver through the septal incision, as in our case. If the tumour is hooked with a finger around the pedicle and is made to present, a great deal of it can be sucked away until it is small enough to slip through the defect. In excising the pedicle it seems advisable to lift it up and excise a small portion of the septum with the pedicle. The table should be tilted slightly to the left so that when the left atrium is flushed before closure all the air can escape without being occluded beneath the septum.

Hypothermia is necessary to cover the period of circulatory arrest, and a difficulty arises in the use of surface cooling with an open chest. This means that the wound would generally have to be closed during induction of the cooling unless a blood stream method of cooling is available (Brock and Ross, 1955). This latter method has the great advantage, in this type of case, of permitting cooling to be carried out after the chest has been opened, and it has the additional advantage of facilitating rapid re-warming before closure of the chest. Resuscitation of the heart in our case was greatly hampered by lack of prompt re-warming facilities. Diathermy re-warming is effective in cases with good circulation, but a surface re-warming loses its efficiency when there is circulatory failure.

Summary

Myxoma of the atrium is likely to be encountered in the assessment and surgery of cases diagnosed as mitral stenosis.

In order to avoid the hazard of tumour emboli, the myxoma should be removed with a minimum of manipulation, and the cerebral vessels should be snared before re-establishing the arrested circulation.

It appears to us that the most satisfactory approach is via the right atrium, with an incision in the septum under conditions of hypothermia.

Blood-stream cooling avoids delay in removal of the tumour and postponement of a definitive operation, and re-warming carried out by this method facilitates rapid resuscitation of the heart.

Details of the successful surgical removal of a left atrial myxoma are given.

REFERENCES

- Brewin, T. B. (1943). *Guy's Hosp. Rep.*, 97, 64.
Brock, R. C. (1956). *Ibid.*, 105, 382.
— and Ross, D. N. (1955). *Ibid.*, 104, 99.

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FIG. 1.—Photograph of tumour, with patches of clot.

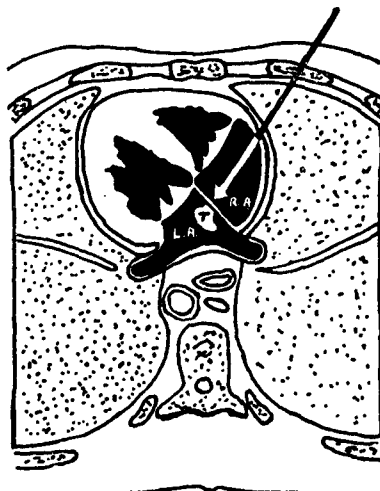


FIG. 2.—Diagram showing approach to the left atrium through the right atrium. T=myxoma; R.A.=right atrium; L.A.=left atrium. (After Brock, 1956.) Reproduced by permission of *Guy's Hospital Reports*.

HAEMOGLOBIN K IN AN EAST INDIAN AND HIS FAMILY

BY

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The abnormal haemoglobins in East Indians so far described are principally sickle-cell haemoglobin (haemoglobin S) and haemoglobin D, and to a less extent haemoglobin E. Haemoglobin S is found in some aboriginal communities of Southern India, where in the Panyans and in the Irulas the percentage incidence is about 30, and in some tribes in Western India (Lehmann and Cutbush, 1952a, 1952b; Büchi, 1955; Sukumaran, Sanghvi, and Vyas, 1956). The rather high incidence of 55% has been mentioned for the Parjah Kondhs by Foy, Brass, and Kondi (1956). Although some families with the sickling trait have been noticed among Biharis working as labourers in Assam (Dunlop and Mozumder, 1952), sicklers were not detected amongst 23 Karias and 100 Oraons employed as forest labourers on the Andaman Islands (Lehmann and Ikin, unpublished). Shukla and Parande (1956) have observed sickling in a Mahar family. The Mahars are a "scheduled caste" in Maharashtra, and it is noteworthy that the earliest communities of India, including the Veddoids, were either driven by the later arrivals into remote places where they retained their identity or were subjugated and incorporated into what we know to-day as the scheduled castes. Though first reported in isolated instances from America and Europe, haemoglobin D has been found to occur in 3% of Sikhs and in 1% of Gujaratis (Bird and Lehmann, 1956a; Jacob, Lehmann, and Raper, 1956). India would thus appear to be a reservoir for this abnormal haemoglobin. Haemoglobin E was first discovered in a child of mixed Hindu ancestry (Itano, Bergren, and Sturgeon, 1954), but none has been found in many Indian communities investigated since, except for some occasional observations in Bengalis (Bird and Lehmann, 1956b; Chatterjea, Saha, Ray, and Ghosh, 1956; Saha, Dutta, and Ghosh, 1957). The incidence of haemoglobin E is of course high immediately East of Bengal in Burma and in the neighbouring Siam and Malaya.

The "Fast-moving" Abnormal Haemoglobins

The first abnormal haemoglobins to be discovered by electrophoretic technique were all migrating more slowly at alkaline pH than normal adult haemoglobin (haemoglobin A). In the last two years, however, four haemoglobins have been described which move faster than haemoglobin A at alkaline pH: H, I, J, and K. There has been some confusion about the nomenclature, and the following is based on a discussion of this problem at a working party meeting under the chairmanship of Dr. J. V. Neel during the 6th Congress of the International Society of Hematology in Boston in 1956 (see Lehmann, 1957).

Haemoglobin H (Rigas, Koler, and Osgood, 1955) has been found in Chinese, in Filipinos (Motulsky, 1956), in Siamese (No-Nakorn and Minnich, 1956), and in one Malaysian Malay (Lehmann and Singh, 1956). The only observations in non-Mongoloids are in two Greek families (Gouttas, Fessas, Tseveris, and Xefteri, 1955), in a Greek Cypriot

(Ager, unpublished), and in a Jordanian Arab (personal communication by Dr. J. C. White).

Haemoglobin I was seen in an American negro family and in Algiers (Rucknagel, Page, and Jensen, 1955; Cabannes, Sendra, and Dalaut, 1955).

Haemoglobin J was discovered in an American negro family (Thorup, Itano, Wheby, and Leavell, 1956). It was noted in West Africa—at first called "Liberia I" (Robinson, Zuelzer, Neel, Livingstone, and Miller, 1956)—and was found according to Robinson *et al.* (1956) in a French Canadian family by Colonel W. H. Crosby. Huisman, Noordhoek, and da Costa (1957) have found this haemoglobin in an Indonesian family; and Raper (1957) has described an example in a Gujarati Indian.

Haemoglobin K has been described in three Berber families by Cabannes, Buhr, and Sendra (1956), and by Robinson *et al.* (1956) in a survey of Liberians—provisionally named "Liberia II." Edington and Lehmann (unpublished) have seen three examples amongst members of the Dagomba tribe from Northern Ghana. In a man of East Indian origin and in his son we have now seen a haemoglobin which has the electrophoretic properties described for haemoglobin K.

Electrophoretic Properties of Haemoglobin K.—Haemoglobins H and I move at pH 8.6 considerably faster than haemoglobin A and are separated from it about as much as haemoglobin E in the reverse direction. Haemoglobins J and K move more slowly than H and I; haemoglobin K is the slower. While haemoglobin J just faintly separates from haemoglobin A, haemoglobin K tends to appear as a band in front of haemoglobin A but barely separated from it. At pH 6.5 the situation is reversed and the abnormal component is attached to the rear of the haemoglobin A band. There is, however, a discrepancy between the reports on haemoglobin K: Cabannes *et al.* (1956) found a separation between haemoglobins A and K at this acid pH, whereas Robinson *et al.* (1956) found no such separation in their mixture of haemoglobin A and "Liberia II," which latter—subject to a final comparison between the two—is thought to be identical with haemoglobin K.

Findings

The subject of the present investigation, an Indian resident in London, was born in South Africa, where his grandfather had immigrated from India (Madras). Though he married a woman of Scots and West Indian origin there is no evidence in his appearance or from his family history that there has been any admixture of non-East Indian blood amongst his own ancestry. He was 43 years old and was being examined for assessment of Addison's disease and treatment of pulmonary tuberculosis. As he was a non-European he was examined for abnormal haemoglobin. There was no anaemia, and no abnormality was found in the size or appearance of his red cells; the osmotic fragility of these cells was normal. The sickling test was negative, and alkali-resistant haemoglobin (haemoglobin F) was absent. The solubility of the reduced haemoglobin was within normal limits (Itano, 1953).

On paper electrophoresis at alkaline pH the haemoglobin was seen to consist of two components—one resembling haemoglobin A in its electrophoretic properties, and another, amounting to 38%, which was moving faster than haemoglobin A though it was barely separated from it. His haemoglobin mixture was compared with mixtures of haemoglobins A+H and A+J respectively each both at alkaline and at acid pH. The first was obtained from a Greek Cypriot and the second was kindly made available by Dr. A. B. Raper. Furthermore, Dr. H. A. Itano and Dr. T. H. J. Huisman obliged us by comparing the haemoglobin of our patient with mixtures of haemoglobins A+J, and Dr. R. Cabannes by comparing it with a haemoglobin A+K mixture. The outcome of these comparisons was that the abnormal haemoglobin of our patient moved on paper electrophoresis at alkaline pH very much more slowly than haemo-

globin H (or I) and rather more slowly than haemoglobin J, but identically with haemoglobin K (Fig. 1).

As noted above, Cabannes *et al.* (1956) found their haemoglobin A+K mixture to separate into two fractions on paper electrophoresis at pH 6.5, but Robinson *et al.* (1956) failed

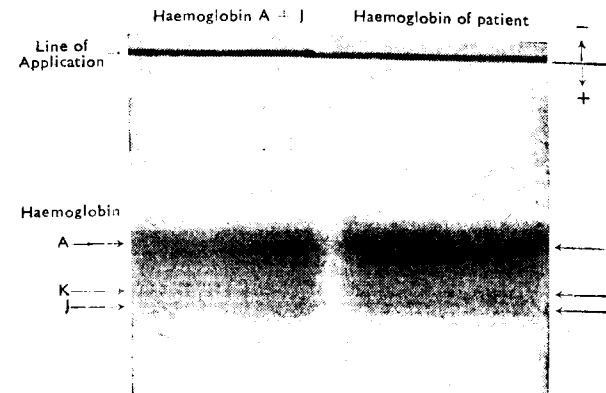


FIG. 1.—Paper electrophoresis at pH 8.6, barbiturate buffer. Comparison of haemoglobins A+J with the haemoglobin of the patient (A+K). It will be seen that at pH 6.5 haemoglobin consists of haemoglobin A and of another component migrating faster than haemoglobin A but more slowly than haemoglobin J.

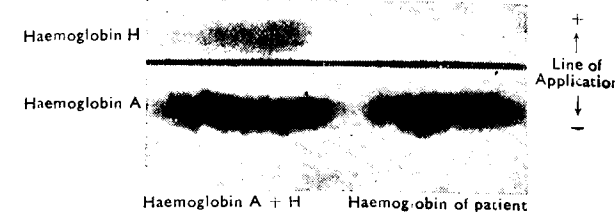


FIG. 2.—Paper electrophoresis at pH 6.5 phosphate buffer. Comparison of haemoglobins A+H with the haemoglobin of the patient (A+K). It will be seen that at pH 6.5 haemoglobin A moves towards the cathode, and haemoglobin H towards the anode, and that the abnormal component of the patient's haemoglobin does not separate from haemoglobin A.

to achieve a separation with their sample at this pH. Our sample behaved like that of Robinson *et al.* (1956) (Fig. 2). Edington and Lehmann's three samples of haemoglobins A+K from Ghana (unpublished) also did not separate on paper electrophoresis at pH 6.5.

On examination of the patient's family one child was found to have the same abnormal haemoglobin as the father (Fig. 3). Its blood picture was normal, foetal haemoglobin was absent, and the osmotic fragility was within normal limits.

Comment

Haemoglobin K has so far been seen in Kabyles, Libyans, and Dagombas, all from Africa. The present example

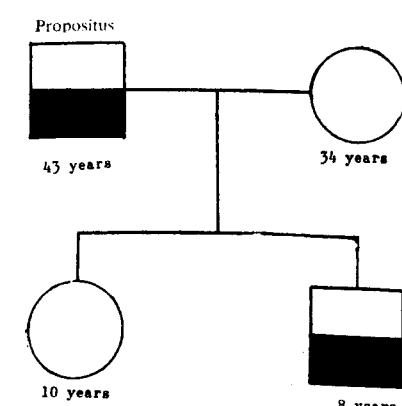


FIG. 3.—Family of the propositus. White = haemoglobin A; black = haemoglobin K.

be assessed. Haemoglobins C, D, and E have been found to exist at higher frequency in populations other than those in which they were originally described. Although haemoglobin K is "rare" at present, it may well not be considered rare in years to come, when more populations have been examined for abnormal haemoglobins.

Summary

An abnormal haemoglobin was discovered in a South African of Indian extraction living in London. The haemoglobin had the electrophoretic properties of haemoglobin K. One son showed the same abnormality.

We should like to thank Professor F. T. G. Prunty, physician to St. Thomas's Hospital, London, for his permission to examine the propositus, who at the time was a patient under his care. We are grateful to Dr. A. B. Raper for enabling us to use his haemoglobin A+J mixture in this study, to Dr. H. A. Itano and Dr. T. H. J. Huisman for comparing our haemoglobin mixture with known samples of haemoglobins A+J, and to Dr. R. Cabannes for identifying it by a comparison with his original specimen containing haemoglobins A+K.

REFERENCES

- Bird, G. W. G., and Lehmann, H. (1956a). *British Medical Journal*, 1, 514; *Man*, 1.
— (1956b). Quoted by Lehmann, J. *clin. Path.*, 1956, 9, 180.
Büchi, E. C. (1955). *The Anthropologist*, 1, 25.
Cabannes, R., Buhr, J. L., and Sandra, L. (1956). *Proc. 6th Congr. int. Soc. Hemat.*, Boston, p. 448.
—, Sandra, L., and Dalaut (1955). *C.R. Soc. Biol. (Paris)*, 149, 914.
Chatterjee, J. B., Saha, A. K., Ray, R. N., and Ghosh, S. K. (1956). *Bull. Calcutta Sch. Trop. Med.*, 4, 103.
Dunlop, K. J., and Mozumder, U. K. (1952). *Indian med. Gaz.*, 87, 387.
Foy, H., Brass, W., and Kondi, A. (1956). *British Medical Journal*, 1, 289.
Gouttas, A., Fessas, P. H., Tseveris, H., and Xetleri, E. (1955). *Sang.*, 26, 911.
Huisman, T. H. J., Noordhoek, K., and da Costa, G. J. (1957). *Nature (Lond.)*, 179, 322.
Itano, H. A. (1953). *Arch. Biochem.*, 47, 148.
—, Bergren, W. R., and Sturgeon, P. (1954). *J. Amer. chem. Soc.*, 76, 2278.
Jacob, G. F., Lehmann, H., and Raper, A. B. (1956). *E. Afr. med. J.*, 33, 135.
Lehmann, H. (1957). *Blood*, 12, 90.
— and Cutbush, M. (1952a). *British Medical Journal*, 1, 404.
— (1952b). *Trans. roy. Soc. Trop. Med. Hyg.*, 46, 380.
— and Singh, R. B. (1956). *Nature (Lond.)*, 178, 695.
Motulsky, A. G. (1956). *Ibid.*, 178, 1055.
No-Nakorn, S., and Minnich, V. (1956). *Proc. 6th Cong. int. Soc. Hemat.*, Boston, p. 441.
Raper, A. B. (1957). *British Medical Journal*, 1, 1285.
Rigas, D. A., Koler, R. D., and Osgood, E. E. (1955). *Science*, 121, 372.
Robinson, A. R., Zuelzer, W. W., Neel, J. V., Livingstone, F. B., and Miller, M. J. (1956). *Blood*, 11, 902.
Rucknagel, D. L., Page, E. B., and Jensen, W. N. (1955). *Ibid.*, 10, 999.
Saha, A., Dutta, R., and Ghosh, J. (1957). *Science*, 125, 447.
Shukla, R. N., and Parande, A. S. (1956). *Indian J. med. Sci.*, 10, 892.
Sukumaran, P. K., Sanghvi, L. D., and Vyas, G. N. (1956). *Curr. Sci.*, 25, 290.
Thorup, O. A., Itano, H. A., Wheby, M., and Leavell, B. S. (1956). *Science*, 123, 889.

A European seminar on "The Nurse in Industry" was held in London recently under the joint auspices of the International Labour Office and the World Health Organization. About 50 representatives from 15 countries attended the seminar, and among those who took part were industrial nurses, social workers, industrial medical officers, and medical inspectors of factories. There were discussions on the importance of the nurse as a member of the occupational health team, which might include an industrial medical officer, first-aid attendant, social worker, chemist, and safety officer. Among the suggested duties of the occupational health nurse were the first care of accidents and sickness, occupational and non-occupational, the follow-up of this care, rehabilitation, assisting with the prevention of accidents and physical and mental sickness. She should also assist in the planning and carrying out of the programme of health education for individuals and groups; and she should be responsible for the organization and administration of the nursing services and the training and supervision of first-aid attendants and auxiliary nursing personnel where they are employed. In addition to all this she should be concerned with establishing and maintaining good relationships with employers, employees, foremen, supervisors, and the social services—and she should be independent in relation to the factory management.

ABSORPTION OF FREE ACID, POTASSIUM, AND BENZATHINE PHENOXYMETHYLPENICILLIN AFTER ORAL ADMINISTRATION

BY

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Phenoxymethylpenicillin (penicillin V) was first prepared in 1947 (Behrens *et al.*, 1948), but was not used as a therapeutic agent until 1953 (Brandl *et al.*, 1953). Since then many reports have demonstrated that it is more reliably absorbed after oral administration than other forms of penicillin (Jones and Finland, 1955; Juncher and Raaschou, 1955; Wright *et al.*, 1955; Heatley, 1956; Welch, 1956; Rinsler and Cunliffe, 1956; Bunn, 1956). It is also therapeutically effective (Martin *et al.*, 1955; Hart *et al.*, 1956; Wood *et al.*, 1956). In the majority of these investigations, phenoxymethylpenicillin free acid has been used, but more recently some attention has been given to phenoxymethylpenicillin salts (Andresen, 1955; Björkman and Löfberg, 1956; Brunner and Giovannini, 1956; Kaipainen and Härkönen, 1956). A knowledge of the blood levels and persistence of effect that can be obtained with different preparations and doses is clearly of importance in planning treatment. This report describes the levels achieved with 60-mg. and 240-mg. doses of phenoxymethylpenicillin free acid, and compares the results from the higher dose of this compound with those from corresponding amounts of potassium and benzathine salts of phenoxymethylpenicillin. The absorption of the benzathine salt has also been studied in patients with treated pernicious anaemia in whom there was complete gastric achlorhydria.

Methods

The subjects comprised volunteers from amongst doctors, medical students, nurses, and convalescent patients not suffering from cardiac, renal, or gastro-intestinal disease. In the first series of observations on 24 people a single dose of 60 mg. of phenoxymethylpenicillin free acid was given half an hour before breakfast. Serum concentrations were measured at $\frac{1}{2}$, 1, 2, 3, 4, 5, and 6 hours after swallowing the tablet. Twenty subjects took part in the second series of observations, in which the serum levels obtained with single doses of 240 mg. of phenoxymethylpenicillin free acid, 266 mg. of potassium phenoxymethylpenicillin, and 320 mg. of benzathine phenoxymethylpenicillin were compared. Equivalent weights of penicillin were present in these three different doses, which were administered in two tablets. The 20 subjects all took the three preparations in successive weeks in a random order. The tablets were taken half to one hour before breakfast. The interval and the type of meal were kept constant for each subject, so that the comparisons were made so far as possible under identical conditions. Finally, to investigate the importance of gastric hydrochloric acid in the absorption of benzathine phenoxymethylpenicillin, this compound was given to 11 patients with treated pernicious anaemia who had agreed to take part

in the trial. The diagnosis had been confirmed by examination of the peripheral blood and bone marrow and the demonstration of a histamine-fast achlorhydria.

The concentration of penicillin in the serum was estimated by dilutions in phenol-red-glucose-serum medium (May *et al.*, 1947), which were inoculated with *Streptococcus pyogenes*. Comparisons were made with similarly inoculated dilutions of benzylpenicillin in the same medium. This technique was used in previous studies from these departments (Wayne *et al.*, 1949).

Results

The serum concentrations obtained with the 60-mg. dose of phenoxymethylpenicillin free acid are shown in Table I. With this dose, high concentrations were not obtained in the blood, but appreciable levels persisted for up to three hours.

The results with 240 mg. of phenoxymethylpenicillin free acid are shown in Table II and the comparison with the two salts in Tables III and IV. There was considerable variation between individuals in the concentrations achieved with each preparation. The most rapid absorption and highest concentrations were achieved with the potassium salt. At the half-hour measurement the potassium salt gives a significantly higher mean level than the benzathine salt. The other comparisons do not show a significant difference. With all three forms the mean persisted for up to four hours

TABLE I.—Serum Levels (Units/ml.) After 60 mg. of Phenoxymethylpenicillin Free Acid by Mouth

Subject No.	Hours after Administration					
	$\frac{1}{2}$	1	2	3	4	6
1	0.125	2.0	1.0	0.25	0.125	0.03
2	0.25	0.5	0.25	0.125	0.03	0
3	0	0.03	0.25	0.125	0.06	0
4	1.0	0.5	0.25	0.03	0	0
5	0.125	0.5	0	0	0	0
6	0.03	0.25	0.125	0.06	0.03	0
7	—	0.125	0.25	—	0.03	0.03
8	0.5	0.25	0.03	0	0	0
9	0.125	0.25	0.25	0.06	0	0
10	0	0.25	0.25	0.03	0	0
11	0.06	0.25	0.125	0.06	0	0
12	1.0	1.0	0.125	0.03	0	0
13	0.5	0.25	0.125	0.06	0	0
14	0	0.03	0.25	0.25	0.03	0
15	0.06	0.5	0.125	0	—	0
16	0.125	0.25	1.0	0.125	0.06	0
17	1.0	0.5	0.25	0.25	0.03	0
18	0.03	0.125	0.25	0.125	0.06	0
19	0.25	0.5	0.125	0.06	0.03	0
20	0.5	1.0	0.06	0.03	0	—
21	0.125	0.5	0.125	0.03	0	—
22	0.125	0.25	0.25	0.125	0.06	—
23	0.25	0.5	1.0	0.5	0.25	0.125
24	0	0.125	0.125	0.25	0.125	0.03
Mean	0.27	0.43	0.28	0.11	0.04	—
Standard error	0.07	0.08	0.06	0.03	0.01	—

TABLE II.—Serum Penicillin Levels (Units/ml.) After 240 mg. of Phenoxymethylpenicillin Free Acid by Mouth

Subject No.	Hours after Administration					
	$\frac{1}{2}$	1	2	3	4	6
25	0.25	0.5	0.25	0.125	0.06	0
26	2.0	1.0	0.5	0.25	0.125	0
27	2.0	2.0	0.5	0.06	0	0
28	4.0	2.0	0.5	0.06	0	0
29	4.0	2.0	0.25	0.06	0	0
30	0	2.0	0.5	0.06	0	0
31	1.0	2.0	1.0	0.25	0.03	0
32	4.0	2.0	0.5	0.125	0	0
33	1.0	2.0	2.0	0.25	0.125	0.03
34	8.0	1.0	1.0	0.125	0.06	0.03
35	0.5	0.5	1.0	0.5	0.25	0
36	0.03	0.5	2.0	0.5	0.125	0
37	4.0	4.0	0.25	0.06	0.03	0
38	0.06	1.0	1.0	0.25	0.125	0
39	2.0	4.0	2.0	0.25	0.03	0
40	2.0	2.0	0.25	0.06	0	0
41	4.0	8.0	1.0	0.25	0.125	0
42	2.0	1.0	1.0	2.0	0.1	0.03
43	0.125	2.0	0.25	0.06	0.03	0
44	4.0	4.0	0.25	0.06	0.06	0
Mean	2.17	2.52	0.80	0.27	0.06	0.004
Standard error	0.47	0.48	0.13	0.03	0.002	—

above 0.06 unit per ml., which may be taken as the minimum bacteriostatic level (Wayne *et al.*, 1949).

The benzathine salt was given by mouth to 11 patients with pernicious anaemia (Table V). The mean levels were higher than in the subjects with normal gastric function.

Discussion

The lower (60-mg.) dose of phenoxymethylpenicillin is the amount that might be given in the long-term prevention of infection. The concentrations obtained here with this dose are similar to those reported by Henry and Meynell

TABLE III.—Serum Penicillin Levels (Units/ml.) After 266 mg. of Potassium Phenoxymethylpenicillin by Mouth

Subject No.	Hours after Administration					
	½	1	2	3	4	6
25	2.0	1.0	1.0	0.5	0.25	0.03
26	0.25	0.5	0.5	0.25	0.125	0
27	4.0	2.0	0.25	0.125	0	0
28	8.0	2.0	0.5	0.25	0	0
29	2.0	2.0	1.0	0.25	0.125	0
30	1.0	4.0	1.0	0.125	0.03	0
31	4.0	2.0	0.5	0.25	0.125	0
32	8.0	4.0	0.5	0.06	0	0
33	4.0	8.0	2.0	0.5	0.06	0
34	8.0	2.0	0.25	0.03	0	0
35	0	0.25	0.125	0.03	0	—
36	4.0	4.0	0.25	0.03	0	0
37	8.0	8.0	1.0	0.125	0.06	0
38	2.0	2.0	1.0	0.5	0.25	0
39	2.0	1.0	0.5	0.25	0.125	0.06
40	2.0	2.0	1.0	0.25	0.25	0.125
41	1.0	4.0	0.5	0.25	0	0
42	16.0	4.0	0.5	0.125	0.03	0.03
43	4.0	2.0	0.5	0.125	0.03	0
44	4.0	2.0	0.5	0.125	0.03	0
Mean	4.22	2.94	0.69	0.20	0.07	0.013
Standard error	0.90	0.47	0.10	0.03	0.02	—

TABLE IV.—Serum Penicillin Levels (Units/ml.) After 320 mg. of Benzathine Phenoxymethylpenicillin by Mouth

Subject No.	Hours after Administration					
	½	1	2	3	4	6
25	0.03	0.5	0.5	0.25	0.03	0.03
26	0.5	0.5	0.125	0.125	0.125	0.03
27	2.0	1.0	0.125	0.03	0.03	0
28	2.0	1.0	0.25	0.06	0.03	0
29	2.0	1.0	0.5	0.25	0.125	0.06
30	2.0	2.0	0.25	0.06	0	0
31	0.5	1.0	1.0	0.5	0.03	—
32	2.0	1.0	0.5	0.125	0.06	—
33	0.5	0.5	4.0	2.0	0.25	0
34	1.0	4.0	2.0	1.0	0.5	0
35	1.0	2.0	0.5	0.03	0	0
36	0.25	1.0	2.0	0.25	0	0
37	0.125	0.25	0.5	0.03	0	—
38	2.0	1.0	0.125	0.06	0	0
39	4.0	2.0	1.0	0.5	0.125	0
40	1.0	2.0	0.125	0.06	0	0
41	0.06	2.0	0.25	0.125	0.06	0
42	0.5	1.0	0.125	—	0.06	—
43	4.0	8.0	0.25	0.06	0	0
44	4.0	2.0	0.25	0.06	0	0
Mean	1.47	1.69	0.72	0.29	0.07	0.0075
Standard error	0.29	0.38	0.21	0.11	0.05	—

TABLE V.—Serum Penicillin Levels (Units/ml.) After 320 mg. of Benzathine Phenoxymethylpenicillin to Patients with Treated Pernicious Anaemia

Subject No.	Hours after Administration					
	½	1	2	3	4	6
45	8.0	4.0	4.0	1.0	0.125	—
46	—	4.0	4.0	1.0	0.25	0.03
47	8.0	8.0	2.0	0.5	0.125	0.03
48	2.0	4.0	4.0	1.0	0.25	—
49	0.03	1.0	4.0	0.5	0.03	0
50	—	0.25	1.0	2.0	2.0	0.25
51	0.125	1.0	1.0	0.5	0.06	0.03
52	0.06	0.5	2.0	0.5	0.125	0.03
53	4.0	8.0	1.0	0.25	0.06	—
54	—	4.0	0.5	0.125	0.06	0
55	4.0	4.0	2.0	1.0	0.5	0
Mean	3.28	3.52	2.32	0.76	0.33	0.05
Standard error	1.20	0.82	0.13	0.16	0.17	0.05

(1956). High levels cannot be obtained with this small amount, which will have an effect only on highly sensitive organisms.

The larger dose (240 mg.) of phenoxymethylpenicillin free acid gave much higher serum levels, and effective amounts were present in the blood for up to four hours. The higher concentrations achieved with the potassium salt have also been reported by Kaipainen and Härkönen (1956) and by Björkman and Löfberg (1956). The calcium salt apparently gives levels similar to those afforded by the free acid (Henriksen *et al.*, 1956; Rinsler and Cunliffe, 1956).

Some of the physical and chemical properties of the benzathine salt of phenoxymethylpenicillin have been described by Brunner and Giovannini (1956). The solubility in water of benzathine phenoxymethylpenicillin is 0.08% at 37° C. The pH of the saturated solution is about 5 and the solubility rises with increasing pH values. The minimum solubility is at pH 4.5, but in more acid conditions the solubility of the compound increases sharply. In the group of subjects with normal gastric function, lower levels were attained with the benzathine salt than with the free acid and potassium salt. The results in the patients with pernicious anaemia suggest that in the absence of gastric hydrochloric acid the benzathine salt is more fully absorbed. In tablet form it has no advantages over the other preparations. The lower peak values are not associated with a longer persistence of effective concentrations. However, the low solubility of the salt in water means that oral suspensions are relatively stable and it may be more suitable for administration in syrup form. In adults the potassium salt in tablet form is clearly preferable.

Summary

The serum concentrations achieved after 60-mg. and 240-mg. oral doses of phenoxymethylpenicillin free acid have been investigated.

The levels given by the potassium and benzathine salts in amounts equivalent to the 240-mg. dose of free acid have been compared. The potassium salt was most rapidly absorbed and gave the highest peak values. The benzathine salt gave the lowest values. The persistence of effect was similar in all three substances.

In patients with treated pernicious anaemia the benzathine salt gave higher levels than in the normal subjects.

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REFERENCES

- Andresen, P. (1955). *Ugeskr. Læg.*, 117, 1365.
 Behrens, O. K., Corse, J., Edwards, J. P., Garrison, L., Jones, R. G., Soper, O. F., Van Abeele, F. R., and Whitehead, C. W. (1948). *J. biol. Chem.*, 175, 793.
 Björkman, G., and Löfberg, J. (1956). *Svenska LäkT.*, 53, 1387.
 Brandt, E., Giovannini, M., and Margreter, H. (1953). *Wien. med. Wschr.*, 103, 602.
 Brunner, R., and Giovannini, M. (1956). *Ibid.*, 106, 243.
 Bunn, P. A. (1956). *J. Lab. clin. Med.*, 48, 392.
 Hart, F. D., Burley, D., Manley, R., and Brown, G. (1956). *British Medical Journal*, 1, 496.
 Heatley, N. G. (1956). *Antibiot. Med.*, 2, 33.
 Henriksen, E., Larsen, I., Nielsen, E. J., Roholt, K., and Tybring, S. (1956). *Ugeskr. Læg.*, 118, 801.
 Henry, L., and Meynell, M. J. (1956). *Postgrad. med. J.*, 32, 297.
 Jones, W. F., and Finland, M. (1955). *New Engl. J. Med.*, 253, 754.
 Juncher, H., and Raaschou, F. (1955). *Ugeskr. Læg.*, 117, 1131.
 Kaipainen, W. J., and Härkönen, P. (1956). *Scand. J. Clin. lab. Invest.*, 8, 18.
 Martin, W. J., Nichols, D. R., and Heilman, F. R. (1955). *Proc. Mayo Clin.*, 30, 467.
 May, J. R., Vourekka, A. E., and Fleming, A. (1947). *British Medical Journal*, 1, 627.
 Rinsler, M. G., and Cunliffe, A. C. (1956). *Lancet*, 2, 328.
 Wayne, E. J., Colquhoun, J., and Burke, J. (1949). *British Medical Journal*, 2, 1319.
 Welch, H. (1956). *Antibiot. Med.*, 2, 11.
 Wood, W. S., Rosenthal, I. M., Spies, H. W., and Lepper, M. H. (1956). *Ibid.*, 3, 38.
 Wright, W. W., Kirshbaum, A., Arret, B., Putnam, L. E., and Welch, H. (1955). *Ibid.*, 1, 490.

EVAPORATED MILK IN INFANT FEEDING

BY

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Attention has recently been drawn to eight large outbreaks of food-poisoning which occurred within one month (Anderson and Stone, 1955; *Monthly Bull. Minist. Hlth*, 1955; *Lancet*, 1956). They were all traced to spray-dried milk and found to be due to a staphylococcal enterotoxin. During the preparation the actual organisms had been destroyed, but the toxin, which is relatively heat-stable, had not. It is destroyed by heating to 88° C. (190.4° F.) for one hour. Roller-dried types of dried milk have not been incriminated in similar outbreaks, but they do contain live micro-organisms which can on occasion give rise to gastro-intestinal upsets. A personal experience, for example, was of an infant who developed diarrhoea after the first feed from a newly opened tin. The laboratory reported "a heavy growth of *B. proteus*." The fact that tins are dated indicates a recognition of some degree of danger.

In evaporated milk we have a perfectly safe infant food. The milk is received from the farm and raised to an initial temperature of 212° F. (100° C.) during solids stabilization and, later during final sterilizing (after cans are hermetically sealed), to 240° F. (115.5° C.) for 15 minutes. During this process no milk is retained in any chamber for more than 15 minutes between the heating processes. This is of considerable significance because investigations have shown that 35% of cases of bovine mastitis are caused by the staphylococcus (Malcolm, 1957). Milk may therefore arrive at a factory already contaminated, although untouched by hand. In the investigations referred to above a steady build-up was found in the staphylococcal count in a balancing chamber which was incompletely emptied during a working day. This could not happen in the process of evaporating milk. The final sterilization completely eliminates any live organisms or spores. There only remains the question of heat-stable toxin remaining potent. The factory process of evaporation does not give any opportunity for a build-up of toxin-producing organisms. It would therefore seem impossible for the end-product to contain any, unless perchance the milk already contained a toxin when it arrived at the factory. The staphylococcal enterotoxin is, of course, peculiar in that although it is inactivated by heating to 65° C. for 30 minutes, it may withstand heating to 100° C. for 15 to 30 minutes (Wilson and Miles, 1955). Milk arrives at the factory from many sources, and any toxin which may be contained in a sample is no doubt so diluted in the bulking process that the chances of its causing any gastro-intestinal upset are extremely remote.

Why, then, is it not more widely used in this country as an infant food? The answer appears to be "that uncritical prejudice has been the chief factor in the limitation of its use." This is a quotation from a paper by Marriot and Schoenthal published with reference to their experience in America as far back as 1929. It seems equally true in this country nearly 30 years later.

Experience in Blackburn

Evaporated milk has been in general use in infant feeding in the Blackburn Group of Hospitals for over four

years. It would appear that experience here can be of use to others, and is therefore worth recording.

In the Blackburn Group, the original intention was not specifically to introduce evaporated milk as the basic food for infants. What was desired was some simplification of the routine in the milk kitchen. It was the policy up to that time to continue to use whatever food the infant had been having up to its admission. Many different feeds were therefore being used. This seemed wasteful in time and in money, as tins of various brands of dried milk inevitably were unused through going "out of date." The question to be settled was therefore what food could be used to eliminate these troubles. It has been repeatedly demonstrated, and is within the experience of most of us, that an infant can thrive on almost any of the recognized branded foods and on the national products. Clearly the decision had to rest on factors other than simple nutritional value. After due thought it was felt that in evaporated milk we had a product with a combination of qualities not found collectively in dried foods. It is quite sterile and does not deteriorate on keeping. It mixes easily and the end-product is homogeneous. There are no large particles and the fat does not separate out. There is no tendency to blockage of the holes in the teat and thus no temptation for the attendant to finger the teat. The fat is very finely divided into globules only one micron in diameter. This aids its digestibility by increasing the surface area exposed to digestive enzymes. The heat treatment modifies the protein physically, with the result that a fine soft curd is formed in contrast to the tough curd of untreated milk. This also is reflected in the stool, which resembles that of a breast-fed infant. The altered protein has less allergenic properties. Finally, evaporated milk can be used for infants of all ages, both mature and premature, and also when cereals are added, if desired. It was therefore decided to adopt evaporated milk for general use in infant feeding in this group of hospitals virtually to the exclusion of all other artificial foods.

It must be stressed that the first choice of feed is always breast milk. This applies not only in the maternity departments of this group but also in the children's general wards. Mothers are admitted with the infant whenever possible for breast-feeding. Expressed breast milk is used whenever it can be procured for appropriate cases.

Preparation of Feeds.—The system known as pre-sterilization is adopted in the milk kitchen. Evaporated milk is eminently suitable for this method. Feeds for 12 or 24 hours are prepared in bulk and the bottles filled, cooled rapidly, and placed in a refrigerator. At feed-time the bottle is placed in a container of hot water and brought to the required temperature.

Premature Infants

It has been repeatedly demonstrated that evaporated milk, suitably modified by dilution with water and the addition of sugar, is as good a feed as any spray-dried, roller-dried, or untreated cows' milk (Ford, 1949; Gruber *et al.*, 1949; Sturrock, 1952). Moncrieff (1956) suggested that perhaps unsweetened evaporated milk is the most practical alternative to breast milk. Sauer (1932) had the opportunity of feeding two triplets on an evaporated-milk formula and comparing them with the third, who was breast-fed. He found that the weight gains were similar, and that frequently the stools could not be distinguished.

A basic formula of one part evaporated milk and two parts water with one level teaspoonful sugar per 4-oz. mixture (3 g. per 100 ml.) of evaporated milk used, serves very well as a feed for premature infants. No rigid quantity per pound is used. It varies widely with different infants. Feeds begin between the second and fifth days of age according to size and condition of the infant. There seems nothing to be gained by using dilute feeds at first. Usually bland fluids are given initially, then a small quantity of full-strength milk formula, and this is increased as rapidly as is practicable up to the amount that experience shows the infant will comfortably

take. This may be 4 oz. or more per pound (250 ml. or more per kg.) body weight per day in some cases. Concentrated vitamins are introduced from the end of the first week and an iron preparation is given by mouth after the first month. Artificially fed infants are usually discharged when they weigh $5\frac{1}{2}$ lb. (2.5 kg.). When expressed breast milk has been available a gradual change over to the milk formula is made when 5 lb. (2.3 kg.) is reached. Usually the mother has by this time considerable experience in caring for her infant, as more often than not she is kept in hospital with the baby. In all cases she is shown the preparation of feeds and the care of teats and bottles. She is given a printed guide to subsequent feeding and is seen from time to time in a follow-up clinic. The local authority is notified in advance of her discharge and she is supervised in the home by health visitors.

It was previously our practice to change from expressed breast milk to a half-cream roller-dried milk. It was often noted that the infants' buttocks quickly became red and not infrequently actually became raw. The sisters from time to time suggested that changing to some other brand of milk would prevent this trouble. The brands were accordingly tried, always with disappointing results. Sore buttocks continued to occur. It was with some surprise that we gradually became aware that when evaporated milk was used there were very few sore buttocks in the premature infants and that when they did occur it was usually as a result of antibiotic therapy and due to thrush infection. This was certainly not one of the findings anticipated when the type of feeding was chosen. The reason for the improved results so far as buttocks are concerned is not very clear. It seems unlikely that sterility is the answer, as a good milk-kitchen technique with terminal sterilization had been employed. It seems likely to be associated with the presentation of the fat, but no special experiments have been done to prove this hypothesis. It is interesting, however, to record Lowenburgh (1929), who wrote of evaporated milk: "Complete digestion of the fat is practically assured and the irritating effect of free fatty acids so troublesome with ordinary milk is eliminated."

Another common finding when a change was made from expressed breast milk to a half-cream milk was that the infant put on a great deal of weight very rapidly and became bloated and rather pale. This appearance is not seen when an evaporated milk formula is used. The infants resemble the breast feeders much more closely than when fed with other types of milk.

Full-term Infants in the Maternity Department

Where breast milk cannot be employed all infants are fed with an evaporated milk formula. The same formula as for premature infants can be used. An average infant will take about $2\frac{1}{2}$ to 3 oz. per pound (156-190 ml. per kg.) body weight by the end of the first week. We have had no occasion to use any other feed. Bland fluids are, of course, given for various reasons, but when milk feeds are begun it is evaporated milk which is invariably used in default of breast milk. The mother is given details of how to carry on after discharge and the usual follow-up arrangements are made. No effort is made to influence her choice should she prefer to use some other type of feed. Feeding full-term infants with the evaporated milk formula has proved to be entirely satisfactory and is accepted as such by all concerned in the maternity department. There is no desire to change back to a dried milk. When the method was introduced there was, of course, as much prejudice within the department as elsewhere, but in the light of experience all that has long since disappeared.

Infants in General Wards for Sick Children

Formerly it was our practice to keep the infant on the feed it had been having up to the time of admission. Thus many brands were employed. This meant that a nurse had to spend a lot of time preparing feeds in the milk kitchen and that there was waste on account of tins going out of date. It was to see if these two factors could be eliminated that the question of a standard feed was considered. As

described above, it was decided to give a trial to an evaporated milk formula, and by general consent the trial has extended into accepted routine.

The present practice is to put all infants who are not receiving breast milk on the evaporated milk formula. This is done without regard to the feed used outside hospital. Bland fluids are used as indicated by the medical condition, but when milk is reintroduced into the diet it is the reconstituted evaporated milk which is employed. If a cereal is necessary, it can be added to the formula without any difficulty, just as it can be added to fresh cow's milk. Bottled pasteurized milk is used when the toddler stage is reached.

So far there has been little need for any other milk. Evaporated milk is used for the ordinary run of cases of respiratory infections, feeding difficulties, meningitis, urinary infections, and the like; and also for the more complicated cases, such as coeliac disease, infantile eczema, and other allergic conditions. It has been used in hypercalcaemia and in hyperchloraemic renal acidosis. But there is no fetish in its use. Other feeds have simply not been necessary. In America it seems commonplace for an infant to require a soya-milk feed in treatment of allergy, but we seem to manage quite nicely without it here. Now that calcium-free milks are available we may perhaps get quicker results with the hypercalcaemic infants, and shall certainly use such a milk if necessary. But experience shows that the standard formula used is an excellent general artificial feed and that there is no necessity to stock various types of branded milks. One might anticipate that some other milk could similarly be used quite successfully. We have not put this to the test, as we feel that evaporated milk is essentially safest and is the least trouble to prepare.

If a high-protein feed is required, a more concentrated formula can be prepared by using less water, or protein can be added to the standard formula. Feeds with a lower fat content are very rarely required. This is probably because the fat is so finely divided into globules. Citration is not commonly employed in this unit, but it can easily be done if desired.

In an Isolation Hospital

Isolation hospital units are usually difficult to staff these days; standardization of feeds is therefore especially desirable if it can be achieved. This has proved to be just as possible here as in other departments. Perhaps the most important type of case to consider is that of gastro-enteritis. We follow the usually accepted practice of rehydration, electrolyte balance, and electrolyte repair, and come eventually to the reintroduction of milk feeds. The usual standard formula can again be employed without any difficulty. It is used just as ordinary milk is used in the older child. If the very wasted infant should require high-protein treatment a stronger—less dilute—preparation of evaporated milk is usually well tolerated. A protein preparation can be added to the ordinary formula if desired. Evaporated milk is similarly used in the dysenteric diseases. Lactic acid feeds and the like appear to be quite unnecessary and the results are at least as good as previously.

Evaporated Milk Outside Hospital

There has been no question of "pushing" this type of feeding by doctors and nurses in the hospitals. Its adoption by those in hospitals has had inevitable repercussions outside. Mothers from the maternity departments have continued to use the preparation when they reach home. Other parents have associated the feed given in the hospital with the recovery of their sick child and wish to continue on the feed. Those whose job it is to market evaporated milks have not, of course, been slow to take advantage of the situation thus created. The result is that the milk is now stocked by the welfare clinics, and those concerned with infant feeding are becoming well versed in the use of evaporated milk. Many mothers keep their infants on the formula until the stage of toddler diet and a few even beyond. Others prefer to use some other feed, and from

the hospital end no attempt is made to influence them one way or the other. It is true to say that in this area parents are "getting used" to evaporated milk for infant feeding. The health visitors are also by now quite accustomed to advising on how it should be used.

There are many substandard homes and many ignorant parents in this area. There is a tendency to think that a tin of evaporated milk is dangerous in such circumstances. This is, of course, the reverse of the truth. A baby taking a full bottle uses a whole tin of milk in a day. As both milk and container are sterile there is little danger here. An infant on a 4-oz. (114-ml.) feed uses a tin in two days. Some manufacturers issue a half-size can, which would be used in one day. If the tin is cleaned on top and pierced by two holes and covered with a clean saucer after each portion of milk is withdrawn, there is little likelihood of contamination. If the tin is kept on the mantelpiece over a hot fire, and cleanliness is not a feature of the family, then there may be some risk of contamination, but it is still likely to be much less than if a dried milk is used. There is an appreciable moisture content in so-called dried milk. The tin lasts not one day or two days, but one week or two weeks. It is not sterile to begin with, and the hand of the preparer of the infant feed is put into the package 20 to 40 times each day—say, over 200 times by the time the package is finished. It is not likely to remain uncontaminated.

Some advocate the preparation of a full 24-hours requirement of food at once. This is, of course, quite suitable for hospitals and for the home in which there is a refrigerator. It is satisfactory in winter in any clean home, but in the less clean home it is probably undesirable. Far better to pour the requirement of each feed into the cleansed bottle and add the appropriate amount of boiled water and sugar, and use straightaway. The residue is best kept in the tin. This should be covered and placed in a cool place as indicated above.

A Formula for General Use

Experience shows that one great and common difficulty besets all who would advise on the use of evaporated milk for feeding of infants. How do we carry in our head the data on which to base a formula for any given child? Most doctors and nurses carry in their heads relevant facts on which they can check feeds if a dried-milk preparation is used. This is usually based on a fluid requirement of $2\frac{1}{2}$ oz. per lb. (156 ml. per kg.) of body weight per 24 hours. If the feed is four-hourly and five feeds are given in a day, then half the expected weight in pounds gives the size of the individual feed—namely, a 10-lb. (4.5-kg.) infant requires about five feeds of 5 oz. (140 ml.) each. This can easily be applied to the evaporated milk if the following formula is used:

Evaporated milk, one-third ..	..	This provides
Water, two-thirds ..	..	about 20
Sugar, a level teaspoonful for every	..	calories per
4 oz. (114 ml.) of the mixture ..	..	oz. (28 ml.)

Thus a 12-lb. (5.4-kg.) baby would require approximately a 6-oz. (170-ml.) feed five times a day. The formula is:

Evaporated milk ..	2 oz. (57 ml.)	Calories	100
Water ..	4 oz. (114 ml.)	..	122½
Sugar ..	1½ teaspoonfuls	..	22½
Per day ..	30 oz. (850 ml.)	..	612

This is an approximation, and many infants will take nearer 3 oz. per lb. (190 ml. per kg.) of body weight. It will be seen that this formula conforms to accepted standards of daily calorific requirement. It is sometimes desirable to give some extra water. This can be given as plain water or as a separate drink containing a vitamin-C preparation.

As with dried foods, some evaporated milk is fortified with vitamin D. It is unwise to rely on this alone to substitute for cod-liver oil, as there is then a deficiency of vitamin A. Sturrock (1952) found that infants so fed had significantly more upper respiratory infections than those fed on other milks and supplemented with additional vitamins in the form of cod-liver oil or vitamin concentrates.

Cod-liver oil or its equivalent plus orange juice or its equivalent should always be given.

In this country evaporated milk contains 33 I.U. of vitamin D₃ per undiluted fluid ounce (28 ml.). This means that when reconstituted there are about 500 I.U. per quart (440 I.U. per litre). National dried milk contains 1,400 I.U. per reconstituted quart (1,230 I.U. per litre) and an average figure for other proprietary powdered milks is 1,600 I.U. per reconstituted quart (1,410 I.U. per litre). In view of the suspicion that idiopathic hypercalcaemia of infancy is associated with a high intake of vitamin D, it will be noted that if evaporated milk is used the additional vitamin A can be given without unduly raising the vitamin-D intake—for example, a teaspoonful of cod-liver-oil compound as issued by the infant and child welfare clinics contains about 700 units of vitamin D and 3,500 units of vitamin A, and if given to supplement a daily intake of 20 oz. (570 ml.) of evaporated milk formula, means a total daily intake of about 950 units of vitamin D plus an additional 3,500 units vitamin A. If, on the other hand, 20 oz. (570 ml.) of reconstituted dried milk were given plus a teaspoonful of cod-liver-oil compound, 1,400 to 1,500 units of vitamin D would be taken daily plus the additional 3,500 units of vitamin A.

Cost as Compared with National Dried Milk

The cost of an ounce (28 ml.) of reconstituted evaporated milk is 0.4 pence and of reconstituted National dried milk 0.245 pence. It would seem on first sight, therefore, that it would cost nearly twice as much to feed an infant on evaporated milk as on National dried milk. This, of course, is far from the truth. The Table shows the relative cost to

	4 oz. (114 ml.) National Dried Milk × 5	4 oz. (114 ml.) Evaporated Milk × 5	8 oz. (227 ml.) National Dried Milk × 5	8 oz. (227 ml.) Evaporated Milk × 5
Baby food per day	4-9d.	8-0d.	9-8d.	16-0d.
Fresh milk, 1 pint	8-0d.	4-0d.	8-0d.	4-0d.
Total cost per day	12-9d.	12-0d.	17-8d.	20-0d.

a family which uses 1 pint (570 ml.) of fresh milk and, for the baby, either National dried milk or evaporated milk, bearing in mind that one cannot have both National dried milk and priority cheap milk for the same infant. While baby is small it is cheaper to feed on evaporated milk than on National dried milk, while when he is big it is more expensive. It is clear that the difference in cost is negligible. It is to be noted that no specific formula is being used here, both milks being merely reconstituted to cow's milk standard for fair price comparison.

Summary

Evaporated milk can be used as an infant feed for premature and mature infants in maternity departments where breast milk cannot be used. It can be used as a feed for infants in wards for sick infants, including wards for infectious diseases. It can be used, with very rare exceptions, to the exclusion of all other milk preparations if desired. A simple method of calculating feeds based on the $2\frac{1}{2}$ oz. fluid per pound (156 ml. per kg.) per day is described. This enables doctors and nurses to prescribe the appropriate feeds as easily as for any other food. It is shown that it makes very little difference to a family budget whether evaporated milk or National dried milk is used.

REFERENCES

- Anderson, P. H. R., and Stone, D. M. (1955). *J. Hyg. (Lond.)*, **53**, 387.
 Ford, J. F. (1949). *Lancet*, **1**, 987.
 Gruber, S., Litvak, A., Rascoff, H., and Norton, R. (1949). *J. Pediatr.*, **35**, 70.
Lancet, 1956, **1**, 241.
 Lowenburgh, H. (1929). *Med. Tms (N.Y.)*, **57**, 84.
 Malcolm, J. F. (1957). *Vet. Rec.* In press. Personal communication.
 Marriot, M., and Schoenthal, L. (1929). *Arch. Pediatr.*, **46**, 135.
 Moncrieff, A. A. (1956). *Infant Feeding*. London.
Monthly Bull. Minist. Hlth (Lond.), 1955, **14**, 203.
 Sauer, L. W. (1932). *J. Pediatr.*, **1**, 194.
 Sturrock, M. E. (1952). *Med. Offr.*, **87**, 243.
 Wilson, G. S., and Miles, A. A. (1955). *Toplay and Wilson's Principles of Bacteriology and Immunity*, 4th ed. Arnold, London.

BLOOD CHIMERISM IN A PAIR
OF TWINS

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This paper describes some tests on the blood of a brother and sister who are twins: the blood groups show that each twin is living on red cells only some of whose ancestors were directly inherited, the rest having been acquired as grafts *in utero* from the opposite twin; the presence of female "drumstick" nodules on the nuclei of some of the polymorphs of the male twin shows that ancestral white cells too must have been successfully grafted. Mixed blood in dizygotic twins is common in cattle but appears to be extremely rare in man.

In 1916 Lillie demonstrated an anastomosis of blood vessels between the chorions of dissimilar bovine twin embryos. Lillie said that the rapidly elongating embryos "meet and fuse in the small body of the uterus at some time between the 10 mm. and 20 mm. stage. The blood vessels from each side then anastomose in the connecting part of the chorion; a particularly wide arterial anastomosis develops, so that either foetus can be injected from the other." Lillie realized that in this anastomosis was to be found the explanation of the freemartin condition: hormones of the male twin, having crossed the anastomoses, could divert the proper development of the sex apparatus of the female twin. This explanation, so far as we know, has not been superseded.

In 1945 Owen discovered that the red cells of dizygotic twin cattle were antigenically a mixture of two kinds and that this could be explained if primordial red cells, having crossed the anastomoses, could take root and grow in the opposite twin. This discovery was of fundamental importance to the theory of the nature of antibodies (Burnet and Fenner, 1949).

In 1953 a blood donor, Mrs. McK., was found to have two kinds of blood (Dunsford, Bowley, Hutchison, Thompson, Sanger and Race, 1953). Of her red cells 60% were O, *kk*, *Jk^aJk^b* and 40% were A₁, *Kk*, *Jk^bJk^b*. On inquiry Mrs. McK. said she had had a twin brother who died in infancy 25 years before. As Mrs. McK.

Note.—In a letter to the *British Medical Journal* in 1953 Mr. S. Baron, of California, said that he himself must be a chimera because in his R.A.F. days he had been told that he was group "AO." Curiously, the grouping had been done by two of us (B. W. I. and R. R. R.), and reference to our records showed him to be a normal group B. We mention this in the hope that the letter will no more be quoted as another example of a chimera.

secreted H substance but no A substance in her saliva it was assumed that the O cells were her own and that the A cells were descendants of immigrant embryonic cells from her brother. Mrs. McK. is normal in every way and is clearly not a freemartin, for she has now had three children. Certain physical properties of the anti-B of Mrs. McK. showed it to be of the kind found in persons of the genotype A₁O, as opposed to the kind found in persons of the genotype OO (Filitti-Wurmser and Jacquot-Armand, 1956).

Five months after the publication of this human example, mixed blood was reported in a pair of sheep twins (Stormont, Weir, and Lane, 1953); the twins were of different sex, and the female was found to be a freemartin.

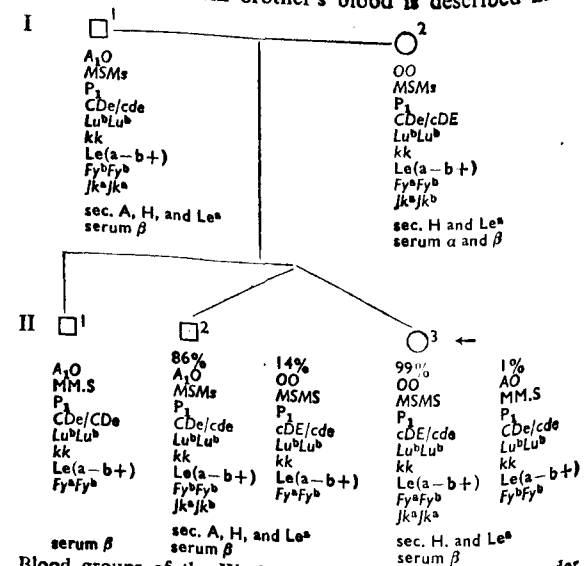
In their masterly work "Quantitative Studies on Tissue Immunity," Billingham, Brent, and Medawar (1956) describe the finding that twin chicks are chimeras—probably all of them.

Another example of chimerism in man is reported by Nicholas, Jenkins, and Marsh (1957) in the present issue of this Journal.

Blood Groups of the Family W.

Recently Miss W., aged 21, made her first donation of blood at the North London Blood Transfusion Centre. Her red cells appeared at first to be a very weak form of group A, for when mixed with anti-A or anti-A+B on a slide and looked at through the microscope very small agglutinates were seen which were vastly outnumbered by unagglutinated cells: anti-B caused no agglutination. The serum of Miss W. contained anti-B but no anti-A. The very weak reaction with anti-A led to the testing of the blood of the W. family and the realization that we were dealing with another example of chimerism, this time with the advantage that both twins were alive.

The blood groups of the family of Miss W. are shown in the pedigree (see Fig.). Nothing unusual was found in the groups of her father or her mother or her elder brother. When the twin brother's blood was tested it was easily seen to be a mixture, because he has a much less unequal proportion of the two components than his sister. The two components of the mixed blood possessed by the twins differ in five systems: ABO, MNSS, Rh, Duffy, and Kidd. The grouping of the twin brother's blood is described first.



Blood groups of the W. family. The groups directly under the twin chimeras, II-2 and II-3, are those of their inherited blood; a little to the right are those of their grafted blood. Antisera used: anti-A, -A₁, -B, -A+B, -H; anti-M, -N, -S, -s, -U, -Mia, -Vw; anti-P+P₁, P₁; anti-C, -c, -Cw, -D, -E, -e, -f, -V; anti-Lu^a, -Lu^b; anti-K, -k; anti-Lea, -Leb; anti-Fya; anti-Jka, -Jkb. Arrow = propositus.

Method of Separating O and A₁

The original method used by two of us (R. S. and R. R. R.) to separate the two components, O and A₁, in the blood of Mrs. McK. was used again. The method is simple in principle. Anti-A is added to the mixed blood in a Petri dish. The larger agglutinates of A cells are collected and are then freed from agglutinin by shaking in the presence of dissolved A substance. The remaining mixture of A and O cells is put into a long tube and left to settle; the agglutinated A cells sink more quickly than the free O cells, which are taken from the supernatant fluid.

As the method has not previously been published it may be useful to give some details here—though doubtless improvements could be made to every stage.

The amount of blood required depends on the proportions of the components. For II-2 three Petri dishes were enough, but for II-3 we used ten before we had a really adequate sample of A cells—for only about 1% of her cells were A.

For the separations we used human anti-A and an extract of the seeds of *Dolichos biflorus*—which agglutinates A₁ cells more avidly than does human anti-A (Bird, 1951). We are grateful to Lieutenant-Colonel G. W. G. Bird, who suggested the use of the extract because of its avidity and because, being a simpler substance than human anti-A, it might later be more easily won from the agglutinated A cells by the A substance. This proved indeed to be true.

Probably the more dilute the extract the better, so long as it can still cause enormous agglutinates of A₁ cells on a slide: a crude extract diluted 1 in 5 was found to sensitize A₁ and O cells for antiglobulin serum, so that subsequent tests had to be on saline suspensions of the separated cells. This difficulty was later overcome by using an extract that had been purified by chemical means: it could probably have been overcome by mere dilution of the extract.

1. Into each Petri dish put 2 ml. of diluted *Dolichos biflorus* extract (or 2 ml. of human anti-A diluted 1 in 2) and 0.5 ml. of a 50% suspension of the A₁:O mixture of cells. Rock until the agglutinates do not seem to be getting bigger. (If the A cells are relatively few the agglutinates are very small and difficult to catch; the agglutinates can be made larger by centrifuging the mixture and returning it to the dish.) Pipette the larger agglutinates into a tube marked A. Rock the dishes again and pipette their contents into a tube marked O; the dishes are washed with a few millilitres of saline, which is transferred to tube O.

2. Fill tube A with saline and invert; when the agglutinates have settled (in a few seconds if they are large ones) remove the supernatant saline; wash in this way three more times. To the deposit of agglutinates add 3 ml. of A substance (Knickerbocker) and 3 ml. of saline. Shake hard and leave for about 20 minutes. Look for agglutinates in the supernatant suspension: if they are present add more A substance or perhaps wait longer. Fill the tube with saline, leave it to stand, first on a slope then vertically, for about an hour. Take as much as needed of the supernatant suspension, and wash the cells therein three times: this is the A sample.

3. While 2 is going on centrifuge tube O to bring small agglutinates together, but do not remove the supernatant antibody and saline. Add more saline, if necessary, to fill the tube; invert. Stand, first on a slope then vertically, for about an hour. Remove sufficient supernatant suspension, and wash the cells therein three times: this is the O sample.

Groups of the Twin Brother, II-2

The addition of anti-A caused large agglutinates to appear, but even by the naked eye a pink background could be seen which the microscope showed to be due to very large numbers of unagglutinated cells.

Some of the results of testing the red cells of II-2, untreated and after separation of the A and O components, are shown in the Table. The groups of the two fractions are given in the pedigree.

Reactions of Certain Critical Antisera with the Red Cells of II-2 Before and After Separation of the Two Components

Red Cells of II-2	Anti						
	-A	-A ₁	-B	-s	-C	-E	-Fy ^a
Untreated	+++*	+++*	-	w	+++*	+	w*
A separated	+++	+++	-	+	+++	+++	-
O	-	-	-	-	-	-	++

The asterisk means that unagglutinated cells were very obvious.

Theoretically the separation could have been made with anti-C, with anti-E, with anti-s, with anti-Fy^a, or with anti-Jk^b, but the relative weakness of these agglutinations and the scarcity of the antisera made the separation with anti-A the obvious choice.

We did, however, make one cross-check. The red cells of II-2 were separated with anti-E (lacking incomplete anti-D) made very avid by the addition of Löw's (1955) papain solution. The separation was successful, for the supernatant unagglutinated cells were CDe/cde, and, as anticipated, they were group A. (They were strongly agglutinated by anti-A and practically no unagglutinated cells were to be seen—in marked contrast to the effect of anti-A on the untreated sample.) The E cells were separated by mixing the blood of II-2 with the same anti-E but without the papain solution. The collected agglutinates could be freed from antibody by simply shaking hard with cold saline. Tests showed these cells to be cDE/cde, and, as expected, group O. (The cells could not be freed from anti-E when papain had been used.)

Groups of the Twin Sister, II-3

The addition of anti-A caused very small agglutinates to appear, but the vast majority of the red cells were group O. The A cells were evidently too few in number to cause any difficulty in grouping by the other antisera, all of which are less sensitive than anti-A. The testing of the O cells was therefore straightforward, and, as expected, the groups were those of the O component in the blood of the twin brother. The separation of the A cells was rather laborious, but it was done by the method described above. The groups of both fractions are shown in the pedigree.

Proportions in the Mixtures

Counts of the proportion of the two kinds of red cells possessed by each twin were kindly made by Dr. P. L. Mollison and Miss Marie Cutbush, of the Medical Research Council Blood Transfusion Research Unit. Several ingenious methods were used and the results were:

Twin brother, II-2	..	A 86%	..	O 14%
Twin sister, II-3	..	A 1%	..	O 99%

Genotypes of the Twins

Both twins are secretors: the brother secretes in his saliva A and H (and Le^a), the sister secretes H (and Le^a). This would seem to establish beyond doubt that the genetic groups of the boy twin are those of the A series and of the girl twin those of the O series. The saliva of the boy twin did not differ detectably from that of his father in the amount of A and H substance it contained.

White Cells of the Twins

Dr. W. M. Davidson has kindly examined films of the blood of the twins and of their parents. In the films of the male twin polymorphs were found with the "drumstick" nuclear knobs present normally only in females (Davidson and Smith, 1954). The proportion of cells with "drumsticks" was compatible with a mixture of male and female blood in the proportion shown by the blood groups.

Discussion

Ninety per cent. of dizygotic bovine twins are said to have mixed blood, but in man it must be a great rarity. Were it not so the Transfusion Services would have detected more ABO mixtures, for, in England, about 34% of dizygotic twin pairs differ in their reactions with anti-A or with anti-B. (This figure is extracted from Smith and Penrose, 1955, Appendix Table 2, which gives phenotypic sib-sib frequencies for the ABO system in England.) The Blood Group Research Unit has tested, without finding a mixture, samples of blood from 77 pairs of twins thought by skilled observers to be dizygotic: 68 of them differed in their ABO, MNS, or Rh groups, and the antisera of these three systems should have been able to detect mixtures, had they occurred, in one or the other twin. (Of the remaining nine pairs, seven differed on other systems.)

It follows that anastomoses between dizygotic human twins either must be very rare or must develop at a time when the ancestral blood cells are losing their faculty to take root in a foreign bed, or when the host tissue is becoming less tolerant of immigrant cells. Professor J. D. Boyd thinks that anastomoses are rare but probably not as rare as the very infrequent recognition of chimeras would suggest. In monozygotic twins, on the other hand, mixed blood must be very common—though undemonstrable.

Judging by the W. twins it seems that, in man, the proportion of the two kinds of blood in one twin is independent of the proportion in the other twin. This is not what happens in cattle, for according to Irwin (1955) each of a pair usually has the same mixture; that is to say, if twin A has 60% A blood and 40% B blood then his fellow twin B will also have 60% A blood and 40% B blood.

Dr. Davidson's finding of female "drumsticks" in the nuclei of some of the polymorphs of the male twin shows that the ancestors of these cells too can be successfully grafted. The proportion of polymorphs with "drumsticks" was compatible with a graft of the extent shown by the red cells; if this proves a general rule it may have useful implications in the study of the lineage of these cells.

The female twin is of the genotype OO, and 99% of her red cells are group O. Her serum contains anti-B but no anti-A. The absence of anti-A is presumably a manifestation of the phenomenon of acquired tolerance, studied particularly by Billingham, Brent, and Medawar (1953, 1956); the presence of A cells early in uterine life has presumably inhibited the production of anti-A.

In cattle and in fowls the tolerance to foreign blood cells acquired in foetal life can later be shown not to be limited to blood cells: the majority of dizygotic twin cattle are fully tolerant to grafts of each other's skin (Anderson, Billingham, Lampkin, and Medawar, 1951), and the same is true of chickens (Billingham *et al.*, 1956). Professor Medawar and his colleagues think it probable that skin could be successfully grafted between Miss W. and her twin brother.

Both twins are secretors. They secrete the ABH antigens for which they have inherited genes: they do not secrete the antigens of their grafted red cells. From this we may assume that the ABO genes do their parallel work of manufacturing water-soluble A, B, and H substance in cells other than those in which they are busy providing alcohol-soluble A, B, and H substance for the red cells.

The first human chimera to be recognized, Mrs. McK., has demonstrated conclusively, by having three children, that the hormones of a human male foetus had no power to upset the normal sexual development of his female twin. In the parallel situation a cow is sterile. Evidently the human male is backward, compared with the bull, in developing his endocrines—which is perhaps not surprising considering the relative tempo of their two lives. In man we suppose that the embryonic female hormones have no effect on the development of the male twin—but on this point there is so far no evidence.

Summary

Two human blood chimeras are described—twins of different sex. The male twin has 86% A₁ and 14% O red cells; he also has female "drumsticks" in some of his polymorphonuclear white cells. The female twin has 99% O cells and 1% A cells.

The A₁ cells are MSMS, CDe/cde, Fy^bFy^b, Jk^aJk^b; the O cells are MSMS, cDe/cde, Fy^aFy^b, Jk^aJk^a; in their other groups they do not differ. Secretion tests on saliva show that the A₁ series belongs genetically to the male twin and the O series to the female.

We are grateful to the blood donor, Miss W., and to her family, who have been most generous in their help. We are indebted to Dr. Amos Cahan, of the Knickerbocker Foundation, New York, for a large supply of A substance.

- REFERENCES
- Anderson, D., Billingham, R. E., Lampkin, G. H., and Medawar, P. B. (1951). *Heredity*, 5, 379.
- Billingham, R. E., Brent, L., and Medawar, P. B. (1953). *Nature (Lond.)*, 172, 603.
- (1956). *Phil. Trans.*, 239, 357.
- Bird, G. W. G. (1951). *Curr. Sci.*, 20, 298.
- Burnet, F. M., and Fenner, F. (1949). *The Production of Antibodies*, p. 103. Macmillan, Melbourne.
- Davidson, W. M., and Smith, D. R. (1954). *British Medical Journal*, 2, 6.
- Dunsford, I., Bowley, C. C., Hutchison, A. M., Thompson, J. S., Sanger, R., and Race, R. R. (1953). *Ibid.*, 2, 81.
- Flitt-Wurmer, S., and Jacquot-Armand, Y. (1956). *Rev. Hémat.*, 11, 58.
- Irwin, M. R. (1955). In *Biological Specificity and Growth*, edited by E. G. Butler, p. 68. Princeton Univ. Press, New Jersey.
- Lillie, F. R. (1916). *Science*, 43, 611.
- Löw, B. (1955). *Vox Sanguinis* (old series), 5, 94.
- Nicholas, J. W., Jenkins, W. J., and Marsh, W. L. (1957). *British Medical Journal*, 1, 1458.
- Owen, R. D. (1945). *Science*, 102, 400.
- Smith, S. M., and Penrose, L. S. (1955). *Ann. hum. Genet.*, 19, 273.
- Stormont, C., Weir, W. C., and Lane, L. L. (1953). *Science*, 118, 695.

HUMAN BLOOD CHIMERAS A STUDY OF SURVIVING TWINS

BY

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The term "chimera" (originally a fabulous fire-spouting monster, part lion, part goat, and part serpent) has been used in botany for many years to denote an individual plant in which there are two or more tissues differing in their genetic constitution, such as a graft hybrid. Its first application in mammalian physiology appears to be that of Anderson, Billingham, Lampkin, and Medawar (1951), who applied it to the condition in cattle mentioned below.

It has long been known (Owen, 1945) that communication between the circulations of binovular bovine twins can occur *in utero*, resulting in an interchange of erythroblasts with persistence throughout life of mixed blood groups. The only such human chimera hitherto reported has been that of Dunsford, Bowley, Hutchison, Thompson, Sanger, and Race (1953), in which, unfortunately, one twin died in infancy. We now present a study of twins both of whom are chimeras and whose relatives were available. Simultaneously with this, another pair of chimeras is being reported by Booth, Plaut, James, Ikin, Moores, Sanger, and Race (1957).

The propositus, Mrs. W., is a healthy married woman aged 29 who attended for antenatal blood grouping in July, 1956. She has now had three pregnancies resulting in healthy children. When her blood was tested with anti-A serum moderate-sized agglutinates were seen in a sea of free cells. Further investigation showed her blood cells to be of two distinct groups. Her twin brother, both parents, husband, and all her three children were studied. The brother, as was first shown by Dr. Dorothy Parkin, is also a chimera. Neither of the twins has ever had a blood transfusion.

Methods

The mixture of cells in each chimera was separated by differential agglutination, using anti-A and group O sera in parallel, and the proportion of free group O cells determined by triplicate counts in a haemocytometer. Deposited group A cells were freed of the α -agglutinin by elution at 56° C., but then gave equivocal results with most antisera.

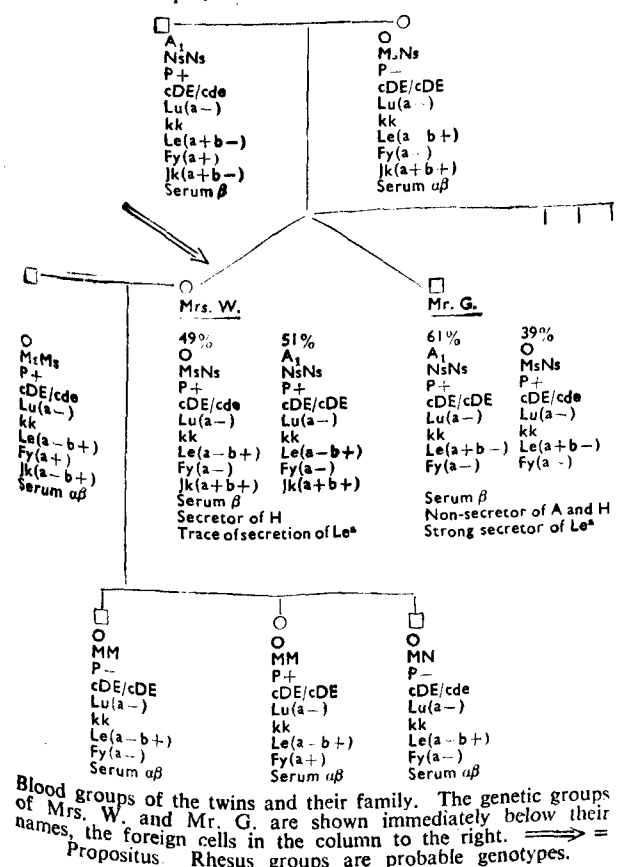
The A cells were also separated by differential agglutination with a potent anti-M serum, but became panagglutinable in human serum, having presumably been coated with incomplete anti-human species agglutinins. The genotype of the A cells was therefore largely deduced by comparison of the results of mixed-field agglutination with those obtained on the separated O cells. Dr. Race, Dr. Sanger, and Miss Moores also separated the A cells, using the method described by them (Booth *et al.*, 1957), and confirmed our deductions. We have since been able to elute the human anti-A used for our separation by a technique similar to theirs but using A-secretor saliva. We have checked the results on Mrs. W. on the A cells thus separated.

The antibodies used for grouping were: anti-A, A₁, B, A+B, H; anti-M, N; anti-P; anti-C, D, E, c, e; anti-Lu^a; anti-K; anti-Le^a, Le^b; anti-Fy^a. *Ulex europaeus* anti-H and rabbit anti-M and N sera were used, other sera being of human origin. Appropriate controls were employed throughout. Kidd and S grouping was done by the M.R.C. Blood Group Research Unit, who also checked the Lewis groups, using two anti-Le^a and two anti-Le^b sera.

In testing for Le^a substance serial doubling dilutions of saliva were mixed with one volume of diluted anti-Le^a serum and left at room temperature for 30 minutes. One volume of Le(a+) cells in albumin was then added and the mixture examined microscopically after two hours' incubation. The results are shown in the Table. Standard

Saliva	Anti-Le ^a	Anti-H	Anti-A
Control group O Le(a+) ..	1 in 64	No inhibition	No inhibition
" O Le(a-) ..	1 " 2	1 in 32	" "
Mr. G. " " " " " "	1 " 128	No inhibition	" "
Mrs. W. " " " " " "	1 " 2	1 in 32	" "

quantitative techniques were used for estimation of A and H substances in saliva. The sera of the family were tested against a panel of fully grouped cells covering the ABO, MNS, P, Rhesus, Lutheran, Kell, Lewis, Duffy, and Kidd groups in saline, serum/albumin (1:1), and by the indirect Coombs technique.



Coverslip films of capillary blood were made and examined for nuclear sex of the neutrophils by Dr. W. M. Davidson (see Davidson and Smith, 1954).

Results

The results of investigating the eight members of the family are shown in the pedigree (see Fig.). Each of the twins has blood of two distinct types, differing in ABO, MN, and Rhesus groups. All Mrs. W.'s cells are, however, Le(a-b+) and all Mr. G.'s Le(a+b-). The twins are of different secretor status; the Table shows their saliva reactions. The sera of both twins contain anti-B agglutinin to a titre of 1 in 64. Tests at various temperatures in saline, serum/albumin, and using anti-human globulin serum failed to demonstrate anti-A either free in the serum or blocking or coating the cells. No irregular antibodies were detected. The cells and sera of the remaining six members of the family showed no abnormality.

Nuclear sexing of the neutrophils revealed six "drumsticks" in 318 cells in Mrs. W.'s blood, and six in 338 in Mr. G.'s. Mrs. W.'s Arneht count was 3.27 and Mr. G.'s 3.30.

Discussion

There can be no doubt that the mixed blood groups arise from the interchange of erythroblasts *in utero*. The only alternative theory, that of somatic mutation, is excluded by the occurrence of a similar condition in both twins and the involvement of more than one blood group system and of the leucocytes.

Mrs. W.'s husband is of group MM and two of her children are of this group. It therefore follows that her genetic group must contain an M gene, and is therefore the O series given directly under her name in the Fig. This is confirmed by the fact that she is a secretor of H but not of A. Mr. G.'s genetic group cannot be determined with certainty as he is a non-secretor of ABH substance, and is unmarried. It seems reasonable, however, to presume that it is A₁, thus accounting for the A₁ cells in Mrs. W.'s blood.

It is now well established (see Race and Sanger, 1954) that Le(a+) individuals are all non-secretors of water-soluble ABH substance and secretors of Le^a, and that Le(a-) individuals are nearly all ABH secretors with only a trace of Le^a in the saliva. The secretor status of the twins corresponds to the Lewis groups found. Sneath and Sneath (1955) have shown that red cells take the Lewis group of the plasma in which they are suspended. This was demonstrated by transfusion experiments and also *in vitro*, and they suggest that the Lewis antigens are adsorbed to the cells from the plasma. Stormont (1949) has shown that the antigens of the J group of cattle behave similarly, and also that interchange of blood groups in bovine chimeras does not include the J group. The foreign cells in the circulation of each of the twins we have described have adopted the Lewis group of the host. Our results therefore bear out Sneath and Sneath's conclusions that the Lewis antigen belongs to the tissues and is only secondarily attached to the red cells; they also closely parallel Stormont's findings.

Our findings on Mrs. W. support the view that the early existence of group A cells has suppressed the formation of anti-A. It is of interest that Mr. G. has not produced anti-M or anti-e in response to the foreign MNEe cells. Although Mrs. W. is a secretor and although her blood contains 51% of borrowed group A cells she is not able to secrete A substance in her saliva.

We have so far shown the presence of foreign red cells in each twin. Foreign white cells of the "chromatin-positive" type normally found only in the female are also present in Mr. G.'s blood. It is probable that foreign leucocytes are present in Mrs. W., though it is more difficult to be certain in her case. On the basis of her Arneht count the number of chromatin-positive cells is rather low. The fact that the number of chromatin-positive leucocytes is similar in both twins is in keeping with our finding of roughly equal proportions of red cells of the two types in

each twin. Because of the presence of foreign leucocytes it seems more appropriate to call these people blood chimeras than blood-group chimeras. We have found no evidence of hormonal effects; Mrs. W. is a normal healthy woman with three healthy children and therefore not a freemartin.

There are two pairs of twins among first cousins, but one of each pair died in infancy. Attempts have been made to investigate the survivors, but so far without success.

Summary

A pair of binocular twins is described, each of whom has blood which is a mixture of the same two distinct types differing in ABO, MN, and Rhesus groups. Each twin has, however, only a single Lewis group, and the Lewis groups of the twins are different, each corresponding to that expected from the secretor status. A family study of the blood groups has been made. Nuclear sexing of neutrophils shows that foreign leucocytes are present in the blood of the male twin and probably present in the female twin.

It is considered that these are chimeras similar to that reported by Dunsford *et al.* The Lewis group findings confirm the demonstration by Sneath and Sneath that the Lewis antigen belongs to the tissues and is only secondarily attached to the red cells. Results in the Lewis group are comparable with those in the J group of bovine chimeras.

We are indebted to Mrs. W. and all her family for their co-operation in this investigation; to Dr. Dorothy Parkin, of the Medical Research Council Blood Group Reference Laboratory, for some of the preliminary investigations of the twins, and also for first demonstrating that Mr. G. is also a chimera; to Dr. R. R. Race, Dr. Ruth Sanger, and Miss Phyllis Moores, of the Medical Research Council Blood Group Research Unit, for checking our results, determining the Kidd and S groups, and examining A cells separated by their technique. We are also grateful to Dr. Race for much valuable advice and to Dr. W. M. Davidson, of King's College Hospital Medical School, for undertaking the nuclear sexing.

REFERENCES

- Anderson, D., Billingham, R. E., Lampkin, G. H., and Medawar, P. B. (1951). *Heredity*, 5, 379.
Booth, P. B., Plaut, G., James, J. D., Ikin, E. W., Moores, P., Sanger, R., and Race, R. R. (1957). *British Medical Journal*, 1, 1456.
Davidson, W. M., and Smith, D. R. (1954). *Ibid.*, 2, 6.
Dunsford, I., Bowley, C. C., Hutchison, A. M., Thompson, J. S., Sanger, R., and Race, R. R. (1953). *Ibid.*, 2, 81.
Owen, R. D. (1945). *Science*, 102, 400.
Race, R. R., and Sanger, Ruth (1954). *Blood Groups in Man*, 2nd ed. Blackwell Scientific Publ., Oxford.
Sneath, J. S., and Sneath, P. H. A. (1955). *Nature (Lond.)*, 176, 172.
Stormont, C. (1949). *Proc. nat. Acad. Sci. (Wash.)*, 35, 232.

Medical Memorandum

Leukaemia and Oestrogen Therapy

Oestrogens have been shown by many workers to produce neoplasms in experimental animals. The risk of producing or accelerating neoplastic growth in human therapy is usually thought to be entirely hypothetical, provided that the dosage is within the usual therapeutic limits, which is much less than that used in experimental work.

Kirschbaum (1951), Burrows and Horning (1952), and Gardner (1953) have reviewed the literature on the effects of oestrogens on the incidence of leukaemia in mice. It is clear that, experimentally, oestrogens do increase the incidence of leukaemia in animals and that this is of the lymphatic type.

No record has been found of human lymphatic leukaemia associated with oestrogen therapy. A case is recorded in which lymphatic leukaemia occurred during stilboestrol therapy for carcinoma of the prostate.

CASE REPORT

A man aged 70 was seen as an out-patient in March, 1953, with symptoms of frequency and dysuria, said to be of six weeks' duration. The prostate was not enlarged, but was hard and nodular. The other findings relative to our story were that the liver was not palpable and that no abdominal mass was felt, indicating that the spleen was not palpable. Some posterior cervical glands were noted. Radiological examination revealed no metastases in spine, pelvis, and skull. The blood count on April 1 showed: haemoglobin, 86% (12.6 g./100 ml.); R.B.C., 4,410,000 per c.mm. A leucocyte count was not made. The formaldehyde stable acid phosphatase was 35 units per 100 ml. A diagnosis of prostatic carcinoma was made, and stilboestrol therapy was begun. He was treated as an out-patient. About the middle of April 10 mg. thrice daily was prescribed, and during the next few months he had 4,000 mg.

On September 19 his general practitioner observed marked oedema of the legs and an enlarged spleen. He was referred to the out-patient department, and the blood count on September 29 was: haemoglobin, 55% (8.1 g./100 ml.); R.B.C., 2,800,000 per c.mm.; formaldehyde stable acid phosphatase, 0.8 unit per 100 ml. A leucocyte count was not done.

On October 31 he was admitted to hospital with severe symptoms of anaemia. Blood count on November 1 showed haemoglobin, 28% (4 g./100 ml.); R.B.C., 1,620,000 per c.mm. Leucocytes 44,000 per c.mm. (lymphocytes and smear cells 95%, polymorphs 5%). Spleen was enlarged to the level of the umbilicus. Blood transfusions were given, and the degree of anaemia fluctuated accordingly. The total leucocyte count increased to 70,000 on November 12 and fell to 38,200 on the 16th, with no change in the type of cell present. Marrow aspirated from the ilium on November 10 showed the appearances typical of lymphocytic leukaemia. Death occurred on November 21.

At post-mortem examination enlarged glands were found in the neck, mediastinum, mesentery, and around the aorta and common iliac arteries. The spleen was grossly enlarged (1,400 g.), and had some infarcts. The prostate was enlarged, but not hard; it contained a few small firm masses. The marrow of the lower lumbar vertebrae was leukaemic. In the prostate was a moderately well differentiated carcinoma. The spleen and glands showed typical lymphatic leukaemia.

COMMENT

There is no proof that this patient did not have leukaemia before receiving stilboestrol therapy. The leucocyte count was not performed, but, if normal, lymphatic leukaemia would not have been excluded, as experience shows that when all cases of anaemia are exhaustively investigated the aleukaemic variety is relatively common. The haemoglobin and red-cell count were almost normal at the beginning of therapy; no splenic enlargement was noted, but posterior cervical glands were present. If leukaemia were already present before stilboestrol therapy, progress would at this age be slow, and the cell type was well differentiated.

Thus there are three alternatives: the stilboestrol induced the leukaemia; the stilboestrol accelerated the leukaemia; the lymphocytic leukaemia of well-differentiated cell type in an elderly person presented as a rapidly progressive and fatal anaemia. Therefore I regard this last alternative as improbable.

Co-operation from Mr. F. I. Evans, Dr. Blair Macaulay, and Dr. N. C. W. Owen is gratefully acknowledged.

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REFERENCES

- Burrows, H., and Horning, E. S. (1952). *Oestrogens and Neoplasia*, p. 80. Blackwell, Oxford.
Gardner, W. U. (1953). *Advances in Cancer Research*, 1, p. 204. Academic Press, New York.
Kirschbaum, A. (1951). *Cancer Res.*, 11, 742.

Reviews

PAEDIATRICS FOR THE G.P.

Pediatrics. Edited by Donald Paterson, M.D., and John Ferguson McCreary, M.D. (Pp. 654+xvi; illustrated. £5 10s.) Philadelphia and Montreal: J. B. Lippincott Company. London: Pitman Medical Publishing Co. Ltd. 1956.

This Canadian textbook, to which 37 authors have contributed, has been "designed primarily for the physician in the general practice of medicine"; it is planned to be less comprehensive than the large textbooks for consultant paediatricians, but fuller than a synopsis. It should serve its purpose well, for it contains a great deal of information set out to emphasize diagnosis and treatment; and it may be accepted as authoritative. The editors are to be congratulated on their success in maintaining balance between the various sections, and they have added materially to the usefulness of the book by their careful attention to cross-references. The details of treatment are clear, and a praiseworthy attempt has been made to underline the importance of giving necessary explanations and guidance to parents. Many readers will find the chapters on paediatric gynaecology, adolescence, and therapy and procedures especially welcome.

There are surprisingly few spelling mistakes for a volume of this size, but please may we have Kinnier Wilson's name spelt correctly in the index? And the index as a whole might be made more helpful by some rearrangement—for example, by placing "mental retardation" and "cerebral palsy" under the main headings of "mental" and "cerebral" respectively. The book is well produced, with a paper of good quality, and there are nearly 200 illustrations, including radiographs and a few coloured plates.

N. B. CAPON.

CERVICAL DISK LESIONS

Lesions of the Cervical Intervertebral Disc. By R. Glen Spurling, M.D. (Pp. 134+xi; illustrated. 36s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1956.

This book is a companion to an earlier volume on lesions of the lumbar intervertebral disk by the same author. Unlike the lumbar lesions, however, cervical disk disease has not yet a well-established pathology and symptomatology, and it is therefore a more controversial subject. After a description of the anatomy of the cervical spine, Dr. Spurling gives his views on the clinical and pathological aspects. These, rather than a critical assessment and evaluation of current opinion, form the substance of the work. It is therefore not surprising that few readers will be in entire agreement with what he has written; but what is said is clearly said, and this makes the book most acceptable. The extent of difference of opinion is illustrated by the range in the reported incidence of soft cervical disk protrusions at operation. This varies from 17% to 85%, and is 64% in the present work. Opinion in Britain is more in accord with the lower figure (from Sweden). This may be because the disease behaves differently here, or because greater distinction is drawn between acute traumatic disk herniation and the sequelae of chronic degenerative disease—usually referred to here as cervical spondylosis (a term which is given a more restricted meaning in this book). Such differences naturally affect the emphasis laid on various methods of treatment and the indications for their use. Some of the recommendations are open to criticism, regardless of opinion about the cause of various symptoms. For example, many consider that myelography may aggravate demyelinating disease and would therefore not agree with the advice that this investigation should be done in most cases when this condition is suspected and cranial structures are not affected. Among technical points, the recommended use of hemilaminectomy has the disadvantage that exposure is limited and the dentate ligaments cannot be divided on both sides; post-operative

exercises are not mentioned; and the fluoroscopic technique described exposes the surgeon to considerable irradiation. In the management of the case conservative treatment is recommended initially, but the use of a collar is dismissed and intermittent halter traction is alone advised, regardless of the age of the patient or the condition of his vertebrae.

There is still an inadequate amount of information about the correlation of radiological abnormalities and clinical symptoms and signs of cervical intervertebral disk disease, and this book does not remedy the deficiency. Every aspect of the subject is under review, and this work is a useful record of current thought in an important neurosurgical centre by a surgeon of great experience.

P. H. SCHURR.

RHEUMATOLOGY

Contemporary Rheumatology. Proceedings of the Third European Rheumatology Congress, The Hague, 1955. Edited by J. Goslings and H. Van Swaay. (Pp. 683+xix; illustrated. 95s.) London: Cleaver-Hume Press Ltd. 1956.

This is a very handsome and well-edited volume. It contains a record of the proceedings of the Third European Rheumatology Congress, which was held in Holland in 1955. A full summary is given of all the papers presented, which seems a pity, as some of these are worthless. Luckily, however, many of the papers printed in this volume are of importance, and these justify the rather high price asked for it. The contents are arranged under five headings: (1) rheumatic fever, with eighteen papers; (2) connective tissue, with 22 papers; (3) spinal arthritis, with 33 papers; (4) rheumatism in its relationship to social medicine, 18 papers; (5) 33 papers on miscellaneous aspects of the rheumatic diseases. Nearly half of the papers are in English, but those which are not are followed by a brief summary in English, and many have a useful bibliography. There are also a full index and a number of illustrations.

W. S. C. COPEMAN.

CLINICAL PHYSIOLOGY AND PATHOLOGY

Klinische Physiologie und Pathologie. By Ferdinand Hoff. (Pp. 1,120+xii; illustrated. D.M. 79.50.) Fifth edition. Stuttgart: Georg Thieme. 1956.

The first edition of this work on clinical physiology and pathology by Professor Ferdinand Hoff was published in 1950, and it speaks well for the success it has achieved that the present volume should constitute the fifth edition in the short space of seven years. This latest edition has undergone complete revision and considerable enlargement in the light of modern research in the whole field of general medicine. The success of the book has also been recognized in several countries outside Germany. The author holds an almost religious belief in the dependence of clinical medicine on the application of anatomy, physiology, pathology, and psychosomatic and social medicine. He relates this interdependence in every system under discussion and shows the repercussions of these factors on the patient as a whole. So fervent is Professor Hoff's belief in the essential integration of medicine that he repeats himself somewhat too often. One is glad to see physiology and pathology brought, as it were, to the bedside—an attitude that is all too infrequent at the present time; but the thoroughness, not to mention discursiveness, with which this is done tends to detract from its real value.

The causes, symptoms, and manifestations of the diseases discussed—and they involve the whole of general medicine—are set forth clearly, but treatment does not come within the purview of the work, and to this extent, in my opinion, diminishes its usefulness. After reading the book, however, no student or postgraduate, in whatever sphere, should be guilty of divorcing illness at the bedside from the basic principles of applied physiology and pathology—the foundations of medicine—and the specialized worker should not fail to guard against the risks of a too narrow specialization. Turning from the general to a particular example; in the section on diseases of the lungs there is a singularly wide

breadth of approach to, among other things, the problems of the pulmonary circulation and respiratory function, embodying the researches of physiologists, pathologists, and clinical workers. Again, the anatomical and functional relationship of the heart and lungs, which work as a single oxygenating unit, is fully appreciated, and it is recognized that disorders of deranged function in the one may easily lead to secondary changes in the other. Professor Hoff emphasizes that damage to any part of the circuit will affect the efficiency of the whole.

The production of the book reaches the usual high standard of the Georg Thieme publishing house. The profuse illustrations comprise, in the main, good-quality clinical and x-ray photographs. One would have preferred to see the relevant bibliography at the end of each chapter rather than, as at present, at the end of the whole book. Criticisms notwithstanding, the author's broad and philosophic conception of medicine should appeal to British clinicians.

PHILIP ELLMAN.

HEARING DEFECTS IN CHILDREN

Hearing Defects of School Children. By the Committee on Defective Hearing of the Scottish Council for Research in Education. (Pp. 114+x. 10s. 6d.) London: University of London Press Ltd. 1956.

This report is by a committee of Scottish teachers and one medical officer of health, and is based on hearing tests by pure-tone audiometry of 4,170 12-year-old primary-school children in the County of Fife carried out by four second-year students from a teachers' training college after four weeks' training in such tests by a headmaster of a school for severely deafened children. The committee had originally envisaged a much larger survey, and regards this as a pilot scheme.

The early chapters on technical considerations of audiometry and on previous investigations are informative and interesting, but the rest of the report reveals little that is not already well known. No old stone has been left unturned, and perhaps the most useful feature is the committee's suggestions for further research. It feels that more research is needed on the relationship between the ability to hear speech and testing for pure tones; on improved tests of ability for deaf children; on the standard technique to be adopted in audiometric testing; on a more precise classification of children with defective hearing for educational purposes; and on the variability of defects of hearing. If the committee had widened the field from which its members were drawn and included at any rate a brace of otologists it is possible that some of what is suggested as further research might have formed part of the present investigation.

TERENCE CAWTHORNE.

STROKES

Management of Strokes. By Keith W. Sheldon, M.D. (Pp. 134+x; illustrated. 24s.) Philadelphia and Montreal: J. B. Lippincott Company. London: Pitman Medical Publishing Co. Ltd. 1956.

This short book is one of the "Practitioners' Pocket Book" series. Its basic purpose is excellent: to stress the fact that there are many possible causes for sudden cerebral catastrophes and that in a number of these cases active investigation and treatment are necessary. The author underlines the importance of adequate history-taking and examination, and apparently this truism needs restating if the comment that "spinal puncture is used as an excuse not to do a neurologic examination" is valid. The author's intention is not completely fulfilled by his book. There are short accounts of many conditions which may cause coma or sudden hemiplegia, and much useful information on their management, but the presentation is somewhat confusing and no clear indication is given of when special investigations such as angiography or air encephalography should be undertaken. The illustrations are copious and vary from reproductions of angiograms to line drawings

more reminiscent of a strip cartoon than of a medical book. This type of cartoon may perhaps be useful in stressing detail, but it should be accurate; the picture of a foot resting on an object labelled "foot on hot plate—no reaction" with the caption "Dejerine-Roussy syndrome" seems somewhat misleading when a prominent feature of the thalamic syndrome described by these authors is usually over-reaction to diffuse stimuli. It is unusual also to spell berry aneurysm with a capital B, which would seem to suggest that this is an eponym rather than a description of the lesion. In spite of these criticisms the book will be of real value if it interests doctors generally in the problem of acute cerebral episodes and their adequate treatment.

J. W. ALDREN TURNER.

ACUTE COR PULMONALE

Le Cœur Pulmonaire Aigu dans l'Embolie Pulmonaire. By A. Tourniaire, M. Tartulier, F. Deyrieux, and J. Blum, with the collaboration of Pierre Marion. Preface by R. Leriche. (Pp. 190; illustrated. 3,700 frs.) Paris: Expansion Scientifique Française. 1956.

This is a good monograph, the title of which may be translated as "The Acute Pulmonary Heart in Pulmonary Embolism," unless, as Gibbon once said, one veils the name in the obscurity of a learned language and calls it acute "cor pulmonale." There does not seem to be any satisfactory name for intense or chronic embarrassment of the right ventricle. As the authors point out, the term is not synonymous with pulmonary embolism, but denotes a more or less sudden failure of the right side of the heart from acute rise of pressure in the pulmonary arteries due to various causes. Stressing the importance of medical cases, the authors give a clear picture of the clinical findings, noting the importance of jugular engorgement and right ventricular *bruit de galop*. There is a long chapter on the important cardiographic aspects. The limb leads receive rather more notice than the precordial. The great difficulty in appreciating the very wide range of abnormalities is made clear, particularly in those cases where the heart is already abnormal, which is likely to be the case in patients with "medical" disease. The cardiograms are excellent. The chapter on physiopathology is particularly interesting, and surveys very well the effects of reflex pulmonary vasoconstriction and of the rise in pressure in the coronary sinus causing stagnation in the cardiac circulation. Finally the surgical treatment is discussed and the chances and risks weighed: whether to wait too long and kill a moribund patient, or embark on a dangerous and perhaps fatal operation and prevent possible recovery. All this is sanely dealt with. This monograph is an excellent piece of work. It lacks an index and table of contents, but there are 28 pages of references.

TERENCE EAST.

OBSTETRICS SIMPLIFIED

The Gist of Obstetrics. By H. B. Atlee, M.D., F.R.C.S., F.I.C.S. (Pp. 327+ix; illustrated. 45s.) Springfield, Illinois: Charles C. Thomas. Oxford: Blackwell Scientific Publications. 1957.

Dr. H. B. Atlee is Head of the Department of Obstetrics and Gynecology in Dalhousie University, Halifax, Canada. This small book, with large type and clear line-drawings, with a racy style and a touch of humour here and there, is based on lecture notes prepared for his students. It reduces obstetrics to very simple proportions by avoiding nearly all theory (even in the case of the "disease of theories"—toxaemia of pregnancy) and by dogmatically laying down only a few lines of treatment. The methods of management advised are not always in accord with general opinion or modern knowledge, but they are not supposed to be—the book purports to describe only those methods which have been found to work best in Dr. Atlee's clinic. Which only goes to show that obstetric practice is, and should be, largely determined by its environment.

T. N. A. JEFFCOATE.

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EVIDENCE OF A DIVIDED PROFESSION

The Representative Body at its special meeting last week decided to give evidence to the Royal Commission. The meeting did not appear to reach this decision with any great pleasure. It was, it seemed, influenced to do this by the fact that the Royal College of Physicians had somewhat eagerly made the same decision some few weeks earlier—an action which made it all the more difficult for the meeting to vote in favour of the resolutions that made the giving of evidence conditional on the inclusion of public health doctors in the terms of reference of the Commission; or, alternatively, on the immediate setting up of an independent inquiry into their remuneration and status. Dr. S. Wand, the Chairman of Council, and had, with the Chairman of the Public Health Committee, strongly urged the Minister of Health in a personal interview to include the public health doctors in the Commission's review if the profession decided to give evidence. But Mr. Vosper's hands appear to have been tied by the local authorities. If the consultants had been content to hold their hand and had then joined with the other two branches of the profession in deciding finally on what terms the profession as a whole might have been prepared to co-operate with the Royal Commission the outcome might well have been different. If, in spite of difference of opinion on tactics and timing, the profession had remained united in achieving a common aim—because there were no differing views on this—then they could have advanced from a position of strength. But the lamentable fact is that unity was lacking, and many consultants as well as general practitioners have voiced their strong and justifiable dissatisfaction with the immediate causes of this.

The principal comfort offered to the medical officers in the public health service was expressed in the following resolution passed by the Representative Body last week.

"That in the opinion of this meeting, the Association should submit evidence to the Royal Commission but reiterate its strong disapproval of the

exclusion of doctors employed by local authorities from the terms of reference of the Commission, and should undertake, in any discussions connected with the findings of the Royal Commission and by all available means, to press for the safeguarding of the position of these doctors relative to that of other members of the profession."

If those speaking on behalf of medical officers of health last week were critical of their general practitioner and consultant colleagues in the Representative Body for not passing the resolution they pressed for, they were equally critical of the position they find themselves in as employees of local authorities—of the local governments of this country. Never before, we believe, has there been such outspoken demand for separation from local government, for, in fact, incorporation in the body of medicine. Never before, certainly, has there been such general discontent with the position all medical men find themselves in to-day. Indeed one venerable voice was heard to declare that doctors in the N.H.S. were in fact the employees of Parliament. Even though this may not be strictly the legal fact of the case of medicine in Britain to-day, support for this view may well be found in the fact that within recent months the Prime Minister has announced in Parliament what immediate increases in pay doctors are to receive. Many still do not seem to appreciate the implications of this. But a long debate on motions urging that Council should give evidence only if the validity of the Spens Reports were first tested in the Courts showed that the Representative Body realized what was at stake. These motions were not carried when the Representative Body learned from the Chairman of Council that Counsel's opinion was against such a course. Other motions, however, showed that the Representative Body is determined to be vigilant. For example, a motion by Torquay, agreeing that evidence should be given, at the same time stressed "the need for (1) negotiation in all disputes, and (2) arbitration in all cases where negotiation fails." Other motions were passed urging that the machinery and method of withdrawal from the N.H.S. be kept under constant review, that plans be formed for mass resignation if a satisfactory settlement is not reached, and that the Council should "proceed urgently with preparations for an alternative 'Health Scheme.'" Whatever the Government may think it has achieved, it cannot congratulate itself on the grave and widespread dissatisfaction it has provoked among doctors working in Britain's much-vaunted National Health Service.

It would be wrong to disguise the fact that the present controversy has revealed a profession divided in itself as it has never been before. We fear that the

fact that several different professional bodies are to give their separate pieces of evidence to the Royal Commission may increase this division. The profession has failed to present evidence as one body—evidence in which the views and claims of different sections of doctors could have been co-ordinated, and which, so presented, would have had the overwhelming force that united action alone can provide. Harsh things were said about this at the Representative Meeting last week, as the report in this week's *Supplement* shows. While it is salutary for these discontents to be brought to the surface and not allowed to smoulder, it is profitless to perpetuate them. A real and sincere effort must be made in the coming months to heal the differences that exist among members of the same profession—a profession that is at the cross-roads in its relationship with the State. General practitioners see themselves as having to bear the brunt of the battle if an open conflict breaks out. They see themselves, too, in an especially difficult position as their livelihood depends to-day almost entirely on their employment in the N.H.S. through their contracts with local executive councils. Consultants and specialists see that it is the hospitals owned by the State that for the most part provide the tools of their craft and accommodation for their patients. They can withdraw only to a very limited extent into other premises, and in this respect feel themselves at a disadvantage as compared with the general practitioners, who in their turn see the consultants enjoying still a large measure of private practice. Both regard the N.H.S. as having disrupted the mutual relationship and dependence that used to exist before, and that certainly made them conscious of their belonging together to the same profession. The public health doctors have seen their previous contacts with clinical medicine broken, their association with the hospital life of the country interrupted, and their status gravely impaired. And they give bitter expression to their feeling of being isolated in the profession to which they belong.

There is no quick and easy answer to these many urgent problems facing the medical profession to-day. Whatever mistakes may have been made from time to time by this or that section of our membership, what does stand out is that the N.H.S. is so constructed as to facilitate and indeed encourage them. If the N.H.S., as so many believe, awaits a much-needed reform, it will be re-shaped to the benefit of the public, and of the profession, only if we can compose our differences, close our ranks, and preserve that variety in unity which makes for a satisfactory relationship. To achieve this, magnanimity and tolerance will have to be joined to intelligence and energy.

SIR RONALD ROSS, 1857 TO 1932

Throughout history malaria has been one of the most persistent and most widespread of diseases. Once endemic in vast areas of the world and afflicting millions of people every year, its hold is now gradually being broken and an active campaign for its complete eradication is being pursued vigorously by the World Health Organization. That such an ambitious project could be conceived and planned is, as its Director, Dr. M. G. Candau, emphasized in his speech at the Ross Centenary luncheon on June 3, the result of the work of Sir Ronald Ross, who established the basic principles guiding this campaign 45 years before the introduction of D.D.T. and similar insecticides. Had Ross lived to hear these words the disappointment and frustration which filled his later years would all have been swept away. Awarded the highest scientific and public honours he was yet denied the greatest satisfaction which can be given to any discoverer—that of seeing his discovery bring immediate and universal benefit to his fellows. An uncompromising and outspoken individualist, he often showed impatience with what seemed to him the laggard and unimaginative methods of governments and civil servants. A phrase ever on his lips was one used by Edward VII, "If preventible, why not prevented?" By such phrases sovereigns can sometimes stir their governments into activity. To Ross it was a battle-cry backed by every argument of logic, economics, and duty. He was an idealist leading a crusade and those who were not obviously active in his cause were against him. It is of such stuff that all the great reformers are made but which is found more rarely in the laboratory. The eradication of malaria, once successful, will count as one of the greatest medical triumphs of all time, and it has taken a world organization to attempt it. That Ross could even foresee its possibility is characteristic of his imaginative and creative mind. To his work in the laboratory he brought the attributes of the poet and novelist in whose work such diverse critics as John Galsworthy and Sir Osbert Sitwell have seen the light of literary genius. Concentration to the point of obsession, combined with unswerving devotion to his aim, is one of the marks of the poet. That these same qualities served to reveal the truth about the transmission of malaria was no accident. By all the standards of academic research to-day, when individualism is at a discount, Ross would seem the most unlikely of candidates for such an important role. He once remarked that "as a matter of fact, nearly all the ideas in science are provided by amateurs, such as my uncle Ross; the other gentlemen write the textbooks and obtain the professorships." This shaft was a charac-

teristic one, and the attitude which inspired it may explain why his formal medical training, while satisfying the requirements, elicited little of the determination and ardour which he was to show in India when confronted with the tragic human problem of malaria.

Ronald Ross, the eldest of the ten children of General Sir Campbell Ross, was born on May 13, 1857, at Almora in India, where his family, of Scots descent, had long been established. It was at his father's wish that he enrolled at Bart's in 1874 in order to train for the Indian Medical Service, and after seven years of somewhat perfunctory studies his modest aim was achieved. For several years, in the leisure afforded by routine duties, he cultivated his undoubted literary talents and published two verse dramas and a novel. His work in India had interested him in sanitary matters, and during a year's leave in 1888-9 he obtained the then newly established diploma in public health and took a course in bacteriology with Professor Klein. In spite of this evidence of a more serious interest in medical problems he was, five years later, almost determined to give up medicine and devote himself entirely to literature, but another leave in London, in 1894-5, was to prove a turning point in his career. Already acquainted with the pioneer work of Laveran, who had first identified the malaria parasite in 1880, as well as with the theory that the mosquito was the carrier of the disease, he submitted a successful Parkes prize essay which convincingly refuted the older miasmatic theories, still widely held. Nobody in India had succeeded in demonstrating the malarial parasite, and Ross's first view of it was given him by Patrick Manson, who showed him specimens found in the blood of a patient in Charing Cross Hospital. Manson had discovered that the filariae of sufferers from elephantiasis were ingested by mosquitoes, and he had already formed a hypothesis which incriminated the mosquito as the insect vector of malaria. He thought, however, that the disease reached man in drinking water contaminated by parasites from the mosquitoes which rested on it. Nor did he know which of the many varieties of mosquitoes was the carrier. He urged Ross to find out.

Filled with determination to succeed in this task Ross returned to India. After two years of work which called for the utmost patience and courage a short and modest communication was sent to this *Journal* and published on December 18, 1897. It announced the discovery of *Plasmodium falciparum* in two *Anopheles* mosquitoes. Manson's theory of the vector had been proved correct and the species had been named. The date of this discovery, August 20, 1897, Ross himself named as "Mosquito day." Ross then went on to demonstrate scientifically the

route by which the parasite was transmitted and so to disprove the second part of Manson's hypothesis. At Manson's suggestion he studied the organism responsible for avian malaria and traced its passage from the stomach to the salivary gland of the mosquito whence it passes into the skin and blood stream of a healthy bird. The lesson for human malaria was obvious and was proved beyond doubt when put to the test. The news of this great step forward was given by Manson to the annual meeting of the British Medical Association at Edinburgh in July, 1898. Ross's own report was published in this *Journal* in the following February (p. 432).

With his scientific work on the aetiology of malaria completed Ross resigned from the I.M.S. in 1899 and took the chair of tropical medicine at Liverpool. There he began his long campaign for the application of the new knowledge which he had done so much to establish. The first handbook of the Liverpool school, published in 1900 (and in many later editions) was "Instructions for the prevention of malarial fever, for the use of residents in malarious places." A year later he visited the United States and examined and advised on malarial control in Panama. Surgeon-General Gorgas said many times that the building of the canal would have been impossible without the work of Ross. Others were not slow to appreciate the significance of his achievement. A fellowship of the Royal Society in 1901 was followed by the Nobel Prize for medicine in 1902 and many other distinctions from universities and learned societies all over the world. Official appointments and a knighthood (in 1911) failed to make him an orthodox committeeman. Literature was still a powerful attraction; he composed music and formulated ingenious and unorthodox mathematical theories and systems; for many years his editorship of *Science Progress* made that journal one of the most original and vigorous of scientific periodicals. But all these were diversions. His main energies were still given to the passionate advocacy of his great cause—prevention of malaria by mosquito control—and in this cause he attacked "obstructionists" wherever he found them with such pugnacity and candour that he antagonized many who might have welcomed a different approach. The general public responded readily to his fervour and indignation, and in 1926 he saw a tangible memorial of his endeavours when the Prince of Wales opened the Ross Institute and Hospital for Tropical Diseases at Putney (now in the London School of Hygiene and Tropical Medicine). It was, however, a heavy commitment for an ailing man of 70, and financial worries embittered his few remaining years. His death, in his own institute on September 16, 1932, was noted in newspapers throughout the world.

Now, twenty-five years later, when new technical aids and new materials, new national and international organizations have brought his great project within the bounds of possibility, it has not been necessary to argue the merits of the scheme. Although he did not realize it, Ross had won his case.

TOXICITY OF STREPTOMYCIN

It has been recognized since soon after its introduction to therapeutic use that streptomycin may damage the eighth nerve, more commonly the vestibular branch. Dihydrostreptomycin, at first thought to be free from this disadvantage, soon proved to be equally dangerous, and more often to the auditory branch. The results of such damage may be a fair price to pay for life-saving treatment, such as that for miliary tuberculosis or tuberculous meningitis, but the penalty is excessive when the indication for the treatment was some lesser condition and particularly when some innocuous form of chemotherapy might have served equally well. That even moderate doses may be dangerous to patients with impaired renal function was pointed out eight years ago by K. Graf,¹ who defined the maximum permissible dose for prolonged treatment if permanent vestibular damage is to be avoided as 24 mg. per kg. of body weight; lesser doses than this down to 16 mg. per kg. were said also to cause vestibular disturbance, but usually of a temporary nature. This author also observed that children tolerate the antibiotic better than adults. D. T. Carr and his co-workers² reviewed the records of 10 patients at the Mayo Clinic in whom vestibular disturbance or deafness was produced by dihydrostreptomycin, and found reasons for this effect in all but one of them. These authors believed that such damage is apt to result if the blood concentration exceeds 60 µg./ml.: this level was either shown or suspected to have been exceeded in four patients because of impaired renal function, and in five because of excessive doses, either individual or total (2 g. daily in one dose or 1 g. three times a day).

Most clinicians have probably heard of occasional patients who have suffered eighth-nerve damage from only a short course of streptomycin, the dose not being excessive, and have been content to assume either an idiosyncrasy or perhaps unrecognized impairment of renal function. That this is not a very rare occurrence and indeed apparently becoming more common is evident from the findings (see p. 1444) of Mr. T. Cawthorne and Mr. D. Ranger at the National Hospital for Nervous Diseases, Queen Square. In the past six successive years they have seen 2, 3, 2, 2, 4, and 9 patients (total 22) who have suffered eighth-nerve damage, affecting vestibular function in 21 and hearing in 3, from total doses of streptomycin not

exceeding 20 g. The total dose was 10 g. or less in 12 patients, and in only 7 was a daily dose of 1 g. exceeded. With one exception, a man of 25 with gross renal damage, they were middle-aged or elderly patients. This confirms the greater susceptibility of older people, but the paper also makes it very clear that re-education to compensate for loss of vestibular function becomes increasingly difficult with age, a point being reached at which the permanent disability is very great. Two of these patients are recorded as having demonstrable impairment of renal function, and in these it was evidently of a severe degree, the disorder treated being pyelitis in a solitary kidney. But it is noteworthy that in several others the indication for giving streptomycin suggests a possibility or likelihood of renal insufficiency: in two this was nephrectomy, in one tuberculosis in a solitary kidney, and in two nephrolithiasis. It would be interesting to know whether the remaining patients, in whom the diagnosis suggests no renal abnormality, had in fact normal renal function, at least for their age and so far as existing tests will reveal. It may well be that capacity to excrete streptomycin furnishes a more delicate test of renal function than those in routine use. If, on the other hand, these toxic effects can occur in patients who excrete streptomycin normally, another mechanism must be invoked to explain them. To know this is particularly important, because on it depends whether the risks of the treatment can be determined beforehand or not.

It is abundantly clear that streptomycin should be given with great caution, if at all, to patients with damaged kidneys, unless the indication for it is tuberculosis in a potentially fatal form. Only four of these 22 patients were treated for this infection: the diagnosis in the remainder either implies that the drug was given prophylactically as cover for surgery, or suggests an infection for which an alternative form of chemotherapy might well have served. It is to be hoped that few surgeons now feel it necessary to administer streptomycin or indeed any antibiotic as cover for "laparotomy," "arthrodesis of toe," or "hernia." In resection of the colon, oral neomycin is preferable to streptomycin by either route, and in various urinary and other infections sulphonamides, the older and newer urinary antiseptics, and a variety of other antibiotics are possible alternatives. Several years ago high medical authorities in the United States reached the conclusion that streptomycin should be reserved, with few exceptions, for the treatment of tuberculosis, and the findings reported here lend further support to such an attitude. This antibiotic should certainly never be administered without good and clear reasons. Perhaps the principal temptation to its unnecessary use is the existence of several proprietary mixtures of penicillin and streptomycin, the forerunners of other mixtures claimed to possess

virtues exceeding those of any single antibiotic. The indications for this combination with few very uncommon exceptions are doubtful, and those for which it is chiefly given are better served by penicillin alone.

BLOOD GROUP CHIMERAS

The chimera was a fabulous animal of classical mythology, made up of parts of three other known "ordinary" animals. The term was first applied scientifically to plants made up of tissues from more than one genetically separate individual. In the animal kingdom chimeras are much rarer than among plants and are almost entirely confined to the lower phyla. They are perhaps best known among insects, in which, since the secondary sexual characters are determined by the genotype of each separate tissue and not by hormones, sex chimeras are not uncommon and each component shows normal characters. It is not difficult to create chimeras in the lower vertebrates, but, as one ascends the scale, immune reactions make this progressively harder.

Among the mammals probably the first examples were found by F. R. Lillie,¹ who showed that in non-identical bovine twins the blood vascular systems frequently fused at the 10–20 mm. stage, thus making cross-transfusion possible: he also showed that the hormones of one twin may affect the other and that this effect is permanent, the adult female twin being sterile, owing presumably to the effects of her male twin's hormones *in utero*. This work was considerably extended in 1945 by R. D. Owen,² who showed conclusively that in cattle the red blood cells of each twin could survive in the body of the other in adult life—that is, that the cells were not merely crossing from one twin into the other but were tissue homografts surviving and regenerating themselves in the host and that the host was tolerant to them. He cites a case of superfecundation where each calf had, in addition to its "own" cells, cells of a group that it could have inherited only from the sire of the other calf, and it proved possible to separate the two types of blood cell *in vitro*. In 1953 the phenomenon was described in man.³ In this case a group O individual who lacked α agglutinin in her serum not only had A cells in her circulation, but was regenerating these A cells and tolerant of them, and was not sterile. This observation is of fundamental immunological importance.

In 1949 L. D. Felton⁴ defined the phenomenon of "immunological paralysis": he used it to describe the impairment of immunity caused by injecting adult mice with very large doses of type-specific pneumococcal polysaccharide. The non-appearance of antibody is

almost certainly due to the long persistence of the antigen in the tissues, but the effect, though long-lasting, is not necessarily permanent. The term "immunological tolerance" is used to describe the acceptance of homografts by animals which have been injected with living homologous cells before, or very shortly after, birth.⁵ It has further been shown that this state of tolerance can be induced by injecting foetal or newborn animals with foreign proteins, and that this state appears to be permanent. B. Cinader and J. M. Dubert⁶ demonstrated that this tolerance was specific, rabbits rendered tolerant to human albumin at birth being still capable of making antibodies to other proteins (for example, tobacco mosaic virus). This presumably explains why all the five reported chimeras—the original case of I. Dunsford and his co-workers³ and the two pairs reported in this issue by P. B. Booth *et al.* (p. 1456) and by J. W. Nicholas *et al.* (p. 1458)—contain β agglutinins in their sera and are normal and healthy. They do not appear, for example, to have a lowered resistance to infection owing to a general inability to make antibodies. One might venture to suppose from this that chimeras, truly group O but with A cells in their circulations, could in certain circumstances make some form of anti-A, and this has in fact been shown to happen. The original case, Mrs. McK., made anti-A during pregnancy and this subsequently disappeared.⁷

The implantation of primitive blood cells in the host may take place at an early stage by placental fusing—haemocytoblasts are found in placental tissue up to two months' gestation, and this agrees with Lillie's finding in cattle. However, in order to effect immunological tolerance the transplant need not necessarily take place as early as the 10-mm. stage. M. Simonsen⁸ showed in chickens that with non-persistent antigens the time of injection is critical, too early injection giving no response. This does not apply directly to homografts, when the antigen persists, but a later fusing of circulations (if, indeed, mixing of placental circulations is essential to explain this phenomenon) may explain why the human chimeras are not freemartins—the mixing taking place after each sex is firmly established. The presence of the opposite twin's white cells, as well as red cells, in the circulation of the chimera is strongly suggestive evidence of the transplantation of primitive haemocytoblasts before differentiation. In general the immunological characters of red cells are determined by the genotype of the primitive blood cell. That other characters (the presence or absence of Le^a and Le^b) could be acquired chameleon-like from the surrounding tissues was shown by J. S. Sneath and P. H. A. Sneath,⁹ who demonstrated this *in vitro* and also found it *in vivo* in recently transfused patients. The case reported by J. W. Nicholas *et al.* (p. 1458) is of particular interest in that this state of affairs has been found "occurring naturally." This may be taken, perhaps, as further evidence of R. Grubb's¹⁰ hypothesis (subsequently confirmed by R. Ceppellini¹¹) that the Lewis^a genotypes are expressed fundamentally in the body fluids and only incidentally in the red-cell agglutinogens.

Acquisition of tolerance to red blood cells may lead some to suggest that haemolytic disease of the new-

¹ Graf, K., *Schweiz. med. Wschr.*, 1949, 79, 793.

² Carr, D. T., *et al.*, *J. Amer. med. Ass.*, 1950, 143, 1223.

¹ Lillie, F. R., *Science*, 1916, 43, 611.

² Owen, R. D., *ibid.*, 1945, 102, 400.

³ Dunsford, I., Bowley, C. C., Hutchison, A. M., Thompson, J. S., Sanger, R., and Race, R. R., *British Medical Journal*, 1953, 2, 81.

⁴ Felton, L. D., *J. Immunol.*, 1949, 61, 107.

⁵ Billingham, R. E., Brent, L., and Medawar, P. B., *Philos. Trans. Roy. Soc. B*, 1956, 239, 357.

⁶ Cinader, B., and Dubert, J. M., *Brit. J. exp. Path.*, 1955, 36, 515.

⁷ Dunsford, I., and Stacey, S. M., *Proceedings of the 6th Congress of the International Society of Blood Transfusion*, 1956, 39, 21.

⁸ Simonsen, M., *Acta path. microbiol. scand.*, 1956, 39, 21.

⁹ Sneath, J. S., and Sneath, P. H. A., *Nature (Lond.)*, 1955, 176, 172.

¹⁰ Grubb, R., *Revue d'Hematol.*, 1950, 5, 268.

¹¹ Ceppellini, R., *Proc. V. Int. Cong. Biol. Trans.*, Paris, 1954, p. 207.

¹² Billingham, R. E., and Brent, L., *Transplantation Bull.*, 1957, 4, 67.

born due to anti-D could be prevented by the induction of immune tolerance, by injecting rh-negative girls with Rh-positive blood at birth. R. E. Billingham and L. Brent¹² have pointed out that this might be dangerous, for they demonstrated that mice injected at birth with spleen showed in development a deficiency of lymphoid tissue inversely proportional to the degree of tolerance, leading in extreme cases to non-development and early death.

A diagnosis of "chimera" must never be made on the blood-group picture alone; the microscopic appearance of group A₃ cells in the presence of α or $\alpha\beta$ grouping serum is characterized by the presence of small agglutinates in a field of unagglutinated cells. This appearance may be similar to that of chimera blood, and the resemblance may be enhanced by the absence of α from the serum of the A₃ blood. In the blood of all cases examined, both of Owen's cattle and of the human chimeras, there was evidence of mixed cell population on more than one blood-group system, though one cannot assume that in all cases twins will differ on more than one system or even on one. In suspected cases a history of a twin should be sought, and to confirm the diagnosis the bloods should be separated, with the recovery of at least one sample in pure form (in A₃ blood the sample cannot be separated into two lots of cells with different agglutination properties). When the diagnosis has been confirmed, further investigations on the case, and hence in this field generally, would be most desirable. It would be of great interest to interchange skin grafts between the twins to confirm or refute P. B. Medawar's belief (referred to in the paper by Booth and his colleagues) that such grafts would be permanently tolerated. In particular, it would be profitable to study the survival time of the homograft cells in the chimera, since this might show whether the organism is immunologically paralysed or, as one would expect, immunologically tolerant.

BIRTHDAY HONOURS

The elevation to the peerage of Sir Horace Evans will give great pleasure to his many friends and colleagues in the medical profession. The citation after his name in the official list reads simply, "Physician," and all will warmly welcome the recognition thus accorded to a most distinguished doctor and, through him, to clinical medicine. Sir Horace succeeded Lord Dawson of Penn as physician to Queen Mary in 1946 and was appointed physician to King George VI in 1949 and to Queen Elizabeth II in 1952. Few members of our profession can have had to bear, with such skill and devotion, such a grave responsibility as fell on Sir Horace during his care of King George VI in the serious illnesses which preceded his death in 1952.

Among those who receive a knighthood is Professor G. R. Cameron, F.R.S., who occupies the chair of morbid anatomy at University College Hospital Medical School. An Australian, he graduated at Melbourne University in 1922, and was appointed to a readership at U.C.H. in 1934. His name is associated particularly with profound studies of the structure and function of

the animal cell. He has rendered important services to the Agricultural Research Council, especially in relation to the toxicity of insecticides, and to the nation in time of war by his studies of the physical effects of war gases. Two other Australians to be knighted are Major-General F. K. Norris, who served in a score of campaigns in both world wars and became Director-General of the Australian Army Medical Services, and Professor A. B. P. Amies, professor of dental surgery at Melbourne University. Professor G. W. Pickering, now Regius Professor of Medicine at Oxford, has brilliantly combined the pursuits of clinical medicine and research, most notably perhaps in his work on the blood pressure. In this work in clinical science he was inspired by the late Sir Thomas Lewis, under whom he worked at University College Hospital. Professor Pickering was professor of medicine at St. Mary's Hospital from 1939 until his appointment to the Regius Professorship of Medicine at Oxford University, where his many gifts will be brought to bear on both teaching and research. Other recipients of knighthoods for their medical services are Dr. R. Brunel Hawes, who served for many years in the Colonial Medical Service, and was formerly professor of medicine at the King Edward VII College of Medicine, Singapore, and Mr. J. H. Pierre, a distinguished consulting surgeon in Trinidad. The K.C.V.O. is conferred on Mr. Ralph Marnham, surgeon to the Queen. Two members of the medical profession are also knighted for political and public services; they are Colonel M. Stoddart-Scott, a Conservative Member of Parliament since 1945, and Mr. S. T. Irwin, consulting surgeon and member of the Northern Ireland Parliament; Mr. Irwin is a past president of the Northern Ireland Branch of the B.M.A.

INTERNATIONAL FEDERATION OF SURGICAL COLLEGES

Sir Harry Platt, P.R.C.S., recently presided at a meeting in London at which the decision was taken to establish an international Federation of Surgical Colleges. Representatives attending the meeting came from the Royal College of Surgeons of England, the American College of Surgeons, the Royal College of Surgeons of Edinburgh, the Royal College of Surgeons in Ireland, the Royal Faculty of Physicians and Surgeons of Glasgow, the Royal Australasian College of Surgeons, the Royal College of Physicians and Surgeons of Canada, l'Academie de Chirurgie de Paris, the Belgian Surgical Society, the Royal College of University Surgeons of Denmark, the Dutch Association of Surgeons, the Italian Society of Surgery, the Norwegian Surgical Society, and the Swedish Surgical Association. The members of the new Federation will not be individual surgeons but such national surgical institutions as may be elected to membership. The inaugural meeting is to be in Stockholm in July, 1958. The purpose of the Federation is an admirable one—to improve and maintain the status of surgery throughout the world. Launched under such favourable auspices and already assured of the support of many of the world's leading surgical colleges, the federation should soon be in a position to make a substantial contribution to the advancement of surgery.

THORACIC SURGERY IN CZECHOSLOVAKIA A RECENT VISIT TO PRAGUE

BY

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The dominating feature of the post-war scene in Europe is the sharp division between the "free" western and the Communist eastern states. In many people's thinking this has even led to the impression that the countries east of the iron curtain are not really European at all, but nothing could be further from the truth. Everywhere in Europe one recognizes a common culture based originally on the Christian religion. The general background is quite different from regions where other religions are followed, such as the Middle East or the Far East.

Invitation to a Medical Congress

During recent months there has been a notable relaxation of tension between east and west, although relations have undergone a sharp decline since the Hungarian rising. Nevertheless in certain directions, notably in Poland and Czechoslovakia, the relaxation of restrictions persists, and the present possibility of meetings between professional men seems likely to prove one of the most hopeful signs for the future health of the European Society of Nations that has appeared for many years. In Britain, it is true, we still look upon the eastern European countries with mingled apprehension and interest, and it was with a mixture of these feelings that I received last autumn an invitation to read a paper at a Czechoslovak national congress on lung resection in Prague. But as I could discern no political implications I resolved to go in spite of the turbulent events in neighbouring Hungary.

The congress was held in December under the auspices of the Czechoslovak Medical Association, an active body with a number of clinical Sections, of which the Pulmonary, Phthisiological, and Surgical were co-operating for the present occasion. The meeting was unusual in that foreign speakers had been invited. I found myself in the company of (among others) Professors Nuboer (Utrecht), Boris Ossipov (Moscow), Nicolai Amosov (Kiev), and W. M. Rzepecki (Zakopane, Poland). There were in fact a number of other guests from Poland, from Eastern Germany, from Bulgaria, from Yugoslavia, and one from distant Pekin. I do not know the exact figure of local physicians and surgeons who attended the congress, but the number must have been in the region of 250.

The proceedings were opened on December 9 by the Czechoslovak Minister of Health, to whom the guests were presented beforehand. He was followed by Professor Diviš (Prague)—the Grand Old Man of thoracic surgery in Czechoslovakia—who gave a historical survey of lung surgery. We were then treated to a show of medical films produced by the State Film Corporation which included a subject familiar enough in this country but unthinkable for a film—a warning to patients not to waste the time of doctors and hospitals! We also saw an excellent film on rehabilitation after spinal injury and a cartoon on the danger of alcohol for drivers.

Standard of Thoracic Surgery

A summary of the remainder of the proceedings will probably give the best indication of the scope of discussions and the level of attainment that has been achieved in thoracic surgery in Czechoslovakia. On December 10 and 11 the subject was resection for tuberculosis, and on December 12 bronchiectasis was the topic. The general sub-

ject of lung resection for tuberculosis was discussed in excellent papers by Professor J. Procházka (Hradec Králové) from the surgical standpoint and by Dr. Mydlil (Zámbek) from the physician's point of view. The papers summarized a nation-wide experience of 1,066 resections which had been performed by 16 Czechoslovak surgeons and followed up for a minimum period of twelve months. That this method of treatment is of recent application in general is shown by the fact that only 28% of the total number had a follow-up period of more than two years. The operative mortality (12.3% in men, 7.3% in women) seemed very high by current British standards, but 78% of patients followed for a least one year remained well. It was clear that many patients were operated on without the period of preparation by chemotherapy and rest that most workers in Britain consider essential for good results. Professor A. Fingerland (Hradec Králové) gave a masterly survey of the pathological features of resected specimens.

On the second day there was an interesting paper by Dr. E. Janěfk and two colleagues (Prague) on the fate of a group of 464 tuberculous patients who were discharged from hospital during 1951–2, and who would have been eligible for resection treatment on present standards. They were for various reasons treated by other methods. It was observed that 95.5% of the whole group were still alive; 66% were "clinically cured," 11% improved, and 18.5% unchanged or worse. It was shown that a selective pneumothorax gives good results in suitable cases, and the opinion was confirmed that thoracoplasty is on the whole a satisfactory operation. This type of survey, while subject to the limitation of all "might-have-been" thinking, is useful in providing a firm basis for the work of the thoracic physician and surgeon, whose viewpoint is changing constantly with new developments in treatment. Dr. M. Kubín and Dr. J. Kruml (Prague) made an interesting bacteriological study of resection specimens, and their paper and the previous one emphasized again the opinion that patients on the whole were not treated for sufficiently long before operation to give optimum results. Resistance to streptomycin was noted twice and to P.A.S. and isoniazid six times each in 152 positive cultures from resection specimens.

On the third day Professor Fingerland reviewed the pathological anatomy of bronchiectasis, and Professor K. Šiška (Bratislava) described the results of a national survey of the surgery for bronchiectasis in adults (over 15 years of age). This disclosed that only 269 resections for bronchiectasis had been performed at ten different centres in the country between 1947–55. That the surgical treatment of this disease still presents a considerable problem was evident from the fact that there was a large complication rate and an overall operative mortality of 8%, though this had been reduced to 2% in the hands of the most experienced surgeons. Professor Rapant and his colleagues in a paper on the surgical treatment of bronchiectasis in children reported a 4% mortality in 72 cases.

The procedure at the meeting differed from that current in Britain in that there was no opportunity for immediate discussion or comment on the papers. The afternoons were devoted to communications from the guests. Among these I reported a study from Aintree Hospital, Liverpool, of 399 cases of lung resection for tuberculosis which had been followed up for a minimum period of five years. Speakers from other countries described their own experiences and it became clear that, while conditions were less favourable for the wide use of resection for tuberculosis in Yugoslavia, Bulgaria, Russia, and China, the method is increasingly being used in all these countries. No doubt resection is not so often applicable as in Western Europe because of the poor living conditions, which make it necessary to treat patients with very advanced and active disease.

Visits to Hospitals

Apart from the congress itself a visit was organized to the military hospital at Hradec Králové, about 65 miles (105 km.) north-east of Prague. This is a large modern hos-

pital in which, despite its name, most of the staff and patients are civilians. Professor Jaroslav Procházka is the chief of the surgical clinic, which is well organized and equipped. There is a particular interest in thoracic and cardiac work, and full facilities for cardiac investigation are provided. We saw a mitral valvotomy most competently performed by Dr. Procházka using the modern technique. We were also taken on a ward round where an excellent selection of thoracic surgical cases was demonstrated. The pathological department under Professor Fingerland, and the x-ray department under Professor J. Baštecký were excellently organized and equipped.

Personal visits were made to the second surgical clinic in Prague, which is under the charge of Professor Diviš. This is an eighteenth-century hospital with massive walls and long gloomy corridors, though the wards I saw were small and cheerful enough. Not very much routine thoracic surgery seemed to be done here, however. I also visited the second surgical clinic at Brno, which is under the direction of Professor Jan Navrátil. In spite of the familiar difficulties of old buildings and insufficient equipment, the work done here is obviously first class. I saw a mitral valvotomy and a lobectomy performed with great skill. They have a large experience of mitral valvotomy—more than 300 cases—and success in a few of the more difficult types of cardiac operation, such as for aortic stenosis and atrial septal defect.

Impressions of the Medical Scene

The general impression I got of thoracic surgery in Czechoslovakia was that great interest is taken in all aspects of the subject, and that very great progress had been made during the last few years. Before the war the level of achievement seems to have been much as in Britain and Germany in 1938, but the German occupation put a stop to further advance until about 1947, when contact with Western nations was resumed. These contacts ended after the coup d'état in 1948. Nevertheless interest was maintained and progress made almost entirely through reading reports in the literature and applying the methods described therein. It is in fact remarkable and heartening to see how much practical progress can be made in this manner. Where instruments and apparatus have been lacking, the deficiency has been made up as well as possible from local resources. There is no lack of surgical skill and clinical acumen, and whatever else may be thought of the organization of the State there is no doubt that the medical profession has maintained its traditional standards intact. In fact, one may surmise that, beset by difficulties such as we in Britain can hardly appreciate, the doctors of Czechoslovakia have been thankful to belong to a profession to which they have always been able to give their wholehearted devotion.

We visitors were comfortably accommodated in a hotel, and those of us who did not speak Czech or German were provided with a personal interpreter, usually a doctor or a doctor's wife, who accompanied us everywhere. In the evenings we went to the Ballet and the Opera, and there was an official dinner. As a whole we were a very cheerful and friendly group, and conversation and inquiry were at all times free between us as far as the language barrier would permit. Many interesting facts emerged, such as the impression that there is no shortage of doctors in Czechoslovakia but a considerable difficulty in obtaining nurses of sufficiently high quality. This seems to be largely due to a ban on nursing by members of religious orders during the past few years.

The tuberculosis situation in the Balkan countries is evidently extremely serious, and I was told that the sanatorium beds in Czechoslovakia had been increased five-fold compared with before the war, yet many thousands of patients still wait for admission. It is evidently seldom possible to treat them long enough in hospital, while domiciliary treatment is severely limited by very primitive housing conditions. In Bosnia, it seems, housing conditions are such that there is on an average only one bed to every three and a

half persons in the population. Furthermore, it appears that the health insurance scheme is not always able to provide costly drugs for ambulant patients.

Life in Prague

Prague itself had a general air of drabness which almost hides the beauty of a city extremely rich in architectural treasures. All the shops were open on Sunday morning, but the goods for sale, though reasonably plentiful, did not offer very great variety, and were on the whole rather expensive and of distinctly inferior quality. Clothes were particularly expensive, a good suit costing £50 to £80, while cars and the electrical and mechanical goods in the shops were noticeably poorly made.

In conversation there were many interesting sidelights on professional life. In Czechoslovakia an experienced doctor, either in practice or in a hospital clinic, gets a monthly salary of about £105. The head of a clinic may earn as much as £160 per month. This seems certainly very much better than in neighbouring Poland, but when it is compared with the price of clothes and of motor-cars it is clear that the money would not go very far. It is small wonder that a distinguished physician said to me that the longer he had been qualified the less his salary became worth, and a doctor's wife said, on the subject of the general difficulties of life, "We breathe, we eat, and we have good jobs, so we really have nothing to worry about." The country is highly industrialized, and apparently about 60% of the women go to work, this being necessary to supplement their husbands' wages. The people in the streets seemed warmly clad for the winter, and the doctors I met were well enough dressed. Compared with any Western European city there was very little traffic in the streets. Indeed in Prague there are probably more really old cars to be seen than in any other capital city of Europe.

While I found little evidence of hostility to Russia (and indeed the Russians are frequently very likeable people), I did find a general scepticism about Russian methods in surgery. It was clear that much more interest was portrayed in Western techniques than in those from more eastern countries.

General Conclusions

It is not easy to sum up my impressions. The Czechoslovak people are industrious, intelligent, likeable, and friendly. They live and work under conditions very similar to ours, and the differences seem to be ones of degree rather than kind. Nevertheless they clearly live under many oppressive restrictions which must be hard to tolerate. Historically, however, this state of affairs is nothing new. The brief independence and maturity of Czechoslovakia during the 20 years between the world wars was the culmination of a 300-year struggle for freedom against the harsh subjection to the Austro-Hungarian Empire. Occupation of the country by the Germans in 1938-9, and the more recent Communist domination, have made conditions exceedingly difficult for those in the professions. Freedom of thought, however, is in the last analysis the necessary condition for the existence of the professions, and certainly in medicine and in the arts such as music ancient traditions are jealously safeguarded. The great Jan Hus, who became Rector of the University of Prague in 1402 and who was burned as a heretic in 1415 at Constanza, said, "Love the truth; defend the truth; speak the truth; and hear the truth." This spirit still lives, but its present state may be compared to the Alpine flowers hidden beneath the snow.

The Scientific Film Association has published a special issue of its journal, *Scientific Film Review*, Vol. 3, No. 2. The issue contains a list of 300 recent medical films, as well as a list of films on polar exploration and research. Brief details of each film are given. Copies of the issue are obtainable from the Scientific Film Association, 164, Shaftesbury Avenue, London, W.C.2, price 3s. 6d. net.

MEDICAL BIRTHDAY HONOURS

The names of the following members of the medical profession were included in a Birthday Honours List published in *Supplements to the London Gazette* on June 13.

Barony

Sir HORACE EVANS, G.C.V.O., M.D., F.R.C.P. Physician to Her Majesty the Queen.

K.C.V.O.

RALPH MARNHAM, M.Chir., F.R.C.S. Surgeon to Her Majesty the Queen.

K.B.E. (Civil Division)

FRANK KINGSLEY NORRIS, C.B., C.B.E., D.S.O., E.D., M.D., of Upper Hawthorn, Victoria, Australia. Major-General. For services to medicine.

Knighthood

ARTHUR BARTON PILGRIM AMIES, C.M.G., D.D.Sc., F.R.C.S.Ed., F.R.A.C.S., F.D.S.R.C.S. Dean of the Faculty of Dental Science, University of Melbourne, Victoria, Australia.
GORDON ROY CAMERON, D.Sc., M.B., F.R.C.P., F.R.S. Professor of Morbid Anatomy, University College Hospital Medical School.

RICHARD BRUNEL HAWES, C.M.G., M.B., F.R.C.P., D.T.M.&H. Consulting Physician to the Colonial Office.

SAMUEL THOMPSON IRWIN, C.B.E., M.Ch., F.R.C.S.Ed., M.P. Consulting Surgeon, Royal Victoria Hospital, Belfast. For political and public services in Belfast.

GEORGE WHITE PICKERING, M.D., F.R.C.P. Regius Professor of Medicine in the University of Oxford.

JOSEPH HENRY PIERRE, M.B., F.R.C.S.Ed. Specialist Surgeon, General Hospital, Port of Spain, Trinidad.

MALCOLM STODDART-SCOTT, O.B.E., T.D., M.D., M.P. Member of Parliament for Pudsey and Otley, 1945-50, and for Ripon since 1950. For political and public services.

C.B. (Military Division)

DAVID DUNCAN, O.B.E., M.D., D.P.H. Surgeon Rear-Admiral.

PHILIP FRANCIS PALMER, O.B.E., M.B., B.Ch., D.P.H. Major-General, late R.A.M.C. Honorary Surgeon to the Queen.

ARNOLD ASHWORTH POMFRET, O.B.E., M.B., Ch.B., D.O., D.O.M.S. Surgeon Rear-Admiral.

C.M.G.

FREDERICK ROLAND GEORGE HEAF, M.D., F.R.C.P. David Davies Professor of Tuberculosis in the University of Wales, and Consultant in Tuberculosis to the Colonial Office.

DAVID JAMES MASTERTON MACKENZIE, O.B.E., M.B., Ch.B., D.P.H. Director of Medical Services, Northern Region, Nigeria.

C.B.E. (Military Division)

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M.V.O.

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ALFRED JOHN CRAIG, M.D., F.R.C.S. For medical services in Malta.

MABEL ALICE DOBBIN CRAWFORD, M.D., M.A.O., F.R.C.S.I. Medical Officer, Ministry of Supply.

MUTHIAH DORAISINGHAM, L.M.S. Deputy Permanent Secretary to the Ministry of Health and Deputy Director of Medical Services, Singapore.

MARY KATHERINE DOROTHY DOUGLAS, M.B., Ch.B. For political and public services in Fife.

JOHN RICHARD HERTSLET FULTON, M.B., Ch.B., M.R.C.P. Chairman of the Otago Hospital Board, Dunedin, New Zealand.

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ARTHUR WESLEY SUGUNARATNAM THEVATHASAN, M.R.C.P. For public services in Singapore.

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IRWYN MORSE PERKINS, M.R.C.S., L.R.C.P. Squadron Leader, R.A.F.

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PETRO SOLOMON BLANDINA MUGANWA, Medical Officer, Uganda.

VILIKESA RAMAQA, Senior Assistant Medical Practitioner, Medical Department, Fiji.

Military Cross

JOHN MALCOLM ELLIOTT, M.B., Ch.B. Captain, R.A.M.C. In recognition of gallant and distinguished services in the operations in the Near East, October to December, 1956.

The following have been mentioned in dispatches in recognition of gallant and distinguished services in the operations in the Near East, October to December, 1956: Surgeon Lieutenant John Gwyther Bradford, M.B., B.S., R.N., 45 Commando, Royal Marines, and Acting Surgeon Lieutenant Peter Gordon Harries, M.B., B.S., R.N., H.M.S. *Diana*.

Correspondence

Post-maturity

SIR,—I share Professor Dugald Baird's hesitation (*Journal*, May 4, p. 1061) at crossing swords over my article on post-maturity (*Journal*, April 13, p. 851), especially as he is the distinguished occupant of the chair of midwifery in my old university. Professor Baird records a reduction in perinatal mortality in Aberdeen from 45 per 1,000 births in the period 1938-47 to 28 per 1,000 in the years 1953-6, and claims that this is the result of "routine surgical induction of labour in the 42nd week and the greater use of caesarean section." But surely there might be other causes—for example, the greater use of antibiotics and blood transfusion. Besides, the years 1939-45 were war years, when British hospitals were largely depleted of skilled staffs. In the years 1938-45 the perinatal mortality in England and Wales was 59.5 per 1,000 births, and in 1955 40 per 1,000—a 33.3% reduction.

In hospital K in my paper, during the period 1938-47 the perinatal mortality was 41.8 per 1,000 births. In the period 1952-6 it was 23 per 1,000 births—a 47.7% reduction. This is 27% more than the reduction claimed by Professor Baird, and that without any increase in the number of terminations of pregnancy for post-maturity. "Unexplained deaths" have, I think, been sufficiently explained in my paper. I assure Mr. W. G. Mills (p. 1061) that all the hospitals quoted in my article admit mostly normal plus a fair proportion of abnormal cases, and in that respect differ not at all from the general run of British maternity hospitals.

Since my article went to press I have gratefully received two other hospital reports. One is that of the Birmingham Maternity Hospital, 1953, on the staff of which I find Mr. Mills's name. There were 1,762 births and 109 surgical inductions for post-maturity without any other indication (6.1%). That is twice the highest induction rate recorded in my paper. The perinatal mortality was 8.4% and the caesarean section rate 12.43%. This should be compared with 3.3% and 1.8% respectively in hospital K, when no inductions were done for post-maturity after 40 weeks. The other report received by me since my paper went to press is that of the Liverpool Maternity Hospital, 1953. There were 2,844 births, and not one induction for post-maturity is recorded. The perinatal mortality was 4.1%, and the caesarean section rate 9.1% (none for post-maturity). Is any further evidence needed of the uselessness, not to speak of the danger to mother and child, of surgical induction for so-called "post-maturity"?

I beg my younger colleagues, including Mr. Mills (the old ones being beyond hope), to think for themselves on this matter after studying with open minds the evidence I have adduced, and to cease letting themselves be led astray by the lure of great names.—I am, etc.,

Sydney, Australia.

F. J. BROWNE.

Stillbirth Rates in "Non-white" Women

SIR,—It is almost ungracious to pick even a small piece of gristle from the most digestible dish that Professor F. J. Browne served up in the *Journal* of April 13 (p. 851), yet the unqualified statement that, in comparison with white women, "it is well known that stillbirth rates are much higher among 'non-white' women," needs amplification if it is not to become just another mystical concept, quoted and requested as an excuse for high foetal loss in undeveloped areas.

That the rates are higher there is, of course, no disputing: that they should be so by virtue of some supposed racial trait is open to serious question. In Zululand, at any rate, a number of reversible factors play their part in the production of a high rate of perinatal mortality, notably maternal syphilis, lack of adequate hospital facilities, fatalism, and magic, and most of all a suspicion of medicine itself. It is possible to mitigate the ill-effects of these artificial barriers within quite a short space of time: by precept and by prac-

tice most prejudice can be broken down, as is witnessed by a fall in maternal syphilis rates, as judged by the Wassermann reaction, in our wards from 25% in 1950 to under 7% in 1955. Whether post-maturity can be blamed for foetal death is impossible to say in a community of women who never—or hardly ever—know the date of their last menstrual period and whose estimate of the duration of pregnancy varies from five months in one young woman to three years in another patient. The latter, a magician in her own right, claimed to have had a former gestation of five years, and, she triumphed, seeing our disbelieving glances, produced a live baby at the end of it.

The most important step in any attempt to reduce the needless loss of life in childbirth is the establishment of confidence, which stems from attendance at antenatal clinics. The services that can be rendered at out-station clinics, held often in sheds and garages, are necessarily but crude and imperfect, yet they materially alter the subsequent course of delivery. Between 1953 and 1955, 1,504 Zulu women were delivered at the Charles Johnson Memorial Hospital. Full details are available of 1,493 births which resulted in 1,557 babies, 91 (5.8%) of which were stillborn or died within the first ten days of life, supporting the contention of a high

	One or More Antenatal Attendances	No Antenatal Attendances	Total
Number of women	1,116	377	1,493
"babies"	1,156	401	1,557
Live births	1,126	340	1,466
Stillbirths and deaths	30	61	91
Rate %	2.6	15.6	5.8

Stillbirths and infant deaths within 10 days in 1,493 Zulu parturients.

stillbirth rate among such women. But 1,116 of these women were examined antenatally and their labours managed from the beginning: they produced 1,156 babies, of which 30 (2.6%) were stillborn or died within ten days compared with 61 deaths among 401 babies born to 377 women who had never been examined antenatally and whose labours were not so supervised, a rate of 15.6%. More than half the total stillbirths were from women who came into hospital from the district during labour, and in half of these again no foetal heart was audible on admission. One in ten of the stillbirths were from untreated syphilitic mothers.

These figures are quoted to underline the error inherent in the original generalization and to show that there is a reasonable expectation that childbirth may become as safe and as sure a process for Zulu women as it now is for their English sisters.—We are, etc.,

Nqutu, Zululand.

MARGARET BARKER.
ANTHONY BARKER.

Women's Footwear

SIR,—Your correspondent (*Journal*, May 18, p. 1180), in suggesting a talk between the Minister of Health and the President of the Board of Trade with a view to new sumptuary laws, rightly calls attention to this health problem but fails to appreciate the wider and educational aspects of the problems involved.

First of all, it is not only women shopping for themselves who cannot find correctly designed footwear, but teenagers and adults of both sexes are in a similar position.¹ It is not therefore surprising that four out of five of those leaving school have acquired foot deformity or that foot discomfort is the commonest complaint of old age. The loss of time and money due to foot troubles must be enormous, and little of it at present comes within the range of the National Health Service. There is good evidence to show that, if correctly shod from cradle to the grave, most of our foot troubles would be avoided.

A formidable educational problem exists in this field. Many medical men either fail to appreciate the importance of foot health or are indifferent to it. It will be necessary first to educate the medical profession to appreciate the scandal of the present incidence of foot deformity, the need for early diagnosis, and the, often, inadequacy of treatment when deformity is well estab-

lished. The school medical service shows little awareness of the position. In most schools to-day physical education is performed in footwear that is not the shape of the normal human foot and does not allow the foot to function freely. The 1955 report of the school health service for the city and county of Newcastle upon Tyne, referring to orthopaedic defects, states: "Some difficulty was encountered here as we were not clear as to what is meant by the phrase 'normal feet.'" There is therefore an urgent need for a better understanding of normality and recognition of the early signs of deformity.²

The second part of the educational problem concerns the general public. They must be made appreciative of the faults of fashion footwear and its ultimate effect on their foot health. Such education has been highly successful concerning children's footwear—so much so that the trade has cashed in on it and uses foot health slogans for sales promotion. It is in this field that legislation may be necessary to safeguard the public from misrepresentation—for example, footwear that advertising suggests has a straight inner border may deviate from the "straight" as much as 18 degrees. There is a definite need for a better understanding by medical men of shoe trade terminology. Terms such as "short fit" have been misunderstood even by Ministers,³ and it is not without significance that, in the opinion of a shoe and trade journal,⁴ my request at a recent foot health convention for the platform to define "shoe-fitting," "disturbed the meeting."

To-day, those aware of the facts of foot health and footwear may seek all day and seek in vain for correctly designed, factory made, footwear—it does not exist. It seems, therefore, that action is required to get the shoe trade to manufacture for teenagers and adults footwear the shape of human feet. This is probably the most difficult task of all. The Ministry of Health has been asked repeatedly to take the initiative and has consistently refused. In 1953 the Ministry attributed the high incidence of foot deformity to wrong size selection by parents and pinned its faith on the shoe trade reforming itself. The first has been proved wrong⁵ and as for the second, the "fashion element" has since become firmly established in teenage styles and now begins to invade children's footwear. There is as yet no evidence of an effective foot health policy emerging from the Ministry.

Educating the Minister may therefore prove quite a formidable task, but, whatever has brought us to this sorry state of affairs, it is surely the duty of us all to see that the Minister of Health, without further delay,⁶ sets up a committee to inquire into the cause and incidence of acquired foot deformity and to make recommendations for its effective control and treatment.—I am, etc.,

London, S.E.15.

REFERENCES

- 1 Pratt, C. A., *British Medical Journal*, 1956, 2, 714.
- 2 — *Lancet*, 1953, 1, 746.
- 3 — *Ibid.*, 1953, 2, 143.
- 4 *Shoe and Leather Record*, February 19, 1957.
- 5 *Hansard*, November 22, 1951, Question No. 102.

Medical Use of Hypnotism

SIR,—I was glad to see that Professor Alexander Kennedy (*Journal*, June 8, p. 1317) has given the weight of his authority to encourage the use of medical hypnotism. It would long ago have become a recognized therapeutic weapon if it were not for the fear the average doctor has of being regarded as a mountebank by his fellows, and even by the laity, if he were to make use of it. With regard to the latter there need be no fear, as the average patient accepts such treatment readily if it is explained beforehand. As regards the former, once the practitioner has overcome his inhibitions and made a start, he will quickly recognize his limitations and make a weapon against disease and that he has in hypnotism a weapon against neglect. I myself suffering which he must neither misuse nor neglect. I myself have used it spasmodically rather than systematically throughout the whole of my medical career, but am convinced that a scientific study of hypnotic suggestion could reveal much of the hidden mysteries of health and disease. While I still find many uses for it in psychological medicine, I regret I have now little opportunity of applying it in organic illness.

Professor Kennedy is doubtful about the use of hypnosis in childbirth because of "the great amount of time one has to spend with the patient," and also because he believes that someone trained in hypnosis must be present throughout. May I respectfully beg to differ? The command, "When your time comes you will go through labour without ex-

periencing pain," will be obeyed punctually like any other suggested post-hypnotic instruction. The patient need not be in a deep amnesic trance, and indeed may prefer not to be and will hold on to her normal consciousness throughout. This suggestion of painless labour is repeated with variations during the three or four weeks' training period which precede the labour, the number of sessions depending upon the suggestibility of the expectant mother. There are two alternatives with the trained subject. One is to hand her over to the doctor or nurse who intends to be present. The command then is: "You will obey Dr. S in the same way you obey me, and he will produce the trance condition to make labour painless." The other way is to make the subject herself responsible in some such way as this: "Any time you wish to pass into the trance state you can do so by counting slowly up to twenty." Professor Kennedy is right in saying that hypnosis is an ideal way of having children, and coming from him this should do much to popularize the method.

Hypnotism works through the dynamic of the imagination, and in using it as a therapy the practitioner must study his patient's psychology so that he can put himself mentally *en rapport* with his subject and phrase his suggestions accordingly. He will, for example, have a far stronger hold on an alcoholic addict if he makes an emotional appeal with the subject in a trance state than if his suggestion is merely, "Alcohol makes you ill." Creative work of this sort can be temporarily exhausting but immensely rewarding.

—I am, etc.,

R. MACDONALD LADELL.

Scarborough.

SIR,—It is very satisfying to see the *B.M.J.* giving so much of its space to the subject of hypnotism, for this is a subject which has been sadly neglected in the recent past, particularly in teaching hospitals, where its inclusion in the curriculum and demonstration of the uses to which it can be put would be of great value.

As Dr. H. Stewart says in his article (*Journal*, June 8, p. 1320), hypnotism used in the correct manner will often produce good results in cases which have been abandoned as "incurable." I, too, have found a very satisfying success rate in many such cases. Dr. Stewart is to be congratulated on taking on such difficult cases, for he, like Dr. A. Fry (p. 1323), makes light of the skill required in using hypnosis, for it is not skill in producing the hypnotic state that is important but what is done with that state once obtained. Unfortunately, hypnosis is very time-consuming for the practitioner, as Dr. Stewart comments, for 30-45 minutes per session is usually needed, and the doctor must be prepared to work with his patient and help him in uncovering unconscious material. The results, however, are very worth while and satisfying to anyone who is prepared to put the time and effort into this most interesting aspect of medicine.

—I am, etc.,

B. R. FINLAY.

Wembley Park.

Vaccine Against Poliomyelitis

SIR,—The authors of the Medical Research Council's report (*Journal*, June 1, p. 1271) dismiss the possibility of bias in their younger vaccinated group (p. 1275). Possibly they have made further analyses of the defaulters which they have not published, but there are one or two which I think should be considered.

The first, and most obvious, is the exact age distribution (year by year) of the defaulters as compared with the volunteers. Certainly the volunteer rate varied considerably from year to year, as the authors comment. It seems possible then that the defaulter rate might also vary markedly. If this was the case one would have to consider the appreciable variation in the poliomyelitis attack rate between the years 1 to 5. Incidentally, the eight months' difference between the November and March births could then perhaps be of some importance. The second is whether the defaulter rate (for local authority areas) is in any way related to poliomyelitis experience in the area between January to June, 1956. It would also be interesting to know,

indicated. Treatment with reserpine was started. She was given a dose of 2.5 mg. on the first day, 5 mg. on the second day, and 8 mg. daily from the third to the seventh days. As there was marked Parkinsonism on the seventh day of treatment, the dosage of reserpine was reduced to 3 mg. daily. On the morning of the ninth day the patient was found to be in a condition of stupor. She could not be roused, but there was a little response to painful stimuli. She had a moderate pyrexia—temperature 100° F. (37.8° C.), and her general condition was poor. There was excess salivation and fine crepitations were heard, particularly at the bases of the lungs. We considered that she was suffering from acute pulmonary oedema, the result of excess secretion, plus stupor, associated with reserpine therapy. She responded to treatment with penicillin, atropine, nikethamide, and general nursing measures, and was fully conscious the next day. In addition, there was considerable improvement in her mental condition following recovery from stupor. After recovery, no gross lesion was detected on physical examination. X-ray chest, blood sugar, serum proteins, serum sodium, serum potassium were all normal. E.E.G. record was immature for her age, the response to hyperpnoea suggesting a mild instability. She has since received smaller doses of reserpine with definite benefit; she has become interested in her surroundings, occupied, and friendly, but there has been considerable restlessness, and the affect is childish and rather incongruous.

I am grateful to Dr. D. J. C. Dawson, resident medical superintendent of the Londonderry and Gransha Hospital, for permission to publish these findings.—I am, etc.,

Londonderry.

GEORGE A. KERNOHAN.

Abnormal Bleeding in Brucellosis

SIR,—Since the publication of an article on brucellosis in children (*Journal*, March 16, p. 617), I have received several interesting reports from doctors in different parts of the country which illustrate this complication. I should be very glad to hear from any other practitioners who may have met with such troubles—namely, abnormal bleeding (apart from epistaxis) occurring during the course of an attack of brucellosis in either adults or children.—I am, etc.,

Royal United Hospital,
Combe Park, Bath.

HUGH R. E. WALLIS.

Psychiatry in Africa

SIR,—As the *Journal* reaches me eight weeks after publication may I, even later than Dr. John A. Ewing (*Journal*, March 23, p. 703), offer my comment on the letter of Dr. A. Stewart Henderson (*Journal*, February 2, p. 283) which was in reply to Dr. T. A. Lambo's paper (*Journal*, December 15, 1956, p. 1388)? I find myself in agreement with what Dr. Ewing has to say about the magical element in some of our own methods which are labelled scientific. Or can Dr. Henderson offer a rational explanation of convulsion therapy, which is purely empirical and above all based on an accident? Out here in Africa we see and hear a great deal of magical cures, and some of them we can no more doubt than the psychotherapeutic cures effected in the temples of ancient Egypt or in medical centres which were dedicated to Asklepios, as at Epidaurus of great fame. Nor is it questionable that the Bantu himself considers the white man's medicine to be of the same nature as the one offered to him by his medicine-man, if of superior magic.

In a paper on observations on the psychology of the East African, which I am reading at the invitation of the Berlin Psycho-analytical Society, I make, *inter alia*, the point that it is not yet established whether our Western psychotherapeutic methods are a fit instrument for either the neuroses or psychoses of the Bantu. For once, his super-ego is, structurally and genetically, very different from that of the European; the aspects and the handling of transference and counter-transference require re-thinking. I am further of the opinion that proper understanding in this field of knowledge will depend a great deal on the research of our future

African colleagues, firmly based themselves on the cultural background of their countrymen and trained in Western modern psychological methods. For this reason I consider the contribution of Dr. Lambo as of great interest.—I am, etc.,

Tanga, Tanganyika.

ERICH SIMENAUER.

The H-bomb

SIR,—I would like to support Dr. Doris B. Jaffé's plea (*Journal*, June 1, p. 1307) that the Association should show some concern regarding the H-bomb tests: not only those by Britain but by America and Russia. Unfortunately the press and propaganda are in the hands of those with some vested interest in the continuation of the fission bomb development. We are told again and again that we must have a deterrent, but what value can it have if we know that a fission bomb war, with perhaps fifty or a hundred such bombs exploded simultaneously, would entail the possibility of life being wiped off the earth? At present H-bombs have been developed large enough to devastate areas wider than Wales. Such a thought must deter us as well as others. We are told repeatedly that when an H-bomb is exploded the fall-out is negligible, but such statements refer only to the heavy particles; the effect of the medium-sized fall-out, from one test after another done by different nations over weeks and months, must have effects not yet possible to calculate, particularly as the size of the bombs is not published. If these tests are so harmless why are they done in isolated areas?

Must we always be dominated by politicians (whom one knows by experience often to be stupid and unreliable people) and never have the courage to speak out and condemn things we know to be harmful to humanity? If we lack the courage to interfere in this mad race we shall ourselves be as responsible as those involved in it when the final disaster occurs and we are faced with millions dying or slowly expiring burned and blind. This is something which concerns us all, and neither the Association nor we as individuals can take an isolated attitude regarding it.—I am, etc.,

London, W.1.

CLIFFORD ALLEN.

Sir Victor Horsley

SIR,—I have one outstanding memory of Horsley and one which I am surprised none of your readers has recalled. I was one of a group of medical officers who sat on the beach at Gallipoli and heard him lecture on brain injuries in war. There was no cover and the Turks held all the heights. Not a shot was fired. They must have known Horsley was there.—I am, etc.,

Winchester.

J. F. MAYNE.

Sir Ronald Ross

SIR,—Dr. J. B. Gurney Smith inquires (*Journal*, June 8, p. 1365) whether the Ross Institute has in mind any celebration of the centenary of Ronald Ross's birth. Indeed it has. The standing committee considered that the occasion would be best marked by a statement from someone with outstanding influence on the present policy of malaria control and eradication. No one could be more appropriate than the Director-General of the World Health Organization, Dr. M. G. Candau, who kindly agreed to propose the memory of Sir Ronald Ross at a luncheon organized by the Ross Institute. Unfortunately preoccupation with the World Health Assembly which takes place in May made Dr. Candau's participation on the actual date, May 13, impossible, and it was decided that a slight delay in the celebration would be more than counterbalanced by the value of Dr. Candau's contribution to it. The celebration was held in the London School of Hygiene and Tropical Medicine on June 13.—I am, etc.,

London, W.C.1.

G. MACDONALD,
Director,
The Ross Institute.

Obituary

M. VAN DEN ENDE, Ph.D., M.B.

Professor M. van den Ende, dean of the faculty of medicine at the University of Capetown and professor of bacteriology there, died at Capetown on June 5, aged 45.

Marinus van den Ende was born on February 2, 1912, and graduated M.B., Ch.B. at the University of Capetown in 1933. Four years later he came to Cambridge to work in the department of pathology, and in 1939 he joined the staff of the Medical Research Council. In 1940 he took the degree of Ph.D. at Cambridge. At this time he was engaged in the development of vaccines against typhus, and during the war he served in the R.A.M.C. in North Africa and Italy, working mainly on the control of epidemic diseases. He returned to London after the war, but within a short time he was appointed professor of bacteriology at Capetown, and later he became dean of the medical faculty there. During the past few years he had been developing an important unit for virus research. Less than a year ago he was awarded the Silver Medal of the Medical Association of South Africa for his original research.

Dr. C. H. ANDREWES writes: Marinus van den Ende came to England shortly before the war. At first he did not understand us and was perhaps a little mistrustful. But that soon changed: in the end he became in himself a bridge of mutual help and understanding between British and South African medical sciences. He was a man of enormous energy and drive, and inspired others to push forward with him. In the early days of the war, at the National Institute for Medical Research at Hampstead, and during the blitz—which he hated—he achieved great things: in control of infection by suppressing dust, in typhus, and finally in scrub typhus. As a colleague he was a source of much joy and satisfaction, though hardly of peace and quiet. At times he would "hit the ceiling": "Why the blank dash does that so-and-so . . . ?" He also had moods of bleak depression. But most of us loved him, knew him capable of big achievement, and felt it fitting that he should go home to fill the chair of bacteriology at Capetown. I had the pleasure of visiting his home in 1955 and was most struck by the way his colleagues looked to him for an unfailing supply of the van den Ende drive and inspiration. This was shown not least when he knew he had a fatal illness. He did not try to pretend that things were otherwise, even made a joke about it, and strove to give his utmost as long as he had the strength to do it—and even after. South Africa's big loss is ours too.

C. F. T. SCOTT, M.B., Ch.B.

Dr. C. F. T. Scott died at Ryde in the Isle of Wight on May 3, aged 82. With his passing metropolitan medicine, and Willesden in particular, mourns the loss of a stalwart of the last generation, one of the band of "good B.M.A. men" who have done so much in the last forty years to advance the prestige and status of general practice.

Born at Greenisland, Co. Antrim, Charles Frederick Trousdale Scott was one of the many Ulstermen who have adorned English medicine. He studied medicine at Edinburgh University, where he graduated M.B., Ch.B. in 1907. After various hospital appointments, including that of resident medical officer at the Royal Isle of Wight County Hospital, he took up general practice in Willesden in 1911, and there for 36 fruitful years he played a full and active part in local medical affairs. There seems to be something in Willesden which provides an excellent nutrient medium for B.M.A. enthusiasm, and with the encouragement and active

co-operation of the late William Paterson (himself local honorary secretary for 25 years) Scott flung himself with zeal into the thick of B.M.A. activities. It became his hobby, and the "chain reaction" of committee work never became a burden to him, as a glance at the impressive list of his committees will show. He was a member of the old Insurance Acts Committee for 20 years, Public Health Committee for many years, the Medico-political Committee, Maternity and Child Welfare and many other subcommittees centrally, while at local level he was honorary secretary of the Metropolitan Counties Branch from 1926 to 1932 and president in 1934. In Willesden he was chairman of the Division and representative at the A.R.M. for 17 years.

It was perhaps in his work as a member of the Medical Services Committee that Scott found his true *métier*, and never was there a worthier champion on behalf of those who were called upon to appear in answer to complaints. He guarded their interests, in the face of overt anti-medical bias, with a pugnacious tenacity which earned him the respect of his fellow members and the gratitude of many Middlesex practitioners. He retired from practice in 1947. Dr. Scott married Margaret McDonald in Edinburgh in 1911. There were no children. After the death of his wife in 1956 he went to live in the Isle of Wight, where he died. We in Willesden will remember him with respect and affection.—M. M.

JOHN BRENNAN, M.B., Ch.B.

Dr. John Brennan died at a nursing-home at Cardiff on April 30 after a prolonged illness. He was 55 years of age.

John Brennan was born at Barrow-in-Furness in 1902 and was educated at Aberdeen University, where he graduated M.B., Ch.B. in 1931. After graduation he held several appointments in the North of England before going to the Merthyr General Hospital in 1932 as a house-surgeon. He then settled at Merthyr Vale (Merthyr Tydfil), where he soon built up an extensive practice. His charming manner gave great confidence to all those with whom he came into contact, and he enriched the lives of many. He took a leading part in the social and sporting activities of the town as a director of the Merthyr Tydfil football club and a member of the Welsh Football Association. He was a member of the executive committee of the North Glamorgan and Brecknock Division of the British Medical Association, and was a past president of the Merthyr and Aberdare Medical Society. A sincere Roman Catholic and a past president of the Catenian Society, he was also an active member of the Catholic Young Men's Society of Dowlais. He served as a major in the R.A.M.C. from 1939 to 1945 and was mentioned in dispatches in 1943 for his work in the North African campaign, during which he was wounded at Tobruk. To his widow, Dr. Catherine Brennan (formerly Clark), who also graduated at Aberdeen, and who was the first woman doctor to start a general practice in Merthyr Tydfil, the sympathy of all his friends goes out in her bereavement.—T. H. S.

C. H. MARSHALL, M.B., F.R.C.S.Ed.

Mr. C. H. Marshall, formerly surgical specialist to the Uganda Government, died at Mombasa, Kenya, on May 20. He was 73 years of age.

Claude Herbert Marshall was born at Twickenham on August 12, 1883, and was educated at Dulwich College and at Guy's Hospital, qualifying M.R.C.S., L.R.C.P. in 1908. Soon after qualification he went out to Entebbe to take up an appointment as medical officer in the Uganda Protectorate. A year or two later he was on special service as medical officer to the Anglo-German-Belgian Boundary Commission, and contributed a chapter on the habits and customs of the people of Ruanda to the report of the commission, which was published in 1913. In the following year he was appointed medical superintendent of the sleeping-sickness measures in the Uganda Protectorate. At this

time he wrote a number of articles on trypanosomiasis, three of which were published in this *Journal*. During the first world war he served as a captain in the Uganda Medical Service from 1914 to 1917 and, later, with the 4th London General Hospital. He obtained the London degrees of M.B., B.S. in 1921 and the F.R.C.S.Ed. in 1925, at which time he was senior medical officer and surgeon in charge of the European Hospital in Uganda.

He left the Uganda Medical Service in 1934 on his transfer to Kenya to become medical officer in charge of the Mines and Missions Hospital at Kakamega. On the outbreak of the second world war in 1939 he joined the R.A.M.C., but later transferred to the East African Army Medical Corps, in which he held the local rank of lieutenant-colonel. His services were recognized three times by mention in dispatches. After the war he went into private practice at Mombasa. A member of the British Medical Association for over forty years, he was president of the Uganda Branch from 1926 to 1929 and again in 1932-3, and he became chairman of the Mombasa Division in 1946.

A. R. W. writes: Claude Marshall died quietly in his chair at home. He was found next day, a book open on his knee. The pity is he had not written one. I knew him only in the last ten years of his life after he had drifted into a quiet backwater, when all that remained of the wider, stirring days were a few trophies and the occasional tales one could pry out of him, of witches and holy sheep, of a thin black line of Askaris against a charging mob, or of the parting of friends when the news of the first war came to the Boundary Commission. After the war he took his F.R.C.S.Ed., and became the first surgical specialist to be appointed by any of the East African Governments. He went on safari with the Prince of Wales and the Duke of Gloucester, and after many years in the Uganda service left to take over the hospital at the Kakamega Mines. The outbreak of the second world war found him in Mombasa and took him to Somalia, and so at last back to Mombasa. He had many friends who with many others felt that in his white suit and shoes, with a buttonhole of orchids or carnations, he stood for something good, of values and a way of life slowly being forced out. Claude was of the frontiers, a man of adventure and sport, who sailed his boat and played golf until he was 70. And yet also he was a man of books, of good talk and good food and drink. Ever ready for argument or new ideas, he remained young in spirit even after his health began to fail. There are many who feel they owe to him and his skill with the knife their lives, and they will remember him sitting at the bedside with a Mutalere cheroot in a short holder in his mouth as he reassured them and gave them hope and confidence. Others, numbered among his friends—to whom he was a gracious host with a ready wit and sympathetic ear—will long remember him and regret his passing.

THOMAS BREWIS, M.B., D.M.R.

Dr. Thomas Brewis, who died at his home at Scarborough on May 29, was the son of the eminent Edinburgh gynaecologist of the last generation, Dr. N. T. Brewis. Born on May 18, 1894, he graduated M.B., Ch.B. at Edinburgh in 1925, and, specializing in radiology, obtained the Diploma of Radiology at that university in 1926. After a year's work at the Hull Royal Infirmary he settled at Scarborough in 1928, when he became honorary radiologist to the Scarborough Hospital, and, in 1948, senior radiologist to the Scarborough, Bridlington, Malton, and Whitby group hospitals.

L. S. D. writes: Dr. Brewis had two objectives in life, his family and his work. He was a devoted husband and father; he was by nature fond of children and was blessed with four of his own, and they were fortunate in their father. To his work he gave all that he had and more. He raised the x-ray departments in his hospitals, and the standard of radiology in the area, from the primitive state that he found

them in 1928 to a level of modern effectiveness and accuracy. He was a man of few words, but those he used were kindly: his opinion was valued by us all, and we could always rely on his help in our problems. He never spared himself; whenever we had a night emergency we would see the light in the x-ray department burning in the small hours—Brewis was contending with the stacks of films and reports that would have swamped most men. He will be greatly missed, but his memory will live on. We extend our sympathy to Mrs. Brewis and her children in their loss.

EDGAR GOLDSCHMID, M.D.

Professor Edgar Goldschmid, pathologist and medical historian, died in Lausanne on May 26, aged 75.

Born in Frankfort-on-Main on December 14, 1881, Edgar Goldschmid graduated as a doctor of medicine at Munich in 1905. After holding clinical posts in Munich and London, he started his pathological career in Frankfort, and after a year in Berlin and a period in Geneva he returned to Frankfort, where in 1920 he was appointed extraordinary professor of pathological anatomy. In 1933 he resigned and removed to Lausanne, where he was appointed lecturer in the history of medicine at that university.

Dr. E. ASHWORTH UNDERWOOD writes: The death of Edgar Goldschmid is another grievous loss in the ranks of the older school of historians of medicine. His father, Eduard Goldschmid, was a banker and a collector of Italian paintings and works on art. From his early years Goldschmid was brought up in an artistic atmosphere. Educated at the Lessing Gymnasium at Frankfort, Goldschmid began his medical studies at Freiburg-im-Breisgau, passing thereafter to Kiel for a year. At Munich he was much influenced by Otto von Bollinger, the professor of pathology, under whom he later graduated in medicine with a dissertation on tuberculosis in infants. From his Berlin days he preserved many recollections of Ernst von Bergmann, the professor of surgery. From Berlin he returned for a period to Munich before graduating there.

After graduating Goldschmid was for a period an assistant in Posselt's skin clinic and in Lindemann's medical clinic at Munich, and he then spent some months as an assistant in the German Hospital in London. At the end of 1906 he became assistant to Eugen Albrecht at the Senckenberg Institute for Pathological Anatomy at Frankfort. He was devoted to Albrecht, whose early death was a great blow to him. Goldschmid next spent about a year at the Institute for Experimental Therapy in Berlin under Friedberger, with whom he published two papers. During the years 1910 to 1913 Goldschmid was assistant to Max Askanazy, the distinguished professor of pathological anatomy at Geneva. In 1913 he returned to a permanent post at the Senckenberg Institute, and after the foundation of the University of Frankfort in 1914 he became a Privatdozent. From then, and after his appointment as the extraordinary professor of pathological anatomy in 1920, he contributed to that subject, especially his articles on the size and weight of the heart in the *Handbuch der normalen und pathologischen Physiologie*.

Goldschmid's first notable work in the history of medicine was also his greatest. This was his *Geschichte und Bibliographie der pathologischen-anatomischen Abbildung* (1925), in which he dealt in great detail with the history of pathological illustration, and discussed fully medical works containing such illustrations. The numerous coloured reproductions in this book are especially fine. On several occasions in later years he returned to this subject, and he frequently lectured on it. His other writings dealt with the history of skin diseases and with the work of outstanding nineteenth-century pathologists and physicians. For about twelve years he gave regular courses on the history of medicine at Lausanne University.

I knew Goldschmid well for many years. To intimate friends he was a charming companion, full of reminiscences and amusing conversation on many subjects. At Lausanne he had a fine library, and his house was full of paintings and silver from his father's great collection. Art, music, and history remained the great passions of his life to the end.

INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending June 1 (No. 22) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available.

The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES in Countries and London	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria	1	0	3	0	1	6	0	3	0	5
Dysentery	740	47	273	10	7	1,370	204	212	9	1
Encephalitis, acute	4	1		0		3	0		0	
Enteric fever:										
Typhoid	6	0	0	0		5	0	0	0	
Paratyphoid	9	1	2 (B)	0	1 (B)	16	1	1 (B)	0	1 (B)
Food-poisoning	176	21	18	0		275	38		1	
Infective enteritis or diarrhoea under 2 years				18	20				8	26
Measles*	21,613	893	176	245	281	3,839	316	283	133	218
Meningococcal infection	26	3	14	1		31	4	13	2	
Ophthalmia neonatorum	29	2	9	0		24	1	1	0	
Pneumonia†	320	22	163	4	5	442	23	178	6	1
Poliomyelitis, acute:										
Paralytic	42	2		6	3	38	2		5	0
Non-paralytic	25	0				21	0			
Puerperal fever‡	9	1	15	1	1	216	29	11	0	1
Scarlet fever	691	58	76	22	21	492	35	81	24	13
Tuberculosis:										
Respiratory	646	74	278	24		685	90	157	27	
Non-respiratory	34	3	19	3		99	6	12	2	
Whooping-cough	1,807	69	206	6	41	1,812	94	231	45	143

DEATHS in Great Towns	1957					1956				
	Eng. & Wales	Land.	Scot.	N. Ire.	Eire	Eng. & Wales	Land.	Scot.	N. Ire.	Eire
Diphtheria	0	0	0	0	0	0	0	0	0	1
Dysentery	0	0		0		1	0		0	
Encephalitis, acute		0			0		0			0
Enteric fever	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years	2	0	4	1	1	3	0	2	0	1
Influenza	4	0	0	0	0	4	0	0	0	0
Measles		0	0	0	0		0	0	0	0
Meningococcal infection		0	0				1	1		
Pneumonia	155	15	16	10	11	185	26	22	11	9
Poliomyelitis, acute	1	0				3	0			0
Scarlet fever		0	0	0	0		1	0	0	0
Tuberculosis:										
Respiratory	37	5	11	1	4	55	5	6	2	5
Non-respiratory	0	0	0	0	0	0	0	0	1	2
Whooping-cough	0	0	0	0	0	0	0	0	0	1
Deaths 0-1 year	189	40	33	5	9	215	32	28	9	18
Deaths (excluding stillbirths)	4,912	710	568	120	157	4,960	719	506	125	153
LIVE BIRTHS	8,345	1250	980	267	341	8,629	1311	1010	229	423
STILLBIRTHS	226	22	22			222	25	25		

* Measles not notifiable in Scotland, whence returns are approximate.
† Includes primary and influenzal pneumonia.
‡ Includes puerperal pyrexia.

Vital Statistics

Vaccine Against Asiatic Influenza

So far only one case of influenza due to the new strain of virus A has been confirmed in western Europe. This patient had recently arrived at The Hague from the Far East. The virus has also been isolated from patients in Australia, and the infection continues to spread in India, Pakistan, and other eastern countries.

The production of a vaccine made with the new Asiatic strain of virus A is proceeding at the Wright-Fleming Institute at St. Mary's Hospital. Dr. F. Himmelfeit is in charge of this work. Professor Robert Cruickshank, director of the institute, announced this week that the first trial batch of vaccine has been made and is ready for administration to volunteers. If antibody formation is satisfactory and the vaccine passes other tests, the Wright-Fleming Institute is ready to produce a regular supply of the vaccine. At present it seems that a monovalent vaccine is all that is necessary to give protection against influenza caused by this new strain.

Sir Macfarlane Burnet, speaking at Sydney before leaving for Europe last week, said that he believed that the virus of Asiatic influenza will spread to epidemic proportions in nearly every country in the world, flaring up in winter conditions. He thought that there would almost certainly be an epidemic in Australia.

Week Ending June 8

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 589, whooping-cough 1,523, diphtheria 4, measles 23,290, acute pneumonia 326, acute poliomyelitis 74, dysentery 657, paratyphoid fever 2, and typhoid fever 4.

Infectious Diseases

The largest increases in the notifications of infectious diseases in England and Wales during the week ending June 1 were 2,100 for measles, from 19,513 to 21,613, and 73 for scarlet fever, from 618 to 691; the largest decreases were 212 for whooping-cough, from 2,019 to 1,807, and 33 for dysentery, from 773 to 740.

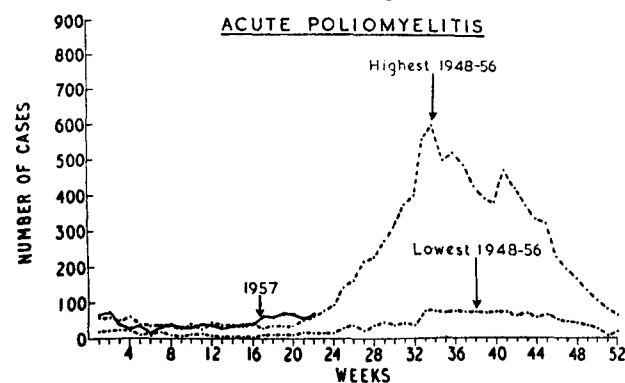
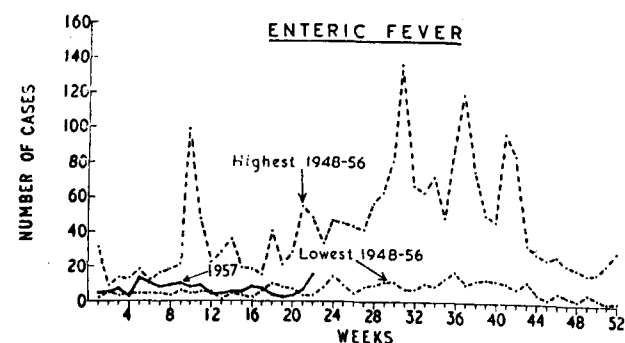
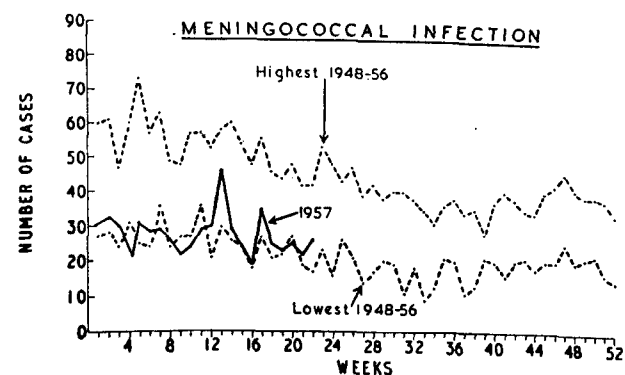
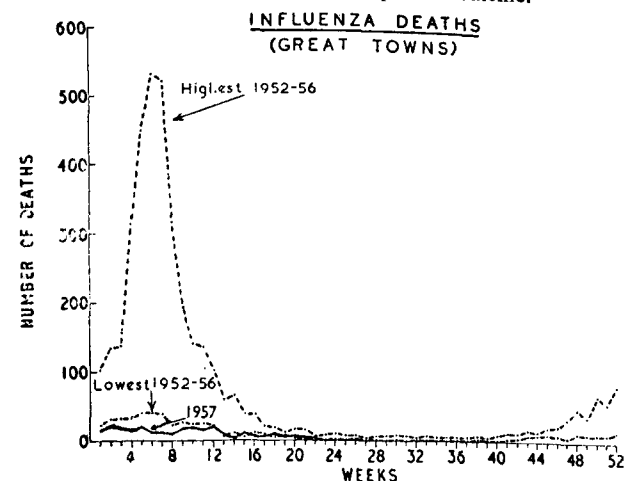
The notifications of acute poliomyelitis numbered 67, and these were 12 more for paralytic and 3 more for non-paralytic cases than in the preceding week. The largest returns were Essex 6 (Colchester M.B. 2), Devonshire 5 (Exeter C.B. 4). 3 cases were notified in Bristol C.B.

The number of notifications of measles rose by 100 or more in 7 counties; the largest rises were 518 in Yorkshire West Riding, from 2,473 to 2,991, and 346 in Lincolnshire, from 450 to 796. The largest exception to the rising trend in measles was a fall of 178 in London, from 1,071 to 893. Towns with a large rise in the incidence of measles were 164 in Sheffield C.B., from 438 to 602, 124 in West Bromwich C.B., from 85 to 209, 123 in Bedworth U.D., from 79 to 202, 114 in Leeds C.B., from 193 to 307, and 99 in Grimsby C.B., from 116 to 215, and the largest decline in the cities was 111 in Birmingham C.B., from 961 to 850. Only small variations were reported in the returns of scarlet fever. The largest fall in the incidence of whooping-cough was 38 in Lancashire, from 180 to 142. Only 1 case of diphtheria was notified, compared with 3 in the preceding week.

The chief feature of the returns for dysentery was a rise of 72 in Lancashire. The largest returns were Lancashire 225 (Whiston R.D. 41), Manchester C.B. 35, Liverpool C.B. 23, Irlam U.D. 17, Stretford M.B. 12, Fylde R.D. 10), Yorkshire West Riding 137 (Bradford C.B. 33, Leeds C.B. 28, Sheffield C.B. 27, Selby U.D. 10, Thorne R.D. 10), London 47 (Bethnal Green 10), Durham 43 (South Shields C.B. 14), Northumberland 28 (Newcastle upon Tyne C.B. 21), Nottinghamshire 27 (Nottingham C.B. 9, Mansfield M.B. 9), Cheshire 27, Yorkshire East Riding 25 (Kingston upon Hull C.B. 21), Warwickshire 21 (Birmingham C.B. 11), and Southampton County 20 (Southampton C.B. 17).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the years 1948-56 (influenza, 1952-6) are shown thus - - - - -, the figures for 1957 thus ———. Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



The Working Population

The "Industry Tables" of the 1951 Census of England and Wales have now been prepared by the General Register Office and published by H.M. Stationery Office (price £7 7s. net). They show that the total number of persons working in all industries (including the Services) in 1951 was 19,940,024 (13,782,268 males and 6,157,756 females), compared with 16,655,236 (11,538,697 males and 5,116,539 females) at the previous census in 1931. Workers are classified under some 350 heads, of which the largest are building (with 1,045,000 workers), farming (786,000), and defence (711,000). In all of these men greatly outnumbered women. The largest numbers of women were employed in hospitals (294,000), education (285,000), and canteens (218,000), in all of which they outnumbered men. Comparative figures for 1931 are shown so far as the changes made in the classification since then permit. In some of the older industries numbers occupied had fallen; for example, coal mining (from 841,000 men to 667,000), cotton weaving (from 249,000 persons to 123,000), and boot-and-shoe making and repairing (from 187,000 to 162,000). The most striking fall was in private domestic service, in which the number of women occupied fell from 1,120,000 to 360,000 and the smaller number of men fell almost as sharply.

Medical News

Ross Centenary Luncheon.—The Ross Institute of Tropical Hygiene held a luncheon in London on June 13 to commemorate the centenary of Sir Ronald Ross's birth. Dr. M. G. CANDAU, director-general of W.H.O., proposed the toast to Ross's memory. On August 20, 1897—"Mosquito Day," as he later called it—Ross first observed malarial parasites in the gastric wall of an anopheline mosquito. Paying tribute to Ross, Dr. Candau said that like most geniuses Ross was ahead of his time: some 45 years before the advent of D.D.T. and other residual insecticides. Ross had established the basic principles on which W.H.O.'s malaria policy was to be founded. He had recognized the need to concentrate on prevention rather than cure, and that for antimalarial measures to succeed they must form an integral part of general sanitary work. Ross repeatedly declared that help from outside could be given only as "object-lessons," the rest being left to local endeavour. Dr. Candau felt sure Ross would have approved W.H.O.'s present approach to malaria control and eradication, particularly the concept of eradication. Discussing the place of research in malaria eradication, Dr. Candau paid tribute to the "outstanding study" by Professor G. Macdonald and Mr. G. Davidson, of the Ross Institute, on insecticide-resistance in mosquitoes, and he also mentioned a trial of chloroquinized salt, undertaken by the U.S. Public Health Service, as a means of mass malaria prophylaxis in special circumstances. A recent estimate of the population of the malarious regions of the world was 1,070 million, continued Dr. Candau. Of these, 680 million (57%) lived in the 63 countries where now eradication of malaria could be expected "within a comparatively few years." Replying, Professor G. MACDONALD, director of the Ross Institute, said that Dr. Candau, by his advocacy of a policy of malaria eradication in place of one of control at the eighth World Health Assembly in 1955, had himself accelerated W.H.O.'s programme in this field—a field where W.H.O. already had a most distinguished record. "By doing so, he has changed the policy of half the world," said Professor Macdonald, "and established a height of greatness for himself." Professor Macdonald then turned to the research at the Ross Institute on the inheritance of insecticide-resistance. That very day, by the purest of coincidences and as the culmination of a lengthy study, he said, he and Mr. Davidson had been able for the first time to demonstrate—and to Dr. Candau himself—the mechanism of the inheritance of resistance to D.D.T. by anopheline mosquitoes. This was

not claiming that they now knew all about resistance, warned Professor Macdonald, but it showed that the type of difficulties likely to be encountered in the field could at least be understood—though not necessarily eliminated—as a result of properly planned research.

Professor Gallie in Edinburgh.—Professor W. E. GALLIE, emeritus professor of surgery at Toronto, and 27 Canadian surgeons, members of the Gallie Surgical Club of Toronto, visited Edinburgh last week. On Friday, June 14, Professor Gallie was guest of honour at a dinner at the Royal College of Surgeons to celebrate his 75th birthday. The next day Dr. R. I. HARRIS, of Toronto, unveiled a plaque at Edinburgh University commemorating Professor James Syme and his pupil and son-in-law, Lord Lister.

International Association for Psychopharmacology.—At the International Symposium on Psychotropic Drugs, held in Milan last month, it was proposed that an International Association for Psychopharmacology should be formed. Preliminary discussions took place during the symposium, at which an organizing committee was elected, and it was decided that a definitive meeting should be held in Zurich at the time of the Psychiatric Congress in September, 1957. In the meantime, a representative of each country undertook to contact those who might be interested in the formation of such an association. Will anyone who is interested, or who has definite views regarding the scope and limitations of the proposed association, please write to Dr. P. B. BRADLEY, The Medical School, Hospitals Centre, Birmingham, 15.

W.H.O. Regional Office in Copenhagen.—On June 15 the Danish Government handed over a new building at 8, Scherfigsvej, Copenhagen, to W.H.O. It is to be used for the W.H.O. Regional Office for Europe, which up to the present has been in the Palais des Nations at Geneva. The new building adjoins W.H.O.'s tuberculosis research office. The Regional Office will direct and co-ordinate the Organization's work in Europe, and also in Morocco.

Royal College of Surgeons.—At the council meeting on June 13 Lord WEBB-JOHNSON, P.P.R.C.S., was admitted as a member of the Court of Patrons. The following were co-opted to the council for 1957-8 as representatives of various branches of medical practice: Dr. JOHN HUNT (general practice), Mr. A. C. H. BELL (gynaecology and obstetrics), Mr. C. GILL-CAREY (otolaryngology), Dr. FRANKIS T. EVANS (anaesthetics), Mr. A. B. NUTT (ophthalmology), and Dr. E. ROHAN WILLIAMS (radiology). Sir WILFRED FISH was invited to continue as the representative of dental surgery on the council. A covenanted gift of £45,000 from Messrs. Cerebos Ltd. was received with gratitude. The diploma of F.R.C.S. Ltd. was granted to 108 candidates (general surgery, 100 out of 334 candidates; otolaryngology, 8 out of 29 candidates; ophthalmology, 2 out of 16 candidates: two of the successful candidates have not yet complied with the regulations).

Registers of Medical Auxiliaries.—The Board of Registration of Medical Auxiliaries has recently published its registers of dispensing opticians, orthoptists, and operating-theatre technicians. In the registers of dispensing opticians and orthoptists the names are arranged geographically, so that the addresses of medical auxiliaries in any particular area can be quickly found. Alphabetical lists of names are also included. The Board also maintains and publishes registers of chiropodists and radiographers. A register of audiology technicians, who have recently been recognized as medical auxiliaries, is now being prepared. Copies of these registers will be supplied free to members of the medical profession on application to the registrar, Board of Registration of Medical Auxiliaries, B.M.A. House, Tavistock Square, London, W.C.1.

Hungarian Red Cross.—The Hungarian Red Cross organization is to be allowed to manage its own affairs again, according to a statement from the Hungarian Information Service in London dated June 6. During the October up-

rising the affairs of the Red Cross Society were placed under a government-appointed commissioner and "college" of five professors. The commissioner and the five professors are now being superseded by a new committee charged with re-establishing the Hungarian Red Cross's autonomy. The statement adds that the Hungarian Red Cross will resume its traditional work, "which has been neglected in the last few months."

Dermatological Essay Competition.—The American Dermatological Association offers prizes of \$500, \$400, \$300, and \$200 for original papers on "some fundamental aspect of dermatology or syphilology." Winning papers become the property of the American Dermatological Association, and the winner of the first prize may be invited to read his paper at the Association's annual meeting next year, his expenses being paid. The competition is open to all medical practitioners, and the closing date is November 15. Further details may be obtained from Dr. J. LAMAR CALLAWAY, American Dermatological Association, Duke Hospital, Durham, North Carolina.

Lady Tata Memorial Awards.—The Trustees of the Lady Tata Memorial Trust, on the recommendation of their (European) scientific advisory committee, have made the following new awards for research on leukaemia and allied conditions. The awards date from October 1. Dr. G. KLEIN (Sweden) and Dr. M. BESSIS (France), grants for research expenses; Dr. G. V. SEAMAN (department of colloid science, Cambridge), scholarship and grant for research expenses. In addition, two scholarships and four grants for research expenses are renewed.

F.R.C.P.I.—At a meeting of the Royal College of Physicians of Ireland on June 7, with the president, Dr. F. J. O'DONNELL, in the chair, the following members were admitted to the fellowship: W. A. GILLESPIE (Bristol), E. M. CHEFFINS (Papworth Everard, Cambs), J. D. KENNEDY (Blackrock, Galway), D. J. O'CALLAGHAN (Kilgarvan, Co. Kerry), and H. B. KELLY (Cleveland, U.S.A.).

Christine Murrell Fellowship.—The Medical Women's Federation has awarded the first Christine Murrell Memorial Fellowship to Dr. ANN MULLINS, for research on disability resulting from obesity.

Queen's Commendation.—Lieutenant-Colonel P. L. E. WOOD, D.S.O., R.A.M.C., has been awarded the Queen's Commendation for Brave Conduct. The citation states that Colonel Wood volunteered to be lowered from a helicopter into a boat in rough weather and successfully treated a dangerously ill soldier.

Royal College of Nursing.—Miss G. M. GODDEN, Matron of Hammersmith Hospital, London, has been re-elected president of the College for the coming year. Miss FRANCES GOODALL has relinquished her position as general secretary after nearly 30 years' service with the College. She was appointed assistant secretary in 1927, became secretary in 1935, and was made the College's first general secretary in 1942.

Sir Macfarlane Burnet, F.R.S., director of the Walter and Eliza Hall Institute, Melbourne, has come to Europe for the International Congress on Poliomyelitis in Geneva next month. While here he will also discuss the medical dangers of radiation with British authorities. Sir Macfarlane is chairman of the Australian national radiation advisory committee.

Professor J. H. Burn, F.R.S., professor of pharmacology at Oxford, received the honorary D.Sc. of Yale University on June 10.

Dr. D. M. Leiberman, consultant psychiatrist, Bexley Hospital, Kent, has accepted a W.H.O. appointment as professor of neurology at the All India Institute of Mental Health, Bangalore.

Dr. J. A. Scott, medical officer of health of the London County Council, has been appointed chairman-elect of the council of the Royal Society of Health. He will assume office on October 1.

COMING EVENTS

Irish Medical Association.—Annual meeting, July 2 to 5, at University College, Cork. Clinical discussions will include papers on "Dynamic Therapeutics in Chronic Disease," "The Prevention and Treatment of Pre-eclamptic Toxaemias and Eclampsia," and "Recent Advances in the Treatment of Duodenal Ulcer."

Oxford Graduates Medical Club.—Summer dinner at Trinity College, Oxford, July 5, 7 for 7.30 p.m., under the chairmanship of Dr. MAURICE CAMPBELL. Tickets (37s. 6d.) from Mr. R. MACBETH, F.R.C.S., department of otolaryngology, Radcliffe Infirmary, Oxford.

First Annual Ciba Foundation Lecture on Research on Ageing.—July 9, 5 p.m., at the Zoological Society of London, Dr. NATHAN W. SHOCK (Baltimore) will lecture on "Age Changes in Physiological Functions in the Total Animal." Admission by ticket from the assistant secretary, Ciba Foundation, 41, Portland Place, London, W.1.

Radiography and Medical Photography.—Exhibition by Messrs. Ilford Ltd., July 11 to August 23 (Monday to Friday, 10 a.m. to 5 p.m.), at Tavistock House North, Tavistock Square, London, W.C.1. Open to all interested.

International Society for Biological Rhythm.—Sixth conference will be held in Semmering, Austria, August 26-28. Details from Dr. A. SOLLBERGER, Anatomical Department, Caroline Institute, Stockholm 60.

NEW ISSUES

Archives of Disease in Childhood.—The new issue (Vol. 32, No. 162) is now available. The contents include:

BRAIN DAMAGE AFTER FEBRILE CONVULSIONS. Malcolm Fowler.
SOME INVESTIGATIONS ON THE METABOLISM OF PHENYLALANINE AND TYROSINE IN CHILDREN WITH VITAMIN C DEFICIENCY. T. H. J. Huisman and J. H. P. JONKIS.
THE ELECTROLYTE CONTENT OF THE SWEAT IN FIBROCYSTIC DISEASE OF THE PANCREAS. B. W. W. bb, P. T. Fluic, and M. J. H. Smith.
KERNICTERUS NOT ASSOCIATED WITH HAEMOLYTIC DISEASE. Wong Hock Boon.
HAEMOGLOBIN IN CORD BLOOD IN NORMAL AND PROLONGED PREGNANCY. Gösta Rooth and Sven Sjöstedt.
ATYPICAL CONGENITAL HAEMOLYTIC ANAEMIA. A. J. Brafield and I. Reef.
THE NATURAL HISTORY OF NEPHROSIS. R. McLaren Todd.
MALIGNANT HYPERTENSION IN A CHILD DUE TO UNILATERAL KIDNEY DISEASE. C. Isaacs and S. Wayburne.
PERTUSSIS ANTIBODY RESPONSE AFTER TRIPLE ANTIGEN. G. V. Feldman.
ADRENOCORTICAL FUNCTION IN HYPERCALCAEMIA OF INFANCY. John Anderson, E. G. Brewis, and W. Taylor.
ADRENAL NECROSIS IN GENERALIZED HERPES SIMPLEX. R. T. Brain, R. C. B. Pugh, and J. A. Dudgeon.
A CLINICAL STUDY OF THE ABDOMINAL SKIN REFLEXES IN NEWBORN INFANTS. Ole K. Harlem and Arve Lönnum.
CONGENITAL MALFORMATIONS OF THE HEART AND THE GREAT VESSELS ASSOCIATED WITH CONGENITAL ABSENCE OF THE SPLEEN. David Levy.
DUPLICATION OF THE PITUITARY AND STOMATODAEAL STRUCTURES IN A 38-WEEK MALE INFANT. W. R. M. MORTON.
IDIOPATHIC HYPERLIPIDEMIA. K. S. Holt.
SUBCUTANEOUS FAT NECROSIS OF THE NEWBORN WITH CALCIFICATION OF THE TISSUES. Margaret B. Martin and Eluned M. Steven.
RADIOLOGICAL CALCIFICATION OF INTERVERTEBRAL DISKS IN CHILDREN. I. S. Wallman.
INTERPOSITION OF THE COLON BETWEEN LIVER AND DIAPHRAGM (CHILADITI) SYNDROME IN CHILDREN. A. D. M. Jackson and C. J. Hodson.
BENIGN HAMARTOMA OF THE LIVER. R. E. Rewell.
HYDROCEPHALUS AFTER INTRA-UTERINE FUNGAL INFECTION. A. F. Barry.
BOOK REVIEWS.

Issued six times a year; annual subscription £3 3s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

British Journal of Ophthalmology.—The new issue (Vol. 41, No. 6) is now available. The contents include:

RETINOPATHY OF PREMATURITY (RETROLENTAL FIBROPLASIA). Irene D. R. Gregory.
STUDIES ON THE ANTIGENIC STRUCTURE OF THE EYE USING THE FLUORESCENT ANTIBODY TECHNIQUE. D. St. C. Roberts.
SOEMMERRING'S RING. N. L. Stokoe.
ANTERIOR CHAMBER LENTICULAR IMPLANT. Harold Ridley.
SAFETY REQUIREMENTS FOR ACRYLIC IMPLANTS. Frederick Ridley.
THE RIDLEY LENS IMPLANT. Edward Epstein.
PROXIMAL MALIGNANT GLAUCOMA. H. L. Birge.
CORRESPONDENCE.
BOOK REVIEW.
NOTES.

Issued monthly; annual subscription £4 4s.; single copy 8s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Saturday, June 22

ASSOCIATION OF CLINICAL BIOCHEMISTS (SOUTHERN REGION).—At Adden-brooke's Hospital, Cambridge, 2 p.m., meeting. Scientific papers.

Tuesday, June 25

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Mr. A. K. Monro: Role of Surgery in Skin Diseases.

Wednesday, June 26

BIRMINGHAM MEDICAL INSTITUTE: SECTION OF PSYCHIATRY.—At Highcroft Hall Hospital, Erdington, 7 for 8 p.m., clinical meeting. Discussion: Concurrent Mental Disorders within the Family Group.
INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. R. W. Riddell: Mycological Routine in Dermatology.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Mr. J. R. Belcher: Emphysematous Cysts of the Lung.

Thursday, June 27

INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. G. C. Wells: Keratinization.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—4 p.m., Dr. A. Macgregor: Haemochromatosis.

Friday, June 28

BIOCHEMICAL SOCIETY.—At Department of Chemistry, King's College, Newcastle upon Tyne, 11.15 a.m., 363rd meeting.
●INSTITUTE OF DERMATOLOGY.—5.30 p.m., Dr. S. C. Gold: clinical demonstration.
INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. F. H. Young: clinical demonstration.
POSTGRADUATE MEDICAL SCHOOL OF LONDON.—10 a.m., Mr. L. Gillis: Amputations.

Saturday, June 29

ASSOCIATION OF CLINICAL BIOCHEMISTS.—At New Lecture Theatre, Royal Victoria Infirmary, Newcastle upon Tyne, 11 a.m., joint meeting with Biochemical Society. Papers and demonstrations, including a symposium on mucoproteins.

APPOINTMENTS

KENNEDY, WALTER P., Ph.D., F.R.F.P.S., F.R.S.Ed., Principal Medical Officer (Industrial Group), The Distillers Company Limited.
LIVERPOOL REGIONAL HOSPITAL BOARD.—D. P. A. L. Scott, M.B., Ch.B., D.P.M., Whole-time Consultant Psychiatrist at Rainhill Hospital; P. Pinkerton, M.D., D.P.M., Whole-time Consultant Psychiatrist in Child Psychiatry jointly between the United Liverpool Hospitals and the Regional Hospital Board, and Lecturer in Child Psychiatry in the University of Liverpool; M. M. Burrows, M.B., B.Ch., F.F.A.R.C.S., D.A., Consultant Anaesthetist (maximum part-time) at St. Catherine's Hospital, Birkenhead; W. R. Lamb, F.R.C.S.I., F.F.A.R.C.S., Consultant Anaesthetist (maximum part-time) in St. Helens and Warrington Groups; C. A. Hopkins, M.B., Ch.B., M.R.C.P., Whole-time Tuberculosis Medical Officer to Liverpool and District Eastern Hospital Management Committee.
MANCHESTER REGIONAL HOSPITAL BOARD.—D. W. Purser, M.B., Ch.B., F.R.C.S., Consultant Traumatic and Orthopaedic Surgeon, Lancaster and Kendal Hospitals; J. McHugh, M.B., B.S., D.P.H., Whole-time Deputy Medical Superintendent and Assistant Psychiatrist, Brockhall Hospital, Blackburn; A. J. Sims, M.B., B.S., F.F.A.R.C.S., Whole-time Assistant Anaesthetist, Bury and Rossendale Group of Hospitals.
NEEL, L. E., F.R.C.S., Consultant Thoracic Surgeon to Fr. Muller's Hospital, Mangalore, S. India.
O'DONNILL, SEAMUS, M.Ch., F.R.C.S., County Surgeon, Tipperary (N.R.), Eire.
ROLFE, M. G., M.B., B.Chir., F.F.A.R.C.S., D.Obst.R.C.O.G., Consultant Anaesthetist to the London Hospital.
SELLORS, T. HOLMES, D.M., M.Ch., F.R.C.S., Consultant Surgeon to National Heart Hospital, Westmoreland Street, W.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Hudson.—On June 16, 1957, at Liverpool Maternity Hospital, to Barrie, wife of Dr. Donald Hudson, The Firs, Ruff Lane, Ormskirk, Lancs., a son.
Sudbury.—On June 9, 1957, at Brentwood, Essex, to Mary (formerly Sadler), wife of Dr. J. R. Sudbury, a son.
White.—On May 26, 1957, at Bromsgrove, Worcs., to Frances Mary (formerly Cottam), M.B., Ch.B., and Henry Maxwell White, M.B., Ch.B., a daughter.

MARRIAGES

Christian—Needham.—On June 13, 1957, at Nottingham, Henry Thomas Christian, Ph.C., M.P.S., to Cecile Elizabeth Needham, M.B., Ch.B.

DEATHS

Braunwell.—On June 1, 1957, Charles Braunwell, M.R.C.S., L.R.C.P., J.P., of Bank Farm, Forest Row, Sussex.
Brewis.—On May 29, 1957, at 55 Esplanade Road, Scarborough, Yorks., Thomas Brewis, M.B., Ch.B., D.M.R.
Brown.—On May 3, 1957, at the home of his elder daughter, Chatham, Kent, John Brown, M.B., Ch.B., D.P.H., of Aberdeen.
Fonseca.—On June 6, 1957, at "Brynawel," Ebbw Vale, Mon., Frank Muller Fonseca, F.R.C.S.I., D.P.H.
Gornall.—On June 2, 1957, William Arthur Gornall, M.D., of Ulrik, Nailsa, near Bristol.
Stocks.—On May 25, 1957, Mary Sylvia Stocks, M.R.C.S., L.R.C.P., of 7, Garnett Road, Hampstead, London, N.W.
Wilkinson.—On May 31, 1957, at Kemerton, near Tewkesbury, Glos., Edward Aubrey Guy Wilkinson, O.B.E., M.R.C.S., L.R.C.P., Surgeon Captain, R.N. (retired), aged 81.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Indirect Contact with Rubella During Pregnancy

Q.—What precautions are necessary for a woman in the early stages of pregnancy who has not had rubella and whose husband has been in contact with the disease? He is believed to have had rubella. Is artificial immunization with gamma-globulin indicated?

A.—Rubella is not likely to be transferred by indirect contact, so that unless the husband develops the disease (which is not very probable since he already has had it) the chance of his wife becoming infected is not so high as to justify special prophylactic treatment. The supply of gamma-globulin is limited, and its use should be reserved until there has been direct exposure to infection. The most important step is for the wife to avoid contact with a sufferer from the disease until she has passed the 16th week of pregnancy—although the period of serious risk is probably restricted to the first 10 weeks.

Fertility after Mumps Orchitis

Q.—A few weeks ago a patient had a severe bilateral mumps orchitis, and the testicles are now smaller than previously and still tender. In a case such as this where the patient is anxious about his future fertility is a seminal analysis indicated, and, if so, how soon should it be done? Is there any point in advising against sexual intercourse until the testicular tenderness has gone?

A.—Though it would certainly be reasonable to have a seminal analysis done to assess the patient's likely fertility following bilateral mumps orchitis, it would be unwise to have this done too soon, since marked impairment of spermatogenesis would inevitably be shown. What is of far greater importance is the extent—if any—to which recovery of testicular function may proceed, and it would therefore be advisable to wait for, say, six months before doing the seminal analysis. In the meantime, the prognosis regarding future fertility should be very guarded.

Provided that coitus does not aggravate the testicular tenderness, there is no reason to advise abstinence until the tenderness has gone.

Rupture of Membranes in Concealed Accidental Haemorrhage

Q.—What are the indications for rupturing the membranes in concealed accidental haemorrhage? In particular what should be done in an acute case where the uterus is "woody hard" to the touch and is not contracting?

A.—Except in those cases where for some special reason (e.g., a live baby in an elderly primigravida) it is decided to deliver by caesarean section, artificial rupture of the membranes is indicated in all cases of concealed accidental haemorrhage and should be carried out as soon as the patient is in satisfactory hospital surroundings. The old fear that the uterine muscle may be so damaged that it will not contract is groundless. Moreover, if labour does not advance quickly an oxytocin drip infusion can be given as well. The main reason for rupturing the membranes is to ensure the delivery of the baby and placenta as soon as possible. Until the placenta and blood clot are delivered, the state of shock is unlikely to pass—even though morphine, blood transfusions, and the usual remedies are applied. It may be added that release of tension within the uterus may just possibly inhibit the utero-renal reflex which is thought to account for renal cortical necrosis.

There is now a further urgent reason for rupturing the membranes in these cases. One of the great dangers is the

development of afibrinogenemia or other coagulation defect. The best way of preventing or arresting this development is to rupture the membranes. The operation should be carried out simultaneously with resuscitation procedures and should not be delayed in the hope that the patient's general condition will improve, or until the uterus shows signs of spontaneous muscular activity. At the same time the blood should be studied for coagulation defects so that these can be corrected by concentrated plasma or fibrinogen as necessary.

Serum Amylase in Acute Abdomens

Q.—What is the value of the serum amylase estimation in the differential diagnosis of acute upper abdominal emergencies?

A.—The serum amylase estimation is of the greatest value in the differential diagnosis of acute abdominal emergencies in which acute pancreatitis is suspected. In acute pancreatitis the serum amylase is nearly always raised during the first few days of the illness, but may fall very rapidly again to normal levels, often by the fourth or fifth day of the illness. The other conditions in which the serum amylase level may be raised are in cases of perforated peptic ulcer or acute cholecystitis, but in these it is very unusual to find a figure of more than 500 units, whereas in acute pancreatitis levels above 1,000 units are not infrequently found. Thus, if the figure is over 500 units, and the case clinically seems to be one of acute pancreatitis, the test is very strong confirmation of the diagnosis. Any hospital treating acute abdominal emergencies should have facilities for carrying out this estimation at any time.

Acid Phosphatase in Prostatic Cancer

Q.—What is the value and reliability of the acid phosphatase estimation in the diagnosis, treatment, and prognosis of prostatic cancer?

A.—It is assumed that the question relates to the quantitative estimation of acid phosphatase in the blood serum. The amount of enzyme is determined by assaying the end-products of its catalytic activity (under prescribed conditions) on a known concentration of an organic substrate (usually phenyl phosphate). This forms the basis of the King-Armstrong method. The normal range of findings is generally accepted as being from 0-5 units. Modification of the test, however, is required to distinguish between the acid phosphatase elaborated by adult prostatic epithelium and similar enzymes derived from other sources. The latter are thought to be eliminated by the formalin inactivation technique of Abul Fadl and King,² and with this technique figures of over 2.5 units are suggestive of abnormal prostatic epithelial activity. Such levels commonly occur in cases of prostatic cancer where the malignant cells often retain a capacity for enzyme production.

In general it follows that the more widely disseminated the malignant process, the more likely is the serum acid phosphatase to be raised. With the modified test, values exceeding 5 units in fact show a high degree of accuracy in confirming the diagnosis, while conspicuously elevated figures of 50 units or more occur only in advanced cases of the disease. On the other hand, a number of prostatic cancers fail to make a significant contribution to the serum phosphate content owing to their smallness, site, or lack of secretory activity, and thus a normal value does not exclude the presence of cancer. In urological practice somewhat over two-thirds of cases with obvious metastases show a raised serum phosphatase as opposed to about one-third in which radiological evidence of dissemination is lacking. Diagnosis in many instances will already be assured on clinical grounds, so that the value of the phosphatase determination as a primary diagnostic method is comparatively small. Nevertheless the test serves a useful purpose in suggesting or confirming the condition if the nature of the primary lesion or of metastases is doubtful clinically, and it is helpful in the differentiation of some bone deposits from Paget's disease.

Raised serum phosphatase values commonly fall soon after the institution of endocrine therapy and may remain reduced indefinitely despite subsequent reactivation of the disease. Persistent or recurrent high values may indicate inadequate therapy and call for increased oestrogen dosage.

With regard to prognosis, nearly two-thirds of patients with normal levels at the time of diagnosis survive five years as opposed to one-third with raised initial values. It must be remembered, however, that normal levels are sometimes encountered with anaplastic tumours, and if metastases are already apparent the outlook is bad.

REFERENCES

- ¹ King, E. J., and Armstrong, A. R., *J. Canad. med. Ass.*, 1934, 31, 376.
² Abul Fadi, M. A. M., and King, E. J., *J. clin. Path.*, 1948, 1, 80.

Epididymitis from Retrograde Passage of Urine

Q.—Is it possible to develop epididymitis, apparently due to the retrograde passage of urine along the vas deferens, as a result of lifting a heavy weight while the bladder is full?

A.—It is generally accepted that epididymitis can develop during an unusual exertion or violent strain whilst the bladder is full and that it is caused by urine being forced along the vas deferens. A similar condition can be produced by the injection of a small amount of sterile water along the vas at the time it is divided at operation. This condition of non-specific epididymitis occurred from time to time in young men during the last world war when they were doing unaccustomed physical exercise with a full bladder. If it should become recurrent, it may prove necessary to divide the vas in order to prevent it.

Pityriasis Rosea in Early Pregnancy

Q.—Is there any risk of foetal abnormalities following pityriasis rosea early in pregnancy? Some authorities consider the condition a virus infection.

A.—The evidence that pityriasis rosea is due to a virus infection is very scanty.

Pityriasis rosea and similar eruptions are not at all uncommon during pregnancy, and I am not aware that an association with developmental abnormality has ever been noted.

Fractured Clavicle and Venous Obstruction

Q.—It is argued that the standard method of splinting a fractured clavicle causes venous obstruction, and that the only support needed in such fractures is an arm sling. What is your expert's view of this?

A.—There are so many different ways of treating a fractured clavicle that it is difficult to be certain what the questioner means by "the standard method." None of the methods usually employed in Britain should cause venous obstruction, and no case of venous obstruction from the treatment of a fractured clavicle has been seen in at least one large British fracture clinic during the last 22 years. It would therefore appear that this complication is a very rare one, if, indeed, it ever occurs.

A sling would be an adequate support for an undisplaced fracture of the clavicle, an incomplete fracture, or a fracture in a young child, but the more usual cases of clavicular fracture in adults are much better treated by some simple device such as the old-fashioned three-handkerchief sling, which gives the patient much more comfort.

Biochemical Tests in Chronic Pancreatitis

Q.—What biochemical changes commonly occur in chronic pancreatitis and which are helpful in diagnosis? Is the blood cholesterol estimation useful?

A.—The most useful tests in chronic pancreatitis are those which aim at demonstrating inefficient digestion of food. These include microscopic examination of the faeces after a

meat meal, the estimation of faecal fat content, and fat and nitrogen balance tests. All of these are likely to yield abnormal results in established cases.

It is also possible to look for abnormal concentrations of pancreatic enzymes such as lipase or diastase in the blood, urine, or duodenal contents. The faecal trypsin estimation may also be of value, particularly in infancy. In many cases, however, these procedures will yield normal results. More recently the estimation of duodenal enzymes has been combined with the injection of secretin, which is a specific stimulant of pancreatic secretion, but this is not a routine procedure at most centres.

There is no general relation between pancreatic function and the blood cholesterol level, although this may of course be raised if obstructive jaundice is present.

Bulk-producing Laxatives and Intestinal Obstruction

Q.—Do laxatives, such as methyl cellulose, which depend for their action on increasing the bulk of the intestinal contents, predispose to intestinal obstruction? Is there any hazard in using such laxatives for prolonged periods in appropriate cases?

A.—This type of laxative can give rise to obstruction in patients with an ileostomy if too much is taken in the dry state, when an agglomeration may form in the intestine and impact at the inextensible stoma. The granules should be soaked in a little water before being taken.

Rarely constipation is due to failure of motility in the large bowel when considerable faecal masses stagnate and become inspissated, eventually leading to obstruction; this condition is usually seen in the aged. Methyl cellulose, or psyllium seeds, tend to increase the difficulty in these cases. Otherwise there is no hazard in the prolonged administration of these laxatives.

NOTES AND COMMENTS

Amateur Boxing.—Dr. JOHN CAHILL (Middlesbrough) writes: Your answer to the question under this heading ("Any Questions?" May 18, p. 1195) would have been more complete if you had added that the doctor in attendance has no authority to stop a contest. His function is to advise—a distinction with a difference.

OUR EXPERT replies: Under the rules of the Amateur Boxing Association the referee is in complete charge of the bout and only he has the authority to stop it. However, he is well versed in the medical indications for stopping a bout.

Gynaecomastia from Oestrogen Therapy in Prostatic Cancer.—Dr. J. M. SIMISTER (Medical Adviser, Ward, Blenkinsop and Co., Ltd., London) writes: I much regret that I overlooked a typing error in the letter I sent to you about stilboestrol diphosphate ("Notes and Comments," June 1, p. 1316). The initial intravenous dose should be 500 mg. and not 5 mg.

Books of "Any Questions?" and Refresher Course Articles.—The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices include postage. *Any Questions?*, Volumes 2 and 3 (8s. each); *Refresher Course for General Practitioners*, Volumes 2 and 3 (26s. 6d. each inland, 26s. overseas); *Clinical Pathology in General Practice* (22s. 3d. inland, 21s. 9d. overseas).

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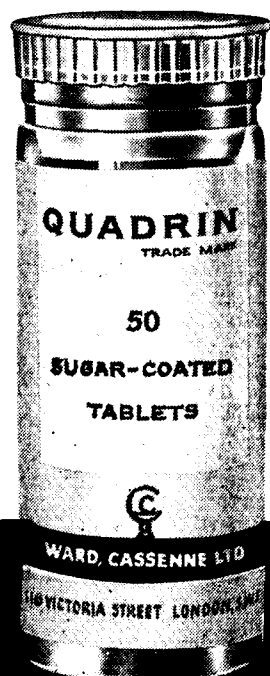
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RELIEVES—

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and breasts.

BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 29 1957

PHYSIQUE AND MENTAL BREAKDOWN IN YOUNG ADULTS

BY

R. W. PARNELL, D.M., M.R.C.P.
The Warneford Hospital, Oxford

A method is described of estimating body type by means of physical anthropometry in the form of a three-numeral index, similar to the somatotype index introduced by Sheldon (Sheldon, Stevens and Tucker, 1940). This index is related largely, though certainly not wholly, to genetic influence. In the second part of this report, disposition to breakdown in early adult life is shown by comparing the frequency of somatypes among patients and among healthy controls.

Estimating Body Type by Physical Anthropometry

The method of estimating body type presented here is similar to that described previously (Parnell, 1954a, 1954b). The same measurements are taken, but interpretation has been simplified. The method is basically the same as that used for 11-year-old children (Parnell *et al.*, 1955), but a different style chart is used. This contains all the necessary information, so that no extra tables are required.

Although the aim has been to correspond as closely as possible with Sheldon's estimates of somatotype, the components are here termed Fat (F), Muscularity (M), and Linearity (L) in place of his usual endomorphy, mesomorphy, and ectomorphy. (Bone development is included in the estimate of muscularity.) In using F, M, L ratings, primary dominance is indicated by capital letters, secondary dominance by small letters—for example, Fm, Fl, Mf, Ml, Lm, Ll. F, M, L nomenclature is used to emphasize that the scores are physical measurements and to avoid the assumption that the scores describe exactly the same entities as those rated photoscopically by Sheldon. The emphasis, therefore, is in the first place on phenotype, that which can be measured at a given time, rather than on Sheldon's somatotype.¹

A copy of the new chart, which is called the "Muscularity 4" or M.4 chart, is shown in Fig. 1. The basic measurements are those of young men aged 16–24 years. The ratings in the first and third components of the index can be determined directly from the chart.

¹ There are important distinctions here. A morphogenotype is presumed to exist because of the persistence of individual structure through life, just as genotypes are presumed to exist because human beings give birth to human beings, not to other species. It is impossible, however, to deal directly with the genotype, which is an abstract concept; only the phenotype can be measured. Sheldon's somatotype is defined as the best estimate of morphogenotype possible on the available evidence of phenotype or successive phenotypes. The term "somatotype" was introduced to indicate the path an individual may be expected to follow through life in relation to other people, assuming normal conditions of nutrition, exercise, and health.

The Fat scale is a logarithmic one, to correct for skewness in the male distribution of the sum of the three skinfold measurements, and is based, as previously, on the measurements of Oxford University students. Their mean "total fat" measurement is given a rating of 3½ to correspond roughly with the mean in endomorphy among students of 3.2 (Sheldon *et al.*, 1940) and of average man of 3.34 (Sheldon, 1954). The third component, Linearity, is given directly from the ponderal index, height in inches divided by the cube root of weight in pounds. It corresponds closely to the median of the range for each component given in Sheldon's tables (1954).

Instead of height, bone, and muscle measurements each at half standard deviation intervals, as in the earlier Deviation Chart (Parnell, 1954b), the new M.4 chart gives height at 1½-inch (3.8-cm.) intervals, and for each height a column of right-sided bone and muscle measurements appropriate to a rating of 4 in "Muscularity." These are calculated from the Oxford University student's average measurements (in the Height 70 in.—1.75 m.—column) making the assumption that for a given rating in Muscularity, bone and muscle measurements are proportionate to height; for example, a man of 67 inches (1.67 m.) with 4 in Muscularity has bone and muscle measurements 67/70, those of a man of 70 inches (1.75 m.) and the same Muscularity.

To determine the individual's score in this component, his bone and muscle measurements are ringed (Fig. 1) and the mean of their positions is found in relation to his height column. A provisional estimate for Muscularity is allotted according to the number of columns the mean score lies to the right or left of the appropriate height, counting each column passed as half a unit more or less respectively than 4. (The spacing of the height columns at 1½ inches (3.8 cm.) was chosen to make this possible.) A correction has then to be made for fat, since it is impossible to exclude this from muscle-girth measurements, and subcutaneous fat inevitably contributes something, though only a small amount, to "bone" measurements, resulting in an overestimate of muscularity where more than average fat is present. In this case allowance must be made by subtracting from the provisional estimate. Similarly, where there is less than average fat, the correction takes the form of adding. The amounts to be subtracted or added are proportional to the difference between an actual fat rating and the mean total fat, and are shown in Fig. 1. Phenotype 53½—see Fig. 1, is an example.

From the Universities of Oxford and Birmingham 2,063 men students were typed by this method, their distribution being shown in Fig. 2.²

Extremes in Muscularity

Anyone unfamiliar with the data might be excused for thinking that this distribution underestimates the muscularity of this population. Fig. 3, however, illustrates the distribution of candidates at a "Mr. Universe" physique competition. The median Mr. Universe has a phenotype, by this method, of 271, and even if the second component estimate is based on bone alone, to exclude the obvious muscle hypertrophy from weight-lifting and other progressive resistance exercises, his median type is 264. There can be no doubt that extremes in the second component exist, though not in the university population reviewed.

Comparison with Deviation Chart Typing

Comparison of the Deviation Chart and Table Typing method, previously reported (Parnell, 1954b), with the M.4 method of typing the student population is provided in Table I. It may be seen that the differences between the results, using these two methods, are slight. The differences between Table Typing and photoscopic interpretation have also already been reported (Parnell, 1954b); the differences between the present method and photoscopic interpretation are rather larger, not particularly in the first and third components, but in the second component discrepancies exceeding half a unit occurred in about one-third. The second component, however, is the most difficult to assess photo-

²Occasional plotting difficulties were encountered and dealt with by $\frac{1}{2}$ point reductions of secondary components while maintaining primary dominance—for example, phenotypes 633 and 336 were plotted as 624 $\frac{1}{2}$ and 242 $\frac{1}{2}$ respectively.

TABLE I.—Differences Between M.4 Chart Ratings and Table Type Ratings on 2,063 Healthy Young Men Aged 17-24 Years. (Difference Equals M.4 Minus T.T.)

Difference:	Percentage Distribution									
	-2	-1½	-1	-½	0	+½	+1	+1½	+2	
Component:										
I. F (endomorph)	0.0	0.1	1.5	20.9	57.0	18.2	2.1	0.2	0.0	
II. M (mesomorph)	0.0	0.5	6.7	27.4	42.9	19.1	3.2	0.2	0.0	
III. L (ectomorph)	0.0	0.2	1.9	10.4	41.9	38.1	7.5	0.1	0.0	

Discrepancies exceeding a half were found in 3.9% of F ratings, 10.6% of M ratings, and 9.7% of L ratings.

scopically, and discrepancies exceeding half a unit occurred in 17% of mesomorphic estimates reported by expert photoscopic somatotypists (Tanner, 1954). Nor is there any guarantee that this amount of agreement among experts with similar training could be obtained by observers with less training; indeed, experience seems to show it not infrequently worse.

Principal Advantages

It is therefore for reasons of consistency and objectivity that the M.4 method is recommended. It is less subject than photoscopic typing to variable interpretation by different observers, or by one observer on different occasions—a variability permitted by the range of choice in Sheldon's ponderal index tables. Inter-observer error with the M.4 chart depends only on the accuracy with which the measurements are taken, and probably inter-observer error in measuring approaches the column interval on the chart only in the case of bone measurements: even here it should seldom exceed 1 mm. with trained observers.³

³In fat subjects, outside curved callipers with rounded points are preferable to the straight-arm type, because they dip more closely to the bone.

ADULT DEVIATION CHART OF PHYSIQUE (Male Standards)		NAME.....	AGE..... 18	DATE.....													
		OCCUPATION.....	Married/Single.....	Ch.: M.....F.....	REF. No.....												
Fat :	(Skinfold)	Age	Total 3 Skinfold Measurements														
(mms.)	Over triceps ... 18	16-24	12	15	18	22	27	33	40	48	57	68	83	100	120		
	Subscapular ... 22	25-34	15	18	22	27	33	42	50	59	70	84	101	120	142		
	Suprailiac ... 17	35-44	17	21	25	30	37	46	55	66	78	95	116	138	162		
	Total fat ... 57	45-54	18	22	27	32	40	49	59	71	84	102	124	147	172		
ENDOMORPHY Estimate ...			1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7		
Height (ins.) ... 67.0	55.0 56.5 58.0 59.5 61.0 62.5 64.0 65.5 67.0 68.5 70.0 71.5 73.0 74.5 76.0 77.5 79.0 80.5																
Bone : Humerus 6.8	5.34 5.49 5.64 5.78 5.93 6.07 6.22 6.37 6.51 6.65 6.80 6.95 7.09 7.24 7.38 7.53 7.67 7.82																
(cms.) Femur 9.5	7.62 7.83 8.04 8.24 8.45 8.66 8.87 9.08 9.28 9.49 9.70 9.91 10.12 10.33 10.53 10.74 10.95 11.16																
Muscle : Biceps 31.6	24.4 25.0 25.7 26.3 27.0 27.7 28.3 29.0 29.7 30.3 31.0 31.6 32.2 33.0 33.6 34.3 35.0 35.6																
(cms.) Calf 36.3	28.5 29.3 30.1 30.8 31.6 32.4 33.2 33.9 34.7 35.5 36.3 37.1 37.8 38.6 39.4 40.2 41.0 41.8																
First estimate of mesomorphy ...		1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7			
Correction for fat (T.F. mms.) ...		12	15	18	22	27	33	40	48	57	68	83	100	120	140		
Age : 16-24 ...		+½	+½	+½	+½	0	-½	-½	-½	-½	-½	-½	-½	-½	-½		
25-34 ...		(+½)	(+½)	(+½)	(+½)	0	-½	-½	-½	-½	-½	-½	-½	-½	-½		
35+ ...		(+½)	(+½)	(+½)	(+½)	0	-½	-½	-½	-½	-½	-½	-½	-½	-½		
MESOMORPHY (corrected estimate)		1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7			
Weight	Wt. lb.	H.W.R.	Age														
Present			18	12.1	12.3	12.5	12.7	12.9	13.1	13.3	13.5	13.7	13.8	14.0	14.2	14.4	
H.K.W.			23	11.7	12.0	12.2	12.5	12.8	13.0	13.2	13.4	13.6	13.8	14.0	14.2	14.4	
Usual			28	11.5	11.8	12.1	12.4	12.6	12.8	13.0	13.3	13.5	13.7	13.9	14.2	14.4	
At 18 years			33	11.3	11.7	12.0	12.3	12.5	12.7	12.9	13.2	13.4	13.6	13.9	14.1	14.4	
At 23 years			38	11.2	11.5	11.8	12.1	12.4	12.6	12.8	13.1	13.3	13.6	13.9	14.1	14.4	
Recent change			43+	11.1	11.4	11.7	12.0	12.3	12.6	12.8	13.1	13.3	13.6	13.9	14.1	14.4	
ECTOMORPHY			1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7		
Biacromial (cms.) ... 38.0	30.7 31.6 32.4 33.3 34.2 35.1 36.0 36.9 37.7 38.6 39.5 40.4 41.3 42.2 43.0 43.9 44.8																
Bi-iliac (cms.) ... 30.0	23.0 23.8 24.6 25.4 26.2 27.0 27.8 28.6 29.4 30.2 31.0 31.8 32.6 33.4 34.2 35.0 35.8 36.6																
Androgyny 3 x Biac-Bi-iliac 84.0	66.4 68.8 71.2 73.5 75.9 78.3 80.6 83.0 85.4 87.8 90.1 92.5 94.8 97.2 99.6 102.0 104.3 106.7																
Strength : R. Hand																	
L. Hand																	
Lumbar pull																	

FIG. 1.—Adult deviation chart for physique—M.4 style. Phenotype 5343 at age 18. Androgyny score (Tanner, 1951) 84.0 lies about halfway between mean values for men and those for women (in boxes).

The principal advantages of the M.4 chart over the Deviation Chart lie in speed and simplicity. Ringing measurements on the M.4 chart and estimating phenotype are now one operation, while, before, two tables had to be consulted and a calculation worked out for each individual.

It must be mentioned, however, that the increased objectivity is in some respects a drawback; clearly the M.4 chart

preliminary estimates of dominance when somatotyping with the help of Sheldon's tables. For this purpose, to discard the photograph altogether would be to rob oneself of a valuable permanent record and an additional source of instruction in such matters as dysplasia. The physical anthropometric estimates, however, undoubtedly sharpen the definition of typing, both by adding greater precision and by improving agreement between observers. In practice, one comes to rely greatly on this objective check to photoscopic impressions.

Weight Variation at a Given Age

Variation in the weight of Oxford students from one year to the next has been reported elsewhere (Parnell, 1954c). Among men, 83%, and among women, 91%, changed less than 10 lb. (4.5 kg.) in a year, roughly two-thirds gaining and one-third losing. Only 6% of students gained more than a stone (6.35 kg.); only about 1% lost more than this amount. Considerable variation occurs, therefore, though not very often in health. There is room on the Deviation Chart to enter differing weight or fat measurements recorded at one age or subsequent ages.

Extreme Weight Variation in Mental Illness

Extreme variation of phenotype estimates may be met in patients with anorexia nervosa who, when most emaciated, may have subcutaneous fat and ponderal index scores corresponding to phenotype 217. After insulin-coma treatment and recovery, these measurements may change so that they correspond with phenotype 524, and two months later settle close to 424, the only constant finding being a "dip" type of index with lowest rating in the middle component. Without knowledge of the history it would be impossible to grasp from the M.4 chart alone at the worst stage of illness that the somatotype probably lies within an orbit of ± 1 to 1 point from type 424. The photograph, however, may help directly, for it shows body width and length proportions, clearly indicating ectomorphy 4 ± 1 to the trained eye. Obvious loss of weight, clinically or photoscopically, prevents undue importance being attached to the excessively high ponderal index found at the height of this illness.

Women's Phenotypes

Women may be measured in the same way, their measurements plotted on the M.4 chart, and a phenotype estimate derived. Such estimates have been plotted for 671 women students entering Oxford and Birmingham Universities between 1950 and 1954 (Fig. 4). Their distribution differs to some extent from the distribution of women's somatotypes

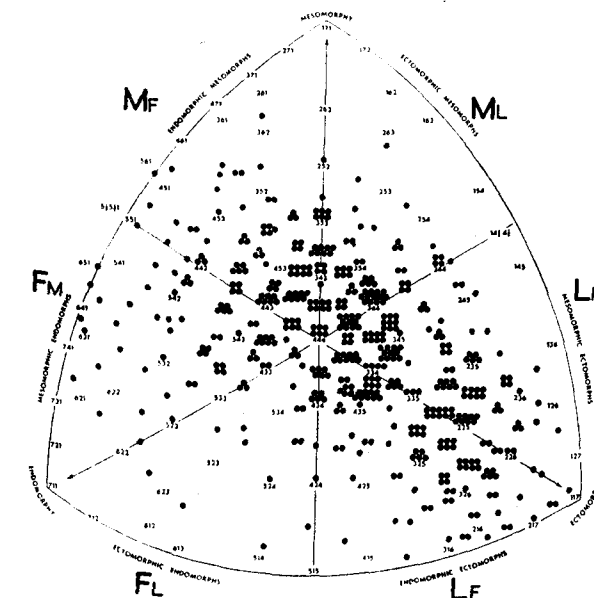


FIG. 2.—Phenotype distribution of 2,063 men students from the universities of Oxford and Birmingham.

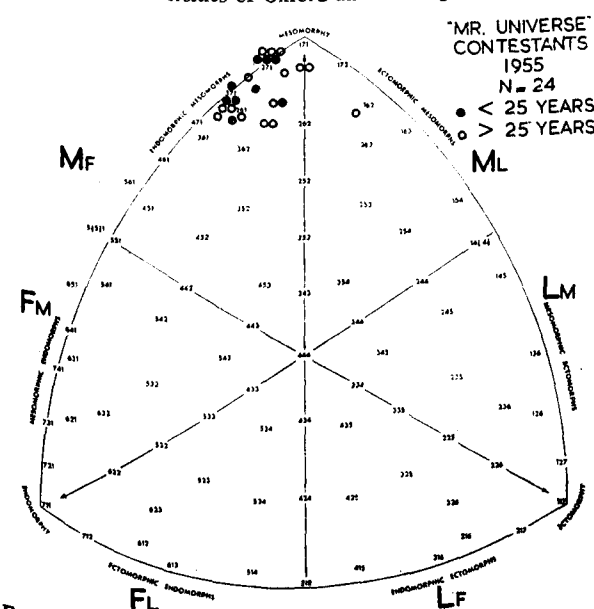


FIG. 3.—Phenotype distribution of 24 competitors at the 1955 "Mr. Universe" physique contest.

works best with healthy persons; exact allowances for changes in weight and subcutaneous fat brought about by underfeeding or illness may be difficult to assess, whereas evidence of the true rating in, say, ectomorphy is normally detectable in the photograph. It is not claimed that the M.4 method by itself is as suitable for Sheldon somatotyping as photoscopy. It is, however, an accurate and consistent way of phenotyping, and there is considerable scope in socio-medical surveys for a method of phenotyping healthy people by physical anthropometry alone, especially where photography is impracticable for lack of accommodation, equipment, or time, or again on grounds of expense or unwillingness to be photographed on the part of any of the subjects. But, in addition to phenotyping without photography, these phenotype estimates are here used and are recommended as

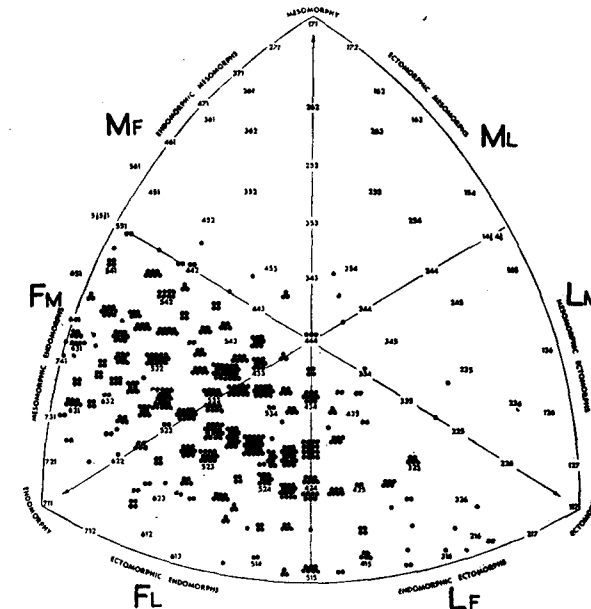


FIG. 4.—Phenotype distribution of 671 women students from the universities of Oxford and Birmingham.

published by Sheldon (1954, p. 13). Unfortunately, his photoscopic standards for women have not so far been published, and, although it will be a comparatively simple matter, when the time comes, to prepare conversion tables based on the percentile distribution in each component, the percentile distributions for this sample are not yet available either (Sheldon, 1956, personal communication). It is recognized that the adoption of an independent distribution for women might lead to some confusion, but if the differences in technique and nomenclature describing M.4 phenotypes are kept in mind, such confusion should be avoided. The M.4 scales are more precise in themselves and more easily grasped than photoscopic interpretation: these are distinct advantages.

Disposition to Breakdown

Disposition to breakdown in mental health is measured for individual somatotypes or groups of somatotypes by comparing the frequency of each type in a series of patients and a series of controls. The first series of patients here consists of 208 consecutive Oxford University students advised by their general practitioners to attend the Warneford and Park Hospitals during the last four years for consultant psychiatric opinion. The first 100 were mentioned in an earlier report (Davidson *et al.*, 1955). The control series consists of 405 Oxford students attending a pilot health service between

1947 and 1950, for which the volunteer rate was 70%. M.4 phenotype and independent photoscopic estimates were compared before settling the final somatotype to be used. Fig. 5 shows those somatotypes ringed which appeared more often in the patient series; Fig. 6 those somatotypes which appeared more often among the healthier controls. The actual frequencies may be compared in Table II. There is a highly significant difference between the distribution of the 208 patients and the 405 healthy controls ($\chi^2=24.25$, $P<0.001$). A comparative ratio in the third column of

the table—Comparative ratio = $\frac{\% \text{Patients}}{\% \text{Controls}} \times 100$ —indicates by higher figures which physiques show greatest disposition to breakdown. These are the linear or ectomorphic physiques, especially those in whom fat is more prominent than muscle (Lf), but high rates were also found in Fl types: briefly, muscular builds were least disposed to upset.

Similar conclusions concerning the significant association of comparative mental and muscular weakness in young men are reached if the student patients are compared with Sheldon's figures for somatotype frequency in a large American population ($n=46,000$) from 16 years of age upwards. Comparison of non-student patients under 30 years with student controls also yields the same general trend. The Oxford student population appears rather more

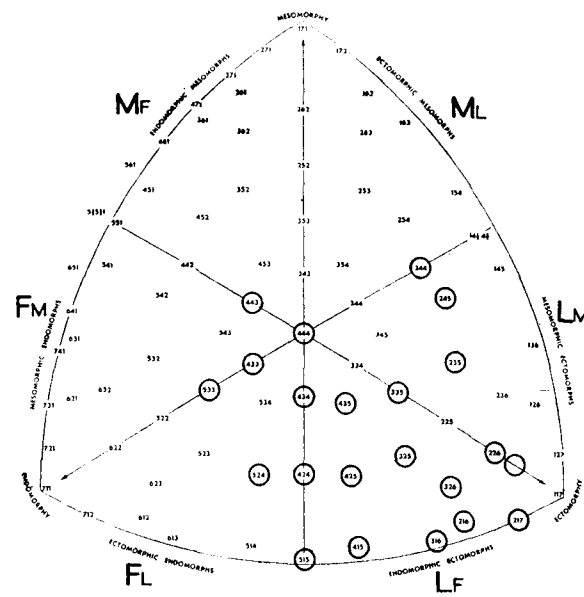


FIG. 5.—Somatotypes which appeared more often among Oxford men students under psychiatric care than among healthy students.

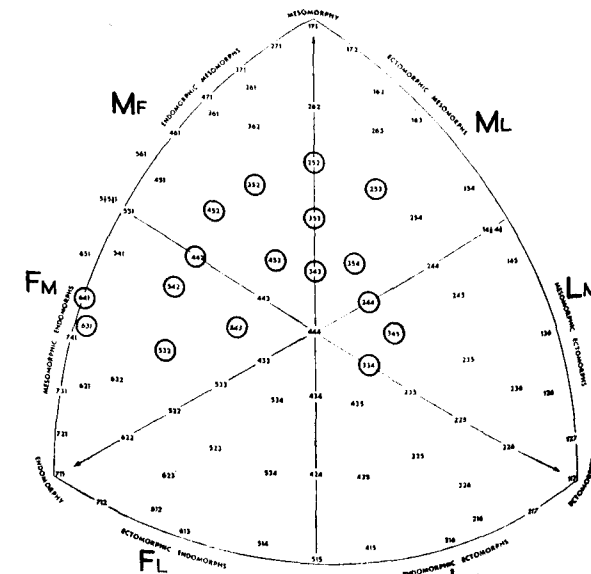


FIG. 6.—Somatotypes which appeared more often among healthy men students at Oxford than among patients.

TABLE II.—Percentage Distribution of Male Patients by Dominance of Physique

Dominance	Oxford Students			Other Patients		U.S.A. Sample ($n=46,000$)
	Patients ($n=208$)	Controls ($n=405$)	% Patients % Controls $\times 100$	Under 30 Years ($n=195$)	% Patients % Controls $\times 100$	
FAT:						
Fi Central	5.8	2.5	232	3.6	104	1.9
Fi Peripheral	9.2	3.7	248	5.6	167	5.1
Fm Central	7.2	5.4	133	4.1	76	7.7
Fm Peripheral	13.0	16.6	78	9.7	59	17.7
MUSCULAR:						
Mf Central	5.8	12.1	48	4.6	38	7.8
Mf Peripheral	8.2	21.5	38	13.8	64	26.9
Mi Central	6.3	11.2	56	10.2	91	9.4
Mi Peripheral	9.2	15.6	59	16.9	108	22.0
LINEAR:						
Lm Central	4.8	13.8	25	10.2	74	5.9
Lm Peripheral	22.1	29.4	75	26.1	89	17.8
Lf Central	14.9	5.7	262	9.2	161	3.6
Lf Peripheral	36.1	12.4	291	27.1	218	6.3
444	3.4	1.0	340	1.0	100	4.2
Total	100.2	100.2	100	100.2	100	100.0

Oxford student patients v. controls, $\chi^2=24.25$, $P<0.001$. Non-student patients v. controls, $\chi^2=27.66$, $P<0.001$. (Type 444 excluded.)

linear than the general population in the States, and this tends to lessen the contrast between non-student patients and student controls.

Individual phenotypes show striking contrast in disposition—for example, type 452 was five times more common in the healthy sample, type 325 six times more common among the patients.

The question may reasonably be asked whether this general trend could be due to mental patients losing weight. The answer is that careful weight histories were taken and allowance made for any weight loss recorded; secondly, the photographic check was used and a further independent check was provided by the ratio of height to chest width. Neither height nor chest width changes appreciably with weight loss, and although the mean ratio for samples of patients showed them to be more linear as a group than healthy persons, there was no excess of patients with ratios either more or less linear than the average for healthy persons of their own particular phenotype.

Disposition to Mental Illness in Young Women

So far 227 women patients under the age of 30 years have been phenotyped by combined M.4 chart estimates and photoscopy. Of these, 75 were attending at the Park Hospital for functional nervous disorders, the remaining 152 had been admitted consecutively to four mental hospitals. The distribution of their phenotypes by dominance is given in Table III, and may be compared with the figures for 671

TABLE III.—Percentage Distribution of Women Patients by Phenotype Dominance

Phenotype Dominance	Women Patients Under 30 Years ($n=227$)	Birmingham and Oxford Students ($n=671$)	Ratio % Patients % Controls $\times 100$
FAT:			
Fi Central	11.5	7.3	157
Fi Peripheral	37.9	40.4	94
Fm Central	4.4	3.3	(133)
Fm Peripheral	19.8	41.0	48
MUSCULAR:			
Mf Central	0.0	0.5	(0.0)
Mf Peripheral	0.0	0.8	(0.0)
Mi Central	0.0	0.5	(0.0)
Mi Peripheral	0.0	0.5	(0.0)
LINEAR:			
Lm Central	0.9	0.1	(-)
Lm Peripheral	1.3	0.2	(-)
Lf Central	7.5	3.1	242
Lf Peripheral	40.2	16.6	242
444	0.9	0.5	(-)
Total	100.0	100.0	100

Women patients under 30 years v. healthy students, $\chi^2=62.73$, $P<0.001$. (The three poorly populated sectors and type 444 were excluded.)

healthy women students at Oxford and Birmingham Universities. Once again the difference in distribution is highly significant ($\chi^2=62.73$, $P<0.001$), with the same Lf phenotypes showing the highest disposition to breakdown. Among fat but more muscular women belonging to the Fm sector there is a great excess of healthy students. Figs. 7 and 8 illustrate the contrast between phenotypes which are commoner in the patient and healthy samples respectively. There are too few women in sectors Mf, Mi, and Lm to justify comparison.

Somatotype and Psychiatric Diagnosis

No significant difference has been found so far in the physical distribution of patients admitted to mental hospitals and those attending the neurosis centre. An account of the relationship between physique and mental illness will not, however, be complete until the results are related to psychiatric diagnosis. For this purpose, psychiatric records are being collected, using certain well-defined clinical criteria for up to 200 patients of each sex in progressive age groups. This study is now well advanced, and in due course will form the topic of a combined report with Dr. Ian Skottowe, the psychiatrist concerned.

Summary and Conclusions

A method is described of estimating body type by means of physical anthropometry in the form of a three-numeral phenotype index, similar to the somatotype index introduced by W. H. Sheldon. The index is derived during the clinical interview by entering the measurements direct on to an M.4-style Deviation Chart. The F, M, L, phenotype index of Fat, Muscularity, and Linearity may be read from the chart without further tables, except that tables are most convenient for calculating the ponderal index of Linearity.

Comparison with the results of Deviation Chart and Table typing previously reported (Parnell, 1954b) shows that the differences between component ratings determined in this way and by the M.4 type chart are small. The M.4-style chart has notable advantages.

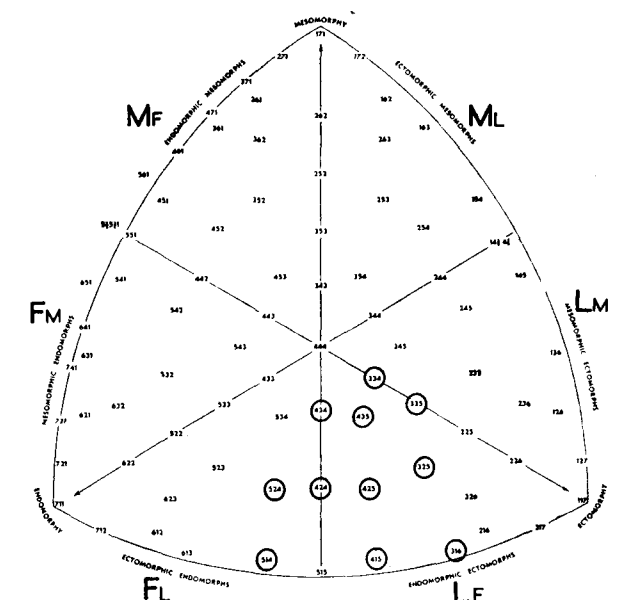


FIG. 7.—Phenotypes which appeared more often among women mental hospital patients under 30 years of age than among healthy students.

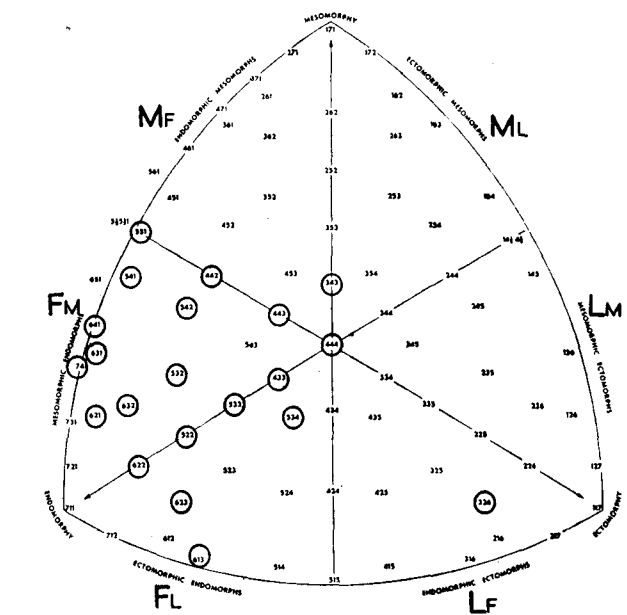


FIG. 8.—Phenotypes which appeared more often among healthy students than among women patients under 30 years of age.

Women's phenotypes may be derived from the M.4 chart, using the same absolute scales. Their phenotype distribution is reported. The possibility of subsequent correction of this distribution is discussed.

Weight variation at a given age is discussed in relation to phenotyping both healthy persons and mental hospital patients.

Disposition to mental breakdown is measured in terms of phenotype frequency in patient and control series. (The phrase "somatotype frequency" is reserved for the young men who were photographed and typed by Sheldon's criteria.) There was a highly significant tendency for mental disturbances to occur more often in Sheldon's endomorphic ectomorphs—that is, a linear build with proportionately more fat than muscle—type Lf. More muscular young men, especially endomorphic mesomorphs (type Mf), were much commoner in the healthy sample. For example, phenotype 452 was five times more common among healthy young men, phenotype 325 six times more common among patients.

The somatotype distribution of other young men patients, excluding students, showed similar significant trends.

Among women under 30, disposition to breakdown was once again significantly much greater in Lf phenotypes. In sector F1 there was about average expectation of breakdown. Lastly, in sector Fm there was a significantly higher proportion of healthy students.

APPENDIX : NOTE ON SUBCUTANEOUS TISSUE CALLIPERS

The subcutaneous tissue callipers ("Q") used throughout this work are no longer in production. Their specification, and that of the Harpenden callipers now available, are given by Tanner and Whitehouse (1955). Unfortunately, the equation they gave for transforming "Q" measurements to Harpenden equivalents is unworkable owing to an error. A set of Harpenden Total Skinfold measurements in millimetres is therefore provided in the table below for each age group to replace the "Q" figures given in Fig. 1 if Harpenden callipers are used.

Equivalent Skinfold Measurements Using Harpenden Callipers

Age	Total of Three Skinfold Measurements													
16-24	10	12	14	17	20	24	29	36	45	57	73	93	114	
25-34	12	14	17	20	24	30	38	48	60	74	94	114	+	
35-44	13	16	19	22	27	35	44	55	68	87	109	+	+	
45-54	14	17	20	23	29	37	47	61	74	95	118	+	+	
Estimate F	1	1½	2	2½	3	3½	4	4½	5	5½	6	6½	7	

Based on 180 duplicated measurements partially selected to cover the scale

The Harpenden callipers have two advantages—the spring loading varies relatively little as the jaw opens, and, secondly, the dial is capable of more accurate measurement. They have one serious disadvantage: the needle takes time to settle. Repeated studies with serial photographs of calliper dial and stopwatch show that even in the lower part of the scale the needle settles by variable amounts up to 1 mm. in the first 10 seconds after the callipers are applied, and continues to move for 30-45 seconds or so afterwards. In the upper part of the scale, it moves as much as 2-4 mm. in the first 10 seconds. The accuracy of the procedure should not be overrated.

I thank Dr. R. W. Armstrong, Dr. W. Ogden, Dr. S. L. Last, Dr. R. G. McInnes, Dr. Ian Skottowe, and Dr. P. Berkenau, together with other psychiatrists, who have kindly allowed me to measure patients under their care at hospitals in the Oxford Region. Dr. I. J. McQueen introduced me to contestants in the "Mr. Universe" physique contest organized by the National Amateur Body Builders' Association. Miss G. E. Peierls and Miss M. Caudwell provided statistical assistance and Mrs. N. V.

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REFERENCES

- Davidson, M. A., Lee, D., Parnell, R. W., and Spencer, S. J. G. (1955). *J. ment. Sci.*, 101, 810.
 Parnell, R. W. (1954a). *British Medical Journal*, 2, 491.
 — (1954b). *Amer. J. phys. Anthropol.*, 12, 209.
 — (1954c). *J. Hyg. (Lond.)*, 52, 369.
 — (1955). In *Modern Trends in Psychosomatic Medicine*, edited by D. O'Neill, p. 182. Butterworth, London.
 Peierls, G. E., Standley, C. C., and Westropp, C. K. (1955). *British Medical Journal*, 1, 1506.
 Sheldon, W. H. (1954). *Atlas of Men*. Harper, New York.
 Stevens, S. S., and Tucker, W. B. (1943). *Varieties of Human Physique*. Harper, New York and London.
 Tanner, J. M. (1951). *Lancet*, 1, 574.
 — (1954). *Amer. J. phys. Anthropol.*, 12, 257.
 — (1955). *Growth at Adolescence*. Blackwell, Oxford.

THE CONCEPT OF MEDIASTINAL PAIN

BY

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The usual patterns of pain occurring in ischaemic heart disease, hiatus hernia, and pericarditis are well recognized. Many clinicians, however, will remember having seen patients with a history of sudden or severe chest pain somewhat similar to, or even identical with, that occurring in myocardial infarction, but in whom a subsequent diagnosis of carcinoma of the lung or other condition involving the mediastinum was ultimately proved. There is no doubt that chest pain can arise from the involvement of several different pain-sensitive structures in the mediastinum by various pathological processes, and the following case reports illustrate the fact that the patterns of pain resulting may cause considerable difficulty in diagnosis. Interesting variations in the sites of pain reference have also been noted.

Bronchial Neoplasm with Mediastinal Involvement

It is not rare for new growth of the bronchus to present with a sudden excruciating central chest pain which may be mistaken for the pain of myocardial infarction. It is similar in character, radiating up into the neck and jaw and down into the arms, but with the significant addition of a component of pain which radiates up into the head, scalp, face, and ears. Furthermore, the pain is repeated at longer or shorter intervals. In the first instance such a pain may be regarded as due to myocardial infarction, but with recovery and then repeated attacks without confirmatory electrocardiographic evidence, the diagnosis of myocardial infarction becomes untenable. Most physicians will have seen such patients who were regarded as having cardiac pain, and subsequently a neoplasm of the bronchus with mediastinal involvement has been found.

Interestingly, in one case of carcinoma of the left upper lobe bronchus referral of pain to the left side of the head occurred.

Case 1.—A man of 49 years was awakened from sleep one night with severe retrosternal pain followed in several minutes by left hemiparesis of considerable severity. He vomited. The pain then radiated to the left elbow and lasted about one hour. This recurred twice subsequently, and none of the attacks was induced by exertion or change of posture. An unproductive cough developed at about this time. Examination revealed a sthenic man with a dry cough. There was moderate hypertension. The percussion note was slightly impaired over the left lung apex anteriorly. An E.C.G. tracing was normal. A chest x-ray film revealed a mass in the region of the aortic knuckle (Figs. 1 and

2), which was subsequently shown to be a bronchial carcinoma. Six months later, necropsy revealed widespread carcinoma, originating in the left upper lobe bronchus, involving the mediastinum and with metastases in bones and brain. No myocardial infarction was found.

Case 2.—A woman aged 52 had a chest infection with an abnormal shadow in the left lower lobe. The shadow grew and the lung was excised. The lesion was found to be squamous-cell carcinoma with histologically proved lymph-node involvement. Later there were attacks of very severe retrosternal pain with radiation into the face and head, and, in particular, pain was felt in a premolar on the right side of the lower jaw; the pain also radiated into the left arm. A pleuro-pericardial friction rub was present with each exacerbation of pain. No electrocardiographic evidence of myocardial infarction was found in any of several tracings.



Fig. 1.—Case 1. X-ray film showing a mass in the region of the aortic knuckle.

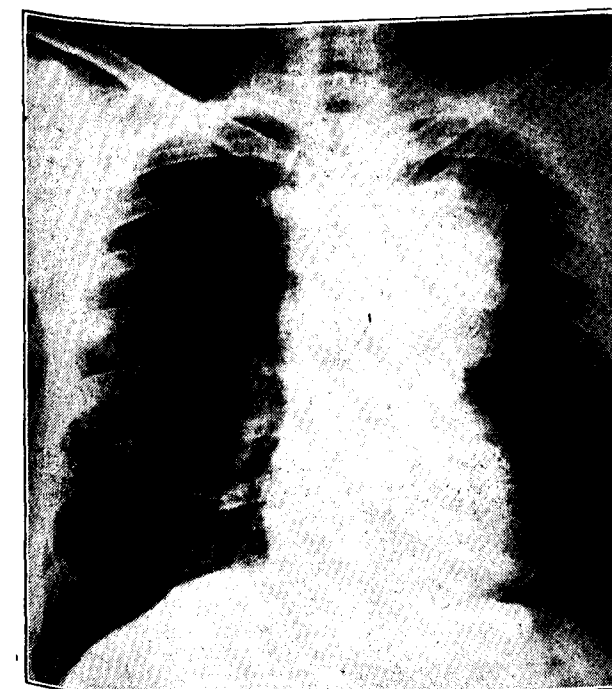


Fig. 2.—Case 1. X-ray film taken three months after Fig. 1. The lesion was a carcinoma of the left upper lobe bronchus.

It seems certain that this pain originated in the mediastinal structures which were invaded by new growth and that mediastinal pleurisy was associated.

Case 3.—A seaman aged 38 developed severe aching pain in his chest in December, 1950. It was situated in the centre of his chest, radiating down the inside of his left arm and the outside of his right arm. It also went through into his back. The pain was so excruciating that it made him weep, lasted altogether four days, and then disappeared completely. He was thought to have an atypical myocardial infarction without E.C.G. changes. In June, 1951, the pain recurred and he was a little short of breath. In July, 1951, the pain recurred again; it was felt between the shoulder-blades and went up into his neck. In February, 1952, he had another attack of a very severe pain which lasted a week. At this time it included his shoulders and his neck, and reached up to his right cheek. Immediately before admission to hospital the pain in his arms started again, and was very severe. An x-ray film of the chest showed a large mediastinal tumour. Biopsy showed a poorly differentiated carcinoma, the origin of which was doubtful.

Mediastinal Gland Involvement by Reticulosis, Sarcoidosis, Tuberculosis, or Secondary Neoplasm

When mediastinal glands are involved in these conditions the patient may present with pain which is identical with the pain described above. A significant diagnostic feature again is the radiation into the head and face. Here also the diagnosis may be obscure until obvious glandular enlargement is found in the chest x-ray film, and this development may be delayed for weeks or even months.

Case 4.—A woman aged 36, 3½ months pregnant, complained of cough of two years' duration and intermittent attacks of pain of varying degrees of severity which were felt in the left side of the face. The pain came first in the upper jaw, spread into the lower jaw, then into the face below the left eye and finally to the scalp on the left side. There was a gradual spreading of the pain until all the sites mentioned were involved. It had been present intermittently for three months, but then became continuous. In addition, she noticed increasing shortness of breath, and for two months she had increasing "indigestion." This was a nasty burning sensation deep inside the chest, unrelated to food or posture and not relieved by powders. An x-ray film of the chest showed a mass in the left lower lobe with a paramediastinal mass in the upper part of the left hilum. At thoracotomy malignant glands in the mediastinum and a massive invasion of the left lung by growth were found. The patient died eight months later following the birth of a normal child. Necropsy showed multiple metastatic carcinoma, histologically very anaplastic, the primary growth being probably in the breasts.

Case 5.—A man of 55 developed dull persistent pains in the right shoulder followed by malaise and then pains in the left shoulder. One morning he experienced sudden agonizing pain in the back and around the chest which spread widely up into the throat, jaws, face, ears, especially the left ear, to the top of the head and down both arms to the elbows. The pain persisted severely for about two weeks and then less severely for about three months, and was accompanied by shortness of breath and hoarseness of the voice. Physical examination revealed loss of weight and breathlessness. The left vocal cord was found to be paralysed. The blood pressure was normal and there was no inequality of the pulses. Chest x-ray examination revealed widening of the superior mediastinum and a small indefinite shadow in the left lower lobe. Bronchoscopy was normal, apart from the paralysed left vocal cord. An E.C.G. tracing was normal. Wassermann and Kahn reactions of the serum were negative. A course of palliative deep x-ray therapy was given to the superior mediastinum with relief of pain, but the patient died five months after the appearance of the first symptoms. Necropsy revealed carcinoma of the lung with secondary deposits in the mediastinal glands.

Case 6.—A man of 37 developed an intermittent fever with nocturnal sweats, lassitude, and pain in the left buttock. He then suffered from a constant ache in the upper part of the left side of the chest, which passed to the shoulder and scapular region. This was accompanied on occasions by a sharp needle-like pain felt deeply behind the sternum, shooting up to the left side of the neck synchronously with each heart beat, the attacks lasting several minutes and dying away slowly. He also noticed itching of the skin. Chest x-ray films revealed widening of the

superior mediastinum (Fig. 3), and bronchoscopy was normal. A blood count showed a polymorphonuclear leucocytosis (84% of 16,000 leucocytes per c.mm.) and an E.S.R. of 80 mm. per hour (Westergren). A provisional diagnosis of malignant lymphoma was made and a course of deep x-ray therapy instituted, which resulted in considerable relief of the pain. Several months later, however, irregular fever recommenced and several rubbery non-tender glands appeared in the left supra-clavicular region. Biopsy of these glands showed Hodgkin's disease. The patient's condition steadily deteriorated and he died three years after the appearance of the first symptom. Necropsy revealed extensive deposits of lymphadenoma tissue in almost all viscera, including bone marrow.



FIG. 3.—Case 6. X-ray film showing widening of superior mediastinum, found to be due to Hodgkin's disease.

Cardiac Pain

Cardiac pain occurs with angina pectoris and with myocardial infarction, and both these are sufficiently well recognized not to require detailed description here. Pain of ischaemic cardiac disease may, of course, be experienced at first in one of the peripheral sites of radiation, such as the thumb, hand, or elbow, and it is only later, perhaps after months, that it is felt in the typical central position.

Apart from the commonly recognized sites of pain reference, pain may be felt in the head, and, as the following cases show, it is not possible to say that face and head pain occurs only in those cases where the mediastinum is involved in a neoplastic process.

Case 7.—A man of 52 was admitted to hospital having experienced a severe occipital headache which persisted for some hours and was followed 18 hours later by severe retrosternal pain which was worse on coughing and breathing. He was restless and short of breath. He was found to have an anterior myocardial infarction with early heart failure. No friction rub was heard at any time and no evidence of subarachnoid haemorrhage or cervical spondylosis was found.

The fact that respiratory movements very occasionally aggravate the pain of myocardial infarction may be a source of confusion. Not only may pain be referred to the occiput, as in the above case, but also to the vertex of the head, without any pain being experienced at the same time in the neck or jaws.

Case 8.—A man aged 46 had several attacks of angina pectoris with pain retrosternally, followed immediately on each occasion by headache at the top of the head. There was no sense of pain or constriction in the neck or jaws at any time. The last attack was associated with myocardial infarction, a typical pattern of through-and-through postero-lateral infarction being obtained on electrocardiography. Vertical headache was a feature of this attack also.

The absence of evidence of cervical spondylosis in the above two cases is stressed because spondylosis may cause occipital pain which can be referred to the vertex of the head or even as far forward as the forehead. Furthermore,

radiation of pain in the fourth to eighth cervical dermatomes arising from spondylosis may superficially resemble the pain of myocardial ischaemia. Careful history-taking and physical examination, however, will almost invariably enable the clinician to arrive at the correct diagnosis. In this connexion, Case 9 is of interest.

Case 9.—A man of 61 was referred to hospital with a provisional diagnosis of arthritis of the left shoulder. Two weeks previously he experienced retrosternal pain which came on after moderate exertion and which spread to the left shoulder and down the arm to the fingers. It was relieved by rest and recurred on slight exertion, but he stated that the ache in the arm itself was almost continuous. An E.C.G. tracing showed the changes of posterior myocardial infarction. He was treated with rest in bed, analgesics, and anticoagulants. The chest pain was relieved but that in the arm persisted. It was found that this pain could be aggravated by lateral flexion or rotation of the neck and that the movements of the latter were limited. An x-ray film of the cervical spine revealed gross osteoarthritic changes and disk degeneration in the lower part of the cervical spine with angulation between the fourth and fifth cervical vertebrae (Fig. 4). The patient experienced considerable relief from the pain in the arm when the neck and back were kept extended, and a cervical collar was fitted.



FIG. 4.—Case 9. X-ray film of cervical spine. Gross osteoarthritic changes are present, with narrowing of disk spaces and angulation between the fourth and fifth cervical vertebrae. A cervical collar had been fitted when this film was taken.

Pericarditis

This condition is often painless, and in uraemia, for example, a loud pericardial friction rub may be present without the patient being aware of any discomfort. Acute non-specific pericarditis, however, may be very painful, and the distribution of pain is similar to that of myocardial infarction. On occasion it is described as a tight constricting band round the lower chest. Frequently the pain is aggravated by respiration. Where there is a large effusion, a dull retrosternal discomfort or pain is often described.

Case 10.—A man of 45 was admitted to hospital with a severe chest pain of eight hours' duration. He had been quite well previously until he was awakened from sleep at about 3 a.m. one day, with sudden severe chest pain felt retrosternally, radiating up towards the neck. The pain was burning in type and was aggravated by deep breathing and movement. The pain was eased only when he lay still with a hot-water bottle on his chest. On physical examination he did not look ill, but respiration was shallow. Both the temperature and the pulse were slightly raised, no pericardial friction rub was heard, and other findings, including chest x-ray examination, were normal. An electrocardiogram showed elevated ST segments in leads I, II, and III. The pain subsided in the next two days and a repeat electrocardiogram five days later was almost normal.

Case 11.—A man of 31 with established aortic stenosis of rheumatic origin was admitted to hospital with history of listlessness for one week and retrosternal pain for one day. The pain came on gradually and was constant, but was aggravated by deep breathing. It did not radiate. Three weeks previously he had had a sore throat. He was found to have an acute rheumatic exacerbation with a high remittent fever but a fixed pulse rate of 60 beats a minute due to complete heart-block. Three days later the pain, which had persisted, suddenly became very severe, jabbing, and, as before, was greatly aggravated by respira-

tion. A harsh leathery pericardial friction rub was audible. The blood urea concentration was normal. He died suddenly several days later. Necropsy revealed widespread acute fibrinous pericarditis and calcific aortic stenosis. Numerous Aschoff nodules were found in the myocardium.

Aneurysm of the Aorta

Fusiform or saccular aneurysm of the thoracic aorta may give rise to pain in the chest, especially if it enlarges rapidly or presses on pain-sensitive structures (Case 12). Intense boring pain may be experienced where pressure on spine or ribs occurs and erosion of bone results. In syphilitic aortitis the coronary ostia may be partially occluded, and this, combined with the frequently associated aortic incompetence, may give rise to intractable angina pectoris at rest, with or without myocardial infarction.

Case 12.—A man of 40 was seen at hospital with a two-months history of a dull aching pain across the front of his chest, with malaise and shortness of breath on exertion. The pain was

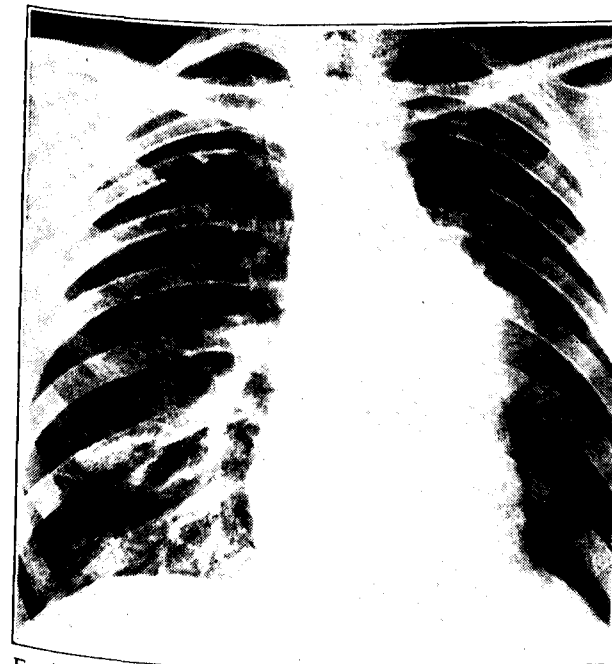


FIG. 5.—Case 12. X-ray film showing a large aortic aneurysm.

constant, but was eased by his walking "round-shouldered." It was aggravated by coughing and deep breathing but not at that time by exercise. At times it spread to both axillae, shoulders, and back. A history of previous venereal infection was obtained. Physical examination revealed evidence of aortic incompetence, and an area of diffuse systolic pulsation and dullness to percussion was found to the left of the upper half of the sternum. The blood Wassermann reaction was strongly positive and an aortic aneurysm was demonstrated on chest x-ray examination (Fig. 5). Penicillin was given in large doses and a thoracotomy was performed. As the aneurysm could not be excised, it was wrapped in "orlon" cloth. Post-operative recovery was satisfactory and complete relief from pain was obtained.

Dissecting Aneurysm

Dissecting aneurysm is, in most cases, an excruciatingly painful condition, the pain, depending on the site of the initial intimal tear, starting in the chest or abdomen and spreading through to the back between the shoulder-blades and often down the arms and elbows. Paraesthesiae may be felt in the limbs, probably due to interference with the blood supply to nerves and nerve plexuses. Inequality of the pulses is a valuable sign where this condition is suspected.

Oesophageal Pain

Oesophageal Spasm.—Many normal persons have experienced the short-lived but extremely unpleasant sensation which is usually brought on by swallowing liquids, especially

cold liquids, or solids rapidly. An acute sensation of pain develops deep in the chest and spreads round the thorax. It is constricting in character and may radiate into the back and into the neck and arms down to the elbow. It rises rapidly in a crescendo to considerable discomfort and then dies away slowly. It is likely that such pain originates in muscle spasm of the oesophageal wall. A similar longer-lived sensation is sometimes felt by patients who have cardiospasm (achalasia) in the early stages of the disease, and then it may be the major symptom and overshadow the discomforts of dysphagia.

Oesophageal Irritation and Superficial Erosion.—In many persons, drinking very hot liquids causes an acute or dull burning sensation felt at the lower end of the sternum deep in the chest. This spreads laterally round the thorax and sometimes upwards into the root of the neck. It is a pain similar to that which occurs with established oesophagitis due to reflux of gastric contents in the presence of a hiatus hernia. In such a case hot liquids and solids may all cause a similar pain which is described as occurring as the food passes over what seems to the patient to be a "raw area" in the gullet. Such a sensation is not uncommon for a few days in a patient who has swallowed aspirin tablets the last thing at night; these may lie in the lower oesophagus and there produce a localized oesophagitis giving rise to a sensation of deeply situated pain in the chest with an exacerbation on swallowing.

Oesophageal Ulceration.—Deep ulceration as opposed to superficial oesophageal inflammation will produce similar pain, but often with radiation into the back, neck, head, and sometimes to the left ear. If, however, the ulcer penetrates into the laterally placed structures of the mediastinum—for example, the lung root—then the pain is felt laterally in the axillary region on the side which is involved.

Spontaneous Perforation of the Oesophagus.—When the oesophagus is torn by violent efforts to vomit and there is extravasation of oesophageal contents into the mediastinum and usually into the pleural cavity, a sudden and severe pain is felt in the lower chest and epigastrium and sometimes in the shoulder. The pain is intense, there is collapse and shock, the abdomen is found to be rigid, and a diagnosis of perforated intra-abdominal viscus is usually made and acted upon accordingly (Moynihan, 1954). The pain in this case originates in irritation of the lower mediastinal structures and the diaphragmatic pleura, and it is noteworthy that it is felt mainly in the epigastrium. Gas escapes into the mediastinal tissues and tracks upwards, producing subcutaneous emphysema over the root of the neck within a few hours of the initial acute episode (Barrett, 1946; Eliason and Welty, 1946).

Mediastinal Pleurisy and Emphysema

These conditions are not often recognized clinically. A patient who has experienced sudden and usually severe pain retrosternally with radiation into the neck and arms will say that the pain is made worse by taking a deep breath or coughing. Crepitations are heard near the sternum on auscultation, and these may be synchronous with the heart beat or with swallowing, and vary in number and intensity with alteration in the patient's posture. Frequently subcutaneous emphysema above the clavicles and suprasternal notch develops.

Chest x-ray examination will sometimes reveal air in the mediastinal tissues, especially in the lateral view, and invariably reveal subcutaneous emphysema when this is present.

Acute mediastinal emphysema associated with interstitial emphysema of the lungs may occur during a bout of coughing, on strenuous physical exertion, and sometimes in states of dehydration (Macklin and Macklin, 1944).

Case 13.—A man of 64 had been chesty for a few days with cough and fever. He suddenly developed a severe retrosternal pain in the upper part of his chest. The pain was sharp and tight and radiated up into the root of the neck to the level of the jaws; it also radiated into the left shoulder and upper part of the left arm. It was acutely aggravated by his trying to take a deep

breath, which was cut short as is characteristic with pleural pain. On examination showers of crepitations were heard over the manubrium sterni. No subcutaneous emphysema was found. The temperature did not exceed 99° F. (37.2° C.). An x-ray film of the chest showed a moderately enlarged heart. Three electrocardiograms showed no evidence of myocardial infarction or pericarditis. The pain and pleural signs rapidly disappeared on rest and antibiotic therapy. A similar attack occurred two months later; again there was no evidence of myocardial infarction, and the patient recovered on the same treatment.

In Case 13 the pain closely simulated the pain of myocardial infarction in character and distribution, but crepitations were heard over the sternum and the pain was clearly related to respiration, which suggested the correct diagnosis.

Case 14.—A youth of 19 experienced a sudden severe pain in the chest while heaving some bricks into a truck. He became breathless and distressed. The pain spread to the root of the neck and to both shoulders and arms. The classical signs of air in the mediastinum were found on his admission to hospital, and there was subcutaneous emphysema of the upper part of the chest wall (Hamman, 1939, 1945). The condition cleared up spontaneously in a few days.

Case 15.—A boy aged 14 had been unwell for some days. He developed moderately severe discomfort in his chest, situated retrosternally and without radiation; it was worse on breathing and on effort. On examination a loud pleuro-pericardial friction sound was heard over the front of the chest, and subcutaneous air was noted over the clavicles. He was found to be in diabetic pre-coma. A chest x-ray film showed the typical appearance of mediastinal emphysema with subpleural air separating the mediastinal parietal pleura from the mediastinal structures. There was no pneumothorax.

There is no doubt that in Case 15 the pain was caused by escape of air into the mediastinum, and it is likely that the severe central chest pain which is sometimes felt in spontaneous pneumothorax has a similar origin.

Spontaneous Pneumothorax

Occasionally it may be difficult to distinguish clinically between spontaneous pneumothorax and myocardial infarction. In the former, retrosternal pain may occur with radiation to the neck, jaw, and arms as in coronary occlusion. Possibly this is due in some cases to concomitant mediastinal emphysema, as mentioned previously. It is not only in cases of tension pneumothorax that this distribution of pain occurs, but sometimes in cases where the amount of air in the pleural cavity is small and is difficult to detect clinically. The following case is of this type.

Case 16.—A man of 30 experienced a sudden pain in the left side of his chest anteriorly while preparing his breakfast. It was not particularly severe at the time. He then started cycling to work, when the pain became more severe, was worse on deep respiration, and radiated to the left shoulder and base of the neck, making him breathless. He also noticed weakness, pallor, and coldness of the left arm and hand which lasted about an hour. When seen eleven hours after the onset of the trouble he was not distressed. The left chest wall moved slightly less than the right, and pleuro-pericardial friction sounds and a loud precordial systolic click were heard. A chest x-ray film revealed a small pneumothorax on the left side.

There is little doubt that air had escaped into the mediastinum as well as into the left pleural cavity. The transient pallor and coldness of the left arm was presumably due to arterial spasm, which may have been induced by air in the tissues surrounding the left subclavian artery.

Discussion

No attempt is made to consider the possible mechanisms of referred pain. It is evident that similar pain distributions can be produced by different pathological lesions involving the mediastinal tissues, but it seems that malignant growths in that region give rise more frequently to referral of pain to face and head than do other mediastinal lesions such as myocardial infarction. The whole clinical picture must of course be taken into account in diagnosis, and the value of radiographic and electrocardiographic study is obvious.

Not infrequently, however, it is only after watching the patient over a period of time that the cause of mediastinal pain becomes apparent.

Summary

A wider concept of mediastinal pain is suggested from the study of a number of clinical conditions.

The commoner causes of mediastinal pain are briefly discussed and illustrative cases quoted.

Similarities and differences in pain patterns are noted.

The value of a careful clinical approach is stressed and the use of special investigations indicated.

We thank Dr. J. S. Richardson for helpful criticism and permission to report one of his cases, and the records and photographic departments of St. Thomas's Hospital for their help.

REFERENCES

- Barrett, N. R. (1946). *Thorax*, 1, 48.
 Eliason, E. L., and Welty, R. F. (1946). *Surg. Gynec. Obstet.*, 83, 234.
 Hamman, L. (1939). *Bull. Johns Hopk. Hosp.*, 64, 1.
 — (1945). *J. Amer. med. Ass.*, 128, 1.
 Macklin, M. T., and Macklin, C. C. (1944). *Medicine (Baltimore)*, 23, 281.
 Moynihan, N. H. (1954). *Lancet*, 2, 728.

A MILDLY AFFECTED FEMALE HAEMOPHILIAC

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Haemophilia, a disease controlled by a sex-linked recessive gene, is naturally very seldom encountered in women. There are a few well-authenticated female haemophilic patients; a family described by Merskey (1951) included three affected females, the daughters of a cousin marriage in a haemophilic family. Israëls, Lempert, and Gilbertson (1951) record another case, that of the daughter from the marriage of a haemophilic patient and a known carrier. In both of these instances later work has shown that the patients had classical haemophilia. In addition, it is occasionally found that female carriers of haemophilia have some unusual tendency to bleed (Fantl and Margolis, 1955); it is presumed that the abnormal gene is only partially recessive in these patients.

The girl whose case is described here is unusual because when first encountered she had no knowledge of any other affected member of the family. The case is worth recording because it illustrates features in the management of haemophilic bleeding.

Case Record

On July 7, 1956, a 19-years-old girl, who was dangerously ill with uncontrollable post-operative bleeding, was flown into the centre of Oxford by helicopter from Bournemouth and admitted to the Radcliffe Infirmary under the care of Professor L. J. Witts.

When the patient was 3 years old her mother and father separated and she was subsequently brought up by her father. On questioning she said that she knew of no other instances of abnormal bleeding in the family. Her childhood had been uneventful, and the only indications of an abnormal bleeding tendency were rather heavy periods and three weeks' bleeding from a tooth socket following extraction of a single tooth in her early teens. The bleeding

was not severe enough to prevent attendance at school. Another extraction two years later was uneventful.

In August, 1955, she was delivered of a healthy full-term male child and following delivery there was continuous bleeding from a vaginal laceration, despite repeated suturing and packing of the vagina. After two weeks the right internal iliac artery was ligated, but bleeding continued for another three days. She was in hospital three months, and was transfused with 37 pints (21 litres) of blood. At that time laboratory tests gave the following results. Bleeding-time: 2½ minutes; clotting-time, 11 minutes (Lee and White); prothrombin time, 14 seconds; prothrombin index, 100%; platelets, 195,000 per c.mm. All these results were normal and the cause of bleeding remained obscure.

She was well until five weeks before her transfer to the Radcliffe Infirmary, when she was admitted to a Bournemouth hospital with a heavy vaginal haemorrhage and epis-taxis. A diagnosis of incomplete abortion was made. On dilatation and curettage quantities of placental tissue were removed. Vaginal bleeding persisted, and four weeks later a further curettage was done, but this failed to improve her condition and blood was transfused almost continuously. Ten days before she came into our care she underwent an emergency abdominal hysterectomy and right salpingo-oophorectomy, following which blood loss per vaginam continued and abdominal bleeding started. The day before her transfer she had a brisk vaginal haemorrhage. The vagina was packed and she was given 180 ml. of fibrinogen solution, followed by 2 pints (1,140 ml.) of blood. It was then found that there was a large tender mass in the abdomen arising out of the pelvis.

When she arrived in Oxford she looked much fitter than we had expected, and her chief complaint was of colicky pains in the lower abdomen. Physical examination revealed a vertical midline incision in the lower abdomen 11 cm. long, already partly healed. The clips and sutures were still *in situ*. The lower abdomen was tense and tender, and there appeared to be both a thickening of the layers of the abdominal wall under the scar and also a large mass rising out of the pelvis. It was thought that both abnormalities were due to haematoma. A slight loss from the vagina of dark offensive-smelling blood was noted. The patient was incontinent of small quantities of rather turbid urine. Passage of a catheter did not reveal any residual urine.

Investigation of the Bleeding Tendency

Routine tests on admission gave the following results: haemoglobin, 84% (12.4 g. per 100 ml.); W.B.C. 6,700 per c.mm.; E.S.R., 32 mm. in 1 hour (Westergren); platelet count, 606,000 per c.mm.; bleeding-time, normal; tourniquet test, negative; clotting-time (Lee and White), 6 minutes (normal); prothrombin consumption index, 16–31% (abnormal); one-stage prothrombin time, normal; two-stage prothrombin, 90% (normal).

The only definitely abnormal result was the raised prothrombin consumption index. Further investigation revealed an abnormal thromboplastin generation test, inability of the patient's plasma to correct the clotting defect in known haemophilic blood, and a level of antihemophilic globulin (A.H.G.) of 18–25% of normal.

These results showed without doubt that the patient had a mild degree of classical haemophilia, a conclusion so unlikely in the absence of any family history that the patient's father was asked to attend the hospital as soon as possible (the whereabouts of her mother was not known).

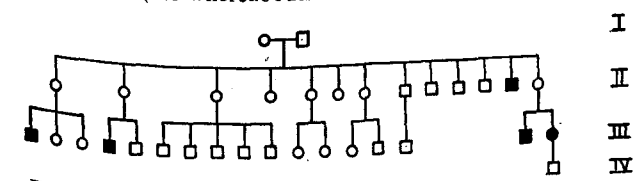


FIG. 1.—Family history of the patient, who is III 17. Her brother's blood was tested. The other clinically affected members (II 12 and III 1 and 4) are all dead.

From him and, later, from the patient's mother, who was traced and interviewed, the true family record was obtained (Fig. 1). It was then clear that the family included four severely affected male haemophiliacs, including the patient's own brother, and that the patient's mother was a carrier of haemophilia.

The patient's mother, father, brother, and baby son were tested and the following results obtained:

	Patient's Mother	Patient's Father	Patient's Brother	Patient's Son
Clotting-time	8½ min.	5 min.	More than 40 min.	2½ min. (capillary blood).
Level of A.H.G., 71%	Normal	Normal	0	17%

The brother's blood gave the results of a severely affected haemophiliac and his history of repeated bleeding episodes confirmed the diagnosis. No abnormality was detected in blood samples from the mother and father. The father had experienced no abnormal bleeding. The patient's mother gave a history of menorrhagia and bleeding for one week following the removal of seven teeth, and later for one to two weeks following the removal of 21 teeth. Delivery of her children was uneventful, and an abdominal operation was not followed by excessive bleeding. Clearly the

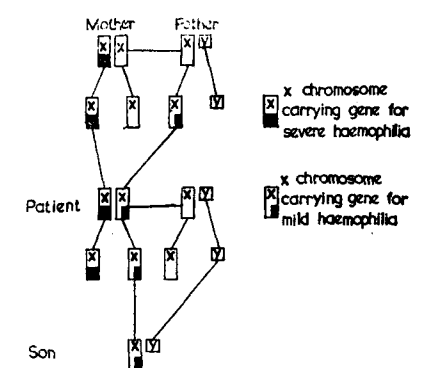


FIG. 2.—Diagram to illustrate the possible hypothesis to explain the clinical and laboratory findings in the patient and her relatives. The patient's mother is a carrier of severe haemophilia. The father is normal. It is assumed that a mutation for mild haemophilia has occurred in the sperm carrying the father's X chromosome to the patient. The patient's son is assumed to have inherited the X chromosome which carries mild haemophilia.

It is difficult to suppose that the patient is a carrier of an incompletely recessive haemophilic gene. Were this the explanation her mother might be expected to be equally severely affected. Moreover, the patient's son should be either a normal male or a severely affected haemophiliac. The level of 17% of A.H.G. recorded in his blood is similar to that of his mother. The only obvious explanation is that the patient is a carrier of severe haemophilia and that the remaining gene has been modified to produce mild haemophilia. The son has fortunately inherited the gene for mild haemophilia (Fig. 2).

Progress While in Hospital

On July 11 a large clot appeared at the vulva and oozing continued. During this day her pulse rate rose and her blood pressure fell gradually, and she continued a low-grade pyrexia of 99–100° F. (37.2–37.8° C.).

On July 12 a limited vaginal examination was carried out by Professor Moir, who found a firm mass in front of and above the vagina, and a large clot coming through the wound in the vault. There seemed to be an extensive haematoma, partly in the abdominal wound but probably also extending round the bladder and into the lower pelvic peritoneum. It was decided to open the abdominal incision and attempt to evacuate the underlying clot, following a fresh plasma transfusion.

Next day she was given 1 litre of fresh plasma in 70 minutes. This raised her A.H.G. level to 50% and the prothrombin consumption index fell to 13%. At the end of the transfusion and under general sedation and local

analgesia a 3-cm. incision was made in the lower part of the scar and 3-4 oz. (85-114 ml.) of clot was removed; but this made little difference to the contour of the abdomen, and it was felt that most of the bleeding was interstitial and generalized, as it so often is in haemophilia. A fuller vaginal examination was done, a large offensive-smelling clot was removed, and a swab was taken for bacterial culture. The impression of a large haematoma in the pelvis was confirmed.

On July 14, following the examination of the previous day, there was little vaginal bleeding, but her haemoglobin level had fallen from 13.3 g. per 100 ml. on July 10 to 7.1 g. per 100 ml. It should be mentioned here that it was never possible to measure the rate of bleeding either from the vaginal loss, which was mainly of days-old clot, or by palpation of the lower abdomen, in which the size of the haematoma fluctuated from day to day. The pulse and the patient's own well-being proved the most useful guides to therapy.

She was given 1 litre of fresh plasma and 1 litre of fresh blood, and from this time on frequent similar transfusions were given. Large clots were passed with almost unchanging frequency (about four clots a day) per vaginam, and the haemoglobin level was maintained at an average of 10 g. per 100 ml., falling as low as 5.9 g. on July 20, and rising to 13.5 g. on August 6. The presence of vaginal clots caused her great discomfort and removal always gave relief. A culture of *E. coli* was obtained from clot and urine. The organism was insensitive to penicillin V, which she had been taking, but sensitive to chlortetracycline, which was started on July 15. She became afebrile, but her temperature rose again on July 26, when the chlortetracycline was stopped. From then on sulphadimidine and penicillin V were given and she remained afebrile up to the time of discharge. Her general condition improved with the control of infection, and from July 15 there was a steady reduction in the apparent size of the pelvic mass, as judged by abdominal palpation, and micturition returned to normal in spite of continued bleeding.

During her treatment in Oxford she was given 13½ litres of fresh plasma, 9 litres of fresh blood, and 5 litres of stored blood. On average the A.H.G. level was raised to 45% by the transfusion of 1 litre of fresh plasma.

On July 29 she had a minor rigor after plasma transfusion, and this recurred on July 30 after plasma. There were fortunately no further similar reactions. On July 31 she woke up to find the eyelashes of all four lids had fallen out on to the sheet in the night. There were no signs of local inflammatory change, and we have not been able to explain this. Fortunately, new growth soon started again.

On August 6 the amount of clot passed seemed to be less and it again had a foul smell. We were inclined to take the pessimistic view at this stage, and assumed that she must be forming an infected pelvic haemorrhagic "cyst." To our surprise and satisfaction she improved from then on. Transfusions and clots became less frequent and smaller, and her haemoglobin slowly rose. The abdominal wound was completely healed.

On August 11, six weeks and three days after operation, the bleeding finally stopped, and from then she improved rapidly and finally left hospital in good health one month later, her only complaint being of some urgency of micturition. Her abdomen was quite normal on palpation.

Discussion

In the absence of any clear indication of haemostatic defect, excessive bleeding in a female is particularly disconcerting. There is the natural tendency to attempt to control the bleeding by methods known to be effective in haemostatically normal people. In this patient the defect was haematologically so slight that it was unlikely to be detected in any but a specialist laboratory, and the patient's ignorance about her own family prevented any specific search for haemophilia.

Had the diagnosis been clear from the onset the general management of the case would undoubtedly have been different. Haemophilic bleeding cannot be controlled without restoring a normal clotting mechanism. Had the true problem been appreciated, the first curettage would have been preceded by a big transfusion of fresh plasma. Thereafter the local bleeding site would have been left alone to heal and bleeding treated by transfusion of fresh plasma and whole blood. Any extension of the bleeding area by operation can only increase bleeding in a haemostatically abnormal patient.

It may be wondered why the patient's bleeding was so persistent and rapid even after her haemostatic mechanism was virtually controlled by transfusion. When first seen at the Radcliffe Infirmary she was bleeding from an inaccessible secondarily infected site. In such a wound the vessels are not normally contractile and, unless local pressure can occlude the blood flow temporarily, normal coagulation cannot arrest the bleeding. In such adverse circumstances it is necessary to have great patience and to recollect that haemophilic bleeding is usually finally arrested by healing.

Summary

A female patient, apparently suffering from mild haemophilia, was admitted to hospital with severe post-operative bleeding. Her progress and treatment in hospital are described. A study of her near relatives was made.

We thank Professor L. J. Wits for permission to publish the case; Mr. J. W. Nankivell for referring the case; and Drs. O. Gunnery, E. R. Jones, and N. M. Parkes for help in obtaining samples of blood from relatives. We also thank the Oxford Regional Blood Transfusion Service, whose very helpful co-operation was largely responsible for the patient's recovery. Miss Ruth Anderson carried out the laboratory tests on which the diagnosis was based. Dr. R. G. Macfarlane and Professor L. J. Wits kindly read the manuscript.

REFERENCES

- Fantl, P., and Margolis, J. (1955). *British Medical Journal*, 1, 640.
 Israëls, M. C. G., Lemoort, H., and Gilbertson, E. (1951). *Lancet*, 1, 1375.
 Merskey, C. (1951). *Quart. J. Med.*, 20, 299.

VENO-OCCLUSIVE DISEASE OF LIVER IN AFRICAN CHILDREN

BY

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All the publications on veno-occlusive disease of the liver have originated from Jamaica, where it is reported as occurring predominantly in children (Jelliffe *et al.*, 1954a, 1954b; Bras *et al.*, 1954) and more rarely in adults (Stuart and Bras, 1955). The authors who observed this condition in Jamaica had never seen it while working in equatorial Africa, in Indonesia, or in the temperate zones (Jelliffe *et al.*, 1954b). However, cases of this nature are said to have occurred in Egypt (F.A.O.-W.H.O.-Macy Foundation, 1955, p. 76).

In 1953 Hill *et al.* described a hepatic syndrome in Jamaican children clinically identical with veno-occlusive disease of the liver. They termed this syndrome serous hepatitis on the basis of certain histological observations. However, on reviewing their cases subsequently they found that these showed the histological picture of veno-occlusive disease of the liver (Addendum to Jelliffe *et al.*, 1954b; Bras and Hill, 1956).

Veno-occlusive disease of the liver occurs most commonly in children between the ages of 1½ and 3 years,

although adults, older children, and even younger infants may be affected. Bras believes that he has seen lesions of this nature in the newborn (F.A.O.-W.H.O.-Macy Foundation, 1955, p. 70). Clinically the condition has been divided into three overlapping phases (Jelliffe *et al.*, 1954b). The acute phase starts suddenly with hepatic enlargement, which is usually associated with ascites. This phase may be of short duration and complete recovery may occur; on the other hand, the disease may progress over a variable period to the subacute phase. A small proportion of the patients die in the acute phase of liver failure or intercurrent infection. During the subacute phase there is persistent firm hepatomegaly, which is often asymptomatic, but recurrent attacks of ascites may occur. It is doubtful whether any of the subacute cases recover completely, although they may improve clinically with subsidence of ascites and disappearance of hepatomegaly. Most of these cases progress to the chronic phase of liver failure and cirrhosis. Splenomegaly may occur in the chronic phase, but is an uncommon feature in the acute and subacute phases. Jaundice is unusual except terminally. Liver-function tests show progressive liver damage as the disease progresses. Serum protein levels are low, with a relatively high globulin level.

The histology of the liver in veno-occlusive disease has been thoroughly investigated by means of serial liver biopsies (Jelliffe *et al.*, 1954b; Bras *et al.*, 1954). The feature common to all phases is an occlusive process involving the smaller branches of the hepatic venous tree. This occlusion is either partial or complete, and is due to endophlebitis causing concentric intimal padding of the vessel wall. In the early phase the intima is greatly swollen by oedema, but later connective tissue is laid down. Thromboses are rare. The occlusion of the veins gives rise to intense centrilobular congestion with widening of the sinusoids, which may then rupture and coalesce to form blood "lagoons." The pressure of the blood lagoons produces necrosis of the surrounding liver cells. Finally, there is replacement fibrosis which distorts the liver architecture and progresses to centrilobular cirrhosis.

Macroscopic examination in the early phase of the disease shows that the liver is smoothly swollen and turgid with blood, but that later it becomes finely granular, with the development of a collateral circulation and varix formation. This condition differs from the classical Chiari's syndrome (Thompson, 1947) by the total absence of thromboses in the major hepatic veins.

Three cases of veno-occlusive disease of the liver in African children at this hospital are described.

Case 1

A female African child aged 14 months was admitted to hospital on March 15, 1955. The history was of swelling of the legs and abdomen for one month and rapid respiration for four days. She had been breast-fed until 4 months of age and since then had been fed on maize porridge, small quantities of skimmed milk, and vegetables. She had never been taken to a witch-doctor or given herbs of any type. She had had no previous illnesses. One older sibling and her mother and father were quite well.

On admission the child was very dyspnoeic and oedematous, with marked abdominal distension. There was a mild degree of pallor but no jaundice. Her state of nutrition was poor; she had sparse fine hair and depigmented skin. The heart was not enlarged and there were no murmurs. Jugular venous pressure was not raised. Crepitations were heard at the bases of both lungs. The edge of the liver was

palpable three fingerbreadths below the costal margin in the mid-clavicular line and there was much free fluid in the abdomen. There were dilated veins around the umbilicus.

On chemical and microscopic examination the urine showed no abnormalities. A blood count showed: haemoglobin, 9.5 g. per 100 ml.; leucocytes 15,200 per c.mm. (33% neutrophils, 61% lymphocytes, 5% monocytes, 1% eosinophils). The Wassermann reaction was negative. Liver-function tests showed: thymol turbidity, 5.5 units; thymol flocculation, + + + +; colloidal red, + + + +; Takata-Ara, + + +; alkaline phosphatase, 18.2 units; prothrombin index, 92%. The total serum protein level was 3.5 g. per 100 ml. (globulin 2 g., albumin 1.5 g.).

Mantoux tests (1/1000 and 1/100) were negative. X-ray examination of the chest showed consolidation of the right lower lobe and collapse of the left lower lobe and a lamellar effusion in the right pleural cavity. The heart was not enlarged, and on fluoroscopy was shown to be pulsating normally. Barium swallow examination revealed no oesophageal varices. The electrocardiogram was normal.

Paracentesis abdominis was done on several occasions, yielding considerable quantities of straw-coloured fluid. The fluid had a total protein content of 1.5 g. per 100 ml. and a specific gravity of 1008. Culture of the fluid did not reveal *Mycobacterium tuberculosis*.

Biopsy of liver and peritoneum and a portal venogram were done through a small abdominal incision (Mr. L. Stein). The peritoneum was healthy and the liver appeared swollen and plum-coloured, and on microscopic examination



FIG. 1.—Case 1. Showing areas of centrilobular congestion of the liver (low power).

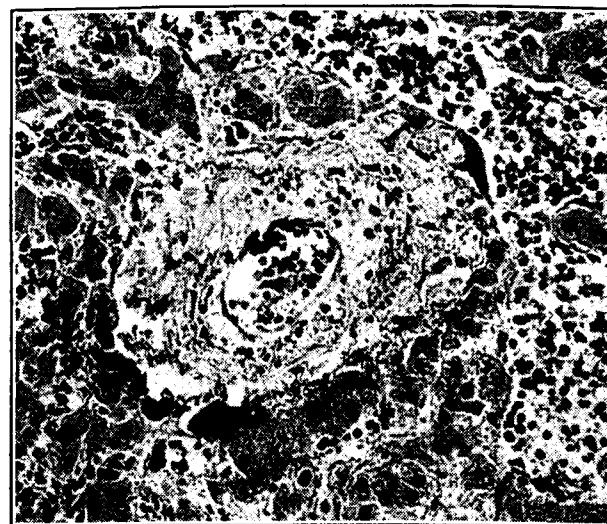


FIG. 2.—Case 1. Showing endophlebitis of a central vein of the liver with centrilobular congestion and a blood lagoon (high power).

revealed marked centrilobular congestion. The portal venogram suggested obstruction to the intrahepatic blood flow.

During her stay in hospital the patient's condition steadily deteriorated. Ascitic fluid re-formed at frequent intervals, causing distress. Paracentesis abdominis produced only brief relief, and four weeks after admission the patient died of bronchopneumonia.

Necropsy Findings (Dr. R. V. Dando).—The right pleural cavity contained a small amount of straw-coloured fluid. The lungs showed the features of bilateral bronchopneumonia. A branch of the right pulmonary artery was occluded by ante-mortem thrombus. Microscopical examination of this vessel showed no abnormality of the wall. The heart and pericardium were normal. The liver was smooth and intensely congested. Neither the hepatic veins nor the inferior vena cava contained ante-mortem thrombi. Microscopical examination of the liver showed well-marked centrilobular congestion with atrophy of liver cords and merging of adjacent sinusoids. Many of the sublobular and centrilobular veins showed acute oedematous intimal thickening with almost complete occlusion of the lumina. There were no ante-mortem thrombi in these vessels. Pathologist's comment: The histological features are those of veno-occlusive disease of the liver. Death was due to veno-occlusive disease of the liver and bronchopneumonia.

Case 2

A female African child aged 5 months was admitted to hospital on August 8, 1955. The history was one of abdominal swelling for 10 days. She had been breast-fed since birth, and this had been supplemented with three daily feeds of porridge, milk, and water for the month before admission. No herbs or witch-doctors' medicine had been given. Pregnancy and delivery had been normal and there was no history of previous illnesses. Mother, father, and three siblings were all well.

Examination on admission revealed a small child with gross oedema of the body, particularly affecting the abdomen and lower limbs. There was no pallor or jaundice or any obvious signs of malnutrition. The heart and lungs were normal. The liver edge was palpable at the umbilicus and the spleen was just palpable at the costal margin. There was much free fluid in the abdomen.

Chemical and microscopical examination of the urine showed no abnormalities. A blood count revealed: haemoglobin, 11.6 g. per 100 ml.; leucocytes, 9,800 per c.mm. (32% neutrophils, 67% lymphocytes, 1% monocytes). The Wassermann reaction was negative. Blood urea was 22 mg. per 100 ml. Liver-function tests showed: thymol turbidity, 2 units; thymol flocculation, + + + +; colloidal red, + +; Takata-Ara, negative; prothrombin index, 75%. The total serum protein level was 4.2 g. per 100 ml. (globulin 2.4 g., albumin 1.8 g.).

Mantoux tests (1/1000 and 1/100) were negative. X-ray examination showed normal heart and lungs, and no evidence in bones of congenital syphilis. Intravenous pyelography showed normal renal excretion and normal renal calices. Barium swallow examination revealed no oesophageal varices.

Paracentesis abdominis on several occasions yielded considerable quantities of straw-coloured fluid. The specific gravity of the fluid was 1007 and the protein content was 0.9 g. per 100 ml. Neither *M. tuberculosis* nor any other organism could be cultured from the fluid.

Laparotomy was performed through a small abdominal incision (Mr. L. Stein). The liver was found to be congested and very swollen. The peritoneum was healthy. A portal venogram showed marked delay in the blood flow through the liver. The hepatic artery was ligated in the hope of relieving the hepatic congestion. Microscopical examination of a biopsy specimen of the liver showed marked centrilobular congestion.

During the child's stay in hospital her abdomen became distended with fluid, necessitating repeated paracentesis.

Blood and plasma transfusions were given. Five weeks after admission she became febrile and dyspnoeic, and was found to have bilateral bronchopneumonia. In spite of antibiotics she died four days later.

Necropsy Findings (Dr. R. V. Dando).—Both lungs showed numerous atelectatic areas and the features of a well-marked bronchopneumonia. The pulmonary arteries, the heart, and the pericardium were normal. The cardiac end of the oesophagus contained numerous small varices. The liver was greatly enlarged and mottled owing to congestion. The inferior vena cava and hepatic veins contained no thrombi. The spleen was congested and slightly enlarged. Microscopical examination of the liver showed diffuse centrilobular congestion and marked dilatation of the sinusoids. In many of the sections the centrilobular and sublobular veins showed striking oedematous thickening of the intima with almost complete occlusion of the lumina of these veins. Pathologist's comment: The histological features are those of veno-occlusive disease of the liver.

Case 3

A female African child aged 1 year was admitted to hospital on March 2, 1956. The history was of swelling of the legs and abdomen for four months. She had been fully breast-fed for three months, and on admission was still being breast-fed as well as receiving maize porridge, vegetables, and small quantities of meat. There was no history of medicines or herbs having been given. She had had no previous illnesses, and her mother, father, and two siblings were quite well.

Examination on admission revealed an undernourished child. The skin showed patchy depigmentation but no nutritional dermatosis. The hair growth was moderate. A mild degree of pallor was present but no jaundice. The lungs were healthy and no evidence of cardiac failure was found. The abdomen was distended and there were several dilated tortuous veins filling from below over the epigastrium. The liver had a firm rounded margin palpable three finger-breadths below the costal margin in the mid-clavicular line. There was a small amount of free fluid in the abdomen. The legs were mildly oedematous.

No abnormalities were found in the urine, chemically or microscopically. A blood count showed: haemoglobin 8.2 g. per 100 ml.; leucocytes, 21,400 per c.mm. (69% neutrophils, 28% lymphocytes, 1% eosinophils, 1% monocytes, 1% basophils); reticulocytes 5%. Erythrocyte sedimentation rate was 28 mm. in one hour. Red-cell fragility test was normal. Coombs and Schumm's tests were negative. No malaria parasites were seen on blood smears. Eagle's test was negative. Liver-function tests showed: thymol turbidity, 5.5 units; thymol flocculation, + + + +; colloidal red, + + + +; Takata-Ara, +; alkaline phosphatase, 15.5 units; prothrombin index 76%; serum bilirubin, 3.1 mg. per 100 ml. Total serum protein level was 6.1 g. per 100 ml. (globulin 3.6 g., albumin 2.5 g.).

A bone-marrow smear showed an erythroid reaction, normoblastic in type. Platelet genesis was normal. The myeloid series showed no abnormality.

Mantoux test 1/1000 strength was negative, but 1/100 strength was positive. X-ray examination of the chest revealed clear lung fields and the presence of hilar glands. The heart and pericardium were normal.

Paracentesis abdominis yielded only a very small quantity of straw-coloured fluid.

Treatment consisted of blood transfusion, streptomycin and isoniazid, and vitamin K. Three weeks after admission a liver biopsy and portal venogram were done through a small laparotomy wound (Mr. L. Stein). The liver was smooth and intensely congested, and numerous venous collaterals were seen. The venogram showed a striking hold-up of the blood flow through the liver.

About six hours after operation the patient had a severe haematemesis and died in spite of blood transfusion.

Section of the liver biopsy showed extremely severe centrilobular congestion with destruction and loss of parenchymal cells and condensation of the stroma. In one area of the section fibrous intimal thickening of a small venous channel with partial obstruction of the lumen was seen.

Necropsy Findings (Dr. J. Shapiro).—Lungs were congested and oedematous. Hilar glands were enlarged and caseous; microscopical examination of these showed tubercle follicles. Heart and pericardium were normal. Several dilated varices were found in the oesophagus. Dilated veins were seen in the wall of the stomach. Spleen and kidneys were congested. Liver was enlarged, rubbery and plum-coloured. There were no thrombi in the firm, and plum-coloured. There were no thrombi in the hepatic veins. On section large quantities of dark red blood exuded from the cut surface of the liver. Microscopical examination of the liver revealed very marked congestion of the sinusoids with compression and atrophy of the parenchymal cells. The centrilobular veins showed intimal thickening with fibrosis and in many cases complete occlusion. The portal tracts showed scanty infiltration by lymphocytes and plasma cells. Pathologist's comment: The features suggest those of veno-occlusive disease of the liver.

Discussion

The three cases reported above were in all respects typical of veno-occlusive disease of the liver as originally described in Jamaica, except that our patients were all less than 18 months of age and were thus younger than the average of the Jamaican cases. Cases 1 and 2 were of the acute fulminating variety of the disease, and death was due to intercurrent infection after a relatively short illness. Case 3 corresponded to the description of the subacute phase of veno-occlusive disease of the liver with a longer history of swelling of the legs and hepatomegaly and more advanced liver disease, and finally death from haematemesis. There were marked disturbances of liver-function tests in all our cases, and serum proteins showed inverted albumin globulin ratios. Jaundice was not detectable clinically in any of the patients, but the serum bilirubin was raised in Case 3. The livers of all three patients were intensely congested, and microscopical study of necropsy specimens showed endophlebitis of the smaller venous radicles, with centrilobular congestion and associated cellular atrophy and stromal condensation in Case 3. There were no thrombi in large hepatic veins or inferior vena cavae. Case 3 had a primary tuberculous lesion in the lungs, but there was no evidence of tuberculosis in the abdomen or liver.

The aetiology of veno-occlusive disease of the liver is unknown. All the cases seen in Jamaica occur in the poorer economic groups, and, although clinically there is no striking evidence of malnutrition, the dietary histories in these cases suggest that malnutrition or subnutrition forms the unvarying background to this disease (Stuart and Bras, 1955). However, in veno-occlusive disease of the liver there is a remarkable rarity of fatty infiltration of the liver, which is the common hepatic manifestation in malnutrition (*British Medical Journal*, 1953). In a series of 150 cases of serous hepatitis (later found to be veno-occlusive disease of the liver), only 5 had associated fatty infiltration of the liver (Hill *et al.*, 1953). It has been suggested that veno-occlusive disease of the liver is caused by bush teas which are consumed by the poorer classes in Jamaica, and that these teas, which consist of various herbs, seeds, and roots, may be especially toxic to malnourished individuals (Jelliffe *et al.*, 1954b; Stuart and Bras, 1955).

None of our patients were strikingly undernourished, although two showed some evidence of malnutrition. At this hospital we see very many severely undernourished African children, and although fatty infiltration of the liver is a very common finding on biopsy or at necropsy, veno-occlusive disease of the liver is very rare. In our experience it would appear almost certain that malnutrition alone is not the cause of the disease.

In South Africa, Selzer and Parker (1951) reported a condition identical with veno-occlusive disease of the liver. They

described 12 cases in European and coloured adults and children. No liver biopsies were done, but six of the patients died and necropsies were carried out on them. Selzer and Parker present strong evidence that the condition observed by them was caused by the consumption of bread made of inadequately winnowed wheat and contaminated with senecio, or ragwort, a common wild plant.

Although there was no evidence to suggest that our patients had taken any herbs or plant substances such as senecio, it is common for African children to be given witch-doctors' medicines, this fact usually being concealed when the child is brought to hospital.

Thus it appears that although malnutrition was very unlikely to have been the only or even the primary cause of veno-occlusive disease in our patients, we cannot exclude the possibility that toxic substances, especially witch-doctors' herbs, were important aetiologically.

Summary

1. Clinical and pathological features of veno-occlusive disease of the liver are briefly reviewed.

2. Three cases of veno-occlusive disease of the liver in African children are described. All were less than 18 months of age, the first two presenting in the acute phase of the disease and dying from intercurrent infection, and the third in a subacute phase and dying from a haematemesis.

3. Our cases are discussed in relation to those described in Jamaica, particularly with regard to aetiology.

ADDENDUM.—Recently a further case of veno-occlusive disease of the liver was diagnosed on liver biopsy in a female African child aged 2 years with hepatosplenomegaly. She had a history of abdominal distension for two months and a previous history of having been given witch-doctors' herbs on several occasions.

I thank Dr. E. Kahn, senior paediatrician, and Dr. S. Wayburne, paediatrician, for access to their case records and for help and advice in connexion with this paper; Dr. J. Higginson, senior pathologist, and Drs. R. V. Dando, J. Shapiro, and I. W. Simson, pathologists, Baragwanath Hospital and South African Institute for Medical Research, for biopsy and necropsy examinations on the cases; the medical superintendent, Baragwanath Hospital, for permission to publish the cases; and Mr. M. Ulrich, of the South African Institute for Medical Research, for the photomicrographs.

REFERENCES

- Bras, G., and Hill, K. R. (1956). *Lancet*, 2, 161.
- Jelliffe, D. B., and Stuart, K. L. (1954). *A.M.A. Arch. Path.*, 57, 285.
- British Medical Journal*, 1953, 1, 146.
- F.A.O.-W.H.O.-Macy Foundation (1955). *Proceedings of Conference on Protein Malnutrition, Jamaica, 1953*. Cambridge Univ. Press.
- Hill, K. R., Rhodes, K., Stafford, J. L., and Aub, R. (1953). *British Medical Journal*, 1, 117.
- Jelliffe, D. B., Bras, G., and Stuart, K. L. (1954a). *Pediatrics*, 14, 334.
- (1954b). *Ann. trop. Med. Parasit.*, 48, 386.
- Selzer, G., and Parker, R. G. F. (1951). *Amer. J. Path.*, 27, 885.
- Stuart, K. L., and Bras, G. (1955). *British Medical Journal*, 2, 348.
- Thompson, R. B. (1947). *Arch. Intern. Med.*, 80, 602.

The Alcoholic and the Family is introduced by these words: "This booklet is not a medical handbook, nor does it set out to cover all the many aspects of alcoholism. Its purpose is to show that, by a true understanding of his problem and his position, the family of an alcoholic may do much to help him when he wishes to recover." The booklet is issued by the Church of England Temperance Society. It discusses some of the reasons why a person may become an alcoholic and how to help him. In outlining various forms of treatment, emphasis is placed on the need for co-operation between the alcoholic himself, his family, and his medical adviser. The booklet may be obtained from the Church of England Temperance Society, 4, Palace Gate, London, W.8, price 6d. net, together with another, *Alcohol and Drug Addiction* (free), which lists hospitals, institutions, and nursing-homes where such cases are admitted.

DUODENAL ULCERS IN CHILDREN

BY

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The occurrence of peptic ulcers in infancy and childhood has been known for over 100 years. Its frequency has not been realized until recently and does not seem to be generally recognized. Several specialized textbooks on children's diseases give it scant mention, and only discuss the acute perforating and bleeding ulcers of the neonatal period.

Apart from its surprisingly high incidence in children, when looked for, peptic ulcers in childhood differ in a number of respects from the textbook picture of ulcers in adult life. Below, therefore, some of the literature on this subject is reviewed and a series of 20 cases of duodenal ulcers in children between the ages of 7 and 15 seen at Booth Hall Hospital in the last five years is presented.

Incidence and Classification

Proctor (1925) found only 2 children among 8,260 cases of peptic ulcers in the records of the Mayo Clinic, and Guthrie (1942) found 9 cases in 6,059 post-mortem examinations at the Glasgow Children's Hospital between 1914 and 1941. Karlström (1949), reviewing the incidence of peptic ulcers in 26 paediatric clinics in Sweden, found 30 cases in a five-year period. On the other hand, Girdany (1953) reported 45 children with ulcers between the ages of 1 and 11 during only one year at the Children's Hospital, Pittsburg, and Alexander (1951) found 30 duodenal ulcers among 254 x-ray studies of the gastro-intestinal tract in children.

The history of ulcer pain in adults may go back to childhood. Proctor found in a series of 1,000 adult patients with duodenal ulcers that 26 dated the onset of their symptoms to childhood, even to the age of 4 or 5. Our series in Booth Hall shows a suspicious yearly increase in the incidence of duodenal ulcers since our interest in the problem. It appears that "those who seek shall find."

Cases of peptic ulcer in children are classified into primary, or secondary to burns, infection, or other illnesses. Another classification divides them into neonatal, infantile, childhood (1-9), and adolescent types. Gastric ulcer is much less frequent. Its ratio to duodenal ulcer has been estimated between 1:7 and 1:3. Our cases were all primary. They include only childhood and adolescent cases, and the younger age group is therefore not discussed. Only cases of duodenal ulcers are included.

Although from the literature the sexes appear to be equally susceptible to duodenal ulcers, 14 of our 20 cases

were males. At the time of diagnosis four were aged 7, one 8, one 10, five 11, three 12, and two aged 13, 14, and 15 respectively (Fig. 1). The length of the history varied from 2½ years to one day, with an average of 10 months. The delay was longest when the presenting symptom was pain and shortest when haematemesis was early. In four of our patients there was a family history of duodenal ulcer in one of the parents.

Clinical Picture

In infancy duodenal ulcer is an acute condition characterized by rapidly developing pathological changes and showing little tendency to repair. Perforation and haemorrhage are therefore commoner in this age group. In older children the disease tends to conform more and more to the adult pattern. As in 10% of adults the clinical picture is atypical, a much higher incidence of obscure presentations must be expected in children.

In our 20 cases the presenting symptom was pain in 14. In five of these the character, location, and time relation to meals or relief by milk suggested duodenal ulcer. In nine the pain was not typical of duodenal ulcer. Five patients gave a history of haematemesis on admission and one was admitted with a perforated ulcer.

In children the course of duodenal ulcer can be divided into three phases: acute, atypical, and typical. At the onset ulcers commonly present as acute conditions. The abdominal pain may be severe, generalized, or localized to the umbilicus, right hypochondrium, or right iliac fossa. The children may scream and double up with pain. Vomiting is usually associated with it and occasionally the temperature is elevated. It is therefore not surprising that the literature abounds with reports of patients who had an appendicectomy prior to the establishment of the correct diagnosis. The severe colicky pain may also raise the suspicion of intestinal obstruction. Haematemesis and perforation may occur at this stage—as they may at any stage—and so help in diagnosis. We wrongly operated under the mistaken diagnosis of appendicitis three times.

Case 1.—A boy was first admitted to hospital when he was 14 with a year's history of colicky central abdominal pains which were very severe while they lasted. They occurred at infrequent intervals, at first lasting several hours. Later they occurred almost daily. There was definite tenderness in the right iliac fossa. Subacute appendicitis was diagnosed. At laparotomy through a Battle incision, the appendix was removed. A Meckel's diverticulum 2 in. (5 cm.) long was found and excised. Immediately after he left hospital the colicky abdominal pain recurred. It was now centred just above McBurney's point and was so severe that it made him roll about in bed. A diagnosis of subacute obstruction was entertained but could not be substantiated. Hospitalization again led to quick subsidence of the pain. When, however, the pain soon recurred at home he was admitted for laparotomy, when a large duodenal ulcer of the anterior wall was found. Medical treatment was instituted with temporary success. Frequent relapses necessitated vagotomy and gastro-enterostomy at the age of 18, since when he has been symptom-free.

During the second phase the history is still atypical but symptoms are less acute. The abdominal pain is often generalized, central in position, or in the right hypochondrium. It may be associated with vomiting, but is frequently not relieved by vomiting, food, or alkalis. Although there is no time relationship to meals the pain is often worse at night. The attacks may last from a few minutes to several hours and may occur at odd and sometimes infrequent intervals. Direct questioning may occasionally elicit a more typical history. The association of the pain to food may not have been noticed but may be present. Particularly important is the pain which wakes the child at night or gives rise to distress in the morning. Other symptoms include pallor, loss of appetite, and loss of weight. Local tenderness may be absent, particularly if the ulcer is on the posterior wall. The suggested diagnosis during this phase is commonly mesenteric adenitis, periodic disease, food allergy, cyclical vomiting, etc.

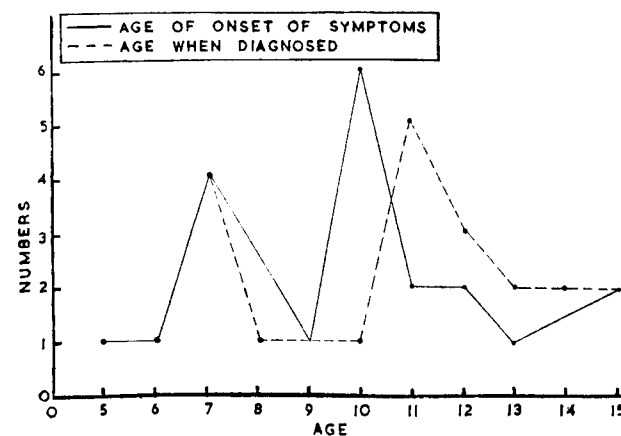


FIG. 1.—Age incidence of the series.

Case 2.—A boy aged 14 was sent to us with a provisional diagnosis of tabes mesenterica. He gave a 4-months history of central abdominal pains of constant nagging type which bore no relation to meals. They tended to come on at no particular time but were worse at night. Recently, vomiting occurred with the attacks and he had had some diarrhoea. Although his appetite was good he had lost weight. Apart from his unhealthy appearance physical examination was negative. The night pains suggested the possibility of a peptic ulcer. Barium-meal examination showed some pylorospasm. The duodenal cap was irritable, with a slight deformity of its lesser curve. There was a suspicious fleck of barium in some of the serial films. There was occult blood. His haemoglobin was 64%. A fractional test meal was normal. He was treated medically in hospital for five weeks with gratifying result. He has had no recurrence for the past two years.

During the third phase symptoms more closely resemble the adult pattern. It is the older child who is more commonly seen in this phase.

Case 3.—This boy was first seen in 1949 at the age of 7 with a severe attack of pain in the right hypochondrium and vomiting. There was diffuse tenderness in that area. A diagnosis of hepatitis was made but could not be proved. Short attacks of abdominal pain continued. In 1953 he had a severe attack of right-sided abdominal pain and tenderness when a normal appendix was removed. Intermittent attacks of pain lasting about 10 minutes continued. In May, 1955, when he was first admitted to Booth Hall Hospital in a severe attack, it was noticed that these pains were eased by milk, and the diagnosis of duodenal ulcer was established. Five months later the attacks became typical. There was a definite relation to meals, and symptoms were relieved by food and alkalis. It was only now that tenderness over the duodenum was noticed. When last seen, 18 months later, there was still duodenal tenderness and occasional pain.

Case 4.—This case shows well the progression from atypical to more typical symptomatology and the difficulty of diagnosis. In May, 1955, a girl aged 10 first attended hospital with a fortnight's history of severe recurrent pains in the right iliac fossa associated with vomiting. Her temperature had been raised at the beginning of the attacks. As there was tenderness in the right iliac fossa appendicitis was diagnosed and a normal appendix was removed. A month later the pain recurred. This time it was situated higher up in the right side of the abdomen, and was on occasion so severe that it made her roll on the floor. Full investigations including barium meal, intravenous pyelography, cholecystogram, etc., were negative. Her symptoms improved on propantheline. In September, 1956, the pain was first noticed to be present mainly in the mornings. She felt better when she had frequent meals. There was now tenderness in the epigastrium. Barium-meal examination showed an irregularity of the duodenal cap with a small ulcer.

Complications

Children are liable to the same complications as adults, apart from malignancy, which has not been reported. Haematemesis is more common than melaena. Melaena without haematemesis is rare, and occurred only twice in our series, although occult blood is frequently present in the faeces. In spite of the absence of overt bleeding the children can be very anaemic. Haematemesis can be massive.

A boy of 12 who had a six-months history of typical abdominal pain had no haematemesis. The benzidine test was negative. His haemoglobin on admission was 50%. Another small boy of 7 who had a two-weeks history of abdominal pain and a haematemesis three days before admission had a haemoglobin of 30%.

The ulcer perforated in two children in this series. One was a boy of 15 who had a year's history of attacks of colicky abdominal pain. Closure of the perforation resulted in cure. The other was a girl of 11 who was first admitted with haematemesis. She gave a year's history of abdominal pain unrelated to food. The barium meal examination showed a deformed and tender duodenal cap but no ulcer. She settled on medical treatment. She was readmitted nine months later with a perforation following recurrence of the pain for three weeks. Closure of the perforation again resulted in loss of symptoms.

Pyloric stenosis has been reported in about 25% of cases, more frequently in older children. There is, however, a

large spastic element which is reversible. One gets the impression from the literature that some of these cases have been operated on after too short a trial of medical treatment. Gross pyloric obstruction can usually be relieved medically, as it is caused more by massive oedema or spasm than fibrosis.

Case 5.—A boy of 12 had a 2½-year history of intermittent intense epigastric pains and vomiting two hours after meals. I first heard of him when our radiologist rang me up to tell me that he had done a barium-meal examination requested by the child's practitioner. He found a large duodenal ulcer and about 80% residue of barium in the stomach after six hours. After six weeks' treatment in hospital the residual barium in the stomach was negligible at 1½ hours, although tenderness and pain were still present.

Diagnosis

The realization that a duodenal ulcer is not a rare condition in children may be the first step in arriving at this diagnosis. In the acute and atypical phase there may be

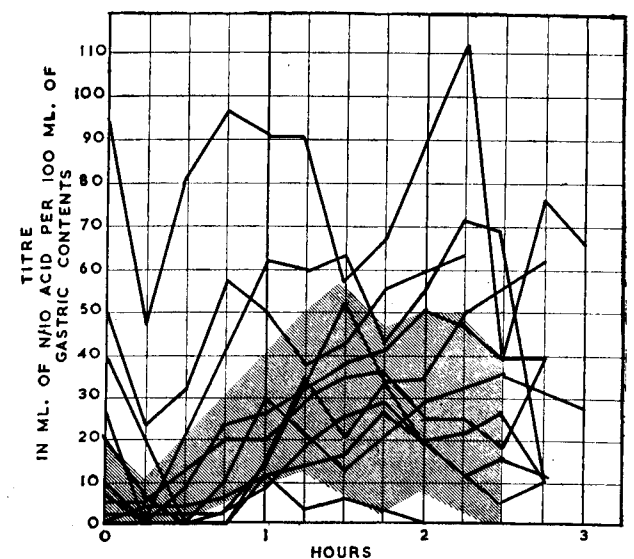


FIG. 2.—Free acid curves of 10 children with duodenal ulcers. Shaded area represents the average normal limits of hydrochloric acid.

no indication in the history or from the physical signs that the underlying condition is an ulcer. In following up these patients with recurrent abdominal pains it is important to go into the symptomatology again at each interview, and sometimes ask leading questions about the time of day the pain mostly starts.

The only aid which established the diagnosis beyond doubt was a barium-meal examination. The fractional test meal is of little help, as it is usually normal in these cases. Ten of our cases had this investigation. Only one patient (Case 5) showed marked hyperacidity (Fig. 2). The benzidine test is often positive but is not diagnostic. Even at laparotomy an ulcer, even when specifically looked for, can easily be overlooked. There is very little fibrosis and the outer coat of the duodenum may appear normal. It is impracticable and probably unwise to carry out a barium-meal examination on every patient with obscure or recurrent abdominal pain. It is commonly of no help in the early phases of the disease and becomes positive only after several months, usually when the clinical picture contains some suggestive features. A premature barium-meal examination may therefore lead to failure to find the correct diagnosis.

The demonstration of the niche of a duodenal ulcer in children is difficult. Barium frequently passes the duodenal cap so rapidly that a niche cannot be demonstrated. The gross deformities of adults are rarely seen. Some bulbar deformity can usually be shown. This should, I believe, be accepted as confirmation of the diagnosis as it has been

borne out by the subsequent course of our patients. Often there is irritability of the cap and intermittent pylorospasm during the early part of the examination. This may be present in children, anyhow, and cannot be accepted as diagnostic evidence unless the clinical picture and course strongly suggest an ulcer. A repeat barium-meal examination a few months later may establish the diagnosis. The x-ray changes appear to be related to the chronicity of the lesion. In this series the average length of the history of cases showing a definite ulcer was 23 months; of those showing a deformed duodenal cap 7 months; and of those showing only irritability 4 months.

Two of our 20 patients did not have a barium-meal examination, one because the ulcer was found at laparotomy, and the other because of admission with a perforated ulcer. Four showed a definite ulcer; two of these, however, had a negative examination six months previously. Nine patients showed deformity of the duodenal cap. Five had pylorospasm and an irritable cap only. These had or developed a typical ulcer history later, as well as epigastric tenderness. One had haematemesis as well.

Treatment

Except for closure of perforations all our patients were controlled on medical treatment during childhood and adolescence. One required surgery at the age of 19 for frequently recurring attacks of pain. Two more may require surgery later. The indications for surgical treatment are, according to various writers, the same as for adults. Cameron (1953) found only 13 examples recorded in the American literature up to 1953. This small number is to be expected, as the bleeding vessel is not sclerosed and fibrosis of the ulcer bed is not callous and should respond to medical treatment. After the age of 17 stenosis or frequently recurring attacks of pain may occasionally demand surgery. At that age vagotomy and gastro-enterostomy may result in fewer growth and nutritional disturbances than partial gastrectomy. Gastro-enterostomy alone has been followed by an anastomotic ulcer in several instances. Medical treatment to be effective must be prolonged with four to six weeks' stay in hospital, not too frequently interrupted by such "terrifying investigations" as fractional test meals or barium meals in a dark room. Apart from routine treatment of rest, alkalis, sedatives, and propantheline, this should include, where necessary, psychiatric treatment.

Psychiatric Considerations

The pros and cons of an emotional background have been hotly debated for some time. Proctor and Alexander state that worry and stress play no part in the aetiology of duodenal ulcers in children. Aye (1953) and Chapman *et al.* (1956) found emotional trauma in all their patients. Our psychiatric unit is at present engaged in the psychological evaluation of our patients, so that I only want to summarize some of our experiences. These agree with Girdany's statement that these patients "are usually bright and tense and characterized by their parents as nervous. They often seem to be lacking in outward emotional ability and tend to keep things to themselves."

A typical example was a girl of 11 whose mother told me that the girl did not show grief like her sister when their father died. According to her mother her worries go inwards.

Our experience also agrees with the conclusions of Chapman *et al.* that the common factors in these patients are: "(1) their marked inability to be comfortable with expressions of any hostile or aggressive feelings, and (2) their resultant passivity and subnormal assertiveness with a strong need to attempt to obtain endless amounts of affection and approval by being servile and obliging to all persons around them." They are the children who hand you their temperature charts during the ward round.

It seems that when circumstances develop which bring strain in family relationships in children of this mental

make-up, a duodenal ulcer may develop. In our experience two of the most important precipitating causes appear to be the death of the father and worry over school examinations, particularly if an exaggerated importance is instilled into them of the necessity of passing the 11+ examination.

Six of our 20 patients had lost their father. These children, although not unduly disturbed outwardly, try to make up to their mothers for their loss by attempting to take the paternal role.

In 7 of the 14 patients in whom, owing to age, worry over the 11+ examination could be operative we found a significant relationship of the development of symptoms to intensive preparation for the examination, worry over the approaching examination, or over failure to pass it.

Case 6.—A boy started intensive coaching 18 months before the examination. Three months later symptoms developed. Six months prior to the examination he had to be admitted to hospital with severe symptoms. Significant improvement occurred only when the scholastic pressure at home was relaxed, but minor exacerbations continued with each examination he had to sit.

Case 7.—This boy, the son of ambitious parents, failed his 11+ examination. The full implications of failing again were constantly explained to him. He started extra coaching at home. A month later symptoms developed.

Case 8.—A girl was expected to pass her examination but as the date approached her work fell off. Her parents kept on reiterating that she must do well and "this examination settles your entire future." While waiting for the result her symptoms developed.

Case 9.—A girl failed her 11+ examination. Within a fortnight of starting at a technical school her symptoms began. She told us she was very worried over her failure to pass, as this meant she would not be able to go on to the university and would have a poorer job in consequence.

Case 10.—A boy was coached for the examination. Symptoms began before he sat for it but became worse after he started in his new school, where he had difficulty in keeping up with the other children. Since transfer to an easier school symptoms have subsided.

Prognosis

The prognosis for duodenal ulcer cases appears to be good. Children of the 7-9 age group responded well to treatment and symptoms did not on the whole recur. In children aged 10 to 15 years symptoms tended to recur more frequently, but could be controlled at least over the adolescent period.

Summary

A series of 20 children between the ages of 7 and 15 with duodenal ulcers is presented. The clinical picture can be subdivided into an early acute and later atypical and typical phases. Barium-meal examination often becomes diagnostic only when the clinical picture shows some features suggestive of peptic ulceration. Surgical treatment is rarely required except for perforations. The influence of home stresses in the aetiology is discussed, particularly loss of the father and pressures put on the child with regard to school examinations.

I thank Dr. W. H. Patterson, Dr. M. L. Thomson, and Dr. A. Holzel for allowing me to include their patients in this series; Dr. J. Fawcitt, without whose radiological skill some of these cases would not have been diagnosed; and Dr. A. A. Cashmore, who is at present engaged in a psychiatric study of these patients.

REFERENCES

- Alexander, F. K. (1951). *Radiology*, 56, 799.
- Aye, R. C. (1953). *Ibid.*, 61, 32.
- Cameron, A. L. (1953). *A.M.A. Arch. Surg.*, 66, 827.
- Chapman, A. H., Loeb, D. G., and Young, J. B. (1956). *J. Paediat.*, 48, 248.
- Girdany, B. R. (1953). *Pediatrics*, 12, 56.
- Guthrie, K. J. (1942). *Arch. Dis. Childh.*, 17, 82.
- Karlström, F. (1949). *Helv. paediat. Acta*, 4, 455.
- Proctor, O. S. (1925). *Surg. Gynec. Obstet.*, 41, 63.

SYMPTOMATIC DYSTONIA AS A COMPLICATION OF ENCEPHALOPATHY IN AFRICANS

BY

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This paper describes five cases of symptomatic dystonia complicating encephalopathy with mental defect in indigenous Africans. In the original description of his case Thomalla (1918) used the general term "dystonia lenticularis" to include double athetosis, pseudosclerosis (Westphal-Strümpell), Wilson's disease, and torsion spasm. Under this general term I present two cases of torsion spasm, two with double athetosis, and one with Westphal's pseudosclerotic clinical features, all showing mental defect and a clinical mixture of related syndromes. In these patients dystonia, their predominant feature, was symptomatic of a definite illness such as encephalitis lethargica or other affection of the basal ganglia; unlike Ziehen-Oppenheim disease, dystonia musculorum deformans, which is of unknown aetiology.

Dystonia is not uncommon as the presenting symptom in some cases of Wilson's disease, and C. de Lange in 1945 (quoted by Reese, 1946), stated that torsion spasm has also been encountered in a case of tuberculoma of the fronto-parietal region. But Wilson's disease and torsion dystonia have never been described outside Europe and America, and certainly not in indigenous Africans.

Torsion spasm is a condition of comparative rarity. So far as I can trace, some 62 cases have been recorded, mostly in Germany and America, since Schwalbe (1908) and Ziehen (1911) first drew attention to it. Blandy (1920) described the first case in England, admitted to the National Hospital, Queen Square, London. However, with the exception of Wimmer (1921), who described the mental condition of his patient as "very slightly impaired," and of Taylor (1920), who noted "progressive mental enfeeblement" in his Case 2, all authors have failed to mention the coexistence of mental defect and dystonia lenticularis. Brain (1955) stated that psychical changes are absent, and Wechsler (1947) observed that mentality is normal. Also Purves-Stewart and Worster-Drought (1952) pointed out that there is no mental impairment.

Most of the earlier cases and opinions supported a conception of a nosological entity, consequent upon familial or racial degenerative process, *ab origine* in the corpus striatum. But in this connexion Meyer and Cook's (1936) cases are important. They described two personal cases of status marmoratus (*état marbré*), both of which were said to be the subjects of a severe degree of mental defect and quadriplegia from infancy. Their first patient suffered also from generalized fits, torsion dystonia, and choreo-athetosis. These observations favour the conception of multiple aetiological factors causing similar syndromes rather than the existence of separate nosological entities.

Four of the five cases presented here were post-encephalitic and had a noteworthy degree of mental defect. The existence of an infective process is doubtful

in the last case, but the clinical features were similar to those of myoclonic encephalopathy. The first case is typical and was characterized by bizarre and grotesque contortions of the trunk and limbs, a marked degree of motor agitation, and alternation of hypotonicity and hypertonicity.

Torsion Spasm

Case 1

A girl aged 5 came under observation in April, 1956. She was the youngest of six children, three of whom died in infancy. The father was aged 39 and the mother 29 at the time the patient was born. The family history revealed no familial or hereditary nervous or mental disease. The grandparents are alive and well.

The patient was normal at birth. In 1954 she had a febrile illness which was followed by a localized rash on the

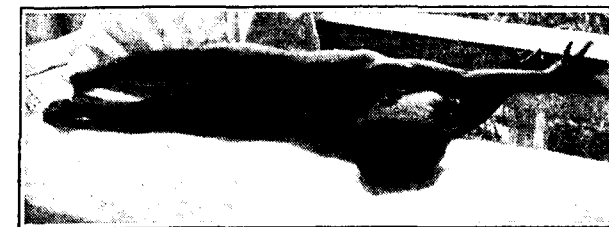


Fig. 1.—Showing the opisthotonos in Case 1.

right side of the abdomen and on the lateral side of the right leg (? herpes zoster). The rash, which eventually coalesced, first contained clear fluid which later became purulent. The child was described as "very ill" at this stage, lying "immobile and unconscious."

When she got better she had lost most of the previously acquired functions: she could not stand or walk, speech was lost, and she could not understand spoken words. After an interval of a year it became apparent that the child's mental development was retarded; at the same time her movements had become automatic. Eighteen months from the onset of her febrile illness she started to exhibit opisthotonos with complex, purposeless, and predominantly tonic movements (Fig. 1).

When lying she made silly, bizarre, and rather grotesque wriggling movements of the body and limbs with spasmodic twistings of the arm. When efforts were made to lift her up or get her to walk (Fig. 2) she showed characteristic hypertonicity and a curious torsion of the body. The whole picture, which fluctuated and varied from minute to minute, presented at irregular intervals an admixture of athetosis, spasmus mobilis, and chorea, and yet there was evidence of differentiation from these conditions. Definite physical signs included irregular pupils with relative dilatation of the right pupil. She had squint of the right eye, and on passive manipulation of the limbs tonic-clonic movements were felt.

She showed a marked degree of emotional instability, had temper tantrums, and made odd unintelligible noises. One feels that her mental development had been arrested. The condition at present seems stationary.



Fig. 2.—Case 1. Showing characteristic hypertonicity and torsion of the body in the effort to walk.

Case 2

This case showed features of paralysis agitans in addition to peculiar spasmodic twisting of the trunk, extension and pronation of the left arm, and copious salivation.

This patient was a boy of 6½ years with a negative family history. His mother was aged 30 and his father 37. His early development was uneventful even though his birth was unduly prolonged and difficult. He walked and talked before he was 16 months.

Three years previously the patient had a febrile illness with a generalized diffuse rash ("ekitigbi," measles). When he seemed to be getting better he suddenly became worse. He was stuporous for two days, during which he could be aroused only with great difficulty, and even then for only

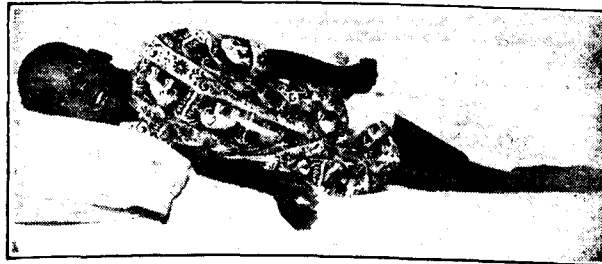


FIG. 3.—Case 2. Showing characteristic posture.

a short while. Shortly afterwards, when he seemed to have recovered, he started to show speech difficulty, grimacing, and intellectual retardation.

When first seen he was like a young child of 3, with peculiar involuntary movements, a facile smile, and a spasmodic grin. His posture was characteristic, with a moderate degree of lordosis and irregular twistings of the spine, yet his occasional posture of flexion and his rigidity resembled those of paralysis agitans. The left arm was frequently though transiently extended and hyperpronated at one time and almost normal at another (see Fig. 3), and the involuntary movements were tic-like, with great motor restlessness, resembling choreo-athetoid movements of Oppenheim and Vogt, and of Freund and Vogt. Hypertonicity seemed to be the predominant tone.

Although he had lost his speech after the illness, by the time he was seen he was able to utter some words occasionally with comparative ease but indistinctly. Tendon reflexes were difficult to elicit but seemed to be normal. Both pupils showed miosis and there was squint in both eyes. His head was a peculiar shape.

Both this case and Case 1 were still under observation at the time of writing.

Double Athetosis

In the following cases double athetosis, with poor mentality associated with pyramidal lesions, was the most predominant aspect of the clinical picture. Distal muscles of the extremities showed constant involuntary movements. The combination of the athetoid movements with associated movements, and the preponderance of severe motor agitation over paralytic symptoms, were noticeable features in Case 3. Both Cases 3 and 4 showed variable tonic muscular spasms.

Case 3

A Yoruba boy aged 14 was seen at Aro Hospital Clinic in November, 1955. Four years previously he had complained of vague rheumatic pains, fever, and sore throat; these were followed by a short period of delirium. A state of profound prostration ensued, finally giving place to a brief period of insomnia. Soon afterwards he was said to have had what seemed to be myoclonic convulsions, especially of the abdomino-diaphragmatic region. He appeared to have recovered from this condition, but after a lapse of three months he complained of slight fever and was noticed to be drowsy for about two days. Later he was dragging his leg, and the left arm was described as "weak."

On his admission to hospital there were definite physical signs of a positive Babinski reflex on the left, slight tremor, and athetoid movements of both hands, more marked in the left hand. His articulation was a bit impaired, and though he was alert and amiable he showed definite dullness intellectually. He was simple and euphoric. The liver was slightly palpable.

The most prominent features here were the severe tonic muscular spasms, hyperaesthesia of the soles of both feet, moderate twisting of the pelvis, and lordosis. For a long time the patient was obviously incapacitated by the extreme spasticity in both legs and had to be carried in and out of the clinic. Later, his condition improved and he could walk about but with some difficulty. The athetoid hands also showed marked incoordination and extension-hyperpronation of the distal portion of both arms. The face, head, and neck escaped. There was no opisthotonos and no head retraction. A marked degree of athetosis predominated. His condition seems to be improving and the pelvic contortions are now less marked.

Case 4

The next case is one of progressive dementia with behaviour of a low-grade mental defective. Perseveration is present. Myostatic disturbance is a prominent feature. She is untestable.

A girl aged 9 was referred for "nervousness and fidgeting." She was a second child of the mother and had a normal early history. Her father is aged 43 and her mother 27. Another child of the family (by another wife), a half-brother to the patient, has been admitted to Aro suffering from organic psychosis. The father is a nervous, unstable person. The mother, who is mentally dull, has a young baby of 9 months.

Nothing noteworthy happened to the patient until a year ago. She was then supposed to have a mild attack of small-pox, and a week after the onset of the illness she became very excited for about three days, during which she was visually hallucinated. She was taken to the native medicine-man in Ijebu, after whose treatment the child "became normal again." A few months later she had a severe convulsion, just "out of the blue," and from that time, according to her mother, she began to act like an imbecile. She had to be dressed, washed, and her toilet habits had become lax.

On admission she was dull, mute, apathetic, and had no interest in anything around her. She was very dependent on her mother. There was bilateral athetosis, which was more marked in the left than in the right hand (Fig. 4) and which her mother said was the latest symptom to appear and the most troublesome. There were residual signs of hemiparesis on the right side.

Careful analysis of the child's behaviour—for example, withdrawn regressed condition and complete lack of emotional rapport—has occasionally aroused one's suspicion with regard to the presence of psychosis coexisting with bilateral athetosis. Her present state is one of deterioration.

Pseudosclerosis

Pseudosclerosis of Strümpell (1898) as a nosological entity has been greatly disputed. The better-known authors on the subject have failed to agree and the present trend is to consider this condition as a subgroup of the syndrome of hepato-lenticular degeneration with all its clinical variants



FIG. 4.—Case 3: bilateral athetosis.

The question remains whether the same aetiological factors apply.

The following case was referred to us first diagnosed as neurotic and later as schizophrenic. At this stage the clinical picture, which in some ways reminded one of the early phase of disseminated sclerosis, was later superseded by definite signs and symptoms of striatal disease and a widespread organic damage to the brain.

Case 5

An illiterate Yoruba adult aged 32 was brought in by his mother in May, 1955. She complained of his generalized tremor, progressive dementia, and inability to walk properly; also that he wandered aimlessly about the room most nights and slept the best part of the day. According to his mother his illness started a year before his admission, "the day he shook hands with a friend with whom there was a long-standing quarrel." The right hand started to shake slightly without any progression for three months, after which it spread to the entire body, including the face and head. At this time he found it difficult to sleep and for several weeks lay awake all night.

The difficulty in speech and the signs of mental deterioration did not come into the picture until five months later. The mental symptoms, which included occasional hallucinatory experiences, memory defect for recent and remote events, disorientation for time, place, and person, appeared insidiously and have since dominated the somatic component.

The mother, aged 55, has not been well for several years. There was "nothing significantly wrong" except for a feeling of being unwell. She had corneal changes in her left eye; otherwise physical examination revealed nothing abnormal. The father died eight years ago of a protracted illness of which the mother gave such a poor description, including her own interpretation of the cause, that nothing important could be adduced from it. The patient is the eldest of three children. The other two siblings—a boy of 12 and a girl of 27 years—are alive and well. No family history of nervous and mental illness.

On admission the patient showed generalized tremor, with choreiform twitches all over the body, and these were exaggerated when he attempted to perform any act like shaking hands—that is, marked intention tremor. He could understand spoken words after a long repetition, but was typically staccato in speech when he made an attempt to answer questions. He was disoriented for time, place, and person, and showed complete memory defect for recent and past events.

He was ataxic in all limbs and generally sluggish. The area of hepatic dullness was greatly diminished. There were no physical signs of pyramidal involvement. Although his mother gave a history of mood fluctuation at the onset of the illness, he was apathetic on admission and has since remained so. His face was expressionless and mask-like, and there was the characteristic extreme slowness of movements and increased muscle tone.

His condition is one of progressive deterioration of physical and mental power. Whilst certain features of the physical picture approximate disseminated sclerosis and the mental picture resembles that of organic psychosis, there are certain qualities to the two components of the clinical picture which resist any attempt to explain one component as typical or true and its association with the other as one of essential concomitance. Clinical evaluation of the dyskinetic phenomena, however, places the total picture in the category of lenticular degeneration of a fairly rapid onset (probably toxic-infective), with a pronounced degree of progressive dementia. In spite of the genetic association of pseudosclerosis with hepato-lenticular degeneration, the history of "a slight febrile illness" is regarded here as being more than casual. It would not be unlikely if this proved to be a slight encephalitic attack, as evidenced by its clinical residuum. Campbell and Morse (1924) described a case (including necropsy findings) of pseudosclerosis following erysipelas. These authors also quoted A. Westphal and

Sioli, who in 1922 produced evidence of the infective origin of the pseudosclerotic process. In their case the syndrome followed what was probably an encephalitic attack (cf. Denny-Brown, 1946).

Discussion

In all five cases clinical and laboratory findings support the exclusion of "functional" and organic psychoses, especially juvenile G.P.I. (slight clinical evidence of organic psychosis in Case 4 as indicated above).

It seems that variations in the sequelae of encephalitic process are possibly due to individual variations in the relative susceptibility of different levels of the cerebrospinal axis, and it can be suggested that racial or familial vulnerability and/or previous disease may be an important factor in the focal predominance of the underlying pathogenetic factor.

The clinical interrelationship of these syndromes is of great theoretical interest, especially when one considers the clinical admixtures, in most cases manifesting features of pseudosclerosis, spastic pseudobulbar palsy with contractures and choreo-athetoid movements of Oppenheim and Vogt, and Freund and Vogt, Oppenheim's dystonia musculorum deformans, double athetosis, von Bechterew's hemitonia apoplectica, status marmoratus, Hunt's striatal syndrome, and other ill-defined clinical states which Strümpell (1913) thinks belong to his amyostatic syndrome—for example, the paramyoclonic type of lethargic encephalitis. The relatedness of the clinical syndromes is also reflected in the histopathology of the lesions of the basal ganglia, and earlier investigators placed emphasis upon the manifold pathological findings which may be encountered in the study of the lesions of the basal ganglia.

All the five cases presented here show the "amyostatic symptom-complex" of Strümpell as a sequel to encephalopathy. The maintenance of posture was impaired in all our cases. Involuntary activities varied, showing features of alternating tremor or of choreoid, athetoid, or dystonic movements. Critical analysis of the symptomatology and repeated examinations revealed the fact that although these clinical states are variable, mixed, and could be better understood as a conglomeration of syndromes of the basal ganglia rather than clear-cut disease entities, acquired illness could give rise to clinical states which are indistinguishable in certain respects from those whose aetiological factors are associated with familial and/or racial predilection. There is no doubt that this condition of dystonia musculorum deformans, originally described by Ziehen and Oppenheim, is very rare when compared with the number of patients showing dystonia as a symptom of brain disease.

In considering the constitutional aspect of the clinical syndromes, this material is not large enough, nor could it be sufficiently carefully studied in this respect for one to come to definite conclusions. Kehrer (1928) and Guttmann (1936) have, however, produced evidence of constitutional factors in chorea and athetosis. Kehrer coined the name "choreopathic personalities" for the abnormal individuals in the family of these patients.

It may also be cautiously assumed that there is in these patients a certain *somatic vulnerability* which may be, in part, an expression of genetic-constitutional predisposition to dystonic disease. Also, the same factor may be of aetiological significance in the true dystonia musculorum deformans of unknown aetiology.

Summary

Five cases of symptomatic dystonia, complicating encephalopathy with mental defect, have been described in *native Africans* and the clinical similarity between these related syndromes has been emphasized. The youngest patient (aged 5) with dystonia musculorum deformans of acquired origin has also been added to the literature on the subject.

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REFERENCES

- Blandy, M. A. (1920). *J. Neurol. Psychopath.*, 1, 148.
 Brain, R. (1955). *Diseases of the Nervous System*. Oxford Univ. Press, London.
 Campbell, C. M., and Morse, M. E. (1924). *J. Neurol. Psychopath.*, 5, 28.
 Denny-Brown, D. E. (1946). *Diseases of the Basal Ganglia and Subthalamic Nuclei*. London.
 Guttmann, E. (1936). *J. Neurol. Psychopath.*, 17, 16.
 Kehr, F. A. (1928). *Erblichkeit und Nervenleiden*. Berlin.
 Meyer, A., and Cook, L. C. (1936). *J. Neurol. Psychopath.*, 16, 341.
 Purves-Stewart, J., and Worster-Drought, C. (1952). *The Diagnosis of Nervous Diseases*, 10th ed. London.
 Reese, H. H. (1946). *Yearbook of Neurology and Psychiatry*, p. 201. Chicago.
 Schwalbe, M. W. (1908). *Eine eigentümliche tonische Krampfform mit hysterischen Symptomen*. Berlin.
 Strümpell, A. (1898). *Dtsch. Z. Nervenheilk.*, 12, 115.
 — (1913). *Neurol. Zbl.*, 33, 1303.
 Taylor, E. W. (1920). *Arch. Neurol. Psychiat.* (Chicago), 4, 417.
 Thomalla, C. (1918). *Z. ges. Neurol. Psychiat.*, 41, 311.
 Wechsler, I. S. (1947). *Textbook of Clinical Neurology*, 6th ed. London and Philadelphia.
 Wimmer, A. (1921). *Rev. neurol. (Paris)*, 28, 952.
 Ziehen (1911). *Neurol. Zbl.*, 31, 109.

TREATMENT OF A CASE OF COMPULSIVE SWEARING

BY

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Coprolalia as a symptom occurs in the major psychoses leading to personality deterioration and disintegration. Compulsive utterances of an obscene nature are, however, an unusual occurrence where the personality remains intact, and generally form part of a wider clinical syndrome originally described by Itard (1825), mentioned by Trousseau (1867), and delineated by Gilles de la Tourette in 1885. The essential features of the syndrome now bearing the latter's name include a childhood onset with multiple motor tics, a vocal tic developing later into vulgar utterances, and sometimes also a compulsion to repeat both the words and the actions of others. Frequently the motor component is impulsive and very bizarre, bearing a relationship to the latak which used to be seen in the Malay peninsula (O'Brien, 1883). But it is usually the uncontrolled audible obscenities that force the sufferer into an increasing social isolation, providing, some writers feel, the basis for an eventual psychotic withdrawal.

These uncommon cases are acknowledged to be extremely difficult to treat; the lack of success may be judged from the multiplicity of remedies tried. The physical restraint, isolation, skimmed-milk baths, and static-electricity treatments of an earlier era have given place to modern psychotherapeutic procedures, yet there are few well-authenticated cases in the literature that have lost their tics. None of the patients of Gilles de la Tourette, five of whom were followed over some years, showed any sustained improvement. Itard's old woman, who was seen by Charcot, began ticking as a child of 7 and died at 85, still pouring forth the grossest obscenities. Guinon (1886) and the other older writers

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(Prince, 1906; Gilles de la Tourette, 1899) were uniformly gloomy upon the likelihood of recovery. Kinnier Wilson (1955) gives the syndrome a sinister outlook, characteristically "ending in insanity," and though accurate information on prognosis is sparse most authorities describe a progressive worsening of symptoms. One of the three cases collected by Ascher (1949) from the Phipps Clinic developed schizophrenia; while his two personal cases did not improve with psychotherapy. Of Heuscher's (1953) three cases one also became schizophrenic. Mahler and Rangell (1943) had a boy of 11 under continuous psychotherapy for 30 months, and agreed with the previous authorities that the prognosis was unfavourable.

The following case is described because of the satisfactory response to therapy.

Case Report

A salesman aged 28 was admitted to hospital on June 11, 1954, and discharged on November 26, 1954.

His father, aged 61, was healthy, a printer in charge of a composing department. He was a quiet man, even-tempered, and somewhat ineffectual, who made few demands on the family. The mother, aged 56, was also healthy, but house-proud, hot-tempered, strong-willed, and close to the patient. There was one healthy married sister aged 24. There were no familial illnesses and no history of chorea or tics.

Personal History

The patient's birth on August 2, 1926, was normal, but he was over one month premature and under weight. There were initial feeding difficulties, and the frenulum of the tongue required freeing at 2 weeks. He was convulsed at 2, had measles and chicken-pox at 2½, and pneumonia at 4. (These incidents are mentioned because of the possible aetiological importance of brain damage.) Though his speech was retarded the other milestones were normal. A timid shy child with temper tantrums, night terrors, and many minor compulsive rituals, he attended elementary school at 5, secondary school at 12, leaving at 14½ to work in the father's print-shop for two years before becoming a hat salesman. At 18 he was called up for the Army (B1) and served for two years in Egypt before being discharged with the rank of sergeant at the age of 22. He then joined his present firm and has since risen progressively to the position of a senior salesman who covers an important territory.

Play with his sister and other children continued normally until the age of 9, but from that time on he made attachments with boys only. Masturbation began before 15 and continued. At 18, when in the Army, he became the active partner in anal intercourse, and his relationships have remained exclusively homosexual. There is a well-marked madonna-prostitute split in his love objects. There are those men whom he admires and feels love for and also, as he says, the casual pick-ups with whom he has intercourse. Always a good worker, he is money-conscious, ambitious, and successful, yet anxious and tied to the home. Both selfish and sensitive, his manner is ingratiating with superiors, for he is afraid of "the big man in business."

Present Illness

At the age of 7 he developed tics originally thought to be St. Vitus's dance but later diagnosed at Great Ormond Street as habit spasms. The wriggling of his body, facial contortions, and sensitivity to noise subsided gradually over the next two years. But at 9 he began making noises, and these soon developed into the swearing which persisted with such distress to his family until he was 13. Reading *Tom Sawyer* made a deep impression on him and he began to say "huckleberry fuckleberry fuck fuck." He was reported to his teacher for using "dirty words" and scolded severely at home, but the pronouncements had developed an

involuntary, repetitive, explosive quality and, despite everything, persisted. He was symptom-free while in the Army, but at 22 some noises reappeared in the form of a vocal tic, resembling a hiccup, which he found difficult to suppress. At 23 he felt a compelling urge to swear along with the noise, and six months later began to do so. A short crow was made by a sharp Valsalva manoeuvre with first the sound "uck" and later the word "fuck" superimposed. Simultaneously there would be a violent jerk of the head, arms, and eyes, almost seizure-like, resembling rather a Moro reflex and giving him a strikingly infantile appearance. Though slowly increasing in severity his symptoms had been present four and a half years.

In the few months prior to admission the exclamation "shit" had been added to the original one. The frequency of utterance was by then from 10 to 40 an hour. He was usually free for half an hour on awakening, and at his best when alone and occupied by some task. He was regularly worse at home in the evenings, in the time before his father's return from work, when the family learned to anticipate a regular barrage. Attempts at suppression led to tremendously increased tension and subsequently an increased discharge. These exclamations occur whether he is silent or speaking, but he is free from them during sleep and they have never invaded his writing. It eventually became quite impossible for him to suppress or disguise the convulsion and noise even when conversing with clients. He was obliged to stop working, and for the first occasion sought help. By this time both his mother and his sister were refusing to accompany him out of the house, and it had become impossible for him to ride upon a bus or visit a restaurant or a cinema because of the volume and frequency of his utterances. He was becoming a recluse, professionally disabled and virtually unable to leave the home.

Investigations

He was of somewhat boyish appearance with prominent eyes, but general physical and neurological examination revealed no abnormality, though the symptom was very much in evidence. He was co-operative and friendly, admitting to several minor compulsive rituals and showing a tendency to both echolalia and pallilalia. Orientation was perfect, he was not depressed, and there were no delusions or hallucinations. Memory and attention were normal, there was good superficial insight, and he was observed to be symptom-free during sleep.

The blood count, W.R., B.M.R., and chest film were all normal. The E.E.G. was within normal limits, there was no change with overbreathing, and the responses to photic stimulation were regular and symmetrical. There were no paroxysmal features and no evidence of a focal lesion. The record was repeated with bilateral sphenoidal electrodes and intravenous thiopentone without revealing any abnormality. Psychological testing failed to reveal any dysfunctionality. In the verbal sphere, his vocabulary was average, and the Wechsler gave a full-scale I.Q. of 114. An attempt was made to observe and count his tics, using cinephotography and an electromyograph and then time-sampling the film. He was then interviewed and the tics were counted while supposedly stressful and neutral material was discussed with him. No detectable change in the rate, intensity, or form of his tics and respiratory grunts was observed.

Treatment and Outcome

On June 25 psycho-analytically orientated psychotherapy, in 50-minute sessions four times a week, was begun under the supervision of Dr. Kräupl-Taylor. It had been decided that the immediate aim of our treatment was to attempt to alter the form of the compulsive utterance and restore the patient as rapidly as possible to social life, despite a residual respiratory tic which in itself might perhaps not have been crippling and for which there was possibly an organic basis. No attempt was made to treat his inversion. He was unable to give up any defences and could never free-associate. Little progress was made and no alteration in the frequency or content of the vocal tic had been observed after 40 inter-

views. Carbon dioxide treatment (70% CO₂) was then begun and carried out four times a week. While apparently still inaccessible he quite frequently made the most striking and violent sucking movements, and those dreams that he was able to recall afterwards were full of obvious phallic imagery.

In the following weeks a gradual decrease in tension ensued, and a lessening in the frequency of the utterances was both reported subjectively by the patient and noted in the record maintained by the nursing staff. He received 30 treatments, increasingly spaced out, over a period of two months and was discharged from hospital, having been shown before a hospital conference, on November 26. The coprolalia had disappeared, so had the muscular tic. He retained an inconspicuous vocal tic, resembling a soft hiccup, occurring three or four times a day, but this could be controlled and cleverly concealed. He became apprehensive when due to leave hospital, and received chlorpromazine, 25 mg. twice daily, in the 10 days before and after discharge.

He has now been working for 15 months with no further treatment and is leading the life of a busy and successful sales representative. He is relaxed and at ease in interviews, in itself a striking change, and only an observer familiar with this case could detect the vocal tic. "It is better than it has ever been, but I am not without the desire or the occasional noise." Some sort of sound is made three or four times a day, concealed in a stutter or slight hesitation in his speech. He has just completed, as he himself says, "a successful and profitable 4,000-mile trip for the company."

Discussion

This case appears to be a good example of the Gilles de la Tourette syndrome, showing the childhood onset with multiple tics and coprolalia, a latent period, and the return in adult life of a convulsive muscular tic, a vocal tic with at first "mental" and later again actual coprolalia. Though never showing echopraxia, there were pallilalic and echolalic features; he developed, for example, the compulsion to shout repeatedly the name of another patient in the ward who had at one time made fun of his disability. The psychotherapeutic approach was fruitless. Heuscher (1953) suggested that the difficulty and danger of this approach rests in the role of the tic as the last "desperate defence against psychosis." Mahler and Luke's (1946) view and that of Mahler, Luke, and Daltroff (1945) were somewhat similar: of nine children followed up by them, though mostly still in their teens, two had already become psychotic. They viewed the adolescent condition as an organ neurosis only indirectly accessible to psychotherapy, and concluded that there was no direct correlation between recovery and the length of treatment or psychotherapeutic method tried. Weisman (1952) has dealt along psycho-analytic lines with respiratory tics in adults, which he also regarded as a defence against something worse. Unfortunately, he gave no clear indication of the outcome.

The aetiology of the syndrome is probably multiple and is imperfectly understood. There is a prevalent feeling that a substratum of organic brain damage exists upon which psychodynamic factors can operate, determining the form that the tics and utterances take. Though it remains difficult to separate tics from motor compulsions (Abraham, 1921), and whatever the symbolic meaning of the former, whether regarded as a pre-genital conversion or not, there is no problem here. In this case the patient largely abandons symbols and informs us quite overtly what he means by his choice of hostile and "dirty" words.

The coincidence in time between the CO₂ treatments and the amelioration of symptoms of 4½ years' standing was dramatic. But it is quite impossible to exclude the possibility of spontaneous improvement, particularly in a condition where the intensity of symptoms is known to fluctuate. It was seen that, during a period of relatively successful sexual adjustment (when in the Army), he had been symptom-free. If we assume that the change was not merely a chance one, for CO₂ inhalations to precipitate a 15-months

remission is interesting. This improvement appears to have continued of its own accord, and the occasional out-patient "maintenance" treatment which had been envisaged has been unnecessary. This simple decrease and disappearance of symptoms, as Meduna (1953) has indicated, is seen quite as often as a cathartic emotional release, which did not occur in this case.

Suppose there did exist in the genesis of these tics and this repetitive speech disturbance a self-perpetuating process by which the muscular and vocal discharges themselves provide the stimulus for a further discharge. In these circumstances a manoeuvre designed to interrupt this process, by lowering the excitability of the system, then seems less empirical than it first appears. After inhalation of CO₂ the disturbance in the plasma hydrogen-ion concentration is very considerable (pH 7.2→6.7—A. Bartholomew, personal communication). Adrian (1930) noted that the hyper-excitability and spontaneous firing in peripheral nerve preparations was prevented by transfer to an atmosphere of 5% CO₂, and Lorente de Nó (1947) has shown that a similar concentration of CO₂ raises the demarcation potential (4 millivolts, approximately 60%) and also the threshold for stimulation in peripheral nerve.

It is, of course, not possible to argue directly from results obtained in isolated amphibian core conductors when attempting to understand phenomena in the multisynaptic systems which must be concerned in the reverberating neuronal networks that are postulated in higher mammals (Ashby, 1952): though there is evidence that the synapse is the more sensitive to changes in hydrogen-ion concentration (Eccles, 1953). Speculation on the mode of action of any apparently successful but empirical therapy is especially tempting in a condition whose outlook has been regarded as so grave. Whatever this mode of action and in whatever terms, whether neurological or psychological, it is stated, the fact remains that the CO₂ inhalations appear to have initiated in this case a return towards normality.

Summary

A classical case of Gilles de la Tourette's disease is described in which coprolalia, gradually increasing in severity over a period of four and a half years, had forced the patient into becoming a recluse, confined to the home in a state of almost complete social isolation. Though psycho-analytically orientated psychotherapy produced no change in the frequency or form of the patient's utterances, carbon dioxide treatment initiated an almost immediate improvement in symptoms which made discharge from hospital and rapid return to work possible. This improvement has been maintained over the 18-months period of follow-up. The difficulties encountered by the author and others in the psychotherapy of this condition are discussed, and some speculations are made upon the possible neurophysiological basis for the interruption of these repetitive and apparently self-perpetuating speech disturbances.

I thank Dr. Kräupl-Taylor for his advice and for kind permission to publish this case

REFERENCES

- Abraham, K. (1921). In *Selected Papers on Psychoanalysis*. London.
Adrian, E. D. (1930). *Proc. roy. Soc. B*, 106, 596.
Ascher, E. (1949). *Amer. J. Psychiat.*, 105, 267.
Ashby, W. R. (1952). *Design for a Brain*. London.
Eccles, J. C. (1953). *The Neurophysiological Basis of Mind*. New York.
Gilles de la Tourette, G. (1885). *Arch. neurol. (Paris)*, 9, 19.
— (1899). *Sem. méd. (Paris)*, 19, 133.
Guilmon, G. (1886). *Rev. Médecine*, 6, 50.
Heuscher, J. E. (1953). *J. nerv. ment. Dis.*, 117, 29.
Iard, J. M. G. (1825). *Arch. gén. Méd.*, 8, 403.
Lorente de Nó (1947). *Stud. Rockefeller Inst. med. Res.*, 131, 132.
Mahler, M. S., and Luke, J. A. (1946). *J. nerv. ment. Dis.*, 103, 433.
— and Daltroff, W. (1945). *Amer. J. Orthopsychiat.*, 15, 631.
— and Rangell, L. (1943). *Psychiat. Quart.*, 17, 379.
Meduna, L. J. (1953). *J. nerv. ment. Dis.*, 117, 39.
O'Brien (1883). *J. Straits Br. Acad. Soc.*, p. 143.
Prince, M. (1906). *J. nerv. ment. Dis.*, 33, 29.
Trousseau, A. (1867). *Chn. méd. Hôtel-Dieu, Paris*.
Weisman, A. D. (1952). *A.M.A. Arch. Neurol. Psychiat.*, 68, 444.
Wilson, S. A. K. (1955). *Neurology*. Butterworth, London.

AGE AT WHICH THE DECIDUOUS TEETH ARE SHED

BY

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The age at which the milk teeth of children are shed is a subject which has been relatively little studied. In 1923 Hellman gave figures based on a survey of American boys and girls from poor and wealthy homes. In this country, a survey of children at an institution was made by Stones, Lawton, Bransby, and Hartley in 1951. This gap in our knowledge is surprising, for there is good reason to believe that the age at which the deciduous teeth are shed may influence the age at which the succeeding permanent teeth erupt (Leslie, 1951).

The statistics presented in this report have been obtained by new methods which allow a more accurate assessment of mean shedding times to be made than has hitherto been possible.

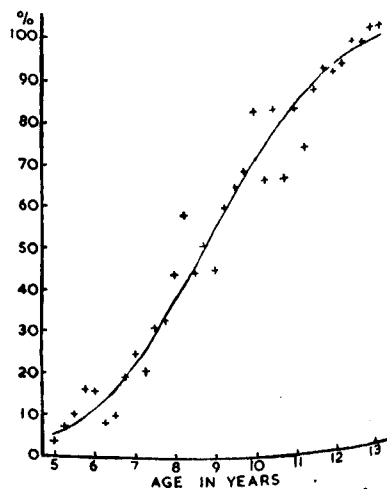
Method

The analysis has been made from data relating to a sample of 1,427 boys and 1,365 girls aged 5 to 13 years, attending infant, junior, and secondary modern schools in Birmingham. The children were examined during the course of the Birmingham Anthropometric Survey, and are fully representative of the elementary-school population of the city.

At the examination a series of anthropometric measurements and dental observations were made on each child, the latter by the same observer throughout (E. D. T.). An account of the information recorded and the way in which it was prepared for analysis was given in a previous paper (Clements, Davies-Thomas, and Pickett, 1953).

For the purpose of this analysis, all deciduous teeth seen in the jaw were coded as "present" and missing teeth as "shed," the latter category including teeth either shed or extracted. The space might be empty or be filled by a permanent tooth.

The coded records in the form of punched cards were sorted into order of ascending age and then formed into groups with an age range of three months. Within each of these age groups the proportion of children with a particular deciduous tooth present was calculated. This was done for each deciduous tooth in turn. The proportion gradually decreases with age until all the children have shed the tooth.



The observed and expected shedding frequencies of boys' upper first deciduous molar tooth.

The age at which 50% of the children have the tooth and 50% have not may be accurately calculated from such a series of observations by a statistical method recently devised (Finney, 1952). The standard deviation of the distribution, which is a measure of the range, may also be obtained. This technique of probit analysis has been used throughout, and the close correspondence of observed and expected shedding frequencies derived from the analysis confirmed that it is applicable to the data. The Chart on the previous page is a diagrammatic representation of these frequencies in the upper first deciduous molar tooth. An account of the method of analysis, applied to similar observations on permanent teeth, has been given in an earlier paper (Clements *et al.*, 1953).

Results

The statistics have been computed for the right and left sides of the upper and lower jaws of boys and girls separately. Comparison shows no difference between the sides other than would be expected to arise from random errors of sampling. For this reason the data presented here relate only to the right side of the jaws.

Mean Time at Which Teeth are Shed.—The mean times at which teeth are shed in the right upper and lower jaw are given in Table I for both sexes, with the standard error of

TABLE I.—Mean Shedding Times, Standard Errors, Standard Deviations, and the 5% and 95% Limits of Mean and of Distribution, for Teeth of Boys and Girls in Right Upper and Lower Jaws

Tooth	Mean and Error (Months)	Limits of Mean		S.D.	Limits of Distribution	
		5% Limit	95% Limit		5% Limit	95% Limit
Boys						
Upper jaw:						
A	80.23±0.73	79.03	81.43	11.78	60.91	99.55
B	91.13±0.72	89.95	92.31	11.91	71.60	110.66
C	133.10±0.90	131.62	134.58	18.04	103.51	162.69
D	105.13±1.15	103.25	107.01	27.47	60.07	150.19
E	115.25±1.16	113.35	117.15	28.79	68.03	162.47
Lower jaw:						
A	72.52±0.75	71.29	73.76	9.97	56.17	88.88
B	85.74±0.65	84.68	86.81	9.38	70.35	101.13
C	122.08±0.85	120.69	123.47	16.00	95.84	148.32
D	98.89±1.39	96.61	101.17	33.31	44.26	153.52
E	106.71±1.35	104.50	108.92	34.93	49.42	163.99
Girls						
Upper jaw:						
A	77.89±0.61	76.89	78.89	8.95	63.21	92.57
B	87.80±0.75	86.57	89.02	12.55	67.22	108.38
C	123.81±0.89	122.36	125.26	16.98	95.97	151.66
D	101.94±1.24	99.91	103.97	27.96	56.09	147.79
E	112.48±1.15	110.59	114.37	27.37	67.59	157.37
Lower jaw:						
A	68.21±0.61	67.20	69.21	7.05	56.64	79.77
B	81.08±0.74	79.87	82.30	10.70	63.53	98.64
C	110.52±0.77	109.25	111.79	14.18	87.27	133.77
D	95.99±1.34	93.78	98.19	31.15	44.90	147.08
E	101.95±1.26	99.89	104.02	30.53	51.89	152.02

the mean, the standard deviation, and the 5 to 95% fiducial limits of the distribution: 90% of children fall within these limits. Outside them are only the earliest 5% and the latest 5%.

Effect of Socio-economic Background on Time at Which Teeth are Shed

The shedding times given in Table I are obtained from data relating to children of all types of socio-economic background. It was possible that variation in these times might be associated with differing socio-economic backgrounds. The children have therefore been divided into three groups, each varying in this respect. Their allocation to each group depends upon their parents' occupation, and is based on the classification used by the Registrar-General (1951). The first group includes his social classes I and II, formed of professional and intermediate workers. The second is equivalent to his social class III, consisting of skilled

workers. The third includes his social classes IV and V, and consists of semi-skilled and unskilled workers.

The mean ages at which the deciduous teeth were shed were computed for these three socio-economic groups whenever sufficient data were available. In the first group, satisfactory estimates could be obtained only for the lower first deciduous incisor, the upper and lower first deciduous molar, and the lower second deciduous molar teeth of boys. Although the evidence is incomplete, these indicate that, on the average, deciduous teeth are shed earlier in children from the first socio-economic group than in those from the second. The lower first incisor teeth show a difference of 4.65±3.68 months in mean shedding age between these two groups. The upper first molar teeth show a difference of 20.22±2.72 months, the lower first molar teeth one of 18.99±4.17 months, and the lower second molar teeth one of 20.68±5.70 months. The differences shown with the molar teeth are large and statistically significant. No significant differences were found to exist between the mean times at which teeth are shed among children from the second and third socio-economic groups.

Hellman (1923) provides estimates of the mean shedding times for deciduous teeth in samples of wealthy and poor children. These indicate an earlier shedding time for the first and second incisors and canine teeth in both boys and girls from the wealthy group, with the exception of the girls' lower first incisor and the boys' upper canine. The differences are very small, and none is statistically significant, but their relative consistency may indicate a trend. Hellman found that, unlike the incisor and canine teeth, the first and second molar teeth were shed, on the average, later in wealthy than in poor children. This is not in accord with our data, and it seems evident that these teeth show very variable mean shedding times. Differences in extraction rates may be involved.

Difference in Mean Times at Which Teeth are Shed

Boys and Girls.—The difference between the mean shedding times of the deciduous teeth of boys and girls is given in Table II. Without exception, boys show a later mean

TABLE II.—Differences Between Mean Shedding Times, with Standard Errors, of Teeth of Boys and Girls in Right Upper and Lower Jaws, and Between the Upper and Lower Jaws in Same Sex

Tooth	Difference Between Mean Shedding Times in Months with S.E.			
	Boys-Girls		Upper-Lower	
	Right Upper Jaw	Right Lower Jaw	Boys	Girls
A	+2.34±0.95†	+4.32±0.97†	+7.71±1.05†	+9.68±0.86†
B	+3.33±1.04†	+4.66±0.99†	+5.39±0.97†	+6.72±1.05†
C	+9.29±1.26†	+11.56±1.15†	+11.02±1.24†	+13.29±1.18†
D	+3.19±1.69	+2.90±1.93	+6.24±1.80†	+5.95±1.83†
E	+2.77±1.63	+4.75±1.84†	+8.54±1.78†	+10.53±1.71†

† Indicates a probability of less than 1%. Teeth A, B, C, D, and E represent 1st and 2nd incisors, canines, and 1st and 2nd molars respectively.

shedding time than girls. These differences are statistically significant for the upper and lower first and second incisors, canines, and second lower molar teeth. The variation between the sexes in the canines is particularly pronounced. The average difference is 4.91±0.97 months, and compares well with Hellman's finding that girls shed their teeth 4½ months earlier, at an average, than boys. A similar conclusion was reached by Stones *et al.* (1951).

Upper and Lower Jaws.—The difference between the mean shedding times of corresponding teeth in the upper and lower jaws are given in Table II for boys and girls separately. In both sexes the mean times are later in the upper jaw than in the lower jaw, and the differences are all statistically significant. The average difference is 8.51±0.82 months, and is very near to Hellman's estimate of 7 months. Stones *et al.* (1951) also found that the first and second upper incisors and upper canines were shed later than the corresponding teeth in the lower jaw, but that the lower molar teeth were shed later than the upper ones.

Sequence in Which Deciduous Teeth are Shed

The usual order in which the deciduous teeth are shed has been determined from the mean times given in Table I. The order is the same in the upper and lower jaws of both boys and girls, and the sequence may be represented as follows:

i_1	i_2	c	m_2	m_1
i_1	i_2	c	m_2	m_1

The sequence in which the incisor teeth are shed is the same as that found by Hellman (1923) and by Stones *et al.* (1951), but this is not so for the canines and molars. In the two latter surveys the order in which these teeth are shed differs between boys and girls.

Time Between Shedding Deciduous Teeth and Eruption of Permanent Teeth

Estimates of the time interval between the shedding of the deciduous teeth and the eruption of the corresponding permanent teeth are given in Table III. The mean shedding

TABLE III.—Time Interval in Months Between Mean Time of Shedding Deciduous Teeth and Mean Time of Eruption of the Permanent Teeth

Tooth	Boys			Girls		
	Birming- ham	Hellman Wealthy	Poor	Birming- ham	Hellman Wealthy	Poor
<i>Upper Jaw</i>						
A	3.90	3.72	3.84	5.40	1.57	0.00
B	7.04	7.20	6.48	6.72	6.00	7.32
C	4.46	6.60	10.20	8.16	4.26	5.16
D	19.83	2.88	11.52	8.16	15.51	2.40
E	22.97	7.08	13.44	3.36	20.28	4.92
<i>Lower Jaw</i>						
A	0.44	0.48	1.44	0.36	1.01	0.12
B	1.89	2.88	1.92	1.56	3.09	2.16
C	4.08	5.64	2.40	8.52	2.38	2.76
D	37.31	5.04	31.32	12.00	30.34	4.92
E	41.16	4.56	33.72	12.36	37.67	9.36

Teeth A, B, C, D, and E represent 1st and 2nd incisors, canines, and 1st and 2nd molars respectively.

times in Table I have been combined with mean eruption times obtained from the same sample of Birmingham children (Clements *et al.*, 1953). Estimates derived from the data of Hellman (1923) and of Stones *et al.* (1951) have also been made, and are included in Table III.

The average intervals of time between shedding the deciduous upper and lower first and second incisors and canines and the eruption of corresponding permanent teeth are small and very similar in all three surveys. The intervals between shedding and eruption of molar teeth, however, are generally greater and differ between the surveys. The Birmingham data show the largest intervals here, followed by Hellman's sample of children from poor homes. All the estimates indicate, however, that the average interval between shedding and eruption of molar teeth is greater in the lower than the upper jaw.

Discussion

On the average, the children in the Birmingham survey shed their teeth earlier than did either wealthy or poor American children in 1923 (Hellman, 1923). Their mean shedding times are also earlier than those estimated from a sample of English children living in an institution (Stones *et al.*, 1951). The discrepancies between the two English surveys may be due in part to the inevitably more restricted nature of the institutional data, which are based upon smaller numbers and a greater homogeneity of material than occurs in the Birmingham sample.

The average time at which teeth are shed is also linked with the extraction rate, where extracted teeth are included in the data. Stones *et al.* (1951) show that there may be as much as twelve months' difference between the average shedding time of the molars when extracted teeth are included and excluded. This may account for many differences

between the surveys, particularly where the molars are involved. The incidence of caries, which has been shown to occur most often in these teeth (Mellanby and Mellanby, 1950) may vary greatly between one group and another. It is, in fact, known to be lower in the teeth of children at an institution than in those living at home (Mellanby and Mellanby, 1951).

Both Hellman's data (1923) and the Birmingham Survey material indicate that there is at least a tendency towards an earlier mean shedding time for the deciduous teeth of children with a superior socio-economic background compared with the teeth of children less well placed. This may be another factor leading to heterogeneity between the English surveys. It also suggests that environmental factors such as living conditions and nutritional standards are of great significance to the life of the teeth. Earlier shedding of milk teeth leading to earlier eruption of permanent teeth may be another aspect of the well-known trend towards an earlier maturity as standards of life improve.

Summary

The mean times at which the deciduous teeth are shed have been computed from a sample of 1,427 boys and 1,365 girls aged 5 to 13 years, attending elementary schools in Birmingham.

Children with a superior socio-economic background tend to shed their milk teeth earlier than others.

Boys shed their milk teeth an average of 5 months later than girls. The teeth in the upper jaw are shed an average of 8½ months later than corresponding teeth in the lower jaw.

The sequence in which the deciduous teeth are shed is given, and is the same for boys and girls.

Estimates of the interval between shedding deciduous teeth and the eruption of corresponding permanent teeth have been made. The interval is greatest for the molar teeth.

We gratefully acknowledge the receipt of a grant from the Medical Research Council. We thank Professor Sir Solly Zuckerman for his helpful advice, and express our gratitude to the City of Birmingham Education Committee for its co-operation in the conduct of this survey.

REFERENCES

- Clements, E. M. B., Davies-Thomas, E., and Pickett, Kathleen G. (1953). *British Medical Journal*, 1, 1421.
Finney, D. J. (1952). *Probit Analysis*, 2nd ed. Cambridge.
Hellman, M. (1923). *Dent. Cosm.*, 65, 1329.
Leslie, G. H. (1951). *A Biometrical Study of the Eruption of the Permanent Dentition of New Zealand Children*. Government Printing Office, Wellington, N.Z.
Mellanby, H., and Mellanby, M. (1950). *British Medical Journal*, 1, 1341.
Mellanby, M., and Mellanby, H. (1951). *Ibid.*, 1, 51.
Registrar-General (1951). *Classification of Occupations*, 1950. H.M.S.O., London.
Stones, H. H., Lawton, F. E., Bransby, E. R., and Hartley, H. O. (1951). *Brit. dent. J.*, 90, 1.

A new "practical training" centre for mentally handicapped persons was opened at Acton Lodge, Isleworth, earlier this month. Mr. J. VAUGHAN-MORGAN, Parliamentary Secretary to the Ministry of Health, in congratulating the Middlesex County Council on their work in this field, said that in the country as a whole there were still 3,000 children and 5,000 adults suitable for special training who were not yet receiving it. This lack of suitable training facilities was also recently stressed by the Minister of Health, Mr. DENIS VOSPER, at the opening of a new occupational centre for mentally defective children at Mapperley, Notts, in May. "So far," said the Minister, "we have only found it possible to give priority to the needs of children. But there are already over 5,000 boys and girls over 16 who are reported by local health authorities to be suitable for, but are not receiving, senior training."

TIME OF ERUPTION OF PERMANENT TEETH IN BRITISH CHILDREN AT INDEPENDENT, RURAL, AND URBAN SCHOOLS

BY

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In 1953 an account was given of the time of eruption of permanent teeth in a sample of schoolchildren from Birmingham between the ages of 5 and 13 years (Clements, Davies-Thomas, and Pickett, 1953). The dental observations were made in the course of the Birmingham Anthropometric Survey between 1947 and 1948, when children attending urban elementary schools were examined. Between 1949 and 1952 the survey was extended to include boys and girls in grammar and technical schools in Birmingham and independent and rural schools within a 30-mile radius of the city. Children at urban elementary schools between the ages of 14 and 15 years were also examined. By this means schoolchildren up to the age of 19 years and of very varied background were included in the survey population.

This paper provides an account of the times at which the permanent teeth of children attending different types of school erupt. Children from independent schools form a sample whose economic background is particularly good. Those from rural elementary schools are of mixed economic background; their comparison with children at urban elementary schools gives an indication of the effect of rural as opposed to urban life on the age of eruption.

Method and Material

A full description of the methods of examination, the preparation of the records, and the technique of analysis were given in the earlier paper (Clements *et al.*, 1953).

Previous analysis has shown that there is no significant difference in the eruption times of teeth on the right and

TABLE I.—Number of Children at Each Type of School For Each Year of Age

Age Group (Years)	Boys			Girls		
	Independent	Rural Elementary	Grammar, Technical, and Urban Elementary	Independent	Rural Elementary	Grammar, Technical, and Urban Elementary
5	—	39	—	—	34	—
6	—	39	—	3	24	—
7	3	36	—	4	38	—
8	13	36	—	6	33	—
9	20	36	—	6	39	—
10	18	30	—	8	38	—
11	19	29	28	16	35	6
12	17	24	49	10	27	16
13	23	21	96	9	23	71
14	19	17	139	3	18	77
15	15	6	159	4	3	151
16	20	—	87	5	—	61
17	18	—	47	8	—	20
18	9	—	21	2	—	7
19	—	—	4	1	—	—
Total	194	313	630	85	312	409

left sides of the jaw (Clements *et al.*, 1953). The statistics have therefore been computed from data relating to the right side only throughout.

Table I gives the total number of boys and girls examined at each type of school for each year of age. The numbers of children examined at independent schools in each age group are not large, particularly in the girls' sample, and it was not possible to obtain estimated eruption times for all teeth.

The samples of children from grammar and technical schools have been combined with those of the 14- and 15-year-old children at urban elementary schools, for none contain sufficient numbers to be considered alone. They do not include any children below the age of 11 years.

Results

The following abbreviations have been used: I_1 for the central incisor, I_2 for the lateral incisor, C for the canine, Pm_1 for the first premolar, Pm_2 for the second premolar, M_1 for the first molar, M_2 for the second molar, and M_3 for the third molar tooth.

Mean Eruption Times in Different Types of School

Table II gives the mean time at which the permanent teeth erupt for boys and girls separately in the three school groups. The mean eruption times previously computed for children at urban elementary schools are also included. Estimates of the eruption times of each tooth except M_3 can be given only in the rural elementary school group. The age range of the urban group lies outside the age at which I_1 , I_2 , and M_1 erupt, while the small numbers in the independent school sample are responsible for gaps in the table here.

Comparison of Mean Eruption Times in Different Types of School

Table III provides a comparison of the mean eruption times of the teeth of children in the three school groups examined here and also those of children at the urban elementary schools previously visited. Differences at the 1% and 5% level of probability have been indicated.

Differences between the two purely urban groups are of doubtful significance, for small numbers are involved. The children at rural elementary schools show a trend, most marked in the boys' sample, towards an earlier mean age of eruption than occurs in urban elementary schools.

The teeth of boys at independent schools also show a relatively constant trend towards earlier eruption times than are found in those of children at urban elementary schools, although upper and lower M_2 are an exception to this. Only two estimates of eruption times can be made from the girls' data; both are earlier in the independent-school sample, but neither is significantly so.

In the previous study of children at elementary schools a comparison was made between the eruption times of the teeth of children whose parents were in professional or managerial occupations with those whose parents were skilled or unskilled workers (Clements *et al.*, 1953). This showed a very consistent trend towards earlier eruption in the first group, but the numbers involved were small and no significant differences arose between mean eruption times of individual teeth, although the mean differences over all the teeth was 3.36 ± 1.13 months. It is therefore interesting that the tendency towards earlier eruption found in the teeth of these children is also evident in the teeth of children at independent schools, whose socio-economic background may be regarded as at its most favourable.

There are no significant differences between the mean eruption times of the teeth within the three school groups latterly visited. No consistent trends between them are obvious, although this may be due to the small numbers involved.

Although the general tendency is towards earlier eruption in children at these schools, the mean eruption time of M_2 is exceptional. In the upper and lower jaws of boys in each

group, in the upper and lower jaws of girls in the mixed urban group, and in the upper jaw of girls in rural elementary schools this is later, although with one exception not significantly so, than in children at urban elementary schools. It has been suggested by Leslie (1951) that the time at which the milk teeth are shed affects the time of eruption of subsequent corresponding permanent teeth. This suggests that the second deciduous molar teeth, which are known to be particularly subject to caries (Mellanby and Mellanby, 1950), have been kept longer by children at these schools.

Discussion

The 1947-8 sample of children at elementary schools who form the basis of the previous Birmingham Anthropometric Survey report (Clements *et al.*, 1953) was more representative of the child population as a whole than is the sample of children analysed in the present paper. The latter, however, serve to confirm tendencies apparent in the earlier data and may throw some light on the factors involved.

The mean eruption times of the permanent teeth of the children at elementary schools first examined tended to be earlier than those given by other authors, most of which were the result of dental surveys made some years ago. This, taken in conjunction with the well-marked trend towards earlier eruption in children from a rural and from a superior socio-economic environment indicated in the results

of the present analysis, corresponds to the trends towards earlier development shown by overall body growth.

An apparent reversal of this tendency in the case of the second molar teeth may be a consequence of the susceptibility of the milk molars to decay. It may be assumed that the more satisfactory the nutritional conditions, the longer will these teeth be kept. As the time of eruption of the permanent teeth is influenced by the time at which the milk teeth are shed, this will lead to later eruption of the permanent molars by children living in better conditions.

Summary

The mean times at which the permanent teeth erupt are given for children attending three groups of schools. These are (a) independent schools, (b) rural elementary schools, and (c) urban grammar, technical, and elementary schools, the latter including children aged 14 and 15 years only.

The eruption times of the teeth of children at these schools is compared with those of children previously examined at urban elementary schools.

The permanent teeth of children at independent and rural elementary schools tend to erupt earlier than do those of children at urban elementary schools.

TABLE II.—Mean Eruption Times in Months with Standard Errors of the Permanent Teeth of Boys and Girls at Different Types of School

Tooth	Boys				Girls			
	Independent	Rural Elementary	Grammar, Technical, and Urban Elementary (Aged 14-15 Years)	Urban Elementary (Aged 5-13 Years)	Independent	Rural Elementary	Grammar, Technical, and Urban Elementary (Aged 14-15 Years)	Urban Elementary (Aged 5-13 Years)
Upper Jaw								
I ₁	—	81.27 ± 1.32	—	84.13 ± 0.71	—	84.94 ± 2.11	—	79.46 ± 0.57
I ₂	93.35 ± 7.39	96.46 ± 2.02	—	98.17 ± 0.74	—	96.91 ± 1.94	—	93.80 ± 0.87
C	123.08 ± 2.73	126.18 ± 2.27	127.38 ± 11.65	137.56 ± 0.92	—	127.86 ± 1.88	125.08 ± 18.86	128.07 ± 0.85
Pm ₁	—	120.73 ± 2.20	132.06 ± 3.00	124.96 ± 1.12	—	118.76 ± 2.19	—	117.45 ± 0.84
Pm ₂	126.44 ± 3.35	128.54 ± 1.83	135.06 ± 3.19	138.22 ± 1.13	—	125.72 ± 1.72	—	132.76 ± 1.17
M ₁	—	73.14 ± 1.69	—	73.29 ± 0.78	—	75.03 ± 3.07	—	71.25 ± 0.77
M ₂	144.92 ± 3.72	143.78 ± 2.57	147.09 ± 1.84	143.67 ± 0.94	—	141.87 ± 2.88	143.85 ± 2.40	137.94 ± 0.88
Lower Jaw								
I ₁	—	71.88 ± 1.38	—	72.96 ± 0.72	—	73.47 ± 2.43	—	69.22 ± 0.57
I ₂	—	85.34 ± 1.81	—	87.63 ± 0.71	—	85.40 ± 2.33	—	84.17 ± 0.70
C	121.30 ± 3.36	124.35 ± 1.46	128.62 ± 4.17	126.16 ± 0.80	—	109.76 ± 2.38	—	112.90 ± 0.74
Pm ₁	129.39 ± 2.73	124.88 ± 1.95	123.29 ± 13.52	136.20 ± 0.99	—	120.17 ± 1.92	—	126.33 ± 0.94
Pm ₂	136.26 ± 3.10	136.13 ± 2.30	136.18 ± 5.70	147.87 ± 1.17	131.31 ± 5.74	135.73 ± 2.50	141.69 ± 2.81	139.62 ± 1.17
M ₁	—	71.53 ± 1.43	—	73.69 ± 0.79	—	72.02 ± 1.64	—	70.08 ± 0.67
M ₂	140.37 ± 3.32	138.02 ± 1.95	138.59 ± 3.23	136.87 ± 0.84	132.46 ± 1.06	131.44 ± 1.88	139.96 ± 3.38	134.15 ± 0.89

TABLE III.—Difference, with Standard Errors, between the Mean Eruption Times in Months of the Teeth of Boys and Girls at Urban Elementary Schools and at Other Types of School

Tooth	Boys			Girls		
	Independent	Rural Elementary	Grammar, Technical, and Elementary	Independent	Rural Elementary	Grammar, Technical, and Elementary
Upper Jaw						
I ₁	—	2.86 ± 1.50	—	—	—	—
I ₂	4.82 ± 7.43	1.71 ± 2.15	—	—	—5.48 ± 2.19*	—
C	14.48 ± 2.88†	11.38 ± 2.45†	10.18 ± 11.69	—	—3.11 ± 2.13	—
Pm ₁	—	4.23 ± 2.47	—7.10 ± 3.20*	—	0.21 ± 2.06	2.99 ± 18.88
Pm ₂	11.78 ± 3.54†	9.68 ± 2.15†	3.16 ± 3.38	—	—1.31 ± 2.35	—
M ₁	—	0.15 ± 1.86	—	—	7.04 ± 2.08†	—
M ₂	—1.25 ± 3.84	—0.11 ± 2.74	—3.42 ± 2.07	—	—3.78 ± 3.17	—5.91 ± 2.56*
Lower Jaw						
I ₁	—	1.08 ± 1.56	—	—	—4.25 ± 2.50	—
I ₂	—	2.29 ± 1.94	—	—	—1.23 ± 2.43	—
C	4.86 ± 3.45	1.81 ± 1.66	—2.46 ± 4.25	—	3.14 ± 2.49	—
Pm ₁	6.81 ± 2.90*	11.32 ± 2.19†	12.91 ± 13.56	—	6.16 ± 2.14†	—
Pm ₂	11.61 ± 3.31†	11.74 ± 2.58†	11.69 ± 5.82*	8.31 ± 5.86	3.89 ± 2.76	—2.07 ± 3.04
M ₁	—	2.16 ± 1.63	—	—	—1.94 ± 1.77	—
M ₂	—3.50 ± 3.42	—1.15 ± 2.12	—1.72 ± 3.34	1.69 ± 1.38	2.71 ± 2.08	—5.81 ± 3.50

* Probability of less than 5%. † Probability of less than 1%.

The mean eruption time of M₂ shows a reversal of this tendency. It is suggested that this is due to the susceptibility of the milk molars to caries and their consequent earlier loss in less favourable conditions.

We gratefully acknowledge the receipt of a grant from the Medical Research Council. We thank Professor Sir Solly Zuckerman for his advice, and express our gratitude to the City of Birmingham education authorities, without whose co-operation the survey would not have been possible.

REFERENCES

- Clements, E. M. B., Davies-Thomas, E., and Pickett, Kathleen G. (1953). *British Medical Journal*, 1, 1421.
Leslie, G. H. (1951). *A Biometrical Study of the Eruption of the Permanent Dentition of New Zealand Children*. Government Printing Office, Wellington, N.Z.
Mellanby, H., and Mellanby, M. (1950). *British Medical Journal*, 1, 1341.

ATTEMPTED SUICIDE WITH MEPROBAMATE TREATED WITH LEPTAZOL

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Meprobamate (2-methyl-2-N-propyl-1,3-propanediol dicarbamate; "miltown"; "equanil") was synthesized by Ludwig and Piech in 1950, and is widely used as a tranquilizer in the treatment of anxiety states and other psychoneurotic disorders. It has received wide acclaim as a most promising and relatively non-toxic drug offering many advantages over the usual sedative preparations prescribed in the treatment of these conditions. As there are few reported instances of meprobamate overdosage, we describe the following case, and draw particular attention to the effective therapeutic response to leptazol.

Case Report

A 30-year-old man, weighing 103 lb. (46.7 kg.) was admitted to hospital in coma. He had attended the outpatient department some days prior to admission, where meprobamate, two 400-mg. tablets four times daily, had been prescribed for an anxiety neurosis. He had, however, taken two tablets every four hours for a period of three days, and finally on the night before admission had ingested 20 tablets (8 g.) as a single dose. The following morning he was found unconscious in his room and was admitted to hospital.

Examination revealed a poorly developed comatose man insensitive to stimuli. Respirations were shallow at 20 a minute, pulse rate 84 a minute, axillary temperature 97° F. (36.1° C.), and blood pressure 80/60 mm. Hg. Other findings of particular interest were marked flaccidity of all limbs and an inability to elicit any tendon reflexes. He appeared to be in a state of hibernation combined with muscle relaxation and profound depression of the central nervous system. Gastric lavage was performed and an intravenous infusion of 5% glucose in saline instituted; at the same time it was decided to administer an intravenous injection of leptazol as an antidote to meprobamate. The effect of leptazol was dramatic. Within a minute of injecting 3 ml. the patient regained consciousness and responded to questioning although still drowsy, and he was able to give a relatively clear account of events leading up to his ingestion of the excessive dose of meprobamate the previous day. An examination of the nervous system 10 minutes after the

restoration of consciousness revealed extremely brisk tendon reflexes. His blood pressure had risen to 90/60 mm. Hg, and he complained of feeling intensely cold. Progress from this stage was uneventful, and by the following morning he appeared to have made a complete recovery.

Discussion

In 1954 Berger published a detailed account of the pharmacological properties of meprobamate. It produces a reversible flaccid paralysis of skeletal muscle with the abolition of tendon reflexes. Smaller doses produce muscle relaxations and sedation, without the stimulating effect common to most sedative drugs. Meprobamate, like mephensin, acts on the central nervous system as an interneuronal blocking agent, but is more effective and better tolerated than the latter.

When administered in the usual dose of one to six 400-mg. tablets daily, it is generally regarded as being an extremely safe drug. Selling (1955), in the study of 187 patients, described certain minor adverse effects. The first patient had two fainting attacks and fever of 102° F. (38.9° C.) following the administration of two tablets. A second developed urticaria after four days' treatment. Angioneurotic oedema developed in a third, and five patients complained of gastric discomfort. Selling describes two cases of meprobamate overdosage. One patient ingested 20 g. over a 24-hour period, became extremely sleepy, and developed a bradycardia of 40 a minute. The patient was made to walk about, and hot coffee was given in an attempt to keep her awake. She finally slept soundly for a period of 10 hours. Another patient consumed 40 g. of meprobamate within 24 hours and suffered no ill effects.

In his article Berger reported that meprobamate protected animals from E.C.T. seizures, and appeared to act as an antagonist toward leptazol and strychnine-produced seizures, and we therefore decided in this instance to use leptazol as a specific antidote to meprobamate overdosage.

Meprobamate seems to be a most valuable drug with a potentially wide field of application in clinical medicine. Its uses are not confined to the treatment of anxiety states. The anticonvulsant action suggests further study in the treatment of epilepsy, and the rigidity of Parkinson's disease might also benefit from its muscle-relaxant effect. With the ever-widening field of application one must anticipate an increased incidence of overdosage. Here we suggest leptazol as a specific antidote to meprobamate overdosage.

Summary

A case is described of attempted suicide with meprobamate and a dramatic restoration to consciousness following the intravenous injection of leptazol. The literature is briefly discussed, and a wider application of tranquilizers is envisaged. It is suggested that leptazol be used as the antidote to meprobamate poisoning.

We thank Dr. M. E. L. Tonkin, Superintendent of Coronation Hospital, for permission to publish this report.

REFERENCES

- Berger, F. M. (1954). *J. Pharmacol.*, 112, 413.
Selling, L. S. (1955). *J. Amer. med. Ass.*, 157, 1594.

Mr. JOHN WILSON, the Director of the British Empire Society for the Blind, who is himself blind, has recently returned from a 15,000-mile tour of British territories in the Mediterranean and West Africa. The society by working with governments, local organizations, and missions is endeavouring to reduce the prevalence of preventable blindness. Mr. Wilson writes in the society's news bulletin that "Detailed surveys have now confirmed the appalling fact that there are 400,000 blind people in Nigeria, Ghana, Sierra Leone, and Gambia." The society also aims at training blind people to work and earn their living, rather than beg for it, and encourages blind children to attend school.

Medical Memorandum

Chlorpromazine as a Suicidal Agent

The increased use of chlorpromazine may result in suicidal attempts or accidental poisoning. There is little guidance concerning treatment, as few cases have been reported (Aubertin *et al.*, 1954; Vallat and Lepetit, 1954; Beal, 1955; Fontan *et al.*, 1955; Langeron *et al.*, 1955; Sinha and Mitra, 1955; Sykes, 1955). The main interest in the following case is the large dose ingested and the quick recovery despite chronic bronchitis.

CASE REPORT

A woman aged 52 consumed 390 25-mg. tablets of chlorpromazine. One hour later she was drowsy, confused, ataxic, and shocked. Gastric lavage—18 pints (10.2 litres) of warm water—and anti-shock measures were carried out. Methedrine, 60 mg. intravenously, repeated in one hour, and penicillin, 500,000 units six-hourly, were given. Respiratory collapse developed three hours later; this responded to atropine, 1/100 gr. (0.65 mg.) intravenously, and amphetamine sulphate, 20 mg. two-hourly, and picrotoxin, 2 mg., intramuscularly. Further improvement followed mucus extraction from the trachea by intranasal catheterization. The patient was regarded as being out of immediate danger six hours after ingestion.

In view of possible liver damage and white blood dyscrasias with therapeutic doses of chlorpromazine in the early weeks of treatment, the diet was augmented for one week with vitamin B₁₂, vitamin-B complex, glucose, fruit juices, soluble insulin (5 units twice daily), choline, methionine, and high-protein foods. White blood counts and urine examinations were performed daily and liver-function tests twice weekly for six weeks.

Gastric analysis showed the equivalent of 67 25-mg. tablets of chlorpromazine, and a just detectable positive reaction was found in the C.S.F. (undertaken after a lapse of five days).

Tachycardia, myalgia, and increased auditory and visual hallucinations (present for the first time) remitted in two days. Mist. pot. brom. was given three times a day and soluble barbitone, 10 gr. (0.65 g.) at night, neither being detoxicated by the liver. A congested fauces showed four necrotic patches, which cleared in two weeks. Low-grade pyrexia, and congestion and effusion of the left base, persisted for three weeks despite antibiotics. Gradual leucocytosis with toxic granulation during the first week reached 22,800 on the tenth day, subsequently returning to normal. Liver-function and urine tests were normal throughout.

COMMENT

Death from acute chlorpromazine poisoning has not, to our knowledge, been recorded. Our patient recovered dramatically as in other reported cases (Vallat and Lepetit, 1954; Sinha and Mitra, 1955). In treatment we had six main objectives: to remove the maximum quantity of drug from the stomach, to prevent hypotension, respiratory collapse, and depression of C.N.S., to combat shock, and to avoid damage to hepatic and haemopoietic systems. Chlorpromazine is very soluble in water, which is therefore a suitable medium for gastric lavage and should be continued until fluid returns clear. A wide-bore tube is recommended to avoid blockage, as returning fluid may contain sediment. Chlorpromazine diminishes gastro-intestinal motility, therefore lavage should always be undertaken despite a considerable lapse of time after ingestion. An explanation of the small quantity of chlorpromazine found in the lavage fluid may be due to breakdown in solution on standing. An experiment showed that 100 mg. of chlorpromazine in 200 ml. of water after five days had lost 20% of its strength. The drug's anti-emetic properties appear to render administering emetics a doubtful procedure.

Hypotension has been reported in three cases (Beal, 1955; Fontan *et al.*, 1955; Vallat and Lepetit, 1954). In our case

the blood pressure remained at 102/80 as on admission. The use of amphetamine is controversial, as the makers state that "pressure amines should not be used to counteract this hypotension," but in a case of Sykes (1955) dexamphetamine was taken with what was regarded as a toxic dose of chlorpromazine without ill effects. Azima and Ogle (1954) describe two cases of persistent hypotension returning to normal with concomitant administration of oral methedrine. Methedrine was administered intramuscularly to a case of chlorpromazine poisoning by Sinha and Mitra (1955), who claimed good results without hypotension. The *British Medical Journal* (1955) queries animal experiments by Dasgupta and Werner (1954) to demonstrate loss of pressor response after chlorpromazine. We consider amphetamine helped to maintain blood pressure in our case and to prevent depression of C.N.S. The latter did not present a serious problem until one and a half hours after the second methedrine injection, and showed improvement when amphetamine was reinstituted. The makers, however, suggest noradrenaline as the pressor agent of choice (personal communication). It is given intravenously and requires dilution. The makers of "levophed" (L-noradrenaline) recommend a dilution of 1 ml. to 250 ml. of isotonic saline. Intravenous fluids were contraindicated in our case, however, because of the risk of pulmonary oedema.

If bronchial obstruction is a prominent feature administration of noradrenaline appears to carry risk. The most alarming period in our case was four hours after ingestion, when respiratory collapse occurred. Fontan *et al.* (1955) report a case in which "gross bronchial obstruction" was a marked feature. Hypothermia, reported in three cases (Aubertin *et al.*, 1954; Fontan *et al.*, 1955; Sinha and Mitra, 1955), was not observed in our patient. The makers state that neutropenia is more common than leucocytosis, but that the latter occurs. In view of our patient's chest condition it is not possible to state definitely that leucocytosis was related to administration of chlorpromazine, although it is noted that pulmonary congestion was not evident until the white count approached normal.

The congestion and necrosis of the fauces bear comparison with those of another case of Vallat and Lepetit (1954), who described stomatitis and "buccopharyngeal lesions." In our case picrotoxin was stopped after one dose, as in excess it can cause convulsions. Chlorpromazine has known epileptogenic properties (Lomas *et al.*, 1955), so that there was risk of potentiation. Riddell (1955) suggests that high-protein diet, choline, and methionine may precipitate hepatic coma, so it may be unwise to use them. Three of the seven cases (Beal, 1955; Fontan *et al.*, 1955; Sykes, 1955) of chlorpromazine poisoning occurred in children, possibly because tablets are small and sugar-coated, therefore palatable and readily swallowed. Aggravation of psychiatric symptoms has been noted in one case (Vallat and Lepetit, 1954) but increased frequency of auditory and onset of visual hallucinations have not been reported. These are probably toxic phenomena of chlorpromazine, as hallucinosis remitted in a few days, although amphetamine might have been responsible.

We thank Dr. J. S. McGregor, medical superintendent, for permission to publish; Mr. D. C. Hubbard and Miss Rockley for technical assistance; Mr. Fox, Forensic Laboratory, Nottingham; and the nursing staff for invaluable co-operation.

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REFERENCES

- Aubertin, E., Martin-Dupont, C., and Tavernier, J. (1954). *Sem. Hôp. Paris*, 30, 2307.
Azima, H., and Ogle, W. (1954). *Canad. med. Ass. J.*, 17, 116.
Beal, J. A. (1955). *British Medical Journal*, 2, 1620.
British Medical Journal, 1955, 1, 338.
Dasgupta, S. R., and Werner, G. (1954). *Brit. J. Pharmacol.*, 9, 389.
Fontan, Verger, Bentegeat, Lapeyre-Mensignac, and Estrade (1955). *Sem. Hôp. Paris*, 31, 2255.
Langeron, L., Crocchel, L., and de Swarte, D. (1955). *Presse méd.*, 63, 146.
Lomas, J., Boardman, R. H., and Markowe, M. (1955). *Lancet*, 1, 1144.
Riddell, A. G. (1955). *Postgrad. med. J.*, 31, 389.
Sinha, G. B., and Mitra, S. K. (1955). *J. Ind. med. Ass.*, 24, 557.
Sykes, W. S. (1955). *British Medical Journal*, 2, 324.
Vallat, J. N., and Lepetit (1954). *Sem. Hôp. Paris*, 30, 2307.

Reviews

COLLECTED PAPERS OF EHRLICH

The Collected Papers of Paul Ehrlich. Volume I—Histology, Biochemistry, and Pathology. Compiled and edited by F. Himmelweit, M.D., Ph.D., F.R.C.P.Ed., with the assistance of Martha Marquardt. Under the editorial direction of Sir Henry Dale, O.M., G.B.E., F.R.S., M.D., F.R.C.P. (Pp. 653 + viii; illustrated. £12. Set of 4 volumes £28.) London and New York: Pergamon Press. 1956.

The publication of the first volume (and the following three volumes) of the collected papers by "this man of rare genius," as Sir Henry Dale calls Ehrlich in the introduction, was made possible by the unique co-operation between the Wellcome Trust, the Pergamon Press, Sir Henry, Dr. Himmelweit, and Miss Marquardt, Ehrlich's personal secretary. And what a worthwhile co-operation it is! Nobody but another man of genius could have described so vividly the main stations in Ehrlich's life and summarized so lucidly his principal activities and achievements: Dale, looking as a scientific cosmopolitan on the research world of the late nineteenth century, must have felt strongly the close relationship of their two minds. The contributions by Himmelweit and Miss Marquardt, though less apparent, were nevertheless considerable. The impression one receives on reading some of the papers, theses, notes, and lectures, as presented in the first volume, is their incredible freshness and vigour, although their time-bound form, content, arguments, and in certain instances even erroneous conclusions, should place them as purely historic documents. There are the contributions to histology and haematology (pp. 19-113 and pp. 114-277), which are to everybody's knowledge part of textbooks since the beginning of the century. Nevertheless, to workers, say, in the field of modern leukaemia research it must come as an inspiration to follow the original description of the rational approach and critical evaluation of results. But not only the haematologist is given this pleasure of rediscovering through Ehrlich the vitality of what one may be inclined to take for granted; the pharmacologist, the biochemist, and the iatro-chemist have the same opportunities, and may even find in famous papers like "The Requirement of the Organism for Oxygen" (pp. 433-97) and "The Relations Existing between Chemical Constitution, Distribution, and Pharmacological Action" sources for better or new ideas. I am looking forward to the next volumes, which together with Volume I should adorn every medical scientist's bookshelf.

F. BERGEL.

TRACE ELEMENTS IN NUTRITION

Trace Elements in Human and Animal Nutrition. By E. J. Underwood. (Pp. 430; illustrated. \$9.50.) London: Academic Books Ltd. 1956.

The diseases which can result from the absence of trace elements from the diet have always been a live problem in Australia, where extensive tracts of the country are unsuitable for sheep-raising because of deficiency of the soil in copper or cobalt. The author of this admirable new textbook, however, does not restrict his subject-matter to his own Dominion, but reviews the effects of trace elements, either in deficiency or excess, throughout the world. Moreover, his interests cover not only naturally occurring diseases as seen by the clinician or practical farmer, but laboratory experiments in which other mineral deficiencies, unknown in nature, have been produced. He discusses the role of cobalt in the formation of vitamin B₁₂ of molybdenum in the enzyme xanthine oxidase, and of zinc in carbonic anhydrase. He tells us how excess of selenium causes "alkali disease" and "blind staggers" among farm stock in parts of America, and how excess of molybdenum, unless balanced by extra copper, causes diarrhoea in parts of Somerset. The medical reader can hardly fail to be intrigued by the whole story which the author so skilfully unfolds,

but certain topics must receive his special attention as vitally affecting human health. Thus iodine is important in regard to the incidence of goitre, fluorine in regard to dental caries, and cobalt in regard to vitamin B₁₂ and pernicious anaemia. Although iron is perhaps not strictly a trace element, its discussion is wisely covered by a long chapter. An item which may surprise the non-expert is the prominence of tea as a rich source of manganese and fluorine. We are told, moreover, that human blood plasma contains three times more zinc than iron. The book is excellently printed, illustrated, and indexed, and it can be strongly recommended.

T. MOORE.

THOUGHT CHANGES IN SCHIZOPHRENIA

The Collected Works of C. G. Jung. Volume 5—Symbols of Transformation: An Analysis of the Prelude to a Case of Schizophrenia. Translated by R. F. C. Hull. "Collected Works," edited by Sir Herbert Read, Michael Fordham, M.D., M.R.C.P., and Gerhard Adler, Ph.D. (Pp. 567 + xxix; illustrated. 35s.) London: Routledge and Kegan Paul. 1956.

In 1911 Jung, then 36, made an important contribution to the study of schizophrenia which appeared in translation as *The Psychology of the Unconscious*. Jung has now revised the volume, bringing in much of his later work, and the English translation, with the title *Symbols of Transformation*, is the latest addition to his "Collected Works." It contains an analysis of the prodromal stages of thought changes in schizophrenia. The fantasy material of a young American woman, whom Jung never met, was submitted to him by the late Théodore Flournoy, whose patient she had been. Later an American psychiatrist who had read Jung's commentary on her reflections, and was then treating the patient for a schizophrenic illness, informed him that personal acquaintance with her had not taught him "one iota more" of her mentality than Jung had already deduced. The fantasies were mainly concerned with personal themes, often of a mythological character. In an attempt to understand this strange material Jung collated it with analogues from the art and literature of classical and modern workers. A striking series of parallels is presented and in particular the recurrence of autonomous symbols. The relevance of these to the patient's mental state was unmistakable. As a study of the deeper layers of the mind the book is unrivalled.

The objective phenomena observed in this research were very different from the personalism which characterized the writings of Freud and others. The publication of the book, including as it did the theory of the collective unconscious and its symbolism, ended the collaboration of Freud and Jung. The new translation—a great improvement on previous editions—is enriched with a unique collection of plates and text figures.

E. A. BENNET.

THE INNER EAR

Die Ortho- und Pathobiologie des Labyrinthes. Als Grundlage der dystonischen und dystrophischen Erkrankungsprozesse des Innenohres. By K. Wittmaack. Edited by H. Rollin. (Pp. 294 + xii; illustrated. D.M. 36.) Stuttgart: Georg Thieme Verlag. 1956.

Edited by Professor Rollin, this book is a condensation of the results of Wittmaack's life-long work on the inner ear. As such it should find a place in the libraries of departments of otology, but it will mainly be of value to the histopathologist rather than the clinician, since the clinical aspects of inner-ear diseases occupy only 60 pages out of a total of nearly 300. Discussion of the functional examination of hearing covers eleven pages, and that of labyrinthine function only four. Nearly half the book deals with the pathological anatomy and physiology of the inner ear, whilst the remainder is concerned with the normal anatomy and physiology of this organ. As one would expect from Wittmaack, there is a good section on histopathological results from experiments on animals; this covers about 80 pages. The inclusion of at least two types of endolymphatic hydrops—acute and chronic—in the classification of dysfunc-

tional inner-ear disorders may not find general acceptance. However, it is interesting to note that acute endolymphatic hydrops is the most likely explanation for many cases of sudden perceptive deafness. The book is well illustrated with over 180 photomicrographs of the inner ear and is printed on excellent-quality paper. The full table of contents at the front compensates largely for the lack of an index.

TERENCE CAWTHORNE.

CLINICAL RHEUMATOLOGY

Rhumatologie Clinique. By Pierre P. Ravault and Georges Vignon. (Pp. 604; illustrated. 4,600 fr.) Paris: Masson et Cie. 1956.

This is a large and well-produced book on the rheumatic diseases written chiefly from the clinical angle by two general physicians who have obviously an extensive, but not exclusive, interest in this branch of medicine. Many of their views would not meet with universal acceptance from rheumatologists, but their approach is a practical and systematic one which should encourage other clinical professors of medicine to interest themselves more in this field.

The sections which are of the most interest are those concerned with the soft-tissue lesions known variously as panniculitis, tendinitis, etc., and other non-articular tissues and organs; the section on gout; and the chapter on the differential diagnosis of acute and subacute articular "rheumatism." There is a useful and rather unusual chapter on secondary rheumatic or arthritic manifestations in the course of other disease syndromes—infective, endocrine, collagen, haematological, allergic, cardiovascular, and associated with disorders of the central nervous system. This makes the point that the competent rheumatologist can be no narrow specialist. References are given at the end of each chapter, but almost without exception to French literature, and very few recent. A notable feature of this volume is the excellence of the reproduction of radiographs.

W. S. C. COPEMAN.

APPLICATION AND INTERPRETATION OF LABORATORY TESTS

Clinical Pathology: Application and Interpretation. By Benjamin B. Wells, M.D., Ph.D. Second edition. (Pp. 488 + xvii. 59s. 6d.) Philadelphia and London: W. B. Saunders Company. 1956.

Much of the progress in medicine during the last two decades is the fruit of increased accuracy of diagnosis and improved control of treatment—advances due largely to widespread availability of laboratory facilities. Yet the physician who depends upon the laboratory for the diagnosis is usually clinically inexperienced, whereas he who spurns its usefulness is denying himself and his patient the benefits of modern knowledge. The narrow path separating these extremes requires an intelligent compromise between science, art, and practice. Much help in bridging the gap between medicine and clinical pathology is given by books such as this which deal with the application and interpretation of laboratory tests without being concerned with their technical aspects. The author writes with authority and wisdom, dealing chapter by chapter with the different systems of the body, and discussing for each the value and limitations of the most commonly used and readily available tests. Particularly praiseworthy is his reasoned dismissal of various tests which have been copied from textbook to textbook and long since discarded as being without clinical value.

R. I. S. BAYLISS.

TUBERCULOSIS RESEARCH

Ergebnisse der Gesamten Tuberkulose-Forschung. Edited by St. Engel, L. Heilmeyer, J. Hein, and E. Uehlinger. Band XIII. (Pp. 659 + viii; illustrated. D.M. 96.) Stuttgart: Georg Thieme. 1956.

This beautifully produced 13th volume of the "Advances in Tuberculosis Research" is to be the last one by this title. As tuberculosis is getting less important as a disease, the

next volume will deal with "Advances in Tuberculosis and Diseases of the Lungs." Appropriately this last volume deals entirely with the chemotherapy of tuberculosis, which led to this recent change in policy. After three chapters on general aspects of chemotherapy, the chemotherapy of tuberculosis in each organ is separately presented, and there are three chapters on, respectively, the treatment of infants, the treatment of children, and tuberculous meningitis. This method of presentation unfortunately results in a good deal of repetition, and one feels that the book is swamped with detail and too much attention is paid to methods of treatment which are now out of date. The book is a treasury of reference, especially to the German literature, but many important British and American references have been omitted. Altogether some 2,500 authors are included, but their work is not analysed critically and many of the authors' conclusions are accepted on their face value. One would like to have seen a better integration of established knowledge in a more concise manner. The editing is not quite up to the usual German thoroughness; for example, in the author index one Smith combines all the many persons by that name referred to in the text.

JOHN LORBER.

COLLAGEN DISEASES

Collagen Diseases. By John H. Talbott, M.D., and R. Moleres Ferrandis, M.D. (Pp. 232 + xv; illustrated. \$6.50.) New York and London: Grune and Stratton. 1956.

This monograph is divided into five sections: systemic lupus erythematosus, polyarteritis, dermatomyositis, systemic scleroderma, and thrombotic thrombocytopenic purpura. It is really a series of reviews of current literature—there are 540 references—and comparatively little of the authors' own material is described or analysed. The section on systemic lupus erythematosus is the most complete, and it is of interest to note the diagnostic significance given by the author to false-positive serological tests for syphilis in this condition. The separation of dermatomyositis and systemic scleroderma has not proved entirely satisfactory. It would surely have been better, in the present state of our knowledge, to accept that there is a wide range of conditions between the extremes of acute dermatomyositis and chronic systemic scleroderma. The inclusion of thrombotic thrombocytopenic purpura is an interesting feature, but is not easy to justify when a much commoner condition like temporal arteritis receives only a passing mention. The book is well written and well produced, although unfortunately some of the coloured photomicrographs have reproduced badly.

J. D. N. NABARRO.

ELECTROCARDIOGRAPHY

EKG-Fibel. By R. Heinecker. Foreword by F. Hoff. (Pp. 200; illustrated. D.M. 19.80.) Stuttgart: Georg Thieme. 1956.

This primer of electrocardiography gives a short and clear introduction to the subject. The print is good, and as a variety of types are used the facts are easy to find. The matter is systematically arranged. The standard three leads still come first, then the unipolar and precordial leads of Wilson, and finally the thoracic leads of Nehb—dorsal, anterior, and inferior. The description of the P waves is lucid and useful. The general method is descriptive, and but little interpretative; not that this is always possible, but it is what is really needed for beginners, where it can be done. The illustrations are clear as a rule, though some are rather small. The heart sounds are often shown recorded with the electrocardiogram, which the author calls an important advance; but there is no account of their interpretation and they are often far from distinct. The accounts of the illustrations are well set out. There are no references. Altogether an informative but very condensed little book.

TERENCE EAST.

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INFLUENZA VIRUS VARIANTS

Since April of this year successive outbreaks of influenza have occurred over a wide area of the Far East. The epidemic was first reported from Hong Kong and Singapore in April, then Japan, Indonesia, Formosa, the Philippines, Borneo, and Indochina were involved during May, and towards the end of this month and during June outbreaks have occurred in Madras, Bombay, Delhi, and Karachi. The usual attack rate has been between 10% and 20% of the various populations, though some areas such as Manila have suffered even more severely. The illnesses have been said to be typical of mild influenza, there have been few complications or deaths, and recovery has been rapid.¹ Outbreaks have also occurred among the passengers and crews of ships calling at affected places, and such ships have arrived at ports on the west coast of the U.S.A., Australia, and the Netherlands.

The dominant antigens of the viruses recovered from the Asian outbreaks show no obvious relationship to those of former years, though soluble complement-fixing A antigen has been demonstrated. The Asian influenza A virus thus seems to be one which has not been found since 1933, and it may in fact never before have been experienced by the world population. The discovery has revived speculation on the origin of variant influenza viruses and of epidemics, a subject recently considered in detail by C. H. Andrewes.² The network of laboratories established by the World Health Organization has now been in existence for some ten years, and during this time the viruses recovered from many local and nation-wide outbreaks have been studied. In one such epidemic there was a relatively rapid spread from the Mediterranean to Britain,³ but the others have usually been simultaneous prevalences over wide areas of the world's surface and have not spread from place to place in any regular sequence. Yet, as

Andrewes² emphasizes, the viruses recovered from such simultaneous epidemics have usually been closely allied antigenically and sometimes have clearly differed from previous strains. He favours the view that many antigenic variants may arise which fail to survive because they lack the capacity to spread, and that the successful variant possesses not only a new antigen but also the ability to spread and to displace other influenza viruses.

The theory of origin of influenza virus variants which is acceptable both to Andrewes² and to K. E. Jensen⁴ is that variation is a form of mutation "directed" by the effect on the virus of its sojourn in human hosts possessing antibodies resulting from previous epidemics. It has been found that virus cultivated in the presence of specific antibody undergoes a change and that a new antigen appears which is less well neutralized by the antibody of the medium than that formerly present. This holds for growth in eggs⁵ and also in immunized mice.⁶ Such antigenic variation tends to occur in small steps, a fact resembling the minor antigenic variation met with naturally in the past ten years with the so-called A-prime viruses. Jensen⁴ indeed believes that an almost continuous spectrum exists in the influenza A viruses from those recovered in 1933 and 1934 (W.S. and PR8 viruses) to the most recent strain of 1956. This view is not accepted by all authors, and A. Isaacs⁷ particularly has shown that some of the variant A-prime viruses are widely different from each other. Nevertheless the Asian virus is reported to be more remote from the A-prime family than this was from the older "A" viruses, and it is this sudden jump in antigenic structure which is so hard to explain. Indeed, some have already pointed out that mutation among viruses is similar to animal mutation and may therefore be influenced by the environment and by radioactivity.⁸ If genetic mutation is the explanation, then it is odd that new antigenic variants arise during inter-epidemic periods, when, as Andrewes² remarks, times are hard for the virus and it is difficult to locate. In contrast, when the virus is multiplying enormously during an epidemic and by all the rules the chance of a mutation should be greater, the antigen remains obstinately constant. The plain man may perhaps draw an analogy between virus variation and the antibiotic resistance of bacteria. Cultivation of an organism in a medium containing an antibiotic often gives rise to progeny with an increased resistance to the antibiotic. Mostly the resistance develops in successive small steps, but sometimes, as happens with *Haemophilus influenzae* and streptomycin, a big jump in resistance occurs and the new variant rapidly replaces its susceptible brethren in the culture or in the patient. The influenza virus will clearly be in its

¹ Gordon Smith, C. E., Turner, L. H., and Helliwell, C. J. V., *British Medical Journal*, 1957, 1, 1412.
² Andrewes, C. H., *Calif. Med.*, 1956, 84, 375.
³ Chu, C. M., Andrewes, C. H., and Gledhill, A. W., *Bull. Wld Hlth Org.*, 1950, 3, 187.
⁴ Jensen, K. E., *Advanc. Virus Res.*, 1957, 4, 270.
⁵ Archetti, I., and Horsfall, F. L., Jr., *J. exp. Med.*, 1950, 92, 441.
⁶ Magill, T. P., *ibid.*, 1955, 102, 279.
⁷ Isaacs, A., *Lancet*, 1956, 2, 960.
⁸ Pirie, N. W., *ibid.*, 1957, 1, 1246.
⁹ Davenport, F. M., Hennessy, A. V., and Francis, T., Jr., *J. exp. Med.*, 1953, 98, 641.

most precarious position at the end of an epidemic, when the human susceptibility is least and the stimulus to modify may then be at its greatest.

What then are the prospects for areas not thus far affected by epidemics? The Asian virus has probably already reached Britain by air (see p. 1536) if not by sea, and if past experience is a guide it will be some months before the colder weather brings about the usual setting for an epidemic. But the scale of the impending outbreak cannot be foretold. A virus possessing a novel antigenic make-up should have a good start, but herd immunity is a complex affair and may not depend entirely on specific antiviral antibodies. The most serious possibility which has to be considered is whether the mild virulence of the Asian strain will remain at its present level or will alter. One has to go a long way back into the past before encountering nation-wide epidemics with an unusually high mortality, but it is a fact that both of the lethal waves of 1891 and 1918 were preceded by milder epidemics. It is also thought that the 1889-90 epidemic originated in Bokhara in central Asia, but there were other foci in northern Canada and Greenland. The 1957 Asian virus appeared first of all in Hong Kong in a refugee camp and may have travelled from the interior of China. Its virulence has everywhere been mild, but the stability of this biological property is just as important as its antigen. Meanwhile it seems sensible to explore our own immunological situation by looking for evidence of neutralizing antibodies in people of different ages. For, as F. M. Davenport and his colleagues⁹ were the first to show, the antibody response formed in early childhood by exposure to the strains of virus then current is indelibly imprinted on the antibody pattern throughout life. It is therefore possible that just as persons over 35 to-day possess antibodies to the swine influenza virus, perhaps because the latter's antigen is similar to a previous human pathogen, some imprint of the Asian virus may also be found in sera from certain age groups.

Finally, the possibility of providing protection against our future enemy is one which has received much attention in the lay press. Most of the comment has assumed that an influenza vaccine can be prepared which will give substantial protection. But experience with inactivated vaccine against influenza has been very variable, and immunization is still an experimental procedure. Whatever steps are taken by our health advisers it is much to be hoped that if a vaccine is developed it will receive as careful a scientific trial as can be devised, in spite of the somewhat threatening situation and the short time which may be available.

DANGERS OF CIGARETTE-SMOKING

The Medical Research Council has now advised the Government that a direct causal connexion exists between tobacco-smoking and lung cancer. It has set out its conclusions in a statement published at p. 1523 of the *Journal* this week, and they may be summarized thus: the death rate from lung cancer has greatly increased in Great Britain and other countries during the last 25 years; evidence from many investigations agrees in showing that a major part of the increase is associated with tobacco-smoking, particularly of cigarettes; the most reasonable interpretation of this evidence is that the relationship is one of direct cause and effect. As the Council points out, the decisive evidence is not based on the observation that the increase in the national mortality followed an increase in the national consumption of cigarettes. It is derived from two types of inquiry. In the first type a comparison of the previous histories of lung-cancer patients with those of patients not suffering from that disease has shown that the group of patients with lung cancer contains more smokers and fewer non-smokers than the other group, and that there is "a steadily rising mortality as the amount of smoking increases": evidence in support of this comes from nineteen inquiries published in this country, the U.S.A., Finland, Germany, Holland, Norway, and Switzerland. The evidence thus provided by this retrospective investigation has been confirmed by prospective inquiries conducted by Doll and Hill in this country and Hammond and Horn in the U.S.A. In this second type of inquiry persons in a defined group of the population were asked to give details of their smoking habits, and their fate is being followed. Doll and Hill, whose first five-year follow-up of the fate of British doctors was published in this *Journal* last year, found that there is a higher mortality from lung cancer in smokers than in non-smokers, in heavy than in light smokers, in cigarette than in pipe smokers—and that the mortality was higher in those who continued to smoke than in those who gave it up. The evidence to date suggests that 1 in 8 of lifelong heavy smokers die of lung cancer, against 1 in 300 of non-smokers.

¹ Lowe, C. R., *British Medical Journal*, 1956, 2, 1081.

² Hammond, E. C., and Horn, D., *J. Amer. med. Ass.*, 1954, 155, 1316.

³ Doll, R., and Hill, A. B., *British Medical Journal*, 1956, 2, 1071.

⁴ Sanghvi, L. D., Rao, K. C. M., and Khanolkar, V. R., *ibid.*, 1955, 1, 111.

⁵ Wynder, E. L., and Bross, I. J., *ibid.*, 1957, 1, 1137.

⁶ ——— and Day, E., *Cancer*, 1956, 9, 86.

⁷ Palmer, K. N. V., *British Medical Journal*, 1954, 1, 1473.

⁸ Oswald, N. C., and Medvei, V. C., *Lancet*, 1955, 2, 843.

⁹ Leese, W. L. B., *ibid.*, 1956, 2, 762.

¹⁰ Hammond, E. C., and Horn, D., "Smoking in Relation to Death Rates," a paper read at the Annual Meeting of the American Medical Association, New York City, June 4, 1957.

¹¹ Wynder, E. L., and Graham, E. A., *J. Amer. med. Ass.*, 1950, 143, 329.

¹² Ochsner, A., and DeBakey, M., *Arch. Surg.*, 1941, 42, 209.

¹³ ——— *Surg. Gynec. Obstet.*, 1939, 68, 438.

Evidence that other diseases are associated with, and possibly in part caused by, tobacco-smoking is gradually accumulating. These diseases include respiratory tuberculosis in adults,¹ coronary thrombosis,^{2,3} cancer of the mouth and oropharynx,^{4,5} cancer of the larynx,⁶ and chronic bronchitis,⁷⁻⁹—and, some would add, a delusion that smoking is harmless. On less secure or slighter evidence various observers claim to have detected association between smoking and post-anaesthetic respiratory complications, cancer of the bladder, emphysema, and some vascular (including Buerger's) diseases. The latest report to be published comes from E. C. Hammond and D. Horn.¹⁰ On behalf of the American Cancer Society they have analysed death rates in relation to smoking in a population of 187,783 men aged 50-69; the follow-up period averaged 44 months. Apart from providing confirmatory evidence of an association between smoking and lung cancer, coronary artery disease, and pulmonary disease other than cancer, as well as several other diseases, the study showed that the general death rates of smokers greatly exceeded those of non-smokers. The death rate of men in this population who regularly smoked less than half a "pack" of cigarettes a day was 34% higher than the death rate of men who never smoked. The rate for men smoking one to two packs a day was 96% higher, and for men smoking two or more packs a day 123% higher. These figures refer to general mortality from all causes.

One argument against accepting a causative connexion between smoking and lung cancer derives from the old axiom that correlation does not mean causation. The same type of person, it is said, might be both liable to develop lung cancer and subject to the strong desire to smoke. But, as more evidence accumulates, much of it reliable, showing an association between smoking and not only lung cancer but several other diseases, it becomes harder to believe that the liability to fall victim to one of these diverse disorders could be constitutionally associated with a desire to smoke. A considerable group of the diseases, too, affect a part of the body—namely, the respiratory tract—with which inflammatory and carcinogenic substances in the tobacco smoke come into direct contact. There is evidence that atmospheric pollution plays some part, but a relatively minor one, in the causation of lung cancer—but there is no excess mortality from this in those especially exposed to risk, as transport workers, garage hands, and policemen. Some have maintained that cancer of the lung has increased at the expense, so to say, of cancer in other sites; but there has been no such reduction in cancer of other parts of the body. Sub-

stances known to be carcinogenic have been found in tobacco smoke (e.g., 3:4-benzpyrene); and the Medical Research Council's annual report (see p. 1524 in this issue) refers to the observations by Dr. I. Lasnitzni that small quantities of 3:4-benzpyrene induced hyperplasia of epithelial cells in human foetal lung-tissue grown *in vitro*.

As the M.R.C. points out, our knowledge of the cause of lung cancer is still incomplete, and factors other than smoking tobacco produce it. There is need for continued research on this as well, of course, as on the whole problem of cancer. The Council has set up two committees to co-ordinate the experimental work now being done, being greatly helped in this by funds put at its disposal by the British Tobacco Manufacturers Association. Further work on previous lines, coupled with fundamental work on the chemical analysis of tobacco and its products of combustion, should in time yield more precise data which will enable us to penetrate through the smoke-screen to the final cause of lung cancer. In addition to its financial support of the M.R.C.'s investigation, the Imperial Tobacco Company is carrying out research in its own laboratories, and last year the Tobacco Manufacturers Standing Committee—as announced in its first annual report—was set up "to assist research into smoking and health questions, to keep in touch with scientists and others working in the U.K. and abroad, and to make information available to scientific workers and the public": Sir Alfred Egerton, F.R.S., and Sir Ronald Fisher, F.R.S., have agreed to become its scientific consultants.

In the presence of the painstaking investigations of statisticians that seem to have closed every loophole of escape for tobacco as the villain in the piece, it is as well to remember that now for a great many years clinicians have been convinced of a causal connexion between cigarette-smoking and lung cancer. In their paper¹¹ of 1950 Ernest L. Wynder and Evarts A. Graham referred to the fact that I. Adler in 1912 "was one of the first to think that tobacco might play some role . . ." In 1941 Ochsner and DeBakey¹² expressed their "definite conviction that the increase in the incidence of pulmonary carcinoma is due largely to the increase in smoking, particularly cigarette-smoking, which is universally associated with inhalation," thus reiterating a conclusion they had arrived at in 1939.¹³ The testimony of the clinician thus adds force to this conclusion of the M.R.C.: "The evidence for an association between lung cancer and tobacco-smoking has been steadily mounting throughout the past eight years, and it is significant that, during the whole of

this period, the most critical examination has failed to invalidate the main conclusions drawn from it."

Last year 18,000 died of cancer of the lung. The disease is on the increase. The evidence against cigarette-smoking is now so overwhelming that, in the absence of contrary valid evidence or of some means of excluding the carcinogenic factor from what used to be called "the yellow peril," it is incumbent on doctors to do all they can to dissuade the young from acquiring a habit so deleterious to health. Smoking is a widespread and pleasurable social habit, and unfortunately the appetite for it grows with what it feeds upon. But the hazards to health and life are undeniable, hazards which must be brought home to the public by all the modern devices of publicity: none of these, however, is likely to be so effective as the personal advice of the family doctor, and of the school doctor, to those in their care. Some of the evil effects of alcohol were brought under some sort of control by restricting the hours of its availability to the public. There is, therefore, something to be said for prohibiting smoking in such public places as cinemas and theatres—and even, dare we say in these columns, in the meetings of the Representative Body of the B.M.A. In the meanwhile those who enjoy smoking will wait anxiously for the research work now in hand to discover some way of making a world-wide social habit safe.

SOMA, PSYCHE, AND SELECTION

How much is the chance of an applicant for a job determined at an interview by his or her body build? People differ in appearance and in the way they think and behave, but can we predict the one from the other? Some of us think we can by a process that we should find difficult to describe in measurable terms, yet we look at a man and from his appearance expect certain things of him. Throughout medical history there have been attempts to put this clinical impression into measurable terms by the classification of body build and the correlation of this with temperament or liability to disease, all claiming some measure of success, and all mistrusted by the majority. In recent years the lead has been taken by Sheldon and his associates,^{1,2} who relate body build to temperament and propensity to mental illness. But their assertions have been sceptically received by many, partly because there is some natural resistance to being told that such qualities as aggressiveness, leadership, and sociability can be estimated from physical measurements. The chief criticism of Sheldon's work is that his assessment of physique is by no means entirely objective, and the qualities of

temperament that he describes are not capable of measurement. Medical officers of student health services are becoming more seriously interested, however, in the possibilities of estimating temperament and the likelihood of mental breakdown from some simple objective measurements of the body which can be made in a few minutes without embarrassment to the subject. In the opening pages of this issue we publish an article by Dr. R. W. Parnell, who, as a follower of Sheldon, has improved upon his master in technique, and, on the basis of objective measurements, has been obtaining interesting results in his attempts to correlate physique with mental processes.

The problem confronting all students of this subject has been to decide what to measure and how to express the measurements in the form of a scale. The Sheldonian technique is the basis of modern assessment of body build, but is laden with esoteric terminology and symbolism that inevitably clutter the fruits of an enthusiast's work. Parnell has decided that the three components of body build worth measuring are fatness, muscularity, and what he calls "linearity." The measurements of fatness and muscularity seem reasonable enough, but his linearity component is open to criticism and appears to be little different from a scale of height. It is a notable advance, however, to simplify the classification of physique by using a few measurements which can be made quickly and accurately by anyone. On the basis of these measurements each component—fatness, muscularity, and linearity—of the body is given a score on a seven-point scale. This "three-dimensional" classification can be plotted on a triangular-shaped chart in which each corner has the highest score for a particular component and the opposite side the least score for that component. Distribution maps can be prepared on these charts for visual or statistical comparison of the body builds of groups of subjects. It may come as a surprise to many that the body features measured in this way have any relation to temperament or mental disease, yet Parnell's results are arresting.

He finds a highly significant difference between the body build of 405 healthy students and that of 208 students who were advised by their general practitioners to seek psychiatric care. Some particular body builds showed striking differences in distribution between the two groups—for example, the averagely fat, rather muscular, short man was five times more common in the healthy group, and the slightly under averagely fat, poorly muscled, tall man was six times more common in the group of patients.

¹ Sheldon, W. H., Stevens, S. S., and Tucker, W. B., *The Varieties of Human Physique*, 1940, London.
² ———, Dupertius, C. W., and McDermott, E., *Atlas of Men*, 1954, New York.
³ Parnell, R. W., *British Medical Journal*, 1953, 2, 473.
⁴ ———, *ibid.*, 1954, 2, 491.
⁵ ———, *J. Hyg. (Lond.)*, 1954, 52, 369.

Generally speaking, the tall men, especially those with a higher score for fat than for muscle, were more likely than other men to go to their general practitioners and be advised to see a psychiatrist, whilst the muscular builds were least likely to do so. The difference in the two physique groups may be a difference in the incidence of mental breakdown or may be simply that the muscular type prefers not to consult his doctor when his mind is disturbed. Whatever the explanation, a difference of behaviour clearly exists between the two groups. Very similar results have been obtained in the comparison of 227 women patients with 671 healthy women students, with the same tall, fat rather than muscular builds predominating among the patients. In previous reports Parnell³⁻⁵ has compared the body build of students with their smoking habits, sporting activity, academic performance, and choice of faculty. Each time he has compared body build with a quantity which can be reasonably precisely measured and which is independent of subjective assessment. Some remarkable correlations have appeared, interesting enough to warrant further work and exploration along these lines.

Certain questions need to be answered, however. Does body build vary with nutrition, age, or illness, and what features of the body are most reliable as an index of the basic body type? Subcutaneous fat and therefore weight can be altered at will and thereby one can change one's scores for fatness and linearity and so disguise one's character—or does one's character change too? Claims are made that the basic body build is determined by the age of 5 and that changes in nutrition do not alter it, yet it is hard to believe that Parnell's simple measurements will not reflect changes in growth and size of calorie reserves. How far personality assessment from body measurements will be of value in the selection of students for university education or applicants for jobs remains to be seen. The present information is totally inadequate and could be harmful if misused: what is a statistically established likelihood in a large group is not necessarily the truth about the individual. Present results indicate, too, some awkward inter-correlations. For example, the body build which gets the highest proportion of first-class honours at Oxford is the same build as that of the student who is most likely to be attracted to the chemistry faculty and to go to a general practitioner for advice about mental illness. Medicine appears to attract those with the same body build that is associated with good all-round achievement in sport and academic life and with the least likelihood of having to consult a general practitioner about mental illness.

GENERAL-PRACTITIONER OBSTETRICS

In spite of all that is said about hospital confinement, it is certain that many pregnant women will insist on remaining under the care of their own family doctor, either at home or in hospital beds at his disposal. The specialist may fail to obtain a proper perspective on domiciliary midwifery because he sees most of the family doctor's failures and very few of his successes. A recently published survey of general-practitioner obstetrics is therefore to be welcomed.¹ It is a review of 4,277 deliveries in the year ending May 31, 1955, among the patients of 116 family doctors belonging to the South-west of England Faculty of the College of General Practitioners. Rather less than half of these doctors had held postgraduate resident hospital appointments in obstetrics, but only 10% had been practising domiciliary midwifery for less than five years. The standard of care given and the good results obtained are praiseworthy, but they must not be taken to reflect the picture of general-practitioner obstetrics throughout the country or even in the south-west of England. Not all the family doctors in that area participated in the survey. The presumption that those who volunteered were particularly keen on obstetrical practice is supported by the fact that each of the participants averaged 30 maternity cases during the year, of which roughly one-third were delivered in general-practitioner maternity hospitals. Moreover, nearly all of the doctors had direct access to laboratory and radiological facilities, and almost two-thirds had general-practitioner hospital beds at their disposal—figures that will be envied by many of their colleagues in other parts of the country. This survey must therefore necessarily offer a biased sample, yet the details of the report will repay study by consultants, general practitioners, and administrators alike.

The survey shows what good work can be done under the present system, and hints how much better the results could be. For example, it is shown that the perinatal mortality for deliveries under general-practitioner supervision—23.5 per 1,000 total births in this series—can be reduced by more careful selection of cases. In particular, hypertension, prematurity, breech presentation, multiple pregnancies, and high parity were noted so adversely to affect the perinatal mortality as to be regarded as requiring the services of a specialist maternity hospital; in fact about 18% of the 4,277 deliveries were in such hospitals. Other clinical comments centre on various complications such as delay in labour and the place for forceps in domiciliary midwifery; but it is apparent that there is much scope for the wider use of local analgesia and of the prophylactic administration of ergometrine by the general practitioner. As to changes in the maternity services, the survey, perhaps wisely in an objective report, offers no criticisms and tenders no suggestions, but does remark that the National Health Service at present does not encourage

¹ An Obstetric Survey by Members and Associates of the South-west of England Faculty of the College of General Practitioners, 1957. Price 6s.
² Report on the Obstetric Service under the National Health Service by the Royal College of Obstetricians and Gynaecologists. Revised November, 1956.

the general practitioner to provide a full maternity service. It may be relevant that, of the confinements in this survey under his supervision, the general practitioner attended 63% and was present at the delivery of the baby in only 48%. The revised report² of the Royal College of Obstetricians and Gynaecologists to the Cranbrook Committee recommended that a way should be found of enabling the general-practitioner obstetrician to devote sufficient time to his obstetric work. This might entail a restriction in the number of patients on his list, but if so, far from there being any financial loss to him, he should command for the added responsibilities an increased income, perhaps by way of an adequate fee for each maternity case.

TUBERCULIN REACTIONS

The spontaneous appearance of a positive reaction at the site of a previously negative Mantoux test is a well-recognized phenomenon. It may follow primary tuberculous infection, but it is more commonly noted as a sequel to B.C.G. vaccination. It provides evidence that the injected tuberculin has remained at the site of inoculation for a long time, since it may become apparent several months later. The many factors governing the tuberculin skin test have been admirably surveyed by Pepys,^{1,2} who drew particular attention to the availability and persistence of the antigen, tuberculin, at the inoculation site. Its fixation and persistence depend partly upon the local vascular supply, and this may be influenced by drugs such as histamine, adrenaline, and the steroid hormones. An increase in lymphatic absorption, especially if associated with increased capillary permeability, may reduce the retention of tuberculin and be followed by decreased reactions. Conversely, adrenaline vasoconstriction prolongs the persistence of tuberculin and may enhance the tuberculin patch-test reactions.³

The incorporation of tuberculin in an oily vehicle increases the persistence of tuberculin, since this material will resist lymphatic absorption. The response to depot tuberculin provides a rough means of distinguishing patients who are truly tuberculin-insensitive from those who have, because of disease, a depression of the normal skin-test response.⁴ The combination of a negative Mantoux reaction with a positive depot tuberculin test occurs in sarcoidosis, Hodgkin's disease, and leprosy, in all of which skin sensitivity to tuberculin may be depressed. In these subjects depot tuberculin appears to reveal a degree of tuberculin sensitivity too low to be elicited by aqueous tuberculin. This greatly increased potency of depot tuberculin has been confirmed by K. M. Citron,⁵ who obtained positive reactions to 5 T.U. of depot tuberculin in tuberculous patients who had been desensitized by repeated intramuscular tuberculin until they had failed to react to 100 T.U. of intradermal aqueous tuberculin.

D. G. James and J. Pepys⁴ also showed that successful B.C.G. vaccination was signified by a positive conversion

at the site of a previously negative depot tuberculin site, and it is not too much to hope that it may act as a similar indicator for the recognition of natural infection. The need for such a long-acting tuberculin test has been emphasized by C. T. Dotter⁶:

"Currently, the tuberculin test reveals only those individuals who have been infected with tuberculosis at least four weeks prior to the time of testing. Hypothetically, children now being tested for tuberculosis can be infected immediately before or soon after the test is performed. Ironically, in such cases failure to disclose that the disease had been contracted would give a false sense of security. . . . An antigen should be sought which, placed in the body, would be quiescent but potent. Upon the subsequent appearance of tuberculin sensitivity, the antigen should produce a clinically recognizable response, thus drawing attention at the earliest possible moment to the onset of infection. . . . Ideally, a 'tuberculin test' should be developed with life-time potency."

In recent studies, using aqueous tuberculin, F. O'Grady⁷ has also drawn attention to the "revivescence reaction." A positive reaction may appear at the site of a previously negative tuberculin reaction when further intradermal tuberculin is given. The belief that this is due to an increase in sensitivity to tuberculin is supported by the finding that, after a positive response, a reaction can often be obtained to doses which were previously ineffective. The response to these small doses of tuberculin is frequently of a kind which may occur in patients with tuberculosis. By measuring the depth and diameter of induration each day, O'Grady⁸ had previously noted that some patients with tuberculosis showed striking differences in the Mantoux reaction from healthy subjects. Though many patients with active tuberculosis responded in similar fashion to normal subjects, over one-half of them gave a response which was never encountered in the absence of active tuberculosis. This was characterized by transience of the induration. It may be likened to the accelerated response of smallpox vaccination in the partially immune. O'Grady regards this "tuberculous" response as a step on the road towards desensitization, since it appears to be a modified response, possibly due to the antigenic stimulation of the coexisting tuberculous focus or due to repeated serial tuberculin inoculations.

The interrelationships of antigen, antibody, and the inflammatory response, all of which play a part in the production of the revivescence reaction, are as yet too complex to permit an accurate immunological explanation for its occurrence. Our lack of knowledge of the immunological basis is matched by our ignorance of the biochemical basis, and a combined immunological and biochemical approach is important to an understanding of the mechanism of tuberculin hypersensitivity. It may also resolve some of the long-standing speculations surrounding allergy and immunity in tuberculosis.

¹ Pepys, J., *Amer. Rev. Tuberc.*, 1955, 71, 49.
² See also *British Medical Journal*, 1954, 2, 1279.
³ Pepys, J., *Acta allerg. (Kbh.)*, 1953, 8, 265.
⁴ James, D. G., and Pepys, J., *Lancet*, 1956, 1, 602.
⁵ Citron, K. M., *Tubercle (Lond.)*, 1957, 38, 33.
⁶ Dotter, C. T., *Dis. Chest*, 1956, 29, 230.
⁷ O'Grady, F., *Brit. J. Tuberc.*, 1957, 51, 74.
⁸ — *ibid.*, 1956, 50, 159.

TOBACCO SMOKING AND CANCER OF THE LUNG

STATEMENT BY THE MEDICAL RESEARCH COUNCIL

The Increase in Lung Cancer

In its annual report for 1948-50* the Council drew attention to the very great increase that had taken place in the death rate from lung cancer over the previous 25 years. Since that time the death rate has continued to rise, and in 1955 it reached more than double that recorded only 10 years earlier (388 deaths per million of the population in 1955 compared with 188 in 1945). Among males the disease is now responsible for approximately 1 in 18 of all deaths. Although the death rate for females is still comparatively low, it also has shown a considerable increase in recent years, and the disease is now responsible for 1 in 103 of all female deaths.

Three comments may be made on these figures. In the first place, the trend over the last few years indicates that the incidence has not yet reached its peak. Secondly, the figures are not to be explained as a mere reflection of the introduction and increasing use of improved methods of diagnosis but must be accepted as representing, in the main, a real rise in the incidence of the disease to an extent which has occurred with no other form of cancer. Thirdly, only a small part of the rise can be attributed to the larger numbers of older persons now living in the population; in the last ten years the lung cancer death rates among both men and women have risen at all ages from early middle life onwards.

Possible Causes of the Increase

The extent and rapidity of the increase in lung cancer point clearly to some potent environmental influence which has become prevalent in the past half-century and to which different countries, and presumably also men as compared with women, have been unequally exposed. The pattern of incidence of the disease rules out any possibility that the increase can be due, in a substantial degree, to special conditions, such as occupational hazards, affecting only limited groups. It is necessary to seek some factor or factors distributed generally throughout the population, and in considering the possibilities it must be borne in mind that a very long period, 20 years or more, may elapse between exposure to a carcinogenic agent and the production of a tumour. From the nature of the disease attention has focused on two main environmental factors: (1) the smoking of tobacco, and (2) atmospheric pollution—whether from homes, factories, or the internal combustion engine.

Smoking as a Cause of Lung Cancer

(a) Epidemiological Surveys

The evidence that heavy and prolonged smoking of tobacco, particularly in the form of cigarettes, is associated with an increased risk of lung cancer is not based on the observation that the substantial increase in the national mortality followed an increase in the national consumption of cigarettes. It is derived from two types of special inquiry. In the first, patients with lung cancer have been interviewed and their previous histories in relation to smoking and other factors that might be relevant have been compared with those similarly obtained from patients without lung cancer. The results of nineteen such inquiries (in this country, the U.S.A., Finland, Germany, Holland, Norway, and Switzerland) have been published. They agree in showing more smokers and fewer non-smokers among the patients with lung cancer, and a steadily rising mortality as the amount of smoking increases. In the second type of

inquiry, information has been obtained about the smoking habits of each member of a defined group in the population and the causes of the deaths occurring subsequently in the group have been ascertained. There have been two such investigations, one in the U.S.A. covering 190,000 men aged 50-69, and the other in this country covering over 40,000 men and women whose names appeared on the *Medical Register* of 1951. In both the results have been essentially the same. The investigation in this country, which has now been in progress for more than five years, has shown with regard to lung cancer in men:

- (1) a higher mortality in smokers than in non-smokers;
- (2) a higher mortality in heavy smokers than in light smokers;
- (3) a higher mortality in cigarette smokers than in pipe smokers;
- (4) a higher mortality in those who continued to smoke than in those who gave it up.

It follows that the highest mortalities were found among men who were continuing to smoke cigarettes, heavy smokers in this group having a death rate nearly 40 times the rate among non-smokers. Although no precise calculation can be made of the proportion of lifelong heavy cigarette smokers who will die of lung cancer, the evidence suggests that, at current death rates, it is likely to be of the order of 1 in 8, whereas the corresponding figure for non-smokers would be of the order of 1 in 300. The observation on the effect of giving up smoking is particularly important, since it indicates that men who cease to smoke, even in their early forties, may reduce their likelihood of developing the disease by at least one-half.

It should be noted that the excess of deaths from lung cancer among smokers was not compensated for by any corresponding reduction in the number of deaths from cancer of other sites in the body; in other words, there was a total incidence of cancer in the smoking groups in excess of the incidence that would have prevailed in the absence of smoking.

It will be apparent from what has been said that the evidence from the many inquiries in the last eight years, both in this country and abroad, has been uniformly in one direction and is now very considerable. It has been further strengthened recently by the observation from several sources that the extent of the relationship with smoking differs for different types of lung tumour which can be distinguished only by microscopic examination.

(b) Laboratory Evidence

From the physical and chemical point of view there is nothing inherently improbable in a connexion between smoking and lung cancer. Tobacco smoke consists largely of microscopic oily droplets held in suspension in air, and these droplets are of a suitable size to be taken into the lungs and retained there. Over a hundred constituents have so far been identified, and, among these, five substances have already been found which are known to be capable, in certain circumstances, of causing cancer in animals. Some workers have succeeded in producing tumours in animals by painting concentrated extracts of tobacco tar on the skin. Known carcinogens are present in tobacco smoke in very small amounts, however, and there is no certainty that such low concentrations could be harmful to human beings. Nevertheless, the finding of carcinogenic agents in tobacco smoke is an important step forward, in that it provides a rational basis for the hypothesis of causation.

Atmospheric Pollution as a Cause of Lung Cancer

It has been known for some years that mortality from lung cancer is greater in urban areas than in the countryside. This fact, together with the identification of carcinogenic substances in coal smoke and in motor vehicle exhausts, has led to the supposition that exposure to atmospheric pollution may be concerned with the increase in lung

*Cmd. 8387. H.M.S.O., 1951.

cancer. The role of atmospheric pollution is particularly difficult to investigate however, and the evidence is neither so consistent nor so extensive as that relating to tobacco smoking. On the one hand, no excess mortality from lung cancer has been observed in persons who would be especially exposed by the nature of their work to atmospheric pollution—for example transport workers, garage hands, and policemen. On the other hand, the results of a number of investigations have suggested that a relationship does exist between atmospheric pollution and lung cancer. Perhaps the best evidence for this relationship comes from studies of the small number of deaths from the disease among *non-smokers* in different types of residential district; in these studies higher death rates have been observed among non-smokers in large towns than among those in rural areas. On balance, it seems likely that atmospheric pollution plays some part in causing the disease, but a relatively minor one in comparison with cigarette smoking.

Assessment of the Evidence Relating to Smoking and Lung Cancer

Knowledge of the causation of lung cancer is still incomplete. Many factors other than tobacco smoking are undoubtedly capable of producing the disease; for example, at least five industrial causes have been recognized. Nevertheless, the evidence for an association between lung cancer and tobacco smoking has been steadily mounting throughout the past eight years, and it is significant that, during the whole of this period, the most critical examination has failed to invalidate the main conclusions drawn from it. It has indeed been suggested that the fundamental cause may be some common factor underlying both the tendency to tobacco smoking and to the development of lung cancer some 25 to 50 years later, but no evidence has been produced in support of this hypothesis.

In scientific work, as in the practical affairs of everyday life, conclusions have often to be founded on the most reasonable and probable explanation of the observed facts, and so far no adequate explanation for the large increase in the incidence of lung cancer has been advanced save that cigarette smoking is indeed the principal factor in the causation of the disease. The epidemiological evidence is now extensive and very detailed, and it follows a classical pattern upon which many advances in preventive medicine have been made in the past. It is clearly impossible to add to the evidence by means of an experiment in man. The Council are, however, supporting a substantial amount of laboratory research which may throw more light on the mechanism by which tobacco smoke and other suspected causative factors exert their effect, and which may thus eventually add to the degree of proof already attained as a result of studies of human populations. It must be emphasized, however, that negative results from work with animals cannot invalidate conclusions drawn from observations on man.

Conclusions

1. A very great increase has occurred during the past 25 years in the death rate from lung cancer in Great Britain and other countries.
2. A relatively small number of the total cases can be attributed to specific industrial hazards.
3. A proportion of cases, the exact extent of which cannot yet be defined, may be due to atmospheric pollution.
4. Evidence from many investigations in different countries indicates that a major part of the increase is associated with tobacco smoking, particularly in the form of cigarettes. In the opinion of the Council, the most reasonable interpretation of this evidence is that the relationship is one of direct cause and effect.
5. The identification of several carcinogenic substances in tobacco smoke provides a rational basis for such a causal relationship.

MEDICAL RESEARCH COUNCIL

ANNUAL REPORT, 1955-6

The growth of the Medical Research Council during the last decade has been remarkable. At the end of the second world war the Council administered, besides the National Institute for Medical Research and the (Emergency) Public Health Laboratory Service, 21 research units and groups and had an external scientific staff of five.¹ Its parliamentary grant-in-aid for the year 1945-6 was £295,000. Last year, according to the Council's latest report,² there were 57 research units and groups and 58 external scientific staff, as well as the enlarged National Institute and the Public Health Laboratory Service³; the Council also had the major responsibility for the Institute of Cancer Research at the Royal Cancer Hospital. The parliamentary grant-in-aid had risen to £2,329,500 for ordinary expenditure and £49,500 for non-recurrent items.⁴ At the end of the period the Council was employing a staff of 1,802 for its own purposes and a further 1,031 in the Public Health Laboratory Service.⁵ Administration and central expenses accounted together for only 5.7% of the Council's budget.

Research Establishments

The various divisions of the National Institute for Medical Research, and the Council's other research establishments and groups, with their heads or directors and brief notes on

TABLE I.—National Institute for Medical Research, Mill Hill: Director, Sir Charles Harington, F.R.S. The Institute was Established in 1915

Division	Head of Division	Research Programme
Biochemistry	Sir Charles Harington, F.R.S. Dr. J. Walker	The work of the Institute is generally designed to cover as wide a field as possible in basic non-clinical medical research, and most investigations are of a long-term character. Occasionally, as with the research on the common cold, the work verges on the clinical field; and members of the Institute's staff commonly collaborate in clinical developments arising from their discoveries. Certain major themes, such as chemotherapy and virus diseases, are constantly under study; sometimes, as in the division of human physiology where the main task is to investigate the effects of low temperatures on human performance, a fairly closely defined field of research may be allotted; for the rest, the direction that the work takes is largely determined by the particular interests of the senior members of the staff
Organic Chemistry	Dr. F. Hawking	
Chemotherapy	Dr. M. R. Pollock	
Bacterial Physiology	Dr. W. S. Feldberg, F.R.S.	
Physiology and Pharmacology	Dr. O. G. Edholm	
Human Physiology	Dr. A. S. Parkes, F.R.S.	
Experimental Biology	Dr. C. H. Andrewes, F.R.S.	
Bacteriology and Virus Research	Dr. A. J. P. Martin, F.R.S.	
Physical Chemistry (until March, 1956)	Dr. A. S. McFarlane	
Biophysics and Optics	Dr. W. L. M. Perry	
Biological Standards	Dr. W. C. Lister	
Engineering Division	Miss J. R. Taylor	
Library		

¹ *Medical Research in War: Report of the Medical Research Council for the Years 1939-45*. Cmd. 7335, 1947. H.M.S.O., price 7s. 6d. net.

² *Report of the Medical Research Council for the Year 1955-1956*. Cmd. 180, 1957. H.M.S.O., price 9s. net.

³ Administered by the M.R.C. on behalf of the Ministry of Health.

⁴ These consisted of special apparatus and buildings. Owing to the Government's policy of curtailing public expenditure, the Council in fact limited expenditure on this account to £19,500.

⁵ The 1,802 M.R.C. workers comprised 511 scientific staff (of whom 172 were medically qualified), 676 technical, 343 administrative (including clerical), and 272 maintenance staff. In addition there were 55 African staff in the Gambia. The corresponding breakdown of P.H.L.S. staff was 151 scientific (of whom 125 were medical), 474 technical, 174 administrative, and 232 maintenance.

⁶ The Committee of Privy Council for Medical Research consists (*ex officio*) of the following: The Lord President of the Council (*chairman*), the Secretary of State for the Home Department, the Secretary of State for Commonwealth Relations, the Secretary of State for the Colonies, the Secretary of State for Scotland, the Minister of Health, the Minister of Labour and National Service, and the secretary of the Medical Research Council (*secretary*).

their research programmes, are listed in Tables I and II. The new research groups established last year were those for the experimental investigation of hereditary diseases and of behaviour; and those for research on the occupational aspects of ageing, atmospheric pollution, the epidemiology of respiratory diseases, viruses, and trachoma. After

October 1, 1956, and therefore not included in the present report, three further research groups were constituted: namely, for work on metabolic disturbances in surgery (Leeds), for research on carcinogenic substances (Exeter), and for research into the general effects of radiation (Edinburgh). In the Public Health Laboratory Service a new

TABLE II.—Establishments other than the National Institute for Medical Research

Research Unit or Group	Place and Date Established	Director	Principal Subjects of Research
Department of Clinical Research	London, 1919	Dr. E. E. Pochin	Thyroid disease, radioisotopes, gastro-intestinal function
Clinical Research Unit	" 1934	Dr. R. T. Grant, F.R.S.	Cardiovascular function and diabetes
Neurological Research Unit	London, 1933	Dr. E. A. Carmichael	Applied physiology and pathology of the nervous system
Department of Experimental Medicine	Cambridge, 1945	Professor R. A. McCance, F.R.S.	Metabolism and nutrition; changes during growth and disease
Clinical Endocrinology Research Unit	Edinburgh, 1946	Committee under chairmanship of Professor J. H. Gaddum, F.R.S. (<i>Hon.</i>) Dr. J. Reid	Hormone assays and their clinical applications
Clinical Chemotherapeutic Research Unit	Glasgow, 1946	Professor G. W. Pickering (<i>Hon.</i>)	Antirheumatic action of salicylate
Group for Research on Body Temperature Regulation	Oxford, 1954	Professor D. Baird (<i>Hon.</i>)	Body temperature regulation and hypothermia
Obstetric Medicine Research Unit	Aberdeen, 1955	Dr. P. M. D'Arcy Hart Dr. D. A. Mitchison (<i>Hon.</i>)	Epidemiological, clinical, and laboratory research on obstetric mortality and morbidity
Tuberculosis Research Unit	London, 1948	Dr. P. L. Mollison	Clinical trials of chemotherapy and immunization
Group for Research on Drug Sensitivity in Tuberculosis	" 1954	Dr. R. R. Race, F.R.S. Dr. A. E. Mourant	Bacteriological aspects
Blood Transfusion Research Unit	" 1946	Dr. J. F. Loutit Miss C. A. P. Wood Dr. G. J. Popják	Blood transfusion practice and haemolytic syndromes
Blood Group Research Unit	" 1946	Dr. R. R. Race, F.R.S. Dr. A. E. Mourant	Genetical analysis of blood group antigens
Blood Group Reference Laboratory*	" 1950	Dr. J. F. Loutit Miss C. A. P. Wood Dr. G. J. Popják	Reference and supply laboratory for blood-grouping sera
Radiobiological Research Unit	Harwell, 1947	Mr. Ralston Paterson Mr. W. Binks Dr. C. S. Hallpike, F.R.S.	Effects of ionizing radiations
Radiotherapeutic Research Unit	London, 1941	Dr. T. S. Littler	Clinical radiotherapy
Experimental Radiopathology Research Unit	London, 1953	Sir Stewart Duke-Elder (<i>part-time</i>) Sir Stewart Duke-Elder (<i>part-time</i>) Mr. H. C. Weston	Ionizing radiations and cellular enzymes
Betatron Research Group	Manchester, 1953	Professor Arnold Sorsby (<i>Hon.</i>)	Megavoltage x-radiation
Radiological Protection Service†	Sutton, 1953	Professor H. Grüneberg, F.R.S. (<i>Hon.</i>) Professor J. R. Squire (<i>Hon.</i>)	Protection against radiation hazards
Otological Research Unit	London, 1944	Lady Mellanby Professor B. S. Platt Dr. L. J. Harris Dr. M. F. Perutz, F.R.S.	Clinical and laboratory study of the ear and eighth nerve
Werner Research Unit on Deafness	" 1949	Professor J. T. Randall, F.R.S. (<i>Hon.</i>)	Hearing-aids and audiometry
Ophthalmological Research Unit	" 1948	Professor H. A. Krebs, F.R.S. (<i>Hon.</i>)	Physiology and pathology of the eye; visual pigments
Trachoma Research Group	" 1956	Dr. E. F. Gale, F.R.S. Miss A. Bishop Dr. F. Kingsley Sanders Professor A. Bradford Hill, F.R.S. (<i>Hon.</i>) Dr. D. Hunter (<i>part-time</i>)	Aetiology of trachoma
Group for Research in Occupational Optics	" 1949	Dr. J. P. Bull	Visual aspects of working efficiency
Werner Group for Research in Ophthalmological Genetics	" 1954	Dr. J. M. Barnes Dr. T. Bedford	Genetical studies, especially on retinal dystrophy
Group for Experimental Research in Inherited Diseases	" 1955	Sir Wilfrid de Gros Clark, F.R.S. (<i>Hon.</i>) Dr. J. C. Gilson	Hereditary disease in animals, with special reference to medicine
Pathology of the Skin	Birmingham, 1952	Dr. P. J. Lawther	Tissue culture studies of skin, hypersensitivity reactions, and clinical studies
Nutrition Building	Mill Hill, 1939	Dr. I. A. McGregor Dr. J. C. Waterlow Dr. R. F. A. Dean Dr. J. Newsome	Dental research
Human Nutrition Research Unit	Cambridge, 1944	Dr. N. H. Mackworth	Malnutrition in colonial territories
Dunn Nutritional Laboratory	Cambridge, 1926	Professor R. W. Russell (<i>Hon.</i> , until April, 1956) Professor Aubrey Lewis (<i>Hon.</i>) Professor R. W. Russell (<i>Hon.</i>)	Vitamins
Unit for Research on the Molecular Structure of Biological Systems	" 1946	Professor L. S. Hearnshaw (<i>Hon.</i>) Dr. J. N. Morris Dr. L. F. Hewitt Mr. B. K. Kelly Dr. W. Lane-Petter	X-ray diffraction studies of proteins and other substances
Biophysics Research Unit	London, 1947	Professor A. Haddow	Cellular proteins and nucleic acids
Cell Metabolism Research Unit	Oxford, 1945		Metabolic processes and enzymes
Chemical Microbiology Research Unit	Cambridge, 1944		Protein metabolism in micro-organisms
Group for Research in Chemotherapy	London, 1955		Chemotherapy in protozoa
Virus Research Group	London, 1926		Mechanism of cellular infection
Statistical Research Unit	" 1943		Development and application of statistical methods in medicine; design of clinical trials
Department for Research in Industrial Medicine	" 1943		Toxic hazards in industry
Industrial Injuries and Burns Research Unit	Birmingham, 1952		Aetiology, pathology, and treatment of burns
Toxicology Research Unit	Carshalton, 1947		Effects of poisons
Environmental Hygiene Research Unit	London, 1950		Atmospheric and thermal aspects of working efficiency
Climate and Working Efficiency Research Unit	Oxford, 1948		Climatic studies on working efficiency
Pneumoconiosis Research Unit	Penarth, S. Wales, 1945		Effects of environment and heredity on health of coal-workers
Group for Research on Atmospheric Pollution	London, 1955		Clinical aspects of air pollution
Group for Epidemiological Research on Respiratory Diseases (Air Pollution)	Sheffield, 1956		Bronchitis and air pollution
M.R.C. Laboratories, Gambia	Gambia, 1953		Prevalent tropical diseases
Tropical Metabolism Research Unit	Jamaica, 1955		Malnutrition, especially protein deficiency
Infantile Malnutrition Research Unit	Kampala, Uganda, 1953		Effects of malnutrition on African child
Group for Research on Bilharzia Disease	St. Albans, 1947		Schistosome metabolism and immunity and chemotherapy
Applied Psychology Research Unit	Cambridge, 1944		Measurement of human performance under environmental stresses
Industrial Psychology Research Group	London, 1918		Satisfaction and discontent in industry
Social Psychiatry Research Unit	" 1948		Social aspects of mental illness
Group for the Experimental Investigation of Behaviour	" 1955		Biochemistry of behaviour
Group for Research on Occupational Aspects of Ageing	Liverpool, 1955		Psychological aspects of ageing
Social Medicine Research Unit	London, 1948		Social factors influencing health
Serum Laboratory	Carshalton, 1947		Immunology and serology
Antibiotics Research Station	Clevedon, 1949		Development of new antibiotics
Laboratory Animals Bureau	London, 1947		Information centre of laboratory animals
Institute of Cancer Research‡	"		Experimental investigation of cancer, chemotherapy, radioisotopes, radiodiagnosis, radiation protection, and radiotherapy

* Administered for Ministry of Health. † Jointly with Ministry of Health. ‡ Since 1951 the M.R.C. has assumed the major responsibility for the Institute of Cancer Research. The Institute continues to receive substantial support from the British Empire Cancer Campaign.

regional laboratory was opened at Leeds and a new laboratory at Chelmsford; associated laboratories at Maidstone and Swansea were also taken over. In addition to the support of these establishments and its external scientific staff, the Council aided with grants nearly 300 other research workers.

Administrative Structure

The present composition of the Medical Research Council is given below (Table III). Two new members were appointed during the year, Professor G. PAYLING WRIGHT and Dr. J. D. N. HILL replacing Professor G. R. CAMERON, F.R.S., and Professor AUBREY LEWIS. The Council is responsible to a Committee of Privy Council¹ under the chairmanship of the Lord President, the EARL OF HOME.

TABLE III.—Present Membership of the Medical Research Council

The Earl of Limerick, <i>Chairman</i>
Sir Geoffrey Vickers, V.C., <i>Treasurer</i>
Mr. Richard Fort, M.P.
Professor R. Platt (professor of medicine, Manchester)
Professor E. T. C. Spooner (professor of bacteriology and immunology, London)
Professor G. W. Pickering (Regius professor of medicine, Oxford)
Professor A. Bradford Hill, F.R.S. (professor of medical statistics, London)
Professor G. F. Marrian, F.R.S. (professor of biochemistry, Edinburgh)
Professor R. C. Garry (Regius professor of physiology, Glasgow)
Mr. H. J. Seddon (clinical director, Royal National Orthopaedic Hospital)
Professor G. Payling Wright (professor of pathology, London)
Dr. J. D. N. Hill (senior lecturer in clinical neurophysiology, London)
Sir Harold Himsworth, F.R.S., <i>Secretary</i>
Sir Landsborough Thomson, <i>Second Secretary</i>

The Council is assisted in its work by three boards and numerous research committees. The boards are the Industrial Health Research Board, under the chairmanship of Sir HAROLD HIMSWORTH, F.R.S., the Council's secretary; the Public Health Laboratory Service Board, under the chairmanship of Sir LANDSBOROUGH THOMSON, the second secretary; and the more recent Clinical Research Board, whose membership is set out in Table IV.

TABLE IV.—Clinical Research Board

Sir Geoffrey Jefferson, F.R.S., <i>Chairman</i> (emeritus professor of neurosurgery, Manchester)
Professor Dugald Baird (Regius professor of midwifery, Aberdeen)
Lord Cohen of Birkenhead (professor of medicine, Liverpool)
Professor Sir Charles Dodds, F.R.S. (Courtauld professor of biochemistry, London)
Dr. J. D. N. Hill (senior lecturer in neurophysiology, London)
Professor C. F. W. Illingworth (Regius professor of surgery, Glasgow)
Professor G. W. Pickering (Regius professor of medicine, Oxford)
Professor R. Platt (professor of medicine, Manchester)
Mr. H. J. Seddon (clinical director, Royal National Orthopaedic Hospital)
Dr. W. P. H. Sheldon (physician, Hospital for Sick Children, Great Ormond Street)
Professor B. W. Windeyer (professor of radiology, London)
Dr. F. J. C. Herrald, <i>Secretary</i>

Assessors to the Board

Sir John Charles (Ministry of Health)
Dr. K. Cowan (Department of Health for Scotland)
Dr. F. F. Main (Northern Ireland Ministry of Health and Local Government)

Clinical Research

The now customary review articles on "Some Aspects of Medical Research" in the Council's report are preceded this year by two on policy. The first concerns clinical research, the second the development of research in genetics. In the

clinical field the Council sees its role as the support of work which because of its specialized nature, novelty, scale, or urgency is beyond the accepted scope of university or hospital departments. The Council has always taken the view that it should complement, but not supplement or replace, research programmes in the medical schools, universities, and hospitals. To help decide on the merits of research schemes put up to it the Council now has its Clinical Research Board. The Board is expected to advise the Council on such matters as the establishment and siting of new research units and the reorganization of existing ones, the scientific policy of individual units, choice of staff, and the award of research grants. When the Board was appointed three years ago there were already 21 clinical research units and another forming. Since then new units have been established for research on obstetric medicine (Aberdeen), the general effects of radiation (Edinburgh), atmospheric pollution (London), the epidemiology of respiratory diseases (Sheffield), and metabolic disturbances in surgery (Leeds). During this three-year period 86 new research grants for clinical research and 36 training awards in this field have also been made.

The Council has also taken over certain major clinical research projects, financed by Exchequer funds and conducted up to now within the framework of the N.H.S. These include the unit for juvenile rheumatism at the Canadian Red Cross Hospital, Taplow, and the neuropsychiatric research centre at the Whitchurch Hospital, Cardiff. Other developments are the formation of a clinical neuropharmacology research unit at Birmingham, a clinical genetics research unit at Great Ormond Street, and a psychiatric research group at Graylingwell Hospital, Chichester. The Council has also assumed responsibility for Dr. R. W. PARNELL'S programme of research on the constitutional aspects of psychiatric medicine at the Warneford Hospital, Oxford, hitherto supported by the Nuffield Foundation. The Council is also concerned with three clinical research establishments in the tropics—at Fajara in the Gambia, at Kampala in Uganda, and at Kingston, Jamaica.

Research in Genetics

The Council has a long and distinguished record in this field, particularly in the biological study of heredity, but the recent developments in nuclear science have underlined the need for much greater knowledge of genetic processes in man. The Council has therefore stepped up its programme to meet the need. In 1951-2, £18,000 was being spent on human and experimental genetics; in the current year the figure is over £50,000; and by 1960 the amount committed from a wide range of basic disciplines to this field is urgent, and the Council wishes it to be known that it can offer specialized training in genetical methods through its scholarship and clinical fellowship schemes. "There are now good opportunities," states the report, "for research careers both in university departments and as members of the Council's own scientific staff."

Other Aspects of the Report

The Council's review of selected fields of medical research emphasizes the ever-growing importance of its activities. And indeed the report as a whole is a most valuable source of reference and information for anyone practising medicine, in whatever field. Here only the titles of the subjects reviewed can be given. The first is a review of the aetiology of cancer of the lung, which gives the scientific background to the Council's statement on tobacco smoking and lung cancer (see p. 1523). The other subjects reviewed are research on poliomyelitis and whooping-cough vaccination, filariasis, protein deficiency, growth and renal function, abnormal haemoglobins, microbial genetics, radiation and transplantation immunity, radiation and leukaemia, the chemistry of peptides and proteins, chemical aspects of

antibiotics, and the mass spectrometer for respiratory gas analysis described in our pages last month (May 25, p. 1205).

The remainder of the annual report deals with the work of the Council's various research establishments, external staff, and grant holders. A special section is given to the Public Health Laboratory Service, directed by Dr. G. S. WILSON. Besides its central laboratory at Colindale, the Service now has regional laboratories at Cambridge, Cardiff, Leeds, Liverpool, Manchester, Newcastle, Oxford, and Sheffield, and there are also 50 area laboratories in England and Wales. The Service also maintains "reference" laboratories for enteric fever, dysentery, malaria, fungus diseases, venereal disease, and for the investigation of salmonellae, streptococci and staphylococci, and viruses. Other specialized laboratories are the air hygiene, food hygiene, and epidemiological research laboratories at Colindale; the National Collection of Type Cultures and the standards laboratory for serological reagents, both also at Colindale; and the epidemiological research unit at Cirencester under the part-time direction of Dr. R. E. HOPE SIMPSON.

The report lists the Council's publications and also the members of its principal research committees. The names of all the research workers and others mentioned in the report are indexed.

A SYMPOSIUM ON GOITRE

[FROM A SPECIAL CORRESPONDENT]

The annual meeting of the American Goiter Association was held in New York, from May 28 to 30, under the chairmanship of Dr. BROWN DOBYNS, of Cleveland.

Thyroid Cancer

The first papers were concerned with thyroid cancer. Dr. VIRGINIA FRANTZ (New York) described the production of tumours in a series of rats which had been treated by radioactive iodine or an equivalent dose of external irradiation. She described the carcinomas which appeared both in the thyroid and in other organs, and also noted a number of fibrosarcomas, probably the same as those described by previous workers as of thyroid origin, although clearly these were not so. Dr. B. J. DUFFY (Washington, D.C.) followed with a review of the whole subject of radiation as a cause of thyroid cancer in man. There seemed incontrovertible evidence that irradiation of the thymus in infants had led in many cases to the development of a thyroid carcinoma in children and young adults, and there was much experimental evidence to support such a view, he said. Dr. I. DONIACH's view that irradiation might both initiate and promote malignant changes in the thyroid was also adumbrated. Dr. WILLIAM MEISSNER (Boston) described a number of patients in whom there was histological evidence of thyroid carcinoma being present for periods of from ten to twenty-five years. There was no doubt that a small group of such tumours grew very slowly and that their presence was compatible with long life. A group of workers from Ann Arbor gave some encouraging reports of radioactive iodine therapy in the treatment of thyroid carcinomas in cases in which treatment had previously been abandoned because they were thought unsuitable. Dr. COLIN THOMAS (Chapel Hill, North Carolina) stressed the value of using L-triiodothyronine for the suppression of thyrotrophic hormone in patients with thyroid cancer, its advantages over ordinary dried thyroid medication being the quickness of response and duration of action.

Dr. PAUL STARR (Los Angeles) described the use of triiodothyronine in forty patients with goitre over a period of three to eighteen months. Reduction in size occurred in nearly all, and in about one-third the goitre was eventually invisible. Certain nodules, however, appeared unaffected, and this was taken as evidence that they were malignant. In the discussion that followed, others had not been so fortunate in reducing the size of simple goitre, either with

triiodothyronine or with dried thyroid. Dr. D. P. RALL (Bethesda) reported on eighteen patients with cancer of the thyroid and pulmonary metastases who had been treated with large doses of radioactive iodine. The resulting pulmonary fibrosis had been responsible for the death of two, and there was evidence in five others that the pulmonary reserve had been reduced. In general it seemed that, if less than 90 millicuries of ¹³¹I was deposited in the chest, pulmonary fibrosis did not develop.

Malignant Exophthalmos and Nodular Goitre

Dr. E. P. McCULLAGH (Cleveland) reported some fascinating results in the treatment of malignant exophthalmos. Three different techniques had been used: the first was the well-tried one of giving thyroid, or preferably large doses of triiodothyronine; the second was the use of intravenous corticotrophin in large doses; but the third and by far the most interesting was section of the pituitary stalk. Eight patients treated in this manner had shown remarkable improvement, and certainly the coloured photographs of them were very striking.

A number of papers related to investigations into the nodules of non-toxic goitre. Dr. BROWN DOBYNS in his presidential address reviewed a histological and autoradiographic survey of some 350 thyroid tumours removed at operation. He related the size of cell and follicle to function, and made the interesting point that, if tall follicular cells were also broad, the fact that they were functioning was often overlooked, although they might indeed represent extreme hyperplasia. Mr. SELWYN TAYLOR (London) described a series of tissue slice experiments using the Warburg technique, in which material had been obtained from patients at operation, and compared the relative sensitivity of nodules and non-nodular tissue. Dr. R. V. PITT-RIVERS, F.R.S. (London), described a chromatographic study of the distribution of radioactive iodine in the nodules and non-nodular tissue from patients with non-toxic nodular goitre. Many of these patients were found to have relatively large amounts of moniodotyrosine and relatively little thyroxine. Dr. JEFFRIES (Cleveland) commented that in such patients there was evidence that they were under extreme stimulus from the anterior pituitary, and additional thyrotrophic hormone by injection had little effect.

The outstanding paper of the meeting was the Van Meter prize essay, which had been awarded to Dr. D. DONIACH and Dr. I. ROITT (London) for their paper on the auto-immunological changes in Hashimoto's disease. This work has already been reported in London, and it made a profound impression on the meeting in New York. There were a number of other outstanding papers. Dr. N. FREINKEL (Boston) reported a study of the effect of thyrotrophic hormone on thyroid tissue *in vitro* in augmenting ³²P uptake. Under these conditions the radioactive phosphorus was incorporated mainly in the cephalin and phosphoinositide components, and this selectivity was discussed in relationship to the enzyme changes it presumably accompanies. Clearly we are going to hear much more about the enzyme systems in the thyroid in the near future.

Goitrogenic Diets

Dr. L. VAN MIDDLESWORTH (Memphis) gave an amusing paper on some goitrogenic diets which he had used in the rat. Soya bean flour was definitely goitrogenic and he had found it accompanied by increased faecal excretion of thyroxine. Commenting, Dr. J. H. MEANS (Boston) suggested that the word thyroxinorrhoea might be coined for the occasion. It is not surprising that this was the paper which was reported in the newspapers next day.

There were many other excellent papers, and the last half-day's programme was held in conjunction with the annual meeting of the American Endocrine Society. The latter is a huge body and more than 1,000 of its members were present, as contrasted to some 300 representing the Association. There was a goodly representation from Great Britain

on this occasion, for, in addition to those mentioned above, Dr. RAYMOND GREENE (London) presented a paper on the serum protein abnormalities in Hashimoto's and other diseases and Dr. W. R. TROTTER (London) took an active part in the discussions.

APPROVED NAMES

On March 16, 1957 (p. 642), we printed the last supplement (dated February, 1957) to the consolidated list of "approved names" selected by the British Pharmacopoeia Commission. Below is the latest, dated May, 1957. We have added a brief note on the main use of each drug. Communications relating to "approved names" should be addressed to the secretary, British Pharmacopoeia Commission, General Medical Council Office, 44, Hallam Street, London, W.1.

Approved Name	Chemical and Other Names	Notes
Amisometradine	6-Amino-1-methylallyl-3-methylpyrimidine-2 : 4-dione "Rolicton"	Diuretic
Florantyrone	7-Fluoranthren-8-yl-γ-oxobutyric acid "Zanchol"	Cholagogue
Halothane	2-Bromo-2-chloro-1 : 1 : 1-trifluoroethane "Fluothane"	Volatile general anaesthetic
Norethandrolone	17α-Ethyl-17-hydroxy-19-norandrost-4-en-3-one "Nilevar"	Anabolic agent
Pentacynium	4-(2-[N-(5-Cyano-5 : 5-diphenylpentyl)-N-methylamino]ethyl)morpholine dimesylate "Presidal"	Ganglion-blocking agent
Prochlorperazine	1-[3-(2-Chloro-10-phenothiazinyl)propyl]-4-methylpiperazine "Compazine"; "stemetil"	Treatment of nausea and vomiting
Tolpronine	1-(1 : 2 : 3 : 6-Tetrahydropyridino)-3-o-tolylloxypropan-2-ol "Proponesin" is the hydrochloride	Anodyne

Nova et Vetera

NATIONAL HEART HOSPITAL 1857-1957

The National Hospital for Diseases of the Heart first opened its doors on July 1, 1857. It owed its foundation to Dr. Eldridge Spratt, who in the hospital's early years showed himself to be a physician of skill and foresight, but aggressive in character and resentful of any form of control. Spratt was born in 1825 and qualified L.R.F.P.S. Glasgow in 1853, becoming M.D., 1859. He died on September 14, 1902.

The hospital was first established at 67, Margaret Street, Marylebone, with Spratt as its physician, chairman, secretary, and treasurer. During the first three years 1,475 patients had been treated, but by 1864 they averaged 100 a week. In-patients were first admitted in 1859. The early years produced little except recurring financial crises and dissatisfied committees. In 1868 the hospital moved to larger premises at 85, Newman Street. Improvements followed the appointment in 1871 of Captain W. F. P. Dadson as honorary secretary. Over the next few years he considerably reduced the debts and ensured the continuance of the active work of the hospital.

A further move was made in April, 1874, this time to 32, Soho Square, a house originally built for Sir Joseph Banks,

F.R.S., by the Adam brothers. Here the hospital remained for the next 40 years. In this same year trouble arose between the committee and Dr. Spratt over his annexation of hospital collecting-boxes and their contents; it was also disclosed that Spratt's private patients had been supplied with drugs from the hospital stock. On January 18, 1875, the committee requested his resignation as physician. Having passed their resolution to get rid of Spratt, the committee "doubtless went home to bed breathing sighs of relief and congratulating themselves that their troubles were now over. They little knew their founder. Dr. Spratt also left the meeting, but, unlike the committee, he returned, and not alone, for in the early hours he brought with him a large removal van and a party of sturdy removal men. To open the front door was the work of a moment for Dr. Spratt, and once inside the hospital it did not take long for his well-trained helpers to place in the van every portable article which Dr. Spratt indicated. Furniture, instruments, books, and pictures disappeared, together with an organ, which had been presented to the hospital by a supporter. In addition, Dr. Spratt gave orders for the removal of a large quantity of lead, and all this was duly stowed away in the van. The party then drove off in triumph." Some of these articles were later returned. For many years afterwards Spratt continued to describe himself in the *Medical Directory* as physician to the hospital.

By 1912 the increasing numbers of patients and the pressure of a progressive medical staff combined with other factors to emphasize the need for larger premises. It was found impracticable to rebuild in Soho Square, and eventually a suitable site was found in Westmoreland Street, Marylebone, where the present building was formally opened in January, 1914. Another notable event in 1912 was the appointment of Captain Robert Whitney as secretary, a post which he continues to hold to-day. In 1919 postgraduate courses in cardiology were inaugurated, and in 1926 Lady St. Cyres endowed the annual lecture which bears her name and which has since been delivered by eminent cardiologists from all over the world.

The last thirty years have shown continual progress and increasing work, both clinical and academic. The threat of war in 1938 indicated the necessity for a country branch which could maintain an adequate service for cardiac patients without the risk of exposure to bombing, which would be the case in London. Maids Moreton Hall at Buckingham was accordingly acquired, and when war was declared in September, 1939, it was fully occupied. Throughout the war postgraduate teaching continued, and in 1947 the Institute of Cardiology, an institution of the British Postgraduate Medical Federation, was established in association with the hospital; the following year the hospital was designated a teaching hospital, with the new title "National Heart Hospital." By 1950 the lease of 47, Wimpole Street was acquired, where accommodation was found for angiocardigraphic and phonocardiographic sections, as well as additional accommodation for nurses. The present accommodation in Westmoreland Street is proving inadequate for the steadily increasing demands of all departments. Plans for the extension of the hospital, including the provision of two operating theatres and additional beds, are now before the Ministry of Health.

From modest beginnings the National Heart Hospital has become an outstanding centre of cardiological teaching and practice. This year Princess Alexandra of Kent honoured the hospital by consenting to become its Patron, continuing the tradition of royal patronage inaugurated by the Duke of Albany and maintained by the Duke of Cambridge and the Duke of Connaught. The centenary celebrations will include a dinner at the Apothecaries' Hall in October, at which it is hoped to welcome many eminent cardiologists together with past and present workers at the hospital, and the Minister of Health.

¹ Whitney, R., *The Place of Hearts. Being a History of the National Hospital for Diseases of the Heart, 1857-1937*. London.

Correspondence

Poliomyelitis and Pregnancy

SIR,—I have been most interested in your annotation re the above (*Journal*, June 8, p. 1352). During the 1950 poliomyelitis epidemic, in the area in which I practise, nine adult females were affected, and of these five were pregnant. These cases have been reported elsewhere,¹ and, while not of themselves statistically significant, I was able to collect references in the literature to a further 234 cases of poliomyelitis in pregnancy out of a total of 881 adult women suffering from the disease—an incidence of 26.6%. The figures of Bradley and Gale² referred to in your annotation were compiled from questionnaires sent to a number of hospitals. The incidence of pregnancy revealed would therefore tend to be on the low side, as pregnancy, if early, might well be missed clinically unless an accurate menstrual history were taken, and even obvious pregnancy might go unrecorded. It does seem reasonable that the increased metabolic strain of pregnancy would predispose to a more severe attack of poliomyelitis, in the same way that excessive exertion is known to do—quite apart from any endocrine factor.

Priority for poliomyelitis immunization is a difficult question, but it is worth pointing out that in the case of the pregnant woman two lives and not one are at stake.—I am, etc.,

Dartmouth.

W. G. KEANE.

REFERENCES

- ¹ Keane, W. G., *Research Newsletter*, February, 1956, No. 10, p. 6. College of General Practitioners.
- ² Bradley, W. H., and Gale, A. H., *Monthly Bull. Minst. Hlth (Lond.)*, 1948, 7, 56.

Toxicity of Promazine Hydrochloride

SIR,—It has been observed in the Hospital for Mental and Nervous Diseases in St. John's, Newfoundland, that severe local reactions have occurred following the use of intravenous "sparine" (promazine hydrochloride). As this drug is now being used more freely for the control of excited states, and nothing has appeared in the literature to date concerning these reactions, I would like to cite a few instances.

Patients have been observed following admission to have extreme swelling of the forearm with a red indurated area around an injection site. Investigation revealed that the patients had received an injection of 100 mg. of sparine on the day prior to their arrival in hospital. This has occurred in four cases. It was assumed that the drug had leaked into the tissues due to faulty technique. Although no tissue necrosis occurs with the intramuscular use of the drug, however, it is known that if leakage occurs into the subcutaneous tissue necrosis develops. Further observation revealed that when the technique of giving the intravenous injection was strictly supervised and appeared faultless the same reaction occurred: thus the following technique is recommended. When giving 100 mg. (2 ml.) of the drug, make sure the needle is inserted firmly in the vein, then draw up 2 ml. of blood. Proceed with the injection slowly, retracting the plunger slightly following the administration of each ½ ml. The same precaution should be used as when administering intravenous iron.

Since this technique has been practised no case of local reaction has occurred. It is therefore suggested that, unless the precautions outlined above are followed, the routine use of intravenous sparine should not be practised.—I am, etc.,

St. John's, Newfoundland.

E. A. MOORE.

Choledochoduodenostomy

SIR,—Mr. John Hosford's advocacy of external choledochoduodenostomy (*Journal*, May 25, p. 1202) raises an off-recurring problem. No doubt, when fibrosis or strictures resulting from long impaction of stones at the lower end have occurred, some sort of short-circuit is desirable in

preference to dilatation or blind sphincterotomy. Nevertheless, I have been struck with the occurrence of a cicatricial narrowing at the actual ostium of the papilla itself and have adopted a policy of circumcising the papilla, with suturing of the duct wall to the duodenal mucosa. When the duct is dilated above, this procedure gives an adequate opening and allows dependent drainage. It is preferable, I think, to the oblique split suggested in standard textbooks, and has the advantage over external choledochoduodenostomy in that complete drainage is afforded of the distal part, and if any retained calculi have been overlooked there is every opportunity for them to pass.

This "cicatricial papillitis" is to my mind more than an occasional finding if it is searched for. When a urethral sound is passed into the duct and the papilla inspected from within the duodenum it has all the appearance of a diminutive penis with cicatricial phimosis. Hence my advocacy for "circumcision" of the ampulla. On occasions minute granulations may even be detected on the margins of the ostium. These findings, after all, are only what one would expect when stones have been lying for a time in the common duct. The trauma and associated infection as stones attempt successfully or unsuccessfully to pass through the papilla would result in inflammation at the narrowest part—that is, the ostium—which on healing leads to cicatricial narrowing.

To undertake a short-circuit above, when a lesion which may be easily remedial is actually present below, would seem, therefore, to be begging the question.—I am, etc.,

Bath.

C. PATRICK SAMES.

Operative Treatment of Coronary Insufficiency

SIR,—Your reference to my contribution to the symposium on the coronary circulation in the Harvey Tercentenary Congress (*Journal* June 15, p. 1413) requires correction. I did not express the opinion that "external collaterals were more important than intercoronary anastomoses."

Having recorded my experiences—with 45 patients treated by similar operations—in support of Dr. Claude S. Beck's advocacy of operative treatment of coronary insufficiency, I merely expressed "the belief that in some measure the collaterals established by surface grafting or inflammation may, on occasion, play an appreciable part in the relief of coronary insufficiency." Dr. Beck had advanced the view that the benefit from such operations derived almost completely from improvement in the intercoronary communications, developing after operation. My own experience in this field having been almost entirely clinical it would have been presumptuous for me to dispute—or indeed criticize—views which he has formed as a result of a vast experimental and clinical experience.

The short film shown at the conclusion of my remarks demonstrated indisputably that two patients—previously severely crippled by coronary disease—were able, after surface grafting operations, to perform severe exercise and undertake heavy work. No one would seriously suggest that comparable benefit could have been obtained from any known drug or other medical treatment. While the nature of the disease for which they are undertaken may well make the outcome of these operations unpredictable in individual cases, Dr. Beck has shown that suitable cases can be undertaken with an almost nominal mortality, and that the functional result in the great majority of cases is good.—I am, etc.,

Newcastle upon Tyne, 2.

GEORGE A. MASON.

Transaminase in Myocardial Infarction

SIR,—Attention has recently been focused on the value of serum glutamic oxalacetic aminophase (transaminase) estimations in the differential diagnosis of myocardial infarction (annotation, *Journal*, March 9, p. 573). There appear to be few published reports of transaminase levels in cases of dissecting aneurysm of the aorta. In the inves-

tigation reported by Kattus *et al.*¹ there was one case in which the level was 16 units, though the time after onset at which this estimation was made was not mentioned.

It may be of interest to report that this finding of a normal level was also noted in a recent case in the Belfast City Hospital in which the diagnosis was confirmed at necropsy. The transaminase level 9 hours after the onset of pain was 11 units, and 12 hours later was 9 units.—I am, etc.,

Belfast.

J. C. MEENAN.

REFERENCE

¹ Kattus, A. A., Watanabe, R., Semenson, C., Drell, W., and Agness, C., *J. Amer. med. Ass.* 1956, **160**, 16.

Hospital Confinement

SIR,—Dr. J. P. O'Dwyer (*Journal*, June 8, p. 1364) should not think that I would regard it the least discourteous of him to argue with me his thesis that hospital confinement is safer than home confinement. I would feel complimented. I still await proof that the statement is an established fact. A hospital achieves nothing. It is the obstetricians in the hospital who achieve. If a hospital obstetrician is prepared to go out into a patient's home there is no procedure he cannot carry out there, and I know of no facilities he cannot take with him. It is less economic in time and money for him to do so, but it can be done. It is not the hospital that makes good results but the man in attendance. By propaganda it is being spread that merely by being in hospital a patient will secure the best attention, when what is really meant is that good attention can be given to a greater number of patients by a certain number of doctors if their patients are all gathered together in one place. It is so much less trouble to a consultant if he can have his patients in a hospital, and by being less trouble the patient releases him to attend to a greater number of patients.

What indeed does hospital confinement mean? It means that breech delivery, forceps delivery, manual removal of the placenta, perineal repair, and so on are done by a recently qualified house-surgeon or by a registrar under training. It is said that these are done "under supervision," but the truth is rather that they are done by remote control. Hospitals get puffed up with admiration for their own cleverness. They publish figures to show how much better results they are getting than their predecessors, but never do they stop and compare their results with those obtained by the same men in patients' houses. I have in front of me the report of an English hospital where one-sixth of the patients are delivered by caesarean section. Is it true that the betterment of mother and baby is secured by the thousands of premature inductions of labour that are done in hospital?

So far as the newborn baby is concerned, in spite of the much more meticulous attention in hospital, infection is common because of the gathering together of a large number of people in one building. Every paediatrician will agree that a baby is safer once it returns to the more secluded surroundings of its own home. The isolation and aseptic handling babies are given in hospital are necessary because there the baby is at so much greater risk of infection. If a man, consultant or general practitioner, is prepared to take the time and trouble, and prepared to take his "facilities" with him, I have no hesitation in declaring that he will have better results in the patient's home. I could name several skilled and careful family doctors whose results for both mother and child are (exasperatingly) as good as any comparable series from a hospital. I wish these inarticulate men would publish their results over, say, ten years. It is not because they do domiciliary confinements that their results are so good but because they are conscientious, experienced, careful doctors. Hospital doctors see the mistakes and mishaps of family doctors—good ones and bad ones—and lump them together as being due to the fact that the patient was not in hospital. How many hospitals in their annual reports list the cases of failed forceps in hospital? They are glossed over as "trial forceps," and yet

if a family doctor had sent in such a case it would gleefully be included in the table for "failed forceps." It is the man that counts, not the place where he works.

However, properly conducted home confinement is uneconomic; it is hard and exacting work, and I have no doubt the present trend towards hospital confinement will continue.—I am, etc.,

Newcastle upon Tyne, 2.

FRANK STABLER.

SIR,—Unlike Dr. J. P. O'Dwyer (*Journal*, June 8, p. 1364) I see no harm in a little controversy on this subject. He is too ready to generalize. In this part of the country early discharge from hospital would be no answer to the shortage of hospital beds. Here hospital confinement is rightly reserved for selected groups of women—namely, primiparae, multiparae for whom the G.P. has found reason to expect difficulty or danger, and those admitted on "social grounds." These last form an important group who cannot be disposed of by early discharge. They are, in my experience, booked for hospital confinement not so much to ensure good conditions for actual delivery as to provide adequate rest and freedom from anxiety during the puerperium. Early discharge in these cases would defeat the object of admission. The same is often true of those of the first two groups where admission has in fact been justified by complications at delivery. Dr. O'Dwyer's simple solution can really only be applied to those who need not have been admitted to hospital at all. The real answer to the shortage of hospital beds—and this applies to medical cases as well as to midwifery—is not to send into hospital people whom we can care for adequately at home.—I am, etc.,

Credition, Devon.

K. P. ISSERLIS.

Sign of Rain

SIR,—I learnt the poem, "Signs of Rain" by Edward Jenner, about 1889 when a very small boy in Ireland. Jenner was a country practitioner, and only a countryman accustomed to the sounds and sights of the countryside is likely to have written:

"Loud quack the ducks, the peacocks cry.
The distant hills are looking nigh.
How restless are the snorting swine!
The busy flies disturb the kine."

There are thirty-one signs of rain in the poem, and the two last lines are:

"'Twill surely rain—I see with sorrow
Our jaunt must be put off to-morrow."

A few years ago I got a copy from the late rector of Bowness-on-Solway written in long-hand by the local schoolmaster and headed "by Edward Jenner": it is mentioned in Jenner's biography, but not in Erasmus Darwin's. Jenner wrote another poem, "Address to a Robin," which is said to be better poetry, and "The Natural History of the Cuckoo." He must have been one of the early bird-watchers. I shall be glad to send a copy of "Signs of Rain" to anyone interested.—I am, etc.,

Itchen Abbas,
Winchester.

J. F. MAYNE.

SIR,—I was doubtless wrong in assigning the lines about old Betty's joints being on the rack to Dr. Edward Jenner (*Journal*, May 18, p. 1181). But my excuse is that they were given to him in a cutting which I have in my possession, and which I think must have been taken from a copy of *John o'London's Weekly*. I was a little uncertain about the possibility of Erasmus Darwin being the author, and looked up the *Oxford Dictionary of Quotations*, edited partly by Bernard Darwin, but no quotation from his ancestor Erasmus Darwin is included—1941. I am most obliged to Dr. J. C. Burne (*Journal*, June 1, p. 1305) for his correction.—I am, etc.,

London, N.W.1.

F. PARKES WEBER.

Women's Footwear

SIR,—Many doctors must have been delighted to see Mr. Reginald T. Payne's letter (*Journal*, May 18, p. 1180) on the subject of the fashionable high heels displayed in shops which deal with footwear for women. Some years ago a considerable amount of correspondence on the subject of footwear appeared in the *Journal*. I was surprised to find no reference to the work of the late Dr. James Mennell. He gave a long address in the Physical Medicine Section of the Royal Society of Medicine on November 17, 1939. As I always had difficulty in finding shoes suitable for walking, much depending upon the height and the angle of the heel, I consulted Dr. Mennell. He sent me to a firm which manufactured shoes according to his measurements; Dr. Mennell ensured that his prescription was followed. From that date I have worn only the footwear which they make on a last made specially for me. Many friends and patients did I send to Dr. Mennell during the war; every one was provided with comfortable and durable footwear.

Do modern orthopaedic surgeons to-day work on similar lines? Dr. Mennell taught that the correct height of the heel varied. Some men require a heel $2\frac{1}{2}$ in. (6 cm.) high; some women find comfort only with heels $\frac{1}{2}$ in. (1.9 cm.) high. Those who prefer the unnatural appearance of the fashionable very high heel must suffer pain when walking and standing. Later, they develop backache and round shoulders. Surely the graceful appearance of an upright posture is more attractive than the slanting forward pin-point heels. Unfortunately one sees these in many of the photographs of a number of women in fashionable gatherings.—I am, etc.,

London, W.1.

AGNES SAVILL.

Acute Amphetamine Poisoning

SIR,—I have read Dr. George Newbold's letter (*Journal*, June 1, p. 1303) about amphetamine resinate tablets with great satisfaction, as this has fully endorsed my own experience with "barbidex" and "dexten." The principle involved in these preparations appears to me to surpass the mentioned potentialities, as it presents a new mode of oral therapy which is unique in being quite independent of individual and physiological changes. The employment of resins for controlled drug absorption offers not only a great margin of safety for drug-resinates, but should, in my opinion, also present a stable and readily available remedy for the treatment of many kinds of drug poisoning, even if taken in the form of ordinary or enteric-coated tablets. Would it not be expedient for casualty departments, G.P.s, and ambulances to keep a small amount of resin as first-aid equipment, and thus to be able to gain sometimes life-saving time?—I am, etc.,

London, N.W.2.

H. MARGULIES.

Coal-gas Poisoning

SIR,—The subcommittee on coal-gas poisoning welcomes all criticism of its report, including that of the medical officers of the Gas Council (*Journal*, June 8, p. 1361), though it is somewhat surprising considering the help the committee received from the Gas Council. The medical officer of one of the largest gas boards was a full and valuable member of the committee, even if his views, like my own, were not always accepted. The real point at issue is, as the second sentence makes plain, the question of emphasis. Their outlook is essentially concerned with workers in the gas industry; our report was mainly to bring facts to the Council which were, we felt, of most importance to a wider public.

With regard to their specific criticisms on the use of air-lines and canister masks, I, in my ignorance, would have agreed with them; but we had definite evidence that these appliances are in fact used in industry with success, and we did not feel capable of taking issue with industry and the manufacturers on this matter. This is something which they might well undertake. Each canister has stamped on

it the length of exposure for which it is effective, and as these are only likely to be available for industrial workers their industries can, on the whole, be trusted to see they are properly used and up to date.

Our remarks on treatment were, in the main, addressed to first-aiders whose first instinct is always to apply artificial respiration in case of failure of breathing, and I am sorry if we did not stress this sufficiently. To those who are not first-aiders it would have been necessary to appraise the value and applicability of the various methods of artificial respiration, and this we did not think was within our province. The value of compressed air was discussed, but we thought that, to the general public, a reference to it was likely, on balance, to cause more harm than good, and the specialized equipment using it is only likely to be in the hands of those trained in its use and value. For this reason we stressed the value of mechanical oxygen respirators which are becoming available and give a strictly controlled and alternating positive and negative pressure. It seemed to us, though we had not got all the data we wished, that this type of apparatus was likely to be more generally useful and efficient than one which used air instead of oxygen. Though we tried to learn from industry we stated clearly that our report did not refer to gas poisoning in industry, which is well looked after by H.M. Inspector of Factories. For our purpose I still believe our emphasis was broadly correct, and I think that if Dr. Hughes and his committee reconsider it in this light they might agree. But we are grateful for his letter nevertheless, and hope it may further the purpose we all have—to reduce the amount of coal-gas poisoning.—I am, etc.,

Winsford, Ches.

W. N. LEAK,
Chairman, B.M.A. Coal-gas
Poisoning Subcommittee.

Is This a Record?

SIR,—I cannot supply Dr. G. I. Watson (*Journal*, June 8, p. 1362) with competitive figures, but when x-ray was the luxury of the wealthy rather than the just "must" of all a patient of mine, a grocer's boy, bolted 1s. 2½d., a customer's change he was carrying between his teeth, when his bicycle hit the kerb. That was on a Monday. On Saturday he passed one shilling; on Sunday one halfpenny; and on the Tuesday two pennies. In this case, at least, the rate of travel was roughly in ratio to the size of the object.—I am, etc.,

Morpetn.

G. B. STENHOUSE.

The H-bomb

SIR,—Why is no mention made of Russian fall-out, when ours is causing such great concern? Russian fall-out contaminated the land hemisphere, ours the sea hemisphere. Was it recent Russian fall-out that disturbed my background count readings here in London 16 days after they exploded their bomb in Siberia? The background count varied between the normal reading of 10 counts per minute to double that figure here in London on April 31. Could we have confirmation or denial of this from other observers? Or is this matter now so political that we are not even allowed to know the truth about Russian fall-out?—I am, etc.,

London, W.1.

M. ASH.

Two Stray Hairs

SIR,—Two unusual minor cases seen in my practice in the past year may interest your readers.

A girl in her twenties complained of intermittent tinnitus of three days' duration, which was aggravated by movement of the head. The noise was similar to the rushing sound heard when a sea-shell is placed over the ear. Auriscopy revealed a hair about 1 in. (2.5 cm.) long in the external auditory canal with the tip touching the drum. Movement of the hair caused the tinnitus, and its removal effected a cure.

A young man of similar age complained of an eye-lash in the conjunctival sac. Inspection at first did not reveal it, but the patient indicated a small fair hair $\frac{1}{4}$ in. (0.3 cm.) long projecting from the upper lid margin at the inner canthus. Traction on this trebled the hair's length and

changed its colour to black. Further traction removed an eye-lash similar in shape and colour to the patient's $\frac{1}{2}$ in. (1.2 cm.) long, curved, black, and with a fair tip. It was then realized that the tip of the hair had projected from the lacrimal punctum.—I am, etc.,

Birstall, Leics.

J. J. McMULLAN.

Scapulo-thoracic Crackling in Youth

SIR,—The last paragraph of Dr. Guy Beauchamp's letter (*Journal*, June 8, p. 1362) contains the good sense which makes him such a successful practitioner; but, having said that this disorder is due to hypermobility of the scapula and that it is associated with faulty posture, he then refers to the correction of the mechanical disability by manipulation. Faulty posture is by its nature not correctable by manipulation, and it is difficult to understand how hypermobility of the scapula can be altered. Manipulation is such an excellent method of treatment in so many conditions that it seems unfortunate that it should be recommended for disabilities, such as faulty posture and hypermobility, in which it appears unlikely to produce any effect whatever.—I am, etc.,

London, N.W.1.

W. D. COLTART.

Gardening Hazard

SIR,—The following gardening hazard seems to be worth reporting.

A patient was recently brought to me suffering from extensive burns of her fingers. She had been about to start a bonfire and removed one of her gloves to strike a match. No sooner had she done this than there was a series of small explosions and intense pain in the gloved hand. Thinking the whole box of matches had caught fire, she threw it away and tore off the glove. In so doing she also burned the ungloved hand. Later, the box of matches was picked up intact. The gloves had been cleaned several times in Germany and were evidently thoroughly impregnated with some highly inflammable chemical.—I am, etc.,

Farnham, Surrey.

E. M. TOWN-JONES.

Slippery Hospital Floors

SIR,—Dr. R. A. Spalding (*Journal*, June 15, p. 1419) rightly draws attention to the danger of over-polished hospital floors. Another and perhaps equally dangerous matter is the modern "lady cleaner" who sprinkles lots of washing powder on the dry floor surface and then creates a slippery emulsion by spreading this over the floor surface by means of a damp cloth. The intention is to wash the floor, but light dusting is the vocation of this modern type of "help," and on stone-surfaced floors or inlaid tiles the result is almost fatal. In the case of linoleum and polished surfaces there is the so-called non-skid floor polish, but for the other type of the supposed washed floor, perhaps a damaged coccyx and one day someone claiming heavy compensation from the Ministry.—I am, etc.,

London, W.1.

NORMAN P. HENDERSON.

Medical Classicism

SIR,—As one involved in the minutiae of medical editing, I was struck by two phrases which appeared on page 841 of the April 13 issue of the *British Medical Journal* (my italics): "At a certain stage of infection, host cells may contain no virus demonstrable by the classic method of breaking up the cells and inoculating the product into other susceptible cells" (column 1); and "The epidemiology of these conditions in nature is consistent with the transfer of virus from one host to another by one of the classical methods" (column 2).

After pondering long over these I came to the conclusion that, aside from the euphonious aspect, there might also be semantic justification for use of the different words "... no virus demonstrable by the (first class, standard) method of breaking up the cells ..." and "... transfer of virus

from one host to another by one of the (time-honoured?) methods." My complacency over reaching this, as I thought, plausible explanation of the choice of terms was shattered when I reached the final paragraph on page 844 (again my italics): "Equally relevant is the classical account (M.R.C., 1956) of the occurrence of bone sarcomata in technicians using radium paint in the manufacture of luminous watch-dials, etc." "1956" hardly satisfied the requirements of the concept of "classical" that I had just settled in my own mind—for example, I firmly believe in the rightness of the expression "classical caesarean section" and, to quote from the "secular" press, "classical liberalism" as opposed to "social liberalism."

From the recklessness with which the word "classical" usually appears in the medical literature, it would appear that authors believe an article needs only to appear in print to assume the stature of a "classic" and merit the descriptive adjective "classical." Does not such looseness rob both of the words of any significance, or wherein does it lie, and specifically what is it?—I am, etc.,

Philadelphia.

JEAN HUSTED.

Sterilization of Dressings

SIR,—That there are many chinks in the "aseptic line" has been emphasized recently by the work of Dr. J. H. Bowie¹ and Professor Howie² and others. Tulle gras or petroleum-jelly gauze is very widely used, particularly in the treatment of burns where asepsis should be so important. In many hospitals autoclaving is the routine method of sterilization, as hot-air ovens are not usually readily available. Authority for this practice is given by the B.P.C., 1954, in which two methods of sterilization are recommended: (1) heating at 150° C. for one hour; (2) autoclaving at 125° C. for half an hour. Owing to the lack of penetration of steam into the tulle gras or petroleum-jelly gauze the second method can only be the equivalent of dry heat at 125° C. for half an hour. It would seem probable, therefore, that in many hospitals burns and other wounds are being treated with non-sterile dressings.—I am, etc.,

West Hartlepool.

HUGO GRANT.

REFERENCES

- 1 Bowie, J. H., *Pharm. J.*, 1955, 174, 473, 489.
- 2 — *Hosp. Engineer*, 1957, April and May.
- 3 Howie, J. W., and Timbury, M. C., *Lancet*, 1956, 2, 669.

Herpes Zoster and Poliomyelitis

SIR,—Prior to 1939, if I saw more than two or three cases of herpes zoster in the course of a year it was a fact worthy of remark. Since about 1942 I have noticed that in the early part of each year I have been treating more and more cases of herpes, until now I expect to see three or four dozen such cases between January and June each year. Occasionally the number has well exceeded three or four dozen, and in those years I have noticed that I have invariably had more cases of poliomyelitis to treat later in the year than I usually do. This year my cases of herpes have amounted to a number very much above normal—most of them having occurred during the last six weeks—and I am uneasily wondering now whether I am to see a correspondingly heavy rise in the poliomyelitis rate later on.

It may be pure coincidence, but the increase in the incidence of both herpes and poliomyelitis appears to me to troops were stationed in the country. Did they form a reservoir of carrier-borne infection? I have wondered whether the virus causing herpes zoster is an early development in which the incidence of both diseases is high merely provide good conditions for the development of any virus. The is quite a lot of chicken-pox, and here the connexion between the viruses is close indeed, I suppose. Can a virus mutate and cause different diseases at different stages of mutation? Does an attack of one virus disease ever con-

fer any immunity to other virus diseases? I have yet to see a case which has recovered from herpes zoster develop poliomyelitis later in the same year. As a humble G.P. these questions have often occurred to me, but I am afraid I have not found the answers.—I am, etc.,

Wolverhampton.

VICTOR RUSSELL.

Trichomonas Vaginitis

SIR,—The paper by Dr. Josephine Barnes and her colleagues (*Journal*, May 18, p. 1160) on the use of a culture medium for the clinical detection of trichomoniasis seems to have aroused considerable controversy.

I cannot comment on the merits of the Kupferberg medium, or modifications thereof, for this purpose, but should like to add a word to Dr. R. F. Jennison's letter (*Journal*, June 8, p. 1365) describing his experiences with a modification of my former medium.¹ Since publishing the formula for my original medium I have been able to simplify it very much further and to bring it within the scope of constituents readily available to any laboratory or clinic. Furthermore, by resorting to Seitz filtration for sterilization any adverse effect of overheating is avoided. Thus prepared, all batches appear uniform in their ability to sustain growth of *Trichomonas vaginalis*.

This new-formula medium has been given extensive clinical laboratory trial by Dr. M. Joan Whittington at the Whitechapel clinic, in both male and female patients. The new medium was found markedly superior to wet smear examination for the detection of both trichomoniasis and moniliasis. The medium formula and results obtained in this trial on over 1,000 specimens have been reported by us.²—I am, etc.,

J. G. FEINBERG,

Bencard Allergy Research Unit.

Betchworth, Surrey.

REFERENCES

- 1 Feinberg, J. G., *Nature (Lond.)*, 1953, 171, 1165.
- 2 — and Whittington, M. Joan, *J. clin. Path.*, in press.

Televised Operations

SIR,—As I know you are aware, there has been considerable publicity in the lay press recently regarding the colour television demonstrations carried out by an American firm at the Royal College of Surgeons and at St. Bartholomew's Hospital. Several of the papers have given accounts which strongly suggest that colour television has never previously been used for this purpose in England, but this is far from the truth. Indeed, we were the pioneers, having employed colour television at St. Thomas's Hospital in 1949 and demonstrated operations at the International Congress of Ophthalmology in 1950.¹ I think the publicity obtained by the Americans in this case is a blow to British prestige and very unhelpful to the British radio industry, and particularly to Pye Radio, who co-operated with us freely and with no cost during our experiments.

The advantages of colour television of operations is marked in cases where the audience is expert and to whom it is necessary to demonstrate details of technique, but for undergraduate training the advantages are much less evident, for the student should be in the theatre to see all that is happening and not just the details of operation.—I am, etc.,

HAROLD RIDLEY.

London, W.1.

REFERENCE

- 1 *Acta XVI Concilium Ophthalmologicum*, 1950, 2, 1397.

POINTS FROM LETTERS

Smoking and Cancer of the Lung

Dr. LOUIS LINNELL (Manchester) writes: The *Manchester Guardian* of June 15 contained this remark in its stock exchange report, "Tobacco shares rose on a report from America, which was at first exaggerated by the market, of a new cure for cancer." Surely this decisively clinches the connexion, previously suspected on statistical grounds, between smoking and cancer of the lung!

Obituary

H. S. DE BOER, C.M.G., M.C., M.R.C.S., L.R.C.P.
D.P.H., D.T.M.&H.

Dr. Henry S. de Boer, who until his retirement in 1947 had been a member of the Colonial Medical Service and had served in four of the East African territories, died suddenly at Hemel Hempstead on June 7. He was 68 years of age.

Henry Speldewinde de Boer was born at Colombo, Ceylon, on May 10, 1889, and studied medicine at the London Hospital, qualifying M.R.C.S., L.R.C.P. in 1913. From 1915 to 1920 he served as a captain in the R.A.M.C., and was awarded the Military Cross in 1918, being also mentioned in dispatches. After the war he obtained the Cambridge D.P.H. in 1920, and went to Kenya, where he served as medical officer. He took the London D.T.M.&H. in 1923. He was appointed senior health officer in East Africa in 1926, and served as medical officer of health both at Kisumu and at Mombasa. At Kisumu, where he made himself beloved, his memory is kept green not only by the trees he planted in order to dry swampy patches, but also by the street which bears his name. Incidentally, he was the local tennis champion. A mosquito, *Aedes de boeri*, also commemorates his work at Kisumu. At Mombasa he organized a notable health and baby welfare exhibition which brought the award of the shield of the National Baby Week Council.

In 1931 de Boer moved to Northern Rhodesia to take up the appointment of deputy director of sanitary services. This post he held for only two years before he was appointed D.D.M.S. of Uganda. He moved again in 1938 to become D.M.S. of Nyasaland, and he remained there until 1942, when he returned to Uganda as D.M.S. He was president of the Nyasaland Branch of the British Medical Association in 1938-9.

De Boer retired in 1947, having been appointed C.M.G. two years previously, and on his return to England became a temporary medical officer at the Ministry of Health, later being appointed airport medical officer at Northolt. In 1947 he was elected a county councillor for the Hemel Hempstead division of Hertfordshire. He married Frances Ethel Bartholomeusz in 1920 and had two sons, one of whom is a doctor. He will be remembered with affection and respect by all those, of whom the writer is one, with whom he worked in East Africa, and in England after his retirement.—J. L. G.

J. C. R. B. writes: Dr. Henry de Boer had a long and distinguished career in the Colonial Medical Service. His dynamic energy and his forceful personality were for many years a by-word in East and Central Africa. It is not too much to say that countless people of all races owe their lives and health to his foresight in initiating public health measures many years ago in the countries in which he served and to the personality and drive with which he carried them through. Henry de Boer was a fighter, and in peacetime, as in the 1914-18 war, he did not know the meaning of fear. He fought not for himself but for his department, his friends, his staff, and above all for his principles. These were attributes, and they gained him the respect of all with whom he came in contact: but it was his genuine humanity, his friendliness, and his kindness of heart that endeared him most to those who knew him best. Countless acts of personal kindness and unfailing loyalty will remain a loving memory with his hosts of friends. He always had the interests of his staff at heart, and he would support them and defend them in all cases of difficulty with a truly paternal care. He set himself the highest standards and expected the same of others: but even those who had transgressed and received the admonition from him which they undoubtedly deserved would leave with the knowledge

that they had been fairly treated and that, so far as their chief was concerned, they could regard themselves as off to a new start.

I have written of Henry de Boer's life in Africa, but after his retirement it was typical of the man that he did not rest in seclusion. He quickly found an outlet for his ability and enthusiasm, and by public-spirited voluntary work in community and health affairs proved himself again, in a different sphere, an outstanding citizen and a true Christian. Always throughout his married life he had the blessing of a happy family life and a home which was open to all. To his widow, in her bereavement, there will be the knowledge that she was part of the pattern, and to his sons there will be the proud memory of a truly great father who served his country well.

H. C. LUCEY, M.D., D.P.H.

Dr. H. C. Lucey, consultant pathologist to the Metropolitan Hospital, died on June 8 at Eastbourne. He was 73 years of age.

Herbert Cubitt Lucey was born on November 15, 1883, the son of Dr. W. Cubitt Lucey, who practised in north London. From University College School he went on to Guy's Hospital, qualifying M.R.C.S., L.R.C.P. in 1909 and graduating M.B., B.S.(London) later in the same year. After earlier house appointments he became obstetric resident at Guy's, and proceeded to the M.D. in obstetrics and gynaecology in 1911. Dr. Lucey was then attracted to bacteriology and pathology, and was appointed assistant in the bacteriological department at the hospital. He continued to work in this capacity until he joined the R.A.M.C. shortly after the outbreak of the first world war. At first he was posted to the Royal Herbert Hospital, Woolwich, where in addition to working in the laboratory he had charge of the department of venereal diseases, and later he served in France. On demobilization from the R.A.M.C. he took the D.P.H. and became pathologist to the Metropolitan Hospital, where he continued to do admirable work until the outbreak of the second world war, when he was transferred in the E.M.S. to Haymeads Hospital, Bishop's Stortford, as pathologist. At the end of the war, and much to the regret of the staff of the Metropolitan Hospital, Dr. Lucey decided to remain at Haymeads Hospital, especially as he had now made his home in the district. He continued at Haymeads Hospital until his retirement to Eastbourne in 1955. His wife, one son, and one daughter survive him.

C. W.-D. writes: I first met Herbert Lucey in 1911, when he held the appointment of "charity" or obstetric resident at Guy's Hospital, and I was serving as an "extern." I can well recall how his kindness and consideration to his junior externs impressed me, and how ready he was with the utmost cheerfulness to help at any time, even when called out to assist on the district in the middle of the night. Consequently I was delighted to meet him again as a colleague, firstly for a time at the Royal Herbert Hospital in the R.A.M.C., and after the 1914-18 war at the Metropolitan Hospital, London, to which he had been appointed pathologist. Our happy association here continued for twenty years until the outbreak of war in 1939.

Dr. Lucey was a very sound and reliable pathologist, although knowledge of this fact probably did not extend much beyond those coming into personal contact with him. He was quite content to work quietly in his laboratory, and very seldom attended meetings even in his own specialty. It was equally difficult to persuade him to record and publish any of the most interesting observations he made from time to time, and consequently his contributions to medical literature were few and far between. In one important article in 1950 he pointed out the "fortuitous factors affecting the leucocyte count in blood from the ear."

The outstanding factor in Lucey's personality was his invariable cheerfulness, and in our long association I never knew him otherwise. One had not the slightest hesitation at any time in seeking his help and advice, as one always knew

any request would be received with courtesy and understanding and help ungrudgingly given. Lucey will be very much missed by his friends.

T. VICARS OLDHAM, M.B., B.Ch.

Dr. T. Vicars Oldham died at Harrow Hospital on May 31 at the age of 68.

Thomas Vicars Oldham was born on January 31, 1889, the son of Dr. Hugh Falconer Oldham. From Rugby School he went on to King's College, Cambridge, but for most of his time as a medical student he lived in Dublin, graduating M.B., B.Ch. at Dublin University in 1914. Entering the R.A.M.C. on the outbreak of the first world war, he served mostly in the Middle East, having previously taken part in the Gallipoli landings. When the war ended he remained as a regular R.A.M.C. officer until he retired with the rank of major in 1928 to join his father in general practice at Morecambe. He was chairman of the Lancaster Division of the B.M.A. in 1929-30. In 1934 he came south to Harrow-on-the-Hill, where he took over the practice of the late Dr. W. A. Wilson-Smith. At the outbreak of the second world war in 1939, and within a month or two of completing his period as a reservist liable to recall, he was recalled to the R.A.M.C. and served throughout the war, first at Newport, then as liaison officer for South Wales, and finally in the medical supplies department at the War Office. On his return to Harrow after the war, in addition to re-establishing himself in general practice, he was responsible for the medical care of the boys of Malvern School, who shared the premises of Harrow School during the war, working in close contact with Dr. O. R. Tisdall, the then medical officer to Harrow School.

A colleague writes: Having thoroughly re-established himself in general practice, but looking forward to retirement in the near future, Tom Oldham was struck down with tragic suddenness while doing his evening surgery on May 31 and died from a coronary attack shortly afterwards in Harrow Hospital. Although he did not hold any of the more prominent offices in public life, he could always be found doing a lot of the drudgery and less spectacular jobs with cheerfulness and marked efficiency. He was for many years a member of the hospital staff at Harrow and a member of the hospital committee. He was interested in all forms of sport and at one time was a first-class golfer and a strong supporter of medical golfing societies, particularly that of Harrow and Wembley hospitals. It has been said of a man, rather as a compliment, that "he did not suffer fools gladly." It was rather the reverse with Tom Oldham, and therein lay his charm and his success in general practice. Only those of us who took on some of his work on the rare occasions on which he took a holiday knew to what extent he devoted himself to his patients, particularly the very young and the very old. It is not given to us all to show the patience and attention which he did to his patients and which went far beyond his "terms of service." He died, as he would have wished, quite suddenly, after a life blessed by good health. He will be sadly missed, not only by his widow and two daughters, but also by his many patients and his medical colleagues in Harrow.

LILIAN M. BLAKE, L.R.C.P.&S.Ed.

Dr. Lilian M. Blake, one of the first women doctors to practise in Stockport, died on May 12, 11 days after her 86th birthday.

Lilian May Blake was born on May 1, 1871, and received her medical education at the London (Royal Free Hospital) School of Medicine for Women, taking the Scottish triple qualification in 1895. In the same year she settled in practice at Stockport, but owing to ill-health had to move to Colwyn Bay in 1906, and there she was for a time medical officer to Penrhos College, a boarding-school for girls. She returned to general practice during the first world war, and

in 1924 moved to Northampton, where she continued to work until she retired in 1935. Her popularity was widespread, and wherever she lived and worked she made many friends. Dr. Blake is survived by an adopted daughter.

W. A. GORNALL, M.D.

Dr. W. A. Gornall died suddenly at his home at Nailsea, Somerset, on June 2, at the age of 55.

William Arthur Gornall was born on August 19, 1901, and was educated at Bristol University, where he graduated M.B., Ch.B. in 1924, proceeding to the M.D. five years later. He was in general practice in Bristol for a short while before moving to Nailsea in 1929. It was at this little Somerset village that his life work was performed.

A colleague writes: Arthur Gornall bequeathed his eyes to the Bristol eye bank and his body for medical research. This action was so much in character with the whole of his life that it seems the obvious beginning of a tribute to him. He was a good clinician, painstaking and conscientious, and kept himself up to date by reading and attending postgraduate lectures, as well as holding a clinical assistantship at Bristol General Hospital. But to this clinical acumen he added an intense devotion to his patients and to all mankind, so that his profession became a welcome accepted vocation. He was so integrally a part of the village community that for many doctors in Somerset and Bristol the words Gornall and Nailsea were synonymous, and after his death the village, as it was said, was in consternation. A lifelong Methodist, he was one of the mainstays of the little church there, and all good works commanded his sympathy and devoted service. Foreign missions and the National Children's Home were his special interests, and to them was added his work for the British Red Cross. In spite of all these demands on his time he was an active and keen member of the British Medical Association, having been chairman of the East Somerset Division in 1953-4 and a representative at the Annual Representative Meeting for several years. At the inception of the National Health Service he became honorary secretary of the Somerset Local Medical Committee, and his calm and knowledgeable advice was always helpful to his colleagues and to the executive council. It was at the Cardiff meeting of the B.M.A. in 1953 that he first admitted he had coronary pain, but he stayed to the end of the meeting. Then came a long illness, faced with characteristic courage and a gaiety of spirit which sprang from his simple Christian faith and assurance. Later he was able to return to the work he so loved, and was in active practice when the end came with tragic suddenness. To his multitude of friends it seems almost unbearable, but to him it meant, as we sang at his memorial service,

"Now I have found the ground wherein
Sure my soul's anchor may remain."

He married Mary, daughter of Mr. Osborn Appleby, of Nailsea, and they had three sons, all still at school.

WALTER PATEY, M.D.

Dr. Walter Patey died at Newton Abbot Hospital on June 2 at the age of 74.

Walter Patey was born on February 9, 1883, and was educated at Dulwich College and at St. Thomas's Hospital, qualifying by taking the London Conjoint diploma in 1907. In the same year he obtained the London degrees of M.B., B.S., proceeding to the M.D. two years later. After serving as a clinical assistant in the ear department at St. Thomas's and house-physician at the Norfolk and Norwich Hospital, he entered general practice at Newton Abbot. During the first world war he served in the R.A.M.C. in France. At the time of his retirement in 1951 he had been an honorary medical officer at Newton Abbot Hospital for forty years.

G.M.T. writes: Walter Patey enjoyed his work, and he was a keen sportsman in a quiet and an unassuming way. He

sailed a dinghy, fished for trout, and enjoyed badminton and lawn tennis—he played a good game at the latter until two or three years before his death. In both work and games he was a kind and loyal partner and a courteous and scrupulously fair opponent, and he was always on the best of terms with his colleagues in practice. He leaves a widow, two sons, and a daughter.

Sir COURTENAY MANIFOLD, K.C.B., C.M.G. M.B., C.M.

The obituary of Sir Courtenay Manifold was published in the *Journal* of June 15 (p. 1422).

We are indebted to Mr. A. DICKSON WRIGHT for the following appreciation: The bare recital of the wonderful career of General Sir Courtenay Manifold does not suffice in the mind of many to bring back to us the picture of this wonderful old man. At the age of 93 he published a small volume of his life, reaching back into the far distant past—resembling in this respect another famous nonagenarian, Dr. Parkes Weber, who has published two books after passing the age of 90. In Sir Courtenay's memoir he remembers sailing round the Cape in a sail transport to India at the age of 4 with his father, who was going out to a military appointment. He maintained that he was the only person living who had done this, and recalled the captain shooting an albatross and presenting the little boy with the dried skin and feathers.

Particularly sad will be those of us who enjoyed the delightful hospitality of his charming home, Harbour Heights, in Kyrenia, with its wonderful view of the old Venetian harbour and the distant Turkish shore. It was indeed an occasion then to be conducted round the antiquities of Cyprus, climbing the hills to Hilarion and clambering over Roman ruins and ancient monasteries, with no signs of physical fatigue from the old man to match one's own. In the evening, far into the night, he would recall his old days in India and China, and bring out the old route maps of his exploration of the Han River in China and other things too wonderful to relate. Next morning at seven we would be taken to swim below the old fort, with the jackdaws cawing above and Lady Manifold calling from the shore, because she was convinced that with his sight almost completely gone he would one day swim far out to sea and disappear. Then back to breakfast under the pomegranate tree in his beautiful garden; and so the delightful days would pass by, either at Kyrenia or up in his villa in the pine trees of the mountains at Troodos.

Nearly every year he would come back to England, always with his faithful Cypriot servant, George, and he would make long motor drives over the country, visiting old friends and relations of his wife's and his own. It was always a joy to see him and enjoy the simplicity and charm of his deportment. Lady Manifold, always by his side, provided a spectacle filling one with admiration as she gently steered him along in those last remarkable years of his life: to her must go a very special sympathy.

L. W. HEFFERMAN, M.D., F.R.C.S., F.R.C.S.Ed.

Dr. L. W. Hefferman, who was a well-known general practitioner in Swansea, died at his home at Swansea on June 20. He was 62 years of age.

Leslie William Hefferman was born on March 7, 1895. As a pupil at Epsom College he was awarded the Freer Lucas entrance scholarship to the Middlesex Hospital, where, later, he gained the Lyell scholarship and gold medal. After qualifying M.R.C.S., L.R.C.P. in 1920 he held the appointments of house-surgeon and assistant demonstrator in anatomy at the Middlesex, and then went to Burma as assistant chief medical officer to the Burma Corporation at Namtu, where he also acted as surgeon to the general hospital. Returning to the United Kingdom in 1924, he

settled in practice at Swansea, where he was for a time assistant surgeon to the general hospital, and where he remained until his death. An interesting feature of Hefferman's career was his acquisition of several higher qualifications in middle life. In 1941 he obtained the Diploma in Obstetrics of the Royal College of Obstetricians and Gynaecologists; two years later he graduated M.B., B.S. from London University, being granted a distinction in anatomy; in 1944 he became a Fellow of the Royal Colleges of Surgeons of England and Edinburgh; and in the following year he proceeded to the M.D.

Dr. Hefferman had served on the council of the Medical Practitioners' Union for some years before he was elected president of the union in 1938, an office he continued to hold until 1948. A member of the Swansea borough council for about a quarter of a century, he was also a commissioner of the St. John Ambulance Association, an honorary life member of the Priory of Wales, and a commander of the Venerable Order of St. John of Jerusalem.

G. F. BUCHAN, M.D., F.R.C.P., D.P.H.

The obituary of Dr. G. F. Buchan was printed in the *Journal* of June 15 (p. 1422).

We are indebted to Dr. J. AUBREY IRELAND for the following appreciation: As one who had the privilege and pleasure of serving on the Public Health Committee of the B.M.A. alongside Dr. Buchan for a number of years, I recollect the way in which he approached every subject under discussion with such clear-minded intelligence; he seemed to be able to get quickly to the heart of the matter and was never at a loss in expressing his opinions, which, based on sound common sense, were always valuable contributions to arriving at decisions. When the meetings of Committee C of the Whitley Council were being held his presence was always looked forward to, and he certainly pulled his full weight on those occasions. He was a man of great charm, wit, and efficiency, and I am sure the Public Health Committee of the B.M.A. will feel that a most valuable member, really liked and trusted by everyone, has left behind him memories that will be long held by his fellow members.

AUGUSTO S. BOYD, M.D.

Dr. Augusto Samuel Boyd, a former President of the Republic of Panama, died in Panama City on June 18, at the age of 77.

Having graduated in medicine at Columbia Medical School, New York, in 1899, he held a surgical appointment at the New York City Hospital before becoming chief surgeon at Santo Tomás Hospital, Panama. From then on he took an active part in political affairs, serving on the Panama municipal council, of which he was president from 1906 to 1908. A member of the National Assembly for many years, he was president of the Panama National Committee of Hygiene and a prominent figure at Pan-American medical congresses. In December, 1939, he was elected President of the Republic of Panama, but he retained this office for only nine months.

Universities and Colleges

UNIVERSITY OF LONDON

The degree of M.D. was awarded to J. H. Evans and P. K. Thomas on April 10.

The following candidates have been approved at the examinations indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN PSYCHOLOGICAL MEDICINE.—At Institute of Psychiatry, H. R. Alderton, A. A. Bartholomew, D. T. F. MacSorley, C. M. B. Pare, A. C. R. Skynner, H. J. Walton. The following have passed in Part I only: J. S. Bearcroft, A. A. Black, M. R. Chaudhry, L. J. Klein, S. I. Cohen, R. H. Culpan, B. M. Davies, J. Erulkar, R. H. Fox, N. B. McDiarmid, W. J. Nicholson, C. M. Parkes, E. W. Poole, C. J. Wardle.

ACADEMIC POSTGRADUATE CERTIFICATE IN TROPICAL MEDICINE AND HYGIENE.—At London School of Hygiene and Tropical Medicine, M. A. Aslam, A. H. Dehkan.

Medico-Legal

INSANITY AND DIVORCE

[FROM OUR MEDICO-LEGAL CORRESPONDENT]

Section 6 (2) of the Divorce (Scotland) Act, 1938, provides that in any action for divorce on the ground of incurable insanity the defender is not to be held to be incurably insane unless it is proved that he has been for five years immediately preceding the raising of the action under care and treatment as an insane person. Where it is proved that he has been under such care and treatment he must be presumed to be incurably insane unless the contrary is shown to the satisfaction of the court.

Recently an undefended divorce action was brought in the Court of Session¹ by an Edinburgh husband on the ground of his wife's incurable insanity. The wife had been detained under care and treatment in a mental institution in England for more than five years immediately preceding the action except for a period of 12 days during which she had been at large after an escape. The question was whether the 12 days during which she had escaped from lawful detention prevented the court from holding that she had been for the necessary five years under care and treatment.

Lord Guthrie in his judgment said that the case was a difficult and important one, and involved the construction of the relevant English statutes as part of the law of Scotland. Section 85 of the Lunacy Act, 1890, provided that, if any person detained as a lunatic under the Act escaped, he might be retaken and detained without a fresh order and certificate at any time within 14 days after the escape. Lord Guthrie held that, as the order for the wife's detention remained in force for 14 days after her escape and she had only been absent for 12 days, her absence, although not authorized or incidental to her care and treatment, could not be held to be a breach of its continuity. It was sufficient that the order remained in force throughout her absence.

Lord Guthrie's decision is consistent with a decision of the Court of Appeal in England² on the interpretation of the words "continuously under care and treatment" in s. 2 of the Matrimonial Causes Act, 1937. The court then held that a patient's discharge from an institution in England and removal to an institution in Scotland did not interrupt the continuity of the period of care and treatment.

¹ *Scotsman*, June 12, 1957.

² *British Medical Journal*, 1952, 1, 52.

Vital Statistics

Influenza in Great Britain

Some cases of influenza in Pakistanis due to virus A have been detected in London. At the time of going to press the strain had not been identified as the epidemic Asiatic strain. 57 Pakistanis who had flown from West Pakistan, where outbreaks of the disease are occurring, arrived in England on June 13 to man a ship bound for Pakistan. They were kept under daily surveillance, and on June 15 one became ill with influenza. On June 17, 11 more fell ill, and subsequently 2 further cases were reported. The patients were isolated at the Port of London Isolation Hospital, Denton, Gravesend. These men had some contact with the crews of other ships, so that it is possible for the Asiatic influenza to have been introduced into Britain in this way, though this is not confirmed.

Influenza has since been reported in the crews of two ships at Bristol. The men were in the Port of London at the relevant time and could possibly have been infected by the Pakistanis. Again, virological tests are not yet complete.

Late News: On going to press we learnt that the strain of virus isolated from one of the Pakistani patients is antigenically related to that causing Asiatic influenza (A/Singapore/1/57).

Poliomyelitis Vaccines

Last week Glaxo Laboratories Ltd. announced plans for a 50% increase in the production of poliomyelitis vaccine during the next year. New laboratories are to be built to manufacture it. The firm hopes to produce enough vaccine to provide a double dose before next spring for all children already registered.

The United States public health service has announced that about six million doses of Salk vaccine are being re-tested after failing to meet minimum requirements for potency.

Week Ending June 15

The notifications of infectious diseases in England and Wales during the week included: scarlet fever 547, whooping-cough 1,371, diphtheria 8, measles 21,793, acute pneumonia 308, acute poliomyelitis 83, dysentery 457, paratyphoid fever 3, and typhoid fever 7.

Infectious Diseases

The only large increase in the incidence of infectious diseases in England and Wales during the week ending June 8 was a rise of 1,677 in the number of notifications of measles, from 21,613 to 23,290. The largest decreases were 284 for whooping-cough, from 1,807 to 1,523; 102 for scarlet fever, from 691 to 589; 83 for dysentery, from 740 to 657.

74 cases of acute poliomyelitis were notified, and these cases were 6 more for paralytic and 1 more for non-paralytic cases than in the preceding week. The largest returns were London 9 (9 boroughs with 1 case), Devonshire 8 (St. Thomas R.D. 5, Exeter C.B. 2), Sussex 7 (Brighton C.B. 4, Hailsham R.D. 2), Southampton 7 (Havant and Waterloo U.D. 5, Portsmouth C.B. 2).

The increase in the incidence of measles was confined to the Midlands and the south, and 9 counties had an increase in the number of notifications of 100 or more. The largest rises were 265 in Essex, from 570 to 835, and 253 in Wiltshire, from 367 to 620. In the northern section of the country the incidence of measles declined; the largest falls in notifications were 302 in Yorkshire West Riding, from 2,991 to 2,689, and 145 in Durham, from 1,053 to 908. In Norfolk the number of notifications in the urban areas fell by 42, from 299 to 257, the largest fall being 97 in Kings Lynn M.B., from 177 to 80; but in the rural areas the number of notifications rose by 186, from 218 to 404. The towns with the largest increases in the incidence of measles were Nottingham C.B. 218, from 198 to 416; West Ham C.B. 104, from 127 to 231; and Swindon M.B. 87, from 132 to 219. The largest decline in the incidence of whooping-cough was 50 in Yorkshire West Riding, from 149 to 99. Only small variations in the local trends of scarlet fever were recorded; the largest was a fall of 24 in Essex, from 66 to 42. 4 cases of diphtheria were notified, being 3 more than in the preceding week; 2 of these cases were notified in Birmingham C.B.

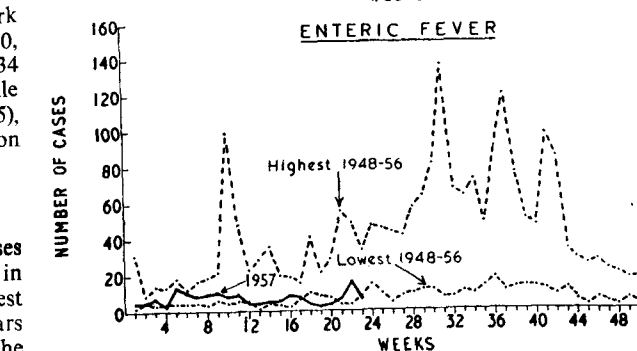
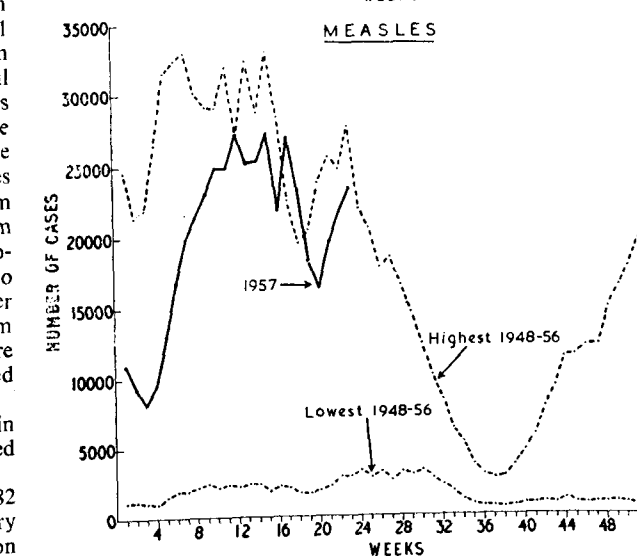
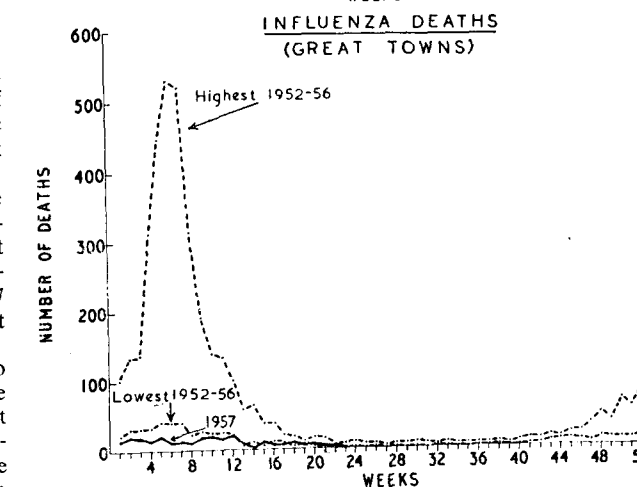
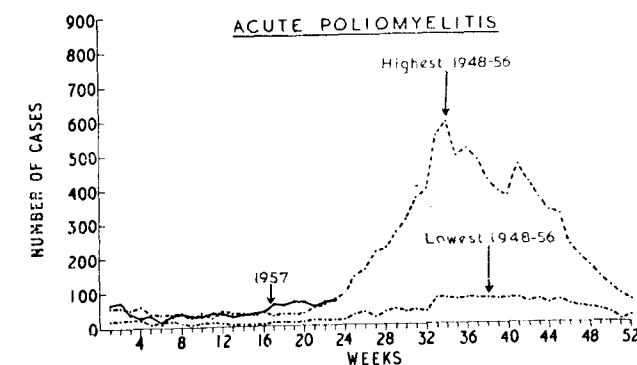
Both the cases of paratyphoid fever were notified in London, and 2 of the 4 cases of typhoid fever were notified in Essex, Thurrock U.D.

The chief centres of dysentery were Lancashire 182 (Liverpool C.B. 32, Irlam U.D. 27, Swinton and Pendlebury M.B. 20, Manchester C.B. 14, Blackpool C.B. 12, Whiston R.D. 10), Yorkshire West Riding 73 (Leeds C.B. 25, York C.B. 13, Sheffield C.B. 12), London 68 (Bethnal Green 10, Southwark 10), Surrey 40 (Croydon C.B. 23), Durham 34 (South Shields C.B. 11), Northumberland 33 (Newcastle upon Tyne C.B. 18), Cheshire 33 (Stalybridge M.B. 15), Warwickshire 24 (Birmingham C.B. 13), and Southampton 21 (Southampton C.B. 9).

Graphs of Infectious Diseases

The graphs below show the uncorrected numbers of cases (deaths for influenza) of certain diseases notified weekly in England and Wales (great towns for influenza). Highest and lowest figures reported in each week during the years 1948-56 (influenza, 1952-6) are shown thus -----, the

figures for 1957 thus ———. Except for the curves showing notifications in 1957, the graphs were prepared at the Department of Medical Statistics and Epidemiology, London School of Hygiene and Tropical Medicine.



INFECTIOUS DISEASES AND VITAL STATISTICS

Summary for British Isles for week ending June 8 (No. 23) and corresponding week 1956.

Figures of cases are for the countries shown and London administrative county. Figures of deaths and births are for the 160 great towns in England and Wales (London included), London administrative county, the 17 principal towns in Scotland, the 10 principal towns in Northern Ireland, and the 14 principal towns in Eire.

A blank space denotes disease not notifiable or no return available. The table is based on information supplied by the Registrars-General of England and Wales, Scotland, N. Ireland, and Eire, the Ministry of Health and Local Government of N. Ireland, and the Department of Health of Eire.

CASES In Countries and London	1957					1956				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	4	0	2	1	2	4	0	2	0	2
Dysentery ..	687	68	256	7	5	1,381	169	196	6	
Encephalitis, acute	3	0		0		8	8		0	
Enteric fever:										
Typhoid ..	4	1	0	0	2	9	1	0	0	1
Paratyphoid ..	2	2	0	0		21	1	(B)	0	
Food-poisoning ..	197	27	17	0		413	38		0	
Infective enteritis or diarrhoea under 2 years ..					21				11	21
Measles *	23,290	964	136	235	310	3,184	317	287	55	168
Meningococcal infection ..	26	4	8	0	1	27	8	11	1	
Ophthalmia neonatorum ..	38	3	4	0		25	0	1	0	
Pneumonia †	326	19	153	6	1	329	16	144	7	1
Poliomyelitis, acute:										
Paralytic ..	46	7	4	5	2	38	1		1	
Non-paralytic ..	28	2				17	0			
Puerperal fever §	214	28	11	0		187	35	6	0	
Scarlet fever ..	589	58	65	28	22	575	51	74	17	12
Tuberculosis:										
Respiratory ..	591	62	229	15		674	74	124	32	
Non-respiratory ..	86	6	22	7		118	10	12	9	
Whooping-cough ..	1,523	65	160	3	54	1,929	97	220	72	140

DEATHS In Great Towns	1957					1956				
	Eng. & Wales	London	Scotland	N. Ireland	Eire	Eng. & Wales	London	Scotland	N. Ireland	Eire
Diphtheria ..	0	0	0	0	0	0	0	0	0	0
Dysentery ..	1	1		0		0	0		0	
Encephalitis, acute		0			0		0			0
Enteric fever ..	0	0	0	0		0	0	0	0	
Infective enteritis or diarrhoea under 2 years ..	5	0	3	0	1	1	0	0	0	0
Influenza ..	4	0	1	0	0	1	0	0	0	0
Measles ..		0	0	0	0		0	0	0	0
Meningococcal infection ..		0	0				0	0		
Pneumonia ..	216	34	23	6	6	185	31	21	17	7
Poliomyelitis, acute	1	0			0	0	0			0
Scarlet fever ..		0	0	0	0		0	0	0	0
Tuberculosis:										
Respiratory ..	46	7	7	1	1	43	3	12	1	4
Non-respiratory ..		2	0	0			0	0	0	0
Whooping-cough ..	2	0	0	0	0	0	0	0	0	1
Deaths 0-1 year ..	197	22	40	3	18	205	26	21	7	14
Deaths (excluding stillbirths) ..	5,085	717	547	93	149	4,605	656	545	105	161
LIVE BIRTHS ..	8,329	1,194	942	237	548	7,849	1,108	954	202	387
STILLBIRTHS ..	222	28	27			219	25	23		

* Measles not notifiable in Scotland, whence returns are approximate.

† Includes primary and influenza pneumonia.

§ Includes puerperal pyrexia.

Medical News

Central Health Services Council.—Lord COHEN OF BIRKENHEAD has been unanimously elected chairman of the Central Health Services Council, in succession to Sir FREDERICK MESSER. Lord Cohen was previously vice-chairman of the council.

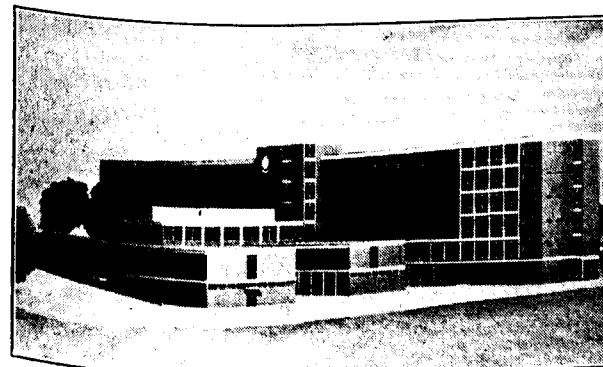
Fairley Laboratories.—The laboratories of the London Hospital for Tropical Diseases, St. Pancras Way, have been named "The Fairley Laboratories." At a simple ceremony at the laboratories on June 21 Sir HENRY DALE, O.M., F.R.S., unveiled a bronze plaque, near the main entrance, recording that this was done in recognition of Sir Neil Hamilton Fairley's "outstanding services to research in tropical medicine and pathology." Sir Henry Dale recalled how, as a young medical officer with the Australian forces in the Middle East during the first world war, Sir Neil Hamilton Fairley had laid the foundation of his expert knowledge of tropical diseases and how by his research on a number of them he had been able to suggest improved methods for their treatment. He was one, said Sir Henry, they were proud to honour as a great citizen of the British Commonwealth. Sir NEIL HAMILTON FAIRLEY, F.R.S., then expressed his deep appreciation, and Sir GEORGE McROBERT, on behalf of the hospital's medical staff, spoke of their pleasure at this permanent reminder of the work of one of the greatest of Australians.

Ionizing Radiations in Hospitals.—Advice on the protection of hospital staff occupationally exposed to ionizing radiations is given in the *Code of Practice for the Protection of Persons Exposed to Ionizing Radiations* (H.M.S.O., price 8s. net), published this week. The *Code of Practice* has been drawn up by the standing committee, of which Sir CHARLES DARWIN, F.R.S., is chairman, and appointed for the advice of Ministers under the Radioactive Substances Act, 1948. The *Code* is a loose-leaf booklet to allow later amendment, containing sections on the use of x rays in diagnosis and of x rays and γ-ray beam units for therapy, and on the use of radioactive isotopes; there is also a supplement giving fundamental data on radiation protection for those concerned with the design of radiological or radiotherapy departments. The *Code* does not deal with the protection of patients. Commending the *Code* to all hospital authorities, to whom it has been sent, the Minister of Health, Mr. DENNIS VOSPER, states that it is not his intention at present to use his powers under the Radioactive Substances Act to make Regulations safeguarding the health of exposed hospital workers. Instead, he asks hospital authorities to see that practice in their radiological and radiotherapy departments conforms with the minimum safety recommendations of the *Code*.

British Orthopaedic Association.—The Robert Jones centenary meeting was held at Shrewsbury and Oswestry last month, under the chairmanship of the association's president, Mr. PHILIP WILES. On the first day a series of scientific papers were read and discussed. The second day was devoted to a visit to the Robert Jones and Agnes Hunt Orthopaedic Hospital, Oswestry, where clinical demonstrations had been arranged by the staff, over 200 patients attending for the purpose. Tributes were paid to the memory of Sir Robert Jones, and a film of him working at St. Thomas's Hospital was shown by Mr. S. A. S. MALKIN. On the last day, under the chairmanship of Mr. H. J. SEDDON, three members of the Medical Research Council's committee on poliomyelitis vaccination addressed the meeting and answered questions: Professor C. H. STUART-HARRIS (Sheffield) spoke on field trials of poliomyelitis vaccine, Dr. W. L. M. PERRY (National Institute for Medical Research) on the preparation and testing of the vaccine, and Professor G. W. A. DICK (Belfast) on vaccination with live virus. Afterwards further scientific papers on orthopaedic subjects were read and discussed.

Royal Society of Tropical Medicine and Hygiene.—At the society's fiftieth annual meeting, held at Manson House, London, on June 20, Brigadier J. S. K. BOYD, F.R.S., was elected president for the next two years. The Chalmers medal for 1957 was presented to Dr. A. J. HADDOW, of the Virus Research Institute, Entebbe, Uganda.

Hospital for Harlow New Town.—The accompanying picture shows a model of the new hospital, costing about £2m., it is proposed to build in Harlow new town. Speaking at a press conference on Wednesday, Sir GRAHAM ROWLANDSON, chairman of the N.E. Metropolitan Regional Hospital Board, said that work on the first stage of the hospital—the out-patient, radiology, and casualty departments, some residential buildings, and site clearing, principally—was expected to start next year, and be completed



early in 1960. The final hospital, which was to be built in four stages, would have 244 beds. A notable feature of the hospital's planning is that the radiology and pathology departments are designed to be big enough to accept work direct from local general practitioners. It was now widely recognized, said Sir Graham Rowlandson, what an important role out-patient diagnostic and consultative facilities could play in reducing the need for admission to hospital. Harlow is in process of expanding from a rural area, with a population of about 5,000, to an urban community of 80,000. The architects of the new hospital are Messrs. Easton and Robertson, in association with the regional board's architect, Mr. W. G. PLANT.

Southern General Hospital, Glasgow.—On June 21 Mr. J. NIXON BROWNE, Joint Parliamentary Under Secretary of State for Scotland, opened three new units at the Southern General Hospital, Glasgow. The units were a twin operating theatre unit, a chest clinic, and a psychiatric clinic. These units, said Mr. NIXON BROWNE, were only a part of the general development of Glasgow's hospital services which the Western Regional Hospital Board was now undertaking, though each was important in its own way. Other work being planned included such major schemes as a new maternity hospital for Glasgow and a radiotherapy institute, complementing the one recently opened in Edinburgh, to serve the West of Scotland. The cost of the three units at the Southern General Hospital was £175,000.

Medical Libraries and the Copyright Act.—The Copyright Act, 1956, came into force on June 1. Among the Regulations issued by the Board of Trade under the Act, and also coming into force on June 1, were the Copyright (Libraries) Regulations, 1957 (S.I. No. 868, of 1957). These Regulations exempt certain teaching and research libraries, including those concerned with medicine and science, from the provisions of the Act so far as the copying of copyright works is concerned, where this is done for research, private study, or to supply other libraries. The Regulations prescribe the conditions under which such copying may be done. The Copyright (Libraries) Regulations, 1957, are obtainable from Her Majesty's Stationery Office, price 3d. net.

"Journal of Aviation Medicine."—A "microcard" edition of volumes 1 to 27 (March, 1930, to December, 1956) of the

Journal of Aviation Medicine is now available. Subsequent volumes will be published on "microcards" early in the year following their appearance. The *Journal of Aviation Medicine* is the official journal of the Aero Medical Association of the United States. The 180 cards on which the 27 volumes are recorded are obtainable from the Microcard Foundation, Box 2145, Madison 5, Wisconsin, U.S.A., price \$45.

Perinatal Mortality Survey.—The National Birthday Trust's survey of perinatal mortality has been postponed from November this year until the first week of March, 1958 (see the note in our issue of May 18, p. 1192). A further pilot survey on perinatal mortality will, however, be carried out in November: a pilot survey in Nottingham has already been completed. The main survey, besides the one-week survey of all births in England, Scotland, and Wales, will now include an inquiry by health visitors eight weeks later into the "health, fate, and feeding" of some of the babies born during the survey week, and a pathological assessment of all infant deaths occurring within three months of the start of the survey week. It is estimated that about 4,000 infant deaths will be available for pathological study during the three months.

F.R.C.S. (Eng.).—At a council meeting of the Royal College of Surgeons of England on June 13 the following were admitted fellows:

J. W. Garraway, W. J. L. Harries, E. J. Hargadon, M. D. Lord, W. K. M. C. Watkins, G. R. Benett, P. S. Watson, D. H. Nixseaman, G. Kazantzis, B. L. Whitaker, M. W. F. Dunning, H. E. D. Griffiths, H. B. Eckstein, P. E. Huddy, P. H. E. Courtenay, P. Goodall, J. W. Goodfellow, G. P. C. Orlay, K. M. Fussell, E. Kirz, C. R. Griffin, B. T. Hammond, A. Charan, G. Goswami, A. M. Ahuja, M. Husain, N. K. G. Mendis, D. D. Beard, J. H. Hodgson, A. R. Kirby, M. K. Marchant, M. K. Senapati, C. V. Wijesinha, J. A. Wilkinson, N. A. Allouba, A. G. Bond, A. K. Chaudhry, H. D. P. Goonatillake, G. A. D. Lavy, B. K. Madden, A. M. Mendis, B. Nolan, G. J. Smart, O. Wesley-James, E. Bader, R. Basu, R. G. K. de Castro, M. H. Flint, J. R. W. Gleave, S. Z. Haider, C. D. Levis, I. J. MacQueen, S. K. Mukhopadhyay, D. Sengupta, D. C. Vora, B. M. Andrea, S. K. Bulchandani, K. V. Chaulal, H. Collinson, K. B. Cornwell, A. Litton, J. R. McQuaide, G. M. Nunn, R. A. Patel, J. P. Richardson, A. G. G. Robson, N. Samuels, B. D. Sharma, K. N. Sharma, T. Stack, H. Sunderland, J. G. Sweeney, C. Toker, R. O. Wise, F. C. O. Allen, J. R. Badger, K. S. Brearley, M. R. Chaudhary, H. J. Done, H. L. Duthie, W. J. Eskdale, R. K. Greenwood, R. S. M. Ling, D. C. Mackenzie, B. R. Meyerowitz, J. F. Newcombe, I. C. Patel, V. M. Rao, F. P. Soonawalla, D. W. Whiteway, C. A. Cass, J. A. Evans, N. J. Jackson, P. R. Knight, P. Knipe, A. B. Oliveira, R. C. Varma, J. Ludbrook.

F.R.C.S. (Otolaryngology and Ophthalmology).—At a council meeting of the Royal College of Surgeons of England on June 13 the following were admitted fellows: *In otolaryngology.*—R. A. Williams, R. V. Tracy Forster, G. O. Clark, R. K. Roddie, A. W. Morrison, B. W. M. Bushell, I. H. Jafri, and V. T. Hammond. *In ophthalmology.*—P. A. Graham and R. Pararajasegaram.

W.H.O. Executive Board.—Sir JOHN CHARLES, chief medical officer to the Ministry of Health, was elected chairman of W.H.O.'s executive board at the opening of its 20th session. Dr. P. E. MOORE, director of Indian and Northern Health Services in the Canadian Department of National Health and Welfare, was elected one of the two vice-chairmen.

Editor of "Chemistry and Industry."—Mr. W. E. DICK has been appointed editor of *Chemistry and Industry*, the weekly journal of the Society of Chemical Industry. He was previously for many years editor of *Discovery*.

London University.—Dr. M. J. H. SMITH, Ph.D., senior lecturer in chemical pathology at King's College Hospital Medical School, has been appointed to the university readership in that subject tenable at the School.

Sheffield University.—The following new appointments were among those announced after a meeting of the university council on June 21: Dr. G. R. HERVEY, lecturer in physiology; Dr. H. ECKERT, temporary assistant lecturer in therapeutics; and Dr. G. HOLMES and Dr. W. J. C. WILKINSON, demonstrators in anatomy.

Dr. D. B. Jelliffe, visiting professor of tropical medicine at Tulane University, New Orleans, and formerly W.H.O. visiting professor of paediatrics at the All India Institute of Hygiene and Public Health, is making a survey of comparative methods of preventive paediatrics in the Caribbean. The survey is being conducted under the auspices of the China Medical Board of New York.

COMING EVENTS

Industrial Medicine for General Practitioners.—Intensive course at the London School of Hygiene and Tropical Medicine, September 23–29. Apply by July 1 to the registrar, London School of Hygiene and Tropical Medicine, Keppel Street, London, W.C.1, from whom further details may be obtained.

Royal Medico-Psychological Association.—116th annual meeting, Oxford, July 2–5, under the presidency of Dr. R. W. ARMSTRONG. Meeting open to members and guests. Further details from the secretary of the association at 11, Chandos Street, Cavendish Square, London, W.1.

M.R.C. Open Lecture.—July 5, 5 p.m., at the National Institute for Medical Research, Mill Hill, London, N.W.7. Dr. GEORGE W. CORNER will speak on "The Rockefeller Institute for Medical Research; its Founders and its Achievements."

Second International Congress of Psychiatry.—Zurich, September 1–7. The main theme will be a review of our knowledge of the schizophrenias. Details from the general secretary, 28, Lenggstrasse, Zurich, 8, Switzerland.

NEW ISSUES

Journal of Clinical Pathology.—The new issue (Vol. 10, No. 2) is now available. The contents include:

- A SPECTROPHOTOMETRIC METHOD FOR THE RAPID ESTIMATION OF BLOOD OXYGEN SATURATION, CONTENT, AND CAPACITY. I. C. Roddie, J. T. Shepherd, and R. F. Whelan.
- THE ESTIMATION OF NORADRENALINE IN URINE AND ITS EXCRETION IN NORMAL AND HYPERTENSIVE SUBJECTS. W. J. Griffiths and Susanne Collinson.
- A MICRO-METHOD FOR SERUM CALCIUM AND SERUM MAGNESIUM. R. H. Wilkinson.
- A NEW COLORIMETRIC MICROESTIMATION OF SUGAR IN BLOOD AND BIOLOGICAL FLUIDS. I. St. Lorant.
- THE ESTIMATION OF CATECHOLAMINES IN URINE BY A CHEMICAL METHOD. H. Weil-Malherbe and A. D. Bone.
- A PAPER-CHROMATOGRAPHIC TECHNIQUE FOR THE DETERMINATION OF PLASMA CORTICOSTEROIDS. Barry Lewis.
- HYPERNATRAEMIA IN EXTRARENAL URAEMIA. Joan F. Zilva and J. N. Harris-Jones.
- A METHOD FOR DEPROTEINIZATION OF BLOOD AND OTHER BODY FLUIDS. G. Hunter.
- PORPHYRIN METABOLISM AND BARBITURATE POISONING: OBSERVATIONS ON CASES OF ACUTE AND CHRONIC POISONING. Torben K. With.
- A CASE OF ANURIA DUE TO DESTRUCTION OF GLOMERULI. John C. Dick.
- LYMPH-NODE CHANGES DUE TO POLYVINYL PYRROLIDONE. Robert P. Towers.
- IMPROVED METHODS FOR DETECTING α , ϵ -DIAMINOPIMELIC ACID IN LUNG LESIONS. R. Condon and A. Howard.
- THE PATHOLOGY OF SICKLE CELL HAEMOGLOBIN C DISEASE AND SICKLE CELL ANAEMIA. G. M. Edington.
- LOCAL INFECTION WITH *Pasteurella septica* AFTER A DOG BITE. H. E. Emson.
- ESTIMATION OF NUCLEOTIDE CONTENT OF RED CELLS. N. C. Hughes Jones and Margaret A. Robinson.
- Neisseria pharyngis* BACTERIAEMIA IN A PATIENT WITH SUBACUTE BACTERIAL ENDOCARDITIS. Reginald Hudson.
- THE SENSITIVITY OF *Proteus* TO NITROFURANTOIN *in vitro*. P. W. Kippax.
- SURVIVAL OF BLOOD GROUP FACTORS AFTER DEATH. J. B. Enticknap.
- TECHNICAL METHODS:
 - AN AUTOMATIC DISPENSER FOR MULTIPLE SEROLOGICAL TITRATIONS. B. Weitz.
 - A SLIDE RULE FOR HAEMATOLOGICAL CALCULATIONS. J. W. Nicholas.
 - THE DETERMINATION OF ESTERIFIED (UNPLIT) FAT IN FAECES. S. L. Tompsett.
- ASSOCIATION OF CLINICAL PATHOLOGISTS: 58th General Meeting.

Issued quarterly; annual subscription £2 2s.; single copy 12s. 6d.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

Ophthalmic Literature.—The new issue (Vol. 10, No. 4) is now available. It contains a comprehensive selection of abstracts of the literature on ophthalmology and related subjects. Six issues and a volume index each year; annual subscription £4 4s. (or in combination with *British Journal of Ophthalmology*, £7 7s.); single copy 25s.; obtainable from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1.

SOCIETIES AND LECTURES

A fee is charged or a ticket is required for attending lectures marked ●. Application should be made first to the institution concerned.

Monday, July 1

INSTITUTE OF NEUROLOGY.—5.30 p.m., Professor J. C. Eccles (Australia): Central Action of Afferent Impulses from Muscle Spindles.

Tuesday, July 2

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5 p.m., Imperial Cancer Research Fund Lecture by Dr. I. Berenblum (Israel): Some Recent Advances in Skin Carcinogenesis.

Wednesday, July 3

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Mr. O. S. Tubbs: Surgery of the Pericardium.

INSTITUTE OF LARYNGOLOGY AND OTOTOLOGY.—5 p.m., Dr. N. Rh. Blegvad (Copenhagen): A Modern View of the Treatment of Sinusitis. 6 p.m., Dr. B. T. Withers (Houston, Texas): Combined Operation of Submucous Resection and Rhinoplasty (with colour film).

Thursday, July 4

LEBANON HOSPITAL FOR MENTAL AND NERVOUS DISORDERS.—At Winter Garden, Cora Hotel, Upper Woburn Place, W.C.1, 5 p.m., 58th annual meeting.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—5.30 p.m., Otolaryngology Lecture by Dr. W. H. Kelleher: Modern Approach to the Treatment of Respiratory Defects in Polymyositis.

Friday, July 5

INSTITUTE OF DISEASES OF THE CHEST.—5 p.m., Dr. F. H. Young: clinical demonstration.

APPOINTMENTS

DUTTON, W. A. W., M.B., Ch.B., M.R.C.O.G., M.M.S.A., Tutor in Obstetrics and Gynaecology, Queen's University, Kingston, Ontario.
NORTH-WEST METROPOLITAN REGIONAL HOSPITAL BOARD.—*Consultants*, Margery G. Blackie, M.D., F.F.Hom., Homoeopathic Physician, Royal London Homoeopathic Hospital; Ben Cohen, M.B., F.R.C.S., D.L.O., Ear, Nose, and Throat Surgeon, St. Mary's Cottage Hospital, Hampton; F. A. Binks, M.D., M.R.C.P., Assistant Physician, Edgware General Hospital; J. W. Lewis, M.B., F.F.A.R.C.S., Anaesthetist, Clare Hall Hospital; Philippa E. I. M. Southey, M.B., D.M.R.D., Radiologist, St. Charles' Hospital, Senior Hospital Medical Officer, W. W. Campbell, M.B., Ch.B., Assistant Psychiatrist, Leavesden Hospital.
REINHOLD, J. D. L., D.M., M.R.C.P., D.C.H., Assistant Professor of Paediatrics in the University of Colorado from July 1, 1957.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Gordon.—On June 10, 1957, in Adelaide, Australia, to Nesta (formerly Lewis), wife of William Fleming Gordon, F.R.C.S., a daughter.

DEATHS

Adamson.—On June 6, 1957, at Ellinge, Alkham, near Dover, Kent, Charles Henry Adamson, M.B., F.R.C.S.Ed., aged 86.
Beattie.—On June 8, 1957, at Levuka, Fiji, Ivor Hamilton Beattie, L.M.S.S.A.
Blake.—On May 12, 1957, Lilian May Blake, L.R.C.P.S.Ed., L.R.F.P.S., of Woodland Avenue, Northampton, formerly of Colwyn Bay.
Cawthorn.—On May 31, 1957, at Mooroonpa, Victoria, Australia, Frank Raymond Cawthorn, O.B.E., M.B., B.S., Colonel, I.M.S., retired.
Cons.—On June 5, 1957, Dennis Neville Cons, M.B., B.S., of Perry Vale, London, S.E.
Crooke.—On June 6, 1957, William Crooke, M.R.C.S., L.R.C.P., of Woodhome, Willaston-in-Wirral, Cheshire, formerly of Wallasey.
Hewitt.—On June 7, 1957, at Summerlea, Sandown, Isle of Wight, Robert Morton Hewitt, M.D., aged 86.
Lucey.—On June 8, 1957, at Eastbourne, Sussex, Herbert Cubitt Lucey, M.D., D.P.H.
Mandy.—On June 5, 1957, at Cornerways, Tanners Hill, Hythe, Kent, Percy Stephen Mandy, M.R.C.S., L.R.C.P., aged 85.
Morgan.—On June 5, 1957, at the London Hospital, Henry Lewis Morgan, M.D., F.R.C.S., of Hindhead, Surrey, late of Bishop Auckland, Co. Durham, and Valparaiso, Chile.
Oesterlein.—On June 12, 1957, at his home, "High Point," Ripley Road, Knaresborough, Yorks, William Henry Oesterlein, M.B., Ch.B., D.Obst.R.C.O.G.
Patey.—On June 2, 1957, at Newton Abbot, Devon, Walter Patey, M.D., aged 74.
Ritchie.—On June 3, 1957, in London, Theodore Francis Ritchie, D.S.O., M.B., Ch.B., Lieutenant-Colonel, R.A.M.C. (retired), aged 80.
Robertson.—On May 29, 1957, at his home, 613, Newark Road, Lincoln, Daniel Robertson, M.B., Ch.B., aged 52.
Stewart.—On June 13, 1957, George Herbert Stewart, O.B.E., M.B., Ch.B., Lieutenant-Colonel, I.M.S., retired, of Le Beau Côté, St. Saviour's, Jersey, Channel Islands, aged 82.
Slessor.—On June 9, 1957, at 24, Saltoun Place, Fraserburgh, Aberdeen-shire, Robert Alexander Slessor, M.B., Ch.B., D.P.H., aged 80.
Thomson.—On June 8, 1957, at the Royal Northern Infirmary, Inverness, Edward Russell Thomson, M.B., Ch.B., of 39, St. John Street, Hanley, Staffs.

Any Questions?

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Early Symptoms of Parkinsonism

Q.—What are the earliest symptoms in Parkinson's disease? Is dysuria one of them?

A.—It is usually true to say that in Parkinsonism physical signs precede symptoms, and the neurologist will often recognize early evidence of Parkinsonism in a patient who is being examined for some other reason. If the patient does seek advice because of symptoms, he will usually complain of tremor (which he will probably have had for a considerable time and may well be fairly advanced) or slowness of movement either in one hand or of the body in general. At an early stage a patient with Parkinsonism may become unsteady and will sometimes present himself because he has, in fact, fallen when trying to turn quickly. Only rarely will early changes involve alteration in the voice or in the handwriting. Dysuria of any kind is no feature of Parkinsonism even in its advanced stages, and the presence of dysuria in a patient clearly suffering from Parkinsonism will certainly have some other origin, such as prostatic enlargement.

Chlorpromazine Rashes

Q.—What skin rashes occur with chlorpromazine, roughly in order of frequency? Are any characteristic of the drug? Should its administration be stopped if a rash appears?

A.—Skin rashes occurred in 27 (5.5%) of 412 patients treated with chlorpromazine mainly for psychiatric conditions.¹ The majority of these gave a history of allergic responses to other drugs. The rash occurred usually in the second week of treatment. Only two patients were receiving less than 100 mg. a day. Above this level there was no correlation with dosage or duration of treatment. When the drug was stopped the rash usually cleared within a week and did not recur if treatment was started again. In some cases the rash disappeared in spite of the continued administration of chlorpromazine. The types of rash recorded were generalized dermatitis (6), maculopapular (2), generalized erythema multiforme (2), generalized exfoliative dermatitis (2), and acneiform lesions of the face (1). The remainder appear to have suffered from a dermatitis localized to the arms, chest, neck, and forehead. Pruritus, often persisting after the rash had disappeared, was common, and one patient remained sensitive to light for some time.

REFERENCE

¹ Moyer, J. H., Kinross-Wright, V., Finney, R. M., *Arch. Intern. Med.*, 1955, 95, 202.

V.D. Prophylaxis

Q.—Apart from abstinence or the use of a condom, what is the best means of prophylaxis against venereal disease? I have in mind the type of man who, if he uses a condom, has difficulty in performing the sexual act.

A.—Micturition and the use of soap and water immediately after coitus are probably the most effective anti-gonococcal measures. The gonococcus is not motile but is deposited at the meatus in a droplet of mucus, whence it infects the meatal mucous membrane by progressive colonization. If this droplet is washed away and the glans and mucous surface of the prepuce can be carefully cleansed, the odds are against infection taking place.

The use of treponemacidal creams containing mercury or arsenic, and especially those containing penicillin, is not recommended, nor is the swallowing of penicillin tablets

before or after exposure to infection. Syphilis is far too serious a disease to risk masking it with insufficient treatment without follow-up, for that is what such chemoprophylaxis really amounts to. Occasionally the disease develops silently, and the promiscuous man or woman is well advised to submit to a periodic blood test.

Value of Dieting in Gout

Q.—What is the value of dietary restriction in gout? What foods are worth avoiding, and is it possible to obtain appropriate diet sheets?

A.—The value of dietary restrictions in gout is less now that such potent uricosuric agents as probenecid are available. This drug can be administered for long periods, and by its use the level of uric acid in the serum of gouty subjects can be lowered to within the normal range. In patients who are prone to frequent attacks of gout it is wise that in addition they should avoid foods with a high purine content. The following contain large amounts of purine: sweetbreads, kidneys, liver, sardines, whitebait, herring roes—and, in smaller amounts, ham, bacon, pork, goose, duck, and all shellfish. Diet charts for gout can be obtained from Messrs. H. K. Lewis & Co., Ltd., 136, Gower Street, London, W.C.1.

Effect of Amputation of Cervix on Child-bearing

Q.—What complications may be anticipated during pregnancy and labour in a woman who has undergone amputation of the cervix uteri?

A.—It is well recognized that the higher the cervix has been amputated, the higher the incidence of abortion and premature labour in subsequent pregnancies. According to the figures collected by Hunter¹ there is also an increased incidence of antepartum haemorrhage, probably due to tears in the cicatricial lower uterine segment.

If only amputation of the cervix was done at operation, then a conservative attitude to labour may be adopted provided that the amputation was not high and that the cervical rim has softened to some degree with advancing pregnancy. However, the patient must be confined in a fully equipped maternity unit, for if the cervical stump fails to dilate in labour, caesarean section will be necessary; while if vaginal delivery is effected a cervical laceration may require suturing.

If the cervical amputation has been performed as part of a pelvic floor repair, obstetricians are somewhat more inclined to perform elective section. In 100 women delivered after the 36th week in Hunter's series, the section rate was 18%, two-thirds being performed electively and one-third after the cervix had failed to dilate in labour. One relevant factor is that the patient may express concern lest vaginal delivery be followed by recurrence of prolapse with the need for a further operation. But the physiological effects of pregnancy, and not the method of delivery, alone determine the outcome to the pelvic floor in the individual case, and even elective section cannot be a guarantee against recurrence of the prolapse. If vaginal delivery is envisaged, a liberal episiotomy should be performed.

REFERENCE

¹ Hunter, J. W., *J. Obstet. Gynaec. Brit. Emp.*, 1955, 62, 809.

Diesel Oils and the Skin

Q.—Is it true that diesel oils are particularly apt to cause skin lesions in those exposed to them, and, if so, why? What is the best protection for the hands for those working in garages, etc.?

A.—Diesel oils are a frequent cause of skin lesions. These oils are often produced by the direct distillation of crude oil without subsequent refining and may contain up to 1.5% of organic sulphur compounds, which are recognized skin irritants. Diesel oils have a high viscosity and consequently are difficult to remove from the hair follicle by ordinary washing once skin contamination has occurred. The oil

tends to remain in the hair follicle, where the continued irritation gives rise first to comedo formation. Subsequently acne-like lesions may develop and, if rupture of the dilated sebaceous gland into the dermis occurs, a sterile abscess may form. This may later become infected. Since the oils are difficult to remove, powerful cleansing agents such as paraffin or petrol are frequently used. These, of course, are also apt to cause dermatitis.

Gloves are the best protection for the hands, but where fine manipulations are required gloves may not be usable. Barrier creams are of relatively little value. They prevent the oil from filling the cracks by the nails and the skin creases, but do little to prevent penetration of the hair follicle or to assist removal from the follicle. Where contamination with diesel oils has occurred the use of one of the more powerful industrial cleansing agents is justifiable. After using such a cleansing agent the skin should be thoroughly rinsed, dried, and anointed with an emollient cream.

"Liver Palms" and Vascular Spiders

Q.—What is the clinical significance of "liver palms" and vascular spiders? Does the presence of either of these signs in an otherwise normal person presenting himself for life insurance examination indicate a need for further investigation, and, if so, what should be done?

A.—Erythema of the palms may signify liver disease but is also found with pregnancy, rheumatoid arthritis, certain cancers, especially bronchial, and in some normal people often familiarly. Vascular spiders, likewise, may indicate liver disease, particularly cirrhosis, but may also occur in normal pregnancy, in rheumatoid arthritis, and in normal people, especially children. The finding of a few vascular spiders is not sufficient to diagnose liver disease, but the development of many, with increasing size of old ones, should not be dismissed lightly, and cirrhosis must definitely be excluded before life insurance. Both signs occurring together are more significant than either alone.

A past history of acute hepatitis, especially if severe or relapsing, or of heavy alcoholic intake should be elicited. The most important corroborative evidence clinically is hepato-splenomegaly. The urine should be examined for excess of urobilinogen, and the serum bilirubin, albumin, and globulin, and the thymol and zinc sulphate tests performed. If the diagnosis remains in doubt the patient should not be accepted for life insurance until further assessment in hospital has been undertaken. This may include the bromsulphthalein excretion test and aspiration liver biopsy.

Toxicity of Paint Strippers

Q.—What are the principal chemical constituents of paint strippers, and what hazard do they entail for the professional and the amateur decorator?

A.—There are several methods of paint removing. The blowlamp, caustic liquids, solvents with wax to delay evaporation, all have their uses. Caustic liquids are damaging to skin, eyes, and clothes, but otherwise are not harmful, unless of course they are swallowed. It is the solvent group of paint removers which present the major hazard to both professional and amateur users. The following solvents merit special care in that their fumes should not be inhaled; benzene, methylene chloride, and methyl alcohol (methanol).

The risks to health from benzene are twofold. In high concentrations it is a powerful and swift narcotic, while exposure to lower concentrations over a period of time causes serious damage to the bone marrow, showing itself in blood changes. The narcotic effect of methylene chloride is less than that of chloroform, but its local irritant effect is somewhat greater. In lower concentrations over a period, damage to liver and kidneys has been described. Methylene chloride decomposes in the presence of heat and moisture to form phosgene and hydrochloric acid. Phosgene is a cause of pulmonary oedema. Methanol is none other than wood alcohol, and its main toxic effect is on the optic nerve; it

also has narcotic properties. As well as the inhalation risk with the solvent strippers there is also a risk of skin damage which calls for suitable measures to minimize contact.

The fire risk of solvents in paint removers merits as serious consideration as do the risks to health from inhalation. Paint stripping with a solvent should never be done in a poorly ventilated, confined space. In other situations the amateur decorator may avoid trouble by opening windows and doors, but for the professional, who may have repeated exposures, local mechanical exhaust ventilation is a better protection.

Ease of Ophthalmoscopy in Girls

Q.—When examining the optic fundus I find it much easier to get a good view in the case of young women and girls than in youths or older people of either sex. The reason appears to be that their pupils are larger. Is this a well-recognized fact, and, if so, what accounts for it?

A.—It is well known that the pupils of children and adolescents are larger and more active than those of adults, the pupil becoming smaller and less active with increasing age. Women also tend to have larger pupils than men.

Apart from the obvious variations in pupil size due to variations in the amount of light entering the eye, emotion may also have marked effects. Almost any strong emotion, pleasant or unpleasant, can cause pupillary dilatation, and anxiety or fear are the commonest causes of this. It is probable that the anxiety associated with the approach of an unfamiliar instrument in a patient predisposed by age and sex to a large labile pupil accounts for the pupillary dilatation in young women during ophthalmoscopic examination.

Protruding Ears

Q.—What treatment is advised for a female baby with very large protruding ears. Will binding the ears back have any effect? Alternatively, if a plastic reconstruction is advised, when should this be undertaken?

A.—No treatment is advised for a female baby with very large protruding ears. Binding the ears back will have no effect whatever. There will be a natural tendency for the ears to fall back on their own, and there must be many girls about to-day who conceal some degree of aural deformity under their hair. Plastic surgery is advised only after the age at which the ears have ceased to grow. This is probably at or after 8 years of age. In my opinion operation should not be undertaken even then unless the child is anxious to have the deformity corrected.

Books of "Any Questions?" and Refresher Course Articles.—The following books are available through booksellers or from the Publishing Manager, B.M.A. House. Prices include postage. *Any Questions?*, Volumes 2 and 3 (8s. each); *Refresher Course for General Practitioners*, Volumes 2 and 3 (26s. 6d. each inland, 26s. overseas); *Clinical Pathology in General Practice* (22s. 3d. inland, 21s. 9d. overseas).

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British Medical Association

PROCEEDINGS OF COUNCIL

The Council met on Wednesday, December 19, at B.M.A. House, with Dr. S. WAND in the chair.

The Council received with deep regret the report of the death of Sir Lionel E. H. Whitby, President of the Association from 1948 to 1949, and of Dr. John Irvine Milne, of Manchester, member of Council from 1950 to 1956. The CHAIRMAN said that Sir Lionel Whitby and Dr. Milne had a great deal in common; both were popular and kindly men. Sir Lionel Whitby played a great part in the field of science, and he carried out his duties as President of the Association faithfully and scrupulously. Since his Presidency he had done a great deal for the Association in connexion with medical education. Dr. Milne was a very good member of Council and a good friend to the Association.

The members stood in silent tribute.

B.M.A. Honour

A letter was received from Sir Henry Dale expressing his appreciation of the honour which had been conferred upon him by the award of the Gold Medal of the Association. It appeared that the medal had not before been awarded to a research worker who had never been engaged in any form of actual practice, and this, said Sir Henry Dale, increased his sense of the exceptional honour done to him.

The Council unanimously agreed to record in the Association's Book of Valour the name and action of Lieutenant Stanley Grahame Sutton, R.A.M.C. Lieutenant Sutton, who is a National Service medical officer in the R.A.M.C., had displayed great gallantry and devotion to duty in Cyprus last June in rescuing and treating injured men trapped in a forest fire.

Part-time Work for Local Authorities

The CHAIRMAN reported that a special Subcommittee of Committee C of the Medical Whitley Council met in November to review the part-time fees payable by local authorities. The negotiations were based on the proposals for a new agreement drawn up by the Association's Liaison Committee and subsequently approved by the Council, and agreement was reached on all items in the claim. A new agreement was drawn up for England and Wales, and consultations are proceeding for Scotland. The new scale

of fees (see *Supplement*, December 29, p. 228) was formally approved by Committee C on December 12. The agreement would replace the 1947 and 1951 agreements. The Chairman added that this successful outcome was due in no small measure to the work of Dr. A. V. Kelynack, Assistant Secretary of the Association.

Remuneration Claim

The CHAIRMAN said that at the recent meeting of the Negotiating Committee he invited the Joint Chairmen, Sir Russell Brain and Dr. A. B. Davies, Acting Chairman of the General Medical Services Committee, to attend the Council meeting. Sir Russell Brain had felt unable to do so because of his constitutional position, but Dr. Davies had accepted.

Dr. A. B. DAVIES, at the Council's invitation, gave an account of events in connexion with the remuneration claim. The Negotiating Committee received and studied the report of the debate at the Council meeting held on November 7. At that time they were all awaiting the Minister's reply to the Memorandum sent to him on September 12. On October 18, addressing the Conference of the Executive Councils Association, the Minister said, "It is not true that we have considered the details of the claim." That was five weeks after he had received the Memorandum, and on November 3 the Minister wrote to Dr. Macrae that he would reply "shortly." The reply, received on November 22, consisted of two terse paragraphs cursorily rejecting the claim. After the Minister's original rejection of the claim in July, the Negotiating Committee put forward legal representations, and the Minister promised a reasoned reply based on the arguments of his legal advisers. No such argument was contained in the letter of November 21.

The suggestion that the matter should or could be brought before the Courts was a red herring. The Minister knew that the doctors' individual contract was not related in any direct way to the financial provisions of the terms of service. A medical practitioner applied "to take service in an area upon the terms and conditions for the time being in operation in that area and for admission to the Medical List." The terms and conditions in operation in any area at any particular time were on the overriding

contractual obligation which the Government had with the profession. It was not only a contractual obligation—it was a moral obligation and it was an act of faith. The profession came into the service on the Government's assurance that it would accept Spens. The Minister was now trying to cast that act of faith aside.

The profession had built its house upon a rock, said Dr. Davies, the rock of Spens. It seemed firm and indestructible, but underneath that rock there were shifting sands, the shifting sands of ministerial trickery. The Minister said, "We have no contractual obligation"; and the profession had been betrayed. The Negotiating Committee was stunned, and the profession was shocked.

But the reply was not accepted. The same day letters were prepared and sent to the Minister and to members of the General Medical Services and Joint Consultants Committees. Dr. Davies authorized the sending out of a similar letter to local medical committees, and a statement was sent to the press. Because of the national situation the statement did not receive the publicity it might have done.

The Negotiating Committee had not retreated one inch from its position, nor had it surrendered one farthing of its claim. There had been several letters backwards and forwards trying to get the Minister to make a reasoned reply on the legal argument, but his replies were evasive. His last reply was that the Ministers found it difficult to see what they could usefully add to the correspondence, but they would be willing to meet the Negotiating Committee if it thought any good purpose would be served thereby. Dr. Davies said that after consultation with Sir Russell Brain he had authorized the publication of these later letters (*Supplement*, December 29, p. 227), and they would be found quite enlightening on ministerial views. In the middle of the correspondence Sir John Hawton elected to divide the Ministers' reply into two parts. The first part dealt with the validity of a claim, although the Minister had said that the Government had not considered the claim. On November 21 he had written that the claim had now been fully considered, and on December 4 he said that on the first part of the claim—namely, the merits of the case—the Ministers had decided that under present economic circumstances they could not consider it. The second part of the claim was on the matter of the contractual obligation, and again Sir John Hawton wrote, "It is our confirmed opinion that no such contractual obligation exists."

This, concluded Dr. Davies, brought the matter up to date.

To Dr. J. C. ARTHUR'S (Gateshead) question whether the Minister had ever been asked straight out, "Do you or do you not repudiate Spens?" Dr. DAVIES replied that he had not been asked that direct question.

Dr. E. C. DAWSON (Derby) also spoke on the question of the contractual obligation of the Government to act in accordance with the Spens Report. He understood that the profession had a cast-iron case on legal grounds as well as moral grounds. The Minister had challenged the profession to take the matter into court for adjudication, and Dr. Dawson could not see why the challenge should not be accepted. Had the Negotiating Committee considered taking it to court? To back out now would be a defeatist move.

The CHAIRMAN said that the obligation was subject to a "general overriding obligation to the profession." There was no written contractual obligation in the terms of an ordinary form of contract.

Dr. J. A. L. VAUGHAN JONES (Leeds) said that this was a serious position. A leading article in the *British Medical Journal* had spoken of the need for unity, and he would like the Negotiating Committee to feel that it had the profession behind it. He also wanted the profession to be satisfied that the Negotiating Committee was completely tied together and had a united purpose. He would like an assurance that there were no difficulties in the Negotiating Committee and that there was the unity spoken of in the *Journal*. The profession was considerably stirred up by

these happenings and was behind the Negotiating Committee all the way, but it should be organized fairly soon for action.

Dr. A. V. RUSSELL (Wolverhampton) said that the law was inclined to settle disputes on the letter rather than the spirit, and the outcome of a recourse to the courts might be doubtful. Dr. Davies had said it would be useless to proceed on their own contracts. The Danckwerts Award had set out clearly what should be the doctors' deserts in the light of the Spens recommendation. Spens, up to the moment, had been the profession's anchor. The profession entered into a gentleman's agreement which it had loyally supported, but the politicians were ruled by expediency and nothing else.

What was to happen now? There was a question of mass resignation, but they must be perfectly sure that the profession was united on that issue. The press was not friendly to the profession. But it seemed to the speaker that this unfortunate position offered a great opportunity. Dr. Dain had said in 1948 that they would be able to shape the Service from within, and all had worked extremely hard to do this, but because of political obstruction they had not been able to shape it as completely as they would like. If, as a result of this betrayal of faith—for it was nothing else—they were drawn into the position of rejecting the National Health Service, it might be that there would be an opportunity to frame a health service which would work more efficiently and more economically than at present, and at the same time give to doctors a return more commensurate with their responsibilities and status.

Dr. DAVID BROWN (Liverpool) said that many practitioners still felt confused about the matter. It was a blow to find that there was not the legal obligation on the Government that most of them had thought that there was. Was it possible to get the Government to agree to arbitration under the chairmanship of the man who set the standard, Sir Will Spens? Negotiations had been going on since February 7, and he did not know of any other profession or trade union which would be so complacent. If there was no satisfactory reply from the Ministry the Council should call a Special Representative Meeting before the end of January, and a meeting of Council should be held in the first half of January.

Dr. H. H. D. SUTHERLAND (London) said that many practitioners thought that the Danckwerts interpretation of Spens held for all time. Could the Secretary remind the Council of the statements made to the profession about May 7, 1948, when the Council determined to advise the profession to enter the health service on a series of statements and guarantees made by the then Minister of Health? The opinion was expressed then that these guarantees were insufficient and might be quite worthless, and the statements by succeeding Ministers of Health had confirmed that opinion.

Dr. ARTHUR said that they must be realistic. The courts might prove that there was a promise from the Minister in 1948 to honour Spens, but this could not bind the present Minister. His policy was decided by Parliament, and Parliament had to take regard of changing circumstances. The Minister was faced with the problem of stopping inflation, and he had reversed the policy of his predecessors in order to do so. If there was repudiation of Spens it might be the best rallying point for the profession one could possibly have. It might be better to ask the Minister the direct question.

Dr. H. GUY DAIN (Birmingham) said that when the Negotiating Committee met the Minister on January 4 he would probably say that the Government was not prepared to pay any more to doctors, that the claim had not been considered on its merits, that there might be a good case but the Government had not got the money and was not prepared at the moment to look at it. That was the sort of answer the Negotiating Committee was likely to get, and he thought it would be wise not to talk about taking legal action or going to arbitration. He was sure the Minister would not agree to arbitration.

What we should look at now, he said, was what steps we are going to take when we get a final "No." That was the problem to be studied now. Were mass resignations from the Service to be pressed for if there was a definite refusal of Spens by the Minister? If so, the profession would come out on a question of principle, not a question of money. Mass resignations were unnecessary. If doctors resigned in a body in a few areas of sufficient size it would be equally effective. He did not think it essential that consultants should resign. It was the general practitioners who could make or break the Service, and general practitioners were strong enough to do so.

Dr. G. W. IRELAND (Midlothian) asked whether it was possible to keep this issue isolated. He wondered if it could be looked at as something bound up with the whole structure of the National Health Service and with the professional status of the doctor in society. If this broader context was kept in mind there would be a different response from the Government and from the public. The Association must have a policy which covered the whole Service and not dealing merely with isolated events.

Dr. I. M. JONES (Sunderland) directed attention to a resolution of the Representative Body which said that the Council should assume greater responsibility for all claims by the profession, and he thought the Council should accept this fuller responsibility. Some clear-cut plan for the future should be adopted that day. He agreed with Dr. Dain on what the Minister's reply would be, but it was the Negotiating Committee's reply which had to be considered. Should it ask for independent arbitration? If the Minister refused, the profession would be faced with an issue which would affect the social and economic status of the doctor not only now but for many years to come. There should be a Council meeting early in January to decide what its attitude should be.

Quite apart from remuneration, many practitioners were concerned with the overall pattern into which medicine was drifting. An alternative to the present Service was being considered, and no doubt this would come to the Council in due course, but he could not agree that because such a plan was being developed it was a reason for delaying something which should have been done some time ago. The Government, this very summer, granted supplements to civil servants to cover increases in the cost of living in the last twelve months. The profession could not accept a proposition to wait another two or three years. The Divisions must know that the Council meant business and was making an effort to proceed with haste.

Mr. S. F. LOGAN DAHNE (Reading) said that the Council was being realistic and must continue to be so. This did not mean it would do anything to undermine the position of the Negotiating Committee, but it supported it. It seemed to him that there must be a Council meeting early in January. The British Medical Guild must be put into operation, and it must be got across to the Minister that the profession was prepared to fight. Whatever was eventually done must be done by the whole profession. The politicians must be made to realize that doctors were exceedingly important in the community and that the community would be in great difficulty without them. They had all done their best to make the Service work. They must win this time, for if they did not the profession was finished for ever.

Future Action

The CHAIRMAN said that it was clear that the Minister's reply did not satisfy the Council. He thought also the Council was agreed that not a lot of positive action could be taken until the outcome of the meeting with the Minister on January 4 was known. There remained the question of what could be done now. He would ask the Council not to be precipitate. Arbitration was a very good thing, but it could happen at the wrong time. It could be at the right time before the wrong man; it could be at the wrong time before the right man. The point was being reached where they had to decide on their general tactics. Could

anything be done in advance of the meeting on January 4? In view of what was likely to happen, should the weapons be sharpened now? ("Hear, hear.")

The plan of campaign perhaps should not be debated now, but there was one decision which could be taken, and that was whether the Guild machinery should be got going.

Dr. SUTHERLAND asked if it was possible to have the statement for which he had asked earlier, and the SECRETARY replied that there was a letter dated July, 1946, from the Permanent Secretary of the Ministry of Health to the British Medical Association in which it was said that the Minister fully accepted the Spens recommendations with regard to remuneration. In January, 1949, there was a statement in the House by the Parliamentary Secretary to the effect that when the final accounts for the period July 5, 1948, to March 31, 1949, had been made it would be possible to see whether the remuneration of general practitioners did in fact accord with the Spens recommendations. If it did not it would be gone into to see what adjustments were necessary. This statement referred to the General Practitioner Spens Report. With regard to the consultants and specialists, the Minister stated on June 3, 1949, that the report on the remuneration of consultants and specialists would be available the next day, and that "the Government accepts the recommendations in principle."

Dr. DAVIES, replying, said that the Negotiating Committee was absolutely united in purpose. On paper there were constitutional difficulties, but in fact they did not exist. It had been agreed when the Negotiating Committee was set up that neither the Joint Committee nor the General Medical Services Committee would act without the other, and that any decisions should be referred to the parent committees in each case. From the beginning the Council had endorsed the setting up of the Committee, and 50% of the members were members of Council. He could not commit either Committee on future action, but he would assure the Council he would do all he could to weld the different branches of the profession together.

With regard to resorting to the courts, Dr. Davies said that the Chairman of Council had answered Dr. Dawson. Other possibilities had been discussed, but these were matters for the Negotiating Committee, which would be advised on the views of the Council. He would assure the Council that there had been no delay on the part of the Committee.

Dr. F. GRAY (London) said that the Guild machinery should be put into operation immediately. This would take some time. In the past the Guild had been concerned with G.P.s only. It was now essential that all sections of the profession should be organized. This was not the time for passing resolutions or calling special meetings; it was a time for getting down to quiet preparation in readiness for every eventuality. Dr. Gray was quite certain that the Ministers would continue to say "No." The Guild had to reach members who never thought of attending an ordinary B.M.A. meeting, and it also required information from these members. It would be unwise to hold a special meeting of Council or a Special Representative Meeting until the Guild machinery was working. The energies of members of Council would be better employed in their areas than coming to London for a special meeting.

Dr. R. G. GIBSON (Winchester) thought the Divisions were ahead of the Council and the Guild machinery should be got to work now. Dr. J. A. L. VAUGHAN JONES said that in the area of the Yorkshire Branch the machinery was already working and the group leaders were meeting on January 9.

It was agreed to leave it to the Chairman to make the necessary decision about a special meeting of the Council. In any case the next meeting of Council was fixed for January 30.

It was also agreed, on the motion of Dr. A. BEAUCHAMP, that the Joint Chairmen of the Negotiating Committee be invited to attend the next meeting of Council.

Position of Negotiating Committee

In reply to Dr. I. M. JONES, who asked for a definition of the position of the Negotiating Committee *vis-à-vis* the Council, Dr. DAVIES said that the Negotiating Committee consisted of an equal number of members appointed by the General Medical Services Committee and the Joint Committee of Consultants and three public health members co-opted after the first meeting. The Committee's remit was to prepare the case, negotiate, and report to its parent committees. The Negotiating Committee had no funds whatever.

The CHAIRMAN added that the Negotiating Committee was an independent body representing the General Medical Services Committee and the Joint Committee. Only half of it was responsible to the Council, and it must be regarded as completely independent.

Dr. I. M. JONES commented that the Negotiating Committee had no power to accept any settlement without reference back to the two committees. Surely the General Medical Services Committee was responsible to the Council.

Dr. BEAUCHAMP thought the Negotiating Committee's job was to get the 24%, and if they failed they must inform their parent bodies and future action would have to be taken by the Association.

Dr. GRAY, speaking as a member of the Negotiating Committee, agreed with this view.

Dr. DAVIES said that it was essential that they should keep together, and there was a danger in drawing hard-and-fast rules on who was responsible for this or that.

Dr. R. HALE-WHITE (London) asked if the principle was accepted that if the 24% was not achieved the Negotiating Committee would report back to the Council.

Mr. A. LAWRENCE ABEL (London) did not think it was quite clear to the Joint Committee what they would do in the event of refusal. The G.M.S. Committee part of the Negotiating Committee would report back to the G.M.S. Committee, and the consultant members of the Joint Committee would undoubtedly report back to the Central Consultants and Specialists Committee. But the representatives from the Colleges on the Negotiating Committee would report back to the Colleges, who would make their own decision whether they would pull their weight with the Association. He was worried about that little gap.

Mr. H. H. LANGSTON (Winchester) agreed mainly with what Mr. Abel had said. The view was that the Negotiating Committee would report back to its constituent bodies. He hoped that the next step would be that the Joint Committee would fall in with any action that the Association felt it appropriate to take.

The CHAIRMAN said that the process of negotiation was very diverse, and it was only when one got into an impasse that one considered sanctions. He thought they had better be left for the moment.

Dr. J. G. M. HAMILTON said that it had been implied that the Royal College of Physicians, Edinburgh, had repudiated the remuneration claim. That was false. The College had believed that it was inexpedient and unwise to make the claim when the claim was made, but, having made its point, it did not resign from the Joint Committee and it had worked loyally with it. He had every reason to suppose that it would continue to do so.

General Medical Services Committee

It was agreed that the Acting Chairman of the Committee, Dr. Davies, should present the report. Dr. DAVIES then moved that the report be received.

Dr. R. FORBES (Hendon) raised a question on the provision under the protection-of-practices scheme that during an "emergency" a doctor absent from his practice would remain on the medical list and be expected to make deputizing arrangements to enable his practice to be carried on. The scheme departed from the scheme previously in operation in that it was proposed, on the absent doctor's return, that patients who had transferred to the list of another practitioner should be given the option of returning to his list or remaining on the list of the deputizing doctor. Those

who chose to remain on the deputizing doctor's list would be at liberty to do so, but he would not be paid for them for 12 months, the money being given to the practitioner who had returned, and from whose list the patients had been taken. Dr. FORBES asked if this agreed with Sections 31 and 36 of the Act, and whether it amounted to the buying and selling of a portion of a practice. Were the Association's solicitors consulted on this matter?

Dr. DAVIES replied that the Committee was asked to confine itself to minor emergencies, the Ministry refusing to consider any other type. The number of practitioners concerned was 9 or 11, and the Committee was anxious to preserve and protect the interests of these absentee practitioners. Patients would be informed that their own doctor had returned, but there remained the freedom of choice of the patient. The Ministry's lawyers had gone into the legal aspect, and the Committee was assured that there was no infringement of the Act.

Dr. W. M. KNOX (Glasgow) said that this provision was taken out of the scheme in operation in Scotland during the last war.

Dr. FORBES said he was concerned about the fact that the deputizing practitioner might be acquiring a certain number of patients from someone else at the price of a year's wages.

Dr. W. E. DORNAN (Sheffield) said that the basic principle of transfer of goodwill was that a man had something to transfer. If these patients were no longer prepared to adhere to him he had nothing to sell. He did not think any charge of breach of the provisions of Section 35 could be maintained in these circumstances.

Dr. FORBES asked for an assurance that something in writing would be obtained from the Ministry that this proposal was not an infringement of the Act, and Dr. DAVIES replied that it was now embodied in an Act of Parliament.

Dr. I. M. JONES raised the question of the Committee's comment on the resolution of the Annual Representative Meeting that précis of the evidence of witnesses before service committees should be prepared and signed by the witness, and that proceedings against a doctor before a service committee should be only in respect of a breach of the regulations, and that the doctor be notified in advance of the inquiry of the regulation of which he was alleged to be in breach. The Committee's comment was that the tribunal it was possible to seek further amendments at this stage. In any case this particular resolution was contrary to a decision taken by the Annual Conference of Local Medical Committees last year. He moved the reference back of this part of the report, but it was not seconded.

Dr. DAVIES said that the matter would be kept in mind, and when an opportune time came it would be gone into again.

Asked if the protection-of-practices scheme contained any reference to the purely private practice, Dr. ALEXANDER BROWN said that it did.

Dr. DAVIES moved that the remainder of the report be approved, and this was carried.

Dr. GIBSON said that there was an increasing shortage of radiographers, and he asked that the General Medical Services Committee should consider it, because the shortage was affecting the services available to the general practitioner.

Central Consultants and Specialists Committee

Mr. A. HOLMES SELLORS moved the reception of the report. Speaking to a recommendation that representations be made to the Ministry of Health that a national scheme for the training of mental health officers should be formulated and put into operation without delay, Dr. H. D. CHALKE said that there was already a working party on this. The recommendation was agreed to.

Arising out of the Waverley Report, the Committee had considered the concern of the Psychological Medicine Group Committee at the recommendation of the Waverley Committee that, although the directors of Army medicine and surgery should be up-graded to the rank of major-general, the directors of pathology and psychiatry should remain in

a lower rank. The Committee recommended that the Council should approve the principle that the directors of Army psychiatry and pathology should have equal status with the directors of medicine and surgery, and that representations should be made to the Minister of Defence accordingly.

Major-General J. C. A. DOWSE asked the Council to reject this recommendation. It was the custom in the Services to make senior appointments largely on the grounds of responsibility. The principle suggested by the Waverley Committee was that there should be three leaders of treatment in the armed Forces, and that the directors of surgery, medicine, and Army health should be major-generals. He understood that these recommendations had not yet received the great favour with the armed Forces, who were at the moment discussing the recommendations of the Waverley Committee. It was desired to improve the professional status of officers in the Army, Navy, and Air Force, but they did not consider this method of establishing posts for various professional people necessarily to be the correct one. It must be for the Service to decide whether rank should be given automatically, and he hoped it would be left to the Services to decide the appropriate ranks for the various branches of the profession.

Mr. LOGAN DAHNE said that the position of pathologists was very important. With regard to pathologists, he believed a great deal of our success in the Burma campaign was due to the high rank of the pathologists, who were thus able to get their advice adopted.

Mr. HOLMES SELLORS said that the Committee had not had the advantage of the information which Major-General Dowse had now given, and he felt a little uneasy about the recommendation.

The recommendation was not accepted.

Mr. HOLMES SELLORS, speaking on hospital medical staffing, said that the position was causing great anxiety and there was no immediate solution to the problem.

Mr. E. A. GERRARD (Manchester) said that there was a good deal of unhappiness in the junior hospital staffs. The registrar problem did not seem to be sorting itself out. This problem did not concern only the senior registrars. Registrars, senior house officers, and surgeons were all affected. The problem might appear beyond solution, but something should be done, and, if only they could get away from the idea that all consultants must be equal and that it was a disgrace to be an assistant physician or surgeon, it would be an advantage. He believed the Association should take a lead in this matter. The Council and the Central Consultants and Specialists Committee should try to sort it out and relieve this log jam. If something was not done he did not know what would happen.

Dr. HAMILTON said that the present position was deplorable. It was eighteen months since the Strachan Committee's report was put forward and accepted as Association policy, and now the principles of that report seemed to be dead. Everybody who looked at this matter in a realistic way realized that the hospital service must have another career grade. No service could be run by major-generals alone; there must be colonels. He would like to ask if the Chairman of the Committee could give an assurance that the proposals of his Committee contained the essential principles of the Strachan report, including that of a second career grade; if so, where were they?

Dr. DAVID BROWN said that a large part of the work in the hospitals to-day was carried out by senior registrars, and some of them even at the age of 40 were paid a ridiculously small salary for the work they were doing. They were discontented—and some were leaving the country for posts abroad.

Mr. LANGSTON said that the Ministry would not look at one of the main recommendations of the Strachan report, and that was why the Committee had not gone any further. Before any new form of grade was introduced as a permanent feature there had to be a review of the consultant and other needs of the regions. Until this had been done it was impossible to move the Ministry.

Mr. A. DICKSON WRIGHT said that under the old system there were assistant surgeons and full surgeons, and there should be something like that now. Much of the work was being done by registrars, and at present a man went straight from being a senior registrar to full consultant, and that was not right. If the consultant body could be increased by an influx of people of assistant standard it would not increase the number of full consultants. The position was arising now that when people over 40 years of age applied for a position they were considered on compassionate grounds, and the brilliant young man had to be content with a post as registrar. The great opponent to the assistant grade had been the B.M.A., because it felt that the Government would use these men in order to economize. But the right thing was to have some intermediate stage between full consultant and registrar. It was a criticism of the hospital service that so much was being done by the registrars.

Mr. HOLMES SELLORS said that it was continually being pointed out to the Ministry that there was a shortage of consultants. It had always been Association policy that there should be more consultants. On the question of the assistant consultant grade, had they not been warned by what had happened in the S.H.M.O. grade? Many had not a clear idea of what they meant by an assistant consultant. If registrars were doing more work than they should, was it not time for the consultant to ask for more help? He was very unhappy at the idea of a new grade being created.

Dr. ARTHUR asked if Mr. Holmes Sellors would agree that, if a consultant was a consultant for 20 years and a registrar was a registrar for ten years, there must be twice as many registrars as consultants.

Mr. GERRARD moved "That the Council expresses its concern at the lack of progress which has been made in solving the problem of hospital medical staffing." The CHAIRMAN said that the debate would be reported, and suggested that this would indicate that the Council's mind was seriously exercised about this problem.

Mr. LOGAN DAHNE, referring to the visit of Lord Moran to the committee to give an account of the work of the Minister's Advisory Committee on Distinction Awards, said that he had no doubt that the people who received distinction awards deserved them, but this Committee was dispensing public money in strict secrecy. No one knew who received what or why. They were entitled as taxpayers to know a little more about how and why this public money was dispensed.

Mr. D. S. PRACY (Atherstone) moved that this paragraph of the report be referred back.

Mr. DICKSON WRIGHT said that it would be contrary to ethics to publish this kind of information: it could be regarded as advertising.

Dr. DAVID BROWN seconded the reference back. He did not think anybody was very satisfied about a committee which worked in secrecy. The money should be a responsibility payment, as the Representative Body had said.

Dr. I. D. GRANT asked if some consideration could be given to the question of responsibility payments. If a consultant was of sufficient value to the community to be appointed in charge of wards then he had sufficient standing to merit an award or a responsibility payment for the work he did. The ordinary practitioner could see very little to choose in the men who were in charge of the wards. They were all equally good.

Mr. HOLMES SELLORS said that the Committee went into the question of responsibility payments. He did not claim that Lord Moran's Committee was right every time, but it was nearly always right, and anyone who felt that he should have a merit award could apply to the Committee. The fact that there were a number of vacancies was periodically notified. If the profession decided that they did not want the merit award system it would be abolished and the money would be lost.

Dr. WRATHALL ROWE thought that the Central Consultants and Specialists Committee could produce a tentative alternative scheme on which the Representative Body might

give its views. The point of the general practitioner having some say in merit awards was very important.

Mr. LANGSTON said that the point not brought out in the Committee's report was that this was the first major discussion it had had on this question for a long time. Lord Moran was invited to attend the Committee and give as much information as he felt able to. The paragraph in the report, "The Committee does not consider it desirable to take any action which would result in the abolition of the distinction award system, and it has reaffirmed its confidence in Lord Moran and his advisory committee," was actually passed in the form of two resolutions. If a reference back was accepted, the Council would be passing something contrary to the consultants and specialists' own resolution arrived at after a full discussion. It would be a serious matter in the eyes of the Committee. There was no question at all but that the entire Committee, representing all the consultants in the country, expressed an overwhelming vote in favour of the merit award system as it now stood.

Dr. J. A. PRIDHAM (Weymouth) said that this was a matter for the consultants themselves, and it would be unfortunate if the Council turned this down.

The reference back was defeated.

Dr. D. BROWN, referring to the Committee's comment on a resolution of the Annual Representative Meeting stating that the Council had failed to implement a resolution passed at the 1955 meeting relating to the Bradbeer report on the internal administration of hospitals, said that his Division's resolution was carried overwhelmingly by the Representative Body and yet the same evasive reply was received from the Committee. The resolution had expressed the belief that the lay and ancillary services must be subordinate to the medical and that the equal tripartite administration recommended by the Bradbeer Committee was not in the interest of the patient.

Mr. HOLMES SELLORS said that the Committee had made a careful commentary on the Bradbeer report, which was adopted by the Joint Committee.

Mr. STAVELEY GOUGH said that he had a great deal of sympathy for the attitude of the Representative Body. This was the one part of administration where the overall responsibility of the doctor stood out. The doctor-patient relationship was involved.

The CHAIRMAN said that the resolution was not mandatory and he wondered if the Committee would look at it again.

Dr. BROWN said he wanted the Council to consider this matter. A policy-making resolution had been passed by the A.R.M. and an autonomous body was flouting it.

It was agreed that the matter should be referred back to the Committee. A paragraph dealing with resolutions of the Representative Body on general-practitioner beds in hospital was also referred back. A further paragraph commenting on a resolution of the Representative Body recommending that all medical grades of so-called "whole-time" hospital staff should be allowed to pursue the practice of their profession in their off-time duty, and which after consideration was opposed by the Committee, was withdrawn.

The remainder of the report was adopted.

Private Practice Committee

Dr. ALEXANDER BROWN presented the report, which included a report on the negotiations with the Treasury on fees for part-time services by general practitioners for Government departments. One outstanding matter, the fee for a full examination and report in a single case, remained to be settled. The Committee recommended that the Treasury be informed that the Association considered that the fee for a comprehensive medical examination should be at least £2 2s., but would accept the offer of 37s. 6d. for this service without prejudice to the reopening of negotiations at an early date. The recommendation was agreed to.

Dr. HALE-WHITE asked if there was anything to report on the question of drugs under the National Health Service for private patients.

Dr. BROWN replied that there had been a joint meeting of the Private Practice Committee and the General Medical Services Committee, and a report of this meeting would be considered by each Committee at its next meeting. What the result would be he could not say at the moment.

The report was approved.

Finance

Mr. L. DOUGAL CALLANDER, Treasurer, presented the financial report. He said that finance was running more or less in the way he predicted at the last meeting, and he was still hopeful that there would be a surplus of £12,000 as against £47,500 last year. The Brighton meeting was very successful, but the cost of Representative Meetings was becoming from some points of view very high. The income from the exhibition depended on the size of the hall, and it might be necessary to consider seriously resorts where there was ample accommodation. It was never possible to accommodate all the people who wanted to exhibit. The position was more difficult than ever with the scientific exhibition. It was most undesirable to charge a registration fee, but the cost of the meeting was increasing very markedly. It had been suggested that he should be consulted on all proposals of the local executive committee involving expenditure of funds provided by the Head Office.

The report was agreed to.

Long Service of Staff

The CHAIRMAN OF COUNCIL, presenting the Office Committee report, drew attention to the retirement of Mr. W. Fish, of the accounts department, who had been in the service of the Association for fifty years. The Council agreed that suitable recognition should be made of his long and faithful service. The Committee had also considered a memorial to Miss M. E. Gregg, and was arranging for the purchase of a clock to be placed in Committee Room A in her memory.

It was also reported that Major D. D. Milne, a nephew and residuary legatee of the late Sir Ewen Maclean, had presented to the Association the silver trowel used by Sir Ewen when he laid the foundation stone of B.M.A. House in Sydney in September, 1939. The gift was accepted with gratitude and had been placed among the collection of things of historical interest at B.M.A. House in London.

Association's Publications

Dr. J. G. M. HAMILTON presented the report of the Journal Committee. He said that, for the ten months to October 31, the increase in the cost of production and dispatch was 7½% over the corresponding period in 1955. It was expected that there would be an overall net deficit on the publications for 1956 of about £900. This figure was reached after writing off stocks of the third collection of *Refresher Course for General Practitioners* published in October. £900 represented 0.2% of the turnover.

In response to a request, the Committee had decided to make the *Journal* available to dental and veterinary students at cost price.

Following a complaint by the Breconshire Local Medical Committee regarding the reporting of medical matters in the national press on the same day as the *Journal* was published, a representative of the local medical committee attended a meeting of the Journal Committee by invitation. He stated that his committee felt strongly that the *Journal* should not be released to the press until Friday, the day that day would be aware of the contents of the *Journal* before press comment appeared. The Journal Committee decided to reaffirm its previous decision to take no action which would be likely to harm the Association's relations with the press.

Dr. ANNIS GILLIE presented the Family Doctor Committee report. She paid a warm tribute to the lay assistant editor, Miss Joyce Ward, who was leaving in March to take

up a new appointment with one of the large publishing houses. Dr. Gillie said that it seemed there would be a net financial surplus at the end of the year, and that once again the magazine had been conducted at no cost to the general funds of the Association.

Other Committees

Mr. H. H. LANGSTON, presenting the report of the Constitution Committee, recommended that an extra day be added to the 1957 Annual Representative Meeting for discussion on the final report of the Committee. The recommendation was that the A.R.M. should commence on Wednesday, July 10, and the report form the first item of business of the meeting.

This was agreed to. Mr. Langston added that the final report would be presented to the Council at its January meeting.

Dr. J. A. PRIDHAM, Chairman of the International Relations Committee, presented the report which contained the suggested revised constitution for a British Supporting Group for the World Medical Association, to stimulate interest in and provide financial support for the World Medical Association. Membership would not be confined to medical practitioners, and would confer certain benefits according to the type of membership taken up. The recommendation to accept the constitution was agreed to.

The Annual Representative Meeting, 1956, had instructed the Council to continue to press the Government to ratify the Geneva Conventions of 1949, and it was agreed to send this resolution to the Foreign Office.

It was also agreed that two delegates and two alternate delegates, Dr. S. Wand, Dr. I. D. Grant, Dr. J. A. Pridham, and the Secretary, be appointed to represent the Association at the General Assembly of the World Medical Association in 1957.

Dr. H. H. D. SUTHERLAND presented the report of the Amending Acts Committee. He said that the Committee had discussed with Dr. J. B. Mathieson, Chief Medical Officer, Australia House, the various schemes which formed the Australian Health Service, and the information which he had given would be fully studied at the next meeting.

The CHAIRMAN OF COUNCIL presented the report of the Rehabilitation of Disabled Persons Committee in the absence of the chairman and any members of the Committee. The Committee had studied Recommendations 1, 2, and 32 of the Percy Committee's report, and sought for authorization to discuss the matters raised therein with the Ministry of Health, together with such representatives of other Government departments as the Ministry of Health considered desirable. This was agreed to. Other recommendations (which were agreed to) dealt with the way in which the Committee proposed that the subject of rehabilitation might be brought to the notice of general practitioners. The Committee wished to explore the possibility of publishing a series of articles in the *British Medical Journal* on aftercare in various conditions, and recommended that the attention of the British Postgraduate Medical Federation and of postgraduate medical deans be drawn to it. It was also recommended that the General Medical Council be approached on the possibility of rehabilitation being included in their recommended subjects, and that papers on the medical and social aspects of aftercare be included in the annual scientific meetings of the Association. Lastly, that consideration be given to the possibility of the Annual Meeting in Birmingham in 1958 having as a central theme the medical and social aspects of aftercare, with special reference to the rehabilitation of the disabled.

All these reports were accepted. The reports of the Film Committee, the Central Ethical Committee, and the Maternity Services Committee were approved.

Other Business

From the observations of members of Council it was obvious that there is a good deal of unevenness in the

allocation of petrol to doctors. The Ministry of Fuel and Power is to be asked to look into it and to issue uniform instructions to the petroleum officers in all areas.

It was reported that Sir Tudor Thomas had accepted nomination for election to the council of the British Red Cross Society to represent the Association. Dr. H. D. Chalke and Dr. J. B. Tilley were appointed to represent the Association at the 1957 Congress of the Royal Society of Health, and Dr. A. Barker was elected to serve on the Joint Committee of the Association and the Magistrates' Association in the place of the late Dr. Denis Carroll. A report was received from Dr. F. A. Belam on the conference on supplements and additives to feeding-stuffs for animals held by the British Veterinary Association in November.

Plans for a study tour to Denmark in 1957 were announced. The tour is being arranged by the representative of the Danish Institute in Great Britain and will take place from September 1 to 12.

The CHAIRMAN OF COUNCIL said that he was authorized at the last meeting to make an appeal through the columns of the *Journal* for Hungarian refugee doctors if he felt it necessary. He had kept in touch with the Office throughout, and the problem was a difficult one. There were about 36 such doctors here; some wished to remain, others did not. Some of the doctors had already been helped financially, others would need help to qualify. It was proposed that a conference of the various interested bodies should be held to examine the problem in all its aspects. There were also some British doctors now in this country who had been turned out of Egypt, and these also were being assisted where needful. The fund used was the Charles Hastings Fund. It was agreed that the profession should give such assistance as it could to the Hungarian refugee doctors.

BRITISH MEDICAL GUILD

A meeting of the Board of Trustees of the British Medical Guild was held at B.M.A. House on December 19, with Dr. S. WAND in the chair.

The Board of Trustees considered whether, in view of the present position of the remuneration claim, the local machinery of the Guild should be put into operation.

Dr. J. A. L. VAUGHAN JONES moved that the Guild machinery be put into operation, and this was seconded by Dr. A. V. RUSSELL and carried unanimously.

In reply to Dr. H. H. D. SUTHERLAND, Dr. MACRAE, Secretary, said that "setting the machinery in motion" meant inviting the hon. secretary of each local Division of the British Medical Association to act as convener of a meeting of the whole profession in his area, in order to set up a local committee of the Guild. The local committees would then arrange convenient groups of doctors and appoint conveners of groups, meetings of which would be held for discussion on the position.

It was agreed to inform the trustees of the various defence trusts of this decision, and that the Negotiating Committee should also be informed of the action which the Board was taking.

HUNGARIAN DOCTORS

Members who know of Hungarian doctors needing advice or help should get in touch with Brigadier H. A. Sandiford, Medical Director, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1. The majority of the 45 doctors known to have arrived here have been interviewed at the Bureau and advised on registration and the prospects of practice in this and other countries. A few have obtained temporary registration for hospital work. The B.M.A. has given each a small donation. Several doctors and their families are receiving hospitality from British medical hosts for a few weeks.

OPHTHALMIC GROUP COMMITTEE

A meeting of the Ophthalmic Group Committee was held on December 14 at B.M.A. House, with Mr. O. GAYER MORGAN in the chair.

Spectacles for Hospital Patients

The Committee has several times discussed the tendency of patients to leave the hospital eye service because of the narrow range of spectacle frames provided, and their inability to have National Health Service lenses fitted to private frames. The matter was again raised with the Ministry on the revision of the Supplementary Ophthalmic Service regulations. The Ministry replied that it was well aware of this problem, which had been repeatedly considered. There were two serious difficulties, the first being that there was no power under which hospitals could purchase and supply to patients frames outside the National Health Service ranges—hospitals could only supply and charge in accordance with the statement of fees and charges, unless special frames or lenses outside that statement were prescribed by the hospital ophthalmologist as clinically necessary for a particular patient. The second difficulty was a practical one. New types of commercial frames were constantly appearing, and the department could not examine them all and fix a charge appropriate to the hospital eye service. It was doubtful, concluded the Ministry, whether a charge could be fixed for a single type of "private" frame which could preserve the principle that the hospital service did not seek to make a profit nor to compete unfairly with commercial firms.

The opinion was expressed that all that was necessary was to extend the hospital range by two or three further frames—for instance, the "library" frame. If this were done hospitals would be able to retain many of their patients. A survey had been carried out in one hospital, and it was found that 75% of patients chose from two types of frames; 10% chose one particular frame; and 10% chose one out of six other frames, so that ten types of frames were in demand to suit 75% of hospital cases. Last year this particular hospital dispensed 54% of its ophthalmic prescriptions. It was suggested that the Ministry should be informed of these figures and asked to agree to the provision of a limited number of additional frames. A wider range had been agreed to for children.

Another point which had arisen under the revision of the Supplementary Ophthalmic Service regulations related to the remission of charges where glasses were repaired or replaced, to which the Ministry had replied pointing out that glasses supplied privately, but of a type suitable for repair with parts supplied under the Supplementary Ophthalmic Service, could in principle be repaired free of charge at the discretion of the Ophthalmic Services Committee. Only glasses supplied under the Supplementary Ophthalmic Service could be replaced free of charge.

Rehabilitation of Disabled Persons

At the request of the Association's Rehabilitation Committee the Committee considered recommendations contained in the Piercy report relating to blind persons. The Piercy Committee recommended that the provision of work for the blind under section 29 of the National Assistance Act should be a duty of the local authorities, carried out under the powers to be given to them by the Disabled Persons (Employment) Act. Expenditure incurred by local authorities for social rehabilitation should rank for a grant. It further considered that the provision of a placement service specially for the blind led to a patchwork of administration resulting in a service for the blind inferior to that available for other classes of disabled persons. The Piercy Committee recommended, however, that the Ministry of Labour should assume full responsibility for ensuring that the placing of the blind was put on a satisfactory footing and should provide the placement service, thus relieving local authorities of the responsibility. Local authorities and voluntary organ-

izations were at present carrying out the work satisfactorily, and should continue to do so if they wished, at any rate for the time being.

The Ophthalmic Group Committee expressed the view that it would be better not to mix services for the blind with those for other persons, and that the employment by local authorities of voluntary organizations to care for blind people was working satisfactorily. The personal contact made possible by the present arrangements for co-ordination of facilities should be preserved.

Lenses for Reading-glasses

As reported at the last meeting of the Committee, the Ministry of Health had been considering the policy to be adopted now that production of flat lenses had ceased. It was reported to the Committee that a letter had been received stating that the existing provision for the supply of flat lenses for reading-glasses under the N.H.S. would continue until December 31, and from January 1, 1957, curved lenses would be provided for all glasses without extra charge, except in cases where flat lenses were desirable in the interests of the patient. Where flat lenses were provided in such cases the charge would be the same as for curved lenses. The statement of fees and charges would be amended to give effect to this policy.

The CHAIRMAN reported that the Joint Committee of the Ophthalmic Group Committee and the Faculty of Ophthalmologists had finished its series of meetings on future policy. The report was practically ready, and copies would be sent out to its constituent bodies early next month for discussion.

MEDICAL WAR RELIEF FUND
SIXTEENTH ANNUAL REPORT

The year ended August 31, 1956, is the sixteenth since the formation of the Fund. Looking back over the early years, it is well to record that it was due to the foresight of the late Dr. G. C. Anderson (Secretary of the British Medical Association) that the Fund was established. It was realized that as a result of the war medical practitioners and their dependants might find themselves in unexpected financial difficulties. Not only was there risk to life during active service with the armed Forces, but there was risk also in civil life from air raids. In addition, evacuation of patients brought great changes to many practices.

Dr. Anderson sought the experience gained by the Royal Medical Benevolent Fund from the War Emergency Fund, which was established during the 1914-18 war.

An appeal was issued by the Presidents of the British Medical Association, the Royal Colleges, and the Royal Medical Benevolent Fund. Contributions quickly reached the office from members of the profession, and great generosity was shown by those overseas. A total of £84,643 was subscribed; the total distributed to date in gifts and loans amounts to £83,245.

For the year ended August 31, 1956, the amount awarded in gifts was £2,407 9s. 8d., of which were:

15 Awards for education (schools and universities) ..	£1,276	0s.	0d.
8 Awards for maintenance ..	£887	0s.	0d.
6 Awards for special gifts ..	£244	9s.	8d.
	£2,407	9s.	8d.

All the children who have been helped have done well, and their reports are satisfactory. It is gratifying to know that one boy has just completed his medical training, and it is anticipated that another student will qualify during the coming year. A girl has been accepted as a student at University College and a boy has gained a Foundation Scholarship at Epsom College.

It is not possible to forecast the exact figure which will be needed to meet future requirements for school fees, but

it is hoped that the present available funds will enable those boys and girls now receiving assistance to complete their education.

Awards for maintenance have been made to ensure continuity of help in needy cases, and this year six special grants were given, all being for unexpected emergencies.

The Committee has received continued and much-appreciated help and advice from the Royal Medical Benevolent Fund and the Royal Medical Foundation of Epsom College. The Committee wishes particularly to refer to all the work undertaken by Mr. Pennefather, of the R.M.B.F., Secretary of the Distribution Subcommittee. He has held the office since the inception of the Fund, and it is with sincere regret but most grateful appreciation of all his work that the Subcommittee bids him farewell on his retirement.

The Secretary of the Fund (Dr. A. V. Kelnack) will take over the Distribution Subcommittee, and all correspondence should be addressed to her at B.M.A. House.

The Committee wishes to express its gratitude to the officers of many benevolent funds, secretaries of B.M.A. Divisions, and other friends for their helpful advice and co-operation, and particularly to Messrs. Price, Waterhouse & Co. for their services as Honorary Auditors.

The audited statement of accounts for the year ended August 31, 1956, is appended to this report.

E. A. GREGG,
Chairman.

STATEMENT OF ACCOUNT—AUGUST 31, 1956

	Accumulated Totals to August 31, 1955	Transactions of Year ended August 31, 1956	Accumulated Totals to August 31, 1956
	£ s. d.	£ s. d.	£ s. d.
Income:			
Donations received ..	84,633 15 11	9 9 0	84,643 4 11
Interest on investments ..	7,326 19 7	174 15 3	7,501 14 10
Total Income ..	£91,960 15 6	£184 4 3	£92,144 19 9
Expenditure:			
Loans, less repayments and amounts converted into gifts ..	13,226 10 0	(2,051 10 0)	11,175 0 0
Gifts ..	68,148 14 11	3,869 5 7	72,018 0 6
Total Awards ..	81,375 4 11	1,817 15 7	83,193 0 6
Administration expenses ..	2,775 4 8	214 2 10	2,989 7 6
Losses on realizations of investments ..	324 11 2	437 5 3	761 16 5
Total Expenditure ..	84,475 0 9	2,469 3 8	86,944 4 5
Surplus (subject to depreciation in value of investments):			
Balance at August 31, 1955 ..	7,485 14 9		
Excess of expenditure over income for the year ..		(2,284 19 5)	5,200 15 4
Balance at August 31, 1956 ..	£91,960 15 6	£184 4 3	£92,144 19 9

NOTES:

1. The surplus of £5,200 15s. 4d. at August 31, 1956, was represented by:

	£ s. d.
Investments at book values at August 31, 1955 ..	6,985 18 9
Less: Sold during year ..	2,000 0 0
	4,985 18 9
(Market value at August 31, 1956—£3,975)	7 4 1
Sundry debtor ..	207 12 6
Balance at bank ..	
	£5,200 15 4

2. At August 31, 1956, gifts amounting to £1,275 had been approved for future payment over a period of years.

Report by the Honorary Auditors.—We have examined the above statement with the books and records of the Fund and have found it to be in accordance therewith. We have not obtained independent confirmation of the balances of loans outstanding amounting in total at August 31, 1956, to £11,175.

3, Frederick's Place,
Old Jewry, London, E.C.2.
December 13, 1956.

PRICE, WATERHOUSE & CO.,
Chartered Accountants.

The Ministry of Health's booklet, *National Health Service Superannuation Scheme (England and Wales): An Explanation*, has been revised again to take account of changes made by the N.H.S. (Superannuation) Regulations, 1955, and Superannuation (Local Government and N.H.S.) Interchange Rules, 1955. The booklet deals, as simply as possible, with contributions, benefits (including examples), reckoning of service, and special provisions for doctors and dentists in the general-practitioner services. New entrants to the scheme get a free copy; it is also on sale at the Stationery Office, price 1s.

GENERAL MEDICAL SERVICES COMMITTEE

The General Medical Services Committee met on December 20, with Dr. A. B. DAVIES in the chair. Also attending the meeting were Dr. S. Wand, Chairman of Council, Dr. I. D. Grant, Chairman of the Representative Body, and Mr. L. Dougal Callander, Treasurer of the Association.

Dr. H. Guy Dain Honoured

The Annual Conference of Local Medical Committees, having approved the proposals for the institution of the Claire Wand Award for outstanding services for general practice, the Trustees of the Claire Wand Fund recommended that the first award be presented to Dr. H. Guy Dain. With the present session Dr. Dain will have completed 40 years' service on the G.M.S. Committee and its predecessor, the Insurance Acts Committee, of which he was chairman for 11 years. This long period of devoted and outstanding service had contributed so much to the cause of the general practitioner and his work that the Trustees felt that such recognition as they could bestow could not be more highly deserved.

Dr. W. M. KNOX, one of the two remaining members of the Committee who were also members of the old Insurance Acts Committee, said that he was a member of that body when Dr. Jonas died suddenly and Dr. Dain took over the duties of Chairman. He congratulated Dr. Dain and thanked him for the great services he had rendered.

Dr. F. GRAY said that he also was a member in the interim period, and he particularly remembered the struggle with the Ministry of Health under Dr. Dain's leadership. He would add his tribute to Dr. Dain, who was then laying the foundations of work which had since been carried to fruition.

The recommendation was carried with acclamation. Dr. DAIN, in response, said that it was difficult to say anything at all; it was rather overpowering to find this item at the beginning of the agenda. He was not unappreciative of what had been said, but he had enjoyed it all. The work had been an interesting experience over the years. To have the first award of the Claire Wand Fund was very gratifying, and he thanked the Committee for the way he had been received that morning.

The CHAIRMAN welcomed Dr. Harding, a new member of the Committee.

Central Pool

The Ministry of Health having contended that the Committee should now suggest some means of arriving at a reliable estimate of the earnings of general practitioners in the National Health Service from private practice, a meeting was held by officers and officials of the Association with Professor Allen and the Association's accountant to discuss the matter. The Ministry, it was reported, have now been informed that the Committee would not agree to any inquiry into this matter which relied upon any sort of self-selected sample or which involved the use of figures derived from any source other than an inquiry designed solely for the purpose. The Committee was anxious to obtain a more up-to-date assessment of private earnings, since it was convinced there had been a steady decline since the issue was decided by Mr. Justice Danckwerts in 1952, but it was essential that a large-scale inquiry must be undertaken if the figure was to be assessed at anything like a reasonable degree of accuracy. The view was that a sample of less than 75% of all general practitioners would give a distorted figure. In addition it must ascertain how widely varied was the distribution of private-practice earnings and how much of what private practice remained was undertaken by older practitioners. The accounts on which the inquiry would be based would need to be related to the actual earnings for the year in question.

Drugs for Private Patients

A report of the joint meeting between the Private Practice Committee and the G.M.S. Committee held in November was received and discussed, and it was agreed that it

the Private Practice Committee decided to set up a sub-committee to go further into the matter the G.M.S. Committee would afford full support.

Publication of Annual Report

The Committee considered suggestions which had been received from the Editor of the *British Medical Journal* with regard to the publication of the Committee's Annual Report in the *Supplement*. The Editor expressed the view that it would be in the interests of the Committee if a much shorter version of the report was published, which would include the features of particular interest to the profession at large and those which the Committee wished to have stressed. The Editor thought that if the editorial staff could feel free to present in attractive fashion the outstanding portions of the report in about eight pages of the *Supplement* the work of the Committee would become more widely known. The work would be done in closest collaboration with the Secretary and with the approval of the Chairman of the Committee.

After a short discussion it was agreed to accept the Editor's suggestion, and it was left to the Chairman and the Secretary to determine in consultation with the Editor how best to distribute the full report to those for whom it was essential.

Remuneration Claim

The CHAIRMAN said that on the invitation of the Chairman of Council he had attended the Council meeting the day before and had addressed the meeting in order to bring the Council up to date on this important matter. He hoped that his action would be approved in view of the importance and urgency of the issue. (Agreed.)

Dr. Davies then gave an account of his speech to the Council (see "Proceedings of Council," at page 1). He added that when general practitioners came into the Service they did so on the promise of the Minister that both the Spens reports would be implemented. The Minister's statement was recorded in *Hansard*. The letter from Sir John Hawton stating that no contractual obligation enforceable in law existed was beside the point, and there had been several letters backwards and forwards asking the Minister for more details which had not yet been forthcoming (*Supplement*, December 29, p. 227). In a letter dated December 3 Sir John Hawton stated that the issue was twofold—one a general claim for increased remuneration and the other the contractual obligation. On the first, the Minister had decided that under present economic circumstances he could not at present consider it, and on the second he said there was no contractual obligation enforceable in law.

There was a moral as well as a contractual obligation between the Minister and the profession. The Negotiating Committee had not retreated one inch from its position nor surrendered a farthing of the claim. The Negotiating Committee would meet on January 3 and a deputation would see the Minister the next day.

Dr. S. WAND (Chairman of Council) said that the Minister promised a reasoned reply based on the advice of his legal advisers to the Committee's supplementary memorandum. This had not come. He did not think, however, that anybody had believed the question would be solved immediately, and so far the Minister had not been willing to discuss the merits of the case. It was clear that decisions would have to be made in the near future on the kind of action to be taken, and the Council of the Association had decided to call a meeting of the British Medical Guild, which had the necessary power to carry out the fight. The Board of Trustees of the Guild had decided that the machinery of the Guild should be prepared, and instructions were now going out to all secretaries to overhaul the machinery in the various areas. Neither the Council nor the Guild could take any further action at the moment. It was in the hands of the Negotiating Committee, which was a Joint Committee.

Dr. O. C. CARTER, speaking as a member of the Spens Committee, said it was agreed that the Spens Report should be binding on the profession and the Govern-

ment, and the greatest possible care was taken in forming the recommendations. At the time the profession was told that Spens was the yardstick for all time for adjusting remuneration. Although as a purely private practitioner he was not directly concerned in the dispute, he thought the strongest possible steps should be taken to see that the promises made in 1947-8 were implemented.

Dr. KNOX, as another member of the General Practitioner Spens Committee, agreed with what Dr. Carter had said. The Spens Committee reviewed the remuneration of the general practitioners, and the Danckwerts award provided the means of adjusting it to particular times.

Dr. J. C. ARTHUR reminded the Committee, as he had reminded the Council, that the Minister was bound by Parliamentary policy which was affected by present inflationary trends. Extra money awarded to any profession would produce that much more inflation, but in his desire to combat inflation the Minister was degrading the status of the doctor. Spens must be re-established.

Dr. B. CARDEW said that Parliament had not repudiated Spens, but one had to accept that Parliament had been compelled to override all sorts of previous decisions. Whatever happened, Spens must not be allowed to slip. If the Government were allowed to adopt the position that Spens was no longer the yardstick, the profession would be in an intolerable position. The moment was approaching when action and timing would have to be clearly thought out. Was the Negotiating Committee thinking ahead?

The CHAIRMAN said that the remit of the Negotiating Committee, which was composed of members from the Committee, the Joint Committee, and three public health members as observers, was to prepare the case and conduct the negotiations.

Dr. I. D. GRANT pointed out that the attitude of the Royal Colleges and the Joint Consultants Committee in case of a fight was not known, and Mr. NICHOLSON LAILEY, speaking as a private individual, said that it was essential that the Guild machinery should adequately represent consultants and general practitioners. It would be the opinion of the consultants at the periphery which would affect the central consultants.

Dr. M. SORSBY pointed out that the longer the matter went on the lower would become the doctor's remuneration in relation to the cost of living, and more and more practitioners would get deeper and deeper into financial difficulties. What did the Negotiating Committee propose to put before the profession?

Dr. A. BROWN said that if the Negotiating Committee had reached an impasse it became a question of what the profession was going to do, and information as to what the profession thought would be obtained through the Guild.

Dr. H. C. FAULKNER said that the Committee could not afford to wait for the machinery of the Guild; general practitioners were expecting a clear lead now.

Dr. B. BURNS did not see why the profession should indulge in this bickering with the Ministry for three or four years. He could not see that anything had been done to improve relations between doctors and their patients. The reply of the Minister gave the opportunity to look into the Service as a whole; terms of service were wrapped up with the terms of remuneration. He did not think the Committee was as familiar as it should be with opinion at the periphery. Doctors were far more concerned with the nature of the Service than they were with the question of remuneration. This might be the last opportunity to effect an alteration in the Service.

Dr. A. M. MAIDEN said that the lead had to come from the British Medical Association. The average practitioner did not understand the set-up of the Negotiating Committee, but he understood the British Medical Association.

The CHAIRMAN said he gathered that the Committee supported the actions of its representatives. He did not think the Negotiating Committee should be rushed with a resolution urging precipitate action. He would suggest a resolution on the lines that the G.M.S. Committee, having heard a report from its acting chairman on the progress of

negotiations to date, and having learned that a further meeting of the Negotiating Committee and a meeting with the Minister were due to take place, pledged its full support to its representatives on that Committee, and asked to be informed without delay of the outcome of the meeting with the Minister so that it might consider subsequent action.

This resolution was carried unanimously, and it was decided to send copies to the Negotiating Committee, to local medical committees, and to the *Journal*.

Action of the N.I.D. Trust

A meeting of the Trustees of the National Insurance Defence Trust was held during the day. It was reported that the Council of the Association was setting the machinery of the Guild into operation but that the Guild had no funds of its own. It was right that the Trust should be the first to make a contribution to the Guild's funds, said Dr. KATE HARROWER, the Hon. Treasurer. At the moment it would be a guarantee of money which could be drawn on as and when desired, and she suggested that £10,000 should be made available from the Trust funds if it was needed.

This was agreed to unanimously.

The Trustees also agreed to bear the cost of subsistence allowances attributable to the G.M.S. Committee and members of the Conference, in conformity with the decision of the Representative Body to pay subsistence allowances to members attending central meetings.

Rural Practice

Dr. C. F. R. KILLICK presented the report of the Rural Practices Subcommittee. He said that the Subcommittee considered the resolution of the A.R.M. which stated that doctors found it impossible to co-operate fully in the economy in prescribing drugs because of advertising methods. But the Subcommittee felt that there was little purpose in going to the pharmaceutical industry and that the resolution should be referred to the Association's committee appointed to go into the matter of prescribing. The list of specially expensive drugs should be left as it was at present.

The most important item of the report was the interim report of the Mileage Committee. The Subcommittee expressed its concern at the manner in which a minority report had been sent to the Ministry without prior consultation and after the report had been agreed.

The Mileage Committee recommended that none of its recommendations should be implemented until the final report was available and had been given to the medical profession, to local medical committees, to the G.M.S. Committee, and to the Conference, and only after it had been agreed upon by these bodies should any recommendations be implemented. The present report was only an interim one, and the Subcommittee felt that the Minister should be informed that the Committee could not at this stage discuss these recommendations with officials at the Ministry. Provisionally, and pending the final report on the matters still outstanding, the proposals contained in the interim report should be approved.

In reply to a question on the delay, Dr. Killick said that the problems of mileage were very big. They had not been dealt with for many years, and to get a scheme to suit all areas was almost impossible.

It was agreed that the interim report should be received and that no exception should be taken to the proposals. Dr. Killick was warmly thanked for his patience and perseverance in a difficult matter.

Prescription Charges

The CHAIRMAN reported that a press conference was held on the action of the Minister in imposing the 1s. per item charge on prescriptions. It was well attended and good publicity resulted. It was reported that the Rural Practices Subcommittee supported the action of the Committee, and that several letters opposing the imposition of the charge had been received.

Elimination of Inflation

The CHAIRMAN OF COUNCIL reported that the Distribution Committee had been informed that the Minister had agreed to set up an alphabetical register in an endeavour to eliminate inflation of doctors' lists. It was said that the cost of any register other than an alphabetical register would be prohibitive.

It had been agreed at an earlier meeting to ask an outside firm of business consultants to look into the problem, and a question was raised whether these inquiries should be pursued. It was decided to ask the Ministry to confirm that the Minister had agreed to the formation of an alphabetical index, and, if so, that the outside inquiries be discontinued.

Trainee General Practitioner Scheme

A report was given of a meeting at the Ministry of Health at which the report of the Trainee General Practitioner Subcommittee, which had been approved by the Committee and the Conference, was discussed. Mr. D. C. BOWIE, who led the deputation, said that the Ministry asked that they might have an observer on the advisory body which was to be set up to review the future of the scheme, and the representatives thought there would be no objection to that. The second point was that where any question of appeal arose, unless both parties agreed to a local hearing, the appeal should be heard under the regional organization proposed. Thirdly, the Ministry were quite in agreement with the lowering of the present minimum list of 2,000 patients, provided that the circumstances of the practice enabled sufficient training to be given. Fourthly, the Ministry undertook to bring to the notice of every university throughout the country the value of the courses for trainers organized by the British Postgraduate Medical Federation in London. The Ministry were sending out a letter to executive councils asking them to study the report and consider how best the recommendations might be adopted locally. A letter would also be sent to local medical committees from the Secretary of the Committee amplifying the section of the report relating to appeals.

The CHAIRMAN said that it was most satisfactory that the Ministry had accepted the recommendations practically *in toto*. The report was accepted and the draft letters approved. It was also agreed that the Committee should pay the expenses of G.M.S. Committee members who sat on the appeal body in the same way as for other tribunals. The Committee expressed its appreciation of Mr. Bowie's chairmanship of the subcommittee.

Payment for Examination of Employees

The Joint Consultants Committee had been considering the operation of paragraph 14 of the Terms and Conditions of Service of hospital medical staff which excluded from the National Health Service the examination and reporting upon employees or prospective employees at the request of the employer. Consequently fees could be claimed and retained by hospital medical staffs for this work, except where the patient was referred to hospital by a medical practitioner for a second opinion, when no fee could be charged. This created a difficulty, and the Joint Committee took the view that in such cases the consultant should be entitled to a fee as he would be if the employee was referred to him direct. The Ministry, however, took the view that if the general practitioner required a consultant opinion the latter must do the work within his contract. The Joint Consultants Committee decided to seek the views of the G.M.S. Committee before taking the matter further.

Professor CLOAKE explained that the general practitioner was not necessarily a practitioner in the National Health Service, and he understood this was a service paid for by the employer. The general practitioner should give the report asked for on the basis of his own examination and responsibility. If in the course of his examination he found grounds for a more extensive examination, and if that included obtaining the opinion of a consultant, he should do it later after sending in his report. The obtaining

of the opinion of a consultant was obviously to the advantage of the patient, and consultants would have no objection to giving an opinion if that was all they were asked for. It was where an opinion was asked for and used in the report to the employer that unfairness arose.

After a little discussion the CHAIRMAN said that there were two lines of action for the general practitioner. Either he felt that for his own benefit, as the patient's doctor, the consultant's opinion was necessary before he committed himself, or that it was in the patient's interest. Where a consultant's opinion was desired purely from the point of view of compensation or for an employer's information a fee should be paid to the consultant. This view was concurred with by the Committee, and it was agreed to so inform the Ministry and the Central Consultants and Specialists Committee.

Other Business

A letter was received from the Ministry of Health stating that further consideration had been given to the question of the payment of expenses of candidates for appointments attending interviews at a distance from their homes, and that it was agreed that general practitioners in contract with an executive council would be reimbursed at the rates payable to Health Service officers in the higher subsistence category when attending interviews for hospital appointments, and the same rates would apply in respect of applicants for general-practitioner vacancies. This was accepted.

It was also reported that the Department of Health for Scotland had agreed to the appointment of a separate committee to investigate prescribing in Scotland. The Committee would also investigate the question of hospital prescribing.

Scottish News

GENERAL MEDICAL SERVICES SUBCOMMITTEE (SCOTLAND)

A meeting of the General Medical Services Subcommittee (Scotland) was held in the Glasgow Regional Office on Tuesday, December 11, with Dr. C. J. SWANSON, of Aberfeldy, in the chair.

Membership of the Subcommittee

The Subcommittee received with regret the news of the death of two of its senior members, Dr. Benjamin Hutchison, of Cambuslang, and Dr. D. Dale Logan, of Newmains. Tribute was paid to the valuable services rendered by these two practitioners during their terms of office.

Dr. D. Livingston Kerr, of Lanarkshire, Dr. James Watson, of Thornhill, and Dr. D. M. F. Batty, of Edinburgh, were welcomed to their first meeting.

Mileage

The news that the Mileage Committee for England and Wales had published its report was received with interest, and it was agreed that, although this report applies only to England and Wales, it would be very helpful if it could be seen by the Subcommittee's Rural Practitioners' Subcommittee.

Prescribing Costs

The Subcommittee received with satisfaction information from the Department of Health, in connexion with the proposal to appoint a United Kingdom Committee to examine prescribing costs, that, following representations from the Subcommittee, a separate committee would examine the position in Scotland, and that its terms of reference will cover prescribing in the hospital service as well as in general practice.

Prescribing

It was reported that, following a request from the Subcommittee, the Department had agreed to add tube gauze to

the schedule of prescribable appliances, provided it was restricted to prescribing on form E.C.10A. The Subcommittee agreed to the Department's suggestion.

Smallpox Vaccination Publicity

The Subcommittee considered a proposed circular from the Department to executive councils drawing attention to a vaccination publicity poster which might be obtained for general practitioners who wished to display it in their consulting-rooms. The Subcommittee agreed both with the contents of the circular and with the poster.

Scottish Medical Practices Committee

The Subcommittee agreed to nominate Dr. James Watson, of Thornhill, for appointment to the Scottish Medical Practices Committee in place of the late Dr. Benjamin Hutchison.

Elimination of Inflation

The CHAIRMAN reported that this important subject had been discussed with representatives of the Department at the last routine meeting, and that it had been agreed that the Department would request the Ministry of Health to arrange for a joint meeting with the Minister of Health and the Secretary of State, when representations could be made regarding the urgency of introducing measures to combat the apparent increase in inflation. It had also been agreed that the representatives of the Subcommittee would ask the General Medical Services Committee to approach the Ministry with a similar request.

Sickness among Hospital Staffs

The Subcommittee considered a letter from the Dundee Local Medical Committee about a departmental memorandum dealing with the general question of sickness among hospital staffs, and issued by the Eastern Regional Hospital Board to boards of management. The Dundee Local Medical Committee was concerned about the possibility that, if certain of the arrangements suggested are enforced, the position of the general practitioner attending the sick member might well be undermined. It was reported that the memorandum had not been seen by the Joint Consultants Committee (Scotland), and it was agreed, therefore, that before further consideration was given to the matter the views of that Committee should be obtained.

HOSPITAL MEDICAL STAFF BOARD-AND- LODGING CHARGES

The agreement in Committee B of the Medical Whitley Council on a scale of charges payable by resident medical staff in the hospital service, of which preliminary notice was given in the Ministry's circular letter to hospital authorities dated July 25, 1956 (see *Supplement*, August 11, p. 99), has now been published in detail in a Ministry memorandum (H.M.(56)107) and M.D.B. Circular No. 34.

The memorandum points out that various questions relating to board and lodging are still under consideration by a subcommittee of Committee B. The most important of these is the question of accommodation standards, and this is now under active discussion by the subcommittee.

N.H.S. STAFF PAY INCREASES

National Health Service administrative and clerical staff earning up to £1,200 a year have been awarded a 3% increase in salary on the basis of the rise in the cost of living since February 1, 1956. Another industrial court award gives an immediate increase of 5% on the basis of the rise in the cost of living since September 1, 1955, to N.H.S. dispensing assistants. Medical laboratory technicians in the Service will also receive an immediate 5% increase in salary.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Reform of Health Service

SIR,—It is evident from the many letters written by practitioners from all over the British Isles that there is growing dissatisfaction with the working of the National Health Service and that "leadership by the B.M.A." is being demanded. I believe that the initiative for change must come from the periphery, so that "the B.M.A." can know the numbers and views of those they will have to represent. The practitioners need a standard round which to rally, an alternative scheme which they can discuss and vote upon in the Divisions and then instruct their representatives accordingly.

I hope to offer a scheme which will serve as a basis for discussion and amplification. In doing so I am assuming that it is the policy of both the "great" political parties that a National Health Service free to all users should exist, and it can also be assumed that the majority of the patients also think so—for complaints from the public are few. For this reason the National Health Service will have to be modified, and in such a way as to (1) be in the best interests of the patient, (2) ensure professional freedom from pressure of, or allegiance to, a "third" party, and (3) maintain a fair form of remuneration. Best interests of the patient would be served if they were permitted to attend the doctor of their choice as required and not to have to "register" with one particular doctor. It would help restore the doctor-patient relationship if the choice of doctor were free each time advice was sought, and the patient would then be that doctor's "patient" only as long as he consulted him, as has always been the case in private practice. Administratively, this would mean that the patient would be regarded much as the "temporary" patients are at present, and a duly completed record card would be forwarded to the executive council promptly and fully completed (for the remuneration would depend on it). Professional freedom can only be ensured by the return of ownership of goodwill to all practitioners. When filling vacancies the successful applicant would have first option on the purchase of the goodwill of the practice. In this way an industrious, good practitioner could, by his work and skill, increase his practice and its value to him, and his wife would more willingly devote her life to a tangible asset rather than feel herself the unpaid servant of an impersonal State service.

A fair form of remuneration would be ensured by means of payment per item of service. It can be envisaged that a global sum allocated out of general taxation funds to a new National Health Service might be no larger than the present sum, but that its distribution would be in accordance with the services rendered professionally, as shown on the "temporary" patient cards submitted, and not necessarily, as at present, to those with the most "heads" on their list. An even more effective way of restoring the doctor-patient relationship would be for the doctors to render accounts direct to their patients on an appropriate E.C. form on which could appear an approved scale of charges, and the patients could present these accounts when duly receipted by the doctors to an authority for repayment, in full or in part, depending on their incomes. This would supply an incentive for a doctor to work secure in the knowledge that he was still in that patient's confidence and was not by his enthusiasm and availability at all hours going to decrease the value of his capitation fee. The patient would also feel that he was rewarding his doctor personally and would feel that he was obtaining something worth paying for, for many regard free advice and attention as suspect of "utility" and offer to pay for private advice when really worried.

In a letter of this length I cannot enlarge upon the many benefits to both doctor and patient offered by such a scheme. I had hoped that some more eminent member of our pro-

fession would have attempted to crystallize the feelings of the practitioners in order to produce, in the widest possible terms, a standard to which all who wished for a change could rally, but none has been forthcoming and I have ventured to submit this scheme before the ardour of the many displeased practitioners is dissipated in a host of resolutions. May I ask that all those who feel that they are for such a scheme should say so without qualification at this stage?—I am, etc.,

Hildenborough, Kent.

C. GLAISHER.

Unity of Purpose

SIR,—If your readers will swallow Dr. Bruce Cardew's final paragraph (*Supplement*, December 29, 1956, p. 230), they will swallow anything. Almost the only resolution of the 1956 Conference of Local Medical Committees which expressed a decision of the conference against the will of the platform was designed to mitigate the injustice of an absent principal's responsibility for the acts and omissions of his deputy. It was passed by a substantial majority, but only the vigilance of its movers resuscitated it after attempted infanticide by way of an unfortunate error of reporting in the *Journal*. The G.M.S. Committee later made no mistake about smothering the infant, however, and it was quietly laid to rest in the Committee's report, among a collection of trivia which "called for no action."

As Dr. Cardew figured prominently among the assassins, he owes it to your readers to explain how he reconciles this procedure with his brazen pieties about "considered decisions of conferences" and "the whole basis of democratic representation." Turning to Dr. Cardew's second paragraph, it is clear that he and I keep different company. It is rare for me to meet a doctor who has a good word to say for the existing system. And how could it be otherwise? A mass of regulations designed to provide sanctions against the doctor, and not a single provision for dealing with the delinquent patient. The entire fabric of capitation fee, certification, and prescribing calculated to annihilate the dignity of a great profession and the sense of responsibility of a great nation. Is it surprising that no other country has lowered itself to this level?

Your leading article "Unity of Purpose" (*Journal*, December 15, p. 1417) acknowledges the rising tide of discontent in the profession. Your call for constructive planning of a better service rather than for precipitate action is sound common sense. All must surely approve the unity achieved in our attempt to prevent the State from ratting on its promises in the matter of remuneration. But whether any useful purpose would be served by insisting upon unity between the various sections of the profession in an attempt to resolve the injustices peculiar to the general medical section is a matter upon which I am open to conviction. Experience has shown that, in the matter of remuneration, we can count upon superb leadership from the B.M.A. But yours, Sir, is almost the only B.M.A. voice we have heard raised on the subject of terms of service and the fundamental problem of the relationship of medicine to the State—surely of the greatest ultimate importance to the profession. In this respect, I have seen no evidence of spontaneous leadership by the Association, and no deference to the considered decisions of conferences by committees which are elected democratically enough, but which are thereafter exclusively autonomous.—I am, etc.,

Sheffield, 10.

B. BURNS.

SIR,—In your leading article under this heading (*Journal*, December 15, 1956, p. 1417) you draw the conclusion from recent correspondence that dissatisfaction with the National Health Service as it is to-day is as great as the grievance over pay. That may be so, but if these two causes are to be considered together we shall not achieve "unity of purpose" in the profession, and through lack of the strength which comes from this we may well fail to obtain improvement at all. The remuneration claim is becoming increasingly urgent especially in relation to country practitioners, whose costs in

transport, drugs, and telephones have all risen steeply of late. The B.M.A. must represent the general agreement over our claim based upon Spens, and it must be pressed home to the Government now by stronger measures. The profession is as united over this as it can be over anything.

No reform of the N.H.S. can be considered until the financial status of the doctor in relation to society is re-established. Spens was our yardstick at the outset, and later in the hands of Mr. Justice Danckwerts. That is now being challenged again, and this challenge must be met before we dare consider changes in the National Health Service which would now confuse this vital and straightforward issue. Moreover, there is by no means a comparable unity of purpose in relation to what changes in the Service should be made. If the B.M.A. doubts this let it issue another questionnaire to ascertain members' views on the manifold proposals that are being made. Let us recall the time that elapsed between the issue of the first questionnaire and the final acceptance of the present Service that was practically thrust upon us individually while the B.M.A. as a team was still stonewalling every over from the Government.

We are not going to drop our claim to maintenance of financial status. So that, if we are also going to sue for changes in other respects, the two issues are bound to become interwoven and confused as they are in the leading article, prejudicing the success of both. No doubt Government circles would be highly delighted by such a policy. We should soon be told that remuneration was dependent upon the type of service that was finally to be decided, and the Government would be encouraged to argue about this for ever, if only to stave off a financial show-down before that ever-receding date when inflation will have been halted for ever. In spite of 1911 and 1948 I think we can overlook the "long history" of the B.M.A. if that body will now apply itself with vigour to the urgent question of the restoration of our financial position. When that is done we may well embark upon reform of the N.H.S., with all the debate and disunity that this is likely to engender amongst doctors and the public. In the meantime reform is a red herring, and those who allow it to be dragged across the trail of our degradation will be suspect. Does the B.M.A. want to encourage a diversion of attention from its failure to date on this long-outstanding and now most pressing problem of the sanctity of Spens? We cannot dodge Government bad faith by simply remounting in the old stable. It is time that the B.M.A. or some other leadership put a stop to this persistent policy of Governments consulting with our patients and their representatives the lowering of our relative status step by step. For that, from our point of view, is exactly what happens every few months when further wage claims come before Government tribunals. Everyone gets a rise except a minority, including doctors, who are apparently scheduled for ruin along with the general economy of the whole nation. The argument of a few who say that we should set an example of restraint is completely discredited by now. We have been doing that for a year or so, and there is still no sign that it amounts to anything but saving money for the Government to spend on elevating the status of nearly everyone else in relation to ourselves. By all means let us retain unity of purpose in this matter and see it through now. No Health Service will work until doctors can establish honest relations with the Government, and no such service will continue to serve the public, or retain the type of men it needs for the purpose, if we now relax our claim to equality of respect beside those who serve it in most other occupations.—I am, etc.,

Eye, Suffolk.

J. SHACKLETON BAILEY.

SIR,—The leading article (*Journal*, December 15, p. 1417) headed "Unity of Purpose" is very disturbing. Hitherto the policy has been to settle the issue of remuneration first as a matter of principle, and then to consider the reform of the National Health Service. Now the position seems to be reversed, and the question of remuneration appears to be only a side issue. Then withdrawal from the Service, except

—as the leading article puts it—into an alternative service, is deprecated. Now the whole point of withdrawal is that it is the only effective weapon we have if negotiations fail. If it was right to consider it before the Danckwerts Award, when there is no doubt that the threat of it was a factor in bringing things to a head, why is it wrong now? What argument is the Negotiating Committee going to use to exert pressure?

The leading article speaks of divisions in the profession which already exist. Do they exist? Are we really divided on the question of our claim? Have our leaders any evidence that the profession would be divided over a proposal to withdraw? Have we had meetings throughout the country to consider any action whatever? If there are rifts in the profession, let us know what they are, and let us discuss them and settle them. It is true that the question of remuneration is only one of a number of important questions, but it is the one with which we are concerned at the moment, and I am sure that there is no lack of unity in our purpose concerning it, only increasing anxiety at the delay. We will not help by making it part of much wider issues, however important they may be.—I am, etc.,

Interden, Kent.

B. W. WYLLIE.

Distribution of Consultants

SIR,—The recent appointment of a new paediatrician in this area has served to emphasize the apparent, and possibly real, disparity in the distribution of consultants throughout the country.

The Health Service is called "National," and central supervision by the Ministry of Health should produce the advantage of correlating the number of consultants in each specialty with the distribution of the population, particularly if that number is limited. This does not, of course, apply to certain consultants, such as plastic and thoracic surgeons, who can only operate efficiently from special centres.

The new paediatrician appointed to this area replaces two part-time consultants, who have been given duties in other areas. This new appointment has been made at a time when the whole of Cornwall is without a consultant paediatrician. A recent paper, summarized in the *British Dental Journal*, illustrates a similar uneven distribution of consultant dental surgeons.—I am, etc.,

Wroughton, Wilts.

W. L. CALNAN.

REFERENCE

Brit. dent. J., 1956, 101, 198.

Was it a Drug?

SIR,—I seem to remember that one of the first tenets of the National Health Service was the free availability of any drug to any patient who required it. Apart from the fact that free drugs now cost 1s. per item, the Government is attempting to restrict further the patients' rights by classifying all sorts of increasingly unlikely preparations as food-stuffs or toilet requisites.

Silicone creams, medicinal shampoos, and liver extract tablets are the latest to be charged back to the prescriber. Once charged back, one must give up an afternoon's engagements and take up the valuable time of one's colleagues to prove to them (1) that everything else in the *Pharmacopoeia* has been tried, and (2) that this was the only substance which had ever done the patient any good. Moreover, there is the ludicrous position that even one's colleagues may be deluded into finding that what is a drug for one patient becomes a toilet preparation for the next. In any event the prescriber will give up using the preparation in case he is caught again, and this is presumably what is intended.

Any cream with a lanoline base or anything which might later could be condemned in this same way, and I see no end to this further Ministerial interference. This particular wedge is only being lightly struck as yet, but heavier blows will follow.—I am, etc.,

Pelsall, Staffordshire.

T. R. GILCHRIST.

Increased Prescription Charge

SIR,—Dr. Peter A. Walford (*Supplement*, December 22, 1956, p. 225) hits the nail on the head. In common justice the whole prescription charge should be waived in the case of all over pensionable age—they have difficulty even in fetching their medicine, let alone running around claiming refunds. I would say these are the only people who have cause to complain of the increased charge. I am in the happy position of practising between a chemist's shop and a sweet-and-tobacconist's. The enormous sums poured out week by week in the latter make nonsense of the bitter complaints of hardship in the former. If the Government had provided free of charge tea, bread, sugar, or any other necessity, there would have been equally loud complaints if a shilling tax were then imposed.

This is not to say I admire this clumsy and cumbersome device for checking extravagance. The whole Health Service is obviously creaking at the joints and needs re-modelling "from the ground upwards," but that is another story.—I am, etc.,

London, E.2.

D. E. PEAKE.

SIR,—I presume the increased charges for medical prescriptions are an endeavour by the Chancellor to economize and save money. Allow me to suggest a better way of achieving this object—namely, by abolishing the old-age pensioners' tobacco token scheme. I believe that £15m. are spent (wasted) annually on this useless weed. If these old people smoked less or, better, not at all, there would be less illness, and in consequence less expenditure on cough medicines and expensive antibiotic drugs to relieve them of their chronic bronchitis, asthma, pulmonary tuberculosis, and neoplastic diseases, which are often brought on and aggravated by their smoking habits.

It is a well-known fact that if one of the partners is a non-smoker the other purchases the double quantity at a reduced rate and re-sells to younger members of his family. This is a shameful racket and we pay the bill. If these old folk must smoke, let them pay the full price—give them extra food, but not tobacco.

While on the subject of smoking, may I appeal to the Minister of Health to place "smoking prohibition" notices in all ambulances, sitting cars, and taxis used for the transport of patients? The absence of such notices makes it impossible for patients suffering from chest diseases to voice their objections. Recently a chronic bronchitic patient refused to travel in an ambulance unless a non-smoking journey could be guaranteed, threatening to get out if anyone attempted it. Another case was brought to my notice of a very sick man who was conveyed from his home to the Leeds General Infirmary. The smoky atmosphere made him so dyspnoeic that he refused to return by the same form of transport. He unfortunately died a few weeks later. Surely smokers could forgo their objectionable habits while being conveyed to and from hospital. It would be necessary to enforce the non-smoking rule under all circumstances, whether the vehicle was full or empty, imposing a fine for infringement.—I am, etc.,

Leeds.

DAVID A. HERD.

Merit Awards

SIR,—I congratulate you on featuring Santa Claus in your Christmas number, although it was only in eight lines under the heading of "Distinction Awards" (*Supplement*, December 22, 1956, p. 222). The picture of Lord Moran making his annual distribution of a million and a quarter pounds of the taxpayers' money in the form of life annuities, pensionable sinecures, and whatnot to unnamed persons for unspecified services is indeed seasonable. It is also unique in the sense that this is the only public money spent in this country which is arbitrarily and secretly doled. But is "distinction" the right word? Can anonymous recipients be distinguished for unnamed achievements? I can think of several better words. What was originally an inane piece

of mediaeval paternalism can easily degenerate into Hitlerism in high places with its entourage of bought men and silenced sycophants.—I am, etc.,

Beckley, Rye.

C. G. LEAROYD.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- Allgöwer, M.: Cellular Basis of Wound Repair. 1956.
Anson, B. J.: Anatomy of the Head and Neck. 1956.
Atkinson, D. T.: Magic, Myth and Medicine. 1956.
Bailey, D. S. (Editor): Sexual Offenders and Social Punishment. 1956.
Barrow, R. L., and Fabing, H. D.: Epilepsy and the Law. 1956.
Bentley and Driver's Textbook of Pharmaceutical Chemistry. Sixth edition. 1955.
Berkeley's Pictorial Midwifery. Fifth edition revised by D. M. Stern. 1956.
Bett, W. R.: Sir John Bland-Sutton, 1855-1936. 1956.
Biot, R., and Galimard, P.: Medical Guide to Vocations. 1955.
Bland, J. H.: Clinical Recognition and Management of Disturbances of Body Fluids. Second edition. 1956.
Bleck, E. E., Duckworth, N., and Hunter, N.: Atlas of Plaster Cast Techniques. 1956.
Böhler, L.: Treatment of Fractures. Translated from the 13th German edition. Volume I. 1956.
Bourne, G. H. (Editor): Biochemistry and Physiology of Bone. 1956.
Burn, M.: Mr. Lyward's Answer. 1956.
Burton, J.: Crippled Victory. 1956.
Callomon, F. T., and Wilson, J. F.: Non-venereal Diseases of the Genitals. 1956.
Cantor, A. J., and Foxe, A. N.: Psychosomatic Aspects of Surgery. 1956.
Ciba Foundation Symposium on Bone Structure and Metabolism. 1956.
Ciba Foundation Symposium on Experimental Tuberculosis. 1955.
Ciba Foundation Symposium on Extrasensory Perception. 1956.
Ciba Foundation Symposium on Histamine. 1956.
Cope, Sir Z.: A Hundred Years of Nursing. 1955.
Crossen, R. J.: Synopsis of Gynecology. 1956.
Cruckshank, A. G.: Pocket Prescriber. Sixteenth edition. 1956.
Daley, R., and Miller, H.: Progress in Clinical Medicine. By various authors. Third edition. 1956.
Dayton, H.: Physiology of the Ocular and Cerebrospinal Fluids. 1956.
Edelston, H.: Problems of Adolescents. 1956.
Elliott, K. A. C., et al. (Editors): Neurochemistry: The Chemical Dynamics of Brain and Nerve. 1955.
Evans, W.: Cardiology. Second edition. 1956.
Finkel, E.: Woman in the Modern World. 1956.
Fluhmann, C. F.: Management of Menstrual Disorders. 1956.
Fry, Sir W. K., and Ward, T.: Dental Treatment of Maxillo-facial Injuries. Second edition. 1956.
Goldberger, E.: Heart Disease: Its Diagnosis and Treatment. Second edition. 1955.
Goodale, R. H.: Nursing Pathology. Second edition. 1956.
Gorsch, R. V.: Proctologic Anatomy. Second edition. 1955.
Gowland, W. P., and Cairney, J.: Anatomy and Physiology for Nurses. Fourth edition. 1955.
Gullian's Theory and Practice of Nursing. Seventh edition revised by M. E. Gould. 1956.
Haler, D.: Sudden Death. 1955.
Hutchinson's Food and Principles of Dietetics. Eleventh edition revised by V. H. Mottram and George Graham. 1956.
Jersild, A. T.: Child Psychology. Fourth edition. 1955.
Johnstone, R. W.: Midwife's Textbook of the Principles and Practice of Midwifery. Seventh edition. 1955.
Layton, T. B.: Sir William Arbuthnot Lane, Bt. 1956.
Lemkau, P. V.: Mental Hygiene in Public Health. Second edition. 1955.
Le Vay, D.: Life of Hugh Owen Thomas. 1956.
Levinson, A.: Mentally Retarded Child: A Guide for Parents. 1955.
Minski, L.: Practical Handbook of Psychiatry for Students and Nurses. Third edition. 1956.
Moroney, J.: Surgery for Nurses. Third edition. 1955.
Murphy, D. G.: They Did Not Pass By: The Story of the Early Pioneers of Nursing. 1956.
Naish, F. C.: Breast Feeding: A Guide to the Natural Feeding of Infants. Second edition. 1956.
National Association for Mental Health: Mentally Handicapped Children: A Handbook for Parents. 1956.
O'Keefe, J. A., and Schless, R.: Food and Drugs Act, 1955.
Oughterson, A. W., and Warren, S. (Editors): Medical Effects of the Atomic Bomb in Japan. 1956.
Page, J. H.: Hypertension: A Manual for Patients with High Blood Pressures. Second edition. 1956.
Percival, G. H.: Introduction to Dermatology. Twelfth edition. 1956.
Price's Textbook of the Practice of Medicine. By various authors. Edited by Donald Hunter. Ninth edition. 1956.
Pritikin, R. I.: Essentials of Ophthalmology. 1950.
Robertson, J. K.: Radiology Physics. Third edition. 1956.
Russell, W. R.: Poliomyelitis. Second edition. 1956.
Schiff, L. (Editor): Diseases of the Liver. 1956.
Smith, H. W.: Principles of Renal Physiology. 1956.
Sodeman, W. A. (Editor): Pathologic Physiology: Mechanisms of Disease. Second edition. 1956.
Soffer, L. J.: Diseases of the Endocrine Glands. Second edition. 1956.
Stanton, A. H., and Schwartz, M. S.: The Mental Hospital. 1954.
Tauber, R.: Basic Surgical Skills. 1955.
Trowell, H. C.: Diagnosis and Treatment of Diseases in the Tropics. Third edition. 1956.
Wallin, J. E. W.: Education of the Mentally Handicapped Children. 1955.
Walton, J. N.: Subarachnoid Haemorrhage. 1956.
Williamson, P.: Office Procedures. 1955.
Wohl, M. G., and Goodhart, R. S. (Editor): Modern Nutrition in Health and Disease: Dietotherapy. 1955.
Wood, P.: Diseases of the Heart and Circulation. Second edition. 1956.

H.M. Forces Appointments

ROYAL NAVY

Surgeon Captain D. H. Kernohan has retired.
Surgeon Commanders H. M. Darlow and A. L. Moorby have retired.
Surgeon Lieutenants J. G. H. Sheppard, G.M., C. O. L. Hughes, and W. A. N. Mackie, D.S.C., to be Surgeon Lieutenant-Commanders.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Lieutenant-Commander (Retired) H. G. Rees, O.B.E., has been removed from the Retired List on transfer to the S.A.N. (War Reserve).
Surgeon Lieutenant W. I. H. Bourne to be Surgeon Lieutenant-Commander.

HER MAJESTY'S OVERSEA CIVIL SERVICE

The following appointments have been announced: G. Buchanan, F.R.C.S., Surgeon Specialist, Western Nigeria; A. J. Evans, M.B., B.S., D.A., Senior Specialist, Western Nigeria; J. L. T. Graham, L.R.C.P.&S.I., R. J. Hayhurst, M.B., B.S., and E. J. McArdle, M.B., B.Ch., B.A.O., Medical Officers, Northern Nigeria; A. Hargreaves, M.B., Senior Medical Officer, Kenya; I. K. Hay, M.B., Ch.B., D.P.H., D.T.M.&H., Senior Medical Officer, Sleeping Sickness Service, Northern Nigeria; K. K. Kapadia, M.B., B.S., D.T.M.&H., Medical Officer, Western Nigeria; F. X. Letellier, M.R.C.S., L.R.C.P., D.P.H., Deputy Director of Medical Services, Mauritius; D. A. W. Nugent, M.B., B.S., D.P.H., D.T.M.&H., Specialist Hygienist, Ministry of Health, Gold Coast; C. Nwokolo, M.R.C.P., Specialist (Physician), Eastern Nigeria; R. E. Onwumere, M.R.C.S., L.R.C.P., D.O., Specialist (Ophthalmology), Eastern Nigeria; C. H. Parkin, M.D., C.M., D.P.H., Senior Radiologist, Jamaica; Joan M. Curtis, M.B., B.S., D.O.B.R.C.O.G., Temporary Medical Officer, Falkland Islands; M. W. T. Gedroye, M.B., Ch.B., Medical Officer, Sierra Leone; A. St. F. Henley, M.B., F.R.C.S., Surgeon (Public Hospital), British Guiana; I. A. Key, M.B., B.S., Medical Officer, Tanganyika; F. O. Mueller, M.D., Temporary Medical Officer, Gambia; E. Onori, M.D., Temporary Medical Officer, Gold Coast; P. Paratian, M.B., Ch.B., Medical Officer, Mauritius; C. S. Rajagopal, M.B., B.S., D.C.H., Temporary Medical Officer, Sierra Leone; W. S. Snow, L.R.C.P.&S.I., Medical Officer, Barbados.

Association Notices

Diary of Central Meetings

JANUARY

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| 7 Mon. | S.H.M.O. Group Executive Committee, 2 p.m. |
| 8 Tues. | Organization Committee, 2.15 p.m. |
| 8 Tues. | Training Subcommittee, Occupational Health Committee, 2.30 p.m. |
| 9 Wed. | Remuneration Subcommittee, Occupational Health Committee, 10.30 a.m. |
| 9 Wed. | Financial Advisory Committee, 2 p.m. |
| 9 Wed. | Office Staff Superannuation Fund Committee, following Financial Advisory Committee. |
| 9 Wed. | Private Practice Committee, 2 p.m. |
| 10 Thurs. | Ethical Review Subcommittee, Central Ethical Committee, 10.30 a.m. |
| 10 Thurs. | Joint Formulary Committee, 11 a.m. |
| 10 Thurs. | Central Ethical Committee, 2 p.m. |
| 10 Thurs. | Psychological Medicine Group Committee, 2 p.m. |
| 11 Fri. | Amending Acts Committee, 2 p.m. |
| 16 Wed. | Occupational Health Committee, 10 a.m. |
| 17 Thurs. | G.M.S. Committee, 10.30 a.m. |
| 17 Thurs. | Radiologists Group Committee, 11 a.m. |
| 21 Mon. | Editorial Subcommittee, Joint Formulary Committee, 11 a.m. |
| 22 Tues. | Alternative Edition Subcommittee, Joint Formulary Committee, 11 a.m. |
| 28 Mon. | Staff Side, General Whitley Council (at 14, Russell Square, W.C.), 10.30 a.m. |
| 28 Mon. | Full General Whitley Council (at 14, Russell Square, W.C.), 2 p.m. |
| 29 Tues. | Arrangements Committee (Edinburgh, 1959), 12 noon. (Change of time.) |
| 29 Tues. | Subcommittee on Medical Reports, Joint Committee of the B.M.A. and the Magistrates' Association, 2 p.m. |

FEBRUARY

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| 12 Tues. | Committee on the Rehabilitation of Disabled Persons, 10.30 a.m. |
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Branch and Division Meetings to be Held

BARNET DIVISION.—At Old Fold Manor Golf Club, Thursday, January 10, 7 for 7.45 p.m., dinner. Speaker: Mr. C. D. Read. Medical guests are invited.

BELFAST DIVISION.—At Upper Lecture Theatre, Institute of Clinical Science, Grosvenor Road, Belfast, Thursday, January 10, 8.30 p.m., meeting. B.M.A. Lecture by Dr. J. B. Firth: "Forensic Problems of Medical Interest." Members and senior medical students are invited.

BROMLEY DIVISION.—At Queen Mary's Hospital, Sidcup, Wednesday, January 9, 8.15 for 8.30 p.m., meeting. Dr. R. V. Gibson: "Indications for Surgical Treatment in Heart Disease."

CROYDON DIVISION.—At 43, Wellesley Road, Croydon, Tuesday, January 8, 8.30 p.m., general meeting, followed by B.M.A. film: "The Conjoined Twins of Kano."

EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, January 10, 7.30 p.m., dinner; 8.45 p.m., Dr. D. Curran: "Psychiatric Approach to Crime." Members are invited to bring a Justice of the Peace or an interested member of the legal profession as a guest.

EAST YORKSHIRE BRANCH.—At Quern House, 68, Park Street, Hull, Wednesday, January 9, 8.30 p.m., meeting. Presidential Address: "An Ancient Breed."

HALIFAX AND TADMORDEEN DIVISION.—At Board Room, Royal Halifax Infirmary, Tuesday, January 8, 8.30 p.m., meeting. Lecture by Mr. E. Gledhill: "Use and Abuse of Sex Hormones in Gynaecology and General Practice."

HENDON DIVISION.—At Hendon Way Hotel, N.W., Tuesday, January 8, 8.45 p.m., medico-legal evening. Dr. A. K. Mart and Superintendent Hannam: "The Towpath Murder." Members' friends are invited.

LEWISHAM DIVISION.—At St. John's Hospital, Lewisham, S.E., Sunday, January 13, 10.30 a.m., clinical meeting.

LONDONDERRY DIVISION.—At Londonderry City and County Hospital, Friday, January 11, 8.15 p.m., meeting. Films: "Some Aspects of Accessible Cancer," Part I, Skin; Part II, Lip, Tongue, and Mouth.

NORTH BEDFORDSHIRE DIVISION.—At Library, Bedford General Hospital, South Wing, Thursday, January 10, 8.30 p.m., general meeting.

REIGATE DIVISION.—At Redhill County Hospital, Tuesday, January 8, 8.30 p.m., meeting. Address by Mr. L. H. Savin: "The Differential Diagnosis of Headaches."

SCUNTHORPE DIVISION.—At Board Room, Scunthorpe and District War Memorial Hospital, Wednesday, January 9, 8.30 p.m., meeting. Dr. C. D. Cormac: "The School Medical Service."

SOUTH-EAST ESSEX DIVISION.—At Southend General Hospital, Thursday, January 10, 8.30 p.m., meeting. Talk by Dr. E. G. Sita Lumsden: "Bronchial Carcinoma."

STIRLING BRANCH.—At Golden Lion Hotel, Stirling, Sunday, January 6, 3 p.m., general meeting to discuss rejection of remuneration claim. Address by Dr. C. J. Swanson and Dr. E. R. C. Walker. All medical practitioners in the area of the Branch are invited.

STRATFORD DIVISION.—At Board Room, Queen Mary's Hospital, Stratford, E., Tuesday, January 8, 8.45 p.m., general meeting and discussion.

WANDSWORTH DIVISION.—At South London Hospital for Women and Children, Clapham South, S.W., Friday, January 11, 8.30 p.m., meeting. B.M.A. Lecture by Dr. Philip Ellman: "Management of Rheumatic and Allied Diseases in General Practice" (illustrated by slides).

Meetings of Branches and Divisions

CHELSEA AND FULHAM DIVISION

The annual B.M.A. lecture was delivered by Mr. A. M. A. Moore on November 20, 1956. Colonel Harnett was in the chair, and 40 members and guests from neighbouring Divisions were present. The title of Mr. Moore's lecture was "Painful Conditions of the Hand and Foot."

STRATFORD DIVISION

The annual general meeting was held at King George Hospital, Ilford, on October 23. Dr. N. J. Lawler was in the chair and 35 members were present. The following officers were elected:

Chairman.—Dr. R. Peters.
Vice-chairman.—Dr. H. R. England.
Honorary Secretary and Treasurer.—Dr. A. Elliott.
Assistant Honorary Secretary.—Dr. I. M. Segal.
Dr. D. P. Stevenson, Deputy Secretary of the Association, gave an address on "Current Events at Headquarters," which was followed by a discussion in which Drs. M. Lewis, W. S. Macgowan, I. M. Segal, C. E. Fenton, J. W. Digan, and A. Elliott took part.

WINCHESTER DIVISION

The annual meeting was held at the Royal Hotel on October 27, 1956. Dr. P. A. T. Lowden was in the chair, and 35 members and their guests were present. The following officers were elected:

Chairman.—Dr. J. T. Rowe.
Vice-chairman.—Dr. J. R. Bodington.
Honorary Secretary and Treasurer.—Dr. J. M. Forbes.
After dinner, the President of the Association, Dr. Alexander Hall, addressed the meeting on the subject of the B.M.A.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 12 1957

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REMUNERATION CLAIM
OFFER OF FURTHER MEETING

Four representatives of the Negotiating Committee, Sir RUSSELL BRAIN and Drs. A. B. DAVIES, J. D. S. CAMERON, and S. WAND, met the Minister of Health and the Joint Parliamentary Under-Secretary of State for Scotland on January 4.

The Minister of Health explained that he had not given a reasoned reply to the Committee's supplementary memorandum because he had been advised that there were constitutional objections to his doing so. All that he could say about the legal aspect of the remuneration claim was that, according to the advice he had received, the Government was not under any legal contractual obligation to the profession. As to the merits of the claim, he could not even begin to examine these in the present economic circumstances of the country, since this, in his view, would start a "chain-reaction" in other quarters which would endanger the country's financial stability.

The representatives of the Committee vigorously opposed the Minister's attitude and emphasized, in particular, that it was not merely a dispute about money but a crisis of confidence which went to the roots of the relations between the medical profession and the Government. At the end of a fruitless discussion the Minister offered to meet the Committee's representatives again after he had given further thought to the problem and discussed it again with his colleagues. This offer was accepted, and it was agreed that the further meeting should take place before the end of January.

After the meeting with the Ministers the Negotiating Committee met and unanimously expressed approval of the action taken by its representatives. Later on the same day these representatives held a press conference. By this time the Ministry had issued its own press statement, in which it had again given the figure of 137% as representing the increase which had already taken place in the average war-time remuneration of general practitioners. The Committee's representatives explained to the press that this was an unfair and misleading statement, since it concealed the fact that the Spens Committee had found the actual pre-war incomes to be too low. The increase over the figure agreed with the Ministry, in the light of the Spens report, as the correct average in terms of the value of money in 1939 was only 100%.

VISIT TO CARIBBEAN BRANCHES*

BY

IAN D. GRANT, M.B., Ch.B.

Chairman of the Representative Body

Our colleagues in the British West Indies are faced with many difficulties. Within two years there will probably be a Federation of the West Indian Islands, but the politicians have not yet been willing to include the medical services in the proposed Federation, although the Caribbean Council of the B.M.A. has unanimously agreed that such a co-ordination would benefit both the doctors and the communities they serve.

Barbados

In Barbados, the most densely populated of the islands, the Government service medical officers were very dissatisfied with their working conditions. They are responsible for districts with a population of about 8,000 patients, and receive a salary of £900 per year. Private practice is allowed, but in the country areas the number of patients who can pay fees is very limited. The hospital in Bridgetown is old and ill-equipped. It has 470 beds, but the wards were so overcrowded that occasionally two adult patients lay in one bed, and frequently two, and sometimes even three, children in one cot. When I visited the hospital the surgeon was on leave in Britain. There was no consultant physician, radiologist, or otorhinolaryngologist, and only a part-time anaesthetist who was in private general practice. The staff of the hospital at that time consisted of one surgical registrar, who was paid £1,200 per year, full-time, and one house-surgeon with a year's experience. These two men were in full charge of 250 surgical beds, and in addition saw some 200 out-patients daily. They were so grossly overworked that only urgent cases could be admitted and the out-patient department was closed in the mornings.

In Barbados, the B.M.A. had been completely ignored by the Government, but, as a result of talks at the highest levels, we received an assurance that the Association would be consulted in all medical problems and that an effort would be made to improve the medical services as regards both terms of service and remuneration. Reasonable

*Dr. Grant paid a good-will visit to the Caribbean Branches, on behalf of the Council of the Association, during September and October.

incomes are made by private practitioners, but there does not appear to be much scope for additional private practice, and the Government appointments are so unattractive, except for the clinical experience they offer, that only those with a strong sense of vocation should consider them.

British Guiana

From Barbados I proceeded to British Guiana, where I found the Government medical services very unsatisfactory. The staff were inadequately paid, and the co-operation between practitioners and the hospital staff poor. Patients were admitted to hospital on the recommendation of a priest or a policeman, and general practitioners were not informed of what treatment was given. Consultants stated, with justification, that they had no secretarial assistance, and that they were so overworked that they personally had no time to write letters. Both general practitioners and consultants agreed that admission to hospital should be only through a doctor's letter, but, for political reasons, the Government would not accept this contention. The hospital is old, ill-equipped, and has no air-conditioning. Medical, surgical, and even dental cases are all huddled together in a common out-patient waiting-shed, and each doctor sees about 200 out-patients daily. The best they can do is try to focus attention on the genuinely serious cases and give them what care is possible. One surgeon and one houseman were responsible for 150 beds and all the operations in addition to their daily quota of 200 out-patients. The surgeon was paid £2,000 per year with the right to a very limited amount of private practice, but physically he was unable to do much after his hospital work was finished. Consultants may retain only half their private fees, the other half being kept by the hospital. Tax is deducted at the rate of 50% from the half they are allowed to retain, so that in fact they personally get only 25% of the fee. District medical officers receive a salary of £900 to £1,200 per year on a full-time basis. If they wish to undertake private practice in addition they must refund £300 a year, and hope to recoup that amount or more from private fees. Private patients occupy pay-beds (usually £1 per day) in hospital.

The situation in British Guiana is becoming critical. Many districts have no medical officers, and hospital consultants are not renewing their contracts. The Government discriminates between male and female medical officers, and between married and single medical women.

Many private practitioners in Georgetown have well-equipped consulting-rooms and give a high standard of medical care. A popular general practitioner can earn £4,000 to £5,000 gross per year, but he, of course, has no leave and no pension rights, and he works just as hard as any general practitioner in our National Health Service.

The Minister of Health for some years has had no contact with the local Branch of the B.M.A., and the doctors were not consulted before legislation was introduced. We received a promise that in future the Association would be consulted and be regarded as the mouthpiece of the profession. Under present conditions I could not advise a British graduate to apply for a post in the British Guiana Government service.

Caribbean Conference

The Caribbean Conference met in Trinidad and discussion was lively, statesmanlike, and realistic. It was agreed that the Conference should take place normally every second year, but that special meetings might be necessary in view of the imminence of the West Indian Federation. It was decided to press for the removal of the medical services from the civil services, and that terms and conditions for the medical services should be outwith ordinary civil service rates. The Conference recommended that the medical services should be recruited and maintained on a federal basis, and that when shortages arose there might be interchange of medical officers between the different islands. Each Government should ensure that the B.M.A. would be consulted before changes were introduced in its medical

services and that the Association, representing the profession, should have right of access to Ministers and their officers on any medical subject they desired to bring to their notice.

Trinidad

Trinidad appeared to have fewer difficulties in recruiting hospital staffs than the other islands. The hospital in Port of Spain, though old, was efficient and well staffed, and that in San Fernando modern and well equipped, as was also the Sanatorium at Caura. A thoracic surgeon from the United Kingdom was arriving shortly.

The Trinidad Branch has been studying the initiation of a modified health service for the lower-income groups. A capitation system of payment is suggested, with a maximum list of 2,500, and private practice in addition. On a contributory basis, the worker would pay 10% of his wages to the scheme, and the employer and the Government a similar amount. Dependents could be included, but for them the contribution would be increased. No sickness benefit would be paid, but drugs would be given free of charge. The scheme is still very nebulous, and many of the doctors dislike the capitation method of payment and insist on a fee-for-service payment. Trinidad has more wealth than the other islands, and it is quite possible that some type of health service will be evolved in the near future. The oil companies and some other commercial concerns have built modern and well-equipped hospitals which are staffed by full-time salaried doctors, all of whom appeared satisfied with their working conditions.

Antigua

In Antigua conditions were much less satisfactory. The Government, without previous discussion, threatened to abolish all private practice for Government medical officers, and to pay them a salary of £1,400 per year. At present they receive a maximum of £960, but may undertake private practice. Each doctor provides free care for about 4,000 Government patients but is at risk for up to 8,000, many of whom claim inability to pay fees. The doctors refused the suggested new salaries and now demand a minimum of £1,450, rising to £2,100 after seven years, with the right to private practice in their own districts. At present almost all the doctors come into St. John—the principal town—where they have private consulting-rooms. The districts are therefore often left without a medical officer for several hours daily.

We met the governor, the administrator, and the chief medical officer, all of whom agreed that the B.M.A. would be consulted fully before further suggestions were made. They also agreed the suggested salary scales were not unreasonable, but foresaw many political repercussions if they were accepted. The doctors of Antigua are in good heart, and will, I think, find a satisfactory solution to their problems. During my visit the Government agreed to provide for each district medical officer a nurse, a dispenser, and the full cost of drugs. Prior to that the doctor received £10 12s. 6d. monthly with which to pay for and dispense all necessary drugs to all Government patients.

The hospital in Antigua had been built as a prison camp during the Boer War, but was never used as such. The building is now crumbling. It has 140 beds. There is no air-conditioning in the operating theatre, and only recently have they obtained an adequate x-ray plant. A new ward, very badly designed, has just been completed and it is hoped soon to build a second.

Jamaica

From Antigua I went to Jamaica—the oldest overseas Branch of our Association. The new West Indian University is situated in a beautiful campus. The medical school is well equipped and has an excellent teaching staff. About 15 to 20 doctors graduate each year.

The Government medical officers in Jamaica, numbering about 130, are very restless and unsettled. They formed, a few years ago, the Government Medical Officers' Associa-

BIRMINGHAM CONSULTANTS AND SPECIALISTS

CENTRAL COMMITTEE CHAIRMAN'S ADDRESS

Mr. T. HOLMES SELLORS, Chairman of the Central Consultants and Specialists Committee of the B.M.A., was invited to address the annual meeting of the consultants and specialists of the Birmingham region on November 28. Dr. G. E. OWEN WILLIAMS was in the chair.

A State medical service, Mr. Holmes Sellors thought, had come to stay. On the credit side it had probably led to improvement in the general standard of hospital practice, particularly on the periphery. Consultants and specialists had greater security and superannuation rights. The greatest danger to-day lay in the risk of the hospital medical services being relegated in importance to a minor branch of the Civil Service, and Mr. Holmes Sellors appealed to all consultants and specialists to take a more active interest in medico-political matters. Only by positive effort could the traditions of the profession be safeguarded. The Joint Consultants Committee was accepted by the Ministry as an advisory machine, and relations in the main were friendly. By contrast there was no medical advisory machinery of a freely elected kind at regional board level.

Current Problems

The Joint Committee, said Mr. Holmes Sellors, was shortly to have further discussions with the Ministry on the problems of junior hospital medical staffing. He thought that both the Ministry and the profession realized the difficulties involved. They were well aware, and both sides agreed, that absorption and not dismissal must be the answer to the still-unsolved senior registrar problem.

Of Whitley negotiating machinery, the speaker said it was admittedly slow and ponderous, but he thought its safeguards outweighed its drawbacks. Neither side could go to arbitration without the other agreeing, and this might not always be disadvantageous. He emphasized that Whitley bargaining could not be done in the open.

Finally, Mr. Holmes Sellors called for a good response to a further appeal which was shortly being made for contributions to the Hospital Medical Staff Defence Trust. He stressed the need for adequate funds to cover expenses incurred in the interests of hospital medical staff as a whole, and instanced the cost of the recent successful appeal, now the subject of a further appeal to the High Court, to the Special Commissioners of Income Tax on part-time consultants and Schedule E. The B.M.A., the defence societies, and the Regional Hospitals Consultants and Specialists Association had contributed towards the cost of this.

INCIDENCE OF VENEREAL DISEASE

B.M.A. INQUIRY

On the recommendation of the Venereologists Group Committee of the Association, the Council has authorized a sample inquiry in certain B.M.A. Division areas into the extent to which venereal disease is being treated outside hospitals. There has been a striking fall in the number of new cases attending clinics. The Council thinks it probable that this represents an apparent rather than a real decline in the incidence of venereal disease, and that the simplicity of penicillin treatment has led to a considerable number of cases being treated outside clinics.

General practitioners and consultants in the selected Division areas will be asked to fill in a questionnaire on the number of cases they have treated during 1956 without reference to a venereologist. The inquiry will be strictly confidential. The names of patients will not be required, nor will the names of doctors providing information be disclosed in any report on the inquiry.

tion because they considered the B.M.A. was inept and did nothing to further their interests. Since the advent of a new, very Socialistic, chief minister, Government medical officers have been threatened with a full-time salaried service at a remuneration they think would be considerably less than they receive at present, although no actual salary range has yet been postulated. The consultants also have been threatened with a full-time salary of about £2,000 per year. Both general practitioners and consultants are united in their opposition to this new scheme. I discussed the problem with the Chief Minister, who agreed in principle that the B.M.A. would be consulted before any changes were made, and who was willing to consider the possibility of sessional employment for Government medical officers, leaving them free to undertake private practice after their sessions finished. It was obvious that, although this might be financially satisfactory to both sides, politically the Chief Minister did not like it.

A special meeting of the Government Medical Officers' Association was convened before I left, and it was finally agreed that all representations to the Government should be made by a joint committee of the British Medical Association and Government Medical Officers' Association; and that the latter recognized the B.M.A. as the mouthpiece of the profession. The meeting passed unanimously a resolution urging all their members also to become members of the B.M.A.

Private Practice

The standard of private practice in the West Indies is high. The doctors' offices are well furnished, attractive, and well equipped. Many do their own surgery and have a good stock of instruments. Many have an E.C.G. Some undertake anaesthetics, ophthalmology, or otorhinolaryngology, and provide all the necessary equipment for their specialty. An intending practitioner would require to expend about £5,000 to £6,000 on his office and equipment. He would not, as a rule, earn enough to pay his way during the initial 4 to 5 years, but after that he should earn between £3,000 and £5,000 a year, but income tax would take away a great deal. The normal fee range is from 10s. to £2 2s. Getting away for holidays or study leave would be difficult. Education might present problems. The schools in Barbados, Jamaica, and Trinidad are of good standard. The climate is enervating and the constant sunshine is not very compatible with the arduous work which successful practice entails.

Conclusion

I wish to thank all the Branches which I visited for their great personal kindness and hospitality, to both Mrs. Grant and myself, and for the enthusiastic welcome they extended to us. I would also express my sincere gratitude to the Governors, the Ministers, and the administrators and chief medical officers for the courtesy, sympathy, consideration, and interest with which they heard our arguments and discussed our problems. With a continuance of such good will on both sides it is my hope that a very real improvement will take place in the Government-doctor relationship and that this in turn will lead to a much more efficient medical service for the people.

MEDICAL DISPUTE IN CEYLON

A report from Ceylon states that the Government Medical Officers Association called off its threatened strike, due to start on January 7, pending the outcome of negotiations with the Government. The Prime Minister of Ceylon, Mr. S. W. R. D. Bandaranaike, is personally undertaking the negotiations. The main bones of contention are the Government's proposals for the abolition of private practice and the readjustment of salary scales arising out of the recommendations of the Canekaratne Report on the medical services of the island.

MEDICAL MEMBERS OF HOSPITAL BOARDS AND COMMITTEES

A circular (H.M. (56) 111) to hospital authorities states that the Minister of Health proposes to follow the recommendation of the Guillebaud Committee that medical membership of regional hospital boards should normally not exceed 25%, and he has asked the boards to do the same when making appointments to hospital management committees. Special considerations apply to boards of governors, where provision has to be made not only for nomination of members by the hospital medical staff but also by the university (whose nominees may also be medical). Nevertheless, the Minister asks that regional hospital boards should secure a "reasonable balance" of lay representation when making nominations for membership of boards of governors.

N.O.T.B. ASSOCIATION

At the National Ophthalmic Treatment Board Association council meeting on December 14 members learned with regret of the death of Dr. R. Gordon Simpson, whose work for the association had been of great value. The council received the medical secretary's preliminary report on the subject of medical eye examination in industry. It approved the taking of a stand at the B.M.A. exhibition in Newcastle in 1957. The second annual general meeting will be held on June 14 at B.M.A. House.

PART-TIME LOCAL AUTHORITY WORK IN SCOTLAND

The new scale of fees for part-time local authority work (M.D.C. circular No. 32) reported in the *Supplement* of December 29 (p. 228) applies only to England and Wales. Scales of fees for part-time local authority work in Scotland are now being negotiated and will be announced when agreement has been reached.

HUNGARIAN DOCTORS

The International Medical Visitors Bureau would like more offers of accommodation, for at least one month, for Hungarian doctors and their families, especially in or near London. Any offers should be sent to the Medical Director of the Bureau, Brigadier H. A. Sandiford, British Medical Association, Tavistock Square, London, W.C.1.

HOSPITALITY

A German doctor would like her daughter, aged 12, to arrange a holiday exchange with a British doctor's daughter. The British girl could stay for as long as she likes in a villa in the Hamburg suburbs, and if necessary take a holiday course at Hamburg University or elsewhere.

Would anyone interested please get in touch with Brigadier H. A. Sandiford, International Medical Visitors Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Correction.—The report of the proceedings of Council (*Supplement*, January 5, p. 4) should have stated that it was agreed that a paragraph on the integration of medical officers of health with the hospital service, which formed part of the report of the Central Consultants and Specialists Committee, should be referred to the Public Health Committee for its comments.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Remuneration Claim

SIR,—It would indeed be surprising if a prototype National Health Service, original in its conception and experimental in its design, did not require substantial modification after eight years of operational service. It would be disastrous for its prospects of success if those concerned in its development did not read the lessons of experience. The failure of the Service as an export model underlines its shortcomings. It is abundantly clear that unless it is refashioned satisfactory performance will not be achieved.

The profession will echo Sir Russell Brain's words at his press conference: "This is not merely a pay claim, but a crisis of confidence. It goes to the roots of the relations between the medical profession and the Government." Eight years of uneasy working have at least served to indicate the particular roots that need pruning before the Health Service will bear fruit.

A new charter for a national health service would therefore pay special attention to the following points: (1) The removal of the Service from politics and the creation of an independent authority for its administration. (2) The formulation of a new agreement precise in its terms and clear in its legal implications to replace the recommendations of the Spens Committee upon which the Government has defaulted. (3) Reappraisal of the overwhelming powers vested in "the Minister" under the National Health Service Acts. The interests of the individual doctor are not adequately safeguarded. The virtual absence of employment outside the confines of the Service makes his position especially precarious. (4) The substitution of a payment related to items of service in place of the present capitation fee system in general practice. This would provide better medical care for the patient and give added interest to medical work. It would relieve the pressure of work in hospital out-patient and casualty clinics. (5) The pay of consultants should be directly related to their responsibilities. The secret payment to unknown specialists of substantial sums of money for unspecified services—the ingenious idea of Lord Moran—should stop. Ethically objectionable, it has disrupted the original salary pattern in the National Health Service. These large pensionable increments are not available even to the most efficient and conscientious general practitioner. This evil plan has destroyed the unity of the profession and grievously damaged the mutual confidence of its members.

You, Sir, in a leading article (*Journal*, November 17, 1956, p. 1165) have truly stated that "virtue has gone out of the profession." It will need courageous and imaginative leadership to restore it.—I am, etc.,

Sudbury, Suffolk.

H. BATHURST NORMAN.

SIR,—The Minister of Health has made it clear that in his view the future of medicine must be subject to political expediency, not policy. His repudiation of Spens leaves us no rights nor guarantees for the future. The worse the present inflationary tendencies become, the less expedient will it be to meet our claims, and thus we can hope for nothing from the future except increasing poverty and degradation. He has invited our representatives to meet him again, but with what object, except as a trick to further delay our taking action? He has given us no reason to trust him further.

Let our negotiators refuse to meet him again: there has been too much talk, too much delay. Give us the strong lead we need for universal resignation from the Service at three months' notice: it is the only dignified reply. To refuse to sign certificates or other such paltry measures savours of strike action and can only bring us into public contempt. If, before the notice has expired, our claim be

met in full, then let us continue in the Service for a specified period only, say one year, until an alternative scheme, generally approved by our representatives, can be worked out and put before Parliament, and, if the Minister will not accept this, let us resign again, and finally.

We are not dependent on the Government for a job, nor can the Government provide for the medical care of the people. We do that. The politicians merely arrange a system by which the people pay for it, and it is an unsatisfactory one. What doctor worthy of the name could not make a better living, with time for better medicine, in private practice if there was no free alternative? The terms under which we serve at present must eventually result in the utter degradation of medical practice in this country, to the ultimate detriment of the public interest, and we owe it to the public no less than ourselves to dictate the future policy of the National Health Service: the politicians have had their chance, and they have proved unable and unworthy.—I am, etc.,

Gloucester.

W. R. BLATCHLEY.

SIR,—The Conservative Government, while dividing the nation by its failure to find a common foreign policy with Her Majesty's Opposition, has repeatedly shown a common policy with the Labour Party in regard to its dealings with the medical profession. The present Government has accepted the National Health Service Act of 1948, and has made little or no attempt to modify this Act. In 1951 the Conservative Party gave a pledge that it would remove a grave abuse, introduced by Mr. Aneurin Bevan with the apparent object of forcing a full-time medical service on the public. I refer to the clause in the Act which denies those patients who prefer to remain outside the National Health scheme the facilities for medicines, drugs, etc., accorded to patients receiving treatment under this scheme. It must be common knowledge that such medicines, etc., are paid for out of taxation, and all members of society should be equally entitled to such benefits. The Minister of Health, however, has repeatedly refused in Parliament to remove this gross injustice, or to honour his party's pledge.

It is most unfortunate that the medical profession should be urging a claim for financial adjustment at a time of national economic embarrassment, for the public cannot fail to associate such conduct in their minds with the demands of civil servants and members of nationalized services and industries, who are clamouring for further pay increases. The leaders of the profession in 1948 appear to have been brilliantly outmanoeuvred by Mr. Aneurin Bevan, and the profession can have little hope of an equitable financial settlement from politicians in general or the Government of the day. The medical profession would be wise to remember that our present Government has the inestimable advice of Dr. Charles Hill, who must have learnt many useful political devices when, as Secretary to the British Medical Association, he was in almost daily contact with Mr. Aneurin Bevan at the time of the passing of the National Health Service Act. It would surely be wiser to press for a complete revision of this Act, rather than antagonize the public by insisting on an increase in pay at this most inopportune moment.—I am, etc.,

London, W.1.

W. FERGUSON HANNAY.

SIR,—Your readers might be interested in the measures a businessman would use if he were in our position. One such was in my surgery the other night, and he said: "Doctor, your opponent is the Treasury, so you must concern yourself only with money and power:—(1) Prescribing: Give the patients what they ask for and stop acting as a watchdog for the Treasury, incurring the displeasure of your patients in so doing. (2) Hospital investigations: Don't say 'I can treat you quite well here'; send all those to hospital who want to go. (3) Resignation from the Service: Here you must be very careful, as you cannot afford a failure. Select areas where you can be sure of 100% backing. Action in only a few areas will be enough to make your opponents co-operative. (4) Politics: Finally, you must play politics.

In the Lewisham by-election let all doctors have large banners 'Vote Labour' on their surgeries, and let them say the hard word against the Government. Though the standing of doctors is lower than it was, patients still take notice of what they say. These are the measures that I, as a businessman, think will win you the day. And of course the political lesson will not be wasted on the other side when they get into power."—I am, etc.,

London, S.W.6.

G. ROSEMONT.

SIR,—It seems an extraordinary thing to me that, during these protracted arguments with the current Minister of Health, no one has suggested obtaining the views of the Minister who was in office when the Act came into force. It is a well-recognized fact that the Opposition almost always tries to reverse any decision given by the Government in power. This being the recognized pattern of approach to any problem, it follows that Mr. Aneurin Bevan must inevitably support the medical profession in their claim.

Again, Mr. Bevan, as a staunch protagonist of the down-trodden classes, must speak in our favour. Apart from all that, it would be interesting to know what was his interpretation of the Spens Report in 1948. He, surely, is the one person who should know most about it. On the other hand, a Minister in charge of a Government department may not really be conversant with what is going on, and is only used as a mouthpiece for the permanent Government officials.

Mr. Bevan was the surgeon who conceived the original operation carried out on the medical profession. Mr. Turton, who was only a house-officer in 1948, appears to be suffering from muddled thinking in his interpretation of the Bevan operation, and it stands to reason that Mr. Bevan would be the best man to show him why the operation scar is now showing signs of inflammation, and to explain that a 24% dose of the appropriate antibiotic would immediately stop this dangerous spreading cellulitis. I might add that, in my opinion, the original operation was a badly bungled affair, and that the above treatment can only be palliative, and cannot cure the ghastly mass of obstructive adhesions inside the professional abdomen.—I am, etc.,

Pontypridd.

R. HODKINSON.

SIR,—In your correspondence columns of the last few months we have read many letters of indignation concerning the recent refusal of our claim for an increase in remuneration. Many have expressed the desire to force the Government to yield to our demands. As a professional body we are about to decide what we shall do. Before we commit ourselves irrevocably to action which we might regret later, let us dissect the situation and expose the bones of the matter.

We are a hard-working and conscientious group of middle-class people devoted to the care of the sick. Our service to the community, often taken for granted and sometimes abused, is a difficult one. We feel that the remuneration is not enough for the responsibility we have undertaken, and that the Government (alias taxpayer) is under an obligation to increase it to keep abreast of the rise in cost of living. This claim has been rejected, and now, in order to enforce it, we talk of depriving the people of this country of a health service which, imperfect as it is, at least makes available to everyone the best treatment in the world.

This is a serious step, and before taking it we must be absolutely sure of our moral right to do so. For a moment let us consider what are our "rights." I believe we have two: the right to live until we die, and, during that life, the right to choose between good and evil. The other so-called "rights," such as the freedom of speech, worship, thought, to withhold labour, etc., are, in reality, privileges. In addition to these privileges common to all there are many pertaining to our profession. Among them we must include a high standard of education acquired by our parents' money or our own intelligence (both also privileges), the possession of a special knowledge of healing, a standard of living far higher than vast masses of humanity, both in this country

and abroad, and the privilege of helping people who, in one way or another, are worse off than ourselves. As a profession we have repeatedly emphasized that these unfortunates are the main object of our concern. Yet apparently we are prepared to jettison this ideal in the furtherance of our own personal interest. Hypocrisy, Sir, is an ugly word, but it is the only one that fits.

Unfortunately this point of view will have no appeal to the materialist, who measures his value in terms of money. So let us look at a more practical aspect. Most of us agree that a health service in some form is desirable. Most of us feel that it is not unjust for the healthy to pay for the sick, and the rich to contribute towards the healing of the poor. The economic situation of this country is precarious, and the people who pay are already groaning under a heavy burden of taxation. If we obtain our demands then this burden will necessarily be increased. If we institute a separate service of our own the same result will ultimately follow. How much would we gain? Some of us who are junior partners or who have small practices will gain something, but those in the high-income groups will gain very little. We shall certainly lose much more in the respect of our patients for putting self-interest before service and for using threats to enforce this.

If, then, we are to be charitable towards the people whom we serve, how can we dispel the worries and frustration of the National Health Service that assail us? First, we must apply the same remedy to our anxieties as we recommend to our patients. Each one of us will then get the treatment he deserves. Secondly, we must accept a lower standard of living as the inevitable consequence of a levelling of this standard throughout the world and be grateful for our privileges. Thirdly, we could approach the Government for an additional allowance to cover the rise in cost of practice expenses only, which should be distributed in proportion to our expenses irrespective of partnership shares. Fourthly, if this is not forthcoming, the wealthier doctors might be prepared to help the poorer members of the profession by contributing some of their highly taxed earnings to a pool for redistribution.

When this country is at war most of us are prepared to sacrifice a lot for the benefit of the community. Let us, then, be prepared to sacrifice something in the much greater war we are now waging against poverty, disease, and ignorance.—I am, etc.,

Hoxne, Norfolk.

D. G. A. WESTBURY.

SIR,—We need not convince the public of the detailed merits of our claim. The simple fact is that we are the only section of the working population denied the right to arbitration. Once the public understood this their sense of fair play would ensure their support.

Nor is it necessary to plan an alternative health service before using forcible language, the only kind understood by politicians. An alternative scheme would take years to prepare, and even if the Minister were in agreement he would probably dishonour it later, unless we had already shown him that bad faith and broken promises were not to be tolerated. If we do not succeed in enforcing arbitration on our present claim we will not succeed in anything else.—I am, etc.,

London, E.3.

D. D. ROSEWARNE.

Reform of the Health Service

SIR,—As one of the younger generation of general practitioners with perhaps 25 more years to serve, may I express my views on the National Health Scheme? The present wage dispute is only a symptom of our dissatisfaction with the whole structure of the Health Service. The remedy lies not in grousing and piecemeal arbitration but in the design of a practical and clear-cut alternative scheme.

Four points which I would like to see incorporated in such a scheme are: (1) the freeing of medicine from politics by entrusting its financing to independent insurance companies with which all our patients would be compelled to

insure; (2) the re-establishment of the buying and selling of practices; (3) the cessation of free drugs apart from long-term illnesses—e.g., diabetes—and certain other deserving cases—e.g., old-age pensioners; (4) the free access of every doctor to the tools essential in this age to his trade—e.g., x-rays and E.C.G.s—to enable him to look after his patients within the limits of his ability rather than, as now, within the limits of his resources.

During 1957 the B.M.A. should design such a new scheme in consultation with the profession. Then, on the appointed day, we could withdraw our services from the scheme which has proved to be a miscarriage—inevitable, I hope.—I am, etc.,

Ringwood, Hants.

JOHN INNES.

SIR,—In the present arguments with the present Minister we should realize two main facts. The first, that the N.H.S. began as a political "knight," then became a help towards "full" employment, and is now a headache from which both parties would gladly be free if they could escape from the electoral penalties involved. Such welcome escape would be offered if the doctors "struck," for the odour would then attach to us. To this end each party will continue to make our lives unpleasant, both by major worries, such as leaving us behind in the social stakes, and by minor pin-pricks, such as settling the final debt for 1954 early in October but leaving it unpaid until December 31, 1956. The second fact is that the big club practices, and many poverty-stricken ones, are vastly better off than they dared to dream of pre-war, for the N.H.S. has spread the evils of pre-N.H.S. South Wales contract practices over a lot of the British Isles. The opposite of Bevan's dreams. This sort of practice tends to fight a price war where each doctor or group hopes to hang on longer than the rest and "scoop the pool." The fallacy is that having done so the winner cannot recoup, as would a business, except by lowering his standard of care.

To demand a full-time salaried service with regular office hours, etc., would not frighten the Government: an artificially large pool of unemployed reserves would soon frighten us. My answer is, reward for skill. Permit the private patient to have his drugs off his taxation—I am sure the public would co-operate by coming off N.H.S. lists—and also permit fees for minor operations, excluding circumcision, which all cost the G.P. money to perform.—I am, etc.,

Cromer.

A. HENRY GREGSON.

Confidential Medical Reports

SIR,—A female patient of mine who recently proposed for life assurance to one of the leading "life" companies was telephoned by a female member of the company's Belfast branch office staff and asked: "We have your medical report here and we note that you had a miscarriage early this year. Will you please give us the name of your G.P. so that we may make further inquiry?"

That an inquiry of such a confidential nature should be permitted to be made by an insurance clerk through the notoriously unsafe medium of the telephone system rather shocks me. But, on further inquiry, I learn that at this particular insurance office it is the practice for copies of all medical reports to be made before the original is forwarded to head office. Thus confidential medical reports are available to curious junior clerks, etc., at any time. I understand that several Belfast branch offices follow this deplorable practice, and it would be well if Northern Irish practitioners were apprised of the facts.—I am, etc.,

Bangor, Co. Down.

P. J. WARD.

Unity of Purpose

SIR,—Your leading article (*Journal*, December 15, 1956, p. 1417) rightly emphasizes the need for unity in the profession at this crisis in our affairs. There is little doubt that this end will be best achieved by the Negotiating Committee pressing the Minister to a conclusion on the remuneration issue.

It is obvious from the correspondence in the *Supplement*

BRITISH MEDICAL GUILD

Meetings to be Held

ALDERSHOT AND FARNHAM.—At Northfield Hospital, Aldershot, Wednesday, January 16, 8.30 p.m.
BROMLEY.—At Royal Bell Hotel, Bromley, Sunday, January 20, 6 p.m.
DUMFRIES AND GALLOWAY.—At Cresswell Maternity Hospital, Dumfries, Sunday, January 13, 2.45 p.m.
EAST HERTS.—At County Hospital, Hertford, Tuesday, January 15, 8.30 p.m.
GUILDFORD.—At Mitchell Hall, Royal Surrey County Hospital, Guildford, Thursday, January 17, 8.30 p.m.
HARROW.—At Tithe Farm House, Eastcote Lane, South Harrow, Monday, January 14, 8.30 p.m.
NORTH-EAST ESSEX.—At Out-patient Hall, Essex County Hospital, Colchester, Sunday, January 13, 11 a.m.
NORTH STAFFS.—At North Stafford Hotel, Sunday, January 13, 2.30 p.m.
NUNEATON AND TAMWORTH.—At Three Tuns Hotel, Atherstone, Sunday, January 13, 3 p.m.
ROCHESTER, CHATHAM, AND GILLINGHAM.—At Gymnasium, St. Bartholomew's Hospital, Rochester, Sunday, January 13, 3.30 p.m.
SOUTH BEDFORDSHIRE.—Friday, January 18.
SOUTH MIDDLESEX.—At Casino Hotel, Tagg's Island, Hampton Court, Monday, January 14, 8.45 p.m.
SOUTH STAFFS.—At Medical Lecture Hut, The Royal Hospital, Wolverhampton, Tuesday, January 15, 8.30 p.m.
SOUTH-WEST WALES.—At St. David's Hospital, Carmarthen, Sunday, January 13, 2.30 p.m.
TUNBRIDGE WELLS.—At Royal Mount Ephraim Hotel, Tunbridge Wells, Sunday, January 13, 3 p.m.
WEST MIDDLESEX.—At Nelson Room, Ealing Town Hall, London, W., Monday, January 14, 8.30 p.m.
WESTMINSTER AND HOLBORN.—At Committee Room C, B.M.A. House, Tavistock Square, W.C., Wednesday, January 16, 8 p.m.

during the past months that there are other issues quite as important as the claim for increased pay. The question of compensation should be tackled, and the Government should be pressed to reconsider its attitude to those who have large overdrafts as a result of either improving their premises or building new ones. There has been much talk by the Minister of Health of the need to improve our surgeries, but we must be helped and not hindered in carrying this out. Is it right and equitable that we should receive 2½% interest on compensation moneys yet pay the current bank rate of 6% to 6½% for an overdraft incurred in such improvements?

Such injustices should be given wider publicity, if necessary in courts of law. Our publicity organization for ventilating these grievances is non-existent, as one discovers when they are discussed with one's patients. It is common knowledge that many people believe that all or most of their weekly contributions go to the doctors, and, when they are told that the doctor gets about fourpence gross per week for each individual, one is greeted with cries of incredulous amazement. A much better Health Service can and must be built, but first get public opinion on the side of the medical profession by stressing the faults of the present Service, using the press, the radio, and television services, and by pamphlets in our waiting-rooms, etc.—I am, etc.,

Boston, Lincs.

M. J. SHEEHAN.

S.H.M.O.s and Consultant Appointments

SIR,—Without seeking to minimize the injustice suffered by most S.H.M.O.s, to which Dr. C. B. V. Walker (*Supplement*, December 22, 1956, p. 226) and others have drawn attention, it is, I think, worth pointing out that for a small number this grading does allow the combination of general practice with the practice of a specialty. For them this is a great advantage and one which would be lost if the S.H.M.O. grade were completely abolished.—I am, etc.,

Southwold, Suffolk.

J. C. LEEDHAM-GREEN.

H.M. Forces Appointments

ROYAL ARMY MEDICAL CORPS

Short Service Commission.—Major-General W. E. Tyndall, C.B., C.B.E., M.C., late R.A.M.C., from Retired Pay List, to Short Service Commission, in the rank of Lieutenant.
Lieutenant-Colonel E. A. Smyth, O.B.E., has retired on retired pay (Reserve Liability).
Captain A. V. Forage to be Major.

REGULAR ARMY RESERVE OF OFFICERS

Major-Generals K. A. M. Tomory, C.B., O.B.E., and J. C. A. Dowse, C.B., C.B.E., M.C., late R.A.M.C., having attained the age limit of liability to recall, have ceased to belong to the Reserve of Officers.

ROYAL ARMY MEDICAL CORPS

Colonel G. T. Hankey, O.B.E., T.D., from A.E.R.O., to be Colonel.

Major (Honorary Lieutenant-Colonel) H. R. Hartnell, M.B.E., has ceased to belong to the R.A.R.O., retaining the honorary rank of Lieutenant-Colonel.

Major R. M. Lang, from Active List, T.A., to be Major.

Major J. M. Wilson, from Active List, to be Major.

Captain (Honorary Lieutenant-Colonel) H. L. Connor has ceased to belong to the Reserve of Officers, retaining the honorary rank of Lieutenant-Colonel.

Class III.—Major J. B. Dancer has ceased to belong to the Reserve of Officers, retaining the rank of Major. Captain (War Substantive Major) (Honorary Lieutenant-Colonel) G. G. Black, from Reserve of Officers, to be Captain (War Substantive Major) (Honorary Lieutenant-Colonel). Captain (War Substantive Major) (Honorary Lieutenant-Colonel) G. J. Harrison, having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers, retaining the honorary rank of Lieutenant-Colonel.

Captains (Honorary Majors) C. E. Brown and G. M. Barling, from Reserve of Officers, to be Captains (Honorary Majors).

Captains (Honorary Majors) A. T. Rogers and M. Headlam, having attained the age limit of liability to recall, have ceased to belong to the Reserve of Officers, retaining the honorary rank of Major.

Captain (Acting Major) A. S. C. Peden, from A.E.R.O., to be Captain, relinquishing the acting rank of Major.

Captain (Honorary Major) W. Thomson has ceased to belong to the Reserve of Officers, retaining the honorary rank of Major.

Association Notices

PRIZE ESSAY COMPETITION FOR PROVISIONALLY REGISTERED PRACTITIONERS, 1957

The Council of the British Medical Association is prepared to consider the award, in 1957, of prizes to provisionally registered practitioners for essays submitted in open competition. The subject of the essay is: "Medicine is an Art as well as a Science."

In awarding the prizes due regard will be given to evidence of personal observation and experience. No study or essay that has previously appeared in the medical press or elsewhere will be considered eligible for a prize.

Any provisionally registered practitioner in the pre-registration year at the time of submission of the essay is eligible to compete for a prize. If any question arises in reference to the eligibility of a candidate or the admissibility of his or her essay, the decision of the Council of the British Medical Association shall be final. Should the Council decide that no essay entered is of sufficient merit, no award will be made. At least one prize of £50 is offered. In determining the number of prizes to be awarded, the Council will take into consideration the number and standard of essays received.

Essays must not exceed 5,000 words, and must be typewritten or legibly written in the English language on foolscap paper, on one side only, must be unsigned, and must be accompanied by a note of the name and address of the entrant. Notice of entry for this competition is necessary and a form of application can be obtained from the undersigned.

Essays must be forwarded so as to reach the Secretary of the British Medical Association not later than January 31, 1957. Inquiries relative to the competition should be addressed to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

OCCUPATIONAL HEALTH PRIZE

The Occupational Health Prize was established by the Association for the purpose of encouraging interest and research in the field of occupational health. The Council of the British Medical Association is prepared to consider the award of this prize, which consists of a certificate and £50, in the year 1957. Any member of the Association who is engaged in the practice of occupational health, either

whole-time or part-time, is eligible to compete for the prize. Candidates may select their own subject.

Entries should be submitted in a form suitable for publication and must include personal observations and experiences collected by the candidates in the course of their work. If no entry is of sufficient merit no award will be made. Candidates should confine their attention to their own observations rather than to comments on previously published work on the subject, though reference to current literature should not be omitted when it bears directly on their results, their interpretations, and their conclusions.

Essays, or whatever form the candidate desires his work to take, must be sent to the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1, not later than January 31, 1957. No study or essay that has been published in the medical press or elsewhere will be considered eligible for the prize, and a contribution offered in one year cannot be accepted in any subsequent year unless it includes evidence of further work. A previous prizewinner is not precluded from entering. If any question arises in reference to the eligibility of the candidate or the admissibility of his or her essay, the decision of the Council on any such point shall be final.

Preliminary notice of entry for this competition is required on a form of application to be obtained from the Secretary. Each entry must be typewritten or printed on one side of the paper only, and accompanied by a note of the candidate's name and address. No definite limits are laid down as to the length of essays, but the Council anticipates that, for this competition, essays should consist of between 3,000 and 10,000 words. Inquiries relative to the prize should be addressed to the Secretary.

A. MACRAE,
Secretary.

Diary of Central Meetings

JANUARY

15 Tues.	Estates Committee, 11.30 a.m.
15 Tues.	Central Consultants and Specialists Executive Committee, 2 p.m.
15 Tues.	Finance Committee, 2 p.m.
16 Wed.	Occupational Health Committee, 10 a.m.
17 Thurs.	G.M.S. Committee, 10.30 a.m.
17 Thurs.	Radiologists Group Committee, 11 a.m.
21 Mon.	Editorial Subcommittee, Joint Formulary Committee, 11 a.m.
22 Tues.	Staff Side, Committee B, Medical Whitley Council, 10.30 a.m.
22 Tues.	Alternative Edition Subcommittee, Joint Formulary Committee, 11 a.m.
22 Tues.	Full Committee B, Medical Whitley Council, 2 p.m.
24 Thurs.	Rural Practices Subcommittee, G.M.S. Committee, 2 p.m.
25 Fri.	Drug Addiction Committee, 2 p.m.
28 Mon.	Staff Side, General Whitley Council (at 14, Russell Square, W.C.1), 10.30 a.m.
28 Mon.	Full General Whitley Council (at 14, Russell Square, W.C.1), 2 p.m.
29 Tues.	Arrangements Committee (Edinburgh, 1959), 12 noon. (Change of time.)
29 Tues.	Subcommittee on Medical Reports, Joint Committee of the B.M.A. and the Magistrates' Association, 2 p.m.
30 Wed.	Council, 10 a.m.

Branch and Division Meetings to be Held

ABERYSTWYTH DIVISION.—At Machynlleth Chest Hospital, Sunday, January 13, 3 p.m., meeting. Short papers by Dr. J. Berian Thomas: "Trauma in General Practice"; Dr. J. Anderson: "Some Reminiscences in General Practice"; Dr. E. D. Clifford-Jones: "Anaesthesia in General Practice."

BIRMINGHAM DIVISION.—At 154, Great Charles Street, Tuesday, January 15, 8.30 p.m., meeting. Lecture by Dr. E. R. Bickerstaff: "Modern Views on Minor Strokes."

BRIGHTON AND MID-SUSSEX DIVISION.—At Hove General Hospital, Sackville Road, Wednesday, January 16, 8.30 p.m., clinical meeting on genito-urinary disease.

CAMBERWELL DIVISION.—At B.M.A. House, Tavistock Square, London, W.C.1, Tuesday, January 15, 5 p.m., meeting. Dr. Roger Bannister: "Physiology of the Mile."

CHESTERFIELD DIVISION.—At Walton Sanatorium, Friday, January 18, 8.45 p.m., meeting. A Brains Trust. Panel: Mr. F. J.

Milward, Dr. A. C. S. Courts, Dr. R. T. Gaunt, Dr. T. A. Blyton, and Dr. P. Tait. Question Master: Dr. Malcolm Graham.

CITY DIVISION.—At Committee Room C, B.M.A. House, Tavistock Square, W.C.1, Tuesday, January 15, 8.30 p.m., meeting. Debate: "Are Health Visitors Necessary?" For the motion, Dr. S. King and Dr. J. Greenwood Wilson; against the motion, Dr. M. J. Fitzgerald and Dr. A. Rezler. Any B.M.A. members, but especially those of St. Pancras Division, are invited, together with husbands or wives or other guests.

DUMFRIES AND GALLOWAY DIVISION.—At Cresswell Maternity Hospital, Dumfries, Sunday, January 13, 3 p.m., annual general meeting. Lectures, (1) Dr. Sheenah Russell: "The Infant who Vomits." (2) Mr. J. C. Campbell: "The Misuse of Antibiotics in E.N.T. Work." (3) Dr. James Harper: "Alcoholism as a Medical Problem."

ENFIELD AND POTTERS BAR DIVISION.—At the Firs Hall Ballroom, Green Lanes, Winchmore Hill, N., Saturday, January 19, 6.45 for 7.30 p.m., annual dinner. Guests of Division, Dame Enid Russell-Smith, Dr. Hugh Clegg, Dr. F. J. Fowler, and Dr. A. N. Mathias. Ladies and medical guests are invited.

FURNESS DIVISION.—At Duke of Edinburgh Hotel, Barrow-in-Furness, Tuesday, January 15, 8 p.m., meeting. B.M.A. lecture by Professor T. N. A. Jeffcoate: "The Adreno-Genital Syndrome."

KESTEVEN DIVISION.—Thursday, January 17, 7.15 for 7.30 p.m., dinner; 9 p.m., address by Professor C. G. Rob: "Recent Progress in Vascular Surgery" (illustrated by lantern slides).

LAMBETH AND SOUTHWARK DIVISION.—At Nurses' Lecture Theatre, Lambeth Hospital, Brook Drive, S.E., Tuesday, January 15, 8.15 p.m., meeting. Dr. D. S. Cadman: "Modern Developments in Pulmonary Tuberculosis."

LEWISHAM DIVISION.—At St. John's Hospital, Lewisham, S.E., Sunday, January 13, 10.30 a.m., clinical meeting.

METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C.1, Tuesday, January 15, 5 p.m., meeting. Mr. Eoin Aberdeen: "A Flying Doctor in North-west Australia" (illustrated by colour photographs). All students and recently qualified practitioners are invited.

SCARBOROUGH DIVISION.—At Board Room, Scarborough Hospital, Thursday, January 17, 8.30 p.m., meeting. Lecture by Mr. M. C. Oldfield: "Plastic Surgery" (illustrated by lantern slides).

SOUTH BEDFORDSHIRE DIVISION.—At Board Room, Luton and Dunstable Hospital, Friday, January 18, 9 p.m., meeting. Dr. J. H. Cyriax: "Backache, with Special Reference to Manipulation."

SOUTH SHIELDS DIVISION.—At X-ray Department, South Shields General Hospital, Wednesday, January 16, 8.30 p.m., meeting. Address by Dr. J. McKee: "Public Relations."

SWANSEA DIVISION.—At Morriston Hospital, Swansea, Thursday, January 17, 7.30 p.m., clinical meeting; impromptu discussion of members' questions by a panel representative of the various specialties.

TODMORDEN DIVISION.—At Abraham Ormerod Medical Centre, Todmorden, Friday, January 18, 4 p.m., annual general meeting.

TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tunbridge Wells, Wednesday, January 16, 8.30 p.m., meeting. B.M.A. Lecture by Professor D. M. Dunlop: "New Drugs."

WILLESDEN DIVISION.—At Rehabilitation Department, Willesden General Hospital, Harlesden Road, N.W., Tuesday, January 15, 9 p.m., meeting. B.M.A. Lecture by Dr. F. E. Camps: "Murder?—or Suicide" (illustrated). Members of Wembley and Hampstead Divisions are invited.

Meetings of Branches and Divisions

FOLKESTONE AND DOVER DIVISION

The annual general meeting was held at the Esplanade Hotel on November 7, 1956. Dr. A. D. Broatch was in the chair and 14 members were present. The following officers were elected:

Chairman.—Dr. A. D. Broatch.
Vice-chairman.—Dr. C. P. K. Toland.
Secretary.—Dr. M. Paxton.
Treasurer.—Dr. J. Barham.

A resolution "that the Division resolves to continue full support to the Negotiating Committee in its dealings with the Minister and urges the Committee to accept nothing less than an award according to the Spens report" was carried. Dr. Broatch gave a lecture on "The Medical Aspects of Atomic Warfare."

KESTEVEN DIVISION

At a meeting of the Kesteven Division held on October 25, 1956, considerable dissatisfaction with the rate of progress on the remuneration claim was expressed. The meeting stressed that: (1) the Association should have in readiness the full machinery for taking action if the claim is rejected; (2) a Special Representative Meeting at an early date should be called so that the Minister may be in no doubt as to the result of his refusal of the claim; (3) publicity should be given in the press, at the appropriate time, if necessary, by advertisement; (4) the Association should consider the advisability of giving the Minister a time limit for the completion of negotiations.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY JANUARY 19 1957

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AUSTRALIAN HEALTH SERVICE STATE-SUBSIDIZED BENEFITS

[FROM A CORRESPONDENT]

The Australian National Health Act became fully operative in 1953, its several parts having been introduced gradually since 1949. Its provisions, which are sponsored by the Federal (Commonwealth) Government, consist of the following: A national tuberculosis service for the diagnosis, treatment, and rehabilitation of tuberculous patients, introduced in 1949; a free-milk scheme for schoolchildren, introduced in 1950; a pharmaceutical benefit scheme, also introduced in 1950; a pensioner medical service, introduced in 1951; a hospital benefits scheme, introduced in 1952; and a medical benefits scheme, introduced in 1953.

These services provide free medical and hospital treatment and medicines for pensioners, amounting to about 10% of the population. For the rest of the population they provide a Government subsidy towards the cost of medical and hospital treatment to those who have voluntarily joined prepaid insurance schemes operated by approved organizations. The insurance schemes operated by approved organizations, and pharmaceutical benefits are available to all people irrespective of income. Apart from those in the preventive health services and a small number in salaried hospital appointments, the large majority of doctors in Australia are in independent private practice and are paid on an item-of-service basis. The population of Australia is about 10 million, and there are some 9,000 doctors.

The considerations which decided the Federal Government to base its National Health Service on a system of State-subsidized voluntary medical and hospital insurance for the majority of the people were stated in an address to the World Medical Association in 1953 by Sir Earle Page, at that time Minister of Health for the Commonwealth. The Australian Government believed, Sir Earle Page said, "that a partnership of the medical profession, the community, insurance organizations, and the Government can evolve a method of retaining all the existing traditions and advances on the medical side and still bring the cost of a first-rate medical service within the means of the people."

Pharmaceutical Benefits

This part of the service provides, free to every member of the community, drugs classified as either life-saving or disease-preventing, or both. It consists of: (1) an official list of items numbering 186, all single substances, compounds not being included, originally compiled and amended by a statutory pharmaceutical benefits advisory committee, the majority of whose members are British Medical Association nominees appointed by the Minister for Health; (2) a contract between the Government and registered pharma-

cists for the supply, at a fixed price to the Government, free of charge to patients, of all items on the official list; (3) prescription forms supplied by doctors themselves and bearing their name and address.

There are no penalties for doctors for breaches of the regulations, the only offences for which a doctor can be charged being either a crime or misdemeanour—e.g., fraud. Form of prescriptions (size and shape), quantities prescribable, and number of repeats are defined in the regulations.

When the pharmaceutical scheme was first introduced the indiscriminate prescribing of certain antibiotics by a small percentage of the profession threatened to raise costs inordinately. As a result, the profession and the Government drew up a list of specific diseases for which those antibiotics should be prescribed, which doctors are now required by regulation to observe.

The percentage expenditure on major drugs is: penicillin, 19%; other antibiotics, 28%; sulphonamides, 14%; all other items, 39%. The following table shows the number of scripts, the average cost of each script, and the cost to the Government since 1951:

	Number of Scripts	Average Price s. d.	Amount £
1951-2	6,518,283	20 6	6,712,147
1952-3	6,855,708	18 1	6,199,786
1953-4	7,044,613	20 4	7,160,186
1954-5	9,268,369	17 4	8,048,612

Pensioner Medical and Pharmaceutical Service

The pensioner medical service provides general-practitioner services free of charge to all persons receiving an age, invalid, widow's, or Service pension, or a tuberculosis allowance, and their dependants.

In addition to medicines under the pharmaceutical benefits scheme, which are available to every member of the community, pensioners and their dependants are provided free of charge with all medicines contained in the *British Pharmacopoeia*, together with other specified drugs. These are made available on the prescription of a medical practitioner in accordance with regulations.

The number of prescriptions written for pensioners and their dependants in 1954-5 was 4,418,661 at an average cost of 5s. 11d.

To be eligible for treatment the pensioner must possess an entitlement card issued by the Department of Social Services. This card is the authority for the doctor to provide free medical attention and must be presented to the doctor on each occasion that medical treatment is rendered. The doctor initials and dates the card at the time of each consultation or visit. The patient, or other responsible person, signs a voucher at the time, and this provides the basis of the doctor's claim for payment from the Commonwealth for the services rendered. The voucher also contains a

¹ *British Medical Journal Supplement*, 1953, 2, 93.

statement by the patient authorizing payment for the service rendered to be made directly to the medical practitioner concerned. The contract for service is between patient and doctor and not the Government and doctor.

Any registered medical practitioner may participate in the service. Since the scheme was started there has been a progressive increase in the number of services given by participating doctors, and there has also been a steady increase in the number of pensioners and dependants entitled to the service.

In June, 1955, the number of doctors participating was 4,567, and the average yearly payment per doctor, including mileage, was £552. Medical practitioners are paid at the rate of 10s. per surgery consultation and 12s. per visit. A small extra fee may be charged for an after-hours service or for travelling more than three miles from the surgery. The rates represent a concession of 33½% on ordinary private charges.

It has been stated that a very small section of the profession has abused the pensioner medical service. In a few cases doctors' incomes from the service, as a result of excessive services, have amounted to as much as £3,500 compared with the average of £552. To deal with charges of abuse the Government has constituted committees of inquiry composed entirely of doctors appointed by the Minister for Health from a panel recommended by the Council of the British Medical Association in each State. The committees hear complaints against doctors referred by the Department of Health, and they may recommend to the Minister for Health that a doctor be compelled to refund amounts received for excessive visiting, and/or that he be warned, or that he be suspended from the pensioner medical service for periods of up to a year.

Hospital Benefits

The hospital benefits scheme is based mainly on the principle of Government subsidization of benefits received by way of contributions to voluntary insurance organizations. The Commonwealth Government, however, makes a grant of 8s. per occupied bed per day to all hospitals in all States, whether the occupant is insured or not, and in addition subsidizes the benefit which a contributor receives from a voluntary organization by 4s. a day. In effect the Commonwealth's subsidy is 12s. a day for all persons in hospitals who belong to voluntary insurance organizations.

Rates of contribution to the voluntary organizations vary from a minimum of 3d. a week for a single person and 6d. a week for persons with dependants to 1s. 6d. and 3s. respectively. The smaller contributions qualify for a weekly benefit of £2 2s., which, when the Government grant of £4 4s. is added, amounts to a total of £6 6s. a week; and the larger contributions qualify for a benefit of £12 12s. a week, which, with the Government grant of £4 4s., makes a total of £16 16s. a week.

The hospital benefits scheme has placed public hospitals on a sound basis. Before its introduction all public hospitals, including teaching hospitals, were in debt and working on large overdrafts. In 1954-5 almost £12m. was paid to hospitals from the hospital benefits scheme, and 56% of the population was covered by the scheme.

Australia has approximately 750 public hospitals and 860 private hospitals. Public hospitals generally have three sections—public, intermediate, and private. There are set weekly charges for the private and intermediate sections, and the charge for the public section is generally in accordance with the patient's ability to pay. If the patient cannot pay, there is no charge. The basic charge is £12 12s. a week.

Consultant and specialist hospital appointments are honorary so far as the public wards are concerned, but fees are charged to patients in private and intermediate wards.

Medical Benefits

As with the hospital benefits scheme, the principle of the medical benefits scheme is that the Commonwealth pays a benefit to a person who has voluntarily insured himself. As with the hospitals benefits scheme, the administrative costs of the medical benefits scheme are borne in the main by the

voluntary organizations, no allowance whatever being made by the Commonwealth for administrative costs. The National Health Act provides for two schedules of benefits, schedule 1 including in the main those services normally rendered by a general practitioner, and schedule 2 being a schedule of specialist services, including radiological, pathological, urological, neurosurgical, etc. Schedule 1, apart from consultations and visits, contains 120 items of service, while schedule 2 contains 288 items.

The Commonwealth benefit ranges from 6s. for a consultation to £11 5s. for an operation, and the voluntary organization, which must be non-profit-making and approved, is required at least to match the Commonwealth benefit. The contributor to a voluntary insurance organization, therefore, receives at least 12s., usually a little more, towards the cost of a consultation (generally 15s.) and up to £22 10s. towards the cost of a major operation. The benefit payable by the Commonwealth for a consultation when the patient is referred to a specialist by a general practitioner is £1, the voluntary organization paying at least an equivalent amount.

The weekly rates of contribution vary according to the amount of organization benefit payable. Examples are: single person—9d. for minimum coverage, 1s. 6d. for maximum coverage; family groups or persons with dependants—1s. 6d. for minimum and 2s. for maximum coverage.

There are several hundred voluntary insurance organizations, the largest being the Medical Benefits Fund of Australia, which was established by the medical profession in 1947, when it was threatened with nationalization. Its membership is over 600,000 and its coverage approximately 1,300,000.

A criticism of the medical benefits scheme has been its failure to cover pre-existing disease. As voluntary insurance is the basic principle, pre-existing illness is not permitted to attract a benefit from the date of joining, as otherwise the incentive to insure would be destroyed. However, this restriction applies only to insurance organization benefit. Pre-existing disease ranks for full Commonwealth benefit immediately a person registers with an insurance organization. Also, to meet the case of persons with pre-existing disease, the insurance organizations have now agreed to pay benefits in respect of the particular disease after two years' membership.

Another criticism has been the failure of the voluntary organizations to pay benefits reasonably promptly. In the early days there was considerable delay owing to the rapid growth of the organizations. However, now that the growth is not so rapid and staffs have been trained, payment is more prompt and in many instances payment is made over the counter.

Still another reported criticism is that, whereas with some services—e.g., consultations and visits—the total benefit payable approaches 90% of the doctor's charge (a fundamental principle of the scheme being that the total benefit must not exceed 90%), with a considerable number of services the benefit does not exceed 60%, and in some cases 40%. It is anticipated that, once the organizations have established themselves on a sound actuarial basis with adequate reserves, it will be possible to increase the benefits payable for a number of services.

In 1955 there were 4,154,103 members (45.4% of the population) of voluntary organizations. In 1955 the £13,443,952 cost of medical treatment was met by £4,562,320 from organization benefits, £4,155,086 from Commonwealth benefit, and £4,726,546 from insured members.

In a memorandum to the World Medical Association in September, 1955 (from which much of the information in this article was obtained), Dr. John Hunter, secretary of the Federal Council of the B.M.A. in Australia, wrote that "the medical profession is very happy with the scheme, for it conserves all the principles for which the profession has fought over the years—professional freedom and no alteration in the doctor-patient relationship—and at the same time lays down an economic foundation such as the profession never before possessed."

British Medical Association

ANNUAL MEETING—NEWCASTLE UPON TYNE, JULY 10-19, 1957

President-Elect: WELDON WATTS, A.F.C., M.S., F.R.C.S.

Local General Secretary: G. W. ANDERSON, M.B., B.S., 21, Lyndhurst Road, Benton, Newcastle upon Tyne, 12.

Science Secretaries: IAN RANNIE, M.B., Ch.B., Department of Pathology, Royal Victoria Infirmary, Newcastle upon Tyne, 1; J. I. MUNRO BLACK, M.D., M.S., F.R.C.S., 47, Clayton Road, Jesmond, Newcastle upon Tyne, 2.

Executive Clerk: Miss B. E. MIDDLEMISS, B.M.A. House, Tavistock Square, London, W.C.1.

PROVISIONAL PROGRAMME

The 125th Annual Meeting of the British Medical Association will be held in Newcastle upon Tyne from Wednesday, July 10, to Friday, July 19, inclusive.

The Annual Representative Meeting will be held in the City Hall and will begin on Wednesday, July 10, and will continue on Thursday, Friday, Saturday, and Monday, July 11, 12, 13, and 15.

On the evening of Tuesday, July 9, there will be a Cocktail Party for Representatives and their Ladies, arranged by the Newcastle upon Tyne Division, with the co-operation of the North of England and the Tees-side Branches. This will be held in the Old Assembly Rooms.

A combined Dinner for Representatives and their Ladies will take place at the Old Assembly Rooms on Thursday, July 11, followed by a Dance.

The Overseas Luncheon has been arranged for Friday, July 12, at 1 p.m. in the Old Assembly Rooms.

On Sunday, July 14, there will be three excursions: (1) All-day excursion to the Roman Wall which will be accompanied by guides from the Department of Roman-British Archaeology, King's College, University of Durham. (2) All-day trip to the Farne Islands. (3) Half-day excursion to Durham Cathedral. In the evening a Symphony Concert, sponsored by Abbotts Laboratories Ltd., will be given in the City Hall.

The Adjourned Annual General Meeting and President's Address will take place in the City Hall on the evening of Monday, July 15, and the President's Reception which follows will be held in the Old Assembly Rooms.

The Annual Scientific Meeting and associated functions occupy the period from Monday, July 15, to the evening of Friday, July 19.

The Official Religious Service will be held in St. Nicholas' Cathedral on the afternoon of Tuesday, July 16. The address will be given by the Right Reverend the Lord Bishop of Durham.

There will be a Roman Catholic Service on the same day.

A Jewish Service will be held on Saturday, July 13, at 10 a.m. at the Leazes Park Road Synagogue.

The Annual Dinner of the Association will be held in the Old Assembly Rooms on Tuesday, July 16.

There is to be a full social programme, including a Civic Reception on Wednesday evening, July 17, and a University Reception on Thursday evening, July 18.

The Annual Breakfast of the Christian Medical Fellowship will be held on Wednesday, July 17, at 8.15 a.m.

Several special visits and excursions are being arranged for ladies accompanying members.

The usual Golf Competitions will take place on July 17 and 18.

The Overseas Conference will be held in the afternoon of Wednesday, July 17.

The Reception Bureau for Registration will be open in the Stephenson Buildings, King's College, on Monday, July 15, at 9 a.m.

Each day there will be a programme of surgical operations and clinical demonstrations in the Victoria Royal Infirmary

shown by colour television on a closed circuit. The technical arrangements will be sponsored by Smith, Kline and French Laboratories Ltd.

Three Plenary Scientific Sessions have been arranged as follows: Wednesday, July 17, at 10.30 a.m., subject "The Management of Hypertension"; Thursday, July 18, at 2.30 p.m., subject "The Present Status of Prophylactic Immunization"; Friday, July 19, at 9.30 a.m., subject "Care of the Dying."

In addition, Round-Table Conferences will be held concurrently on Wednesday, July 17, from 9 to 10 a.m. Subjects to be arranged.

The nineteen Scientific Sections will hold meetings, including a special session of the Sections of Obstetrics and Gynaecology and of General Practice on "Obstetrics and General Practice" to be held on Monday, July 15, at 3 p.m.

The provisional arrangements are as follows:

Medicine	.. ..	July 16 (a.m.), July 18 (a.m.)
Surgery	.. ..	July 16 (a.m.), July 17* (p.m.)
Obstetrics and Gynaecology	.. ..	July 15* (p.m.), July 16 (a.m.)
.. ..	.. ..	July 17 (p.m.), July 18 (a.m.)
Anaesthetics	.. ..	July 17 (p.m.), July 18 (a.m.)
Cardiology	.. ..	July 16* (a.m.), July 17 (p.m.)
Child Health	.. ..	July 17* (p.m.), July 18* (a.m.)
.. ..	.. ..	July 19 (p.m.)
Dermatology	.. ..	July 17 (p.m.)
General Practice	.. ..	July 15* (p.m.), July 17* (p.m.)
.. ..	.. ..	July 18* (a.m.)
History of Medicine	.. ..	July 16 (a.m.)
Neurology	.. ..	July 17 (p.m.), July 18 (a.m.)
Occupational Health	.. ..	July 16 (a.m.)
Ophthalmology	.. ..	July 16 (a.m.)
Orthopaedics	.. ..	July 17 (p.m.)
Oto-rhino-laryngology	.. ..	July 18 (a.m.), July 19 (p.m.)
Physical Medicine	.. ..	July 19 (p.m.)
Plastic Surgery	.. ..	July 17 (p.m.)
Preventive Medicine	.. ..	July 17* (p.m.)
Psychiatry	.. ..	July 16 (a.m.)
Radiology	.. ..	July 17* (p.m.)

*Combined session.

Individual programmes for these Sections will be published in a later issue of the *Journal*.

The Scientific Exhibition will be held in the Stephenson Buildings and will be open daily on July 15 to 19. Demonstrations will be given at fixed advertised times, and a wide field of medical interests will be covered. Further details will be published later.

The Annual Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications will also be in the Stephenson Buildings. The Exhibition will be open from 9 a.m. to 6 p.m. on July 15 to 19.

The Ladies' Club will be situated in the Medical School, King's College, and will be open throughout the Meeting.

HOTEL ACCOMMODATION

The following is a preliminary list of hotel accommodation available in Newcastle upon Tyne and district. Members

wishing to reserve accommodation are asked to write direct to the hotel, stating that they are attending the B.M.A. Meeting. The Association cannot accept responsibility for any of the prices stated below. These are the tariffs ruling at the moment and are subject to alteration without notice. Applicants should therefore verify the tariffs when making their reservations. Early application for accommodation is recommended. For hostel accommodation all requests should be made to the Executive Clerk, B.M.A. House, London, W.C.1, and not direct to the hostel.

Name and Address of Hotel	Tel. No.	No. of Rooms	Miles Dis- tant	Tariff, 1957	
				B/B	Weekly Inclusive
<i>City Hotels</i>					Gns.
County Hotel, Neville Str.	2-2471	90		32/6	16½
Grand Hotel, Barras Bridge	2-4091	50		30/-	12
Royal Turks Head Hotel, Grey Str.	2-6111	102		32/6	15
Crown Hotel, Clay- ton Str.	2-6421	87		25/-	—
Douglas Hotel, Grainger Str.	2-7008	50		22/6	11-12
*Gordon Hotel, Clay- ton Rd.	81-1233	30		25/-	7-10
*St. Margaret's Hotel, Osborne Rd.	81-0453	40		17/6	7-8½
*Cairn Hotel, Osborne Rd.	81-1358	50		19/-	—
Embassy Hotel, Jes- mond Rd.	81-1475	38		24/6	—
Imperial Hotel, Jes- mond Rd.	81-3933	42		25/6	—
<i>Seaside Hotels</i>					
Rex Hotel, Whitley Bay	W.B. 2-0326	156	10	22/6	—
Grand Hotel, Tyne- mouth	N. Shields 1360	32	10	25/- - 32/6	12-13
Park Hotel, Tyne- mouth	N. Shields 1766	25	10	27/6	—
Seaburn Hotel, Roker, Sunderland	Whitburn 3225	18	12	30/-	14½
<i>Country Hotels</i>					
Queen's Head Hotel, Morpeth, North'd	Morpeth 83	14	15	25/-	12
Royal Hotel, Hex- ham, North'd	Hexham 1070	15	20	21/-	9-10
Abbey Hotel, Hex- ham, North'd	Hexham 304	33	20	18,6-21/-	9-10
Angel Inn, Corbridge, North'd	Corbridge 119	10	17	18,6-21/-	9
<i>Hotels in Neighbouring Towns</i>					
Palatine Hotel, Sun- derland	Sunderl'd 3793	50	12	21/-	14½
Grant Hotel, Sunder- land	Sunderl'd 5404	75	12	21/6-32/6	9½-10½
Royal County Hotel, Durham City	Durham 2481	34	15	30/-	14½
Three Tuns Hotel, Durham City	Durham 3601	17	15	30/-	14½
<i>University Halls of Residence</i>					
Henderson Hall (men only)		70	2	21/-	—
Ethel Williams Hall (men or women)		74 S. 6 D.	2	21/-	—
Easton Hall (men or women)		40		21/-	—

S.=Single. D.=Double. * Not licensed.

SUPPORTING GROUP FOR WORLD MEDICAL ASSOCIATION

A meeting to inaugurate a British supporting group for the World Medical Association is to be held at B.M.A. House on January 29 at 3.30 p.m. The President of the B.M.A., Dr. Alexander Hall, will preside, and the speakers will be the Chairman of Council, Dr. S. Wand, and the Chairman of the International Relations Committee, Dr. J. A. Pridham. Representatives of medical organizations and of lay bodies traditionally associated with medicine have been invited.

PUBLIC HEALTH COMMITTEE

The Public Health Committee met at B.M.A. House on December 28, with Dr. JOHN B. TILLEY in the chair.

It was reported that the Council had approved the Committee's recommendations on the marriage bar for women doctors in public health appointments, typhus immunization, health visitors and other matters. The resolution of the Annual Representative Meeting on air pollution had been submitted to the Ministries concerned, and replies were received stating that it was the intention of the Minister of Housing and Local Government to fix an appointed day for many of the provisions of the Act, including those dealing with smoke control areas, before the end of the year. The Ministry of Fuel and Power had replied that a scheme was in preparation for considering smokeless fuel supplies and for ensuring that the plans of local authorities did not get out of step with those of the producers of smokeless fuels. The Ministry of Health stated that the Minister was keeping in touch with the Minister of Housing and Local Government on this matter.

As a result of the discussion at the November Council meeting regarding a special committee on "milk," the Chairman of the Committee had suggested that, while the Public Health Committee was directly interested in the administrative aspects of the provision of pure milk, the resolution of the Annual Representative Meeting appeared to be directed towards the scientific side. The Chairman of Council agreed with this view, and the matter had been referred to the Science Committee with a recommendation that it should appoint a special subcommittee to consider the matter and that the subcommittee should include nominees from the Public Health Committee.

Negotiating Machinery

It was reported that the negotiations for appeals machinery in Northern Ireland had broken down but that *ad hoc* arrangements would be made for the outstanding cases to be dealt with.

The Council had approved the Committee's recommendation that the suggestion that public health doctors should join with other local authority employees in negotiating machinery should not be accepted. A letter was received from the negotiating committee for clerks of local authorities concurring with this view.

Ingleby Committee

Representations were made to the Home Secretary following on the November Council meeting that the medical membership of the Ingleby Committee should be increased to include a representative of the public health service, but the Home Secretary replied that he did not feel justified in adding to the membership of the Committee. It was reported that the Chairman of Council, in consultation with the Chairman of the Committee and such other committees as appeared to be concerned, had decided that the membership of the committee appointed by the Council to prepare the Association's evidence to the Ingleby Committee should consist of the Association's side of the Joint Committee of the B.M.A. and the Magistrates' Association, with two representatives each from the General Medical Services, Private Practice, and Public Health Committees, and the Central Consultants and Specialists Committee be invited to nominate its own ranks, in order to provide further expert medical representation.

Remuneration Matters

The Secretary of the Committee reported that every local authority in the United Kingdom had now implemented the Industrial Court Award 2565 (M.D.C. circular 24). Ninety per cent. of all local authorities had implemented the more recent agreement (M.D.C. circular 27) on the remuneration of public health medical officers. Although 12 authorities had at first refused to implement this agreement, only one was still standing out.

The Committee heard with pleasure that agreement had been reached on all items in the claim for increased remuneration for medical practitioners undertaking part-time work for local authorities. A summary of the agreement (M.D.C. circular 32) was published in the *Supplement* of December 29 (p. 228). It was agreed to recommend to Council that the *British Medical Journal* should continue to accept advertisements offering remuneration under the old scale for the next four months, and that all health authorities should be so informed.

The CHAIRMAN reported that, in spite of repeated requests, no reply had been received from the Ministry of Health to the proposal that an independent committee of inquiry—a public health "Spens"—should be set up to consider the range of remuneration of medical officers in the public health services. The Committee voiced its concern at the delay and asked that the Association should continue to express for a reply. Some members of the Committee expressed the disappointment of public health officers in not being associated in some way with the other two parts of the profession in the present remuneration claim; it was explained that the answer to that criticism was that the general practitioners and consultants were asking the Minister for the betterment which public health officers had received in their last award and agreement. Public health officers were concerned with a much greater issue—namely, the whole basis of remuneration in the public health service.

Appointment Without Advertisement

It was reported that a county council had tried to appoint medical officers to "mixed appointments" without advertising the vacancies. A note had been sent by the county council to its medical officers drawing attention to the vacancies and inviting applications. It was understood that the town clerks concerned had sought the Minister's approval to this procedure and the Minister had dispensed with the requirement to advertise. Subsequently one of the vacancies was advertised, the other was not. The same thing happened later in the year in another area, and letters of protest had been received by the Association.

The matter had been taken up with the county council concerned, which replied that it felt that until there was some settled policy on the proposal that certain maternity and public health responsibilities should be returned to borough councils, the needs of a borough would be adequately met by a part-time medical officer of health. The officer appointed would spend 45% of his time on the duties of medical officer of health and the remainder in the service of the county council.

The CHAIRMAN emphasized that the policy of the Association was that all posts should be advertised. Applicants who might wish to apply for posts were prevented from doing so unless they were advertised. It was agreed that the matter should be reported to the Council of the Association so that it could be taken up vigorously with the county council and the Ministry of Health.

Integration of Medical Officers of Health with Hospital Service

The Council at its meeting on November 7 had been informed of the Committee's grave concern that the Joint Consultants Committee should have presented a definite opinion on this matter to the Ministry of Health before the views of the Association (one of the bodies represented on the Joint Consultants Committee) had been formulated. The Central Consultants and Specialists Committee had reported to the Council at the same meeting that it agreed with the view of the Joint Consultants Committee. It did not believe that liaison between the hospital and public health services would be obtained by the medical officer of health becoming a member of the medical staff and of the hospital medical committee.

After reconsidering the matter, the Central Consultants and Specialists Committee had reported again to the Council

on December 19. It recalled that in June, 1956, the Public Health Committee had submitted a resolution to the Consultants, General Practice, and Public Health Liaison Committee that it (the Public Health Committee) agreed with the principle of medical officers of health being appointed honorary consultants of hospital groups and serving on medical advisory committees, and recommended that regional hospital boards should be urged to consider such appointments. Two of the representatives of the Public Health Committee on the liaison committee had, however, dissented from the view of their committee when this resolution was being discussed, and the liaison committee referred the matter back to the Public Health Committee. In the meantime the Joint Consultants Committee had been asked by the Ministry for its views on the recommendation of the Guillebaud Committee on the integration of M.O.H.s with the hospital service. The views which the Joint Consultants Committee gave the Ministry were expressed with the agreement of representatives of the Public Health Committee. It did not appear to the Central Consultants and Specialists Committee, therefore, that the criticism of the Public Health Committee was well founded. Further, the Central Consultants and Specialists Committee reported to Council, it adhered to its policy that the constitution of a hospital group committee is ultimately a matter for the senior medical staff in the group to decide, and that the medical officer of health should serve as a member by invitation and not by right. The Council did not come to a decision on this part of the report of the Central Consultants and Specialists Committee, but referred it to the Public Health Committee for its comments.

Dr. H. D. CHALKE expressed regret that it should have been necessary for this matter to come before the Public Health Committee once again. He noted that the Central Consultants and Specialists Committee had not given any reasons for taking an opposite view to the Public Health Committee, and had merely pointed out that the opinion given to the Ministry of Health by the Joint Consultants Committee had been supported by the members of the Public Health Committee present by invitation at the meeting of the Joint Committee.

Dr. LLYWELYN ROBERTS, as one of those who attended the meeting of the Joint Consultants Committee, said that he was sorry a misunderstanding had arisen. He could not accept the statement that the public health representatives present at the meeting of the Joint Consultants Committee had supported the view put to the Ministry by that committee. There had been an informal discussion, but he certainly did not intend to give the impression that the Public Health Committee, or indeed its representatives present, was in agreement with the Joint Committee in this matter.

The CHAIRMAN stated that the main objection of the Committee was, surely, that the Joint Consultants Committee had expressed a definite opinion to the Ministry when it was known that the Association, one of the bodies represented on the Joint Consultants Committee, was still discussing the matter through its Consultant, General Practice, and Public Health Liaison Committee, and that no final conclusions had been agreed or approved by the Council of the Association.

Dr. H. D. CHALKE pointed out that, while it was true that the Joint Consultants Committee had been asked specifically by the Ministry for its views, the Society of Medical Officers of Health had also been asked for an opinion on this question, but the Society had not yet replied to the Ministry's request. Under its reciprocal arrangements with the Association on medico-political matters, the Society had forwarded a statement to the Association in the hope that the two bodies would be able to formulate an agreed policy. The Society's memorandum had been accepted in principle by the Public Health Committee. This had been done a considerable time ago, and the Society was reluctant to delay longer before reporting to the Ministry. The action which the Society had taken was in direct contrast to the precipitate action of the Joint Consultants Committee.

Dr. J. F. WARIN pointed out that the basis of the decision of the Joint Consultants Committee appeared to be that it was opposed to the suggestion in the report of the Guillebaud Committee that the medical officer of health should be appointed a consultant and serve on the hospital medical staff committee "as a right." He stressed that the policy of the Public Health Committee did not make any reference to medical officers of health having a "right" in these matters. He moved:

That the Public Health Committee does not accept the full implications in the report of the Central Consultants and Specialists Committee to the Council, and considers that it would be helpful if the matter could again be discussed in the Liaison Committee.

The following amendment by Dr. H. D. Chalke to the motion by Dr. Warin was carried, also as the substantive motion:

That the Public Health Committee does not accept the full implications in the report of the Central Consultants and Specialists Committee to the Council and reaffirms to the Council its views as already reported to Council.

The Committee accepted a suggestion by Dr. A. BARKER that, in reaffirming its views to the Council, the Committee's recommendations should be in two parts:

(1) That the Council agrees with the principle of medical officers of health being appointed honorary consultants of hospital groups, and recommends that regional hospital boards should be urged to consider such appointments in the interests of all concerned; (2) that the Council agrees with the principle of medical officers of health serving on medical advisory committees in the interests of all concerned.

Trade Unionism Within the Profession

The Committee considered a report of a meeting between representatives of the B.M.A. and the Association of County Medical Officers, held at the request of the latter, to discuss the question of trade unionism within the profession. The CHAIRMAN said that the matter turned on the fact that there were certain medical officers of health whose salaries were discretionary, and who had little hope of any appeal being accepted by their authorities, who felt that they should have access to the Industrial Disputes Tribunal and not only, by agreement, to the Industrial Court. There were other officers, members of other organizations which, being trade unions, could take disputes to the tribunal and get a binding decision. The suggestion was that if a trade union for county medical officers of health could be formed it could have a seat on Committee C, which was responsible for negotiating salaries, and would then have the right to notify a dispute under the Industrial Disputes Order instead of reference by agreement under the Industrial Courts Act. There was no doubt, continued the Chairman, that there would be an advantage in being able to go to the tribunal, but it had been put to the Association of County Medical Officers that, while the Committee was not entirely satisfied with all the results of the large number of individual appeals which had been taken up by the B.M.A., not one had been lost. The dangers of fragmentation of the profession had been pointed out, but some county medical officers still felt that their problems were unique. The Committee, after a full discussion, felt that, while there was much to be said for obtaining the right to go direct to the Industrial Disputes Tribunal, it did not consider the time was opportune at present. The views of the Committee passed in April, 1956, were reaffirmed—the maintenance of unity in the public health service was as important as the Association's policy of unity within the profession as a whole.

Other Business

The Committee considered draft proposals for amending and consolidating the Milk Regulations. A small sub-committee was set up to go into the proposed amendments and report in time for the next Council meeting.

It was agreed to support a suggestion from the Ministry of Agriculture, Fisheries, and Food that legislation relating to the anaesthetizing of pigs in slaughterhouses should be

amended to give the Minister power to permit by regulation the use of any method of anaesthetizing (as distinct from slaughtering) animals at slaughterhouses and knackery yards. Corresponding action in relation to Scotland was being considered.

A report of a meeting of members of the Committee with representatives of the Society of Medical Officers of Health to discuss the appropriate method of securing nominations for medical officer of health representatives on regional hospital boards was considered. It was agreed to accept the proposals and to recommend them to Council.

Other matters discussed included coastal sewage disposal, public health laundry service, and bacterial rodenticides.

A formal meeting of the Trustees of the Public Health Service Defence Trust was held during the day.

RETIREMENT PENSIONS FOR SELF-EMPLOYED

PROVISIONS OF FINANCE ACT, 1956

[FROM A SPECIAL CORRESPONDENT]

Under the Finance Act, 1956, persons with earned income derived from non-pensionable employment are enabled to provide pensions for themselves under the same favourable taxation terms given to contributors to approved pension schemes (*Supplement*, September 29, 1956, p. 139). From a recent Board of Inland Revenue ruling on the application of the 1956 Act to the medical profession it is now clear that many practitioners will be able to include National Health Service earnings in calculating the contributions which can be made to personal pension policies. The position of those outside the National Health Service remains unaltered by the ruling.

Broadly, practitioners under the N.H.S. can be divided into two classes for the purpose of the 1956 Act. The first comprises those who hold "an office or employment" and are therefore taxed under Schedule E. These practitioners are not eligible to take advantage of the provisions of the 1956 Act. They already receive full tax relief on their contribution of 6% of remuneration to the N.H.S. Superannuation Scheme. This is authorized by Section 378 of the Income Tax Act of 1952, and it is consequently a statutory allowance. All full-time salaried employees in the N.H.S. scheme fall into this group. The second group includes those practitioners who are self-employed and taxed under Schedule D. They contribute 6% of their assumed net earnings to the N.H.S. Superannuation Scheme. Their contributions do not, however, rank for statutory relief of tax under any provisions of the Income Tax Acts, though such relief has in practice been allowed as a concession. The Board of Inland Revenue states it does not intend that the conditions of this concessionary relief shall be altered except as stated below.

Net Relevant Earnings

The second group, which appears to consist largely of general practitioners, is, by statute, allowed to contribute to personal retirement policies under the terms of the 1956 Finance Act, and N.H.S. earnings can be taken into account in computing the "net relevant earnings" on which reliefs are allowed within the limits of that Act. If, however, a practitioner's contribution to such a policy, together with his contributions for the year to the N.H.S. Superannuation Scheme, exceed the maximum permitted allowance under the 1956 Finance Act, having regard to his net relevant earnings for the year, then he will lose the concessionary relief on that amount of his superannuation contributions by which his total payments exceed the maximum permitted allowance under the Finance Act.

It is not at present known into which category part-time consultants will fall in respect of their remuneration, since the question whether these earnings should be assessed for income tax under Schedule D or Schedule E is at present the subject of an appeal to the High Court. If the ultimate

decision is that they should be taxed under Schedule D, then, as regards personal retirement policies, their earnings will be treated in the same way as the N.H.S. earnings of general practitioners.

A practitioner who originally "opted out" of the N.H.S. Superannuation Scheme and maintains policies by arrangement with the Ministry of Health, under the conditions laid down by the Minister, will be entitled to full relief up to the statutory limit in respect of his contribution to a retirement pension policy effected under the terms of the 1956 Finance Act. He will be permitted, if he wishes, to substitute the 1956 Act benefits for his present arrangements, but the conversion procedure to be adopted for such optants is not yet quite clear and is under discussion with the Ministry of Health. However, it must be appreciated that, in the case of either a new policy or a conversion, the 8% at present granted to such a practitioner for the upkeep of existing policies will not rank as part of his "net relevant earnings" for the purposes of the Act.

Further information on individual problems can be obtained from the chief office of the Medical Insurance Agency at B.M.A. House, Tavistock Square, London, W.C.1, and the Scottish office at B.M.A. House, 6, Drumheugh Gardens, Edinburgh, 3, or any of the Agency's branches.

REINSTATEMENT OF SERVICE MEN ON DOCTORS' LISTS

The Ministry of Health has asked executive councils to remind Service men discharged from the Forces that if they wish to be reinstated on the list of the doctor who attended them before their call-up they must communicate with him. Executive councils have been instructed to write to all those who have not signed on with a doctor within three months of their discharge. This instruction follows discussions with the representatives of the G.M.S. Committee.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Remuneration Claim

SIR,—If any of us hesitated to support the claim to have Spens implemented at this time, surely he need hesitate no longer after the announcement that N.H.S. administrative and clerical staffs have been granted a 3% increase in salary on the basis of the rise in the cost of living since February 1, 1956. How do these people get their increases each year while we have spent months of negotiations over a rise due since 1952? One wonders if the Government is deliberately provoking us to abandon the N.H.S. in order that it may be relieved of its ever-increasing financial burden, and yet, by putting the blame on us for walking out, avoid the political setback which any party renouncing the scheme would suffer.

There is some talk of lack of unity in the profession. Surely this is really a lack of unified aim; we know of many faults in the present scheme but are not agreed on how best to effect improvement. How many of us know the details of the Australian, New Zealand, and other health schemes? Informative articles in the *Journal* laying out the pros and cons of these schemes and the difficulties experienced in their administration would help us in deciding between the capitation system, salaried service, and payment for services. Thereafter discussion at the forthcoming local Guild meetings could assist in formulating a unanimous national policy.

It is obvious that we must make a firm stand in this present dispute. If we give way now we may as well forget Spens for good. It is most regrettable that medicine has to be mixed with politics and that we have to haggle over

terms with successive Governments, but at least we could minimize this by getting the Spens agreements on a binding contractual basis now, with automatic annual adjustments, and so prevent repetition of this degrading niggling every few years. If the Minister will not agree to the conditions under which we entered the scheme, let us abandon it altogether and negotiate a new contract, bearing in mind the lessons learnt from the present situation. Seldom has a professional body been treated as we have by Mr. Turton. Anger and dissatisfaction are widespread throughout the profession. Now is the time to take our stand and have all matters of dispute settled once and for all.—I am, etc.,
Edinburgh, 9.
W. A. ELLIOTT.

SIR,—How unfortunate it is that the doctors' claim should be presented so maladroitly as to appear to the public as an ill-timed demand for more money. Although as a hospital doctor I see only one aspect of general practice, it is obvious that many good G.P.s are grossly underpaid at present rates. Conversely, some, judged by the slipshod practices revealed in their hospital referrals, are giving the public less than their money's worth—a dangerous habit. The fault lies in the Gilbertian stupidity of a system of payment which not merely encourages superficiality but actually penalizes professional enterprise and devotion. The remedy would be to provide more money for general practice, if necessary, but to make its acquisition by the individual doctor competitive and conditional on the quality of the service provided. This would reward those who have a sense of vocation, stimulate those who have not, and perhaps encourage a salutary system of financial inequality based on effort and worth. A good deal of the increased cost would be saved by a reduction in the flood of trivialities at present swamping out-patient and casualty departments, and general practice would once more become a worth-while alternative for the unplaced registrar, as well as a great vocation in its own right.

Unfortunately the damage is done. The remuneration claim in its present form is not gaining public support and thus is likely either to fail or at best to win only qualified and grudging concessions. I must concede that some of my own mild antagonism stems from a wry comparison between the tempest aroused by the Minister's rejection of the remuneration claim and the smothered ripples emanating from the agonised threshings of ageing senior registrars. Must the profession persist in inviting the political gibe that it is motivated most forcefully by cupidity?—I am, etc.,
Newcastle upon Tyne, 2.
ERIC G. HARDY.

SIR,—I wonder how many of your readers read the announcement tucked away at the bottom of page 12 of the *Supplement* of January 5 with fury?

N.H.S. administrative and clerical staff are to have a 3% salary increase because of the rise in the cost of living since February 1, 1956. N.H.S. dispensing assistants get a 5% increase because of increased cost of living since September 1, 1955. Medical laboratory technicians receive a 5% salary increase. These increases have been given because of an increase in the cost of living in the past 11 to 16 months. Yet the Government has so far refused a salary increase both to general practitioners, who last had a pay increase in 1951, and to hospital medical staff, who had a meagre increase early in 1954. What is the Public Relations Department of the B.M.A. doing? Our case, due to faulty presentation, appears slender to the general public. If some negotiating bodies can get a salary increase from the Government at the present time, despite the need for "restraint in wage demands," why cannot the Negotiating Committee succeed? Many young practitioners must be seriously wondering if the B.M.A. is of any use at all in negotiating salaries and conditions of service, especially for young doctors.—I am, etc.,
Birkenhead.
BRIAN W. COLE.

SIR,—Up till recently many practitioners felt despondent and irritable about the apparent impotence of the B.M.A.

over the remuneration claim. At this eleventh hour there appears to be a glimmer of light, with the bristling of our representatives' fur in their dealings with the Ministry. The question now arises what practical measures can be taken, rather than theoretical and almost impossible steps. May I suggest the following?

A whole county—e.g., Yorkshire—would have its practitioners resign from the N.H.S. on a certain date (all adjacent areas being asked to co-operate in that they would not accept new patients during the crucial time). In this way the "strike fund" would be adequate. If after several days the Government did not see reason the resignation could be extended to a neighbouring county, and so on. During the time that negotiations are taking place doctors would charge their patients a nominal fee and refuse to sign any Government certificates whatsoever. I am sure that if such a system were adopted it would not be many days before the "chisellers" at Whitehall would come to heel.—I am, etc.,

Birkenhead.

M. SNELL.

SIR,—Publicity in the national press in regard to our case for increased remuneration has been limited to the bald statement that our average income is over £2,000 a year and that we are asking for an additional £500 or so each year. Since most of my patients earn £500 or less each year they view our case with absolute lack of sympathy, if not with antipathy.

I have recently been asking some of my patients how much they think we should receive each week for looking after them. Their guesses range from 5s. to £5 per week, with an average of 12s. a week for each patient. Their unanimous reaction to the true figures was great surprise and sympathy towards our case. With very few exceptions they believe that their weekly purchase of National Insurance stamps is a direct contribution to the cost of the National Health Service.

I was prompted to write this letter by reading the front-page headlines in the newspapers of December 28 about the reinstitution of the British Medical Guild (this was not mentioned in the *B.M.J.* received on the same day). I hope the Guild will institute publicity in the national press to correct the misbeliefs of the public and to arouse their sympathy towards our case.—I am, etc.,

London, W.11.

DAVID SLOVICK.

SIR,—In the present remuneration controversy most doctors feel they are not being adequately recompensed for the hours of work undertaken. Many of us feel the situation would be much improved if we were not "on call" 24 hours out of 24. The G.P.'s day should end with his evening surgery (except in cases of home confinements), and a night service set up to deal with all subsequent calls. This would relieve the harassed G.P., absorb the unemployed doctors, and eliminate the problem of finding someone to wait by the telephone when the doctor's wife goes out. In country districts this would be impracticable, but if a log book were kept and the country G.P. paid an adequate fee (plus mileage in these days of expensive petrol) the scheme should work. This suggestion should not interfere with the doctor-patient relationship any more than does the hospital casualty department, as all late and night calls should be emergencies.—I am, etc.,

Aberdeen.

DOROTHY E. ROBERTSON.

SIR,—When I saw the headline "Minister: We can't afford doctors' pay claim" I was dismayed but not surprised. As I continued to read the article in the *Yorkshire Evening Post* of January 4 my dismay gave way to great anger, for there was a statement by a Ministry spokesman claiming that in addition to a net income of £2,222, the doctor received on average £1,110 practice expenses. There must be many readers like myself who do not remember receiving any such practice expenses, and yet the public will no doubt accept this statement as being true.

Surely this further underlines the pressing need for a virulent publicity campaign to present the true facts to the

public and to dismiss this sort of inaccuracy once and for all. From my own personal experience I find that the vast mass of patients have no idea of the ratio of essential practice expenses to income. Once the bare facts concerning practice expenses are pointed out to them, they have been, without exception, amazed and in full support of our claim.

If this could be done on a nation-wide scale I have every confidence that the overwhelming mass of the public would willingly suffer whatever inconveniences they may be subjected to, in order that pressure may be brought to bear in order to make our claim succeed. Without a publicity campaign, there will be general agreement with a statement in the *Daily Express* that "there can be little sympathy for a £2,000 per year man asking for a £10 per week increase."—I am, etc.,

Dewsbury, Yorks.

D. C. TWIST.

SIR,—On perusing recent correspondence in the *Supplement*, I am perturbed by the numerous side-issues which are being raised. The largest of these is reform of the N.H.S. It is tempting to discuss this at present, but I believe it will lead to protracted discussions, disagreement, etc., which the Ministry will use to good advantage. Discussion of alternative schemes, should we decide to withdraw from the N.H.S., threatens to become another dangerous side-issue. Some such scheme must be—and I hope is being—worked out, but it is best done in "the back room." Presumably the profession will have a large measure of control over such a scheme, and therefore any undesirable features could be quickly and easily changed.

Finally, let us not cloud the main issue in presenting our case to the public. Parading our budgets in the press is, in my opinion, definitely harmful. It is time we realized that whining about overdrafts, hardship, and debts is never likely to gain public sympathy. In spite of our lowered financial status we are still (and rightly so) better off than the average member of the public whose sympathy we seek. Instead, let us dwell first on Spens, secondly on Spens, and thirdly on Spens, so that the emphasis is shifted from the fact that we need more money to the fact that we were promised more money.

When the Minister said "No" again, I drafted this letter, which I later scrapped. However, after watching the presentation of the dispute on the B.B.C.'s television programme "Panorama," in which five doctors (two of them members of the Negotiating Committee) failed to mention Spens, my anger was rekindled.—I am, etc.,

Larkhall, Lanarks.

JOHN JAMIESON.

SIR,—I think it very unwise of individual doctors to allow themselves to be drawn into correspondence in the lay press on the subject of remuneration, etc. Very few people are sufficiently interested in the wage claims of others to attempt to understand them. Therefore let us quietly strengthen our Guild, come to reasonable decisions, and then take the necessary steps to see that these are carried out.

One other point to remember is that after the Dankwerts award the Government was surprised to learn that this was for G.P.s only; and in their dudgeon over the award refused the specialists' separate request for arbitration, for reasons which are obvious but not very honourable. I hope that the Negotiating Committee will make this matter perfectly clear on the present occasion, so that the Spens recommendations for specialists may at long last be put into effect.—I am, etc.,

Birmingham, 15.

ROBERT EVANS.

SIR,—It is difficult to understand the Minister's attitude of pleading national poverty. A very reliable friend of mine tells me we are, as taxpayers, a fairly godmother to the world. For instance, here are just a few items of expenditure he noted in Africa, while visiting his former pupils as a retired headmaster: to Sierra Leone, £10,000 for books for library, £400,000 for university extension; to Nigeria, £4½m. for a hospital—it has still to be staffed,

equipped, and maintained; to the Cameroons, £10m. for new roads—not bad for a place that has no motor transport.

But the British Government has not forgotten the British people entirely in its largesse. Here in Shropshire, as in many other counties, those who would like a Third Programme week-end can be put up in style at one of the stately homes of England at half-price, the other half coming from the Welfare State. There is a long waiting-list.

These are a few samples. Whether these are proof of our prosperity, or an explanation of our alleged poverty, is a matter of opinion. My own is that, having regard to the lavish gifts the Exchequer makes to all and sundry, he must have so much money he could quite easily pay us out of the petty cash.—I am, etc.,

Shrewsbury.

ALBERT E. NICHOLLS.

Unity of Purpose

SIR,—The letter of Dr. Bruce Cardew (*Supplement*, December 29, 1956, p. 230) is a welcome change from the scores of letters published, the majority of which are non-constructive and contain non-specific grumbles and grouses about the N.H.S. In discussions with colleagues one is struck by the lack of justified complaints, apart from remuneration claims, and by the vague idea of what changes are required to make the Service satisfactory to doctors and patients. We have heard of the New Zealand scheme, the Australian, and the Canadian, but the advantages of these are not at all clear, at any rate to the majority of the profession. I am aware of some of the disadvantages, since some patients who emigrated to these parts have returned to this country, being unable to afford the fees demanded for medical treatment, especially if they had several children. Would it not therefore be wise to produce a symposium of comparative medical services, in place of the usual issue of the *B.M.J.*, similar to the issues on medical education? We would then have the opportunity of assessing our own Service. There should also be included a summary of alternative methods of practice payment—e.g., item of service pay, State-salaried service, etc.—and also a statement culled from the massive amount of correspondence as to the main faults (not mere rumblings) of the present Service.

The profession should by now be in a position to state a positive case for either an alternative Service or major alterations in the present one which would produce satisfaction to the majority. As Dr. Cardew says, the vast majority of resolutions at conferences have been concerned with matters of detail, and apparently have not had the desired effect in improving the Service. If we have as yet no definite alternative scheme, is it not time we set about actively to produce one, as I believe was done in 1933 and again in 1939? We could set up a commission of our own, consisting of 7 or 11 just men capable of sorting the wheat from the chaff, and producing within 12 months a loaf of good bread to present to the Government as a necessity for the preservation of medical practice. Such a commission might be paid for from the Defence Fund, as we all understand that this is very large, and £100,000 spent on producing our own requirements for service would be well spent. This reminds me of another point which could be made clear in your symposium, and that is a statement as to our funds available, where they are, and for what they may or may not be used. The majority of members, judging by the remarks of those who attend meetings, do not have any clear knowledge as to our resources.

Finally, it appears that the main criticism of the N.H.S. is the fact that it is tied up with politics and the vagaries of successive Ministers of Health. This being so, should we not cease to talk loosely about withdrawing from the Service and press for a divorce of the profession from politics, perhaps on the lines suggested by Miss Maud Forrester-Brown (*Supplement*, December 15, p. 219), this being one of the few letters containing a constructive policy?—I am, etc.,

Brierfield, Lancs.

H. C. PALIN.

SIR,—Before setting up more committees and wasting months on elaborating an "alternative" Service, let us stress certain principles. The principle of free medical services is absolutely right in our overcrowded, industrialized island with its low standard of living. Higher piecemeal individual contributions to subsidize the profession can only work in smaller and economically stabler societies such as the Scandinavians, New Zealand, etc. In a reality where our Government is spending a large part of the national income on rearming, prestige wars, etc., the funds available for welfare are of necessity deplorably and tragically depleted. Let us direct the bulk of our grievance and frustration against this stark fact on wider political platforms.

So how can we, with the limited funds available for the whole social welfare and progress structure, including housing, education, and medicine, rearrange matters for the greater satisfaction of the greatest number, acting as guardians for those still on the school benches? I believe that every working doctor on the *Register* should be assured a minimum income of £1,000, rising by instalments of £100 per annum for each year on the *Register* to a maximum of, say, £2,500. We could then stop seducing patients on to our lists, seniors for promotion, and management committees for personal privileges, and devote all this time and energy to improving our stature as human beings and thereby the level of our work and of society.

I can hear the dismayed cry of "Full-time salaried service," but the alternative is a perpetuation of the degrading wrangle for personal material betterment. Let those who are unwilling to do their best work on a salary close the gates of the medical vocation behind them. There are enough of a coming generation waiting, grateful for the opportunity of devoting their lives to fascinating, many-rewarding work in conditions of financial security. Are the full-time, salaried hospital staff diletanting for lack of financial incentive? Can the human spirit only rise to the hook loaded with the promise of individual reward?

Any uprising on the strength of a collective wish for genuine human progress will succeed. Not so this schizoid approach. Every movement gets the leaders it deserves. And, in case anyone suspects I am writing from the heights of personal satisfaction, let me explain that I "squatted" this week, and that at the age of 31, eight years qualified, my family are once again having to subsidize me while I wait for a list to grow, frustrated by this enforced idleness.—I am etc.,

London, W.11.

ELEANOR ETTLINGER.

Shortage of Physiotherapists

SIR,—The letter from Mr. R. R. I. Baxter headed "Shortage of Radiographers" (*Supplement*, December 22, 1956, p. 226) will have the support of members of other professions supplementary to medicine. As reference to page 222 of the same issue will show, there is a grave shortage of physiotherapists. This is due mainly to the fact that their remuneration bears no relation either to the time and money spent in obtaining their qualification or to the value of their work in the National Health Service.—I am, etc.,

London, W.C.1.

M. J. NEILSON,
Secretary,
Chartered Society of Physiotherapy.

The Doctor's Week

SIR,—I object most strongly to the appearance in the *Daily Telegraph* of December 28, 1956, of a statement that an investigation by one doctor showed that he worked a 30-hour week. It caused me to keep a record of my working hours during the past week, which was not an unduly busy one, and which may be fairly termed an average week. This showed a 42½-hour week, which did not include hours "on call." I suggest that I am more typical of the "average G.P." belonging to a partnership of three in an industrial area. The publishing of statements in the daily press gives the public an entirely erroneous impression of the "doctor's lot" and does not help our remuneration claim.—I am, etc.,

Swansea.

TREVOR DAVIES.

BRITISH MEDICAL GUILD

Meetings to be Held

CITY.—At Committee Room A, B.M.A. House, Tavistock Square, W.C., Tuesday, January 22, 8.30 p.m.
 CORNWALL.—Sunday, January 27.
 DORSET.—At the King's Arms Hotel, Dorchester, Friday, January 25, 8.30 p.m.
 EAST AND WEST SOMERSET.—At Out-patient Department, Taunton and Somerset Hospital, East Reach, Taunton, Sunday, January 20, 3 p.m.
 EASTBOURNE.—At Princess Alice Memorial Hospital, Eastbourne, Thursday, January 24, 8.30 p.m.
 ENFIELD AND POTTERS BAR.—Saturday, January 26.
 GREENWICH AND DEPTFORD.—At Miller General Hospital, Greenwich High Road, S.E., Tuesday, January 22, 8.30 p.m.
 HAMPSTEAD.—At Board Room, Hampstead General and North-west London Hospital, Haverstock Hill, N.W., Thursday, January 24, 8.15 p.m.
 HENDON.—At Hendon Hall Hotel, N.W., Tuesday, January 22, 8.30 p.m.
 HEREFORD.—Tuesday, January 22.
 LAMBETH AND SOUTHWARK.—At Nurses' Lecture Room, Lambeth Hospital, Brook Drive, S.E., Thursday, January 24, 8.15 p.m.
 LEEDS.—At Leeds City Museum, Sunday, January 20, 2.30 p.m.
 LEWISHAM.—At Small Hall, Lewisham Town Hall, Rushey Green, S.E., Tuesday, January 22, 8.30 p.m.
 MONMOUTHSHIRE.—At St Woolos' Hospital, Newport, Sunday, January 20, 3 p.m.
 NORTH GLAMORGAN AND BRECKNOCK.—At Boot Hotel, Aberdare, Sunday, January 20, 3 p.m.
 NORTH MIDDLESEX.—At Committee Room, North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, January 22, 9 p.m.
 NORTH-EAST SUFFOLK.—At Nurses' Lecture Room, Lowestoft and North Suffolk Hospital, Sunday, January 20, 6 p.m.
 PLYMOUTH.—Tuesday, January 22.
 REIGATE.—At Redhill County Hospital, Tuesday, January 22, 8.30 p.m.
 ST. PANCRAS.—At Committee Room C, B.M.A. House, Tavistock Square, W.C., Wednesday, January 23, 8.30 p.m.
 SHROPSHIRE AND MID-WALES.—At Lion Hotel, Shrewsbury, Sunday, January 20, 2.30 p.m.
 SOUTHAMPTON.—At Royal South Hants Hospital, Thursday, January 24, 8.30 p.m.
 STRATFORD.—At Board Room, Queen Mary's Hospital, E., Tuesday, January 22, 8.45 p.m.
 SUTTON COLDFIELD.—At Sutton Coldfield Hospital, Monday, January 21, 9 p.m.
 WANDSWORTH.—At Wandsworth Town Hall, High Street, S.W., Friday, January 25, 8.45 p.m.
 WEST HERTS.—At Crown Hotel, Garston, Watford, Tuesday, January 22, 8.30 for 9 p.m.

Association Notices

COMPETITION FOR MEDICAL FILMS

The Council of the British Medical Association is prepared to consider the annual award of two prizes of fifty guineas each, with certificates, for 16-mm. medical films. One prize will be for commercial and the other for non-commercial film producers. The first competition will be held this year, the closing date for receipt of entry forms being June 30, 1957, and for the receipt of films September 30, 1957.

The choice of subject is left to the competitor. The judges will pay special regard to the value of the film to the B.M.A. Film Library, and the likelihood of its frequent use. For example, a film showing a broad clinical presentation of a subject is likely to be more acceptable than one limited to a demonstration of operative technique.

Full details of the competition may be obtained from the Secretary, British Medical Association, B.M.A. House, Tavistock Square, London, W.C.1.

Diary of Central Meetings

JANUARY

21 Mon Editorial Subcommittee Joint Formulary Committee, 11 a.m.
 22 Tues Staff Side, Committee B, Medical Whitley Council, 10.30 a.m.
 22 Tues Alternative Edition Subcommittee, Joint Formulary Committee, 11 a.m.

22 Tues Full Committee B, Medical Whitley Council, 2 p.m.
 22 Tues Journal Committee, 2 p.m.
 23 Wed Scientific Exhibition Subcommittee, Arrangements Committee (Newcastle, 1957) (at B.M.A. Regional Office, 7, Windsor Terrace, Newcastle upon Tyne), 10 a.m.
 23 Wed Negotiating Committee, 2 p.m.
 23 Wed Registrars Group Executive Committee, 2.30 p.m.
 24 Thurs Rural Practices Subcommittee, G.M.S. Committee, 2 p.m.
 25 Fri Drug Addiction Committee, 2 p.m.
 28 Mon Staff Side, General Whitley Council (at 14, Russell Square, W.C.), 10.30 a.m.
 28 Mon Full General Whitley Council (at 14, Russell Square, W.C.), 2 p.m.
 29 Tues Arrangements Committee (Edinburgh, 1959), 12 noon (Change of time.)
 29 Tues Subcommittee on Medical Reports, Joint Committee of the B.M.A. and the Magistrates' Association, 2 p.m.
 30 Wed Council, 10 a.m.

FEBRUARY

5 Tues Planning Subcommittee, Occupational Health Committee, 10.30 a.m.
 8 Fri Ingleby Evidence Committee, 2 p.m.

Branch and Division Meetings to be Held

ALDERSHOT AND FARNHAM DIVISION.—At Northfield Hospital, Aldershot, Tuesday, January 22, 8.30 p.m., meeting. Lecture by the solicitor to the Medical Defence Union: "Doctors and Litigation."
 BARNSELY DIVISION.—At Queen's Hotel, Barnsley, Thursday, January 24, 8 p.m., meeting. B.M.A. Lecture by Dr. F. E. Camps: "Medical Adventures and Misadventures."
 BOURNEMOUTH DIVISION.—At Board Room, Royal Victoria Hospital, Boscombe, Friday, January 25, 8 for 8.15 p.m., meeting. Address by Dr. P. M. F. Bishop: "Intersexuality."
 BRADFORD DIVISION.—At Medical Societies' Room, Bradford Royal Infirmary, Wednesday, January 23, 8.15 p.m., meeting. Address by Mr. I. Simson Hall: "Restoration of Hearing, the Aim of Modern Otological Surgery."
 BRISTOL DIVISION.—Wednesday, January 23, 8.30 p.m., visit to one guest.
 DONCASTER DIVISION AND DONCASTER MEDICAL SOCIETY.—At Danum Hotel, Doncaster, Tuesday, January 22, 7.30 for 7.50 p.m., dinner. Paper by Professor Digby Chamberlain: "Treatment of Peptic Ulceration."
 FINCHLEY DIVISION.—At Finchley Memorial Hospital, Granville Road, N. Finchley, N., Friday, January 25, 8.30 for 9 p.m., meeting. Talk by Dr. J. J. F. Merry on elementary principles of therapy with cortisone. A film in colour and sound will follow.
 HALIFAX DIVISION.—At St. John's Hospital, Halifax, Wednesday, January 23, 8.30 p.m., clinical meeting.
 HAMPSTEAD DIVISION.—At Hampstead General and North-west London Hospital, Haverstock Hill, N.W., Thursday, January 24, 8.30 p.m., clinical meeting.
 MERSEYSIDE BRANCH.—At Mecca Sefton House, Exchange Buildings, Liverpool, Friday, January 25, B.M.A. buffet dance.
 MIDLAND BRANCH.—At Children's Hospital, Ladywood Road, Birmingham, Friday, January 25, 8.15 p.m., meeting of clinical and pathological section.
 OLDHAM DIVISION.—At Albion Club, Queen Street, Oldham, Monday, January 21, 9 p.m., meeting. Dr. J. J. F. Merry: "Use of Joint Aspiration and the Injection of Hydrocortisone."
 OXFORD DIVISION.—At Beit and Jameson Room, Rhodes House, South Parks Road, Oxford, Wednesday, January 23, 8.15 p.m., meeting. Sir Geoffrey Jefferson, F.R.S.: "Medical Impressions of My Recent Russian Visit."
 ROCHESTER, CHATHAM, AND GILLINGHAM DIVISION.—At St. Bartholomew's Hospital, Rochester, Thursday, January 24, 8.30 p.m., meeting. Lecture by Dr. R. Forbes: "Recent Developments in Medical Litigation." All medical practitioners in the area of the Division are invited.
 SHROPSHIRE AND MID-WALES BRANCH.—At Board Room, Royal Salop Infirmary, Shrewsbury, Wednesday, January 23, 8.30 p.m., meeting of Clinical and Pathological Section. Lecture by Dr. K. W. Donald: "Man as a Diver."
 SOUTH-WEST ESSEX DIVISION.—At Out-patient Department, Thorpe Combe Maternity Hospital, Forest Road, Walthamstow, E., Wednesday, January 23, 8.30 p.m., meeting. B.M.A. Lecture by Dr. Felix Post: "Mental Disorders of the Elderly in General Practice—A Psychiatrist's Grumble."
 SUTTON COLDFIELD DIVISION.—At Sutton Coldfield Hospital, Monday, January 21, 8.30 p.m., business meeting.
 WEST BROMWICH AND SMETHWICK DIVISION.—At Sandwell Hotel, West Bromwich, Wednesday, January 23, 8.15 p.m., meeting. Talk by Dr. P. H. Addison: "The Law as it Affects the Doctor."
 WIGAN DIVISION.—At Lewis's Restaurant, Wallgate, Wigan, Thursday, January 24, 8 p.m., supper meeting. Dr. Robert Coope: "Obiter Dicta—Some Practical Problems which Interest

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MEDICAL PRACTICE IN CANADA

BY

A. D. KELLY, M.B.

General Secretary, Canadian Medical Association

Canada is a country growing in many directions and is well along the road of transformation from an agricultural to an industrial economy, with the consequent trend towards urbanization. At the same time, the development of the natural resources of the northern hinterland is producing small communities where none previously existed, and the frontiers are still expanding. The population of the country is now greater than 16 million, an increase of 20% since the last census. The effect of a high birth rate and low infant mortality makes natural increase more important than immigration in adding to the population.

Opportunities

Canada is served by slightly more than 16,000 doctors, the physician-population ratio being approximately 1:950, which is not dissimilar to that in the United Kingdom. This ratio has been maintained with remarkable constancy since 1900, the growth of the profession keeping pace with steadily increasing population.

The distribution of physicians is uneven among the provinces, British Columbia and Ontario and Quebec being more adequately supplied than the remainder, but it is erroneous to assume that Canada is experiencing a shortage of doctors. Such a statement is at variance with the views of certain non-medical authorities in Canada and is contrary to the optimistic prospects portrayed by certain official agencies abroad. I make it, however, on behalf of the executive officers of responsible medical organizations who are experiencing increasing difficulty in advising well-qualified immigrants where they may establish themselves. The annual output of the nation's twelve medical schools exceeds 900, a figure which is considerably greater than the annual losses occasioned by death, retirement, and emigration.

Forty per cent. of Canada's medical force is classifiable as "specialist," the remainder comprising the large body of general practitioners, the physicians employed in industrial, institutional, and administrative work, and the medical graduates completing their training. Urban communities are well supplied with general practitioners and specialists, all conducting private practice. Opportunities arise most frequently in the more sparsely settled rural areas and in the new communities which open up as the natural resources

are progressively developed. A well-qualified general practitioner who is prepared to accept the rigorous conditions and the scant amenities of such locations can establish himself in practice. The scope of general practice is considerably broader than is usual in the United Kingdom to-day, and Canadian doctors working in relative isolation assume responsibilities in diagnosis and treatment which demand a high degree of resourcefulness and training.

Examination and Registration

A degree in medicine or any similar qualification does not *per se* confer the right to practise in any part of Canada. To acquire this right, physicians from Canada or elsewhere must present registrable qualifications to the medical licensing authority of the province in which they elect to practise. The licensing of physicians is a function of statutory bodies set up by the Medical Acts of each of the ten provinces. These licensing authorities are usually known as the College of Physicians and Surgeons of (name of province), and each of them maintains a *Register* in which are enrolled the names of those qualified to practise in that province.

Health and education being constitutionally and traditionally within the sphere of the provinces, each of these medical licensing authorities is autonomous, and registered practitioners in one province have no inherent rights in any other province. Admission to the *Register* was formerly accomplished by passing the examinations conducted by the several provincial licensing authorities, but all of them now accept candidates who have passed the examinations of the Medical Council of Canada, which is purely an examining body and which provides the only tangible link between the provincial agencies.

Since the admission of British physicians to the *Registers* maintained by the provincial medical licensing authorities in British Columbia, Ontario, Quebec, and New Brunswick may be gained only by passing the examinations of the Medical Council of Canada, the following general statement of requirements may be of interest. It is emphasized, however, that the application of the rules to any individual candidate should be cleared with the registrar of the medical licensing authority of a province.

Candidates for the examinations of the Medical Council of Canada are required to forward to the Registrar of the Council, at least three weeks before the first day of the examination: (1) a completed application form (obtainable from the Council); (2) an Enabling Certificate from a provincial medical licensing authority (the Enabling Certificate is issued when the candidate satisfies the provincial

requirements of preliminary education, matriculation, education in the basic sciences, medical curriculum and graduation); (3) a statutory declaration of identity; (4) evidence of having served a year's internship in a hospital acceptable to the provincial medical licensing authority; (5) examination fees of \$100; (6) two unmounted photographs.

Examinations of the Medical Council of Canada in medicine, surgery, obstetrics and gynaecology, and public health are conducted in English or French at several Canadian centres in May and October. Successful candidates can register without further examination in any Canadian province on complying with the provincial regulations, including the payment of the provincial registration fee.

Reciprocal registration privileges exist between the General Medical Council of Great Britain and the medical licensing authorities of the following provinces: Alberta, Saskatchewan, Manitoba, Nova Scotia, Prince Edward Island, and Newfoundland. This reciprocity is extended to registered medical practitioners of the United Kingdom and does not necessarily include persons registered on the Commonwealth or foreign lists. In the remaining four provinces registration is obtainable only with the Medical Council of Canada certificate. In either event, consultation with the registrar of a provincial medical licensing authority is a first requirement. Doctors whose medical qualifications were obtained outside the United Kingdom should particularly inquire, as these general statements do not necessarily apply.

Conditions of Practice

The identification of specialists in Canada is a function of the Royal College of Physicians and Surgeons of Canada, and examinations for candidates for fellowship or for certification are conducted annually among those who meet the requirements for graduate training. The higher specialist qualifications and diplomas of Great Britain are well regarded, but they are not necessarily considered the precise equivalent of comparable Canadian qualifications. Since the latter are recognized publicly and professionally as indicating a high level of competence, newcomers aspiring to practise as specialists would be well advised to meet the requirements of the Royal College of Physicians and Surgeons of Canada at the first opportunity.

Independent private practice, either alone or in partnership, is the rule throughout Canada. Group practice in privately sponsored clinics is increasing, but openings for newcomers are infrequent. It is apparent to this transatlantic observer that the National Health Service, or some other influence, has accustomed doctors in the United Kingdom to think of medical work in terms of "posts," "appointments," or other words which carry the connotation of full-time, salaried employment. While it is true that in public health, in teaching, in industrial medicine, in institutional pathology and radiology, and in medical administration such positions exist, they engage such a small proportion of the medical population that newcomers would be well advised to disregard them and to think in terms of private practice.

The sale of practices is practically unknown, and when one doctor succeeds another the transaction usually amounts to the transfer of the house or other real property involved. There is no bar to any licensed physician establishing himself in private practice in the community of his choice.

Salaried hospital appointments are uncommon, but contract practice exists in certain industrial operations such as mining and lumbering and in certain municipalities in the prairie provinces. Health insurance under Government auspices is not in effect anywhere in Canada, but universal hospital-care insurance applies to the citizens of two provinces and may be extended to additional provinces. Health insurance under plans of prepaid medical care sponsored by the medical profession and by insurance companies and co-operatives is making rapid headway and is receiving widespread public acceptance. Freedom of choice of doctor prevails, and the profession is remunerated on the basis of fee-for-service-rendered.

Look First

Information concerning openings for practice, assistantships, institutional appointments, and other forms of medical employment can best be obtained after arrival in Canada by consulting the registrars or the secretaries of the provincial divisions of the Canadian Medical Association. Classified advertisements relating to medical openings appear regularly in the *Canadian Medical Association Journal*, but medical agencies do not exist. Advertisements, however, are an unsatisfactory means of determining the potential openings for practice, and applicants are at a considerable disadvantage when they are separated by time and distance from the source of information. Information must be current if it is to be accurate and useful, and desirable openings are apt to be filled if protracted correspondence ensues. For these reasons, and because there is no substitute for personal investigation, it is recommended that actual examination of opportunities for practice be deferred until after arrival in Canada. There is unquestionably an element of risk in such a course, but the alternative is so unsatisfactory that intending immigrants would be well advised to undertake a preliminary reconnaissance. Under such circumstances dependants should be left at home until arrangements for their reception can be completed.

It is not possible to arrange in advance for attending staff or administrative hospital appointments in the case of senior physicians of specialist or consultant status. Junior house appointments at the level of intern and resident are, however, sometimes available and many of them do not require the incumbent to be fully licensed. This provides a means for young doctors to familiarize themselves with conditions of practice in this country while preparing for the examinations of the Medical Council of Canada. Internships in teaching hospitals are very difficult to obtain, but a number of approved internships in non-teaching institutions are available. Those latter appointments frequently carry with them a small remuneration, in addition to maintenance, which is sufficient to support a single man. A list of hospitals approved for internship will be supplied on application, but all details of appointment should be taken up with the superintendent of the hospital concerned. Doctors interested in a possible internship should inquire whether full provincial registration is a requisite of the post.

Many recent inquiries have been received from senior medical students about the possibility of taking in Canada the pre-registration internship required by the General Medical Council. Such a question, of course, is not answerable by any Canadian agency, and these students have been advised to consult the deans of their medical schools or the appropriate licensing body to determine whether they will recognize a pre-registration internship taken in Canada. Canadian hospitals approved for junior internship by the Canadian Medical Association provide a one-year rotation with adequate staff supervision and instruction.

The cost of living and practising is high in Canada, and immigrants should provide themselves with all capital resources which are exportable in order that they sustain themselves while awaiting returns from private practice. No Canadian medical organization is in a position to assist financially by loans, assisted passages, or other aids.

Conclusion

It is unnecessary to state that the decision to emigrate should not be taken lightly. Such a step involves the attitude of the doctor's wife and affects the future of his children, and in many instances these factors rank equally in importance with the prospects for a satisfactory professional milieu. Transplantation of all living things is likely to be more successful before the roots are firmly imbedded, and it is our experience that after the age of 40 the uprooting process is a questionable procedure.

The Canadian medical profession since its earliest days has been strengthened and enriched by additions to its numbers from Britain, and the post-war and post-N.H.S. arrivals

have maintained the high standards set by their predecessors. Customs and conditions in Canada are different. Whether they are better is a matter of personal opinion. Entry into practice is not automatic but requires considerable investigation and effort on the part of a newcomer. A determined young doctor willing to adapt himself to circumstances as he finds them and to help us improve them as he grows up with the country, can always make a place for himself. To assist this resolute immigrant, I append a list of addresses which will be useful to him as he pursues his career in a new environment.

Provincial Medical Licensing Authorities

The Registrar, The Newfoundland Medical Board, P.O. Box E-5121, St. John's, Nfld.
The Registrar, Medical Council of Prince Edward Island, 170, Fitzroy Street, Charlottetown, P.E.I.
The Registrar, Provincial Medical Board of Nova Scotia, 196, Atlantic Street, Halifax, N.S.
The Registrar, Council of Physicians and Surgeons of New Brunswick, 182, Princess Street, St. John, N.B.
The Registrar, College of Physicians and Surgeons of Quebec, 1896, Dorchester Street W., Montreal, 25, P.Q.
The Registrar, College of Physicians and Surgeons of Ontario, 174, St. George Street, Toronto, 5, Ont.
The Registrar, College of Physicians and Surgeons of Manitoba, 604, Medical Arts Bldg., Winnipeg, Man.
The Registrar, College of Physicians and Surgeons of Saskatchewan, 932, Spadina Crescent East, Saskatoon, Sask.
The Registrar, College of Physicians and Surgeons of Alberta, 501, Alexandra Building, Edmonton, Alta.
The Registrar, College of Physicians and Surgeons of British Columbia, 1807, West 10th Avenue, Vancouver, 9, B.C.

National Bodies

The Registrar, Medical Council of Canada, 77, Metcalfe Street, Ottawa, 4.
The Honorary Secretary, Royal College of Physicians and Surgeons of Canada, 150, Metcalfe Street, Ottawa, 4.
The General Secretary, Canadian Medical Association, 150, St. George Street, Toronto, 5, Ont.
The Editor, *Canadian Medical Association Journal*, 150, St. George Street, Toronto, 5, Ont.

Provincial Divisions of the Canadian Medical Association

Secretary-Treasurer, Newfoundland Division, C.M.A., 11, Forest Road, St. John's, Nfld.
Honorary Secretary, Prince Edward Island Division, C.M.A., 200, Queen Street, Charlottetown, P.E.I.
Executive Secretary, Nova Scotia Division, C.M.A., Dalhousie Public Health Clinic, Halifax, N.S.
Secretary, New Brunswick Division, C.M.A., East Riverside, King's County, N.B.
Honorary Secretary, Quebec Division, C.M.A., 718, Medical Arts Bldg., Montreal, 25, P.Q.
General Secretary, Ontario Division, C.M.A., 244, St. George Street, Toronto, 5, Ont.
Executive Secretary, Manitoba Division, C.M.A., 604, Medical Arts Bldg., Winnipeg, Man.
Secretary, Saskatchewan Division, C.M.A., 932, Spadina Crescent East, Saskatoon, Sask.
Honorary Secretary-Treasurer, Alberta Division, C.M.A., 501, Alexandra Bldg., Edmonton, Alta.
Executive Secretary, British Columbia Division, C.M.A., 1807, West 10th Avenue, Vancouver, 9, B.C.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.

Dangerous Drugs Act: Restoration of Authority

The Home Office announces that the authorities granted by the Dangerous Drugs Regulations under the Dangerous Drugs Act, 1951, have been restored to Dr. Thomas Campbell (Airdrie, Lanarkshire).

PRIVATE PRACTICE COMMITTEE

The Private Practice Committee met at B.M.A. House on January 9, with Dr. ALEXANDER BROWN in the chair.

The Committee was informed that if the new Rating and Valuation Bill was passed the rates of surgery premises, rated as business premises, would be reduced by one-fifth and those of combined premises, used partly for surgery and partly for domestic purposes, by one-seventh.

Fees

It was reported to the Committee that a new fee of 37s. 6d. for a full examination and report in a single case for a Government department is to come into force on February 1. With regard to the implementation of the revised scale of fees for police calls, it was stated that the local authority associations took the view that the adoption of this scale by police authorities was essentially a matter for discussion locally between the authorities and the profession. The Committee agreed that the revised scale should be circulated to Hon. Secretaries of Divisions, with a request that they should bring it to the notice of those members concerned. In view of the new agreement on fees for part-time local authority work, it was decided to ask the British Red Cross Society and the St. John Ambulance Association to increase their fees for first-aid lectures to £2 2s. for a one-hour lecture to the lay public.

Accidents to Doctors

It was reported that the Association's solicitor had been consulted on the resolution of the Annual Representative Meeting instructing the Council to discuss with the Government the matter of compensation for doctors who were injured or lost their lives in attending accidents. The Committee was alarmed at the position revealed as a result of its inquiries. It agreed to recommend to Council that doctors be advised: (1) of the financial risks often occasioned by the lack of adequate cover from compensation and superannuation schemes in the event of death or disablement as a result of attending an accident in the course of medical practice; (2) that the only way by which these risks can be completely and adequately covered is by an appropriate accident insurance policy; and (3) that it would be advisable for those in contract with an employing authority to ensure that there is a suitable clause in the contract covering the payment of compensation in the event of death or disablement which is attributable to the nature of their duties.

GENERAL-PRACTITIONER TUITION IN MEDICAL SCHOOLS

Twenty-two of the twenty-seven medical schools in the United Kingdom have schemes whereby senior students may see something of the general practitioner's work. The present position is set out in a survey made for the British Medical Students' Association, and is a follow-up of a similar survey made in 1953. At that time ten only of the medical schools arranged general-practitioner courses. The present schemes vary from the health centres run by Edinburgh and Manchester Universities for teaching students to those in which the student spends a day with a general practitioner. In between are the residential type of scheme, in which the student lives with a general practitioner for a period and watches his work, and the alternative in which the student is attached to a general practitioner in the morning only for a week or two. The arrangements are said, in the main, to be working satisfactorily and are received enthusiastically by the participants.

REMUNERATION CLAIM

At a meeting of the Stirling Branch of the B.M.A. on January 6, attended by 119 doctors practising in the counties of Stirling and Clackmannan, the following resolutions were passed:

(1) That if the Ministers finally refuse to continue negotiations or if, by March 31, 1957, negotiations are not satisfactorily concluded, this meeting is of the opinion that the Council of the British Medical Association should recommend mass resignation from the National Health Service forthwith. (2) That this meeting urges that the Government be requested to accept the contractual obligation implied in the Spens Reports as the basis of all future negotiations. (3) That this meeting urges the Council of the British Medical Association to set up a committee to inquire into State medical services operated in other countries; to recommend to the Representative Body whether an alternative form of health service to that provided for in the National Health Service Acts and the regulations pertaining thereto would be to the advantage of patients and doctors in the United Kingdom and, if so, the form that such health service should take.

EXCHANGE VISITS WITH CANADA

The scheme for exchange visits between members of the British and Canadian Medical Associations, which has the approval of the Bank of England, will be continued during the financial year April 1, 1957, to March 31, 1958.

Procedure

Three doctors from Britain may visit Canada in exchange for three doctors from Canada. Each doctor from Britain will be required to make all his own travelling arrangements and will also be required to deposit up to £200 with the B.M.A. in London. On arrival in Canada he will receive the equivalent of his deposit in Canadian dollars. Similarly, each Canadian doctor on arrival in Britain will receive the sum deposited in sterling.

Duration of Visits

The duration of the visits is left to the discretion of the doctors concerned. The British and Canadian Medical Associations do not accept any responsibility for a doctor who allows his visit to outlast the money placed at his disposal.

Applications are invited from members of the B.M.A. who wish to take part in such exchanges. Medical practitioners in all branches of the profession, including general practice and public health, are eligible. Each applicant must state the object of his intended visit, and should also give the approximate date on which he hopes to depart (successful applicants will in due course be required to furnish exact dates and details of travel). Applications must be received by the Secretary of the British Medical Association by March 1, 1957.

MEDICAL ACT, 1956

The Committee set up by the Council to examine and report on the working of the Medical Acts held its first meeting recently under the chairmanship of Mr. A. DICKSON WRIGHT. It was decided that the Committee should examine the Consolidated Medical Act of 1956 and any parts of previous Medical Acts still in operation. In the first place, consideration was given to the difficulties which had been reported in connexion with provisional registration.

A preliminary survey was made of the procedure of elective representation of the profession to the General Medical Council. At a subsequent meeting the Committee will examine the disciplinary procedure of the General Medical Council, especially in relation to difficulties which have arisen since the Medical Act, 1950, came into operation.

GENERAL MEDICAL SERVICES
COMMITTEE

The Committee met at B.M.A. House on January 17, with Dr. A. TALBOT ROGERS in the chair. Also present were Dr. S. WAND, Chairman of Council, and Mr. L. DOUGAL CALLANDER, Hon. Treasurer.

The Chairman

This was the first meeting of the Committee which Dr. Talbot Rogers had attended since his illness and he was greeted with acclamation. Dr. Talbot Rogers said that he was very glad to be back. His illness had shown him how many friends he had, and he had particularly valued the messages of sympathy and kindness which he had received. He thanked Dr. A. B. DAVIES for his excellent work as acting chairman during the past four months.

The CHAIRMAN OF COUNCIL said that he wished to express his delight at seeing the Chairman in his place and seeing him look so wonderfully well. He thought it would be proper to show by resolution appreciation of the excellent work carried out by Dr. Davies as acting chairman. Dr. Wand said that he could speak not only as a member of the Committee but also as a member of the Negotiating Committee and of the small group who had been seeing the Minister, and no one better than Dr. Davies could have taken the Chairman's place. Dr. Davies had borne the work of the Committee in a way which did him the greatest credit.

Dr. A. BEAUCHAMP (Chairman of the Conference of Local Medical Committees) seconded. He had never seen anyone do a better job. He had always respected Dr. Davies: now his admiration for him had increased by leaps and bounds.

The motion was carried by prolonged applause, and Dr. DAVIES, in acknowledgment, said that he found the job remarkably easy because of the sincere support of every member of the Committee.

It was reported that Dr. A. S. Howie Wood was now well on the road to recovery. Dr. H. F. Hollis was reported to be ill in hospital. Messages were sent to both invalids.

Remuneration Claim

Reports were received of the meeting of four members of the Negotiating Committee, Sir Russell Brain, Dr. A. B. DAVIES, Dr. J. D. S. Cameron, and Dr. S. Wand, with the Minister of Health and the Joint Parliamentary Under-Secretary of State for Scotland on January 4.

Dr. A. B. DAVIES said that within three or four hours of the deputation leaving the Ministry not only every doctor but every citizen in the Kingdom knew the result of the interview. The Committee might like to have some personal impressions. First of all, the Minister was annoyed over the matter of publicity, which, he said, did not make negotiation any easier. In point of fact, Dr. Davies added, there had not been any negotiations, and on the Ministry's side only a curt refusal to negotiate. The Minister had stated that the claim had not been rejected, and that Spens had not been rejected, but, he had added, the position of Spens in relation to doctors' remuneration was that all relative circumstances must be taken into account, of which Spens was only one.

The Minister had given a categorical answer on the merits of the case: he had not, nor had the Government, considered the merits of the case at all because of the economic position of the country. On that point Dr. Wand had asked whether there had been any time when it would have been possible for the profession to submit a claim, and the Minister in reply had quoted first a period of two months in the last 10 years, and later on he had said that there might have been four months during which the profession could have submitted a claim which the Government could reasonably have entertained.

Dr. Wand had then asked if the Government had realized that increases of pay were going to other sections of the community, and that it was under an obligation to the

medical profession. The Minister had been unable to give a satisfactory reply to this question. Dr. Davies paid tribute to the great ability of Dr. Wand in his handling of the situation. Towards the end of the meeting, Dr. Davies continued, he himself had put specific questions. He told the Minister that, as a Negotiating Committee, they had come to negotiate and so far they had negotiated nothing. He had asked if the Minister agreed with this statement, and he did agree. It had been entirely the Minister's suggestion that they should meet him again.

Dr. Davies added they had not progressed very far, but the claim had not been rejected. Spens was not entirely discarded, and there had been an invitation to meet the Minister before the end of the month.

Invitation to Meet Again

The CHAIRMAN OF COUNCIL, corroborating what Dr. Davies had said, stressed that the Minister had invited the Committee to meet him again. On the legal side the Minister had stated that he had been advised that there was no contractual obligation enforceable in law. He apologized for not issuing a reasoned statement, but found himself unable to do so for constitutional reasons. Dr. Wand had re-read the legal opinion given to the Association, and he could not see how the Government could possibly argue that Spens and Danckwerts together did not mean that periodic adjustments would have to be made to the central pool.

He was not sorry the meeting had been postponed. It meant they had got a little further away from the crises of the autumn and the credit squeeze, and that at a later meeting the door would be opened to negotiations.

The CHAIRMAN expressed the Committee's gratitude for the two reports.

The CHAIRMAN OF COUNCIL said that he thought more stress should be laid on the date when notice of the claim was given; that was February, 1956. The details were submitted in June and the legal opinion was furnished in September, after the Minister had asked for it.

In reply to Dr. H. H. D. SUTHERLAND, who asked if their allies the consultants and specialists were in agreement with the theme which had been expressed, Dr. DAVIES assured the Committee that the Negotiating Committee was completely united. Sir Russell Brain had led the opening of the discussion with the Ministers with the dignity and efficiency one expected from him.

Dr. BRUCE CARDEW said that there had been an extremely favourable reaction to the matter from the responsible press. The primary function of the Negotiating Committee was to secure the future of the profession, and the latter must never allow itself to be placed at the mercy of a shrinking pool.

Asked the meaning of the words used by Sir Russell Brain at the press conference and at the television interview, that the dispute went far deeper than the question of pay, Dr. DAVIES said that Sir Russell used the phrase both to the Minister and at the interviews afterwards, meaning that it was a crisis of confidence between the profession of medicine and the Government. However the Government might determine the question of contractual obligation, it could not escape the moral obligation which depended upon the degree of confidence between gentlemen in a bond.

What Next?

Dr. F. GRAY, speaking as a member of the Negotiating Committee, also referred to the publicity which had been secured as a result of the action taken by the Council of the Association in setting the Guild machinery to work. There might well be a longer interval before they met the Minister again, because of the change of Government, but this was not a waste of time. In the interval a good deal could be done to see that the Guild machinery was set up and was working satisfactorily—that is, that every doctor was brought into one of the Guild groups.

Members of the Committee then gave accounts of meetings which had been held in their area. One point which

came out most clearly at these meetings was the question of confidence. Members of the profession were getting more and more concerned about obvious defects in the Service. There was a feeling that if the Government continued to be awkward about remuneration this might be the opportunity for considering all aspects of the Service.

The CHAIRMAN said that it was true that doctors were dissatisfied with the Service as a whole, but the two matters should not be confused at this stage. There was no doubt that doctors had been badly underpaid.

Dr. SORSBY asked that members of the Committee should be supplied with the documents sent out to Divisions, and when members expected to address meetings it would be helpful if they could be given speakers' notes. Copies of the documents were later circulated at the meeting. It was stressed that the interim period should be used to help the local B.M.A. Divisions and the Guild Divisions.

Dr. P. BURNS said that there was a very great deal of dissatisfaction and much of it arose out of the capitation fee method of payment. He thought that should be discussed. Dr. A. BEAUCHAMP pointed out that the Negotiating Committee was set up to negotiate a claim, not to go into alternative forms of service.

The CHAIRMAN OF COUNCIL said that there was no doubt that many people thought some further investigation should be made into the machinery of the National Health Service. This had not been lost sight of, but the betterment claim must be determined first.

In view of the present position and the large number of meetings being held in the country, further discussion on future action was deferred until the next meeting. It was also referred to the Central Committee of the British Medical Guild.

Income from Local Authorities

A letter from the Ministry of Health was considered regarding the taking into account in the calculation of the central pool of the income derived from local authorities by doctors providing unrestricted general medical services. In view of the vast amount of work involved the Ministry stated that, as a result of discussion, the local authorities' associations had suggested that the amount of the payments for 1953-4 which had been used in calculating the pool for 1954-5 should be used for the 1955-6 calculation, and that local authorities should be told now that annual returns would be required for the five years 1956-7 to 1960-1 so that arrangements could be made in advance. Towards the end of the five years consideration should be given to the matter of whether the percentage of the total payments by local authorities to general practitioners was sufficiently stable to obviate the necessity of frequent returns in the future.

It was reported that Professor Allen had been consulted. He advised that the suggestions could very well be accepted, and the Committee agreed.

Capitation Fee

The next item relating to remuneration was a suggestion from Middlesex that, because of the inordinate delay in the payment of the final settlement, the Ministry's interim payment, excluding loadings, should be not less than 18s. per annum per caput in place of the present figure of 17s.

Points brought out in the discussion were that the profession was asking for a revision of the betterment factor because many of its members were in a state of economic distress. The final settlement money belonged to them, and they received it a year and nine months after they should have it. The Government by this action saved itself an enormous amount of money in interest. It was suggested that the basic rate should be retained at 17s., and that 1s. should be paid towards practice expenses. Since this rate was fixed money had become of considerably less value, and the Government was withholding an increasing amount of the doctor's remuneration each year. The position might be met by a percentage addition each year, made in advance,

so that the doctor would get a bigger proportion of what he was entitled to have, at the time he was entitled to it.

It was expressed strongly that it would be wiser not to press such a procedure just now, and a resolution proposed by Dr. S. WAND, that the Committee was sympathetic with the terms of the Middlesex resolution but felt that steps to implement it should not be taken at the present time, was carried. Dr. Wand said it should be kept as a continuing matter and discussed at an appropriate time.

Matters Discussed with the Ministry

Dr. A. B. DAVIES, reporting on the discussions with the Ministry at the end of November last on a variety of matters, said that the question of the filling of practice vacancies was raised, the particular point being the position when a doctor who had previously carried on a practice returned to the locality and commenced practice again. Although not frequent, cases did arise where a doctor wished to resume practice at his former surgery address, and, provided the area was not closed, the application to do so was granted more or less automatically. The appointed successor should be made fully aware of the position when he was appointed, and, where appropriate, of the possibility of return of the previous doctor.

It was pointed out that it was not only vacancies caused by a doctor's erasure which caused difficulty but those who left of their own accord and then wanted to return. The view was expressed that where a doctor had been removed from a list because of misdemeanour the executive council should have the right to refuse him permission to practise in the same area. If this required amending legislation this should be sought.

The situation, it was agreed, was extremely difficult and both sides are to consider the matter again.

Arising out of the filling of practice vacancies and the hearing of appeals from doctors who were not appointed, Dr. SORSBY raised the point of principle of the Minister disregarding the recommendations of an appeals tribunal. He quoted a recent case in which the appeals tribunal reached a unanimous decision, which was not upheld by the Minister. His opinion was that a precedent had been created.

The CHAIRMAN OF COUNCIL said that the point was that the Minister could or could not take the opinion of the appeals body as he wished, and if he did so he became the person who determined the appointment.

The DEPUTY SECRETARY (Dr. Stevenson) said that the statutory position of the Minister was set out in the regulations; he might decide whether there should be an oral hearing, and where he so decided a panel was set up. The panel hearing the case made a report stating the relevant facts and their conclusions, which was sent to the Minister, who then made his decision. The wider issue was why were members sitting on the tribunals if no one took any notice of their decisions.

It was agreed that strong representations should be made to the Ministry on this matter. It was added that appeals committees should be informed of the reason for the rejection of their decision.

Among other matters discussed with the Ministry was the trainee practitioner scheme. The Ministry suggested a regional advisory type of appeal rather than the local appeal envisaged by the Committee.

A strong case was made for monthly advance payments. The Ministry was sympathetic, and said it would make inquiries on whether it would be possible. It was agreed to press the matter. With regard to the reinstatement on doctors' lists of patients returning to the United Kingdom, the Ministry asked for more information. Arising out of the Committee's report to the Annual Conference on the Supplementary Ophthalmic Services and the suggestion that form O.S.C.1 should be used on every occasion that a patient visited an ophthalmologist or an ophthalmic optician. The Ministry agreed to examine the problem further and comment later in writing.

It was promised that the Ministry would expand paragraph 22 of the Handbook for General Medical Practitioners so as to prevent misunderstandings with regard to the remuneration payable to a locumtenent on a death vacancy.

Also discussed was the question of general-practitioner representation on boards of governors of teaching hospitals, and a promise was given that general-practitioner nominations would be given full consideration when further appointments were made. Local medical committees and Branches and Divisions of the British Medical Association were being invited by the Association to provide suitable general-practitioner nominations for appointment to boards of governors for submission to the Minister.

The question of general-practitioner beds in hospitals was considered, particularly that of general-practitioner maternity beds, and the Ministry undertook to provide figures which would illustrate the overall situation. In connexion with this the situation at Portway Hospital was again before the Committee; an unsatisfactory reply had been received to the Association's letters, and it was agreed that other action would have to be taken if no satisfactory reply was forthcoming.

Practice Accommodation

An interim report was received from the Practice Accommodation Subcommittee which was set up to consider the problems associated with movement of population and redevelopment generally. It was felt that, if hardship among the general practitioners involved in such movements of the population was to be minimized and the continuity of the medical service achieved, certain principles must be established which should be carried into effect not only by the administrative bodies in the health service but by the planning and housing authorities, upon whom in most cases practitioners relied for practice facilities and accommodation. The subcommittee put forward two recommendations: First, that when redevelopment took the form of demolition and rebuilding on the same site all possible steps should be taken to protect existing doctors against encroachment by newcomers, and this could be achieved only by a total closure of the area by the Medical Practices Committee until the situation was stabilized; similar action should be taken in redevelopment which dispersed a centre of population. Secondly, in new housing centres, the estate must be declared closed to prevent an influx of "squatters" in cases of doubt whether the housing authority would provide practice premises only to doctors selected by the Medical Practices Committee.

It was obvious from the replies received to a questionnaire that this is a national problem, and the subcommittee recommended that there should be early consultation with the Ministry. It was stated that there was a similar subcommittee considering the problem in Scotland. It was agreed to accept the interim report and to explore the matter with the Minister.

A discussion took place on the question of surgeries being closed while a doctor was on holiday and a notice being exhibited directing patients to another doctor's surgery. A local medical committee had drawn up a memorandum laying down conditions on which this could be done, but the Committee felt that, although the proposals were not unreasonable, it was a matter for local discretion.

Agreements for Assistants

Dr. F. GRAY presented a report of the Assistants and Young Practitioners Subcommittee. A recommendation that the car allowance of £150 under the trainee practitioner scheme should be raised, as it had been fixed at this amount for over eight years, was accepted.

The most important item of the report dealt with agreements between principal and assistant. The subcommittee felt that the executive councils' power periodically to review such agreements, while fair, did not cover the principal who refused to give his assistant such an agreement. It was recommended that a written agreement between

principal and assistant should be compulsory. This should state the salary, no definite minimum figure being laid down, the holiday period (not less than 21 days a year), the period of sick leave (14 consecutive days, with a total limit of 28 days in any one period of 12 months), off-duty period (any off-duty period forgone should be made up subsequently), and both principal and assistant should be members of recognized medical defence organizations. Lastly, the subcommittee recommended that the consent of the executive council should be contingent upon an assurance from the local medical committee that the proposed agreement was satisfactory.

There was a long discussion on these proposals. The Committee has long thought such agreements to be desirable, but the view was expressed that it was impossible to make them compulsory. Some members suggested that if a principal consistently refused an agreement to an assistant the local medical committee should take this into account when deciding whether the principal should be permitted to have an assistant in future. The Committee had a duty to see that the way to assistantship was made easy, but there were objections to these proposals.

It was agreed to refer the matter back to the subcommittee for further consideration.

Other Business

It was reported that the Minister had agreed to make an alphabetical index of the population in the next financial year. This would be used in combating the increasing inflation of doctors' lists, about which there has been a great deal of discussion in recent years.

The Private Practice Committee's proposal to set up a joint subcommittee to discuss further the question of drugs for private patients was accepted and representatives were appointed.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Arbitration

SIR.—The present great discontent which is being expressed regarding the settlement of our remuneration claim was rightly summed up by Sir Russell Brain at a pay press conference. He said that it was not merely a pay claim but a crisis of confidence that went to the roots of the relations between the Government and the medical profession. I would add that it is much more than a crisis of confidence. The dispute involves certain grave constitutional issues to which you and I drew attention in 1951.¹⁻⁴ It is quite clear to me that a salutary clearance of verbal rubble is necessary if the profession is to understand the difficulties of the problem and the dangerous situation which confronts it. The profession has still not obtained the right to submit any dispute to independent arbitration. For the enlightenment of many of the younger members of our profession it is well to recall the sequence of events during the last seven years.

At the time when the National Health Service (Amendment) Bill was before Parliament the late Sir Lionel Whitby wrote to *The Times* (June 20, 1949) expressing his grave disquiet at the sudden turn of events. Writing on behalf of the profession (he was then President of the B.M.A.), he recalled that in October, 1947, before the N.H.S. began to operate, the then Government had given a pledge to the profession when it set forth its proposals for the establishment of Whitley machinery in the National Health Service. It had stated that it was "anxious to afford the fullest rights to arbitration, subject to the Government's prerogative. A code of conduct is unlikely to be arbitrable, but a simple proposal for a change in wage or salary rates almost certainly is." Sir Lionel stressed that this promise was

repeated by the Ministry in March, 1948, and supplemented by verbal assurances during the discussions which preceded the Act. Yet Clause 13 of the National Health Service (Amendment) Act, 1949, made it painfully clear that the right to independent arbitration was not to be granted. Sir Lionel asked why doctors should be singled out in this way when large sections of the workers in industry enjoyed the right to compulsory arbitration in disputes arising out of their employment. A short time later the matter came up for discussion at the Annual Representative Meeting at Harrogate. On June 24, 1949, Dr. Guy Dain (Chairman of Council at that time) received loud applause when he said, "We must have the right to go to arbitration even though it is the Government which is the employer. It is essential to us, if we are to continue the Service, that freedom to go to arbitration should never be in question." Why is Dr. Dain afraid of arbitration now (*vide Proceedings of Council, Supplement, January 5, p. 2*)?

At the Harrogate meeting I stressed the constitutional issues which would arise when the impersonal State "without a soul to damn or a body to kick" as employer attempted to use its prerogatives against its employees in repudiation of its pledges. Writing on arbitration in the *Manchester Guardian* on July 8, 1949, a leader writer made the following comment: "There is a good deal in what the doctors say, but it does not apply only to themselves. With the great spread of public services, there is a strong case for reconsidering the method of settling differences in regard to which a Minister is indirectly a party to the dispute as well as a judge." The principle conceded by the Government in the 1949-50 period, when it caused to be enacted Section 13 of the 1949 Act and concurred in setting up the Medical Whitley Council, was that the right method for settling the remuneration and conditions of service would be by collective bargaining, backed by arbitration in the event of disagreement. Both the main constitution of the Whitley Councils for the Health Services (Great Britain) and the constitution of the Medical Whitley Council contained a provision to this effect. In spite of the statements made by the Government spokesmen in both the House of Commons and the House of Lords on the second reading of the 1949 Bill regarding arbitration in the case of disagreement, the intended arbitration agreement as far as I am aware has never come into existence, and that is really what has gone wrong.

On February 13, 1951, the Amending Acts Committee obtained a considered opinion on arbitration from an eminent counsel who is now a High Court judge. This was embodied in the first report to Council by the Amending Acts Committee in September, 1951, and considered by a Special Representative Meeting on December 13, 1951. Four recommendations requesting the establishment of a National Health Service court of arbitration were submitted to the S.R.M. by the chairman of the Committee, Dr. H. H. D. Sutherland, and passed. These resolutions became, and they still remain, the policy of the Association. In August, 1951, under Statutory Instrument 1376, entitled the Industrial Disputes Order, 1951, the medical profession was excluded from referring any dispute to the Minister of Labour on terms and conditions of service because the B.M.A. was not a trade union. Whether we were excluded by accident or design is a matter of conjecture. As a result of certain discussions (initiated by the Council of the B.M.A.) it was hoped that the order would be amended in such a manner as to include the medical profession, so that it would be possible for the profession to refer matters in dispute between the Management Side and the profession to the Minister of Labour for arbitration. On July 30, 1951, Statutory Instrument 1373 was made by the Minister of Health and became operative on August 13, 1951. It permitted the Minister of Health to vary the remuneration or other conditions of service of the medical staff of hospitals without reference to either the Whitley machinery or to Parliament. This order was made within the powers given to the Minister of Health by s. 66 of the N.H.S. Act, 1946. On a strict legal construction of s. 66 it could be upheld.

but the method which has been adopted has the effect of removing from Parliament all effective control over the remuneration and conditions of service of the hospital doctors concerned. It leaves them to be settled by the arbitrary decision of the Minister. So far as I am aware, no action was taken to have these statutory instruments annulled under Section 75 of the N.H.S. Act, 1946, or Section 5 (2) of the Statutory Instruments Act, 1946.

The Joint Consultants Committee came up against this problem in its claim for increased remuneration for hospital staffs. In default of agreement, normal Whitley procedure permits a case to go to arbitration. But the medical Whitley machinery does not allow this. As Sir Russell Brain stated in his letter to the *Supplement* in May, 1954,⁴ because the consultants have to submit their claims through Whitley procedure "arbitration [was] unobtainable except with the consent of the other side, which was refused. We are thus left with a moral claim which the Management Side refused to meet, and which was completely unenforceable." The general practitioners had foreseen this possibility when making their claim for betterment. The General Medical Services Committee did not submit its claim to the Whitley machinery but insisted on submitting it direct to the Minister, as the Negotiating Committee is now doing. Under a threat of withdrawal of service the claim was submitted to independent arbitration by Mr. Justice Danckwerts, and, as is well known, the general practitioners obtained a much greater measure of justice.

I am not concerned whether the dispute is in connexion with remuneration or other terms of service. The profession must stand firmly on its right to submit a dispute to an independent court of arbitration. This has been the established policy of the Association since December 13, 1951, but it is quite clear that it has not been pressed on the Government. It is the duty of the Council to act on the instructions of the Representative Body, to press with all the force it can command for the establishment of such an independent court of arbitration and to remedy the injustices of S.I. 1373 and S.I. 1376. We need constitutional guarantees against the assumption into the hands of the executive of wide and arbitrary powers. Even if again the threat of withdrawal of service succeeds in obtaining for the profession the increase in remuneration which we justly demand, our safety as an independent profession is jeopardized if we still have to confide our destinies to the dictatorship of a bureaucratic executive which can only say, "Test it in the courts."—I am, etc.,

London, W.8.

J. ARTHUR GORSKY.

REFERENCES

- ¹ *British Medical Journal*, 1951, 2, 456.
- ² *Ibid.*, 1951, 2, 1017.
- ³ Gorsky, J. A., *British Medical Journal Supplement*, 1951, 2, 171.
- ⁴ *Ibid.*, 1951, 2, 195.
- ⁵ Brain, W. R., *ibid.*, 1954, 1, 280.

The Way Out

SIR,—Your excellent *Journal* comes out here a little late, but you can have no conception of the entertainment it affords. I mean the letters from frustrated and exploited registrars. After having been qualified for 15 years, having done six years of voluntary Army service, and having been a senior registrar for another six years, I came to the conclusion that senior registrars were being badly treated. I wrote to you, Sir, and to another journal; some of these letters, the less virulent ones, were printed; others, growing perhaps monotonous, were not. Those printed anonymously obtained some sympathy but no action; those I signed drew on me the suspicions of several of my seniors; "Elmhirst's a trouble-maker," the word went around. I wrote to the national newspapers and the suspicion became a certainty: "Elmhirst is becoming a nuisance." Kindlier seniors warned me that I was doing myself no good. The news spread to a selection committee. I wrote to successive Ministers of Health, who sympathized on several occasions and said it depended on the profession. I wrote to successive presidents of a Royal College and got, first, more sympathy, and then the information that something would soon be done, it was

hoped. I twice went in person to the Ministry of Health and was interviewed by sympathetic gentlemen with crumbs on their waistcoat creases. I wrote and talked to my local M.P., who forwarded everything to the Ministry of Health and got the usual understanding and sympathy. The B.M.A. had faith, which I had reason not to share, in the proper channels for negotiations.

I, at last, was forced to realize that sympathy was sorry, sterile stuff, and began to try to organize my fellow sufferers. They answered thus: "Why should I want to upset my chief—there may be a job coming up next year?" "Why stick your neck out, old man?" "What about the Registrars Group?" "Why be rash? Something's bound to happen soon." "Why make yourself a marked man?" I tried to organize a procession of sandwichboard-men outside the Ministry of Health—not one volunteer came forward; I wanted a deputation to tour the Royal Colleges and Parliament—not one colleague could I persuade. In short, Sir, I wanted action, any action, to draw attention to injustice and tyranny. I never broke that window in Downing Street; I crossed the Atlantic instead, to a happy exile where I no longer have to pick my subservient way between administrative clerical officers and part-time consultants. Perhaps by now, Sir, you will understand the sour entertainment afforded by your correspondence columns. Are those mealy-mouthed worms really turning at last? Or will they be overgrown by a new generation of senior registrars (for only the adaptable survive), the offspring of long lines of mean and flabby ancestors, suckled by State milk, educated in competitive State schools, and converted into servile technicians by alternate threats and promises? Can these really be my countrymen?—I am, etc.,

Bermuda.

EDWARD ELMHIRST.

SIR,—When this letter reaches you I shall be on my way to Canada. Why? My father, after telling me that I would be better off in business with him, and that I was a fool ever wanting to be a doctor, put me through college and I graduated in 1954. Enthusiastic and healthy, I set about the task of becoming a competent doctor and obtained good posts in medicine, surgery, and obstetrics, and finally became a trainee assistant. In all these I was fortunate enough to have chiefs who were willing to teach and give me the benefit of their experience. Throughout this time there arose from G.P.s, consultants, registrars, and S.H.O.s cries which were to become all too familiar: "This is a fool's game"; "There's no future in medicine"; "Can't live on this pay"; "If I were you I would go abroad"; "Emigrate"; "Go abroad."

I thought that these were the normal grumbles that go with any job and began to look for another appointment. Three months before my traineeship ended I began writing one to four letters a week in answer to advertisements. For my efforts I acquired two typewritten strips of paper without signature or address telling me the posts had been filled. The postmark showed the locale. One gentleman with whom I spoke by telephone asked me for a letter, but was evidently too busy to acknowledge it. Somewhat dispirited, I applied for and was given a post in Canada, whither I now travel.

Mine is not an isolated case. I have with me the names of five people who are coming to the same dead end; I hope I can help them. Why has this state arisen? (1) Overcrowding of the universities, which inevitably led to an excess of under-trained doctors (dentists beware!), thence to provisional registration, and the housemen being made subject to a body which could only see medicine as another line in the wages book. Meanwhile in practice it became usual to receive 40–60 applications for a vacancy—cheap labour was the natural outcome. (2) Much discontent arises in all branches of the profession because of—money. Who is to blame for this? Mr. Turton? No. The blame can only be laid at the feet of those principals and their advisers who were established when the N.H.S. was inaugurated. For a supposedly intelligent section of the community the vagueness of the conditions under which they went to work

makes one wonder if they had been on a glorious binge prior to the appointed day. As for moral obligations, one has only to look into the daily press to see what value they have in civilized communities.

This tirade may not justify emigration, but one cannot live on nothing or one's parents for very long. I am going to a small, isolated settlement, and expect to have a rough time, but at least I have a job and a reasonable salary.—I am, etc.,

Gateshead, 9.

G. H. HODGSON.

Remuneration Claim

SIR,—Having attended a meeting in Harrow this week to reorganize the Guild, I was dismayed at the complete lack of constructive ideas. The answers to questions from the floor were ambiguous and vague—particularly when the junior members of the profession asked if they were to be fairly treated if they supported the seniors and gained our financial objective. There seemed to be no leadership from the top, and those of us who went there to find out what was to be expected from us in our efforts to stand firm together were unable to get any idea of any proposal. There were the usual vague statements about getting out of the N.H.S. into a better service, but nobody was prepared to define this.

In my opinion, unless the B.M.A. give a strong guide soon, the average G.P., whose fighting spirit is being stirred up by the Government's lack of faith in honouring Spens, will sink back into apathy and await his financial doom under the impression that there is no leadership strong enough to convince the Treasury of the justice of our claim. The teachers have their Burnham scale with the obligation of the Government to review this every three years. Let such a definite term be included in any agreement which may be concluded at this time to avoid a repetition of the mess in which we find ourselves now.—I am, etc.,

Northwood, Middx.

J. DAVID SWAN.

SIR,—“A pleasant surprise,” said the Minister when he announced the amount owing to general practitioners for practice expenses for the year 1954–5, and which they would be receiving on January 1. I had not expected to be unduly surprised by getting something for which I had waited the best part of three years, but I was quite open to being pleased. Then consider what happened. I received a sum rather more than 10% of the net personal income alleged by the Minister to be mine, did some thinking, and my pleasure faded. If 10% represents my outlay, and I have had for the past 21 months a similar outlay—I assume that costs have not decreased in that time—then I am still out of pocket some 17½% of my supposed income. Add to that a figure of 5% to represent the average over the year preceding. I come to the conclusion that I am at all times 22½% of a year's income out of pocket. To diminish the pleasure still further, conceive that I might be one of a large group of general practitioners who are living on overdraft and who therefore, at the dictation of a colleague of the Minister's, require to borrow this 22½% at 7% rate of interest.

It is fortunate for his Health Service that the Minister, though he considers the country cannot afford to honour its obligation to the medical profession, does believe that the profession can afford to subsidize the Service with such a capital outlay.—I am, etc.,

Buckie, Banffshire.

J. F. CAMERON.

SIR,—A threat of resignation from the N.H.S., without any intention to do so, is useless. Any government will know this and will merely call our bluff. At the inception of the scheme we saw the pious resolutions of the majority who were against it followed by an ignominious retreat as it became evident that the Government had well-prepared plans and that those who did not join would quickly be put out of business by those who did. This local medical guild cannot achieve a unanimous vote in favour of a resolution

threatening to resign. One can only guess at the numbers who would be prepared to resign in face of blood, sweat, and tears. A possible solution is for small local groups of practitioners with mutual confidence in themselves and in their public health, hospital, private, and Service colleagues to pledge themselves to action should the need arise. They would be “the few,” the martyrs perhaps, but they would make history. There must be some such areas after nine years of N.H.S.

The main issue, the implementation of Spens, should be linked with an issue of even greater importance—our terms of service. This is quite vital, because, when the battle is joined and when our forces are mobilized, we shall be in a position of strength, which may not recur. Circulars should sound our opinions on these points. Plans should be drawn up now. Then we can follow up a Spens victory with a better service for the public and for ourselves, perhaps payment by service, perhaps capitation, but at least away from the politicians. We cannot afford to risk another defeat and relapse into another decade of hoping for the best. Let there be no mistake—if this is to be a fight, to win it we must be prepared for sacrifice, we must have an efficient general staff, know exactly what we are fighting for, and have groups prepared for action.—I am, etc.,

Rosyth.

JAMES CAMPBELL.

SIR,—That doctors should receive an increased reward and enjoy a better living standard than other white-collared workers in return for a greater load of responsibility is recognized as one of the bases of our claim by the vast majority of our profession. It is disconcertingly apparent, however, to those of us who have perhaps 30 to 40 years' hospital service ahead of us, almost inevitably whole-time, that there are those, seemingly part-time, consultants who, supporting the view of *The Times*, which would place our status at no greater than, say, the teachers, consider that the present remuneration is adequate. Can they not be persuaded to realize that an acceptance of this viewpoint must call for immediate abolition of the system whereby public money is distributed secretly and with personal lobbying—the merit award?—I am, etc.,

Harbury, Warwicks.

J. C. A. RAISON.

SIR,—Whatever may be the pros and cons of the argument about the interpretation of Spens, it is difficult not to agree with the Minister that this is no time to press for a 24% increase in pay. Wages are things for which, from the employer's point of view, the time may never seem quite right, but I think it is true to say that at no time since the war has this country been in such obvious and immediate economic danger as it is now, and many eyes will be watching to see if we are prepared to modify our approach in the light of this fact. This is indeed more than a pay claim, “it is a crisis of confidence,” and the confidence issue will be better served if we abandon the other and less important one for a definite period and state very clearly why, in spite of our rights, we are doing so.—I am, etc.,

Sherborne.

T. H. BARRIE.

SIR,—If the Government refuses to implement Spens I suggest we recognize the 4s. 3d. a quarter as the basic retaining fee which it is, and make an extra cash charge for minor surgery, night calls, visits made in response to messages received after 10 a.m., week-end work, and attendance at surgery outside normal surgery hours. In this way we shall be able to meet our extra expenses, and the patient will be reminded that our services deserve a fair reward.—I am, etc.,

Frinton-on-Sea

W. H. SCOTT-EASTON.

Reform of Health Service

SIR,—In spite of the criticism of the capitation fee under the National Health Service, I fail to see how the small practitioner is going to be any better off under any other arrangement. Our armature in the treatment of all forms of sickness, and especially of acute conditions, has developed

out of all proportion since the pre-war years, and even since 1948. Where, in the treatment of a case of average severity, a doctor could count on ten to fifteen visits and charge a fee commensurately, he would rarely nowadays be justified in more than four or five visits. It would be necessary to charge four or five times as much per visit nowadays if the general practitioner intends to bring his income anywhere near the level of that which he was earning prior to 1948.

My main criticism of the National Health Service is the system of allocating practices. After the war I took a derelict country practice, and was in the process of building it up when the National Health Service came into operation. Since then two death vacancies have occurred alongside of me. In the pre-Service days I would have been able to buy either the one or the other of these practices in order to boost my income. Under the National Health scheme, however, although I applied for both vacant practices, pointing out in my application the ease with which I would be able to run either in conjunction with my own, they were allocated to somebody who did not have a practice at all. One or other of these practices, attached to mine, would have given me a list of approximately 3,000, which I could quite easily have managed, instead of wasting half my day as I do now. Also, the cost to the Ministry would have been at least £400 to £500 less per annum.

I think it is correct to say that an influx, at about the same time when the National Health Service came into operation, of doctors previously employed in the Indian Medical Service was the main reason why there was a large surplus of doctors, all of whom were clamouring for practices. I do not know what the answer is for those doctors who have not got practices, and I suppose that the surplus still does exist, but I feel that a better distribution of the patients would, in the long run, prove more satisfactory to the practitioners and be immeasurably cheaper on the Ministry. In my country practice I have a list of 1,600. I could quite comfortably cope with another 1,000. The urban practitioner should be able to cope comfortably with 3,000. In order, however, to give him an income equivalent to a country practitioner with 2,500 on his list, the urban practitioner would require about 3,500, but against this must be considered the fact that the urban population on the whole is never so healthy as the country, and that epidemics are liable to be much more severe in the towns, and especially big towns. A gradual redistribution along these lines is, in my opinion, the only real solution. As things are at present, a practitioner who was caught with a small list when the scheme came into operation is trapped, unless he is lucky enough to have some large development scheme take place in his area. No matter how conscientious, painstaking, or efficient he is, he stands very little chance of increasing his list to any marked extent, and, as far as I can see, no chance at all of getting rid of his small practice in exchange for a larger one somewhere else.

Finally, and with reference to my opening remarks, I cannot see how the practitioner with the small list can possibly agree to resign from the Service as a protest, in spite of all promises of financial recompense from money available to the Guild. My memory is still too ripe with the knowledge of the total loss of my practice within six months of being recalled to the Services in 1939, despite the B.M.A. protection-of-practices scheme, and I certainly have no intention of taking any part in any scheme aimed at forcing the Minister's hand. My commitments in respect of the education of my children simply will not permit it, quite apart from the fact that I have only now recovered from the loss I incurred as the result of the war and my recall to the Services.—I am, etc.,

Diss, Norfolk.

J. H. CULLINAN.

SIR.—Amid all the clamour for increased remuneration for doctors, it is important that we in general practice should have a plan ready to make sure that the pay should be so distributed that good medicine is encouraged and yet time is not wasted in excessive form-filling.

Here is a plan which would be simple and economic to operate. The small-list practitioner would benefit, and yet it would give scope to the conscientious doctor with a full list. The amounts of money are suggestions, as the exact amount would have to be worked out. (1) Every doctor who is employed by an executive council as a principal should be given a basic allowance of about £600 to cover essential surgery expenses, which are almost the same for a big-list man as a small-list man. (2) The capitation fee should be smaller than at present—about 12s. a patient, weighted by an extra 10s. for patients between 500 and 1,500. This should cover all the usual visits and surgery attendances. (3) Payment by service should be paid for all work that involves considerable extra effort and time. This would act as an incentive for conscientious effort. A possible scale of remuneration might be: Minor operations (sebaceous cysts, whitlows, ingrowing toenails), £1 10s.; regular injections for pernicious anaemia or rheumatoid arthritis, £2 for a course of 12 injections; patients who are chronically ill and require regular visiting, £5 a year per patient; attendance at a confinement £2, in addition to usual fee.

The above scheme is only a suggestion, but I hope it will stimulate further correspondence to help shape a plan which will give us all a square deal.—I am, etc.,

Kidderminster.

RICHARD H. GRIFFITH.

SIR.—I hope the profession will not lightly throw over the capitation fee form of payment. It served well in the old N.H.I. days, and, by and large, has served well up to the present in the N.H.S. It is a useful compromise between a salaried service on the one hand, with its risk of impersonal relations between doctor and patient, and on the other hand an item-by-item form of payment with its looser bond between doctor and patient, its increased clerical work, and its risk of carrying a "vested interest in disease" for the doctor. The most useful thing the Minister could do to increase the efficiency of the general-practitioner service would be to increase substantially the capitation fee, while at the same time limiting doctors' lists to 2,500 patients.—I am, etc.,

Blandford.

C. E. LANGLEY.

SIR.—Letters appear occasionally advocating payment by item of service—e.g., Dr. W. N. B. Parker's letter (*Supplement*, December 29, 1956, p. 231). I wonder what this would entail. Presumably huge sheets with columns for, probably, name, address, age, diagnosis, consultation or visit, etc. What a pest this would be during the consulting hours. Every night scores of visits would have to be written up. How many would be missed?

As an elderly practitioner I have vivid recollections of the rendering of bills prior to the N.H.S. days. Quarterly bills were sent out in February, May, August, and November, and half-yearly bills in January and July. I see from my records that I sent 642 to 793 quarterly bills per annum, taking two random years. The highest number for one quarter was 239. Half-yearly bills: highest number, 119 for half-year; average of two random years, 89 for the half-year. Practice: about 2,500. This would be a mere flea-bite to the endless records necessary for items of service.

Dr. C. A. Roberts (p. 231) writes that "there is hardly a qualified man who is able to enjoy his work to-day." This certainly does not apply to me. King George V wrote on the fly-leaf of a friend's Bible: "The secret of happiness is not to do what you would like to do, but to learn to like what you have to do."—I am, etc.,

Currie, Midlothian.

H. MAITLAND MOIR.

Crisis of Confidence

SIR.—Over the past months you have published a considerable volume of correspondence relating to our pay claim. Some has been violent, some practical, some pathetic, some seeking to appease, some aimed at sabotaging our cause, and some patently ridiculous. You have even been kind to me, Sir. You will appreciate that many humble,

practical doctors have found in the airing of their views a useful safety-valve, and that they have also felt that they might be contributing to the common good. Dr. Bruce Cardew (*Supplement*, December 29, 1956, p. 230), speaking from the security of his chairborne eminence, condemns these doctors out of hand, commending recourse to more democratic channels. But what has persistent use of these channels achieved in our cause? How much real improvement has there been in the National Health Service as the result of democratic action over the past 8½ years? The answer, Sir, is, "Precious little."

May we not ask why? We cannot deny the ability of those of our number who have been concerned with the fashioning of the Service from within; we would hesitate to question their integrity. Yet the fact remains that, for all their efforts, our position worsens fast. And this in spite of the fact that we, as a profession, are quite irreplaceable in the economy of the nation. As I see it, three categories of established general practitioner exist: post-1948, with acute anxiety as to income; pre-1948, with perhaps less immediate worry, yet with their capital confiscated by the Government; and those of retiring age, who (because of Governmental pressure) feel obliged to hang on for a further eighteen months in order to qualify for their pensions. The implication is as obvious as it is unkind, but if we are to achieve any true independence we must consider these matters when electing our democratic representatives. Perhaps then we may achieve something more concrete within the democratic structure. The present crisis is the more vital the longer the period of service we contemplate.

While offering no positive proposals as to the cure of our present political ailments, the British Medical Association does not invite its members to make suggestions, and certainly affords us little evidence of having seriously considered those which have been volunteered. Again, it might be thought pertinent to ask why, or even to wonder quite how widely your "crisis of confidence" may be found to go. Referring to the letter from Dr. Anthony Walker and myself (*Supplement*, December 29, p. 230), the Minister most graciously informed us that our views had been noted, yet my subsequent sincere offer of hospitality to him or his representative, with a view to informal discussion of our problems with a few of those most vitally concerned (a course which could have done nothing other than to acquaint him the more forcibly of our present plight), has been turned down with about as much concern over our claim as was shown in the original refusal to negotiate. As has been said before, negotiation requires good faith in a minimum of two parties.

The difficulties besetting the busy family doctor in preparing a plan for an alternative health service are legion. Yet this is what we are reduced to. We can only hope that this may be done in time. Beyond being a crisis of confidence, this is a challenge to the family doctors of tomorrow. I therefore appeal to those of the profession bearing the responsibilities of parenthood, to those with the prospect of many years' useful work ahead of them, to review recent events in the light of past failures, and to approach current problems with a show of determination as yet occult. Let us see our bolder spirits militant in support of a better service, rather than seeking refuge outside their own country, and let us see this spirit appreciated by our elders.—I am, etc.,

Upton, Hunts.

JOHN K. PATERSON.

Approaching M.P.s

SIR.—We live in a democratic State. Our Association prides itself on being run on democratic lines. Let us therefore take immediate steps to make use of one of the main advantages of such a system and approach every Member of Parliament in this country to inform him or her of the true plight of the profession—and I am not merely thinking of remuneration and the disastrous faults of the Health Service. It is my firm belief that these men and

women are honest people with the good of the country at heart. I further believe that they are not fully aware of the state of affairs which exists. If groups of doctors in every constituency could meet their own M.P. and convey to him or her the salient facts, I am confident that matters would be put right.—I am, etc.,

London, S.W.16.

D. G. ALLEN.

Remuneration of Radiographers

SIR.—We are gravely concerned by the financial position of radiographers as disclosed in Dr. Duncan Irving's letter (*Supplement*, October 13, 1956, p. 157).

In these days of high wages it is strange that such a skilled occupation is so poorly paid in all grades in comparison to other medical technicians, especially those in the pathological departments. We suspect that this is due to the fact that they are members of a society, and not trade unionists, and so have not been able to have their claim treated with the consideration it would have received otherwise.

In view of this we are not surprised that there is a steady drift from the profession, and are only amazed that it is not greater. As a result of the increasing understaffing of the radiology departments, we can only see a slowing-down of the work done, and so steadily increasing out-patients' waiting-list as a direct result.

As general practitioners in this district enjoy full access to the radiology department of the local hospital, we have an apprehensive view of the future. Higher pay for the radiographers comparable with that paid in the other departments will stop the wastage, and with the resulting full staffing of the radiology departments throughout the country our local favourable conditions with regard to x-ray investigations will be general.

While we are ourselves having to negotiate for increased remuneration, we think that the medical profession should as well support the claim of those on whom we depend so much to help us in our work.—We are, etc.,

W. M. CROSBIE HALLINAN.

R. G. B. WIGODER.

R. LL. MEYRICK.

H. G. JEFFS.

J. N. KERR.

C. BENN.

J. R. M. SANGSTER.

London, S.E.13.

Salaries of Part-time Radiographers

SIR.—In order to alleviate the national shortage of radiographers their salary scale has been revised. This has been done in an attempt to attract new entrants into a dwindling profession. To bridge the gap until new entrants have been trained, it would surely be expedient and just to remunerate part-time radiographers in accordance with their qualifications, status, and experience, on the same terms as full-time employees. In small hospitals it may well be that only part-time radiographers are an economic proposition. At the recent revision of the scale no consideration at all was given to this category. If the potential services of part-time radiographers, especially among married women, were to be fully exploited, the present serious position could be conceivably relieved. Some are highly qualified ex-superintendents or senior radiographers, who are holding back from resuming work for which they are now paid a salary proportionately lower than that of a newly qualified junior. If the radiological service is to continue satisfactorily, it is hard to understand why this reserve of experts is not used. To say their number is small is based merely on the fact that hardly any are willing to serve in face of the present humiliating remuneration.—I am, etc.,

St. Albans, Herts.

F. FRIEND.

Dangerous Drugs Act: Withdrawal of Authority

The Home Office announces that Dr. William David Thompson (Haverfordwest, Pembrokeshire) is no longer authorized to be in possession of or to prescribe those drugs to which the Dangerous Drugs Regulations apply.

H.M. Forces

Surgeon Captain R. Wear, V.R.D., R.N.V.R., has been appointed an Honorary Physician to the Queen, in succession to Surgeon Captain H. M. Willoughby, V.R.D., R.N.V.R.

A Supplement to the *London Gazette* has announced the following awards:

Fourth Clasp to the Territorial Efficiency Decoration.—Major R. H. Mortis, T.D., R.A.M.C.

Second Clasp to the Territorial Efficiency Decoration.—Major F. J. Fowler, O.B.E., T.D., R.A.M.C.

ROYAL NAVY

Surgeon Commanders L. G. Yendoll and M. H. Adams to be Surgeon Captains.

Acting Interim Surgeon Commanders S. G. F. Linton, M.B.E., and R. S. McDonald to be Surgeon Commanders.

Surgeon Lieutenant-Commanders G. H. Gunson, A. P. M. Nicol, M.V.O., and J. M. Hanson to be Surgeon Commanders.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Commander G. L. Foss, O.B.E., V.R.D., to be Surgeon Captain.

Surgeon Lieutenant-Commander R. A. McKeown to be Surgeon Commander.

Surgeon Lieutenants J. L. Hadley and A. S. Douglas to be Surgeon Lieutenant-Commanders.

ARMY

Colonel R. T. P. Tweedy, late R.A.M.C., has retired on retired pay.

TERRITORIAL ARMY**ROYAL ARMY MEDICAL CORPS**

Colonel M. MacEwan, D.S.O., O.B.E., D.F.C., T.D., has relinquished the appointment of Honorary Colonel, 16 AB Div. R.A.M.C.

Lieutenant-Colonel C. H. Imrie, T.D., has been granted the acting rank of Colonel.

Lieutenant-Colonel C. W. Healey, M.C., T.D., has retired, retaining the rank of Lieutenant-Colonel.

Major J. Newall has been granted the acting rank of Lieutenant-Colonel.

Majors L. F. Richmond, M.B.E., T.D., and E. C. Ellis, T.D., have retired, retaining the rank of Major.

Major M. A. Watson, T.D., has resigned his commission, retaining the rank of Major.

Major J. H. Challenger, from A.E.R.O., to be Major.

Captain (Acting Lieutenant-Colonel) C. Wymes to be Major.

Captain (Acting Major) D. O'Brien to be Major.

Captains I. C. Jones, R. Harrison, D. T. Jones, D. St. J. D. Rees, A. E. M. Sieger, J. Humphreys, R. J. Vale, A. J. Heber, D. M. G. Myles, and E. J. Mann have been granted the acting rank of Major.

Captains R. J. Belas, J. Campbell, R. N. Theakston, and J. E. Bevis to be Majors.

Captain J. Prentice, from Reserve of Officers, Class III, to be Captain, and has been granted the acting rank of Major.

Lieutenant (War Substantive Captain) R. W. Hutchinson, from Emergency Commission, to be Captain, and has been granted the acting rank of Major.

HER MAJESTY'S OVERSEA CIVIL SERVICE

The following appointments have been announced: Ho Hung Chiu, M.R.C.P., D.M.R.D., D.M.R.T., F.F.R., and J. Cook, F.R.C.S., D.P.H. Senior Specialists, Hong Kong; T. S. Derola, M.B., Ch.B., D.T.M.&H., Medical Officer, Zanzibar; J. F. B. Edeson, M.D., Specialist Officer, Grade B, Malaria Research Division, Federation of Malaya; D. W. Ellis-Jones, M.B., Ch.B., D.T.M.&H., D.O., Specialist Ophthalmologist, Uganda; T. R. Jones, M.B., B.S., D.P.H., Health Officer, British Guiana; D. H. Mackay, M.R.C.S., L.R.C.P., Assistant Director of Medical Services, Kenya; J. P. F. Whelan, M.B., B.S., D.T.M.&H., Dip. Bact., Specialist Officer, Grade B, Bacteriological Division, Federation of Malaya; W. S. Crawford, M.B., B.Ch., B.A.O., and J. K. Young, M.B., Ch.B., Medical Officers, Kenya; Freda B. Bonner, M.B., B.Ch., B.A.O., and T. P. Jupp, D.F.C., M.R.C.S., L.R.C.P., Assistant Medical Officers, Bahamas; J. W. Markham, M.B., B.S., Assistant Health Adviser, Aden; H. A. H. Melville, M.B., B.Ch., D.R.C.O.G., Medical Officer, General Hospital, Barbados; R. E. E. Pocock, M.B., Ch.B., D.R.C.O.G., Medical Officer, Southern Cameroons, Federation of Nigeria; A. Popovic, M.D., Temporary Medical Officer, Western Nigeria; D. Stewart, L.R.C.P.&S.Ed., D.P.H., Medical Officer of Health, Jamaica; J. Stügelboud, M.D., Medical Officer, Northern Nigeria; P. B. Thompson, M.B., B.S., Medical Officer, South Pacific Health Service, Fiji.

BRITISH MEDICAL GUILD**Meetings to be Held**

COVENTRY.—At Out-patients' Department, Coventry, and Warwickshire Hospital, Tuesday, January 29, 8.30 p.m.

DUDLEY.—At Grammar School, Dudley, Tuesday, January 29, 9 p.m.

GLASGOW.—At Small Hall, Institution of Engineers and Ship-builders in Scotland, 39, Elmbank Crescent, Glasgow, Thursday, January 31, 8.30 p.m.

LINCOLN.—Sunday, January 27, (1) At The Gables Hospital, Spilsby, 3 p.m. (2) At the Saracen's Head Hotel, Lincoln, 8 p.m.

PADDINGTON.—At Board Room, St. Mary's Hospital, Paddington, W., Monday, January 28, 8.45 p.m.

SOUTH-WEST ESSEX.—At Wanstead Hospital, Hermon Hill, E., Wednesday, January 30, 8.30 p.m.

WEST BROMWICH AND SMETHWICK.—Sunday, January 27, 2.30 p.m.

WEST DENBIGH AND FLINT.—At Marine Hydro, Marine Drive, Rhyl, Sunday, January 27, 2.30 p.m.

WOOLWICH.—At Woolwich Memorial Hospital, Shooters Hill, S.E., Tuesday, January 29, 8.30 p.m.

Association Notices**Diary of Central Meetings**

- JANUARY**
- 28 Mon. Staff Side, General Whitley Council (at 14, Russell Square, W.C.), 10.30 a.m.
- 28 Mon. Full General Whitley Council (at 14, Russell Square, W.C.), 2 p.m.
- 29 Tues. Arrangements Committee (Edinburgh, 1959), 12 noon. (*Change of time*.)
- 29 Tues. Subcommittee on Medical Reports, Joint Committee of the B.M.A. and the Magistrates' Association, 2 p.m.
- 30 Wed. Council, 10 a.m.

- FEBRUARY**
- 1 Fri. Central Consultants and Specialists Executive Committee, 10 a.m.
- 5 Tues. Planning Subcommittee, Occupational Health Committee, 10.30 a.m.
- 6 Wed. Tuberculosis and Diseases of the Chest Group Committee, 2.15 p.m.
- 7 Thurs. Central Consultants and Specialists Committee, 10.30 a.m.
- 8 Fri. Ingleby Evidence Committee, 2 p.m.
- 12 Tues. Committee on the Rehabilitation of Disabled Persons, 10.30 a.m.

Branch and Division Meetings to be Held

CARDIFF DIVISION.—At Park Hotel, Cardiff, Wednesday, January 30, 7.45 p.m., supper meeting. Address by Dr. I. Harvey Flack: "Telling the Public About Medicine." Ladies and guests welcome.

DORSET DIVISION.—At Chest Clinic, Dorchester, Friday, February 1, 8.30 p.m., general meeting.

DUNDEE BRANCH.—At Nicoll and Smiber's Restaurant, Nethergate, Dundee, Friday, February 1, 8 for 8.30 p.m., annual dinner and dance.

NORTH MIDDLESEX DIVISION.—At Committee Room, North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, January 29, 8.30 for 8.45 p.m., meeting. Lecture by Dr. C. H. Andrewes, F.R.S.: "Influenza, Colds, and All That." Medical guests are invited.

PADDINGTON DIVISION.—At St. Mary's Hospital, Paddington, W., Monday, January 28, annual general meeting. To follow meeting of British Medical Guild.

SOUTH STAFFS DIVISION.—At Victoria Hotel, Wolverhampton, Thursday, January 31, 7.45 for 8.15 p.m., annual dinner. Guest of honour: Mr. Leslie Thomas. Members' wives and non-medical guests are invited.

STIRLING BRANCH.—At Stirling Royal Infirmary, Wednesday, January 30, 8.30 p.m., clinical meeting. Lecture by Professor G. L. Montgomery: "Clinical Pathology and the General Practitioner."

SWINDON DIVISION.—At St. Margaret's Hospital, Stratton St. Margaret, Wednesday, January 30, 8.30 p.m., joint clinical meeting with Swindon Medical Society. Films: (1) "Special Problems in the Management of Peptic Ulcer"; (2) "The General Practitioner and Rheumatic Disease."

WANDSWORTH DIVISION.—At Berkeley Rooms, Zeeta House, Upper Richmond Road, Putney, S.W., Friday, February 1, 8.30 p.m., joint meeting with South-west London Chemists' Association. Lecture by Dr. A. A. Mason: "Uses of Hypnosis in Medicine" (illustrated by film).

WEMBLEY DIVISION.—At Board Room, Wembley Hospital, Tuesday, January 29, 9 p.m., combined meeting of all denominations of the Wembley clergy and members of the Division. Address by Dr. Ernest White.

ANNUAL MEETING: NEWCASTLE UPON TYNE, JULY 10-19**SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL**

LONDON SATURDAY FEBRUARY 2 1957

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REMUNERATION CLAIM**MEETING WITH MINISTER ARRANGED**

A meeting between the Minister of Health, Mr. D. F. Vosper, and representatives of the profession's Negotiating Committee has been arranged for February 20. The Negotiating Committee will meet in the afternoon of the same day.

Guildford Meeting

A meeting of the Guildford and District Area Branch of the British Medical Guild was held on January 17 and was attended by 103 doctors in the Guildford area. Dr. Alexander Hall, President of the B.M.A., and Dr. D. P. Stevenson, Deputy Secretary of the B.M.A., addressed the meeting. The following resolution was carried by an overwhelming majority:

This meeting has learned with dismay that the negotiations have at present reached an apparent deadlock, following a meeting of the representatives of the profession and the Minister of Health on January 4. This meeting urges the Negotiating Committee to make immediate plans for direct action and, if necessary, arrange for withdrawal from the Service.

OCCUPATIONAL HEALTH COMMITTEE

A meeting of the Committee was held on Wednesday, January 16, with Dr. J. A. L. VAUGHAN JONES in the chair.

The Committee heard with deep regret of the death on December 11 of Dr. H. Wyers. Dr. Wyers had recently resigned from the Committee because of ill-health, and the CHAIRMAN paid tribute to his immense experience, knowledge, and pleasing personality.

The Committee offered its congratulations to Professor R. E. Lane on his appointment as Commander of the British Empire in the New Year Honours List.

It was reported that the Conference of Advisory Councils on Occupational Health would be held at B.M.A. House on April 9, the subject to be discussed being the employment of disabled persons in industry. The question of the establishment of new advisory councils in areas where there are none as yet is being explored.

Postgraduate Courses in Occupational Health

Arising out of the replies received from deans of medical schools, the Training Subcommittee has considered the most suitable type of course for general practitioners wishing to take up part-time occupational health appointments or wishing to attend refresher courses in occupational health. It has appointed a working party to prepare a specimen syllabus for such courses and to make suggestions on methods of teaching. The CHAIRMAN said it was impractical that

there should be a course in every university and it would be better to concentrate on a few medical schools. The subcommittee would report more fully later.

Certificates for Short Illnesses

The Committee again considered the A.R.M. resolution, which had been referred also to other committees, that industry should be asked to abolish the requirement of medical certificates for short illnesses.

The opinion was expressed that difficulties arose mainly in one-day illnesses, and that it was a matter primarily for industry to sort out. The demand for certificates was tied up with payments, sick benefits, and so on. There were many firms which did not require certificates for less than three days' absence. Organizations running sick-pay schemes had to have some sanctions. It was always assumed that there was a great deal of abuse, but 50% of workers never took a day off, and 25% might be able to stay away up to three days without a certificate. It did not seem possible to cover all the problems by a general ruling, except to point out that if too many certificates were asked for they lost their value. The one-day certificate should be abolished. It was agreed that the course proposed at the last meeting of seeking the views of various employing bodies should be pursued.

Remuneration

The Committee received a report from its Remuneration Subcommittee on the fees paid to appointed factory doctors. The majority of the fees paid at present were fixed in 1947 and it seemed reasonable that there should be an increase. The subcommittee's proposed increases were accepted as recommendations for adoption by the Council of the Association.

The subcommittee had reviewed the Association's recommendations on the remuneration of part-time industrial medical officers in the light of the agreement just concluded on the remuneration of part-time medical officers to local authorities, and the Committee decided to recommend to Council that the rates be revised.

Similar action was taken on the range of remuneration recommended for whole-time industrial medical officers, having regard to the 10% increase in the cost of living since early 1955, when these salaries were last revised, and that public health medical officers had received two cost-of-living increases since then and that general practitioners and hospital medical staff were pressing for an increased betterment factor. An increase in the scales of fees for lectures given at courses for disablement resettlement officers and for services on panels of disablement advisory committees was recommended. The recommended rates conform closely to those agreed in Committee C of the Medical Whitley Council for sessional work for local authorities.

Several points were raised in the discussion on conditions of service, superannuation, and so forth which it was agreed should be remitted to the subcommittee for consideration. Dr. D. L. GULLICK, chairman of the subcommittee, was congratulated on the work which had been accomplished.

Administration of Morphine and Antibiotics

The Committee accepted a report from its Industrial Nursing Subcommittee on the administration of morphine and the use of antibiotics or chemotherapy by nurses in industry. The Annual Representative Meeting had passed a resolution expressing astonishment at the refusal of the Home Secretary to legalize the administration of morphine by competent nurses in serious industrial accidents, and instructed the Council to press for this essential medical service to industrial workers. The Annual Representative Meeting had stated that nursing staff employed in industry should follow hospital practice and not use antibiotic or chemotherapeutic drugs without instructions in writing in each case from a registered medical practitioner.

The subcommittee, after considering these two points very carefully, decided, so far as the administration of morphine was concerned, that it should be recommended to Council that the resolution of the Annual Representative Meeting should be sent to the Home Office to show what the profession thought. On the use of antibiotics, it was said at the Annual Representative Meeting that it was the practice for nurses to accumulate stocks of these and use them rather liberally. The subcommittee felt that the matter could be dealt with by the exercise of care by doctors who had been in the habit of authorizing supplies of drugs for nurses working without the supervision of a medical officer.

Other Business

A letter was received from the chief inspector of factories about the cautionary notice on dermatitis, in which the Committee had recommended the inclusion of advice that the worker should report to a doctor. The chief inspector thought this might result in less reporting rather than more, especially in the smaller factories. It was agreed to suggest that the alternative words "seek medical advice" might be used instead.

The Committee received a manual on first aid in coal-mines published by the St. John Ambulance Association. A new manual, *Occupational First Aid*, was soon to be published.

It was decided, on the recommendation of the Subcommittee on the Schedule of Prescribed Diseases, that the Council should be recommended to submit no evidence on a revision of the terms of prescriptions of diseases Nos. 7, 8, 9, and 28, 29, and 30.

N.H.S. SUPERANNUATION SCHEME

CONCESSION TO INSURANCE POLICY HOLDERS

The Ministry of Health states that it has agreed that general practitioners and part-time specialists who elected to receive a contribution of 8% of their superannuable remuneration towards payment of premiums on their insurance policies, under the arrangements explained in Leaflets S.D.D. and S.D.D.A. issued by the Ministry of Health in 1948 and 1949 respectively, instead of participating in the Health Service Superannuation Scheme may now be allowed to substitute for the original policies recognized for purposes of the option annuity policies which would qualify for the new income-tax relief afforded under Section 22 of the Finance Act, 1956 (see *Supplement*, January 19, p. 30). Recognition of the substituted policies and payment of the Minister's contribution in respect of them will be subject to the following conditions additional to those under which the option was allowed:

(1) Where the original policy is made into a paid-up policy, that policy shall not be assigned or otherwise surrendered before maturity date. A breach of this condition would lead to the discontinuance of the 8% contribution.

(2) Where the original policy is surrendered all the money derived therefrom shall be used in the purchase of the substituted policy.

Applications for approval to substitute policies in accordance with these arrangements should be sent to the Health Services Superannuation Division, Government Buildings, Honeypot Lane, Stanmore, Middlesex, and full details of the proposed transaction should be given. Substitution of new policies cannot be agreed where it is proposed to continue to maintain the policy or policies originally recognized for purposes of the option.

Scottish News

TOUR OF DENMARK FOR SCOTTISH DOCTORS

Following the successful visits to Denmark in 1953 and 1954 of a number of Scottish doctors, the Scottish Committee has accepted another invitation from the Danish Institute to form a party to visit Denmark from August 24 to September 6, 1957. The tour will include visits to hospitals, universities, medical departments, medical institutes, and other places of interest to doctors, as well as sightseeing excursions. Where possible, alternative programmes will be provided to meet the visitors' particular interests. The cost will be approximately £44, including travel Newcastle-Copenhagen-Newcastle and hotel accommodation throughout the tour.

Doctors in Scotland who are interested in joining the party should communicate with the Scottish Secretary, British Medical Association, 7, Drumsheugh Gardens, Edinburgh, 3.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Remuneration Claim

SIR,—As a consultant since 1947 I become more and more depressed as each year the purchasing power of my income becomes less and less. Each year it is a case of "buy less" and "do less," reasonable pleasures must be strictly rationed, and major essential replacements only carried out by courtesy of hire purchase. All this because we have never received a salary envisaged by the Spens Committee.

The Danckwerts Award brought a ray of hope for those in the hospital service, but this was rapidly extinguished by Mr. Butler, since when "the time has never been ripe" for justice to be applied. In 1952 even some members of our own Joint Committee did not think "the time was ripe for negotiation." Nevertheless, they were stimulated into half-hearted activity, and achieved as a result an adjustment of salary which was more than neutralized in the case of part-timers by what may prove to be an irregular change in tax assessment from Schedule D to E. As a result, in many cases the net income after income-tax deduction only is less to-day than it was in 1948—but what of the purchasing power of what is left? It would appear that "the time will be ripe" for consideration of our eight years' underpayment when the economic situation is stabilized and the cost of living reduced, but can anyone other than a moron believe that, at a time of falling prices, any claim for increased remuneration, even when it is morally a debt of years' duration, would have any hope of success? The £24m. quoted as the amount of this claim gives a misleading picture of the cost to the country, because anything from £12m. to £16m. would be repaid in taxation. But the residue would be distributed in large to those who are in need—i.e., junior hospital staff and specialists who are unable to augment their incomes by private practice, etc.

The attitude of the Government as regards implementation of betterment will reflect very seriously on the amounts of pensions payable at the end of the 10-year period, and it could be argued that this is a deliberate policy to keep down the pension payments on which tax reclaim would be less. Should the Negotiating Committee need convincing proof that "the time for action is ripe now or never," include in a circularized questionnaire the item "Is your bank statement ever in red?" However, judging from recent letters in the *Supplement*, hardship has been stressed, and it is up to the profession as a whole to stand solidly behind the Negotiating Committee both individually and in Divisions. In this way we can "give them the arms with which they should be able to do the job."—I am, etc.,

Southampton.

BERNARD SUGDEN.

SIR,—Must it be assumed that the "1939 values" envisaged in the Spens Report can be assessed only in terms of the official cost-of-living index? Could they not be reckoned rather in relation to the national income, as given by the total of all incomes assessable to Inland Revenue? Surely the main objection to any claim based on the price of consumer goods is that it is inflationary, for if the price index rises such claims tend to be increased, whether or not the real resources of the nation increase at the same rate. But the national income figure should indicate a sum actually accounted for by the citizens—partly as income tax, partly as savings, and the remainder as personal expenditure. Would it not be more reasonable to claim that a fair proportion of this sum should be devoted to medical services, rather than seem to be claiming like any trade union that, whoever goes short, it should not be our members?—I am, etc.,

Carlisle, Lanark.

M. B. LEITCH.

SIR,—Dr. Geoffrey Bourne, in a letter to the *Daily Telegraph and Morning Post* of January 17, suggests "that the State should at the present juncture ask the profession to help reorganize the Health Service, stating honestly how much it can afford to expend." Further on in his letter he states: "The present State Service costs more than the nation can afford." That, in my view, is the kernel of the problem, and, while wishing Mr. Vosper all good luck in his appointment as Minister of Health, we should remember that he will have to cut down rather than expand.

Our politicians are beginning to realize that Government spending will have to be reduced by about £600 million per annum, for our national debt is approaching £30,000 million with an annual interest rate of £900 million. What sort of legacy is this to leave our children? No wonder the emigration offices are busy. We could get out of our difficulties if we had 15% increased production in coal and other essentials. This means we would all have to work harder, but doctors cannot work harder than they do at present. Therefore we must reduce the pressure on the N.H.S. and increase the volume of doctors coming forward by making general practice more attractive.

We can only do this by bringing back a certain measure of private practice. Why not modify the N.H.S. to exclude all persons and their families with incomes of £1,000 a year and over? National Insurance cards might present some difficulty, but any of the big five industrial insurance companies could be left to unscramble the scheme. I have often heard it said that they could offer better pension cover for less money than the Government's present scheme, which has no roof to it. I was in business before taking up medicine, and I noticed that the people who got rises were not those who deserved them but those who asked for them at the right time, and, in my opinion, this is definitely not the time to press a claim for higher remuneration.—I am, etc.,

Glasgow, C.3.

A. C. GORDON ROSS.

SIR,—When the national press concerns itself with what we know intimately, we realize how inaccurate, biased, or downright misleading it can be, with its catch-phrases, its items taken out of context, and its generalization. It fol-

lows, therefore, that we can never get the facts presented for us this way. We should use the disgusting method, as follows.

On the mantelpiece of our waiting-rooms we must put up printed placards (issued to us by our own organization) and point these out to patients. The placard should bear (1) a short account of the circumstances and the date concerned in our claim; (2) the gross and net capitation fees per patient per year and an indication that we pay surgery and telephone attendant, cleaning and travel expenses, etc.—these expenses are not paid for us as many think; (3) the size of a well-established practice in the doctor's district—for example, in Stepney this is 1,500; (4) private practice is now almost non-existent. The placards can be numbered and changed as the situation demands to give further facts. This will give our patients—that is, our public—the knowledge that our case did not come up in 1956, at a time of crisis, but has been under consideration for four to five years at least. It will also tell them exactly how little we get for so much service. In 1957 we must use 1957 methods.—I am, etc.,

London, E.1.

DOUGLAS WAYNE.

SIR,—What a pleasure it is to see the letter from Dr. D. G. A. Westbury on the remuneration claim (*Supplement*, January 12, p. 21). Why cannot we all think more of "giving" rather than "getting," of service rendered rather than of status? Let us reform this Health Service by all means, so that we can give better value to our patients, but not this scramble for money only.—I am, etc.,

Chasetown, Staffs.

GEORGE H. PEARSON.

Medical Broadcasts

SIR,—While listening to a broadcast on alcoholism on the B.B.C. Home Service on January 17 I was astounded to hear the speaker recommending his listeners to change their doctors, and to continue to do so, until they found one who was prepared to carry out the form of treatment which he had just described. Even coming from a person whose views may be regarded as authoritative in his specialty, such a suggestion to the general public is surely scandalous. It is just another smear across the once-respected name of the G.P. If we must have these medical broadcasts, is it not possible that some ethical control of the script could be exercised to prevent the expression of self-glorifying, if not fanatical, views by the few at the expense of the many?—I am, etc.,

Burnley.

W. STODDART.

Organizing Medicine

SIR,—It is indeed a grievous thing to note the trials and tribulations being faced by the British medical profession in these days, and for that matter the very serious problems being faced by the British people as a whole. Their indomitable courage and wonderful determination is ever to be admired. That politics or political influences, however, should enter into the relationship between patient and physician in any manner whatsoever is such a frightening thing to the American medical profession that every endeavour is being made here to avoid any repetition of the errors made in Great Britain. That there is much that is good, especially from the patient's point of view, in the British National Health Service cannot be denied, but in the overall scheme of things the broader considerations must also be borne in mind. A dissatisfied and disgruntled medical profession can only mean, in the final analysis, that half-hearted efforts are made in providing the best service, and that a resulting deterioration of service is most likely to occur.

Adequate medical care for all of the people, as a prime necessity of life and obtained within the means of the people, is an ideal being striven for in most, if not all, countries of the West. It is surely therefore a wise step to consider all of the possibilities for approaching a solution to the problem. The means, particularly of meeting the economic burden of the catastrophic illnesses, present a

special and tantalizingly difficult problem. Most planners of attack find themselves in a quandary, for to protect the central fund and avoid disturbing abuses entails a maximal co-operation not only of the patients but also of the medical profession. Those who would control the purse-strings have found it easier to achieve this through the direct control of the medical profession in some organized plan which enslaves the profession as the servant of government, rather than to work out the more difficult solution which would leave the profession free and untrammelled.

As one of those to whom you refer in your leading article (*Journal*, December 15, 1956, p. 1417) who left Great Britain for parts unknown because of a basic inability to accept the new order in Great Britain, I may say I personally have not regretted that step. To be the prisoner of a system which was anathema to me, and of which I had a great personal fear, and to lose a much-loved freedom of action, rendered emigration as the only solution for me. In my new country, however, I am not one of those who will fight willy-nilly against soundly developed plans for providing adequate medical care to the public, but I will fight to the death on one issue—any attempt to enslave the American medical profession as the British plan has enslaved the British medical profession. The Americans are working hard seeking for solutions to their own medical care problems. I believe that in the native ability of the American people and the American way such a solution will be found, and in the not too distant future—a solution which will make no attempt at enslaving the American medical profession.

In closing, I wish to draw attention to one word in your otherwise excellent leading article which has bothered others as it bothers me. The word is a carry-over from those days of yesteryear when Great Britain owned and governed vast colonies and tracts of the world. The new Britain should drop this word, because I know it annoys a majority of Canadians as it probably also annoys Australians and New Zealanders. That word is "Dominion." Surely there is some other word that can be used. Commonwealth is better, but may not be sufficiently explanatory. Englishmen should learn that although England (as distinct from Great Britain) is a great, honoured, and honourable land, and has given very much to the world, not the least being democratic forms of government, Scots, for example, are not Englishmen, nor for that matter are the Welsh. As a Scotsman born, I am reminding you of this, for by getting some inkling of how others feel about being called what they are not it will be so much the easier to understand why such words as the word "Dominion" can annoy.—I am, etc.,

Worcester, Mass., U.S.A.

KENNETH I. E. MACLEOD.

Unity of Purpose

SIR,—The policy of the B.M.A. is to oppose the introduction of a whole-time salaried service, but that is, of course, no reason to refuse publication of letters from those, such as Dr. Eleanor Ettlinger (*Supplement*, January 19, p. 33), who welcome the idea, but it would be well if you controlled the statements of supporters as well as of antagonists. Dr. Ettlinger mentions this island "with its low standard of living" and a Government that spends a large part "of the national income on rearming, prestige wars, etc." One of the aims of the great majority of doctors is to keep the medical services out of politics; and Dr. Ettlinger, who clearly takes the opposite view, will only strengthen the feeling of the majority that politics is a dirty game: neither of her two statements is true, but any stick will serve.

Dr. Ettlinger's suggestions as to the appropriate scale of salaries is ludicrous unless she also feels that the "medical vocation" should involve taking an oath of poverty, chastity, and obedience (to the medical civil service). What is degrading about working for "personal material betterment," and do whole-timers find no such impulse in their minds, even if they do not spend their time "dilettanting" (at least we are indebted to Dr. Ettlinger for something

constructive—a neologism)? Would Dr. Ettlinger's parents have been able to subsidize her again if somebody had not indulged in the degrading wrangle for personal material betterment? And, having been qualified only eight years, Dr. Ettlinger need not talk about "enforced idleness": even the very young have still something to learn.—I am, etc.,

London, W.1.

A. PINEY.

Practice Expenses

SIR,—I should like to bring to your notice a few points about this so-called "Christmas box" which has figured in our recent statements of remuneration. This, I understand, is arrived at as a result of calculations based on the amount by which the expenses element in the capitation fee falls short of the amount shown by subsequent statistical analysis of the actual expenses. How this is done we are not told. All we are told is the sum received by the executive council and available for distribution. This sum is then distributed as a percentage of the capitation fee for treatment. As this money is directly related to expenses, it seems to me inequitable that no account is taken of the mileage payments and dispensing capitation fees, where the expenses element is so much higher (for superannuation purposes 50% in each case, against 30% for the basic capitation fee). Surely this is grossly unfair to the country practitioner, whose expenses are already proportionately above average.

I calculate roughly, ignoring the six places of decimals which vary from area to area, that the individual country doctor would have received from £80 to £100 more if this had been done, which is about equivalent to the amount by which the supplementary payment to a country practitioner with an average rural list falls short of the amount received by a town doctor with an average urban list, whose expenses are proportionately lower.—I am, etc.,

Crawley, Sussex.

C. R. PALMER.

Reform of Health Service

SIR,—Colleagues in general practice owe thanks to Dr. C. Glaisher's suggestion (*Supplement*, January 5, p. 13) that initiative must come from the periphery. I sincerely respect his own initiative, but sadly disagree with most of the points he describes. With your permission (and, I hope, his forgiveness) may I detail my objections?

The doctor-patient relationship: Twice in his letter Dr. Glaisher assumes (without explanation) that his relationship has been destroyed through the machinery of the N.H.S. Yet the doctor-patient relationship can be a product only of the consulting-room or bedside manner, of the approach by the doctor to his patient's clinical or social problem. If it is sincere, then it can never be altered by the method which brought doctor and patient together.

Patients should "register temporarily" whenever they seek advice: Dr. Glaisher suggests that then the doctor would send "a duly completed record card" to the executive council, and do it "promptly" each time, to get his remuneration. In the first place, it is already quite easy for a patient to change his doctor, either within a fortnight of his decision, or at once if he gets the previous doctor's consent (which is most unlikely to be withheld). In the second place, consider the practitioner who retains his patient over several years. Unless he made his notes in duplicate he would be constantly parting with his data which make up the picture of the patient's past medical and social history. This long retrospective view of a patient is too valuable a characteristic of general practice to be lost. In the third place, what does "duly completed" mean? Is this when both sides of a card have been covered according to the size of the doctor's handwriting? Is it when an illness has been finally cured—easy enough to judge for measles or influenza, but problematic in anaemia or carcinoma, and impossible to assess for chronic bronchitis or diabetes?

The doctor's wife feels herself the unpaid servant of an impersonal State service: Does she? She works, and

devotedly, for her husband, his practice, and his patients. Whether or no this is paid depends on arrangement between the doctor and his wife.

Remuneration by act of service: The idea is worth considering, but not, as suggested, by presenting patients with accounts on E.C. forms bearing an approved scale of charges (like a laundry book). Dr. Glaisher describes this as "an even more effective way of restoring the doctor-patient relationship." Would it not be both infallible and ignominious as a move to lower medical prestige?

Patients are suspicious of free advice: Nearly all patients know that they are paying for what they receive. The real difficulty is to get them to realize how small is the proportion of the insurance stamp costs which goes to the medical services. But well above this is the fact that they value the advice they get according to their judgment of a doctor's skill and interest in their cases.—I am, etc.,

Cambridge.

A. S. PLAYFAIR.

SIR,—The most serious defect in the general practice situation is that good practice has a poorer reward than bad practice. The group practice form, which gives the fullest opportunity to the development of fully responsible general practice, is expensive to run. Its ancillary help must be adequately paid. Its premises and equipment are costly; its overheads—telephone, postage, car expenses, mortgage interest, repairs and renewals, etc.—are all heavy. Its capitation units are restricted in number because the individual is fully dealt with. By contrast, the practitioner who makes do with the minimum of help and equipment, and spends but little time on the individual, is considerably better off. He refers all but the simplest problems to the neighbouring hospital, and can give his limited individual attention to more capitation units.

Payment for services rendered is a solution open to abuse. A tax-free grant, on the other hand, for all reasonable practice expenses which have been incurred, together with a reduction of lists to 2,500, would raise the standard of practice all over the country. If the Ministry of Health espoused some such scheme as this it would have no difficulty in regaining the confidence of the general practice side of the profession.—I am, etc.,

Teignmouth.

GEORGE A. F. QUINNELL.

SIR,—It is time that the myth of a "free health service" was exploded for good. If the country cannot afford to pay the doctors then it cannot afford to finance the nation's health as at present organized. Through modern medicine the incidence of killing diseases has been considerably reduced, though not in the public mind, which is fed on high-pressure publicity of dramatic diseases and spectacular surgery. Also, extreme poverty is a rarity, and in many homes to which I go I see patent medicines advertised on T.V. and costing 10s. and more. It should be considered a luxury for a patient to consult a doctor about minor upper respiratory tract infections and fibrositis, and it is fantastic to burden the taxpayer with the cost of removing a harmless sebaceous cyst. It was said that a free service would result in earlier diagnosis, but this is not true in practice. People still come in late stages and when questioned say: "I know you're so busy, I didn't want to bother you, Doctor."

To my mind a plan for a better health service requires an exposing of such anomalies in the light of the local and contemporary situation rather than a journey to Australia. Many doctors believe that general practice is at its best where patients have complete free choice of doctor, so I would abolish the panel system and have patients pay doctors for consultations and be repaid through friendly societies according to the illness, or credit could be given to reduce next year's premium. For this purpose—note, no dictation by a Minister—illnesses could be graded by a nationalized, non-political medical corporation as follows: Grade 1: for illnesses endangering life, full cover and maximum benefits. Grade 2: for illnesses merely preventing employment, reduced cover. Grade 3: for illnesses causing no loss of working capacity, least or no cover. Individual societies might vary the degree of cover for the

last two according to the premium. There should be big concessions for children up to school-leaving age and pensioners. G.P.s would welcome the opportunity to do minor surgery once again. The onus of obtaining free service would be on the patient to obtain a receipt from doctor and chemist where appropriate on a form provided by the society. All premiums should be tax-free, and the Exchequer would provide only a fraction of the present sum as a grant to hospitals, who should have local autonomy, the central corporation acting in an advisory capacity only, and receive funds from taxes, societies, and by provision of amenities.

One thing is certain. Doctors everywhere want release from ministerial control, and will only achieve it by taking the initiative and resigning in a body in favour of a service of their own choice.—I am, etc.,

Harrow, Middx.

D. J. B. MAKINS.

SIR,—I have every sympathy with most of the views expressed in the letter from Dr. John Innes (*Supplement*, January 12, p. 22). I agree equally that in backward areas, where this does not yet apply, the general practitioner should have direct access to specialists in ancillary subjects as well as to those practising the older skills. However, unless he is prepared to undertake departmental as well as individual responsibilities, and also years of specialized training with appropriate examinations, you will perhaps pardon me if I suggest that x-rays and E.C.G.s are the tools of the radiologist and cardiologist respectively rather than the general practitioner. I am sure that radiologists and cardiologists ask nothing better than to help all their colleagues, including those in general practice, but loose thinking of that kind cannot be condemned too hard or too often.—I am, etc.,

Southport.

J. G. BENSTEAD.

Prescription Charges for Diabetics

SIR,—The Medical Subcommittee of the British Diabetic Association has now clarified with the Ministry of Health some financial alleviations for diabetic patients on the new prescription regulations. To be brief, a Ministry letter of November 27, 1956, states that supplies of needles, spirit, testing tablets, and—most important—insulin can be prescribed for three months or more, depending on the doctor's view in the individual case. One shilling only per item would be payable *irrespective* of the quantity ordered. This helpful fact has been publicized to patients in the January issue of the *Diabetic Journal*, but not, so far as we know, to the medical profession at large. This has led to confusion between doctors and patients, and I therefore hope you will, by publishing this letter, inform doctors through your widely read journal.—I am, etc.,

London, W.1.

R. D. LAWRENCE,
Chairman, Medical Subcommittee,
British Diabetic Association.

Arbitration

SIR,—The letter from Dr. J. A. Gorsky (*Supplement*, January 26, p. 41) is most timely. It clearly sets out a problem which confronts everyone working in the N.H.S.—doctor, nurse, physiotherapist, pharmacist, and administrator alike. In fact the problem confronts every group of men and women, inside and outside the N.H.S., who are not members of a recognized trade union. During negotiations prior to the N.H.S., in October, 1947, the Government stated that it was "anxious to accord the fullest rights to arbitration, subject to the preservation of the Government's prerogative." In spite of this promise, as Dr. Gorsky has pointed out, the Industrial Disputes Order (1951) withdrew from any organization which was not a recognized trade union the unilateral right to submit a dispute on remuneration or on terms of service to the Minister of Labour, and through the Minister to an independent court of arbitration. The Annual Report of the Council of the Association (1955) stated that the Minister had "given little hope of an early amendment of the Order": at the same time the Management Side of the General Whitley

Council refused to agree to the right of unilateral reference to arbitration.

In December, 1951, the Special Representative Meeting of the B.M.A. met to consider reform of the N.H.S.¹ The first and the most important resolution passed stated "That an Amending Act should provide for the establishment of a N.H.S. Court of Arbitration to which could be referred by the Ministers or representatives of the Management or Staff Side of Whitley Council disputes on the terms of service, including remuneration, without the consent of either party, whether existing terms or new terms affecting any section or individual member of the profession. But that the proposed arbitration on remuneration should be carried to a conclusion without waiting for the passing of any Amending Act." The second resolution passed stated "That the Court should have power to settle such disputes." These resolutions automatically became the policy of the Association and binding on the Council of the B.M.A. to see that they were implemented. In spite of these instructions and without taking heed of the danger of Industrial Disputes Order (1951) the Council of the B.M.A. in April, 1955, was so satisfied with the results of the Danckwerts adjudication that it advised the Representative Body later that year that "the profession would be well advised to rely for the present on *ad hoc* arbitration arrangements when disputes occur."²

Sir, many of us who have been concerned with this problem since 1948 believe that the Council of the Association should now carry out the instructions of the Representative Body and see that an independent court of arbitration is established forthwith on the lines of the instruction given in December, 1951. If such a court had been established the present impasse with the Minister could not have arisen. Some members of the Council of the Association have argued that such a court is potentially dangerous because the arbitrator might be someone who was not cognizant of the medical problems involved. But surely the person appointed would have to be agreed on beforehand—as was Mr. Justice Danckwerts.—I am, etc.,

London, N.W.1.

REFERENCES

- ¹ *British Medical Journal Supplement*, 1951, 2, 269.
² *Ibid.*, 1955, 1, 284.

E. C. WARNER.

BRITISH MEDICAL GUILD

Meetings to be Held

CAMBERWELL.—At Committee Room, Dulwich Hospital, East Dulwich Grove, S.E., Tuesday, February 5, 8.45 p.m.
WEMBLEY.—At Century Hotel, Forty Avenue, Wembley, Tuesday, February 5, 8.30 p.m.

Association Notices

Diary of Central Meetings

FEBRUARY

- | | | |
|----|--------|--|
| 5 | Tues. | Planning Subcommittee, Occupational Health Committee, 10.30 a.m. |
| 5 | Tues. | Medical Students and Newly Qualified Practitioners Subcommittee, Organization Committee, 2 p.m. |
| 6 | Wed. | Tuberculosis and Diseases of the Chest Group Committee, 2.15 p.m. |
| 7 | Thurs. | Central Consultants and Specialists Committee, 10.30 a.m. |
| 8 | Fri. | Ingleby Evidence Committee, 2 p.m. |
| 11 | Mon. | Armed Forces Committee, 2 p.m. |
| 12 | Tues. | Committee on the Rehabilitation of Disabled Persons, 10.30 a.m. |
| 20 | Wed. | Representatives of Negotiating Committee to meet new Minister of Health (at 23, Savile Row, W.), 11 a.m. |
| 20 | Wed. | Arrangements Committee (Birmingham, 1958), 2 p.m. |
| 20 | Wed. | Negotiating Committee, 2.30 p.m. |
| 21 | Thurs. | G.M.S. Committee, 10.30 a.m. |
| 22 | Fri. | Staff Side, Committee C, Medical Whitley Council, 11 a.m. |
| 22 | Fri. | Public Health Committee, 2 p.m. |

Branch and Division Meetings to be Held

ABERYSTWYTH DIVISION.—At Belle Vue Hotel, Aberystwyth, Saturday, February 9, 7.30 p.m., dinner. Talk by Professor A. S. Duncan: "Obstetrics." Wives of members and guests are invited.

BLACKPOOL AND FYLDE DIVISION.—At Small Ballroom, Norbreck Hydro, Friday, February 8, 8 for 8.30 p.m., dinner and dance.

BROMLEY DIVISION.—At Orpington Hospital, Wednesday, February 6, 8.15 for 8.30 p.m., meeting. Dr. Frank Hartley, Ph.D., F.R.I.C., F.P.S.: "Sex Hormones and Therapy."

CUMBERLAND DIVISION.—At County Hotel, Carlisle, Thursday, February 7, 8 for 8.15 p.m., meeting. B.M.A. Lecture by Sir Walter Mercer: "Surgery in the Soviet Union." Film taken in Moscow will be shown. Members of Dumfries and Galloway Division are invited.

EAST SOMERSET DIVISION.—At Weston-super-Mare General Hospital, Tuesday, February 5, 8.30 p.m., general meeting. Lecture by Mr. W. R. Black: "Some Aspects of Crohn's Disease."

GLASGOW DIVISION.—At Hall of Royal Faculty of Physicians and Surgeons, 242, St. Vincent Street, Glasgow, Thursday, February 7, 8.30 p.m., meeting. Address by Dr. K. Cowan: "Tuberculosis Problem in Scotland."

GUILDFORD DIVISION.—At Board Room, Royal Surrey County Hospital, Thursday, February 7, 8.15 p.m., joint meeting with Guildford and District Branch of B.D.A. Address by Dr. A. H. Galley: "Ambulant Anaesthetics." The meeting will be preceded by dinner at the Angel Hotel at 7 p.m.

HALIFAX DIVISION.—At Alexandra Hall, Halifax, Wednesday, February 6, 8 for 8.30 p.m., annual dinner-dance.

HARROW DIVISION.—At Tythe Farm House, Eastcote Lane, South Harrow, Tuesday, February 5, 8.30 p.m., clinical meeting. Dr. F. Avery Jones, Mr. J. D. Fergusson, and Dr. J. B. Randall: Symposium on Peptic Ulcer.

LEWISHAM DIVISION.—At Lewisham General Hospital, Tuesday, February 5, 8.30 p.m., meeting. Mr. W. G. Cross: "Teeth."

MAIDSTONE DIVISION.—At Royal Star Hotel, Maidstone, Thursday, February 7, 8.30 p.m., meeting. Lecture by Dr. Robert Forbes: "Medico-Legal Aspects of General Practice."

NORTHERN IRELAND BRANCH.—At Upper Lecture Theatre, Institute of Clinical Science, Grosvenor Road, Belfast, Thursday, February 7, 8.30 p.m., meeting. B.M.A. Lecture by Dr. J. H. Cyriax: "Anatomical Factors in Diagnosis." Members and senior medical students are invited.

NORTH STAFFS DIVISION.—At North Stafford Hotel, Stoke-on-Trent, Thursday, February 7, 7 for 7.30 p.m., annual dinner-dance.

NUNEATON AND TAMWORTH DIVISION.—At Red Lion Hotel, Atherton, Tuesday, February 5, 7.45 for 8 p.m., informal supper followed by meeting. Members and their wives are invited.

PORTSMOUTH DIVISION.—At Queen Alexandra Hospital, Cosham, Tuesday, February 5, 7.45 for 8.15 p.m., dinner; 9 p.m., lecture by Sir Heneage Ogilvie.

REIGATE DIVISION.—At Redhill County Hospital, Tuesday, February 5, 8.30 p.m., meeting. Dr. Christopher Hardwick: "Recent Advances in the Treatment of Diabetes."

SCUNTHORPE DIVISION.—At Board Room, Scunthorpe and District War Memorial Hospital, Thursday, February 7, 8.30 p.m., meeting. Mr. J. Gordon Napier: "Toxaemia of Pregnancy."

STRATFORD DIVISION.—At East Ham Memorial Hospital, Shrewsbury Road, E., Tuesday, February 5, 8.45 p.m., meeting. Film: "Acute Abdominal Problems," followed by talk by Mr. Roy Parkinson.

TEES-SIDE BRANCH.—At Stockton and Thornaby Hospital, Tuesday, February 5, 7 p.m., clinical meeting.

Meetings of Branches and Divisions

DUMFRIES AND GALLOWAY DIVISION

A meeting was held in the Cresswell Maternity Hospital on November 4, 1956. Dr. R. N. Rutherford was in the chair, and 26 members and four guests attended. Mr. D. W. Cole gave an account of how atomic energy is produced. Dr. R. N. Rutherford again took the chair at a meeting in the Dumfries and Galloway Royal Infirmary on December 6, when 12 members attended.

NORTH WALES BRANCH

The autumn meeting was held at the Town Hall, Llandudno, on November 3, 1956. Dr. A. Maddock Jones took the chair and 46 members attended. Professor Charles Rob gave a lecture, illustrated by lantern slides, on progress in arterial surgery as it affects general medicine. Drs. Emyr Jones, P. M. Anderson, Wyn Jones, and A. H. Holmes took part in the ensuing discussion.

SOUTHAMPTON DIVISION

At a meeting on November 13, 1956, the executive committee of the Southampton Division resolved: "While fully supporting the Negotiating Committee, and appreciating the work it has done on behalf of the profession, it was felt that the protracted negotiations were causing increased restlessness and dissatisfaction within the profession, and that the time has now come when the placing of a time limit on the negotiations should be considered."

ANNUAL MEETING: NEWCASTLE UPON TYNE, JULY 10-19

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 9 1957

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British Medical Association

PROCEEDINGS OF COUNCIL

The Council of the British Medical Association met at B.M.A. House on January 31, with Dr. S. WAND in the Chair.

The CHAIRMAN was authorized to convey the congratulations of the Council to the 34 members of the Association upon whom Honours were conferred by H.M. The Queen in the New Year Honours List.

The Council stood in silence in memory of Dr. Hardy Vesey Wells, member of Council, 1937-8.

The new Minister of Health, Mr. D. F. Vosper, M.P., was entertained to a fork luncheon during the day.

President of the Association, 1958

In accordance with the nomination of the Midland Branch Council, Dr. A. BEAUCHAMP (Birmingham) moved that Professor A. P. Thomson, Dean of the Faculty of Medicine, University of Birmingham, be nominated to the Representative Body for the office of President of the Association, 1958-9. Mr. D. S. PRACY (Atherstone) seconded, and the motion was carried with applause.

Second World Conference on Medical Education

A communication was received from the World Medical Association stating that plans were now under way for the holding of the second world conference on medical education in Chicago from August 30 to September 4, 1959. The theme for the conference was "Medicine—a Lifelong Study." Suggestions were invited on specific topics to be discussed. A small committee was set up to consider the matter.

Remuneration Claim

Dr. A. TALBOT ROGERS, Chairman of the G.M.S. Committee, who was received with applause on his return to the Council after his illness, said that, as he saw the position, and as his Committee saw it, the delegation which met the Minister on January 4, although it did not come away with any offer from the Minister beyond the fact that he would see them again, did a great deal of good. It appeared that the Minister felt that what the Government had said should be sufficient for the profession to accept that it was impossible to do anything at all about the claim. But by the time the interview was over it seemed as if he was looking for some way whereby the Government could meet the

profession in some respect. Of his own accord he suggested another meeting during January. There had been a change of Ministers since, and it was not unreasonable that the new Minister should ask for a little longer time. A date had been fixed for February 20. The Negotiating Committee had discussed the matter and members of the delegation had been chosen: Sir Russell Brain and himself as Joint Chairmen, Dr. S. Wand, the Chairman of Council, Dr. A. B. Davies, and Dr. J. D. S. Cameron. The delegation would be accompanied by legal and economic advisers. The Negotiating Committee was to meet the same day to receive a report, and Dr. Rogers hoped there would be something more concrete to report at a later date.

The CHAIRMAN added that there was little to say in addition to the report published in the *Supplement* (January 26, p. 38) of the discussions in the General Medical Services Committee. He thought some progress had been made; one had to proceed step by step in these matters.

A large number of resolutions were received from Branches and Divisions supporting the Negotiating Committee.

Report of Constitution Committee

Mr. H. H. LANGSTON (Winchester), Chairman of the Constitution Committee, presented the final report on the Association's constitution which would be before the Representative Body next July. The draft report had been considered by the Council in May, 1956 (*Supplement*, May 19, 1956, p. 300).

Mr. Langston put forward a recommendation of the Committee "that a special committee be appointed under the title of the 'Young Practitioners Committee' to consider all matters affecting medical practitioners not yet fully established in a defined field of practice, including questions referred to other committees or subcommittees, and to make recommendations." He said that it was becoming increasingly obvious that young practitioners felt there was difficulty in bringing their needs before the Association. There were at the moment three bodies within the Association's organization which dealt with young practitioners: the Registrars Group Council, reporting to the Central Consultants and Specialists Committee, the Assistants and Young Practitioners Subcommittee, reporting to the General Medical Services Committee, and the Medical

Students and Newly Qualified Practitioners Subcommittee, reporting to the Organization Committee. There was no co-ordinating body to which problems of the young practitioner could be brought for central discussion and reference to the Council.

Mr. Langston then quoted figures relating to the numbers of young men joining the Association: in 1945 74% of newly qualified men joined in their first or second year; in 1948 87.9% joined in the first or second year, and since then there had been a steady decline; in 1953 the figure was 68.9%, in 1954 it was 67.8%, and last year 66.3%, so that relatively few of the young men qualifying joined within two years of doing so, and there was a drop of 20% in six years.

Having considered these matters, the Constitution Committee therefore put forward the recommendation for a central committee for young practitioners.

Dr. J. A. L. VAUGHAN JONES (Leeds) said that he found the practical application of this suggestion difficult. How were young practitioners defined? His Division started a young practitioners' group. They were very enthusiastic at first and two of them were co-opted on to the Division's executive committee, but by the time they got to know anything about the machinery of the Association they were no longer members of the group. He failed to see that anything worthwhile could be achieved during the period these young practitioners served on this committee.

Dr. BEAUCHAMP said he understood there was difficulty in getting representatives to serve on the Assistants and Young Practitioners Subcommittee of the G.M.S. Committee. If the young practitioner was keen he would attend his Divisional meetings and make his presence felt. His experience was that this would not work.

Dr. TALBOT ROGERS agreed with the previous speakers. He had sympathy with the scheme but he did not think it was practical. He thought it would be unwise to make a quick decision. The G.M.S. Committee had discussed the matter with two representatives from the Assistants and Young Practitioners Subcommittee. Their feeling was that they would like to take it to their own subcommittee and discuss its implications. The mechanism of how it would work was not clear; was it intended that the existing subcommittees should report not to the parent committees but to the co-ordinating committee, or direct to the co-ordinating committee and then to the other committees? More thought should be given to this problem, and young practitioners should be given the opportunity to say whether this was what they really wanted before the recommendation was presented to the Representative Body.

Dr. W. E. DORNAN (Sheffield) agreed that a little more thought was needed, but he did not agree that because young doctors were birds of passage a young practitioners committee should not be tried. As Chairman of the Organization Committee's subcommittee, from which this idea sprang, he could say that it was the young members of that Committee who put it forward. Also on that subcommittee were two medical students nominated by the British Medical Students' Association. The B.M.S.A.'s nominees served on the Subcommittee for one or two years as students and continued after qualification. They served for three or four years and became very useful members.

There were two points to consider, Dr. Dornan said. There was the view of the Finance Committee that the proposed committee was unnecessarily large and likely to be costly; and the point that if the proposed committee included representatives of the British Medical Students' Association and also representatives of the deans of medical schools, the Newly Qualified Practitioners Subcommittee of the Organization Committee could be abolished and this would be a financial saving. The recommendation postulated an entirely new committee in addition to the other subcommittees. In that sense he would ask Mr. Langston to have another look at the matter in consultation with the Organization Committee.

Dr. F. GRAY (London) supported the plea for further consideration of the matter. The Assistants and Young

Practitioners Subcommittee of the G.M.S. Committee, of which he was chairman, was very anxious to have a look at this proposal. Everyone agreed that something should be done, but not all agreed that it should be done in this way. He suggested that it should be deferred until the next meeting. He moved accordingly.

The motion was seconded from the meeting.

Dr. J. L. MCCALLUM (London) said that although the proposed committee might not be the best solution the principle behind it should be accepted in principle. It was a most hopeful sign to the young members of the profession. He hoped that Dr. Dornan's suggestion for enlarging its membership would be considered. He understood that in Australia officials of the Branches went to medical schools to talk to fourth-year students, and they obtained a 90% membership.

Mr. A. LAWRENCE ABEL (London) asked if every consideration had been given to more being done in the local Division meetings. A large number of the newly qualified practitioners who were provisionally registered, or doing their third or fourth resident appointment, or who were assistants felt isolated from the main body of the profession, and he thought more consideration could be given to ways in which senior doctors could get together with their juniors. He did not see otherwise how these men could get their representatives properly elected. Mr. Abel supported the suggestion that consideration should be deferred.

Mr. LANGSTON said that the Committee would accept the deferment of approval of details, but he hoped the Council would approve the proposed committee in principle.

The amendment that consideration be deferred so that the recommendation could be referred to the appropriate committees, including the Organization Committee, was carried.

On the question of approving the principle of the formation of a Young Practitioners Committee, Dr. R. G. GIBSON (Winchester), Chairman of the Organization Committee, said that there was a considerable amount of frustration and unhappiness among young doctors. The fundamental thing they wanted was a forum or parliament which had direct access to the Council. Why should not the young practitioners feel that he had this right? "Let the young practitioners have somewhere where they can talk and know that we shall hear them direct." He hoped the Council would approve this committee in principle.

The CHAIRMAN said that he thought the proposal to approve in principle the setting up of this Committee was out of order. Council had decided to defer making a decision on the recommendation. It was now suggested that a decision should be made on all except the details. He must rule the present discussion out of order. Everybody would have the opportunity of putting their point of view in the future.

Mr. LANGSTON moved that the Report of the Constitution Committee as a whole be approved for presentation to the Representative Body. Before making its Report in final form the Committee had taken into consideration Council's views on the draft Report and suggestions from many quarters.

The final Report did not differ in any major recommendation from that presented to the Council last May, but much time had been spent in clarifying the Report, and he hoped Council considered that ambiguities had been cleared away and that the Report was now a suitable document to go forward to Divisions and to the Representative Body.

Dr. VAUGHAN JONES said that this Report was asked for by the Representative Body and should go direct to that Body. It would not normally go to the Representative Body without comment from the Council.

The CHAIRMAN replied that this was a report from the Constitution Committee to the Representative Body, and all the Council was asked to do was to approve its transmission to the Annual Representative Meeting. The Council accepted no responsibility for it but was at liberty to comment on it.

Dr. VAUGHAN JONES then moved that the Report be approved for presentation to the Representative Body. The CHAIRMAN pointed out that the Council should only approve

the fact that it went to the Representative Body, and Dr. VAUGHAN JONES altered his motion to read: That the Report should be sent to the Representative Body without comment.

Dr. E. C. DAWSON (Derby) said that the Report was a long and interesting document and should be circulated when the mind of the profession could be given to it and was not diverted by the remuneration issue. He would suggest that the timing of the presentation of the Report should be dependent upon the state of the negotiations with the Ministry.

Dr. BEAUCHAMP hoped that it would not be assumed that every Division or every doctor had a one-track mind. He hoped they would go on with it. Dr. J. A. PRIDHAM (Weymouth) agreed.

Mr. LANGSTON hoped the Council would not prevent the matter going forward. He thought the Representative Body would expect to see the Report soon. It had already taken nearly three years to complete. Dr. DAWSON still did not agree.

The amendment that the presentation of the Report be deferred until the time was opportune in the opinion of the Chairman of the Council was lost. The motion approving the presentation of the Report to the Annual Meeting was carried.

It was agreed that the Report should be published in the *British Medical Journal* in advance of the Report of the Council and that Divisions be asked to consider it as soon as possible.

Dr. VAUGHAN JONES congratulated Mr. Langston on the work which he and his Committee had accomplished. The CHAIRMAN added his appreciation of Dr. L. S. Potter's work in preparing the Report.

Hungarian Refugee Doctors

The CHAIRMAN reminded the Council that at the last meeting he was empowered to take steps to issue an appeal to the profession for financial help for doctors from Hungary. The situation had been most confused. He asked for Council's views on the matter in the light of all the circumstances. After some discussion it was agreed that the Chairman should publish a letter in the *British Medical Journal* asking for contributions to provide for the immediate necessities of their Hungarian colleagues.

A letter was received from the Austrian Medical Association asking for assistance. All its available funds had been expended in helping Hungarian refugee doctors, and the Council agreed that any surplus remaining from any fund raised from the profession in this country should be sent to Austria.

It was reported that over 50 Hungarian doctors were known to be in this country, many of whom had been interviewed by the medical director of the International Medical Visitors Bureau of the B.M.A. Financial assistance to the amount of £530 had been given where it was needed.

Finance

Mr. L. DOUGAL CALLANDER, Hon. Treasurer, presented the report of the Finance Committee.

Mr. Callander said it must be obvious from the revenue and capital budgets for 1957 that the situation was not what one would like. He thought it advisable to give the Council the financial background of the Association from two years ago to the present. The Council could then discuss how trends could be remedied.

In 1955 the year finished with a balance of £55,000, £30,000 of which was invested in such a way that the capital would be returned intact with some interest. £5,000 was set aside for the Edinburgh meeting, £5,000 for special legal costs, and £15,000 was carried to the Accumulated Fund. During 1956 there was extra printing, paper, and postage costs for the *Journal* which reduced the surplus on the journals to the region of £1,000. Increases in salaries had been given to the staff. Subsistence expenses to members attending Council and centrally arranged meetings cost

£1,100 in 1956, and in a full year would cost £6,000 including the Annual Representative Meeting. There were increased capitation grants for Branches—and then one came to inflation. Inflation affected everything in the running of the Association, and, although the membership reached the highest figure ever in the history of the Association, the surplus in 1956 would be in the region of only £12,000.

The budget for 1957 showed there would be an estimated surplus of only £702 on the year's working. There was no provision for contingencies in this budget, no provision for the Edinburgh meeting, and no provision for a Special Representative Meeting, which might quite easily be necessary with the remuneration claim now proceeding. Provision had, however, been made for the extra day during which the 1957 Annual Representative Meeting would discuss the report of the Constitution Committee. The budgeting was extremely accurate, and there was no hope that the end of the year would see a larger surplus than was budgeted for.

Mr. Callander then dealt with the measures which could be taken to offset this trend. If all the activities were continued, with no provision for contingencies, and even if the membership increased, it would not be possible to show the £12,000 surplus of last year. Had the membership not increased very considerably during the last two and a half years a loss would have been shown in 1956. It would be appreciated that the membership saturation point was coming nearer.

The Finance Committee had made certain recommendations and suggestions. Inflation was still present and the trend of increased costs was continuing. It was imperative that economy with reasonable efficiency must be effected, otherwise a considerable loss would be shown in 1957, and so far as the Treasurer could see the Association would be faced with the same prospect in 1958, as there was no reason to suppose that inflation was going to end. In two years this could result in an overdraft, and no one wished to have a repetition of what occurred some five or six years ago.

He hoped the Council would agree to a communication being sent to chairmen of committees and subcommittees by the Treasurer, asking that the number of meetings should be kept to a minimum consistent with efficiency. It was suggested that an internal investigation should be conducted by the heads of departments and the Treasurer, in consultation with the various chairmen, so that every possible day-to-day item could be gone into in each department.

The Journal Committee hoped to turn the loss estimated in its budget to a possible surplus of between £8,000 and £9,000. This was not enough for the whole Association, but the Treasurer thought it wrong that whenever the Association was in difficulty the *Journal* should be relied on to put it right. The publications department must, of course, bear its share, but others must also. The Finance Committee suggested that economies in the region of £20,000 must be made. Already the Science Committee had agreed to a saving of £1,000 on postages on books from the library, and the Estates Committee had increased rents, which would produce over £2,000 in a full year. The National Insurance Defence Trustees had agreed to bear all but £500 of the cost of the General Medical Services Committee last year. A recommendation that the British Commonwealth Medical Conference should not be held this year would save £2,500.

Alternative

No doubt, continued Mr. Callander, some members of Council were asking what was the alternative. It was as simple as this: to launch a scheme to increase the subscription by £2 2s. £1 1s. would not be enough, because there would possibly be a decrease in membership if the subscription was raised. He was the last person to want to recommend an increase in the subscription, and he

trusted he would have the help and co-operation of all members of the Council, Chairmen of Committees, and the staff in an endeavour to make the economies he had outlined. This was not the time to panic, the Treasurer concluded, but for serious thought.

Dr. J. G. M. HAMILTON (Edinburgh) said that the Council must approach the question of an increase in the subscription in a realistic way. The increase in the cost of living not only affected the individual but the Association. The remuneration claim was for 24% increase, and if this was applied to the subscription it should be £7 17s. 6d. Did the Council really believe that with an organization of this size, which purported to give the service which it did, it could continue to do so reasonably and adequately for as small a sum as £6 6s.? The *Journal* cost members nothing, and the whole of that £6 6s. was used on the secretarial side of the House. He was not making any motion, but could not an organization of this magnitude with its enormous diversity of activity reasonably expect that its members could pay a subscription of £10 10s. or £12 12s.? He suggested that members should look at their golf club subscriptions.

The CHAIRMAN said that he understood the subscriptions of other professional bodies were to be raised. Did the Council feel that a warning of the necessity to raise the subscription should be given? Dr. Hamilton had emphasized that if the Association was to do the job which the members expected it would cost money.

Mr. A. STAVELEY GOUGH (Watford) said that the membership had been considerably increased and the cost of living was not the only factor; the Association was doing more and must put its affairs in order.

Dr. WRATHALL ROWE asked if he understood the Hon. Treasurer to say that £30,000, which was surplus to income, would be repaid in October.

Mr. CALLANDER replied that that money was the beginning of a reserve fund of £200,000.

Dr. I. D. GRANT (Chairman of the Representative Body) said that the Representative Meeting had to be shown that the Council was doing everything in its power to run the Association as efficiently and economically as possible.

Two years ago it was agreed that £5,000 should be set aside each year for the Edinburgh meeting. It was his impression that the money would be taken out of Association funds and put into a separate account, but he now gathered that that was not the case. The money had been allocated but was included in the £30,000. If this was so, he thought the £10,000 already allocated should be taken out of the £30,000 and put into a separate account for the Edinburgh meeting.

Mr. CALLANDER replied that the allocation for the Edinburgh meeting had not been put into a special account, it was left in the running accounts of the Association.

Dr. GRANT reiterated his view that this money should be put into a special account. It should be invested and then used for the Edinburgh meeting, not for the ordinary purposes of the Association.

The CHAIRMAN said there were two accounts—capital, which included the saving of previous years, and the current account. The capital account might be lumped up in a big figure or it might be divided up into the items for which it was earmarked. The money for the Edinburgh meeting had not been earmarked, but if it was the wish of Council that could be done in the accounts to be presented at the next meeting.

Dr. GRANT said he would be quite happy if it was done in that way. Dr. TALBOT ROGERS said that the Treasurer had stated that nothing had been earmarked in this budget for Edinburgh. The CHAIRMAN said that was so, and Dr. ROGERS said that, having decided to set aside £5,000 each year for Edinburgh, there was a moral obligation to include that £5,000 in the budget.

The CHAIRMAN said that the £5,000 could be included, and there would then be a deficit.

Dr. TALBOT ROGERS said that it had been said that the profession must be prepared to pay more to the Association, and that the activities of the Association had increased.

There was probably an idea at the back of people's minds that extra expense had been incurred in view of the remuneration claim. The National Insurance Defence Trust Fund had paid everything except £500 towards the costs of the G.M.S. Committee and towards the cost of the Negotiating Committee, so that the general practitioner section paid nearly 15s. extra per year.

Dr. I. M. JONES (Sunderland) said that surely the difficulty in 1957 could be met by an overdraft. It was the duty of Council members to point out to their constituents that the Association could not be run properly on the present subscription. The Council must face the issue now and tell the truth to the Representative Body.

Mr. CALLANDER agreed with Dr. Hamilton that it was essential that the money for Edinburgh should be found. He would do everything he could to see that the £5,000 each year until 1959 was put aside. Replying to Dr. Jones, he said the trend for increased costs was still there, but there was no knowing what might happen between now and December.

Dr. CATHERINE HARROWER (Glasgow) pleaded for a complete balance sheet and budget which would show the contribution which had been made to the expenses of the G.M.S. Committee, which cost £10,000 or £12,000 per annum to run, by the National Insurance Defence Trust. The proposal to include the allocation of £5,000 for the Edinburgh meeting in the 1957 budget was carried.

Mr. LAWRENCE ABEL thought that ways and means could be found of making up the deficit. Dr. J. C. ARTHUR (Gateshead) thought the Council should concentrate at this moment on economies.

Dr. BEAUCHAMP said that the average member would expect the Association to cut its coat according to its cloth, and he thought that they must try to economize; Dr. PRIDHAM thought it would be extremely foolish to try to increase the subscription at the moment, although the subscription was cheap. He was chairman of the Organization Committee when the last increase was made and knew the worry which it caused. He suggested that the question of the payment of subsistence allowances should be looked at again.

The CHAIRMAN said that it was obvious that the general view was that no precipitate action should be taken, but that the whole question must be borne in mind.

Public Health

Dr. JOHN B. TILLEY presented the Report of the Public Health Committee. The Committee's recommendations that advertisements from local health authorities should not be accepted after April 30 next unless the authority had accepted and implemented M.D.C. Circular No. 32, and that the Ministry be pressed for a reply to the request for a Public Health "Spens," were accepted, together with a recommendation that a protest should be sent to the Ministry of Health on its action in dispensing with the requirement to advertise medical officer of health appointments in a county council area.

The most important matter in the report, said Dr. Tilley, related to the question of the integration of the medical officer of health with the hospital service. It had been before Council earlier and had been the subject of some discussion. One body had already expressed its views on the matter to the Minister, but the Society of Medical Officers of Health had delayed sending its views forward in the hope of getting an agreed policy with the Association.

The matter arose out of the Guillebaud Report, which recommended that a medical officer of health or a member of his staff should be given an honorary post in a hospital which would encourage the development of a closer link between the hospital and local health authority service. The Guillebaud Committee went on to suggest that he should of right be a member of the medical advisory committee. But the Public Health Committee was not asking that he should be there of right. It did feel, however, that the views of the Guillebaud Committee, which had given

careful consideration to the facts, had put forward something which might be of great value in improving the co-ordination of the National Health Service. He therefore put forward the recommendation of the Committee that the Council should agree with the principle that medical officers of health or a member of their staff should be appointed honorary consultants of hospital groups and that regional hospital boards should be urged to consider such appointments in the interests of all concerned, and that the principle of medical officers of health serving on medical advisory committees should be agreed to.

Mr. STAVELEY GOUGH said that there might be more than one medical officer of health in the region served by the hospital group; not all of them could be consultants.

Dr. H. D. CHALKE said that there was no question of that. All they wanted was that a medical officer of health should be the consultant in epidemiology to a group of hospitals. If there was more than one, presumably one would be selected to serve. Mr. STAVELEY GOUGH replied that the recommendation did not say that; the Guillebaud Report suggested a representative. Dr. TILLEY said that it was not intended that every medical officer of health in any area should be on the staff of any hospital. That was not feasible.

Dr. DORNAN said that the converse occurred in big cities where there were several hospital groups and only one medical officer of health, and even if he had one or more deputies who might be of sufficient calibre to qualify as a specialist in epidemiology it would not be practicable for them to be on every hospital group committee in the area or attached to the staff.

Dr. GRAY said that an admirable report on a difficult and controversial matter had been put forward. The Council was being asked to agree on the principle, not to say that this should be done in every case everywhere. Surely it could be agreed that it was a good principle that a medical officer of health should be appointed as a consultant if there were suitable people available for the post. Dr. BEAUCHAMP hoped boards of governors could be included in the recommendation.

This was agreed to, and the recommendation was carried. A further recommendation that the Council should agree with the principle of medical officers of health serving on medical advisory committees in the interests of all concerned was carried. It was also agreed, on the motion of Dr. CHALKE, that the Ministry of Health and the Society of Medical Officers of Health be informed of the Council's views.

With regard to the procedure for securing nominations for medical officer of health representatives on regional hospital boards, Dr. GRAY said that the principle was admirable but the proposed method was bad. Surely there should be consultation in the first place and any disagreement should be ironed out. He hoped Dr. Tilley would look at this again.

Dr. TILLEY said that the matter was closely discussed with the Society, and this was the agreement which had been reached. He thought there would only be occasional difficulty and he did not think they could go back and ask for anything else.

The remainder of the report of the Public Health Committee was approved.

Private Practice

Dr. A. BROWN (Cambridge) put forward the report of the Private Practice Committee. It was agreed that a strong protest be sent to the Home Office on the appointment of a whole-time local authority employee as coroner for a county borough. Arising out of the question of compensation for doctors injured or killed while attending accidents, the Council adopted the Committee's recommendation that practitioners be advised of the financial risks entailed by the lack of adequate cover, that they could be covered only by adequate accident insurance, and that it would be advisable for those under contract with an employing authority

to ensure that there was a suitable clause in their contracts covering the payment of compensation in the event of death or disablement attributable to the nature of their duties.

A further recommendation that remuneration of practitioners appointed to undertake special routine medical examination of children at boarding-schools and to advise the school authorities generally on matters of health and hygiene should not be less than £1 15s. per scholar per annum was also carried.

General Medical Services

Dr. TALBOT ROGERS, presenting the report, said that there were no recommendations. He drew attention to the agreement of £44m. as the amount for the central pool for practice expenses for 1954-5. This was three times the amount for the previous year. This gave some impression of the way practice expenses had increased, and reinforced the argument with the Minister that remuneration should be adjusted.

Dr. WRATHALL ROWE said that he had been approached by many of his constituents who were dissatisfied with having to wait so long for their practice expense money. Could not the General Medical Services Committee come to some arrangement with the Ministry so that there was an automatic payment on account?

Dr. TALBOT ROGERS said that that idea had been put forward in the Committee and had been discussed. The difficulty was that the size of the settlement varied every year, and it was hoped to maintain the total pool in such a way that there would always be more than £2m. to distribute. A most important factor was the earnings from private practice, which stood at the moment at £2m.

The remainder of the report was approved.

Occupational Health

Dr. VAUGHAN JONES presented the report. Recommendations relating to the remuneration of whole-time industrial medical officers, to be presented to the Representative Body for adoption, were accepted, together with recommendations relating to fees under the Mule Spinning (Health) Special Regulations, and fees paid to appointed factory doctors. The Committee's suggestion that the resolution of the Representative Body relating to the administration of morphine by nurses in industry be sent to the Home Office was accepted, as well as a recommendation that interested bodies be informed of the Representative Body's view that nursing staff should never use antibiotics or chemotherapy in industry without the express instructions of a registered medical practitioner in writing in each case. Other recommendations which were adopted dealt with the assistance which a local authority could give in the employment of older workers by providing suitable premises and supervision for simple assembly work arising out of a resolution passed by the Conference of Advisory Councils on Occupational Health last year and which it was agreed should be sent to local authorities for possible implementation; with the sending of pharmaceutical advertisements to welfare officers of industrial concerns; and with the terms of prescription relating to several industrial diseases. In the one case suitable communications were to be sent to the pharmaceutical industry and to the Industrial Welfare Society, and in the other the Industrial Injuries Advisory Council would be informed that the Association did not wish to submit additional evidence.

Organization

Dr. R. G. GIBSON presented the report of the Organization Committee, which put forward proposals for the amendment of Standing Orders, the term of office of Chairmen of Council, and the method of filling vacancies on the Council. Dr. Gibson said that the term of office of Chairman of Council had been the subject of considerable discussion. There were two points of view: that it could be left to the common sense of Council or that there should be a definite term of office laid down. Common sense might be swayed by sentiment, loyalty, and good manners, and the

Committee felt that it would be wise to lay down a definite term of office, suggesting a maximum of five years at any one time. There were also recommendations on the period of office of chairmen of committees and subcommittees.

Dr. DAWSON thought the recommendation should specify five years' total or continuous service. The CHAIRMAN said that this was only set up for the guidance of Council, it would be a standing order and could be altered; Dr. TALBOT ROGERS commented that once something got into standing orders it became rather a law of the Medes and Persians.

Dr. F. M. ROSE (Preston) thought they were forging chains for themselves. If a chairman was not reappointed at the end of the initial three years it would be felt that there was some reflection on him which might not at all be the case. It would be better left to the good sense of the Council.

Dr. R. FORBES (Hendon) thought there would be some encouragement to younger men coming into the central work of the Association if some offices were limited in time.

Dr. GRAY said that the chairmanship of Council was not a reward for services rendered; the Council knew when the chairman had been in office long enough. He hoped the Council would adhere to its previous practice.

Dr. G. W. IRELAND (Midlothian) supported the recommendation. It enabled the Council to have the chairman they wanted for as long as they wanted him.

Dr. H. H. D. SUTHERLAND (London) pointed out that in 123 years there had been 23 Chairmen of Council, who had served an average of 5.3 years each. He did not think they could improve on that.

Dr. GIBSON said that legal opinion would have to be sought on whether a term of office could be renewed, and with this proviso the recommendation was carried.

With regard to the proposal to limit the term of office of chairmen of committees, Dr. TALBOT ROGERS said that the position here was a little different, particularly with regard to the autonomous committees, who should be able to elect their own chairman. This proposal took away that right.

Dr. GRAY supported Dr. Talbot Rogers. This was not a matter of extreme urgency, and he thought the Committee might be asked for their observations on this proposal. He would move that consideration of this proposal be referred to the committees concerned for their views. Dr. SUTHERLAND seconded. Dr. GIBSON accepted the proposal.

A recommendation was adopted that, in the event of one of the 13 members of Council elected by the Representative Body being appointed as Chairman of Council, a vacancy among the 13 should be deemed not to have arisen, and By-law 70 should be amended accordingly. A recommendation to fill a casual vacancy by a postal vote was withdrawn, and recommendations for amendment to the Articles of Association and the By-laws in relation to previous decisions of the Council were accepted.

The Committee reported that the membership on December 31, 1956, was 70,152, compared with 68,926 at the end of 1955. The membership included over 80% of the working profession in the United Kingdom. A proposal that a full-time secretary for Northern Ireland should be appointed was considered by the Committee, but it was felt that the existing arrangements in respect of regional medical secretaries was preferable to the appointment of medical secretaries resident in the regions.

The report was adopted.

"British Medical Journal"

Dr. J. G. M. HAMILTON, presenting the report of the Journal Committee, said that an extra meeting was held at the invitation of the Finance Committee in order that the Council might be given a more up-to-date estimate of the budget predictions for 1957. The Committee estimated that the advertising revenue for 1957 might be greater than at first anticipated, and costs slightly lower.

With these considerations in mind the Journal Committee was prepared to suggest that the various publications would together provide a gross surplus in 1957 in the region of

£8,000 to £9,000, but the forecast might be upset by circumstances outside the control of the Journal Committee. The Report was adopted.

Science Committee

Mr. J. R. NICHOLSON LAILEY moved the adoption of the Science Committee report. The Committee recommended, in view of the financial position of the Association, that payment of outward postage on books borrowed from the library should be discontinued as a temporary measure; that the Minister of Transport be requested to receive a deputation on the subject of the introduction of legislation requiring motor-cyclists to wear helmets of an approved pattern; and that foreign corresponding members of the Association be appointed. These recommendations were accepted. The Committee also recommended that the Public Health Committee should deal with the question of clean milk, and that the problem relating to the question of attributable illness should be referred to the Committees of the Association dealing with the various aspects of the profession of medicine. The Council decided to refer the latter problem in the first instance to the Compensation and Superannuation Committee.

The Report was adopted.

Other Committees

Dr. W. M. KNOX presented the report of the Scottish Committee. He said that the new Scottish House would be opened on May 2 next.

Mr. L. DOUGAL CALLANDER, moving the report of the Estates Committee, said that consideration had been given to the question of a B.M.A. House in Belfast. It was suggested that a house should be purchased and adapted, but negotiations had been proceeding with the Methodist organization, who were erecting a new building and who would be very pleased to receive the Association as tenants. The Belfast members thought it would be ideal. The present accommodation in Belfast was somewhat indifferent. The Committee recommended that a lease be accepted for a term not exceeding seven years, and this was accepted by the Council after questions as to the accommodation had been answered by Dr. N. S. DICKSON.

Recommendations by the Office Staff Superannuation Fund Committee for a new Trust Deed for the Fund was accepted. Counsel's advice had been taken, and the new deed had been drawn up in accordance therewith. The Chairman of the Council, the Treasurer, and the Financial Comptroller were appointed to act as Trustees of the fund. Professor D. E. C. MEKIE presented the Overseas Committee report.

A recommendation that a loan should be sympathetically considered for the Jamaica Branch to build a hall for its own use on land already in its possession was withdrawn for further consideration.

Dr. TALBOT ROGERS said he thought the Trustees of the N.I.D.T. Fund would like to consider this matter so that they might help their colleagues in Jamaica, and he asked that the recommendation be deferred to enable them to do so.

Dr. HARROWER, Hon. Treasurer of the Fund, seconded the proposal. The matter could be considered at the next meeting of the Trustees.

This was agreed to, the CHAIRMAN expressing thanks to Dr. Talbot Rogers and Dr. Harrower for the suggestion. The report was accepted.

Dr. R. FORBES, moving the report of the Central Ethical Committee, put forward advice to be tendered to the British Rheumatic Association in regard to the list of specialists in rheumatic diseases kept by that body and issued to doctors of persons who became members of the Association who desired to have a private consultation at a reduced fee. The recommendation for advice to be given to the British Rheumatic Association was accepted.

Mr. A. DICKSON WRIGHT, presenting the report of the Medical Act Committee, which was set up to consider a resolution of the Annual Representative Meeting to consider

the working of the Medical Acts 1858-1950 in view of the proposal to set up a consolidating Act, said that the Committee was interpreting its terms of reference, now that the consolidation measure had received the Royal Assent, as if the motion referred to the Medical Act, 1956. An initial survey had been made of the difficulties attendant upon provisional registration, and the procedure for electing direct representatives to the General Medical Council, and the question of disciplinary procedure was to be considered. The Defence Societies had been invited to prepare a memorandum on the difficulties which had arisen since the operation of the 1950 Medical Act.

The report was accepted.

Dr. H. H. D. SUTHERLAND moved the Amending Acts Committee Report. The Committee felt that the resolution of the Brighton meeting stating that the attention of the Government should be drawn to the need for continuous education of the public in the use of the National Health Service was very useful. It recommended that a letter be sent to the Ministry of Health drawing attention to this matter.

This recommendation was accepted.

Dr. Sutherland added that the question of a code of conduct for patients had been considered several times. The Committee believed that there were a number of people in the country who caused annoyance to the doctor and who wasted his time, which must cause misuse of public money. It was extremely difficult to decide how best to deal with this. Parliament would not stand for serious penalties, but in view of the malicious complaints laid against doctors by members of the public two suggestions had been made. One was that when a person made a complaint he should be expected to lodge a sum of money—the Committee made no recommendation on the amount—which would be returned if he proved his complaint. If he failed, the money would be withheld. Secondly, if a doctor found that there were people who continually wasted his time he should be entitled to make representations to the executive council, who would refer it to the appropriate committee. A letter could be sent to the patient, which would be very useful in dealing with people who made a habit of vexatious annoyance.

Dr. TALBOT ROGERS said that both these suggestions had their dangers. The point had been made, whenever the regulations had been discussed, that it should be made as easy as possible for complaints to be put forward. In London, if the chairman did not feel that there was a prima facie case, no more was heard of it. He did not think that the Ministry or Parliament could be converted to the idea that "conduct money" should be asked for in the way suggested. Secondly, it seemed to him that, if a doctor had the right to communicate with the executive council in this way, that body would have to ask the patient what he had to say, and there would be further inquiry before the medical services committee. He thought the dangers in both suggestions would make it unwise for them to be adopted.

Dr. PRIDHAM said that if the chairman knew that there was a "fine" if a complaint was not substantiated he might feel that it must be considered by the medical services committee.

Dr. GRAY said that it was possible for chairmen to rule that there was no prima facie case on a frivolous complaint. The report used the words "savage penalties." It was unfortunate that words used at the Representative Meeting should be incorporated in the Committee's report. Dr. Dain had had a committee which had gone through all the regulations, and no evidence was ever brought to it that savage penalties were being inflicted. All the bodies concerned had declared that they were satisfied with the present machinery.

Dr. SUTHERLAND said that the Representative Body used these words and his Committee was instructed to look at it. It had done so and brought the matter back for action. No stated recommendation had been made. If the suggestions were to be referred back he hoped Council would give some definite instructions.

Dr. DORNAN moved that this paragraph be not approved, and that the Council should inform the Representative Meet-

ing that there was no evidence before it of savage penalties being imposed.

This was agreed to.

Dr. Sutherland reported that the Committee was studying the Australian Health Service. The Committee would like to know if the Council wished it to proceed with this study, and to study the medical services of other parts of the Commonwealth.

The Council agreed that this study should continue as part of the work of the Amending Acts Committee.

The remainder of the report was approved.

The reports of the Maternity Medical Services, the Edinburgh Meeting, and the Joint Formulary Committee were received and adopted without discussion.

The Council elected 26 new Members and the proceedings concluded at 7 p.m.

BRITISH MEDICAL GUILD

A meeting of the Board of Trustees of the British Medical Guild was held at B.M.A. House on January 30, with Dr. S. WAND presiding.

It was reported that a circular letter was issued on December 24, 1956, to all Honorary Secretaries of Divisions and Branches of the British Medical Association in the United Kingdom inviting them to convene early meetings of the profession for the purpose of arranging the appointment of local committees of the Guild. Since then some 150 Divisional areas had either held meetings or had arranged meetings out of a total of 219, so that the great majority were acting. A reminder is to be sent to those who had not yet notified any action being taken.

Resolutions were reported suggesting various methods of procedure, but it was decided to defer consideration of these until after the next meeting with the Minister, it being left to the officers to decide on any action which might become urgently necessary in the meantime.

TEMPORARY TRANSFER OF TELEPHONE CALLS

The Post Office has stated that at some telephone exchanges it will shortly be able to arrange for doctors to have calls from patients temporarily transferred to another number while at the same time enabling the reception of private calls to continue. A second number will be allocated, which will not normally be shown in the *Telephone Directory* or disclosed to inquirers. Calls made to the second number will by-pass the transfer arrangements when these are in force for the main number.

The charge will be 10s. a quarter. If the second number is to be shown in the directory—say against the name of another member of the doctor's family—a small additional charge will be made. Any doctor who is interested, and who uses the temporary transfer of calls service at the regular user or "contract" rate, should get into touch with the local telephone manager, who will let him know if it is possible to provide the service.

REMUNERATION CLAIM

MEETING IN CORNWALL

Some 80 doctors, members and non-members of the B.M.A., in the Cornwall Division area attended a meeting at Truro on January 27. All branches of the profession were represented. The following resolution was passed unanimously:

That this meeting of the medical profession in Cornwall fully approves the action taken by the Negotiating Committee of the British Medical Association to obtain the increased remuneration owing to the profession under the terms of the Spens agreements. It urges the Committee to redouble its efforts and press the claim by all possible means.

WORLD MEDICAL ASSOCIATION BRITISH SUPPORTING GROUP

A representative gathering of doctors and of the ancillary professions, held at B.M.A. House on January 29, decided the time was suitable for the formation of a British Supporting Group for the World Medical Association.

A Steering Committee—consisting of Dr. Alexander Hall, President of the B.M.A.; Dr. S. Wand, Chairman of Council of the B.M.A.; Dr. Ian Grant, Chairman of the Representative Body of the B.M.A.; Dr. J. A. Pridham, Chairman of the International Relations Committee of the B.M.A.; Dr. J. Beynon; Dr. R. L. Luffingham, of Hull; Dr. J. Hazleton, of Reading; Dr. J. G. McCrie, Dean of the Faculty of Medicine, Sheffield University; Mr. H. Parker Buchanan, of the British Dental Association; and Miss C. M. Hall, of the Royal College of Nursing—was appointed, with powers to co-opt, to do the necessary work precedent to the formation of the group.

World Medical Opinion

Dr. A. HALL, who presided at the meeting, said that 125 years ago the sense of a growing need for doctors to have an organization to act as a clearing-house for ideas and information directly concerning their profession had led to the formation of the British Medical Association following a meeting at Worcester. Now New York and Moscow were much nearer London than had been Worcester, and the need to embrace a wider area had led to the formation 10 years ago of the World Medical Association. To-day that body had become a recognized authority for the expression of world medical opinion. Its activities had become diverse and far-reaching in playing its part as the mouthpiece of doctors. It was felt that many would be interested in furthering the activities of such an association by the formation of a British supporting group.

Dr. S. WAND, who briefly referred to the formation of the W.M.A. at the close of the war, said it had done a great deal of work for the practising doctors of the world through their national organizations. It was an association of national medical associations of the world and in that way represented the doctors of a large number of countries. To-day, when there were bodies like I.L.O. and Unesco and similar organizations representing governments, it was very necessary there should be some association to represent the views of the practising doctor, the more so because there had been many cases in the past where the views of governments had been quite different from those of the doctor. In many ways the W.M.A. was a clearing-house for ideas, and over the past few years its influence had increased considerably.

Attempts to Subjugate Doctors

The W.M.A. had been able to help in those countries in which attempts had been made to subjugate the doctors to the State, said Dr. Wand. In many ways the W.M.A. had an impact on the everyday lives of doctors, but it did even more than that in that it brought together people who had a common interest. It was important that its influence should be widened. The idea of setting up a supporting group was to spread an appreciation of the importance of doctors getting to know each other's problems in the international field. Such groups already existed in Australia, Canada, the U.S.A., Sweden, and Italy. In this country we seemed to have fallen a little way behind.

Dr. J. A. PRIDHAM, who spoke from experience as a member of the W.M.A. Council for seven years and as Chairman of its Education Committee, and who had attended the General Assembly each year, said he thoroughly believed in it. International organizations existed, they functioned, they were powerful, and they could not be ignored. All over the world peoples were interested in and demanding health schemes, and that meant politicians were interested also. It was as important in the international sphere as it was in the national that there should be some body to support the doctors. In another direction the W.M.A. was

now trying to get recognition of an emblem for civilian doctors in the event of war which should have a similar standing to that of the Red Cross with the military.

Small Resources

Dr. Pridham said that at present the W.M.A. worked through a small council of about a dozen members and on a budget of less than £50,000 a year, of which about three-quarters came from one source, the U.S.A. It had a tiny secretariat with one doctor as secretary-general—part-time. Constantly there was work which had to be left untouched because of the smallness of the resources available.

A discussion which followed was opened by Dr. J. G. McCrie, who said that from the point of view of engaging the interest of non-medical educational bodies, which was apparently one of the objects in forming the group, much more might be made in the literature of the W.M.A.'s educational activities. There was also the question of the corporate subscription. There were no doubt bodies to which a subscription of £25 would hardly seem adequate to the needs of the work, but to a university that sum might be rather large.

In answer to questions about the use of the funds which might be collected by the group, it was explained that in other countries such funds had been used for work of particular interest to the country concerned. In Sweden it had been directed to finance social security research, a matter which particularly interested Sweden. In Canada it had gone to financing the visits of medical teachers to undeveloped countries. In America the funds went largely to financing the New York offices of the organization and to subsidize the production of the *World Medical Journal*.

Mr. PARKER BUCHANAN mentioned that for 58 years the dentists had had an international organization which had proved most successful. They held an annual conference in some big capital city. Although the British Dental Association had a membership only one-fifth to one-tenth the size of the B.M.A. it had about 1,000 members subscribing to the international body, and for that subscription they got nothing but the pleasure of attending the international conference and supporting the International Federation.

S.H.M.O.s IN CONSULTANT POSTS

CLAIMS FOR REVIEW INVITED

Following discussions in Committee B of the Medical Whitley Council on a claim by the Staff Side that S.H.M.O.s in posts of a consultant nature should be paid on the consultant scale, the Management Side, though not accepting the general principle, has agreed that the Committee should examine the circumstances of individual posts which the Staff Side may put forward.

Three considerations will govern the Committee's examination of such cases—i.e., duties, responsibilities, and quality of the service given.

S.H.M.O.s in one or more of the following categories who feel they can claim to be considered are invited to apply for a form on which to give details of their posts: (1) Those who hold posts that are established as consultant posts; (2) those who hold posts that for the purpose of replacement would be graded as consultant posts; and (3) others who carry out consultant work with full and independent responsibility.

It is pointed out that many S.H.M.O.s in categories (1) and (2) will be those who held hospital staff appointments before July 5, 1948, but were not given consultant grading in the National Health Service, and have continued in the same appointments.

Requests for forms should be sent to the Secretary of the Association, B.M.A. House, Tavistock Square, London, W.C.1, as soon as possible, and completed forms should be returned to the Secretary not later than March 2.

ANNUAL MEETING, NEWCASTLE

CARAVAN PARK

Arrangements have been made at Newcastle for a special caravan site for members attending the annual meeting with their caravans. The site will be at King's College Athletic Union Ground, Cochrane Park, Newcastle upon Tyne, 6. Apart from a limited amount of hard standing and some on rough grass, there will be facilities for obtaining water and disposing of refuse. Hot and cold washing facilities and showers, with dressing-rooms and drying-rooms, will be available in the pavilion, where there will be a children's play-room and light refreshments can be ordered. The site, which is near Henderson Hall, one of the hostels of the University of Durham, is close to shops and a frequent bus service into the centre of the town.

Applications for space should be made in advance to Dr. W. Hunter, c/o B.M.A., North of England Branch Office, 7, Windsor Terrace, Newcastle upon Tyne, 2, stating name and address, registration number of car, and date of arrival and departure. The charge is 6s. a night, which must be paid at the time of application. Alternative accommodation is available for Caravan Club Members at Whitley Bay Club site on the sea front at Old Hartley, 10 miles from Newcastle.

STUDY TOUR OF DENMARK

INVITATION TO ENGLISH DOCTORS

The Danish Government, through the Danish Institute in Manchester, has invited the B.M.A. to organize a party of English doctors for a study tour of Denmark in September. The programme will be arranged by the Danish Institute and the Danish Medical Association, and a guide will be placed at the disposal of the party. The Danish Government will pay travelling expenses in Denmark. The cost of the tour from Harwich back to Harwich (first class throughout) will be £48.

The party will leave Harwich on September 1, and will visit Copenhagen, Elsinore, Hillerød, Roskilde, Aarhus, Vejle, and Esbjerg, returning to Harwich on September 13. There will be visits to medical institutions and sightseeing. Further details may be obtained from the Secretary of the B.M.A., B.M.A. House, Tavistock Square, London, W.C.1, to whom applications to join the tour should be sent before April 30.

HOSPITALITY

An Austrian doctor's daughter, aged 14, would like to arrange a holiday exchange with a British doctor's daughter; the Austrian doctor's sons, aged 17 and 16, would also like an exchange in July or August, 1957.

A French doctor's daughter, aged 17, would like to spend two months during the summer holidays with a British doctor's family on an *au pair* basis.

Would anyone interested please get in touch with Brigadier H. A. Sandiford, International Medical Visitors Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

S.H.M.O. Group

SIR,—This letter is addressed to all S.H.M.O.s, whether members of the B.M.A. or not. The S.H.M.O. Group is the largest in the B.M.A., and is by far the most active. In just over a year since the official formation of the Group its executive committee has put the whole case for S.H.M.O.s (in terms of remuneration, status, grading injustices, and the very existence of the grade) in all quarters and at all levels. Representation has been secured on vital central and regional committees on which S.H.M.O.s were not previously represented. The executive committee has gained some improvement (£75 per annum) on the unfair award of 1954. Most important of all, a further drop in the previous steadily declining status of the S.H.M.O. has been prevented. Much support has been gained for the Group's policy of improving the salary of the S.H.M.O. by bringing this up to 80% of the consultant's salary throughout the scale. Active efforts, not without some hope, are being made on behalf of those S.H.M.O.s doing consultant work.

The future needs utmost vigilance. The Ministry may in its hospital medical staffing proposals present conditions unfavourable for present S.H.M.O.s, and which may lead to a worsening of their position. Therefore the executive committee needs the active support of every S.H.M.O. The award of £75 by the Industrial Court was a small one, but without the S.H.M.O. Group, and the full support of the B.M.A. as a whole, there would have been no award. As chairman of the executive committee, I beg any S.H.M.O.s who are not members of the B.M.A. to use a small part of this award to join the B.M.A. and the S.H.M.O. Group. The B.M.A. is made up of the committees within it, and it is the only effective negotiating machinery. Every new member strengthens the Association, and every addition to the membership of the Group will ultimately benefit all S.H.M.O.s. I would like to appeal especially to S.H.M.O.s in Northern Ireland, whose interests are also equally the concern of the Group. There has been no change in the Group's policy of throwing open all regional meetings to all S.H.M.O.s, whether B.M.A. members or not.

Application forms for membership, which is free to B.M.A. members, may be obtained from the secretary of the Group, B.M.A. House, Tavistock Square, London, W.C.1, from regional representatives, or from myself.—I am, etc.,

G. WARING ROBINSON,

53, Stoneygate Road,
Leicester.

Chairman,
S.H.M.O. Group Executive Committee.

S.H.M.O.s and Consultant Appointments

SIR,—Mr. J. C. Leedham-Green (*Supplement*, January 12, p. 23) is concerned that the Health Service of the future shall provide for the combination of general practice with the practice of a specialty, and in this we are at one. He expresses a fear, however, that this advantage is conditional on the retention, in some guise or other, of a vestige of the S.H.M.O. grade, and here I cannot go with him.

The general practice of medicine is older than the specialties, all of which grew out of general practice, while the S.H.M.O. grade was unknown until 1949, and is peculiar to this country. Whatever may have been the purpose in the mind of whoever devised it, one of its effects has been to procure specialist services at less than the rate accorded to "consultants" doing the same work. The original S.H.M.O.s of 1949 were classified on a personal basis, and the Terms and Conditions of Service of Hospital Staffs (document dated June 7, 1949) defines them as "senior officers performing clinical duties who are not of consultant status, but are not registrars." There was no suggestion that the duties differed from those of "consultants,"

or that the S.H.M.O.s carried them out less competently. The idea of S.H.M.O. posts was a conception first defined in circular R.H.B.50(96) published in October, 1950. Some posts held by S.H.M.O.s are now recognized by regional boards as consultant posts within the boards' establishment, and some have not been designated to this day.

The effect of the existence of the grade, which comprises one-third of all specialist hospital staffs, has been to cause widespread discontent among those so de-graded, and to create a class working at substandard rates alongside their more favoured colleagues, a sort of "minus merit award" as it were. The aim of the S.H.M.O. Group is to remove the cause of the discontent, and to abolish the substandard classification. I deny that a man who has acquired proficiency in a specialty is one whit the less competent to practise it merely because he devotes part of his time to general practice, and to suggest that he should be paid less than his exclusively specialist colleague on this ground alone seems as illogical as to suggest that his general practice should be paid at a cut rate because he is partly occupied in a specialty. On the contrary, I said previously (*Supplement*, November 24, 1956, p. 199) and I repeat now, that, where a practitioner "has shown by the quality of his work and the respect of his neighbours that he is able to act as their adviser in consultation, he should receive the reward to which he would have been entitled if he were not also devoting part of his energies to the wider field of general practice."

I feel sure that, when Dr. Leedham-Green has reflected further, he will agree that the general practitioner who also holds a specialist hospital appointment may render services to the patient at least as valuable as those of the specialist who follows his specialty exclusively. A man is appointed to a hospital staff in virtue of having been adjudged by the appointments committee to be competent to carry out the duties, and to be the best candidate applying. In the terms of circular 50/96, paragraph 3, boards may appoint general practitioners as part-time assistants in certain specialties at S.H.M.O. rates, but in the major specialties, such as Dr. Leedham-Green's own, this course is not open to them unless nobody of consultant status has applied and the post cannot be left vacant (paragraph 2). It is the view of the S.H.M.O. Group that these provisos open the way to the gradual formation of a sub-consultant class which would ultimately prove harmful, first, to the patients in the hospitals where they occur, and, secondly, to the specialist body as a whole, by providing a temptation to employing authorities to exploit the distinction between the two classes. The Group holds firmly that when a candidate is considered by an appointments committee to be fit to be appointed to a post he should be entitled to the salary attaching to that post.—I am, etc.,

Cambridge:

C. B. V. WALKER.

Woman Consultant for Women's Hospital

SIR,—In the South-eastern Region of Scotland a situation has arisen which not only has implications for the public and for the medical profession but also serves as an example of the ill effects of centralized bureaucratic control in the administration of the National Health Service. The Edinburgh Southern Hospitals Group Board of Management is at present concerned with the medical staffing of four hospitals, two of which were established more than half a century ago with moneys raised by women to provide hospital facilities for women desiring the services of women consultants. The medical consultant appointment in the women's hospitals is vacant, and there is a coincidental medical consultant vacancy in the other two hospitals of the group. The Southern Hospitals Board has advised the maintenance of the *status quo*—namely, a woman consultant for the women's hospitals, and an open appointment at the other two hospitals. This advice has not been accepted by the regional hospital board, which has decided to link the vacancies into one appointment—a decision which will, no doubt, appear attractive to the administrator sitting at an office desk, though little or no economy accrues from it.

The Southern Hospitals Group Board of Management has appealed to the Secretary of State for Scotland against this decision.

There is a possibility that this appointment, if advertised, will pass to a male applicant. This would mean, among other things, that any woman desirous of attention from women doctors only is deprived of the services of a woman consultant physician. There is none other available in the region. That this decision of the regional board is contrary to opinion within the region can be judged by the reaction from medical and lay quarters. Professional support for the appeal has come from the regional consultants and specialists committee, the Edinburgh local medical committee, and the Medical Women's Federation of Great Britain. A petition to the Secretary of State, launched spontaneously and unorganized, gathered over 26,000 signatures within three weeks, and was signed by a remarkable cross-section of the public. The basis of the petition is to "stress the necessity of there being available, for the women and children in Edinburgh, the services of a woman consultant physician in Bruntsfield and Elsie Inglis Hospitals." Additionally, there is support from the Edinburgh Executive Council, the Edinburgh Association of University Women, the Edinburgh Professional and Business Women's Club, the Soroptimist Club of Edinburgh, Co-operative Women's Guilds, Townswomen's Guilds, and many other bodies.

It would appear from this wide and forceful public reaction that here we have a regional hospital board out of touch with medical and lay opinion—underestimating the valuable part played by the smaller hospitals in the medical service. Surely no State bureaucracy should assert its authority against such expressed wishes of the people by whom the National Health Service is financed and for whom the National Health Service exists.—We are, etc.,

A. F. WILKIE MILLAR.

T. R. R. TODD.

E. V. KUENSSBERG.

NORMAN M. DOTT.

Edinburgh.

Psychiatric Out-patient Departments

SIR,—Most general hospitals throughout the country now have psychiatric out-patient departments to which patients are referred by general practitioners and others, and which are doing much to relieve the vast amount of minor mental disturbance existing in the community. The majority of patients seen in these departments do not and probably never will need admission to a mental hospital, and many are in full employment or are in other ways useful members of society. This usefulness is often maintained only with the help which they can receive from the out-patient clinic. Many of these departments are staffed wholly or in part by whole-time consultant psychiatrists from neighbouring mental hospitals, and it is this fact which has given rise to the impression which exists in some places that the psychiatric out-patient department does not really belong to the rest of the general hospital; indeed, there are hospitals where it is little better than a barely tolerated lodger; psychiatric consultants, although often asked to give opinions on cases in the wards, are not invited to attend medical staff committees; accommodation is usually inadequate and grudgingly provided; and facilities for physical treatments, such as E.C.T. or abreaction, may be non-existent.

Blame for this state of affairs can be more or less equally apportioned between the hospitals concerned and the regional hospital boards. The general hospitals complain that they have virtually no say in the appointment of psychiatrists who are to work in their hospitals, and may not even know their names; consequently they regard the psychiatric department as something quite separate from the rest of the hospital. The mental hospitals maintain that their filing and appointments systems are superior to the general hospital and they therefore retain all clinical records, and even make out-patient appointments at the mental hospital. Some regional boards have failed to appreciate the growing importance of out-patient psychiatry, and in the

planning of new out-patient departments insufficient attention is paid to the need for specialized accommodation—for example, sound-proof consulting-rooms, treatment and recovery rooms, as well as room for psychiatric social workers and psychologists.

The days when local authorities paid rent for a room in the general hospital to be used by their mental hospital as a follow-up clinic for discharged psychotics have gone for ever, but the attitude of mind which this arrangement engendered still persists in many places. The psychiatric department of a general hospital, whether it be staffed from a mental hospital or not, is nowadays at least as important as that of any other specialty. The doctors serving that clinic should be full members of the staff and be accepted as such by their colleagues. It is therefore important that the hospital management committee of the general hospital should be represented when senior psychiatric appointments to a mental hospital are being made, and appointment to the staff of the general hospital should be included in the contract. Clinical records should be kept in the hospital and appointments made directly through the general appointments office. In this way the psychiatric services will be integrated into the work of the general hospital as a whole and given proper recognition by the medical staff, administrators, and not least by the psychiatrists themselves, some of whom seem quite happy in their isolation. This result has already been achieved in most hospitals where part-time psychiatrists are employed, and there can be no doubt that it is of immense advantage to all concerned.—I am, etc.,

London, W.1.

J. C. SAWLE THOMAS.

Remuneration Claim

SIR,—The Government, through the former Minister of Health, having found that it acted too brusquely in its complete discard of the Spens recommendations, now seems to have adopted the well-known device of the semi-withdrawal and partial discard prior, we presume, to the gentle, unobtrusive final drop. If, by default, we allow the standard of Spens to be lowered we shall have lost our position, and in the future will have to go with our caps in our increasingly decrepit hands begging for a rise and receiving a rebuff. In order to get our position firmly established and to avoid recurring disputes our first resolve should be: "We demand from the Government the immediate recognition of the Spens recommendations as the legal contractual basis for determining our remuneration in the National Health Service."

Industrial sections of the community demand annual pay increases by strikes or threat of strikes, and get their compound increments. It appears never to be the right time for us of the middle classes to apply for any increase of remuneration, and if we do propose to take the only form of direct action open to us, such as withdrawal of service, this action is liable to be called "blackmail and holding the community to ransom." We have every wish not to be forced into this position, but we should be very determined to see that Government promises are kept, and our second resolve should therefore be: "We demand the immediate implementation of the Spens recommendations and their future implementation at periods no longer than every three years." The third resolve (for arguments see the letter by Dr. J. A. Gorsky, *Supplement*, January 26, p. 41) might be: "In the event of any unsettled dispute with the Government we demand the right to submit our claim to independent arbitration." The fourth resolve might be: "Preparation should be made for the reform of the National Health Service in such parts as may be agreed with the Government and among the medical profession." This latter is a long-term issue perhaps not too easy to achieve, but it might crystallize after July, 1958, when a considerable number of practitioners could, if forced to do so, withdraw from the Service, collect their compensation, and with many more become entitled, quite legally, to a very small pension.—I am, etc.,

London, N.8

G. W. M. MACKAY.

SIR,—It is quite apparent that the Government regard the doctors as easy money; in other words, they rely, first, on the fact that the doctors will not let the patient suffer, which of course is quite true, and, secondly, on the fact that the doctors are not sufficiently united yet to stand together, and the Government therefore feel that they can ignore the medical profession and its plea for what it rightly considers to be a recognition of the original agreements made between the medical profession and the State.

The suggestion was made to me the other day that perhaps the first thing we should do is to stop paying our income tax. Another point that has been made apparent is that there is obviously a vast difference in the eyes of the inland revenue between the doctor and the businessman or farmer. The businessman can have jamborees, etc., in the best hotels all over England at the expense of his firm and the inland revenue; the farmer can build a plush pigsty or cowhouse and claim it against the inland revenue. The doctor, however, if he builds a surgery on to his house, or alters it to make it more pleasant for his patients, does not get a stiver off his income tax, and his house agent will tell him at once that by enlarging his house he is reducing its value in the event of his selling it. Not only does he not get a stiver off his income tax, but in fact the stivers are added by an immediate increase in rates. I must admit that, as a humble taxpayer, the logic and fairness of all this are quite beyond me.—I am, etc.,

Harrogate.

GORDON BAILEY.

The Doctor's Week

SIR,—It was with considerable astonishment that I read Dr. Trevor Davies's letter (*Supplement*, January 19, p. 33) headed "The Doctor's Week." I had not realized that there was a G.P. left in England who led such a leisured life. My husband is in a partnership in a mixed residential-rural community with fewer than the average number of patients per doctor. We have considered ourselves fortunate this winter to be seeing so much of each other, as he now works an average of 72 hours a week compared with 80-84 hours a week last winter. These are actual hours worked and do not include nights "on call."

We have a small cottage hospital, and this undoubtedly occupies a great deal of the local G.P.s' time. However, it is a branch of their work which makes them feel that perhaps life is worth while after all in these days of thoughtless misuse of the doctor by a large section of the community.—I am, etc.,

Leatherhead, Surrey.

C. M. WILLIAMS.

Rural Practitioners' Remuneration

SIR,—I have been a principal in a rural dispensing practice for six years, and during that time am supposed to have been compensated for the disadvantage of not being able to attract a large list of patients, and the loss of remunerative time caused through travelling in comparatively scattered areas, by payments from the mileage fund. When, following the Danckwerts award, increased payments on capitation were applied to all practitioners alike, it followed that the rural doctors' "loading" was automatically lessened in proportion; but during the past six years the value of a "mileage unit" in this area has dropped from 4.3d. to 3.7d.—I disregard the lesser significant figures, but the decrease is about 15%—so not only is there a further lessening of the rural loading, but, in this area at any rate, there is a definite fall in the remuneration of the individual doctor under this heading.

Some of the necessary expenses in this type of practice may be of interest, presented to the nearest penny per patient on my list. For each, I pay annually: 5s. 11d. on motor expenses (before the petrol increase); 1s. 4d. on postages, stationery, and telephone; 1s. 6d. on cleaning, heating, lighting, maintenance and rates of my surgery premises (not my house); total, just about half the standard capitation fee.

Let it be thought that the dispensing doctor can quietly make it up on his drug account, let me draw attention to

the annotation on "Vaginitis" (*Journal*, January 19, p. 155). For the two main forms of this distressingly common complaint the writer recommends certain courses of treatment; none of the drugs mentioned is on the specially expensive list for which the dispensing doctor can reclaim payment, yet the net cost for each type of treatment is approximately £4. The dispensing capitation fee is 9s. 9d. I have already expressed myself on the subject of dispensing (*Supplement*, April 9, 1955, p. 163), and there has been no change since then either in the system or my views thereon.—I am, etc.,

Chieveley, Berks.

JOHN RICHARDS.

BRITISH MEDICAL GUILD

STRATFORD DIVISION

The following resolution was passed at a recent meeting of the Stratford Division, British Medical Guild: "That this meeting of the B.M.G. in the Stratford metropolitan area pledges its full support to the trustees of the Guild in any action taken to resolve the present issue to the satisfaction of the profession."

Meetings to be Held

DARTFORD.—At Wedgewood Hall, Royal Victoria and Bull Hotel, Dartford, Wednesday, February 13, 8.30 p.m.

EAST DENBIGH AND FLINT.—At Wynnstay Hotel, Wrexham, Sunday, February 10, 3 p.m.

NORWICH.—At Nurses' Lecture Theatre, Leicester Home, Norfolk and Norwich Hospital, Wednesday, February 13, 8.15 p.m.

Association Notices

ADJUSTMENT OF AREAS OF BARNET AND WEST HERTFORDSHIRE DIVISIONS

Notice is hereby given by the Council to all concerned that it is proposed to transfer from the West Hertfordshire Division to the Barnet Division the area of the Civil Parish of Elstree.

Any member affected by this proposal and objecting thereto should write to the Secretary of the Association not later than March 9, 1957.

A. MACRAE,
Secretary.

Diary of Central Meetings

FEBRUARY

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| 8 Fri. | Ingleby Evidence Committee, 2 p.m. |
| 11 Mon. | Armed Forces Committee, 2 p.m. |
| 13 Wed. | Maternity Medical Services Committee, 2 p.m. |
| 15 Fri. | Ophthalmic Group Committee, 12 noon. |
| 20 Wed. | Representatives of Negotiating Committee to meet new Minister of Health (at 23, Savile Row, W.), 11 a.m. |
| 20 Wed. | Arrangements Committee (Birmingham, 1958), 2 p.m. |
| 20 Wed. | Negotiating Committee, 2.30 p.m. |
| 21 Thurs. | G.M.S. Committee, 10.30 a.m. |
| 22 Fri. | Staff Side, Committee C, Medical Whitley Council, 11 a.m. |
| 22 Fri. | Public Health Committee, 2 p.m. |
| 22 Fri. | Subcommittee on Medical Reports, Joint Committee of B.M.A. and Magistrates' Association, 2.30 p.m. |
| 28 Thurs. | Compensation and Superannuation Committee, 2 p.m. |

MARCH

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| 1 Fri. | Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m. |
| 4 Mon. | Alternative Edition Subcommittee, Joint Formulary Committee, 11 a.m. |
| 5 Tues. | Editorial Subcommittee, Joint Formulary Committee, 11 a.m. |
| 7 Thurs. | Charities Committee, 2.30 p.m. |
| 21 Thurs. | G.M.S. Committee, 10.30 a.m. |

Branch and Division Meetings to be Held

BLACKPOOL AND FYLDE DIVISION.—At Savoy Hotel, Blackpool, Wednesday, February 13, combined meeting with Fylde Section of B.D.A. 7.15 p.m., dinner; 8.30 p.m., Dr. R. Forbes: "Recent Developments in Medical Litigation."

BURTON-ON-TRENT DIVISION.—At Stanhope Arms Hotel, Bretby, Tuesday, February 12, 7.15 for 7.30 p.m., supper meeting. Lecture by Dr. R. A. A. R. Lawrence: "Paediatric Problems in General Practice."

CITY, NORTH MIDDLESEX, BARNET, AND ST. PANCRAZ DIVISIONS.—At Beales Restaurant, Holloway Road, N., Tuesday, February 12, 8 for 8.30 p.m., joint meeting with North London Pharmaceutical Association. Address by Dr. R. E. Ford: "Some Prescribing Problems as Seen at the Ministry." All medical practitioners and pharmacists in the area are invited.

CROYDON DIVISION.—At 43, Wellesley Road, Croydon, Tuesday, February 12, 8.30 p.m., general meeting. Address by Sir Zachary Cope: "The Regional Diagnosis of Acute Abdominal Disease."

DONCASTER DIVISION AND DONCASTER MEDICAL SOCIETY.—At Danum Hotel, Doncaster, Thursday, February 14, annual dinner and dance.

EAST KENT DIVISION.—At Manston R.A.F. Station, Thursday, February 14, 7 for 8 p.m., dinner; 9 p.m., symposium. Members will be guests of the medical officers of the U.S.A.F.

EAST YORKSHIRE BRANCH.—At Quern House, 68, Park Street, Hull, Wednesday, February 13, 8.30 p.m., meeting. Lecture by Dr. R. D. Lawrence: "Diabetes—Old and New Things."

HENDON DIVISION.—At Edgware General Hospital, Tuesday, February 12, 8.15 p.m., clinical evening. Members of Wembley and Harrow Divisions are invited.

KINGSTON-ON-THAMES DIVISION.—At Nurses' Home, Kingston Hospital, Tuesday, February 12, 8 p.m., meeting. Address by Dr. P. J. Kerley: "Tumours of the Lung."

LEIGH DIVISION.—At Courts Hotel, Church Street, Leigh, Tuesday, February 12, 8.30 p.m., meeting. Address by Mr. B. H. Dawson: "Neuralgia."

NORTHERN IRELAND BRANCH.—At Woodbourne House Hotel, Suffolk, Dunmurry, Thursday, February 14, 7.30 for 8 p.m., presidential dinner.

PRESTON DIVISION.—At Sharoe Green Hospital, Fulwood, Preston, Tuesday, February 12, 8.30 p.m., combined meeting with Preston Medico-Ethical Society. Clinical demonstration.

SHROPSHIRE AND MID-WALES BRANCH.—At Board Room, Royal Salop Infirmary, Shrewsbury, Thursday, February 14, 8.30 p.m., meeting of Clinical and Pathological Section. Dr. J. J. Merry will show films and give a talk on "Cortisone."

SOUTH BEDFORDSHIRE DIVISION.—At Out-patient Department, Luton and Dunstable Hospital, Thursday, February 14, 9 p.m., meeting. Mr. E. H. Tong (Superintendent, Whipsnade Zoo): "Some Aspects of Zoo Management." Members' wives are invited.

SOUTH ESSEX DIVISION.—At Oldchurch Hospital, Romford, Sunday, February 17, 10.30 a.m., clinical meeting.

SOUTH STAFFS DIVISION.—At Medical Lecture Hut, Royal Hospital, Wolverhampton, Tuesday, February 12, 8.30 p.m., meeting. Lecture by Mr. N. W. Goodchild (Chief Constable, Wolverhampton): "Forensic Science."

TOWER HAMLETS DIVISION.—At Bearsted Theatre, London Hospital, E., Tuesday, February 12, 5.30 p.m., meeting. Film show.

TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tunbridge Wells, Wednesday, February 13, 8.30 p.m., meeting. Dr. W. G. Oakley: "Diabetes and its Treatment."

WALLASEY DIVISION.—At Hotel Victoria, New Brighton, Tuesday, February 12, 8.30 p.m., annual general meeting.

WINCHESTER DIVISION.—At Board Room, Royal Hampshire County Hospital, Winchester, Thursday, February 14, 9 p.m., meeting. B.M.A. Lecture by Sir Heneage Ogilvie: "The Care of the Dying."

Meetings of Branches and Divisions

GIBRALTAR BRANCH

The annual general meeting was held on November 13, 1956, at the Colonial Hospital, Gibraltar, when 15 members were present. Dr. James A. Durante, the retiring president, reviewed the events of the past year, and commented on the poor attendance, especially of Service members, although the B.M.A. had in the past done more for them than for most of its members.

The following officers were elected:

President.—Mr. R. Scott Stevenson.

Vice-president.—Major R. K. Pilcher.

Honorary Secretary.—Dr. E. A. Imossi.

Honorary Treasurer.—Dr. S. H. Triay.

Mr. D. J. Toomey opened a discussion on pain in the right iliac fossa in which Captain Burwell, Dr. Imossi, Mr. J. M. Hastings, Dr. Ruggeri, and Dr. Cochrane took part. Mr. J. M. Hastings demonstrated an interesting series of cases of renal malformations, illustrated by x-ray films, etc.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

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JOINT CONSULTANTS COMMITTEE

A meeting of the Joint Consultants Committee was held at the Royal College of Surgeons on January 23, under the chairmanship of Sir RUSSELL BRAIN.

Medical Membership of Hospital Boards

Among the matters under consideration was a circular issued by the Ministry on December 31 informing hospital boards that the Minister of Health had accepted the recommendation of the Guillebaud Committee that the medical membership of regional hospital boards should not exceed 25% of the total membership save in quite exceptional circumstances, and advising boards to observe the same principle in making appointments to hospital management committees. The Joint Committee had previously urged the Ministry that the membership of a regional board should include at least five consultants actively engaged in the region concerned, and in addition a general practitioner and a medical officer of health, all nominated by the profession. In a letter from the Ministry informing the Committee of the Minister's decision it was stated that the Minister could not accept this proposal, but that he fully shared the Committee's view that the medical members of the regional boards should consist primarily of active members of the consultant staff in the region, together with a general practitioner and a medical officer of health.

The Joint Committee was profoundly disturbed at the Minister's decision, the more so as it appeared inconsistent with his acceptance of the principle that the medical membership should consist primarily of active members of the consultant staff in the region, who are by no means well represented on regional boards at the present time. The Committee thought it inevitable that the small number of consultants representative of those working in the regions must be still further reduced if the overall number of medical members was to be reduced, while still including representatives of the universities and medical schools, and in addition a general practitioner and a medical officer of health.

The Committee felt strongly that any reduction in the medical membership of hospital boards would of necessity affect adversely the valuable part played by the profession in the administration and planning of the service, and that to place upon a smaller number of doctors the responsibility of serving on the boards and their various committees would make the burden intolerable.

The Committee decided, therefore, to ask the Ministry for an early opportunity of discussing the matter further.

It decided also to discuss with the Ministry again the question of medical advisory machinery at regional board level, in the light of the recommendations of the Guillebaud Committee, while making it clear that it did not regard such machinery in any way as an alternative to adequate representation on regional boards.

Hospital Medical Staffs

Representatives from the Registrars Group of the British Medical Association attended the meeting to put before the Joint Committee their views regarding the problems associated with hospital medical staffing as they affected the prospects of registrars and senior registrars. They pointed out that the salary scales recommended by the Spens Committee had been formulated on the assumption that consultant status would normally be reached at 32 years of age. At the present time, however, senior registrars in the main specialties did not usually obtain their first consultant appointment until several years later than this, with a consequent loss in their total life earnings of £1,700 for every year promotion was delayed beyond the age of 32. They urged that the introduction of a new career grade below consultant status would not provide a satisfactory solution of the problem, since it would permanently lower the total life earnings of a proportion of new entrants into the hospital service. They recommended that there should be a gradual run-down in the number of senior registrars which would ensure reasonable prospects of promotion after an average training period of four years. Pending such a balance being obtained, and as a purely temporary expedient, they suggested that the tenure and salary scale of time-expired senior registrars should be extended, and newly appointed consultants given seniority on the incremental scale for every year over 32 at the time of appointment.

Appointments in Venereology

A deputation from the Venereologists Group Committee also attended the meeting to discuss with the Committee the difficulties experienced in the staffing of venereal diseases departments in areas where there is insufficient work to make a consultant appointment in the specialty practicable.

Moral Obligation

The Committee agreed to a proposal from the Ministry that the Appointment of Specialists Regulations should be amended to allow a consultant or S.H.M.O. whose sessions are reduced, or whose contract is terminated through redundancy, to be offered an alternative appointment without the necessity to apply for the vacancy in open competition.

Hospital Private Beds

The question of the steadily rising charges for hospital private beds was discussed, and the Committee decided to prepare a case for the introduction of a moderately priced private bed. Reference was also made to the many anomalies in the schedules of operations contained in the Pay Bed Regulations, and instances were quoted of the way in which these schedules operated to the disadvantage of the patient rather than to his advantage. It was agreed to submit a reasoned case to the Ministry for the abolition of the schedules.

Other Matters

Among other matters discussed were the shortage of radiographers and physiotherapists, domiciliary consultations by pathologists, the attendance of chairmen of hospital group medical advisory committees at meetings of hospital management committees, and the payment of fees for the examination of prospective employees at the request of employers.

CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE

The Central Consultants and Specialists Committee met at B.M.A. House on February 7, Mr. T. HOLMES SELLORS in the chair.

Executive Committee Report

The executive committee reported its action with regard to income-tax relief in respect of the professional expenses of whole-time hospital medical staff. It was decided to ask the Joint Consultants Committee to press the Government to implement the recommendation of the Royal Commission on the Taxation of Profits and Incomes regarding the rules governing the professional expenses of persons in salaried employment.

Consultations with the Staff Side of Committee B regarding the remuneration of S.H.M.O.s in consultant posts were reported. The Management Side had stated it could not entertain generally the suggestion that S.H.M.O.s occupying such posts should be remunerated on the consultant scale, but would be prepared to discuss circumstances relating to individual posts which the Staff Side brought forward. It was suggested by the executive committee that a notice be inserted in the *British Medical Journal* inviting S.H.M.O.s who came within the scope of the review to apply for a form on which they would give the information necessary for their claims to be examined; that a panel be set up by the central committee to examine the applications and submit to Committee B the names of those who appeared to have a prima facie case to be remunerated on the consultant scale; and if Committee B referred the final selection of cases to a subcommittee an S.H.M.O. representative should be co-opted to that subcommittee. It was emphasized that the only people concerned were S.H.M.O.s worthy of consultant grade and carrying out consultants' work.

These recommendations were agreed to.

A report was received of the action of the Council at its last meeting with regard to the integration of medical officers of health with the hospital service (*Supplement*, February 9, p. 56). The executive committee had considered the matter, and reiterated its view that it could not be accepted that a practitioner should be appointed to the consultant staff of a hospital as of right by virtue of his status and office in some other sphere of medicine and without consultation with the hospital staff. Such an appointment would presumably involve duties and responsibilities which might affect the position of other consultants in relation to treatment and beds, and this could not be accepted without consultation with the hospital staff. With regard to membership of the hospital group medical committee, the Ministry had agreed with the Joint Committee that this was a matter for the hospital medical staff to determine, and this principle could not be waived.

There should be the closest liaison between the hospitals and the public health service. There were considerable advantages in inviting the medical officer of health to serve on the hospital group medical committee, but the invitation to do so should be made by, or with the approval of, the medical staff concerned.

The Committee agreed with the views of its executive and that they be transmitted to the Council.

It was agreed that the Joint Committee should be asked to make a strong protest to the Minister on his decision to reduce the overall medical membership of regional hospital boards to a maximum of 25% of the total membership, and to press that each board should include not fewer than five consultants actively engaged, at least one general practitioner, and one medical officer of health.

Administration of Drugs by Injection

Dr. Robert Forbes, secretary of the Medical Defence Union, attended the Committee for the discussion of this item, which arose out of a fatality after an injection of penicillin, as a result of which the regional hospital board had issued an instruction that intrathecal injections must not be administered until the quantities had been checked by another doctor, a State-registered nurse, or a student nurse, and a signature obtained that it had been done.

Dr. FORBES said that his society had been asked for advice on this rule, and its counsel instructed it to tell members who asked for guidance that this was a rule which they should not operate, on the ground that it was a serious interference with clinical responsibilities. It related at the moment to intrathecal injections, but in a short time it might relate to many other forms of injection.

The matter was referred back to the executive for further consideration, the view being expressed that regional boards should not be able to tell medical people how to do their work.

Administration of Hospitals

The Committee again considered, after the reference back of its report by the Council, the questions of equal tripartite hospital administration, recommended by the Bradbeer Committee. The Committee had expressed the view that hospital medical staff must have the final authority in the clinical care of patients, but, subject to this, it supported the system of tripartite administration in the general running of a hospital.

The opinion was expressed that tripartite administration had worked successfully in some of the larger hospitals. Did the doctor wish to take charge of the catering department or to engage wardmaids and other staff? The criticism that the Ministry was trying to take away from the doctor the charge of the patient was not justified. There was a considerable body of opinion which did not accept this view and regarded these proposals as the thin end of the wedge.

Members of the Committee said that tripartite administration was not working so well as seemed to be indicated. It was very difficult to get what was required, and the doctor was not asked what he was going to spend—all this was done by administrative staff without adequate consultation with matrons and consultants. Tripartite administration worked where there were first-class men, but everybody wanted to be completely independent, and it would be multipartite before long.

The CHAIRMAN pointed out that all this was considered by the Bradbeer Committee. The Committee agreed to a statement that tripartite administration was successful in some cases but where it was unsuccessful there should be an investigation, and that there should be no lay dominance over the nursing and medical professions.

Young Practitioners

Mr. H. H. LANGSTON, chairman of the Constitution Committee, explained the proposals of his committee with regard to the setting up of a young practitioners' committee. He explained that the need for this committee was strongly

felt; the matter was considered by Council at its last meeting (*Supplement*, February 9, p. 53); and it had been referred to the standing committee for approval. The proposals were sympathetically received, and it was agreed that the Committee should give provisional support.

At the same time there were recommendations before the Committee for reconstitution of the Registrars Group drawn up by its executive committee, and these would be considered at the next meeting of the Group Council. The Committee supported the proposals.

A resolution from a regional committee stating that hospital junior medical staffs should be represented at all levels of the negotiating machinery, particularly in Whitley Committees, was discussed. It was pointed out that members of these committees represented everybody, that there were many groups, and when the affairs of any particular group were being discussed representatives of that group should be invited to attend at the appropriate stage.

Joint Consultants Committee

Dr. ROWLAND HILL, deputy chairman, presented a report on the work of the Joint Consultants Committee and Committee B of the Medical Whitley Council. The question of the statutory registration of medical auxiliaries was again before the Committee, which adhered to its decision that its acceptance of the scheme was conditional upon the co-ordinating council being given effective control over the registration boards and that medical members of the boards should be appointed from names submitted by the appropriate medical organizations and from no other source. It now seemed certain that the scheme would go through and that medical influence would be in the minority even on the co-ordinating council. The auxiliary bodies proposed to call themselves "professions supplementary to medicine." The opinion was expressed at the last meeting of the Committee that if the Minister implemented the scheme the medical profession should dissociate itself from it.

Strong feelings were expressed on the dangers of allowing medical auxiliaries to treat patients without medical supervision of any kind, some members expressing the view that the profession should have nothing to do with the scheme, and that specialties should engage their own auxiliary staff and train them themselves. A resolution was passed unanimously that the Joint Committee be recommended to dissociate itself from the recommendations made by the Ministry of Health in regard to the auxiliary service. It was also agreed that the resolution should be communicated to the various faculties.

With regard to hospital medical staffing, the Registrars Group suggested that as a long-term plan the number of senior registrars should be allowed to run down until there was a better ratio between the senior registrar establishment and the number of expected consultant vacancies. In the meantime the Group endorsed the view that existing time-expired senior registrars should be given security with an extending salary scale.

It was once again stressed that the real answer to the problem of hospital staffing was a review of hospital establishments starting at the periphery and working towards the centre. The most important point was the possibility of well-trained registrars being put out of employment, for it seemed that there was no solution to the problem unless the number of senior registrars was drastically reduced. It was pointed out that there could only be a reduction of senior registrars if their work was done by consultants and the matter came back to a review of establishment. The Ministry's suggestion of the creation of an assistant consultant group was opposed by the Joint Committee and the Central Consultants and Specialists Committee.

Standards of Board-and-Lodging Accommodation

The Committee received a statement from the Registrars Group executive on minimum standards of accommodation for hospital residents. That body also considered that regular inspection of the accommodation should be carried

out on a regional basis by inspecting committees appointed by the regional hospital boards. The Registrars Group asked the Committee, if it approved, to forward the proposals to the Board and Lodging Subcommittee of Committee B. The CHAIRMAN said that a subcommittee of the Whitley Committee was discussing what methods were best for establishing throughout the country satisfactory standards of board and lodging. Quite apart from the cost, if the standards were bad there should be a right of appeal against them to the Whitley machinery.

It was agreed that the standards set by the Registrars Group should be put before Committee B.

Future of the Chest Services

The memorandum of the Chest Services Subcommittee, which was set up in January, 1956, to consider and report upon special problems affecting the chest services, was received. It had already been considered by interested committees, which had endorsed the general principles contained in it. The attitude of the Ministry was that tuberculosis was finished and that nothing more need be done about it. Chest physicians did not agree with that view, and put forward proposals for maintaining an organized tuberculosis service based on area clinics. It was agreed that the document should be forwarded to the Joint Consultants Committee.

Remuneration for Part-time Work

The recent agreement for the remuneration of medical practitioners undertaking part-time work for local authorities was reported, and a schedule submitted by the Treasury of fees for work for Government departments not covered by this agreement was considered. The proposals were considered to be satisfactory except in relation to the proposed fee for attendances at pensions appeals tribunals, which should attract a fee of £10 10s. for a day and £5 5s. for half a day's attendance.

The Committee also considered a report from a subcommittee of the Non-Professorial Group Committee relating to the remuneration of university medical teachers and research workers. A memorandum had been prepared by the subcommittee, which had adopted the resolution of the A.R.M. that the remuneration of medical men and women should be that of doctors and should not be related to that of lay personnel. The medical teacher was at a disadvantage because of the later age at which he could commence work, and his salary should be weighted to offset this disadvantage. The figures put forward related to the present time and without prejudice for the near future. The differential between clinical and non-clinical staff was also considered.

The executive committee was authorized to study the memorandum and to transmit it to the Council of the Association for approval so that it could be sent to the university authorities.

The question of fees for examinations carried out in prisons was discussed. It was felt that such examinations could not be classified as domiciliary examinations and that they should carry a minimum fee of £5 5s. for each examination.

Defence Trust

During the day a meeting of the Hospital Medical Staffs Defence Trust was held. The honorary treasurer, Mr. L. DOUGAL CALLANDER, reported that subscriptions amounting to £19,349 were received up to the end of 1956, and interest yields amounted to £411, against a total expenditure of £5,326. The Fund's investments totalled £10,866, and there was on deposit and current accounts £3,568. The last appeal had resulted in a considerable number of cash payments and new bankers' orders, substantially increasing the annual income of the Fund. It was suggested that further appeal letters should be sent out and that action might be taken through the regional committees to stimulate support for the Trust Funds.

Mr. CALLANDER then reported on the action taken by the British Medical Guild in relation to the present remunera-

tion claim. The finances for the Guild had to be found by the defence trusts, and the General Medical Services Committee had already made a very large allocation to the Guild's funds. Not a great deal had been used so far, but if there was an *impasse* after the forthcoming meeting with the Minister there was no knowing what expense would be incurred. He would like to ask for power to transfer £1,000 of the Trust Fund to the Guild funds if required.

After some discussion the proposal was agreed to, subject to consultation with the chairmen of the Joint Committee.

INTERIM REPORT OF MILEAGE COMMITTEE

CHANGES RECOMMENDED

A committee was appointed by the Minister of Health in 1950 to "examine in detail the distribution of the Central Mileage Fund for England and Wales and to make recommendations." The committee, on which were representatives of rural practitioners, has now published an interim report.

The mileage fund is a fund used to recompense rural general practitioners for the loss of earning time incurred in visiting National Health Service patients in country districts over and above that incurred by an urban practitioner for the same number of patients. At present about 87% of the fund goes to meet those expenses that can properly be measured by distances travelled, and about 13% goes to provide additional remuneration where the difficulties of the district are of an exceptional nature.

A scheme for mileage payments was introduced into the National Health Insurance scheme in 1914. It continued as part of the arrangements under the National Health Service in 1948. Until the present committee was set up the scheme had not been comprehensively reviewed since 1924. The committee's report, the preparation of which involved much detailed inquiry, has been sent to all local medical committees and will be part of the G.M.S. Committee's report to the Annual Conference of Local Medical Committees, where it will be open to debate.

Recommendations

The committee anticipates that its recommendations, being of an interim nature, may need amending after experience. In summary, some of the main changes in the present mileage fund scheme proposed are as follows. The fund should be distributed as a whole and called the Rural Practices Fund. Executive councils and local medical committees together should advise the Minister whether they wish the whole or any part of their areas to be included in the mileage scheme. Borough and urban district council areas with populations of more than 10,000 should normally be excluded and rural district areas normally be included. Variations on this should be allowed with the Minister's consent, and a central body should be set up to enable the Minister to consult the B.M.A. and other bodies on whether special requests for variation should be accepted. Patients in designated rural areas should count for payments from the Rural Practices Fund if they live not less than three miles from the doctor's main surgery, except that no doctor should receive any payments unless 10% of his patients live in a designated area and not less than three miles from his surgery.

Units of mileage should be credited on a new scale of one unit for not less than three miles and not more than four miles, and two units per mile thereafter. A model mileage scheme should be prepared by the Minister of Health and the B.M.A., and no variations on this should be allowed without the Minister's approval after consulting the B.M.A. No change is recommended in the present scheme for payments for visiting maternity cases.

The three representatives of executive councils on the committee recorded in the report their "keen disappointment" at the inconclusive results of the committee's deliberations.

PUBLIC HEALTH MEDICAL OFFICERS

INCREASED CAR ALLOWANCES

Committee C of the Medical Whitley Council has agreed on increased rates of motor-car allowances for public health medical officers in England and Wales in view of the circumstances resulting mainly from petrol rationing and the increased price of petrol. The allowances should operate until the end of the month in which petrol rationing stops, and will then be reviewed again. The revised rates take effect from January 1, 1957, and are set out in the appendix to M.D.C. circular No. 33.

The following casual user allowances replace those set out in paragraph 1 of the appendix to M.D.C. circular No. 29: Not exceeding 10 h.p. or 1,199 c.c., 94d.; exceeding 10 h.p. or 1,199 c.c. but not exceeding 12 h.p. or 1,399 c.c., 104d.; exceeding 12 h.p. or 1,399 c.c. but not exceeding 14 h.p. or 1,599 c.c., 114d.; exceeding 14 h.p. or 1,599 c.c., 1s. 04d. The essential user allowances, replacing the lump sum allowances and rates per mile in paragraph 2 of the appendix to M.D.C. 29, are as follows:

	Not Exceeding 10 h.p. or 1,199 c.c.	Exceeding 10 h.p. or 1,199 c.c. but Not Exceeding 12 h.p. or 1,399 c.c.	Exceeding 12 h.p. or 1,399 c.c. but Not Exceeding 14 h.p. or 1,599 c.c.	Exceeding 14 h.p. or 1,599 c.c.
Lump sum allowance	£66	£72	£78	£84
Rate per mile for first 7,200 miles p.a.	52d.	62d.	7d.	8d.
Excess over 7,200 miles p.a.	4d.	44d.	44d.	54d.

An "essential user" temporarily stopping duty journeys as a result of petrol rationing should get the lump sum allowance in full up to April 30. If rationing continues after that 50% of the lump sum should be paid for the following three months, further payment after that being at the employing authority's discretion.

CIVIL SUPPLEMENTARY ESTIMATES

LARGE HEALTH SERVICE INCREASE

Provision for an extra £26,900,000 net for the National Health Service is made in the Civil Supplementary Estimates for the current financial year. Of this, £15m. is required for hospital running costs, £8m. for drugs, appliances, and medicines (after taking into account an extra £1,200,000 received from patients as a result of the 1s. for each item prescription charge), £2,900,000 for payments to doctors, and £1,600,000 to dentists. Welfare foods, including milk, account for another £1,400,000. An annotation on the Supplementary Estimates appears on page 394 of this week's *Journal*.

REGISTRARS GROUP

PROPOSALS FOR RECONSTITUTION

Thirteen out of the 16 regional registrars groups have approved in principle the Registrars Group Council's proposal that the Registrars Group should be reconstituted to represent all grades of hospital junior medical staff (see *Supplement*, December 8, 1956, p. 209). Three regional groups are opposed to it, and three have not replied to the request from the Group Council for their views. The effect of the Group Council recommendations would be that all hospital staff of the grade of senior registrar and under would be able to take part in regional activities, and that their special interests would be represented at central meetings. The group would be renamed the Hospital Junior Medical Staffs Group. Representatives of the regional registrar groups will discuss the recommendations in the Group Council meeting in May.

GOVERNMENT'S OBLIGATION

Two meetings held on February 8 passed resolutions drawing attention to the Government's obligation to stand by the Spens reports.

The Glossop Division of the B.M.A. resolved that "this Division is firmly of the opinion that the Government has a moral obligation to implement the recommendations of the Spens Committee. The Division further deplores the Minister's evasion of this responsibility. A copy of this resolution to be sent to our Member of Parliament." It was the unanimous feeling of the meeting that all other Divisions in the country should bring similar resolutions to the notice of their respective M.P.s because it was only by such action by individual Divisions that the attention of M.P.s generally could be focused on this urgent matter.

At a very well attended meeting of the British Medical Guild in the Hexham Divisional area the following resolutions were passed: (1) that this meeting is firmly behind the B.M.A. in pressing the Government to discharge its obligations to maintain the standard of medical remuneration in accordance with Spens (passed with one dissentient); (2) that this meeting is prepared to support any action considered necessary even to the extent of withdrawal from the N.H.S. (passed with two dissentients).

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Unity of Purpose

SIR,—During the past weeks, doctors have held meetings throughout the country to prepare the way for action on behalf of their case against the Government. It is opportune, then, to discuss what measures are available to us. Most doctors would carry out measures such as refusing to sign certificates, pay income tax, and withdrawing from committees, since these would not inconvenience us much and would provide a practical demonstration of our discontent. But these would very likely prove ineffective, as the inconvenience caused could be suffered or lessened by emergency legislation without major disruption of the Service. Failure would leave the profession open to ridicule. The public would suffer considerable irritation and would be likely to be more antagonized than by the adoption of stronger measures. Small measures and small cause for discontent are synonymous to them.

Resignation would be effective if carried out by the majority. We have an excellent case to present to the public in support of resignation. There would be no refusal to treat the sick, or "strike" action. If resignation was associated with appropriate publicity, public opinion would probably rebound against the Government. But unity of action as against promise of action cannot be relied on. There is a fear that those who resigned would be martyrs to a lost cause. To sum up, the profession would be demoralized by the adoption of paltry, undignified measures doomed to failure. On the other hand, the case for resignation is strong, and the mood of the profession shows that the time is opportune.

There has for long been grave discontent among young doctors, who find it financially crippling to specialize and now almost impossible to establish themselves in general practice. Little wonder that the more ambitious—and often the best—emigrate. There is a very real danger of unemployment in the profession under present conditions, and a pool of unemployed or underpaid doctors would leave the rest completely at the mercy of the Government. It is only now that established doctors are beginning to feel the pinch that unrest is widespread and action is considered.

We are not going to get a general 24% pay rise without action. For action to succeed we must have unity. It is doubtful whether unity can be attained on the remuneration aspect alone. There are many doctors who are not prepared to resign over remunera-

tion *per se*, but who cannot see any future for themselves under the present scheme or are constantly irritated by aspects of it. Thus two groups have arisen—those who wish to press the present claim without mention of revision of the Service, and those who wish to revise the Service and hope to improve remuneration and other grievances in so doing. Any course of action must appeal to as much of the profession as possible, for in unity lies our strength. Now that we have travelled so far along the remuneration road let us proceed to the end and the inevitable *impasse*—and then call for revision of the Service. I do not believe that a new Service would take long to organize. What works in Australia, with evident satisfaction to all concerned, could just as easily work here. If the Government refused to operate a new scheme resignations could be called in; the refusal of the Government to co-operate with us on both remuneration and modification of the Service would strengthen our case. There is much to be said for killing two birds with one stone.

It is most important to study the Government attitude. Assuming that its main interest is in economy and votes, its reaction to a threat of resignation will be to attempt to split the profession. It will, therefore, either postpone matters with an evasively worded comment on Spens and a promise to review the claim when the economic position improves, or offer less than the amount asked for to the whole or part of the profession. Recognition in advance of the motives behind such moves and an alternative scheme, practical and better than the present one, offer the only sure defence against such temptations. Those of us who are content under the N.H.S., and may even have benefited from it, should pause for a moment and consider whether it is not their bounden duty to make medicine an attractive career once more, and not a vocation only.—I am, etc.,

C. ALWYN SHARPLES.

Stockport.

SIR,—Two outstanding grievances are noticeable from the correspondence: underpayment and underemployment. The voice of the latter has the handicap of not being effectively heard, and the consequent amount of National Health fodder continues to grow unchecked. Many other causes of dissatisfaction outside these headings exist.

It therefore follows that those who seek redress in one direction alone are unlikely to have the backing of others whose claims are to them equally in need of recognition. If medicine is to survive, and I say this advisedly, for the nature of its present appeal will come to be recognized as ground-bait ultimately and consequently to be shunned, then these serious disaffections need remedying. It is obvious that importuning or legal pressure is not the answer. A system has been created whose members can only be protected by their unity of action. Such unity is impossible to secure unless major causes for dissatisfaction are redressed. It behoves us therefore to recognize each and every reasonable cause of complaint, and not to use the system of committees to silence them. Until we secure a charter of our rights subscribed to by at least 95% of the profession we will continue to be held to ransom. Thereafter, with this unity of purpose defined and agreed, its implementation would turn on a plan drawn up on some such lines. Every member (at least 95%) of the profession would pledge himself without equivocation to support such a charter. He would guarantee such action, practically, by entering into a contractual agreement to back it by as large a subscription as possible—in the nature of a strike fund—if called upon to make it; further, he would agree to forfeit a substantial sum should he default in supporting any action taken to insist on the observance of any clause of the charter.

The suggestions above incorporated have a strict parallel in the trade union movement, so far as I can appreciate it, and are specially drawn to cover (1) the conflicting interests within medicine, and (2) its special need of large funds to meet the circumstances of the doctor's station in life. Dog eating dog and "the orl right Charley" attitude are anachronisms when the profession as a whole is faced with mounting disaster.—I am, etc.,

JOHN SOPHIAN.

Worthing.

Medicine and Politics

SIR.—When membership of the Cabinet is changed the papers carry formal letters to and from the Prime Minister. In one of these (*The Times*, January 17) the phrase appeared: "Some changes would be good in order to give experience to those who have not had ministerial appointments." Of course the oncoming politician must be trained and tested, but it is not pleasing to think that the Health Service, we who serve and the patients we treat, may be used as guinea-pigs for this purpose. Is this another argument for the reorganization which will get us all out of politics?—I am, etc.,

Lewes.

NOEL H. M. BURKE.

Reform of the Health Service

SIR.—At a crowded gathering of the profession convened to form a local committee of the Guild I was saddened to see how little my colleagues were affected by the *depth* of the crisis facing us. Pay was the great topic. When I warned members of the danger of taking such an unrealistic view of our troubles I was told I was an idealist and that the important thing was to "rake in the lolly." It seems quite tragic that now, when the profession is united and strong (because it is angry), we should waste our powers on the exclusive problem of pay.

I was told that to confuse the reform of the Service with the problem of pay would only cause disunity in the ranks. I cannot see how this can be so. I believe the following basic principles of reform would command the approval of the majority: (1) the removal of the Service from the expedient fingers of the politicians; (2) the immediate payment of compensation at present values; (3) an "item of service" payment; "free" advice has never been thought good advice; (4) return of goodwill—giving back to us a measure of professional freedom; (5) only essential drugs free to all; (6) payment for minor operations and extra payment for being present at a birth; (7) freedom of choice of doctor restored to the patient. Reform is far and away our more important problem. The serpent is writhing on the staff, but an apple will not keep it quiet.

By our calling we are individualists and not given to group loyalties; but who knows when we shall be united again? The future is in our hands, and in this great crisis the eyes of the young in the profession are watching us with hope—and perhaps with fear. This tide in our affairs must be taken at the flood.—I am, etc.,

Lancaster.

FRANK S. RICKARDS.

SIR.—I feel that it is a tragic blunder that battle should have been joined with the Minister of Health on the narrow issue of a common wage claim alone, differing in no manner at all from that of our fellow labourers the railwaymen and the dock-workers, etc. What shred of prestige was left the poor general practitioner after Aneurin Bevan had finished with us has now been gratuitously cast away by our ill-chosen and much-publicized approach to the Minister of Health. Not only have we lost status by our methods of approach, but, whereas our brethren of the railroad and dockyards in their wisdom have seen to it that they have previously armed themselves with an iron fist before they have attempted to shake it in anger, we have, in our folly, resorted to precisely the same methods without any power at all to back up our attitude. By the exercise of but a small amount of art, grace, and wisdom, we should most probably have gained all, and certainly more than we are now seeking, and also have exalted our status in the eyes of public opinion, with its manifold advantages, if we had approached the Government at this time with a determined demand for a thoroughgoing and long overdue overhaul of the many defects and injustices of the Service. It could have been made publicly known that it was being done in the interests of both the profession and the public alike, instead of advertising ourselves merely as the hawkers of just another dreary wage claim.

I suggest, however, that Sir Russell Brain has already at this late date opened the door to a wider and wiser approach, and it is my suggestion that the strongest measures possible should be adopted to enforce if necessary, not a wage claim alone, but a demand to the Minister for a reorganized Service, using as a spearhead for our demands changes that will result in a better service to the public and fairer terms with a far wider scope of paid work for the general practitioner than is at present possible. On the other hand, conscientious doctors as a whole do not want the National Health Service Act repealed, they want it drastically overhauled. A mere increase of the present capitation fee would mean that the G.P. with little to offer would then be overpaid again at the expense of his colleague with more to offer. What is required is scope for payment to those practitioners with the training and equipment to increase their service to their patients which would reduce the hospital shambles and facilitate a reduction of the money squandered in this direction. General practitioners do not want their lost status restored by Act of Parliament; the general practitioner will regain honour where honour is due if he is given the opportunity to render work to the best of his ability.—I am, etc.,

Audley, Staffs.

JOHN F. JENKINS.

Remuneration Claim

SIR.—May I make an attempt at some constructive criticism in order to help solve some of the difficulties with remuneration? The present system of loading, which makes the 501st patient worth 10s. more than the 499th, could be altered in favour of payment more suited to modern trends. We all know that modern medicine is becoming more a matter of increased work in both geriatrics and paediatrics. Therefore, let us have the scales loaded in favour of those patients who take most of our time—namely, the under twelves and over sixty-fives. As an example (to be worked out in detail by the actuaries), we should be paid 25s. per patient in this group and 20s. for every other patient. Administrative difficulties could be helped by the use of a different-coloured card for this group in their record indexing system. If any further loading is considered possible, any doctors with more than 1,000 coloured cards would be entitled to a loading of 5s. per additional patient. This will encourage doctors to take more elderly patients on their lists.

I hesitate to make any further suggestion with the object of saving the country money, but I do feel that a charge for stay in hospital of £1 per adult and 10s. per child per week is not beyond the average pocket to-day, and there is always the public assistance for those who really cannot afford the charge. Furthermore, a charge for night calls from 10 p.m. to 6 a.m. of up to 10s. 6d. would discourage those who wait as long as possible before sending for the doctor. This charge could be made at the discretion of the doctor—who could waive or lower it according to the circumstances he knows the patient to be in. These ideas are put forward for constructive discussion at future meetings, as I feel they may have some value.—I am, etc.,

Woodford Bridge, Essex.

L. M. RUBENS.

SIR.—It is to be hoped that the machinery now being taken out of mothballs includes an effective public information service, lest our preparation for action be met by a nasty popular reaction. Wherefore are we proposing to strike? As I see it, we are proposing to withdraw our services in support of one or other of three alternative demands.

(1) We are claiming a straightforward pay increase of 24%. If this is refused we shall strike—just like any other trade union. If that is our position I, for one, remain a dissident, since I regard it as an open invitation to other unions to do the same. Unhappily, I believe many lay people regard it as our true position. It is an invidious one, which we must disclaim with all the cogency at our command; for it is inflationary and contrary to the public

interest at this present time. Indeed, we should be setting a better example were we to ask for a pay decrease.

(2) We demand that the Government honour its pledge by implementing the Spens recommendations, wherein our pay was tied to the cost of living. But the Government denies the existence of any such contractual obligation, and, unhappily, legal opinion is divided on the matter. Therefore we cannot say irrefutably that the Government has broken its pledge; we believe it has done so, we may swear passionately that it has done so, but when all is said and done we are in no better position than the plaintiff in a civil action for breach of contract. We may not strike on such an issue, we can only offer to go to arbitration.

(3) We are not claiming a mere pay increase; we are claiming an entirely new method of payment per item of service, a method which is an incentive, not a disincentive as at present. We are pressing this claim in the interests of our patients as well as ourselves. Every day I am embarrassed by patients who apologize for having called me out, who apologize at troubling me for what they regard as minor complaints. That is bad, my friends; it is the reverse of positive medicine. It is distressing to the humble and considerate patient. It is to the disadvantage of the meek.

Dr. C. Glaisher (*Supplement*, January 5, p. 13) has put forward suggestions for a scheme which would, I believe, appeal to the general public, and it is to the general public that we must appeal at this time; for if we win their support we shall not have need of strike action. Public opinion is a mighty force; it is the force that moves governments.—I am, etc.,

Bournemouth.

F. ROLAND WILDE.

SIR.—Is it absolutely essential that settlement of our claim should take the form of a proportionate increase all round to offset the reduced value of money? It is all very well to say that redistribution can be considered after our claim has been met, but this line of argument ignores the fact that the lower-paid members of our profession are really up against it and require special consideration now. I sincerely hope that negotiators on both sides of the table will keep this fact uppermost in their minds and will see that justice is applied where it is most needed.—I am, etc.,

Belfast.

H. J. CRONHELM.

SIR.—Might it not be that the Minister agrees the moral justice of our claim, but cannot, at this juncture, either economically or politically, accede to any large increase in pay from whatever source the demand comes? Such a course would inevitably lead to the devaluation of the pound, with all its subsequent ills. That the Service is unsatisfactory and in part degrading cannot be denied, but I cannot help thinking that the removal of the financial barrier as between the sick and their treatment is one of the greatest blessings that this country has ever received. Many would have us resign from this *en masse*. Where would we go from there? Would we go back to bills, and the cutting of treatment down to the minimum so as to avoid hardship to the patient? One correspondent writes that we are the only nation which has been crass enough to institute such a health service. Might we not be the only nation (except Russia) which has had the courage to do so?

Some advocate payment per item of service. Would this not be again erecting the financial barrier? From where is the extra money to come so that the doctors may be better off? Presumably, in part, out of their own pockets in the form of extra taxation. Have we not enough taxation already? This would force more people to apply for public assistance. Already one person in every fifty in this country is supported by public assistance. I must disagree with Dr. W. R. Blatchley (*Supplement*, January 12, p. 20) when he writes: "What doctor worthy of the name could not make a better living . . . in private practice?" My answer to him is that thousands of doctors are to-day financially better off than they were pre-N.H.S.

I believe that eventually we shall find that the only real solution is a salaried service, provided that the public can

be sufficiently safeguarded. We should then be in a position where we could afford to be united in pressing our claims: we should not be imprisoned in one practice for the whole of our professional life: we should not have to provide our own surgeries: we should work an eight-hour day: our pay would be secure and not at the mercy of a more proficient competitor.—I am, etc.,

Cheriton Bishop, Devon.

F. E. GRAHAM-BONNALIE.

SIR.—I suggest we stop these threats of strikes to secure our just demands. Instead let us embarrass the Government by economies. The first of these should be our telephones. On a fixed date we should inform the Postmaster-General we wish to have our telephones removed. The confusion within the Service would be considerable, yet at no loss to us. This last factor will be appreciated by those, like myself, who cannot afford to strike.—I am, etc.,

Irvine.

ANDREW A. GARVEN.

P.A.Y.E. and Surtax

SIR.—Not so very long ago many members of the consultant staffs of the hospitals of this country were transferred, willy-nilly, to the P.A.Y.E. system of tax collection. The system has some virtues, but as applied to this body of men and women it contains an injustice. With surtax at its present level a large proportion of these people are liable to this specific tax, which is levelled upon the total taxable income above £2,000 per annum. Now a man subject to P.A.Y.E. never handles his total earnings—he cannot invest it or put it to work for him in any way. In fact part of his income is a polite fiction. Surely he should only pay surtax on that part of his income over and above £2,000 which he does actually receive. The coexistence of P.A.Y.E. and surtax, as applied to the same individual, cannot be defended in equity or ethics.—I am, etc.,

Birmingham.

L. T. CLARKE.

Medical Trade Union

SIR.—One of the weaknesses of our present negotiating position is that we have no access to arbitration except as a concession from the Minister of Health. Our relative success with the Danckwerts award makes it unlikely that the Minister will agree to arbitration again.

At a recent meeting of doctors in Manchester called to reorganize the Medical Guild a speaker pointed out that if the Guild were a trade union then it could have our present dispute referred to an industrial disputes tribunal, and in this way could secure arbitration. However, we learned from the platform that the Guild is not a trade union in a legal sense and cannot take this action. We all know that by its Articles of Association the B.M.A. is precluded from acting as a trade union, but I do not know of anything in those articles which would preclude it from sponsoring a trade union. It would be a relatively simple procedure to circularize members with a form of application to join the British Medical Union, if we decided to call it that, and it could be organized in a very short time using the B.M.A. offices and staff. I visualize such a union as being a legal device to secure arbitration if negotiations break down, and I do not suggest that any of the more undesirable of trade union activities should be contemplated.

At present we are trying to fight a battle without weapons, and I have no confidence in threats of mass resignation and so on, nor do I agree with the confusion of reforms in the N.H.S. with the question of remuneration. We should have one objective at a time and should make certain we gain the first objective before going on to the second. The proposition I have outlined above seems to me well worth considering, and I would welcome comments on it from a B.M.A. representative and, even more, from a legal expert.—I am, etc.,

Manchester 8.

C. J. GRIFFIN.

H.M. Forces

A Supplement to the *London Gazette* has announced the following appointment and mention in dispatches in recognition of distinguished services in Cyprus for the period July 1 to December 31, 1956:

O.B.E. (Military Division).—Lieutenant-Colonel K. F. Stephens, R.A.M.C.
Mentioned in Dispatches.—Captain I. R. D. Reid, R.A.M.C.

ROYAL NAVY

Surgeon Lieutenant-Commander C. E. Wells has terminated his commission.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Lieutenants M. Wickham, M. G. D. Davys, A. F. Murphy, W. A. Copland, P. W. Harvey, R. L. H. Barnard, C. V. Kaula, M. W. Eddings, and W. J. C. Scott to be Surgeon Lieutenant-Commanders

ROYAL ARMY MEDICAL CORPS

Captains J. P. Crowdy and A. P. B. Harston to be Majors.

REGULAR ARMY RESERVE OF OFFICERS

Major-General J. M. Macfie, C.B., C.B.E., M.C., late R.A.M.C., having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers.

ROYAL ARMY MEDICAL CORPS

Captain (Acting Major) I. L. Gregory, from A.E.R.O., to be Captain, and has been granted the honorary rank of Major.

Class III.—Captain (War Substantive Major) (Honorary Lieutenant-Colonel) W. G. MacDougall, having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers, retaining the honorary rank of Lieutenant-Colonel.

BRITISH MEDICAL GUILD**Meetings to be Held**

MARYLEBONE.—At Committee Room C, B.M.A. House, Tavistock Square, W.C., Friday, February 22, 8.45 p.m.
TOWER HAMLETS.—At Recreation Hall, Mile End Hospital, Bancroft Road, E., Thursday, February 21, 8.30 p.m.

Association Notices**Diary of Central Meetings****FEBRUARY**

- 20 Wed. Representatives of Negotiating Committee to meet new Minister of Health (at 23, Savile Row, W.), 11 a.m.
- 20 Wed. Catering Committee, 12 noon.
- 20 Wed. Arrangements Committee (Birmingham, 1958), 2 p.m.
- 20 Wed. Negotiating Committee, 2.30 p.m.
- 21 Thurs. G.M.S. Committee, 10.30 a.m.
- 22 Fri. Staff Side, Committee C, Medical Whitley Council, 11 a.m.
- 22 Fri. Public Health Committee, 2 p.m.
- 22 Fri. Subcommittee on Medical Reports, Joint Committee of B.M.A. and Magistrates' Association, 2.30 p.m.
- 28 Thurs. Compensation and Superannuation Committee, 2 p.m.
- 28 Thurs. Non-professional Group Committee, 2 p.m.

MARCH

- 1 Fri. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
- 4 Mon. Alternative Edition Subcommittee, Joint Formulary Committee, 11 a.m.
- 5 Tues. Editorial Subcommittee, Joint Formulary Committee, 11 a.m.
- 7 Thurs. Charities Committee, 2.30 p.m.
- 8 Fri. Overseas Committee, 2 p.m.
- 21 Thurs. G.M.S. Committee, 10.30 a.m.

Branch and Division Meetings to be Held

ABERYSTWYTH DIVISION.—At General Hospital, Aberystwyth, Sunday, February 24, 3 p.m., business meeting.
BIRMINGHAM DIVISION.—At 154, Great Charles Street, Birmingham, Tuesday, February 19, 8.30 p.m., meeting. Lecture by Professor W. Melville Arnott: "Drugs—Their Uses and Abuses."
BOURNEMOUTH DIVISION.—At Board Room, Royal Victoria Hospital, Boscombe, Friday, February 22, 8.15 p.m., meeting. Address by Mr. P. W. Clarkson: "Contribution of Plastic Surgery to the Treatment of Endocrine Disorders."
BRADFORD DIVISION.—At Medical Societies' Room, Bradford Royal Infirmary, Tuesday, February 19, 8.15 p.m., meeting in

conjunction with Bradford Medico-Chirurgical Society. Symposium on cortisone.

COVENTRY DIVISION.—At Grosvenor Room, Hotel Leofric, Tuesday, February 19, 7.30 for 8 p.m., combined supper meeting with members of local dental profession. Address by Dr. R. W. H. Tavenner: "Osteomyelitis and the Acute Alveolar Abscess."

DARLINGTON DIVISION.—At Darlington Memorial Hospital, Tuesday, February 19, 8.30 p.m., meeting. B.M.A. Lecture by Mr. R. B. Zachary: "Surgery in Infancy."

EAST HERTS DIVISION.—At Mayflower Hotel, Hertford, Tuesday, February 19, 8 p.m., meeting of Hertford and District Branch of Pharmaceutical Society to which members of the Division are invited. Talk by Dr. J. J. F. Merry: "Therapy with Cortisone." A colour film will be shown.

FINCHLEY DIVISION.—At Board Room, Finchley Memorial Hospital, Granville Road, N. Finchley, N., Friday, February 22, 8.30 p.m., meeting. B.M.A. Lecture by Dr. H. Neville Stafford: "Some Unusual Cases in a Coroner's Experience."

GUILDFORD DIVISION.—At Board Room, Royal Surrey County Hospital, Thursday, February 21, 8.30 p.m., meeting. Lecture by Mr. N. C. Lake: "Problems of Foot Disorders."

HUDDERSFIELD DIVISION.—At George Hotel, Huddersfield, Thursday, February 21, 8 for 8.30 p.m., inaugural dinner.

LONDONDERRY DIVISION.—At City Hotel, Londonderry, Saturday, February 23, 8 for 8.30 p.m., dinner.

MID-ESSEX DIVISION.—At Out-patient Hall, Chelmsford and Essex Hospital, London Road, Chelmsford, Sunday, February 17, 10.45 a.m., meeting. Discussion: "The Menopause." Opening speaker, Mr. A. C. Pearson.

MIDLAND BRANCH.—At Selly Oak Hospital, Birmingham, Friday, February 22, 8.15 p.m., meeting of clinical and pathological section.

MONMOUTHSHIRE DIVISION.—At 20, Stow Hill, Newport, Thursday, February 21, 8.30 p.m., meeting. Address by Professor A. S. Duncan: "Importance of the Placenta in Obstetric Practice." Guests are invited.

NORTH MIDDLESEX DIVISION.—At Committee Room, North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, February 19, 8.30 for 8.45 p.m., meeting. Paper by Dr. G. I. M. Swyer: "Use of Hormones in General Practice." Medical guests are invited.

NORTH STAFFS DIVISION.—At Grand Hotel, Hanley, Tuesday, February 19, 8 p.m., supper meeting. Lecture by Dr. E. M. Donaldson: "The Dermatitis Myth."

OLDHAM DIVISION.—At Albion Club, Queen Street, Oldham, Monday, February 18, 9 p.m., meeting. Dr. C. S. Don: "Treatment of Diabetes—Some Recent Advances."

ST. PANCRAS DIVISION.—At Committee Room C, B.M.A. House, Tavistock Square, London, W.C., Wednesday, February 20, 8.30 p.m., meeting. Lecture-film-demonstration by Dr. P. Sattin: "General Practice Organization." Hospital officers, general practitioners, and members of the City Division are invited.

SCARBOROUGH DIVISION.—At Board Room, Scarborough Hospital, Thursday, February 21, 8.30 p.m., meeting. Lecture by Dr. R. E. Bonham-Carter: "Acute Cardiac Illness in Children."

SOUTH SHIELDS DIVISION.—At Ingham Infirmary, South Shields, Thursday, February 21, 8.30 p.m., meeting. Address by Dr. E. Grey-Turner (Assistant Secretary, B.M.A.): "Present Medical-Political Situation." All medical practitioners in the area of the Division are invited.

SOUTHAMPTON DIVISION.—At Conference Room, Civic Centre, Southampton, Wednesday, February 20, 8.30 p.m., general meeting. Address by Dr. Keith Simpson: "What to do with a Dead Body." Members are invited to meet the speaker at dinner in the Polygon Hotel at 7 p.m.

SOUTH-WEST ESSEX DIVISION.—At Langthorne Hospital, Langthorne Road, E., Wednesday, February 20, 8.30 p.m., general meeting. Discussion to be opened by the Bishop of Barking and Dr. Eric Ashton: "Divine Healing and Co-operation Between Doctors and Clergy." Clergy resident in the area of the Division are invited.

SWANSEA DIVISION.—At Osborne Hotel, Langland, Thursday, February 21, 7.30 for 8 p.m., dinner. Address by Dr. G. D. Kersley: "Trends in Treatment of Rheumatic Diseases."

TOWER HAMLETS DIVISION.—At St. Andrew's Hospital, Devons Road, Bow, E., Friday, February 22, 3 p.m., meeting. Mr. A. J. Walton: "Surgery of the Neck."

WEST MIDDLESEX DIVISION.—At Feathers Hotel, Ealing Broadway, W., Tuesday, February 19, 8 p.m., joint meeting with West Middlesex Chemists' Association and Branch of the Pharmaceutical Society. Lecture by Dr. F. E. Camps: "Some Problems in Toxicology."

WEST SUFFOLK DIVISION.—At Ball Room, Everard's Hotel, Bury St. Edmunds, Tuesday, February 19, 8.30 p.m., annual general meeting. Talk by Dr. Walter Hedgcock (Assistant Secretary, B.M.A.): "Current Affairs."

Dangerous Drugs Act: Withdrawal of Authorities

The Home Office announces that Dr. John Galbraith Mackay Anderson (Birmingham) and Dr. Esmond Millington (Hove) are no longer authorized to be in possession of or to prescribe those drugs to which the Dangerous Drugs Regulations apply.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

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British Medical Association

REPORT OF THE COMMITTEE ON THE CONSTITUTION OF THE ASSOCIATION

ANNUAL REPORT OF COUNCIL: APPENDIX I*

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PRELIMINARY

1. The Constitution Committee was established, on the instructions of the Representative Body, in 1953, with the following terms of reference:

To examine and report on the present structure of the Association, with special reference to the reorganization of the Representative Body.

2. The demand for a review of the Association's constitution arose originally from widespread doubt about the ability of the Representative Body to discharge its functions efficiently. The Representative Body is the Parliament of the Association, and on the efficient conduct of its business the welfare of the Association depends. Misgivings, which were widespread, were summarized and circulated to Divisions by the Winchester Division in 1953 together with constructive, if somewhat drastic, suggestions for reform.

3. In an earlier memorandum, the Winchester Division had referred to Representative Meetings "as a shambles—too many members discussing too many resolutions." The last phrase sums up the factors which have contributed to the present situation. Firstly, the increase in membership, which has almost doubled since before the war, has caused

*Although this is the report of a Special Committee, it will be discussed on the first day of the Representative Meeting as an appendix to the Annual Report of Council, which will be published shortly. Every member is asked to keep this Supplement, which contains matters referred to Divisions, until the subjects have been discussed by his Division.

a proportionate increase in the size of the Representative Body. The question of accommodation has in itself become a major problem, apart from the comfort and convenience of Representatives attending the Meetings. Secondly, the political events of the post-war era were of such vital concern to the profession that the business facing Representative Meetings, both annual and special, grew so great that severe strain was apparent.

4. Although the over-long agendas which accompanied the discussions on the National Health Service Bill and resulted in many important matters being referred to Council with little or no debate are now matters of past history, and although steps have been taken to streamline the agenda to some extent, many members have felt that the Representative Body still has too much to do and is too large in size to conduct its business with despatch and efficiency. It was these factors that caused the Representative Body in 1953 to instruct the Council to form an *ad hoc* Constitution Committee "to take evidence, consider, and report on a reorganization of the Representative Body and such other constitutional matters as Council may decide" (Minute 249). In appointing the Committee the Council had regard to the decision of the Representative Body that not more than 50% of the members should be members of the Council and also to the need to include representatives of all the main fields of practice and of differing types of area with a balanced geographical distribution. This aim has been achieved, but it has necessitated a large committee of some 33 members (see Appendix A).

5. The main objects of the Association, as stated in its Memorandum, are "to promote the medical and allied sciences, and to maintain the honour and interests of the medical profession." Its history has proved that the only certain way of achieving these objects is through a constitution based on sound democratic principles, under which the individual member can (a) freely voice his views and make these views felt in the policy of the Association and (b) satisfy his needs—scientific, social, and material. On this foundation the existing Association structure has evolved. Under this structure the Representative Body (representative, as the name implies, of members throughout the Association) is the Parliament of the Association, formulating policy. The Council has the duty of directing the business of the Association under the control of the Representative Body, and in the discharge of that duty is responsible not only for implementing decisions of the Representative Body but for formulating policy for its consideration. It carries out these duties through the medium of Committees, elected as to part by the Representative Body and as to part by the Council itself. The Branches are territorial units with defined duties, which include the election of the majority of members of the Council. Lastly, the Branches are divided into Divisions, each with autonomous powers in regard to its management, subject always to the provisions of the Articles and By-laws. The Divisions are the basic units of the Association and complete the circle by appointing, in accordance with their numerical strength, the members of the Representative Body. In this way individual members can make their influence felt, through their Representatives, in determining Association policy.

6. With this constitution and with a membership comprising the great majority of the working profession at home and abroad, the Association has been in a powerful position to carry out its objects. It promotes the medical and allied sciences in various ways—through a Standing Science Committee, the *British Medical Journal*, the Library, the scientific activities of the Annual Meetings, which have increased in scope in recent years, and through functions of scientific interest arranged by the Branches and Divisions. Its medico-political activities and its influence in health legislation since the turn of the century have grown with the strength of its membership. The developments affecting medical practice which are referred to in later paragraphs of this Report and in particular the ramifications of the National Health Service have, however, raised the question of whether the constitution in its existing form is such as to enable the Association to continue to function efficiently in the new conditions. The Council has therefore liberally interpreted the instruction of the Representative Body and has so framed the reference to the Committee as to cover an examination of the constitution from the ground up, and, if necessary, to restore the balance between the medico-political and the other manifold activities of the Association summed up in the phrase "to promote the medical and allied sciences." It is from these aspects that the Committee has drafted its Report.

7. Mr. H. H. Langston, of Winchester, has been Chairman of the Committee. At an early stage in its deliberations the Committee delegated a great deal of detailed work to a Chairman's Subcommittee, which has met frequently to examine statistics and other evidence, to collect information, and to correlate the data on which the main conclusions and recommendations of the Committee are based.

General Considerations

8. As a prerequisite to the examination of the several parts of the Association's constitution, the Committee has reviewed the developments affecting medical practice during the past 50 years. In trying to assess the extent to which the constitution may have succeeded or failed as an instrument in furthering the objects of the Association, the Committee has been impressed by the essential soundness of a structure which, designed half a century ago, has served its purpose well and has withstood two major political crises

affecting the basic principles of medical practice; the disruptive effect of two world wars; and the less dramatic but equally important gradual extension of the State's responsibility for health and welfare. In spite of strain and stress and in spite of the increase of specialism which has tended to create gaps between and, indeed, within the main fields of practice, the claim of the Association to speak for the whole profession is stronger now than at any time previously, and is generally recognized. This cannot be attributed to the increase in membership alone, but is in large measure due to the fact that the Association's constitution (as set out in para. 5) is based on a federation of geographical units rather than an alliance of craft groups. In spite of immense differences between these units, both at home and overseas, in size, geographical area, and the nature of the predominant type of practice, it has been possible during the past 50 years to preserve unity of aim and purpose.

9. Though in essentials the constitution has not changed since 1902, there have been many adaptations to changes in the political environment and to changes within the profession itself. Two of these adaptations are important as forming precedents, the implications of which were not foreseen at the time. These were the establishment in 1913 of the Conference of Local Medical and Panel Committees and its executive the Insurance Acts Committee, and the formation in 1927 of the first Special Groups. The reason in both cases was to prevent the formation of separate organizations with the conflicting loyalties arising therefrom.

10. The changes following on the introduction of National Health Insurance and the evolution of machinery for dealing with special groups has resulted in both cases in compromises. In each it is possible in theory for non-members of the Association to influence, if not to direct, Association policy. The stresses and strains inherent in these constitutional compromises have become much more apparent and potentially dangerous now that virtually the whole profession is subject to terms and conditions of service under some form of contract. The division of the administrative structure of the National Health Service into separate compartments and the extension of medical practice under contract to cover the whole community has exaggerated, though it did not cause, the divergence of interests within the profession which had been gradually increasing throughout the whole period. This is reflected in the Association's Committee and Group structure, which, though adapted to meet these problems, cannot be absolved from contributing to some of the difficulties it was designed to cure.

11. In 1938 the Medico-Political Committee was replaced by two standing committees, the Special Practice Committee and the General Practice Committee (now the Private Practice Committee). Each represented a defined field of practice. This emphasized the differing interests between the two groups and also gave undue prominence to the fact that both in the Divisions and in the Representative Body general practitioners were in a majority. This fact above others has created the desire for independence and the defining of spheres of interest. The distinction between sectional interests is largely artificial and its effect on the Representative Body has been exaggerated, but it is nevertheless a factor of importance. The formation of each new special group also fosters the feeling of "being in a minority" among the members of the Group, together with the tendency to seek the right of independent action. Nor is the problem of minorities confined to the Representative Body. It occurs in the Central Consultants and Specialists Committee, where each new group, as well as such categories as whole-time specialists, medical administrators, etc., is in a minority. It occurs, though to a lesser extent, in the Committees dealing with general practice problems. The practitioner in wholly private practice, the unestablished or small-list practitioner, and the rural practitioner may at times feel at a disadvantage in the Private Practice and General Medical Services Committees. The fact that the Council has overriding control over these Committees does not entirely relieve the misgivings felt by members of minority groups; direct access

may be difficult, and they are conscious that their point of view can be expressed only through the major Committee concerned.

12. In the sphere of general practice, the extension of contract practice to the whole community has increased the field of work and consequently the relative importance of the General Medical Services Committee and the Conference of Local Medical Committees. This has caused serious misgivings in some quarters. At the Representative Meeting in 1953 there were 44 resolutions under the heading "General Medical Services," in contrast to 6 in 1927 and 5 in 1935 under the heading "National Health Insurance." The effect of this change is not, however, very important in the Representative Body, because general practitioners are in a majority and because the representatives in the Representative Body and in the Conference of Local Medical Committees are, in the main, the same practitioners. It is in the Consultant and Specialist field that major constitutional problems arise, and these are due mainly to four factors:

(1) The area and structure of Regional Consultants Committees bears no relation to that of the Association's Divisions and Branches, and there is no provision for formal representation of Association units on the Regional Committees.

(2) Consultants and specialists form a minority in the Representative Body.

(3) The need for joint negotiating machinery to maintain a united front in the hospital service field.

(4) The multiplication of Special Groups.

13. Nevertheless, a special committee which was established in 1949 to consider the situation created by the formation of autonomous bodies within the Association and their relationship to the Representative Body found that the difficulties and dangers were more apparent than real and recommended that the existing arrangement should continue.

14. With due regard to past history and appreciating that the newly qualified and as yet unestablished member is in a very different environment and facing entirely new problems, the Committee has examined in great detail each part of the constitutional structure of the Association. It is recommending few radical changes, but these are important and controversial. Briefly they may be summarized as follows:

(1) A new conception of the Branch. (2) A substantial reduction in the size of the R.B. (3) Extension of representation of special interests in the R.B. (4) Revision of the programme of Scientific Meetings. (5) A new approach to the problem of Special Groups.

15. In addition, the Committee is recommending many changes of lesser magnitude, which it is hoped will increase the value of membership to the individual doctor and improve the conduct of business at Representative Meetings. Some of these changes will appear as recommendations, some have already been effected, including the proposal to establish an Annual Conference of Regional Consultants Committees (para. 133); the use of Association funds for social purposes (para. 32); liaison between Divisions and other local bodies (paras. 29 and 31).

16. The proposals made in the Report do not in every instance express the unanimous view of members of the Committee. Membership of the Committee will, however, in no way preclude members from expressing in the Council, in the Divisions, and in the debate in the Representative Body their personal views where these differ from those of the majority of the Committee. In this way it has been possible to avoid minority reports.

I. PERIPHERAL ORGANIZATION

17. The Committee has considered the peripheral organization of the Association under the following headings:

(a) the place of the Branch and Division in the framework of the Association;

(b) the effect on the Branch and Divisions of developments in recent years resulting from health legislation and reorganization of Branch and Division machinery to ensure that local units will be able to reconcile fully within their framework the interests of all members of the Association and to establish effective liaison with other local administrative bodies—statutory and non-statutory;

(c) the geographical distribution of the units.

It has confined its attention to the Home Branches and Divisions, and has not attempted to discuss the organization overseas. The latter is largely dependent on local law and custom, and the constitution of the overseas units of the Association, as set out in the Articles and By-laws, appears to be satisfactory.

1. THE BASIC UNIT—THE DIVISION

(A) The Function of the Division, its Numerical Strength and Area

18. In a democratic institution of the nature of the Association the member as an individual is primarily a member of the Division in the area of which he resides and with which his main contact must be. *Ipsa facto*, he is a member of the whole Association. It follows that the Division must be the basic unit of the Association, so constituted as to serve the essential needs of its constituents. Its area should be such as to provide every one of its members with a reasonable opportunity of attending every important meeting, and its numerical strength such as will allow of efficient organization and reasonable contact between members. The duty of election to membership of candidates within its area should, as advocated in para. 23, rest with the Division and not with the Branch as at present. These basic principles having been accepted, the Committee makes the following observations:

(i) Function of the Division

19. The function of the Division should be to foster and maintain personal contact between its members; to provide these members with opportunity for scientific discussion; and to provide a forum for discussion of their problems.

Personal Contact: The importance of social occasions—formal and, more particularly, informal—as a factor in promoting the success of a Division is emphasized. The provision of opportunities for personal contact must depend largely on local circumstances.

The Young Practitioner: The introduction of the young practitioner to B.M.A. work should be regarded as an integral part of this function.

Scientific Activities: The type of Scientific Meeting will depend to a large extent on local circumstances.

Medico-Political Field: The function of the Division in this field should be:

(a) to implement central and local policy;

(b) to take action on behalf of its members individually or collectively and to co-ordinate the views of those engaged in the different branches of the profession. This aim cannot be achieved by merely duplicating the function of, or attempting to compete with, the various statutory or functional bodies which have specific duties within defined fields. The main object should be to co-ordinate local professional opinion and to pool knowledge and ideas for the common good.

20. The success of a Division must ultimately depend upon the loyal co-operation and support of all its members, no matter in what branch of the profession they may be engaged. Participation in the activities of the Division by its consultant and specialist members is equally as important as that of the general practitioner, and this is true also of the young and unestablished practitioner, whether in the hospital service or in general practice. The public health medical officer, whose work cannot satisfactorily be divorced from that of his colleagues in the other services, has his place in the Division organization. It is the duty of the

Executive Committee to impress upon all members of the Division the importance of regarding themselves as members of *one* body, with closely interrelated interests.

21. In discussing how this integration of the profession could most effectively be achieved the Committee has considered a suggestion that the Division should invariably be coterminous in area with the Executive Council and that it should, through its Executive Committee, operate as the Local Medical Committee. The Committee does not favour this proposal. While there are advantages in a close alignment between the Division on the one hand and the Local Medical Committee and Local Government area on the other, the Division should not necessarily be coterminous with any one statutory or functional body, whether Regional Consultants Committee, Local Health Authority, or Local Executive Council. The function of the B.M.A. Division is by no means confined to the interests of those in contact with the Executive Council. If the area of the basic unit is to be such that every member thereof shall have a reasonable opportunity of attending every important meeting, whether scientific, social, or medico-political, the Division must have considerable autonomy in determining its own area. Within this principle the aim should be to include all the interests represented by the local statutory and functional bodies.

22. So far as the relationship of the Division to the Local Medical Committee is concerned, there is at the present time a considerable overlap in membership, and this overlap should make it possible to ensure that the Division is kept fully informed at its meetings of Local Medical Committee activities.

23. There is a further function—the election of candidates for membership of the Association—which the Committee believes should in future be transferred to the Division. At the present time this duty rests with the Branch Council, and this procedure has given rise to criticism on the ground that it may lead to considerable delay. It has also been suggested that the Division Executive is in a better position to judge the candidates' suitability for membership of the Association. The Committee is recommending the transfer of this function to Divisions subject to certain reservations which are set out in para. 48 of this Report. Its recommendation is contained in Recommendation 6 on page 79.

(ii) Size of the Division

24. In order to carry out its proper functions, the Division should be large enough to include in its membership all the main fields of medical practice. It follows that there is a point below which a Division may be too small numerically or geographically to achieve this, since it is essential that the Executive Committee should, where possible, include representatives of statutory local committees, the Public Health Service, hospital staffs, and other groups within the profession. On the other hand, the Division should not be so large that it is virtually impossible for Honorary Secretaries and Chairmen, together with the members of their Executives, to maintain personal contact with the members of their Divisions.

25. The Committee has found it impossible to arrive at any definite conclusion regarding the optimum size of a Division. 150–200 has been suggested as a possible standard, but it is realized that there must be considerable flexibility to allow for geographical differences, association with hospitals, universities, etc. The very large Division, though compact geographically, presents special difficulties of organization and administration which may sometimes prove a handicap to efficiency. These difficulties have in some instances been overcome by the establishment within the Division of a "ward" system, each with its own organization and officers, but subject to the overriding control of the Executive of the Division.

(iii) Area of the Division

26. As stated in para. 21 the Committee holds strongly to the view that there should be no arbitrary determination of boundaries, but that within the limits of a generally de-

fined policy the unit should have the right to determine its own area, having regard to the convenience of its constituents. The area of the Division should be such that every member has a reasonable opportunity to attend meetings, bearing in mind the revolutionary change in methods of transport since the present Division structure was originally established.

27. To summarize: (a) The autonomy of the Division in determining its boundaries should be preserved. (b) In this determination the importance of a close relationship between the Division and other local bodies—e.g., medical societies, hospital groups, etc.—should not be overlooked. (c) Large units covering, in the main, County areas might well operate more efficiently if divided into smaller areas covering parts of the County. In large Divisions covering urban areas, the "ward" system might be preferable.

(B) Activities of Divisions

28. The answers to a questionnaire, issued to Divisions and Branches as part of the Committee's procedure, suggested a number of ways in which Divisions might improve their efficiency and their service to their members. The Committee considers that it should be for the Divisions themselves to implement the suggestions made in the following brief summary:

(i) Liaison with Local Medical Societies

29. Where active local medical or clinical societies co-exist with B.M.A. Divisions there is adequate liaison or some working arrangement in only about half the cases. The difficulties are appreciated, but much could be done by concerted action to improve the amenities offered to members. Among methods suggested are:

Representation of the Division on Local Medical Societies; joint meeting or meetings called alternately by the Division and Medical Society; invitation to members of the Division to meetings of the Society and vice versa; advertisement of meetings of medical societies through routine notices of Division meetings; the use of the B.M.A. Lecture for bringing local Medical Societies within the sphere of the Division's scientific activities.

(ii) Representation on Executive Committee of Divisions

30. The Committee stresses the importance of representation on Division Executives of all the sectional interests for which provision is made in the Model Rules of Organization framed by the Council of the Association. For instance, even if one or more members of hospital staffs are elected members of the Executive, there should be, in addition, formal representation of the Hospital Advisory Committee or Committees.

(iii) Local Liaison Committees

31. The Committee regards it as the function of every Division to see that effective liaison is maintained with recognized statutory and functional bodies in its area. In certain areas this may be achieved only by forming special liaison committees; in others the existence of such committees may well be unnecessary and the Division Executive Committee, suitably constituted, will be adequate for the purpose. The method of establishing liaison should be left to the discretion of the individual unit in the light of local conditions and circumstances.

(iv) The Use of Association Funds for Social Purposes

32. Many Divisions are handicapped and even embarrassed by the limitations imposed on them in the use of Association funds. The difficulty of collecting and maintaining voluntary funds for the provision of social amenities and hospitality is appreciated, and these funds have no permanent basis. It has become increasingly evident that the local units must be given more latitude in the expenditure of Association funds, particularly in respect of hospitality to guests and the provision of light refreshments at ordinary meetings of the Association. Action has accordingly been taken to provide Divisions with the necessary means for this purpose.

33. The Committee recommends:

Recommendation 1: That the Divisions as at present constituted should form the basic unit of the Association's constitution and that no change of area should be effected except on the initiative or with the consent of the Divisions themselves.

Recommendation 2: That while ease of access for members is of paramount importance in determining Division areas, the importance of maintaining a close relationship with local statutory or functional bodies and other local professional groups should not be overlooked.

2. THE BRANCH

34. Having confirmed the position of the Division as the basic unit of the Association's organization, the Committee turned its attention to the existing Branch structure. Its conclusion is that the present method of peripheral organization—namely, the Branch with its component Divisions—is that most suited to the needs of the Association and should be retained. This conclusion is supported by the replies received from Branches and Divisions to the Committee's questionnaire. The Committee feels, however, that the Branch structure requires to be varied so as to adapt it to the changes in medical practice which have occurred.

35. In 1901, when the present constitution, consisting of a two-tier structure composed of autonomous Divisions grouped to form Branches, was established, the division of medicine into separate branches—general practice, public health, and hospital service—had scarcely begun. Nowadays, the existence of separate fields of practice—accentuated by the National Health Service—has formed one of the main problems facing the Constitution Committee.

36. The Division caters for the individual member and his particular needs and provides a place for the discussion of his problems, whatever his form of practice. In the Committee's view, however, a further unit of sufficiently large functional area is needed, capable of co-ordinating the opinions of all sections of the profession within that area and of mobilizing its forces behind any section needing support.

37. The present Branch structure does not meet this need. The policy of grouping Divisions into Branches based on Local Government areas is unrealistic now that the functions of Local Authorities have changed considerably. In particular, it is doubtful whether many of the small Branches are capable of coping adequately with present-day problems, and, since the control of hospitals has passed out of the hands of the County and County Borough Councils, the main reason for the organization of the Branches, and particularly Division-Branches, on a County basis no longer exists.

38. Accordingly it is proposed that the Branches shall be so reorganized that they are capable of taking effective action in the new circumstances. As indicated in the "Preliminary" section of this Report, so far as the General Medical Services under the National Health Service and the Public Health Service are concerned, there has been little difficulty, under the existing machinery, in arranging for effective co-ordination of local professional opinion. It is in the field of the Hospital and Specialist Service, with its regional organization on a wide basis, that difficulty has arisen. The Branches, as at present constituted, cover widely differing areas and it is by accident rather than by design if the area bears any practical relationship to the views of members employed in the Hospital Service in the Regions can be co-ordinated with the views of their colleagues in the other two sections of professional work. This weak point in the organization must be overcome if the Association is in practice to substantiate its claim to represent the whole profession at local level. With a view to achieving the necessary strength and stability the Committee recommends that the Branches shall be reorganized on a basis corresponding in the main with the areas of the

Regional Hospital Boards. It realizes that this will involve major changes in many areas which may conflict with long-established local tradition and loyalties, but it regards this as an inevitable accompaniment of change designed to bring the whole profession together in one B.M.A. unit of sufficient size.

The Aims of Reorganization

39. The main functions of the Branch would be to co-ordinate the activities of its constituent Divisions and to provide mutual support for the views of the various units and sections of the profession within its area—Divisions, Regional Consultants Committees, Local Medical Committees, etc. In effect, in its new form the Branch would operate as a Branch Council, representative of its constituent units, with functions similar to those of the present Branch Council, modified and extended to meet present-day needs. It would hold regular meetings, though these would not be numerous, and, having important duties to perform, its meetings should attract adequate attendances.

40. The Branch Council should contain in its membership representatives of all the organized bodies in its area, and so be able to speak with authority on behalf of the profession as a whole. It would, as occasion demanded, call together *ad hoc* groups of Divisions for the purpose of discussing matters of interest to the members of the Association within the group. The grouping would vary according to the circumstances for which the combination was used.

41. As a direct result of the modification of function the Branch itself would not have individual membership as at present. Nor would it be under obligation, as is the case at present, to call general meetings, either annual or ordinary, of members of the Association in its area. It would, however, reserve the right to call a general meeting of the members of the Divisions within the Branch area should this be deemed necessary, and the members, by virtue of their membership of the Divisions, would be entitled to attend any such meeting.

42. The Branch should maintain a close relationship with the member(s) representing the constituency in the Council and should take steps to ensure that he receives copies of all notices of meetings issued by the Branch and its Divisions and a special invitation to attend when any matter of import is under discussion or an important social function is taking place. This contact is most important as providing a ready means for keeping the Branch and its Divisions informed of central policy and action and with a channel through which they can make their views known to the Council and its Committees.

43. It is an accepted principle that an effective public relations machinery is essential to the success of any organized body, and this is equally true in the case of the local units of that body. From time to time questions arise in a particular locality which, though of little national interest, are of considerable concern to the profession. It is essential, therefore, that in all areas there should exist a public relations machine in good working order. The need for this will be felt more particularly in the Divisions, but, as the immediate parent body, the Branch should accept the responsibility for seeing that the machine is there and efficiently maintained. Moreover, the Branch should be prepared, if necessary, to set up its own public relations machinery, in effective contact with the central public relations department. In this way the Branch or its Divisions, as circumstances may determine, will be in a position to deal effectively and promptly with local matters as they arise.

44. Reorganization of the existing Branch system on a hospital regional basis would have important advantages. The profession as a whole over a large functional area would be able to speak with one voice and representatives of the different groups within the area could meet to discuss common interests. A closer link would be formed between hospital staffs and the Association, while not interfering with the existing regional machinery through which

consultants and specialists make their views known to their central negotiating bodies. It would help the member of Council representing the area and the member of the Headquarters medical secretariat appointed for the area to keep in close touch with their constituencies. It might be argued that there would be difficulty in arranging effective meetings in such large areas as hospital regions. This difficulty has, however, been overcome in the consultant field and there are good records of attendance at meetings of Regional Consultants Committees. Presumably other members would be prepared, on occasion, to travel relatively long distances, particularly as most regions are based on a university city, which is also a centre of communications. The proposed reorganization would, as indicated previously, have certain disadvantages, the chief of which is the inevitable conflict with long-established local tradition and loyalties. It is believed, however, that as in the past these difficulties will be overcome in the interest of the efficient working of the Association machine.

Function of the Branch

45. Implementation of the proposals for revision of the Branch organization involves a restatement of the functions of the Branch. At present these functions, as defined in By-law 25, are: (1) Co-ordination of the work of Divisions; (2) management of affairs of inactive Divisions, and their reactivation; (3) reporting to Council as to local conditions; (4) election of new members to the Association; (5) provision of Divisional funds out of grants from Headquarters.

46. The first of these functions—the co-ordination of the work of the Divisions—is an essential corollary to the main function of the proposed new Branch—namely, to unite the three branches of the profession into one body.

47. In pursuance of this duty (and following the majority view of the Divisions as ascertained by the Committee), the Branch should retain the responsibility for managing the affairs of inactive Divisions and facilitating their revival; it should also continue to report to the Council on conditions within the Branch area, without prejudice to the passing of information to Headquarters through other existing channels of communication, namely, through the Division, the local member of Council, and the Assistant Secretary assigned to the area.

48. As regards the other functions mentioned, many Divisions feel that the election of new members should be in their own hands and that in financial matters they should deal direct with the Central Office. The Committee has accepted in principle that the election of candidates for membership of the Association should rest with the Division, subject to certain reservations. These are, (a) that in the event of objection by the Division to the election of a candidate the matter should be referred to the Branch Council; and (b) that the election of newly qualified candidates for membership should be carried out by the Central Council. There are good reasons for placing the election of newly qualified candidates in the hands of the Central Council. These candidates are "birds of passage" during the first years of their professional career and particularly during the pre-registration year, which they must spend in two or more hospital appointments. It is essential that they should be brought within the sphere of the Association immediately on qualification and that their election to membership should not be subject to unnecessary delay. For this reason the Committee is strongly in favour of central election.

49. The Committee does not accept the suggestion that the existing method of financing the Divisions should be changed. It feels that so long as the Branch retains certain functions in respect of co-ordination of activities and the resuscitation of inactive units, it should retain the responsibility for financing the Divisions.

50. Stated briefly, the functions of the Branch under the revised constitution would be: (1) *To foster and maintain the unity of the profession within its area by means of exchange of views*; and, with this end in view, (2) *To take*

appropriate and immediate action in support of any section of the profession within its area when requested to do so. (3) *To report such action to Headquarters with a view to active measures by the whole profession if necessary.* (4) *To co-ordinate the work of the Divisions within its area.* (5) *To manage the affairs of inactive Divisions and promote their activity.* (6) *To organize special groups of Divisions for special purposes.* (7) *To provide the Divisions with funds, out of grants from Headquarters.* (8) *To be responsible for maintaining efficient public relations machinery, including the setting up of such machinery in any part of its area where the efforts of the Division have proved not to be effective.* (9) *To report to Council as to local conditions, without prejudice to other existing channels of communication.* (10) *To maintain an effective liaison with the members of Council representing the constituency.* (11) *To elect members of the Association when, and only when, referred by a Division within its area.*

Scheme for Reorganization

51. Accepting the assumption that change is needed to meet changed conditions, the form of organization suggested retains the two-tier peripheral structure which has in the past formed such a successful part of the Association's constitution. In general, the regrouping of Divisions to form Branches conterminous with part or the whole of a hospital region presents no great difficulty, but flexibility is necessary to deal with the few exceptional circumstances. For instance, where, under the proposed scheme, a Division is not wholly included in one Branch area, it will have the right to choose to which of the two Branches concerned it will belong, but it will also be represented on the Council of the other. Also where, as in some areas, Divisions form a natural and clearly defined geographical unit, it may be necessary to regroup them either within or side by side the new Branch structure.

52. It is difficult in some areas to avoid a three-tier organization. This already exists in the case of the Scottish and Welsh Committees, but these Committees have special functions additional to those ascribed to the Branch in the preceding paragraphs. Wales is perhaps the simplest example of the need for compromise. Because of the difficulty of communication between north and south, the existing Branches may have to remain, while the Welsh Committee will assume the role of Regional Council. The Border Counties and the Metropolitan Counties Branches are also examples of a problem which cannot be solved by adherence to a rigid two-tier structure.

53. Further, where established Branches within a region wish to retain their identity they should be given the opportunity to do so, in spite of the fact that this may necessitate, on rare occasions, the setting up of Liaison Committees. Examples are: North of England and Tees-side Branches within the Northern Region; South-Western Branch within the South-Western Region; and Sussex and Border Counties Branches, which are each divided by regional boundaries.

54. The formation *ad hoc* of Liaison Committees for concerted action by the two Branches within a Region would not necessarily imply a three-tier organization. The Liaison Committee would not be an organized unit, but could be called together if and when need arose. If therefore, as seems unavoidable, a modified three-tier structure should be needed in certain areas—that is, Division: *existing Branch*: Regional Council—the question arises, which of the latter should take over the functions now envisaged for the Branch?

55. Clearly, for the sake of consistency, the word "Branch" should be retained to describe the new Regional unit. The problem remains to find a designation for the intermediate organized group of Divisions in those instances where the existing Branch wishes to retain its identity. This has proved very difficult, but in the detailed scheme appended the word "Group" has been used to indicate the retention within the new Regional unit of an existing Branch rather than an *ad hoc* functional group of Divisions formed for a specific purpose. In the main these Groups retain

the titles of the original Branches from which they are derived.

56. The proposed plan for reorganization of the Branches is appended (Appendix B). It will be seen that its effect is to reduce the number of Branches in Great Britain and Northern Ireland from 46 to 42. In Scotland there will be little change except for the elimination of the Division-Branch. In Northern Ireland there will be no change. The Groups may, or may not, prove to be permanent structures, depending on a number of factors such as tradition, ease of access, local options, etc.

57. The Committee recommends:

Recommendation 3: In order to maintain the unity of the profession within the Association in the changed circumstances created by the establishment of a National Health Service, the second tier unit—i.e., the Branch—should be reconstituted on a regional basis. The regions should, as far as possible, follow those of the Regional Hospital Boards under the National Health Service.

Recommendation 4: That the Branch, as reconstituted, should have as its main object the fostering and maintenance of the unity of the profession within its area. Its functions should, in effect, be those of the present Branch Council, modified and extended to meet present-day conditions. For this reason the Branch would not ordinarily hold meetings of the individual members in its area. Its main duty would be to call together its constituent Divisions, or the professional groups within its area, for an exchange of views. It would reserve the right to call a meeting of individual members on a particular occasion if deemed necessary or expedient.

Recommendation 5: That the functions of the Branch, as reconstituted, should be as follows, and that the necessary amendments to the By-laws be made to give effect to these proposals:

(1) *To foster and maintain the unity of the profession within its area by means of exchange of views.* (2) *To take appropriate and immediate action in support of any section of the profession within its area when requested to do so.* (3) *To report such action to Headquarters, with a view to active measures by the whole profession if necessary.* (4) *To co-ordinate the work of the Divisions within its area.* (5) *To manage the affairs of inactive Divisions and promote their activity.* (6) *To organize special groups of Divisions for special purposes.* (7) *To provide the Divisions with funds, out of grants from Headquarters.* (8) *To undertake responsibility for the establishment and the maintenance of efficient public relations machinery in the Divisions within its area; and if necessary to establish Branch machinery.* (9) *To report to Council as to local conditions, without prejudice to other existing channels of communication.* (10) *To maintain an effective liaison with the member(s) of Council representing the constituency.* (11) *To elect members of the Association when, and only when, referred by a Division within its area.*

Recommendation 6: That Article 3 and By-laws 5, 6, and 7 be altered to provide that the election of new members shall ordinarily be by Divisions with the right of reference to Branch Councils, save that in the case of newly qualified applicants election shall be by the Council.

Recommendation 7: That the (provisional) scheme for regrouping of Divisions to form Branches on a regional basis be approved.

Constituencies for Election of "Forty" Members of Council

58. The Committee has considered the effect of its proposals for reorganization of the Branch structure on the procedure for the election of the "forty" members of Council. Under By-law 55 the election is now carried out by constituencies formed by grouped Branches or Divisions. This procedure has proved satisfactory and there seems no

logical reason for change, as the proposed Regional Scheme would continue to provide a rational grouping. The constituencies could be adapted to the proposed Branch structure with very little change and without altering the existing criteria, namely: one member of Council for a constituency of up to 1,600, two for a constituency of up to 2,600, etc. There is one exception. Because of the size of the area and particularly its peculiar geographical difficulties, it is proposed that the South-Western Branch, which on a strict numerical basis would be entitled to elect two members to the Council, should have a quota of three, one of whom will be elected by the Divisions in Devon and Cornwall. The effect of this variation will be to increase the number of directly elected members of Council from 40 to 41, and it will necessitate amendment of By-law 53, which specifies the constitution of the Council. The suggested regrouping is appended (Appendix C).

59. The Committee recommends:

Recommendation 8: That the revised grouping of Home Branches to form constituencies for the direct election of members of Council (Appendix C of Report) be approved; and that By-law 53 be amended so as to increase the number of such directly elected members from 40 to 41.

II. THE REPRESENTATIVE BODY

A. Constitution

(i) Size of the Representative Body

60. The terms of reference of the Constitution Committee conclude with the phrase "with special reference to the reorganization of the Representative Body." Paragraphs 3 and 4 of the Report set out in some detail the reasons which have led to the conclusion that this reorganization is due, if not overdue. Summarized they are:

(i) That the great increase in membership of the Association without alteration of the numerical basis of representation in the Representative Body has caused that Body to grow to a size which, in itself:

(a) hampers efficiency and makes it more difficult to complete, within the allotted time, an Agenda which has lengthened considerably following political developments affecting the profession; (b) severely limits the choice of place at which the Annual Meeting can be held, thereby depriving many Divisions of the privilege of acting as host to the Representative Body; (c) increases the number of potential speakers at the Meeting, thereby interfering with the conduct of business.

(ii) That with the growth in size the representation given to the larger Divisions under By-law 39 appears to be disproportionate in comparison with that of the smaller constituencies.

61. By-law 39, which determines on a numerical basis and with no maximum the number of Representatives to be returned to the constituencies, was drawn up when the membership of the Association was much smaller than it is to-day. In the circumstances then existing there was no danger of the Representative Body reaching a size which might hamper its efficiency or which might give rise to practical difficulty in the matter of accommodation. The present picture is entirely different—in 1956 the size of the Representative Body was approximately 500, as compared with 366 in 1938. In the view of the Committee the situation is now such that the Representative Body is unwieldy in character, with detriment to the efficient conduct of its business and with the risk that matters of vital importance to the profession may not receive the consideration they merit. Bearing in mind the debate in the Representative Body which preceded its formation, the Constitution Committee, after considerable discussion, has reached the conclusion that in order to secure maximum efficiency in the conduct of business a reduction in the size of the Representative Body is essential.

62. The Committee has given due weight to the following arguments which have been put forward in opposition to this view:

(i) Reduction in size with, in a large number of cases, reduction in the number of Representatives which a constituency may return, would exclude from participation in the Meeting younger members of the profession whom it is desirable to attract to central work. These members, while willing and anxious to accept appointment as Representatives in association with senior members of the Divisions, would not be willing to compete for appointment with their senior colleagues. Further, members of the Central Council and Committees are largely recruited from the ranks of the Representative Body, and restriction in size would limit the field of recruitment of central workers to the Association.

(ii) Reduction in size would not be accompanied by a comparable reduction in the number of speeches, for it is unusual for more than one Representative from a constituency to speak to a Motion.

(iii) The statement that the size of the Meeting leads to a loss of efficiency in the conduct of the business can be challenged, though an advantage in reduction in cost to the Association must be conceded.

(iv) The difficulty of finding accommodation is not sufficiently serious to warrant a reduction in size.

(v) Reduction in size would lead to a greatly increased demand for use of the Card Vote.

63. The Committee appreciates the argument that there might be some loss of educational opportunity through restriction in the size of the Representative Body, though it is not willing to accept the contention that such loss is inevitable. The proportion of younger members of the Representative Body has increased considerably in recent years, and there is no evidence that these members are appointed in the main by the large constituencies. Moreover, the Representative Body is not the only source of recruitment to central work. A substantial proportion of the members of Committees are elected by the Council and Branches, and Divisions should accept the responsibility for seeing that their representatives on the Central Council are kept informed of suitable candidates for appointment and should arrange for their nomination. Finally, the increase in size of the Branch Council which will result from the revised constitution of the Branches recommended by the Committee will provide increased opportunity for the keen younger member to become acquainted with the work of the Association, and to pass from peripheral to central work. The Committee does not admit the validity of the other arguments, and so far as the card vote is concerned the Committee proposes safeguards governing its use which it considers would obviate any risk of abuse of the procedure.

64. The Committee has reached the conclusion that the most suitable size for a body with an Agenda of the nature of that presented each year to the Representative Body is approximately 350. This number represents a satisfactory mean between an overlarge body and one which is too small to provide adequate representation. The Committee has examined alternative methods of representation of the U.K. Divisions within the suggested figure of 350, and it does not propose any alteration in the present system of basing constituencies on individual Divisions. Indeed, it maintains the view that, so far as possible, each Division of the Association in the U.K. should be a separate constituency and that reduction in the size of the Representative Body should not be brought about by an extension of the practice of combining Divisions to form constituencies. Having accepted this principle, the Committee has suggested an alteration of the numerical basis of representation to provide a Representative Body with a membership of approximately 350.

65. The Committee has considered various methods of proportional representation within the proposed overall membership, and the scheme finally adopted is shown in Appendix D, with the 1956 figures for comparison. Under existing Regulations each constituency is entitled to elect one Representative for a membership of less than 150, with one

additional Representative for every extra 100 members or part of 100 above that number. The proposed scheme provides for one Representative for the first 200 members in a constituency and one additional Representative for every 250 members or part of 250 above that number. Allowing for Overseas Representatives and for the normal absentee rate, estimated to be in the region of 10%, this scheme would produce a Representative Body with a membership of approximately 350. The Committee is convinced that its proposals provide the only satisfactory way in which a suitable reduction in the overall size of the Representative Body can be achieved.

66. It may appear at first glance that adoption of the revised scheme of representation would entail considerable sacrifice on the part of the large Divisions, with no commensurate sacrifice on the part of the smaller Divisions. This is not so, for, as is shown in Appendix D, with the exception of the small constituency of under 150 members, sacrifice is entailed in every group. The Committee recommends:

Recommendation 9: (a) That the number of Representatives of Home Divisions in the Representative Body be reduced by an amount which will ensure an overall membership of that body of approximately 350. (b) That the Scheme for the formation of Home Constituencies for the appointment of Representatives to the Representative Body, set out in Appendix D, be substituted for that laid down in By-law 39; and (c) That By-law 39 be amended accordingly.

(ii) Voting Strength

67. In approving the scheme, the Committee has considered the possibility of dissatisfaction which might occur in large constituencies as a result of reduction in the number of Representatives which such a constituency might return, and also a suggestion made by one large Division that, in order to maintain proportional voting strength, the use of the card vote under By-law 49 should be extended to include not only matters of policy but also the election of Standing Committees. The Committee does not consider that its proposed scheme would seriously affect voting strength, but is of the opinion that the existing provisions for vote by roll call or by card should be retained.

(iii) Card Vote

68. Arising from this decision, the Committee has considered whether the demand for the card vote should be taken before or after the vote on a motion by show of hands. It was pointed out that in the latter case a card vote would probably be demanded only where the majority in favour of a motion on a straight vote had been a narrow one. It was further contended that the use of the card vote after the taking of an ordinary vote might, by reason of the voting strength of the large Divisions, result in a decision of the majority of the members of the meeting being reversed and action being taken which the Representative Meeting as a whole had declared by straight vote that it was not prepared to take.

69. Before coming to a decision, the Committee has examined the procedure adopted by other large bodies (e.g., the T.U.C. and the N.U.T.) in conducting their annual meetings. In most cases use is made of the card vote only as a challenge to a vote taken. After full consideration the Committee has decided that a similar system would be preferable in the case of the B.M.A., and that the card vote should be taken after the vote on the motion, on a demand by one-third of the Representatives present and voting. It is also the view of the Committee that the existing procedure in the By-laws for conducting the card vote, although time-consuming, is eminently satisfactory for the purpose for which it was designed and should be retained. The Committee recommends:

Recommendation 10: That By-law 49 be amended to provide that if, on a vote having been taken, a vote by card is demanded by one-third of the Representatives present, the vote shall be taken by card.

(iv) Representation of Special Interests in the Representative Body

70. The Committee has considered a request from the Central Consultants and Specialists Committee that it should appoint representatives to the Representative Body.

71. The main points submitted in favour of special representation are:

(i) It would increase confidence among consultants and specialists in the responsibility and authority of the Representative Body. The Representative Body is composed in the main of Representatives elected by Divisions with a majority of general practitioners in their membership. Consequently, the Representative Body is not fully informed of the problems confronting those engaged in the hospital and specialist service under the N.H.S. Act. On the other hand, the Central Consultants and Specialists Committee, whose duty it is "to consider and act" on matters affecting those engaged in the Hospital Service, draws its peripheral members (42 out of a total Committee membership of approximately 74) from the Regional Consultants Committees. These members, well versed in the problems arising in the Regions, have no direct access to the Representative Body, other than by "accidental" appointment as Representative by a Division.

(ii) Direct representation would enable the consultants and specialists to feel that they are taking a greater part in the framing of Association policy.

(iii) The burden on the Chairman of the Committee in presenting his report to the Meeting would be eased if he had the support and assistance of a small number of representatives appointed by his Committee. It may be argued that the Chairman of the General Medical Services Committee, who holds an analogous position in the field of general practice, finds no difficulty in obtaining adequate assistance from members of his Committee who represent Divisions in the Representative Body. For the reasons given this assistance is not available in the same way to the Chairman of the Central Consultants and Specialists Committee. Moreover, although there might be a small number of members of the Committee appointed to the Representative Body as Representatives of Constituencies, they might feel handicapped in dealing with consultant and specialist questions, being bound to some extent by the instructions of their Divisions.

(iv) There is a precedent for special representation in the Public Health field.

72. Against these arguments it has been claimed:

(i) That there is no evidence that the Representative Body is not effectively informed regarding questions relating to the hospital and specialist services.

(ii) That the Central Consultants and Specialists Committee itself represents many diverse interests and special Groups whose views could not be more effectively presented by the addition to the membership of the Representative Body of a very small number of members appointed by the Committee.

(iii) That extension of the principle of sectional representation would inevitably lead to demands from quite minor groups for representation of their special interests.

(iv) That there is no evidence that the representation in the Representative Body of those engaged in the hospital service or in specialist practice is inadequate. At the Glasgow Meeting in 1954 there were 75 consultant members, as compared with 281 general practitioners, thus giving adequate opportunity for expression of the consultant and specialist view. In these circumstances there could be no justification for special representation of consultants.

73. The Constitution Committee has discussed the need for special representation on a sectional basis with the Standing Committees which are concerned with defined fields of practice—namely, the Central Consultants and Specialists, General Medical Services, Public Health, Private Practice, and Occupational Health Committees. There is already provision for special representation of Public Health Service

members, and the Public Health Committee regards the present position as satisfactory. Of the other Committees, the Central Consultants and Specialists Committee alone feels the need for appointment to the Representative Body of members who would speak as members of the Committee and not as representatives of their Divisions.

74. After protracted discussion, in which the Chairman of the Central Consultants and Specialists Committee has taken part, the Committee sees no reason to modify the principle that the Representative Body must be one predominantly representative of the Divisions. In the course of the discussion it has, however, become clear that the problem is one of presentation of special points of view rather than increase in the voting strength of a minority group. Numerical strength and voting power are secondary considerations, and in a body the size of the Representative Body a very small addition to the number of members would make no significant difference. The right of the specially appointed Public Health Service representatives to vote as members of constituencies has never been challenged.

75. The Committee feels that a strong case has been put forward, and that the advantages to be gained by acceding to the request of the Central Consultants and Specialists Committee outweigh possible disadvantages. Bearing in mind that a precedent for special sectional representation already exists, and that the chief aim is to effect a closer integration of an autonomous Committee with the Representative Body, the Constitution Committee suggests that provision should be made for the appointment of four Representatives by the Central Consultants and Specialists Committee. Accordingly, it recommends:

Recommendation 11: That By-laws 38-44 (which deal with the composition of and election to the R.B.) should be amended to provide for the election of four members of the Association by the Central Consultants and Specialists Committee as Representatives in the R.B.

B. The Quorum of the Representative Body

76. The quorum of the Representative Body is at present "one-half of the number of representatives appointed to attend the meeting" (By-law 50). It has been suggested that, owing to the great increase in size of the Representative Body consequent upon the increased membership of the Association, this By-law is now unrealistic and is, in fact, honoured in the breach rather than in the observance. The Committee concurs with this view, and recommends:

Recommendation 12: That the quorum of the Representative Body (at present "at least one-half of the number of Representatives appointed to attend the Meeting") should be reduced to 75 such Representatives.

C. The Conduct of Business at Representative Meetings

1. Functions and Powers of the Agenda Committee

77. *Constitution of Committee.*—The constitution of the Agenda Committee, as laid down in S.O.21 of the Representative Body, has been reviewed, and it is considered that no alteration is necessary. Under the Standing Order the Agenda Committee is composed of the Chairman and Deputy Chairman of the Representative Body, the Chairman of Council, and four members elected by the Representative Body. The Committee has power to co-opt up to four Chairmen of Standing Committees, having regard to the nature of the business coming before the Representative Body. The Committee recommends:

Recommendation 13: That the existing constitution of the Agenda Committee, as laid down in S.O.21 of the Representative Body, is satisfactory and should be retained.

78. *Meetings of Agenda Committee.*—S.O.21 of the Representative Body provides that the Committee "shall meet at intervals during the Meeting to examine the progress made, and, if necessary, to make recommendations to the Meeting." The Committee is of the opinion that S.O.21 should be amended to provide that the Committee should

meet at a convenient time each day to review progress and business outstanding and to advise the Chairman. The Committee recommends:

Recommendation 14: That S.O.21 of the Representative Body be amended to provide that the Agenda Committee shall meet during each day's session of the Representative Body, at a time to be arranged, to review progress and the business outstanding, and to advise the Chairman.

79. *Grouping of Motions.*—Under the Standing Orders, the Agenda Committee is empowered to group motions or amendments which cover substantially the same ground and to mark with an asterisk the motion in the group on which it proposes that the discussion should take place. The Representatives of the constituencies concerned may select this motion or an alternative motion in the group for discussion, or may agree on a common form of motion to cover the group. The Committee considers that the powers of the Agenda Committee should be extended to enable it to submit a common form motion in cases where it considers that the principle covered by the motions in the group is not adequately stated in any single motion. This would be without prejudice to the right of any Representative to speak to his original motion as an amendment to the common form motion. The Committee recommends:

Recommendation 15: That the powers of the Agenda Committee under S.O.21 of the R.B. in respect of the grouping of motions or amendments be extended to enable it to submit a motion in a common form in cases where it considers that the principle covered by the motions in the group is not adequately stated in any single motion; such extension of power to be without prejudice to the right of any Representative to speak to his original motion as an amendment to the common form motion.

80. *Priority Motions.*—The Committee has discussed a proposal for the institution of "priority motions" which would be debated at stated times in the proceedings. Where a motion related to a Committee Report was given priority it would be taken at the time stated and the remainder of the Report in its due order at a later stage in the proceedings. The priority motions would be printed on a separate sheet in addition to appearing in their appropriate place in the main Agenda. Against the proposal, it was suggested that the breaking up of the work of a Committee into priority motions and "the remainder" might embarrass the Chairman of the Committee concerned and the continuity of his work, with detriment to the proceedings of the Meeting.

81. The Committee has decided, therefore, not to recommend any hard and fast rule, but that provision should be made for the introduction, as necessity requires, of a scheme of priority motions on the lines indicated to deal with questions of outstanding importance. The Committee recommends:

Recommendation 16: That the Agenda Committee be empowered, as necessity arises, to give priority to motions on questions of outstanding importance and to arrange for these to be debated at specified times.

82. *Pruning of Agenda.*—The possibility of elimination from the Agenda of motions submitted by Divisions on matters which had already been the subject of action by Central Committees has been discussed. It was suggested that the Agenda Committee should be given power to inform a Division submitting a motion of this kind of the action already taken, and that, unless the Division wished to oppose that action or could offer a reason satisfactory to the Agenda Committee for proceeding with the motion, it would be excluded from the Agenda. However, considerable doubt was expressed in the Committee regarding the wisdom of so curtailing the liberty of the Divisions in this way. The number of such motions must in the nature of things be small, and there is much to be said for their inclusion in the Agenda in order that the Division concerned may be given an opportunity to ventilate some matter which it considers important. A proportion of the motions might

be eliminated by reference to the appropriate member of the central secretariat, who would inform the Division of the action already taken, or by consultation during the course of the Meeting with the Chairman of the Committee, as a result of which the motion might be withdrawn. The Committee recommends:

Recommendation 17: That elimination from the Agenda of the Representative Meeting of motions submitted by Divisions on matters which have already been the subject of action by Central Committees is not advisable; and that Divisions should retain the right to submit to the Representative Body motions on any matters which they consider of sufficient importance for debate.

83. *The Order of the Agenda.*—Standing Order 21 lays down the procedure for the placing of motions on the A.R.M. Agenda. The Standing Order instructs the Agenda Committee

"... so to arrange the Agenda that only those motions by Divisions and Branches strictly relevant to the several paragraphs of the Annual or Supplementary Reports of the Council be considered with such paragraphs; and that all motions by Divisions or Branches on matters not strictly relevant to any paragraphs of the Annual or Supplementary Reports of the Council be placed in appropriate order on the Agenda after the motions proposing final approval of the Annual and Supplementary Reports of the Council have been considered. Provided always,

"(A) That motions by Divisions or Branches which call for reports on matters previously referred to Council shall be placed on the Agenda before motions proposing the approval of Annual or Supplementary Reports of Council. . . ."

84. In giving effect to the Standing Order, it has been the practice so far as this is possible to relate all motions submitted for the Agenda to individual paragraphs of the Annual Report of Council. As in a number of instances the relationship is extremely vague, this procedure involves the expenditure of considerable time and ingenuity. The Committee recommends:

Recommendation 18: That the procedure laid down in S.O.21 of the Representative Body should be strictly observed.

2. *Time Limit of Speeches and Presentation of Report by Chairmen of Committees*

85. The time limit of speeches is laid down in Standing Order 31 of the Representative Body—15 minutes for a Chairman of a Committee in presenting his Report; seven minutes for the mover of a resolution; five minutes for other speakers. There is no provision for extension of time, but it has been the custom to allow a Chairman of a Committee to overrun the time limit, at the discretion of the Chairman of the Representative Body and with the permission of the Meeting. In order better to control the proceedings, the Committee is of the opinion that S.O.31 should be amended so as to limit the amount of extended time given. It therefore recommends:

Recommendation 19: That the Chairman of a Committee may on request to the Chairman, before presenting his Report, and with the permission of the Meeting, be granted an extension of time up to half the period allowed under S.O.31 for presentation of the Report, save that in exceptional circumstances he may be granted such further extension of time as the Meeting itself shall predetermine.

It is not proposed that there should be any alteration in the times of other speeches as laid down in the Standing Order.

86. In connexion with the foregoing, the Committee has considered the custom which has grown up in recent years of allowing a Chairman, on the motion for reception of his Report, to speak to the whole of the Report, notwithstanding

ing the fact that there might be included in the Agenda motions relating to particular paragraphs on which he would have a further opportunity of speaking. Further, where amendments to particular paragraphs of the Report are concerned, it is necessary (under present practice) for the Chairman of the Committee to move the adoption of the relevant paragraph before the amendment is put to the Meeting. As he also has the right to speak to the amendment if he so desires, both the Agenda and business of the Meeting are lengthened.

87. The procedure laid down in S.O.24 of the Representative Body in respect of the presentation of Reports is as follows:

"24. Presentation of Reports.—The Report of the Council or of a Committee shall be presented by the Chairman, or, in his absence, by a Member, of the body submitting such Report, who shall move: (i) that the Report be received; (ii) that the Recommendations, if any, be adopted; (iii) that the rest of the Report be approved. The adoption of each Recommendation shall be the subject of a separate motion. The approval of the rest of the Report shall be moved as a whole, unless the Chairman rule, or the Meeting resolve, that the approval of each paragraph, or of any specified paragraph, be the subject of a separate motion."

The Committee recommends:

Recommendation 20: That the procedure laid down in S.O.24 of the R.B. for presentation of Reports should be adhered to strictly and that the practice of moving the adoption of individual paragraphs of the Report of Council to which amendments are proposed, before the amendment is moved, should be discontinued except in the circumstances indicated in the Standing Order.

3. *Public and Private Sessions of the Representative Body*

88. The Committee has reviewed the practice of some other bodies of holding both public and private sessions. It considers, however, that the existing method of "going into Committee" by the Representative Body on the rare occasions when it is desired to exclude the Press is adequate, and that no action is necessary.

4. *Other Proposals*

89. The Committee's attention has been drawn to the difficulty experienced by the Chairman while conducting the Meeting in dealing with amendments handed up to the platform, in that his attention may be, and often is, distracted from an important debate in progress. In order to facilitate the proceedings of the Representative Body arrangements are to be made for a member of the medical secretariat to be available to the Representatives to receive amendments submitted from the body of the Hall, to examine and advise upon them in the first instance and to pass them to the Chairman.

90. Other suggestions for reducing the burden of work now falling on the Representative Body have been considered. These include a proposal that there should be two meetings of the Representative Body—the first at the London Headquarters at a fixed time each year to deal with motions relating to domestic matters; and the second in conjunction with the Annual Meeting to deal with matters of major Association policy. After careful examination the Committee does not consider such a proposal to be practicable or advisable and is firmly of the view that the existing procedure whereby the Representative Body meets in one complete session should be retained. Similarly the Committee has rejected a proposal that in order to make it possible for the A.R.M. to take place on a prescribed date each year it should invariably be held at Headquarters in London.

III. GENERAL MEETINGS OF THE ASSOCIATION

91. These Meetings, which are prescribed in the Articles of the Association, fall into two categories—(a) the Annual General Meeting, and (b) Extraordinary General Meetings.

Annual General Meeting

92. As the name indicates this meeting must be held in each calendar year in addition to any other General Meetings held, and not more than fifteen months must elapse between the date of one Annual General Meeting and the next. The notice to be given and the business to be transacted is clearly defined in the Articles and it is the duty of the Council to arrange the order of the items of business and the times at which they shall be transacted.

93. The Committee has scrutinized in detail the terms of the relevant Articles and is of the opinion that they do not call for revision.

Extraordinary General Meetings

94. These are all General Meetings other than the Annual General Meeting of the Association. Under the Articles the Council has power to call an Extraordinary General Meeting at any time at its discretion and must call such meeting upon a requisition in writing, made under conditions prescribed in the Articles, by 100 or more members. The requisition and notice must state the object for which the meeting is called.

95. In May 1953 an Extraordinary General Meeting was called on requisition on a matter arising out of the Distribution Scheme which followed the Danckwerts Award. The circumstances revealed an anomaly in the Articles of the Association. It appeared that a resolution of an Extraordinary General Meeting called on requisition under the terms of Articles 24–26 which was opposed to a policy resolution adopted by the Representative Body would be invalid and ineffective under the terms of Article 37. Article 37 vests in the Representative Body "the general control and direction of the policy and affairs of the Association." This interpretation of the Articles was confirmed by Counsel as correct, and in these circumstances he was asked to advise as to the possibility of so amending the Regulations as to make it impossible for an Extraordinary General Meeting to be requisitioned for consideration of a matter within the province of the Representative Body as defined by Article 37. Counsel's opinion is that the Articles can validly be altered as suggested and he has advised as to the form of resolution to be used. This is incorporated in the recommendation which follows. In expressing his opinion, Counsel has pointed out that there might be difficulty in interpreting the Article as amended in a particular case.

96. The Committee feels that the existing position is quite illogical and that any possible difficulty of interpretation in a particular case should not be allowed to stand in the way of regularizing the situation. Moreover, it should not be overlooked that it is within the power of members of the Association who are dissatisfied with Association policy to demand the calling of a Special Representative Meeting. By-law 46 reads:

"46 (1) Representative Meetings, other than the Annual Representative Meeting, shall be styled Special Representative Meetings, and shall be convened at any time by the Chairman of the Representative Body on the requisition of the Council, or on the requisition of not less than twenty Constituencies. (2) At least fourteen days' notice of such Meeting shall be given in the *Journal*, and such notice shall indicate the object for which such Meeting is convened. (3) No business shall be dealt with by a Special Representative Meeting other than that for which it is specifically convened."

97. The Committee recommends:

Recommendation 21: That the Articles of the Association be altered by adding at the end of Article 24 the following words:

"for the purpose of considering any matter other than a matter which affects the general control and direction of the policy and affairs of the Association."

(As amended the Article would read: "24. The Council may whenever it thinks fit and (without prejudice to the provisions of the Companies Act, 1948) it shall upon a requisition made in writing as hereinafter provided by any one hundred or more Members convene an Extraordinary General Meeting for the purpose of considering any matter other than a matter which affects the general control and direction of the policy and affairs of the Association.")

IV. THE ANNUAL SCIENTIFIC MEETING

98. Article 30 instructs the Council to arrange at least once a year a Scientific Meeting: one such meeting to be convened at the same place as the Annual General Meeting of the Association but so as not to conflict with it. By long custom this Annual Scientific Meeting has followed immediately upon the Annual Representative Meeting. It has been suggested that this custom detracts from the importance of the Scientific Meeting in that the attention of the press is focused on the medico-political proceedings, with possible restriction of the publicity given to the scientific activities of the Annual Meeting and a loss of prestige to the Association as a body having as one of its main objects the "promotion of the medical and allied sciences." Further, the Annual Representative Meeting in 1955 requested the Council (Minute 270) "to investigate the possibility of combining the Scientific Meeting and the Annual Representative Meeting so that all members of the Association might have the opportunity of taking part in both the scientific and the medico-political activities of the Association."

99. Two possible methods of dealing with the problem have presented themselves to the Committee, and these have been examined in considerable detail. They are: (a) that the Scientific Meeting should be held concurrently with the Annual Representative Meeting, and (b) that the present order of the two meetings should be reversed and the Annual Scientific Meeting be held immediately preceding the A.R.M.

100. There are practical difficulties in the way of adopting the first suggestion, and these fall mainly into two categories: (i) the time factor; (ii) the additional accommodation required. The effect of holding the two meetings concurrently would be to lengthen the period of the proceedings, and to ensure success all those attending, whether at the A.R.M. or at the Scientific Meeting, would be compelled to remain for the whole period. Quite apart from the expense involved, it is extremely unlikely that many Representatives would find it possible to be away from their practices for so long, and the strain on the hotel accommodation, already acute in most of the places in which the Annual Meeting is held, would be such as to make the situation extremely difficult.

101. This avenue having been exhausted, the Committee next turned its attention to the proposal that the Annual Scientific Meeting should precede the A.R.M.; but here again it was faced with insuperable difficulties. It has examined various schemes for rearranging the major events of the Annual Meeting—business, scientific, and social—but has been unable to find one which would meet the convenience of those attending the Scientific Meeting and the Annual Representative Meeting but would not at the same time jeopardize the success of some of the events considered indispensable to the Meeting and of the various evening functions.

102. The Committee has reluctantly been forced to the conclusion that any attempt to vary the present order of the proceedings of the Annual Meeting would create more anomalies than it would solve, and that the difficulties inherent in arranging a satisfactory programme are such as to outweigh any possible advantages. Its considered view is that the existing arrangements should be retained. Another possible method of bringing the scientific activities of the Association into their right perspective is, however, dealt with in the following paragraph of this report.

A Second Scientific Meeting

103. It is proposed that there should be held annually a second scientific function, short, concentrated, and of high professional standing. The meeting would occupy a long week-end, would take place midway between Annual Meetings as the most suitable time (i.e., early in December) and would normally be held only in those towns which could not accommodate the Annual Meeting of the Association. The number attending would vary with the town chosen, but it is estimated the average would probably be in the region of 250 visitors, with an equal number from the area.

104. The programme might take the following form: One Plenary Session. One General Session. Two Round-Table Conferences. Clinical Demonstrations in hospitals, clinics, etc. Medical films, or possibly clinico-pathological conferences.

105. Speakers at the plenary and general sessions would be chosen on a national basis. There would be no individual Scientific Sections. Sessions would not be permitted to overlap, in order to ensure a good audience. Clinical demonstrations would be staged in small batches by the local profession.

106. There would be an initial social evening function, but no further social events. Those attending would make their own hotel arrangements, and it is hoped that private hospitality would be available for those desiring it.

107. As the requirements of the meeting would be modest in nature the cost to the Association would be moderate—possibly an average of £200 or even less. Equally the cost to those attending, apart from travel, would be low and within the means of the majority of practitioners, including the young and less well-to-do.

108. The advantages of the Meeting would be considerable:

(a) to the Association in an increase in scientific status, both within the profession, with the professional organizations, and through the press with the public;

(b) to B.M.A. members in the provision of a concentrated meeting of high scientific attainment at lost cost;

(c) to the local B.M.A. units, in demonstrating to members and others living in the area that the Association has a direct interest in the individual member and in his clinical activities. The member would be afforded the opportunity to meet and hear some of the most eminent in the profession and also of making contact with practitioners from other parts of the country. The importance of the local Division would be enhanced, and a closer and more intimate relationship would be established between the Division and Headquarters. Local interest in the activities of the Association would be stimulated and the various branches of the profession in the neighbourhood would be brought into closer contact in organizing the programme.

109. The Committee strongly supports the proposal for a second Scientific Meeting on an experimental basis and for a limited period.

110. The Committee recommends:

Recommendation 22: That modification of the existing arrangements for holding the Annual Meeting of the Association having been examined and found impracticable, the existing arrangements be retained.

Recommendation 23: That a Second Scientific Meeting of the Association be held at an appropriate time during the year; and that the Council be empowered to draw up and to put into operation a scheme for such a meeting.

V. THE COUNCIL

Constitution

111. The Council is the executive of the Representative Body and is required under By-law 64 to meet not less than four times in each year. The Council elects its own Chairman, who holds office for such period as the Council itself determines.

112. Until 1949 the Council was composed of 66 members elected as follows:

(a) 10 members *ex officio*—namely, President, Immediate Past-President, and President-Elect of the Association, Chairman, Immediate Past-Chairman, and Deputy Chairman of the Representative Body, Chairman and Immediate Past-Chairman of the Council, Treasurer and (during the year immediately following his period of office as Treasurer) the Past-Treasurer.

(b) 22 members elected by members of the Branches in Great Britain and Northern Ireland grouped for the purpose.

(c) 8 members similarly elected by the Branches not in Great Britain or Northern Ireland.

(d) 12 members elected at the A.R.M. by the grouped Representatives of the Constituencies in Great Britain and Northern Ireland.

(e) 8 members elected at the A.R.M. by the Representatives acting together.

(Total $d+e=20$.)

(f) 3 Service members, representing respectively the Royal Navy, Army, and Royal Air Force Medical Services elected by the A.R.M.

(g) 2 members elected by the Public Health Service members of the Association.

(h) 1 woman member elected by the women members of the Association.

Total : 66 Members.

113. In 1948 there was evidence of a fairly widespread feeling that the Council was to some extent out of touch with the rank and file of the profession and a demand arose for its reconstitution in order to ensure more effective representation of the periphery. Accordingly, in 1949 changes were made which had the effect of almost doubling the number of members directly elected by constituencies, while reducing by nearly half the number elected by the Representative Body. The present constitution of the Council (77 members) is as follows:

(a) 11 members *ex officio*—namely, President, Immediate Past-President, and President-Elect of the Association, Chairman and Deputy Chairman of the Representative Body, Chairman and Deputy Chairman of the Council (in the year following the year in which he ceased to be Chairman of Council), Treasurer, in which he ceased to be Chairman of Council, *Chairman of Central Consultants and Specialists Committee, *Chairman of General Medical Services Committee, *Chairman of Journal Committee.*

(b) 40 members elected by the members of the Branches in Great Britain and Northern Ireland grouped for the purpose.

(c) 7 members similarly elected by the Branches not in Great Britain or Northern Ireland (one less than formerly).

(d) 2 members elected by Representatives of Constituencies in Scotland

(e) 1 member elected by Representatives of Constituencies in Wales, including Monmouthshire.

(f) 10 members elected at the A.R.M. by the Representative Body as a whole.

(Total $d+e+f=13$.)

(g) 3 Service members, representing respectively the Medical Branch of the Royal Navy, the Army Medical Service, and the Medical Branch of the Royal Air Force elected by the Representative Body as a whole.

(h) 2 members elected by the Public Health Service members of the Association.

(i) 1 woman member elected by the women members of the Association.

Total : 77 Members.

114. The Constitution Committee has endeavoured to assess the results of the changes introduced in 1949. These have not been in operation long enough to determine whether they have been wholly successful in achieving the objects desired, but the evidence available to the Committee suggests that there is both sufficient continuity of membership and that there is both sufficient continuity of membership and that the present constitution of the Council is satisfactory. It is now possible for a member of Council elected by a constituency to keep in touch with all the units he represents; this was frequently quite impossible before the changes were introduced.

115. The Committee has examined several suggestions submitted with the object of increasing the representative

*Additions. The Past-Chairman of the Representative Body and Past-Treasurer are no longer members of Council *ex officio*.

character of the Council. For instance, it was proposed that, to ensure that the members were elected by a well-informed electorate, the majority of the members should be elected by the Representative Body. The Committee does not think this would be acceptable in view of the recent change nor that it would bring members of Council in closer touch with members in the Divisions.

116. The Committee has considered the possibility of direct representation of young practitioners. It feels that it would be extremely difficult to provide an electorate for such a category and that suitable nominees might not be able to spare the necessary time. Young practitioners already take a part in the central work of the Association through at least three of the Standing Committees—the General Medical Services, Central Consultants and Specialists, and Organization Committees, and by this means their views do reach the Council. For these reasons the Committee does not recommend that young practitioners should have a seat in the Council. It is making proposals through another channel for solving the special problems of this section of the Association's membership.

117. The Committee has considered a return to the rule which limited the tenure of office of members of Council elected by constituencies to six years. This was abolished in 1949, when an alternative method of securing continuity was discontinued. The Committee sees no reason for reintroducing the limitation.

118. Lastly, the Committee has reconsidered a suggestion, made on more than one occasion in the past, that the procedure operative in Local Government circles should be adopted in the Council of the Association. Under this procedure, three members would be elected by each constituency, each would be limited to a tenure of three years, one retiring each year. After careful consideration the Committee has decided that any advantages to be gained by such a proposal are insufficient to justify the radical changes in the constitution which would be required. It recommends:

Recommendation 24: That no change should be made in the constitution of, and the methods of election to, the Central Council of the Association.

Presentation of Committee Reports to Council

119. By-law 78 provides that each Standing Committee shall elect a Chairman, and, if the Chairman is not a member of the Council, a Deputy Chairman who is a member. Standing Order 10 of the Council places the duty of presentation of the Report of a Committee on the Chairman of that Committee, or in his absence on a member of the Committee. Where the Chairman is not a member of the Council, the duty of presentation falls upon his Deputy.

120. Representations have been made to the Committee that Chairmen of Committees (Standing or Special) who are not members of the Council should be allowed, if they so wish, to present their Committee Reports in person. The Committee does not favour this proposal. Under existing procedure it is within the discretion of the Chairman of Council, on the request of a Committee whose Chairman is not a member of the Council, to invite the Chairman of the Committee to introduce and speak to the Committee Report in the Council. The Constitution Committee feels that this procedure adequately meets the situation and that there is no necessity for a special rule.

VI. COMMITTEES AND STANDING COMMITTEES

121. Committees are appointed by the Representative Body or by the Council or both jointly. The chief officers of the Association are members *ex officio* of all Committees. This provision places a heavy burden on the officers concerned. The number of Committees is very large and tends to increase and it is manifestly impossible for them to attend all meetings. Nevertheless the Committee is firmly of the opinion that the provision should be retained, as it places at the disposal of the officers useful information regarding all fields of the Association's work.

122. Committees are divided into two classes, Standing Committees and Special Committees. At present there are 18 Standing Committees and approximately the same number of Special Committees. Under the By-Laws certain Standing Committees have authority to include in their membership persons not members of the Association. By implication and practice this authority is also extended to Special Committees.

123. The Standing Committees are, under the Articles and By-laws, an integral part of the Association's constitution. Their composition, powers, and duties are defined in a Schedule to the By-laws. The majority of their members are, in general, appointed as to part by the Representative Body and as to part by the Council. They have power to call to their assistance for special purposes persons specially qualified to assist in any matter coming within their purview. They are required by the By-laws to report to and act under the instructions of the Council and their meetings are held according to a schedule prescribed at the beginning of each session.

124. Special Committees are appointed annually *ad hoc*, and their number may vary from time to time according to the creation of new Committees or the completion by others of their terms of reference. The majority of these special committees (for example, Compensation and Superannuation, International Relations) are more or less permanent in character, but the specialized nature of their work makes it advisable to keep them as special committees rather than Standing Committees, with the emphasis on selection rather than election of their members. In addition, there are a number of Joint Committees, such as the Joint Committee of the Royal Colleges, the Royal Scottish Corporations, and the Central Consultants and Specialists Committee; the Joint Formulary Committee of the B.M.A. and the Pharmaceutical Society; the Joint Committee of the B.M.A. and the Trades Union Congress, etc.

125. The Constitution Committee, which is itself an example of a special committee established by the Council and the Representative Body for a specific and limited purpose, has reviewed the constitution and terms of reference of all the Committees of the Association. It is satisfied that the present Committee machinery is, in general, adequate and suitable for the purpose for which it has been established, and that no alteration in the structure is called for. It has, however, ascertained the views of the Committees regarding the details of their composition and references, and certain of the Committees have made proposals for modifications of their constitution as follows:

Charities: This Committee is composed of members elected as to 4 by the Representative Body (including 1 from Scotland and 1 from Wales) and 2 by the Council; together with the representatives of the Council of Epsom College and the Committee of Management of the Royal Medical Benevolent Fund.

It is desired to make the membership more comprehensive by adding 2 representatives of the younger members of the profession, nominated as to 1 each by the Central Consultants and Specialists and General Medical Services Committees; and the duly appointed representative of the B.M.A. on the Joint Committee of Epsom College.

Finance and Journal: These Committees include in their membership in each case 4 appointed by the Representative Body. Under Standing Order 52 of the Representative Body only Representatives may be nominated for appointment in this category. This restriction applies in only one other Committee—the Organization Committee, which has raised no objection. The Finance and Journal Committees desire that the restriction should be removed, in order that the Representative Body may have a free field in electing its members to these Committees.

Private Practice: The reference to this Committee as at present worded is: "To consider and report on matters affecting the profession in the field of private practice not specially referred to other Committees, etc." The Com-

mittee feels that its reference could with advantage be amended to make it clear that the phrase "private practice" includes private consulting as well as private general practice; it also suggests that as it is the only Committee appointed by the Association to consider matters affecting the profession in the field of private practice the words "not specially referred to other Committees" should be deleted.

Public Health: The Committee desires to extend its reference, at present restricted to "consideration of and report on questions relating to the Public Health services," to include the field of preventive medicine.

126. The Constitution Committee supports the above proposals and recommends:

Recommendation 25: That steps be taken to amend the Schedule to the By-laws in respect of the following Standing Committees in the manner indicated:

Charities Committee: To add to the membership 2 representatives of the younger members of the profession nominated as to 1 each by the Central Consultants and Specialists and General Medical Services Committees; and the duly appointed representative of the B.M.A. on the Joint Committee of Epsom College.

Private Practice Committee: To substitute for the first sentence in the existing reference the following: "To consider and report on matters affecting the profession in the field of private general or consulting practice."

Public Health Committee: To substitute for the first sentence in the existing reference the following: "To consider and report on questions relating to preventive medicine and the Public Health services."

Recommendation 25: That steps be taken to amend Standing Order 52 of the Representative Body by the deletion of the reference to the Finance and Journal Committees.

Scottish Committee

127. The Scottish Committee seeks to change its title to "Scottish Council." The Committee is satisfied that it would be an advantage to the Association in Scotland if this change could be effected, and that it would be in a very much stronger position in relation to the autonomous bodies in Scotland and also to the Department of Health. At present exchanges between the Scottish Committee and the Scottish Department of Health and other bodies are carried out mainly by special subcommittees of the Scottish Committee, and the name "Subcommittee" is a disadvantage in that it suggests inferior status. These subcommittees would be in a much more advantageous position as Standing Committees of a Scottish Council. It is claimed that the Scottish Committee differs from other Standing Committees in that it is, in part, elected by the Divisions in Scotland, and is therefore analogous to the Federal Council in Australia. The Committee states emphatically that the proposed change of title, while it would increase the prestige of the Association in Scotland and give great satisfaction to Scottish members, would not affect in any way the status of the Committee *vis-à-vis* the Council of the Association, nor need there be any confusion through the use of the word "Council"; this being always qualified by the prefix "Scottish." The proposed change would not affect the relationship between the General Medical Services Committee and the General Medical Services Subcommittee (Scotland). This is and would remain a Subcommittee.

128. The Committee recommends:

Recommendation 27: That the proposed change of title from "Scottish Committee" to "Scottish Council" be approved and that the Schedule to the By-laws be amended accordingly.

Liaison Between Committees

129. Under existing references it is possible for two or more committees to consider and take different action upon one

and the same subject, which may be one involving policy. This is particularly so in the case of resolutions of the Representative Body referred by the Council to more than one committee. The normal procedure is for the Committees concerned to consult one another before reporting to the Council or taking action, but such consultation is not mandatory. By-law 80 provides that any Committee may, in respect of any matter before it, consult or make any report or suggestion to another Committee of the Association, etc., but there is nothing in the By-law to preclude unilateral action by one Committee in a matter of import to another.

130. The Consultation Committee proposes that the situation should be safeguarded by amendment of the By-law and it recommends:

Recommendation 28: That By-law 80 be amended to provide that every Committee *shall*, in respect of any matter before it which is of special interest to another Committee of the Association, consult that other Committee. In the event of disagreement no action shall be taken without reference to the Council.

VII. THE POWERS OF THE AUTONOMOUS BODIES

131. The Constitution Committee has reviewed the position of the autonomous committees and in particular the position of the Central Consultants and Specialists Committee in relation to the joint negotiating machinery for hospital and specialist services.

132. The term "autonomous bodies" derives from the fact that the Council and Representative Body have delegated to the two Committees concerned, the General Medical Services and the Central Consultants and Specialists, certain powers and the Central Consultants and Specialists, certain powers of independent action within their terms of reference. The effect of this is to give them a measure of autonomy not enjoyed by the other Standing Committees. This situation has been brought about by the need to adjust the Association's medico-political machinery to the changes, previously referred to in this report, due to the extension of the responsibility of the State for health and welfare. In 1950 the Representative Body reviewed the situation, and after full consideration of all the circumstances, reached the conclusion that no useful purpose would be served in disturbing the existing arrangement. In doing so it declared that the autonomous powers of the two Committees, in so far as they derived from the Representative Body, should be subject to specific renewal by successive Annual Representative Meetings. This policy has been strictly observed.

133. Notwithstanding their autonomous powers, the Committees remain an integral part of the Association machinery. They report regularly on action taken or proposed to the Council of the Association and, through the Council, to the Representative Body, where their Reports are subject to criticism or approval, as are the Reports of other Association Committees.

134. The Constitution Committee considers that present practice, under which the autonomy is subject to annual renewal, provides a sufficient safeguard against divided counsels and disunity in matters of policy in the profession. It notes with satisfaction the decision of the Central Consultants and Specialists Committee to convene an Annual Conference of Regional Consultants Committees and believes that this Conference, if so constituted as to be truly representative of consultants and specialists and hospital staffs throughout the country, will lead to a closer relationship between the organized body of consultants and the Council and Representative Body of the Association and to a mutual increase of confidence.

135. The Committee takes the view that, as the Representative Body has given the various sections of the profession autonomy not only of discussion but of action, its role in relation to these sections should be to consider a report of action taken or proposed, to measure this against

the problems of other sections of the profession, and to use the whole weight of the B.M.A. in carrying out that action as policy of the Association and not merely that of a negotiating committee. The opinion of the profession as a whole, exerted through the Association, is the prevailing factor in negotiations with the Government.

136. The Committee considers that the partnership between the Royal Colleges and the Association in joint negotiating machinery in connexion with the hospital services should continue. The Joint Committee as at present constituted is recognized by the Government as the negotiating body for hospital staffs, and in Whitley Committee B a working arrangement with the Royal Colleges is essential. The Committee considers that there should be no change at present in the existing joint machinery for consultants and specialists.

137. The Committee recommends:

Recommendation 29: (a) That the existing relationship of the autonomous bodies to the Association should be continued, subject to ratification annually by the Representative Body of the powers of these bodies. (b) That the arrangement under which the Joint Committee between the Central Consultants and Specialists Committee of the B.M.A. and the Royal Colleges and the Scottish Royal Medical Corporations acts as the negotiating body with the Government in respect of those engaged in the hospital and specialist service under the N.H.S. should be continued.

VIII. THE CONSTITUTION AND ORGANIZATION OF SPECIAL GROUPS

138. The Council is empowered under By-law 37 and in accordance with Article 21 to form (and to dissolve) special groups of members "having distinctive professional interests and being, by reason of their paucity of numbers or of their local distribution, unable to obtain adequate representation of these interests through the Divisions and Branches." The first special Groups were established in 1927 and numbered two, Pathologists and Spa Practitioners Groups. Since then the number of groups has steadily increased and they now number fourteen. With the possible exception of the Non-Professorial Teachers Group, all are closely linked to the Hospital and Specialist field and except for the Registrars and Senior Hospital Medical Officers are aptly designated "Clinical Groups," in that they deal with questions peculiar to particular specialties.

139. Since the establishment of the National Health Service there has been a departure from the original principle underlying the Group structure. Problems arising in the Hospital Service have led to applications for the formation of "Non-clinical Groups" of officers employed in that Service. The Constitution Committee regards with some favour the Scottish practice of dealing with special problems arising in connexion with the Hospital and Specialist Service through special subcommittees of the Central Consultants and Specialists Committee (Scotland), subject, as in Scotland, to adequate representation of the practitioners concerned at regional level. It realizes, however, that there is a risk in this procedure of the establishment of "splinter specialist societies" if the formation of a Group, which the members concerned considered essential to the effective protection of their interests, should be refused.

140. There are already precedents for a different method, analogous to the Scottish arrangement, for dealing with special interests. The assistants and unestablished practitioners, who, under the existing Rules, had a *prima facie* case for the establishment of a Group, have accepted an arrangement whereby the members of a special subcommittee of the General Medical Services Committee are elected on a regional basis and regard themselves as to some extent responsible to their constituents. The advantage of this procedure is that representatives of the parent Committee are members of the Subcommittee and take part in its discus-

146. The Committee is of the opinion that Federal Councils as at present constituted are a useful part of the constitution of the Association and should be retained. Accordingly it does not wish to submit any recommendation on this particular item of its report.

APPENDIX A

MEMBERSHIP OF CONSTITUTION COMMITTEE

Sixteen Council Members

Officers of the Association—ex officio

Dr. Alex. H. Hall, Hove (President).

Dr. S. Wand, Birmingham (Chairman of Council).

Dr. I. D. Grant, Glasgow (Chairman of Representative Body).

Mr. L. Dougal Callander, Doncaster (Treasurer).

Chairman of Organization Committee—*ex officio*

Dr. Ronald Gibson, Northleigh, Kings Worthy, nr. Winchester.

Dr. J. Cottrell, Grimsby

Dr. H. Guy Dain, Birmingham.

Dr. F. Gray, London.

Dr. E. A. Gregg. London.

Dr. R. Hale-White, London.

Mr. H. H. Langston, Shawford, nr. W.

Dr. J. C. Macarthur, Carlisle, Lanark

Mr. J. R. Nicholson-Lailey, Taunton.

Dr. J. A. Pridham, Broadway, Weymouth.

Dr. A. Talbot Rogers, Bromley.
Sir, I wish to thank you for the

Sir J. W. Tudor Thomas, Cardiff.

Eighteen Non-Council Members

Mr. Gordon N. Bailey, Harrogate.

Dr. J. T. Baldwin, Penicuik, Midlothian.

Dr. T. S. Blaiklock, Morpeth.

Dr. H. J. Browne, Barlaston, nr. Stoke-on-Trent.

Dr. Joan Chappell, Edmonton, Middx.

Dr. R. Cove-Smith, London.

Dr. H. J. Cronhelm, Belfast.

Dr. A. B. Davies, Walsall.

Mr. J. L. Kilks, Bournemouth

Dr. D. L. Gullick, Stevenage, Herts.

Dr. J. Kelman, Perth.

Dr. P. Lyle, Southport.

Sir John McNee, Kings Worthy, nr. Wi

Mr. A. M. A. Moore, Upminster, Essex.

Dr. J. H. E. Moore, Leeds.

Mr. J. D. R. Murray, Boldre, Lymington, Hants.

Dr. D. F. Whitaker, Guildford (*deceased*).

Dr. Morgan G. Williams, Cardiff.

APPENDIX B

PROVISIONAL PLAN FOR REORGANIZATION OF BRANCHES ON REGIONAL BASIS

N.H.S. Hospital Region		Proposed Regional Branch	B.M.A. Structure	
			Divisions in Proposed Branch	Divisions in Existing Branches and Proposed Groups (Underlined)
ENGLAND AND WALES				
1. NEWCASTLE	NORTHERN (17 Divs.)	{	Bishop Auckland	<u>North of England</u> (12 Divs.)
			Blyth	
			Consett	
			Durham	
			Gateshead	
			Hexham	
			Morpeth	
			Newcastle upon Tyne	
			North Northumberland	
			South Shields	
			Sunderland	
			Tyneside	
			Cleveland	<u>Tees-side</u> (4 Divs.)
			Darlington*	
			Hartlepoons	
			Stockton	<u>Bo der Counties</u> (1 Div.)
			Cumberland	

* Darlington Division includes the following R.D.s: Aysgarth, Leyburn, and Whitty, which are in the Leeds R.H.B. area. It is suggested that they remain with Darlington.

† The Border Counties Branch consists of the Cumberland Division (Newcastle R.H.B.) and the Dumfries and Galloway Division (Western R.H.B. Scotland). Both look to Carlisle as the medical centre and should remain an entity—Border Counties Group.

N.H.S. Hospital Region	Proposed Regional Branch	B.M.A. Structure
		Divisions in Existing Branches and Proposed Groups (Underlined)
2. LEEDS	YORKSHIRE (12 Divs.)	Bradford Dewsbury Goolse and Selby Halifax Harrrogate Huddersfield Leeds Scarborough Todmorden Wakefield, Pontefract, and Castleford York East Yorkshire Yorkshire* (11 Divs.) East Yorkshire (1 Div.)
* It is suggested that the following Divisions of the existing Yorkshire Branch be transferred to the East Midland Branch (Sheffield R.H.B. area): Sheffield, Doncaster, Rotherham, Barnsley.		
3. SHEFFIELD	EAST MIDLAND (16 Divs.)	Buxton* Chesterfield Derby Glossop* West Derby Nottingham Leics and Rutland Grimsby Holland Kesteven† Lincoln Scunthorpe Sheffield Doncaster Barnsley Rotherham Derbyshire (5 Divs.) Nottingham (1 Div.) Leics and Rut- land (1 Div.) Lincolnshire (5 Divs.) Yorkshire (4 Divs.)
* The Buxton and Glossop Divisions are in the County of Derbyshire but in the area of the Manchester R.H.B. It is suggested that these Divisions should remain with the East Midland Branch (Derbyshire Executive Council and County Council areas). † Part of Kesteven Division (S. Kesteven R.D.) is in the Cambridge R.H.B. area. It is suggested it should remain in the Lincolnshire County area as part of the E. Midlands Branch.		
4. EAST ANGLIAN	EAST ANGLIAN (9 Divs.)	East Norfolk Norwich West Norfolk Suffolk Cambs and Hunts Isle of Ely Peterborough Norfolk (3 Divs.) Suffolk (3 Divs.) Cambs and Hunts (3 Divs.)
5. N.W. METROPOLITAN	NORTH-WEST METROPOLITAN (18 Divs.)	Barnet East Herts* Mid-Herts West Herts N. Beds S. Beds Finchley Hampstead Harrow Hendon Kensington and Hammersmith Marylebone Paddington St. Pancras S. Middlesex Wembley W. Middlesex Willemston Hertfordshire (4 Divs.) Bedfordshire (2 Divs.) Metropolitan Counties (12 Divs.)‡
6. N.E. METROPOLITAN	NORTH-EAST METROPOLITAN (10 Divs.)	Mid-Essex† N.E. Essex S. Essex S.E. Essex S.W. Essex City Enfield and Potters Bar N. Middlesex Stratford Tower Hamlets Essex (4 Divs.) Metropolitan Counties (6 Divs.)‡

N.H.S. Hospital Region	Proposed Regional Branch	B.M.A. Structure
		Divisions in Existing Branches and Proposed Groups (Underlined)
7. S.E. METROPOLITAN	SOUTH-EASTERN (14 Divs.)	Bromley Dartford East Kent Folkestone and Dover Maidstone Rochester, Chatham, and Gillingham Tunbridge Wells Brighton and Mid-Sussex Eastbourne Hastings Camberwell Greenwich and Deptford Lewisham Woolwich Kent (7 Divs.) Sussex (3 Divs.)§ Metropolitan Counties (4 Divs.)‡
8. S.W. METROPOLITAN	SOUTH AND WEST METROPOLITAN (10 Divs.)	Chelsea and Fulham Lambeth and Southwark Wandsworth Westminster and Holborn Croydon Guildford Kingston Reigate Richmond West Sussex Aldershot and Farnham Metropolitan Counties (4 Divs.)‡ Surrey (5 Divs.) Sussex (1 Div.)§ Southern (1 Div.)
	SOUTHERN (10 Divs.)	Guernsey|| Jersey|| Portsmouth Salisbury Southampton Winchester Bournemouth Dorset Southern (7 Divs.)|| Dorset and West Hants (2 Divs.)

* East Herts Division is divided into two parts by the boundary between N.E. and N.W. Metropolitan Regions. It is suggested that the Division should remain associated with the Herts County area.

† Mid-Essex Division. Saffron Walden U.D. and R.D. are within the area of the East Anglian R.H.B. It is suggested that this area remains with Essex.

‡ Metropolitan Counties Group. It is suggested that membership of Group Council and constituencies for representation on B.M.A. Council be based on four quadrants and that the existing Metropolitan Branch Council reconstituted as a Group Council continue to act as a unit covering Divisions in London, Middlesex, etc. The position is so exceptional that the question of retaining the title "Branch" for this Group should be considered. Some Divisions—namely, Kensington and Hammersmith, Lambeth and Southwark, Westminster and Holborn—are in two R.H.B. areas. No change in their areas is suggested.

§ Sussex Branch. The Sussex Branch is in two R.H.B. areas; the dividing line also separates two Executive Council areas. The West Sussex Division has therefore been included in the South and West Metropolitan Branch and this implies the discontinuance of the Sussex Branch as a unit. There is no reason why liaison should not be maintained on an ad hoc basis for scientific and social meetings or it may become a Group.

|| South-West Metropolitan R.H.B. Area. The Channel Islands will naturally be attached to the reconstituted Southern Branch.

9. OXFORD	SOUTH-MIDLAND (5 Divs.)	Northants Oxford Buckingham* Reading* Swindont Northants (1 Div.) Berks, Bucks, and Oxon (3 Divs.) Wiltshire (1 Div.)
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* A small area in the South of the County of Buckinghamshire and a small part of Berkshire are in the N.W. Metropolitan R.H.B. area (Slough, Maidenhead, Windsor). The existing Division boundaries should be retained.

t The greater part of Swindon Division is in the Oxford R.H.B. area, whereas the greater part of the Trowbridge Division of the Wiltshire Branch is in the South-Western R.H.B. area. The Salisbury Division, formerly in the Wiltshire Branch, opted for transfer to the Southern Branch (S.W. Metropolitan) area some time ago. It is suggested that the Wiltshire Branch be dissolved and that the two remaining Divisions should be given the option to join one of the new Regional Branches. It should not be difficult for one Division Executive (possibly Salisbury) to be responsible for arranging for a joint meeting to deal with any matters at County or L.M.C. level. Alternatively the northern half of the County can remain within the Gloucester and Somerset Group.

N.H.S. Hospital Region	Proposed Regional Branch	B.M.A. Structure	
		Divisions in Proposed Branch	Divisions in Existing Branches and Proposed Groups (Underlined>
10. S. WESTERN	SOUTH-WESTERN (11 Divs.)*	Gloucestershire†	Gloucestershire (1 Div.)
		Trowbridge	Wiltshire (1 Div.)
		Bath, Bristol, East Somerset, West Somerset	Bath, Bristol, and Somerset (4 Divs.) (Gloucestershire and Somerset Group)
		Barnstaple, Cornwall, Exeter, Plymouth, Torquay	S. Western (5 Divs.) (Cornwall and Devon Group)

* Owing to the extensive area and the difficulties of communication the Branch should be divided into two groups: the Devon and Cornwall and the Gloucester and Somerset Group. The two Divisions in Wiltshire may be attached to the latter (see above).

† Part of the Gloucestershire Division Branch is in the Oxford R.H.B. area (Cirencester R.D. and U.D., Northleach R.D., and N. Cotswold R.D.). These have been included with the greater part of the County in the S.W. area.

11. WELSH	WELSH COMMITTEE (9 Divs.)	E. Denbigh and Flint, W. Denbigh and Flint, N.W. Wales	North Wales (3 Divs.)
		Aberystwyth, Cardiff, Monmouthshire, N. Glamorgan and Brecknock, S.W. Wales, Swansea	South Wales and Monmouth (6 Divs.)
12. BIRMINGHAM	WEST MIDLAND (15 Divs.)	Birmingham, Coventry, Dudley, Nuneaton and Tamworth, Rugby, S. Warwickshire, Sutton Coldfield, W. Bromwich and Smethwick	Midland (8 Divs.)
		Shropshire and Mid-Wales	Shropshire and Mid-Wales (1 Div.)*
		Burton-on-Trent, North Staffs, South Staffs, Walsall and Lichfield	Staffordshire (4 Divs.)
		Hereford, Worcester and Bromsgrove	Worcestershire and Herefordshire (2 Divs.)

* A small part of Mid-Wales (Radnorshire and part of Montgomery) is included with the Shropshire and Mid-Wales, and the Worcester and Hereford Branches. It will be "no change" from the point of view of B.M.A. organization if despite the national boundary these areas remain with the existing Branches.

13. MANCHESTER	NORTH-WESTERN (21 Divs.)	Blackburn, Blackpool and Fylde, Burnley, Furness, Lancaster*, Preston, Westmorland†	North Lancs and Westmorland (7 Divs.)
		Ashton-under-Lyne, Bolton, Bury, Crewe, Hyde, Leigh, Macclesfield and E. Cheshire, Manchester, Mid-Cheshire, Oldham, Rochdale, Salford, Stockport, Wigan	S. Lancs and E. Cheshire (14 Divs.)

* The R.D.s of Sedburgh, High Bentham, and Bowland in the Leeds R.H.B. area have been included, as at present, with the Lancaster Division.

† Part of the County of Westmorland is in the Newcastle R.H.B. area but has been retained with the Westmorland Division.

N.H.S. Hospital Region	Proposed Regional Branch	B.M.A. Structure	
		Divisions in Proposed Branch	Divisions in Existing Branches and Proposed Groups (Underlined>
14. LIVERPOOL	MERSEYSIDE (7 Divs.)	Birkenhead and Wirral, Chester, Liverpool, St. Helens, Southport, Wallasey, Warrington	Merseyside (7 Divs.)
15.	ISLE OF MAN	Isle of Man	Isle of Man

SCOTLAND

A. NORTHERN	NORTH OF SCOTLAND (6 Divs.)	Orkney, Caithness, Inverness, Ross and Cromarty, Sutherland, Outer Isles	Aberdeen (1 Div.) Northern Counties of Scotland (5 Divs.)
		Shetland, Aberdeen City, Aberdeen and Kincardine	Aberdeen (3 Divs.)
B. NORTH-EASTERN	NORTH-EAST OF SCOTLAND (4 Divs.)	Banff, Moray, Nairn*	Northern Counties of Scotland (1 Div.)
C. EASTERN	EAST OF SCOTLAND (3 Divs.)	Perth, Dundee, County of Angus	Perth (1 Div.) Dundee (2 Divs.)
D. SOUTH-EASTERN	SOUTH-EAST OF SCOTLAND (5 Divs.)	Fife, City of Edinburgh, East and Mid-Lothian, S.-Eastern Counties, W. Lothian	Fife (1 Div.) Edinburgh and S.E. Scotland (4 Divs.)
E. WESTERN	WEST OF SCOTLAND (9 Divs.)	Argyll, Ayrshire, Dunbartonshire, Glasgow, Lanarkshire, Renfrew and Bute, W. Wigtown	Glasgow and West of Scotland (7 Divs.)
		Stirling, Dumfries and Galloway†	Stirling (1 Div.) Border Counties (1 Div.)

* It is suggested that the County of Nairn should remain with the N. Scotland Branch while Moray and Banff should be transferred to N.E.

† Dumfries and Galloway should remain in Border Counties Group but integrated with the W. of Scotland Branch.

NORTHERN IRELAND

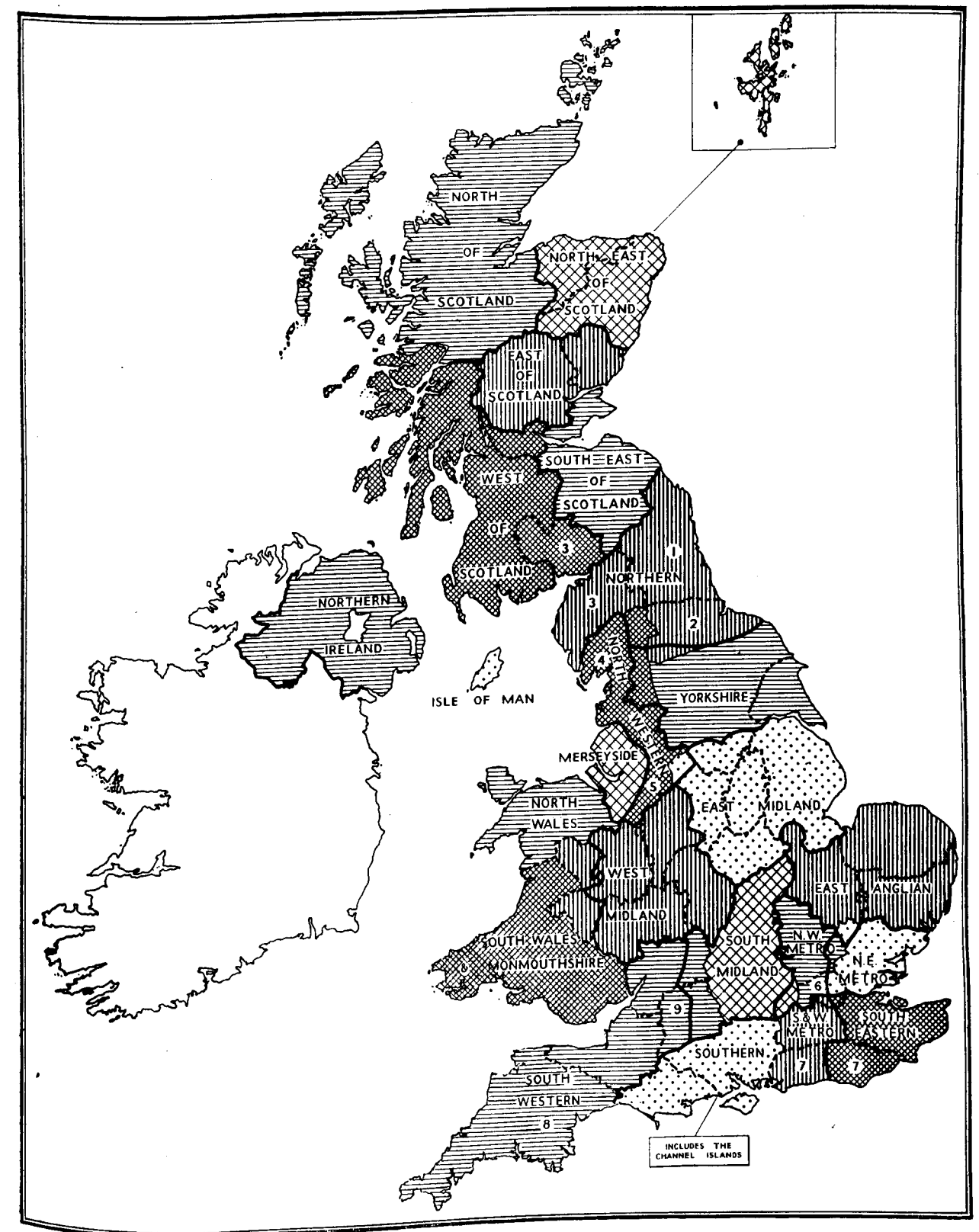
NORTHERN IRELAND HOSPITALS AREA	NORTHERN IRELAND (7 Divs.)	Belfast, County Armagh, Fermanagh, Londonderry, North-East Ulster, Tyrone, West Down	Northern Ireland (7 Divs.)
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APPENDIX C

REVISION OF CONSTITUENCIES FOR ELECTION OF 40 MEMBERS OF COUNCIL

Suggested Constituencies*

Group	Members	Seats
1. Northern	2,129	2
2. Yorkshire	2,165	2
3. East Midland	2,622	3
4. East Anglia	1,087	1
5. Home Counties:		
(1) Divisions in Herts and Beds	822	1
(2) Divisions in Middle	1,877	2
(3) Marylebone Division	958	1
(4) Divisions in London (see p. 89)	1,411	1
6. Essex	1,885	2
7. South-Eastern	2,580	2
8. South and West Metropolitan:		
(1) Divisions in London (see p. 89)	1,222	1
(2) Surrey—West Sussex	2,154	2
9. Southern:		
Salisbury Division. Divisions in Hants and Dorset, Isle of Wight (Channel Islands)	1,575	1
10. South Midland	1,651	1



Regional Hospital Board Boundaries

Proposed New Branch Boundaries
(delineated by shading)

Existing Branch Boundaries

Groups (indicated by numerals):

1. North of England Group
2. Tees-side Group
3. Border Counties Group

4. North Lancs and Westmorland Group
5. South Lancs and East Cheshire Group
6. Metropolitan Counties Group

7. Sussex Group
8. Devon and Cornwall Group
9. Gloucester and Somerset Group

* Italics indicate no change.

Group	Members	Seats	Group under Revised Scheme
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Scotland

* Maximum 5 representatives.

other countries are in progress, and agreements are expected shortly with Belgium, Norway, and Israel.

Reciprocal social security agreements now exist between the United Kingdom and France, Italy, the Netherlands, Luxembourg, Denmark, Switzerland, Sweden, Australia, New Zealand, the Irish Republic, the Channel Islands, and Malta. Negotiations with other countries are in progress, and agreements are expected shortly with Belgium, Norway, and Israel.

¹ *British Medical Journal*, 1956, 1, 911.
² *British Medical Journal Supplement*, 1956, 1, 263.
³ *Ibid.*, 1956, 2, 181.

C. ALLAN BIRCH.

SIR,—I support strongly Dr. J. C. Sawle Thomas's plea (*Supplement*, February 9, p. 62) for the development of psychiatric departments in general hospitals and for their closer integration with these hospitals. We lag far behind several European countries and parts of North America in this respect. For example, in Scandinavia it is the rule for general hospitals to have large psychiatric departments with about 100 beds available for psychiatric patients. In the new Montreal General Hospital there is an excellent arrangement in which various diagnostic and therapeutic psychiatric facilities are used by out-patients, day hospital patients, and ordinary in-patients alike. I have a vivid recollection of

wartime service in R.A.F. hospitals in which the most fruitful collaboration developed between the psychiatrists on the one hand and on the other the general surgeons and physicians, of whom some said that they had never realized the possibilities in this direction before. The psychiatric departments of general hospitals are usually much better situated geographically than mental hospitals for the development of day hospitals, night hospitals, and other services designed to maintain and further contact with the community.

Disused wards and other hospital buildings, adjoining old houses, and similar premises can readily be adapted for outpatient, day hospital, and other therapeutic uses, so that expansion need not wait on a large programme of capital works, but could proceed apace given the will and enthusiasm from hospital staffs and management authorities and fairly moderate financial encouragement from the Ministry.—I am, etc.,

Crockham Hill, Kent.

A. HARRIS.

Salaries of Part-time Radiographers

SIR,—As a radiographer who has recently resumed part-time employment, I can most heartily endorse the criticisms expressed in Dr. F. Friend's letter (*Supplement*, January 26, p. 45).

In order to be able to work away from my home it is necessary to employ a competent "baby-sitter," and her wages, combined with the cost of travelling and of lunch, leave little out of the meagre salary now paid to part-time radiographers. Other correspondents have stressed the lack of radiographers and the fact that this has resulted in some departments only being able to operate under conditions of extreme difficulty. There must be many of my profession who gave up their posts after marriage and would now be glad to resume their work if this offered a reasonable reward. The lack of consideration given to the remuneration of part-time radiographers is an example of the short-sighted policy that has characterized the recent negotiations of salary scales for medical auxiliaries.—I am, etc.,

Ruislip, Middlesex.

V. M. GORDON.

Remuneration Claim

SIR,—At this vital stage in the negotiations with the Minister over the adjustment of our remuneration I find myself quite intolerant of the views expressed by your correspondents Drs. A. C. Gordon Ross and George H. Pearson (*Supplement*, February 2, p. 49).

Dr. Ross suggests that this is not an opportune moment to press our claim. I wonder if Dr. Ross is aware that the Minister himself admitted to the Negotiating Committee that during the past ten years there has only been a period of two to four months when a claim could have been submitted without causing the Government financial embarrassment? Has Dr. Ross any reason to suppose that conditions will be any more propitious during the next ten years? Dr. Pearson makes an even more preposterous remark when he suggests that the profession is "scrambling for money." After waiting patiently for nearly six years and exercising admirable restraint, this point of view defies understanding. Dr. Pearson then exhorts us to improve our service to our patients, and give them better value, rather than this "scrambling for money." We all admire idealism and self-sacrifice, but at this juncture Dr. Pearson's brand is pure humbug.

Let us face the hard fact that the future of medicine under the N.H.S. is at the cross-roads. Weakness now may well be disastrous. It will be a hard struggle to persuade the Government that it must honour its obligations, and never have tenacity of purpose and complete unity in the profession been more important than at the present time. We owe this not only to ourselves but to the future generations who will follow after us. Our immediate objectives must be: (1) to secure the unconditional acceptance of Spens by the Government, with adjustments to the central pool at agreed

regular intervals; (2) to insist that politics be divorced from the Health Service. Later, further refinements can be introduced. When our claim has finally been implemented may I suggest that the salary adjustments of registrars and junior hospital staffs, not forgetting practice expenses of the small-list practitioners, be given first priority?—I am, etc.,

Caerphilly.

D. R. V. PRYS-JONES.

SIR,—Let us cast aside all personal and selfish interests to join forces for the good of the profession as a whole, now and in the future. Since 1951 the value of the pound has fallen 25% and the salaries of our secretaries, cleaners, etc., have increased as have all other unavoidable expenses. There is no reasonable argument against the justice of our claim.

Two questions seem to have arisen: (1) Should we set an example to the community in not asking for an upward adjustment to our remuneration? (2) Can the country afford it? On the first issue, does anyone still believe our example would be followed? We have refrained for four years in tendering a claim, and what section of the community has done likewise? Financial experts differ in their analysis of the monetary situation. A view supported by Sir Stafford Cripps was that by increasing the tax on tobacco he would curb inflation. Events proved this to be completely false, and in fact this resulted in what he hoped to avoid most, because workers demanded and received more money to meet the rise in their cost of living; not, mark you, to meet the Government's cost-of-living index, as this excluded tobacco in its calculations. Governments themselves are mostly responsible for inflation. High direct and indirect taxation may be deflationary in theory by mopping up spending power, but in practice the effect is the exact opposite, as people demand more money to pay for these taxes.

Regarding (2) above, of course the country can afford it. Fortunately, the cost of the whole Health Service will soon be saved by cutting down the appalling waste on conventional weapons. With a little imagination and determination a similar sum could be saved by more careful budgeting. One of the curses of this country to-day is that there are too many people spending with scant care other people's money. The people are having the Health Service on the cheap, at the doctor's expense. Massive withdrawal from the Service could result in the patients having to pay 5s. per consultation and 10s. per visit. This would almost double our incomes and possibly cause widespread strikes in industry. The Government must honour its obligations to the medical profession. I am optimistic about the outcome, as I have faith in the spirit and determination in the interests of justice of the majority of the medical profession.—I am, etc.,

Chesterfield.

KENNETH E. MCIVER.

SIR,—I am whole-heartedly with the Negotiating Committee in maintaining that there is a moral obligation implied in the Spens reports to maintain in the future a proper social and economic status for general medical practitioners and specialist practitioners. That a definite contractual obligation exists to agree to increased remuneration is not, of course, accepted by the Government. And we are not so sure ourselves that this obligation could be enforced by action in the courts. Realization of this comes rather late in the day. That being so, and considering the present economic circumstances of the country, it would seem that we are not on very secure ground. That this may be an unpalatable view to many I am well aware, but this is a time for honest expression of all shades of view. The times are crucial and we cannot afford to blunder into defeat.

There is much brave talk these days by our leaders about "being on the eve of severe conflict with the State," about the profession getting "geared for action," about "weapons sharpened now," etc. And our negotiations with the

Government are being conducted under the threat of withdrawal from the Service. I shudder when I hear that the view is held that withdrawal (resignation or strike action) would force the Government to capitulate within a week. This is dangerous advice. No Government can allow itself to be bent to the will of any section of the community. Furthermore, do our negotiators really believe, as they profess, that general practitioners would resign from the Service if called upon? Do we general practitioners really mean that we would resign, refuse our patients sickness certificates, leave them to pay for their medicines, suffer all the attendant discomfitures of our action? Of course we would not. And the Government knows it. High time that our negotiators did.

What is to be done, then? Depart at once from all talk and threats of withdrawal or we will end in disaster. Strike action is gutter talk, unworthy of our profession. Let us negotiate without threats. And let us never mention withdrawal again until we have an alternative and better service to offer. The practice of a little self-criticism at times would do us all a lot of good.—I am, etc.,

Perth.

R. RITCHIE.

A Layman's View

SIR,—As a non-medical professional worker whose standard of living has been declining at least as rapidly as the average doctor's, I read the weekly correspondence in the *Supplement* with interest and a good deal of sympathy. Perhaps you will forgive me making a comment from outside, bearing in mind that as a member of the public I shall in due course pay my share of whatever increased remuneration you are able to obtain.

I suppose most patients look on doctors, as I do, as being relatively well paid, and the average figures quoted seem to bear this out, even though they may conceal pockets of real hardship. (Many of us have to make do on much less than £1,000 a year, let alone £2,000.) But as patients we are also aware that doctors are usually overworked, often harassed by lack of facilities, and frequently frustrated. I therefore welcome letters such as Dr. G. A. F. Quinnell's (*Supplement*, February 2, p. 51), advocating reduction of lists to 2,500, tax-free allowances for practice expenses, and extension of group practice. Of course, these and similar changes will take time, and you cannot be expected to drop your claim for more pay immediately. But, if your campaign could be shown to touch on these wider aspects as well as the £500 a year, I feel sure you would gain as much greater public support—and that may make all the difference in your negotiations with the powers-that-be.

I think most people at the receiving end value the N.H.S. as a great achievement. Perhaps it is natural that its weaknesses are brought home more forcibly to doctors than to others. To sum up, in my view confidence between doctor and patient can be benefited by practical efforts to improve the N.H.S., but is certain to be impaired by attempts to abolish it or to replace it by some untried alternative.—I am, etc.,

Stanmore, Middlesex.

C. H. R. MEREDITH.

Saving on Prescribing

SIR,—Might one who retired from practice over ten years ago make some criticism, and offer a means of bringing the Minister of Health and the profession more closely together on the vexed question of increased remuneration? When I was in practice I remember being sternly reproved by our regional medical officer because the average cost of my prescriptions was a fraction over 5d. each. I was urged to use cheaper ingredients of equivalent therapeutic value—or else. To-day I am informed that the average cost is about 5s. per prescription. I know that in the bad old days the chemist was disgracefully paid, but the present increase in their remuneration and the extra cost of B.P. preparations does not account for such a disparity as we see to-day.

If I might offer an opinion, I am convinced that the practice of ordering expensive proprietary preparations, which are usually labelled with incomprehensible names and guaranteed to perform miracles, in lieu of careful diagnosis and advice has magnified the drug bill beyond all reason. I would exclude antibiotics from this discussion, but the use of these, too, is grossly abused. If these proprietary preparations are essential to the well-being of the public one ought to use them, but do most of them cut short illness or preserve life any more effectively than simpler remedies such as are listed in the B.P.C.? A case in point. A child suffering from a small spot of impetigo on the corner of his mouth had prescribed for it $\frac{1}{2}$ oz. (15.5 g.) of cortisone ointment which cost about 30s., when a pennyworth of white precipitate ointment would have done just as well. Let our teachers, both in hospital and in lectures, lay special stress on the utmost economy with efficiency.

Hospital research is a different matter; medical science must advance. I am discussing the average prescriptions issued by the profession to the tune of millions per annum to N.H.S. patients. Why not observe a self-denying ordinance for a period of, say, 12 months, restrict expensive prescribing to a necessary minimum, and then ask for an increase in pay, which will have been well earned, instead of recriminations and threats of strike action which will become us? The medical profession has a genuine grievance, but this is shared by all professional classes, especially the salaried groups. The underlying cause is inflation and excessive taxation. Let us not forget that the health section of our welfare scheme is not covered by weekly contributions, but directly by taxation. If we are extravagant we are spending our own money as well as that of our neighbours. A drive for economy in prescribing and in many other branches of the medical service would be of great benefit to our whole community.—I am, etc.,

Holyhead.

HOWARD ENGLISH.

Drugs for Private Patients

SIR,—It is manifestly absurd that private patients should be deprived of the right to receive drugs for which they pay by enforced contributions to the National Health Service. And yet one of the frequently reiterated complaints about the Service is that it has given rise to an enormous and quite unnecessary, if not actively harmful, increase in the consumption of medicine by the populace at large. Any right gained by private patients to receive their drugs under the National Health Service would still further add to this undesirable feature of the Service, and I venture to think that the solution lies in the opposite direction and that National Health Service patients should, except when under hospital treatment, be made to bear a substantial part of the cost of *National Formulary* medicine (say 50%) and the entire cost of proprietary preparations. In this way it might be possible to remedy an obvious injustice without further adding to an already undesirable state of affairs.—I am, etc.,

London, S.W.7.

J. N. LORING.

Item-of-service Payment

SIR,—Let those who advocate a "payment for item of service" beware. They may not be aware of the current practice of executive councils in dealing with forms E.C. 24 (rev.). In addition to a preliminary scrutiny these are later compared with records at local maternity hospitals. Add to this the fact that municipal midwives now complete a form stating whether the G.P. was actually present during labour. The situation is fraught with bureaucratic possibilities—little bowler-hatted men carefully inspecting Granny Smith's *derrière* to make sure that she has, in fact, had her weekly gold injection in her right buttock and not in her left, as claimed in some form or other.

The capitation system has glaring defects, but let us not abandon it in favour of something much worse.—I am, etc.,

Barrow-in-Furness.

J. H. C. CORR.

S.H.M.O.s and Consultant Appointments

SIR,—I thank the many S.H.M.O.s who wrote to me following my letter (*Supplement*, February 9, p. 61). S.H.M.O.s who are doing consultant work have the opportunity of having their posts considered for payment at consultant rates as mentioned in the notice "S.H.M.O.s in Consultant Posts (p. 60). All S.H.M.O.s should bring this notice to the attention of their colleagues whether B.M.A. members or not. Application forms duly completed must be returned to the Secretary, British Medical Association, by March 2, or it may be too late.—I am, etc.,

G. WARING ROBINSON,
Chairman,
S.H.M.O. Group Executive Committee.
Leicester.

H.M. Forces**ROYAL AIR FORCE**

Air Vice-Marshal P. B. L. Potter, C.B.E., Q.H.S., has been granted the acting rank of Air Marshal.
Air Commodores L. M. Corbet, C.B.E., and A. F. Cook, C.B.E., Q.H.P., have been granted the acting rank of Air Vice-Marshal.
Group Captain T. C. Macdonald, A.F.C., to be Air Commodore.
Group Captain J. Kemp has retired.
Wing Commanders H. L. Willcox, P. A. Cooper, G. H. Stuart, P. A. Lee, A. S. Amsden, J. R. R. Jenkins, H. P. R. Smith, A.F.C., A. R. C. Young, O.B.E., and R. C. Jackson to be Group Captains.
Squadron Leader K. Bazarnik, A.F.C., to be Wing Commander.
Flight Lieutenants I. A. McIntosh, J. A. Hill, J. P. McRory, and P. R. Wagner to be Squadron Leaders.
H. B. Kelly to be Squadron Leader.
Flight Lieutenants C. P. Handforth, P. M. Healy, A. Lyon, A. G. May, M. C. Batchelder, R. Stalker, and R. D. Merson have been transferred to the Reserve, retaining the rank of Squadron Leader.
Flight Lieutenant F. J. Davies has resigned his commission, retaining the rank of Squadron Leader.

ROYAL AUXILIARY AIR FORCE

Squadron Leader E. R. Spicer has resigned his commission, retaining his rank.

BRITISH MEDICAL GUILD**PLYMOUTH DIVISION**

A meeting representing all branches of the profession within the Division area was held in Plymouth on January 22. The attendance numbered over 150. Dr. Noy Scott was elected to the chair. A resolution was passed unanimously that "this meeting supports with confidence the Negotiating Committee in the steps already taken to maintain the implementation of Spens terms for settlement of the remuneration claim."

Association Notices**Diary of Central Meetings****FEBRUARY**

- 27 Wed. Maternity Medical Services Committee, 2 p.m.
28 Thurs. Compensation and Superannuation Committee, 2 p.m.
28 Thurs. Non-professional Group Committee, 2 p.m.

MARCH

- 1 Fri. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
4 Mon. Alternative Edition Subcommittee, Joint Formulary Committee, 11 a.m.
5 Tues. Editorial Subcommittee, Joint Formulary Committee, 11 a.m.
6 Wed. Training Subcommittee, Occupational Health Committee, 10 a.m.
7 Thurs. Ingleby Evidence Committee, 11.30 a.m.
7 Thurs. Journal Committee, 2 p.m.
7 Thurs. Charities Committee, 2.30 p.m.
8 Fri. Overseas Committee, 2 p.m.
12 Tues. Amending Acts Committee, 2 p.m.
14 Thurs. International Relations Committee, 2 p.m.
14 Thurs. Organization Committee, 2 p.m.
21 Thurs. G.M.S. Committee, 10.30 a.m.

Branch and Division Meetings to be Held

BLACKBURN DIVISION.—At White Bull Hotel, Church Street, Blackburn, Tuesday, February 26, 8.15 p.m., meeting. Address by Dr. P. H. Addison: "The Law as it Affects the Doctor."

CARDIFF DIVISION.—At B.M.A. Welsh House, 195, Newport Road, Cardiff, Wednesday, February 27, 8.25 p.m., general meeting; 8.30 p.m., B.M.A. Lecture by Dr. V. D. Allison: "Changing Face of Infection."

DEWSBURY DIVISION.—At Board Room, General Hospital, Moorlands Road, Dewsbury, Friday, March 1, 8.30 p.m. B.M.A. Lecture by Dr. J. D. Allan Gray: "Antibiotics."

DORSET DIVISION.—At Chest Clinic, Dorchester, Friday, March 1, 8.30 p.m., general meeting. Mr. A. Alexander, D.V.S.M.: "Veterinary Medicine, with Special Reference to Communicable Diseases." A film on foot-and-mouth disease will also be shown. All veterinary surgeons in Dorset are invited.

EASTBOURNE DIVISION.—At Hellingly Hospital, Tuesday, February 26, 8 for 8.30 p.m., clinical meeting. Papers by (1) Dr. D. Krausz: "Some Aspects of E.C.T."; (2) Dr. H. V. W. Elwell: "Psychotherapy"; (3) Dr. R. M. Ellison: "Drugs for the Elderly."

EAST DENBIGH AND FLINT DIVISION.—At Wynnistay Arms Hotel, Wrexham, Thursday, February 28, joint meeting in conjunction with Wrexham Clinical Society. 7 for 7.30 p.m., dinner; 8.15 p.m., B.M.A. Lecture by Professor A. G. Watkins: "Paediatrics in the West Indies."

ENFIELD AND POTTERS BAR DIVISION.—At King's Head Hotel, Market Place, Enfield, Wednesday, February 27, joint meeting with Enfield Solicitors' Association. 8.15 p.m., reception; 9 p.m., B.M.A. Lecture by Mr. Norman Richards, Q.C.: "The Doctor's Contact with the Law." Medical and legal guests and members of the North Middlesex and Barnet Divisions are invited.

LEWISHAM DIVISION.—At Lewisham General Hospital, Friday, March 1, 8.30 p.m., meeting. Dr. C. A. Holman: "Treatment of Haematological Problems in General Practice."

MAIDSTONE DIVISION.—At Royal Star Hotel, Maidstone, Saturday, March 2, 3 p.m., illustrated lecture by Mr. Ronald B. Haynes: "Studies of Bird Life in Kent."

MANCHESTER DIVISION.—At Fallowfield Hotel, Wilbraham Road, Manchester, 14, Tuesday, February 26, 8.30 p.m., meeting. Medical Forum—subject for discussion: "That Medical Education To-day Does Not Adequately Prepare Students for Medical Practice." To be introduced by Drs. H. W. Ashworth, L. D. Harris, R. F. Logan, W. T. Westwood, and M. P. Winstanley.

MARYLEBONE DIVISION.—At Medical Society of London, 11, Chandos Street, W., Thursday, February 28, 8.45 p.m., meeting. Address by Dr. W. D. Nicol: "Tranquillizers—Their Use and Abuse." A general discussion will follow. Members of Paddington, St. Pancras, City, and Hampstead Divisions are invited.

NORTH GLAMORGAN AND BRECKNOCK DIVISION.—At East Glamorgan Hospital, Church Village, Pontypridd, Thursday, February 28, 7.30 p.m., joint meeting with Rhondda Medical Society. Symposium: "Pneumoconiosis." Panel of speakers: Professor J. Gough, Dr. A. L. Cochrane, Dr. A. Caplan, and Dr. J. D. Ball.

ROCHDALE DIVISION.—At Turner Hall, Birch Hill Hospital, Littleborough, Rochdale, Wednesday, February 27, 8.30 p.m. B.M.A. Lecture by Mr. A. Lawrence Abel: "Common Diseases of the Rectum."

SOUTH ESSEX DIVISION.—At Nurses' Lecture Theatre, Oldchurch Hospital, Romford, Friday, March 1, 9 p.m., meeting. B.M.A. Lecture by Dr. Hugh Clegg (Editor, *British Medical Journal*). Dr. Clegg will give a short lecture on the Publishing Activities of the B.M.J., and invites questions on the *Journal*, and all its works, after the lecture.

SUTTON COLDFIELD DIVISION.—(1) At Town Hall, Sutton Coldfield, Wednesday, February 27, 9 p.m. to 1 a.m., annual dance. (2) At Good Hope Hospital, Rectory Road, Sutton Coldfield, Friday, March 1, 9.15 p.m., meeting. B.M.A. Lecture by Sir Walter Mercer: "Surgery in Russia" (illustrated by cine-film and lantern-slides). Members are invited to take lay guests.

WEMBLEY DIVISION.—At Board Room, Wembley Hospital, Tuesday, February 26, 9 p.m., meeting. Talk by Mr. David Trevor: "Backache." Members of Hampstead, Harrow, Hendon, and Willesden Divisions are invited.

WEST BROMWICH AND SMETHWICK DIVISION.—At the Sandwell Hotel, West Bromwich, Tuesday, February 26, 8 p.m., meeting. B.M.A. Lecture by Mr. Harold Dodd: "Venous Disorders of the Lower Limb."

WESTMINSTER AND HOLBORN DIVISION.—At Board Room, St. George's Hospital, Hyde Park Corner, S.W., Wednesday, February 27, 8.15 p.m., meeting. B.M.A. Lecture by Dr. Hugh Gainsborough: "Psychosomatic Medicine."

WIGAN DIVISION.—At Lewis's Restaurant, Wallgate, Wigan, Thursday, February 28, 8 p.m., meeting. Lecture by Dr. F. M. Rose: "The Place of the College of General Practitioners in Modern Medicine."

Meetings of Branches and Divisions**ENFIELD AND POTTERS BAR DIVISION**

Dame Edith Russell-Smith, Deputy Secretary, Ministry of Health, was the guest of honour at the annual dinner of the Division held on January 19. Dr. G. G. Doel, chairman.

**SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL**

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GENERAL MEDICAL SERVICES COMMITTEE

The General Medical Services Committee of the B.M.A. met on February 21 at B.M.A. House, with Dr. A. TALBOT ROGERS in the chair. The Committee spent the whole day discussing the position arising out of the rejection by the Government of the profession's claim for an increase in remuneration.

Mr. Harry Cooper

The CHAIRMAN referred to the death of Mr. Harry Cooper, and paid a tribute to the accuracy of his work in reporting the Committee's proceedings and those of its predecessor, the Insurance Acts Committee, for the *British Medical Journal* for so many years. The last occasion that Mr. Cooper attended a meeting was in November last.

REMUNERATION CLAIM

The CHAIRMAN, reporting on the interview between representatives of the Negotiating Committee and the Minister of Health on February 20, said that the deputation had had a very disturbing day. He agreed with Dr. Wand's view that in all his years of negotiations with different Ministers he had never met with such a stubborn and blank refusal to listen to the profession's point of view.

The Government had refused to consider the merits of the claim at all. The Minister during a two and a half hours' discussion was driven at one time to admit that there was justice in the doctors receiving something further for their services, but in spite of that the Minister kept harping on the economic situation of the country, and because of this the Government could not look at the merits of the claim.

When the deputation entered the Minister's room, Dr. Rogers continued, it knew nothing about the proposed Royal Commission. "We reacted unanimously and strongly against the whole idea of a Royal Commission, pointing out the many disadvantages. We asked that the Joint Chairmen should be able to see the Prime Minister, and that was refused."

Announcement of Royal Commission

The announcement of the Royal Commission was made in Parliament in such a way as to suggest that by this means the Government was really offering something worth while for the future. In effect, said the Chairman, the present claim had not been considered, and would not be considered until the Royal Commission had sat and deliberated as long as a Royal Commission might deliberate. The Minister was asked why the Royal Commission could not look at the future methods of payment while in the meantime an adju-

cator was appointed to decide the merits of the case and allow of some adjustment of doctors' remuneration within a reasonable time and which could, if necessary, be re-adjusted after the Royal Commission had reported. That was said to be impossible. The terms of reference of the Royal Commission were not yet known, but it appeared that it would be asked to look at the method of payment of doctors and the level of their payment in comparison with other professions.

Departure from Spens

This, said the Chairman, was departing a very long way from Spens. The Spens Agreement covered two things. The first was the alteration in the value of money. The Minister said that this would not be mentioned in the Royal Commission's terms of reference, but if and when the Association gave evidence before the Commission it could bring forward arguments on the change in the value of money. Secondly, Spens was concerned with changes in the remuneration of other professions, and if it could be shown that other comparable professions had gained on the medical profession it was a strong argument for adjustment. There was no suggestion, said Dr. Rogers, that that was what the Royal Commission was going to look at. It was being asked to examine the absolute incomes of the different professions, and the doctors' incomes would be compared, together with their responsibilities and training, with other professional classes, including teachers, clergymen, and other small-income groups which the Government cared to stress.

"All the things which we thought we had won through our careful work in the Spens Committee and through our subsequent explanation to Mr. Justice Danckwerts—our agreements—have gone into the melting-pot. Many questions which we thought were settled, and which we have fought to retain as rights, will have to be considered *de novo*." The dependence of the Pool upon the number of doctors would have to be considered again, Dr. Rogers continued. The whole machinery of the Central Pool would have to be reconsidered.

The Minister had admitted that the Royal Commission would not necessarily recommend an increase in doctors' remuneration. It might quite well be that there would be a recommendation in the opposite direction.

Whitley Machinery

Sir Russell Brain, continued the Chairman, was concerned about the question of negotiation under Whitley B. At the present moment, although there were grumbles about the Whitley set-up, it contained one very important provision

which often worked against the profession, but occasionally could be made to work in its favour, and that was that unless there was complete agreement in Whitley B the *status quo* continued. Unless both sides agreed, a matter could not be taken to arbitration, and therefore the present consultant remuneration, including the merit award system, was bound to go on if consultants wanted it to do so. In answer to a question from Sir Russell Brain, the Minister had said that the Whitley machinery would be washed out if the Commission so reported.

There was no guarantee that the Government of the day, probably not the present Government, would accept the Commission's advice. The Minister had said he could not commit his Government or any other Government to accept beforehand any finding of the Royal Commission. Royal Commissions were set up to advise the Government, and the Government decided how much of the advice was acceptable, or how much was practical in the circumstances then obtaining. The addendum to the Prime Minister's statement, arising out of a question from Mr. Gaitskell, that the Commission would be empowered to advise retrospective payment was of little value. The Government could say that the economic climate was such it could not afford to give £60m. or whatever it was to adjust doctors' back claims.

Grave Warning

It was a very grave note he was sounding, said the Chairman, but it had to be sounded. This was no way for a reasonable government to suggest settling a pay claim.

The Royal Commission's remit was being extended to include the pay of public health medical officers and dentists. In the public health officers and dentists, two of the most controversial sections of the whole Health Service were being brought in, both of whom had considerable problems to solve. The consideration of these problems would add months, if not years, to the work of the Commission.

There was one other point, Dr. Rogers added. The Government was willing to help, in advance of the Royal Commission's findings, the junior hospital staffs, which meant staff up to and including the rank of senior registrar. The delegation took the attitude, and the Minister agreed, that this was a separate matter from the setting up of a Royal Commission.

JUSTICE IN THE CLAIM

Dr. S. WAND, Chairman of Council, said that, without going into the history of the happenings yesterday, there were perhaps two points he could mention. One was that he asked the Minister, if the economic climate was the same when the Royal Commission reported as it was to-day, would the findings be implemented? The Minister had replied that if the economic climate was the same "we would have to consider that." It was clear from this that if the economic climate was the same the report, even if it was accepted, might not be implemented. The second point was that towards the end of the meeting the Minister had said that no one could dispute that there was justice in an increase for the doctors. "I took that up and said, 'Minister, I have copied this out and I am going to quote this, but I want to be sure that I have this right . . . do you agree that you said that?'" The Minister, said Dr. Wand, tried to side-step by saying that some such words would appear in the statement in the House. But, since these words were not included in the statement in the House, he felt justified in quoting them.

"When I came away from that meeting," went on Dr. Wand, "I was as angry as I have ever been after a meeting with any Minister. The discussion that we were expecting to have with the Minister did not take place. He presented us, as you have seen from this morning's papers, with a *fait accompli*. What does that mean? It means that the Government is going to use . . . a particular type of weapon with which to destroy all that has gone before. The Danckwerts award was made by an independent judge,

and the Royal Commission is the one method which the Government can use to destroy that by its own nominees and with terms of reference which no one can discuss except the Government itself."

The Commission would be a very long-standing one, while we had no guarantee that its report would be implemented if it was in the profession's favour; if it were not in the profession's favour it was obvious that the Government would want to implement it. Had the profession any guarantee that the Royal Commission would not recommend a full-time salaried service?

Broken Pledges

"We came into this service," continued Dr. Wand, "with certain pledges and promises; we accepted them because they came from a British Government. Supposing the Royal Commission finds in our favour and suppose the findings are accepted, can we rely on those promises? (No.) I am going to ask you, and this is a very serious question, that we have to consider very carefully, not merely whether we can go on working for such an employer now, but whether we can go on working for such an employer in the more distant future. The whole basis on which doctors enter service of this kind depends on trust. Can we any longer trust the Government? If we cannot trust the Government it is not a matter of resigning now, it is a matter of saying we will have nothing to do with any service which is run by any Government. That is, as I see it, the issue before us. The issue is no longer one only of remuneration for the immediate future. Even if the Government gives us our 24% we have still got to consider very carefully whether any professional person can work for a Government which can behave in this fashion."

In the Discard

Dr. A. B. DAVIES said that little remained to be added. There had been no negotiation at all. The Government would not listen to the claim, they had indicated that they never would; there had been no suggestion of arbitration, either on the money or an interpretation of the back promises, no adjudication on Spens or Danckwerts or any of the understandings on which they came into the Service; there had been no consultation—they were told that it was never the custom to consult a negotiating body on setting up Royal Commissions.

"All this means, as Dr. Wand had said, that everything that we ever had, anything that we ever won, anything that was ever agreed on coming into the Service is now in the discard. That means Spens, that means Danckwerts, even Whitley. There is no promise that our claim will ever be considered, although the Minister admits there is some justice in it." The only thing which came out of it, which was quite separate from the claim, was the indication that the Management Side of Whitley would be advised to consider the claim of hospital staffs up to the rank of senior registrar.

The CHAIRMAN said that it was interesting that the Minister said "that the Government was willing to instruct," giving away the fact which had always been disputed, that that was exactly what the Government did, it instructed the Management Side of Whitley.

Dr. DAVIES said that one satisfactory thing was that the public health officers would be considered in the constellation of medicine.

The Negotiating Committee

Dr. H. GUY DAIN asked what happened at the Negotiating Committee which met in the afternoon.

The CHAIRMAN replied that it was determined at that meeting that without any avoidable delay all the different constituents of the Negotiating Committee, the G.M.S. Committee, and the Joint Consultants Committee, should discuss the matter and decide what their views should be. The

Negotiating Committee had no longer the task of negotiation; there was no one to negotiate with. When the Council of the Association met next week it was hoped that the views of the different constituent bodies would be available to it. When the Council met the Guild met; the Council could constitute itself into the Guild.

The Negotiating Committee had decided that a letter should be sent to the Prime Minister, signed by Sir Russell Brain and himself, which would be in the form of an appeal to the Prime Minister, even at that last moment, to do something. Nothing could be done about the Royal Commission, but the intention was to suggest that the Royal Commission should be more concerned with the basis of doctors' pay rather than the amount. It was felt that the two issues could still be separated, and that when the terms of reference of the Commission were announced they could be directed to the future rather than to the present. It might still be possible, if the Government wished, for the profession's present dissatisfaction to be referred to an arbitrator. That was the note which would be sounded in the letter to the Prime Minister.

Repudiation of Spens

Dr. H. N. ROSE asked if it was understood that the Government did not repudiate Spens until the Royal Commission reported.

The CHAIRMAN replied that the Government had said all the way through that the Spens Report was a suggestion as to how they should start in the Health Service, and that it did not have any continuing validity. Up to now the Government had said that the Spens recommendations were one of the things which should be taken into consideration when assessing the future, but yesterday they could not even get that, there was no suggestion that the word "Spens" would appear anywhere in the terms of reference of the Commission.

Dr. ROSE asked if it should be taken then that the Government had abandoned Spens and repudiated it entirely.

The CHAIRMAN replied that they had repudiated it entirely, and the representatives of the profession when they gave evidence before the Royal Commission must say that this was where they came in and ask the Commission to agree with its interpretation and reject the Government interpretation.

Dr. O. C. CARTER, a member of the Negotiating Committee in 1948, said that Spens meant far more than remuneration to general practitioners. He could not see any virtue in a Commission, because if the Government dishonoured Spens it could still more easily disregard the findings of a Commission. There were other things which might come in, such as a State-salaried service.

The Platform

Dr. WAND said that they must decide on what platform they were going to fight. The platform should be the simple fact "that we ask for adherence to Spens by the Government by agreement or arbitration. The Government having agreed that, we will consider with the Government the question of looking into the whole structure of the National Health Service." He would throw that out for discussion. He did not attach himself to it completely, but he put it forward to get something concrete; "our demands are the adherence to Spens, brought up to date by agreement or arbitration. If the Government showed that they were willing to keep to their bargain by doing that, we can proceed to discuss with them any further step which may be required to follow."

On the question of propaganda, now was the time to make it clear that sooner or later this must be taken out of party politics altogether. It seemed to him that a good deal of the attitude of the present Government was based on a fear of controversy in the House and repercussions from the Opposition. On the other hand, if the Opposition got back into power the profession could not expect to get much help from it, and therefore the only way to get a health

service which would be satisfactory was to make it clear to the population at large that it must be divorced from political control—that is, Parliamentary control—so that no party came into it, and now was the time to start that.

Dr. STEVENSON, in response to a question from Dr. WAND, produced a letter from Sir William Douglas written on May 2, 1950, which stated "that the Minister agrees that the Spens Report remains the basis of remuneration of general medical practitioners until such time as after the usual consultation some other basis is found."

Dr. J. C. ARTHUR said that this went beyond Spens. All Spens did was to fix the social status of the doctor in 1939, and that was reaffirmed in 1948. That was the point on which they were slipping, and if that could be got over to the profession they might be stimulated to do something effective. The social pattern was changing, and in that lay the very grave danger of this Royal Commission. They were liable to be judged by other professions, and some of these other professions had for many years been envious of the doctor. . . . That was where Spens and Danckwerts had been so important; they had held them up, and he thought that it must be made clear to all the profession that what they were fighting for was not the immediate award but their status in comparison with other professions. If they lost now, they were lost for ever, they would drop in the social scale, and if that could be got over to the profession clearly and simply they would respond to an appeal to do something really drastic.

Action

The Committee then proceeded to discuss what action it should take. After a debate, in which nearly every member of the fully attended meeting joined, it was decided, with only two abstentions, that an emergency Conference of Local Medical Committees should be called in April, and that it be recommended to the conference that general practitioners should be advised to resign from the Health Service unless the Government agreed to an immediate and satisfactory settlement of the profession's claim or to arbitration.

A proposal that general practitioners who were members of administrative bodies should be advised to cease co-operating in the administration of the Health Service was not agreed to as a matter for immediate action, but as one which should be considered at the appropriate time.

The Committee set up a small subcommittee to prepare as a matter of urgency an alternative scheme for the organization of general practice outside the N.H.S.

The following statement was issued by the Committee at the conclusion of the meeting:

"The General Medical Services Committee, representing some 21,000 family doctors in the National Health Service, has learned with anger and resentment of the Government's cynical disregard of the Committee's just claim for an adjustment in remuneration, the level of which has not been changed since April, 1951. Not only has the Government clearly repudiated its obligations, but, by the appointment of a Royal Commission, it has destroyed the very basis upon which the profession agreed to enter the National Health Service only nine years ago. Indeed, as recently as 1950, an assurance was given by the Ministry of Health that 'the Spens Report remains the basis of remuneration of general medical practitioners until such time as after the usual consultations some other basis is substituted.' The Government, by appointing another body without any form of consultation, has committed a flagrant breach of trust which creates a position totally unacceptable to the profession."

"Thus the profession is in the position that, after waiting six years for the Government to implement its pledge to alleviate the effects of the steady decline in the value of its remuneration, it now faces a further and indefinite delay. It is difficult to believe that any other section of the community would be expected to submit to such cavalier treatment and to wait for up to ten years for the effect of rising prices to be mitigated—and without any assurance that this will be the ultimate outcome."

"The Committee is therefore summoning an emergency Conference of Local Medical Committees throughout the country at an early date and is recommending to that Conference that, unless the Government agrees to an immediate and satisfactory settlement of the profession's claim or to arbitration, general practitioners throughout the country will be advised to send in their resignations from the Service. An alternative scheme for the organization of general practice will be issued at the appropriate time."

REMUNERATION CLAIM EXCHANGE OF LETTERS WITH PRIME MINISTER

At its meeting on February 20 the Negotiating Committee authorized its joint chairmen to write a personal letter to the Prime Minister (see *Journal*, February 23, p. 471). The following is the text of the letter signed by Sir Russell Brain and Dr. A. Talbot Rogers and dispatched to Mr. Harold Macmillan on February 21.

The members of the Negotiating Committee of the medical profession at their meeting yesterday afternoon asked us, their joint chairmen, to write to you to express their profound dissatisfaction at the Government's decision on the remuneration claim which you announced in the House of Commons. The Government has refused to honour its obligation to apply the terms of the Spens Committee's reports, as interpreted by the Dankwerts award. It has thus broken its agreement with the doctors when they entered the Health Service. It has been made clear that the Government does not recognize this obligation, but the late Minister of Health, Mr. Turton, said that it would not be right for him to be judge in his own cause.

We agree that the method of adjusting medical remuneration to changing circumstances may benefit by being looked at, and if that stood by itself we should welcome the opportunity of assisting the Government in every way possible. But a Royal Commission is no answer to the present claim, and it is manifestly unfair that doctors who have had no compensation for the rise in the cost of living for six years should await the result of the slow deliberations of a Royal Commission, and meanwhile be expected to go on loyally and ungrudgingly maintaining the Health Service though their real incomes remain grievously depressed.

We therefore ask that the present dispute between us should be submitted to an independent arbitrator without delay.

Your decision causes the gravest anxiety to those who have at heart good relations between the medical profession and the Government and the welfare of the Health Service.

Prime Minister's Reply

The following letter from the Prime Minister was received by Sir Russell Brain on February 25, a similar letter being received by Dr. Talbot Rogers at the same time.

I have to acknowledge the letter of February 21 signed by yourself and Dr. Talbot Rogers regarding the difficult situation that has arisen in connexion with the remuneration of doctors in the Health Service.

Naturally I am very sorry that it has not been possible to arrive at an agreed solution of this problem. The Government feels that the Royal Commission is the only way in which a permanent system can be devised which will stand the test of time. I want to assure you that the purpose of the Royal Commission is not to waste time. On the contrary, I shall certainly urge its chairman to proceed without delay. Moreover, the work of the Royal Commission would not preclude some interim adjustment.

I must also repeat the Government's offer to deal with certain classes, that is hospital officers up to senior registrars, immediately.

While I realize the disappointment of your members at any delay I am convinced that in the long run this procedure is likely to improve the relations of the medical profession with the State and the public whom they serve so loyally.

The Scottish Association of Medical Administrators held its first meeting of the year in Stobhill Hospital, Glasgow, on February 1. The following officers have been appointed for the year: Honorary President, Sir Andrew Davidson; Chairman, Dr. S. G. M. Francis; Vice-Chairman, Dr. C. Bainbridge; Honorary Secretary and Treasurer, Dr. P. W. R. Petrie.

PUBLIC HEALTH COMMITTEE

SUPPORT FOR REMUNERATION CLAIM

The Public Health Committee of the B.M.A., at its meeting on February 22, pledged "the full support of doctors in the Public Health Service for their colleagues in general and hospital practice in the serious crisis with which the whole profession has been faced."

OPHTHALMIC GROUP COMMITTEE

The Ophthalmic Group Committee of the B.M.A. met on February 15, with Mr. O. GAYER MORGAN in the chair. The Committee spent the entire day discussing and revising the draft report of the Joint Subcommittee of the Group Committee and the Faculty of Ophthalmologists on the future of the ophthalmic services. The report will be circulated to members of the Committee in order that they can call their constituents together to obtain their comments on it in time for the Committee's meeting in May.

HOSPITAL MEDICAL STAFF

INCREASED MILEAGE ALLOWANCES

The General Whitley Council has agreed on temporary increases in mileage allowances payable to hospital medical staff and which apply to journeys made on or after December 5, 1956, and will cease when the increased customs duty under the Hydrocarbon Oil Duties (Temporary Increase) Act, 1956, no longer has effect. The increases are as follows: cars up to and including 10 h.p., 1d. on each rate per mile; cars over 10 h.p. 1d. on each rate per mile; motor-cycles over 150 c.c. but not more than 500 c.c., 1d. per mile; cars and tri-cars of 500 c.c. or less, motor-cycle combinations, and motor-cycles over 500 c.c., 1d. per mile.

MATERNITY SERVICES COMMITTEE

ROYAL COLLEGE OF MIDWIVES' EVIDENCE

In a memorandum of evidence to the departmental committee on maternity services, now sitting under the chairmanship of Lord Cranbrook, the Royal College of Midwives states its view that there should be more careful selection of general-practitioner obstetricians. To raise the standard of domiciliary maternity care to that obtaining in the best practices, all general practitioners should be required to have postgraduate experience in a maternity hospital or unit, and should attend refresher courses at regular intervals.

NORTHERN IRELAND HOSPITALS AUTHORITY

ANNUAL REPORT

No outstanding developments are recorded in the eighth annual report of the Northern Ireland Hospitals Authority for the year ended December 31, 1955. The net expenditure increased steadily and in the financial year 1954-5 exceeded £8,000,000. The scheme introduced in 1954 in which an annual block allocation of money is made to each management committee by the Authority was continued and met the approval of the committees. A slight decrease in the demands on the hospital and specialist services is reported.

Scottish News

REGISTRARS GROUP COUNCIL FOR SCOTLAND

A meeting of the Registrars Group Council for Scotland was held in Edinburgh on February 1 with Dr. HAMISH WATSON in the chair.

Great dissatisfaction was expressed with the terms of the agreement on the recent changes in residential charges for hospital medical staff, and with the fact that such an agreement had been reached without prior consultation with those most affected. It was agreed that the following resolution should be forwarded to the Chairman of the Joint Consultants Committee (Scotland) with copies to the Central Joint Consultants Committee and the Central Registrars Group Council:

That the council regrets the terms of the recently issued M.D.B. circular No. 34 on residential charges and that agreement on them was reached without adequate consultation with those who would be affected by them, and urges that early consideration be given to their revision.

Constitution of the Group

A long discussion took place on the proposals from the executive committee of the Central Registrars Group Council for the reconstitution of the Group. It was resolved that the principle be accepted that the constitution of the Registrars Group Council for Scotland be extended down to and including senior house officers. No decision was reached on the best method of ensuring adequate house-officer representation on the registrars groups. This matter was referred to the regional groups, and is to be discussed further at the next meeting of the council.

Other matters discussed were the question of hospital junior medical staff being represented on the Central Joint Consultants Committee and the Staff Side of Whitley Committee B; senior registrars undertaking domiciliary consultations when no consultant was available; and promotion prospects of senior registrars and registrars in Scotland during the next 15 years. This latter subject is to be given further consideration at the next meeting of the council.

GENERAL MEDICAL SERVICES SUBCOMMITTEE (SCOTLAND)

A meeting of the General Medical Services Subcommittee (Scotland) was held in Edinburgh on February 14, with Dr. C. J. SWANSON (Aberfeldy) in the chair.

Trainee General Practitioner Scheme

The Subcommittee considered a letter from the Department of Health suggesting that discussions might be held about the operation of the Trainee Practitioner Scheme in the light of the report of the Trainee Practitioners' Subcommittee of the G.M.S. Committee.

While appreciating that there were essential differences in the scheme in England and Scotland, the Subcommittee agreed that the report should be discussed with the Department in so far as it applies to the operation of the scheme in Scotland.

Mileage

The CHAIRMAN reported that the Rural Practitioners' Subcommittee was considering the interim report of the Mileage Committee for England and Wales, and that the Department had been asked to arrange for a meeting of the Scottish Mileage Committee at an early date to resume consideration of the position in Scotland.

Elimination of Inflation

It was reported that the liaison committee with the Scottish Association of Executive Councils had recently considered general measures to be taken to combat inflation

and the proposal of the Ministry of Health to introduce an alphabetical index. The Subcommittee agreed that a meeting between representatives of the Department, the Scottish Association of Executive Councils, and the Subcommittee should be arranged to consider the situation.

Prescription Changes

The following proposal from Dundee Local Medical Committee was considered by the Subcommittee:

That the money paid for prescriptions should be returned to old-age pensioners not in receipt of supplementary pensions on presentation of receipts at the post office along with their old-age pension books.

The Subcommittee was in sympathy with the views of the Dundee Local Medical Committee, and agreed to suggest to it that, since this is a United Kingdom matter, it should arrange for the proposal to be considered at the Annual Conference of Local Medical Committees in June.

Medical Records of National Service Men

The Subcommittee considered proposals from the Department on arrangements for the custody of the medical records of men called up for National Service and for reinstatement of Service men's names on doctors' lists. The essential points of the new arrangements are, first, that when a man is called up his medical record will in future be retained by the executive council for a period of two years and three months; and, secondly, that when two years and three months have elapsed from the date when a man was removed from the list on call-up the council will write to him at the address from which he was called up, explaining to him the position regarding registration with a practitioner.

Other Items

Other subjects considered by the Subcommittee were drugs and appliances; initial practice allowances; accidents in the home; mass radiography campaigns; medical service committees and tribunal procedure; protection of practices scheme; and fees for superannuation examinations.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Remuneration Claim

SIR,—There must be few doctors now who are not angry at the treatment we have received from the Government in respect of our wage claim. As far as I can judge from the information available, the Ministry more or less agrees that there is justification behind it but that the country cannot afford it. So we are to go on being exploited and, in effect, subsidizing the Welfare State. This is indeed an extraordinary relationship between employer and employee.

Of course all this dispute is only bringing to the surface the long-standing loss of confidence between ourselves and successive ministries since we were beguiled into the National Health Service in 1948. As far as the doctors are concerned, it has been a very one-sided bargain with self-restraint and self-sacrifice on our side and exploitation of our traditional loyalty on the other. A complete rearrangement of the N.H.S. is required, removing it from the intimate control of party politicians.

Our whole professional status is at stake and we have an opportunity now, as never before since 1948, to free ourselves from political serfdom. By determined action we can still preserve for the future all that is best in the tradition of medicine. Let us make sure that this time we are not diverted from our purpose by the professional politician.—I am, etc.,

J. S. TAYLOR.

Guildford, Surrey.

SIR,—Yesterday the Minister of Health behaved in the way the majority of us expected. He has employed further

delaying tactics, assuming, no doubt, that politically the medical profession is unimportant and divided in its views.

The time has now come for us to unite wholeheartedly, putting aside all personal anxieties, to make it abundantly clear to the people of this country, and to the politicians, that our primary concern is not for an increase in salary but for complete reform of the National Health Service. We have a duty to those who will follow us in our great tradition to raise medicine out of the bureaucratic bog in which it is now so sickeningly floundering. We must impress upon the nation that we are above politics, and that those whose duty it is to organize and control the Health Service must be unaffected by the ebb and flow of party popularity. Our predecessors handed to us a great tradition which, owing to the conditions forced upon us by the ill-conceived Service which controls us to-day, we shall be unable to pass on to those who follow us. The era of vocation is dying; the doctor of to-morrow will be a poor descendant of the great men of the past.

Let us not talk of "striking" or refusing to sign certificates. We have one duty before us, and that is a unanimous mass resignation at once. If we delay now our chance will have gone for ever and we will be guilty of betraying all that we have inherited.—I am, etc.,

Bewdley, Worcs.

DAVID E. SARGENT.

SIR,—As one temporarily exiled from my country and profession, I have followed with the greatest concern and interest the present controversy on professional-Governmental relations. From the enforced, oversimplified viewpoint of a vacuum certain facts stand out.

Our own medical politicians are also in a vacuum but through no fault of their own. This is partly because, as yet, the profession has not spoken with a single voice, and partly because the present structure of the profession makes this extraordinarily difficult on a part-time voluntary basis, when our leaders cannot get out into the highways and by-ways. This is not to be interpreted as meaning we need paid medical politicians. Most of life is a shade of grey, but very occasionally at any given moment, by the best current standards of any society, a definite black or white occurs. The profession could try to make up its mind whether this is or is not now occurring. Accepting that only those with a chip on their shoulder, like myself, write to papers, then the profession appears to be divided in this controversy into three groups: those who wish to change the health scheme; those who are concerned with remuneration; and those who see this as a breach of faith. The first thing that our leaders might do is to find out from the profession which of these points is the basic current issue. When they have discovered this, they then could discover how large a majority is of this opinion. They could then give the leadership to allow the profession to decide what action, if any, is to be taken. If action is to be taken, then more than a 51% majority is required—say 66% or 75%.

Now, depending upon what is found, action could be as follows. If we wish to change the health scheme we are not entitled to take action unless we have something better with which to replace it. Have we at the moment? If so, let us proclaim it. If not, then we should proceed as we are until we have. Then and only then is it correct to start action. Is this a remuneration claim? If it is, there is a time-honoured method for staking this—the strike. But what a time to strike. How have we been engineered into such a position at a time when the economy of our country is endangered, so that no one can look favourably on this action? In spite of all our sacrifices we still have a greater buffer of cash than most of our patients. If this is an ethical problem of professional-Governmental relations in which the Government has broken faith, we have three alternatives: accept what has occurred and adjust our future actions so that it does not occur again; let the Government have its own way continuously; or fight now. If we fight now we have decided we are dealing with a black: this must not be returned with another. This must be explained to the nation. We must establish favourable public relations

and tell why and what we are going to do. Ensure that a large majority of the profession is agreed on a course of action. This might be divided into, say, three monthly time periods in which we (1) stopped writing anything, (2) worked to rule—going slow, (3) only treated emergencies. Under no circumstances could we be prepared to negotiate on this plan. If our demand had not been met at the end of a time period we would move to the next. At all costs we would have to see it through to the bitter end, unrelenting, and always explaining to the nation that this was in their benefit.

This letter may well be out of date when it reaches you, but I am willing to stake my reputation as a tipster that if this really is a breach of faith, then, because our Government are honourable men, they would give way somewhere around the introduction of the second time period. If there is no breach of faith, then we have no right to even start along this path.—I am, etc.,

Chicago, U.S.A.

RICHARD G. DUNNING.

SIR,—The Minister of Health has now finally rejected the Spens recommendation and our claim for reasonable adjustment of remuneration, and as the costs of running practices are steadily rising the profession has no alternative to pressing their claim in no uncertain manner and with no more procrastination.

The Minister has prolonged negotiations with the Negotiating Committee by the age-old method of dangling a carrot before a donkey, and assuming that the medical profession was too proud and too disunited to take any drastic action. Perhaps he thought the medical profession sufficiently softened up and ready for the kill? The promise of a Royal Commission is simply a follow-up of the delay tactics which have really only been political trickery. By all means let us have a Royal Commission to get the future on a firm basis, but in the meantime an increase in remuneration for the middle and lower lists must be granted, for while Nero fiddles Rome burns. The standard of living of doctors with the middle and lower panels is rapidly going down, causing increasing financial worries, inability to afford reasonable holidays, and social anxieties and inability to educate their families to the standard of previous generations of medical men; these factors must lower the standard of general practice and of the efficiency of the Health Service.

As mass resignation from the Service involves the payment of compensation and loss of pension rights—although if the Government were so minded these matters could be held over until agreement had been reached and our resignations rescinded—perhaps the quickest and best action would be a token strike involving refusal of all certificates, except death, cremation, and certificates required for emigration. It should be made quite clear to the people that this action was made necessary by the unreasonable attitude of the Government. The action should be taken with the least possible delay, and I would suggest that April 1 be zero hour. As an interim measure by the profession to give immediate relief to the lower-income groups, I would suggest that the present loading of 500 to 1,500 be given to the first 1,000 with effect from April 1, 1957.

If adequate remuneration was given immediately and permanently to all groups of the profession, the ethics and standard of medicine would improve. If we do not succeed in our efforts now the decline and fall of the general practitioner will be well and truly launched.—I am, etc.,

Wetherby, Yorks.

S. T. PYBUS.

SIR,—After attending the local meeting of the British Medical Guild we, as young practitioners, are worried about the way in which the coming crisis in the National Health Service is being handled. It seems to us that the important points are: that the Spens Reports are repudiated by the Government; that there is no method of legally forcing the Minister to abide by his agreement; and that the official B.M.A. or Guild policy seems to be that, if a large number of doctors threaten to resign from the Service, then the Government will agree to our claims and resignation will not be necessary, and that this process can be repeated every few

years. We think that this policy cannot succeed, and that the Minister has already decided to await our attempts at resignation.

It should be explained to the public that all we are asking is for the Minister to be made to keep his promises and that we want independent arbitration. We think that some sort of health insurance plan is to-day essential, and that, apart from a small section of the community, private practice is, for several reasons, now finished. As we cannot possibly in future trust any Minister's verbal promises, any doctor in the early or middle years of his career cannot hope for a reasonable future in a health scheme controlled by the Government. Therefore our only possible step is first to set up a nation-wide health insurance scheme, and after that resign from the present health scheme on the grounds that the Minister will not go to arbitration.

No doubt an alternative scheme could be made ready in a year from now. There are about 20,000 G.P.s—£10 from each one would produce £200,000, and this sum, or double if necessary, would surely provide a team of accountants, statisticians, insurance experts, etc., with enough funds to bring into effect by next January a complete scheme, preferably based on capitation payment. Possibly, just as we are about to change over to our own scheme, the Minister would offer various compromises; but the only offer we should even consider would be a legally binding contract based on the Spens Reports.

We suggest that further discussion with the Minister is useless, except, perhaps, to make the point that we think he ought to go to arbitration, but threats of resignation asking for more money do not frighten the Minister, but do antagonize the public. We ask all who are interested in a plan of this type to press for a further meeting of the British Medical Guild by contacting their colleagues locally and by writing to the B.M.A.—We are, etc.,

A. J. CLARKE.

E. G. McCLEAN.

M. J. EVERTON.

J. S. NELSON.

B. KENDRICK.

N. E. STEBBINGS.

Nottingham.

Resignation

SIR,—Two points should be considered in the event of a mass resignation of general practitioners from the National Health Service. On resignation each general practitioner who is owed his compensation money will be entitled to it. As he only gets 2½% interest, and interest rates are now about double that, it will be of great advantage to him, and each of the recipients might be willing to loan part of it to the Medical Guild. It will cost the Government about £50 million, but this cannot be helped. The other point which is not mentioned enough—and should be point one in any settlement—is no victimization. Every general practitioner who has resigned must have the right, if he wishes, to be admitted to the National Health Service in his own practice again, as he was before. This is absolutely essential and unnegotiable.

I think certificates should be given as now so that the patient does not lose. I think a fee should be charged for each service and a receipt given to the patient. Until normal service is resumed the Ministry of Health will save millions in fees, and may perhaps repay patients. Attendances will be confined to the necessary ones, and there are few who cannot afford a fee. Those who cannot will be treated as they used to be—free. Prescriptions can be issued on E.C.10 with "Executive Council" crossed out, and the problem of paying for them resolved between the patient whom it concerns and the Ministry.—I am, etc.,

J. RICHARDSON.

Colwall.

Item-of-service Payment

SIR,—Now that we are to have a Royal Commission, let us hope that it will blow a breath of common sense into our affairs. Could any system of payment be more utterly absurd than the present, which rewards more work with less pay? Under the capitation system I lose money every time my telephone rings. Is it to be wondered at that most of us answer the night telephone these days with a snarl?

Not only have we to suffer the discomfort and inconvenience of getting out of bed, but we actually have to pay for the privilege, and the further away the patient lives the more it costs us. Small wonder that so many of us are punished for not giving adequate attention to patients, when in fact the system actively encourages this very thing.

When the capitation system was introduced, it covered only a minority of patients. Most were still private; busy times meant more pay, not less; and we were free to make our own adjustments to the cost of living, to our patients' circumstances, and other relevant factors. In my opinion the capitation system is outmoded. It was workable when applied to a minority, but it was never meant to cover the whole population, and in making it do so we are accentuating its disadvantages, with a result which is impractical to say the least. For goodness' sake let us have payment per item of service. The telephone will then be a merry tinkle, night calls almost a pleasure, and we shall hear no more of these miserable fines for inadequate attendance which so degrade us to-day.—I am, etc.,

E. Grinstead, Sussex.

E. J. DENNISON.

Senior Registrars and Consultant Appointments

SIR,—After reading the report of the Central Consultants and Specialists Committee submitted to the Council on December 19, 1956 (*Supplement*, January 5, p. 1), I was disturbed that so little consideration was given to the question of hospital staffing, particularly the position of the senior registrars. It was evident by the remarks of Mr. E. A. Gerrard, Dr. J. G. M. Hamilton, and Mr. Dickson Wright that the Council was very uneasy about the whole situation and is looking for a lead from the Chairman of the Central Consultants and Specialists Committee. I know from experience that this Committee has always a very full agenda and often a long time is spent on trivial problems. Surely it should concentrate on really important issues.

The hospital service has come to stay, and one cannot deny that since the appointed day it has been vastly improved. Many doctors decide that they would like to make hospital work their career. They obtain a house appointment, and at the same time study for a higher diploma. They may hold an appointment of S.H.O. for one year, then become a registrar for two. The best of these obtain posts as senior registrars. Many of them have now occupied this position for four years or more and have contributed in no small way to the hospital service. What is to happen to these men? It would appear that there are not enough consultant posts to absorb them. In certain specialties not only have they acquired a knowledge of their subject but also considerable technical skill. If these appointments are to be terminated, what a loss it would be, and, indeed, after having been trained to such a high degree, they would have no alternative means of employment except in the hospital field.

It is obvious from the information which I have that many boards consider that the problem has become chronic and the retention of these senior registrars after four years is blocking the promotion ladder, and they are contemplating terminating their appointments. Surely the Central Consultants and Specialists Committee should view this with deep apprehension. It alone can give a lead to the Ministry, which I am sure is deeply concerned about the problem. A simple solution would be to absorb these senior registrars of four years or more as assistant consultants (the terms and conditions to be a subject of negotiation), and at the same time the intake of senior registrars in certain specialties should be reduced for a period of years.

I hope the Central Consultants and Specialists Committee will give its earnest attention to this pressing problem. Its remit, I would suggest, should not be confined to senior registrars alone, but should include the pattern of hospital staffing for the future. The B.M.A. is a powerful body, and if it were to give a constructive and unbiased opinion I am sure it would be treated with respect by the Ministry.—I am, etc.,

Manchester, 13.

R. L. NEWELL.

BRITISH MEDICAL GUILD

BOURNEMOUTH DIVISION

At a meeting of the profession in the area the following resolution was passed unanimously: "That this meeting of the medical profession in the Bournemouth, East Dorset, and West Hants area approves and supports the action of the Negotiating Committee to obtain adjustment of the remuneration of the profession under the terms of the Spens Committee's recommendations."

ISLE OF ELY DIVISION

At a recent meeting arranged by the Division, to which all medical practitioners in the area were invited, the following resolution was passed: "That this meeting fully approves and endorses the present claim for increased remuneration for all medical practitioners engaged in the National Health Service."

WEMBLEY DIVISION

A meeting was held at the Century Hotel on February 5. Sixty medical practitioners from the area attended. The following resolution was carried unanimously: "That this meeting is unanimous in pledging its support of the Negotiating Committee and hopes that it will have strengthened that Committee's hand in taking a strong line with the Minister."

Meetings to be Held

BIRMINGHAM.—At Birmingham Medical Institute Library, 154, Great Charles Street, Thursday, March 7, 8.30 p.m.
CHELSEA AND FULHAM.—At Fulham Town Hall, London, S.W., Friday, March 8, 8.30 p.m.
ENFIELD AND POTTERS BAR (ENFIELD EAST GROUP).—At 2, Crescent Road, Enfield, Middlesex, Monday, March 4, 9 p.m.
ENFIELD AND POTTERS BAR (ENFIELD WEST GROUP).—At Chertton, 14, The Ridgeway, Enfield, Sunday, March 3, 8 p.m.
EXETER.—At Library, Royal Devon and Exeter Hospital, Thursday, March 7, 8.30 p.m.
RICHMOND.—At Recreation Hall, Royal Hospital, Richmond, Sunday, March 3, 11 a.m.

Association Notices

Diary of Central Meetings

MARCH

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| 4 Mon. | Alternative Edition Subcommittee, Joint Formulary Committee, 11 a.m. |
| 5 Tues. | Editorial Subcommittee, Joint Formulary Committee, 11 a.m. |
| 5 Tues. | Estate Committee, 11 a.m. |
| 5 Tues. | Financial Advisory Committee, 2 p.m. |
| 6 Wed. | Training Subcommittee, Occupational Health Committee, 10 a.m. |
| 7 Thurs. | Ingleby Evidence Committee, 11.30 a.m. |
| 7 Thurs. | Compensation and Superannuation Committee, 2 p.m. |
| 7 Thurs. | Journal Committee, 2 p.m. |
| 7 Thurs. | Charities Committee, 2.30 p.m. |
| 8 Fri. | Full-time Non-Professorial Medical Teachers and Research Workers Group Committee, 2 p.m. |
| 8 Fri. | Overseas Committee, 2 p.m. |
| 12 Tues. | Amending Acts Committee, 2 p.m. |
| 12 Tues. | Finance Committee, 2 p.m. |
| 14 Thurs. | Ethical Review Subcommittee, Central Ethical Committee, 10.30 a.m. |
| 14 Thurs. | International Relations Committee, 2 p.m. |
| 14 Thurs. | Organization Committee, 2 p.m. |
| 15 Fri. | Ophthalmic Group Committee, 10 a.m. |
| 15 Fri. | Library Subcommittee, Science Committee, 11.30 a.m. |
| 20 Wed. | Committee on Medical Education, 2 p.m. |
| 21 Thurs. | G.M.S. Committee, 10.30 a.m. |

Branch and Division Meetings to be Held

BARNET DIVISION.—At Middlesex Arms Hotel, Barnet By-pass, Saturday, March 9, 8 for 8.30 p.m., meeting. Short talk by Dr. Walter Hedgcock (Assistant Secretary, B.M.A.): "Recent Events." Members' ladies are invited.
BOLTON DIVISION.—At Bolton Royal Infirmary, Tuesday, March 5, 8.30 p.m., meeting in conjunction with Bolton Medical Society. B.M.A. Lecture by Dr. R. A. J. Asher: "Face Values."
BOURNEMOUTH DIVISION.—At St. Ann's Hospital, Canford Cliffs, Bournemouth, Monday, March 4, 5 p.m., psychiatric clinical meeting.
BRIGHTON AND MID-SUSSEX DIVISION.—At Hotel Metropole, Brighton, Friday, March 8, 7.30 for 8 p.m., B.M.A. annual dinner.
BROMLEY DIVISION.—At Nurses' Recreation Room, Beckenham Hospital, Wednesday, March 6, 8.15 p.m., meeting. Address and discussion introduced by Dr. R. I. S. Bayliss: "Cortisone in General Practice."

CHESTERFIELD DIVISION.—At Walton Sanatorium, Friday, March 8, 8.45 p.m., meeting. Lecture by Mr. E. A. Nicoll: "The Knee Joint."

GLASGOW DIVISION.—At Hall of Royal Faculty of Physicians and Surgeons of Glasgow, 242, St. Vincent Street, Glasgow. Thursday, March 7, 8.30 p.m., meeting. Address by Dr. A. F. Maclean: "Medical Hypnosis."

HALIFAX DIVISION.—At Board Room, Royal Halifax Infirmary. Wednesday, March 6, 8.30 p.m., meeting. B.M.A. Lecture by Professor J. M. Webster: "History of Forensic Science in Britain."

HARROW DIVISION.—At the Rest Hotel, Kenton Road, Kenton. Tuesday, March 5, 8.30 p.m., clinical meeting. Dr. Donald Hunter: "Diagnosis and Treatment of the Anaemias, including Industrial Hazards." Members of Wembley and Hendon Divisions are invited.

HARTLEPOOL DIVISION.—At Staincliffe Hotel, Seaton Carew. Wednesday, March 6, 8.30 p.m., meeting. Lecture by Dr. M. H. Armstrong Davison: "The Maladies of Mary Queen of Scots and Her Husbands."

HASTINGS DIVISION.—At Royal East Sussex Hospital, Tuesday, March 5, 8.15 p.m. B.M.A. Lecture by Mr. A. Dickson Wright: "Vascular Disorders of the Extremities."

HOLLAND DIVISION.—At White Hart Hotel, Spalding, Friday, March 1, 7.30 for 8 p.m., supper; 9 p.m., address by Dr. Robert Forbes: "Medico-Legal Problems in Practice."

LEWISHAM DIVISION.—At Langley Rooms, the Green Man, Bromley Road, S.E., Thursday, March 7, 7.15 for 7.45 p.m., dinner dance. Members may invite two non-medical guests besides their wives/husbands and four other medical guests and their wives/husbands.

READING DIVISION.—At Large Chemistry Lecture Theatre, Reading University, Tuesday, March 5, 8.30 p.m., meeting. B.M.A. Lecture by Dr. W. R. S. Doll: "Cause of Lung Cancer."

ROCHESTER, CHATHAM, AND GILLINGHAM DIVISION.—At St. Bartholomew's Hospital, Rochester, Thursday, March 7, 8.30 p.m., meeting. Lecture by Dr. F. E. Camps: "The Emmett-Dunne Case." All medical practitioners in the area of the Division are invited.

SOUTH ESSEX DIVISION.—Thursday, March 7, visit to May and Baker, Dagenham. 2.30 p.m., meet at factory; 5 p.m., leave by coach for London; 6 for 6.30 p.m., dinner at Charing Cross Hotel; 8.30 p.m., Wyndham's Theatre; 10.45 p.m., return by coach to Dagenham.

SOUTHPORT DIVISION.—At the Prince of Wales Hotel, Southport, Friday, March 8, 8.30 p.m., meeting. Lecture by Dr. P. C. P. Cloake: "Mental Symptoms in Organic Cerebral Disease." Open to members of the medical profession.

SOUTH WALES AND MONMOUTHSHIRE BRANCH.—At Morriston Hospital, Swansea, Thursday, March 7, 3 p.m., joint clinical meeting with Swansea Division. Cases on view from 2.30 p.m.

SOUTH-WEST ESSEX DIVISION.—At Langthorne Hospital, Leytonstone, E., Wednesday, March 6, 8.30 p.m., meeting. Mr. W. D. Coltart and Dr. J. H. Cyriax: "To Manipulate or Not to Manipulate." Questions and a discussion will follow.

STIRLING BRANCH.—At Falkirk Royal Infirmary, Wednesday, March 6, 8.30 p.m., clinical meeting. Lecture by Dr. R. G. Somerville: "Polio-myelitis and Polio-myelitis Vaccination, the Present Position."

SWINDON DIVISION.—At Goddard Arms Hotel, Swindon, Thursday, March 7, 8.30 p.m., annual dinner meeting. Chief guest, Dr. Katherine Williams.

WEST MIDDLESEX DIVISION.—At Acton Technical College, High Street, Acton, W., Tuesday, March 5, 8 p.m., conjoint meeting with B.D.A. (Middlesex and Hertfordshire Branch): Acton, Ealing, and Chiswick Section). Programme of sound films: "General Anaesthesia in the Dental Chair." Dr. T. H. S. Burns will answer questions in the discussion to follow.

Meetings of Branches and Divisions

CITY DIVISION

The inaugural meeting of the 1956-7 session was held in the Old Library, B.M.A. House, on October 16, 1956. Over 100 members and their guests were present. Dr. Keith Simpson gave the B.M.A. lecture on "It Looks Like Crime."

DUNDEE BRANCH

The annual B.M.A. lecture was held in the Queen's Hotel on November 30, 1956. Mr. A. Buchan, vice-president, was in the chair and 86 members, guests, and friends attended, including representatives of the legal profession and the police. Dr. F. E. Camps spoke on "Dumb Evidence: The Interpretation of Injuries Due to Road Accidents." Dr. J. Scott Innes, Mr. J. R. S. Paterson, and Dr. A. A. B. Scott took part in subsequent discussion. A collection was taken for the Hungarian Relief Fund.

HOLLAND DIVISION

A meeting was held in the White Hart Hotel, Boston, on November 24, 1956. Thirty-five members attended. After dinner Dr. W. A. S. Falla gave an address on "Changes in Psychiatry in the Last 20 Years." It was arranged that the local medical profession should make an immediate donation of 50 guineas to the Mayor of Boston's Hungarian Relief Fund.

SUPPLEMENT TO THE
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British Medical Association

PROCEEDINGS OF COUNCIL

REMUNERATION CLAIM

A special meeting of the Council of the Association was held on February 28 to consider the situation resulting from the decision to set up a Royal Commission on medical and dental remuneration.

Dr. S. WAND was in the chair, and there was an almost full attendance of Council members.

Meeting with Minister

The CHAIRMAN said that when the delegation from the Negotiating Committee met the Minister of Health on February 20 it was confronted with a statement from Mr. Vosper that the Government proposed to set up a Royal Commission, and that it would be prepared to instruct the Management Side of Whitley Committee B to negotiate a settlement for junior hospital medical staff up to senior registrar. The Government's proposal, which was decided on without any discussion at all, caused extreme anger on the part of all members of the delegation. Mr. Vosper made it clear that there was no obligation on the Government to accept the findings of the Royal Commission, or to implement them if it did, if the economic state of the country was as it is now. He did admit later that there was justice in an increase for the doctors.

Dr. Wand said that he had expressed the feelings of the delegation to the Minister in such a way as to leave him in no doubt about them. The G.M.S. Committee and the Public Health Committee had passed certain resolutions, which had already been published (see *Supplement*, March 2, pp. 97 and 100), and at its meeting that day the Joint Consultants Committee had passed a resolution advising those it represented to support the general practitioners in every possible way. In the event of the general practitioners being compelled to withdraw from the National Health Service the Joint Consultants Committee would advise its constituents fully to support this withdrawal by refusing to permit the hospital and specialist services to be used in any way as a substitute for the family doctor service. The Committee had also agreed to recommend to the Negotiating Committee that the Government's proposal immediately to increase the remuneration of junior hospital medical staff should be accepted (see page 109).

Dr. Wand pointed out that there were two issues: the immediate claim, and the purpose for which the Royal Commission was set up. At some stage it might be neces-

sary to separate the two issues or bring them together. Either course would be quite proper, and it was for the Council to decide which to adopt. Later in the meeting Council would probably wish to pass resolutions; in the meantime, however, the meeting was open to free discussion.

Dr. J. G. M. HAMILTON asked if it was true that the Government would be announcing the terms of reference of the Royal Commission that afternoon; if so, would it be possible to send a telegram to the Prime Minister if thought advisable?

The CHAIRMAN said that Dr. Talbot Rogers would deal with that question.

Question and Answer

Dr. A. TALBOT ROGERS, Joint Chairman of the Negotiating Committee, said that after the meeting with the Minister there was a meeting of the Negotiating Committee at which it was agreed that there was a need for consolidation between the different sections of the profession in the future. The next day the General Medical Services Committee met, and spent the whole day discussing the matter. It agreed unanimously to call an emergency Conference of Local Medical Committees at the earliest possible date, and to recommend that unless the Government agreed to an immediate and satisfactory settlement of the profession's claim or to arbitration general practitioners throughout the country should be advised to send in their resignations from the Service. It was added that an alternative scheme for the organization of general practice would be issued at the appropriate time. Dr. Rogers was confident that it would meet with the approval of the G.M.S. Committee, of the Council, and of the practitioners.

As would be known, Sir Russell Brain and he had sent a letter to the Prime Minister, and a reply had been received stating that the Royal Commission would work as fast as a Royal Commission could, and that the setting up of the Royal Commission would not preclude an interim adjustment.

A further meeting between the Minister and Sir Russell Brain and himself took place that morning. The Minister did not know the terms of reference of the Commission, nor did he know anything about its composition. It was understood the terms of reference were to be announced that afternoon in the House of Commons.

At the interview, said Dr. Rogers, Sir Russell and he tried to obtain some information on what was meant by

the phrase of the Prime Minister "that the work of the Royal Commission would not preclude some interim adjustment." First, the Minister assured them that in his view there was no constitutional objection to negotiation or discussion on a matter already referred to a Royal Commission while the Commission was sitting, and that he himself would not advance any argument that such discussion could not take place.

Next, if there was to be an interim adjustment, there were, Dr. Rogers told the Minister, four main ways in which it could be agreed upon in the present circumstances, and he asked him to indicate which might be chosen. First, the Government might make an offer of so much money as an interim settlement; secondly, there might be negotiations with the officers of the Ministry about the right and proper sum to be allocated; thirdly, it might be put to arbitration, either to a single arbitrator to be agreed or to a court of arbitration; and fourthly, it might be dealt with by the Royal Commission as a matter of first priority before going on to consider future methods.

The Minister listened with patience, and said that in his view the Government did not look favourably on arbitration, that there were difficulties for both sides in referring it to the Royal Commission, and that it was probable the method would be by negotiation with the Ministry itself. The Minister, in his first words, had pointed out the difference which had been detected in the Prime Minister's letter, in which two adjectives were used, one an "interim" adjustment for the whole profession, and the other an "immediate" adjustment for junior hospital medical staff. He said it meant that it was felt there were good reasons for looking straight away at the question of junior hospital staff, but there was no such urgency with regard to the whole of the interim settlement, and it seemed unlikely that conversations about an interim adjustment could begin before the end of April.

It was pointed out to the Minister that the General Medical Services Committee had pledged itself to call a special Conference of Local Medical Committees which was likely to take place in April, and that nothing had happened to justify alteration of this plan. Dr. Rogers thought the Minister was left with the idea that if the Government wished to suggest to the Conference that they were in earnest about an early interim adjustment there should be a definite date fixed for conversations to commence within a very short time of the calling of the Conference. The Minister said he did not wish to commit the Government, because it would depend upon the economic situation at that time, and he did not wish to suggest an adjustment which it would not be possible to carry out. He felt that there were certain trends which would be more clear by that time.

The Minister was also pressed to indicate whether these negotiations would be separate negotiations as they had always been in the past—that is, between general practitioners and the officers of the Ministry on the one side, and the consultants and Whitley on the other. He, Dr. Rogers, had pointed out that for the last year the profession had come together and would wish to put their case together. The Minister replied that it could be dealt with as one claim, and if it was decided that a percentage increase should be given in order to meet this interim adjustment it could be negotiated for both sides of the profession.

On the question of whether the Royal Commission could make retrospective awards, the Minister said that it was open to the Commission to make recommendations. Dr. Rogers had gained the impression that the delay which had occurred since the claim was first made last year would not be counted against the profession.

The last question was whether, in view of the difference of opinion about the validity of the Spens and Danckwerts findings, the Royal Commission would be able to receive arguments based upon the profession's interpretation of Spens. The Minister replied that they would be able to put this forward, and the Royal Commission would hear their views and it would be part of the duty of the

Commission to decide the right and proper way to interpret it.

His own feeling, continued Dr. Talbot Rogers, was that the decision of the General Medical Services Committee, which was undivided in its view that the matter should be put to the Conference and that the Conference should be asked for the strongest possible action, still stood. The situation had to some extent changed since the meeting of the Committee. He knew that the Committee would wish to discuss these developments, but until the terms of reference were known it would not be decided whether the Committee should be called in advance of its regular meeting. He assured the Council that the work of the Committee in preparation for resistance to the Government was going on without any let-up; at the moment judgment was reserved, "but we are keeping our powder dry."

Dr. W. WOOLLEY asked if the findings of the Commission would be mandatory, to which the CHAIRMAN replied that no part of the Royal Commission would be mandatory.

Greatest Crisis

Mr. S. F. LOGAN DAHNE, after congratulating the joint Chairmen on the work they had done, said he was sure the Council would support the Negotiating Committee, the G.M.S. Committee, and the Joint Consultants Committee. This was the greatest crisis the profession had ever had, and he believed that if it did not win this fight the profession would be depressed in status and remuneration to the level of artisans. They must hold firmly to the unity which they had, they must hold on to their dignity and the fact that theirs was a learned profession, and they must hold on to their courage.

What should be their short-term and long-term strategy? The Guild must be kept fully alert and informed and ready to act; secondly, they must have plans for action in the event of resignation, so long as such plans were Guild action. They must endeavour to put their case to the public and prove to the public and to the Government that it was not merely remuneration they were worried about. A British Medical Association planning commission on improvement of the National Health Service must be set up. The main object must obviously be to get immediate justice, and second to set up a permanent court of arbitration on all aspects of remuneration and terms of service, otherwise this trouble might be recurrent. Endeavours should be made to set about obtaining reasonable and reasoned amendments to the Act to make it a real health service and not, as it was at the moment, a sickness certification servitude. The Health Service must be removed completely from being a plaything of party politics; medicine should never be used for vote-catching. This was one of the things which worried the profession equally with the question of remuneration.

The Prime Minister must be told that temporary adjustments for the junior hospital staff would be accepted without prejudice to their cause, and the Royal Commission would only be accepted provided it could be told how the National Health Service should be organized and run. Finally, direct negotiation with the Minister must be demanded straight away, or an immediate *ad hoc* independent arbitration on the present issue.

Dr. A. V. RUSSELL said that the remuneration issue was the one to keep to the fore; anything else would confuse it. Remuneration was not the only subject which caused discontent, they all knew that. It was a matter of broken pledges; the profession had had enough of broken pledges over the years, and it was coming to the point where they might not be content to serve an employer they could not trust.

Was it sufficient to have a Royal Commission which was not mandatory? The Prime Minister had opened the door a little; he might open it a little more or close it quickly. They should not be content with a Royal Commission; what they must have for a reasonable settlement of the claim was an arbitration whose findings would be binding upon both sides.

It was very important to have the outlines of an adequate alternative service to put before the profession, and he was glad to hear that the framework of something of that kind was being prepared. Dr. Russell thought the next step was to call a Special Representative Meeting and to put before it a very definite recommendation for action.

Dr. A. BARKER said it was difficult to discuss the terms of reference of the Royal Commission before they were known, but the Queen's Commission must be accepted. Evidence must be placed before it on the points to which Mr. Logan Dahne had called attention, and with which all were agreed.

The immediate problem was the problem of remuneration. Dr. Russell had said they should insist on arbitration, but he understood the Minister had ruled out arbitration. Dr. Talbot Rogers had left an impression that there would be direct negotiations between the Government and the Association. He hoped the General Medical Services Committee or the Negotiating Committee or whatever body went forward would be supported in its efforts to secure an interim payment now, and meanwhile evidence to be given to the Royal Commission would be planned which would not only help remuneration but would produce a service worth while.

Dr. H. GUY DAIN said he thought that the terms of reference might be concerned not only with the amount of remuneration but the methods by which it was paid. If the Association gave evidence to the Commission it should be stated that the question of methods was a matter for private argument, agreement, and arrangement between a good employer and a willing servant. It should be made clear that a Royal Commission was regarded as an improper body for arranging terms of service or remuneration. That was fundamental.

As far as an interim adjustment was concerned, this should be argued with Ministers of the Crown, not with officials of the Ministry. He was entirely opposed to discussion at that level. Discussion was now at the Prime Minister's level and it should remain there.

Dr. F. M. ROSE said they could not anticipate their participation in the work of the Royal Commission until the terms of reference and personnel were known. Did Dr. Talbot Rogers obtain from the Minister any undertaking about the other part of Spens, the allowances for private practice, the increase in the pool on the number of new doctors coming in, and other factors?

Dr. TALBOT ROGERS replied that the Minister was asked whether the Royal Commission was intended to look at the distribution of money, and the reply was that the matter of distribution would be discussed with the Minister's officers as before; he gathered that it was mainly a question of deciding the global amount to be paid to general practitioners which the Royal Commission was concerned. It seemed that it was believed that even after the Royal Commission had reported there would still be discussions between the Ministry officials and themselves on the right and proper way of distributing the pool each year. He felt that once the Royal Commission had reported the Government would come forward with some entirely different method of calculating the pool.

The CHAIRMAN said that until the terms of reference, which might be available some time during the afternoon, were announced it would be better to confine comments to the appointment of a Royal Commission rather than on the terms of reference.

No Immediate Settlement

Dr. IAN D. GRANT, Chairman of the Representative Body, said he hoped Dr. Talbot Rogers would be invited to ask the Prime Minister for a categorical reply to the question whether he was willing to give an interim adjustment in remuneration forthwith. He saw no justification for the Minister's statement that negotiations on this matter could not be opened immediately, and the Prime Minister should

be informed that the Council wished this adjustment to be made forthwith.

It was absolutely vital that if constituents were to be asked to send in their resignations the nature of the alternative service should be available at the earliest possible moment. It was no use having meetings until constituents could be told what was proposed and invited to comment upon it.

Dr. TALBOT ROGERS said that it was likely that the answer to a demand for immediate negotiations would be that the Government would not make any offer until May. That seemed quite definite from the way the Minister spoke. The Prime Minister had intimated the possibility of an interim adjustment, and Mr. Vosper had stressed that this meant an interim and not an immediate settlement, intimating that the Government was not in a position to offer an immediate settlement except for the small section of junior hospital staff. He did not think the economic situation on which all the Government's arguments were based had altered or was likely to alter in the next ten days, and he thought the suggestion that something might be done after the end of April was the best which could be got. They should continue to be ready to take advantage of this. The Negotiating Committee was meeting again to consider this new situation. He did not think an offer from the Government should be asked for; it should be done by negotiation. The Government did not favour arbitration. Ever since Danckwerts the idea of a single arbitrator had been anathema to the Ministry. The Ministry was seized of the importance of not wasting time.

Dr. GRANT asked if the offer of an interim adjustment could be obtained in writing from the Prime Minister.

Dr. E. A. GREGG said that he had great sympathy with the words of Dr. Dain and Dr. Grant, and it was undoubtedly a hopeful element that the Prime Minister should have written as he did. He would plead that any alternative form of service in the event of resignation should be made as simple as possible. The Council and profession must take the advice of those who had been in contact with the Minister of Health and the Prime Minister. The profession had never before been face to face with the Prime Minister, and that was a great improvement in their position.

Dr. WOOLLEY referred in appreciative terms to the support given by the Public Health Committee to the claim. The Royal Commission must be accepted, and evidence would have to be given by the Association. He had not heard anything which would seem to justify the watering down of the report of the General Medical Services Committee and the action recommended. He hoped the Council would support the Committee and concentrate on that for the rest of the afternoon.

Dr. J. A. PRIDHAM said he thought the profession realized that it was now or never. It was not just a question of money; it was a question of faith, confidence, and broken pledges. He believed the profession was as angry and as united as it had ever been. In all his experience he had never known the press and the public so behind the profession, and unless they stood and fought they would lose the respect of the country. They must continue with their preparations. There was plenty of time for the Government to make some offer more concrete than at the moment.

Dr. R. HALE-WHITE said he was perfectly certain that it was the firm attitude which had been taken by the profession which had brought about the slight improvement and which had brought them into direct contact with the Prime Minister. He was sorry that Dr. Talbot Rogers did not feel that he could for the time being press ahead with that contact. He also thought that preparations for action should proceed without delay. He would ask Dr. Talbot Rogers one question. He gathered that if resignation from the Service was eventually advised, all else having broken down, it would be timed in such a way that it would be most favourable for people to get compensation. The Government having completely ignored one contract, was it certain that they could not go back on the matter of compensation?

Dr. TALBOT ROGERS said that Dr. Macrae had put the question of compensation to the Minister at the first interview. The Act said quite distinctly that a doctor now in the Service would receive compensation when his resignation became effective. The Minister stated that he did not contemplate promoting any other legislation in order to make it possible for him not to deal with compensation. Dr. Rogers said that if the Council felt he should ask the Prime Minister for an assurance in writing with regard to an interim adjustment he would suggest that the Negotiating Committee should be asked to consider whether a further letter should be sent to the Prime Minister by Sir Russell Brain and himself.

G.M.S. Committee Decisions Supported

The CHAIRMAN said he gathered from the debate that the action of the G.M.S. Committee in making recommendations for refusal of service in certain events had the approval of Council. ("Yes.") Did Council approve the proposals that the preparations for refusal of service should be continued? ("Yes.")

The Chairman then asked whether the Council wished to discuss what action it would take in relation to the appointment of the Royal Commission, and whether it wished to discuss the question of giving evidence to the Royal Commission. He would remind the Council that, as the Government need not approve the Royal Commission's findings, nor need the profession approve the findings.

Dr. I. M. JONES said that the Council had not yet discussed the appropriateness of referring a claim of this nature to a Royal Commission. They could not object to the Queen setting up a Royal Commission, but they could legitimately object to that Royal Commission being used for this purpose. Such a method would not be accepted in industry or any other walk of life, and he hoped nothing had been said on the profession's side which implied acceptance of a major issue being referred to a Royal Commission. He thought Dr. Grant's suggestion about a letter going to the Prime Minister was eminently sound, and in that letter it should be made clear that the intended use of a Royal Commission was not accepted and that arbitration was insisted upon. Once a Royal Commission was accepted Spens and Danckwerts would be gone.

The CHAIRMAN read a letter received from Sir William Douglas in June, 1950, which stated that the Ministry agreed that the Spens Report remained the basis of remuneration of general practitioners until such time as, after consultation, some other basis was found.

Dr. J. G. M. HAMILTON asked what would be the position with regard to superannuation if general medical practitioners withdrew from the Service.

The CHAIRMAN said that if there was a break in a doctor's service, and he did not ask for a return of his superannuation contributions and he returned to employment within 12 months, his rights were secure and he continued from where he left off.

Dr. HAMILTON asked if it was possible for an expression of the Council's views on the terms of reference to be sent to the Prime Minister.

The CHAIRMAN replied that at its interview with the Minister the deputation was told categorically that it was not in a position to discuss terms of reference of the Royal Commission or to influence them.

Dr. HAMILTON expressed disagreement with speakers who had said that it was not appropriate to discuss action in relation to the Royal Commission and that the Council should confine itself to immediate action. The Royal Commission offered a notable opportunity for looking at the Health Service as a whole. Even if, as it seemed likely, its terms of reference would be restricted to the remuneration question, the Royal Commission would be prepared, presumably, to accept evidence from the Association, and that would be an opportunity it would be criminal to neglect. If it turned out to be quite inappropriate to give evidence on widely based terms of reference he hoped the Council

would decide to set up a broadly based planning commission which would look at the fundamentals of the Service and not merely at the remuneration problem.

Dr. F. GRAY said that it was obvious that all decisions could not be taken that afternoon and there was much which must be left over. Council had agreed to support the action of the G.M.S. Committee, and flowing from that decision there were certain others. The Government had two main objects in view; one was to postpone for three years or more the settlement of the claim, and the other was to get rid of Spens and Danckwerts. With regard to the claim the Royal Commission was irrelevant. The G.M.S. Committee decision did not in any way depend on what the Royal Commission did, what its terms of reference were, or who were the people appointed to it.

The other question was what reply went to the Prime Minister. He submitted they had given the best possible reply by saying that they supported the G.M.S. Committee. As a member of the Negotiating Committee he had been struck by the fact that slight progress on two occasions had been made after definite action had been taken—in December after the Council decided to put the Guild machinery into action, and again after the G.M.S. Committee had made its decisions last week. The only thing which had impressed the Government was the strength of the profession. They had to fight now or sink, and whatever reply was made to the Prime Minister it must make clear that the fight would be continued until it was won.

Dr. A. BEAUCHAMP said that perhaps it would be possible for Sir Russell Brain and Dr. Talbot Rogers to see the Prime Minister and ask him what he meant and get an agreed statement from him.

Dr. H. H. D. SUTHERLAND supported the suggestion.

Terms of Reference

The CHAIRMAN then read the terms of reference of the Royal Commission which had just been received.

To consider:

- (1) how the levels of professional remuneration from all sources now received by doctors and dentists taking any part in the National Health Service compare with the remuneration received by members of other professions, by other members of the medical and dental professions, and by people engaged in connected occupations;
- (2) what, in the light of the foregoing, should be the proper current levels of remuneration of such doctors and dentists by the National Health Service;
- (3) whether, and if so what, arrangements should be made to keep that remuneration under review, and to make recommendations.

The CHAIRMAN said that the terms of reference were so vague and carried so many dangers that more information was needed before the Council could determine its attitude towards them. They seemed to contain inherent dangers for the profession's future, and seriously to endanger the conditions on which it came into the Service and the status of the whole profession in the future. He felt that the Royal Commission should not be welcomed at this stage, but that answers to some questions should be sought.

Dr. Wand thought that if they adhered strictly to the claim, and deferred judgment on the Royal Commission, the two things could be quite safely separated.

Dr. A. BEAUCHAMP stressed that having seen the terms of reference it was important that representatives should interview the Prime Minister on questions on which there was doubt—first of all on the interim settlement, and secondly on the meaning of the terms of reference—and get an agreed statement.

Council's Resolutions

The Council proceeded to adopt the following resolutions.

- (1) The Council fully supports the decision of its General Medical Services Committee to convene a special conference of representatives of local medical committees and to recommend to that Conference that, unless the Government agrees to an immediate and satisfactory settlement of the

profession's claim or to arbitration, general practitioners throughout the country will be advised to send in their resignations from the Service.

(2) The Council has heard a report of the interpretation by the Minister of Health of the Prime Minister's statement that the possibility of interim adjustment was not precluded. On the evidence before it, the Council can see no fundamental change in the situation which would justify any alteration in the course of action recommended by its General Medical Services Committee.

(3) The Council has noted the statement made by the Prime Minister in Parliament that he is prepared to clarify his statement at the appropriate moment. The Council believes that the present is the appropriate time and is inviting the Negotiating Committee to approach the Prime Minister for immediate clarification.

(4) The Council has noted with great satisfaction the assurances of support given by the Public Health Committee of the Association, representing medical officers in the public health service, and the Joint Consultants Committee, representing hospital medical staffs.

(5) The Council resolves that the convening of a Special Representative Meeting be requisitioned at an appropriate time to consider a report and a recommendation of the Council concerning the further action to be taken by the Association in the present dispute with the Government on medical remuneration.

In addition the Chairman of Council and the Secretary were asked, with the assistance of legal advisers, to seek clarification of the terms of reference of the Royal Commission.

BRITISH MEDICAL GUILD

A meeting of the Trustees of the British Medical Guild was held immediately following the meeting of the Council of the British Medical Association on February 28, with Dr. S. WAND in the chair.

It was reported that Guild machinery had been set up, and honorary officers appointed in most areas in England and Wales, Scotland, and Northern Ireland.

A recommendation was accepted from the General Medical Services Committee asking that all possible steps be taken to ensure that no area in this country was without an effective local unit of the British Medical Guild, and a report was received of the discussions which had taken place in the Council meeting preceding the meeting. It was agreed that appropriate action should be taken with a view to completing the setting up of the Guild machinery as quickly as possible.

Expenditure up to date was noted, and the Trustees expressed their gratification at the financial support afforded by the General Medical Services, Hospital Medical Staffs, and Public Health Service Defence Trusts.

THE HYPOCRITIC OATH

Let's appoint a Royal Commission,
A sort of super Inquisition,
A splendid democratic wheeze
And emphasize the credit squeeze.
We'll make those doctors toe the line
And give them our own medicine.
We'll get our (radio) Dr. Hill
To administer and gild the pill,
And show that under Mr. Vosper
Their practices might thrive and prosper.
If we judiciously procrastinate
They can cool their heels till '58.
Thus, by tactics rather questionable,
Enough will soon be pensionable
And we'll have no moral obligation
To that awkward generation.

Envoi

Macmillan's are publishing a book next May
On "How to make your patience pay."
"J. B."

JOINT CONSULTANTS COMMITTEE

STATEMENT ON REMUNERATION CLAIM

The Joint Consultants Committee met on February 28 under the chairmanship of Sir Russell Brain to receive a report from the Negotiating Committee on the present state of the remuneration claim. After the meeting the Committee issued the following statement.

"It is unreasonable that the Government should have refused to examine, in association with the doctors, in the light of all circumstances which seem relevant to each side, the merits of their claim to safeguard their standard of living. Such an examination does not necessarily mean that the claim would be agreed either in whole or in part, but it does mean that the Government, by undertaking the examination, would show that spirit of co-operation necessary to maintain trust and confidence inside the National Health Service.

"The public will appreciate that they will obtain the best and the most economical Service, in which the traditions of medicine are fully devoted to the welfare of the sick, if Governments encourage a spirit of true partnership between themselves and medicine.

"We hope that the Prime Minister's statement that he does not rule out an interim adjustment of medical remuneration will lead to an early invitation from the Minister of Health to negotiate this with him.

"The need of hospital patients for continued care and emergency treatment can only be maintained within the Health Service, and this work will not be interrupted. But the Joint Consultants Committee will advise those whom it represents to support the general practitioners in every possible way. In the event of the general practitioners being compelled to withdraw from the National Health Service the Joint Committee will advise its constituents fully to support this withdrawal by refusing to permit the hospital and specialist services to be used in any way as a substitute for the family doctor service.

"The Committee agreed to recommend to the Negotiating Committee that they should accept the Government's offer to propose an immediate increase in the remuneration of junior hospital staffs in the Whitley Committees."

PUBLIC HEALTH COMMITTEE

The Public Health Committee met on February 22 at B.M.A. House, with Dr. JOHN B. TILLEY in the chair.

The Committee offered its congratulations to Dr. H. M. Cohen on his appointment as Commander of the Order of the British Empire in the New Year Honours List.

Remuneration Claim

Dr. J. F. WARIN, one of the Committee's representatives on the Negotiating Committee, reported on the position to date of the remuneration claim by hospital medical staff and general practitioners. The setting up of a Royal Commission had been announced, but at the moment nothing was known of its terms of reference or membership. So far as medical officers of health were concerned, they regarded themselves as doctors, not as public health service employees, and this was the opportunity to align themselves fairly and squarely with their colleagues in the profession.

Dr. H. D. CHALKE said that the situation had to be thought of in two parts—their whole-hearted support for the rest of the profession, and, secondly, the fight to secure the adoption of the principle that the salaries of public health doctors should be regarded as payment to them as doctors and not as local authority employees. They must not give up their idea of an inquiry into public health remuneration. The General Medical Services Committee had passed a resolution saying that it would recommend withdrawal from the Service to a special conference of Local

Medical Committees unless there was an immediate and satisfactory settlement of the claim or arbitration. This must be supported. Dr. LLYWELYN ROBERTS said that public health medical officers must keep in line with the other sections of the profession. They should give all their strength and power to support them in the action they were taking. If the Council agreed to co-operate with a Royal Commission, then public health doctors would wish to be included.

After some further discussion along the same lines Dr. W. G. HARDING moved a resolution:

That the Public Health Committee pledges the full support of doctors in the public health service for their colleagues in general and hospital practice in the serious crisis with which the whole profession has been faced.

This was carried unanimously.

A further resolution expressing grave concern that the Prime Minister's statement in the House of Commons on February 20 suggested that doctors in the public health service might be excluded from a comprehensive review of medical remuneration by the Royal Commission was carried unanimously.

Other Business

It was reported that the comments of the *ad hoc* subcommittee which considered the proposed amendments to the Milk Regulations were agreed to by the Chairman of the Committee and forwarded to the Ministry of Agriculture, Fisheries and Food. It was also agreed to await the coming into action of the new regulations before taking any action on preparing a report for the Representative Body on the subject of pure milk for the nation.

The Assistant Secretary reported that 91% of local authorities had notified implementation of the agreement on the remuneration of public health medical officers from April 1, 1956, in accordance with M.D.C. circular No. 27, and that 59% of local authorities had notified implementation on the remuneration of medical practitioners undertaking part-time work for them from January 1, 1957, as promulgated in M.D.C. circular No. 32.

A letter was received from the Ministry of Health stating that there was at present no evidence that there was a risk to the health of the nation arising out of the entry of immigrants into this country, and it was agreed to recommend to the Council that a further approach be made to the Ministry calling attention to the dangerous situation arising out of the importation of tuberculosis into this country by refugees and immigrants. The view was expressed that there should be compulsory x-rays taken of all immigrants.

EXCHANGE VISITS WITH THE U.S.A.

The scheme for exchange visits between members of the American and British Medical Associations, which has the approval of the Bank of England, will be continued during the financial year April 1, 1957, to March 31, 1958. Two doctors from Britain may visit the U.S.A. in exchange for two doctors from the U.S.A. Medical practitioners in all branches of the profession are eligible. Further information may be obtained from the Secretary of the Association, B.M.A. House, Tavistock Square, London, W.C.1.

The Department of Health for Scotland has reminded regional ambulance committees that long-distance rail travel is often better for patients than ambulance, as well as saving petrol. The Department states that under arrangements between the ambulance service and the railways compartments can be reserved for patients and their escorts, the patients being conveyed to and from the station by ambulance. The entire responsibility for train-ambulance journeys rests on the ambulance service, including cost of tickets. The general practitioner only needs to inform the service that travel by train would be suitable.

Questions Answered

Compensation and Superannuation after Resignation

Q.—Under what conditions does a general practitioner who terminates his contract with an executive council receive his compensation and superannuation?

A.—*Compensation.* The National Health Service Compensation Regulations, 1948, provide (Regulation 13.1.) that "The compensation payable to a practitioner . . . shall be paid to the practitioner . . . on the retirement from practice or death of the practitioner concerned, whichever shall first occur. . . ." Regulation 13.3. is as follows:

For the purpose of paragraph 1 . . . of this Regulation, retirement from practice means retirement from practice as a medical practitioner giving general medical services under Part IV of the Act or under Part IV of the N.H.S. (Scotland) Act, 1947.

It follows, therefore, that once a practitioner's resignation from the list of an executive council (or councils) becomes effective he has retired from practice within the meaning of Regulation 13.1. without prejudice to his continuing to practise privately or in some form of salaried appointment under another employing authority in the N.H.S. Hitherto this has been the interpretation placed on this Regulation by the Ministry, and compensation has been paid with little or no delay immediately the contract with the executive council is terminated. Even in cases where there has been a possibility that the doctor might re-enter the list in the not-too-distant future the Ministry has made payment. Payment may be withheld only if it is known at the time of application that a doctor is merely changing from one area to another.

Superannuation. Doctors who cease superannuable employment under an employing authority in the N.H.S. (and there is no need to talk about retirement in this connexion) do not receive any benefit under the superannuation scheme unless (1) they have paid contributions for at least five years (for a pension or widow's pension 10 years), and (2) have reached the minimum retiring age of 60. In all other cases, except attributable injury or disease, they receive a return of their own contributions, less tax, but with compound interest at 2½%.

If, however, there is a break in service and the doctor does not receive a return of contributions and returns to superannuable employment within 12 months, his rights are secure and he continues from where he left off. It would be confusing to quote all the regulations dealing with this point, as they deal with a variety of approved employment outside the Health Service—for example, National Service, service with a university, courses of study, and so on. However, the relevant regulations are Regulations 18 and 19, which may be summarized as follows:

When a person enters the employment of an employing authority within 12 months of ceasing superannuable service under an employing authority, and has not received a return of contributions, he can count all his previous contributing service towards future benefits. He must notify his new employing authority within three months. Even if he has received a return of contributions he can recover his lost period of service by repaying to the authority "an amount equal to any sum paid to him by way of return of contributions on or after his ceasing to hold that other employment, together with an amount equal to any income tax which was deducted from his contributions in respect of such payment."

Under normal circumstances the Superannuation Division of the Ministry does not offer to repay contributions until there has actually been a disqualifying break in service—that is, after 12 months. In certain circumstances, even after a disqualifying break, a doctor may buy back previous contributory service by making additional contributory payments. The answer to the superannuation part of this question applies also to hospital medical staff in the N.H.S.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Remuneration Claim

SIR.—The decision of the Government to set up a Royal Commission to inquire into the remuneration of doctors, having regard (as reported by the B.B.C.) to the income levels of other professional classes, prompts certain observations. Why was this important decision made without prior consultation with the profession? Surely consultation in such an important step would have been reasonable. As it is, the Government not only lays itself open to the charge of delaying the claim on remuneration but also of obscuring even more important issues.

There can be no doubt that the present discontents go much deeper than problems of remuneration, and this has repeatedly been made very clear to the Minister of Health and to the Secretary of State for Scotland. The medical profession would welcome the immediate creation of a Royal Commission if its task were to examine the whole structure and working of the National Health Service in the light of nearly ten years' experience. This broadened inquiry by a Royal Commission should be carried out quite independently of the present remuneration claim, which should be settled now on its own merits. Lord Salisbury has recently stated that an interim review of the salaries of junior medical and dental staff in hospitals would be undertaken. If this is intended to remedy the plight of the underpaid members of the profession, it is impossible to understand why senior hospital medical officers are to be omitted from this review.

It seems that as a profession we are faced with the following alternative paths of professional degradation. On the one hand we can stand on our dignity and decline to ask for more pay. We then go steadily downwards financially, with loss of status and ultimately loss of suitable recruits to the profession. Or, on the other hand, we can abandon our professional dignity and continually clamour for what we were promised. We will then have still further opportunity for observing that, while the militant trade unions secure annual increments for their members, we, who cannot strike, are ignored. In either case the outlook for the Health Service is gloomy indeed. Now that we are all in this present unhappy position the only solution to our difficulty, in my opinion, is for the Government to let the present claim go to arbitration, and for the Royal Commission with a broad remit to set to work immediately.—I am, etc.,

Lochmaben, Dumfriesshire

CHRISTOPHER CLAYSON.

SIR.—One of the most perplexing problems in the remuneration fight is the exact income of general practitioners from capitation fees, excluding dispensing or mileage. The Ministry of Health and the B.M.A. appear to differ on this point. Looking through the practice vacancies advertised in the *B.M.J.* over the last year it appears that the average number of patients on a list is somewhat between 1,500 and 2,000. I would like to suggest, to clear up this controversial point, that a list be issued showing the gross amount a doctor receives from his National Health Service patients—e.g., how many individual G.P.s receive over £3,000, between £2,000 and £3,000, between £2,000 and £1,500, and under £1,500. This would give, in my opinion, a much fairer picture of the G.P. pay than showing what "Dr. Average" earns.

I also notice that when a trade union applies for an increase it applies on behalf of the lowest-paid person and on the basic rate. It does not say that the average person earns so and so. Nor does it take any notice of the person's overtime pay. Why should doctors not apply on the same lines?—I am, etc.,

London, S.E.6.

R. G. WIGODER.

SIR.—As a doctor holding Conservative views I am naturally reluctant to take action against this Government. Nevertheless, I feel we have had a raw deal, and must take all steps to win our just claim. I think most of us will support the Government's endeavour to cut the high level of its own expenditure in order that the penal level of direct taxation may be reduced. Such reduction in taxation must prove a great help to us and the country at large. It must be obvious that if the Government concedes our £20m. claim it is in a bad position to resist other claims from many sources. Could we not help the Government to help ourselves by, on our part, offering to agree that some part of this, or a larger sum, should be used to improve the conditions and efficiency of the N.H.S. (1) by upgrading S.H.M.O.s in the hospital service to full consultant status where they are doing consultants' work, (2) by taking the increase on the smaller numbers of a doctor's list and so make it economically worth while for a larger list to be voluntarily reduced, leading to less harassed and rushed work, and greater opportunity for the newcomers into practice? I have great sympathy with the layman's views expressed by Mr. Meredith (*Supplement*, February 23, p. 95). The Government, I feel, is sympathetically disposed. Can we give it the loophole to escape from its general policy in the instance of our claim?—I am, etc.,

South Shields.

JOHN MCKEE.

SIR.—I noted with interest the large number of letters in the *Supplement* of February 16 expressing the wider causes of dissatisfaction than the implementation of Spens. As a recently qualified doctor I can well remember the time spent as a hospital resident, both in the wards and in the casualty departments, with cases that could equally well have been treated at home. It has required only a short time in general practice to understand the reason for this. The keener you are, the harder you work, the less pay you get and even less time to enjoy it. Could there possibly be anything more ridiculous? Surely now is the time to press for major alterations in the Service. The lesson to be learned from the remuneration claim is to put in a demand for an increase in remuneration commensurate with the rise in the cost of living each year. A 4% rise each year would antagonize the Exchequer less and get more public sympathy than a 24% rise after six years of poverty.—I am, etc.,

Old Hill, Staffs.

D. WATTON.

SIR.—The ethical correctness of mass resignation from the National Health Service in order to exert pressure on the Government seems to me to be gravely open to doubt. I hope the profession will not be stampeded into such collective action, and so become guilty of "unprofessional conduct" in the eyes of the general public, which certainly is not with us in this matter. Far better to negotiate for arbitration now on a smaller interim award, and then await with patience the findings of the Royal Commission. After all, we might regret tying ourselves to Spens if the cost-of-living index were to fall.—I am, etc.,

Blandford, Dorset.

CHARLES E. LANGLEY.

SIR.—In spite of the Minister of Health's admission of the justice of the doctors' recent claim for more money, the claim was turned down out of hand and the Government declined to allow this matter to go to arbitration.

It has been suggested that there should be a mass resignation of general practitioners from the N.H.S. This would create a great many difficulties for the bulk of doctors concerned, and as a result many doctors might decline to take this action and the plan might very well fail. However, G.P.s as a group have a very powerful weapon at their disposal. They are among the relatively small group of people who do not pay their income tax under the P.A.Y.E. scheme. If a large number, but not even necessarily all G.P.s, declined to pay any income tax at all, there would indeed be a serious problem for the Government to face. It certainly could not commit about 20,000 doctors to prison, because

(1) there would not be room for them; (2) the N.H.S. would be completely disorganized, as there would be no G.P.s to work it; (3) it would make the Government appear even more stupid than it is. If this plan were adopted, no G.P.s taking part in the scheme would need to worry about the effect on their patients of their resignation from the N.H.S.

This scheme could also be extended to the refusal to pay telephone bills—it would be little hardship to have one's telephone cut off, and it would certainly create a disproportionate amount of trouble.—We are, etc.,

Pontefract.

ROBERT G. FORSTER.
PETER J. REYNOLDS.

SIR,—I especially agree with Dr. K. E. McIver's letter (*Supplement*, February 23, p. 94), where he says: "One of the curses of this country to-day is that there are too many people spending with scant care other people's money." Is it not possible that, if greater care was taken over prescribing, then there might be sufficient money in the kitty to give us that rise in pay which we think we deserve?—I am, etc.,

Ipswich.

M. W. GONIN.

SIR,—It would seem that we are now faced with the possibility of mass resignation from the N.H.S. It seems that we are then to treat our patients privately. I think it is high time that we faced reality and considered just what this means.

Dr. K. E. McIver (*Supplement*, February 23, p. 94) thinks that if we charged our patients 5s. per consultation and 10s. per visit our incomes would be doubled. So they might be, on paper. But would we ever see the money? If I were a patient, I certainly would not pay. And supposing we booked the fees and sent accounts. Would that make any difference? Of course not. Most of us would be lucky if we recovered the cost of rendering the accounts.

The issue, to me, is quite clear and simple. Let us face it. Are we prepared to treat our patients for an indefinite period for nothing and live on our savings, if any, until the Government capitulates? If we are, then by all means let us resign. But do let us realize exactly what this entails. When David faced Goliath he did have a stone for his sling. I doubt whether we shall have even a sling.—I am, etc.,

West Drayton, Middx.

A. COYER.

SIR,—Now that we are approaching a decisive battle between the profession and the Ministry, the end of which is unpredictable, we must be sure exactly what our aims are and how far they can and should be achieved.

Every week the *Supplement* contains letters demanding that politics should be divorced from the Health Service. What does this mean? That Parliament should renounce interest in the measures taken to preserve the health of the nation, including the expenditure of several hundreds of millions of public money annually? Even if a Minister or a Parliament could contemplate this for five minutes, are your correspondents so ignorant of the constitution as to imagine that such a self-denying ordinance could apply to future Parliaments and Ministers? Let our would-be politicians abandon this parrot-cry and save us from becoming ridiculous. Our quarrel with the Minister is over remuneration, and some of us who may be prepared to co-operate in collective action to secure fair treatment in this respect may be deterred if it is assumed that we consent to being used in an attempt to destroy a Health Service of which we are proud.

Once the principle of an adjustment to our payment in respect of rising prices has been conceded, I do not believe we should be wise in opposing a searching and impartial inquiry into the fairest basis for future payment, such as is presumably to be undertaken by the Royal Commission. Nor do I believe we should cling too obstinately to a uniquely privileged position in which we are completely protected against the effects of national economic adversity

if the Royal Commission should oppose that position. We cannot divorce ourselves from the community and expect to retain its sympathy and support.—I am, etc.,

Scarborough.

F. V. SIMPSON.

Registration of Medical Auxiliaries

SIR,—On page 67 of the *Supplement* of February 16 it is reported that the Central Consultants and Specialists Committee, in discussing the Ministry's proposals for the statutory registration of professions supplementary to medicine, referred to "the dangers of allowing medical auxiliaries to treat patients without medical supervision of any kind, some members expressing the view that the profession should have nothing to do with the scheme." This statement implies that the scheme does not provide for those professions who already work under medical direction to continue to do so. However, the introduction to the scheme states that one of the functions of the registration body would be to regulate "discipline."

The Chartered Society of Physiotherapy has always required its members to take patients only from medical practitioners, and this it will continue to do. The society has therefore asked the Minister of Health on more than one occasion to ensure that the legislation setting up the State registration body should contain a requirement that physiotherapists admitted to the State register should only take patients from doctors. The Chartered Society is glad to know that it will have the support of the Central Consultants and Specialists Committee on this point.—I am, etc.,

London, W.C.1.

M. J. NEILSON,
Secretary,
Chartered Society of Physiotherapy.

Opportunities in Australia

SIR,—Sir Stanley Davidson (*Journal*, May 14, 1955, p. 1171) stated that the annual production of doctors in Australia exceeded the national requirements and that Australia was rapidly becoming over-doctored. A recent visit to Australia revealed that his opinion was not shared there at the time nor is it shared there now. Australia is still short of doctors, and because of this she is admitting doctors who were educated outside the Commonwealth, though in general doctors educated in Great Britain would be preferred. For the next few years, at any rate, there are great opportunities for young English doctors in Australia, and they will have the satisfaction of feeling that they are helping to grapple her to us with hoops of steel.

Australia is a great country, and the Broken Hill Proprietary Company, the Snowy River Hydro-Electric Scheme, the discovery of immense deposits of bauxite and other minerals in Queensland, and the expansion of agriculture by improved conservation of water, the addition of trace elements to the soil, and the reduction of the rabbit population, illustrate its achievements and potentialities. The basic wage is high, and, although it is not possible in Australia to accumulate great fortunes like Rockefeller, Ford, and Nuffield, there are still people who have incomes of £30,000 a year after payment of tax, people who can pay £20,000 for a seaside cottage or £100,000 for a country property. Incomes like this are not likely to come the way of medical men, but a number of doctors in Australia take an active interest in farming, business, or racing, and some become permanent truants in these fields.

Australia accepts British qualifications for registration. It is an advantage for a man to have a higher qualification in medicine or surgery and experience of obstetrics. There are B.M.A. offices in all the capital cities from which information about opportunities can be obtained. A short period as an assistant will enable a man to learn the Australian "know-how." Some men then work for some years in a one-doctor town to accumulate experience and capital, but eventually a man with a higher qualification should be able to join a group practice with a hospital connexion and have increasing opportunities of developing his own special interest.

It is not yet possible for members of the Royal College of Physicians of London to be incorporated in the Australasian College or *vice versa*, but this may come in the future. The Royal Australasian College of Physicians combines the functions of the Royal College of Physicians and the Association of Physicians in this country, and members take a full part in the activities of the College. No one who has visited a man with his membership in successful general practice in Australia can gainsay the fact that this is one of the most rewarding lives which medicine offers to-day.—I am, etc.,

Oxford.

L. J. WITTS.

Naming of Health Centres

SIR,—In reply to a question in the House of Commons this month, the Parliamentary Secretary to the Minister of Health named the health centres so far provided in the country under the N.H.S. These are seven in number, and of these three are named: thus in Sunderland there is the Alderman Jack Cohen Health Centre. Most of what we dislike in the Health Service to-day results from the intrusion of politics into medicine. Whatever our views on health centres are, let us at least beware of their possible use as objects of individual or party political advancement. I do not suggest this to be the case in the health centres provided so far, but if titles are to be given to what are, after all, public and not private enterprises, then what could be more appropriate than the illustrious names from our own profession who have contributed so much more to mankind than all the politics in the world?—I am, etc.,

Rugeley, Staffs.

STANLEY DILLON.

Unity of Purpose

SIR,—I was very interested to read the letter from Dr. C. Alwyn Sharples (*Supplement*, February 16, p. 69). While agreeing wholeheartedly with him on the necessity for unity of action in pressing our remuneration claim, I feel quite sure that to combine this with a call for the revision of the whole structure of the Health Service would be the worst possible way of achieving our aims. Reports of the resolutions passed at meetings of the B.M.A. and the British Medical Guild up and down the country indicate that the profession is indeed firmly resolved to take united action if the remuneration claim is again dismissed by the Government. Such unity cannot, however, be expected on the much wider and more complicated issue of revision of the Service as a whole.

The Government would, I am sure, be delighted to have the opportunity of obscuring the issues of our claim with prolonged discussions and arguments over quite unrelated matters concerning the Health Service in general. The setting up of a Royal Commission could well cause a delay of two years or more, and would put us in a very weak position indeed. We could scarcely expect public sympathy for strike action taken while the justice of our claim was under examination by an independent body, and we certainly could not expect any increase in our remuneration until their report had been completed. Let us therefore keep the issues at stake as simple and clear-cut as possible, lest by attempting to achieve too much at once we end by achieving nothing.—I am, etc.,

Ascot, Berks.

JOHN F. NEWCOMBE.

Medicines for Nursing Staff

SIR,—The Ministry of Health has ruled that the nursing staffs of our hospitals should pay for medicines, should they require them, in the same way as other members of the public. This of course should never have been done for two obvious reasons, among many others: (1) because of the nature of their professional calling, and (2) that it is difficult enough to get nursing staff, without insulting them when you have got them. The Ministry has surely forgotten

the Mosaic law, "Thou shalt not muzzle the ox which treadeth out the corn," a liberal translation of which might be: "You must not withhold a mouthful of food from the ox which is spending its time and energy in preparing food for you"—an excellent and, if I may say so, a very obvious and acceptable rule.

The country spends somewhere in the nature of £600m. annually on a health service, a large proportion of which goes in administration, and this vast expenditure will not be lessened by adding to it the cost of auditing a pernicious rule of this nature; which cost will surely greatly exceed the number of shillings collected from the nursing staffs. There is a point at which officialism can cause revolt, but long before this stage is reached there is produced, in those against whom it is practised, means of deception and evasion of a highly undesirable nature. In this case some will make no attempt to enforce the rule, others will evade it with stimulating cunning, and a third class, while outwardly adopting it, will then, to save their consciences, be tempted to prescribe larger quantities of the medicines required, half of which will probably be wasted. This financially sterile and morally indefensible measure should be withdrawn without delay.—I am, etc.,

Oxford.

C. J. L. WELLS.

Where the Money Goes

SIR,—Mine is a rural practice, and I dispense on a capitation basis. I have trained my household to be most punctilious about the collection of the shilling prescription tax when I am out, and when in my surgery I make a point of ostentatiously filling in one of the spaces on Form E.C.61 in front of my patients for every shilling that I take. At the same time I have spent a lot of time in explaining to them that these shillings all go to the executive council every month to swell the Exchequer funds. In spite of this, my cook, whose family lives locally, tells me that a great many of my patients believe that the doctors all keep these shillings for themselves, and although I have gone to great pains to explain the position I very much doubt whether I have yet convinced her that this is not the case. I have not convinced her family or her neighbours. The time I have taken in explanations seems to have been wasted.

Is the time not now opportune for the Council of the B.M.A. to undertake a widespread campaign to instruct the public how the N.H.S. is really financed? I am sure that many doctors would co-operate in their surgeries if suitable posters in pictorial or diagrammatic form were issued, and replaced with fresh ones monthly, setting forth the proportionate cost of the hospital services, the drug bill, and the doctor's average payments. The doctor's receipts could further be broken down to show the approximate cost of running his car and his surgeries. Other posters could show how little of the weekly insurance contributions ultimately pay the doctors. No doubt the dentists would be willing to join forces now that we are together concerned in the proposed Royal Commission.—I am, etc.,

Wivenhoe, Essex

WALTER RADCLIFFE.

Salaries of Part-time Radiographers

SIR,—The letter from Mrs. V. M. Gordon (*Supplement*, February 23, p. 94) raises a wider issue than the current underpayment of trained radiographers. There must be many women trained to skills in the professions and industry who would like to work, but cannot afford to pay out of their taxed income for the substitute care of dependants in the home. An important inequity here is surely the failure of the Inland Revenue system to allow the proper price of a "baby-sitter," nurse, or housekeeper to be set against income tax as an expense of the work of a woman with children or other helpless dependants. Such an allowance would release skilled persons for work in many fields to the advantage of the national economy.—I am, etc.,

London, N.W.11.

MAIR THOMAS.

BRITISH MEDICAL GUILD

Meetings to be Held

GLASGOW.—At 234, St. Vincent Street, Glasgow, Monday, March 11, 8 p.m.

Association Notices

Diary of Central Meetings

MARCH

12	Tues.	Amending Acts Committee, 2 p.m.
12	Tues.	Finance Committee, 2 p.m.
14	Thurs.	Ethical Review Subcommittee, Central Ethical Committee, 10.30 a.m.
14	Thurs.	G.M.S. Committee (Emergency meeting), 10.30 a.m.
14	Thurs.	International Relations Committee, 2 p.m.
14	Thurs.	Organization Committee, 2 p.m.
15	Fri.	Central Consultants and Specialists Committee Executive, 10 a.m.
15	Fri.	Ophthalmic Group Committee, 10 a.m.
15	Fri.	Library Subcommittee, Science Committee, 11.30 a.m.
15	Fri.	Consultant, General Practice, and Public Health Liaison Committee, 12 noon.
15	Fri.	Science Committee, 2 p.m.
20	Wed.	Joint Formulary Committee, 11 a.m.
20	Wed.	Committee on Medical Education, 2 p.m.
20	Wed.	Public Relations Committee, 2 p.m.
21	Thurs.	G.M.S. Committee, 10.30 a.m.
27	Wed.	Council, 10 a.m.

Branch and Division Meetings to be Held

COVENTRY DIVISION.—At Out-patient Department, Coventry and Warwickshire Hospital, Tuesday, March 12, 8.30 p.m., meeting to take the form of a "Spot Diagnosis" Evening.

CROYDON DIVISION.—At 43, Wellesley Road, Croydon, Tuesday, March 12, 8.30 p.m., meeting. B.M.A. Lecture by Sir Heneage Ogilvie: "Peptic Ulceration."

DARTFORD DIVISION.—At Bexley Mental Hospital, Thursday, March 14, 8.30 p.m., meeting. Lecture and clinical demonstration by Dr. L. C. Cook and hospital staff: "Tranquillizers." Clinical cases will illustrate early diagnosis of some common psychoses.

DEWSBURY DIVISION.—At Prospect Hall, Cleckheaton, Friday, March 15, 7.45 for 8.15 p.m., annual dinner dance.

DUDLEY DIVISION.—At Victoria Hotel, Old Hill, Tuesday, March 12, 7.45 p.m., meeting of Dudley, Stourbridge, and District Branch of Pharmaceutical Society to which members of the Division are invited. Film and lecture by Dr. J. J. F. Merry: "Therapy with Cortisone."

DUMFRIES AND GALLOWAY DIVISION.—At Cresswell Maternity Hospital, Dumfries, Sunday, March 10, 3 p.m., meeting. Address by Professor D. M. Dunlop: "New Drugs."

EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, March 14, 7.30 p.m., dinner, 8.45 p.m., Mr. A. L. Gunn: "The New Look in Antenatal Care."

EAST YORKSHIRE DIVISION.—At Quern House, 68, Park Street, Hull, Wednesday, March 13, 8.30 p.m., meeting. Lecture by Mr. A. E. Roche: "Some Genito-urinary Reflections."

GLASGOW AND WEST OF SCOTLAND BRANCH.—At Institution of Engineers and Shipbuilders in Scotland, 39, Elmbank Crescent, Glasgow, Wednesday, March 13, 4 p.m., meeting. Lecture by Sir Geoffrey Todd: "Prognosis of Pulmonary Tuberculosis in the Light of Modern Treatment, with Special Reference to Midhurst Sanatorium." (Under the joint auspices of the Glasgow and West of Scotland Branch and the N.A.P.T.). All medical practitioners in the area of the Division are invited.

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, March 14, 8.30 p.m., meeting. Lecture by Dr. R. E. Hope-Simpson: "Common Infections in General Practice."

HENDON DIVISION.—At Hendon Hall Hotel, N.W., Tuesday, March 12, 8.45 p.m., meeting. Dr. Michael Ward: "The Ascent of Everest."

ISLE OF WIGHT DIVISION.—At Wheatsheaf Hotel, Newport, Thursday, March 14, 8.15 p.m., meeting of Isle of Wight Section of B.D.A. to which all members in the area of the Division are invited. Talk by Mr. A. C. Kerr: "Fluoride and the Teeth."

KINGSTON-ON-THAMES DIVISION.—At Nurses' Home, Kingston Hospital, Tuesday, March 12, 8 p.m., meeting. Address by Dr. E. R. Cullinan: "Medicine in East Africa."

LANCASTER DIVISION.—At Clarendon Hotel, Morecambe, Saturday, March 16, 7.30 p.m., annual dinner. Guest of honour, Professor A. G. Ross Lowdon.

NORTH-EAST ESSEX DIVISION.—At Nurses' Recreation Room, Colchester Maternity Hospital, Lexden Road, Tuesday, March 12, 8.30 p.m., meeting. Brains Trust to discuss questions on dyspepsia.

PRESTON DIVISION.—(1) At Sharoe Green Hospital, Fulwood, Preston, Tuesday, March 12, 8.30 p.m., meeting. Selection of medical films. (2) At Chorley and District Hospital, Wednesday, March 13, 9 p.m., meeting. Further selection of medical films.

SCARBOROUGH DIVISION.—At Board Room, Scarborough Hospital, Thursday, March 14, 8.30 p.m., meeting. Lecture by Mr. G. K. Tutton: "Epilepsy."

SHROPSHIRE AND MID-WALES BRANCH.—At Board Room, Royal Salop Infirmary, Shrewsbury, Friday, March 15, 8.30 p.m., general meeting.

SOUTH-EAST ESSEX DIVISION.—At Southend General Hospital, Thursday, March 14, 8.30 p.m., meeting. B.M.A. Lecture by Mr. J. C. Ainsworth-Davis: "Urological Symptoms—Their Significance and Investigation."

STRATFORD DIVISION.—At King George Hospital, Eastern Avenue, Ilford, Tuesday, March 12, 8.45 p.m., meeting. Discussion: "The Care and Rehabilitation of the Aged Sick in the Home." On the platform: The Rt. Hon. Lord Amulree, Dr. S. Lell, and Dr. H. C. Faulkner. Members and Associates of local faculties of the College of General Practitioners, together with resident hospital officers, are invited.

TEES-SIDE BRANCH.—At Spark's Café Royal, Middlesbrough, Thursday, March 14, 8.30 p.m., meeting. Lecture by Professor M. L. Rosenheim: "Treatment of Nephritis."

TUNBRIDGE WELLS DIVISION.—At Edenbridge and District War Memorial Hospital, Wednesday, March 13, 8.30 p.m., meeting. Mr. A. Dickson Wright: "Patients Who Have Deceived Me."

Meetings of Branches and Divisions

DORSET DIVISION

A meeting was held at the chest clinic, Dorchester, on December 13, 1956. Dr. T. V. Cooper took the chair and 28 members were present. Dr. S. G. Graveson gave a lecture on "Some Aspects of Neurology To-day." A resolution was passed urging the B.M.A. to take immediate steps to obtain an increase in mileage allowance for those not directly compensated for the increased price of petrol.

DUMFRIES AND GALLOWAY DIVISION

A meeting was held in the Cresswell Maternity Hospital on January 13, 1957. Dr. R. N. Rutherford was in the chair, and 51 members attended. Short lectures were given by Dr. Sheenah Russell, on "The Infant who Vomits," Mr. John C. Campbell, on "The Misuse of Antibiotics," and Dr. James Harper, on "Alcoholism as a Medical Problem."

MACCLESFIELD AND EAST CHESHIRE DIVISION

The annual meeting was held at the Macclesfield Arms Hotel on November 25, 1956. The following officers were elected:

Chairman.—Dr. A. Holmes Smith.
Vice-chairman.—Dr. W. E. Thomas.
Immediate Past Chairman.—Dr. R. W. Harte.
Honorary Secretary and Treasurer.—Dr. M. B. Casey.
Assistant Honorary Secretary.—Dr. C. Shiero.
Public Relations Secretary.—Dr. F. E. Lomas.

SOUTH MIDDLESEX DIVISION

The annual general meeting was held on December 17, 1956, at the Casino Hotel, Taggs Island. Thirty-five members attended. The following officers were elected for 1957:

Chairman.—Dr. R. P. K. Coe.
Vice-chairman.—Dr. C. D. Meadowcroft.
Honorary Secretary and Treasurer.—Dr. G. C. L. Woodroffe.
Honorary Social Secretary and Public Relations Officer.—Dr. W. A. de C. Shearman.

HER MAJESTY'S OVERSEA CIVIL SERVICE

The following appointments have been announced: J. D. Arneaud, M.B., B.S., D.C.P., Superintending Medical Officer (Specialist), Bacteriological Laboratory, Health Department, Trinidad; H. S. A. Bishop, M.B., Ch.B., Medical Officer Grade "B," Health Department (Institutions), Trinidad; P. I. Boyd, M.D., M.P.H., Deputy Director of Medical Services, British Guiana; A. Gray, M.B., B.S., Deputy Chairman, Silicosis Medical Bureau, Northern Rhodesia; V. W. J. Hetreed, M.B., B.S., T.D.D., Senior Specialist, Federation of Nigeria; W. H. McDonald, M.B.E., M.B., B.S., D.T.M.&H., Deputy Director of Medical Services, Fiji; K. Sivam, L.M.S., D.P.H., Senior Port Health Officer, Singapore; J. L. Beecher, L.M.S.S.A., Resident Medical Officer, Kenya; R. C. Morgan, M.R.C.S., L.R.C.P., Assistant Medical Officer, Princess Margaret Hospital, Bahamas; J. Telfer, M.B., Ch.B., Medical Officer, Northern Nigeria; J. E. Walcott, M.B., Ch.B., D.T.M.&H., Bacteriologist and Pathologist, Barbados; Mary M. Bools, M.B., B.Ch., Assistant Bacteriologist, Barbados.

ANNUAL MEETING: NEWCASTLE UPON TYNE, JULY 10-19

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LIFE AND WORK OF THE MERCHANT
NAVY SURGEON*

BY

ALEXANDER DUFF, M.D., F.R.C.S.Ed.

The ship surgeon is of fairly respectable ancestry and antiquity, and has gradually emerged from the mists of time in the same way as his counterpart on land. Men of action have always required the assistance of philosophers to have always required the assistance of philosophers to administer to their spiritual and physical needs, to act as navigators at sea, as geographers when strange lands were encountered, as lawgivers if these were inhabited, and as historians on returning home, and among these philosophers medical men, or men whose medical activities predominated, have stood high.

Professor T. K. Monro in a fascinating work¹ lists under the heading "Piracy" 12 names of medical men who were distinguished in that sphere of action. These were in the seventeenth century, and include Thomas Dover, of Dover's powder fame, and it is related that surgeons were privileged not to have to sign the pirates' articles when captured, but to be replaceable by the next surgeon captured—that is, to be liberated. At this time military and naval surgery formed one of the most important branches of the craft. Textbooks were devoted to it—for example, *The Surgeon's Mate*, by J. Woodall (1617), which I recently found quoted in an article.

The eighteenth century saw the inception of regular shipping routes, and the East Indiamen of that day regularly carried surgeons. The explorer Mungo Park was at one time surgeon in the East Indiaman *Worcester*. Towards the end of the nineteenth century we find Sir A. Conan Doyle making two voyages. He did not enjoy the second and determined to leave the sea, giving as his reasons the lack of work, the low pay, the bad climate, and the torpor induced by too many drinks with the passengers.

In modern times a series of Merchant Shipping Acts regulates the carriage of doctors on board, and the present position is that a doctor must be carried in every foreign-going vessel if the number of persons on board is 100 or over, or if the number of steerage passengers is 50 or more, which makes it officially an emigrant ship. There are no regulations for any upper limit over which an assistant surgeon is required, but some of the largest liners do carry assistants. The number of British ships carrying surgeons at the present time is said to be about 300.

*Part of an address given to the Southern Branch of the B.M.A. on May 26, 1956.

Entry into the Merchant Navy

The first necessity is to secure a job, and the kind of job with which a man begins will naturally be in a vessel of one of the secondary lines or in what is called an "intermediate" ship of a larger line.

Three types of posts are available in the British M.N. First, there is the regular surgeon in the large passenger liners. These companies have in recent times made efforts to secure a satisfactory medical service, and to this end have made these posts permanent, offering continuous contracts with provision for holidays, study leave, and, in some cases, pensions. Obviously this is a very specialized type of medical career, especially on the shorter transatlantic routes, with a complete change of passengers every few days, though the crews are under the surgeon's care for a little longer. The remuneration, including as it does private fees from the passengers, may be quite attractive.

Secondly, there is the long-term contract in such ships as cable ships, whalers, exploratory expeditions, foreign-based pilgrim ships, and the like. These posts are comparable to the contracts for one or a few years offered weekly in the *B.M.J.* by industrial concerns on land in various parts of the East—they offer a longish interlude in one's career.

Thirdly, and much the most numerous, are the posts in secondary liners, where the voyages are fairly long and conditions comfortable though not luxurious, remuneration modest, fees few, and employment casual. The surgeon ranks as the head of a department.

Materia Medica

The ship surgeon is the only true G.P. left, a remark I can make with impunity now that general practice is recognized as a specialty by the Royal Society of Medicine: moreover, once at sea there is no N.H.S. The surgeon is employed by the owners on a salary to look after their crew and steerage passengers, if any, and is permitted to engage in private practice among the first-class passengers. It will be evident that his professional activities will be limited in respect of what equipment is carried on board, and this is regulated by the Ministry of Transport's "Medical Scales" or schedules of requirements.

There are pharmaceutical chemists in dock areas whose job in life is to go through ships' dispensaries and top up the various materials carried to comply with the scales. Most shipowners will allow the surgeon to include such additional supplies as he wishes—the cost of drugs, though it may be causing alarm in some circles, being a flea-bite to most of the costs of running a ship. Internal medicine is

catered for by a classical collection of galenicals and the necessary dispensary equipment. One might think that an apothecary's balance ranks with a billiard-table or shooting-stick in unsuitability for use at sea, but this is not the official view. The supply may be augmented by a consignment from the host of samples one has accumulated, with the benefit to the bursting drug-cupboard at home.

Surgery is now quite adequately provided for by a recently revised list of instruments, including oxygen-administering apparatus. One might question the wisdom indeed of providing a long-handled flushing curette, or the likelihood of anyone using the little dental niblicks provided.

Books

Chief among the works of help to a ship surgeon is an official publication, *The Ship Captain's Medical Guide*, which is intended for the guidance of captains of ships without surgeons, but is very helpful to any doctor without recent maritime or tropical experience. The doctor would do well to read this volume, and indeed make any marginal notes he may feel required, since he may reflect that if anyone is going to be treated in his ship by the captain, with the sole aid of this book, it will be himself. The book includes one item not usually found in medical books—that is, a short form of the burial service, approved by the Archbishop of Canterbury.

Burial at sea is not acceptable to the Chinese. The custom is for the deceased's fellow countrymen to have a whip-round to raise the amount necessary for the doctor's fee for embalming. Anyone, therefore, contemplating sailing with a Chinese crew should provide himself with the necessary knowledge, though I believe that better organization and stricter supervision ashore make it less common than formerly for more or less dying men to be shipped in crews.

I know of only one unofficial textbook for the ship surgeon, that written by the late Dr. Vavasour Elder,¹ and it is very much out of date. Dr. Chalmers Parry has published a book² on Lascar Hindustani for ship surgeons, which is simply a sailors' phrase book with the Hindustani rendered phonetically in Roman characters. A number of British lines employ Lascar crews as being better able to stand tropical conditions, and these men speak Luscani Bât—a very low ungrammatical Hindustani.

Another work by Dr. Parry is *A Polyglot Medical Questionnaire*,³ with a digital system of communication. In this the doctor chooses the question in his language and points to the corresponding text in the patient's. The patient, who must be able to read his own language, picks out the reply, which is numbered and which enables the doctor to translate it back into his language. The text of this work exists in 27 languages, but unfortunately only 12 are at present published, all European.

Present Condition of M.N. Medical Service

Even the large companies have difficulty in securing sufficient good men, and it cannot be denied that the ramshackle service that at present supplies the needs of secondary ships, that large section of the M.N., could be improved.

I have no wish to wear the gown of the planner, but I fear that unless something is done it will only be a matter of time before the planners do get round to the M.N.M.S., and we may find one day that it is a branch of the N.H.S., or supplied entirely by men seconded from the Royal Navy. It behoves the two most interested bodies, the Shipping Federation and the B.M.A., to formulate a policy. At present there is none at all.

Two alternatives present themselves—to attempt to extend and consolidate a service of permanent sea-going doctors or to accept that a constantly rotating service of men who are doctors first and seafarers second is better. The permanent men are in favour of the first, seeing in the temporary seafarer a threat to their position. Indeed, one has recently stated that free holidays and cheap gin are the chief factors that lure the latter to sea.

The shipping companies are also much in favour of the permanent man. They have to provide a crew for each ship that sails, and it is obviously much more convenient not to have to search for a doctor every time. Also they have the captain's opinion on the previous voyage, and would not offer a really bad man another voyage. The crews themselves, however, think differently, and it is with this knowledge that I express myself in favour of a better part-time service.

Conclusion

The difficulty in securing a better service ought not to be great, being chiefly one of organization. Many men would go to sea if they could get a ship, and many ships would be glad to have them if they could get them at the time they are required. I trust that the maritime subcommittee of the Private Practice Committee of the B.M.A. may exert itself in the direction I have indicated.

Some men are deterred from going to sea by the feeling that they are inadequately equipped in the matter of operative surgery. This emerged in some recent correspondence in the *B.M.J.* The paucity of articles and textbooks for the ship doctor extends also to postgraduate courses. And yet the requirements are not great, they are merely dissimilar to those for any other branch of practice. The number of individual operations that might be performed at sea is small, but includes one or two from almost every branch of surgery. I commend to the bodies responsible for postgraduate courses the peculiar requirements of the ship surgeon.

REFERENCES

1. Monro, T. K., *The Physician as Man of Letters, Science and Action*. 1951. E. and S. Livingstone, Edinburgh.
2. Elder, A. V., *Ship Surgeon's Handbook*, 1927. Baillière, London.
3. Parry, S. C., *Lascar Hindustani for Ship's Surgeons*. Lewis, London.
4. ———, *Polyglot Medical Questionnaire*, 1953. Lewis, London.

Scottish News

WOMAN CONSULTANT FOR WOMEN'S HOSPITAL

BOARD'S DECISION TO STAND

The Secretary of State has decided not to interfere with the decision of the South-eastern Regional Hospital Board in Scotland not to restrict the consultant post in medicine at the Bruntsfield and Elsie Inglis Hospitals to women candidates. The Board's decision was the subject of a letter to the *Supplement* of February 9 (p. 62).

The Secretary of State received a number of representations on the matter, including a petition signed by 20,000 people. In a letter to the Board of Management for Edinburgh Southern Hospitals he records that the Regional Hospital Board had two part-time consultant vacancies for the Southern Hospitals Group—the first of three half-days for adult work at the Bruntsfield and Elsie Inglis Hospitals (this post was previously held by a woman doctor), and the second for four half-days at the Deaconess and Longmore Hospitals (this post was previously held by a male doctor). The board decided that the two posts should be combined into a single one for the whole group, open to either sex, because a new appointment of this kind would have a substantially higher remuneration and would thus attract a consultant of the highest calibre. It emphasized that should a woman candidate prove worthy in open competition she would be appointed to the combined post with its fullest confidence.

The Board of Management, however, represented that a woman candidate might not be successful in open competition; there would then be a break with the long-standing tradition at the Bruntsfield and Elsie Inglis Hospitals, and women in the South-eastern Region would be deprived of the services of a woman physician of consultant rank. If a woman was available who could be regarded as suitable she should be appointed, even if she might not be successful

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Royal Commission

SIR,—At the present time there is, I believe, a greater degree of unanimity in the profession than has been present for some years. I think we would be very wise not to lose sight of essentials in the present dispute. Our claim, when made, was for an increase of 24% backdated to April last year, when there was already several years of accumulating loss of purchasing power. We need to be careful that an interim settlement does not upset the unity, for we have asked either for the 24% or arbitration. A Royal Commission report is suspect from the outset, for the history of these reports shows clearly that their findings may be discarded by the Government or selectively accepted. All whole-time and many part-time consultants know to their cost the drawbacks of being assessed under Schedule E when there is already a Royal Commission report advising that the Schedule E rule governing deductible expenses should be amended to permit the allowance of expenses reasonably incurred for the proper performance of the duties of the office, as is the case under Schedule D. Subsequent to the Danckwerts award to G.P.s, minor but arbitrary and uneven changes were made in the hospitals. Registrars and house-officers got an increase of £75, most consultants received £350 (based on the full-time rate), but a consultant with an "A" merit award received only £50. I am not entering the arena to argue about merit awards except to express a personal opinion that something comparable seems desirable in the G.P. field, preferably organized among themselves. Payment by counting of heads makes no allowance for outstanding quality of service.

The terms of reference of the Royal Commission would appear to be calculated to reduce the actual buying power of the whole profession, as they do not specifically include a reference to the conditions upon which the profession agreed to enter the Health Service. It seems, therefore, that we would be wise to approach the interim settlement circumspectly, as what we seek is a cure and not a placebo. I think that most of us resent the appointment of a Royal Commission to settle in part something we thought was settled in 1948. Its findings will only be acceptable if they produce a solution which maintains the status of the doctor in the community under Government monopoly employment conditions. The *Lancet*, in its leading article of March 2, includes the following sentences: "What has been unfair about the attitude of successive Governments is that in seeking economies they have expected a special contribution from people who get their livelihood from public funds: when the Civil Servant or the person working in some national undertaking is denied the proper rate for the job, because the Government 'cannot afford it,' he is in fact being forced to make an additional contribution to the Exchequer, supplementary to what he pays in taxes; and the same is true of the doctor who is asked to accept uncompensated depreciation of his income when (even in the National Health Service itself) the need for compensation of other groups is freely recognized. What is unjust is also in the long run unwise, and grave damage to the Service will be averted only if the Government demonstrate that they are not as uninterested or as cynical as they appeared."

It is, I think, unfortunate that the same article, while frowning upon mass withdrawal from the N.H.S., does not indicate what steps the profession could take to secure redress from injustice. Sweet reason has been shown to be a failure. It would be tragic for the future if we allow exploitation of the differing difficulties in the various branches and age groups among us to deflect our aim from the main purpose—24% or arbitration. Other problems must be settled later. Lastly, why were the terms of refer-

in a competition for a consultant post open to either sex. It therefore proposed that the two posts should be kept separate, and that the post at the Bruntsfield and Elsie Inglis Hospitals should be advertised as restricted to women only. The Board of Management was supported by the regional consultants and specialists committee, the Edinburgh Local Medical Committee, and the Medical Women's Federation of Great Britain.

ASSISTANTS AND YOUNG PRACTITIONERS SUBCOMMITTEE

The Assistants and Young Practitioners Subcommittee of the G.M.S. Committee met on March 1 with Dr. F. GRAY in the chair. The following resolution was passed unanimously:

The Assistants and Young Practitioners Subcommittee of the British Medical Association, representing assistants and unestablished practitioners throughout the country, fully supports the action of the General Medical Services Committee in convening a Special Conference of Local Medical Committees to consider a recommendation that, failing an immediate and satisfactory settlement of their claim for increased remuneration, or the submission of that claim to arbitration, general practitioners should withdraw from the National Health Service.

The view was put forward by more than one speaker that the remuneration claim also offered an opportunity to examine the Health Service as a whole. Dr. R. M. S. MATTHEWS moved that the G.M.S. Committee should be asked to draw the Council's attention to the Subcommittee's request that any increase in remuneration should be the occasion for a more equitable distribution of present and future work in general practice, whereupon Dr. F. G. TOMLINS moved an amendment

That any increase in remuneration should be the occasion for a change in the method of remuneration designed to give an incentive to a more equitable distribution, and a higher standard, of work in general practice.

This amendment was carried by the young-practitioner members of the Subcommittee only voting, but there was an even division when the vote was put to the whole Subcommittee. It was agreed that discussion on Dr. Matthews's substantive motion should be postponed to the next meeting.

The Subcommittee considered a request from the G.M.S. Committee for its views on the recommendation of the Constitution Committee that a special committee of the Association be appointed under the title of "Young Practitioners Committee" to consider all matters affecting medical practitioners not yet fully established in a defined field of practice, including questions referred to other committees or subcommittees, and to make recommendations.

The Subcommittee saw no reason to establish this new committee and thought that any difficulties could be overcome by more efficient liaison between existing committees.

HOSPITALITY

A French doctor's daughter, aged 19, would like to stay with a medical family near Oxford or Cambridge on an *au pair* basis for a few months. She would help with children or teach them French, Latin, or Greek. A son, aged 13, of the same doctor would like to stay as a paying guest in the same neighbourhood, or arrange an exchange with a British boy of similar age.

A Norwegian doctor's daughter, aged 17, would like to arrange an exchange with a British girl. The British girl could spend the summer of 1957 or 1958 among the fiords with opportunity for fishing, bathing, and mountaineering.

A French doctor in the Department of Vendée would like his son (12) and daughter (13) to arrange a holiday exchange with two children during July and August.

Would anyone interested please get in touch with Brigadier H. A. Sandiford, International Medical Visitors Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

ence of this Royal Commission not discussed and agreed with our leaders before publication? To be confronted with the appointment of a Royal Commission was affront enough.—I am, etc.,

Dorchester.

T. V. COOPER.

Reform of Health Service

SIR,—It is held by some, perhaps the more senior members of the profession, that to seek revision of the National Health Service and an adjustment in pay would be fatal to both causes. Long experience of dealings with Government departments no doubt prompts this opinion. The opinion is open to at least two criticisms. It misrepresents the facts, for surely the majority of practitioners would not be satisfied with the proposed extra pay, but with no revision of the Service; and it is extremely bad publicity. There is no easy way to correct the misapprehension which we should create in the mind of the public. Quite possibly both these criticisms carry less weight with the seniors than with those who have their professional lives ahead of them. A strong undercurrent of desire for reform is undoubtedly flowing, although, as yet, it flows in many separate channels. The need for brevity here demands some oversimplification of the issue. I would propose the following.

The health and sickness of the individual and the family unit should be the direct concern of the general practitioner, and all relationships involved therein should be completely outside party politics or any form of State control. The State, then, must not be our employer or pay our fees. It is clear that the vast majority of the population cannot meet the cost of individual serious illness out of current income, and that insurance cover is essential. Could we not explore the question of health insurance with the big insurance companies in this country, who are so well versed in this business? Could it not be made compulsory for every individual to carry minimum cover in the same way as third-party motor insurance is compulsory? Unless there is compulsion at this point, the man who is never ill, never bothers to put himself on a doctor's list, would not be paying his essential bit to the pool. Increased premium would provide for additional cover. Health propaganda would be in the interests of the insurance companies. The general practitioner would be paid by fee for service, giving a receipt which would be handled by the insurance companies for partial refund.

Now that a revolution in the distribution of income has taken place in this country, there should be a small and diminishing number of cases where payment of cash really caused hardship. If the co-operation of the highly efficient insurance companies (with which I have no connexion) could be obtained along these lines, I believe that a vast improvement in the status and performance of the general practitioner could be expected. On the other hand, if our pay claims were met to-morrow, what hope would there be of salvation for most of us beyond a temporary period of solvency?—I am, etc.,

Andover.

JOHN W. EVANS.

SIR,—May I fish in our troubled waters for answers to two objections to existing arrangements? Nowadays a G.P. is stuck where he starts. There is much to be said for lifelong marriage to a locality. But family circumstances, health considerations, economic factors, or professional developments may make moves desirable. And certainly a man stays put better of choice than of necessity. At present, G.P.s, old or young, receive level payment for patients, rich or poor; and the more assiduous doctor receives relatively less pay. There is need for salutary realism in this aspect of the doctor-patient relationship. Surely now is the time for us to plan boldly and swiftly to relieve politicians and civil servants of responsibility for family doctors' arrangements.—I am, etc.,

London, W.1.

WILLOUGHBY CLARK.

SIR,—No reasonable person can deny that the N.H.S. is grossly abused by a large proportion of patients and regretably, but understandably, by many doctors. Because of the compulsory contribution system the general attitude of the lay public is, "We must get as much as we can out of the N.H.S.," and the doctor is called in or attended for the most trivial complaints, such as the common cold, a small scratch, or a bruised finger. If the patient had to pay out of his own pocket for each service this abuse would largely cease. A majority of patients no longer come to their doctor to seek advice but to demand service. Frequently the patient's opening words are, "I want a prescription," or, "I want a certificate," or, "I want an x-ray," and there is a temptation, under pressure of numbers, to give way to their demands. Our advice is often ignored, particularly if it involves any personal effort on the patient's part. Influenced by the popular press and by certain speakers on the radio and television, we are often regarded as incompetent and negligent.

Witness the results. A once-noble profession is degenerating into a lowly form of shop assistant. We are finding it increasingly difficult to practise good medicine in this Utopia for the malingerers, fools, selfish neurotics, and barrack-room lawyers. The only solution, if we are to restore the fallen status and standards of our profession and at the same time to protect the interests of genuine patients, is to withdraw completely from the N.H.S. Let there be a Government-financed scheme with payment per item of service for the disabled, the chronic sick, and persons receiving National Assistance. Essential and life-saving drugs, and only such drugs, might well be subsidized by the Government. Hospital services could also be financed by the Government, but the patient must pay according to his means. The claim for increased remuneration must not be allowed to cloud the vital issue—the fate of the medical profession under the N.H.S.—I am, etc.,

Kingsbridge, Devon.

R. D. FRANCE.

SIR,—It seems a pity that the recent negotiations between the profession and the Government should have been overshadowed by the question of remuneration. The main issue is surely the impossibility of running an efficient Health Service under present conditions, and that doctors, under any circumstances, should refuse to prolong this monstrously extravagant system. By implying that salaries are the real contention, they will find themselves a little embarrassed, if their demand is acceded to, in persisting in withdrawal from the N.H.S. For, *au fond*, no salary increase can compensate the frustrations of present-day practice. I suppose the only saving hope is that no Government can afford to spend more than £600m. with economy and social morality at its present ebb.—I am, etc.,

London, N.21.

D. O. HANCOCK.

SIR,—May I state with the greatest possible emphasis what I and many colleagues are convinced is the fundamental evil of the present Health Service? The question put by Dr. S. Wand to the G.M.S. Committee (quoted in the leading article "Action and Reaction," *Journal*, March 2, p. 508), "... whether we can go on working for such an employer..." touches on it, but not strongly enough. We must not go on working for any employer.

The inescapable truth is that the essential doctor-patient relationship is impossible if the doctor is an employee, above all if the employer is any politician or political body—whether minister (Prime or Health), or executive council, or any other power group. We must be in direct contact with our patients, with no third party intervening. We can and should run our own Health Service, making it clear that it is for the benefit of the patients—not ourselves. It would be cheaper and far more effective than the mess that the professional politicians have forced on the country. I am in agreement with the ideas expressed in the letter from the younger practitioners of Nottingham (*Supplement*, March 2, p. 102).—I am, etc.,

London, N.W.3.

A. DALBY.

Remuneration Claim

SIR,—It is being suggested that our remuneration should be compared with that of other professions. May one make an urgent plea that it should rather be compared with the pay of manual workers and artisans? There was a time when one could employ a full-time maid for a weekly wage equal to what oneself received for a single night visit. Two such maids and one was able to have full service in one's home. To get the same service to-day one would have to pay out weekly one's gross income for looking after ten or a dozen patients for a whole twelvemonth. Once upon a time a man would do a day's work in one's garden gladly for the amount which one received for a single visit to a patient. To-day the gardener will expect more for his day's work than the doctor receives for a year's attendance on one patient. A man would readily clean a car for an amount equal to that received for a single surgery consultation. To-day he expects for the same service more than half a doctor's gross income for tending one patient for one year. As a result one can no longer afford to pay for these services, but must carry them out for oneself. The time not spent actually in the care of patients is filled with these chores—alone or helping a hard-pressed, overworked, and quite unpaid wife. There is no proper time for the sort of recreation needful if one's mind—the chief instrument of one's work—is to be maintained at concert pitch. There is no time for the professional reading which is absolutely necessary if one's efficiency and skill in work are to be kept at a proper standard. Small wonder that we succumb so easily to the blandishments of the drug advertisers—to the great loss of the country's purse, and even at times to the direct detriment of the individual patient.

Since we are members of a learned profession there must be a dependence between our standard of living and our efficiency. If the community insists on lowering the one, then it automatically lowers the other, to its own great loss.—I am, etc.,

West Bromwich.

D. SAKLATVALA.

SIR,—May we deplore the continued use of the word "strike" by the lay public, and even by members of the medical profession, when discussing the question of resignation? We are surprised that the B.M.A. has ignored the repeated references to "the doctors' strike" in the daily press. By allowing this inaccuracy to persist, the B.M.A. condones misrepresentation of our case and thus encourages alienation of public opinion. Our threat is one of resignation. We should take care to see that it is always described as such.—We are, etc.,

Salisbury.

C. J. R. ELLIOTT.
D. M. STIBBS.

SIR,—Amid all the clamour and publicity surrounding the dispute between the doctors and the Government, a most important point has not been given due emphasis either in broadcasting or in the press. The Prime Minister, in the House of Commons, denied any "contractual obligation" to the profession. This statement removed the only form of contract that ever existed between the two parties. Would anybody be prepared to work under these conditions?—I am, etc.,

Chandlers Ford, Hants.

J. S. BROCKET.

SIR,—We seem to be holding a pistol to the head of the Minister of Health, but have we made sure that it is loaded? My newspaper informs me that there will be a unanimous withdrawal of services, but I know this to be untrue, as I shall not withdraw mine.

An important point, perhaps overlooked, is that the most active co-operation of our patients will be needed if charges for services are to be made (as suggested by many of your angry correspondents), and I see no indication that our arguments have such force that the public will support them with their own money until the Minister is brought to heel. I am still serving my apprenticeship in general practice, and

have no direct knowledge of conditions prior to 1948, but many of the complaints of older established practitioners seem to me quite unwarranted. I should like to take up one or two. Of course we should like more money, so would everyone, but the need is not so urgent. Most practitioners appear to me to live quite well, and much of the extra money will simply be transferred from the Minister of Health to the Chancellor of the Exchequer. We all know that our comparative standard of living has fallen, but it gives some pleasure to see miners and farm workers living more reasonable lives; most of our patients do not wish to return to pre-war ways, even if we do. The doctor-patient relationship is said to have altered, and, while remembering that such a state is not brought about by one of the parties alone, it is also well to realize that there has been a general levelling up in society and that it is salutary if patients keep us alert, and occasionally have the impertinence to ask questions without accepting our every remark as oracular. And it cannot be other than to the general good that adequate advice and treatment are no longer even partially dependent on a patient's having an adequate income.

The amount of correspondence that the wage claim has produced is evidence of great unrest in the profession, and it would seem reasonable that the incontrovertible claims of junior hospital staff should be met forthwith (these are in danger of neglect by being associated with a debatable claim); and that the Royal Commission should have wide terms of reference to include an inquiry into the whole structure of the Health Service—the case for removing it entirely out of the ambit of politics seems very strong. I see no good reason for pursuing a bald wage claim, like a narrow-minded trade union, and hope that many other new and young doctors feel the same, and do not wish to imperil the very great national achievement of the Health Service.—I am, etc.,

Warboys, Huntingdon.

R. R. CHARLWOOD.

SIR,—Surely the time has come for plain thinking in this matter of remuneration: it is not a question of whether the nation's purse can stand a further twenty million pounds a year but whether Mr. Everyman's pocket can stand a penny or so a week, and the ample grounds for believing that the answer is "yes" have recently been strengthened by the knowledge (as a simple calculation from recently published figures will reveal) that every person in this country contributes about three pounds per annum towards the prosperity of his bookmaker. Since the question has been vulgarized by open discussion in the lay press (which I am sure none of us would have wished in the first instance) one marvels that the profession prefers to remain secretive rather than turn such publicity to good account by seeking to ensure that the public are better informed of the true facts. If we were strong and silent we could forgive ourselves, but, as a body, we would appear to be weak and silent.

Why have we not tumbled to the fact that our claim would be met were public opinion on our side? This it most certainly is not. I have yet to meet anyone outside the profession who knows how much of his weekly contribution goes to his doctor, or how much his doctor receives for looking after his health for a year; I have yet to meet the man who has not sympathized entirely with our claim when confronted with the answers. Even the thinking-classes are often under the impression that the much-vaunted "average salary" is a net income, and when they are told of the remuneration of hospital officers their response is one of amazement, not to say incredulity. Why have we failed to mobilize this great force? One would like to think that Dr. Wand's words over the wireless the other evening struck at the consciences of millions of our non-televueing patients. Can we help to prevent a repetition of public under-information by insisting that N.H.S. contributions and those for National Insurance are receipted by two separate weekly stamps?

The *per capita* fee is ludicrously low—could it be that my senior colleagues who accepted it at the inception of the

Public Health Service Members

Two members of Council are nominated and elected by members of the Association employed in the public health service as defined in By-law 1 (3). Candidates must be members of the public health service as so defined.

One Woman Member

One woman member of Council is nominated and elected by women members of the Association.

Nominations

The nominations must be on the prescribed forms, copies of which can be obtained on application to me. In the case of the 40 members to be elected by Divisions and Branches, the nomination may be by a Division or Division-Branch as such, or by not fewer than three members of any Branch in the Group.

A notice will be published by the Council in the *Supplement to the British Medical Journal* of April 27, 1957, of the candidates nominated. Where contests occur, voting papers containing the names of all duly nominated candidates will be issued on April 27, 1957, from the Head Office, British Medical Association, Tavistock Square, London, W.C.1, to each member in the Group, or to the public health service members, or to women members. A notice will be published by the Council in the *Supplement* of May 18, 1957, giving the results of the elections where there have been contests.

A. MACRAE,
Secretary.

Diary of Central Meetings**MARCH**

- 20 Wed. Joint Formulary Committee, 11 a.m.
- 20 Wed. Committee on Medical Education, 2 p.m.
- 20 Wed. Public Relations Committee, 2 p.m.
- 21 Thurs. G.M.S. Committee, 10.30 a.m.
- 27 Wed. Council, 10 a.m.
- 29 Fri. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.

APRIL

- 9 Tues. Conference of Advisory Councils on Occupational Health, 12 noon.
- 16 Tues. Scholarships Subcommittee, Science Committee, 11.30 a.m.
- 17 Wed. Occupational Health Committee, 10 a.m.
- 18 Thurs. G.M.S. Committee, 10.30 a.m.

Branch and Division Meetings to be Held

ALDERSHOT AND FARNHAM DIVISION.—At Cambridge Hospital, Thursday, March 21, 8.30 p.m., clinical meeting.

BIRMINGHAM DIVISION.—At 154, Great Charles Street, Birmingham, Tuesday, March 19, 8.30 p.m., meeting. Lecture by Dr. B. C. Tate: "Some Common Skin Disorders in Infants and Children."

BRIGHTON AND MID-SUSSEX DIVISION.—At Hotel Metropole, Brighton, Thursday, March 21, combined meeting with Pharmaceutical Societies of Brighton and Hove, 6.30 for 7 p.m., informal dinner; 8.30 p.m., discussion to be opened by Dr. Raymond Greene: "Hormone Therapy."

BRISTOL DIVISION.—At Main Physics Lecture Theatre, Royal Fort, Wednesday, March 20, 6.30 for 7 p.m., dinner; 8.30 p.m., meeting. Dr. Doris M. Odum: "Medical Aspects of Homosexuality." Members are invited to take one guest. Members of Bristol Law Society, the probation service, and senior members of the police are also invited.

CITY DIVISION.—At Mildmay Mission Hospital, Austin Street, E., Tuesday, March 19, 8 p.m., clinical meeting. Any B.M.A. members, but especially those of St. Pancras Division, are invited.

DONCASTER DIVISION AND DONCASTER MEDICAL SOCIETY.—At Danum Hotel, Doncaster, Tuesday, March 19, 7.30 p.m., dinner. B.M.A. Lecture by Professor D. M. Dunlop: "Changing Fashions in Therapeutics."

DUDLEY DIVISION.—At Station Hotel, Dudley, Thursday, March 21, 8 for 8.30 p.m., dinner dance.

EAST HERTS DIVISION.—At Hertford County Hospital, Tuesday, March 19, 8.15 for 8.30 p.m., meeting. Films presented by Dr. J. Currie.

ENFIELD AND POTTERS BAR DIVISION.—At Nurses' Recreation Room, Chase Farm Hospital, Enfield, Friday, March 22, 8 for 8.30 p.m., meeting. Clinical demonstration by Dr. R. M.

Mason: "Some Aspects of Rheumatoid Arthritis." Members of North Middlesex Division are invited.

GLASGOW DIVISION.—At Glasgow Regional Office, 234, St. Vincent Street, Glasgow, Friday, March 22, 8.30 p.m., annual meeting.

GLOUCESTERSHIRE BRANCH.—At Cheltenham General Hospital, Thursday, March 21, 6.15 p.m., meeting. B.M.A. Lecture by Dr. Peter Bishop: "Endocrine Therapy."

GRIMSBY DIVISION.—At Board Room, Grimsby General Hospital, Tuesday, March 19, 8 p.m., clinical meeting.

HARROGATE DIVISION.—At Leeds Regional Hospital Board Headquarters, Park Parade, Harrogate, Friday, March 22, 8.30 p.m., meeting. B.M.A. Lecture by Dr. S. T. Anning: "Common Skin Diseases."

HYDE DIVISION.—At Pack Horse Inn, Mottram, Wednesday, March 20, 8.45 p.m., scientific meeting. Talk by Dr. W. S. Brindle: "Midwifery in General Practice," to be followed by film: "Low Forceps Delivery—Using Pudendal Block Anaesthesia." Mr. T. B. Fitzgerald will make a few remarks on the film.

KESTIVEN DIVISION.—At George Hotel, Grantham, Thursday, March 21, 7.30 for 7.45 p.m., annual social evening. Guest speaker, Mr. A. Dickson Wright: "Oliver Cromwell's Head."

LAMBETH AND SOUTHWARK DIVISION.—At St. Thomas's Hospital, S.E., Tuesday, March 19, 7.30 for 8 p.m., clinical meeting.

MACCLESFIELD AND EAST CHESHIRE DIVISION.—At Cheadle Royal Hospital for Mental Diseases, Wednesday, March 20, 8.30 p.m., meeting. Talk by Dr. W. V. Wadsworth: "The Modern Mental Hospital."

MARYLEBONE DIVISION.—At Committee Room B, B.M.A. House, Tavistock Square, London, W.C., Tuesday, March 19, 8.30 p.m., meeting.

MONMOUTHSHIRE DIVISION.—At St. Mellon's County Club, Thursday, March 21, 7.45 for 8.15 p.m., dinner. B.M.A. Lecture by Professor W. Grey Walter: "The Human Engine." Members and their wives and guests are invited.

NORTHAMPTONSHIRE BRANCH.—At Board Room, Northampton General Hospital, Sunday, March 17, 8 p.m., meeting. B.M.A. Lecture by Dr. J. D. N. Hill: "Epilepsy."

NORTH MIDDLESEX DIVISION.—At Committee Room, North Middlesex Hospital, Silver Street Edmonton, N., Tuesday, March 19, 8.30 for 8.45 p.m., meeting. B.M.A. Lecture by Professor H. Scarborough: "Staphylococcal Fever."

NUWEXON AND TAMWORTH DIVISION.—At Newdegate Arms Hotel, Nuneaton, Saturday, March 23, dance.

OLDHAM DIVISION.—At Affion Club, Queen Street, Oldham, Monday, March 18, 9 p.m., meeting. Mr. A. N. Guthkelch: "What Use is Neurosurgery?"

ROCHDALE DIVISION.—At Carlton Ballroom, Rochdale, Friday, March 22, 8 for 8.30 p.m., annual dinner and dance.

SHEFFIELD DIVISION.—At New Lecture Theatre, Sheffield Royal Infirmary, Sunday, March 24, 3 p.m., meeting of North Midlands Faculty of College of General Practitioners. First Pfizer Postgraduate Lecture by Dr. H. R. Vickers. All medical practitioners in the area of the Division are invited.

SHROPSHIRE AND MID-WALES BRANCH.—At Lion Hotel, Shrewsbury, Friday, March 22, 7.30 for 8 p.m., annual dinner dance.

SOUTHAMPTON DIVISION.—At Polygon Hotel, Friday, March 22, 7.30 for 8 p.m., annual dinner and dance.

SOUTH MIDDLESEX DIVISION.—At Anchor Hotel, Shepperton, Wednesday, March 20, 9 p.m., meeting. Talk by Dr. A. K. Mant and Detective-Inspector Hannan: "The Tow Path Murders" (with lantern slides). Members may bring one guest of either sex at their own risk.

SOUTH SHIELDS DIVISION.—At Ingham Infirmary, South Shields, Wednesday, March 20, 8.30 p.m., meeting. Address by Mr. L. P. Lossman: "Headache."

SOUTH-WEST WALES DIVISION.—At Stepney Hotel, Llanelli, Thursday, March 21, 7.30 for 7.45 p.m., dinner-meeting. Dr. Sheila Sherlock: "Acute Liver Failure."

SWANSEA DIVISION.—At Osborne Hotel, Mumbles, Thursday, March 21, 7.30 for 8 p.m., dinner. B.M.A. Lecture by Mr. J. Ivor Griffiths: "Upper Respiratory Sepsis."

WEMBLEY DIVISION.—At Gymnasium, Wembley Hospital, Tuesday, March 19, 9 p.m., meeting. B.M.A. Lecture by Dr. C. Keith Simpson: "Crime and the Doctor" (illustrated). Members of Willesden, Hendon, Hampstead, and Harrow Divisions are invited.

WEST BROMWICH AND SMETHWICK DIVISION.—At "The Red Cow," High Street, Smethwick, Friday, March 22, 8 p.m., annual dinner dance. (Dinner at 9 p.m.)

WIGAN DIVISION.—At Haigh Hall, Wigan, Thursday, March 21, 8.15 p.m., joint meeting with Wigan Law Society. Buffet supper. Address by Mr. W. J. H. Palfrey: "Organization of a Murder Investigation in a Country Force."

The annual general meeting of the Oxford Region Registrars Group will be held in the Committee Room, Radcliffe Infirmary, Oxford, on Wednesday, March 20, at 8.15 p.m.

Correction.—In the report of the meeting of the Public Health Committee (*Supplement*, March 9, p. 109), the remarks ascribed to Dr. Llywelyn Roberts should have been ascribed to Dr. J. B. Morgan.

ANNUAL MEETING: NEWCASTLE UPON TYNE, JULY 10-19**SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL**

LONDON SATURDAY MARCH 23 1957

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**GENERAL MEDICAL SERVICES COMMITTEE
REPORT TO SPECIAL CONFERENCE**

Members are asked to keep this Report, which contains matters which will be referred to Divisions.

The General Medical Services Committee's report to the special conference of local medical committees to be held on April 30 to consider the remuneration claim has been sent to all local medical committees.

History of Claim

Recalling the history of the present remuneration claim on behalf of hospital medical staffs and general practitioners, the Committee emphasizes to its constituents that the reports of the two Spens Committees are the foundation of the claim. The profession entered the Health Service in the belief that the Government's acceptance of the Spens recommendations would end the arguments that had taken place in the past over medical remuneration.

That Governments of the day accepted the Spens Reports was amply proved by various ministerial statements from 1946 onwards, the most recent being in a letter dated May 22, 1950, from the Permanent Secretary of the Ministry of Health to the B.M.A.:

The Minister agrees that the Spens Report remains the basis of the remuneration of general medical practitioners until such time as after the usual consultations some other basis is substituted.

In spite of the Danckwerts award, which laid down a betterment factor appropriate to the year ending March, 1951, the profession some five years later found its remuneration was again substantially below the standards laid down in the Spens Reports. The Committee states in its report that it "had been reluctant, in view of the national situation, to press its case, but by January, 1956, it felt compelled to seek an adjustment in remuneration to enable doctors to keep abreast of the steep and continuing rise in the cost of living since April, 1951." The profession's claim in its final form (see *Supplement*, July 28, 1956, p. 75) was submitted to the Minister of Health and Secretary of State for Scotland in June, 1956. It asked for an increase of not less than 24%.

Moral and Contractual Obligation

The G.M.S. Committee points out that the profession's Negotiating Committee, on the advice of Sir James Millard Tucker, Q.C., was doing no more than to seek the fulfilment of the Government's promises made to the profession when

Report of the Interdepartmental Committee on Remuneration of General Practitioners, 1946. H.M.S.O.
Report of the Interdepartmental Committee on the Remuneration of Consultants and Specialists, 1948. H.M.S.O.

it agreed to enter the National Health Service in 1948. In other words, the Negotiating Committee maintained that the Government not only had a moral obligation to the profession but also an overriding contractual obligation on account of its acceptance of the Spens Reports. To this the Ministers replied in July that the Government could not accept the premises on which the claim was based.

The Government took the view that "the remuneration of the medical profession, like that of others, must be determined from time to time in the light of all relevant circumstances," and "that in present circumstances it would not feel justified in giving consideration to any claim for a general increase in medical remuneration."

This reply was quite unacceptable, the G.M.S. Committee states in its report, for the country's economic position over the period covered by the claim suggests that the Government could have advanced the same argument at any time. Against a background of substantial increases in many other fields, including the Civil Service, the answer was particularly unconvincing. It seemed that the Government was evading its obligations by maintaining that the very cause of the profession's claim—inflation—had itself created a situation which prevented even the merits of the case being considered.

Legal Memorandum

The Committee's report goes on to record discussions with the Minister of Health in August, in which he said that the Government took the view that the Spens Reports merely established a starting-point for entry into the Health Service and they did not entail the automatic and periodic adjustments envisaged by the profession. Nevertheless the Minister invited the Negotiating Committee to submit a supplementary memorandum amplifying the legal aspects of its claim.

This memorandum (see *Supplement*, November 3, 1956, p. 173) was sent to the Ministers in September. It pointed out that the terms of reference of the general-practitioner Spens Committee required it to pay due regard "to the desirability of maintaining in the future [G.M.S. Committee's italics] the appropriate social and economic status of general medical practice and its power to attract a suitable type of recruit to the profession." That the recommendations in the Spens Committee's report were in fact framed with this intention is corroborated, in the opinion of the G.M.S. Committee, in numerous parts of the Spens Report. It was also significant that on no occasion throughout the proceedings before Mr. Justice Danckwerts did the Government attempt to controvert the principle of periodic and continuing adjustment, and if further evidence was needed it could be found in the Ministry's own handbook, published in 1955, which states:

The central pool is now calculated on the basis of the estimated net remuneration appropriate for general practitioners

in 1939 (as recommended by the Spens Committee in 1946) together with a betterment factor taking account of the changes in the value of money since that time.

The Ministers' answer to this memorandum was that they were still of the opinion that no contractual obligation existed, but if the Negotiating Committee did not accept this view the matter could be tested in the courts.

The Negotiating Committee replied that it had never alleged the existence of a contractual obligation which could be enforced by legal proceedings in the ordinary way. What, however, was vital to the profession's case was that the contractual obligation existed, whether or not it was enforceable in the courts, and that implicit in that obligation was the Government's moral obligation to give effect to the recommendations of the Spens Committees and to implement the promises which were made to the profession when it entered the National Health Service.

Fruitless Discussions

At a further meeting with the Negotiating Committee's representatives on January 4 the Minister repeated that, according to legal advice he had received, the Government was under no contractual obligation to the profession and the Spens recommendations did not require periodical adjustments of remuneration in the way that the Committee contended. As to the merits of the claim, he could not even begin to examine these in the present economic circumstances of the country, since to do this, in his view, would start a "chain reaction" in other fields which would endanger the country's financial stability.

At the end of a fruitless discussion, in which the Negotiating Committee's representatives emphasized that it was not merely a dispute about money but a crisis of confidence which went to the roots of the relations between the medical profession and the Government, the Minister invited the Committee's representatives to meet him again after he had given further thought to the problem and discussed it with his colleagues.

The Negotiating Committee's representatives met the new Minister of Health, Mr. D. Vosper, on February 20. Mr. Vosper reminded the deputation that his predecessor had made it quite clear that in present economic circumstances the Government could not consider the claim on its merits. He pointed out that the economic position had not changed since January and therefore there could be no question of reversing the decision. He then said that the Government had decided that the time was opportune for a full review of medical remuneration through an independent inquiry which would take into account the position of the medical profession in relation to other professional classes in the community. Accordingly the Queen had approved that a Royal Commission should be appointed for this purpose.

Attitude to Royal Commission

This unilateral decision on the part of the Government was received, the G.M.S. Committee report states, with dismay and anger by the members of the deputation. "The profession," it declares, "was confronted with a *fait accompli* which would precipitate the gravest crisis in the profession since the National Health Service began, and the Minister must be responsible for the consequences."

The report goes on to record that the Minister made it clear that the Government could not agree in advance to accept the recommendations of the Royal Commission. Indeed, he admitted that, if the Commission reported in the profession's favour and at the time of the report the economic position in the country had not improved, the Government would hold the same view as it did to-day. "In other words," states the report, "the Government's attitude was that, despite increases given to other sections of the community and substantial increases in the cost of the N.H.S. itself, doctors must wait indefinitely for justice to be done." Negotiations had been refused.

Following this deadlock the Negotiating Committee requested its joint chairmen to send an immediate letter to

the Prime Minister asking that at this late hour the possibility of arbitration be considered. The Prime Minister replied and the letters were published (see *Supplement*, March 2, p. 100).

Meanwhile, the G.M.S. Committee met on February 21 and considered the implications of the Royal Commission. In its report to the special conference, the Committee states that the Government's decision meant that it had repudiated its promises to the profession when it entered the Service. In other words, Spens, and all that it means to the profession, was in danger of being lost and with it the basis of the Danckwerts award—a judicial interpretation of the Spens formulae.

Resignation Advised

The Government's decision meant that the adjustment of the present rates of remuneration, which are related to conditions obtaining in April, 1951, was to be postponed for an indefinite period. Even then there was no guarantee that any increase would be recommended, or, if recommended, accepted by the Government of that day.

Above all, says the Committee, it meant that the profession could have no further trust in the Government. As recently as 1950 an assurance was given by the Ministry of Health that the Spens Report remains the basis of remuneration of general medical practitioners until such time as after the usual consultations some other basis is substituted. No such consultation had taken place. The Government, by its unilateral decision, had repudiated this promise, broken its contract, and committed a flagrant breach of faith.

The General Medical Services Committee goes on to report its decision that, unless the Government agreed to an immediate and satisfactory settlement of the profession's claim or agreed to refer the dispute to arbitration, general practitioners throughout the country should be advised to send in their resignations from the Service.

Interim Adjustment

The Prime Minister's letter in reply to that of the joint chairmen of the Negotiating Committee was the first indication that the Government did not preclude some interim adjustment of doctors' remuneration. The joint chairmen interviewed the Minister of Health on February 28, but the Minister could give no indication of what the interim adjustment might be, nor on what premises it could be based. He again stressed the Government's offer to make an immediate adjustment in the remuneration of junior hospital staff, up to and including the rank of senior registrar, and he hoped that discussions in Whitley Council would proceed without further delay.

It appeared to the G.M.S. Committee that the Prime Minister's statement meant little more than an offer to make some interim adjustment in remuneration at a later date, but the Government was not prepared to commit itself on the amount of the adjustment, or its relationship to the main tenets of the profession's claim. There was nothing to indicate that there was any possibility of an immediate and satisfactory settlement, nor that the claim would be sent to arbitration.

Meeting on February 28 (see *Supplement*, March 9, p. 105), the Council of the Association received a report of the action taken by the G.M.S. Committee. It endorsed the Committee's decision to convene a special conference and to recommend to that conference that, unless the Government agreed to an immediate and satisfactory settlement of the profession's claim, or to arbitration, general practitioners would be advised to send in their resignations from the service.

Terms of Reference

In its report the G.M.S. Committee records the terms of reference of the Royal Commission as follows:

To consider:

(1) How the levels of professional remuneration from all sources now received by doctors and dentists taking any part in the National Health Service compare with the remuneration received by members of other professions, by other members

of the medical and dental professions, and by people engaged in connected occupations;

(2) What, in the light of the foregoing, should be the proper current levels of remuneration of such doctors and dentists by the National Health Service;

(3) Whether, and if so what, arrangements should be made to keep that remuneration under review.

And to make recommendations.

Commenting on these, the Committee gives an opinion by the Association's legal advisers:

(1) On these terms of reference there are three points of outstanding significance:

(a) The Government have taken it upon themselves to prescribe and limit the considerations which the Royal Commission should take into account instead of leaving it to the Commission to consider all the relevant factors. (b) The limitations which the Government have imposed will arbitrarily and drastically restrict the considerations which the Royal Commission are permitted to take into account. (c) The limitations are likely to be gravely detrimental to the future economic and social status of the medical profession if not of the professional classes generally.

(2) As to the first point, it is sufficient to say that the Government, by themselves prescribing the considerations which are relevant to doctors' remuneration, are prejudging the very issue which ought to be left to the Royal Commission to consider. The terms of reference, in order to be fair, clearly should have enabled the Royal Commission to take into account all relevant factors. By depriving the Royal Commission of the right to take into account all relevant factors, the Government are depriving the Royal Commission of the power to act in accordance with the principles of justice and are setting themselves up as a judge in their own cause.

(3) The extent of the limitations which the terms of reference impose can be simply illustrated by comparing them with the terms of reference of the Spens Committees. Each of the Spens Committees was instructed to obtain whatever information and evidence it thought fit and to have regard to the desirability of maintaining the proper social and economic status of the type of medical practice with which the Committee was concerned, and the power of that type of practice to attract suitable recruits. The social and economic status of doctors should obviously be considered, not only in relation to other doctors, or other professions, or other persons employed in the National Health Service, but also in relation to farmers, business men, civil servants, and all the many other non-professional classes who form part of the social and economic structure in which the doctors have to live. In the wide field of comparison which ought to have been left open to the Royal Commission, the Royal Commission might well have come to the conclusion that some comparisons were more cogent than others; but those are matters which should have been left to the Royal Commission to consider for itself.

(4) If one ignores for the moment the reference to "connected occupations," which cannot by itself have the effect of materially widening the scope of the Commission's inquiries, it is obvious that the purpose of the terms of reference is to put the professions into a self-contained group and to exclude consideration of the relationship between that group and other sections of the community. If, therefore, the professions are losing ground in their social and economic status as a whole, these terms of reference are calculated to intensify that process by precluding an appeal to external standards. The process for which a precedent is here created could react most unfavourably on the terms of service of other professional men in public employment.

Joint Chairmen Meet Prime Minister

The joint chairmen of the Negotiating Committee, Sir Russell Brain and Dr. A. Talbot Rogers, met the Prime Minister on March 12.

They pointed out to the Prime Minister that the terms of reference of the Royal Commission had been interpreted as excluding from consideration many factors which had been placed before the Spens Committees. The Prime Minister thought that this view was based on a misunderstanding, and agreed that an exchange of letters should remove doubts on their right interpretation.

The joint chairmen reported that it was clear to them that the Government did not regard immediate arbitration as an appropriate method of settling the present claim. The Prime Minister told them that he hoped very much that the

Royal Commission would recommend a method of adjusting remuneration inside the Health Service for the future.

The Prime Minister went on to say that the interim adjustment raised more complex issues than the immediate award to the junior hospital staffs. He was giving it his personal consideration, but could not commit himself at the moment to a date for the announcement of the Government's intentions. The joint chairmen stressed the desirability of these being made known in advance of the Special Conference of Local Medical Committees in April.

Repudiated Promises

The G.M.S. Committee says in its report that the results of the meeting with the Prime Minister are disappointing and lead to no fundamental change in the situation. "The most that can be said is that, from stating that an interim adjustment was 'not precluded,' the Prime Minister has now agreed to make a statement at some indefinite date in the future about the amount and method of carrying out the adjustment."

"The Government's insistence upon still further delay before making any offer which might lead to a satisfactory settlement, coupled with the fact that the terms of reference of the Royal Commission are detrimental to the profession's interests, creates a very serious situation. Indeed, all the disastrous events of the past few months lead the Committee to the inevitable conclusion that the Government is determined by the device of a Royal Commission to rid itself of the embarrassment of the Spens Reports and the Danckwerts award and to replace them by a new basis of remuneration less favourable to the profession. That this entails the repudiation of promises made in 1948 and again in 1950 seems to have caused the Government no concern but has angered the profession to the point of resignation. *The Government has refused to discuss the merits of the claim, refused to negotiate, and refused to arbitrate.* The issue is now far more than one of money."

It is possible, says the Committee, that the Government will come forward with some kind of offer before the Special Conference meets on April 30, but it holds the view that the profession would be wise to examine any such offer in the light of the wider issue involved—namely, the Government's clear and ultimate intention to discard the recommendations of the Spens Report and the Danckwerts award.

Recommendations

The Committee recommends to the special conference that:

As there has been neither a satisfactory settlement of the profession's claim nor the submission of that claim to arbitration (1) the resignations of all N.H.S. general practitioners be collected forthwith and held, and (2) the Committee's plan for a progressive withdrawal of general practitioners from the National Health Service (as outlined in the appendix) be put into effect until such time as a satisfactory settlement is achieved or the dispute is referred to arbitration.

ORGANIZATION OF GENERAL PRACTICE IN EVENT OF RESIGNATION FROM SERVICE

The following document has been sent to all local medical committees as an appendix to the G.M.S. Committee's report to the special conference.

THE PLAN

Progressive Withdrawal

The British Medical Guild will take steps to obtain the resignations of all N.H.S. general practitioners. These resignations will be collected and held and put into effect initially in a number of selected areas. The number of selected areas will be progressively increased if the need arises.

Practitioners in the areas selected—and in these only—will be asked to notify executive councils on July 2 of their

intention to withdraw from the Medical List from October 2. They will not be asked to withdraw from the Obstetric List.

This means that from October 2, with the exception of maternity medical services, general practice under the National Health Service will *cease* in these areas. General practitioners will continue to treat their patients under the following arrangements:

During the month of October former N.H.S. patients will be treated *privately* but no private fees will be asked of them. The public will be informed that doctors in these areas are anxious to give the Government one last chance to honour the promises made to the profession when they entered the N.H.S. in 1948, and that they are doing everything possible to avoid a position in which their patients suffer financially.

Nevertheless, if the Government still declines to agree to a satisfactory settlement or to arbitration it will be necessary after November 1 for general practitioners in those areas to charge their patients a *standard token fee* which it is recommended should be:

- 5s. 0d. a consultation ;
- 7s. 6d. a visit.

Patients should be given receipts for these fees, and advised to take them to the nearest National Insurance office in order that the Government may have an opportunity of refunding the sums involved. Doctors will, of course, have discretion to waive or modify these fees in special cases such as old-age pensioners, and in rural areas it may be necessary to increase the fees in cases where excessive travelling is involved, or drugs are provided by the doctor. These arrangements do not, of course, preclude the introduction of contributory schemes for medical treatment in areas where such arrangements may be practicable.

If a settlement is not reached within a reasonable time, general practitioners will be compelled to make full economic charges for their services.

Provision of Drugs

General practitioners who resign from the Service can no longer issue prescriptions on Form E.C.10.

They will, therefore, be advised to issue prescriptions on private forms for the duration of the emergency.

It will be explained to the public that although the Government has broken its contract with the doctors it still has an obligation to the public. It is, therefore, for the Government to decide whether it will refuse to accept prescriptions issued in this way.

Certification

No National Insurance certificates will be issued. General practitioners will issue their own private certificate forms.

Maternity Services

It will be explained to the public that the profession is determined that no expectant mother will suffer in any way by the withdrawal of her doctor from the National Health Service.

General practitioners in the selected areas will be advised not to resign from the Obstetric List, and all doctors will be advised to continue to provide maternity medical services, and to claim the appropriate fees from the executive council in the ordinary way.

Financial Position of the Doctor

General practitioners in the selected areas who resign from the Medical List will be given *financial support*, and their remuneration will be supplemented from the Defence Trusts in accordance with the amount of their last quarterly cheques from the executive council *less* the total amounts received from private practice and maternity fees.

The Defence Trusts have agreed to use their reserves to provide the required financial supplement, but doctors in *all areas* are now being asked to agree to an *additional levy* of 3d. per patient per quarter. This will be paid into a special

account and any balance not used will be repaid when the dispute is settled.

In this way *all doctors* will have an opportunity of contributing to the fight and of ensuring that resignations can be put into effect in an increasing number of areas.

How the Plan will Work

General practitioners in *all areas* will be asked to support the plan and be invited to give an undertaking that they would be prepared to *send in their resignations to be held for use at any time* if required to do so. With these conditions additional resignations in the Committee's hands an early announcement will be made that a number of areas have been selected and that, after three months' notice and with effect from October 2, N.H.S. general practice will cease in those areas. The identity of the areas will not be published until July 2. The Government will be informed of the overall figure of resignations held and that general practitioners in an increasing number of areas will be advised to tender their resignations should this prove necessary. In this way, large areas of the country will eventually be outside the N.H.S. and the doctors concerned will have their remuneration supplemented from the Defence Trusts through its reserves and from contributions received from the other areas.

Compensation

Hitherto, the interpretation placed on the N.H.S. Compensation Regulations by the Ministry has meant that compensation has been paid with little or no delay immediately a general practitioner's contract with the executive council is terminated. Even in cases where the Department have suspected that the doctor might re-enter the list in the not too distant future they have made the payment. Only if it is known at the time of application that a doctor is merely changing from one area to another has payment been withheld.

There is some reason to believe that the Government—during the emergency—might seek to withhold compensation by drawing a distinction between *retirement* and *temporary withdrawal* from the Service.

In the plan now recommended whereby the doctors concerned are given financial security, it is doubtful whether the payment of compensation is of great significance.

Further information on this subject will be issued later, but for the time being general practitioners in the areas selected are advised *not* to submit a claim for the immediate payment of any compensation due to them.

Superannuation

Those doctors in the selected areas who remain on the Obstetric List will retain their superannuation rights. In the case of other doctors, the position is that, if, during a temporary break in service, a doctor does not receive a refund of contributions and returns to superannuable employment *within 12 months*, his rights are *secure* and he continues from where he left off.

It can, therefore, be said that so far as the present plan is concerned, doctors' superannuation rights are completely safeguarded.

Additional Safeguards

The date of resignation in the first selected areas has been planned to ensure that the doctors concerned will have at that moment just received payment from the executive council for the preceding quarter.

In addition, it is aimed to pay out the final settlement in respect of the financial year 1955-6 around this time.

Doctors employed by local authorities and hospitals have given an assurance that they will refrain from any steps which might embarrass their general practitioner colleagues.

Industrial medical officers will be asked to give a similar undertaking.

Finally, doctors situated in the fringes of the selected areas will be asked to give an undertaking that they will *not* accept new patients from the selected areas on their lists, or to treat them as temporary residents under the N.H.S. for the duration of the emergency.

No Detriment Clause

A number of difficulties will inevitably arise during the course of the emergency.

No settlement with the Government will, therefore, be agreed unless it contains a general no detriment clause.

Summary

It is becoming increasingly clear that the Government will not yield unless the profession is not only firm in its intentions but also demonstrates beyond all doubt that it has a workable plan.

The Committee is confident that the plan submitted is workable.

It ensures a progressive withdrawal from the Service with financial support for the doctors concerned. It demonstrates that the profession has no intention of submitting itself to Government dictation, and is fully prepared to organize an alternative service until such time as it can be certain that the Government is prepared to fulfil its obligations.

Full details about the number and method of selecting the areas to take part in the progressive withdrawal will be announced at the appropriate time.

GENERAL MEDICAL SERVICES COMMITTEE EMERGENCY MEETING

An emergency meeting of the General Medical Services Committee was held at B.M.A. House on March 14 in order to discuss the remuneration claim, and to decide on the advice to be given to the Special Conference to be called in April.

Pointing out that basically he did not consider that the situation had changed at all since the previous meeting, the Chairman, Dr. A. TALBOT ROGERS, said he proposed to speak fairly fully about the meeting which he and Sir Russell Brain had with the Prime Minister.

Meeting With Prime Minister

That the Prime Minister had agreed to see them in such a short time had given considerable satisfaction to the profession, whatever may have been the outcome of the meeting. The fact that for the first time in the history of the negotiations it had been possible to go right to the head of the Government and to have an interview on a friendly and sympathetic basis, without any questions being barred or sidestepped, should not be discounted.

They were also told that registrars and junior hospital staffs were to be offered 10% as from April 1, and that it would be offered immediately without going through the Whitley machinery. No objection was raised to that, said Dr. Rogers, because both Sir Russell Brain and himself took the view that if that limited group were to be given some much-needed relief, the sooner it received it the better, and the advantage of having a definite date on which it started was very considerable. They made it clear that the offer was regarded as being without prejudice to the future claim on behalf of the whole profession. It was probable that in any correspondence there might be between the Joint Consultants Committee and the Ministry, that would be put in black and white.

The Prime Minister was left without any doubt that the special conference would be called in April and would be advised by the Committee what course of action it should take. There was no suggestion that the Prime Minister's offer of an interim settlement was in any way going to influence the Committee in calling the profession together to discuss the whole situation, and to advise strong action unless their rightful demands were settled.

The Chairman took the view that the emphasis had shifted a little, for three weeks earlier Mr. Vosper, the Minister, said that he was not in favour of any arbitration or interim settlement, but the Prime Minister had taken the matter a stage further by saying that an interim settlement was not precluded. It was true that it was vague and did not go very far, because it was not known when and how it would

happen; but at least it was something positive rather than negative. The Prime Minister was seized of the necessity for the Committee to know something more before the April conference, and Dr. Rogers hoped that the Government were in no doubt of the need for not delaying the matter indefinitely.

"I do not see anything in the discussion we had with the Prime Minister that in any way suggests to me that I should say to you that you should delay or alter your plans," continued the Chairman.

Exchange of Views

The Chairman said that it was an unhurried meeting. The Prime Minister was accompanied by Mr. Vosper and one of his private secretaries. There were no civil servants present.

Sir Russell Brain and he had put forward the oft-stated views of the profession that it came into the Service on the basis of Spens, and had believed, until resistance was encountered the previous year, that Spens provided a yardstick on which claims for changes in remuneration could be based. Sir Russell Brain brought in many of the arguments, and the Chairman said that he had taken the line that it seemed particularly unfair on the profession because patience and restraint had been exercised, and they had not come forward, as might well have been the case after the Danckwerts award, to the Government of the day, year by year, and said, "This year we need another 3% or 4% to catch up with the inflation which is taking place." The Prime Minister said he believed that if it had been possible year by year to make an adjustment it might have been easier to do so. That, of course, overlooked the fact that when Mr. Macleod was Minister the profession would have been unlikely to get that year-by-year adjustment.

The Prime Minister pointed to the economic position. Everything possible was being done to stop inflation getting worse. He went on to say of the Spens agreement that it could not be regarded as something akin to the Tablets of the Lord brought down from the mountain and valid for ever and a day. Dr. Rogers said that his reply to the Prime Minister was that the profession was composed of reasonable people, and it was realized that it might be necessary to re-adapt an agreement from time to time after ten years in the light of circumstances. He also pointed out that, until the Royal Commission had sat and until a different form of remuneration had been negotiated, if it were found necessary, there was still reason to hold to Spens, and the position was not altered even although, it was agreed, in any inflationary period it was difficult for any government to pin its obligations for ever.

The opportunity then arose, continued the Chairman, to speak about the terms of reference of the Royal Commission, and to point out that they had given rise to a great deal of disquiet in the profession. They were too restricted and prejudged the issue before the Commission started. The Joint Chairmen stressed the fact that they felt that, before any arbitration or Commission could decide upon what was right and proper so far as amounts of remuneration were concerned, all the different factors which made the profession of medicine very different from other professions had to be taken into consideration. In particular they mentioned the length of time of the doctor's training, the length of time it took the young doctor to establish himself after training, the hours he worked, and so forth, and expressed the view that many of those factors were not admissible under the present terms of reference of the Royal Commission.

The Prime Minister replied that he believed that all the points mentioned, together with others mentioned afterwards, such as the change in the value of money and the validity of the Spens Report, could be brought before the Royal Commission. It was pointed out to him that if that were the case it was not clear to the profession; and the Prime Minister, realizing that those fears were real ones, said he was willing for there to be an exchange of letters between himself, Sir Russell Brain, and the Chairman in

which there would be set out as fully as desirable all the points on which it was considered important to be certain that evidence could be given by the profession. If those points were admissible, he would say so in writing, and would do that with the full knowledge of the Chairman of the Royal Commission. That would materially alter the amount and type of evidence which the profession might be able to give to the Royal Commission.

Public Health Service

The Chairman said that the main discussion then really concluded, but one matter of vital importance came out, which he confirmed later by direct question to Sir John Hawton. It was not intended that the remuneration of any doctors employed in the Public Health Service should be considered by the Royal Commission. The only way in which that particular group of doctors would come in would be as one of the comparable professions, but not as one of the professions whose remuneration the Commission was set up to consider. That, said Dr. Rogers, would be a great disappointment to public health colleagues, who had hoped that their remuneration and future would have been discussed with the remainder of the profession and not as a separate group. It was felt, however, that the inclusion of the public health practitioners' remuneration would bring with it the necessity for so much more discussion and the calling of so much more evidence from other sources that it would inevitably delay the work of the Commission quite considerably.

Finally, the Chairman said he gained the impression from the Prime Minister that, although he was trying to hurry the Commission, it was unlikely that the Commission's work would take less than nine months or possibly a year.

Dr. A. BROWN asked whether in fact the Association or the General Medical Services Committee had yet decided to give evidence. The CHAIRMAN replied that no decision had been taken whether evidence would be given or not.

Dr. S. WAND, Chairman of Council, said he desired to know whether a Commission appointed by Her Majesty had necessarily to have regard to an exchange of letters which were not contained in the terms of reference. He raised the point because it was reported in the press on March 12 that Mr. Vosper, in a written reply, stated that the Royal Commission would normally be concerned with levels of remuneration and not with methods as such. Whether or not questions such as that referred to were within its terms of reference must rest with the Commission itself to decide.

In reply, the CHAIRMAN suggested that Mr. Vosper's written reply was something prepared in advance. Mr. Vosper had been present when the question was raised, and neither he nor the Prime Minister seemed to see any constitutional difficulty in the particular amplification of the interpretation of the terms of reference. As he had understood the Prime Minister, Mr. Macmillan said that if the profession would submit its letter he would consider it in consultation with the Chairman of the Commission and his reply would be made known to the Chairman of the Commission. That being so, one would have thought that it would be adhered to by the Chairman when advising his Commission on what evidence it was able to hear.

Replying to Dr. B. CARDEW, the CHAIRMAN said that Mr. Vosper had agreed that the whole of the Spens arrangement was something pertinent to be put in the letters.

Dr. W. G. HARDING asked whether, in view of the statement contained in the terms of reference of the Royal Commission that all doctors taking any part in the National Health Service should be considered, the point had been taken up with the Prime Minister.

The CHAIRMAN, in reply, said that he saw Sir John Hawton and asked him whether the public health doctors were going to be brought in, and he replied that he thought that the terms of reference had been framed to exclude them. The Chairman pointed out that surely the terms of reference brought in a high proportion of public health officers, to which Sir John replied that it must have been an error.

Dr. W. G. HARDING said that those engaged on the public health side considered themselves to be doctors. "We told you that a week or two ago in our statement of support," he added, "and we would deplore it if we were to be sacrificed on the altar of expediency."

Interim Payment

Dr. F. GRAY suggested that there was nothing which altered the decision that had already been taken, and asked whether a statement could not be made to the effect that the profession was going ahead.

Dr. H. GUY DAIN said it would appear that the Joint Chairmen had come back from their interview with the Prime Minister without an answer to the question when the interim payment would come on and how much it would be.

The CHAIRMAN, in reply, said that the Prime Minister had sidestepped them. It was simple to say straight away that the junior hospital staff should have a 10% increase, but the position of the remainder of the profession was more complicated than that. There had to be further study of it. When the Prime Minister was pressed on when that would be he left little doubt that it would not be before April, but he would not be tied to a definite date. All he would say was, "I shall make a further statement in due course."

It was a fair inference to draw, said the Chairman, that, having fixed 10% for the group which the Prime Minister had all along said was in most need, it was unlikely that he would be thinking in terms of a larger percentage when it came to the remainder of the profession.

Dr. A. MACRAE said that the Prime Minister, when asked in the House whether the terms of reference were sufficiently comprehensive, replied that he thought they were, but that if they were not he would have to do something about it.

Dr. F. M. ROSE asked whether the Prime Minister gave any indication whether, if there were an interim settlement, it would be applied to any particular section of general practitioners, or whether it would be coupled with any conditions in connexion with distribution.

The CHAIRMAN replied in the negative.

Dr. O. C. CARTER recalled the Chairman's opening words that there was little or no change since the last meeting, and said that in his view there was a profound change in the political and economic climate of the country. "I have a feeling," he continued, "that it may affect the attitude of the public towards us unless great care is taken to see that we are not lumped in with engineers and others."

There were two main interests. One was the immediate interest of those doctors who were finding it difficult to carry on at their present level of remuneration, and the second, and more serious, interest was the future of medicine. "I should like to be certain that there is no possibility of selling our heritage for a mess of pottage," said Dr. Carter. "I should be in favour of informing the Government that, although we have no control over its action in appointing a Royal Commission, we are not particularly interested in it because we have an agreement about the methods of fixing the remuneration of doctors." It would be a difficult situation if the profession had to disown the Commission's findings, and it would be better from the beginning for the profession to dissociate itself from it and not give evidence before it.

The CHAIRMAN said it would seem that the Committee had decided that no fundamental change had taken place, and that it had to go forward with its own preparations. (Agreed.)

Recommendations to Conference

The Committee then went on to discuss action to be taken, and the recommendations that it would make to the special conference of local medical committees on April 30. A summary of the Committee's report to the conference, together with its recommendations and the proposed plan for the organization of general practice in the event of withdrawal from the Service, appear in the opening pages of the Supplement.

PUBLIC HEALTH COMMITTEE

EMERGENCY MEETING

An emergency meeting of the Association's Public Health Committee is being held on March 22. The chairman, Dr. J. B. TILLEY, called the meeting to discuss the Government's intention that the remuneration of public health medical officers should not be considered by the Royal Commission. This intention had been confirmed by Sir John Hawton, Permanent Secretary to the Ministry of Health, in answer to a question from Dr. A. T. Rogers, joint chairman of the Negotiating Committee, as reported at page 128 in this Supplement in the proceedings of the G.M.S. Committee. Dr. W. G. Harding, representing the Public Health Committee on the G.M.S. Committee, protested that doctors in the public health service considered themselves doctors, and he told the Committee that they would deplore being separated from their colleagues.

Scottish News

TOUR OF DENMARK FOR SCOTTISH DOCTORS

Doctors in Scotland who are interested in joining the party being formed by the Scottish Committee in response to the Danish Institute's invitation to visit Denmark from August 24 to September 6 should communicate with the Scottish Secretary, British Medical Association, 7, Drumsheugh Gardens, Edinburgh, 3. The tour will include visits to hospitals, universities, medical departments and institutes, etc., and sightseeing. The cost will be approximately £44, including travel Newcastle-Copenhagen-Newcastle and hotel accommodation.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Doctors or Technicians?

SIR,—As diagnosis should precede treatment, so appreciation of a situation should precede action. Friends of mine who know the new Minister of Health intimately agree in assuring me that he is entirely honest and anxious to do the right thing, the sort of man who might be expected to appreciate the doctors' claim even if he could not quite agree with it. It is therefore important to realize that our claim has been dealt with almost entirely by the Prime Minister. This suggests that wider issues are involved than the medical implications of the Spens agreement. What are they? I attempt a diagnosis without judging the validity of the political issues.

The Prime Minister is known rightly to regard the halting of inflation as of paramount importance. He also—probably rightly from the material point of view—considers that the future of the country depends on developing its scientific resources. As a business man he aims at technical efficiency, though he does not strike one as an expert on personnel management. With these aims, how does he view the doctors' case? Quite simply he is likely to view them as making a large demand on the type of intellectual capacity and scientific training that he is anxious to canalize into technical engineering. From the national point of view he is concerned that medicine, as a whole, should not be so attractive or well paid that, in order to compete with it, the salaries of his new engineers and technicians would have to be raised too high, for this would be immensely inflationary. This I think explains the setting up of the Royal Commission, as I held well before its terms of reference were known.

This view is, I think, confirmed by the composition of the Royal Commission just announced, all of whom are

eminent and most respected people. The chairman is an industrialist in a technically advanced industry. Professor Jewkes is an economist who pulls no punches and whose diagnoses delight from their clarity even when they fail to please from their conclusions. Mrs. Baxter can be expected to look on medicine as one of a number of competing employments. Mr. Bonham-Carter, as a former personnel manager, may have a better idea of personnel and public relations than this Government has shown hitherto. Mr. Gunlake, the actuary, will estimate the long-term results of any increase in doctors' remuneration at least as much as the present implications of Spens—and so one might go through the list. The net result seems to be a business committee to assess the financial result of doctors' pay without any bunkum about professional standards or traditions, for, with the exception of Sir David Hughes Parry, a professor of law, members of any profession are strikingly absent from the Royal Commission.

This, I take it, is the situation we have to face, and if we do not realize it our tactics will be wrong, for we shall be attacking the wrong targets. This letter is too long already to suggest what our action should be, though it is clear that to succeed we must present our claims in terms of national and not sectional interest. The example of the shipbuilding dispute warns us that to "strike" simply in defence of Spens is not the way to win popular support or professional success. The world has changed much in recent years, and we must adapt ourselves to it.

I very much fear that the Royal Commission is so constituted as to imply a "technical" report—i.e., that hospital staff should become a sort of elite, like engineers, and general practitioners be looked on as humbler technicians and paid accordingly. This is what Mr. Bevan thought and planned for, and we are accustomed to seeing Conservatives becoming more Socialist than the Socialists. But I think that in the long run this view will be disastrous to the health of the nation, for, though I have profound respect for our academic brethren, life has to be lived and medicine practised in everyday life, and a good G.P. needs at least as much skill and a lot more *nous* than most of those who teach in the wards. Man is still a person, an individual, and the future of medicine lies in the integration and not the fragmentation of those who practise it. The National Health Service ought to work to this end, and it is a thousand pities that the Prime Minister should have decided to review medical and dental remuneration mainly from the technicological angle and not in the wider context of the whole national health, on which, finally, all economic progress depends.

As I said at the beginning, this letter is only an attempt to assess the situation. It does not affect my belief in the moral validity of Spens until some other basis is reached by agreement and not dictation. I think this could only be reached in a full review of the working of the National Health Service, and I am sure that it would pay the Government and the public to undertake this.—I am, etc.,

Winsford, Cheshire.

W. N. LEAK.

Reform of Health Service

SIR,—From the correspondence in your columns it is becoming increasingly clear that the profession is as worried about the structure of the N.H.S. as about the problem of remuneration. It will therefore be of interest to your many readers who advocate reform of the Service to know that the Fellowship for Freedom in Medicine has under consideration an entirely new plan which it intends to publish within the next few weeks. In addition to embodying many of the suggestions made by your correspondents, this plan will greatly reduce the control of the medical profession by the Government, and it will save the Exchequer a very substantial sum. When the plan is published there will probably be criticisms of points of detail, but we hope the principles upon which it is founded will commend themselves to the profession, and will form the basis of a reformed N.H.S. in which we can work contentedly.

The present Service has shown so many glaring defects that it will have to be drastically altered soon—only the almost unlimited good will of the profession has kept it going till now. The appointment of the Royal Commission with such restricted terms of reference can serve no useful purpose. The amount of remuneration is only one of many things that are wrong with the existing Service: this particular item cannot be taken out from the rest, looked at, and reported on, as if it were separated from the structure and the working of the Service in general.

Meanwhile the Fellowship condemns as strongly as anyone the Government's action in breaking a moral and contractual obligation for the sake of financial expediency. We have been shown more clearly than ever before the dangers of a great profession placing itself so firmly in the clutches of the politicians and why it is imperative that the doctors escape from State domination.—I am, etc.,

E. C. WARNER,
Honorary Secretary,
Fellowship for Freedom in Medicine.

London, W.1.

SIR,—As the son of a G.P. I had a glimpse of a noble profession as it should be practised, and my ambition was, from infancy, to enter it. This I achieved in 1950, only to find in the interim the picture had changed. Now that I have attained years of discretion and some experience in several districts, more than one country, and in at least two branches of the Health Service I would like to voice the opinions which I had no opportunity to form or express before my future was ordained for me.

The present undignified wrangle is but a symptom of a disease contracted in 1948, and even the symptom is misinterpreted by the general public and some doctors. To get back to basic essentials, we took an oath on graduation to serve mankind in the form of our patients. There was no mention of a middle man to accept a premium from those who receive the service and then disburse these funds to those who provide it, in the process regulating how, where, and to what extent this service will be rendered. A minority of the profession are paid a salary to preserve the health of the members of an industrial or a governmental community such as the armed Forces, and to that extent they are "employed." But that does not apply to the profession as a whole. The community is in fact its true employers, appointing and paying both ourselves and the Government who have usurped our patients' authority.

I admit the justice of our present claim and we have probably gone too far to change our main goal, but surely everyone can see that a change in government or even a reshuffle will necessitate a repeat performance within the next few years, Spens and Danckwerts notwithstanding. Let the Royal Commission then sit by all means, but make sure that it deals, not primarily with the remuneration issue but with complete reform of the structure of the National Health Service. In fact, the Royal Commission is a step in the right direction in so far as it represents the people of the country rather than the Government. Does a shop-keeper negotiate his prices, his place of business, or his selling methods with anyone but those who buy his wares?

The man in the street will still want his free medical care, and the improvident among us will not take out a voluntary insurance policy to guard against the eventuality of illness. Apart from employers deducting premiums from wages, which is a return to compulsion, the only alternative is a scheme similar to that in operation in Australia with which I have had a fleeting acquaintance. As I understood it the Government paid a subsidy of approximately 45% of the cost of hospitalization, and provided all life-saving drugs free, including insulin, antibiotics, cortisone, etc. This was available to everyone without charge or means test, although these hospitalization costs were calculated on the cost of a bed in a public ward. Intermediate and private bed extras were met by the patient. At least another 45% of in-patient treatment costs could be met by joining a medical insurance organization, one of which was run by the B.M.A., or at least closely connected with the Australian Association.

Private bed extras could be met by paying a slightly higher premium. These ranged from 1s. 6d. to 3s. 6d. per week roughly, and covered a man and his family for almost all medical expenses, including general practitioner, consultant, and ancillary services. In addition the Government chipped in for these latter costs if the patient was a member of such an insurance fund.

Among the advantages of the Australian scheme are the following. The patient passes money direct to the person who renders the service and then claims from the insurance company. He realizes there is a financial obligation on his part and that medical attention is not just something to be turned on like a tap. The insurance company deals with the patient only; there is no one between the patient and his medical attendant. Doctors can raise their fees when necessity arises without reference to any higher authority.

That is an outline of a scheme I saw working with all participants reasonably content. I strongly urge the B.M.A. to approach our antipodean colleagues for full details, and with these in hand ascertain the reaction of the major insurance companies. Let the Royal Commission proceed and make sure that the whole issue and the alternative plans are placed before it as eloquently and forcefully as possible.—I am, etc.,

Edinburgh, 9.

T. F. SANDEMAN.

Woman Consultant for Women's Hospital

SIR,—You kindly published a letter (*Supplement*, February 9, p. 62) from four male practitioners, telling of an appeal by the Southern Hospitals Group Board of Management to the Secretary of State for Scotland against the decision of the Regional Hospital Board to group the vacancies for a consultant physician in four hospitals in Edinburgh into one appointment. The letter gave reasons why it is thought that two of the hospitals should continue to have a woman physician, as this is what the patients obviously want, and pointed out that this not only expressed the view of the Southern Hospitals Group Board of Management but had the support of the regional consultants and specialists committee, the local medical committee (representing the men and women general practitioners of Edinburgh), the Medical Women's Federation, the Edinburgh Association of University Women, the Soroptimist Club, Co-operative Women's Guilds, Townswomen's Guilds, and many other bodies. To ascertain the opinion of the general public a petition to the Secretary of State for Scotland was started and was signed in the course of a few weeks by 28,000 people, representing men and women from all walks of life.

The reply from the Secretary of State for Scotland (*Supplement*, March 16, p. 116) was unsatisfactory, and it implies that those who are pressing for a woman to be appointed at the two women's hospitals are prepared to have a woman at any cost, whether her experience and qualifications were suitable or not. This cannot be contradicted too strongly; the women doctors themselves have always recognized the necessity for holding the highest qualifications and experience.

Having worked for an international women's association, I have had the opportunity of stating with pride that in our country not only do we have equal pay but, on the whole, we have also equal opportunities—more equal, I believe, than in any other country. We cannot but be aware, however, that there are still occasions when the woman has to have definitely higher qualifications to be successful in obtaining an appointment. In this case, if the vacancies in the four hospitals are put together, two of the hospitals will never have had a woman physician on their staff. This fact, together with the knowledge that the male applicants will greatly outnumber the female, makes one feel that the scales will be seriously weighted against a woman being appointed. It is for these reasons that such an enormous and important body of opinion, both professional and lay, is supporting the Southern Hospitals Group Board of Management in the stand it is making.—I am, etc.,

London, N.W.8.

JANET K. AITKEN.

SIR,—I refer to the recent decision of the Secretary of State for Scotland "not to interfere" with the South-eastern Regional Board's proposal to combine the consultant physician charges at the four hospitals of the Southern Hospitals group in Edinburgh into one appointment (*Supplement*, March 16, p. 116): by which proposal the two women's hospitals of the group (Bruntsfield Hospital and Elsie Inglis Maternity Hospital) may lose their traditional character of being women's hospitals staffed entirely by women, the proposed new appointment being open to a consultant of either sex.

When a governmental body makes an unpopular decision and adheres to that decision in the face of popular protest, one usually finds that the desires or needs of one section of the community are sacrificed to satisfy the desires or needs of the country as a whole. There is, however, no such justification for the Secretary of State for Scotland's recent decision to refuse the appeal of the Southern Hospitals Group Board against the Regional Board's proposal. Indeed, in the face of the widespread, vigorous, and unanimous public protest expressed in this region it seems hard to understand what reason could be advanced sufficiently overwhelmingly for this appeal to be refused. Since the Regional Board's announcement was made there has not been a single expression of public opinion in its favour.

I, as a general practitioner, make use of every single hospital in Edinburgh, and I, for one, would be very sorry to see Bruntsfield and Elsie Inglis Hospitals lose their present character, or indeed the other hospitals of the group, the Deaconess and Longmore Hospitals. To me, one of the greatest assets of all four hospitals as at present staffed is that one knows one's patients will really be seen by the consultant to whom one sends them. The combination of all the medical consultant work at the four hospitals into one single charge will, it is said, enable a better service to be offered. In my view this would be both difficult and unlikely. Uniformity leads more often to mediocrity than to the heights of achievement (how many examples of this could one quote), and the chief sufferers would be the public, who, after all, pay for their hospitals and whose voices should not go unheard.—I am, etc.,

Edinburgh, 7.

P. M. M. ORR PATERSON.

Value of Obstetric Lists

SIR,—As the G.P. stands so much at the cross-roads, one is prompted to ask if any real value is placed upon the appointment of a practitioner to an executive council's obstetric list other than financial. My reason for raising this query is that I felt recently that I would like to prepare myself to sit for one of the lesser diplomas in obstetrics, having been on the special obstetric list for some nine years, the object being to stimulate study and keep abreast with modern trends. To my surprise I was informed that my nine years' service on the special obstetric list was of no import and that I was required to have held a resident appointment in obstetrics for six months. Now, as I qualified during the war and went into the Forces almost immediately, I am excluded from sitting for what I take to be a great stimulus to an obstetrician practitioner. But the more important question, beyond my natural disappointment, is the fact that the bodies who make these awards count more reliance on a six months' resident appointment than years of service on an obstetric list with all its many and difficult implications. This being so, one must ask, is there any real need for a special list and if so just where in the academic field must it be placed?—I am, etc.,

Shipley, Yorks.

J. A. FRAIS.

Present Crisis

SIR,—While listening to the views of Mr. Frank Cousins ("Any Questions?", B.B.C.) I wondered if any approach, official or unofficial, had been made to the trade union movement in our present impasse? Even the moral support of such a large organization would, I feel, be of great

benefit to us at the present time, and its views of and support for the alternative scheme would be of value to us in our relationship with the public when such a scheme came into operation.—I am, etc.,

Dalry, Ayrshire.

W. M. WILSON.

Remuneration Claim

SIR,—Dr. R. R. Charlwood (*Supplement*, March 16, p. 119) is, I am sure, quite right in believing that there are many young G.P.s who, thinking along much the same lines as he does, have not the slightest intention of withdrawing from the Health Service on the issue of the 24% pay claim. The Government has, it appears to me, behaved very badly in refusing arbitration, and it is tempting to try to teach it a lesson; the fact remains, however, that there are aspects of the structure of the Health Service which are far more damaging to the practice of good medicine than the lowered incomes of the doctors who work in it. The most serious are, perhaps, the involvement of the Service in day-to-day politics, and the fact that the doctor who puts money into improving the efficiency of his practice suffers for it financially. (The settlement of the present claim would not solve this problem, to which it is irrelevant.) I would be willing to contemplate resignation, and even to see my patients suffer some temporary hardship as a consequence, if there were any question of a better Health Service emerging from the upheaval. But to resign on the narrow issues of the present claim seems to me neither good ethics nor good sense.—I am, etc.,

Biddenden, Kent.

J. E. C. TOWER.

SIR,—In your leading article (*Journal*, March 9, p. 569) you say that "no one is so conscious of the present defects of the N.H.S. as those doctors working in it; and the greatest of all defects is the intervention of the party politician between patient and doctor." I think this statement needs clarification, so that the medical profession and the general public may know what this intervention is and how it acts adversely.

You then go on to say: "Unfortunately there is no other way of bringing home to public and Parliament the present profound distrust of the profession with its employer than by action such as that recommended." As far as one can see, action is contemplated at the present time purely on the request for more remuneration.—I am, etc.,

Margate.

G. L. BROCKLEHURST.

SIR,—It is most devoutly to be hoped that our negotiators will not be put off by Mr. Macmillan's hint of an interim rise of pay. It may well be merely a trick to ensure further delay. I would earnestly suggest that two well-trying sayings be borne in mind, one, perchance influencing the Prime Minister—namely, "Divide and rule"—and the other that will, I hope, influence our own people—"Once bitten, twice shy."—I am, etc.,

Thame, Oxon.

C. H. BARBER.

SIR,—I am a practitioner with a list a little below the average, and the question of increased remuneration is becoming one of urgent necessity. It is, however, of paramount importance that our negotiators should make perfectly clear precisely what they hope to achieve. There has been much talk of Spens and a percentage increase but not one word about how the additional money is to be distributed. If it is an increase in the capitation fee which is envisaged, then I am certainly not prepared to join in a mass resignation. Such an award would be a retrograde step and would merely increase the inequity which is inherent in the present distribution of the pool.

The total amount of the pool includes a sum for practice expenses, and this is distributed as a proportion of the capitation fee. Thus a practitioner with a list of 3,000 receives three times as much as one with a list of 1,000. Since most practice expenses are basic and do not vary

with the size of the list except, perhaps, petrol consumption, it is clear that practices with a large list are overpaid and that those with a small list are underpaid. There would be some relief of hardship if practice expenses were paid direct, even at a flat rate and the balance as capitation fees. This could be done now without any increase in the total remuneration while we await the findings of the Royal Commission.—I am, etc.,

Edinburgh. 10.

D. S. COWNIE.

Acknowledgment of Applications

SIR,—The following cyclostyled circular from the secretary of a group hospital management committee was received by my house-surgeon in acknowledgment of his application for a house-physician job:

"With reference to your application for the post of house-physician I will let you know in due course if you are required for interview."

Such an abrupt circular is becoming all too frequent as the sole response many candidates get for their trouble. Personally I would have expected a more courteous reply, even if the application had been for that of a lavatory attendant, but no doubt such is the status of the profession to-day that doctors can no longer expect even perfunctory thanks for the tendering of their services.—I am, etc.,

Carmarthen.

A. HENRY MILLARD.

Improving Maternity Care

SIR,—The memorandum of evidence of the Royal College of Midwives (*Supplement*, March 2, p. 100) stated sound, but incomplete, views. I am equally certain that to raise the standard of hospital maternity care all hospital practitioners should be required to have periodic postgraduate experience of domiciliary midwifery under the supervision of suitable general-practitioner obstetricians.

From the reports of patients and personal observations it seems that in some maternity hospitals the technical aspect of midwifery may be quite satisfactory. Unfortunately, however, the treatment on the humanitarian side can only too often be described as primitive. I am sure a two-way exchange is a more sensible and satisfactory answer to our mutual desire to improve all aspects of midwifery.—I am, etc.,

Birmingham. 26.

J. D. LACON.

Royal Commission and Public Health Doctors

SIR,—Although public health medical officers are not parties to the present remuneration claim, they are well represented on the Negotiating Committee with a watching brief. Their public announcement of whole-hearted support (*Supplement*, March 2, p. 100) was well received both by the Negotiating Committee and the General Medical Services Committee.

At the meeting with the Minister on February 20 it was made plain to us that the Royal Commission would cover the public health service. Mr. Vosper, the Minister, said: "We hope it will go wider to include doctors in local authority employment and the dental profession." In addressing the G.M.S. Committee (p. 97) next day, Dr. Talbot Rogers referred to this extension of the remit to the Royal Commission. In my own report of the proceedings at the Ministry I said that apart from the offer to junior hospital officers the only satisfactory thing was that public health officers would be considered in the constellation of medicine and not in the constellation of N.A.L.G.O.

While there is no doubt that this extension of the remit would be a delaying factor, nevertheless the later report of the meeting between the Prime Minister and Joint Chairmen shows further evidence of confused thought and indecision on the part of the Government, as public health officers will no longer be the concern of the Commission.—I am, etc.,

Walsall.

A. B. DAVIES.

BRITISH MEDICAL GUILD

Meetings to be Held

KINGSTON-ON-THAMES.—At the Griffin Hotel, Market Place, Kingston-on-Thames, Tuesday, March 26, 8 for 8.30 p.m.

Association Notices

SPECIAL REPRESENTATIVE MEETING

Notice is hereby given that on the requisition of the Council a Special Representative Meeting of the British Medical Association will be held in the Great Hall, B.M.A. House, Tavistock Square, London, W.C.1, on Wednesday, May 1, 1957, at 10 a.m. The business of the meeting is to consider a report and a recommendation of the Council concerning the further action to be taken by the Association in the present dispute with the Government on medical remuneration.

By Order of the Chairman of the Representative Body.

A. MACRAE,
Secretary.

AREAS OF BARNET AND WEST HERTFORDSHIRE DIVISIONS

Notice is hereby given by the Council to all concerned that as from the date of this notice the area of the Civil Parish of Elstree is transferred from the West Hertfordshire Division to the Barnet Division.

A. MACRAE,
Secretary.

Diary of Central Meetings

MARCH

27 Wed. Council, 10 a.m.
29 Fri. Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.

APRIL

9 Tues. Conference of Advisory Councils on Occupational Health, 12 noon.

Branch and Division Meetings to be Held

BATH, BRISTOL, AND SOMERSET BRANCH.—At Royal United Hospital, Bath, Wednesday, March 27, 8.30 p.m., meeting. Dr. H. Yelloweas: "Command Performances."

BOURNEMOUTH DIVISION.—At Board Room, Royal Victoria Hospital, Boscombe, Friday, March 29, 8.15 p.m., meeting. Address by Mr. H. J. B. Atkins: "Research into the Virus Aetiology of Cancer."

DARTFORD DIVISION.—At Black Prince Hotel, Bexley, Wednesday, March 27, 8 p.m., annual dance for members, their wives, and guests.

DUNDEE BRANCH.—At Queen's Hotel, Nethergate, Dundee, Friday, March 29, 8.45 p.m., joint meeting with East of Scotland Branch, Pharmaceutical Society. Lecture and films by Dr. J. F. Merry: "Cortisone and Derivatives."

EASTBOURNE DIVISION.—At Princess Alice Memorial Hospital, Eastbourne, Friday, March 29, 8.30 p.m., meeting.

LANCASTER DIVISION.—At King's Arms Hotel, Lancaster, Tuesday, March 26, 8.30 p.m., general meeting.

MID-ESSEX DIVISION.—At Council Chamber, County Hall, Chelmsford, Wednesday, March 27, 8.15 p.m., meeting. Guest speaker, Sir Heneage Ogilvie: "Problem of the Education of the Public on Cancer."

NORTH WALES BRANCH.—At Powis Hall, University College, Bangor, Saturday, March 30, 3 p.m., spring meeting. Symposium on Toxaemia of Pregnancy by the staff of St. David's Hospital, Bangor.

ST. HELENS DIVISION.—At Providence Hospital, Wednesday, March 27, 8.30 p.m., annual general meeting.

SCARBOROUGH DIVISION.—At Board Room, Scarborough Hospital, Thursday, March 28, 8.30 p.m., annual general meeting.

SOUTHAMPTON DIVISION.—At Royal South Hants Hospital, Wednesday, March 27, 8.30 p.m., special meeting.

SOUTH BEDFORDSHIRE DIVISION.—At Warden Tavern, Luton, Friday, March 29, 8 p.m., annual dinner dance.

STOCKPORT DIVISION.—At the Guildhall, Stockport, Friday, March 29, 7.45 for 8.30 p.m., first annual dinner. Guest speakers, Dr. W. J. S. Reid, Dr. E. A. Gerrard, Dr. Miles Parkes, and Mr. W. Rees. Each member is invited to take one guest (medical or non-medical).

TOWER HAMLETS DIVISION.—At Mile End Hospital, Bancroft Road, E., Friday, March 29, 3 p.m., clinical meeting.

WARRINGTON DIVISION.—At New Fir Grove Hotel, Latchford, Without, Wednesday, March 27, 9 p.m., buffet dance.

WOOLWICH DIVISION.—At Woolwich Memorial Hospital, Shooters Hill, S.E., Tuesday, March 26, 8.30 p.m., meeting. Address by Dr. N. R. Mackay: "Radioactive Isotopes."

ANNUAL MEETING: NEWCASTLE UPON TYNE, JULY 10-19

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 30 1957

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British Medical Association

ANNUAL MEETING—NEWCASTLE UPON TYNE, JULY 10-19, 1957

President-Elect : WELDON WATTS, A.F.C., M.S., F.R.C.S., 21, Lyndhurst Road, Benton, Newcastle upon Tyne, 12.
Local General Secretary : G. W. ANDERSON, M.B., B.S., Department of Pathology, Royal Victoria Infirmary, Newcastle upon Tyne, 1 ; J. I. MUNRO BLACK, M.D., M.S., F.R.C.S., 47, Clayton Road, Jesmond, Newcastle upon Tyne, 2.
Science Secretaries : IAN RANNIE, M.B., Ch.B., M.S., F.R.C.S., 47, Clayton Road, Jesmond, Newcastle upon Tyne, 1 ; J. I. MUNRO BLACK, M.D., M.S., F.R.C.S., 47, Clayton Road, Jesmond, Newcastle upon Tyne, 2.
Executive Clerk : Miss B. E. MIDDLEMISS, B.M.A. House, Tavistock Square, London, W.C.1.

PROVISIONAL PROGRAMME

The 125th Annual Meeting of the British Medical Association will be held in Newcastle upon Tyne from Wednesday, July 10, to Friday, July 19, inclusive.

The Annual Representative Meeting will be held in the City Hall; it will begin on Wednesday, July 10, and will continue on Thursday, Friday, Saturday, and Monday, July 11, 12, 13, and 15.

On the evening of Tuesday, July 9, there will be a Cock-tail Party for Representatives and their Ladies, arranged by the Newcastle upon Tyne Division, with the co-operation of the North of England and the Tees-side Branches. This will be held in the Old Assembly Rooms.

A combined Dinner for Representatives and their Ladies will take place at the Old Assembly Rooms on Thursday, July 11, followed by a Dance.

The Overseas Luncheon has been arranged for Friday, July 12, at 1 p.m. in the Old Assembly Rooms.

On Sunday, July 14, there will be three excursions: (1) All-day excursion to the Roman Wall which will be accompanied by guides from the Department of Roman-British Archaeology, King's College, University of Durham. (2) All-day trip to the Farne Islands. (3) Half-day excursion to Durham Cathedral. In the evening a Symphony Concert, sponsored by Abbott Laboratories Ltd., will be given in the City Hall.

The Adjourned Annual General Meeting and President's Address will take place in the City Hall on the evening of Monday, July 15, and the President's Reception which follows will be held in the Old Assembly Rooms.

The Annual Scientific Meeting and associated functions occupy the period from Monday, July 15, to the evening of Friday, July 19.

The Official Religious Service will be held in St. Nicholas' Cathedral on the afternoon of Tuesday, July 16. The address will be given by the Right Reverend the Lord Bishop of Durham.

There will be a Roman Catholic Service at 11.30 a.m. on Saturday, July 13, at St. Mary's Cathedral.

A Jewish Service will be held on Saturday, July 13, at 10 a.m. at the Leazes Park Road Synagogue.

The Annual Dinner of the Association will be held in the Old Assembly Rooms on Tuesday, July 16.

There is to be a full social programme, including a Civic Reception on Wednesday evening, July 17, and a University Reception on Thursday evening, July 18.

The Annual Breakfast of the Christian Medical Fellowship will be held on Tuesday, July 16, at 8.15 a.m.

Several special visits and excursions are being arranged for ladies accompanying members.

The usual Golf Competitions will take place on July 17 and 18.

The Overseas Conference will be held in the afternoon of Wednesday, July 17.

The Reception Bureau for Registration will be open in the Stephenson Buildings, King's College, on Monday, July 15, at 9 a.m.

From July 15 to 19 there will be a programme of surgical operations and clinical demonstrations in the Royal Victoria Infirmary shown by colour television on a closed circuit. The technical arrangements will be sponsored by Smith, Kline and French Laboratories Ltd. (see p. 138).

Three Plenary Scientific Sessions have been arranged as follows: Wednesday, July 17, at 10 a.m., subject "The Management of Hypertension"; Thursday, July 18, at 2.30 p.m., subject "The Present Status of Prophylactic Immunization"; Friday, July 19, at 9.30 a.m., subject "Care of the Dying."

In addition, three Round-Table Conferences will be held concurrently on Wednesday, July 17, from 9 to 9.45 a.m. The nineteen Scientific Sections will hold meetings, including a special session of the Sections of Obstetrics and

Gynaecology and of General Practice on "Obstetrics and General Practice" to be held on Monday, July 15, at 3 p.m. (Details are given below.)

The Scientific Exhibition will be held in the Stephenson Buildings and will be open daily on July 15 to 19; a wide field of medical interests will be covered. Further details will be published later.

The Annual Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications will also be in the Stephenson Buildings. The Exhibition will be open from 9 a.m. to 6 p.m. on July 15 to 19.

The Ladies' Club will be situated in the Medical School, King's College, and will be open throughout the Meeting.

HOTEL ACCOMMODATION

The following is a preliminary list of hotel accommodation available in Newcastle upon Tyne and district. Members wishing to reserve accommodation are asked to write direct to the hotel, stating that they are attending the B.M.A. Meeting. The Association cannot accept responsibility for any of the prices stated below. These are the tariffs ruling at the moment and are subject to alteration without notice. Applicants should therefore verify the tariffs when making their reservations. Early application for accommodation is recommended. For hostel accommodation all requests should be made to the Executive Clerk, B.M.A. House, London, W.C.1, and not direct to the hostel.

Name and Address of Hotel	Tel. No.	No. of Rooms	Miles Distant	Tariff, 1957	
				B/B	Weekly Inclusive
City Hotels					
Royal Turks Head Hotel, Grey Str.	2-6111	102		32/6	15
Crown Hotel, Clayton Str.	2-6421	87		25/-	—
Douglas Hotel, Grainger Str.	2-7008	50		22/6	11-12
*Gordon Hotel, Clayton Rd.	81-1233	30		25/-	7-10
*St. Margaret's Hotel, Osborne Rd.	81-0453	40		17/6	7-8½
*Cairn Hotel, Osborne Rd.	81-1358	50		19/-	—
Embassy Hotel, Jesmond Rd.	81-1475	38		24/6	—
Imperial Hotel, Jesmond Rd.	81-3933	42		25/6	—
Seaside Hotels					
Rex Hotel, Whitley Bay	W.B. 2-0326	156	10	22/6	—
Grand Hotel, Tyne-mouth	N. Shields 1360	32	10	25/- —32/6	12-13
Park Hotel, Tyne-mouth	N. Shields 1766	25	10	27/6	—
Seaburn Hotel, Roker, Sunderland	Whitburn 3225	18	12	30/-	14½
Country Hotels					
Queen's Head Hotel, Morpeth, North'd	Morpeth 83	14	15	25/-	12
Royal Hotel, Hexham, North'd	Hexham 1070	15	20	21/-	9-10
Abbey Hotel, Hexham, North'd	Hexham 304	33	20	18/6-21/-	9-10
Angel Inn, Corbridge, North'd	Corbridge 119	10	17	18/6-21/-	9
Hotels in Neighbouring Towns					
Palatine Hotel, Sunderland	Sunderl'd 3793	50	12	21/-	14½
Grant Hotel, Sunderland	Sunderl'd 5404	75	12	21/6-32/6	9½-10½
Royal County Hotel, Durham City	Durham 2481	34	15	30/-	14½
Three Tuns Hotel, Durham City	Durham 3601	17	15	30/-	14½
University Halls of Residence					
Henderson Hall (men only)		70	2	21/-	—
Ethel Williams Hall (men or women)		74 S. 6 D.	2	21/-	—
Easton Hall (men or women)		10		21/-	—

S.=Single. D.=Double. * Not licensed.

CARAVAN PARK

Arrangements have been made at Newcastle for a special caravan site for members attending the annual meeting with their caravans. The site will be at King's College Athletic Union Ground, Cochrane Park, Newcastle upon Tyne, 6. Apart from a limited amount of hard standing and some on rough grass, there will be facilities for obtaining water and disposing of refuse. Hot and cold washing facilities and showers, with dressing-rooms and drying-rooms, will be available in the pavilion, where there will be a children's playroom and light refreshments can be ordered. The site, which is near Henderson Hall, one of the hostels of the University of Durham, is close to shops and a frequent bus service into the centre of the town.

Applications for space should be made in advance to Dr. W. Hunter, c/o B.M.A., North of England Branch Office, 7, Windsor Terrace, Newcastle upon Tyne, 2, stating name and address, registration number of car, and date of arrival and departure. The charge is 6s. a night, which must be paid at the time of application. Alternative accommodation is available for Caravan Club Members at Whitley Bay Club site on the sea front at Old Hartley, 10 miles from Newcastle.

REGULATIONS REGARDING DRESS

Academic Dress is to be worn at the President's Address, the President's Reception, the Official Religious Service, the Roman Catholic Service, the Civic Reception, and the University Reception.

Robes may be hired from Messrs. Ede & Ravenscroft, Ltd., 93, Chancery Lane, London, W.C.2, or Messrs. Gray & Son (Robemakers), Ltd., Saddler Street, Durham. Early application is advised, as the supply of gowns is limited, and it is suggested that the gowns be sent to the home address of the individual concerned. It is hoped to have a representative of the local robemakers available at the University during the Annual Meeting.

Evening Dress (Tails or Dinner Jacket), with Decorations, is to be worn at the President's Reception, Civic Reception, University Reception, and Annual Dinner. Evening Dress without Decorations should be worn at the Representatives' Dinner and the Representatives' Dance.

TICKETS

No tickets for functions or excursions can be issued in advance, with the exception of the Annual Dinner (details of which are given below).

All tickets for functions up to Sunday, July 14, will be available for Representatives at the A.R.M. Inquiry Office, City Hall Entrance, on July 9, 10, 11, 12, and 13, and for ladies at the Ladies' Club, Medical School, King's College.

Tickets for all other functions after Sunday, July 14, will be available from Monday, July 15, at the Reception Bureau, Stephenson Buildings, or at the Ladies' Club.

ANNUAL DINNER

Special Notice

The Annual Dinner in Newcastle upon Tyne this year will take place on Tuesday, July 16, in the Old Assembly Rooms. This follows the successful innovation made in Brighton last year, when the Dinner was held on the Tuesday instead of the Thursday as had been customary in the past. The maximum number which the room can take is 350. Arrangements for advance booking will be announced in a later issue of the Supplement.

EDINBURGH GRADUATES' DINNER

The Edinburgh Graduates' Dinner will be held in the Royal Station Hotel, Neville Street, Newcastle upon Tyne, on Saturday, July 13, at 7 for 7.30 p.m. All Edinburgh graduates attending the A.R.M., or resident in the area, together with their ladies and guests, will be welcome.

Tickets (25s. each, exclusive of wines) may be had on application, with remittance, to Dr. E. R. C. Walker, 7, Drumsheugh Gardens, Edinburgh, 3.

GLASGOW GRADUATES' DINNER

The Glasgow Graduates' Dinner will be held in the Britannia Rooms, Tilley's Restaurant, Newcastle upon Tyne, on Saturday, July 13, at 7.45 for 8.30 p.m. The dinner is open to Glasgow graduates who are attending the Annual Meeting, their ladies, and guests. Tickets will cost 30s. each, including cocktails, but excluding wines. Numbers are limited to 120, and early application, with appropriate remittance, should be made to Dr. J. T. McCutcheon, British Medical Association, Glasgow Regional Office, 234, St. Vincent Street, Glasgow, C.2. (Dress—Dinner Jackets.)

WELSH DINNER

The Welsh Dinner will be held at the Royal Turk's Head Hotel, Grey Street, Newcastle upon Tyne, at 7.30 p.m. on Friday, July 12. All Welsh Representatives, accompanied by their ladies, will be welcome at this dinner. Tickets, 25s. each (exclusive of wines), may be obtained on application, with remittance, to Dr. I. M. Jones, 3, Parkside, East Herrington, Sunderland.

CHRISTIAN MEDICAL FELLOWSHIP ANNUAL BREAKFAST

The Annual Breakfast of the Christian Medical Fellowship will be held in the Banqueting Hall of the Royal Station Hotel, Newcastle upon Tyne, on Tuesday, July 16, at 8.15 a.m. The Chairman will be Mr. Weldon Watts (President-Elect of the B.M.A.) and the speaker will be Dr. Robert G. Cochrane, Adviser in Leprosy, Ministry of Health; Consulting Leprologist, Tropical Diseases Hospital, St. Thomas's Hospital, and St. John's Hospital; formerly Principal and Director of Christian Medical College, Vellore. The proceedings will terminate at 9.15 a.m. Those intending to be present are asked to notify Dr. W. Condie, Pierremont, 36, Sunderland Road, Heworth, Gateshead, 10, Co. Durham.

GUILD OF SS. LUKE, COSMAS AND DAMIAN

There will be a Mass for Catholic doctors attending the B.M.A. Meeting at St. Mary's Cathedral (opposite the Central Station), Clayton Street, Newcastle, at 11.30 a.m. on Saturday, July 13. An address will be given by the Very Rev. G. P. Dwyer, D.D., Ph.D., Catholic Missionary Society. Academic Dress will be worn, and robing will take place in the County Hotel. Following this there will be a reception and luncheon in the County Hotel (also opposite the Central Station). Members and wives will be welcome. Tickets, price 8s. 6d., may be obtained from the A.R.M. Inquiry Office.

SCIENTIFIC MEETING

PLENARY SESSIONS IN CHEMISTRY LECTURE THEATRE, KING'S COLLEGE

Wednesday, July 17, 10 a.m.: "The Management of Hypertension"

Chairman: Professor MAX L. ROSENHEIM (London).
Speakers: Dr. ROBERT COOPE (Liverpool); Professor JOHN McMICHAEL (London); Mr. E. G. TUCKWELL (London); Dr. JOHN H. HUNT (London).

Thursday, July 18, 2.30 p.m.: "The Present Status of Prophylactic Immunization"

Chairman: Sir JOHN CHARLES (London).
Speakers: Professor R. CRUICKSHANK (London); Dr. J. GRANT (Gateshead); Dr. T. FRANCIS, jun. (Michigan, U.S.A.); Professor C. H. STUART-HARRIS (Sheffield); Dr. P. M. D'ARCY HART (London).

Friday, July 19, 9.30 a.m.: "Care of the Dying"

Chairman: Dr. T. H. BATES (Newcastle upon Tyne).
Speakers: Dr. I. D. GRANT (Glasgow); Professor A. G. R. LOWDON (Newcastle upon Tyne); Mr. C. J. L. THURGAR (Newcastle upon Tyne); Dr. R. BODLEY SCOTT (London); The LORD BISHOP OF DURHAM.

SCIENTIFIC SECTIONS

All sessions will be held in the Stephenson Buildings, King's College. Morning sessions are from 9.30 a.m. to 12 noon, and afternoon sessions from 2.30 to 5 p.m.

MEDICINE

President: Professor F. J. NATTRASS, M.D., F.R.C.P. (Newcastle upon Tyne).

Vice-Presidents: C. N. ARMSTRONG, M.D., F.R.C.P. (Newcastle upon Tyne); H. G. MCGREGOR, M.D., M.R.C.P. (Brighton); J. G. SCADDING, M.D., F.R.C.P. (London).

Hon. Secretaries: GORDON F. EDWARDS, M.B.E., M.B., M.R.C.P., 1, Park Crescent, Roundhay, Leeds, 8; R. B. THOMPSON, M.D., M.R.C.P., The Medical School, King's College, Newcastle upon Tyne, 1.

Tuesday, July 16.—Morning. Combined session with Sections of Surgery, Cardiology, and Radiology, on Arterial Embolism. General introduction, Dr. WILLIAM EVANS (London); Diagnosis of Limb Embolism, Sir JAMES LEARMONTH (Edinburgh); Radiological Aspects (speaker to be announced later); Surgical Treatment, Professor CHARLES ROB (London); Cerebral Embolism, Dr. H. A. DEWAR (Newcastle upon Tyne); Long-term Anticoagulant Therapy, Dr. CATHERINE C. BURT (Edinburgh).

Wednesday, July 17.—Afternoon. Cortisone in General Practice: Speakers will include Professor G. A. SMART (Newcastle upon Tyne) and Dr. R. B. THOMPSON (Newcastle upon Tyne).

SURGERY

President: A. DICKSON WRIGHT, M.S., F.R.C.S. (London).
Vice-Presidents: Professor DIGBY CHAMBERLAIN, Ch.M., F.R.C.S. (Leeds); HAROLD C. EDWARDS, C.B.E., M.S., F.R.C.S. (London); JOHN GILMOUR, M.S., F.R.C.S. (Newcastle upon Tyne); GEORGE A. MASON, V.R.D., F.R.C.S. (Newcastle upon Tyne).

Hon. Secretaries: DAVID TIBBS, M.C., F.R.C.S., River House, Wylam, Northumberland; J. F. R. WITCOMBE, M.Chir., F.R.C.S., 22, Parkside, Cambridge.

Tuesday, July 16.—Morning. Combined session with Sections of Medicine, Cardiology, and Radiology on Arterial Embolism.

Wednesday, July 17.—Afternoon. Combined session with Section of Radiology on Radiological Investigation of the Biliary Tract: Dr. SCOTT PARK (Glasgow), Mr. DUDFIELD ROSE (Newcastle upon Tyne), Dr. J. D. DOW (London), Mr. DICKSON WRIGHT (London).

Thursday, July 18.—Morning. The Diagnosis and Treatment of Carcinoma of Stomach: Clinical Aspects in Diagnosis, Mr. JOHN GILMOUR (Newcastle upon Tyne); Radiology, Dr. G. A. S. LLOYD (London); Gastroscopy, Mr. HERMON TAYLOR (London); Exfoliative Cytology, Dr. R. O. K. SCHADE (Newcastle upon Tyne); Treatment, Professor DIGBY CHAMBERLAIN (Leeds). Late afternoon. Exposure Treatment of Burns in Bagdad: Professor W. E. M. WARDILL (Bagdad).

OBSTETRICS AND GYNAECOLOGY

President: Professor H. HARVEY EVERS, M.S., F.R.C.S., F.R.C.O.G. (Newcastle upon Tyne).

Vice-Presidents: Professor W. I. C. MORRIS, F.R.C.S.Ed., F.R.C.O.G. (Manchester); Professor W. C. W. NIXON, M.D., F.R.C.S., F.R.C.O.G. (London); FRANK STABLER, M.D., F.R.C.S., F.R.C.O.G. (Newcastle upon Tyne); JOHN STALL-WORTHY, F.R.C.S., F.R.C.O.G. (Oxford).

Hon. Secretaries: WILFRID MILLS, T.D., F.R.C.S., M.R.C.O.G., 99, Harborne Road, Edgbaston, Birmingham, 15; LINTON SNAITH, M.D., M.S., F.R.C.S., F.R.C.O.G., 2, Osborne Villas, Newcastle upon Tyne, 2.

Monday, July 15.—Afternoon. Combined session with Section of General Practice. Pre-eclampsia: Mr. O. V. JONES (Bangor), Dr. CATHERINE HARROWER (Glasgow), Dr. JOHN FISHER (Abingdon). General-practitioner Responsibility in Gynaecology: Mr. J. K. RUSSELL (Newcastle upon Tyne), Dr. A. J. GRAY NEWTON (Broomhill, Northumberland), Dr. A. DESMOND STOKER (Winster, Derbyshire).

Tuesday, July 16.—Morning. Placental Insufficiency: Dr. G. T. JOHNSON (Newcastle upon Tyne). Prolonged Labour: Professor W. C. W. NIXON (London), Dr. ALISTAIR GUNN (London), Professor A. S. DUNCAN (Cardiff). Unusual Uses of the Flying Squad: Mr. FRANK STABLER (Newcastle upon Tyne), Dr. ROBERT TENNENT (Glasgow).

Wednesday, July 17.—9 a.m. Round-table Conference: Some Causes of Public Alarm and Anxiety; Irradiation in the Antenatal Period; Rubella and Virus Infections; Rh Interreaction. Chairman, Professor HARVEY EVERS. Afternoon. Combined session with Sections of Child Health and Preventive Medicine on Puberty and Its Problems: Dr. T. N. MACGREGOR (Edinburgh), Professor LESLIE BANKS (Cambridge), Dr. D. V. HUBBLE (Derby).

ANAESTHETICS

President: H. H. PINKERTON, M.B., F.R.F.P.S., F.F.A.R.C.S. (Glasgow).

Vice-Presidents: R. P. HARBORD, M.D., F.F.A.R.C.S., D.A. (Leeds); JOAN MILLAR, M.D., F.F.A.R.C.S., D.A. (Newcastle upon Tyne), Professor E. A. PASK, O.B.E., M.D., F.F.A.R.C.S. (Newcastle upon Tyne).

Hon. Secretaries: J. A. G. HORTON, M.B., D.A., Department of Anaesthesia, Royal Victoria Infirmary, Newcastle upon Tyne, 1; CYRIL F. SCURR, M.V.O., M.B., F.F.A.R.C.S., D.A., Department of Anaesthetics, Westminster Hospital, London, S.W.1.

Wednesday, July 17.—Afternoon. Deaths Related to Anaesthesia: Introduction and General Aspects of the Problem, Dr. JOHN GILLIES (Edinburgh); Anaesthesia for Patients with Intestinal Obstruction, Dr. H. J. V. MORTON (London); Anaesthesia for Emergency Obstetrics, Dr. W. D. WYLIE (London); Anaesthetic Fatalities in Relation to the Use of Relaxant Drugs, Dr. A. R. HUNTER (Manchester).

Thursday, July 18.—Morning. Barbiturate Toxicity and Coma: Treatment of Barbiturate Poisoning without Convulsant Drugs, Dr. ERIC NILSSON (Lund, Sweden); Experimental Evaluation of Bemegride, Dr. T. J. THOMSON (Glasgow); Abnormal Responses to Barbiturates, Dr. J. W. DUNDEE (Liverpool); Clinical Experience with Buthalitone Sodium, Dr. P. H. SIMMONS (London); General discussion opened by Dr. B. R. M. JOHNSON (London).

CARDIOLOGY

President: Professor J. CRIGHTON BRAMWELL, M.D., F.R.C.P. (Manchester).

Vice-Presidents: OSCAR BRENNER, M.D., F.R.C.P. (Birmingham); H. A. DEWAR, M.D., F.R.C.P. (Newcastle upon Tyne); WILLIAM EVANS, D.Sc., M.D., F.R.C.P. (London); W. G. A. SWAN, M.D., F.R.C.P. (Newcastle upon Tyne).

Hon. Secretaries: WALLACE BRIGDEN, M.D., F.R.C.P., 139, Harley Street, London, W.1; FREDERIC JACKSON, M.B., M.R.C.P., 18, North Avenue, Gosforth, Newcastle upon Tyne, 3.

Tuesday, July 16.—Morning. Combined session with Sections of Medicine, Surgery, and Radiology on Arterial Embolism.

Wednesday, July 17.—Afternoon. The Treatment of Resistant Heart Failure, Dr. OSCAR BRENNER (Birmingham); The Use and Abuse of the Electrocardiogram, Dr. CURTIS BAIN (Harrogate); The Role of Quinidine in the Treatment of the Arrhythmias, Dr. PAUL WOOD (London); Rheumatic Carditis in Children To-day, Dr. WALLACE BRIGDEN (London); Prognosis after Cardiac Infarction, Dr. FREDERIC JACKSON (Newcastle upon Tyne); A colour film, "The Jugular Venous Pulse," Dr. PATRICK MOUNSEY (London).

CHILD HEALTH

President: Professor WILFRID GAISFORD, M.Sc., M.D., F.R.C.P. (Manchester).

Vice-Presidents: Professor DONALD COURT, M.D., M.R.C.P., D.C.H. (Newcastle upon Tyne); REGINALD LIGHTWOOD, M.D., F.R.C.P., D.P.H. (London); CHARLES PINCKNEY, M.B., F.R.C.P. (London).

Hon. Secretaries: GEORGE DAVISON, M.D., F.R.C.P., D.C.H., Shincliffe, Station Road, Crumlington, Northumberland; STANLEY D. V. WELLER, M.D., M.R.C.P., D.C.H., 50, Southborough Road, Bickley, Kent.

Wednesday, July 17.—Afternoon. Combined session with Sections of Obstetrics and Gynaecology and Preventive Medicine on Puberty and its Problems.

Thursday, July 18.—Morning. Combined session with Section of General Practice. Acute Chest Disease: Professor DONALD COURT (Newcastle upon Tyne), Dr. J. FRY (Beckenham).

Friday, July 19.—Afternoon. The Collagen Disorders: Speakers will include Dr. BARBARA ANSELL (London), Dr. A. HILL (Stoke Mandeville), Dr. C. CARTER (London). Chairman, Dr. R. LIGHTWOOD (London). Iatrogenic Disease in Paediatrics: speakers will include Dr. A. WHITE FRANKLIN (London), Dr. ALICE STEWART (Oxford), Dr. K. CAMERON (London), Dr. MARY CROSSE (Birmingham). Chairman, Dr. C. PINCKNEY (London).

DERMATOLOGY

President: J. FERGUSON SMITH, M.D., F.R.F.P.S. (Glasgow).

Vice-Presidents: R. MASON BOLAM, M.D. (Newcastle upon Tyne); A. GIRDWOOD FERGUSON, M.D., M.R.C.P.Ed., F.R.F.P.S. (Glasgow); I. B. SNEDDON, M.B., M.R.C.P. (Sheffield).

Hon. Secretaries: R. MASON BOLAM, M.D., The North Cottage, Adderstone Crescent, Jesmond, Newcastle upon Tyne, 2; PETER BORRIE, M.D., M.R.C.P., 115A, Harley Street, London, W.1.

Wednesday, July 17.—Afternoon. Acne Vulgaris. Dr. A. J. ROOK (Cambridge); Vesicular Eruptions of the Hands, Dr. STEPHEN GOLD (London); Neurodermatitis, Dr. A. GIRDWOOD FERGUSON (Glasgow).

GENERAL PRACTICE

President: H. F. WATTSFORD, M.B., B.S. (Newcastle upon Tyne).

Vice-Presidents: JOHN BEYNON, T.D., M.B., B.S. (Brighton); MONA MACNAUGHTON, M.B., Ch.B. (Newcastle upon Tyne); S. WAND, M.B., Ch.B. (Birmingham).

Hon. Secretaries: R. J. F. H. PINSENT, M.D., 1, Mayfield Road, Handsworth, Birmingham; ANDREW SMITH, M.B., B.S., Rose Villa, Whickham, Newcastle upon Tyne.

Monday, July 15.—Afternoon. Combined session with Section of Obstetrics and Gynaecology on Pre-eclampsia and on Gynaecology in General Practice.

Wednesday, July 17.—Afternoon. Combined session with Section of Preventive Medicine on Illness of the School-child. Programme to be announced later.

Thursday, July 18.—Morning. Combined session with Section of Child Health on Acute Chest Disease.

HISTORY OF MEDICINE

President: Sir ZACHARY COPE, M.D., M.S., F.R.C.S. (London).

Vice-Presidents: DOUGLAS GUTHRIE, M.D., F.R.C.S.Ed. (Edinburgh); C. E. KELLETT, M.D., F.R.C.P. (Shotley Bridge); J. DUDFIELD ROSE, M.B., F.R.C.S. (Newcastle upon Tyne).

Hon. Secretaries: N. M. MATHESON, M.R.C.P., F.R.C.S., F.A.C.S., Ashford Hospital, Ashford, Middlesex; ROBERT MOWBRAY, M.D., M.R.C.P., D.C.H., 220, Giles Gate, Durham.

Tuesday, July 16.—Morning. Mark Akenside, Sir JOHN CHARLES (London). Cholera Epidemics in Newcastle, Pro-

fessor JOHN BOYLES (Newcastle); John Snow's Place in History, Dr. M. H. A. DAVISON (Newcastle); The Influence of Leyden upon the Edinburgh Medical School, Dr. D. J. GUTHRIE (Edinburgh); The *De Dissectione* of Charles Etienne, Dr. C. E. KELLETT (Newcastle).

NEUROLOGY

President: HUGH GARLAND, T.D., M.D., F.R.C.P. (Leeds). *Vice-Presidents:* WALPOLE LEWIN, M.S., F.R.C.S. (Oxford); J. W. ALDREN TURNER, D.M., F.R.C.P. (London). *Hon. Secretaries:* R. W. GILLIATT, D.M., M.R.C.P., 51, Harley Street, London, W.1; J. N. WALTON, M.D., M.R.C.P., 5, Dilston Terrace, Gosforth, Newcastle upon Tyne, 3.

Tuesday, July 17.—Afternoon. Symposium on Epilepsy: Modern Views on Classification, Dr. DENIS WILLIAMS (London); Value of the Electroencephalogram in Diagnosis, Dr. DENIS HILL (London); Anticonvulsant Therapy, Dr. HOUSTON MERRITT (New York); Pitfalls and Success in the Surgical Treatment of Focal Epilepsy, Dr. WILDER PENFIELD (Montreal); Epilepsy as a Social Problem—a Summing-up, LORD COHEN OF BIRKENHEAD.

Thursday, July 18.—Morning. Symposium on Cerebral Vascular Disease: Recent Advances in Knowledge of Cerebral Vascular Disease, Dr. RAYMOND D. ADAMS (Boston, Mass.); Medical Management of Subarachnoid Haemorrhage, Dr. J. MACDONALD HOLMES (Stafford); Radiological Investigation in Cases of Cerebral Vascular Disease, Dr. JAMES BULL (London); The Management of "Strokes," Dr. F. A. ELLIOTT (London).

OCCUPATIONAL HEALTH

President: J. J. O'DWYER, C.B.E., M.B., D.P.H. (London).

Vice-Presidents: GEORGE BUCHANAN, B.L., L.R.C.P.&S., D.P.H., D.I.H., D.T.M.&H., D.P.A. (Glasgow); CHARLES CRESDEE, M.R.C.S., L.R.C.P. (Huddersfield); G. E. GRAVES PEIRCE, M.B., F.R.C.S. (London).

Hon. Secretaries: DAVID GULLICK, M.B., B.S., Mount View, Western Road, Stevenage, Herts; R. I. MCCALLUM, M.D., M.R.C.P., Nuffield Department of Industrial Health, the Medical School, King's College, Newcastle upon Tyne, 1.

Thursday, July 18.—Morning. The Management of Pneumoconiosis in General Practice: opening speakers, Dr. A. MEIKLEJOHN (Glasgow), Dr. J. C. GILSON (Llandough), Dr. R. A. TREVEHICK (Sheffield), Dr. FENWICK LISHMAN (Crook, Co. Durham).

OPHTHALMOLOGY

President: J. S. ARKLE, O.B.E., M.B., F.R.C.S.Ed. (Newcastle upon Tyne).

Vice-Presidents: GEORGE BLACK, M.B., F.R.C.S. (Leeds); ALEX G. CROSS, M.D., F.R.C.S. (London); H. VERNON INGRAM, O.B.E., T.D., M.B., D.O.M.S. (Middlesbrough, Tyne); A. E. P. PARKER, M.B., F.R.C.S. (Middlesbrough, Tyne).

Hon. Secretaries: DEREK AINSLIE, M.D., F.R.C.S., D.O.M.S., 87, Harley Street, London, W.1; JAMES M. L. HOWAT, M.B., D.O.M.S., D.O., 3, Tankerville Terrace, Newcastle upon Tyne, 2.

Tuesday, July 16.—Morning. Chiasmal Disease, Professor NORMAN DOTT (Edinburgh), Dr. A. MOONEY (Dublin); Recent Advances in the Diagnosis and Treatment of Glaucoma, Mr. R. J. H. SMITH (London); Ocular Changes in the Leukaemias, Mr. P. D. TREVOR ROPER (London); Cataract Surgery under Chlorpromazine Hydrochloride, Mr. H. VERNON INGRAM (Newcastle upon Tyne).

ORTHOPAEDICS

President: C. GORDON IRWIN, M.B., F.R.C.S.Ed. (Newcastle upon Tyne).

Vice-Presidents: JOHN BASTOW, M.D., F.R.C.S. (Bath); JOHN CHARNLEY, M.B., F.R.C.S. (Manchester); J. KENNETH STANGER, M.B., F.R.C.S. (Newcastle upon Tyne).

Hon. Secretaries: L. W. PLEWES, C.B.E., M.D., F.R.C.S.Ed., Blake Hall, Kensworth, Dunstable, Beds;

JOHN V. TODD, M.Ch.Orth., F.R.C.S., 20, The Grove, Gosforth, Newcastle upon Tyne, 3.

Wednesday, July 17.—9 a.m. Round-table Conference with Section of Physical Medicine on Low Back Pain. Chairman, Dr. HUGH BURT (London). Dr. S. JOSEPHS (Newcastle upon Tyne), Dr. I. N. MACIVER (Newcastle upon Tyne), Mr. N. W. ROBERTS (Liverpool).

Wednesday, July 17.—Afternoon. Pain in the Arm, Mr. ROBERT ROAF (Liverpool), Mr. J. KENNETH STANGER (Newcastle upon Tyne), Dr. MICHAEL KREMER (London); Reconstructive Surgery of the Upper Limb Following Poliomyelitis, Mr. ALEX MILLER (Glasgow).

OTO-RHINO-LARYNGOLOGY

President: W. I. DAGGETT, M.B., F.R.C.S. (London).

Vice-Presidents: R. E. JOWETT, M.D., M.R.C.P., D.L.O. (Sunderland); RONALD MACBETH, D.M., F.R.C.S., F.R.C.S.Ed. (Oxford); FRANCIS MCGUCKIN, M.D., F.R.C.S., F.R.C.S.Ed. (Newcastle upon Tyne).

Hon. Secretaries: J. D. K. DAWES, M.D., F.R.C.S., 40, Bewick Road, Gateshead, Co. Durham; LIONEL TAYLOR, M.B., F.R.C.S., 55, Harley Street, London, W.1.

Thursday, July 18.—Morning. The Scope of Surgery in the Management of Deafness, Mr. I. B. THORBURN (Liverpool), Mr. F. MCGUCKIN (Newcastle upon Tyne).

Friday, July 19.—Afternoon. Epistaxis, Mr. J. P. STEWART (Edinburgh), Dr. H. A. DEWAR (Newcastle); Presenting Symptoms and Signs of Malignant Disease of the Upper Respiratory Tract, Mr. W. A. MILL (London), Mr. R. D. OWEN (Cardiff), Mr. MUNRO BLACK (Newcastle upon Tyne).

PHYSICAL MEDICINE

President: HUGH BURT, M.B., F.R.C.P. (London).

Vice-President: GUY BEAUCHAMP, M.B., Ch.B. (London); JAMES CYRIAX, M.D., M.R.C.P. (London); J. B. STEWART, M.B., D.Phys.Med. (Marlborough); A. ZINOVIEFF, M.R.C.S., L.R.C.P., D.Phys.Med. (Durham).

Hon. Secretaries: A. T. RICHARDSON, M.B., M.R.C.P., D.Phys.Med., the Royal Free Hospital, Gray's Inn Road, London, W.C.1; M. THOMPSON, M.D., M.R.C.P., Department of Physical Medicine, the Royal Victoria Infirmary, Queen Victoria Road, G.P.O. Box No. 141, Newcastle upon Tyne, 1.

Wednesday, July 17.—9 a.m. Round-table Conference with Section of Orthopaedics on Low Back Pain.

Friday, July 19.—Afternoon. The Painful Heel, Dr. A. T. RICHARDSON (London); The Painful Foot, Dr. GUY BEAUCHAMP (London); Results of Rehabilitation of Injured Miners, Dr. A. N. ZINOVIEFF (Durham); Hydrocortisone in Lesions at the Shoulder and the Elbow, Dr. J. CYRIAX (London); Intra-articular Steroid Therapy, Dr. M. THOMPSON (Newcastle upon Tyne).

PLASTIC SURGERY

President: Professor T. POMFRET KILNER, C.B.E., D.M., F.R.C.S. (Oxford).

Vice-Presidents: D. N. MATTHEWS, O.B.E., M.D., M.Ch., F.R.C.S. (London); MORTIMER H. SHAW, M.B., F.R.C.S. (Leeds).

Hon. Secretaries: F. I. HERBERT, M.B., F.R.C.S., 23, Linden Road, Gosforth, Newcastle upon Tyne, 3; W. GROSSMANN, M.D., L.D.S. R.C.S., 79, Harley Street, London, W.1.

Wednesday, July 17.—Afternoon. Programme to be announced later.

PREVENTIVE MEDICINE

President: J. B. TILLEY, M.D., D.P.H. (Newcastle upon Tyne).

Vice-Presidents: Professor E. M. DUNLOP, M.C., M.A., M.D., F.R.S.Ed. (Newcastle upon Tyne); J. F. WARIN, M.D., D.P.H. (Oxford); ELSPETH WARWICK, M.B., D.P.H. (Nottingham).

Hon. Secretaries: J. ALUN EVANS, M.R.C.S., L.R.C.P., D.P.H., 5, Crossfield Avenue, West Winds, Porthcawl, Glam.; R. C. M. PEARSON, M.D., M.R.C.P.Ed., D.P.H., Health Department, Town Hall, Newcastle upon Tyne, 1.

Wednesday, July 17.—Afternoon. Joint session with Sections of Obstetrics and Gynaecology and Child Health on Puberty and its Problems.

Wednesday, July 17.—Afternoon. Joint session with Section of General Practice on Illness of the Schoolchild, programme to be announced later.

PSYCHIATRY

President: Professor ALEXANDER KENNEDY, M.D., F.R.C.P., M.R.C.P.Ed., D.P.M. (Edinburgh).

Vice-Presidents: LOUIS MINSKI, M.D., F.R.C.P., D.P.M. (Sutton, Surrey); Professor MARTIN ROTH, M.D., M.R.C.P., D.P.M. (Newcastle upon Tyne); IAN SKOTTOWE, M.D., M.R.C.P., D.P.M. (Oxford).

Hon. Secretaries: ROBERT ORTON, M.D., M.R.C.P.Ed., D.P.M., Royal Victoria Infirmary and King's College Medical School, Department of Psychological Medicine, Queen Victoria Road, Newcastle upon Tyne, 1; D. A. POND, M.D., M.R.C.P., D.P.M., Yew Trees, Dover House Road, Roehampton, S.W.15.

Tuesday, July 16.—Morning. Symposium on Tranquilizers, Professor J. ELKES (Birmingham), Dr. L. C. COOK (Dartford), Dr. E. H. KITCHING (Manchester).

RADIOLOGY

President: S. WHATELY DAVIDSON, M.D., F.R.C.P., F.F.R. (Newcastle upon Tyne).

Vice-Presidents: PAIGE ARNOLD, M.D. (Sunderland); R. A. KEMP HARPER, M.D., F.R.C.P.Ed., F.R.F.P.S., F.F.R., D.R. (London); W. S. SHEARER, M.B., F.R.C.S.Ed., D.R. (Edinburgh).

Hon. Secretaries: B. D. HOUSTON, M.B., B.S., D.M.R., "Roanhead," Melbury Road, Newcastle upon Tyne, 7; ARTHUR JONES, M.D., M.R.C.P., D.M.R.T., Radiotherapy Department, St. Bartholomew's Hospital, London, E.C.1.

Tuesday, July 16.—Morning. Combined session with Sections of Medicine, Surgery, and Cardiology on Arterial Embolism.

Wednesday, July 17.—Afternoon. Combined session with Section of Surgery on Radiological Investigation of the Biliary Tract.

COLOUR TELEVISION

There will be a daily programme of closed-circuit colour television from the Royal Victoria Infirmary to the Gymnasium, King's College, sponsored and produced by Smith, Kline and French Laboratories Ltd. The programme will consist of clinical demonstrations and surgical operations by members of the staffs of the Medical School, King's College, University of Durham, and the Royal Victoria Infirmary, Newcastle upon Tyne.

Monday, July 15.—12.15–1.15 p.m. Chairman, Mr. J. S. ARKLE. Cases of Corneal Grafts, Mr. H. VERNON INGRAM. Cases of Plastic Lenticular Implants and Contact Lenses, Mr. L. H. LAKE. Cataract Extraction by the Intracapsular Method, Mr. H. VERNON INGRAM, Mr. P. J. L. HUNTER, Dr. M. H. ARMSTRONG DAVISON. 1.15–2.15 p.m. Chairman, Dr. C. N. ARMSTRONG. Some Disorders of Thyroid Function, Dr. F. T. FARMER, Professor G. A. SMART, Mr. C. J. L. THURGAR.

Tuesday, July 16.—12.15–12.45 p.m. Chairman, Professor F. J. NATTRASS. Muscular Dystrophy, Dr. J. N. WALTON, Mr. W. H. STANTON. 12.45–1.15 p.m. Chairman, Professor G. A. SMART. The Treatment of Arthritis, with Special Reference to Intra-articular Injections, Dr. M. THOMPSON, Dr. N. CARDOE. 1.15–2.15 p.m. Chairman, Professor A. G. R. LOWDON. Compression of the Median Nerve in the Carpal Tunnel, Dr. H. G. MILLER, Mr. J. K. STANGER.

Wednesday, July 17.—12.30–12.55 p.m. Chairman, Dr. J.

FERGUSON SMITH (Glasgow). The Treatment of Some Common Skin Disorders, Dr. R. MASON BOLAM, Dr. B. WILSON. 12.55–1.20 p.m. Chairman, Professor S. D. M. COURT. Primary Tuberculosis of Skin and Mucous Membranes, Dr. F. J. W. MILLER, Dr. M. D. TAYLOR. 1.20–1.50 p.m. Peripheral Vascular Disease, Dr. D. J. TIBBS, Mr. D. N. WALDER. 1.50–2.15 p.m. Chairman, Mr. JOHN GILMOUR. Partial Gastrectomy by the Billroth I Method, Professor A. G. R. LOWDON.

Thursday, July 18.—12.15–12.45 p.m. Chairman, Dr. H. G. MILLER. Cleft Lip and Palate, Mr. J. R. G. EDWARDS. Miss M. E. MORLEY. 12.45–1.15 p.m. Chairman, Dr. M. THOMPSON. (1) Early Gait Training in Hemiplegia, Miss N. BOLAM, Miss P. LYTTLETON. (2) Treatment of a Fractured Neck of Humerus, Miss M. JENKINS, Mrs. N. ROBINSON. 1.15–1.50 p.m. Chairman, Professor G. A. SMART. The Diagnosis of Sex, Dr. C. N. ARMSTRONG, Dr. A. R. HORLER. 1.55–2.15 p.m. Chairman, Mr. J. I. MUNRO BLACK. Otosclerotic Deafness, Mr. F. MCGUCKIN.

Friday, July 19.—12.15–1.15 p.m. Chairman, Mr. J. V. TODD. The Diagnosis and Treatment of the Torn Cartilage in the Knee, Mr. C. GORDON IRWIN, Mr. J. K. STANGER, Mr. P. N. ROBSON.

PROVISIONAL TIME-TABLE OF MEETINGS

R.—Events available for members of Representative Body and Ladies accompanying them.
L.—Events primarily arranged for Ladies.
U.—Events for all Members and Ladies accompanying them.
*—Academic Robes should be worn.

Tuesday, July 9

4.30 to 6.30 p.m.—Annual Representative Meeting Inquiry Office open at the City Hall.
4.30 to 6.30 p.m.—Ladies' Club open, Medical School, King's College.
8.30 to 10.30 p.m.—R. Cocktail Party (by invitation of the Newcastle upon Tyne Division and North of England and Tees-side Branches) at the Old Assembly Rooms.

Wednesday, July 10

9.00 a.m.—Annual Representative Meeting Inquiry Office open at the City Hall.
9.00 a.m.—Ladies' Club open, Medical School, King's College.
9.30 a.m.—Annual Representative Meeting starts at the City Hall.
11.00 a.m.—Welcome by the Lord Mayor of Newcastle upon Tyne at the City Hall.
p.m.—L. Excursion to Delaval Hall and Tynemouth.

Thursday, July 11

9.00 a.m.—Annual Representative Meeting Inquiry Office open.
9.30 a.m.—Ladies' Club open.
9.30 a.m.—Annual Representative Meeting.
a.m.—L. All-day excursion to Otterburn, with visit to Otterburn Mills.
7.30 p.m.—R. Dinner for Representatives and Ladies, Old Assembly Rooms.
9.30 p.m. to 12.30 a.m.—R. Representatives' Dance, Old Assembly Rooms.

Friday, July 12

9.00 a.m.—Annual Representative Meeting Inquiry Office open.
9.30 a.m.—Ladies' Club open.
9.30 a.m.—Annual Representative Meeting.
a.m.—L. Excursion to Hedley's Works.
1.00 p.m.—Overseas Luncheon, Old Assembly Rooms.
p.m.—L. Excursion to Hexham.
p.m.—L. Exhibition of Durham Quilting; tea by invitation of Mrs. Munro Black.
7.00 for 7.30 p.m.—Aberdeen Graduates' Dinner, Tilley's Restaurant.
7.30 p.m.—Welsh Dinner, Royal Turk's Head Hotel.
p.m.—Irish Dinner.
—R. Theatre (tickets will be arranged for the Theatre Royal).

Saturday, July 13

9.00 a.m.—Annual Representative Meeting Inquiry Office open.
9.00 a.m.—Council Meeting.
9.30 a.m.—Ladies' Club open.
a.m.—L. All-day excursion to Alnwick, visiting Alnwick Castle.
a.m.—L. Conducted Tour of Laing Art Gallery for special exhibitions of local silver, glass, etc.
10.00 a.m.—Annual Representative Meeting.
10.00 a.m.—Jewish Service, Leazes Park Road Synagogue.
11.30 a.m.—* Roman Catholic Service, St. Mary's Cathedral, Clayton Street; Reception and Luncheon to follow at the County Hotel.
p.m.—L. Garden Party.
7.45 for 8.30 p.m.—Glasgow Graduates' Dinner, Tilley's Restaurant.
7.00 for 7.30 p.m.—Edinburgh Graduates' Dinner, Royal Station Hotel.
p.m.—L. "At Home," Ethel Williams Hall.

Sunday, July 14

Excursions—R. (1) All-day excursion to the Roman Wall. (2) All-day excursion to the Farne Islands, tea by invitation of the North Northumberland Division. (3) Half-day excursion to Durham Cathedral, tea by invitation of Durham Division.
8.30 p.m.—Orchestral Concert, City Hall.

Monday, July 15

9.00 a.m.—Annual Representative Meeting Inquiry Office open.
9.00 a.m.—Scientific Exhibition opens in Stephenson Buildings, King's College.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications opens at the Stephenson Buildings, King's College.
9.00 a.m.—Reception Bureau for Registration opens at the Stephenson Buildings, King's College.
9.30 a.m.—Ladies' Club open.
L.—Excursion to visit Trinity House, Bessie Surtees' House, and Guild Hall.
10.00 a.m.—Annual Representative Meeting.
12.30 p.m.—Annual General Meeting at the City Hall.
—Council Meeting (on conclusion of A.R.M.).
12.15 to 2.15 p.m.—Colour Television, Gymnasium, King's College.
3.00 p.m.—Special Session of Sections of Obstetrics and Gynaecology and General Practice: "Obstetrics and General Practice."
—L. Garden Party at Blagdon Hall.
8.15 p.m.—U.* Adjourned Annual General Meeting and President's Address at the City Hall.
9.30 p.m.—U.* President's Reception, Old Assembly Rooms.

Tuesday, July 16

8.15 a.m.—Annual Breakfast of the Christian Medical Fellowship.
9.00 a.m.—Reception Bureau open for registration, Stephenson Buildings.
9.00 a.m.—Scientific Exhibition open, Stephenson Buildings.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open at the Stephenson Buildings.
9.30 a.m.—Ladies' Club open.
9.30 a.m.—Scientific Sections, Stephenson Buildings.
10.15 a.m.—L. Excursion to Hedley's Works.
—L. Exhibition of Durham Quilting; and Coffee Party by invitation of Mrs. Munro Black.
12.15 to 2.15 p.m.—Colour Television, Gymnasium, King's College.
2.30 p.m.—U.* Robing for Official Religious Service.
3.00 p.m.—U.* Official Religious Service. St. Nicholas' Cathedral.
7.30 p.m.—U. Annual Dinner at the Old Assembly Rooms.

Wednesday, July 17

9.00 a.m.—Reception Bureau open for registration, Stephenson Buildings.
9.00 a.m.—Scientific Exhibition open, Stephenson Buildings.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open at the Stephenson Buildings.
9.00 a.m.—Round-table Conferences.
9.30 a.m.—Ladies' Club open.
a.m.—All-day excursion to I.C.I. Nylon Factory at Wilton Park.

10.00 a.m.—Leinster and Childe Golf Competition, Northumberland Golf Club, Gosforth, Newcastle upon Tyne.
10.00 a.m.—Notts Ladies' Challenge Golf Competition, Benton Park Golf Club, Arcot Hall, Cramlington.
10.00 a.m.—Scientific Plenary Session—Chemistry Lecture Theatre, King's College: "The Management of Hypertension"
a.m.—L. Coffee and Chamber Music by invitation of Mrs. W. G. A. Swan.
12.30 to 2.15 p.m.—Colour Television, Gymnasium, King's College.
2.30 p.m.—Scientific Sections, Stephenson Buildings.
3.00 p.m.—Overseas Conference.
p.m.—L. Conducted Tour of Laing Art Gallery for special exhibits of local silver and glass.
8.30 p.m. to 12 midnight.—U.* Civic Reception and Ball.

Thursday, July 18

9.00 a.m.—Reception Bureau open for registration, Stephenson Buildings.
9.00 a.m.—Scientific Exhibition open, Stephenson Buildings.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open at the Stephenson Buildings.
9.30 a.m.—Ladies' Club open.
9.30 a.m.—Scientific Sections, Stephenson Buildings.
10.00 a.m.—Treasurer's Cup Golf Competition, Northumberland Golf Club, Gosforth, Newcastle upon Tyne.
12.15 to 2.15 p.m.—Colour Television, Gymnasium, King's College.
2.30 p.m.—Scientific Plenary Session, Chemistry Lecture Theatre, King's College: "The Present Status of Prophylactic Immunization."
p.m.—L. Small parties to visit gardens in the district, Stocksfield, Corbridge, etc.
p.m.—L. Tea Party by invitation of Miss Pybus.
8.30 to 10.30 p.m.—U.* University Reception, King's Hall, King's College.

Friday, July 19

9.00 a.m.—Reception Bureau open for registration, Stephenson Buildings.
9.00 a.m.—Scientific Exhibition open, Stephenson Buildings.
9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open at the Stephenson Buildings.
9.30 a.m.—Ladies' Club open.
9.30 a.m.—Scientific Plenary Session, Chemistry Lecture Theatre, King's College: "Care of the Dying."
12.15 to 1.15 p.m.—Colour Television, Gymnasium, King's College.
2.30 p.m.—Scientific Sections, Stephenson Buildings.

OPHTHALMIC GROUP COMMITTEE

The Ophthalmic Group Committee held an adjourned meeting on March 15, with Mr. O. GAYER MORGAN in the chair, to continue discussion of the agenda of the meeting of February 15.

Ophthalmic Qualifications Committee

The Ophthalmic Qualifications Committee had given preliminary consideration to the recommendation in paragraph 4 of the report of the Joint Subcommittee on the future of the Ophthalmic Services—a recommendation that for applicants who had been medically qualified for at least ten years and who satisfied the criteria in all other respects the Ophthalmic Qualifications Committee be empowered to waive the requirement that they must have served six months in a resident appointment or equivalent whole-time non-resident appointment. This concerned applicants for admission to the central professional list.

On this preliminary consideration the Qualifications Committee had given general approval in principle to the recommendation, but had been doubtful about defining by reference to a period of years the category of practitioners whom it was proposed to bring within the scope of the recommendation. The Committee had thought it more appropriate to specify a date before which practitioners must have obtained their medical qualification in order to be able to

apply for admission to the central list under the proposed new rule. It had also suggested that practitioners who wished to take advantage of the proposed new rule must produce evidence to show that compliance with the requirement of holding a six months' resident appointment or equivalent whole-time non-resident appointment would cause them undue hardship.

The Qualifications Committee are to consider the matter further.

N.O.T.B. Clinics in Industry

The Committee's observations had been sought by the Occupational Health Committee on a letter from the N.O.T.B. Association. This letter stated that before the National Health Service the old N.O.T.B. had arranged with a number of large industrial concerns for clinics to be held on the premises attended by an ophthalmologist and a dispensing optician, the ophthalmologist being selected by the firm and the patient being assured that he had complete freedom of choice to seek attention elsewhere. In some industrial firms to-day ophthalmic medical practitioners and a dispensing optician attended, and the council of the N.O.T.B. Association, which since 1948 had replaced the old Board, felt that it would be valuable to extend this work wherever possible. The council proposed this month (March) to remind its medical members of the valuable work which could be done in this way, and sought the co-operation of the Occupational Health Committee.

The Ophthalmic Group Committee discussed the advantages of the scheme, together with the possibility of its interfering with work outside it, and accepted it on principle, on the understanding that ophthalmologists would have the wider duty of being advisers to the firm, that a full economic rent was charged for the facilities provided, and that the work should be open to any ophthalmologist.

Use of General Practitioner's Surgery

The Central Ethical Committee had received a request for advice from a member. An ophthalmologist visited the member's surgery at regular intervals for the convenience of patients who wished to have refractive tests under the Supplementary Ophthalmic Scheme, and it had been suggested, again for the convenience of the member's patients, that a dispensing optician should be present. The Central Ethical Committee had thereupon expressed the view that it would be ethically undesirable for an ophthalmic medical practitioner to visit regularly a general practitioner's surgery to see patients who required refractive tests and that there was similar objection to the proposed presence of a dispensing optician, as any such arrangement tended to limit the free choice of the patient. It had then sought the views of the Ophthalmic Group Committee.

In its discussion the Committee had in mind the dangers of shepherding inherent in such an arrangement, but recognized the difficulties which arose in outlying districts. Several members of the Committee thought it generally undesirable for an ophthalmologist to consult regularly in the premises of a general practitioner under the S.O.S.; others thought it might be satisfactory if a panel of ophthalmologists were employed; others thought that in remote districts it might be in the interests of the patient if such a practice were permitted.

It was decided that the Chairman should ask if he could attend the next meeting of the Central Ethical Committee, without binding the Group Committee in any way, and should report back.

Blindness Certification

The Committee considered the case of a member who had held a consultant appointment in the N.H.S. immediately prior to departure for the Commonwealth, and who, during his stay in the Commonwealth, had also held a consultant appointment. Back in this country he was anxious to undertake blind certification on behalf of the local authority, but, because he was not regarded as of consultant status, the county medical officer of health was not prepared to make use of his services.

The Ministry's first reply said it was part of the object of using consultants for certification of blindness that this work should be linked with examinations which may lead to appropriate treatment. This would hardly be the case if someone not associated with the hospital department in which treatment could be given was undertaking certification.

In reply it was suggested that the fact that the member could not personally undertake the hospital treatment, where that was necessary, was irrelevant.

In a further reply the Ministry claimed that the phrase "ophthalmologist of consultant status" meant an ophthalmologist who held, or had held, the post of consultant ophthalmologist on the staff of a hospital in the National Health Service.

The Committee felt that the Ministry had decided on this definition without consultation; under it, a retired ophthalmologist, however distinguished, would not be of consultant status. It was decided to take the matter up with the Ministry.

Licensing of Civil Aircraft Pilots

An ophthalmic surgeon who had examined two patients who wished to take out licences as civil aircraft pilots wrote to the Group Committee to express surprise that the Ministry of Transport and Civil Aviation were apparently prepared to accept an optician's report as satisfactory when deciding that a person's visual qualities were adequate for piloting an aircraft; and also that the examination needed to answer the questions on Ministry form C.A. 541 regarding vision was not more exacting.

The Committee decided to seek further information.

Use of Title "Ophthalmologist"

On several occasions the attention of the Association had been called to the use of such titles as "consulting ophthalmologist" by a non-medically qualified person, but it had not been possible to take any action, as there was no special protection for this term in the Medical Acts. The Council had recently appointed a Committee to examine the working of the Medical Act, and it felt that the Group Committee might wish to ask this new Committee to recommend an appropriate amendment of the Act to restrict the term "Ophthalmologist" to medical men.

It was agreed to seek this protection for the term and also to seek protection for the term "Oculist."

Ophthalmic Investigation Committees

The Ministry had confirmed that a doctor on the central professional list for providing Supplementary Ophthalmic Services, but who did not undertake work under those services, was not an "ophthalmic medical practitioner" for the purpose of membership of an Ophthalmic Investigation Committee. When the Regulations were in draft no one had contemplated that an ophthalmic medical practitioner not taking part in those services would have sufficient interest in them to join in their administration, but these circumstances had arisen in one special case. The Ministry had noted the view of the Group Committee that a doctor in this position should be eligible for membership of an Ophthalmic Investigation Committee, and the Department would consider whether the point could be met when the question of amending the Regulations arose. The Regulations could hardly be amended on points of detail at the present time.

Fee for Duplicate Consultation

The Group Committee considered correspondence concerning a case in which a consultant had examined a patient and then had decided, at the same visit, to complete form B.D.8 in order that he might be duly certified. The county council in question had claimed that where a duplicate consultation such as this took place for two separate purposes they were entitled to charge a reduced fee for the examination and completion of form B.D.8. It was stated that the county M.O.H. would take the matter up with the Medical Whitley Council. The Group Committee felt that if a

consultant found that a patient should be on the blind register he should report the fact, in which case a second appointment would be made.

Leaflet for Medical Students

The Group Committee considered the draft of a leaflet which the N.O.T.B. Association suggested should be included with the literature which was issued to medical students on graduation. It advised them on the procedure when they wished to have a patient's eyes examined. The Group Committee decided that the leaflet should be redrafted and considered at the next meeting.

Disposal of Records

The Ministry of Health announced that it contemplated proposing that the period of five years, fixed for the retention of the upper part of form O.S.C.2—after the end of the financial year to which the form related—should be reduced to four years. This was because of storage difficulties. The Group Committee agreed with this proposal.

Pupils at Fee-paying Schools

The N.O.T.B. Association had written to draw attention to the possibility that headmasters at some fee-paying schools might not always be aware of the facilities available for safeguarding the eyesight of their pupils. Its council therefore proposed to raise the matter with the Association of Public School Medical Officers. The Group Committee decided to redraft a letter which it had sent several years ago on the same subject.

GENERAL MEDICAL SERVICES COMMITTEE

A meeting of the General Medical Services Committee was held at B.M.A. House on Thursday, March 21, 1957, at 10.30 a.m. Dr. A. TALBOT ROGERS occupied the chair for the first part of the proceedings, the chair subsequently being taken by Dr. A. B. DAVIES.

At the outset of the meeting Dr. B. CARDEW said he would like to see the principle established that, when members of the Committee gave accounts to their various bodies of what took place at meetings, they did not introduce personalities or organizations.

The CHAIRMAN then reported to the Committee on the recent interview that he and Sir Russell Brain had with the Prime Minister.

Cranbrook Committee

The draft Memorandum of Evidence for the Cranbrook Committee was received and adopted with minor drafting amendments. Dr. H. D. CHALKE congratulated those concerned on drawing up such an excellent report.

Assistants and Young Practitioners Subcommittee

Dr. F. GRAY said that the Subcommittee had given very careful consideration to the Constitution Committee's proposal to set up a Young Practitioners Committee of the B.M.A., which would consider all matters affecting medical practitioners who were not fully established in a defined field of practice, including questions referred to other committees, and which could make recommendations thereon with right of direct access to Council. It was resolved finally that:

(1) The Assistants and Young Practitioners Subcommittee should remain in existence as a Subcommittee of the G.M.S. Committee; (2) that the Subcommittee is broadly satisfied with its relationship to the parent Committee; and (3) that the Subcommittee sees no reason to establish the proposed new committee, but if any matter referred to one of the three Sub-

committees at present in existence also concerns one or other of the existing Subcommittees it should be referred to it in the ordinary way.

Expressing his own personal view, Dr. GRAY said that a new subcommittee such as the one proposed would only cause strife amongst the various sections of the profession, particularly between the unestablished and the senior practitioners. It was disastrous in the interests of the profession that such proposals should have been made.

Dr. J. A. PRIDHAM said it was not intended that the Assistants and Young Practitioners Subcommittee should be wound up. The matter had been thrashed out in the Constitution Committee, and feeling in that Committee and in the Council was that the young practitioner, whether established or not established, felt that he was not getting his proper voice in the Association, and was not being looked after.

Dr. B. CARDEW said he could appreciate the general argument, but it was difficult to follow the actual mechanics of having two committees the functions of which would be so similar that they would be considering the same problems month after month.

Dr. F. M. ROSE suggested that the answer was in the machinery of the Association itself.

The resolution of the Subcommittee was accepted.

Other Business

The Committee then considered a large number of items on the agenda dealing with routine matters and completed its business at 5.30 p.m.

CONSULTANT WORK IN S.H.M.O. POSTS

As a result of the announcement (*Supplement*, February 9, p. 60) that Committee B of the Medical Whitley Council had agreed to consider the cases of S.H.M.O.s who claim to be in posts of a consultant nature, some 800 applications have been received. Cases are now being prepared by the B.M.A., and supporting evidence is being sought from medical staff and hospital committees on whether the duties, responsibilities and quality of work of the claimants are of consultant nature. The claim to Committee B will be that individual S.H.M.O.s who can be shown to be doing consultant work should be paid on the consultant scale, although the personal grading of the individual is not necessarily that of consultant. Whatever the outcome of the applications, neither the present hospital establishments nor the personal grading of applicants will be affected.

Questions Answered

Superannuation on Resignation

Q.—Next year I shall be 60 years old, and shall have completed 10 years of service in the N.H.S. If I resign in October in a selected area, what is to prevent the Government from accepting my resignation with gratitude, refunding my superannuation contributions, and saving the money which it would have had to pay me in pension from the following year onwards? It should have little difficulty in replacing me by an unestablished practitioner.

A.—Those doctors in the selected areas who remain on the obstetric list will retain their superannuation rights. In the case of other doctors the position is that, if, during a temporary break in service, a doctor does not accept a refund of contributions and returns to superannuable employment within 12 months, his rights are secure and he continues from where he left off. It can therefore be said that so far as the present plan is concerned doctors' superannuation rights are completely safeguarded.

No settlement with the Government will be agreed to unless it contains a general no-detriment clause safeguarding the interests of those doctors who resigned.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Woman Consultant for Women's Hospital

SIR.—In "Scottish News" under "Woman Consultant for Women's Hospital" (*Supplement*, March 16, p. 116), statements from the Secretary of State's letter to the Southern Hospitals Group Board of Management are given which we think are misleading, and tend to throw the present controversy into wrong perspective. We would be grateful if you would permit us to make a few observations.

While it is true that the physician's work at Bruntsfield and Elsie Inglis Hospitals has heretofore been estimated at three half-days, the Regional Hospital Board had accepted the fact that at least five half-days of clinical work are undertaken in these hospitals. There appears no reason why work estimated erroneously at three half-days in 1948 should continue to be underpaid.

The only argument for changing the *status quo* given by the Regional Hospital Board, against the advice of the Board of Management and against a great weight of medical and lay opinion, is that someone "of the highest calibre" might be attracted to the new consultant position. The representations made by the Board of Management against this argument are of wider import than is implied by the letter from the Department of Health. Not only is a woman consultant desired for the women's hospitals but a woman "of the highest calibre." Further, it is strongly felt that the amount of work in four scattered hospitals would be too much for one person. This point of view is supported by the regional consultants and specialists committee.

The original appeal from the Board of Management to the Regional Hospital Board for the maintenance of the *status quo* did not ask for the post at Bruntsfield and Elsie Inglis Hospitals to be restricted to medical women only. This has arisen as the result of the expressed desire of the people, lay and medical. It is obvious that the only satisfactory solution to the difficulty would appear to be the appointment of a woman consultant to the women's hospitals.—We are, etc.,

E. A. BAXENDINE,
SUSANNE J. PATERSON.

Edinburgh.

General Practitioners and the Hospital Service

SIR.—It would seem, judging from the poor response to appropriate advertisements in the medical press and elsewhere, that insufficient publicity has been accorded a scheme providing for combined training of recently registered graduates in general and hospital practice, and I should be grateful if I may be permitted to repair this omission to some extent through the medium of your correspondence columns.

Some time ago a statement of policy agreed between the Joint Consultants Committee (Scotland), the General Medical Services Subcommittee (Scotland), and the Department of Health for Scotland was issued (see *Supplement*, March 17, 1956, p. 88) urging that (1) a combined training scheme should be developed which offers the practitioner concurrent training and experience in hospital and general practice on completion of his pre-registration year or on completion of National Service if later, and (2) entry into general practice on a part-time basis should be made easier for doctors who have continued in hospital service up to the level of registrar, but who have decided not to devote the whole of their subsequent career to hospital and specialist work.

The basis of this scheme is that a practitioner accepted for training will undertake a two-year programme of work under which he will spend approximately half his time in hospital employment, at the senior house officer or registrar level according to the needs of the particular hospital, and

the other half as a trainee assistant in general practice under the guidance and tuition of an experienced practitioner approved for the purpose by the regional selection committee.

While it was the original intention that as nearly as possible the trainee should carry out both elements of his training concurrently, spending approximately half of each day in hospital and the other half outside, it was anticipated that modification would be necessary to suit local conditions, providing, for example, for the whole-time devotion of alternate periods of up to one year to hospital service and to general practice. After studying ways and means of participating in the scheme the Borders Hospitals Board of Management concluded that in a mainly rural area concurrent training was not a practicable proposition and decided that two trainees should be simultaneously employed, exchanging between general practice and hospital so that there is always one of the two in each field.

The hospital work will involve service in the capacity of senior house officer in the orthopaedic department at Peel Hospital, but during their periods of residence the trainees will have ample opportunity of gaining experience in branches of hospital work other than orthopaedics, as the hospital accepts a wide variety of general surgical and medical cases from four border counties for specialist and emergency treatment in the appropriate wards, while clinics in various specialties, including diseases of ear, nose, and throat, ophthalmology, dietetics, and gynaecology, are conducted at various hospitals within the Group. Experience in general practice will be gained in a large partnership practice in Selkirk, an attractive county town, which offers a considerable variety of medical work, including midwifery and the facilities of a cottage hospital, within a mixed industrial and agricultural community. These proposals have been approved by the higher authorities concerned, and it is hoped that two suitable trainees may shortly be forthcoming to permit their implementation.—I am, etc.,

Galashiels.

G. B. WALKER.

Reform of Health Service

SIR.—Ideas on the reform of the method of payment of general practitioners are attracting more interest, and it was suggested in the *Manchester Guardian* of December 29, 1956, that some alteration was necessary to avoid a "quinquennial earthquake" before pay adjustments could be made. May I with humility, since I have only a short experience of general practice, make some suggestions towards this purpose?

The unemployed people are most in need of the G.P.'s help—i.e., children up to school-leaving age, students, retired people, and the disabled and permanently unemployed. They should be registered with a doctor, who is paid for this by capitation fee. The employed person and his wife can choose to pay into an insurance scheme to reduce their payment to the G.P., or pay for these services as they are received, and they may go, as originally, to whom they please. This insurance scheme could be run privately, as suggested by Dr. J. W. Evans (*Supplement*, March 16, p. 118), or by the Government. The money received would provide an investment income for the insurer which, in the case of the Government, could possibly be offset against the cost of the Health Service. Then the patient and the doctor would suffer less restriction, and, if a reduction in Health Service costs affected taxation, they would be better off for being thrown on to their own resources.—I am, etc.,

Newbury.

L. P. A. NEWBORNE.

Buying and Selling of Practices

SIR.—I think an end should be made to the publishing of letters concerning the remuneration of general practitioners. Surely, after so many months, this problem has been well and truly thrashed out. To continue this never-ending bickering rather cheapens our noble profession in the eyes of the world.

For this reason I think more time should be spent on the question of the buying and selling of practices. Think of the number of present-day doctors who answer vacancy advertisements. Have you thought of the poor doctor not wishing to put forward the same referees again and again as each new vacancy arises? Now there is no scope for improving one's lot apart from increasing an already too large medical list. What of the doctor who has started in a working-class area? He makes a large practice by dint of hard work. Why can't he sell such a practice and buy another practice in some other part of the country should he so wish? However, this is impossible, thanks to a rather silly bargain struck by civilian doctors during the period when the then coming generation of medical men was still in the Services. In other words, the very thing against which we fought—i.e., national socialism—was let in through the medical backdoor.

Therein lies the answer to the huge exodus of doctors from our shores. It is obviously not the temperate British climate but the intemperate workings of a befuddled governmental brain. Therefore I implore you to do something about the goodwill of medical practices which have been made by the efforts and minor sacrifices of individual doctors. What is the future of the said doctor in a busy industrial area? To stay there for the rest of his life? What an ambition. If this is what it means to be a doctor in Britain I, for one, shall leave and start from scratch in a foreign country and make sure that, should I be blessed with children, they will not be looked down upon as being apathetic Britishers.—I am, etc.,

Dagenham, Essex.

SYDNEY HICKS-ROE.

Remuneration Claim

SIR.—From the variety of views expressed in the correspondence reaching the *Journal*, it is apparent that there is no uniformity of opinion on the above. There has indeed been a regrettable lack of clear leadership which might well account for this.

A statement has been issued (*Supplement*, March 23, p. 125) as to the action to be taken by individual doctors when they resign from the Service, but is this really the first thing which must be determined? In withdrawing from the N.H.S. the profession will be taking a step which cannot be repeated. It is the ultimate weapon and must therefore be used to deal fully with all the problems. Consequently, before withdrawing it is essential to be clear as to the reasons for withdrawal and under what conditions service might again be resumed in association with the Government. As far as I know, no clear pronouncement has been given on this. I would suggest that the following might be sufficient as a working platform.

- (1) As far as general practice is concerned, the profession will not agree to work directly under State control, as this inevitably involves political decisions and interferes with the proper doctor-patient relationship. Alternative methods would be matters for discussion and negotiation between the profession and the Government.
- (2) Other branches of the profession may, of necessity, have to rely to a greater extent on direct Government financial payments, but it should be a *sine qua non* that any doctor, whether in general practice or employed in hospital, university, local authority, civil service, or other work, must be dealt with primarily as a member of the medical family.
- (3) In case of any dispute, independent arbitration must be available by right on the request of either side in the dispute, and the arbitration findings must be accepted by both parties.
- (4) Remuneration levels throughout the profession generally must be brought up at once to those envisaged as being appropriate under the Spens Report. The appropriate levels could be decided by an arbiter or arbitration court.

The Government has so far refused to consider arbitration in the present dispute, and the Prime Minister has even been indiscreet enough to announce a 10% increase to junior hospital staff, although there is in existence a Whitley Committee which is supposed to deal as an independent body with these matters by negotiation between the management and staff sides. Such anarchy should not be coun-

tenanced, but if the profession is to be strong in resistance the sections must be united, and if they are to go forward together in action the objectives must be clear. To produce such a statement is the duty surely of the B.M.A. Council. Why is it being delayed?—I am, etc.,

Inveresk, Midlothian.

JOHN RIDDELL.

SIR.—I would like to give you the views of a young general practitioner on the remuneration claim. Although an increase in pay would be nice at any time, I feel it is not justified at the moment to press on the country any further burden. Viewing our situation in society, I do not think we are relatively worse off than our friends in other professions, and reading the analyses of professional incomes and their increases since 1939, as they are published in the *Financial Times*, supports this. The problem of pay differentials is one affecting the whole middle class. If we can live in reasonable circumstances and give our children the best possible education, I am content.

I regret very much the manner and the timing of the B.M.A. effort to force this on the Government. I do not feel their arguments are sufficiently convincing, and I doubt the support that will be received from the profession as a whole. Little effort has been made (certainly none in my area) to determine the reaction of doctors to the pay claim. If I am right, whether the present B.M.A. policy fails or succeeds it cannot help the profession in the long run. We will either encourage all others to put up prices and so force up the cost of living, or we will no longer be regarded as knowing what we are talking about. The success of Britain now, as ever, depends on our ability to adapt our way of life to suit present trends. The absence of large differences in pay between the classes and the provision of first-class educational opportunities for all are, I think, the essentials. I am sure the medical profession will be able to give the country a lead.—I am, etc.,

Welwyn, Herts.

CHARLES DANSIE.

SIR.—The decision, likely to face the individual practitioner, to give or to withhold his support to the application of pressure in support of our pay claim is an anxious one. If he gives his support he is too well aware that the inflationary effect will, coming from an influential profession, be out of proportion to the financial sum involved and capable within a short time of depriving him of any benefit obtained. If he withholds his support he condones a breach of agreement.

May I propose that a compromise proposal be put forward—namely, that, in return for the submission of our claim to arbitration, we agree to accept any reward in the form of non-transferable Government stock redeemable in 10 years or on previous death or in cases where it is agreed that hardship now exists?—I am, etc.,

Basingstoke.

R. GALLIMORE.

SIR.—If a favourable public opinion is necessary to a successful outcome of our remuneration claim we seem bound to lose the day unless something can be done about this mythical "average G.P." who now earns £2,222 per annum free of all practice expenses. This individual has been presented on many fronts. He figured prominently in an article, "Paying the Doctor," in the *Financial Times* of December 29, 1956, which stated that the expenses of which he was relieved included the wages of an assistant and a secretary, as well as the rent and furnishing of his surgery. The same newspaper exhibited him again on February 22, stating categorically that he had an income of "£2,222 (gross after deduction of expenses)." The B.B.C. had him "on the spot" in a programme of that name on February 26 as having a gross income of £3,300, which, after deduction of expenses, left him "a little over £2,200."

What are the facts? Who is this "average G.P."? Are my own circumstances different from those of thousands of my colleagues? There are 2,021 names on my list, which is, I believe, slightly larger than average. I do not

employ an assistant, and the only secretarial work listed among my expenses is that done at cut-price rates by my wife. My earnings from all sources for the past three years, after deduction of expenses allowed by the Inland Revenue, have averaged only three-quarters of that which apparently I should be earning.

So long as the public believes that we have been enjoying an annual income of £2,222 free of all expenses since "Danckwerts," just so long will it be impossible for us to make the man in the street realize that we have any justification in asking for more money. Unfortunately, one finds little evidence that anything is being done to destroy the illusion.—I am, etc.,

Launceston, Cornwall

DONALD M. O'CONNOR.

* * The Spens Committee regarded £1,111 as being the proper average net income from all sources for a general practitioner in a National Health Service. This was in terms of 1938 values of money. The Danckwerts award doubled this figure for 1951 values of money, and stated that the average net remuneration per doctor should be £2,222. The total net remuneration from all sources of N.H.S. general practitioners is therefore a global sum of £2,222 multiplied by the number of principals.—Ed., B.M.J.

SIR.—I should like to offer the B.M.A. my whole-hearted support with respect to the present action in the matter of remuneration, but may I make a plea that wider issues should be considered also by the profession? The administrative interference and Governmental attitude towards the profession has whittled away the last shreds of any independence. Much of the administrative work is carried out by officials who are either unwilling or unable to deal with the medical questions with which they are continually confronted. The old tradition and value of the Hippocratic Oath and the doctors' position in society have disappeared in spite of the assurances of 1948.

I think one ought to remember that—in a recent court case, I believe—it has been argued and established that there exists a "master-servant" relationship between the Ministry and the profession. This, I believe, is the core of our problem, since in the older tradition we were servants only to our patients, to science, and our conscience. This is the outcome of the generally increasing reluctance to assume or reward responsibility. It is after all we who literally and figuratively have to act in the last resort. In that way I believe we are different from many other professions where the action taken affects welfare and life of our fellows less directly.—I am, etc.,

Colchester.

S. L. SHERWOOD.

Those Small Lists

SIR.—I quote a report from the *Daily Telegraph* of February 26. "Some country doctors with small lists of patients, it was pointed out, are as much in need of an increase [of pay] as any of the hospital doctors." This, of course, is true. It would probably be even more cogently true of the town doctors with small lists, since their uncompensated expense ratio is higher. Not only is it true, but this kind of remark has good propaganda value. It appeals to the fair-minded and not-too-analytical British public. To many small-list doctors whose memories are short, it may even sound a note of promise in their grim struggle to make ends meet. This particular hand-out from B.M.A. House may indeed indicate a genuine intention on the part of our present-day leaders to look after their less fortunate colleagues. But to those of us who have been closely linked with B.M.A. politics this is an oft-told tale which has acquired an unsavoury smell. Probably it was told in the fight with Lloyd George in 1911—I don't remember. Certainly it was a spearpoint of our propaganda in the fight with Bevan in 1947-8 and again in securing the Danckwerts arbitration in 1950-1. Yet the small lists remain and there is extensive unemployment in our profession.

The plain fact is that, by force of circumstances, the B.M.A. is run by the doctors with large lists. No one can afford the time-consuming game of medical politics unless he has a substantial income and at least one capable and willing assistant. And so the big committees at B.M.A. House which settle our destinies are composed almost exclusively of the "haves." I am about to retire from the N.H.S. and my view is detached. I feel impelled to sound a warning to the small-list and the unestablished doctors. Presently, if the fight is on, they will be asked to support a policy of collective resignation. Their support will be indispensable. They will be well advised to make their co-operation conditional upon a proper plan for the redistribution of remuneration in general practice. Such a plan should take account of the expense ratio of small practices and should solve the unemployment problem by drastically cutting down the capitation fee payable in relation to the upper ranges of lists above 2,500. Perhaps the G.M.S. Committee has already thought out a plan on these lines and is ready to present it to the special conference. It would be a handsome gesture and would do much to secure that indispensable unity.—I am, etc.,

Orpington Kent.

A. C. E. BREACH.

Saving on Prescribing

SIR.—The suggestion in Dr. Howard English's letter (*Supplement*, February 23, p. 95) that, in effect, doctors should economize by prescribing cheap standard preparations and be rewarded by an increase in their remuneration, is unwise. Especially is this so in the light of the growing volume of evidence of the superior quality of proprietary drugs, both from the pharmaceutical and clinical points of view. The evidence includes: (1) A recent report¹ by eminent analysts that a large proportion of standard barbiturate tablets examined by them were unsatisfactory, whereas all proprietary tablets examined were satisfactory. It is understood that the analysts are extending their survey to other classes of drugs, and have already made a preliminary observation that similar startling differences in quality were apparent in these. (2) A recent review by Dr. J. C. McClure Browne *et al.*² on clinical and laboratory assessments of senna preparations, in which they conclude that "Not only do apparently identical B.P. preparations of syrup of senna differ widely in their therapeutic effect, but, at average doses, the B.P. syrups tested were no better than inert controls. Chemical assay confirmed previous indications of deterioration in aqueous B.P. preparations. A dry granular preparation of senna pod ('senokot'), used in doses usually prescribed, proved to be chemically stable and to have a potent laxative effect." (3) Criticism³ by the Director of Medical Services, Cyprus, of the *National Formulary* on the ground that it was not an authoritative guide to modern therapeutics, but merely a compilation of all these preparations which may still be used by doctors, whether the medicament is still considered efficacious or no.—I am, etc.,

Horsham, Sussex.

F. F. MARCHBANK.

REFERENCES

- 1 Bagnall, H. H., and Stock, F. G., *Pharm. J.*, 1956, 177, 441.
- 2 Browne, J. C. M., Edmunds, V., Fairbairn, J. W., and Reid, D. D., *British Medical Journal*, 1957, 1, 436.
- 3 *Chemist and Druggist*, 1957, 167, 80.

Board-and-lodging Charges

SIR.—Since the inception of the National Health Service there has been a continuous process of reducing the reward for the services of whole-time hospital medical staff as compared with (1) the general community; (2) other groups of public service employees; (3) lay hospital officers; (4) general practitioners who, in any case, are largely notoriously under-remunerated for the work they do.

We know that there has been a continuing external relativity decline in regard to full-time hospital medical staff remuneration as compared with each of these other groups, and we know also that the 1951 increase for hospital medical officers (not awarded until 1954, and then not retrospectively) created an upheaval in the internal salary relativities as

between hospital medical staff grades themselves. Now a further disturbance has been caused by the recent unjustifiable residential charges for hospital medical officers. Quite apart from the anger which has been engendered among whole-time resident S.H.M.O.s, the recent board-and-lodging circular has made nonsense of differentials. For example, a fourth-year single resident senior registrar will receive a cheque for a larger amount than a single resident senior hospital medical officer on his starting salary after deduction of income tax and board-and-lodging charges. The senior registrar will receive £40 a year net more than the S.H.M.O. A second-year single resident S.H.M.O. receives £250 gross a year more than a fourth-year single resident senior registrar, but this is whittled down to only £17 a year net more after corresponding deductions have been made in each case. A single consultant in residence on his starting salary earns £14 a year less net than the top level single resident S.H.M.O. after deductions for tax and living in. In other words, the income of the resident medical officer drops on his initial promotion from senior registrar to S.H.M.O. or from S.H.M.O. to consultant.

This situation may or may not be equitable, depending on one's particular point of view about overlapping salaries, but I wonder whether it was the intention of the negotiating bodies so to disturb the balance of pay of the various hospital medical grades that the more "junior" medical officer receives a larger pay cheque than the more "senior." This is one of many illustrations of the host of anomalies that have developed since the old local authority hospital days. The extraordinary thing is that so many of the adjustments which are initiated on the hospital side seem ultimately to be to the disadvantage of the medical officer. Is it that the Treasury agents out-maneuvre their contestants, or that the hospital side negotiating party is forced by ministerial pressure to make unsatisfactory compromises, or is it, as some would contend, that we just haven't a clue?

Stoppages for insurance and superannuation contributions have been ignored in the above calculations, although in point of fact this makes the S.H.M.O.'s position worse relative to the senior registrar. Moreover, if the senior registrar achieves consultant status, the S.H.M.O. pays more in superannuation contributions than the senior registrar in proportion to his ultimate pension at this stage.—I am, etc.,

F. STEEL.

London, N.11.

Retiring Age

SIR.—I wonder if the frustrated senior registrars and others realize that one of the main factors accounting for their plight is the unnecessarily high retiring age imposed on our profession by the N.H. Service Superannuation Division of the Ministry of Health. And, for those who do not know, it is worth repeating that, except for psychiatrists and those fully incapacitated by ill-health, the minimum pensionable retiring age is 60, which seems to me oppressive.

I am quite sure that if the permissible pensionable retiring age could be lowered to 55 it would make for a much greater flexibility in the Service, allow a freer influx and advancement of young doctors, and provide for a natural fall-out of a proportion of less active seniors, with undoubted advantages to the Service as a whole. I suggest that a revision of this ruling on the retiring age would be timely.—I am, etc.,

Bangor.

J. ROBERTS.

Psychiatric Out-patient Departments

SIR.—Are we not proud of our British "bulldog" reputation, characteristic of our nation, and made more pronounced by adversity, emergencies, wars, or privation? In a letter in the *Supplement* of February 9 (p. 62) it was hoped by a correspondent, Dr. J. C. Sawle Thomas, that soon all general hospitals would have their own psycho-logical and psychiatric out-patient departments. To my mind this is a dangerous plan that will increase the number of neurotic people in England. Has not America too much interest in psychiatry, too much personal publicity, less

spiritual vitality, because of this? By all means let there be psychiatric units in some hospitals; but we should make it more difficult for mistakes, graver than imagined by unthinking people, to be made by housemen that will expose the private lives of many completely normal and balanced individuals to scrutiny and recordings.

Individuals may be high-spirited, serious, original, or even shy. If there is some tragedy or deep sorrow in their personal lives they may be temporarily unhappy or morose. Soon the fire and spiritual pride of our nation will be quelled by this "quick summing up" of patients, sent to hospital for other reasons, by a busy or tired physician or surgeon, who may think they are in need of psychological help. Once the label is there, the "rubber stamp" mentioned by Dr. C. Allan Birch (*Supplement*, February 23, p. 93) implies that the patient is below par psychologically—a heavy accusation to make. Too much criticism of our neighbours will remove truth, naturalness, of manner, and happiness of spontaneity. I hope some of my medical colleagues will heed the warning, because, once initiated as in State medicine, whinings and recriminations are too late.—I am, etc.,

M. M. DOBSON.

London, W.1.

Assurance Profits

SIR.—The fiftieth anniversary of the Medical Insurance Agency (long may it prosper) prompts me to ask a question which seems pertinent and well might be the subject of an inquiry by the Agency.

How much unexpected extra profit have the life assurance businesses made in the last 20 years following the introduction of chemotherapy and the antibiotics? The introduction of chemotherapy and the antibiotics must be an astronomical one and should be comparatively easy to calculate. The discomfort caused by the difficulty in investing this windfall is in daily evidence in the financial columns of newspapers, and most of the bigger companies seem to be disposing of a part of it by erecting huge nondescript blocks of offices. This money has been earned by medical science, and it would seem only reasonable that a proportion of it should be returned to source. For instance, were 10% of it applied to the capital re-equipment of hospital services, it might go a long way towards giving the National Health Service the "new look" it so badly needs.—I am, etc.,

Norwich

P. H. SUTTON.

G.P. Refresher Courses

SIR.—We live in an age of broken promises. Recently I applied for a place in two separate refresher courses for G.P.s, within ten days of the advertisement in the *British Medical Journal*. The first advised me to apply for the September course as that of May was already full and had already a "fairly long waiting-list" for withdrawal places. The second advised me to make early application for a course in May, 1958, as that for May, 1957, "has been booked for some considerable time." All this, of course, is long before I attempt to find a locumtenent.

To reassure myself I turned to the *Handbook for General Medical Practitioners* (1955). Paragraph 265 (page 57) runs (my own italics): "The Minister is anxious that general practitioners taking part in the Service should have every opportunity to attend these courses. . . . The only conditions to be satisfied are that the doctor must . . . have at least 500 persons on his list"—no mention of finding a locumtenent. This is one of the issues on which G.P.s stand alone and affects particularly those who are single-handed. Consultants have no leave problems. Some method must be devised and written into any future agreement on pay and conditions. The cost of a holiday is now prohibitive and these refresher courses offer our only hope of respite from door-bell and telephone. It cannot be too much to ask from a Ministry which values our service so highly that special arrangements are made (*sic*) to keep us up to date. There has been a lot of talk recently about the health of medical students. Does the Ministry care

what happens to the single-handed practitioners who cannot afford a holiday? Is there any other person in the civilized world who is "at risk" for 24 hours a day, each and every day?—I am, etc.,

Barrow-in-Furness.

J. H. C. CORR.

Improving Maternity Care

SIR,—Under the heading "Maternity Services Committee" (*Supplement*, March 2, p. 100) you report that the Royal College of Midwives, in its evidence to the committee on the maternity services now sitting under the chairmanship of Lord Cranbrook, has stated that "there should be more careful selection of general-practitioner obstetricians . . . all general practitioners should be required to have post-graduate experience in a maternity hospital or unit and should attend refresher courses at regular intervals."

One could not deny that there may be (I for one would not judge my equal; still less would I judge my senior) some instances where the general-practitioner obstetrician fails to achieve the necessary standard in his work. Nevertheless I fail to see how in any way it is the prerogative of a nursing organization to question the integrity or capabilities of a group of doctors and to cast aspersions on (1) the professorial and consultant staff on whom has fallen the responsibility of training these doctors; (2) the examining bodies who have passed these doctors in their respective subjects; (3) the local medical committee to whom application must be made for inclusion on the obstetrical list and to whom ample evidence must be given of competence; and (4) the local executive committee on whom rests the final responsibility for agreeing to the inclusion of a practitioner's name on the obstetrical list. Note further, please, that in future we general-practitioner obstetricians are to be ordered to go back to school, not on our own initiative or desire to glean further knowledge, but at the express wishes of the College of Midwives.—I am, etc.,

Liverpool, 7.

HUGH W. FORSHAW.

H.M. Forces

The name of Captain J. Parr, R.A.M.C. (Att. 5 K.A.R.), appears in a list of personnel who have been mentioned in dispatches in recognition of distinguished services in Kenya for the period April 21 to October 20, 1956.

A *Supplement* to the *London Gazette* has announced the following awards:

Fourth Clasp to the Territorial Efficiency Decoration.—Major G. D. Thompson, T.D., R.A.M.C.

Second Clasp to the Territorial Efficiency Decoration.—Colonel J. P. J. Jenkins, O.B.E., T.D. (Retired). Lieutenant-Colonel C. S. Nicol, T.D., and Major R. W. Evans, T.D., R.A.M.C.

First Clasp to the Territorial Efficiency Decoration.—Colonel J. P. J. Jenkins, O.B.E., T.D. (Retired).

Territorial Efficiency Decoration.—Major E. R. Smith-Owen (now S.S.R.C.), Captain (Honorary Major) M. C. W. Long (Retired), and Captain D. L. J. Bilbey, R.A.M.C.

ROYAL NAVY

Surgeon Commander G. A. Miller has retired.
Surgeon Lieutenants J. M. Houghton, P. W. Head, and L. J. Evered to be Surgeon Lieutenant-Commanders.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Captain H. M. Willoughby, V.R.D., has retired.
Surgeon Lieutenants K. E. E. Read, N. A. Lewtas, J. P. R. Richardson, and M. M. Brown to be Surgeon Lieutenant-Commanders.

ARMY

Lieutenant-Colonels M. S. W. Bisdee, O.B.E., A. J. Clyne, C.B.E., and J. C. Reed, C.B.E., from R.A.M.C., to be Colonels.

ROYAL ARMY MEDICAL CORPS

Majors C. E. Stuart, F. J. W. Hooper, T.D., T. P. H. McKelvey, and A. B. Dick, T.D., to be Lieutenant-Colonels.

Major E. G. Hardy has retired, receiving a gratuity (Reserve Liability).

Captains E. H. Hillyard and W. O'C. Fitzpatrick to be Majors.
Short Service Commission.—Lieutenant W. E. Tyndall, C.B., C.B.E., M.C., has relinquished his commission, and reverted to retired pay in the rank of Major-General. Major J. B. Spearman has retired, receiving a gratuity (Reserve Liability).

REGULAR ARMY RESERVE OF OFFICERS

Colonel D. C. Bowie, O.B.E.; late R.A.M.C., having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers.

ARMY EMERGENCY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Colonel F. W. A. Warren, O.B.E., T.D., to be Honorary Colonel, 27 General Hospital.

Colonel M. de Lacey, O.B.E., T.D., has retired, retaining the rank of Colonel.

Lieutenant-Colonels (Acting Colonels) G. S. Adams, T.D., and S. T. Anning, T.D., to be Colonels.

Lieutenant-Colonel B. Holden has been granted the acting rank of Colonel.

Majors (Acting Lieutenant-Colonels) O. Walker, W. H. Valentine, O.B.E., E.R.D., J. G. A. Gilruth, T.D., and L. H. Lerman to be Lieutenant-Colonels.

Major W. K. S. Moore has resigned his commission and has been granted the honorary rank of Major.

Major J. H. Dean, T.D., has resigned his commission, retaining the rank of Major.

Captain (Acting Lieutenant-Colonel) R. B. Wilson to be Major.

Captain (Acting Major) C. W. S. F. Manning has been granted the acting rank of Lieutenant-Colonel.

Captain A. M. Wiley, from Regular Army, National Service List, to be Captain, and has been granted the acting rank of Major.

Lieutenant (War Substantive Captain) S. R. T. Headley, from Emergency Commission, to be Captain, and has been granted the acting rank of Major.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel (Brevet-Colonel (Acting Colonel)) M. J. Lindsey, O.B.E., M.C., T.D., to be Colonel.

Lieutenant-Colonel A. E. K. Price, T.D., has been granted the acting rank of Colonel.

Lieutenant-Colonel G. M. Warrack, D.S.O., O.B.E., T.D., from A.E.R.O., to be Lieutenant-Colonel, and has been granted the acting rank of Colonel.

Majors (Acting Lieutenant-Colonels) J. P. W. Hughes, T.D., I. W. Caldwell, C. O. Carter, R. G. Sykes, E. Grey-Turner, M.C., T.D., J. W. A. Crabtree, and K. C. MacKellvie, T.D., to be Lieutenant-Colonels.

Major E. H. Hanson, T.D., has been granted the acting rank of Colonel.

Majors M. F. Ronayne, O.B.E., and J. S. Binning have been granted the acting rank of Lieutenant-Colonel.

Major J. S. B. Mackay, T.D., has retired, retaining the rank of Major.

Major D. O'Brien has resigned his commission, retaining the rank of Major.

Captain T. W. Barnes to be Major.

Captains N. B. Crisp, T. N. Reynolds, and J. K. Butterfield have been granted the acting rank of Major.

Captain (Acting Major) H. C. Sims, having exceeded the age limit, has retired, and has been granted the honorary rank of Major.

Captain (Acting Major) A. J. Heber to be Major.

Lieutenant (War Substantive Captain) D. A. Stanley, from Emergency Commission, to be Captain, and has been granted the acting rank of Major.

TERRITORIAL ARMY RESERVE OF OFFICERS: ROYAL ARMY MEDICAL CORPS

Colonel C. K. D. Edwards, T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O., retaining the rank of Colonel.

Colonels W. Milburn, M.B.E., T.D., R. Passmore, C. K. D. Edwards, T.D., G. Rigby-Jones, M.C., T.D., J. Smith, O.B.E., T.D., and J. B. Mackay, M.B.E., T.D., from Active List, to be Colonels.

Lieutenant-Colonels J. G. Waugh, J. B. Heycock, M.C., T.D., D. T. Rowlands, and C. W. P. Bradfield, T.D., from Active List, to be Lieutenant-Colonels.

Lieutenant-Colonels D. S. Middleton, T.D., B. C. Jennings, T.D., and D. W. E. Lloyd, M.C., T.D., having attained the age limit of liability to recall, have ceased to belong to the T.A.R.O., retaining the rank of Lieutenant-Colonel.

Majors (Honorary Colonels) J. F. Wilde, T.D., R. K. Debenham, O.B.E., and M. Stoddart-Scott, O.B.E., T.D., M.P., having attained the age limit of liability to recall, have ceased to belong to the T.A.R.O., retaining the honorary rank of Colonel.

Majors (Honorary Lieutenant-Colonels) H. G. Garland, T.D., W. G. Love, T.D., D. A. Hunt, T.D., and K. McL. Cobban have ceased to belong to the T.A.R.O., retaining the honorary rank of Lieutenant-Colonel.

Majors (Honorary Lieutenant-Colonels) C. H. P. Pauli, T.D., A. I. Hunter, P. H. R. Anderson, J. Wright, T.D., T. McK. Robb, and J. D. Finlayson, M.B.E., T.D., having attained the age limit of liability to recall, have ceased to belong to the T.A.R.O., retaining the honorary rank of Lieutenant-Colonel.

Major (Acting Lieutenant-Colonel) H. J. C. J. L'Etang, from Active List, to be Major, and has been granted the honorary rank of Lieutenant-Colonel.

Major H. B. Trumper, T.D., from Active List, to be Major, and has been granted the honorary rank of Lieutenant-Colonel.

Majors D. MacG. Williamson and S. A. Jenkins have ceased to belong to the T.A.R.O., retaining the rank of Major.

Majors J. C. Fletcher, T.D., D. W. L. Leslie, A. S. Fairbairn, C. Bainbridge, O.B.E., J. D. Bruzard, D. B. McVittie, T.D., P. B. Williams, T.D., W. A. Todd, R. W. J. Naismith, S. R. Gosling, J. E. McClelland, and P. Jacobs, from Active List, to be Majors.

Major G. B. Matthews, T.D., having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O., retaining the rank of Major.

Major F. W. Newby-Good, T.D., has ceased to belong to the T.A.R.O., on appointment to the Canadian Army (Supplementary Reserve).

Captains (Honorary Majors) F. G. Brown, T.D., and R. M. McGregor, T.D., having attained the age limit of liability to recall, have ceased to belong to the T.A.R.O., retaining the honorary rank of Major.

Captain (Honorary Major) J. A. Dunlop has relinquished his commission, retaining the honorary rank of Major.

Captains (Honorary Majors) F. R. R. Martin, J. H. Bulleid, G. C. Smith, and D. R. Beaton, T.D., have ceased to belong to the T.A.R.O., retaining the honorary rank of Major.

Captain (Acting Major) D. J. Ellison, from Active List, to be Captain, and has been granted the honorary rank of Major.

Captain (Acting Major) S. Myers, from Active List, to be Captain, relinquishing the acting rank of Major.

Captain B. M. C. Gilsenan, having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O., and has been granted the honorary rank of Major.

Lieutenant (War Substantive Captain) (Honorary Major) J. J. Mitchell, having attained the age limit of liability to recall, has ceased to belong to the T.A.R.O., retaining the honorary rank of Major.

ROYAL AIR FORCE

Air Marshal Sir James MacC. Kilpatrick, K.B.E., C.B., Q.H.P., has retired.

Squadron Leader F. J. Davies has resigned his commission. (Substituted for the notification in a *Supplement* to the *London Gazette* dated February 5.)

Squadron Leader A. M. Cook has been transferred to the Reserve.

Flight Lieutenant A. N. H. Wright has been transferred to the Reserve, retaining the rank of Squadron Leader.

ROYAL AIR FORCE RESERVE OF OFFICERS

Squadron Leaders J. G. Rountree, A. G. Burke, and W. G. Holdsworth have relinquished their commissions, retaining their rank.

Flight Lieutenant C. W. S. Marris has relinquished his commission, retaining the rank of Squadron Leader.

ROYAL AUXILIARY AIR FORCE

Flight Lieutenant R. Mathieson to be Squadron Leader.

ROYAL AIR FORCE VOLUNTEER RESERVE

Squadron Leaders D. B. Matthews, O.B.E., N. E. Stidolph, and C. H. Stewart-Hess have relinquished their commissions, retaining the rank of Wing Commander.

Squadron Leaders T. K. Bryn and T. A. Grimson have relinquished their commissions, retaining their rank, on appointment to the R.A.F.V.R.

Squadron Leaders D. Sheehan, N. Jackson, J. H. McIlraith, G. T. B. Mackinnell-Childs, J. D. Ramsay, T. M. Banham, J. H. Hurst, J. Laurie, E. I. Davis, G. C. W. James, L. M. Rouillard, and R. I. Shier have relinquished their commissions, retaining their rank.

Squadron Leader F. W. Ford has relinquished his commission.

Flight Lieutenants B. G. C. Ackner, H. M. Grant, and H. R. Rolin have relinquished their commissions, retaining the rank of Wing Commander.

Flight Lieutenants, R. C. Browne, C. O. Greer, P. R. K. Bradbury, J. S. Wood, A. T. Hawthorne, H. A. MacLachlan, T. M. Prosser, G. H. Scott, G. G. Lennon, R. W. Parnell, D. C. Russell, J. G. Smith, J. V. Maher, B. G. Parsons-Smith, O.B.E., W. T. Ross, P. H. Davies, A. Shapiro, G. McI. Tucker, D. P. Harris, J. J. O'Dwyer, K. W. B. Rostron, A. B. Rowlands,

J. A. B. Thomas, and M. P. J. Hickey have relinquished their commissions, retaining the rank of Squadron Leader.

HER MAJESTY'S OVERSEAS CIVIL SERVICE

The following appointments have been announced: J. M. S. Garrod, M.B., Ch.B., D.T.M.&H., Director, East African Leprosy Research Centre, East Africa High Commission; Fun Yung Khoo, M.B., B.S., D.M.R.D., Senior Radiologist (Diagnostic), Singapore; H. E. Knowles, M.R.C.S., L.R.C.P., D.M.R.D., Radiologist, Fiji; E. H. Madge, M.B., B.S., Surgeon Specialist, Mauritius; A. W. Mearns, M.B., Ch.B., D.P.H., Senior Medical Officer (Health), Jamaica; H. J. McPherson, M.B., Ch.B., D.O., Specialist, Grade A, Ophthalmologist, Selangor, Federation of Malaya; A. J. Walker, M.D., M.R.C.P., D.P.H., D.T.M.&H., Director of Medical Services, Kenya; R. J. Grove-White, M.D., M.R.C.P., Medical Superintendent, Trafalgar Home, Singapore; C. M. Norman-Williams, M.B., Ch.B., D.P.H., D.T.M.&H., Assistant Director of Medical Services, Western Nigeria; Ellen Carey, M.B., B.Ch., D.P.H., Lady Health Officer, British Guiana; W. Dunn, M.B., Ch.B., D.R.C.O.G., and C. M. MacCallum, M.B., Ch.B., Medical Officers, Silicosis Medical Bureau, Northern Rhodesia; Rosemary Hart, M.D., Specialist (Physician), Gold Coast; M. Crkvenac, M.D., Temporary Medical Officer, Northern Nigeria; A. B. Roberts, M.R.C.S., L.R.C.P., and K. Toal, M.B., B.Ch., Medical Officers, South Pacific Health Service, British Solomon Islands Protectorate; C. E. P. Samarasinghe, L.M.S., D.C.H., C.P.H., D.P.H., D.T.M.&H., Medical Officer of Health, Gold Coast; N. P. B. Smyth, L.R.C.P.&S.I., Medical Officer, Kenya; I. D. Smyth, M.B., B.Ch., Medical Officer, St. Vincent, Windward Islands; H. J. Van Der Kaay, M.D., Medical Officer, Western Nigeria; D. A. Westwood, M.B., Ch.B., Medical Officer, Northern Nigeria.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- American College of Surgeons, Committee on Trauma: Early Care of Acute Soft Tissue Injuries. 1954.
- American College of Surgeons, Committee on Trauma: Outline of the Treatment of Fractures. 1956.
- Antoine, A.: Slimming the French Way. 1956.
- Beatty, B.: How to Live with Your Blood Pressure. 1956.
- Beck, A. C.: Obstetrical Practice. Sixth edition. 1955.
- Beck, F.: Ten Patients and an Almoner. 1956.
- Bender, L.: Psychopathology of Children with Organic Brain Disorders. 1956.
- Bisland, E.: True Book About Sister Kenny. 1956.
- Bourne, G.: Heart Disease. 1954.
- British Red Cross Society: Maternal and Child Welfare Manual No. 9. 1956.
- Brocher, J. E. W.: Die Occipito-Cervical-Gegend: eine diagnostisch-pathogenetische Studie. 1955.
- Campbell, W. C.: Operative Orthopaedics. Two volumes. Third edition, edited by J. S. Speed and R. A. Knight. 1956.
- Clegg, D. G.: Pattern for the Listening Eye. 1956.
- Colson, J. H. C.: Postural and Relaxation Training. 1956.
- Cook, J. G.: Virus in the Cell. 1956.
- Diehl, H. S.: Elements of Healthful Living. Third edition. 1955.
- Ellis, R.: Dictionary of Dietetics. 1956.
- von Euler, U. S.: Noradrenalin. 1956.
- Garrill, S. L., and Lesses, M. F.: Diseases of the Thyroid Gland. 1955.
- Harrower, M. (Editor): Medical and Psychological Teamwork in the Care of the Chronically Ill. 1955.
- Hurlock, E. B.: Child Growth and Development. 1956.
- Hutschnecker, A. A.: Love and Hate in Human Nature. 1956.
- Ivy, A. C., et al.: Observations on Krebiozen in the Management of Cancer. 1956.
- Jackson, R.: The Cervical Syndrome. 1956.
- Kotinsky, R., and Witmer, H. L. (Editors): Community Programs for Mental Health. 1955.
- Lamare, N.: Love and Fulfilment in Woman. 1955.
- Laughlin, H. P.: Neuroses in Clinical Practice. 1956.
- London Transport Executive: Health in Industry. 1956.
- McCleary, G. F.: Peopling the British Commonwealth. 1955.
- Marshall, A. H. E.: Outline of the Cytology and Pathology of Reticular Tissue. 1956.
- Mechl, P. E.: Clinical vs. Statistical Prediction. 1954.
- Michaelis, A. R.: Research Films in Biology, Anthropology, Psychology, and Medicine. 1955.
- Monsarrat, K. W.: On Human Thinking. 1955.
- Moore, D. C.: Complications of Regional Anesthesia. 1955.
- Moragues, V., and Lynxwiler, C. P.: Cardiac Anomalies. 1954.
- Moseley, H. F.: Polio-myelitis and Ayurveda. 1954.
- Om Prakash, K.: Keratoplasty. 1955.
- Paton, R. T.: Health, Culture, and Community. 1955.
- Paul, B. D.: The Boke of Chyldren. 1955.
- Phaire, T.: Freud and Religious Belief. 1956.
- Philp, H. L.: Maxillofacial Anatomy. 1954.
- Shapiro, H. H.: Pediatric Years. 1955.
- Spekter, L.: The Ignoble Art. 1956.
- Summerskill, E.: The Ignoble Art. 1956.
- Winton, F. R. (Editor): Modern Views on the Secretion of Urine. 1956.
- Woodger, J. H.: Physics, Psychology, and Medicine. 1956.

BRITISH MEDICAL GUILD

Meetings to be Held

ENFIELD AND POTTERS BAR.—At George Hotel, Enfield Town, Monday, April 1, 9 for 9.30 p.m., joint meeting of General Practitioner Groups.

ISLE OF WIGHT.—At Unity Hall, Newport, Tuesday, April 2, 3.30 p.m.

TUNBRIDGE WELLS.—At Pump Room, Tunbridge Wells, Sunday, April 7, 2.45 p.m., Dr. S. Wand: "The Doctors' Dispute."

Association Notices

Diary of Central Meetings

APRIL

- | | |
|-----------|--|
| 1 Mon. | S.H.M.O.s Group Executive Committee, 2 p.m. |
| 9 Tues. | Conference of Advisory Councils on Occupational Health, 12 noon. |
| 10 Wed. | Standing Joint Committee of R.M.P.A. and Psychological Medicine Group, 11 a.m. |
| 10 Wed. | Private Practice Committee, 2 p.m. |
| 11 Thurs. | Alternative Edition Subcommittee, Joint Formulary Committee, 11 a.m. |
| 11 Thurs. | Editorial Subcommittee, Joint Formulary Committee, 2 p.m. |
| 11 Thurs. | Central Ethical Committee, 2 p.m. |
| 11 Thurs. | Ingleby Evidence Committee, 2 p.m. |
| 12 Fri. | Public Health Committee, 10.30 a.m. |
| 16 Tues. | Scholarships Subcommittee, Science Committee, 11.30 a.m. |
| 17 Wed. | Occupational Health Committee, 10 a.m. |
| 18 Thurs. | G.M.S. Committee, 10.30 a.m. |
| 25 Thurs. | Joint Committee of the B.M.A. and the Magistrates' Association, 2 p.m. |
| 30 Tues. | Special Conference of Local Medical Committees, 10 a.m. |

Branch and Division Meetings to be Held

BROMLEY DIVISION.—At Bull's Head Hotel, Chislehurst, Wednesday, April 3, 6.30 for 7 p.m., dinner; 8.30 p.m., joint meeting with Law Society of Bromley. Address by Dr. J. H. Harley Williams: "Personality in Medicine."

CHESTERFIELD DIVISION.—At Station Hotel, Chesterfield, Friday, April 5, 7.30 to 8 p.m., reception. Presidential Address by Dr. Malcolm Graham: "No Humbug." Members and their ladies are invited.

CITY DIVISION.—Thursday, April 4, 2.30 p.m., visit to Brooke House (The Finsbury Employment Centre for the Elderly). Any B.M.A. members, but especially those of St. Pancras Division, are invited, together with spouses or other guests.

CLEVELAND DIVISION.—At Hinton's Café, Corporation Road, Middlesbrough, Wednesday, April 3, 7.30 p.m., supper meeting. B.M.A. lecture by Dr. E. B. Strauss: "Intractable Pain."

DORSET DIVISION.—At Nurses' Teaching Unit, Dorset County Hospital, Friday, April 5, 8.30 p.m., meeting. B.M.A. Lecture by Dr. M. A. Partridge: "Some Strange Cases."

DUNBARTONSHIRE DIVISION.—At Canniesburn Hospital, Tuesday, April 2, 8.15 p.m., annual general meeting, followed by meeting of all practitioners under contract with Dunbartonshire Executive Council.

EAST DENBIGH AND FLINT DIVISION.—At Blossoms Hotel, Chester, Thursday, April 4, 8.30 p.m., annual general meeting.

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, April 4, 8.30 p.m., meeting. Lecture by Dr. E. A. Bennet: "Psychosomatic Disorders."

HASTINGS DIVISION.—At Lecture Room of Nurses' Home, Royal East Sussex Hospital, Hastings, Tuesday, April 2, 8.15 p.m., meeting. Address by Dr. G. E. Beaumont: "Diagnosis of Jaundice."

HOLLAND DIVISION.—At Bridge Hotel, Sutton Bridge, Saturday, April 6, 7.30 for 8 p.m., supper; 9 p.m., B.M.A. Lecture by Professor C. H. Stuart-Harris: "Virus Diseases."

LEICESTERSHIRE AND RUTLAND BRANCH.—At X-ray Department, Leicester Royal Infirmary and Children's Hospital, Wednesday, April 3, 8.30 p.m., meeting. B.M.A. Lecture by Dr. Ffrangcon Roberts: "Health During the Industrial Revolution."

LEWISHAM DIVISION.—At Traumatic Clinic, Lewisham General Hospital, High Street, Lewisham, S.E., Tuesday, April 2, 8.30 p.m., meeting. Address by Mr. J. G. Yates-Bell: "Management of Urological Problems in the Home."

NORTH BEDFORDSHIRE DIVISION.—At South Wing, Bedford General Hospital, Thursday, April 4, 8.30 p.m., meeting. Lecture by Mr. Kenneth Walker: "Problems Associated with Infertility."

NORTH-EAST ESSEX DIVISION.—At Red Lion Hotel, Colchester, Tuesday, April 2, 8.30 p.m., Brains Trust. Subject: Dyspepsia. Panel, Mr. R. D. Reid, Dr. S. A. Propert, Dr. J. B. Penfold, and Dr. R. Sauvan Smith.

NORTH STAFFS DIVISION.—At Grand Hotel, Hanley, Tuesday, April 2, 8 p.m., supper meeting. Lecture by Dr. E. C. Hutchinson: "Some Observations on Cerebral Vascular Disease."

NUNEATON AND TAMWORTH DIVISION.—At Three Tuns Hotel, Atherstone, Thursday, April 4, 8 p.m., informal supper; 8.45 p.m., general meeting.

SALISBURY DIVISION.—At White Hart Hotel, Salisbury, Saturday, April 6, 7.15 for 7.30 p.m., dinner; 8.30 p.m., meeting. B.M.A. lecture by Dr. Donald Hunter: "Studies of Metabolism in Skeletal Diseases." All medical practitioners in the area of the Division are invited.

SCUNTHORPE DIVISION.—At Scunthorpe and District War Memorial Hospital, Sunday, April 7, 10.30 a.m., clinical meeting.

SHEFFIELD DIVISION.—At University Medical Library, Friday, April 5, 8.30 p.m., annual general meeting.

SOUTH BEDFORDSHIRE DIVISION.—At Out-patient Hall, Luton and Dunstable Hospital, Saturday, April 6, 9 p.m., meeting. Lecture by Miss Rose Heilbron, Q.C.: "The Legal Responsibilities of Doctors."

SOUTH-EAST ESSEX DIVISION.—At Overcliff Hotel, Westcliff, Thursday, April 4, 8.30 p.m., meeting. Address by Dr. C. Keith Simpson: "Clues at the Scene." Members of Southend-on-Sea and District Law Society are invited.

SOUTH MIDDLESEX DIVISION.—At Anchor Hotel, Shepperton, Wednesday, April 3, 9 p.m., meeting. Talk by Sir Russell Brail, P.R.C.P.: "Cervical Spondylosis."

TUNBRIDGE WELLS DIVISION.—At Pump Room, Tunbridge Wells, Sunday, April 7, 5 p.m., meeting.

WEST HERTS DIVISION.—At Shrodel's Hospital, Vicarage Road, Watford, Friday, April 5, 8.30 for 9 p.m., joint clinical meeting with West Herts and Watford Medical Society.

WEST SUSSEX DIVISION.—At 2, Longfellow Road, Worthing, Sunday, April 7, 4.30 p.m., general meeting.

Meetings of Branches and Divisions

HAMPSTEAD DIVISION

A dinner was held at the House of Commons on March 7 by invitation of the Rt. Hon. Henry Brooke, M.P., Minister of Housing and Local Government and Minister for Welsh Affairs. Members' wives were among the 54 persons who attended. Dr. L. J. Stoll presided, and the chief guests were the Rt. Hon. Dennis Vosper, M.P., Minister of Health, and Dr. A. Macrae, Secretary of the B.M.A. Mr. Brooke proposed the toast of "the Hampstead Division of the British Medical Association," and Dr. Macrae replied. In responding to the toast of "Our Guests," proposed by the chairman, Mr. Vosper expressed the hope that he would have further opportunities of meeting members of the Association in local Divisions.

KENYA BRANCH

The annual general meeting was held on January 25. The secretary reported that during 1956 membership of the Branch topped the 300 mark for the first time. Monthly meetings were held throughout the year, and among the speakers were Sir Robert McIntosh on anaesthesia, Sir Harold Gillies on plastic surgery, Sir James Learmonth on peripheral nerve compression, and Drs. Harries and Lawes on their work in the Nairobi respiratory unit. Among the Branch Council's activities was the achievement of upgrading of salaries of medical staff following negotiations with the Nairobi City Council. The following officers were elected for 1957:

Vice-president.—Dr. K. V. Adalja.

Honorary Secretary.—Mr. Andrew Hicks.

Honorary Treasurer.—Dr. J. A. Carman.

WEMBLEY DIVISION

A combined meeting of doctors and clergy was held on January 29 at Wembley Hospital. Dr. M. Latner was in the chair. Dr. E. White spoke on possible methods of co-operation between the clergy and medical practitioners. He suggested talks to married and engaged couples, on the lines of those given by the Marriage Guidance Council, to be organized by both doctors and clergy, and the possibility of a centre where a patient could discuss his problems with either a clergyman or a doctor, or both. His talk was followed by a discussion. It was felt that action should be taken to establish co-operation, and a steering committee was provisionally appointed.

WEST SUFFOLK DIVISION

The annual general meeting was held at Everard's Hotel, Bury St. Edmund's on February 19, 1957. Dr. T. C. Kirkpatrick was in the chair, and 26 members attended. The following officers were elected for the ensuing year:

Chairman.—Dr. J. W. E. Cory.

Deputy Vice-chairman.—Dr. T. C. Kirkpatrick.

Honorary Secretary and Treasurer.—Dr. S. Blaxland.

ANNUAL MEETING: NEWCASTLE UPON TYNE, JULY 10-19

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 6 1957

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British Medical Association
SPECIAL REPRESENTATIVE MEETING
Wednesday, May 1, 1957

REPORT OF THE COUNCIL

THE DISPUTE ON REMUNERATION

The following resolutions were adopted by the A.R.M., 1956:

125. **Resolved** (*nem. con.*): That this Meeting welcomes the proposal for a joint approach by the General Medical Services Committee and the Joint Consultants Committee to the Minister on the question of remuneration of members of the profession.

126. **Resolved**: That this Meeting wholeheartedly welcomes the joint approach by the Consultant and General Practitioner Committees to matters affecting remuneration, warmly congratulates those responsible for this unity of action, and hopes that in any such activities in the future the Public Health Services may be fully represented.

The Council has been kept fully informed of the strenuous but abortive efforts of the Negotiating Committee to secure an opportunity of negotiation or, alternatively, of arbitration on the claim for an adjustment of the remuneration of general medical practitioners and hospital medical staffs in the National Health Service.

The following statement was issued by the Council after an emergency meeting on February 28:

(1) The Council fully supports the decision of its General Medical Services Committee to convene a Special Conference of Representatives of Local Medical Committees and to recommend to that Conference that, unless the Government agrees to an immediate and satisfactory settlement of the profession's claim or to arbitration, general practitioners throughout the country will be advised to send in their resignations from the Service.

(2) The Council has heard a report of the interpretation by the Minister of Health of the Prime Minister's statement that the possibility of an interim adjustment was not precluded. On the evidence before it, the Council can see no fundamental change in the situation which would justify any alteration in the course of action recommended by its General Medical Services Committee.

(3) The Council has noted the statement made by the Prime Minister in Parliament that he is prepared to clarify his statement at the appropriate moment. The Council believes that the present is the appropriate time and is inviting the Negotiating Committee to approach the Prime Minister for immediate clarification.

(4) The Council has noted with great satisfaction the assurances of support given by the Public Health Committee of the Association, representing medical officers in the Public Health Service, and the Joint Consultants Committee, representing hospital medical staffs.

(5) The Council resolves that the convening of a Special Representative Meeting be requisitioned at an appropriate time to consider a report and a recommendation of the Council concerning the further action to be taken by the Association in the present dispute with the Government on medical remuneration.

The long and unhappy story of the dispute with the Government is contained in the Report of the General Medical Services Committee to the Special Conference of Local Medical Committees to be held on April 30. In order to avoid the expense of publishing a separate report for the purpose of the Special Representative Meeting, the Report of the G.M.S. Committee to the Conference is appended to this Report of the Council. An extensive summary of the details of the plan for the organization of general practice in the event of resignation from the National Health Service, appeared in the *Supplement* to the *Journal* of March 23.

The Council fully endorses the proposals of the G.M.S. Committee, and recommends:

Recommendation: That, as there has been no satisfactory settlement of the profession's claim or the submission of that claim to arbitration, (1) the resignations of N.H.S. general practitioners be collected forthwith and held; and (2) the plan for a progressive withdrawal of general practitioners from the National Health Service (as outlined in the Appendix) be put into effect until such time as a satisfactory settlement is achieved or the dispute is referred to arbitration.

The Royal Commission

The Council has considered what should be the attitude of the Association to the Royal Commission on the Remuneration of Doctors and Dentists.

The Council, anxious to put an end to this unfortunate dispute by peaceful methods, regards arbitration as the proper alternative to negotiations, which have been refused. It is clear, however, that the Royal Commission is not an

arbitration tribunal, since its composition and terms of reference have not been agreed upon by the parties to the dispute and since neither party is under any obligation to accept its recommendations.

Moreover, it appears to the Council that the terms of reference of the Royal Commission are such as to preclude it from making just decisions as to the correct levels of medical remuneration in the National Health Service.

The Council considers it to be of fundamental importance that, in the interests of the Health Service and the general community, the profession should hold fast to the principle enunciated in the terms of reference of the Spens Committees—the principle that the incomes of medical practitioners engaged in a publicly organized health service should be fixed with due regard to the financial expectations of medical practice in the past and to the desirability of maintaining in the future the proper social and economic status of medical practice and its power to attract a suitable type of recruit to the profession. To co-operate with the Royal Commission by submitting evidence to the Commission would be to acquiesce in the abandonment of this principle and to accept the view that the economic status achieved by the medical profession in the past is of no account, that the promises of successive Governments to maintain this status should be dismissed from consideration, and that all that matters now is that the incomes of doctors should be adjusted to those received by members of other “professions” and “connected occupations,” such as architects, accountants, bankers, solicitors, surveyors, pharmaceutical chemists, nurses, physiotherapists, chiropodists, laboratory technicians, and dental mechanics.

The Prime Minister has suggested that an exchange of letters regarding the interpretation to be placed by the Royal Commission on its terms of reference might reassure the profession, but the Council is advised that the terms of reference in their present form cannot be so construed as to ensure the observance of the principle referred to above. This could be ensured only by a radical amendment of the terms themselves.

Again, although the claim lodged by the Negotiating Committee was for an adjustment only of the remuneration of general practitioners and hospital medical staffs, the Council is strongly of the opinion that a full review of medical remuneration—the declared purpose for which the Royal Commission was appointed—should include consideration of the incomes of doctors employed by local authorities. It understands, however, that it is not intended that the Commission should pronounce on the remuneration of these members of the profession.

The Council feels sure that the existence of this unhappy dispute, due to the refusal of the Government to allow either negotiation or arbitration, is deplored by the whole profession, and that, if the present claim were satisfactorily settled, the profession would then be entirely willing to engage in discussions with the Government on the machinery for periodical adjustments of remuneration in the future with a view to preventing a recurrence of crises of this kind.

The Council recommends:

Recommendation: (1) That, in the opinion of the Representative Body, in present circumstances it is undesirable that the Association should co-operate in any way with the Royal Commission on the Remuneration of Doctors and Dentists; (2) that, if at a later date circumstances should so alter as to enable the Representative Body to reconsider its attitude to the Royal Commission, any decision to participate be conditional on the inclusion of all public health medical officers within the terms of reference of the Royal Commission.

Health Services in the Future

The record of the Government's treatment of the profession in this and other matters has brought home defects in the relationship between Medicine and the State in the National Health Service as now constituted. The Council has formed the view—which it believes to be shared by many thoughtful members of the Association who have at

heart the maintenance of the best traditions of the profession—that the time has come when the Association should institute a comprehensive review of medical services administered by the State in the light of nine years' experience of the National Health Service. The Council suggests that this review should be undertaken by a Committee fully representative of the interests concerned, medical and lay. The aim would be to eradicate those faults of the present system which cause dissatisfaction to the public and frustration to the profession.

The Council recommends:

Recommendation: That the Council be instructed to institute an inquiry into the whole field of publicly administered medical services in the light of the experience gained of the National Health Service since 1948.

B.M.A. MEMORANDUM TO MEMBERS OF PARLIAMENT

Last week the Association's Public Relations Officer, Mr. John Pringle, sent a memorandum headed "A Crisis of Confidence" to Members of both Houses of Parliament. It is reproduced here in full.

SOME NOTES ON THE DISPUTE WITH THE GOVERNMENT

The medical profession entered the National Health Service in 1948 on a promise by the Minister of Health that the Government accepted—without reservation—the recommendations of the Spens Reports. No responsible person in or out of the Government has ever denied that these pledges were in fact given—and accepted—and that it was on this basis that the profession entered into a completely new relationship with the State.

What has been in dispute from time to time has been the interpretation of the Spens Reports themselves. In 1950 differences developed between the Government and the profession. These differences were, by agreement, referred to an adjudicator, Mr. Justice Danckwerts, who was asked to determine the proper remuneration of general practitioners:

“in order to give effect to the recommendations of the Spens Committee, having regard to the change in the value of money since 1939, to the increases which have taken place in incomes in other professions, and to all other relevant factors.”

The Danckwerts adjudication was accepted both by the Government and the profession.

In the five years following the Danckwerts award the value of money fell by at least 24%. Increases have been given to many other professions, and many groups in the community have enjoyed increases ranging from 30 to 40%. The medical profession has received nothing.

RESTRAINT BY THE PROFESSION

Out of consideration for the country's economic difficulties, and in deference to the Government's appeals for restraint, the profession has year by year refrained from making any fresh claim. What was proper remuneration in 1951 cannot be right in 1957. A claim for an increase of not less than 24% in the remuneration of general practitioners, consultants, and other hospital medical staff was submitted to the Government last year. It was submitted on June 14, 1956. But, in fact, intention to claim had been notified to the Government as far back as February, 1956.

The claim was backed by the highest economic and legal advice. The arguments used in it appear to the profession to be unanswerable. On no single occasion have the Government attempted to answer them. They have refused to consider the claim at all. This is the outstanding fact which disposes of the argument that the doctors are

“unreasonable” people who are asking to be “insulated” for ever and ever against rising prices by their insistence on the Spens Reports.

Apart altogether from Spens, the Government have refused to look at the claim even on its simple merits—that the doctors are at least 24% worse off than they were in 1951.

Representatives of the Negotiating Committee of the profession have met the Minister of Health on three occasions, and the Joint Chairmen met the Prime Minister on March 12, merely to be informed of Government decisions. As at the present date, the following is the situation:

**Refusal to examine the claim.
Refusal to negotiate.
Refusal to arbitrate.**

THE ROYAL COMMISSION

The situation has been worsened by the method which the Government have adopted and which the profession see as an effort to escape alike from their difficulties and their obligations to it.

Without a single word of consultation with the profession the Government have set up a Royal Commission to review medical remuneration. This announcement has been widely and trenchantly criticized as a transparent device for shelving the Government's responsibility.

The B.M.A. Council was determined not to rush into taking a “snap” decision about this Royal Commission. The highest legal advice available to the Council was taken. The question of the profession's attitude to the Commission has been under careful examination for well over a month. After all this consideration the B.M.A. Council yesterday reached a decision to recommend to the doctors that:

it is undesirable in present circumstances that the Association should co-operate in any way with the Royal Commission on the remuneration of doctors and dentists.

This is a very grave decision. It is hoped that Members of Parliament will appreciate that it has not been reached lightly. It scarcely needs saying, we trust, that not the slightest suggestion of disrespect to the chairman and members of the Commission is intended; still less, the least disrespect to the Crown.

Everyone knows the facts regarding the appointment of Royal Commissions. They are set up by the Crown, but on the advice of the Government of the day. The job they have to do is determined by the Government's. If their terms of reference are the Government's, it is appointment and terms of reference are misconceived, it is the Government which must bear the criticism, and nobody else.

The B.M.A. Council has come to its decision because:

(1) The profession has repeatedly made it clear that it would welcome the submission of its pay claim to independent arbitration and would abide by the result. On March 18, referring to industrial disputes, the Prime Minister said: “Surely this is a time when we should accept some form of arbitration rather than have recourse to self-destructive struggles. . . . In the long run, and for the common good, an umpire is better than a duel.”

It will be argued by Government spokesmen that the Royal Commission constitutes “some form of arbitration.” This is not so.

The Royal Commission cannot be regarded as an arbitration tribunal, since its composition and terms of reference have not been agreed by the parties to the dispute and since neither party is under any obligation to accept its recommendations.

(2) The terms of reference of the Royal Commission pre-judge the issue in favour of the Government. This question of the terms of reference is, of course, fundamental. Any ordinary committee, still more a Royal Commission, is bound, throughout its proceedings, to have a continuous regard to the job it is asked to do as set out in its terms of

reference. It must not, and cannot, go outside its terms of reference. The value of its recommendations will be weighed by all concerned according to how strictly it has answered the questions put to it.

Below are the two sets of terms of reference:

- (i) The terms of reference for the (General Practitioner) Spens Committee of 1945;
- (ii) The terms of reference of the Royal Commission, 1957.

Spens

“To consider, after obtaining whatever information and evidence it thinks fit, what ought to be the range of total professional income of a registered medical practitioner in any publicly organized service of general medical practice; to consider this with due regard to what have been the normal financial expectations of general medical practice in the past, and to the desirability of maintaining in the future the proper social and economic status of general medical practice and its power to attract a suitable type of recruit to the profession; and to make recommendations.”

Royal Commission

“To consider:

“(a) How the levels of professional remuneration from all sources now received by doctors and dentists taking any part in the National Health Service compare with the remuneration received by members of other professions, by other members of the medical and dental professions, and by people engaged in connected occupations;

“(b) What, in the light of the foregoing, should be the proper current levels of remuneration of such doctors and dentists by the National Health Service;

“(c) Whether, and if so what, arrangements should be made to keep that remuneration under review.

“And to make recommendations.”

It will be seen at once that (a) and (b) in the Royal Commission's terms of reference are restrictive. The Spens terms of reference were concerned with the medical profession in its relation to the community as a whole—e.g., the references to “the desirability of maintaining in the future the proper social and economic status of general medical practice” and the need to maintain recruitment to the profession.

The B.M.A. considers it to be of fundamental importance that, in the interests of the Health Service and the general community, the profession should hold fast to the principle enunciated in the terms of reference of the Spens Committees—the principle that the incomes of medical practitioners engaged in a publicly organized health service should be fixed with due regard to the financial expectations of medical practice in the past and to the desirability of maintaining in the future the proper social and economic status of medical practice and its power to attract a suitable type of recruit to the profession.

To co-operate with the Royal Commission by submitting evidence to the Commission would be to acquiesce in the abandonment of this principle and to accept the view that the economic status achieved by the medical profession in the past is of no account, that the promises of successive Governments to maintain this status should be dismissed from consideration, and that all that matters now is that the incomes of doctors should be adjusted to those received by members of other “professions” and “connected occupations,” such as architects, accountants, bankers, solicitors, surveyors, pharmaceutical chemists, nurses, physiotherapists, chiropodists, laboratory technicians, and dental mechanics.

PROFESSIONS LOSING GROUND

It is common knowledge that the professional classes have been losing ground in the last 20 years relatively to other sections of the community. The terms of reference of the Royal Commission can only intensify this decline of the professional classes in social and economic status.

To co-operate with a Royal Commission with such terms of reference by submitting evidence to it would, in the view of the Council of the B.M.A., be to acquiesce in the

view that the economic status agreed for the medical profession in the past is of no account.

The Prime Minister has suggested (in his interview with Sir Russell Brain and Dr. Talbot Rogers) that an "exchange of letters" regarding the interpretation to be placed by the Royal Commission on its terms of reference might in some way reassure the profession. The Council is unable to see how this would help. The Royal Commission must be guided by its express terms of reference and nothing else. The Council is advised on the highest legal authority that no exchange of letters can radically alter the plain meaning of these terms.

The Council would like Members of Parliament to be assured on one other matter.

This unhappy dispute need never have happened. It is only due to the refusal of the Government to allow either negotiation or arbitration. Only the Health Service can suffer. This the profession has no wish to see happen, and the Council gives this pledge:

If the present claim can be satisfactorily settled by negotiation or arbitration, the medical profession will then be willing to engage in discussions with the Government on the machinery for periodical adjustments of remuneration in the future, with a view to preventing a recurrence of crises of this kind.

But the Council is convinced that the Royal Commission, with its present terms of reference—however interpreted—can neither deal properly with the present claim nor provide a satisfactory basis for the future.

HEALTH SERVICES IN THE FUTURE

The record of the Government in its dealings with the profession in this and other matters has led to a "crisis of confidence" between Medicine and the State which is now going much deeper than remuneration. The mere fact that it has been possible for the profession to suffer the treatment recently accorded it by the present Government is clear evidence that something is radically wrong in the relationship between Medicine and the State in the National Health Service as now constituted.

The B.M.A. Council decided yesterday that the Association itself should institute a comprehensive review of medical services administered by the State in the light of nine years' experience of the present National Health Service.

The Council intends that this review should be undertaken by a Committee fully representative of the interests concerned, medical and lay. The aim will be to eradicate those faults of the present system which cause dissatisfaction to the public and frustration to the profession.

The B.M.A. is convinced that the time has now arrived for a full examination of present health services, an examination which will continue irrespective of any settlement which may be arrived at of the profession's present remuneration dispute with the Government.

REMUNERATION CLAIM

DIARY OF EVENTS

1946

April.—Report of the Interdepartmental Committee on Remuneration of General Practitioners (G.P. Spens Committee).

1948

May.—Report of the Interdepartmental Committee on the Remuneration of Consultants and Specialists (Consultants and Specialists Spens Committee).

These committees were required not merely to recommend the proper levels of remuneration in the two branches of the profession but also to pay due regard to the desirability of maintaining in the future the appropriate social and

economic status of each section. Committees' recommendations accepted by profession and Government as the basis upon which the profession entered the N.H.S.

1950

May 22.—Letter from Permanent Secretary of Ministry of Health to B.M.A. "The Minister agrees that the Spens Report remains the basis of the remuneration of general medical practitioners until such time as after the usual consultations some other basis is substituted."

1952

March 24.—Adjudication by Mr. Justice Danckwerts on the betterment factor applicable to G.P. remuneration to give effect to Spens Committee recommendations, taking into account change of value of money since 1939. A betterment of 100% awarded as appropriate for 1951 compared with 1939 (*Supplement*, March 29, 1952, p. 113).

June.—Staff Side Committee B, Medical Whitley Council, put in claim for betterment for hospital medical staff in light of Danckwerts award.

July 3.—Statement by Minister of Health in Parliament:

"I want to make it clear that the terms of reference of Mr. Justice Danckwerts's award were confined solely to the question of the remuneration of general practitioners in the N.H.S. and his award has no wider application. In accepting the results of the adjudication, which was of an exceptional nature, the Government have by no means adopted the view that similar adjustments in other fields should follow. In their view, there is no justification for any assumption that the appropriate standard of remuneration for the professional classes is a rate of 100% above that in force in 1939. They consider that remuneration should be determined in the light of all relevant circumstances."

1954

April.—Increases made in remuneration of hospital medical staff; regarded by Staff Side of Whitley Committee B as restoring balance between consultants and specialists and general practitioners as at March, 1951 (*Supplement*, April 10, 1954, p. 145).

1956

February.—Minister of Health and Secretary of State for Scotland notified of consultants and specialists' and general practitioners' intention to make a joint remuneration claim. Joint Negotiating Committee set up; joint chairmen Sir Russell Brain and Dr. A. T. Rogers.

June 14.—Claim based on Spens Reports submitted to Ministers (*Supplement*, July 28, 1956, p. 75).

July 13.—Ministers replied; could not accept premises of claim. Government took view that "the remuneration of the medical profession, like that of others, must be determined from time to time in the light of all relevant circumstances" and "that in present circumstances they would not feel justified in giving consideration to any claim for a general increase in medical remuneration."

August 1.—Representatives of Negotiating Committee met Ministers. Ministers did not accept Committee's contention that Government had contractual obligation to profession. Government's view that Spens Reports merely established a starting point and did not entail automatic and periodic adjustments of remuneration.

September 12.—Supplementary memorandum on legal aspects of contractual obligation (*Supplement*, November 3, 1956, p. 173) submitted to Ministers by Negotiating Committee.

November 21.—Ministers' reply: still of opinion no contractual obligation existed; suggested matter could be tested in courts.

December 19.—Council of B.M.A. decided to overhaul British Medical Guild machinery (*Supplement*, January 5, p. 1).

1957

January 4.—Negotiating Committee's representatives met Ministers. No progress made. Ministers reiterated that

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PUBLIC HEALTH COMMITTEE ATTITUDE TO ROYAL COMMISSION

A special meeting of the Public Health Committee was held at B.M.A. House on March 22. Dr. J. B. TILLEY occupied the chair. The meeting was convened by the chairman to discuss the Government's intention that the remuneration of public health medical officers should not be considered by the Royal Commission. The Committee had before it a resolution passed by the G.M.S. Committee at its meeting on March 21, in the form of a recommendation to Council, that, in present circumstances, the Council should not co-operate with the Royal Commission.

After a debate held *in camera* the Committee passed unanimously two resolutions:

- (1) That the Council be informed that the Committee pledges its full support for the recommendation of the General Medical Services Committee.
- (2) That, on the assumption that the Council adopts the recommendation of the General Medical Services Committee, if at a later date circumstances should so alter as to enable the Council to reconsider its attitude to the Royal Commission, any decision to participate should be conditional on the inclusion of all public health medical officers within the terms of reference of the Royal Commission.

It was reported that no reply had yet been received from the Ministry to the Council's request for an independent inquiry into the remuneration of public health medical officers.

It agreed that, in the event of an independent inquiry being offered, another meeting of the Public Health Committee would be convened.

JUNIOR HOSPITAL MEDICAL STAFF PAY INCREASES

All hospital authorities have received instructions from the Ministry of Health to increase by 10% from April 1 the salaries of hospital medical and dental staff up to the grade of senior registrar. This follows the statement by the Prime Minister on March 12 that these increases would be made. The new rates per annum for whole-time appointments (with the old in brackets) are as follows:

Senior registrar: £1,210 in first year (£1,100); £1,320 in second year (£1,200); £1,430 in third year (£1,300); £1,540 in fourth year (£1,400). Registrar: £935 in first year and any subsequent year (£965). (£850); £1,061 10s. in second and any subsequent year (£775). Junior hospital medical officer: commencing at £852 10s. (£775) and rising by annual increments of £55 to £1,182 10s. (£1,075). Senior house officer: £819 10s. (£745). House officer: £467 10s. for first post held (£425); £522 10s. for second post held (£475); £577 10s. for third and subsequent post held (£525).

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.

Government had been advised that no legal contractual obligation to profession existed. Ministers stated merits of claim could not be examined in present economic circumstances.

January 17.—Change of Ministers of Health in Government reorganization. Mr. D. Vosper appointed.

February 20.—Negotiating Committee's representatives met Mr. Vosper, who repeated that Government could not consider merits of claim as economic position unchanged. Minister announced that Royal Commission would be set up for full review of medical and dental remuneration. No prior consultation about this with profession. Negotiating Committee requested its joint chairmen to send immediate letter to Prime Minister asking even at that late hour that arbitration might be considered (text of letter and Prime Minister's reply, *Supplement*, March 2, p. 100).

February 21.—G.M.S. Committee decided to recommend resignation of G.P.s from Service if Government did not agree to immediate and satisfactory settlement of claim or, alternatively, arbitration.

February 28.—Joint chairmen of Negotiating Committee met Minister of Health. Minister unable to enlarge on statement in Prime Minister's letter that work of Royal Commission would not preclude some interim adjustment of remuneration. Minister repeated Government's offer of immediate adjustment of remuneration of junior hospital medical staff.

B.M.A. Council endorsed G.M.S. Committee's decision to recommend resignation of G.P.s to special conference. Prime Minister's statement on interim adjustment did not fundamentally alter situation. Assurances of support for G.P. resignation received from Joint Consultants Committee and Public Health Committee. Decision taken to convene special representative meeting. Council invited Negotiating Committee to approach Prime Minister for clarification of statement about interim adjustment.

Terms of reference of Royal Commission announced in Parliament (*Journal*, March 9, p. 569).

March 6.—Negotiating Committee asked its joint chairmen to approach Prime Minister. Results disappointing. Prime Minister suggested exchange of letters might remove doubts about interpretation of terms of reference of Royal Commission. Prime Minister made it clear that Government did not regard arbitration as appropriate.

March 12.—Emergency meeting of G.M.S. Committee. Decision taken to recommend that, in present circumstances, the Council should not co-operate in any way with Royal Commission.

March 22.—Emergency meeting of Public Health Committee. G.M.S. Committee's recommendation to Council that Association should not co-operate with Royal Commission endorsed. Exclusion of public health doctors from terms of reference of Royal Commission should future decision to participate in Royal Commission should be conditional on inclusion of public health medical officers in terms of reference.

March 23.—G.M.S. Committee's recommendation to special conference on April 30 and plan for organization of general practice in event of withdrawal from Service published (*Supplement*, March 23, p. 123).

March 27.—B.M.A. Council met. Endorsed G.M.S. Committee's recommendation that the Association should not under present circumstances co-operate in any way with Royal Commission. Considered that terms of reference precluded Royal Commission from making just decisions on levels of medical remuneration in the N.H.S. Decision taken to recommend to special representative meeting on May 1 that Council be instructed to institute inquiry into whole field of publicly administered medical services.

March 28.—Memorandum on dispute with Government sent by Association's Public Relations Officer to members of both Houses of Parliament (see p. 150 of this *Supplement*).

The Committee set up by the Scottish Health Services Council to review maternity services in Scotland recently held a meeting to begin hearing oral evidence from selected organizations. The Committee's terms of reference are: "To consider, through a professional subcommittee in the first place, the range of provision which should be available in the National Health Service in the interests of the mother and child during pregnancy, confinement, and lying-in; and to advise how best such provision can be secured within the framework of the Service." The chairman of the committee is Professor Montgomery, who is chairman of the Scottish Health Services Council. The medical secretary is Dr. Mabel Mitchell, of the Department of Health.

British Medical Association

PROCEEDINGS OF COUNCIL

The Council of the British Medical Association met at B.M.A. House on March 27, with Dr. S. WAND in the chair.

A great deal of the afternoon session was spent in considering the Council's report to the Special Representative Meeting to be held on May 1. This report and Council's recommendations to the Representative Body are published in the opening pages of this Supplement.

Obituary

The CHAIRMAN reported with regret the deaths of Isaac Jones, a member of Council, and of Robert Walter Dickson Leslie and William Stobie, former members of Council.

Late Mr. Harry Cooper

In paying tribute to the late Mr. Harry Cooper, the CHAIRMAN said it was doubtful whether there had been a more loyal supporter among the Association's own members than Mr. Harry Cooper. He was a man who loved the Association and all members of the Association had loved him. His speech at the Brighton Meeting would never be forgotten.

Member Honoured

The Council received with pleasure a report that Lieutenant-Colonel Keith Fielding Stephens, R.A.M.C., had been appointed an Officer of the Military Division of the Order of the British Empire in recognition of distinguished services in Cyprus.

Reports on A.R.M. Resolutions

Council agreed to recommend to the Representative Body, as an economy measure, that the following resolution of the A.R.M., 1954, be rescinded:

That this Meeting requests that when a resolution is passed at a Representative Meeting, the Division or Divisions concerned in moving the resolution be kept informed of the steps taken to implement the resolution.

It was agreed to recommend instead that Divisions should be informed of the final decision.

Hungarian Medical Refugees

It was reported that contributions to the B.M.A. Hungarian Relief Fund now amounted to £748.

Empire Medical Advisory Bureau

Mr. A. M. A. MOORE, Chairman of Committee of Management, presented the reports of the Empire Medical Advisory Bureau and the International Medical Visitors' Bureau. During 1956, 1,688 new inquirers made use of the Empire Medical Advisory Bureau and the International Medical Visitors' Bureau, and 883 made their first personal calls at the Bureaux. The total number of visitors old and new during the year was 2,692.

The Council recorded grateful appreciation of the services of Mr. L. R. Broster during the five years of his chairmanship, and of the Medical Director and staff of the Bureaux. The reports were adopted.

Organization Committee

Dr. RONALD GIBSON, Chairman of the Organization Committee, presented the report of that committee which contained various recommendations for the revision of standing orders of Council. It also contained a recommendation that in place of the Young Practitioners Committee of the Association, recommended by the Constitution Committee, the Council should approve in principle the convening of an informal conference which should meet once a year for the discussion of problems of particular interest to the junior member of the Association; and that it be referred

to the Organization Committee to submit a detailed recommendation covering the arrangements for such a conference.

If this recommendation were adopted it would mean that once a year representatives of doctors employed in all types of junior appointments—for example, junior commissioned ranks in the regular armed Forces, unestablished general practitioners, junior and senior housemen and registrars in teaching and non-teaching hospitals, and those holding junior appointments in the public health service, etc.—could meet together with their senior colleagues on the respective standing committees to review the work of the Association on behalf of junior members during the year. It would also provide a forum for the discussion of new problems of particular interest to the junior member.

Dr. W. E. DORNAN recalled that the matter was first raised at the Cardiff Meeting in 1955, and since then there had been the feeling among the younger practitioners that a young practitioners committee was needed. This was partly due to the fact that the young people did not believe that a subcommittee which normally met once a year could properly represent them. A second criticism was that a subcommittee could report only to its parent body and had no direct access to the Council. The young practitioners wanted a body which had power to make recommendations direct to the Council.

Pointing out that in January the Constitution Committee's report had the support, in principle, of the Organization Committee, Dr. Dornan complained that it was not until he received the Council agenda that he was made aware of the *volte-face* on the part of the Organization Committee.

Dr. F. GRAY said that the matter was carefully considered by the Assistants and Unestablished Practitioners' Subcommittee of the G.M.S. Committee, and at the conclusion of some hard thinking one young assistant said, "I do not see what this committee will do." Dr. Gray pointed out that there would be absolute chaos if any section of the Association could come directly to Council. "I welcome the change of view of the Organization Committee," he said, "and will support it."

Dr. A. BROWN asked whether the difficulty was not one of appointing delegates to such a conference. It would seem that all the conference would do would be to allow young practitioners to let off steam.

Dr. J. A. PRIDHAM pleaded with Council not to turn down the recommendation out of hand, thus leaving the young practitioners with no adequate representation.

Dr. J. B. W. ROWE expressed the hope that Council would adopt the recommendation if only, he said, for the opportunity it would afford of educating the younger members and of developing those who would succeed present members of Council in the future.

Dr. J. A. L. VAUGHAN JONES said it was absolutely fundamental at the moment that the young practitioners should know that the Council was not unmindful of their wishes and problems. On the motion of Dr. I. D. GRANT, Chairman of the Representative Body, seconded by Mr. A. LAWRENCE ABEL, the question was referred back for further consideration by the Organization Committee. It was stressed that Council wished to give effect to the desire to provide a platform of some kind for the young practitioners, and that in producing a scheme the Organization Committee would go into greater detail, including some financial implications.

Postage on Library Books

A recommendation in the report of the Finance Committee that the temporary suspension of the payment by the Association of outward postage on library books be put into effect forthwith was approved.

General Medical Services Committee

In discussing a recommendation moved by Dr. TALBOT ROGERS, Chairman of the G.M.S. Committee, that at an appropriate time in the future discussions be initiated with officers of the Ministry of Health on the provision of drugs for private patients, Dr. ALEXANDER BROWN said that the G.M.S. Committee did not apparently consider that the present was the right time to initiate discussions. In his view there were several reasons why the Association should go forward with the claim for drugs for private patients. The time to endeavour to get a settlement was now.

Dr. F. GRAY said it would be disastrous if those occupied in the main struggle were forced to devote a great deal of time to a less important issue. The G.M.S. Committee had passed the resolution approving the point in principle and had left it to the good sense of Council to state when the appropriate time would be.

Dr. R. HALE-WHITE said that an added reason why the present was an admirable opportunity to press forward with the matter was that private patients were beginning to wonder whether they could possibly continue being private patients in the circumstances.

Dr. TALBOT ROGERS, in reply, stated that in his view the appropriate time for the action suggested was not the present.

A vote on the recommendation was taken by show of hands, and the recommendation was adopted by 20 votes to 13 votes.

The report was adopted.

Central Consultants and Specialists Committee

Mr. T. HOLMES SELLORS, Chairman of the Committee, presented the report and moved its adoption.

Dr. W. WOOLLEY expressed disappointment at not finding any mention whatever of the remuneration issue in the report. He suggested that the Committee should consider some form of levy to help the general practitioners in their fight, which would go a long way towards holding the two parties together.

Mr. HOLMES SELLORS explained that his Committee had not yet had an opportunity of considering the latest developments in the remuneration dispute.

Journal Committee

Dr. J. G. M. HAMILTON presented the report of the Journal Committee, and informed Council that the figures for the *Journal* up to date were gratifyingly better than those in the budget.

Dr. E. C. DAWSON (Derby) criticized the way the remuneration issue had been presented in the *Journal*, and suggested that the whole of the front page of the *Supplement* should be devoted every week to news on the remuneration issue until it was settled.

Dr. W. WOOLLEY (Bristol), dissenting from this view, said that at a recent meeting he had been asked by over 50 members of the Association, together with two non-members, to congratulate the *Journal* staff on the way in which the case for the Association had been presented. Dr. IAN GRANT, for the Association had been presented, warmly commended the leading article "What is the Case?" which appeared in the *Journal* of March 23.

Dr. HAMILTON, in reply, said it would, of course, be wrong for the Council to start editing the *Journal*, but he assured members that the Editor would consider suggestions and criticisms.

Public Health

The Chairman of the Public Health Committee, Dr. J. B. TILLEY, in presenting the Committee's report, moved a recommendation that the Council should reaffirm to the Ministry of Health its view that a dangerous situation was arising from the arrival in this country of immigrants with communicable diseases, and that Government action should be taken in the matter, including a requirement of compulsory chest x-ray for all immigrants before entry to the country.

Dr. H. D. CHALKE said that the attitude of the Government was exemplified in what happened in the case of the Hungarian refugees. When the first contingent arrived mass x-ray units were made available, but were told to do nothing about it, yet one in six of those refugees had a case history of tuberculosis or of contact with the disease. Many were working in mines all over the country in close contact with other workers. The Government should be urged to do something about it, and Dr. Chalke suggested that the case of the Hungarian refugees should be incorporated in the Public Health Committee's recommendation.

An amendment to a recommendation suggested by Dr. J. B. W. ROWE, that the immigrants should have a compulsory chest x-ray before leaving their own country, was agreed to.

Dr. H. H. D. SUTHERLAND pointed out that tuberculosis was not the only danger. Gonorrhoea presented another great problem. There had never been so many cases in the Paddington area for many years, said Dr. Sutherland, and the country was in great danger from a spread of the disease.

The recommendation was adopted, it being further agreed that it should be treated as a matter of urgency.

Public Relations Committee

The CHAIRMAN congratulated the Public Relations Department on the way in which it had handled public relations in the last few weeks.

Other Committees

In presenting the report of the International Relations Committee, Dr. J. A. PRIDHAM said that the World Medical Association, in co-operation with the International Committee of the Red Cross and the International Committee of Military Medicine and Pharmacy, had designed an identifying emblem for the protection of civilian doctors in time of war. It was described as "a red, straight, vertical stick and a serpent represented by a sinuous line over the stick with two undulations on the left side and one undulation on the right side, displayed on a white field." Two recommendations, that the emblem be approved in respect of doctors in the United Kingdom and that representations of doctors in the United Kingdom and that representations of doctors in the Government with a view to the official adoption of the emblem in the United Kingdom, were adopted.

The Committee had received with dismay a report that the *Confédération des Syndicats Médicaux Français* had decided to withdraw from the World Medical Association owing to inability to pay the increased subscription.

A recommendation that the Memorandum of Evidence prepared by the Maternity Medical Services Committee be approved and submitted to the Cranbrook Committee was adopted.

In presenting the report of the Compensation and Superannuation Committee, Dr. A. N. MATHIAS reminded Council that the A.R.M. in 1955 asked Council to "explore the possibility of superannuation payments being made on sessional fees paid by Government departments to part-time medical officers." Representations were made to the Treasury by the Committee, but, having re-examined the case, the Treasury had reaffirmed its view that it would not be appropriate to grant that concession. It had pointed out that the new income-tax relief made available by section 22 of the Finance Act, 1956, would assist practitioners to make provision for an annuity to supplement the expected benefits from statutory superannuation schemes.

The remaining Committee reports were received without discussion.

The Council elected a number of new Members, and the proceedings terminated at 7 p.m.

BRITISH MEDICAL GUILD

At a meeting of the Trustees of the British Medical Guild, held during the course of the Council meeting on March 27, a draft of a document to be issued to all members of the profession was approved.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Consultants and the Dispute

SIR,—I have not and have never had any personal interest in the financial aspects of the National Health Service as these affect the doctor, since, for reasons that seemed adequate to me, I did not give up my honorary status in 1948, or thereafter while I remained on the active staffs of my two hospitals. Nevertheless, I have watched with interest and with all my initial misgivings the evolution of the Service, and I retain a deep concern for the honour and welfare of the profession to which I still belong. It is therefore in freedom and as a spectator that I venture to express my sense of the confusion that, as in 1948, seems again to have descended upon our scene.

As I understand it, the proposal is that the general practitioner in the Service is, upon a date decided, to resign from it, to continue to treat the sick, at first on the problematic view that they may be willing to pay something directly for this, or even if they do not, and, in addition, to subscribe to a levy to support those who may be hard pressed in this dispute. On the other hand, the consultant or the hospital officer is not to resign, but is to continue the tenor of his way, and to receive his emoluments from the State as heretofore. All he is asked to do is what he should in any case be doing—namely, to refrain from dealing at hospital with patients whose care could be adequately handled by the general practitioner.

This curious appearance of neutrality in the dispute is sought to be justified on the ground that the staffing of hospitals is a service that can in no circumstances be interrupted. Surely we all know that the hospitals must be carried on, but how does this require the total abstention of the consultant from the privilege of participation in the financial sacrifice to be made by his colleague in general practice: for example, in the matter of the levy the latter is ready to impose upon himself at the same time as he is putting his living in peril? Again, as I understand, the two principal negotiators with the Government upon this issue represent, the one, the general practitioner, and the other, the general body of consultants and hospital officers. Yet it appears that a companionship in negotiation does not extend to a companionship in action.

This strange dichotomy in action is perhaps clarified by the letter in your pages (*Journal*, 1956, 1, 857) from the President of the Royal College of Physicians, in which it was stated that "the policy of the College has from the beginning been a firm and consistent one of co-operating with the Government of the day." The two operative words here are "policy" and "co-operating." Surely the policy as here defined is nothing more than a commitment to follow Government policy—that is, someone else's policy—whatever this may happen to be on any "day" in question. It is in fact not a policy, save in the sense of that word associated with the ingenious Vicar of Bray.

I do not question that this statement of its President does faithfully represent the "policy" of the College, and, indeed, I was interested at the time to note that no correspondent wrote to you, Sir, to dispute the prudence or the existence of it, or even to point out that it was certainly not a policy that left the College any freedom of action, save to repudiate it. In short, it appears to me that unless and until the College does repudiate this "firm and consistent" intention there can be no possibility of a companionship in action between consultants and general practitioners should a dispute arise between Government and profession, and no rational role for a representative of the College upon a negotiating body in such a situation.

I do not here express any opinion as to the practical wisdom or propriety of the Association's decision that general

practitioners shall resign from the Service, though I have one. To do this is not my present purpose, but rather to express my bewilderment at the sight of two main divisions of our profession both in negotiation with the Government to the same end; the one free, the other ideologically tied to co-operation with the Government of the day; each, if negotiations finally break down, reacting so differently. The one making all the sacrifices, the other making none at all. What a situation! Illogical in its nature and impractical in action, for in this particular event the "policy" of the College turns out to be "firm and consistent" inaction.

If this be a fair summary of things as they are, I ask how can the profession ever hope to succeed, or to impress, in any corporate action if its several elements do not really stand wholly together, each in its appropriate way prepared to take risks and to make comparable sacrifices in a dispute with the Government, if dispute there must be.—I am, etc..

London, W.1.

F. M. R. WALSHE.

SIR,—Dr. W. N. Leak in his letter (*Supplement*, March 23, p. 129) suggests a diagnosis to account for the Government's present attitude to the medical profession. He may well be correct, but I believe the following alternative one should be considered in order to account for our employers' refusal to honour their moral and contractual obligations—namely, that the resignation of the general practitioners from the Health Service is acceptable to the Government.

It is possible that the Government realizes that the Welfare State in its present form can no longer be financed by the country. One of the modifications which may be envisaged in its structure is that the remuneration of general practitioners should, in part, come directly from their patients, while on the other hand the hospital service should remain fully under the control of the State. If, therefore, the socialistic ideal of a comprehensive medical service is to fail, it is politically expedient that blame should be placed on the medical profession, because of the resignation of the general practitioners, rather than that their employers should be forced to admit that they can no longer afford to pay them an adequate wage.

If the above diagnosis is correct, those of us in the hospital service must, at this stage, give very careful thought as to how best to help our colleagues in general practice at the time of their resignation. It may be that the time will come when we have to negotiate on our own with the Government of the day, and any weakness on our part now can only lead to our further degradation in the future.—I am, etc..

London, E.2.

E. J. M. WEAVER.

What is the Case?

SIR,—As I have received several letters following the one to which you drew attention in your leading article (*Journal*, March 23, p. 690), may I attempt to answer them by explaining the clarification of my own mind which came from listening to Dr. Wand at Crewe and discussing the matter at a Branch Council meeting? While watching the Manchester doctors on I.T.V. on March 29 I felt that some other doctors were almost as hazy as I had been myself.

The first point is about the Government attitude to Spens. This was officially stated—though I had overlooked it—in the *Handbook for General Practitioners* (revised to March 31, 1955) issued by the Ministry of Health and given to all doctors in the Service. This states (para. 179, p. 37): "The Central Pool is now calculated on the basis of the new remuneration appropriate for general practitioners in 1939 (as recommended by the Spens Committee in 1946), together with a betterment factor taking account of changes in the value of money since that time" (italics mine). In view of this categorical statement of less than two years ago the equivocations of Ministers of Health and the Prime Minister seem positively dishonest.

This quotation shows that, in setting up a Royal Commission without any consultation with the doctors and dentists, the intention of the Government is to find

some other basis for the payment of doctors than the Spens agreement to which it has signified its adherence. This is a unilateral repudiation of an agreement to which doctors cannot consent, for if it were allowed to pass it would mean that there would be no likelihood, let alone certainty, that any new agreement would not be equally easily set aside in future.

The setting up of the Royal Commission has the unfortunate, but probably well-calculated, effect that while it is sitting it would be unconstitutional for the Government to enter into any discussions about remuneration. As therefore the Prime Minister stated that the setting up of the Royal Commission did not preclude an interim award, it seems clear that he must be premeditating some announcement such as the 10% rise just given to junior hospital staff without the promised reference to the Whitley Council. I think that every profession will agree that this is not the way in which professional pay should be determined, and every trade unionist will support us in our efforts to insist that claims about remuneration should be settled by negotiation and not dictation.

In my previous letter (*Supplement*, March 23, p. 129) I attempted an analysis of the persons composing this Royal Commission. I believe that members of all professions will support us in the contention that professional remuneration should not be decided, even provisionally, by an almost entirely non-professional committee. Indeed, its peculiar composition looks like a studied insult to the whole professional body, a point of which other bodies should take note.

The conclusion I draw from the foregoing is that doctors have unexpectedly and unwillingly been forced into the forefront of the age-long struggle against arbitrary government, and that, while it is important that doctors should understand what the B.M.A. is proposing to do, it is even more important that the whole population should realize the true significance of what the Government is proposing to do, and the importance of ensuring that the remuneration of doctors, as of others, is settled by negotiation or arbitration and not by arbitrary handouts about which the recipients are allowed no say whatever.

Good government depends on good faith, and a better Health Service depends on the Government giving up its attempt to outwit or double-cross the doctors, so that with full confidence we can get down to the job of correcting the faults of the past and planning a happier and more progressive one for the future.—I am, etc..

Winsford, Cheshire.

W. N. LEAK.

Reform of Health Service

SIR,—I believe that the medical profession in this country is now faced with the opportunity to determine whether it will allow itself to become a slave of the State or to maintain the measure of independence compatible with the ideal of service to humanity. It is not intended to criticize any party or political programme, but I feel most strongly that a change of Government would mean the eventual abolition of private practice and the substitution of a full-time medical service. Such a substitution would involve a change in the proportion of beds allotted to private patients by the various hospital authorities. There would almost certainly be many less private beds—possibly even none. This would mean longer waiting-lists for those nursing-homes which have been able to survive. This would cut deeply at the roots of any income derived from private work by consultants.

I feel no doubt whatever that the National Health Service has come to stay. I believe, also, that the present levels of taxation, the increasing cost of living, the high death duties, and other forms of direct and indirect taxation will eventually reduce the vast majority of the population of this country to one common level, which I firmly believe will not be a high one so far as income is concerned. I believe, also, that this process, accelerating as it is, will be complete in a very few years. I do not believe that there will ever be any reduction in the level of taxation, rather the reverse. I believe, in addition to all the above depressing beliefs, that

the prestige of the general medical practitioner, already on the wane, will be finally extinguished unless we as a profession make a sincere and united effort to maintain it.

I have long wondered why the British Medical Association does not put plainly before the public the two alternatives with which the public is faced: either we are going to have a full-time medical service, or some continuation of the present scheme with all its uncertainties, and eventual extinction of the valued relations between general practitioners and patients. It seems to be imperative to me that the British Medical Association should learn what the public really wants, and only fair that the public should know exactly what the two alternatives would entail.

I am sure that in this country now there are comparatively few who are really private patients. I am convinced that in the future there will be fewer still, and I appreciate the fact that all must pay some form of contribution to the Health Service. But I am equally convinced that there are many who would prefer private medical attention, and that conviction leads me to suggest that the British Medical Association should forthwith institute a contributory scheme which would cover the cost of both general-practitioner and specialist services up to an agreed maximum. I realize that there are many forms of insurance in existence which cover the cost of consultant's fees, nursing-homes, and operations. There are also, I believe, some which cover the cost of attention by the general medical practitioner. So far as I am aware, the British Medical Association does not offer to the public any scheme which covers both general practitioner and specialist services. I want to emphasize that it is a primary point in this scheme that the general-practitioner as well as the consultant should be covered, and that the scheme should be run by the British Medical Association, or, if the constitution of that body would not permit such a scheme, by the Guild. I believe that it should be instituted without delay, and for this purpose I suggest that advertising experts should be employed with the widest powers, including the use of television, radio, and the press. The essential point is to make it widespread, arguing that the present crisis in the doctors' affairs might deprive sick persons of medical services and urging all to join at the first opportunity. The amount of contribution would require the services of statisticians as well as accountants. I would suggest that, as the present contribution under the National Health scheme to purely medical services is approximately one-eighth the cost of the weekly National Insurance stamp, it could be assumed that a yearly contribution of £5 5s. would cover the cost of general-practitioner and specialist services, including nursing-homes and operations. With increasing numbers this payment might be decreased and so attract a number of those in the lower-income groups.

I personally do not believe that at heart the general public would welcome a whole-time medical service, but no one, so far as I know, has taken the trouble to explain to the layman in clear and understandable language what such a service would mean; and, though I am entering into no political discussion on the merits or demerits of such a scheme, I feel that the vast majority of people in this country would prefer to retain a measure of personal contact with their doctors, which has hitherto been the basis of medicine in England. It is to nourish this feeling that I put forward the above suggestion of a contributory scheme, which I feel would weld the profession together, would appeal to those sentiments of private enterprise in the medical practitioner which, after all, are at the basis of all successful medical practices of the past, and if the scheme were successful would place the British Medical Association in a position of greatly increased strength, whatever Government policy might be pursued.—I am, etc..

Barnsey

H. E. McLAUGHLIN.

SIR,—I think there is unprecedented unanimity in the profession in feeling that we are being unfairly treated and that vigorous action is required. But I feel, as Dr. W. N. Leak in his excellent letter (*Supplement*, March 23, p. 129) says, we are in danger of firing at the wrong targets. Rather than

indulge in guerrilla tactics to bring an "obdurate" Minister to heel and lambast a Royal Commission, too late in the field and too hamstrung by its terms of reference to achieve much, let us ignore the Commission and accept the fact that the Minister will not offer us suitable terms of employment, and will not negotiate nor agree to arbitration regarding our pay. Let us regard this not as a catastrophe but as a challenge and an opportunity. We withdraw from an ill-conceived N.H.S. and set up our own alternative scheme (remembering always that we are reasonable folk, and if at the eleventh hour the Minister offers arbitration we will accept).

I had looked forward very keenly to the G.M.S. Committee's alternative scheme. Alas, I was bitterly disappointed in it. It would be fatally easy to reel off a purely destructive panegyric regarding all aspects of our alternative scheme, and/or sit back and await annihilation. But surely all need not be lost if we do but think again. As I see it, the following points are fundamental to achieve a successful British medical service: (1) genuine generalized withdrawal from the N.H.S.; (2) administrative simplicity and uniformity; (3) actuarial soundness; (4) fairness both to doctor and patient; (5) manifest justice; (6) fairness to the Government.

Our withdrawals must be genuine; we must be steadfast, not merely when together in the excitement of a meeting, but equally when alone, in the wee small hours, as our resignations gradually mature. This must be no token gesture to prod, bludgeon, or blackmail the Government into complying with our caprice, but a solemn decision, reluctantly reached, to give due notice to an employer whom we—maybe rightly, maybe wrongly, but certainly sincerely—believe to have been unsatisfactory and indeed untrustworthy; and then to take similar employment with new employers—i.e., both the private patient and the British medical service. We must expect our resignations to be accepted and be "permanent"; we must prepare to work our own B.M.S., if need be for years, if need be for ever.

As well as private practice—which we would prefer (I agree that 7s. 6d. and 5s. are reasonable fees at the inception)—let us offer the public a family doctor service on an insurance basis as from the start of our withdrawal and as a cardinal point. I suggest we call it the British Medical Service—the B.M.S.—sponsored by the B.M.A., implemented by the British Medical Guild. It should be centrally organized with standard rates of contribution and terms of service, but with the local medical committees attending to local administrative affairs as at present (obtaining drugs and dressings being the patient's responsibility). Re contributions, we will of course require actuarial and accountant opinion, but as a rough estimate I would imagine that, as we now have a capitation-cum-loading fee of approximately 22s. per head, varying with the size of list, and as we ask for an increase of 24%, we would be happy to get 27s. 6d. per head per year. If we charged 3s. per month (or 8s. 6d. per quarter, or 34s. per year) that should give an adequate margin for meeting administrative expenses, sundry first charges, initial practice and hardship allowances, and mileage, etc. (once established it should be possible to reduce to 2s. 9d., 8s., and 31s. 6d.). The terms of service could be more or less on the old club lines.

At first sight the patient might complain bitterly of a raw deal, of paying twice for the same thing. On reflection, he would still fare very well indeed. Of the 12s. 9d. weekly insurance stamp, only 10d. now goes into the Health Service, and of that less than 1d. goes to the G.P. pool. So he is being done out of less than 1d. per week (incidentally, half of that is his employer's contribution). If he pressed for the return of that 1d., he might get it. I think the Government is much more likely to reply with justification that, even without the family doctor service, he is still paying less than a quarter of the total cost of the Service.

Our Public Relations Department must get this over to the public, together with the gist of our case: (1) "The Minister agrees that the Spens Report remains the basis of

remuneration of general medical practitioners until such time as, after the usual consultation, some other basis is substituted." (2) Our remuneration was adjusted to March, 1951. (3) Our present claim—that it should be adjusted to 1956 (yes, last year)—has not been considered. Arbitration is refused. (4) Even more important than the actual £ s. d., a vital principle is at stake—that a Government promise freely given must be kept, and that a conscientiously compiled claim should be considered (and if need be disputed) on its merits, not summarily dismissed as a matter of political inexpediency; if agreement be not reached, then arbitration must be conceded. We are willing and anxious, now as always, that our case be referred to arbitration. Failing that, and very reluctantly, we must press on with our own British Medical Service. (5) No patient must suffer medically at all, and they need suffer only slight financial hardship—well, hardship is scarcely the word, for if they join the B.M.S., as suggested above, the cost is approximately that of half a cigarette a day.

But whatever we do, let us do it wholeheartedly. Let us have the courage of our convictions, and if arbitration is still refused and our resignations inevitable, let us act boldly and together, not in penny numbers here and there.—I am, etc.,

Rugby.

R. PRESTON HENDRY.

SIR,—We must support the decision of the G.M.S. Committee to resign from the Health Service or the status of the profession will be lost for ever. Only one conclusion can be drawn from the Government's refusal of arbitration. It wants the doctors to resign and so end the N.H.S. in its present form which has brought the country near to bankruptcy. The Government dares not say this because the public loves its "free" doctoring. It is putting the responsibility (and, in the eyes of the public, the blame) of ending the N.H.S. on the shoulders of the doctors. This Government plan to end the present N.H.S. makes the interim scheme devised by the G.M.S. Committee for the medical care of the public after October 1 appear to be inadequate. It presupposes eventual capitulation on the part of the Government and a re-establishment of the N.H.S. on the old lines with all its faults. A scheme must be produced by the B.M.A.—perhaps in conjunction with the insurance companies—to take the place of the National Health Service.—I am, etc.,

Bromley, Kent.

JOHN C. WISHART.

SIR,—The "scheme" will come as a great disappointment to many practitioners, who were expecting that this opportunity would be taken to rally the whole profession's support, unless it is shortly to be followed by the announcement of a reformed and improved alternative Service.

The profession will not feel happy about withdrawal into the vacuum which will exist unless the alternative is soon published, and the method of withdrawal suggested is one by means of which the Government will feel the gradual twist of the thumbscrew and appears to many to be a political move of half-heartedness rather than the action inspired by love of one's profession and a determination to re-establish its high traditions which have so benefited mankind in the past.

Let everyone sign the form of authorization for special levy at once, for we shall need the funds, but let us pursue the search for a practical and worthy service into which to withdraw—a service which must include the ownership of our own goodwill if the profession is to be kept out of politics, and the intervention of a third party (the State) between us and the patient.—I am, etc.,

Hildenborough, Kent.

C. GLAISHER.

Alternative Scheme

SIR,—I believe that, without resigning from the N.H.S., it is still quite possible to secure our pay adjustment, establish for ourselves substantial control of the G.P. service, eliminate politics, and open the way to good general practice. What the N.H.S. needs is effective competition.

Let the B.M.A. sponsor a national scheme of prepaid medical insurance in order to bring private practice back within the reach of those of the public who appreciate good medicine. I feel sure that the premiums could be quite low (compare the Australian scheme outlined on page 25 of the *Supplement* of January 19), even with the provision of drugs included.

The N.H.S. remains and must always remain a real necessity for those who cannot afford to pay. For the rest there is no reason why an alternative scheme should not be provided. Indeed, it should satisfy everyone. The patient would experience the satisfaction of paying for and getting a doctor with leisure to question deeply, to examine carefully, and to explain fully, and would, at the same time, avoid the heavy bills associated with long illness. For the doctor, quality of practice would be rewarded not by numbers on a list but by increasing numbers of "B.M.A." patients. I feel sure that advertisement and assurance that patients would retain N.H.S. hospital rights would make such a scheme an immediate success and a dignified alternative to the nightmare of mass resignation.—I am, etc.,

Holywell, Flint.

DAVID L. WILLIAMS.

Withdrawal from N.H.S.

SIR,—Following the declaration of our leaders of their intention to advise mass withdrawal, and to publish their own alternative plan for the organization of general practice, many of us eagerly awaited the expected strong lead. The mountains having duly gone into labour, there emerged an emasculated scheme for withdrawal by hire purchase, dragging in its wake the placental ghost of fee-paying private practice. Does anyone think that struggle for a principle can ever be conducted against a strong adversary without some hardship and sacrifice?—I am, etc.,

Taplow, Bucks.

KENNETH SIMON.

SIR,—Your leading article (*Journal*, March 23, p. 692) on withdrawal from the N.H.S. ends thus: "As the Government rejects a reasoned case and a reasonable plea for negotiation or arbitration, action of the kind proposed is all that is left." I write to express my profound disagreement. An alternative more in keeping with the dignity of our profession is that we continue to work at our present rate of pay. While thanking our leaders for their efforts, many doctors will prefer to have nothing to do with a scheme which is scarcely distinguishable from a strike. It is deplorable that our profession should even contemplate embarrassing the Government by action of this sort, especially at a time of national difficulty.—I am, etc.,

Crowthorne, Berks.

E. F. CHAPMAN.

Remuneration Claim

SIR,—Many thanks to Dr. R. R. Charlwood (*Supplement*, March 16, p. 119) and Dr. J. E. C. Tower (*Supplement*, March 23, p. 131) for their most sensible letters in this hour of crisis. As a young G.P. I am proud to serve my patients under the National Health Service, and have not the slightest intention of withdrawing my services. I believe that the plan for progressive withdrawal which I received recently is unwise and doomed to failure. We are asked to resign from the National Health Service in selected areas. The obvious step to be taken by the Government is to advertise the vacancies thus created and appoint another doctor in our place. This newly appointed practitioner will then be given all our medical records (the property of the Ministry of Health) and will continue to provide N.H.S. treatment in our area. Our patients will soon tire of paying our fees (token or otherwise), and a gradual drift will take place. As a dispensing doctor under the N.H.S. I know that I can provide for all my patients, whatever their income, the drugs they need. Yet we are told that if the Government remains obdurate it will be necessary to make a fully economic charge to the patients. What nonsense this is. How can our old people be expected to pay for such expensive drugs as tetracycline and acetazolamide, etc.?

Of course we all would like more money—but what is so very wrong with a Royal Commission? By all means, let us work together to obtain a fair reward for our services, but not at the expense of that splendid achievement, the N.H.S.—I am, etc.,

Maidstone, Kent.

PAUL FINCHAM.

SIR,—We, the undersigned medical practitioners, members of hospital staffs on Merseyside, wish to express our strongest indignation and disapproval of the Government's summary dismissal of the profession's recent case for increased pay. We are wholeheartedly prepared to undertake any action initiated by any responsible medical organization that may be required to press our claim to a more reasonable and just conclusion. We believe that words can no longer be effective, and wish vigorous action to be organized as soon as possible.—We are, etc.,

E. ADLER.
N. C. AKHAN.
J. S. BAMFORTH.
R. BECKETT.
J. L. BOWMER.
BRYAN BROOM.
K. BROWN.
W. CAPLAN.
P. M. CARRUTHERS.
RON CARRUTHERS.
W. CARTER.
MYLES M. CLARKE.
H. COLLINS.
G. G. COPELAND.
P. CORKERY.
REG. B. CROSBIE.
E. E. CURETON.
FERGUS A. DUCHARME.
C. M. DURKIN.
IAN R. ENTWISTLE.
M. A. R. ESLICK.
D. GLYN EVANS.
G. H. EVANS.
D. FRIEDBERG.
A. A. GILBERTSON.

A. J. GREHAN.
DAVID HULL.
P. N. JARVIS.
D. JOHNSON.
A. KENNEDY.
D. KRASNER.
R. LERICHE.
V. ST. CLAIR D. LOGAN.
B. E. LOMAX.
B. W. MCGUINNESS.
YVONNE MAHABIR.
CYRIL MAXWELL.
J. MEECHAM.
A. V. MILLES.
J. P. MURRAY.
NORA M. NORRIS.
T. A. O'MALLEY.
A. PATTERSON.
RUTH M. POLAND.
ELAINE ROBINSON.
P. J. ROWELL.
M. E. SHEPHERD.
M. J. WILLIAMS.
EDWIN WONG.
P. WORTHINGTON.

SIR,—I feel that I must be one of many thousands of general practitioners who are viewing the actions and attitudes of our Negotiating Committee with growing concern. At the present time, when the affairs of the country are in such a parlous state, a claim for a 24% rise by a relatively well-off section of the community has no hope of sympathy from the general public and little hope of complete and enthusiastic support from its own members. We have no financial cause to justify a crusading spirit, and that is what is needed for victory. If we had never started a financial claim but had simply pressed for clearer terms of service, I feel that everyone's conscience would now be clearer and their support more enthusiastic.—I am, etc.,

Glynnceath, Glam.

C. M. E. REES.

Value of Obstetric Lists

SIR,—I am writing to support Dr. J. A. Frai's (*Supplement*, March 23, p. 131). Like him, I discovered two years ago that experience on the obstetric register does not qualify you to sit the D.R.C.O.G. examination. In my case I already held an obstetric appointment, but the hospital in which it was done was not then recognized for this diploma, although it has subsequently been so recognized. At the inception of the diploma, it seems, 10 years in general practice obstetrics qualified one to sit the examination. This was discontinued. Surely the Royal College of Obstetricians and Gynaecologists should recognize service on the obstetric list over so many years to sit the diploma. If not, as Dr. Frai's points out, there would appear to be no need for a special obstetric list. It is time that it was decided what value other than monetary can be attached to being on the obstetric list.—I am, etc.,

Honiton, Devon.

T. GLANVILL.

Association Notices

Diary of Central Meetings

APRIL

9 Tues	Conference of Advisory Councils on Occupational Health, 12 noon.
10 Wed.	Standing Joint Committee of R.M.P.A. and Psychological Medicine Group, 11 a.m.
10 Wed.	Private Practice Committee, 2 p.m.

Branch and Division Meetings to be Held

The following meetings, to which all medical practitioners in the areas are invited, will be held to consider the Reports of Council and the G.M.S. Committee on the remuneration issue.

ALDERSHOT AND FARNHAM DIVISION.—At Northfield Hospital, Aldershot, Thursday, April 11, 8.30 p.m.
 BARNET DIVISION.—At Board Room, Barnet General Hospital, Wednesday, April 10, 8.30 p.m.
 BLACKBURN DIVISION.—At White Bull Hotel, Church Street, Blackburn, Tuesday, April 9, 8.15 p.m. (A.G.M.).
 BUCKINGHAMSHIRE DIVISION.—At Bull's Head Hotel, Aylesbury, Tuesday, April 9, 3.30 p.m.
 BURNLEY DIVISION.—At Concert Hall, Municipal Hospital, Burnley, Saturday, April 6, 4 p.m.
 CHELSEA AND FULHAM DIVISION.—At Fulham Town Hall, S.W., Tuesday, April 9, 8.30 p.m.
 CITY AND TOWER HAMLETS DIVISIONS.—At Committee Room C, B.M.A. House, Tavistock Square, W.C., Wednesday, April 10, 8.30 p.m., joint meeting.
 CROYDON DIVISION.—At Out-patient Hall, Croydon General Hospital, Friday, April 12, 8.30 p.m.
 CUMBERLAND DIVISION.—At Globe Hotel, Cockermouth, Sunday, April 7, 3.30 p.m.
 DERBY DIVISION.—At Wilderslowe, Derbyshire Royal Infirmary, Tuesday, April 9, 8.30 p.m.
 DUDLEY DIVISION.—At Nurses' Lecture Theatre, Guest Hospital, Dudley, Tuesday, April 9, 9 p.m.
 DUMFRIES AND GALLOWAY DIVISION.—At Cresswell Maternity Hospital, Dumfries, Sunday, April 14, 3 p.m.
 EAST HERTS DIVISION.—At Council Chamber, County Hall, Hertford, Friday, April 12, 8.30 p.m.
 EAST YORKSHIRE BRANCH.—At Unitarian Church, Park Street, Hull, Thursday, April 11, 8.45 p.m.
 ENFIELD AND POTTERS BAR DIVISION.—At St. Michael's Hospital, Chase Side Crescent, Enfield, Friday, April 12, 8.15 for 8.45 p.m.
 GLASGOW DIVISION.—At Grand Hall, St. Andrew's Halls, Sunday, April 7, 3 p.m. Statement by Dr. Ian D. Grant (Chairman, Representative Body, B.M.A.).
 GUILDFORD DIVISION.—At Mitchell Hall, Royal Surrey County Hospital, Guildford, Thursday, April 11, 8.30 p.m. Address by Dr. D. P. Stevenson (Deputy Secretary, B.M.A.).
 HAMPSHIRE AND ST. PANCRAZ DIVISIONS.—At Great Hall, B.M.A. House, Tavistock Square, London, W.C., Monday, April 8, 8.30 p.m., joint meeting. Dr. Max Sorsby will speak.
 HUDDERSFIELD DIVISION.—At Board Room, Huddersfield Royal Infirmary, Monday, April 8, 8 p.m.
 LAMBETH AND SOUTHWARK DIVISION.—At Nurses' Lecture Hall, Lambeth Hospital, Brook Drive, Kennington Road, S.E., Tuesday, April 9, 8.15 p.m. Dr. Max Sorsby (Member, G.M.S. Committee) will speak.
 LANCASTER DIVISION.—At Royal King's Arms Hotel, Lancaster, Sunday, April 7, 8 p.m.
 LEEDS DIVISION.—At Littlewood Hall, General Infirmary at Leeds, Wednesday, April 10, 8 p.m.
 LINCOLN DIVISION.—At Saracen's Head Hotel, Lincoln, Sunday, April 7, 8 p.m.
 LIVERPOOL DIVISION.—At Y.M.C.A., Mount Pleasant, Liverpool, Sunday, April 14, 3.30 p.m. Dr. D. P. Stevenson (Deputy Secretary, B.M.A.) will speak.
 MACCLESFIELD AND EAST CHESHIRE DIVISION.—At West Park Hospital, Macclesfield, Wednesday, April 10, 8.15 for 8.30 p.m.
 MARYLEBONE DIVISION.—At Medical Society of London, 11, Chandos Street, W., Tuesday, April 9, 8.45 p.m.
 SHROPSHIRE AND MID-WALES BRANCH.—At Board Room, Royal Salop Infirmary, Shrewsbury, Friday, April 12, 8.30 p.m.
 SOUTHAMPTON DIVISION.—At Royal South Hants Hospital, Southampton, Thursday, April 11, 8.30 p.m.
 SOUTH-EAST ESSEX DIVISION.—At Queen's Hotel, Westcliff, Thursday, April 11, 8.30 p.m.
 SOUTH MIDDLESEX DIVISION.—At Ball Room, Casino Hotel, Tagg's Island, Hampton Court, Sunday, April 14, 11 a.m.
 SOUTH STAFFS DIVISION.—At Medical Lecture Hut, Royal Hospital, Wolverhampton, Monday, April 8, 8.30 p.m. Dr. A. V. Russell (Member of Council) will report on the present position.
 SOUTH WARWICKSHIRE AND RUGBY DIVISIONS.—At Grand Hotel, Rugby, Wednesday, April 10, 9.30 p.m., joint meeting. (8 for 8.30 p.m., informal supper).
 STRATFORD DIVISION.—At Manor Park Library, Romford Road, Tuesday, April 9, 8.30 p.m. Address by Dr. D. P. Stevenson (Deputy Secretary, B.M.A.).
 WAKEFIELD DIVISION.—At Out-patient Consulting-room, Clayton Hospital, Wakefield, Thursday, April 11, 8 p.m.

WEST HERTS DIVISION.—(1) At Physiotherapy Department, West Herts Hospital, Hemel Hempstead, Wednesday, April 10, 8.30 p.m. (2) At Watford Peace Memorial Hospital, Thursday, April 11, 8.30 p.m.

WEST MIDDLESEX DIVISION.—At Nelson Room, Ealing Town Hall, W., Tuesday, April 9, 8.30 p.m.

WESTMINSTER AND HOLBORN DIVISION.—At Committee Room C, B.M.A. House, Tavistock Square, W.C., Sunday, April 14, 11 a.m.

WEST SUFFOLK DIVISION.—At Everards Hotel, Bury St. Edmunds, Sunday, April 7, 5.30 p.m.

WILLESDEN DIVISION.—At Rehabilitation Department, Willesden General Hospital, Harlesden Road, N.W., Friday, April 12, 9 p.m.

YORK DIVISION.—At York Medical Society's Rooms, 23, Stonegate, York, Saturday, April 13, 8.30 p.m.

ABERYSTWYTH DIVISION.—At Talbot Hotel, Aberystwyth, Saturday, April 13, 7.30 p.m., dinner; talk by Mr. E. Emllyn Lewis: "Modern Treatment of Burns." Wives of members and guests are invited.

BIRKENHEAD AND WIRRAL DIVISION.—At Arrowe Park Hotel, Friday, April 12, 8.30 p.m., meeting. Address by Mr. J. Ralston Paterson: "Medicine in Russia."

BOURNEMOUTH DIVISION.—At Royal Victoria Hospital, Boscombe, Friday, April 12, 8.15 p.m., meeting.

BRIGHTON AND MID-SUSSEX DIVISION.—At Out-patient Department, Royal Sussex County Hospital, Brighton, Thursday, April 11, 2.30 p.m., general clinical meeting.

BROMLEY DIVISION.—At Royal Bell Hotel, Bromley, Tuesday, April 9, 8.30 p.m., meeting of National Pharmaceutical Union, West Kent Branch, to which B.M.A. members are invited. There will be a quiz on the N.H.S.

CAMBERWELL DIVISION.—At Dulwich Hospital, East Dulwich Grove, S.E., Thursday, April 11, 8.30 p.m., annual general meeting. B.M.A. Lecture by Professor R. Milnes Walker: "Around the World" (with slides and cinematograph film).

CITY OF EDINBURGH DIVISION.—At Lecture Hall, Central Halls, Tollcross, Edinburgh, Thursday, April 11, 8.15 p.m., special meeting.

DEWSBURY DIVISION.—At General Hospital, Dewsbury, Friday, April 12, 8.15 p.m., clinical meeting.

EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, April 11, 7.30 p.m., dinner; 8.45 p.m., B.M.A. Lecture by Dr. J. H. Cyriax: "Lower Lumbar Disk Lesions."

EAST YORKSHIRE BRANCH.—At Quern House, 68, Park Street, Hull, Wednesday, April 10, 8.30 p.m., meeting. Lecture by Mr. William Gissane: "An Accident Has Occurred."

HAMPSTEAD DIVISION.—At New End Hospital, Hampstead, N.W., Wednesday, April 10, 8.30 p.m., meeting. Talk by Dr. F. E. Camps: "Does Crime Pay?"

KINGSTON-ON-THAMES DIVISION.—At Epsom District Hospital, Dorking Road, Epsom, Tuesday, April 9, 7.45 p.m., clinical meeting.

LEEDS DIVISION.—At Littlewood Hall, General Infirmary at Leeds, Wednesday, April 10, 8 p.m., meeting. Lectures by Dr. D. B. Bradshaw and Dr. J. G. Ollerenshaw on their visits to Russia.

LEIGH DIVISION.—At Courts Hotel, Church Street, Leigh, Tuesday, April 9, 8.30 p.m., meeting. Consideration of Reports of Council and G.M.S. Committee on remuneration issue. Address by Mr. P. F. Early: "Dupuytren's Contracture" (illustrated by slides).

MAIDSTONE DIVISION.—At Oakwood Hospital, Maidstone, Thursday, April 11, 8 p.m., general meeting.

MANCHESTER DIVISION.—At Large Lecture Theatre, Clinical Sciences Building, York Place, Oxford Road, Manchester, Thursday, April 11, 8.30 p.m., extraordinary general meeting.

REIGATE DIVISION.—At Reigate Hill Hotel, Tuesday, April 9, 8.30 p.m., divisional meeting.

SOUTH STAFFS DIVISION.—Saturday, April 13, visit to Shakespeare Memorial Theatre, Stratford-upon-Avon, for performance of "As You Like It." Bus will leave Don Everall's Bus Station, Bell Street, Wolverhampton, 3.15 p.m. Dinner at Memorial Theatre, 6 p.m.

SOUTH-WEST ESSEX DIVISION.—At Nurses' Home, Wanstead Hospital, E., Wednesday, April 10, 8.30 p.m., special meeting to consider reports of Council and G.M.S. Committee on remuneration issue.

SOUTH-WEST WALES DIVISION.—At Cliff Hotel, Gwbert-on-Sea, Saturday, April 6, 7 p.m., dinner meeting. Dr. E. Howard Kirching: "Hypnosis." Wives of members are invited.

SWANSEA DIVISION.—At Neath General Hospital, Thursday, April 11, 7.30 p.m., clinical meeting.

SWINDON DIVISION.—At Goddard Arms Hotel, Swindon, Wednesday, April 10, 8.15 p.m., combined meeting with Swindon Pharmaceutical Society.

TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tunbridge Wells, Wednesday, April 10, 8.30 p.m., clinical meeting.

WANDSWORTH DIVISION.—At South London Hospital for Women and Children, South Side, Clapham Common, S.W., Sunday, April 14, 10 a.m. to 12.30 p.m., clinical meeting.

WEST DENBIGH AND FLINT DIVISION.—At Talardy Hotel, St. Asaph, Thursday, April 11, 7 for 7.30 p.m., dinner; 8.30 p.m., annual general meeting, to be followed by discussion on report of G.M.S. Committee. Non-members are invited to take part in the discussion.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 13 1957

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British Medical Association

ANNUAL REPORT OF COUNCIL, 1956-7

Every member is asked to keep this Supplement, which contains matters referred to Divisions, until the subjects have been discussed by his Division.

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PRELIMINARY

Chairman

1. The Council unanimously elected Dr. S. Wand (Birmingham) as its Chairman for a period of three years (1956-9).

The Council has placed on record its deep appreciation of the outstanding services rendered to the Association and the profession by Dr. E. A. Gregg as Chairman of Council for seven years.

Election of Vice-President

2. The Council has much pleasure in recommending:
Recommendation: That Thomas Clarence Routley, C.B.E., LL.D., D.Sc., M.D., F.R.C.P.(C.), of Toronto, be elected a Vice-President of the Association in recognition of his distinguished services to the Association.

Award of Gold Medal to Sir Henry Dale

3. The Council has much pleasure in reporting that it has decided to award the Gold Medal of the Association for Distinguished Merit to Sir Henry Dale, O.M., G.B.E., LL.D.,

M.D., F.R.C.P., F.R.S., in recognition of his distinguished services to medicine in the field of physiology and pharmacology.

Annual Meeting, 1958—Election of President

4. The Council has decided with regret that, owing to doubts as to the adequacy of the accommodation available, it is inadvisable to proceed with arrangements for holding the Annual Meeting of the Association in Margate in 1958. Fortunately, the Midland Branch, which had invited the Association to hold its Annual Meeting in Birmingham in 1960, found it possible to advance the date to 1958, and the Council has gratefully accepted the invitation to visit Birmingham in that year.

The Council has much pleasure in recommending:

Recommendation: That Arthur Peregrine Thomson, M.C., M.D., F.R.C.P. (Birmingham), be elected as President of the Association for 1958-9.

Annual Meetings, 1957, 1960, and 1961

5. The Annual Meeting of the Association will be held this year in Newcastle upon Tyne under the Presidency of

Mr. Weldon P. T. Watts, M.S., F.R.C.S., from July 10 to 19.

The Council has accepted an invitation from the Torquay Division to hold the Annual Meeting in Torquay in 1960, and an invitation from the New Zealand Branch to hold the Annual Meeting in New Zealand in 1961.

Joint Annual Meeting, Edinburgh, 1959

6. The Council, in consultation with the General Secretary of the Canadian Medical Association, has approved preliminary arrangements for the Joint Annual Meeting in Edinburgh from July 18 to 24, 1959, and invitations have been issued to officers of Sections.

The Chairman of Council has sent a letter for publication in the *Canadian Medical Association Journal*, inviting members of the C.M.A. to attend the Joint Meeting. Approximately 1,000 Canadian doctors and their families are expected to be present.

The Late Miss M. E. Gregg

7. In memory of Miss Minnie Elizabeth Gregg, who gave devoted service to the Association as daughter of the Chairman of Council, 1949-56, an electric clock, presented by members of Council, has been installed in the main Committee Room at B.M.A. House.

Representatives of the Association at Conferences of Other Bodies

8. The Council appointed the following to represent the Association at the conferences named:

Conference of Societies registered for Adoption, October, 1956	Dr. Annis Gillie
Annual Congress of Royal Netherlands Medical Association, October, 1956	Dr. S. Wand
British Veterinary Association Conference on "Supplements and Additives in Animal Feeding Stuffs," November, 1956	Dr. F. A. Belam
Brighton Joint Advisory Council on Occupational Health—Conference on Prevention of Occupational Dermatitis, November, 1956	Dr. H. Alexander
Royal Society of Health Congress, April, 1957	Dr. H. D. Chalke
International Hospital Congress, Lisbon, June, 1957	Dr. J. B. Tilley
Canadian Medical Association Annual Meeting, Edmonton, Alberta, June, 1957	Dr. T. Rowland Hill
American Medical Association Annual Meeting, June, 1957	Mr. F. W. Law
Conference of the Church of England Hospital Chaplains Fellowship, July, 1957	Dr. Mary Esslemont
Medical Association of South Africa Annual Meeting, Durban, September, 1957	Dr. E. E. Claxton
	Professor A. A. Moncrieff

Book of Valour

9. The A.R.M. in 1956 (Minute 25) decided on the recommendation of the Council to institute a Book of Valour, to be permanently on view at B.M.A. House, in which there shall be recorded, by decision of the Council, heroic deeds performed by medical practitioners. In each case a copy of the record is to be presented to the medical practitioner concerned or to the next of kin. Arrangements are in hand for the preparation of a suitable Book, and the first entries will be:

Surgeon-Lieutenant Charles Eric Rhodes, M.B., B.S., R.N., who died on June 16, 1955, while attempting to save men trapped in a sunken submarine.

Mark Gregory Baker, M.R.C.S., L.R.C.P., of Ashby-de-la-Zouch, who on August 17, 1955, sacrificed his life while attempting to rescue two men overcome by petrol fumes in a well.

Lieutenant Stanley Graham Sutton, M.B., R.A.M.C., who was awarded the O.B.E. for his bravery during a disastrous forest fire in Cyprus in June, 1956.

Legacies by the Late Sir Henry Brackenbury

10. Legacies under the will of the late Sir Henry Brackenbury which have recently become payable on the death of Lady Brackenbury include £250 for the Charles Hastings Fund and £750 for investment by the Council of the B.M.A., the income of which is to be applied every second or third year as a Prize to be known as "The Brackenbury Prize" to be awarded to a member of the Association at the discretion of the Council "for study essay lecture or other similar contribution on a subject judged by the Council to be of immediate practical importance with regard to public health to some medico-political or medico-sociological problem or to some educational question whether general medical or postgraduate regard being had to literary form as well as to substance."

Petrol Rationing

11. By arrangement with the Ministry of Fuel and Power, the local units of the Association in the areas in which the Regional Petroleum Offices are situated were asked to appoint medical liaison officers whose function would be to advise the Regional Petroleum Officers about claims from doctors for supplementary allowances of petrol for work outside the National Health Service.

British Commonwealth Medical Conference

12. In view of the financial position of the Association and the consequent need for economy, the Council has regretfully decided to postpone the next meeting of the British Commonwealth Medical Conference until 1958.

Study Tour of Denmark

13. The Danish Government (through the Danish Institute) has kindly invited two parties of members of the Association to visit Denmark during August and September, 1957.

Relief for Hungarian Refugees

14. Upwards of 50 refugee doctors from Hungary have been welcomed in the International Medical Visitors Bureau at B.M.A. House, and have been given advice and assistance, financial and other.

The Council sent representatives to a conference at the Ministry of Health at which the position of Hungarian refugee doctors was considered.

The Chairman of Council launched an appeal for contributions in the *British Medical Journal*, partly for the purpose of assisting the Austrian Medical Association in relieving distress among the large number of Hungarian medical refugees in that country.

Consultation with the Profession

15. The Council has noted the following resolution of the A.R.M., 1956:

346. **Resolved:** That this Meeting expresses the earnest hope that, in future, any medical committee or council (or similar body) which advises, or acquiesces in, any major change in medico-political policy, will either take steps to ascertain the views of the profession as a whole, or else to make it clear beyond peradventure that the opinion expressed is solely that of the individuals forming the committee, etc., and by no means necessarily that of the profession as a whole.

Committee on Nuclear and Allied Radiation Hazards

16. At the invitation of the Minister of Health and Secretary of State for Scotland the Council, on behalf of the Association, has suggested the names of medical practitioners who might be invited to serve on a Government Committee to consider the report of the Medical Research Council's Committee on the Hazards to Man of Nuclear and Allied Radiation.

Remuneration Policy

17. The Council has decided not to take any action in connexion with the following resolutions of the A.R.M.,

1956, whilst the present claim for increased remuneration, which has been prepared and presented by a Joint Committee representing hospital medical staffs and general practitioners, is under consideration:

332. **Resolved:** That the Association develop a policy whereby the Council will come to assume fuller responsibility for all future claims submitted by any section of the profession.

334. **Resolved:** That the recommendations of the Council on the subject of remuneration policy be accepted and implemented with the least possible delay and that special emphasis should be placed on the policy outlined in the first recommendation that medical men and women should be remunerated as doctors.

As reported elsewhere in the Council's Report, the Government, through the Ministry of Health, has been urged to set up an independent Committee of Inquiry to consider what should be the range of remuneration of medical officers in the public health service.

Undergraduate Training in General Medical Practice

18. The following resolution of the A.R.M., 1956, has been sent to the General Medical Council:

388. **Resolved:** That this A.R.M. requests the General Medical Council to consider including a period of training and instruction in General Medical Practice in the curriculum of Medical Students.

Reports to Divisions Concerning A.R.M. Resolutions

19. In 1954 the A.R.M. passed the following resolution:

237. **Resolved:** That this Meeting requests that when a resolution is passed at a Representative Meeting, the Division or Divisions concerned in moving the resolution be kept informed of the steps taken to implement the resolution.

Observance of this rule involves not only a considerable burden of work but also considerable expense. As an economy measure, the Council recommends:

Recommendation: (1) That Minute 237 of the A.R.M., 1954, be rescinded. (2) That, when a resolution is passed at a Representative Meeting, the Division or Divisions concerned be informed when a final decision on the subject-matter of the resolution has been reached.

Suggested Summary of Annual Report

20. The Council was asked by the A.R.M., 1956 (Minute 337), to consider the preparation of a short summary of its work, in addition to the Annual Report, for issue to all members. This would involve additional expenditure at a time when the Association can ill afford it. Apart from expense, however, the Council feels that members should be encouraged to read the full report of the Council and not an abridged edition.

A.R.M. Resolutions—Summary of Action Taken

21. The Council submits in Appendix II a summary of action taken in connexion with various resolutions passed at the A.R.M. in 1956. The resolutions in question have been noted in the relevant paragraphs of the Council's Report and it has not been thought necessary to include in the summary nor has it been thought necessary to include in the summary declarations of policy not specifically calling for immediate action by the Council.

The Council has not yet completed its consideration of certain resolutions of the A.R.M., 1956, but hopes to report on these in its Supplementary Report.

GENERAL MEDICAL SERVICES

Remuneration

The Remuneration Claim

22. A full report of the events which have taken place in connexion with the claim for increased remuneration for general practitioners and hospital medical staff will be made to the Special Representative Meeting.

Further developments will be reported in the Supplementary Annual Report.

Size of the Central Pool

Negotiations on the size of the Central Pool have continued and the final settlement for 1954-5, which amounted to £44m., was distributed at the end of last year.

The G.M.S. Committee is doing all it can to expedite the calculation and distribution of the final settlement moneys for subsequent years. Unfortunately, few of the necessary inquiries can be put in train until after the end of the financial year in question.

To illustrate the complexity of these negotiations, the following paragraphs set out the position with regard to the factors which must be taken into account each year:

Number of Doctors in the Service

The figure of the number of N.H.S. principals on the lists of executive councils is factual and is based upon returns from executive councils. The total number thus disclosed is adjusted on the basis of a formula agreed between the G.M.S. Committee and the Ministry to allow for additions and deletions which occur during the year.

Income from Other Sources

With the exception of income from private practice, which remains at the level of £2m. determined by Mr. Justice Danckwerts, the figure of income from other sources is factual and computed from returns made by the various authorities concerned.

The returns from hospitals, local authorities, and Government Departments in recent years indicate that the income from these sources is fairly constant. Factual information will continue to be sought for some years to come, but if there is no change in the situation the G.M.S. Committee, in consultation with the Ministry, will look into the possibility of discontinuing these yearly inquiries and asking the various authorities to make only periodic returns at regular intervals.

So far as private practice is concerned, the Committee has again rejected the suggestion by the Ministry that the last practice expense inquiry undertaken by the Board of Inland Revenue should be used as the basis for calculating the receipts of general practitioners in the N.H.S. from private practice. In consequence, both sides have to date accepted the provisional application of the figure of £2m. decided by Mr. Justice Danckwerts.

In discussing the matter with the Ministry, the G.M.S. Committee, supported by its statistical advisers, maintained that because of the wide diversity of private practice earnings any inquiry into this source of income would have to be on a very large scale to give anything like an accurate picture. Certainly, it is clear that in this sphere a limited sample inquiry, even of the size of that used for practice expense purposes, would be useless and the results misleading.

Practice Expenses

The Ministry has been informed by the Board of Inland Revenue that pressure of work makes an annual inquiry into practice expenses impossible under present conditions. In consequence, although an undertaking was secured that the Board would carry out a further inquiry in 1958, based on accounts for the financial years 1956-7, the practice expense ratio for the years between 1952-3 (the accounting year used for the last official inquiry upon which the 1953-4 Pool was based) and 1957-8 falls to be determined by direct negotiation with the Ministry.

The G.M.S. Committee, on the advice of its experts, agreed to take the results of the 1952-3 inquiry as the baseline, and the total expenses as disclosed by the inquiry for that year were then increased to take account of the increases which were assessed to have taken place in the prices of the various items which go to make up practice expenses as a whole. The Committee is satisfied that the results reflected in the final settlement for 1954-5 have provided a fair valuation of the movement in practice expenses over the period.

Further discussions are now under way on methods of bringing the practice expense ratio up to date for the financial year 1955-6.

Betterment Factor

Pending a settlement of the remuneration dispute, the betterment factor remains at the level of 100% which Mr. Justice Danckwerts held to be applicable some six years ago.

It will be appreciated that the balance due to the profession cannot be computed until the total sum already distributed is known, and for the reasons set out above, it must be some time after the end of the financial year before the final calculation can be made.

Nevertheless, a lapse of some twenty-one months, as occurred in the case of the Pool for 1954-5, is far too long

and the need for dealing more expeditiously with these questions in the future has been impressed upon the Ministry.

Discussions are now proceeding on the size of the Central Pool for 1955-6.

Monthly Payments

Further discussions have taken place with the Ministry on the principle of monthly payments for general practitioners. The A.R.M., 1956, passed the following resolution:

That this A.R.M. urges that negotiations *re* monthly payments to general practitioners be expedited.

The Ministry, whilst not unsympathetic, is reluctant to adopt the suggestion unless it can be certain that the additional work involved will not entail any increase in the staffs of executive councils, but has undertaken to explore the position. It has been pointed out that in some areas where monthly payments are now operating no additional staff has been found necessary and that, in any case, a number of proposals put forward by the G.M.S. Committee—in particular, the abolition of back debits and back credits—should more than compensate for any additional work involved. Discussions are continuing.

Temporary Residents

The amending regulations which came into effect on October 1, 1956, raised the lower temporary resident fee from 5s. to 8s. 6d. The higher fee of 17s. remains unchanged. In addition, the new regulations provided for a right of appeal on the part of any practitioner who is aggrieved by the decision of his Executive Council to classify a particular case as attracting only the lower fee. It is hoped that these new arrangements will obviate some of the difficulties which have previously arisen in connexion with the treatment of temporary residents at holiday camps and institutions.

Supplementary Annual Payments

The A.R.M., 1956, referred the following motion to Council for consideration:

That to obtain Supplementary Annual Payments the qualification of having been in that practice on March 31, 1953, be altered to include all single-handed small-list practitioners who have a static or increasing list irrespective of the date of entry into that practice.

The G.M.S. Committee has examined this suggestion but feels that it is based largely upon a misconception. The scheme of Supplementary Annual Payments was originally devised to prevent any loss to individual small-list practitioners as the result of the introduction of the new scheme for the distribution of the Central Pool in 1953. It is for this reason that the present scheme restricts these payments to those who were in practice at that time.

There seems little justification for extending what is in effect a "no detriment" provision to those who have entered practice subsequently. New entrants setting up in areas where there is a need for more doctors can already receive assistance through the scheme for initial practice allowances. In these circumstances it is felt that no extension of the Supplementary Annual Payments scheme, which was designed to meet a specific need, is warranted.

Machinery for Filling Practice Vacancies

23. The A.R.M., 1956, referred the following motion to Council for consideration:

That this Meeting urges Council to press for the adoption of the Scottish method for filling practice vacancies.

The G.M.S. Committee, with the approval of the Representative Body and the Annual Conference, has already put forward a number of suggestions designed to improve and expedite the filling of practice vacancies in England and Wales. In brief, these proposals were: (1) that the Executive Council should be responsible for appointing a successor; (2) that the decision whether a practice should be dispersed or a vacancy declared should rest with the Executive Council; and (3) that the Medical Practices Committee should act

as an appeals body and, in hearing an appeal, should be required to review all the applications originally submitted.

The matter having been fully discussed with the Ministry, it has been concluded that there may well be good reasons for not disturbing the existing arrangements. The original proposals were prompted mainly by a desire to speed up the selection machinery. Since then it can be said that there has been some general improvement, and it seems that such delays as have occurred are due not so much to any defect in the selection procedure itself but to delays in hearing and announcing the results of appeals against the decision of the Medical Practices Committee. This particular point has been discussed with the Ministry and an assurance obtained that every possible step will be taken to expedite the hearing of appeals and, in particular, to make the results known to all concerned at the earliest possible moment.

On the general issue, apart from the fact that amending legislation would be necessary, the Ministry put forward two grounds of criticism which have some substance. Firstly, the requirement that the Medical Practices Committee as an appeals body should be required to review all the original applications would undoubtedly in practice mean that every case would have to be heard twice. Secondly, the Ministry felt that the proposals did not provide a sufficient counter-balance to local interests.

It was clear from these discussions that early legislation on a matter of this sort was unlikely, and the G.M.S. Committee is satisfied that the Ministry is seized of the importance of doing everything possible to speed up the present selection arrangements. For all these reasons it has been decided to keep the position under review and not to pursue it further for the present.

Medical Practices Committee Certificates

24. At the A.R.M. last year the following motion was referred to the Council for consideration:

That this Meeting recommends that Section 35 (9) of the National Health Service Act, 1946, be more clearly defined even to the extent of amending the Act, so that just as the granting of a Certificate of Valuation protects the practitioner at law, the refusal of such certificates should legally imply that the law has been broken. Furthermore, it recommends that the Medical Practices Committee should be answerable at law for failing to carry out its statutory duties.

The Medical Practices Committee, with whom the matter has now been discussed, takes the view that the particular case which gave rise to the proposals contained in the motion, and which finally ended in the Courts, had a number of unsatisfactory features. In the first place, the certificate had been applied for after the completion of the transaction, and this fact in itself prevented the Committee from issuing a valid certificate since the Act provides that such certificates can be given only in respect of proposed transactions. Secondly, the Valuation Department of the Board of Inland Revenue could not agree with the value placed upon the premises concerned, which in fact were residential and had never substantially been used for practice purposes. The Valuation Department had considered the question more than once but had nevertheless felt unable to increase its own original valuation. Thirdly, the Medical Practices Committee itself, when explaining why a certificate could not be given, had quoted from the letter from the Valuation Department and not restricted itself to the exact terms of the Act. Hence the view expressed by Mr. Justice Vaisey that the Committee had directed its mind to something which was an entirely false point and had nothing to do with Section 35.

Nevertheless, even had it been possible for the M.P.C. to issue a valid certificate, and even if the exact words of the Act had been stated in its letter, that Committee is still not satisfied that it would have been justified in doing so.

It must also be borne in mind that the M.P.C. does not give a legal decision. The refusal of a certificate carries no other implication than that the M.P.C. is not "satisfied" that one can be issued. Thereafter no further action is taken by the M.P.C. but only by the Director of Public Prosecutions in the event of a complaint. In such circumstances, the M.P.C.

may be required to produce its files, but it initiates no steps whatsoever after refusing to grant the certificate. It was pointed out by the M.P.C. that the refusal of a certificate is no bar to the completion of a transaction and undoubtedly the many such transactions may be unexceptionable. The parties, however, are left without the complete protection which a certificate provides.

So far as the M.P.C.'s own procedure is concerned, care is now taken to see that all refusals of certificates are worded in the precise terms of the Act, as indeed the vast majority have been in the past. In those cases where, because of the prior completion of the transaction, it is not possible to give a valid certificate, the M.P.C., in addition to using its standard letter, may add a statement that, were it not so precluded, it would or would not have granted a certificate in respect of that particular transaction.

So far as the latter part of the A.R.M. motion is concerned, the M.P.C. expressed the view that, to the best of its knowledge, the Committee is answerable at law for failure to carry out its statutory duty but that that duty goes no further than to grant or refuse a certificate within the terms of the Act.

To summarize, the following points emerged from the discussion:

1. That the Medical Practices Committee is unable to grant a certificate after any transaction has been completed, and that this fact should be more widely publicized.

2. That there is much to be gained by urging all general practitioners to apply for a certificate when engaged in any transaction which could give rise to a possible transgression of Section 35 of the Act.

3. That the M.P.C. has a standard form of letter which may be helpful to those to whom a certificate is refused because of the prior completion of the transaction.

4. That the agreed form of letter now being issued strictly follows the wording of the Act.

5. That, as far as the latter part of the A.R.M. motion is concerned, the M.P.C. is answerable at law for failure to perform its statutory duty, but that that duty goes no further than to grant or refuse a certificate within the meaning of the Act. It would not be desirable in anybody's interest that the duty of the Committee should be extended, nor that refusal of a certificate by the Committee should "stigmatize" the proposed transactions in the manner suggested in the first part of the A.R.M. motion. All applicants come forward voluntarily, and generally with reasonable proposals.

In view of the explanation given by the Medical Practices Committee it is felt that no action should be taken on the lines suggested in the A.R.M. motion.

Protection of Practices Scheme

25. Some years ago agreement in principle was reached with the Ministry on the steps to be taken to safeguard the practices of general practitioners called up in an emergency. The implementation of this scheme remained subject to a Government decision on the general question of making up the balance of civilian pay in wartime. Largely because of the improvement in the international scene, the matter was not pursued at that time, but with the Suez crisis a small number of general practitioners have been recalled for service with the Forces, and further discussions were initiated with the Ministry on the subject.

In general terms, the arrangements now agreed with the Ministry provide that during an "emergency" recognized by the Minister, after consultation with the profession, a doctor who is absent from his practice will remain on the Medical List and will be expected to make deputizing arrangements to enable his practice to be carried on during his absence.

As far as the Central Pool is concerned, since the absentee doctors will remain on the Medical List, they will continue to be included in the annual calculation, whilst the total remuneration received from the Forces will be deducted from the global pool when the final settlement is calculated at the end of the financial year.

In addition, the expenses of employing a locum or of making other deputizing arrangements is a practice expense

which will be reflected in the overall practice expense ratio when the final settlement is calculated.

From the individual practitioner's point of view, when he joins the Forces his list will be frozen in the sense that for financial purposes the number of patients will, during his absence, be fixed at a number equal to the average during the quarters beginning April 1 and July 1, 1956, or the two quarters immediately preceding that in which he joins the Forces, whichever is the later. During the doctor's absence, transfers of his patients (other than those who have changed their address) to the lists of other doctors will in effect be on a temporary basis. On the absentee doctor's return, Executive Councils will notify all patients (other than those who have changed their place of residence) who were on his list when he joined the Forces but have transferred to another doctor during his absence, that their original doctor has returned to his practice. These patients will be informed that they will be returned to their own doctor's list unless they indicate their wish to continue on the list of the doctor who has been temporarily attending them. If they do not wish to return to their former doctor, the practitioner attending them temporarily will remain responsible for their treatment in all respects but will receive no capitation fees in respect of such patients for a period of twelve months from the date of notification. During this period the fees will be paid to the doctor returning from the Forces.

It is believed that a scheme of this kind will greatly assist the absentee doctor, but it is emphasized that it is only designed for a temporary emergency and any large-scale call-up would call for measures of a different kind.

Practice Accommodation

26. The special Subcommittee of the G.M.S. Committee which is investigating the problem of practice accommodation, particularly in redevelopment areas, has submitted an interim report which will be the subject of exploratory discussions with the Ministry of Health. Particular attention is being paid to the question of the use of local authority accommodation by general practitioners on new housing estates, a problem to which the Representative Body referred in Minute 169 last year—namely:

169. **Resolved:** That the Council be asked to inquire into the unsatisfactory position which obtains in certain local authority areas with regard to tenancy terms for houses and surgeries rented by general practitioners on new housing estates.

Loans for Provision of Surgery Accommodation

27. The A.R.M., 1956, referred the following motion to the Council for consideration:

That the Minister of Health be pressed to increase the scope of interest-free loans for the provision of new surgery accommodation, to include all practitioners, either in single practice or in partnership, where such application is endorsed by the Local Medical Committee and Executive Council.

This proposal has been carefully considered, but it is felt that it would be unwise to seek any extension of the Group Practice Loans Fund at the present time. The aim of the existing scheme is to encourage group practice, and to extend these arrangements to other types of practice could only be effected at the expense of the Central Pool. The yearly contribution of £100,000 to the Group Practice Loans Fund is a first charge on the Central Pool, and any increase in this amount could only reduce the amount remaining in the Pool for distribution in other ways.

Mileage

28. The Government Mileage Committee has now issued an interim report dealing with the "ordinary" portion of the Mileage Fund. The question of special mileage will be the subject of a later report following further investigations to be undertaken by the Mileage Committee.

The interim report has been sent to Local Medical Committees in order that they may have a full opportunity of discussing the matter before the Annual Conference.

No action will be taken to implement the recommendations for altering the present principles of mileage distribution until the final report is available and has been approved by the Conference.

Emergency Call Service

29. Following the introduction of an Emergency Call Service, which, organized on commercial lines, began operating in the London area early last year, the G.M.S. Committee set up a special Subcommittee to examine the whole problem of deputizing arrangements, with particular reference to those organized on a commercial basis. Initially some doubts were felt about the legality of such a service, but after legal advice had been taken, and as a result of the investigations undertaken by the Subcommittee, a statement was published in the *Supplement to the British Medical Journal* of October 6, 1956, to the effect that the G.M.S. Committee was satisfied that such schemes did not necessarily run counter to the National Health Service Act and its regulations.

On the general issue it is felt that the interests of general practice and the public are best observed by providing for proper off-duty and leisure time by means of the more established and proved methods of group partnership and rota schemes. Nevertheless, in certain areas it may not always be possible for the individual doctor to participate in such arrangements, and, in consequence, the statement recognized that in some circumstances an Emergency Call Service might constitute a suitable supplement to the more usual methods of practice.

Clearly, however, such schemes can give rise to abuse, and the G.M.S. Committee takes the view that they should always conform with the customary arrangements in the other forms of practice and that they should not be used as an opportunity to escape a contractual obligation to provide a personal and continuing service or to enable a doctor to avoid all emergency and week-end calls.

Efforts have therefore been made to find some means of preventing abuse in the use of the Service and of bringing it under some form of professional control. After careful consideration, the conclusion has been reached that the most effective way of dealing with the situation would be for the Terms of Service to be amended so that a general practitioner would have to obtain the consent of the Executive Council to any standing deputizing arrangements he proposed to make, instead of merely informing the Council of the arrangements that had been made.

If abuse is to be checked, individual deputizing arrangements must be examined on their merits, and, clearly, such a task can only be undertaken by the Executive Council in close consultation with the Local Medical Committee. Such a measure would also provide a means for dealing with those cases where, without resort to the Emergency Call Service, a doctor persistently contracts out of night and week-end calls. In addition, it would ensure that measure of professional control which is felt to be necessary.

In view of the importance of this proposal no action is being taken until the Annual Conference has had an opportunity of considering the matter.

Elimination of Inflation of Doctors' Lists

30. The G.M.S. Committee is pleased to report that the Ministry has at last agreed to the establishment of an alphabetical index as an adjunct to the numerical register now maintained at Southport. It hopes that this very necessary step will gradually diminish the amount of inflation of doctors' lists, and thus lead to a more equitable distribution of the Pool.

Reinstatement of Ex-Service Men on Doctors' Lists

31. The A.R.M., 1956, referred the following motions to Council for consideration:

That it be arranged with the Ministry of Health that the names of men called up for National Service be left on the list of their doctor and that the men's records remain in the

doctor's care until they change their doctor or move away from the district. The only transaction then necessary would be the deduction of the capitation fee during the two-year period of National Service, with restoration of the fee at the end of that time.

That, alternatively, further representations should be made to the Ministry of Health to ensure that, on leaving the Services, a patient is reinstated automatically on his former doctor's list.

Up till now, the risks of increasing inflation have prevented the Ministry from accepting the suggestion that the names of ex-Service men should automatically be reinstated on the lists of their former doctors. The G.M.S. Committee is, however, glad to report that considerable progress has been made in finding a solution to this small but irritating problem.

At present, when a patient is called up, his medical records are sent to Southport, through the Executive Council. It is now suggested that the Council should retain the record during the two-year call-up period, and, if at the end of that period the ex-Service man returns voluntarily to his doctor's list, the record will be returned to the doctor by the Council. Other records not so dealt with will be reviewed by the Executive Council after a short period following the expiration of the term of National Service, and a letter will be addressed to the Service man at his pre-Service address, inquiring whether he wishes to be reinstated on his former doctor's list. If so, the necessary action will be taken by the Council, but in the absence of a reply the record will be sent to the Central Index at Southport, where the man's present whereabouts can be traced. Whilst this scheme will not cover every case, it should cater adequately for the vast majority and represents a considerable step forward.

Maternity Medical Services

The Cranbrook Committee on the Maternity Services

32. The Minister of Health has set up a Special Committee under the Chairmanship of Lord Cranbrook to inquire into the maternity medical services. The Council has set up a Special Committee to prepare the Association's Memorandum of Evidence, and its attention has been drawn to the views expressed by the Representative Body and the Annual Conference of Local Medical Committees that the Obstetric List should be abolished. Similarly, the Committee has been informed of the view of the Conference that there should be uniformity throughout the country of the criteria laid down for the payment of post-natal fees when the patient fails to attend.

In addition to making strong representations to the Ministry, the attention of the Cranbrook Evidence Committee has been drawn to the following resolutions passed by the A.R.M. last year:

144. **Resolved:** That this Meeting, whilst appreciating the action taken in pursuance of Minute 60 of the A.R.M., 1955, feels that even greater pressure should be brought to bear to get more G.P. obstetric beds as soon as possible.

145. **Resolved:** That this Meeting deplores the shortage of maternity beds, which in turn creates a shortage of general practitioner beds.

150. **Resolved:** That this Meeting reiterates the resolution of 1955 that, in view of the wide variation in different Executive Council areas of criteria for admission to the Obstetric List, any duly qualified registered medical practitioner who applies to go on the Obstetric List should be placed on it without further question.

Portway Maternity Hospital

It will be remembered that the lack of facilities for general practitioner institutional midwifery in the Weymouth area led the G.M.S. Committee to seek a meeting with representatives of the South-west Metropolitan Regional Hospital Board. At these discussions at the end of last year, agreement in principle was reached that ten beds under the overall supervision of the consultant obstetrician should be made available at Portway Hospital to local general practitioners for a period of one year in the first instance.

The G.M.S. Committee has subsequently been disturbed to find that these arrangements have met with substantial

local opposition. Indeed, it has now been informed by the Board that, because of certain practical difficulties, the problem is to be shelved pending the report of the Cranbrook Committee, which is to review the maternity services generally. A further interview with the Board is being sought.

Antenatal Care Related to Toxaemia

A memorandum by the Standing Maternity and Midwifery Advisory Committee of the Central Health Services Council on Antenatal Care Related to Toxaemia has now been issued by the Ministry.

The Chairmen of Boards of Governors and Hospital Management Committees have been asked to arrange meetings of professional representatives from the three branches of the National Health Service to discuss the professional issues raised by the memorandum. It is intended that the views of the three branches of the profession should be conveyed to the administrative bodies concerned in the hospital service, who will then report to the Ministry on the need for any action to be taken centrally. Once this stage is reached the memorandum, which draws attention to the need for the fullest liaison between the hospital, the general practitioner, and the local authority, will be discussed with the Ministry.

Trainee General Practitioner Scheme

33. The report of the Special Subcommittee of the G.M.S. Committee on the Trainee General Practitioner Scheme, which was approved by the Annual Conference last year, has been discussed with the Ministry of Health. The Ministry has accepted the recommendations contained in the report, which has now been sent to Executive Councils with the suggestion that steps should be taken as soon as possible to implement its recommendations.

Local Medical Committees have been advised of the steps which have been taken to establish the Regional Appeals Machinery advocated in the report. Whilst it is believed that the number of cases in which the practitioner will feel it necessary to appeal will be small, it is hoped that Local Medical Committees will take advantage of this new facet of the Scheme.

The Advisory Committee suggested in the report has been constituted. Its personnel includes a medical member of the staff of the Ministry of Health, who acts as an observer.

In view of the considerable increase in motoring costs which has occurred since the appointed day, an increase is being sought in the car allowance made under the Scheme.

The A.R.M., 1956, referred the following motion to the Council for consideration:

That in the case of the sudden illness or death of a single-handed doctor where no locum is immediately available, the Secretary of the Local Selection Committee under the Trainee Scheme should have powers, if requested by the practitioner or his representatives, to permit a trainee in the area to carry on the practice for a period of not exceeding seven days.

Consideration has been given to this suggestion, but, having regard to the fact that the primary object of the scheme is to train new entrants to general practice under the supervision of an experienced practitioner, it is considered that the proposal is neither desirable nor practicable.

Charges for Prescriptions

34. Following the Government's announcement of its intention to extend the charges for prescriptions, a deputation from the G.M.S. Committee protested strongly not only against the charges themselves, but about the complete lack of consultation on the new proposals.

The Association is opposed to charges of any kind, and the Government's present scheme, which extends the existing charges in a manner which must discriminate against certain categories of patients, is particularly unfortunate.

In spite of the Committee's protest, and of representations made to the Minister by the Council, the Government has proceeded with its proposals.

Without prejudice to the major principle involved it was pointed out to the Ministry that certain aspects of the scheme

detailed in official circulars which were seen in draft placed unnecessary burdens upon the dispensing doctor, and the Ministry undertook to take full account of the criticisms which were made. In particular it was suggested that one multiple form of receipt should be made available for the use of dispensing doctors, but the Ministry has now intimated that it is unable to agree to this as it regards a single form as being open to abuse. It is therefore proposing to provide separate pads for charges of 1s., 2s., and 3s. The G.M.S. Committee is protesting strongly to the Ministry about this intolerable imposition which attempts to place an unnecessary additional burden on the dispensing doctor.

Multiple Packs

35. Discussions are to take place with the Ministry of Health on the provision of a number of multiple packs which would count as one item only for the purposes of the prescription charge. It is hoped that by these means it will be possible to alleviate the worst discriminatory features of the present scheme of charges.

Prescribing Costs

36. In its last report the Council referred to the Ministry's anxiety at the continued increase in the cost of the pharmaceutical services and its suggestion that, if the present trends continued, the Minister might be forced to limit the cost which fell upon public funds. The Ministry indicated that it would greatly regret such a step and suggested that an inquiry might be undertaken to see whether there was not some way in which doctors might be able to do still more to eliminate additional costs without detriment to their patients. The G.M.S. Committee agreed to discuss the matter further, but made it clear that any search for economy should not be limited to the general practitioner field. Equally, it was emphasized that it was not prepared to enter into discussions on this subject under duress.

It was felt that there were serious objections to the proposal that such an inquiry should be carried out solely within the profession, and the suggestion was made that a Working Party consisting of representatives from the profession and the Department would be an appropriate body to undertake a task of this nature. The Ministry, however, felt that an inquiry of this nature must be wide in its scope and that it would place officials of the Ministry in an embarrassing position if they were called upon to comment on matters which had political implications. The G.M.S. Committee accepted this point of view and agreed that the inquiry should be undertaken by an independent committee.

It is understood that the inquiry will be concerned with all factors which might influence prescribing, including, for instance, medical education and training, the experience of doctors in hospitals, the influence of hospital practice, the effect of advertising techniques by manufacturers on the medical profession, pharmacists, and the public, and pressure by patients. The Ministry has announced that the personnel of the Prescribing Committee will consist of a Dean of a medical school, two general physicians, a pharmacologist, a pharmacist, a statistician, and five general practitioners.

The G.M.S. Committee has now received an invitation from the Ministry to nominate the five general practitioners to serve on the Prescribing Committee, but in present circumstances the Committee does not feel able to make the suggested nominations.

The following resolution passed by the A.R.M. last year has been noted and appropriate action is being taken:

210. **Resolved:** That this meeting of the B.M.A. wishes to inform H.M. Government that doctors find it impossible to co-operate fully in the medicine economy drive, because most advertisements do not state the price of drugs advertised. It considers all medical advertisements to the profession should give an indication of the basic cost.

Prescribing Statistics

37. The Ministry has for some time been seeking to improve the accuracy of the prescribing data which is

circulated to general practitioners. It had been hoped that this scheme, which enables a doctor to compare his prescribing costs with those for the area, would greatly assist in economy in prescribing, but unfortunately the data prepared by the Ministry contained many anomalies due to the methods by which the figures were compiled.

In the course of revising these methods the Ministry put forward the proposal that prescription forms should be stamped with the name of each individual doctor. This proposal could clearly cause considerable difficulties in partnerships, and it was suggested that it should suffice if the pads of forms for use in partnerships were stamped with the collective name of the firm. Unfortunately it is clear that the whole system of sorting and pricing prescriptions is based upon the name of the individual practitioner, and any modification of the system in the manner envisaged would make it extremely difficult, if not impossible, for the scheme to function satisfactorily.

The G.M.S. Committee, with some reluctance, agreed to the Ministry's proposal for individual stamping. It is, however, watching the position carefully and it will not hesitate to make a further approach to the Ministry should it become clear that general practitioners are suffering any undue burden as a result of these arrangements.

Discussions have now taken place with the Ministry on the following resolution of the A.R.M.:

209. Resolved: That the following motion be referred to the Council for consideration:

That in order to assist practitioners to know the cost of drugs, random selection of E.C.10 forms issued by them should be returned to the doctor as soon as the Pricing Bureau has finished with them.

The Ministry welcomed the principle underlying the suggestion, but pointed out that such a scheme would only be practicable in one-third of the country at any one time—that is, in those areas where prescriptions had already been sorted into doctor order. Equally there would be some delay in that prescriptions had to be kept available for six months after pricing, as a check to chemists' accounts. Subject to these reservations the Ministry is looking into the possibility of putting the scheme into operation.

Discount on Drugs

38. Although the Conference of Local Medical Committees last year accepted an offer by the Association of British Pharmaceutical Industry to increase the rates of discount on proprietary preparations from 10% to 20%, it expressed the view that dispensing doctors' prescriptions for drugs on the Special List should be priced and paid for on the basis of the cost to the practitioner and not on the cost to the pharmacist.

This matter has now been discussed with the Ministry, who take the view that there is some justification for the difference in rates of discount, largely because of the fact that the doctor does not incur some of the overhead expenses which the chemist must face. This answer is regarded as most unsatisfactory and further representations are to be made.

Stock Orders

39. Following discussions with the Ministry of Health a further approach is to be made to the National Pharmaceutical Union with the object of securing the introduction in England and Wales of a scheme for stock orders, similar to that which now operates in Scotland.

Provision of Therapeutic Substances for Use in Emergency

40. The A.R.M., 1956, referred the following motion to Council for consideration:

That this Meeting considers that oxygen, blood, and other therapeutic substances required by a general practitioner in an emergency should be conveyed to the patient at the public expense, and without charge to the doctor.

The G.M.S. Committee has now discussed this matter with the Ministry of Health, and in particular has drawn attention

to the difficulties encountered by many rural practitioners in obtaining urgent supplies of oxygen. It has suggested that oxygen and the equipment associated with it should be transported at the public expense. The Ministry's view is that under present regulations there is no power whereby the N.H.S. can pay charges of this nature, and that the chemists' Terms of Service only require them to supply drugs and appliances, with no obligation to deliver. Negotiations between the Ministry and the Chemist Contractors on the subject of oxygen are still continuing, and the Ministry, having noted the views of the A.R.M., has promised that the question of delivery will not be overlooked.

Replacement of Appliances

41. The A.R.M. last year passed the following resolution:

216. Resolved: That Council be asked to consider the practicability of permitting general practitioners to prescribe on Form E.C.10 replacements of those appliances which are at present available only through the Hospital Service.

At the present time general practitioners are permitted to prescribe replacements of certain appliances which are available in the first instance only to the hospital service.

Consideration is now being given to proposals for extending the list by the addition of a number of replacement appliances. An approach will then be made to the Ministry.

General Practitioner Beds

42. The A.R.M., 1956, passed the following resolution:

183. Resolved: That this Meeting urges that general practitioners should have access to hospital facilities, including beds, throughout the country.

The G.M.S. Committee has now discussed this matter with the Ministry and it is pleased to learn that the figures for 1955 (the latest then available) again show some increase in the total of staffed beds allocated to general practitioners.

There is, however, still room for improvement, and the position will be kept under constant review.

Representation of General Practitioners in Hospital Administration

43. Concern has been felt for some time at the lack of general practitioner representation on the Boards of Governors of teaching hospitals. In the London area, for instance, there is a general practitioner representative on only five of the fourteen Boards concerned. The G.M.S. Committee feels most strongly that this undesirable state of affairs should not be allowed to continue, and further representations have been made to the Ministry. During the course of the discussion, the Ministry was informed of the action which the Association is taking in inviting its Branches and Divisions, in consultation with Local Medical Committees, to send to Headquarters the names of suitable general practitioner representatives for appointment to Boards of Governors, which will then be submitted to the Minister.

The Ministry has undertaken to consider these representations in making future appointments and to do what it can to increase the number of Boards which include a general practitioner member. In doing so, however, the Ministry made the reservation that it is limited by the fixed proportion of nominated members and the need to secure a proper balance between medical and lay membership.

The matter will be reviewed again when the vacancies occurring in the early part of this year have been filled.

As far as Regional Hospital Boards are concerned, the improvement in general practitioner representation secured in recent years has been maintained, but here again the situation will be kept under review.

Antitetanus Serum

44. The Ministry's attention has been drawn to the concern felt in the profession at the problems, both medical and legal, which arise as a result of the widespread use of antitetanus serum, and it has been represented that there is a

clear need for the formulation of a national policy on immunization in infancy.

It is understood, however, that the Medical Research Council will shortly be issuing a report which will have a considerable bearing on this problem, and the matter has therefore been left in abeyance until the Council's report is available.

Combined Diphtheria-Pertussis Immunization

45. The A.R.M. last year passed the following resolution:

193. Resolved: That combined diphtheria-pertussis vaccine and combined diphtheria-pertussis-tetanus vaccine should be available to general practitioners in all local authority areas.

This matter had already been discussed with the Ministry on a previous occasion and the suggestion made that the combined diphtheria-pertussis vaccine should be generally available to the family doctor. At that time, the Ministry was awaiting the results of the Medical Research Council's trials of whooping-cough and combined vaccines, and it thought it was probable that a number of local authorities were using the combined vaccine as part of a research project. In such circumstances, it would not be available to general practitioners. Research apart, where local authorities offered a choice of single or combined immunization, the Act required them to afford general practitioners the opportunity of doing likewise.

The G.M.S. Committee has considerable sympathy with the view advanced by the A.R.M., and it considers that the general practitioner should be able to indent upon the local authorities for the vaccine of his choice. It appears, however, that the wishes of the Representative Body cannot be ever, that the wishes of the Representative Body cannot be implemented until all local authorities adopt the combined vaccines for use in their own vaccination schemes. Further consideration is being given to the matter.

Poliomyelitis Vaccination

46. Following discussions with the Ministry a new circular has been sent to local health authorities setting out the arrangements under which general practitioners will in the future be able to take part in poliomyelitis immunization schemes. This prior consultation has done much to prevent a recurrence of the unfortunate situation which occurred when the vaccine was first introduced and which the A.R.M., 1956, referred to in the following resolution:

189. Resolved: That this Meeting deprecates the action of the Minister of Health in making important medical announcements to the general public before informing the medical profession as a whole.

Post-mortem Examinations

47. The A.R.M. last year passed the following resolutions:

152. Resolved: That the Association should take active steps to establish a system whereby the family doctor, having obtained the consent of the next of kin of the deceased, could call in a consultant pathologist to do a post-mortem examination on any of his patients who had died of natural causes and for whom he could issue a death certificate in the usual way.

153. Resolved: That transport should be available for the removal of corpses for post-mortem examinations at public expense at the request of a general practitioner.

The G.M.S. Committee discussed the question of post-mortem examinations with the Ministry of Health some months ago and secured the Ministry's agreement to a suggestion that, when a general practitioner requires a necropsy, if the pathologist agrees, then the cost of transport from home to hospital should be met from public funds.

The question of extending post-mortem facilities on the lines suggested by the Representative Body in the first resolution quoted above is under consideration by the appropriate committees concerned.

X-ray and Diagnostic Facilities

48. The G.M.S. Committee's attention has been drawn to a number of instances in which general practitioners have

been denied direct access to x-ray and other diagnostic facilities in the hospital service. Although it is appreciated that in many instances this situation is brought about as a result of a shortage of radiographers, the G.M.S. Committee feels strongly that general practitioners alone should not be singled out to suffer a complete withdrawal of these facilities. These views have been brought to the notice of the Ministry of Health on previous occasions and the matter will be pursued further.

Amendment of the N.H.S. (General Medical and Pharmaceutical Services) Regulations

49. Amending regulations to give effect to a number of changes which have recently been agreed between the Committee and the Ministry have now been issued and an explanatory letter has been sent to Executive Councils.

National Insurance Certificates

50. The A.R.M., 1956, passed the following resolution:

218. Resolved: That medical practitioners should, at their discretion, be permitted to issue first or any subsequent National Insurance Certificates for a period of up to four weeks.

This proposal has been examined on a number of occasions in the past and appropriate representations have been made to the Ministry of National Insurance, to whom it was also pointed out that in case of doubt a particular patient could always be referred to the regional medical officer.

The Ministry, however, has been unwilling to agree to any general relaxation of the rule. Hitherto, its principal objection was that the most common indication for selecting a case for reference to the R.M.O. is that incapacity has lasted for longer than would have ordinarily been expected from the diagnosis on the certificate. Such an indication would be altogether absent where the cause stated on the first four-weekly certificate is one which ordinarily covers incapacity for a prolonged period. There would be nothing in these cases, which ordinarily lead the Ministry to suspect mistakes in diagnosis or prognosis, which might not be uncommon if four-weekly certificates could be given at the very outset of incapacity.

It is felt that the Ministry's arguments carry considerable weight, and in view of this practical difficulty it is felt that action should not be taken at the present time.

National Service Medical Boards

51. Arrangements have now been completed with the Ministry of Labour and National Service for the disclosure of National Service Medical Boards' findings to general practitioners in certain cases where the candidate is found unfit for military service. Automatic notification of the general practitioner in all cases when the man is found to be unfit is impracticable, for the difficulties facing the Ministry in disclosing information obtained in the administration of the National Service Acts are substantial. In the first place, it appears that the Ministry has no power under these Acts to disclose such information, nor has it power to instruct Chairmen of Medical Boards to reveal the findings of their Boards for purposes unconnected with the National Service Acts. Moreover, the Ministry points out that the general public has rightly assumed that the records of the Medical Boards will be regarded as highly confidential and will not be disclosed in any way which might be prejudicial to the person concerned. This trust in the confidentiality of Medical Boards' records must be preserved. Nevertheless, the Ministry recognizes that, in certain circumstances, where a man is found unfit for service and is suffering from a condition which requires immediate treatment, it would be in the man's own interest to bring the matter to the notice of the family doctor. Accordingly, the Ministry has agreed to ask Chairmen of Medical Boards to communicate with the general practitioner concerned where a man is found unfit for military service on account of one of the conditions shown

below and where he would benefit from immediate treatment:

Affections of the ear, defective vision, diseases of the eye, cardiac disease, hernia, lung conditions other than tuberculosis, disease of the kidneys, diabetes, peptic ulcer.

Insurance Benefit during Part-time Employment

52. The A.R.M. last year passed the following resolution:

215. **Resolved:** That this Meeting considers that gradual return to full-time work, which is desirable after certain illnesses, would be facilitated if National Insurance Benefit, even at a reduced rate, could be payable for a limited time during part-time employment undertaken as a preliminary to resumption of full employment. This Meeting asks the Council of the B.M.A. to approach the appropriate Government Departments to discuss the matter more fully.

This matter has now been raised with the Ministry of Pensions and National Insurance, and it appears that at present the only circumstances in which a person may receive sickness benefit for a day on which he works are: (1) if the work is undertaken under medical supervision as part of hospital treatment and the earnings do not exceed 20s. per week; and (2) if the work is of such an inconsiderable character that it is classified for National Insurance purposes as work as a non-employed person—for example, if his earnings are less than 20s. per week and if the claimant can show "good cause" for breaking the rule of behaviour which lays down that he should do no work.

If a claimant's doctor certifies that such "work of an inconsiderable character" has his approval and is regarded by him as assisting the claimant's recovery, the statutory authorities would very likely accept this as "good cause," but the amount is still limited to 20s. per week.

The Ministry has pointed out that it would mean a fundamental amendment of the National Insurance Act and its regulations to accept the suggestion that benefit, even at a reduced rate, should be payable during part-time employment, and drew the Committee's attention to the following extract from a report by the Percy Committee on the subject in November, 1956:

The suggestion was put to the Committee that smaller firms would take back their disabled workers earlier on a part-time basis if some inducement were offered in the form of continuing payment of sickness benefit proportionate to the reduced hours of working. For example, a worker employed for three-quarters of his time would get that proportion of his wages and one-quarter of his sickness benefit. Because of the difficulties of assessing the degree of working capacity, and cost of administering such a scheme, the emphasis on the number of hours worked to the disregard of other conditions, and the difficulty of providing adequate medical supervision, the Committee is not able to accept the suggestion, which it understands is not favoured by either side of industry.

The Ministry itself takes the view that the emphasis laid by the Percy Committee on the value of industrial rehabilitation points the way to the best means of remedying the problem of the partially fit patient rather than any amendment of the National Insurance Act on the lines suggested in the A.R.M. resolution. In view of the Ministry's explanation, it seems that little useful purpose would be served by pursuing the matter further.

Prevention of Deafness

53. The G.M.S. Committee has been consulted by the Ministry on a suggestion that a memorandum by the Standing Medical Advisory Committee on the prevention and alleviation of deafness might usefully be circulated to general practitioners. The Committee has suggested that the memorandum should be circulated to all general practitioners through Executive Councils.

R.M.O. Examinations

54. The Annual Representative Meeting, 1956, passed the following resolution:

222. **Resolved:** That in the opinion of this Meeting the local national insurance officer should be required, three week-days

before sending Form R.M.3D to a patient, to notify in writing the practitioner in charge of the case.

The Ministry of Health has been approached, but, having consulted the Ministry of Pensions and National Insurance, feels unable to accept the suggestion because of the considerable increase in sickness benefit which would be involved. At the present time, when the Local Office of the Ministry of Pensions seeks an opinion from the regional medical officer, the R.M.O. informs both the patient and the doctor at the same time. The examination takes place not less than five days after this. If he were required first to inform the general practitioner and then three days later to notify the patient, eight days would elapse between the receipt of the request from the Ministry of Pensions and National Insurance and the actual date of examination. It is understood that some 300,000 insured persons return to work as a result of references to the R.M.O., and if a three-day delay were interposed the effect would be not only a corresponding increase in sickness benefit paid out in respect of the longer period of sickness, but a loss of some 900,000 additional working days.

In present circumstances, and in view of this explanation, the G.M.S. Committee does not feel that it is wise to proceed any further with the proposal.

Service Committees and Tribunal Regulations

55. The following resolution of the A.R.M. has been noted for further consideration when the Service Committees and Tribunal Regulations are next under review:

168. **Resolved:** That amendments to Service Committees Regulations should include: (a) That it be a requirement of the Regulations at Medical Service Committee inquiries that a précis of the evidence given by each witness be prepared and signed by the witness. (b) That it should be a requirement of the Regulations that proceedings against a doctor before a Service Committee should only be in respect of a breach of the Regulations, and the doctor be notified in advance of the inquiry of the regulation of which he is alleged to be in breach.

The regulations have just been amended after a very exhaustive survey, and the G.M.S. Committee does not feel that it is possible to seek further amendments at this stage. In any event, it must be pointed out that the A.R.M. resolution is contrary to a decision taken by the Annual Conference last year, and further consideration must be given to the problem before action is taken.

Interview Expenses of Candidates for Appointment

56. Agreement has now been reached with the Ministry on the reimbursement of travelling and subsistence expenses of candidates for appointments in the National Health Service. The new arrangements bring applicants for general practice vacancies and candidates for hospital posts already in general practice into line with their colleagues in the Hospital Service.

General Practitioner Refresher Courses

57. Representations have been made to the Ministry of Health with a view to increasing the contribution which the Ministry makes towards the expenses incurred by a general practitioner attending a refresher course, including the cost of employing a locum during his absence. Attention has also been called to the inadequacy of the present arrangements for paying subsistence allowances to general practitioners attending these courses.

Education of the Public in Health Matters

58. The Annual Representative Meeting last year referred the following motion to the Council for consideration:

That this Meeting deplores the failure of the Ministry of Health to carry out its proper duty in educating the public in everyday matters of health.

Whilst there is little doubt that the Ministry's efforts in this sphere leave much to be desired, it seems unlikely that, at this period of financial stringency in the N.H.S., the

Ministry will agree to embark upon an extensive propaganda campaign in view of the heavy expenditure involved.

For this reason it has been decided to take no immediate action, although the matter will be kept under review.

COMPENSATION AND SUPERANNUATION

Compensation

59. The Council sought the advice of Sir James Millard Tucker, Q.C., on the best method of presenting a case to the Minister of Health on the following Minutes of the A.R.M., 1956:

156. **Resolved (nem. con.):** That Council should press for payment of compensation adjusted to take into account the fall in the purchasing price of the £ and press for immediate payment; and that until such time as full payment of compensation is made the rate of interest be raised to current levels.

157. **Resolved:** That this Meeting requests the Council to press for the payment of compensation moneys, or alternatively it should be possible to convert compensation moneys into any other Government Stocks.

158. **Resolved:** That in cases of proved hardship, doctors should be allowed to draw out their compensation moneys.

Sir James expressed the opinion that the negotiations for increased remuneration might be prejudiced if the Association were able to convince the Minister that additional money should be made available to general practitioners now, either in the form of increased interest or for immediate payment of the outstanding compensation. Sir James's advice, which the Council has accepted, is that, although the Council has a good case on all points, representations to the Minister should be postponed until the completion of the negotiations on remuneration.

Review of Superannuation Schemes

60. The A.R.M., 1956, approved the following resolution:

161. **Resolved:** That Council be asked to review the Superannuation and Pensions Schemes, with special reference to the responsibilities of the young practitioner with less than 10 years' service.

Both the N.H.S. and local government superannuation schemes make some provision for the young medical practitioner who dies, or who has to retire, with less than 10 years' service. The benefits of both schemes are very similar, and they may be summarized as follows:

(1) Retirement or death following an attributable disease or injury—a pension not exceeding two-thirds of average superannuable remuneration, or a lump sum or annual allowance annuable remuneration, of such amount as may be considered reasonable in all the circumstances. If death or retirement occurs after at least five years' service a gratuity equal to average remuneration is also paid.

(2) Death, or retirement on grounds of ill-health, which is not attributable (a) after less than five years' service, a return of contributions only; (b) after more than five years' service, a lump sum equal to not less than average remuneration.

Thus the minimum benefit, once a contributor has five years' superannuable service, is a lump sum equal to average superannuable remuneration—and at five years he will only have contributed a maximum of 30% of this sum.

The Council is of the opinion that these benefits are not unreasonable in relation to the contributions payable, and that, in any case, no pension scheme can be expected entirely to replace the necessity for some form of life cover if adequate provision is to be made for all contingencies.

Pensions after 20 Years' Service

61. In Minute 163 of the A.R.M., 1956, the following motion was referred to the Council for consideration:

That full pension benefit should be available to practitioners who wish to retire after 20 years' service, even if they have not reached the age of 60 years.

As the Superannuation Scheme must remain actuarially sound, the additional cost of earlier pensions would have

to be met either by increased contributions or by reducing the benefit payable, or both. For instance, to obtain a pension of 1½% of total net remuneration at age 45 after 20 years' service a contribution of about 22.8% per annum would be necessary instead of the present 14%. If the pension is to be the same as if service had continued for 40 years, the contributions would be approximately 45% per annum. Alternatively, if contributions remain the same and a practitioner were able to retire on a pension at 45 after 20 years' service, the pension could not be higher than about 0.9% of his superannuable remuneration. A further alternative would be to increase the contributions of all practitioners to pay for the pensions of those who may wish to retire after 20 years' service.

Having considered the matter carefully, the Council is of the opinion that it should not press for revision of superannuation schemes on the lines indicated in the above motion.

Options under Regulation 76

62. The Ministry of Health has considered the oral and written representations made by the Council, and has again decided that it cannot allow those practitioners who in 1948 elected not to enter the N.H.S. Superannuation Scheme to have an opportunity to enter the scheme at this stage. Convincing reasons have been given why it would be impracticable to allow such a change, and the Council is satisfied that no useful purpose would be served by pursuing the matter further.

Clinical Assistants

63. The Ministry of Health has refused to allow part-time clinical assistants to enter the Superannuation Scheme if there has been a disqualifying break since their last appointment within the Service. The Council will reconsider this question when the report of the Government actuary is available on the valuation of the N.H.S. Superannuation Scheme.

Extension of Pensionable Age

64. The Council is aware of a small number of cases in which a practitioner, through lack of suitable warning, neglected to apply for extension of pensionable age until too late. At the request of the Council the Ministry of Health has arranged through Executive Councils to remind practitioners nearing 65 years of age that unless they apply for an extension of pensionable age they cannot continue to contribute to the Superannuation Scheme and increase their ultimate benefits.

Widows' Pensions

65. The Council has considered the following resolution of the A.R.M., 1956:

162. **Resolved:** That the present ruling, whereby women practitioners may draw widows' pensions in respect of their husbands but women hospital officers may not, is unfortunate and should be retrospectively altered forthwith.

This resolution implies that in no circumstances can a woman hospital officer get a widow's pension. This, however, is not the case. If the husband dies before the wife has earned a retirement pension in her own right a widow's pension is paid. The widow receives this pension even if she continues to work within the N.H.S. and if she later obtains her own retirement pension. It continues until her death or remarriage. Only if the husband dies after the wife has earned a pension in her own right is a widow's pension withheld.

The cost of widows' pensions is met by restricting the lump sum retiring allowance paid to husbands to a sum equal to one year's pension (a single man receives a lump sum equal to three years' pension). When a woman hospital medical officer has qualified for her own pension the husband's retiring allowance is equal to three years' pension, less two-ninths. (This reduction is made because of the cover for a widow's pension which had hitherto existed.) As the retire-

ment pension paid to a whole-time woman hospital medical officer may well be sufficient for her own needs, the Council is of the opinion that, in the majority of cases, both the husband and wife will prefer to retain their freedom of action in the disposal of the higher lump sum, which could be used to purchase an annuity if desired. In all the circumstances the Council has decided not to ask for a change in the present procedure.

Superannuation on Fees from Government Departments

66. The A.R.M., 1955, asked the Council "to explore the possibility of superannuation payments being made on sessional fees paid by Government Departments to part-time medical officers." Representations were made to the Treasury and subsequently the whole question was discussed with officers of the Department. The Treasury has re-examined the case presented by Council but has reaffirmed its view that it would not be appropriate to grant this concession. The Treasury has pointed out that the new income-tax relief made available by section 22 of the Finance Act, 1956, will assist practitioners to make provision for an annuity to supplement, if required, the expected benefits from statutory superannuation schemes.

Estate Duty on Widow's Pension

67. The Council has ascertained that the capital value of the pension payable to a widow under a statutory superannuation scheme is taken into account by the Department of Inland Revenue in assessing the amount of any estate duty payable. The capital value, however, is not aggregated with the remainder of the estate but is assessed separately. In addition, discount is allowed because, under the Regulations, the pension ceases on remarriage. In practice, therefore, no estate duty will be paid on the capital value of a widow's pension unless this amount, less any discount, is more than £3,000.

HOSPITAL AND CONSULTANT SERVICES

Medical Membership of Hospital Boards

68. In June, 1956, the Ministry invited the views of the Royal Colleges and the Association on the recommendation of the Guillebaud Committee that, save in exceptional circumstances, the number of medical members on regional hospital boards and hospital management committees should not exceed 25% of the total membership.

Following consultations with representatives of the General Medical Services and Public Health Committees, the Joint Consultants Committee—with the support of the Council—reminded the Ministry that the profession had long been critical of the method of selection of medical members for appointment to the regional hospital boards, which often resulted in few practitioners being appointed who were in active practice in the region concerned or who were recommended by their professional organizations. The Joint Committee urged that the consultant staffs of hospitals in the region should be allowed to nominate not fewer than five of the members of the board; that a representative of the general practitioners and a representative of the medical officers of health in the area should also be appointed on the nomination of the profession; and that the medical membership of a board should be regarded as consisting of the practitioners so appointed and not as including members of the profession appointed otherwise than on the recommendation of a professional organization.

In December, 1956, the Ministry informed hospital boards that the Minister had accepted the Guillebaud Committee's recommendation, and advised boards to observe the same policy in making appointments to hospital management committees.

The Joint Committee has protested that it is inevitable that the small number of consultant members of regional hospital boards representative of those working in the regions must be still further reduced if the overall number

of medical members is not to exceed 25% of the total membership while still including representatives of the universities and medical schools, and in addition a general practitioner and a medical officer of health.

The attention of the Ministry has also been drawn again to the recommendation of the Bradbeer Committee that hospital boards should be encouraged to appoint up to one-fifth of the members of the hospital management committees from among names submitted by the senior medical and dental staffs of the hospitals in the groups.

The question of medical advisory machinery at regional hospital board level has been reopened with the Ministry in the light of the recommendations of the Guillebaud Committee on the subject.

Hospital Medical Staffing

69. Discussions on the reorganization of the structure of hospital medical staffing have continued between the Joint Consultants Committee and the Ministry, but so far no proposals have emanated from these discussions which the Joint Committee feels can usefully be put to its constituent bodies for consideration.

The Council understands, however, that recently the discussions have centred around the problems associated with the senior registrar grade and the question of a new grade between the senior registrar and the consultant. Both the Ministry and the Joint Committee are anxious to find a satisfactory way of dealing with the excessive numbers of senior registrars in certain branches, which, without blocking recruitment, would facilitate the retention of fully trained senior registrars until vacancies occur in the consultant establishment, particularly in such specialties as neurology, neurosurgery, plastic surgery, and thoracic surgery, where consultant vacancies occur only infrequently.

The Joint Committee is opposed to a new "career" grade which would create another rung on the ladder of promotion to consultant status, and, with the passage of time, diminish and ultimately eliminate the prospects of many "time-expired" senior registrars. In general the Joint Committee favours the temporary expedient of extending the tenure of senior registrars, on a rising salary scale, pending a review, hospital by hospital, of the staffing requirements at all levels from the consultant downwards, which it regards as an essential preliminary to a long-term solution of the present difficulties.

Procedure for the Appointment of Consultants and S.H.M.O.s

70. The Council has considered the following motion referred to it by the A.R.M., 1956:

That it is the policy of the Association that vacancies for hospital consultant appointments of more than one session a week should be advertised in the medical press.

It is required by regulation that, before a consultant or S.H.M.O. is newly appointed to the staff of a hospital, the vacancy shall be advertised. It has always been assumed that this would not preclude the offer, without advertisement, of additional sessions at a hospital to a consultant or S.H.M.O. already on the staff. While it is important that there should be full consultation with the consultant staff before sessions are offered to a consultant without advertisement, the Council considers that it would not necessarily be in the best interests of the Service or of the profession to insist that every consultant appointment of more than one session should be advertised. This would hinder the operation of the moral obligation clause, and would also defeat the efforts sometimes made by hospital boards to improve the position of those members of their consultant staffs who have only a small number of sessions.

Indeed, the Joint Consultants Committee has recently agreed to a proposal by the Ministry that the Regulations should be amended to allow a consultant or S.H.M.O. whose sessions are reduced, or whose contract is terminated, as a result of a local reorganization of hospital services, to be offered an alternative appointment without advertisement.

Discussions have taken place between the Joint Committee and the Ministry with a view to improving the operation of the procedure for the appointment of consultants and S.H.M.O.s, and the Ministry has agreed to advise hospital boards as follows:

(a) That hospital medical staff committees should be allowed to see the applications of the short-listed candidates, so that their views thereon might be available to the advisory appointments committee.

(b) That in addition to the two members (one medical and one lay) of the advisory appointments committee nominated by the H.M.C., the board should be urged to nominate at least one member from the consultant staff of the hospital concerned (or where two or more hospitals are concerned, from the consultant staff of one of the hospitals), preferably in a specialty other than that of the medical member nominated by the H.M.C.

(c) That the member of the advisory appointments committee nominated by the board after consultation with the appropriate Royal College should, wherever practicable, come from outside the area of the region and have no hospital appointment either with the regional board or with the board of governors of any teaching hospital in the region.

Internal Administration of Hospitals

71. The Council has considered the following resolutions of the A.R.M., 1956:

247. **Resolved:** That this Meeting most emphatically takes the point of view that Council has failed to implement the resolution 208 (a) passed at the last A.R.M. and, furthermore, by its comments in paragraph 51 in its Annual Report, has weakened the policy laid down by the Representative Body in 1955.

249. **Resolved:** That this Meeting disapproves of the action of Council in not accepting Resolution 208 as official policy of the Association and that it should be implemented in any discussion of the Bradbeer Report.

(Minute 208 of A.R.M., 1955, reads as follows:

208. **Resolved:** (a) That this Meeting, believing everything concerning the patient must be of importance to the clinician in charge and that, therefore, the lay and ancillary services must be subordinate to the medical, considers that the recommendation of equal tripartite administration by the Bradbeer Committee on Internal Administration of Hospitals is not in the interest of the patient (Bradbeer Report, paras. 20-22); (b) that this Meeting affirms that under no circumstances shall the medical and nursing personnel of hospitals be under the control of lay administrators (para. 25); (c) that this Meeting affirms that it should be obligatory for the hospital management committee to consult with the representatives of the senior medical and dental staff (para. 67); (d) that this Meeting welcomes the recommendation in para. 72 of the Report that, when medical administrators with clinical pointed, they should be of consultant status with clinical responsibility. It considers that paras. 77-78 are unworkable; (e) that this Meeting deplores the suggested downgrading of deputy medical administrators, when such are considered desirable, to a R.M.O./R.S.O. grade (para. 81); (f) that this Meeting reaffirms its belief that it is in the interest of the patient to maintain the close link that at present exists between the medical and nursing professions,

with the proviso that section (d) be referred to the Council for consideration.)

The Council does not consider that the system of tripartite administration should be wholly rejected. This system has worked satisfactorily in a number of the larger hospitals for many years, and experience does not suggest that it necessarily operates to the detriment of the patient. The matter has been carefully reconsidered and the Council sees no reason to disturb such arrangements, so long as the views of the hospital medical staff are dominant in clinical matters. In those hospitals where the tripartite system of administration does not work satisfactorily there should be an investigation to ensure that there is no interference by lay administrators in clinical or nursing matters.

Running Costs of Hospitals

72. The Association was invited by Subcommittee D of the Select Committee on Estimates to submit evidence on the running costs of hospitals, with particular reference to the variation in costs from region to region and from hospital to hospital, and to the control exercised by the Ministry and regional boards over the expenditure of hospital management committees. A memorandum of evidence has been prepared and submitted to Subcommittee D.

Attendance at Hospital Management Committees

73. In order to improve co-operation between hospital management committees and their hospital group medical advisory committees, the Joint Consultants Committee has asked the Ministry that hospital management committees should be encouraged to implement the recommendation of the Bradbeer Committee that the chairman of the group medical advisory committee should be invited to attend meetings of the hospital management committee.

Statutory Registration of Medical Auxiliaries

74. The Council has noted the following resolution of the A.R.M., 1956:

308. **Resolved:** That this A.R.M. welcomes the proposed statutory registration of medical auxiliaries, provided that (1) the medical profession maintains some control of the training standards to be aimed at and general ethical conduct, and (2) that the medical auxiliaries retain their present description and are not given independent status as belonging to professions associated with medicine.

The Ministry has prepared a revised scheme for the registration of medical auxiliaries which differs in a number of respects from the original scheme put forward in 1955. The designation previously proposed—that is, "professions associated with medicine"—has been dropped and "professions supplementary to medicine" substituted, the latter being one of the titles suggested by the Joint Consultants Committee. The proportion of medical auxiliaries on each of the proposed registration boards has been reduced, although they still have a majority of one over the other members. Moreover, the new scheme provides that only medical organizations are to be consulted in connexion with the appointment of medical members of the boards. In one important respect, however, the scheme is unchanged. The proposed council to co-ordinate the functions of the various registration boards is to be given no effective control over the boards, and there is no means of resolving a conflict between one of the boards and the co-ordinating council.

The Joint Consultants Committee has asked the Ministry that the membership of the co-ordinating council should be increased to provide for a member appointed by the Association. In order to reach a settlement, it has also informed the Ministry that it would raise no objection to the revised scheme if the powers of the co-ordinating council are satisfactorily strengthened and the medical members of the registration boards are appointed from names submitted by the appropriate medical organizations and from no other source.

The Central Consultants and Specialists Committee, however, feels that the new draft scheme is unsatisfactory in that it gives the various groups of medical auxiliaries a controlling interest in their own training and ethical conduct, and it has urged the Joint Committee to dissociate itself from the scheme if implemented in its present form.

Shortage of Radiographers and Physiotherapists

75. The Joint Consultants Committee has drawn the attention of the Ministry to the grave shortage of radiographers and physiotherapists in many parts of the country and to its effect on the hospital service, and has asked for an opportunity of discussing the matter.

Remuneration Policy

76. The Council has noted the following resolutions of the A.R.M., 1956:

320. **Resolved:** That the Association affirms its adherence to the principle that medical men and women, in whatever form of medical practice or service they are engaged, should be remunerated as doctors, and that their remuneration should not be determined by relation to that of lay personnel employed in the same sphere.

321. **Resolved:** That where it can be shown that in any particular sphere of practice the levels of remuneration are such as to constitute a deterrent to recruitment, the Association take steps to promote or support negotiations for improvement.

322. **Resolved:** That, since the two Spens Reports have established agreed levels of remuneration for general practitioners and hospital medical staffs, and indirectly for most other sections of the profession, the Association reaffirms its policy to maintain these reports as the basis of professional remuneration.

326. **Resolved:** That, for the time being, it be left to the individual sections of the profession themselves to decide whether to continue negotiations within the Whitley Council system or to withdraw from the system, but that the position be carefully watched and reviewed from time to time, regard being paid to: (a) the experience gained as a result of the present joint negotiations (outside Whitley) on behalf of general practitioners and all grades of hospital medical staff; and (b) the view that it might be preferable to retain the Whitley system for minor questions, leaving matters of major national financial importance to be dealt with by direct negotiation.

332. **Resolved:** That the Association develop a policy whereby the Council will come to assume fuller responsibility for all future claims submitted by any section of the profession.

333. **Resolved:** That the various sections of the profession be informed of the Council's preparedness to negotiate directly at the request of any section.

The Central Consultants and Specialists Committee has been informed of Minutes 332 and 333, and while the Committee finds it difficult to see how the Council could assume a fuller responsibility for any negotiations which are conducted through the Whitley machinery, it has welcomed the Council's offer to undertake negotiations at any time at the Committee's request.

Consideration has been given to the following resolution of the A.R.M., 1956:

328. **Resolved:** That the Association take all possible steps to promote an effective system of negotiation whereby decisions reached upon appropriate salary ranges for medical teachers will be binding upon the universities concerned.

Representations were made to the University Grants Committee in July, 1956, on the remuneration of whole-time university medical teachers, when attention was drawn to the following points:

(a) The discrepancies in remuneration between university medical teachers of clinical subjects and their colleagues of equivalent status in the National Health Service, and the even wider discrepancies in the case of medical teachers in the preclinical departments;

(b) The failure of some universities to increase salaries up to the level authorized by the Chancellor of the Exchequer in 1954;

(c) Problems which arise as a consequence of the inadequate rates of remuneration—for example, the difficulty of recruiting medically qualified candidates both for junior posts and to fill vacancies left by senior members of the staff who transfer to more remunerative posts in the National Health Service and elsewhere;

(d) The increasing tendency to appoint candidates who are not medically qualified and the undesirability of this course in view of the importance of medical students being taught very largely by medically qualified teachers who understand more fully the relevance of preclinical work.

The opportunity was also taken to urge upon the University Grants Committee the desirability of establishing separate negotiating machinery for medical teaching staffs.

In reply the Committee stated that its relationship with the universities made it impossible for it to enter into formal negotiations on matters in which university autonomy was highly valued. It was pointed out that some universities had not fully exercised the power to increase salaries, given by the Chancellor of the Exchequer in 1954, but the University Grants Committee suggested that this was a matter for direct representation to the universities concerned. Further consideration is being given to the matter, both generally and in the light of the recent increases announced by the Chancellor of the Exchequer.

Senior Hospital Medical Officers

77. The Council has considered the following resolutions of the A.R.M., 1956:

247. **Resolved:** That this Meeting most emphatically takes the point of view that Council has failed to implement the resolutions in Minutes 203, 205, and 206 passed at the past A.R.M. and, furthermore, by its comments in paragraph 49 in its Annual Report, has weakened the policy laid down by the Representative Body in 1955.

(Note: Minutes 203, 205, and 206 of the A.R.M., 1955, are as follows:

203. **Resolved:** That this Meeting draws attention to the position of doctors graded as S.H.M.O.s in the hospital service who, despite the fact they are engaged in consultant work, are remunerated at S.H.M.O. rates, and requests the Council to treat this matter as one of urgency and do everything possible to ensure that S.H.M.O.s at present inappropriately graded should be paid at consultant rates.

205. **Resolved:** That this Meeting reiterates the resolution passed last year by the A.R.M. (Min. 121). "That no further S.H.M.O. post be established and that existing posts should be subject to biennial review with a view to upgrading."

206. **Resolved:** That all existing S.H.M.O. posts should be subjected to a review by an independent central committee with a view to upgrading.)

251. **Resolved:** That a review of S.H.M.O.s is now overdue. It should be undertaken by a newly constituted central committee of agreed composition. The criteria should be known and accepted in advance.

256. **Resolved:** That no further S.H.M.O. posts should be established and the present posts be subject to biennial review.

258. **Resolved:** That this Meeting recommends that the salary of the S.H.M.O. grade should be raised to 80% of the consultant salary throughout the whole scale.

261. **Resolved:** That all S.H.M.O.s engaged in consultant work unsupervised should be remunerated at consultant rates.

Representations were made to the Ministry by the Joint Consultants Committee in March, 1956, for a further review of S.H.M.O.s, but this was resisted on the ground that the 1951 review was intended to be a final review of hospital medical staff with a personal grading of S.H.M.O.

During the session, however, the Staff Side of Committee B has renewed its proposal that S.H.M.O.s occupying consultant posts should be remunerated on the consultant salary scale. The Management Side, while not agreeing that every S.H.M.O. occupying a post nominally graded as a consultant post should be paid at consultant rates, has agreed to consider—in consultation with the Staff Side—individual cases on their merits. Arrangements for this review are in hand.

With regard to A.R.M. Minute 256, the Council does not consider that it is practicable at this stage to oppose altogether the creation of new S.H.M.O. posts, bearing in mind the agreement between the Joint Consultants Committee and the Ministry for the proper use of the grade and the possibility of alterations in the near future in the structure of hospital medical staffing. The utmost vigilance is being maintained, however, in scrutinizing S.H.M.O. advertisements to ensure that they are within the scope of the grade in accordance with Circular RHB 50/96. Hospital medical staffs have been reminded of the desirability of bringing to the notice of the Association any cases in which hospital boards propose to advertise S.H.M.O. appointments

which, in the opinion of the local consultants, are wrongly graded. There is already machinery whereby the holder of an S.H.M.O. post may appeal against the grading of the post.

With regard to A.R.M. Minute 258, it was reported to the Representative Body in 1956 that an effort had been made in Committee B to restore the overlap between the maximum point of the S.H.M.O. salary scale and the minimum point of the consultant scale by seeking an increase of £200 in the former. This was resisted by the Management Side and the matter was referred to arbitration by the Industrial Court, which awarded an increase of £75 at all points on the S.H.M.O. scale as from April 26, 1956. In view of this, and of the discussions now proceeding with the Ministry for the reorganization of hospital medical staffing, the Council does not consider the time opportune to initiate negotiations regarding the relative remuneration of S.H.M.O.s. It will, however, keep before it the view expressed by the Representative Body for further consideration should the S.H.M.O. grade, or a grade equivalent thereto, be perpetuated under any new medical staffing structure.

Distinction Awards

78. Lord Moran, Chairman of the Minister's Advisory Committee on Distinction Awards, attended a meeting of the Central Consultants and Specialists Committee and explained the method of selecting consultants for awards and the steps taken to ensure their equitable distribution throughout the country and in the various specialties. The Committee has affirmed its confidence in Lord Moran and his Advisory Committee.

In this connexion the Council has considered the following resolution of the A.R.M., 1956:

239. **Resolved:** That in the opinion of this Meeting, the Council should consider the desirability of abolishing the merit award scheme for members of hospital staffs, unless in very exceptional cases, and replacing it by a system allowing for responsibility payments.

The Council does not consider it desirable, however, to take any action which would result in the abolition of distinction awards.

Remuneration of Hospital Medical Staff

79. The Council has considered the following motion referred to it by the A.R.M., 1956:

That the Joint Negotiating Committee should, in the event of any increase in the betterment factor being granted by the Ministry, consider some means by which members of the hospital and consulting services who retired prior to the granting of the last increase in remuneration should now benefit in their pension.

The Council is in sympathy with the principle that as retired practitioners are affected by changes in the cost of living no less than their colleagues in active practice, their financial position should not be overlooked. It has accordingly drawn the attention of the Negotiating Committee to the motion, suggesting that the position of practitioners retired from the National Health Service on pension should be reviewed from time to time *pari passu* with those still in the Service.

The Staff Side of Committee B of the Medical Whitley Council has been informed of the following resolution of the A.R.M., 1956:

263. **Resolved:** That this Meeting of the Representative Body considers that the house officer grades in hospitals are relatively and absolutely underpaid; and calls upon Council to press for substantial increases in the remuneration to these grades.

All grades of hospital medical staff are included in the joint remuneration claim, but on March 12 the Prime Minister announced an increase of 10% in the remuneration of hospital medical staff up to and including senior registrars to take effect from April 1.

Domiciliary Consultation Arrangements

80. The Council has considered the following resolution of the A.R.M., 1956:

267. **Resolved:** That it should be open to the general practitioner under the Domiciliary Consultation Scheme to call in the services of a specialist anaesthetist, not necessarily a consultant.

It has always been the policy of the Ministry that general practitioners should have free choice in arranging domiciliary consultations, provided the practitioner called in is in contract with a hospital board to undertake such consultations. It is, however, also the policy of the Ministry—and one which the Central Consultants and Specialists Committee and the Joint Consultants Committee support—that so far as practicable the domiciliary service should be a consultant service. Accordingly practitioners not of consultant status are not normally invited by boards to take part in the domiciliary scheme unless there are insufficient consultants practising the specialty available in the area to provide an adequate service. The Ministry has agreed that where a general practitioner considers it necessary on medical grounds he may call upon the services of a consultant anaesthetist under the domiciliary scheme.

The Council has considered the following motion referred to it by the Representative Body:

That the principle by which domiciliary consultation fees are payable to full-time consultants should be extended to include also those honorary consultants employed by regional hospital boards but remunerated by universities.

The Council does not favour the payment of domiciliary consultation fees to whole-time members of university teaching staffs who hold honorary hospital contracts. Moreover, it is probable that in many cases the teacher's conditions of service would preclude him from retaining such fees even if they were payable.

The following motion, also referred to the Council by the Representative Body, has received consideration:

That in a scattered area, where a sole consultant has of necessity to perform a large number of domiciliary consultations, consideration be given to extending the maximum number of visits per quarter for which remuneration is allowed.

Detailed inquiries, made with the helpful co-operation of S.A.M.O.s, have shown that a comparatively small proportion of consultants exceed the number of domiciliary consultations for which payment is made, and these are not only in sparsely populated areas. Consequently the Council does not consider there are grounds for seeking an increase in the maximum domiciliary consultation payment for rural consultants alone. Moreover, it doubts the wisdom of taking separate action in this matter at the present time, since the amount of the domiciliary consultation fee, and hence of the maximum payment, is bound up with the general question of remuneration.

The Council has noted the following resolution of the A.R.M., 1956:

313. **Resolved:** That since patients in maternity nursing-homes are entitled to obstetric domiciliary consultations under the N.H.S., this A.R.M. asks the Minister of Health to allow all patients in nursing-homes full access to the complete range of consultant domiciliary service.

An approach on these lines has been made by the Joint Consultants Committee, but in the Ministry's view the wording of the National Health Service Act, 1946, precludes an extension of the domiciliary service to patients in nursing-homes.

The proposal has been noted for further consideration when amending legislation becomes practicable.

Domiciliary Consultations by Whole-time Consultants

81. The Council has noted the following resolutions of the A.R.M., 1956:

272. **Resolved:** That the Association should press for the payment of domiciliary consultation fees to whole-time specialists up to the permitted maximum.

273. **Resolved:** That the B.M.A. deplores that the Ministry of Health differentiates between domiciliary visits done by whole-time and part-time consultants. The non-payment clause for the first eight visits in each quarter should be abolished and the differential payment for distant visits should be paid to whole-time and part-time consultants.

The Staff Side of Committee B has decided to review the conditions under which whole-time consultants are paid for domiciliary consultations in the light of the first year's experience of the present arrangements.

The Council feels that this is a wise course, and hopes to be in a position to report further in its Supplementary Report.

Domiciliary Consultations by Chest Physicians

82. The Council has noted the following resolution of the A.R.M., 1956:

274. **Resolved:** That a chest physician should receive a fee for domiciliary consultation for a patient on the tuberculosis register of a chest clinic if the circumstances are such that a fee for the visit would be payable to any other physician.

Representations have been made by the Staff Side of Committee B that chest physicians should not be debarred from payment for domiciliary consultations in respect of patients on a clinic tuberculosis register, but entitled to payment for all consultations carried out in the patient's home at the request of a general practitioner, provided the patient is not under active treatment at a chest clinic. The Management Side has shown reluctance to accept this proposal and discussions are continuing.

Legal Liability of the Doctor in the National Health Service

83. The Council has had before it the following motion referred to it by the A.R.M., 1956:

That this Representative Body believes that it is not in the best interests of British medicine and the British people that the hospital doctors in the country should have the legal status of technical servants of the hospital authority.

Although the position regarding the legal liability of hospital authorities for the acts and omissions of members of their medical staffs has until recent years developed differently in England and in Scotland, it now appears to be beyond reasonable doubt that in both countries hospital authorities have a vicarious responsibility for the negligence of their medical staffs.

In England the gradual change in the law regarding the relative liabilities of hospital authorities and their medical staffs has so far evoked little apprehension among hospital staffs, and attention has been directed primarily to the practical difficulties arising between medical staffs and their hospital authorities and to the financial implications of the present trend. Much of these difficulties were overcome by an agreement entered into between the Ministry and the medical defence bodies in 1954 for the apportionment of damages in legal actions of this kind.

In some quarters, however, and particularly in Scotland, there have arisen grave misgivings regarding the position of hospital medical staffs. Hospital boards, while not deliberately setting out to interfere with the clinical freedom of hospital medical staff, might feel themselves compelled, because of their responsibility at law and the financial considerations involved therein, to lay down from time to time the procedures to be undertaken, or not undertaken, by certain grades of medical staff, or in other ways to restrict clinical freedom.

Some steps have already been taken in Scotland to explore ways and means of securing the re-establishment in law of the sole responsibility of doctors engaged in hospital practice for the treatment of the patients in their charge.

The Council is awaiting the result of these deliberations before considering the matter further, but it is hoped that it will be possible to report further in the Supplementary Report.

Complaints Involving Hospital Medical Staff

84. During the past session discussions have taken place with the Ministry to ensure the adoption by hospital authorities of a uniform and satisfactory procedure for investigating complaints involving the professional behaviour or competence of members of hospital medical staffs.

Following these discussions hospital authorities have been advised by the Ministry that where a board or hospital management committee (or the chairman acting on its behalf) is of the opinion that a *prima facie* cause for complaint exists, which if well founded would be sufficiently serious to give rise to the question of disciplinary action, a small investigating committee should be set up to ascertain the facts of the case and report back to the board or hospital management committee. This investigating committee should be composed predominantly of members of the profession, including one or two not associated in any way with the hospital or the case, appointed after consultation with the Joint Consultants Committee. Hospital authorities have also been advised that the practitioner should be given prior warning of the complaint, and allowed to appear personally before the investigating committee, and, in addition, to have legal representation if he so desires.

Board-and-Lodging Charges

85. The Council has noted the following resolutions of the A.R.M., 1956:

284. **Resolved:** That this Meeting recommends that a reasonable standard of accommodation and feeding be provided for hospital residents.

285. **Resolved:** That this Meeting recommends that charges for hospital residents' board and lodging should not be increased until agreement has been reached through "Whitley."

It was reported to the Representative Body in 1956 that Committee B of the Medical Whitley Council was considering the desirability of fixing standard charges for board and lodging for the various grades of resident medical staff above house officer in substitution for the arrangement under para. 17 of the Terms and Conditions of Service whereby individual hospital authorities were obliged to fix the charges at the value of the services provided.

In July, 1956, the Management Side, in order to reach a settlement, accepted the standard charges proposed by the Staff Side—namely, for senior house officers, £150; registrars and junior hospital medical officers, £170; and senior registrars, £200. Charges for resident consultants and S.H.M.O.s were also agreed at £400 and £350 respectively. The Minister has power to vary these standard charges in exceptional circumstances, and the Management Side has intimated that where an application for a reduction of the charge is made the Minister will seek the advice of Committee B before reaching a decision.

These new charges were implemented with effect from August 1, 1956, and the Staff and Management Sides of Committee B are now discussing the possibility of fixing minimum standards of board and accommodation. Detailed proposals have been put forward by the Staff Side with the suggestion that where the food or accommodation falls below an agreed minimum standard the doctor should have a right of appeal, primarily with the object of securing an improvement in the board and lodging rather than a reduction in the charge. Apart from this the new charges have the advantage of being agreed centrally and not subject to unilateral alteration by individual hospital authorities.

Normally consultants or S.H.M.O.s living in hospital accommodation occupy separate houses or flats for which rents are fixed on an individual basis. The new board-and-lodging charges for consultants and S.H.M.O.s were fixed in relation to the higher standard of accommodation that would normally be offered to them as compared with that provided for junior staff. It has been agreed in Committee B that where complaints are received from resident consultants or S.H.M.O.s, or from their hospital authorities, that the new charges are unreasonable in view of the standard

of the board and accommodation provided, they shall be investigated on an *ad hoc* basis by representatives of the two sides.

Whole-time Doctors and Income Tax

86. The following resolutions were adopted by the A.R.M., 1956:

281. **Resolved:** That further representations be made to the Government for the provision of income-tax relief for whole-time members of the hospital service for motor-car costs and depreciation and other essential expenditure.

282. **Resolved:** That it be made a condition of service by regional hospital boards that the use of a car and of a telephone is obligatory.

283. **Resolved:** That the Council be requested to reopen with the income-tax authorities the question of tax relief on subscriptions of membership of learned societies, medical books, and journals for public health medical officers and other full-time medical practitioners.

Consideration has been given by the Central Consultants and Specialists Committee to the possibility of sponsoring a test case on behalf of whole-time hospital medical staff in relation to their entitlement to tax relief in respect of the professional expenses which they normally incur (such as the cost of maintaining a car and a telephone, and subscriptions to professional organizations and learned bodies), which are not reimbursed, or only reimbursed in part, by hospital authorities, but counsel has advised that under the existing legislation there is no prospect of establishing a case for tax relief.

In 1955, however, the Royal Commission on the Taxation of Profits and Income recommended that the present Schedule E rules governing expenses should be amended to permit relief from tax in respect of expenses "reasonably incurred for the appropriate performance of the duties of the employment." If this recommendation were adopted it would go a long way towards meeting the just grievances of doctors in whole-time salaried employment. It is understood that other professional organizations are pressing the Government to implement the recommendation, and the Joint Consultants Committee has been asked to lend its support.

At the same time, as an alternative method of dealing with the matter, the Central Consultants and Specialists Committee has asked the Staff Side of Committee B to make a further effort to secure the payment by hospital authorities of adequate allowances to meet the reasonable professional expenses of their whole-time medical staffs.

With regard to A.R.M. Minute 282, the Central Consultants and Specialists Committee is advised that in the present state of income-tax law no advantage would accrue by making provision of a car or telephone a condition of employment.

Whole-time Hospital Medical Staff and Private Practice

87. The Council has considered the following resolution of the A.R.M., 1956:

318. **Resolved:** That this Meeting recommends that all medical grades of so-called "whole-time" hospital staff should be allowed to pursue the practice of their profession in their off-duty time.

The Council is advised by the Central Consultants and Specialists Committee that it has always pursued the policy that so far as practicable the individual practitioners should have the choice of engaging in hospital work on a whole-time or on a part-time basis. The Committee feels that it is consistent with this policy that whole-time hospital medical staff who wish to engage in private practice should seek an alteration in their contracts. It finds it difficult, therefore, to accept the principle that whole-time medical staff should engage in private practice, because this sphere of professional work is of vital importance to those who, not being in receipt of a whole-time salary, depend to a varying degree upon private fees, and in particular to those who have only a relatively small number of sessions in the hospital service.

Moreover, the Central Consultants and Specialists Committee feels that if the Representative Body's suggestions were adopted it would almost certainly lead to a review of the contracts of whole-time hospital medical staff, with no guarantee that they would be offered new contracts for whole-time or even for maximum part-time service. The Committee also considers that, as the salary scales recommended by the Spens Committee were based on the assumption that the doctor engaged whole-time in the hospital service would not participate in private practice, acceptance of the proposal might lead to a review of the terms of service.

Mileage Rates

88. The agreement reached in the General Whitley Council for a temporary increase in the mileage allowance of $\frac{1}{2}$ d. per mile at all points in the scale applies to hospital medical staffs. This increase will be paid during the continuance of the temporary additional petrol tax with effect from December 5, 1956.

Mileage Allowances of Part-time Hospital Medical Staff

89. A number of problems have arisen in connexion with the payment of mileage allowances to part-time medical staff in respect of home to hospital journeys.

The relevant provision in the terms and conditions of service states that a journey between a part-time officer's home (or consulting-room, if nearer) and hospital shall be regarded as an official journey, and therefore attract mileage allowance. This leaves room for differences of interpretation in certain circumstances; for example, where a consultant has only the limited use of a consulting-room, or where he has more than one consulting-room.

These and related questions are now under discussion between the Staff and Management Sides of Committee B.

Study Leave

90. The Council has had before it the following resolution of the A.R.M., 1956:

279. **Resolved:** That this Meeting again requests Council to approach the Ministry and Department of Health for Scotland on the subject of making study leave available to hospital officers, pointing out that some hospital boards do not supply a locum tenens for an absent officer and require the remaining officers to cover the duties of the absentee. Representations should be made to the Ministry that such conditions cannot be fulfilled in many smaller provincial units, and that there are instances where hospital officers do not have opportunities for study leave.

The Central Consultants and Specialists Committee has obtained from various quarters a considerable amount of information on the subject of study leave and is now making a detailed study of the problem with a view to putting forward specific proposals for improving the present arrangements, including the introduction of a standard code of practice in dealing with applications.

A further report will be included in the Supplementary Annual Report of Council.

Hospital Residents' Hours of Work

91. The Council has considered the following motion referred to it by the A.R.M., 1956:

That this Meeting recommends that sufficient hospital residents should be appointed so that each hospital resident doctor shall work less than 168 hours a week.

The Council is in sympathy with the principle that there should be a sufficient number of resident medical staff to carry out the work of the various hospital departments, allowing for adequate off-duty periods for study and recreation. The burden of excessively long hours of duty which junior medical staff have to bear in many hospitals because of the shortage of staff is one of the primary factors which led to the discussions on hospital medical staffing which are proceeding with the Ministry, and the Central Consultants and Specialists Committee will continue to keep this point in the forefront of its discussions on the subject.

Cremation Certificates

92. Representations have been made to the Ministry by the Joint Consultants Committee in support of the following resolution of the A.R.M., 1956:

311. **Resolved:** That resident hospital staff should not be debarred from receiving a fee for completing Part B of the cremation certificate.

Hospital Private Beds

93. In 1955 the Representative Body urged that private beds should be available in all major hospitals, and in 1956 the Council reported that the Central Consultants and Specialists Committee proposed to review the distribution of private beds with a view to considering what steps should be taken to secure an improvement in the position.

The Committee has now examined the position in the light of the latest available statistics, which show that, taking the country as a whole, hospital private beds are not fully used for the treatment of private patients. Bed occupancy figures, particularly when applied to small groups of beds, do not, of themselves, give a wholly reliable indication of the demand. Moreover, owing to the fact that private beds are not allowed to lie vacant, it frequently happens that a bed is not immediately available when required for a private patient, who consequently has to be admitted to a general ward or to a private nursing-home.

Nevertheless, the Committee feels that any demand for additional private beds must be made on the merits of the case, and supported by evidence that there is a demand for private treatment which cannot be met by the facilities available in the area concerned. Inquiries are accordingly being made of hospital group medical committees and local medical committees as to whether experience has shown that the private beds in each hospital group are adequate and appropriately distributed. Where it is felt that more private beds are needed, these bodies are being asked to furnish sufficiently detailed information to enable a case to be put before the Ministry.

Meanwhile the Joint Consultants Committee has reopened with the Ministry the question of the introduction of a moderately priced private bed, and the abolition of the classification of surgical operations in the Pay-bed Regulations.

Part-time Consultants and Income Tax

94. The Council reported to the Representative Body in 1955 that, on the advice of an eminent tax counsel, steps were being taken to test the validity of the policy of the Inland Revenue in transferring to a Schedule E assessment the hospital income of part-time consultants in cases where this represented the major part of the professional earnings.

Early in 1956 appeals on behalf of five consultants were presented to the Special Commissioners on Income Tax, who decided in favour of the consultants concerned. The Commissioners held that the consultants should have been assessed under Schedule D in respect of the remuneration from their hospital appointments and the fees received for domiciliary consultations.

The Crown appealed against this decision and the appeals are to be heard by a judge of the High Court.

Pending a final decision on the test cases, where the hospital income of a part-time consultant has been transferred to Schedule E, assessment will continue to be made under that Schedule. If the Special Commissioners' decision is upheld, and it is finally decided that part-time consultants should be wholly assessed under Schedule D, all Schedule E assessments in respect of which a notice of appeal has been given by or on behalf of the consultant will be abandoned by the Crown and the tax liability will be dealt with under Schedule D.

The medical defence organizations, the Regional Hospitals Consultants and Specialists Association, and the Hospital Medical Staffs Defence Trust have contributed towards the cost of promoting the test cases.

Conference of Consultants and Specialists

95. The conference of representatives of consultants and specialists from all parts of the United Kingdom held in June, 1956, was welcomed as a valuable opportunity for them to discuss together the many problems confronting the profession working in the hospital service. After consulting with its regional committees, however, the Central Consultants and Specialists Committee does not feel that the time has yet arrived when an annual conference would be justified.

It does not propose, therefore, to arrange a conference in 1957, unless some issue of major importance warrants the holding of a special conference.

Statutory and "Item of Service" Fees

96. In accordance with the view expressed by the Representative Body that all statutory and "item of service" fees should be reviewed in the light of 1956 values of money, all such fees payable for consultant services have been considered by the Central Consultants and Specialists Committee.

The revision of the fees for part-time consultant services carried out on behalf of local authorities is dealt with elsewhere in the Annual Report. The fees for part-time services for Government Departments were largely revised in 1955, but representations have been made to the Treasury that the following fees for services not dealt with at that time should now be increased as indicated:

	Present Fee £ s. d.	Proposed Fee £ s. d.
Medical examination of candidates for the Civil Service, where difficult or lengthy, or where special tests are required	Up to 7 17 6	10 10 0
Pensions appeal tribunals:		
Whole-day ..	6 6 0	10 10 0
Half-day ..	4 4 0	5 5 0

The Treasury is also being urged to agree to a minimum fee of £5 5s. for a visit by a consultant to the inmate of one of H.M. prisons.

The Staff Side of Committee B has been asked to examine all "item of service" fees payable to hospital medical staff under their terms and conditions of service, with a view to their adjustment in line with current values of money.

Future of the Chest Services

97. A memorandum on the future of the chest services has been prepared by a special subcommittee of the Central Consultants and Specialists Committee upon which the General Medical Services and Public Health Committees and the Radiologists and the Tuberculosis and Diseases of the Chest Groups were represented.

The memorandum, set out in Appendix IV, has been forwarded to the Joint Consultants Committee as a basis for discussion with the Ministry.

Constitution of the Central Consultants and Specialists Committee

98. The Council has reviewed the constitution of the Central Consultants and Specialists Committee, with special reference to the many problems affecting senior hospital medical officers and hospital junior medical staff, and makes the following recommendation for changes in the constitution of the Committee:

Recommendation: (1) That the constitution of the Central Consultants and Specialists Committee be amended to provide for the appointment of two members by each of the following: (a) the General Medical Services Committee, (b) the Registrars Group Committee, (c) the S.H.M.O.'s Group Committee; and (2) that the Schedule to the By-laws be amended accordingly.

Review of General Practitioners in 10 (b) Appointments

99. The Council has considered the following motion referred to it by the A.R.M., 1956:

That grading reviews be instituted to consider claims for upgrading by doctors holding 10 (b) appointments in the hospital service.

The Council sympathizes with the view that the personal grading of general practitioners holding 10 (b) appointments should be reviewed, and will press that such practitioners should be included in any future review of hospital medical staff.

Newly Qualified Practitioners: Pre-Registration Posts

100. Consideration has been given to the following motion referred to the Council by the A.R.M., 1956:

That posts in the mental hospital service should be included among approved house appointments for the pre-registration practitioner.

The Council has been advised by the Central Consultants and Specialists Committee that it is opposed to the approval of pre-registration posts in mental hospitals, except where there is sufficient scope in general medicine, with adequate supervision, to justify a house-physician appointment.

The Council will keep under review the question of the average time taken by provisionally registered practitioners to complete their pre-registration service, as suggested in the following motion referred to it by the A.R.M.:

That this Meeting considers that the Council should keep under constant review the question of the time taken to fulfil the pre-registration posts required by the Medical Act, 1950.

X-ray Examination of Recruits to the Royal Ulster Constabulary

101. In 1954 the Northern Ireland Tuberculosis Authority decided that chest physicians in its employment should undertake the chest x-ray examination of recruits to the Royal Ulster Constabulary as part of their duties, and without additional payment, on the ground that the Authority was obliged by statute to provide this service. The chest physicians in Northern Ireland, who had previously received fees for this work, took the view that it was outside the scope of their contractual duties for the Authority, and this scope has been supported by counsel, on whose advice proceedings are being brought under Order 54A of the Supreme Court Rules to have the respective obligations of the chest physicians and of the Northern Ireland Tuberculosis Authority clarified.

Inquiry into the Treatment of Venereal Diseases

102. In recent years there has been a marked fall in the number of patients attending V.D. clinics. It is possible, however, that a significant proportion of cases is now being treated by general practitioners since the discovery and use of penicillin in the treatment of syphilis and gonorrhoea. An inquiry is therefore being made in selected areas into the extent to which venereal disease is being treated outside hospital, in order to obtain a more accurate picture of the prevalence of venereal diseases in Great Britain.

Acute Mental Illness

103. The Council has considered the following resolution of the A.R.M., 1956:

299. **Resolved:** That this A.R.M. is disturbed by the fact that mental welfare officers (laymen, without any recognized training or qualifications) have, in their capacity as duly authorized officers, power to overrule the opinions and advice of general practitioners and consultant psychiatrists regarding emergency admissions under the Lunacy Acts. The meeting deplores the lack of standardized training for mental welfare officers, including duly authorized officers, and instructs the Council to press the Ministry of Health to formulate a national scheme of training for these officers and to put it into operation without further delay.

The importance of ensuring that mental welfare officers receive adequate training was emphasized in the evidence submitted by the Association to the Royal Commission on the law relating to mental illness and mental deficiency. The Council has now made representations to the Ministry of Health that a national scheme for the training of these officers should be formulated and put into operation without delay.

REFORM OF THE NATIONAL HEALTH SERVICE**Code of Conduct for Patients**

104. The Council has considered the following resolution of the A.R.M., 1956:

380. **Resolved:** That this Meeting considers that in view of the fact that savage penalties are inflicted on doctors for infraction of their terms of service, there should be some penalty for patients who abuse it.

As the Representative Body is aware, the Medical Service Committee and Tribunal Regulations have been the subject of close scrutiny recently by a special subcommittee set up for the purpose, and in the opinion of the Council Minute 380 of the A.R.M. does not call for special action at this stage.

Public Education in the Responsible Use of the National Health Service

105. The Council has considered the following resolution of the A.R.M., 1956:

382. **Resolved:** That the attention of the Government be drawn to the need for continuous education of the public, both in youth and in adult life, in the constructive and responsible use of the National Health Service.

It feels that there is a real need for a national campaign for the education of the public in the proper use of the National Health Service. It has drawn the attention of the Ministry of Health to the views of the Representative Body and has requested the Department to receive a small deputation to discuss the possibility of a national campaign and the establishment of a permanent advisory body on the lines of the National Fuel Industrial Committee.

Remuneration Under the National Health Service

106. The Council is engaged in a survey of National Health Service schemes in operation in Dominions overseas, including the methods of remuneration.

OCCUPATIONAL HEALTH**Remuneration of Industrial Medical Officers**

107. The Council has reviewed the recommended rates of remuneration set out below, which were approved by the A.R.M., 1955.

	Range
Assistant medical officers	£1,200 to £1,500
Medical officers ..	£1,400 to £2,300

(A practitioner in this grade who gives satisfactory service would be expected to reach his maximum in his early 40's, but the practitioner giving outstanding service would be expected to receive more rapid advancement.)

Senior medical officers ..	£2,000 to £3,000
Chief medical officers or directors of medical services	From £3,000 according to the size of the undertaking and the responsibilities involved.

The salary in each grade should be reviewed at intervals not exceeding two years.

The Association regards these salary ranges as suitable for pensionable appointments. Where no pension scheme is in operation the salary should be adjusted accordingly.

The Council considers that the rise in the cost of living justifies this revision and that it would be helpful to take this opportunity to include a recommendation that, in each grade, salaries should be reviewed at intervals of not more than

two years, and that practitioners should normally reach the upper limit of their range after approximately ten years.

Recommendation: That the section on the remuneration of whole-time industrial medical officers in the statement on "Remuneration and Terms of Service for Industrial Medical Officers," approved by the Representative Body in 1955, be revised to read as follows:

	Range
Assistant medical officers ..	£1,400 to £1,700
Medical officers ..	£1,600 to £2,500
Senior medical officers ..	£2,250 to £3,250
Chief medical officers or directors of medical services ..	From £3,500, according to the size of the undertaking and the responsibilities involved.

The salary in each grade should be reviewed at intervals not exceeding two years and a practitioner in each grade would normally be expected to reach the upper limit of the range after about ten years of satisfactory service. A practitioner giving outstanding service would be expected to receive more rapid advancement.

The Association regards these salary ranges as suitable for pensionable appointments. Where no pension scheme is in operation the salary should be adjusted accordingly.

The existing recommended salary scale for part-time industrial medical officers is as follows:

Hours per week	Minimum Annual Salary £	Hours per week	Minimum Annual Salary £
Up to 1 hour ..	75	9 to 10 hours ..	600
1 " 2 hours ..	150	10 " 11 " ..	650
2 " 3 " ..	225	11 " 12 " ..	700
3 " 4 " ..	300	12 " 13 " ..	750
4 " 5 " ..	350	13 " 14 " ..	800
5 " 6 " ..	400	14 " 15 " ..	850
6 " 7 " ..	450	15 " 16 " ..	900
7 " 8 " ..	500	16 " 18 " ..	950
8 " 9 " ..	550	18 " 20 " ..	1,000

In reviewing this scale, the Council has borne in mind, *inter alia*, the revised scale agreed in Committee C of the Medical Whitley Council for visiting medical officers to establishments maintained by local authorities.

Recommendation: That the recommended salary scale for part-time industrial medical officers in the statement on "Remuneration and Terms of Service for Industrial Medical Officers," approved by the Representative Body in 1955, be revised to read as follows:

Hours per week	Minimum Annual Salary £	Hours per week	Minimum Annual Salary £
Up to 1 hour ..	100	9 to 10 hours ..	700
1 " 2 hours ..	175	10 " 11 " ..	750
2 " 3 " ..	250	11 " 12 " ..	800
3 " 4 " ..	325	12 " 13 " ..	850
4 " 5 " ..	400	13 " 14 " ..	900
5 " 6 " ..	475	14 " 15 " ..	950
6 " 7 " ..	550	15 " 16 " ..	1,000
7 " 8 " ..	600	16 " 18 " ..	1,050
8 " 9 " ..	650	18 " 20 " ..	1,100

Fees Paid to Appointed Factory Doctors

108. The Council is pressing the Ministry of Labour and National Service to raise the fees paid to Appointed Factory Doctors for examinations under the Factories Acts. These fees (with the exception of those for examinations under the Mule Spinning (Health) Special Regulations, 1953) were fixed in 1947, and an increase is clearly overdue. The Ministry is being urged to raise them to the following:

Examination of Young Persons.—Examination at factory: 10s. 6d. for the first and 6s. for each other person examined at any one visit. Examination not at factory: 6s. for each person examined.

Examination under Dangerous Trades Regulations.—10s. 6d. for the first and 3s. 6d. for each other person examined at any one visit.

Investigation and Report on Cases of Industrial Disease or Accident.—£2 2s. per case with an additional £1 1s. for each other case arising from the same cause and investigated on the same day.

Examinations under the Mule Spinning (Health) Special Regulations.—10s. 6d. for the first and 3s. 6d. for each other person examined at any one visit.

Remuneration for Sessional Work for the Ministry of Labour and National Service

109. Representations are being made to the Ministry of Labour and National Service to increase the sessional fees paid to lecturers at courses for disablement resettlement officers and to members of panels of disablement advisory committees.

Co-ordination in the Field of Occupational Health Research

110. The Council reported last year that it was seeking information from the Lord President of the Council about plans for co-ordinating research in the field of occupational health. One of the functions of the Industrial Health Advisory Committee of the Ministry of Labour and National Service is to consider the problems in industry upon which research is required and to advise on their relative priority. As the work of the I.H.A.C. is limited to establishments covered by the Factories Acts, the Lord President of the Council has recognized the need for further co-ordinating machinery, and two Interdepartmental Committees have been set up—one concerned with the research problems of industrial safety and the other with the broader medical aspects of occupational health research. The form of the machinery is not entirely in accordance with the views of the Council on the subject, and it proposes to keep the matter under review.

Development of the Occupational Health Service for Smaller Factories

111. It is evident that a considerable extension of the occupational health service is desirable and may well be brought about in the relatively near future. It would appear that any expansion of the service, particularly for smaller factories, will have to be provided to a large extent by general practitioners, and in this connexion the Council is giving consideration to such matters as the grouping of factories by area or by industry. Consideration is also being given to the most suitable form of short postgraduate course for general practitioners wishing to undertake part-time industrial appointments or to attend refresher courses in occupational health.

Administration of Morphine by Nurses in Industry

112. The following resolution of the A.R.M., 1956, has been considered by the Council:

356. **Resolved:** That this meeting is astonished at the refusal of the Home Secretary, reported in paragraph 80 of the Annual Report of Council, to legalize the administration of morphine by competent nurses in serious industrial accidents, and instructs Council to press for this essential medical service to industrial workers.

The Home Office has been informed of this resolution as an expression of opinion on behalf of all sections of the profession, and has been urged to reconsider its decision on the matter.

Use of Antibiotics or Chemotherapy by Nurses in Industry

113. The Association of Industrial Medical Officers, the Association of Certifying Factory Surgeons, and the Royal College of Nursing have been informed of the views of the Representative Body contained in the following Minute of the A.R.M., 1956:

359. **Resolved:** That in the opinion of this meeting nursing staff employed in industry should follow hospital practice and never use antibiotics or chemotherapy in any form without the express instructions in writing in each case of a registered medical practitioner.

In the opinion of the Council, the implementation of this resolution could be effected to a large extent by the exercise of special care by doctors who authorize supplies of drugs for nurses working without the supervision of a medical officer.

PUBLIC HEALTH

Negotiating Machinery for Doctors in the Public Health Service

121. In August, 1956, the County Councils Association indicated that representatives of the Local Authority Associations would like to discuss proposals for winding up Committee C of the Medical Whitley Council and for transferring negotiations on remuneration and terms of service for medical officers of health, and probably their deputies, to the Joint Negotiating Committee for Chief Officers, and negotiations for other public health medical officers to the Joint Council for Local Authorities' Administrative, Professional, Technical, and Clerical Services. Having regard to the policy of the Representative Body that medical men and women, in whatever form of medical practice or service, should be remunerated as doctors, and that their remuneration should not be determined by relation to that of non-medical personnel in the same sphere, the Council informed the County Councils Association that no useful purpose could be served by discussing the proposal of the Local Authority Associations.

Remuneration of Public Health Medical Officers

122. Every authority in the United Kingdom has implemented fully Industrial Court Award No. 2565 on the remuneration of public health medical officers from January 1, 1955. By the end of March, 1957, 99% of all local authorities had notified implementation of the subsequent agreement in Committee C on increased remuneration from April 1, 1956 (M.D.C. Circular 27). Advertisements from the other local authorities, which include only two local health authorities, are no longer being accepted for publication in the *British Medical Journal*.

The undermentioned resolution of the A.R.M., 1956, was sent to the Ministry of Health in August last. Despite repeated urgent reminders, no reply (apart from an acknowledgment) has been received:

325. **Resolved:** That the Government be urged to set up forthwith an independent committee of inquiry to consider what should be the range of remuneration of medical officers in the Public Health Service, having regard to the remuneration of other sections of the profession and the desirability of the Public Health Service maintaining its power to attract a suitable type of recruit.

Medical Officer of Health for Middlesbrough—Industrial Court Award

123. The long-standing dispute with regard to the salary of the Medical Officer of Health for Middlesbrough has finally been settled in favour of the medical officer. Since 1953 the town council had refused to implement the findings of Regional Appeals Committees on the matter, and it became necessary to make appointments under the authority the subject of an "Important Notice" in the *British Medical Journal*.

Towards the end of 1956 the authority agreed to refer the dispute to the Minister of Labour and National Service under the Industrial Courts Acts and to accept an award of the Industrial Court, provided that the authority's appointments were withdrawn from the "Important Notice." This was done and the dispute was heard by the Industrial Court on February 13. The award of the court granted a considerable increase in salary for the M.O.H., identical with that recommended by the Regional Appeals Committee in 1955, and with similar retrospection to June, 1955.

Northern Ireland Appeals Machinery

124. An impasse has been reached in the negotiations with the Ministry of Health and Local Government in Northern Ireland on the establishment of Appeals Machinery for the medical profession. The Council agreed to accept for a trial period, without prejudice, two-stage Appeals Machinery which had been suggested by the Ministry. This involved a local appeal to his employer by the aggrieved employee

Advertising Circulars Sent by Drug Firms to Welfare Officers of Industrial Concerns

114. The Council deprecates the practice of some drug firms of addressing promotion material relating to medical products to welfare officers of industrial concerns. It considers it wrong in principle that non-medical persons should be urged to purchase these products and to use them where there may be no proper medical supervision. It understands that some firms have sent representatives to call on welfare officers personally. It has sought the assistance of the Association of British Pharmaceutical Industry and the Industrial Welfare Society in bringing about a discontinuance of these undesirable practices.

Certificates for Short Illnesses

115. The Treasury, the Ministry of Pensions and National Insurance, the nationalized industries, and the British Employers' Confederation have been advised of the view expressed in the following resolution of the A.R.M., 1956, and have been asked for their reactions to it:

72. **Resolved:** That this Meeting requests Council to approach industry in general with a view to abolishing the requirement of medical certificates for short illnesses.

Review of the Schedule of Prescribed Industrial Diseases

116. The Council has forwarded comments to the Industrial Diseases Subcommittee of the Industrial Injuries Advisory Council, which, at the request of the Ministry of Pensions and National Insurance, has been reviewing the terms of prescription of the diseases in the Schedule of Prescribed Diseases for the purposes of the National Insurance (Industrial Injuries) Acts.

Cautionary Notice on Dermatitis Issued by the Ministry of Labour and National Service

117. Suggestions have been submitted to the Factory Department about the style and content of its Cautionary Notice on Dermatitis, new draft lay-outs of which are being considered in that Department.

Medical Standards for Road, Rail, and Air Transport

118. Close liaison has been maintained with the Ministry of Transport and Civil Aviation in connexion with the work of the Bus and Coach Subcommittee of the Ministry's Committee on Road Safety. The subcommittee has had regard to the views on medical standards for public service vehicle drivers contained in the Association's Memorandum on Medical Standards for Road, Rail, and Air Transport.

First-aid Regulations Under the Agriculture (Safety, Health, and Welfare Provisions) Act, 1956

119. At the invitation of the Ministry of Agriculture, Fisheries, and Food, comments were submitted on draft Regulations with regard to first-aid requisites to be provided for workers in agriculture.

Advisory Councils on Occupational Health

120. The Council has received a report of the 1956 Conference of Advisory Councils on Occupational Health, when the principal subject discussed was the "Employment of Older Persons in Industry," and agreed that the Association should act as host for the 1957 Conference, on Tuesday, April 9, at B.M.A. House. The principal subject on this occasion was the "Employment of Disabled Persons in Industry."

The Council has reaffirmed its view that Divisions and Branches should sponsor the establishment of new Advisory Councils in their areas, consisting of representatives of the Association, employers' organizations, and trade unions or trades councils.

and an appeal on his behalf by his professional association or trade union to the National Arbitration Tribunal, suitably extended to include representatives of the professional body or trade union concerned and of the Health Service bodies, for the purpose of hearing and advising on such appeals. Subsequently, however, the Council was informed that the Ministry of Labour in Northern Ireland refused to agree to an alteration of the composition of the Tribunal in this way.

The Council then proposed that the establishment of three-tier Appeals Machinery similar to that in Great Britain should be reconsidered. The Ministry took the view that there was no real hope of progress in reviving discussions along these lines, in view of the earlier difference of opinion on the composition of Appeals Committees at the second level. The Council agrees with this opinion. The Ministry has accepted a suggestion by the Council that independent arbitrators should be appointed to hear the two appeals in Northern Ireland which have been outstanding for some considerable time. The Council has stressed the importance of appointing medical arbitrators acceptable personally to the Ministry, the Association, and the aggrieved parties.

Remuneration for Part-time Work for Local Authorities in England and Wales

125. The Council drew up proposals for a revision of the 1947 and 1951 agreements with the Local Authority Associations on the remuneration of medical practitioners undertaking part-time work for local authorities. The Local Authority Associations were asked to agree to *ad hoc* negotiations on these proposals, but the Council finally agreed that the negotiations might take place in a special Subcommittee of Committee C, on the understanding that the Staff Side would include representatives of the various interests concerned. A revised schedule of fees agreed in this Subcommittee was formally endorsed by Committee C, and the Council expressed its satisfaction with the schedule. The new agreement, which came into effect on January 1, 1957, was published in the *Supplement to the British Medical Journal* of December 29, 1956. By the end of March, 1957, 90% of local health authorities had notified its implementation.

Similar arrangements have been made for negotiating a revision of the corresponding agreement in Scotland.

Representation of the Preventive Medical Service on Regional Hospital Boards

126. Following the expression of opinion by the Joint Consultants Committee that each Regional Hospital Board should include a minimum of five consultants under contract with the Board (nominated by the medical staffs of hospitals in the region), together with a general practitioner and a medical officer of health nominated by the profession, consideration was given to the establishment of machinery for securing nominations for medical officer of health representatives on Regional Hospital Boards. A plan was drawn up in consultation with representatives of the Society of Medical Officers of Health, with a view to ensuring that nominations made by either the Association or the Society were mutually acceptable. This plan was approved by the Council and by the Council of the Society, and Honorary Secretaries of Divisions and Branches of the Association were notified of it on February 21, 1957.

Integration of the Preventive Medical Service with the Hospital Service

127. Consideration has been given to the question of closer liaison between the preventive medical service and the hospital service by the appointment of public health medical officers as honorary consultants on hospital staffs and as members of hospital Medical Advisory Committees. The Council approves of the principle, as being in the interests of all concerned, and would urge that consideration be given to such appointments. It does not accept the view of the Guillebaud Committee that medical officers of health should hold such appointments *as of right*, but it

agrees that, in appropriate circumstances, invitations to public health medical officers to accept appointments of this nature can materially assist the integration of the two services.

Appointment of Medical Officers of Health Without Advertisement

128. Representations are being made to the Ministry of Health against its action in dispensing with the requirement to advertise vacant appointments in certain Metropolitan boroughs. These were mixed appointments as medical officer of health for a borough and L.C.C. divisional medical officer. Applications were invited only from medical officers in certain grades in the employment of the L.C.C.

Milk

129. The Council has considered the following resolution of the A.R.M., 1956:

76. **Resolved:** That this Meeting would welcome next year a report from the Council on the subject of pure milk for the nation.

It believes that the general position throughout the country is not really unsatisfactory, and, having regard to the fact that amendments of the Milk Regulations are in draft, it doubts whether the Association would be justified at the present time in embarking upon a full-scale inquiry into the question of pure milk for the nation. Comments on the draft amendments of the regulations have been submitted to the Ministry of Agriculture, Fisheries, and Food. When the new regulations have come into force the Council will consider again the desirability of undertaking a general review of the subject.

Immigrants and Communicable Diseases

130. The Ministry of Health was notified of the views of the A.R.M., 1956, set out in the following resolution:

80. **Resolved:** That this Meeting expresses its alarm at the continued influx of immigrants found to be suffering from communicable diseases, and instructs Council to explore the problem with a view to necessary action.

The Ministry replied that the problem of the immigrant and his health is recognized and the situation is being kept under review, but there is at present no evidence that the risk to the health of the nation under existing arrangements is such as to justify the very serious step of imposing new controls.

The Council cannot accept this opinion, and is pressing the matter with the Ministry and urging the need for a compulsory chest x-ray examination for all immigrants.

Notification of Infectious Diseases

131. In its Annual Report for 1955-6 the Council stated that it regarded it as important to await the views of the Society of Medical Officers of Health, which was reviewing this subject, before deciding on the appropriate action to be taken on the following resolution of the A.R.M., 1955:

149. **Resolved:** That this Meeting is of the opinion that a review of the legislation concerning the notification of infectious diseases should be carried out by the Association with a view to making recommendations to the Ministry regarding the form of revision, which is long overdue.

The Society has indicated that it still has the matter under active consideration, and that its report will be available shortly.

Air Pollution

132. The following resolution of the A.R.M., 1956, was forwarded to the Ministries of Housing and Local Government, Fuel and Power, and Health:

79. **Resolved:** That this Meeting views with grave concern the continued menace to the health of the people caused by air pollution; welcomes the passage of the Clean Air Bill through Parliament; urges the Government to implement its provisions vigorously; and wishes particularly to impress upon local authorities the urgent need to use to the full the statutory powers given to them to declare smoke-control areas.

The Ministry of Housing and Local Government replied that the Minister intended to fix an appointed day for many of the provisions of the Clean Air Act (including those dealing with smoke-control areas) and to issue a circular and explanatory memorandum to local authorities about the administration of the Act. Subsequently, December 31 was fixed as the appointed day, and on December 28 the regulations, circular letter, and accompanying memorandum were sent to local authorities. The Minister proposes to fix an appointed day early in 1958 for the remaining provisions of the Act.

The other Ministries have explained that they will co-operate with the Ministry of Housing and Local Government, which has the primary responsibility.

Tetanus Immunization

133. The Ministry of Health was notified of the following resolution of the A.R.M., 1956:

82. **Resolved:** That this Meeting urges the Ministry of Health to consider the advisability of encouraging active immunization against tetanus as a public health measure.

It was represented to the Ministry that there is a clear need for the formulation of a national policy on immunization against tetanus in infancy, and the Ministry agreed to consider the representations made. However, as it is expected that a report will shortly be issued by the Medical Research Council having a considerable bearing on this question, the matter has been left in abeyance until this report is available.

"Health Nurses"

134. The Council has noted the view of the Representative Body contained in the following resolution of the A.R.M., 1956, but it does not consider it would be wise to take any action at this stage towards its implementation:

84. **Resolved:** That this Meeting believes that "Health Visitors" should be entitled "Health Nurses."

It is believed that there would be considerable opposition to this in some quarters. The point was not made in connexion with the evidence which the Council submitted in 1954 to the Working Party on the Inquiry into Health Visiting, and the Council considers it undesirable to raise it in isolation.

Married Women Doctors and Public Medical Appointments

135. The Council has decided that advertisements for public medical appointments shall not be accepted for publication in the *British Medical Journal* if they fail to conform with the policy laid down in the following resolution of the A.R.M., 1956:

75. **Resolved:** That it be the policy of the Association that no woman doctor should be disqualified from obtaining a public medical appointment or be dismissed from such an appointment simply by reason of marriage.

The principle has been accepted by Committee C of the Medical Whitley Council and promulgated in a circular to local authorities.

Car Allowances for Public Health Medical Officers

136. In July, 1956, an upward revision of the car allowances for public health medical officers was agreed in Committee C, retrospective to April 1, 1956. This brought the allowances into line with those approved by the National Joint Council for Local Authorities' Administrative, Professional, Technical, and Clerical Services. In view of the introduction of petrol rationing and the accompanying rise in the cost of petrol, a temporary further increase has been agreed from January 1, 1957. These increases apply only in England and Wales, as discussions are still proceeding in Scotland with regard to the introduction of national scales of car allowances for local authorities' chief officers and medical officers.

Annual Leave for Public Health Medical Officers

137. The following resolution of the A.R.M., 1956, was referred to the Staff Side of Committee C, and further information will be available in time for the Supplementary Annual Report of the Council.

78. **Resolved:** That the terms and conditions of service of public health medical officers should be reviewed with the object of relating them more closely to those pertaining in the hospital services in regard to annual leave.

MEDICAL ETHICS

Professional Secrecy

138. In 1952 the policy on professional secrecy was reaffirmed by the Representative Body in the following terms:

It is a practitioner's obligation to observe strictly the rule of professional secrecy by refraining from disclosing voluntarily without the consent of the patient (save with statutory sanction) to any third party information which he has learnt in his professional relationship with the patient.

This policy inevitably forms the basis of advice given to the many who make inquiry. Strong arguments have been put forward in favour of some relaxation of this policy in the public interest.

Advertising

139. The report on indirect methods of advertising which was approved by the Representative Body last year states that "it is generally accepted by the profession that certain customs are so universally practised that it cannot be said that they are for the person's own advantage." Various aspects of advertising, in its broadest sense, have been considered by the Council, and the following are among the decisions taken in regard to practices which are not regarded as customary: (a) Ecclesiastical premises should not be used for doctors' surgeries unless they are made available to all doctors in the area. (b) Where it is considered necessary for an assistant to have his own door-plate, the assistant's name should appear in conjunction with the name of his principal and the normal rules relating to door-plates should apply. It is, however, highly undesirable that a trainee assistant should have his own door-plate.

Lay Organizations

140. Agreement has been reached with the National Marriage Guidance Council on the rewording of an approved memorandum on the Relationship of Medical Practitioners to Marriage Guidance work. Joint committees of the local Marriage Guidance Councils and the appropriate Divisions or Branches of the Association are to be responsible for the compilation of lists of doctors who are willing to render the services required.

Numerous lay organizations exist to promote the interests of sufferers from specific complaints, and difficulties occasionally arise through the compilation of restricted panels of specialists, involving a danger of giving publicity to the specialists concerned. The Council acknowledges the co-operation given by these organizations in overcoming the difficulties which have been experienced.

Ethical Rules

141. As part of the general review of the ethical rules the Council is revising the pamphlet entitled "Ethical Rules Relating to Consultations and Other Matters," and hopes to submit the revised version in its Supplementary Report.

The Council has under consideration the provision of rules of procedure for investigating ethical complaints occurring in overseas Branches. Clarification of the Articles and By-laws of the Association and of the Standing Orders of the Council is being sought in regard to the powers of the Central Ethical Committee.

Nearly all local units of the Association in the United Kingdom have adopted the revised rules governing procedure in ethical matters which were approved by the Representative Body in 1950.

PRIVATE PRACTICE

Drugs for Private Patients

142. The following Minutes of the A.R.M., 1956, have been considered by the Private Practice and General Medical Services Committees:

54. **Resolved:** That the Representative Body notes with satisfaction that a further meeting has been held with the Minister of Health on the question of allowing private patients to obtain drugs, appliances, and dressings through the National Health Pharmaceutical Service. It again emphasizes the importance it attaches to this matter of principle and urges the Council to continue to seek a successful solution to this long-standing grievance.

55. **Resolved:** That this Representative Body instructs the Council to take steps to ensure that any further deputations to the Ministry to secure the right of private patients to obtain drugs and appliances through the N.H.S. should be more closely identified with private practice.

When the deputation from the Council met the Minister of Health on April 18, 1956, the Minister suggested that it would be very useful if there were detailed discussions between the Association and officers of his Department directed particularly towards the following points: (1) working out the size of the problem—that is, the present number of patients in the country receiving private treatment; (2) estimating the likely cost; (3) attempting to devise a suitable disciplinary procedure for controlling this prescribing; and (4) considering what consequent adjustments might have to be made in the remuneration of general practitioners (and in particular in calculating the basis of the Central Pool).

Both Committees were agreed that the Minister's invitation should be accepted, but in view of present circumstances the Council has approved the recommendation of the G.M.S. Committee that the discussions with officers of the Ministry be initiated at an appropriate time in the future.

Fees for Part-time Medical Services for Government Departments

143. Recommendations have been made to the Treasury in accordance with the terms of the following Minute 57 of the A.R.M., 1956:

Resolved: That the fee for reports to Government Departments at present standing at 5s. be increased to one guinea in conformity with the fee paid by insurance companies for reports without examination.

The present fee for an extract from a medical practitioner's record is within the range 5s. to 10s. 6d. The Treasury would not agree to a fee of one guinea but offered to increase the minimum of the range to 7s. 6d. The Council has accepted this offer without prejudice to the reopening of negotiations at a later date.

The Council has accepted a Treasury proposal that the fees payable to a general practitioner acting as locum tenens for a prison doctor be as follows: £3 3s. for half a day, £4 14s. 6d. for a full day, £11 0s. 6d. for fortnightly substitution. Previously the fees were £1 10s., £2 5s., and £5 5s. respectively.

Also accepted, without prejudice to the reopening of negotiations at an early date, was a Treasury offer to increase from £1 5s. to £1 17s. 6d. the fee for a full medical examination and report in a single case by a Treasury Medical Officer.

Medical Examination of Elderly Drivers

144. The following Minute 65 of the A.R.M., 1956, has been discussed with representatives of the Accident Offices Association:

Resolved: That when the medical examination of elderly drivers is requested by insurance companies it should be carried out by an independent doctor for a similar fee to that for life insurance, and this fee should be payable by the insurance company.

The Accident Offices Association refused to accept the suggestions made in the above resolution, and thus reaffirmed the views expressed when similar representations were made in 1954. The A.O.A. made a counter-suggestion that the responsibility for deciding whether an elderly man is fit to drive a car should fall on the Government and should be arranged by amendment of the licensing procedure. The Council is of the opinion that no useful purpose would be served by pursuing this matter further at this stage.

Fees for Payment to Practitioners called in by the Police

145. The Council has considered methods of implementing the revised scale of fees for the payment of practitioners in England and Wales called in by the police, which was approved by the A.R.M., 1956, in the light of the following Minute 67 of the A.R.M., 1956:

Resolved: That this Meeting strongly supports Council's action in making a claim for increased fees for payment to practitioners called in by the police, and urges that Council will pursue its claim with the utmost vigour.

Attempts have been made to secure the adoption of the revised scale by police authorities through the Local Authorities' Associations. These Associations have reaffirmed their view, also expressed at the time of the previous revision, that the adoption of the B.M.A. scale is a matter for discussion between individual local authorities and the profession in the light of local circumstances. The Council has asked Division Secretaries to negotiate directly with the appropriate police authority with a view to the adoption of the revised scale in all cases where practitioners undertaking work for the police consider that the new scale would be advantageous.

Medical Examination for Life Assurance

146. The Council has considered the following Minute 69 of the A.R.M., 1956:

Resolved: That if, after a report on a medical examination for Life Assurance has been received, further medical evidence is considered necessary by the Office's Chief Medical Adviser, then that evidence should be obtained at the Office's expense (not at the expense of the patient).

In previous negotiations with the Life Offices Association on the question of fees for medical reports, it has been accepted that the fee of 15s. or £2 2s., as the case may be, shall cover the giving of subsequent information (whether or not involving a further examination) required by an office in elucidation of, or to remedy omissions in, the original report. It has been agreed, however, that a suitable fee should be forthcoming when information additional to that sought in the original report is required. In these cases the request is made to the doctor by the company concerned, and there is no question of the patient being responsible for the fee.

The cases to which Minute 69 of the A.R.M., 1956, would apply are those which arise out of proposals for a type of policy written at a low rate of premium and which will not bear any additional expense. If the company decides that, in view of the evidence contained in the original report, the proposal cannot be accepted, instead of declining the proposal outright it will often give the proposer an opportunity to produce further medical evidence, provided he does so at his own expense. If the patient then seeks additional evidence from his family doctor, the latter is not precluded from charging a fee, and the amount thereof is a matter for arrangement between the doctor and the patient.

The Council is satisfied that the above Minute is being implemented as far as possible.

Certificates in Respect of Absent Voters

147. Minute 71 of the A.R.M., 1956, called for amendment of form R.P.F. 7 as follows:

Resolved: That the medical certificate at present required on form R.P.F. 7 (application to be treated as an absent voter)

is entirely unsatisfactory. It should be amended to read as follows:

I certify that in my opinion it is undesirable, on medical grounds, that this applicant should go in person to the polling booth, and that this state is likely to continue for.....months.

*indefinitely.

(* complete and/or delete as may be necessary)

Signed.....
Registered Medical Practitioner.

Address.....

Date.....

At present the doctor, in addition to certifying that the voter will be unable to go in person to the polling station by reason of physical incapacity, is also asked to certify that the voter is qualified to be registered as an elector for that area. The Home Office has not accepted the revised medical certificate suggested above, but has agreed to amend the wording to make it clear that the statement referred to in the medical certificate does not relate to the applicant's statement that he is qualified to be registered as an elector.

Accidents—Compensation

148. The Council has sought the advice of the solicitor and an expert on insurance on matters arising out of the following Minute 348 of the A.R.M., 1956:

That the following motion be referred to the Council for consideration:

That this Meeting considers that the Council should discuss with the Government the matter of compensation for doctors injured or who lose their lives in attending accidents.

In an analysis of the circumstances in which a doctor may attend accidents the solicitor showed that there are a number of circumstances in which practitioners of all kinds might not receive compensation under statutory provisions. Even where such provisions apply, such as under the National Health Service Superannuation Scheme, the pension payable to the doctor or his widow may be insufficient to allow a reasonable standard of living. In the solicitor's opinion, however, the Government would take the view that there is no justification for placing medical practitioners in a privileged position over the whole of the rest of the community, and there is no likelihood of the Government agreeing to amend the general law in favour of the profession. The insurance expert advised the Council that insurance through an accident policy would present no difficulties, and that to cover the risk of a fatal accident the premium would be about 17s. 6d. for each £1,000 assured.

The Council has decided to advise practitioners as follows:

(a) Of the financial risks often occasioned by the lack of adequate cover from compensation and superannuation schemes in the event of death or disablement as a result of attending the victim of an accident in the course of medical practice.

(b) That the only way by which these risks can be completely and adequately covered is by an appropriate accident insurance policy.

(c) That it would be advisable for those under contract with an employing authority to ensure that there is a suitable clause in the contract covering the payment of compensation in the event of death or disablement which is attributable to the nature of their duties.

Statutory and "Item of Service" Fees

149. Minute 349 of the A.R.M., 1956, asked "that all statutory and 'item of service' fees should be reviewed in the light of 1956 values of money." The Council is continuously reviewing such fees in an attempt to ensure that they are related to the current value of money, and it will continue to do so.

Examination of Emigrants

150. By agreement with the Governments of Canada and Australia, intending emigrants are informed that they are responsible for the doctor's fee of £1 1s. for each adult and for each child over 16 years of age. In the Council's opinion the appropriate fee for a comprehensive examination and

report (such as is required for intending emigrants) is £2 2s. Many emigrants would be unable to pay this fee, and yet to perpetuate the present agreement would be to differentiate between organizations. This, it is considered, would be very unwise, as it would tend to keep the standard fee for a full examination and report at the lowest level and would make it difficult to justify a claim for the proper fee in circumstances where the patient is not directly responsible for the fee. The Council proposes to ask the Australian and Canadian Governments to delete all reference to the amount of the fee from the papers sent to an intending emigrant, and to state instead that the emigrant is responsible for the doctor's fee. The amount of the fee charged will then be a matter for arrangement between the doctor and the emigrant.

Remuneration of Civilian Medical Practitioners

151. Representations to the Ministry of Defence have resulted in increases in the remuneration of full-time civilian medical practitioners employed by the War Office and of part-time C.M.P.s engaged on a capitation basis. Increases were also obtained in the fees for chairmen and members of War Office and Air Ministry Medical Boards, for the Armies, and for the examination of the families of Army examination of recruits for the Regular and Territorial and R.A.F. personnel proceeding overseas.

"No Waiting" Order—Wolverhampton

152. Arrangements were made by the Council for the profession locally to be represented by counsel at a public inquiry into a proposed "no waiting" order for the centre of Wolverhampton. The Ministry of Transport has since confirmed the order without allowing any exemption to medical practitioners.

Appointment of a Local Authority Employee as Coroner

153. It has come to the notice of the Council that a local authority recently appointed one of its whole-time employees as coroner in a part-time capacity. This, in the opinion of the Council, is most undesirable; the post of coroner should always be held by an independent person and the salary offered should be sufficient to attract applications from suitably qualified persons. The Council has protested to the Home Office about the appointment in question.

Remuneration of Medical Officers of Private and Public Schools

154. The Council considers that the Association's policy on the remuneration of medical officers of private and public schools should now be revised. The present policy, as approved by the A.R.M., 1949, calls for the payment of not less than £1 1s. per scholar per annum for duties outside the National Health Service. After consulting the Medical Officers of Schools Association the Council recommends:

Recommendation: That where practitioners are appointed to undertake special routine medical examination of scholars at private or public boarding schools, and to advise the school authorities generally on matters of health and hygiene, the remuneration should not be less than £1 15s. per scholar per annum for duties outside the National Health Service.

Revision of Fees

155. The following increases of fees have been negotiated. (a) Medical Interviewing Committees of the Ministry of Health: fees for chairmen and members increased as from March 1, 1956, to £3 13s. 6d. and £3 3s. respectively for a session of 2½ hours. (b) Silicosis Medical Bureau, Johannesburg:—fees increased as follows: medical examination and report, from £2 2s. to £3 3s.; report of sputum examination, from 10s. 6d. to £1 11s. 6d.; for x-ray film, from £1 1s. to £3 3s.

"BRITISH MEDICAL JOURNAL"

156. During 1956 the circulation of the *British Medical Journal* for the first time exceeded 80,000 copies. The continued increase in the circulation is partly accounted for

by the Association's rising membership, but the steady upward trend of subscriptions from non-members is a gratifying sign that the *Journal* is found of value by medical men throughout the world.

The year was notably successful for the special journals published by the Association, since all thirteen journals increased their circulation, some by as much as 15% to 20%. Many of these additional copies were sold in the United States, where the promotion campaigns carried out by the American agents have had excellent results.

Abstracts of World Medicine has also done well, with an increase of circulation of about 16%; rather more than half the additional subscribers were in the United States.

The third collection of articles from the Refresher Course for General Practitioners was published in book form towards the end of 1956 and is selling well. During the last few years a substantial financial profit has been made by the sale of books in the *Refresher Course* and *Any Questions?* series. A volume entitled *Emergencies in General Practice* will be published later in 1957. After mutually satisfactory financial arrangements had been made, permission was given to the Argentine medical journal, *Semana médica*, to translate the third volume in the *Any Questions?* series into Spanish, and this book is now on sale in South America.

Rising costs of production again made the year a difficult one for publishers. There were substantial increases in the cost of paper and of printing, and the higher rates for inland postage, which came into operation on June 1, 1956, will add about £7,000 a year to the cost of distributing the *B.M.J.* The rise in the membership also added about £5,000 to the annual expenditure on the *Journal*. Though not entirely offsetting these increased costs, the advertisement revenue showed a useful increase on the previous year, and the sales income was also larger both for the *B.M.J.* and for the special journals. Some saving on production costs was obtained by changing the printers of a number of the special journals, and rates for display advertisements in the *B.M.J.* were increased from January 1, 1957.

There is a limit to the savings that can be made by reducing costs of production, and more attention has been paid to the possibility of increasing revenue by promoting sales of the Association's publications. The success of the campaign carried out by the American agents has already been mentioned, and further improvements are hoped for. The Business Manager visited Scandinavia and Holland, calling on medical booksellers, subscription agents, university libraries, and others. Through these contacts and with the good will evident in Scandinavia towards the Association's publications, a steady increase in subscriptions can be expected, especially when the Business Manager's visit has been followed up by the dispatch to specialists in Scandinavia of descriptive circulars about the journals likely to be of interest to them. The British market has also not been neglected; in particular, a campaign to sell more copies of *Abstracts of World Medicine* to registrars and other hospital staff is being carried out.

Much more material is submitted for publication in the *B.M.J.* than can possibly be printed, and this applies to nearly all sections of the *Journal*. In particular, the dispute with the Government about the remuneration of doctors has increased the pressure on the space available in the *Supplement*, particularly in its correspondence columns.

When considering the motion, referred to the Council by the A.R.M., 1956, "that the *Supplement* to the *British Medical Journal* be published in separate form, as was done several years ago, or that it form the centre pages of the *Journal* and be easily detachable for reference," the Council was informed that the additional cost of publishing the *Supplement* in separate form would be over £6,000 a year. Such additional expenditure was not considered justifiable. To place the *Supplement* in the centre pages of the *Journal* would be likely to be unsatisfactory for several reasons: it would mean extra expenditure and would divide the contents of the *Journal* into two parts, causing annoyance to many

readers. The Council therefore resolved that no action be taken at present on the proposal that the *Supplement* should be published in separate form, but that the matter should be reconsidered if the financial situation improves; and that no action be taken on the proposal that the *Supplement* should form the centre pages of the *Journal*.

"FAMILY DOCTOR"

157. *Family Doctor* has now completed its sixth year of publication, and the year 1956 was a successful one from many points of view. In the course of this year a number of changes were effected, all directed towards broadening the base of *Family Doctor* activities.

On October 26, 1956, the first four *Family Doctor* books were published, and these have been widely welcomed. Earlier in the year a special issue under the title "Getting Married," published at 1s., achieved an extraordinary success, and it seems likely that there will be much the same reception accorded to "Getting Married, 1957." This is a completely new edition at the same price of 1s. and in the same format, but with the whole text entirely rewritten and differently presented. Of this new and completely revised edition there is a print order of a quarter of a million copies, and it seems likely that there will be a complete sell-out in a matter of one or two months.

At an early stage in the development of *Family Doctor* there were numerous requests for individual articles and subjects which could no longer be met by the provision of individual back-numbers of the magazine. It was therefore decided to establish a series of pamphlets and reprints, many of which have continued in demand over a period of years. The logical development of this activity was the creation of a group of 32-page booklets at a uniform price of 1s. Distribution of these booklets has been entirely through chemists' shops, and by the end of 1956 nearly half a million copies of these specially designed booklets had been sold. The intention for the year 1957 is to sell over one million. New titles and new subjects have been developed from material which has already appeared in the magazine. The present range of titles is as follows: *Slim Safely*; *Having a Baby*; *All About Asthma*; *Child Management*; *Nursery Feeding*; *Invalid Cookery*; *Feeding the Family*; *How Your Life Began*; *Infectious Diseases of Childhood*; *The Facts of Life*; *Milestones in the First Four Years*; *First Baby*; *Childless Marriage*.

A more recent development has been the creation of another special 80-page publication entitled "You and Your Baby." This covers antenatal care, infant welfare, and all the problems of infant care and infant feeding in the first few months of life. This particular publication has been distributed free of cost to every general practitioner in this country so that it may be passed on to selected patients. It has also been made available to doctors in terms of additional bulk supplies at a cost of only 9s. per dozen. All these activities, and others which are envisaged, are in line with the policy of providing for the public, through *Family Doctor*, a responsible, reliable, accurate, and authoritative source of information.

It has always been the endeavour of the *Family Doctor* Committee to conduct the magazine at no cost to the general funds of the Association while, at the same time, ploughing back into its development a considerable part of the total revenue. It will be recalled that on the year's working in 1955 there was a surplus of £2,561. Once again all these activities have been conducted at no cost to the general funds of the Association, and once again there is a surplus on the year 1956, this time of £2,362.

The decision to increase the page size of *Family Doctor*, which took effect from the January, 1956, issue, has been widely welcomed by readers and advertisers. So has the decision to bring to an end the Home Supplement special feature which served a useful purpose over an earlier and deliberately limited period.

Distribution has been adversely affected in the early part of this year by petrol difficulties, which led to the temporary

suspension of the *Family Doctor* van service. This covered London and the Home Counties, and had just begun to extend into three or four provincial centres.

Family Doctor is the most widely quoted magazine in this country. In a large measure this reflects the prestige and authority that attaches to its publication by the British Medical Association. *Family Doctor* owes a great deal to the support that is given to it regularly by quotations and comments in all the leading national and provincial newspapers.

Over the year 1956 the magazine has become more firmly established and even more widely accepted. Its ancillary activities have broadened the base of the project and, apart from their immediate practical merits, have extended still further the bounds of health education in its widest sense. All the activities of *Family Doctor* are in line with the original policy decisions of the Annual Representative Meeting. In *Family Doctor* the profession has now a first-class medium for ensuring that accurate and authoritative information is available to an increasing section of the public.

FINANCE

(As the auditing of the Association's accounts has not been completed, the Annual Financial Statement will be published in the Council's Supplementary Report.)

158. An effective control of the expenditure of spending committees and departments has been exercised by the Council throughout the past year. Nevertheless the trend in the financial position of the Association is one which is causing the Council some anxiety.

In the twelve months which ended on December 31 last the revenue from all sources was sufficient to meet steadily increasing expenditure and still leave a small surplus to be carried forward after making provision for the Joint Annual Meeting in Edinburgh in 1959. The prospects for the current year, however, are much less favourable, although it is hoped that the prompt steps taken by Council to effect economies will be successful and a deficit on the year's working avoided.

Income

159. The membership in 1956 reached a new record figure of 70,152, which resulted in an improvement on estimates, the income from subscriptions totalling £265,350, after providing for losses arising from resignations and deaths.

By employing the cash surplus to immediate needs in the purchase of short-dated Treasury Bills the income from investments and deposits was increased by nearly £1,500. This additional revenue offset to a great extent the fall in the net rental income, which resulted from a substantial rise in the cleaning and heating costs for the year. By increasing these charges to tenants in the current year the Council hopes to make good the loss of income. The total income from all sources during the year reached over £288,000, an improvement of some £8,000 on the estimates.

Expenditure

160. In the budget for 1956 provision was made for a total expenditure by the spending Committees and departments, with the exclusion of the Publications departments, of £256,750. During the year, however, the Council gave approval for the payment of a cost-of-living bonus to the official and clerical staffs and immediately following the Annual Representative Meeting in Brighton introduced a subsistence allowance for members attending centrally arranged meetings. These, and other unforeseen expenditure, brought the total up to £272,544.

Publications Account

161. The accounts for the *British Medical Journal*, *Family Doctor*, Special Journals, and Medical Abstracts show a small surplus on the year. Although in sharp contrast to the favourable position of the publications at the close of the previous year it was one that had been anticipated by the Council when preparing the budget for the past year.

Surplus for the Year

162. After providing for taxation and an additional £5,000 to the Reserve for the cost of the Joint Annual Meeting in Edinburgh in 1959 a net surplus of £8,600 was carried to the Accumulated Fund.

Trust Funds and Medical Charities

163. The total sum collected on behalf of the Medical Charities was £12,564, which is slightly less than in the previous year. In view of the increasing needs of the benevolent funds the Council appeals for greater support to the Charities.

Revenue Budget for Twelve Months Ending December 31, 1957

164. The Council has approved a provisional budget for the year 1957.

Based on the early estimates prepared by the spending committees and departments the estimated income for the year exceeds the expenditure by only £3,202. After making provision for an addition of £5,000 to the reserve for the 1959 Joint Annual Meeting in Edinburgh there is a budgeted deficit of £1,800.

The Council has already initiated steps which should lead to considerable economy in the day-to-day expenses of the Association, particularly in connexion with the Committee expenditure. It is unlikely, however, that with the need to incur heavy additional expenditure in connexion with the Remuneration Claim there will be any substantial surplus at the end of the year.

Subsistence Allowance

165. The Annual Representative Meeting, 1956, passed the following resolution:

44. **Resolved:** That the principle having long been approved as the policy of the Association, the time has arrived when subsistence allowances should become payable to members when attending centrally arranged meetings for which they have been elected.

The matter was referred to the Organization Committee and the Finance Committee, and their recommendations embodying the following scale of subsistence allowance for members attending centrally arranged meetings of Committees, Subcommittees, Council, Conferences, and the Annual and Special Representative Meetings were subsequently approved by the Council:

Over 8 hours and under 24 hours away from home 12s. 6d.
Over 24 hours or overnight away from home (less a standard deduction of 25s. if sleeper is claimed) 45s. 0d.

The Council decided that the scale should operate as from the close of the Annual Meeting, 1956, and that it be reviewed at the conclusion of the 1956-7 Session in the light of experience.

ESTATES

Headquarters Building

166. As part of the maintenance programme, redecoration of the whole of the offices in the North and South Wings was carried out in 1956.

A series of windows has been completed in the South Wall of the Garden Court Wing and considerable improvement has been effected in the lighting and redecoration of the ground and first floors of this building.

Regional Offices

167. The Council has accepted a lease of accommodation in a new building to be erected in Belfast near the University. Offices and committee rooms will be provided and the unit will provide an attractive regional centre for the members in Northern Ireland.

SCIENCE

168. This has been a year of intense activity, and a number of investigations have been initiated.

A pilot survey on drug addiction is in progress, and the problem of the control of drugs and the extent of their use by addicts is receiving careful study.

Coal-gas Poisoning

169. The Council has approved a report of a special subcommittee on accidental coal-gas poisoning which contains the recommendations set out in Appendix V. The investigation showed that the number of accidental deaths through coal-gas poisoning in recent years had increased at a greater rate than the number of people aged 65 and over and the total amount of gas consumed. The largest increase in the causes of death was the leaving open of gas-taps. Other contributory factors include the loss of the sense of smell and the increasing tendency of old people to live alone.

Diesel Fumes

170. In compliance with the following resolution of the A.R.M., 1956, representations have been made to the appropriate Government Departments:

118. **Resolved:** That in view of the obnoxiousness of exhaust vapour from road vehicles and the possibility that they may cause very serious disease, this Meeting considers that it is its duty to request the Government to secure obedience to the existing law in respect of such fumes.

It has been ascertained that the Ministry of Transport and Civil Aviation are giving consideration to amending the Motor Vehicles (Construction and Use) Regulations, 1955, which would make it easier for the police to secure the conviction of offenders against the law.

Restraint in the Use of New Drugs

171. The Council has considered the following resolution of the A.R.M., 1956:

117. **Resolved:** That the following motion be referred to the Council for consideration:

That the profession would welcome some degree of restraint in the use of new drugs whilst therapeutic trials were in progress provided that such trials were supervised by some central body.

In the opinion of the Council it is unlikely that new drugs would be made available in the United Kingdom before adequate therapeutic trials had been conducted. The Council is firmly opposed to any curtailment of the freedom of practitioners in prescribing. While being sympathetic towards the terms of the motion contained in Minute 117, the Council regards its implementation as impracticable, unless the Association were to embark on a comprehensive scheme for the co-ordination of clinical trials with the Medical Research Council and the larger pharmaceutical firms.

The Library

172. There has been a continued increase in the number of provincial members using the Library. The construction of windows in the south wall has greatly improved the Library facilities. The Council wishes to express its grateful thanks to the donors of 169 books and periodicals presented during the year.

The Council regrets that on financial grounds it cannot implement the motion contained in the following minute of the A.R.M., 1956:

121. **Resolved:** That the following motion be referred to the Council for consideration:

That this Meeting considers that the postal charges made by the B.M.A. Library should be abolished as a compensation to those members living at a distance from London who are not often able to enjoy the amenities of Headquarters.

The Council is anxious to exercise economy wherever practicable, and an appreciable saving would be effected if the Association reverted to the previous arrangement whereby members paid both outward and inward postage

when borrowing books. The Council understands that this practice has already been adopted by other medical libraries.

Recommendation: That in view of the financial position of the Association, the payment by the Association of outward postage on library books borrowed by members be discontinued as a temporary measure.

Medical Implications of Modern Weapons

173. The motion contained in the following Minute of the A.R.M., 1956, has been under consideration by the Council:

343. **Resolved:** That the following motion be referred to the Council for consideration:

That in view of the fact that any future war is likely to start with little warning, it is essential that members of the medical profession should understand the medical implications of modern weapons. This meeting therefore believes that the Government should arrange courses in these subjects which may be attended by any interested medical practitioner.

Contact has been made with the Civil Defence Section of the Ministry of Health, and lectures are now available for Division meetings. It is hoped that further information on practical aspects of radiation hazards will be published later in the year.

First-aid Handbook

174. After consultation with various experts in first aid, the Council has submitted its comments on a revised *First Aid Textbook* prepared by the St. John Ambulance Association, St. Andrew's Association, and the British Red Cross Society. The consultation envisaged in the following resolution of the A.R.M., 1956, has therefore been achieved:

357. **Resolved:** That this Meeting welcomes the statement that the Association is taking an interest in the preparation of a textbook for first-aid workers, and considers consultation with the Association desirable in the preparation of all books of this nature claiming to be standard teaching manuals.

Foreign Corresponding Members

175. The undermentioned have been invited to become Foreign Corresponding Members in view of their outstanding services to medical science:

Robert Debré, Professor of Paediatrics, Paris.
Constantine Choremis, Professor of Bacteriology, Athens.
Pietro Valdoni, Professor of Surgery, University of Rome.
Carlos Jimenez Diaz, Professor of Internal Medicine, University of Madrid.
Axel Herbert Olivecrona, Professor of Neurosurgery, Stockholm.
Guido Von Fanconi, Professor of Paediatrics, Zurich.
William Bosworth Castle, Professor of Medicine, Harvard.
Robert Frederick Loeb, Professor of Medicine, New York.
George Whipple, Professor of Pathology, Rochester, New York.

Insulin Syringes

176. Last year an approach was made to the British Standards Institution to secure the use of the term "ml." on the insulin syringe and package. Manufacturers indicated that, for a variety of reasons, it would be inadvisable to adopt this suggestion. A proposal has now been submitted to the British Standards Institution that it would be of advantage if insulin syringes were calibrated in twentieths instead of in tenths, as such calibration would equate naturally with the strength of insulin solution in units.

Crash Helmets

177. In accordance with the following resolution of the A.R.M., 1956, the Council sent a deputation to the Ministry of Transport to discuss the compulsory wearing of protective helmets by motor-cyclists:

120. **Resolved:** That the B.M.A. press the Ministry of Transport to enforce the use of crash helmets of approved pattern for those riding motor-cycles, and that a deputation should go to the appropriate Ministry to protest against the sale of dangerous Government surplus.

The second part of this resolution has already been covered by regulations under the Road Traffic Act, 1956. The views presented by the deputation on the compulsory wearing of crash helmets by motor-cyclists were sympathetically received by the Ministry. The Council will continue to keep this matter under careful review.

Dawson Williams Prize

178. The trustees of the Dawson Williams Memorial Fund have decided to award the Dawson Williams Prize of £100 for 1957 to Mr. Denis J. Browne, F.R.C.S., London, in recognition of his pioneer work in the field of paediatrics.

Association Prizes

179. The Council wishes to express its appreciation of the services given by the examiners in the undermentioned competitions.

Sir Charles Hastings and Charles Oliver Hawthorne Clinical Prizes

The Sir Charles Hastings Clinical Prize of £75 has been awarded for 1957 to Dr. E. Ellis Jones, Shrewsbury, for his entry on "Minor Degrees of Nephritis in the Young." The Charles Oliver Hawthorne Prize of £50, given to the author of the second best entry for the competition, has been awarded to Dr. J. E. Davies, Carmarthen, for his entry on "Chronic Brucellosis in General Practice."

Katherine Bishop Harman Prize

The Katherine Bishop Harman Prize of £75 has been awarded for 1957 to Dr. M. June Scudamore, Sidford, Devon, for her entry on "Foetal Distress in Labour."

Occupational Health Prize

The Occupational Health Prize of £50 for 1957 has been awarded to Dr. C. P. Chivers, Sandiway, Northwich, Cheshire, for his entry entitled "Respiratory Function and Disease among Workers in Alkaline Dusts." A second prize of £10 has been awarded to Dr. H. Stott, of the Labour Department, Nairobi, Kenya, for his entry on "Pulmonary Disease amongst Sisal Workers."

Provisionally Registered Practitioners' Prize

A prize of £50 has been awarded in the Provisionally Registered Practitioners' Competition for 1957 to Dr. R. M. Whittington, Sutton, Surrey. The subject set for this competition was "Medicine is an Art as well as a Science."

Medical Students' Prize

The following prizes have been awarded for essays on "The Medical Student and Research—Past Achievements and Present Opportunities" in the 1957 Medical Students' Competition: £25 to Mr. W. I. B. Onuigbo, Glasgow University; £20 to Mr. J. T. Silverstone, St. Bartholomew's Hospital Medical School.

Nurses' Prizes

First and second prizes, of 20 guineas and 10 guineas respectively, have been awarded in the following categories of the Nurses' Competition for 1957:

Category 1.—Student Nurses: Essay subject, "The Patient's Social Background in Relation to His Progress and Happiness in Hospital." First prize, Miss Norma M. G. Smith, Sydney Hospital, N.S.W.; second prize: Miss Grace M. F. Ramsay, Dundee.

Category 2.—State-registered Nurses working in hospital: Essay subject, "Team or Group Care in Nursing." First prize, Mr. Brian V. Watkin, London, S.W.17; second prize, Mr. Robert J. Kelman, Aberdeen.

Category 3.—State-registered Nurses working outside hospital: Essay subject, "The Limitation of the Number of Health, Welfare, and Social Visitors to the Individual Family." First prize not awarded; second prize, Mrs. Joyce St. Claire-Vernan, Cromer.

The Council acknowledges with gratitude the nursing textbooks awarded as consolation prizes in this competition by Messrs. William Heinemann.

Mackenzie Industrial Health Lecture

180. The Mackenzie Industrial Health Lecture was delivered on September 25, 1956, by Dr. R. S. F. Schilling at B.M.A. House in connexion with the Annual Meeting of the Association of Industrial Medical Officers.

Victor Horsley Memorial Lecture

181. The centenary of the birth of Sir Victor Horsley was commemorated by the delivery of the tenth Victor Horsley Memorial Lecture by Professor Sir Geoffrey Jefferson on April 12, 1957, at B.M.A. House. The subject of the lecture was "Sir Victor Horsley—His Life and Work."

B.M.A. Lectures

182. The number of B.M.A. lectures to Branches and Divisions so far arranged during the session is 133. The Council records its grateful thanks to the undermentioned, who have kindly assented to give lectures this session:

Mr. A. Lawrence Abel	Mr. Emlyn Lewis
Mr. R. J. McN. Love	
Professor A. G. R. Lowdon	
Dr. R. A. McCance	
Dr. A. S. McLean	
Professor J. McMichael	
Dr. R. H. Mole	
Mr. A. M. A. Moore	
Mr. C. Naunton Morgan	
Professor W. I. C. Morris	
Dr. W. M. Nichols	
Dr. W. D. Nicol	
Dr. Doris Odum	
Sir Heneage Ogilvie	
Dr. M. A. Partridge	
Dr. J. Ralston Paterson	
Professor Robert Platt	
Dr. Felix Post	
Dr. J. B. Randell	
Mr. Norman Richards	
Professor C. G. Rob	
Dr. Ffrangcon Roberts	
Mr. Alexander Roche	
Dr. A. Talbot Rogers	
Professor H. Scarborough	
Dr. R. Bodley Scott	
Professor H. L. Sheehan	
Dr. Keith Simpson	
Professor E. T. C. Spooner	
Dr. H. Neville Stafford	
Dr. David Stafford-Clark	
Dr. E. B. Strauss	
Professor C. H. Stuart-Harris	
Mr. N. Leigh Taylor	
Mr. J. S. Tough	
Mr. Kenneth Walker	
Professor R. Milnes Walker	
Sir Francis Walshe	
Professor W. Grey Walter	
Mr. Michael Ward	
Professor A. G. Watkins	
Professor E. J. Wayne	
Professor J. M. Webster	
Sir Harold Whittingham	
Dr. Denis Williams	
Mr. A. Dickson Wright	
Mr. R. B. Zachary	

Sir Charles Hastings Festival 1958

183. The Council has agreed in principle to the holding of the second Sir Charles Hastings Memorial Festival at Worcester in 1958, the centenary of the first Medical Act.

PUBLIC RELATIONS

Remuneration Claim

184. In the early days of the profession's Joint Remuneration Claim the Negotiating Committee, which is not an

Association Committee, did not consider it appropriate to embark on widespread publicity while the matter was still under discussion with the Ministers. In these circumstances it was difficult for the Council's public relations machinery to function, and this led to a certain amount of criticism from the profession. Following the rejection of the profession's claim, however, the Negotiating Committee accepted the offer of the services of the Association's Public Relations Department, and great activity has occurred during the past few months. Every effort has been made by press statements and conferences, press advertising, posters, and radio and television programmes to bring the profession's views to the notice of the public. At the main conferences the Joint Chairmen of the Negotiating Committee (Sir Russell Brain and Dr. A. Talbot Rogers), the Chairman of Council (Dr. Wand), and the Acting Chairman of the General Medical Services Committee (Dr. A. B. Davies) have been present to answer questions from the press. Arrangements were made for Sir Russell Brain, Dr. Rogers, Dr. Davies, and Dr. Wand to appear on the television programmes of the B.B.C. and the I.T.A., and on B.B.C. sound radio. The advice and co-operation of the Public Relations Department has been sought in the preparation and production of a very large number of other sound radio and television programmes dealing with the profession's claim. In addition to the great increase in telephone inquiries from the press and others interested, a very large number of personal interviews have taken place.

To coincide with the publication of the alternative plan for medical services in the event of the withdrawal of general practitioners from the National Health Service, advertising space was taken in the national press drawing attention to the Prime Minister's statement advocating arbitration in industrial disputes. Facilities were provided for the television services of the B.B.C. and I.T.A. to record the proceedings of the Press Conference held in connexion with the publication of the alternative plan, at which Honorary Public Relations Secretaries were present as observers.

The profession's case has received very good publicity in the press, and widespread editorial support. The press advertisement on arbitration was reproduced in poster form for display in doctors' waiting-rooms, and a copy was sent to every general practitioner in the National Health Service. Members of both Houses of Parliament were sent a document informing them of the profession's case.

Conference of Honorary Public Relations Secretaries

185. Out of 219 Divisions only five have no provision for public relations work. In 78 Divisions a separate Honorary Public Relations Secretary has been appointed. In 136 Divisions the post is combined with that of Honorary Secretary. Local public relations officers have been kept informed of events in connexion with the remuneration claim, and relevant documents and extracts from the national press giving an indication of press reactions have been sent to them.

Immediately prior to the publication of the alternative plan a Conference of Honorary Public Relations Secretaries was held. Over 180 Secretaries or their deputies were present, and were addressed by Dr. Dain, Dr. Talbot Rogers, the Public Relations Officer, and the Deputy Secretary, who answered questions put to them. The Honorary Public Relations Secretaries later attended the Press Conference as observers.

Fire Dangers in Home and Factory

186. The Council has considered the following resolution of the A.R.M., 1956:

351. **Resolved:** That this Meeting calls attention to the urgent need for much more intensive propaganda to inform all members of the community of the dangers of auto-inflammable materials or any other fire dangers in the home and factory.

In the opinion of the Council no direct action by the Association is indicated, but the attention of the Home Office has been drawn to this matter.

Poliomyelitis Vaccine

187. The Council has considered the following resolution of the A.R.M., 1956:

190. **Resolved:** That the B.M.A. use their influence to secure a more realistic attitude towards poliomyelitis by discouraging undue emphasis in press reports of outbreaks of the disease.

The question of press reports on poliomyelitis outbreaks has been considered on previous occasions, but it is considered that the publicity given has not been unduly alarming and the Council does not consider that any approach to the press is necessary.

The Medical Profession and the Press

188. The Minister of Health finally approved an agreed document submitted by the Conference of Representatives of the medical profession and the press on "Recommended Routine Procedure at Hospitals: Information to the Press about the Condition of Patients," which, together with a short covering memorandum by the Minister, was issued by the Ministry to Regional Hospital Boards, Boards of Governors of Teaching Hospitals, and Hospital Management Committees. The co-operation with the press has proved both constructive and useful, and the Conference is remaining in being to consider any questions which might arise in future.

Sir Charles Hastings Lecture

189. The first Sir Charles Hastings Lecture to be held outside London was delivered to an audience of over 1,000 by Sir Henry Cohen, now Lord Cohen of Birkenhead, at Leeds on April 24, 1956, on "The Conquest of Disease." The lecture, all the arrangements for which were undertaken locally in consultation with Head Office, was an outstanding success.

Increased Charges for Prescriptions

190. Widespread publicity was given to the Association's views of the hardship likely to be caused to patients suffering from chronic conditions, following the decision in October, 1956, to charge a shilling for every item of medicine prescribed for patients.

Public Relations in the Hospital Service

191. A proposal was received from N.A.L.G.O. that the B.M.A. should collaborate with it to develop better public relations in the hospital services. After considering the matter the Council is of opinion that no useful purpose would be served by such co-operation.

ARMED FORCES

Service Pay and Conditions

192. The Council has carefully considered the first report of the Waverley Committee, and has submitted observations upon it to the Ministry of Defence. It has been the consistent policy of the Association that remuneration in the armed Forces should not compare unfavourably with that in other branches of the profession, and the Council considers that the rates of pay proposed by the Waverley Committee are not competitive with medical prospects in civil life. The Ministry of Defence has been strongly urged to give close attention to the proposals on pay contained in the Association's memorandum of evidence to the Waverley Committee.

The Council is in agreement with much of the Waverley Report, but is opposed to the suggested division of the medical branches of the Army and Royal Air Force into two sections, specialist and administrative, as this would restrict the experience of individual medical officers who, in the event of war, might be called upon to perform tasks of a varied nature. The Council understands that the recommendations of the Waverley Committee are at present being studied by the Defence Departments and that specialist pay has already been introduced into the Royal Air Force.

Attention has been given by the Council to numerous other matters affecting the medical branches of the Armed Forces, including (a) the need for reviewing mileage allowances in the light of current conditions and the rates now payable to medical officers in the public health and hospital services, and (b) certain aspects of the Army pensions regulations which appear to bear inequitably upon medical officers.

ORGANIZATION

Association Membership

193. The Council submits the following report upon the membership of the Association for 1956:

New members	3,511	
Resignations withdrawn	148	
Reinstated	3	3,662
Removed in arrears	2,463	
Less paid arrears	1,704	759
Resignations		1,079
Deaths		595
Erased from Register		3
		2,436
		Increase 1,226
		68,926
Membership, December 31, 1955		70,152
Membership, December 31, 1956		

The membership of the Association in the United Kingdom represents 71% of the total profession and 80% of the working profession. The membership on March 27 was 69,544.

The apparent fall is due to the usual temporary adjustment caused by arrears in subscriptions.

It is noted that, for the first time, the membership of the Association has passed 70,000. To mark the occasion the 70,000th member was invited to the Council Dinner on November 6 and was presented with a copy of the *History of the British Medical Association*.

Although the membership position may be regarded as satisfactory, in that the overall figure continues to increase and the percentage figure remains steady, the Council continues to watch the position closely and to encourage recruitment in various ways. Current propaganda material is under review with a view to presenting to the practitioner, in a clear and concise form, the objects of the Association, its many activities, and the benefits to be derived from membership.

Honorary Secretaries

194. The Council, on behalf of the general body of members of the Association, desires again to express its deep appreciation of the services of the honorary secretaries of Divisions and Branches, upon whose loyal co-operation the effective local organization of the Association so largely depends. It has noted with considerable satisfaction a revival of activity and a general widening of the scope of activities in Divisions throughout the country.

The Annual Conference of Honorary Secretaries of Branches and Divisions in the United Kingdom in May, 1956, was a well-attended and successful event. The 1957 Conference will be held at B.M.A. House, London, on May 10. Dr. V. Cotton Cornwall, Honorary Secretary of the Merseyside Branch, will be in the chair.

Date of Annual Representative Meeting

195. The A.R.M., 1956, decided:

338. **Resolved:** That the Council be asked to consider changing the date of the Annual Representative Meeting from early summer to the autumn.

Under By-law 45 the decision as to the time and place of the Annual Representative Meeting in each succeeding year rests with the Representative Body, on the recommendation of the Council. In the event of a decision not being taken by the Representative Body, it is left to the Council itself to determine the date and time of the Meeting. Standing Order 103 of the Council prescribes the third week in July "as the most convenient week for the Annual Meeting and one which is now fixed by custom." Variations in this

date have been necessary in order to meet local convenience, but the A.R.M. has invariably taken place in June or July.

The Council has examined the advantages and disadvantages of continuing the existing procedure. It appreciates the difficulty inherent in holding large meetings at conference towns (especially seaside resorts) during the summer season. It feels, however, that if the Annual Scientific Meeting is to be held in conjunction with the A.R.M. the latter must continue to meet at the accustomed time. Not only would it be difficult to attract speakers to the Annual Scientific Meeting while the medical schools are in session, but it would be difficult in university centres to secure the essential accommodation for the large events connected with the Meeting.

Finally, change of the date of the A.R.M., as suggested, would necessitate drastic alteration in the Association's session and that of the local units without any compensatory advantages. The considered opinion of the Council is that the disadvantages inherent in postponing the A.R.M. for a period of three to four months far outweigh any possible advantages. The Council recommends:

Recommendation: That the existing procedure under which the date of the A.R.M. is determined be retained.

Membership of Council—Vacancies

196. The appointment as Chairman of Council of one of the "13" members of Council elected by the Representative Body has directed attention to the constitutional position in respect of the filling of the vacancy among the "13" members which might be considered under By-law 70 of the Association to have arisen. The opinion of counsel on the situation has been taken, and he has advised that it is within the power of the Council to decide not to fill the vacancy, but that if it desires to fill it, under the By-laws a Special Representative Meeting must be convened to seek guidance as to whether the vacancy is to be filled and by what means. It appears to the Council that any attempt to fill a vacancy so arising would be subject to so many anomalies and difficulties as to make the election a practical impossibility, and that for this reason a vacancy should be deemed not to have occurred. The Council recommends:

Recommendation: That in the event of one of the "13" members of Council elected under By-law 53 (c) by the elected Representatives at the Representative Meeting being appointed to the Chair of the Council, a vacancy among the "13" shall be deemed not to have arisen, and that By-law 70 be amended accordingly.

(The necessary amendment of the By-laws is contained in Appendix VI.)

Roll of Fellows of the Association

197. The A.R.M., 1956, adopted the following recommendations of the Council:

Recommendation: (a) That steps be taken to recognize, by the award of a special distinction, distinguished service given by members of the Association to their Division or Branch. (b) That for this purpose there be established a "Roll of Fellows of the British Medical Association," admission to which shall be governed by Regulations.

The Council has approved the following regulations:

Object of the Roll

To grant a distinctive status, recorded and recognized by the Association, for outstanding services given by members of the Association (whether in active practice or retired) to their Divisions or Branches. Such service to comprise purely local service, or local service combined with service given to the Association as a whole.

Criteria for Admission to the Roll

The criteria governing admission to the Roll are:

- (1) A minimum number of years of uninterrupted membership.
- (2) A minimum number of years as holder of an office, or offices, in a Division or Branch.
- (3) Distinguished service as a member of a quasi independent body such as a Local Medical Committee, Hospital Manage-

ment Committee, Faculty of the College of General Practitioners, Medical Practices Committee, etc.

(4) Outstanding achievement as a leader in negotiations at local level.

(5) Service to the Association as a whole—for example, Representative in the Representative Body, Member of Council, Member of Standing Committees.

Procedure for Admission to the Roll

(1) Admission to the Roll of Gold Medallists and Vice-Presidents of the Association to be automatic.

(2) Approval of the nomination to rest with the Council of the Association on the recommendation of the Organization Committee, with admission to the Roll by the Council.

(3) Admission to the Roll to be accompanied by a scroll setting out the reasons for the award and presented by the appropriate local unit of the Association.

(4) The award to be reported to the Annual Representative Meeting, with a citation at the Annual General Meeting.

(5) The Roll to be preserved in the archives of the Association.

(6) Application for admission of a member to the Roll to be made by a Division or Branch with the support of not less than three-fourths of those present and voting at a meeting of the Division or Branch, due notice of the proposal having been given. The application may be sponsored in the first instance by the Division Executive or Branch Council or by not less than three members of the Division or Branch.

Resident Medical Secretaries to Association Regional Offices

198. At the A.R.M. in 1956 discussion of a motion on this subject was deemed to be out of order under Standing Order 8 as the financial implications had not been considered. In view of further comments the Council has again examined the problem as a whole, including the financial aspect, and with the following motion, forwarded by the Manchester Division for the A.R.M., 1957, before it:

Motion by MANCHESTER: That notwithstanding the decision of Council, and the arguments set forth in Section 163 of the Annual Report, this Meeting requests Council to appoint Resident Medical Secretaries, acceptable to the members of the region concerned, to those areas possessing a Regional Office.

After a comprehensive review the Council reaffirms the views expressed in para. 163 of its Annual Report, 1955-6, namely:

"It appears to the Council that a scheme of resident medical secretaries to Regional Offices would offer advantages and disadvantages which may be summarized as follows:

Advantages

"(1) The main advantage is the personal service given by the resident medical secretary to the individual member—in effect 'bringing the Association to his doorstep.'

"(2) Closer contact between the consultants and the B.M.A. through visits to the Secretary at the Regional Office. The contact of these consultants through the normal regional machinery at the present time is remote.

"(3) Closer liaison with the Honorary Officers of Divisions and Branches and the assistance which could be given to Honorary Secretaries in their work, particularly in helping to revive inactive Divisions, etc.

Disadvantages

"(1) The loss of contact on the part of the regional medical secretaries with the headquarters medical activities, with detriment to the services which could be given to the region, as compared with those under the present arrangement. The position in Scotland is unique in that the Assistant Secretary in charge of the Glasgow Regional Office is within easy access of the Scottish headquarters in Edinburgh, spends a substantial proportion of his time there, and is Secretary of one of the main Scottish Committees—the General Medical Services Subcommittee. His contact with the Scottish headquarters is accordingly close and constant. This would not be possible in England and Wales. The resident medical secretary in the provinces, who would probably be serving a number of centres, would be in a much more isolated position unless he travelled frequently to London, where he would have no particular responsibilities in the way of committees, etc. Such an arrangement would be uneconomic and would entail heavy expenditure in travel. It would appear that the Scottish experiment has led to a drift of correspondence from Edinburgh to Glasgow, with which, because of his intimate contact with Edinburgh, the Assistant Secretary is able quite easily to deal. This would not

be the case in the provinces. With the infrequent contact with London, the regional secretary would have no alternative but to seek advice from headquarters regarding the replies or to forward communications to London, with consequent delay in receipt by the member of the information he sought.

"(2) The danger of divided loyalty where a resident medical secretary was responsible both to the units in his region and to the central Council.

"(3) The possibility that the duties involved would be insufficient to employ the resident medical secretary whole-time unless the area he covered was a very extensive one. This in itself might detract from the usefulness of the secretary.

"(4) The danger of interregional rivalry—one part of the region might make undue demands on his time, with detriment to the attention which he could give to other units in the region.

"(5) Lack of attraction of such a post to a medical man on the ground that it was not sufficiently satisfying or attractive without the headquarters work and responsibility to committees.

"(6) Loss of contact between the headquarters staff and the local units, which would be regrettable.

"(7) Difficulty of communication between the various centres in the region. In many instances it would be easier for a secretary to travel from London direct to a particular centre than across country from the regional headquarters.

"In its discussions the Council has considered possible repercussions of the appointment of medical secretaries resident in the provinces on the central office establishment, and has reached the conclusion that it is unlikely that it would be possible to reduce the headquarters medical staff. The Assistant Secretaries are available at all times to assist Branches and Divisions in their regions, and to travel to the various areas when invited. The arrangement appears to have worked well; there is no evidence of any widespread dissatisfaction with it throughout the country or of a general demand for the appointment of resident secretaries.

"The Council is strongly in favour of the continuation of the existing arrangement, and in expressing this view it would stress the dangers arising from decentralization of the work of the assistant secretaries; the difficulties of intercommunication within the regions; and the great advantage to all concerned of the "two-way traffic" between headquarters and the periphery. The Council feels, however, that in order to get the greatest advantage from this "two-way traffic" the visits of the Assistant Secretaries to their regions should be at regular intervals and made after due notice, in order that there may be opportunities for consultation with individual members.

"To sum up, the Council considers:

"(1) That the existing arrangement, under which assistant secretaries attached to the headquarters staff are responsible for defined regions of the country, and freely available on request for advice and consultations, or visits to a particular unit or units, is preferable to the appointment throughout the United Kingdom of resident medical secretaries on the lines of the Glasgow Regional Office.

"(2) That the assistant secretaries should make regular visits to centres in their regions in order to be available to individual members for the purpose of advice and consultation, after due notice to all concerned. Members of the central Secretariat visiting, by invitation, centres outside their regions would similarly be available for the purpose of advice and consultation."

The Finance Committee has examined carefully the financial aspect of the proposal to be submitted to the forthcoming A.R.M. in the Manchester motion, and, having considered its report, the Council, on purely financial grounds, is unable to recommend its approval at this stage.

Autonomous Bodies

199. In accordance with the provisions of Minute 27 of the A.R.M., 1950, the Council submits the usual recommendation for renewal in respect of the year 1957-8 of the autonomous powers of the General Medical Services and Central Consultants and Specialists Committees.

Recommendation: That the autonomous powers of the General Medical Services Committee and the Central Consultants and Specialists Committee be renewed in respect of the year 1957-8.

That the Representative Body looks to these Committees to ensure (1) that no action be taken by either which may prejudice the interests of another part of the profession without full prior consultation with the appropriate interests, and (2) that their autonomous powers will be used so as to expedite and not delay the work of the Association.

Position of the Newly Qualified Practitioner

200. The position of the newly qualified practitioner *vis-à-vis* the Association has received special attention during the past year. Means by which he may be made to feel that the Association takes a keen interest in his welfare and his particular problems have been discussed together with ways in which he may be encouraged to take an active part in central and local activities. Methods by which Association propaganda in the student and pre-registration stage may be strengthened and extended are also being explored.

The action taken by the Council in a number of matters affecting the provisionally registered practitioner is reported in paragraphs of this report under the heading "Hospital and Consultant Services." The position of the provisionally registered practitioner in the event of the refusal of the certificate of satisfactory service, which is essential for full registration, has been the subject of representations to the General Medical Council and the Licensing Bodies.

Compounded Subscription to Association of Newly Qualified Practitioners

201. The attention of the Council has been drawn to an anomaly in By-law 16 (1). This By-law was amended in 1954 with the intention of providing that a practitioner joining the Association in the year in which he qualified for provisional registration could, if he wished, compound into one lump sum of £10 10s. the Association subscription for the period during which he would normally pay a subscription at a specially reduced rate. As the By-law is now worded, however, the newly qualified member compounds the subscription for the five years commencing in January after the year in which he qualifies. Technically, therefore, he is due to pay either £1 1s. or £2 2s. for the remainder of this year, depending on the date of the final examination. This was not the original intention and the Council feels that the terms of the By-law should be adjusted to remove the anomaly. It recommends:

Recommendation: That By-law 16 (1) be so amended as to remedy the present inconsistency in respect of the compounded subscription payable by newly qualified practitioners. (The necessary amendment of the By-law is contained in Appendix VI.)

Convalescent Homes for Members of the Medical Profession

202. The A.R.M., 1956 (Minute 342), requested the Council to consider "ways and means by which a convalescent home or homes could be established for the use of members of the medical profession and their immediate relations." In doing so, the Council has had before it the opinion of counsel that under its objects the Association cannot "advance the personal interest of individual members of the profession by providing or assisting financially to establish or support a convalescent home"; further, that the funds of the Association could not be "expended in an appeal for funds to establish some organization to provide for, or in connexion with, such a home."

In view of this opinion, the Council has sought to ascertain whether there is in fact any widespread demand for such a project, which would in any event be difficult to organize and staff. It has failed to find any such evidence, and in these circumstances feels that members of the profession in general may safely be left to make their own arrangements. If, however, it is felt that some special arrangements are necessary for sick and needy members of the profession, then it suggests that the best way of meeting the situation would be, as at present, by the provision of monetary grants which would enable these practitioners to take a holiday away from their practices or homes.

The B.M.S.A. and the B.M.A.

203. The B.M.A. continues to maintain its close connexion with the British Medical Students' Association. At its

Annual General Meeting in November, 1956, the B.M.S.A. acknowledged its continued indebtedness to the British Medical Association for its generous help and wished it to be made clear that, though an expression of thanks is made each year, it is by no means a routine acknowledgment, but a genuine expression of appreciation.

Areas of Branches and Divisions

204. Approval has been given to the adjustment of areas in the following Divisions: the Divisions of the Malaya Branch; the Wellington Division of the New Zealand Branch; and the Barnet and West Herts Divisions of the Hertfordshire Branch.

Amendments to By-laws

205. Proposals are made in various paragraphs of this Report which necessitate alterations of the By-laws. The Council recommends:

Recommendation: That the By-laws of the Association be altered in the manner shown in Appendix VI.

CONSTITUTION OF THE ASSOCIATION

206. The special Constitution Committee, established on the instructions of the Representative Body in 1953, has completed its remit. Its Report, which was published in the *Supplement to the British Medical Journal* of February 23, 1957, and forms Appendix I of the Annual Report of Council, is submitted for consideration by the Representative Body.

SCOTLAND

Chairman and Deputy Chairman

207. Dr. W. M. Knox and Dr. G. W. Ireland were appointed Chairman and Deputy Chairman respectively of the Scottish Committee for the session 1956-7.

Conference of Honorary and Public Relations Secretaries of Branches and Divisions in Scotland

208. A conference of Honorary and Public Relations Secretaries of Branches and Divisions in Scotland was held in Edinburgh on October 10, 1956. Dr. J. M. C. Gill (Aberdeen and Kincardine Counties Division) presided in the absence, due to illness, of the appointed Chairman, Dr. J. C. Macarthur (Lanarkshire Division). Twenty-three Secretaries were present at the Conference and in addition the following also attended by invitation: The Chairmen respectively of the Scottish Committee, the General Medical Services Subcommittee (Scotland), and the Central Consultants and Specialists Committee (Scotland), the Scottish and Assistant Scottish Secretaries, Dr. Walter Hedgcock, Assistant Secretary, and the Press Officer to the Association in Scotland. Following an "Any Questions?" item, the Conference discussed the following subjects: (a) the best method of approach to "lapsed" or resigned members of the Association; (b) the work of the Medical Practices Advisory Bureau in Scotland and methods of improving liaison between the Bureau and Branch and Division Secretaries; and (c) facilities which members would like to have at Scottish House when it is reopened following reconstruction.

A recommendation from the conference that a further conference should be held in the autumn of 1957 was considered by the Scottish Committee at its meeting on January 15, 1957. The Committee, whilst appreciating the value of these conferences, felt it necessary to have regard to the present financial difficulties of the Association and resolved to defer a decision on the recommendation until a later date.

Report of Joint Committee on Technical Procedures to be Performed by Nurses

209. The Department of Health for Scotland sought the advice of the Committee in connexion with the advisability of circulating to nurse-employing authorities a report prepared by a Joint Committee of the Scottish Health Services

Council on Technical Procedures to be Performed by Nurses. After consultation with the G.M.S. Subcommittee (Scotland) and the Central C. & S. Committee (Scotland), the Committee informed the Department of Health that, although certain differences of opinion had been expressed by members of the profession in Scotland, the consensus of opinion was in favour of issuing the report to all nurse-employing authorities, provided it was made unequivocally clear to all concerned that the report was to be regarded as a guide and not as a directive, and that the responsibility for deciding what procedures a nurse should or should not undertake rested with the doctors in clinical charge of the patient.

Scottish Health Services Council

210. The Committee has accepted invitations from the Scottish Health Services Council to submit written evidence to two of their special committees, one on Laboratory Services and the other on Maternity Services in Scotland, and have appointed two *ad hoc* subcommittees to prepare their evidence.

Reconstruction of Scottish House

211. There has been some delay in the reconstruction work at Scottish House, but it is anticipated that the work will be completed by the end of March, 1957. This delay has, however, been financially advantageous to the Association as the cost of the reconstruction has been spread over a longer period. It is now estimated that the total cost of the reconstruction will be between £23,000 and £24,000, of which £12,000 has already been paid. In addition, the cost of furnishing the new Members' rooms in Scottish House will probably amount to approximately £3,000. Arrangements are being made for the official reopening of Scottish House on Thursday, May 2, 1957, when Dr. Alexander Hall, President of the Association, will perform the opening ceremony.

Visit of Scottish Doctors to Denmark

212. The Danish Institute has again issued an invitation, through the Committee, to doctors in Scotland to visit Denmark during the early autumn of 1957. Details of the programme are not yet available but will include visits to hospitals and universities. The cost of the trip will be approximately £44.

Medical Subcommittee of the Scottish Advisory Committee of the General Whitley Council for Health Services (G.B.)

213. It has been reported to the Committee that the Medical Subcommittee of the Whitley Scottish Advisory Committee has appointed two *ad hoc* subcommittees to consider (a) travelling and subsistence allowances for local authority medical officers in Scotland, and (b) fees for part-time services rendered by medical practitioners for local authorities in Scotland.

Reorganization of Branches on a Regional Basis

214. At the request of the Constitution Committee, the Scottish Committee gave careful consideration to the proposed reorganization of Branches on a regional basis, with particular reference to the suggested titles for the regional Branches. The Committee finally recommended to the Constitution Committee that the titles of the Branches in Scotland should be as follows: North of Scotland Branch; North-east of Scotland Branch; East of Scotland Branch; South-east of Scotland Branch; West of Scotland Branch.

Press Officer's Report

215. In presenting his annual report to the Committee, Mr. Jarvie, Press Officer to the Association in Scotland, stated that the prestige of the B.M.A. with the Scottish press was good and he had little difficulty in obtaining space in the various Scottish newspapers for news items issued by the Association. More than half the space given by the press

in Scotland to the Association's activities during 1956 had been concerned with matters other than remuneration.

Committees which Report to the Scottish Committee

(a) General Medical Services Subcommittee (Scotland)

216. On receiving the information that the Minister of Health and Secretary of State for Scotland proposed to appoint a committee of inquiry to investigate prescribing costs throughout the country, the Subcommittee informed the Department of Health that in the opinion of the profession in Scotland it would be advantageous to set up a separate committee of inquiry for Scotland to cover prescribing in all fields of the National Health Service. The Scottish Committee and the Central Consultants and Specialists Committee (Scotland) supported this proposal. The Ministers have therefore agreed that a separate committee of inquiry will be appointed in Scotland, and that the scope of the committee's investigations will cover prescribing in the hospital service.

The Emergency Call Service has been informed that the Subcommittee concurred with the views expressed by the General Medical Services Committee in the statement published in the *British Medical Journal* of October 6, 1956.

The Subcommittee considered a memorandum issued by the Department of Health in connexion with arrangements for the treatment of employees of hospital boards who are absent from work for long periods on account of illness. The Subcommittee was of the opinion that the implementation of the proposed arrangements might in some cases undermine the position of the patient's own general practitioner. Attention was drawn to the fact that the memorandum had been issued without prior consultation with the profession, and the Joint Consultants Committee (Scotland) has therefore been asked to discuss this matter with the Department of Health.

(b) Central Consultants and Specialists Committee (Scotland)

The Committee has appointed a special *ad hoc* subcommittee to prepare a report for submission to the Central C. & S. Committee (U.K.) setting out the arguments in favour of reverting to the previous position when hospital authorities were not held in law to be vicariously responsible for the clinical actings of doctors working in the hospital service, and the possible legislative steps by which this object could be achieved. The Subcommittee is awaiting advice from legal advisers expert in parliamentary procedure.

The Committee is concerned at the delay by the Health Ministers and the Joint Consultants Committee (U.K.) in reaching a conclusion on the future structure of hospital medical staffing. They therefore urged the Joint Consultants Committee (Scotland) to reopen discussions with the Department of Health for Scotland on hospital medical staffing, and this recommendation has been accepted by the Scottish Joint Committee.

The Committee has amended their terms of reference to make it clear that these cover matters affecting all members of hospital medical staffs.

WALES

217. The Welsh Committee, which includes representatives of all the Divisions and Branches in Wales and Monmouthshire, has met in Shrewsbury under the chairmanship of Dr. A. Maddock-Jones. It provides opportunities for discussion of all matters of special concern to practitioners in Wales.

Consultations are taking place with the Welsh Association of Local Medical Committees with a view to agreeing upon joint nominations to be submitted for general practitioner representation on hospital management committees.

The Annual Welsh Dinner is to be held in Newcastle upon Tyne on Friday, July 12.

MEDICAL BENEVOLENCE

218. The sum received during 1956 by the Charities Trust Fund of the Association for medical charities was £12,564, which is £324 less than that received during 1955. The

following statement shows the amounts collected and distributed during the 12 months:

	1956	
To Subscriptions and Donations collected for:	£	
(a) Royal Medical Benevolent Fund	3,568	
(b) Royal Medical Foundation of Epsom College	1,112	
(c) Royal Medical Benevolent Fund Society of Ireland	81	
(d) Sir Charles Hastings Fund	112	
(e) Dain Fund:	1,956	
(i) General Account	431	
(ii) Franklin Fund Account	4,425	
(f) Distribution at discretion of B.M.A. Charities Trust Fund	11,685	
	260	
.. Requests received and allocated to Medical Charities	619	
.. Subscriptions and Donations in respect of 1957 received in advance	£12,564	
	1956	
By Amounts distributed to:	£	
(a) Royal Medical Benevolent Fund:		
Earmarked contributions	3,568	
Allocated from Trust Fund	1,550	5,118
(b) Royal Medical Foundation of Epsom College:		
Earmarked contributions	1,112	
Allocated from Trust Fund	1,750	2,862
(c) Royal Medical Benevolent Fund Society of Ireland:		
Earmarked contributions	81	
(d) Sir Charles Hastings and Christine Murrell Funds:		
Earmarked contributions	112	
Allocated from Trust Fund	945	1,057
(e) Dain Fund:		
Earmarked contributions	1,956	
Allocated from Trust Fund	440	
Franklin Fund	431	2,827
	11,945	
.. Receipts in advance carried forward	619	
	£12,564	

The Council draws attention to the continuing need for medical benevolence and urges members of the Association to continue and increase their support of the benevolent funds. Copies of the leaflet "The Charities of the Medical Profession" are available from the Secretary. The Council notes with gratitude that once again the surplus from the Annual Welsh Dinner has been donated to the Charities Trust Fund. The Council appreciates the continued support given to the Dain Fund and the Sir Charles Hastings Fund. The Dain Fund assists in the education of sons and daughters of doctors; the Sir Charles Hastings Fund assists doctors in financial difficulty of a temporary nature.

The Council is exploring the possibility of registering the Charities Trust Fund as a charity in order that it may be authorized to accept seven-year covenants. It is anxious that wider publicity should be given to the name of the British Medical Association Charities Trust Fund in order that the correct description should be used in future wills.

MEDICAL FILMS

219. The Council is glad to report that the Association's film library continues to be well patronized. Copies of the following nine films have been added to the library:

- "My First Baby," copy purchased.
- "Gait" (two copies), presented by Imperial Chemical Industries Ltd.
- "Artificial Respiration," presented by Imperial Chemical Industries Ltd.
- "Examination of the Unconscious Patient," presented by Imperial Chemical Industries Ltd.
- "Removal of Clothing and Treatment of a Fractured Collar-bone," presented by Imperial Chemical Industries Ltd.
- "First Aid for a Patient with a Fractured Spine," presented by Imperial Chemical Industries Ltd.
- "Open Injuries to the Hand" (two copies), presented by Imperial Chemical Industries Ltd.
- "The Motion Picture in Medical Education," copy presented by the American Medical Association.
- "Allergic Diseases in Man," copy presented by C. L. Bencard Ltd.

The Council is greatly indebted to those who have kindly presented films to the Association in the past year.

Although high costs and the difficulties of making copies of films available remain as serious obstacles to the hiring of films to Overseas Branches, five films have been sent to Southern Rhodesia as an experiment and it is understood that they have been much appreciated.

The Council is unable to report progress on the production of the general film on rehabilitation, or the film on dermatology, for which detailed plans have been prepared, owing to financial considerations.

Arrangements are proceeding for the holding of a film competition for 16-mm. medical films in two categories—one for commercial and the other for non-commercial film producers. The closing date for the receipt of entry forms is June 30 and for the receipt of films September 30, 1957.

The Council has undertaken the revision of the catalogue of the film library and it anticipates that it will shortly be available in card index form at a cost of 15s., the subscription to cover the issue of approximately 20 supplementary cards. Cardboard containers for the cards will be sold separately.

In response to a request from the American Medical Association, the Council has submitted details of 10 British medical films for consideration for showing at an International Exhibition of Medical Films in New York in June, 1957.

OVERSEAS

H.M. Overseas Civil Service

220. The Council has noted the proposals of the Government in the "Statement of Policy regarding the Organization of H.M. Overseas Civil Service," published as a White Paper (Cmd. 9768) in May, 1956.

The White Paper, which is framed to take account of developments since the creation of H.M. Overseas Civil Service in October, 1954 (as announced in Colonial No. 306), contains two separate proposals. The first is for the creation of a "central pool" of officers having exceptional administrative or professional qualifications who would, if there were a sufficient demand for their services, be recruited into the regular employment of the United Kingdom Government for service overseas. So far as is known no action has yet been taken to implement this proposal. The second is that where an overseas territory approaching independence desires to retain the services of its existing expatriate staff these officers should be placed on a "Special List," in the service of the United Kingdom Government, and should be seconded to the employing government. Negotiations are in hand for the application of the Special List to Nigeria.

In the Council's view it is necessary for the well-being of the medical branch of the Overseas Civil Service that it should continue to be staffed largely by doctors who are prepared to make it their career. To this end, it is essential that officers already serving, or offering themselves for recruitment, should be assured that they will be given the opportunity of continuing in the Service and will, if necessary, be transferred elsewhere if the territory to which they are posted no longer wishes to retain expatriate officers in pensionable employment. The Council does not consider that financial terms, however generous, can adequately compensate an officer whose chosen career is cut off in its prime, and it is not satisfied that the arrangements so far made, or envisaged, give the individual officer sufficient security of tenure. In particular, it has been suggested that the medical branch of the Overseas Civil Service should be linked to the medical branch of the Home Civil Service. These matters have been discussed with representatives of the Colonial Office and of the Ministry of Health, and the Council will continue to do all in its power to secure the position of the officer holding an appointment in an overseas territory.

The Council is also following with interest various schemes which have been devised by certain universities and other organizations for improving the supply of officers of specialist status to overseas territories on short-term contracts by ensuring, as far as possible, that they will find re-employment in the United Kingdom on their return.

Malta

221. One of the terms of the agreement reached in April, 1956, between the Government of Malta and the Medical Officers' Union was that the Government medical service of Malta should be reviewed by an independent commission. Consequently a commission consisting of three members under the Chairmanship of Mr. L. Farrer-Brown visited Malta. The Council has received the Commission's report and has noted with particular interest the Commission's conclusion that the present system lacks sufficient safeguards against administrative decisions being improperly determined by political partisanship, and the recommendations for decentralizing the administration of the medical services and setting up a Medical Council and an Advisory and Executive Board. The Commission is against the creation of a whole-time salaried district medical service with no right of private practice and considers that staff whose duties are mainly clinical should not be classified as civil servants. In the Council's view, the report entirely vindicates the stand taken by the profession in the recent dispute.

Cyprus

222. The latest salary proposals received from the Government of Cyprus were considered to be satisfactory, and the new rates of pay were introduced, retrospective to January 1, 1956. The Government of Cyprus was removed from the "Important Notice" in the *British Medical Journal* last October.

Caribbean Council

223. The third meeting of the Caribbean Council of the B.M.A. was held in Trinidad in September and was attended by the Chairman of the Representative Body, to whom the Council has offered its congratulations on a most successful tour of certain of the Caribbean Branches. The matters raised in his reports have been taken up in the appropriate quarters.

The Council is also indebted to J. A. Pridham for a visit paid to the Bermuda Branch.

EMPIRE MEDICAL ADVISORY BUREAU

224. The Empire Medical Advisory Bureau, on behalf of the Association, welcomes and provides a personal advisory service to doctors from the Dominions and Colonies visiting the United Kingdom.

The use made of the Bureau continues at the high level of previous years. During 1956, 1,280 new inquirers either wrote to or personally visited the Bureau and a total number of 2,358 persons called at the Bureau seeking advice or assistance in one or more problems. In addition, several hundred old inquirers wrote for further information and advice.

The various aspects of postgraduate medical education are of main concern to the majority of new inquirers and information is given on higher qualifications, courses of instruction, hospital appointments, examinations, medical registration, and defence.

The "Summary of Regulations for Postgraduate Diplomas and Courses of Instruction in Postgraduate Medicine," compiled and produced by the Bureau, has been revised and reprinted as is usual each year. The "Summary" has been dispatched overseas to all Branches of the Association, affiliated associations, deans of medical faculties of Commonwealth universities, postgraduate committees, and editors of medical journals. These copies are intended for reference by overseas inquirers, and many tributes to their usefulness have been received.

Between three and four hundred doctors inquired about junior hospital appointments and advice was given on the types, grades, and availability of these.

Visits to hospitals, clinics, and special centres have been arranged through the co-operation of consultants and hospital authorities. A visit to a hospital was arranged for a group of 45 doctors at the request of the Indian Medical Association.

Many visitors have been met personally by the port health medical officers on arrival and a letter of welcome from the Bureau is sent to every visitor whose place and date of arrival are known. These attentions are much appreciated. Through the kind co-operation of authorities arranging courses of instruction, the Bureau is enabled to contact those overseas visitors, already arrived in the country, who do not know of the Bureau's facilities.

All requests by visitors for accommodation to be arranged in readiness for their arrival in the country have been met. In addition, the Bureau has helped visitors after arrival to secure furnished houses and flats. More than 200 doctors and families have been successfully assisted with the problem of accommodation.

Visitors have been enabled to meet colleagues from all parts of the Commonwealth, including senior members of the profession in the United Kingdom, at social functions arranged by the Bureau. "At homes" were held in London, Edinburgh, Liverpool, and Brighton, and a total of nearly 1,200 overseas doctors and wives were able to attend these. Many expressions of appreciation from guests have been received.

The Council is glad to report that the facilities for our overseas Commonwealth colleagues are so fully used.

INTERNATIONAL MEDICAL VISITORS BUREAU

225. The International Medical Visitors Bureau, established in 1950, provides a personal advisory service for medical practitioners desiring to visit the United Kingdom from countries other than those of the British Commonwealth.

More inquirers made use of the Bureau during the year than formerly, and the 408 new inquirers during 1956 came from 44 countries; among these inquirers were 51 Hungarian refugees.

In addition, requests were received from more than 500 doctors or their families for "holiday exchanges" or *au pair* visits.

Many of the inquirers wanted information concerning postgraduate courses of instruction and diplomas. Others sought information about hospital appointments in order to obtain experience of British medicine, and it is known that a few have been successful in obtaining hospital appointments and temporary registration.

Visits to hospitals, clinics, and other institutions were arranged at the request of some of the more senior visitors, and a visit to a teaching hospital was arranged for a group of 30 German doctors. The Bureau is much indebted for the co-operation of heads of departments, consultants, and other authorities in facilitating these visits.

Suitable accommodation has been found in London and the provinces for all visitors requesting this.

Many inquiries in the field "General Information" have been received and dealt with, and visitors are encouraged to make requests with a view to making their visit successful.

The 534 inquiries about "holiday exchanges" for themselves or their families or children and about *au pair* visits were received from doctors in Europe and in the United Kingdom. With the co-operation of national medical associations, the Bureau endeavoured to put the inquirers in touch with suitable contacts, and it is known that 194 "exchanges" were arranged.

The Hungarian refugee doctors who arrived in the United Kingdom during November and December sought the assistance of the Association, and the majority of them visited the Bureau. About half of them wish to remain in the United Kingdom and the remainder wish to go to other countries.

During the interim period when the doctors are learning English, finding out the necessary steps to obtain registration and the prospects of employment or seeking passages to other countries, the Bureau has been able to help them in various ways. Hungarian doctors and their families have been put in touch with U.K. doctors offering them hospitality. Others have been helped to find temporary hospital appointments or non-medical employment or to attend the hospital practice of U.K. hospitals. Information has been given about registration requirements and prospects in the

U.K. and licensing requirements in other countries. The Hungarian doctors have warmly expressed their appreciation of the help given by the Association in these ways.

The Council has pleasure in reporting the increasing use of the facilities of the International Bureau on behalf of colleagues from foreign countries.

INTERNATIONAL RELATIONS**British Supporting Group for W.M.A.**

226. On January 29, 1957, a British Supporting Group for the World Medical Association was inaugurated on the initiative of the Council. A Steering Committee is undertaking the preliminary organization of the Group and further details will be published in due course.

General Assembly of W.M.A.

227. The tenth General Assembly of the World Medical Association was held in Havana in October, 1956, under the presidency of Dr. J. A. Bustamante, of Cuba. The B.M.A. delegates were Dr. S. Wand and Dr. I. D. Grant, and the alternate delegates Dr. J. A. Pridham and the Secretary. The proceedings included the admission of the New Zealand Branch of the B.M.A. to membership of the W.M.A. and the approval of the appointment of Dr. J. A. L. Vaughan Jones as Chairman of the International Occupational Health Services Committee. Among the subjects discussed by the General Assembly were the design of a medical emblem for the protection of civilian doctors in time of war, the role of the medical profession in plans for medical care, and the organization of the *World Medical Journal*. The meeting also adopted a motion "that in all countries it is particularly important that in the budgets of national Governments the allocation of adequate funds for public health should receive a high degree of priority." On receiving a report of the activities of the International Congress on Medical Ethics and Medical Law the Assembly passed a resolution declaring "that it is primarily the function of the doctors of the world to formulate any Code of International Medical Law and that the W.M.A. is the only organization that can speak for the doctors of the world."

Second World Conference on Medical Education

228. The Programme Committee appointed by the W.M.A. is proceeding with the arrangements for the second World Conference on Medical Education, which is to be held in Chicago in 1959. The theme is to be "Medicine—a Life-long Study." Discussions will be arranged under four general headings—namely, basic clinical training for all doctors; advanced clinical training for general and specialty practice; training for research and teaching; and continuing medical education. The President of the Conference will be Dr. Raymond B. Allen, Chancellor of the University of California.

Protective Emblem for Civilian Doctors

229. The tenth General Assembly of the World Medical Association adopted a medical emblem to be used "in providing complete protection to civilian doctors, their assistants and medical civil defence units which are not and cannot be protected by the Red Cross under the Fourth Geneva Convention." The emblem is a "red straight vertical stick and a serpent represented by a sinuous line over the stick with two undulations on the left side and one undulation on the right side, displayed on a white field." The B.M.A. Council has approved the emblem in respect of doctors in the United Kingdom, and is making representations to the Government with a view to its official adoption.

Geneva Conventions

230. In accordance with Minute 374 of the A.R.M., 1956, the Council has renewed its representations to the Foreign Office concerning the ratification of the Geneva Conventions of 1949. The Foreign Office replied on January 22, 1957, that "it is intended to introduce the legislation necessary to enable Her Majesty's Government to ratify the

Geneva Conventions of 1949 as soon as the present exceptionally heavy legislative programme allows." Subsequently it was announced that the necessary legislation was to be introduced during the current session.

Visit to U.S.S.R.

231. At the invitation of the Ministry of Health of the U.S.S.R. and the President of the Academy of Medical Sciences the Council arranged for a party of British doctors to visit the Soviet Union in August, 1956. It consisted of Dr. Mary Esslemont, Mr. Ian Fraser, Dr. J. G. M. Hamilton, Sir Geoffrey Jefferson, Dr. Ralston Paterson, and Professor G. W. Pickering, with Dr. Alexander Duddington as interpreter. A report on the visit appeared in the *British Medical Journal* of November 3, 1956.

Anglo-American and Anglo-Canadian Exchange Schemes

232. The schemes which enable a small number of British doctors to visit the U.S.A. and Canada in exchange for visits to this country by American and Canadian doctors have been continued. Two British doctors have visited Canada and two the United States, while two Canadian doctors have visited Great Britain.

OTHER ASSOCIATION ACTIVITIES**Medical Practices Advisory Bureau**

233. The work of the Bureau in both the Agency and Advisory Departments has been well maintained during 1956. In the Agency section, in which introductions in the field of general practice are predominant, there are inappreciable fluctuations in the number and type of opening dealt with. This makes comparison with previous periods somewhat unreliable, but it can be stated with some confidence that the position is stable and that there is no marked trend in either direction. The ratio of ordinary assistantships to assistantships with view to partnership remains constant at about 3:1, but there is evidence to suggest that, since more principals are loath to bind themselves by promises even when they are seeking partners, the actual number of introductions which lead to partnerships is increasing.

The second inquiry into unemployment and under-employment showed no significant change. So far as involuntary unemployment is concerned, the figure of 5% to 7% in a selected group of those seeking openings in general practice implies that the amount of actual unemployment in the working profession as a whole is very small and that some of the exaggerated statements made are unjustified. On the other hand, the evidence supports the contention that there are too many young practitioners in appointments which offer no early prospect of establishment in the field of practice of their choice. It is perhaps significant that the number of inquiries about practices and appointments overseas is increasing. The number of openings in the Commonwealth and elsewhere, excluding temporary appointments, remains fairly constant and the Bureau continues to deal with a large variety of practices and appointments in all parts of the world.

The advice of the Bureau is sought on a wide range of personal problems, of which perhaps the majority are concerned with prospective partnerships or the contract between principal and assistant. The Bureau supplies a model form of agreement between principal and assistant (adaptable to traineeships) free of charge to members of the Association. Though no model form is possible in the case of partnerships, advice from the point of view of the doctor rather than of the lawyer is freely available.

"British National Formulary"

234. The work of revising the 1955 edition of the *National Formulary* has continued, and it is expected that the next edition, which will be entitled *British National Formulary* to avoid confusion with the *National Formulary U.S.A.*, will be published on August 1, 1957. An alternative edition, with

the preparations grouped according to their pharmacological action, and a revised *Dental Practitioners' Formulary* will also be published on or about that date.

In the course of this revision it has become clear that a number of difficulties will arise for prescribers and dispensers and the lay public as a result of the change from the apothecaries system to the metric system which is to take place in 1963. In order to smooth out these difficulties in good time the Council has decided to invite the Pharmaceutical Society to join the Association in discussions with other interested bodies with a view to initiating appropriate action.

Medical Act

235. An *ad hoc* committee has been appointed to consider and report on the following Minute 345 of the A.R.M., 1956:

Resolved: That in view of the decision of the General Medical Council to promote a Consolidation Bill for the approval of Parliament, the Council be requested to examine and report on the working of the Medical Acts 1858-1950, with special references to the difficulties attendant upon provisional registration, disciplinary procedure, and elective representation of the profession, and to take any urgent action that appears necessary and desirable.

Now that the "Consolidation Bill" has received the Royal Assent and is the Medical Act, 1956, this resolution is not entirely appropriate. The resolution is therefore being interpreted as referring also to the 1956 Act and as if the words "in view of the decision of the General Medical Council to promote a Consolidation Bill for the approval of Parliament" had been omitted. In addition to the above resolution, attention is being given to the following Minute 387 of the A.R.M., 1956:

Resolved: That the following motion be referred to the Council for consideration:

That this Meeting considers that B.M.A. headquarters should circulate to members the names and a short history of all candidates nominated by Divisions for election to the General Medical Council and that the B.M.A. nominations should not be limited to the number of vacancies on the Council.

Rehabilitation

236. The Council has considered the Report of the Government Committee of Inquiry, under the chairmanship of Lord Piercy, on the Rehabilitation, Training, and Resettlement of Disabled Persons. It is gratified to find that many of the recommendations and opinions which the Council put forward in its Memorandum of Evidence have been accepted by the Piercy Committee. Some of the matters raised in the Committee's Report require, in the Council's view, fuller consideration, and an opportunity is being sought to discuss these with the Ministry of Health. In the meantime the Council has invited postgraduate deans to consider including in the courses arranged for general practitioners a session on the potentialities of aftercare and other facilities for rehabilitation, and including in programmes of meetings for specialist groups papers on rehabilitation as applied to the particular subject under discussion.

Capital Punishment

237. In response to a request from the Home Office the Council offered its views on the proposed introduction into English law of the doctrine of diminished responsibility for murder. This principle, which is now incorporated in the Homicide Act, was recommended by the Council in its Memorandum of Evidence to the Royal Commission on Capital Punishment in 1950.

Control of Medical Manpower

238. The Council has continued to provide secretarial and clerical assistance and other facilities for the two Central Medical Recruitment Committees, and has recovered three-quarters of the cost from the Government. It has also maintained the Emergency Register of the medical profession.

Control of Milk Production

239. In 1949 the Councils of the B.M.A. and the National Veterinary Medical Association (now the British Veterinary Association) approved a report on the Provision of Safe Milk of High Quality which had been prepared by a Joint Committee appointed by the two Associations. Paragraph 54 of the Report stated:

The Committee does not consider that the Health Committee and medical and sanitary officers of the local authorities can adequately be replaced by a new set of persons having an agricultural bias and without the training and experience which alone can give a reasonably sound outlook on the importance of the health aspect.

In May, 1956, the B.V.A. informed the Ministry of Agriculture, Fisheries, and Food that it supported the recommendation of the Arton Wilson Committee that the "Milk Production Officers of the County Agricultural Executive Committee should be transferred to the Veterinary Service," but the B.M.A. was not informed of this unilateral action, which was taken without prior consultation with the B.M.A., until February, 1957. The Council has since reaffirmed the policy laid down in paragraph 54 of the Report on the Provision of Safe Milk of High Quality.

Joint Committee of the B.M.A. and the Magistrates' Association

Attempted Suicide

240. The Council referred to the Committee the following Resolutions of the A.R.M., 1956:

393. **Resolved:** That this Meeting notes with concern the fact that in recent years a considerable number of people have been imprisoned for attempting suicide. It supports the statement of the Joint Committee of the B.M.A. and the Magistrates' Association in their report on Attempted Suicide and the Law (1947) that "There is a strong case for an amendment of the law so that attempted suicide (excluding suicide pacts or incitement of another person to commit suicide) would not be dealt with as a legal offence" and expresses its satisfaction that the Committee is giving further consideration to the matter.

394. **Resolved:** That as a matter of urgency Council should consider the need for further discussion with the Magistrates' Association of the treatment of attempted suicide, particularly as the majority of these cases are in need of psychiatric treatment.

The Committee has considered statistics for the years 1946-55 showing the number of cases of attempted suicide known to the police, the number brought before the courts, and the results of proceedings; and a report of informal inquiries regarding the procedure adopted in hospitals when cases of attempted suicide are received.

The present position, compared with that at the time of the report on the subject in 1947, is not sufficiently altered to warrant further extensive inquiries. The Council thinks, however, that there remains support for the recommendation that the law should be amended so that attempted suicide (excluding attempted "suicide pacts" or incitement of another person to attempt suicide) would not be dealt with as a legal offence.

Whilst it is not at present practicable to press for amendment of the law in this respect, it is agreed that attention should again be drawn to the 1947 report and the more recent statistics, in the hope that persons who have attempted suicide may be dealt with as satisfactorily as the present law permits.

A short statement along these lines is therefore being prepared for submission to the medical press and the journal of the Magistrates' Association.

Problem of the Chronic Alcoholic Patient

The Council has had before it the following resolution of the A.R.M., 1956:

395. **Resolved:** That this Meeting considers that the problem of the chronic alcoholic patient with regard to discharge from treatment and subsequent relapse should be a matter for consideration between the B.M.A. and the Magistrates' Association with a view to alteration of the law.

The Council was informed that the Home Secretary's Advisory Council on the Treatment of Offenders was considering possible alternatives to short sentences of imprisonment, and, in this connexion, would be giving attention to the alcoholism. In view of this, and of the fact that the Council's Committee on Drug Addiction had under consideration the inclusion of alcoholism in its deliberations, it was agreed that discussion of the subject by the Joint Committee of the B.M.A. and the Magistrates' Association should be deferred.

Medical Reports to Courts

The Committee has considered a suggestion that it should prepare a memorandum on medical reports to courts, and it has been agreed that this would be valuable both to doctors and to magistrates. A Subcommittee has been appointed to prepare a draft memorandum on the subject.

Inquiry into Law Relating to Children and Young Persons (Ingleby Committee)

241. The Council has appointed a committee to prepare evidence for submission to the Departmental Committee (under the Chairmanship of Lord Ingleby) appointed by the Home Secretary to inquire into the law relating to children and young persons. The committee is taking as a basis for its discussions the Report on Cruelty to, and Neglect of, Children, prepared by the Joint Committee of the B.M.A. and the Magistrates' Association and published in 1956.

Catering

242. An increasing number of members and their guests are taking advantage of the facilities available in the Hastings Room. The Council has therefore continued the full-time waitress service in this room to enable visitors to B.M.A. House to obtain morning coffee, tea, and alcoholic drinks within the licensed hours.

The luncheon service provided in the members' dining-room continues to attract a large number of regular users and at the same time meets the needs of the fluctuating number of members attending committee meetings. The continued rise in the cost of foodstuffs and increased wage scales have necessitated some small advance in the price of meals served. It is the intention of the Council that this service should operate on a "break even" basis so that members of the Association can continue to obtain meals at prices which compare favourably with those charged in comparable establishments.

S. WAND,
Chairman of Council.

APPENDIX I REPORT OF THE CONSTITUTION COMMITTEE OF THE ASSOCIATION

(See B.M.J. Supplement, February 23, 1957.)

APPENDIX II RESOLUTIONS OF A.R.M., 1956—SUMMARY OF ACTION TAKEN

(The paragraph numbers relate to the main part of the Council's Report)

Subject	General	Action Taken
Book of Valour (Min. 25).		Book now being prepared. (Para. 9.)
Accommodation at 1958 Annual Meeting (Min. 339).		Action unnecessary in view of change in venue. (Para. 4.)
Medal of the Association (Min. 341).		Resolution implemented. (Para. 3.)
Consultation with the profession (Min. 346).		Resolution noted. (Para. 15.)
Summary of Annual Report (Min. 337).		Inadvisable and uneconomical. (Para. 20.)
General Medical Services		
Education of public in health matters (Min. 83).		It is not considered that time is appropriate to pursue this matter. (Para. 58.)
Monthly payments (Min. 129).		Discussions proceeding. Ministry investigating possibilities of introducing monthly payments. (Para. 22.)
Supplementary annual payments (Min. 130).		No action taken. Object of scheme of supplementary annual payments was to protect position of those adversely affected by new distribution scheme in 1953. (Para. 22.)
Reinstatement of ex-Service men on doctors' lists (Mins. 134, 136).		Agreement reached with Ministry of Health on a satisfactory method of dealing with this problem. (Para. 31.)
Machinery for filling practice vacancies (Min. 140).		No further action for the present, following discussions with Ministry. (Para. 23.)
General-practitioner maternity beds (Mins. 144, 145, 150).		Further representations made to Ministry, and need for increasing number of general-practitioner maternity beds emphasized in evidence to Cranbrook Committee. (Para. 32.)
Post-mortem examinations (Mins. 152, 153).		Where pathologist agrees, transport costs will be met by hospital. Extension of post-mortem facilities on lines indicated in R.B. resolution under consideration. (Para. 47.)
Service Committees and Tribunal Regulations (Min. 168).		Position will be reviewed when Regulations are next amended. (Para. 55.)
Practice accommodation (Min. 169).		Considered by special subcommittee which is to discuss the whole problem of accommodation with the Ministry. (Para. 26.)
Employment of general practitioners in hospitals (Mins. 177, 181, 182).		Under consideration; to be dealt with in Supplementary Annual Report.
Employment of general practitioners in hospitals (Min. 183).		Further representations made to Ministry on improvement in number of G.P. beds. (Para. 42.)
Poliomyelitis vaccination (Min. 189).		Discussed with Ministry. General practitioners to participate in present arrangements. (Para. 46.)
Combined diphtheria-pertussis immunization (Min. 193).		Possibilities of implementing suggestion still under consideration. (Para. 45.)
Trainee General Practitioner Scheme (Min. 200).		Proposal considered undesirable and no action taken. (Para. 33.)
Economy in prescribing (Min. 209).		Necessary arrangements made with Ministry of Health. (Para. 37.)
Economy in prescribing (Min. 210).		Will be brought to the notice of Ministry Committee investigating prescribing costs. (Para. 36.)
Loans for provision of surgery accommodation (Min. 213).		Not practicable at present time and in view of insufficiency of funds. (Para. 27.)
Insurance benefit during part-time employment (Min. 215).		Ministry of National Insurance regard as impracticable and no further action to be taken. (Para. 52.)

Subject	Action Taken	Subject	Action Taken
General Medical Services—continued			
Appliances (Min. 216).	List of replacement appliances prescribable by general practitioners is under review with view to extension. (Para. 41.)	Hospital and Consultant Services—continued	
Provision of therapeutic substances for use in emergency (Min. 217).	Brought to notice of the Ministry. (Para. 40.)	Internal administration of hospitals (Mins. 247, 249).	Tripartite system of hospital administration works satisfactorily in many hospitals. Council considers system should not be rejected provided medical staff has dominating voice in clinical matters. (Para. 71.)
National insurance certificates (Min. 218).	Regarded as impracticable by the Ministry of National Insurance. (Para. 50.)	Domiciliary consultation arrangements (Mins. 267, 276, 277, 313).	So far as practicable domiciliary service should be a consultant service. Council does not favour payment of fees to whole-time teachers with honorary hospital contracts. Maximum payment for domiciliary consultations under consideration, but Council considers no special case for rural consultants. N.H.S. Act precludes extension of domiciliary service to nursing-homes. (Para. 80.)
Medical Practices Committee certificates (Min. 220).	Discussed with M.P.C. No further action necessary. (Para. 24.)		Still under consideration (Para. 81.)
R.M.O. examinations (Min. 222).	In practice would extend period of sickness benefit at heavy cost. No further action. (Para. 54.)		Under discussion in Whitley Committee B. (Para. 82.)
Compensation and Superannuation			
Advance payment of compensation and increase of rate of interest (Mins. 156, 157, 158).	On advice of counsel action has been postponed. (Para. 59.)	Domiciliary consultations by whole-time consultants (Mins. 272, 273).	Still under consideration (Para. 90.)
Review of superannuation schemes, with special reference to the responsibilities of the young practitioner (Min. 161).	Council considers benefits are not unreasonable in relation to contributions payable. (Para. 60.)	Domiciliary consultations by chest physicians (Min. 274).	Joint Committee asked to press Government for amendment of Schedule E expense rules. Staff Side of Committee B asked to reopen discussions on payment of allowances. (Para. 86.)
Widows' pensions (Min. 162).	No change recommended. (Para. 65.)	Study leave (Min. 279).	New standard charges agreed. Minimum standards of board and accommodation under discussion. (Para. 85.)
Pensions for practitioners who retire before age 60 after 20 years' service (Min. 163).	Council decided it would be unwise to ask for amendment of Superannuation Scheme in this way. (Para. 61.)	Whole-time doctors and income tax (Mins. 281, 282, 283).	Still under consideration.
Attributable illness (Min. 301).	Under consideration.	Board and lodging (Mins. 284, 285).	
Hospital and Consultant Services			
Employment of general practitioners in hospitals (Min. 184).	Council will press for review of personal grading of general practitioners holding 10 (b) appointment, in any future review of hospital medical staff. (Para. 99.)	Geriatric unit; treatment and rehabilitation of chronic disablement (Mins. 288, 290, 291).	Representations made to Ministry as instructed by R.B. (Para. 103.)
Remuneration of hospital medical staff (Mins. 238, 263).	Council suggested to Negotiating Committee that pensions of retired practitioners should be reviewed <i>pari passu</i> with remuneration of active practitioners. (Para. 79.) Staff Side, Committee B informed of Representative Body's view regarding house officer's remuneration. Fuller report to S.R.M. (Para. 79.)	Acute mental illness (Min. 299).	Pre-registration posts in mental hospitals not approved except where adequate scope and supervision for house-physician's appointment. Time taken for full registration being watched. (Para. 100.)
Distinction awards (Min. 239).	Council does not consider abolition of distinction awards desirable. (Para. 78.)	The newly qualified practitioner: pre-registration posts (Mins. 303, 304).	New draft proposals under consideration. (Para. 74.)
Senior hospital medical officers (Mins. 247, 251, 256, 258, 261).	Representations for further review of S.H.M.O.s resisted by Ministry. S.H.M.O.s occupying consultant posts to be reviewed by Committee B with view to payment on consultant scale in approved cases. Council does not oppose creation of S.H.M.O. posts within scope of grade as agreed with Ministry, pending outcome of discussions on hospital staffing. Salary of S.H.M.O. grade will be reviewed in light of changes in hospital staffing. (Para. 77.)	Statutory registration of medical auxiliaries (Min. 308).	Representations by Joint Committee to Ministry in support of resolution (Para. 92.)
		Cremation certificates (Min. 311).	Legal implications and possible action under consideration. (Para. 83.)
		Legal liability of doctor in the N.H.S. (Min. 315).	Council does not oppose offer of additional sessions, or alternative appointment in cases of redundancy, without advertisement. (Para. 70.)
		Procedure for appointment of consultants and S.H.M.O.s (Min. 316).	Adequate junior staff one of primary factors in hospital medical staffing discussions. (Para. 91.)
		Hospital residents: hours of work (Min. 317).	C.C. and S. Committee's policy that hospital staff should have choice of whole-time service, or part-time service with right to private practice. (Para. 87.)
		Whole-time hospital medical staff and private practice (Min. 318).	

Subject	Action Taken	Subject	Action Taken
Hospital and Consultant Services—continued			
Remuneration policy (Mins. 320, 321, 322, 326, 328, 332, 333).	Representations to University Grants Committee in accordance with Min. 328. (Para. 76.)	Reaffirmation of policy of anonymity in broadcasting (Min. 228).	Policy brought to notice of all inquirers on the subject.
National major casualties service (Min. 344).	Still under consideration.	Drugs for private patients (Mins. 54, 55).	Council has accepted the Minister of Health's suggestion of discussions with his officers. (Para. 142.)
Statutory and "item-of-service" fees (Min. 349).	Staff Side of Committee B asked to review item-of-service fees payable under terms and conditions of service. Other fees largely revised. (Para. 96.)	Fees for part-time medical services for Government Departments (Min. 57).	Minimum fee for extract from medical practitioner's record increased from 5s. to 7s. 6d. (Para. 143.)
Reform of the National Health Service			
Education of public in use of National Health Service (Min. 382).	Representations made to Ministry of Health. (Para. 105.)	Medical examination of elderly drivers (Min. 65).	Proposals unacceptable to Accident Officers Association. (Para. 144.)
Code of conduct for patients (Min. 380).	No action recommended. (Para. 104.)	Fees for police calls (Min. 67).	Divisions in England and Wales requested to negotiate with police authorities locally. (Para. 145.)
Occupational Health			
Certificates for short illnesses (Min. 72).	Reported to Treasury, Ministry of Pensions and National Insurance, nationalized industries, and British Employers' Confederation with a request for their reactions. (Para. 115.)	Medical examination for life assurance (Min. 69).	Council satisfied that resolution is being implemented as far as possible. (Para. 146.)
Administration of morphine by nurses in industry (Min. 356).	Home Office has been urged to reconsider its decision. (Para. 112.)	Certificates for absent voters (Min. 71).	Certificate amended by Home Office. (Para. 147.)
Use of antibiotics or chemotherapy by nurses (Min. 359).	Association of Industrial Medical Officers, Association of Certifying Factory Surgeons, and Royal College of Nursing informed of views of A.R.M. (Para. 113.)	Accidents, compensation (Min. 348).	Practitioners advised of risks and of need for adequate insurance cover. (Para. 148.)
Public Health			
Married women doctors and public medical appointments (Min. 75).	Advertisements not accepted for B.M.J. if they fail to conform with the policy laid down. Principle has been accepted by Committee C. (Para. 135.)	Statutory and "item-of-service" fees (Mins. 349, 350).	Review of such fees is being, and will continue to be, undertaken by the Council. (Para. 149.)
Pure milk (Min. 76).	Council believes the general position is not really unsatisfactory, but will reconsider undertaking a full-scale inquiry after the new Milk Regulations have come into force. (Para. 129.)		Minute 350 under consideration.
Annual leave for public health medical officers (Min. 78).	Referred to Staff Side of Committee C. (Para. 137.)	"British Medical Journal"	
Air pollution (Min. 79).	Reported to the Ministries of Housing and Local Government, Fuel and Power, and Health. December 31, 1956, fixed as appointed day for many of the provisions of the Clean Air Act (including those dealing with smoke-control areas). (Para. 132.)	Publication of Supplement (1) in separate form or (2) in centre of Journal (Min. 39).	(1) Too expensive at present. (2) Not popular with readers. (Para. 156.)
Immigrants and communicable diseases (Min. 80).	Representations still being made to the Ministry of Health. (Para. 130.)	Finance	
Tetanus immunization (Min. 82).	Ministry of Health has agreed to consider the representations made. Report by the Medical Research Council expected shortly. (Para. 133.)	Subsistence allowance (Min. 44).	An allowance for members attending centrally arranged meetings of Committees, Subcommittees, Council, Conferences, and the Annual and Special Representative Meetings has been in operation since the close of the Annual Meeting, 1956. (Para. 165.)
"Health nurses" (Min. 84).	Council does not consider it wise to take any action at this stage. (Para. 134.)	Science	
Remuneration of public health medical officers (Min. 325).	Ministry of Health urged to set up independent committee of inquiry but no decision yet received. (Para. 122.)	Preservation of freedom in prescribing (Min. 20).	Resolution noted. (Para. 171.)
		Condemnation of any Government action which might curtail freedom in prescribing (Min. 21).	Resolution noted. (Para. 171.)
		Restraint in use of new drugs pending therapeutic trials (Min. 117).	Implementation considered impracticable. (Para. 171.)
		Observance of existing law in respect of diesel fumes (Min. 118).	Representations made to Government. (Para. 170.)
		Compulsory use of crash helmets (Min. 120).	Deputation sent to Ministry of Transport. (Para. 177.)
		Abolition of library postal charges (Min. 121).	Implementation impracticable in view of financial position. (Para. 172.)
		Courses on medical implication of modern weapons (Min. 343).	Discussions proceeding with appropriate Government Department. (Para. 173.)
		Consultation with Association in preparation of first-aid manuals (Min. 357).	Suggestions made for improvements in new first-aid handbook. (Para. 174.)

Subject

Action Taken

Public Relations

- Poliomyelitis vaccination (Min. 190). Action considered unnecessary. (Para. 187.)
- Fire dangers in home and factory (Min. 351). Resolution communicated to Home Office. (Para. 186.)

Armed Forces

- Steps to improve remuneration where current levels deter recruitment (Min. 321). Ministry of Defence strongly urged to pay close attention to Association's recommendations to Waverley Committee. (Para. 192.)
- Assumption by Council of fuller responsibility for future remuneration claims (Min. 332). Resolution welcomed by the Armed Forces Committee. (Para. 192.)
- Preparedness of Council to negotiate directly at request of any section of the profession (Min. 333). Resolution welcomed by the Armed Forces Committee. (Para. 192.)

Organization

- Date of A.R.M. (Min. 338). Council recommends continuation of existing procedure for determining date. (Para. 195.)
- Roll of Fellows of Association (Min. 93). Regulations governing admission to Roll framed. (Para. 197.)
- Convalescent homes for members of medical profession (Min. 342). Not considered to be a practicable proposition. (Para. 202.)

International Relations

- Geneva Conventions (Min. 374). Representations made to Foreign Office. Legislation for ratification awaiting Parliamentary time. (Para. 230.)

Arbitration Machinery

- Alternative to Industrial Court (Min. 327). Under consideration.

Other Association Activities

- Review of Medical Acts (Min. 345). Special committee appointed. (Para. 235.)
- Review of procedure for the support of candidates for the G.M.C. (Min. 387). Under consideration by special committee set up to consider and report on working of Medical Acts. (Para. 235.)
- Law in relation to attempted suicide (Mins. 393, 394). Position reviewed, and statement is to be published. (Para. 240.)
- Problem of the chronic alcoholic patient (Min. 395). Consideration deferred pending report of other inquiries on the subject. (Para. 240.)

APPENDIX III

RETURN OF ATTENDANCES OF COUNCIL

Name	Attendances	
	Actual	Possible
S. Wand, Birmingham (Chairman of Council)	6	6
Alexander H. Hall, Hove (President)	6	6
I. D. Grant, Glasgow (Chairman of Representative Body)	6	6
L. Dougal Callander, Doncaster (Treasurer)	6	6
T. C. Routley, Toronto (Immediate Past-President)	2	2
Weldon P. T. Watts, Newcastle upon Tyne (President-Elect)	5	6
A. Beauchamp, Solihull (Deputy Chairman of Representative Body)	5	6
E. A. Gregg, London (Immediate Past Chairman of Council)	4	6
Abel, A. Lawrence, London	5	6
Alexander, H., London	5	6
Arthur, J. C., Gateshead	6	6
Barker, A., Whitstable	6	6
Barnes, W. E., Brighton	6	6

Appendix III—continued

Name	Attendances	
	Actual	Possible
Britton, C. J. C., London	4	6
Brown, Alexander, Linton, Cambs	6	6
Brown, David, Liverpool	6	6
Chalke, H. D., London	5	6
Clarke, C. Belfield, London	3	6
Cottrell, J., Grimsby	4	6
Dahne, S. F. Logan, Caversham, Reading	5	6
Dain, H. Guy, Birmingham	5	6
Davies, T. W., Swansea	6	6
Dawson, E. C., Derby	6	6
Dickson, N. S., Templepatrick, Co. Antrim	5	6
Dornan, W. E., Sheffield	5	6
Douglas, N., Hamilton, Lanarks	6	6
Dowse, C. J. A., London	6	6
Esslemont, Mary, Aberdeen	5	6
Forbes, R., London	5	6
Formby, Myles L., London	5	6
Fraser, Ian, Belfast	3	6
Garnham, P. C. C., Farnham Common	2	6
Gerrard, E. A., Manchester	6	6
Gibbons, L. A., Reigate	6	6
Gibson, R. G., Winchester	5	6
Gillie, Annis, London	6	6
Gough, A. Staveley, Watford	6	6
Gray, F., London	6	6
Hale-White, R., London	4	6
Hamilton, James, Oxford	4	6
Hamilton, J. G. M., Edinburgh	6	6
Harrower, Catherine, Glasgow	6	6
Heywood-Waddington, W. B., Littlehampton	6	6
Innes, I. G., Hull	6	6
Ireland, G. W., Ford, Midlothian	6	6
*Jones, Isaac, London	3	5
Jones, I. M., Sunderland	6	6
Jones, J. A. L., Vaughan, Leeds	6	6
Jones, Leslie W., Anglesey	5	6
Knox, W. M., Glasgow	6	6
Langston, H. H., Winchester	4	6
Macarthur, J. C., Carlisle, Lanarks	3	6
McCallum, J. L., London	6	6
McFeely, J. C., Dublin	5	6
Mathias, A. N., London	6	6
Mekie, D. E. C., Edinburgh	5	6
Moody, J. A., Ilford	6	6
Nicholson-Lailey, J. R., Taunton	5	6
Owen, D. R., Chester	5	6
Pracy, D. S., Atherstone, Warwicks	6	6
Pridham, J. A., Weymouth	6	6
Rees, J. O. M., Guildford	6	6
Rogers, A. Talbot, Bromley	4	6
Rose, F. M., Preston	6	6
Rowe, J. B. W., Harrow	6	6
Russell, A. V., Wolverhampton	6	6
Scott, Alexander, Ayr	6	6
Scott, S. Noy, Plympton	5	6
Sellers, T. Holmes, London	6	6
Sutherland, H. H. D., London	6	6
Thomas, Sir Tudor, Cardiff	5	6
Tilley, J. B., Newcastle upon Tyne	5	6
Woolley, W., Bristol	5	6
Wright, A. Dickson, London	4	6

* Died, March, 1957.

APPENDIX IV

FUTURE OF THE CHEST SERVICES.—
MEMORANDUM BY THE CHEST SERVICES
SUBCOMMITTEE OF THE CENTRAL CON-
SULTANTS AND SPECIALISTS COMMITTEE

Introduction

In January, 1956, the Central Consultants and Specialists Committee appointed the Chest Services Subcommittee "to consider and report upon special problems affecting the chest services." At its first meeting the Subcommittee agreed that, in addition to dealing with the particular matters referred to it by the Central Consultants and Specialists Committee, it should discuss and prepare a memorandum on the future of the chest services. To assist it in this task it co-opted additional members with particular interest and knowledge of the subject. This memorandum has therefore been prepared by a Subcommittee under the Chairmanship of Dr. Peter Edwards.

The Development of the Chest Service Between
1948 and 1956

1. In 1948 the local authority tuberculosis service formed the foundation of the N.H.S. chest service. This service retains responsibility for the preventive and social aspects

of tuberculosis, and has developed into a clinical specialty dealing with chest diseases of all types.

2. Chest clinics now handle an increased volume of work and, in general, there has been a steady improvement in the staffing, equipment, and siting of these clinics. With outstanding exceptions, the local authorities' premises were not usually well sited or equipped as clinics, but this very fact has often resulted in priority being given to chest services by boards and management committees. Most clinics now have access to full radiological and laboratory diagnostic facilities. In the provinces the separation of clinics and sanatoria is being steadily diminished, but in some areas the system of separate charge of the patient in clinic and sanatorium persists, and must persist for administrative and for geographical reasons.

3. In general the trend has been towards a closer integration or absorption into the general hospital system, and clinically this has been a great improvement. In the absence of any firm general direction, regional boards have developed their own services as they thought fit and the degree of integration has therefore varied from region to region and also from area to area within the regions. Many boards have revised their services piecemeal as their older physicians retire. In some regions the integration has been carried far; the majority of the chest physicians are on the staff and have beds at the general hospitals where also many of the clinics are held.

The Present Position

4. The recent accelerated decline in the mortality from tuberculosis has created in some quarters a sense of complacency as to the future of this disease; this is far from being justified either by the figures of morbidity or of the incidence of infection. Although there is a decline in the mortality, there is as yet no convincing evidence that the incidence of the disease will diminish at the same rate. There is also a decline in the need for beds, but the demand for facilities for the treatment of this disease is difficult to forecast. It is, however, clear that the need for special provision for methods of prevention, diagnosis, and after-care will continue for many years to come. Even if clinical tuberculosis becomes rare, this desirable state of affairs will be secured and maintained only if extensive organization for its prevention is kept in being.

Chest Clinics

5. The view sometimes expressed that the decline in tuberculosis mortality has reduced the amount of work is erroneous; in fact, it has actually increased the amount of work to be undertaken in connexion with the disease. Excluding the cases referred by mass radiography units or discovered by examination of contacts, it is already apparent that the ratio of persons who have to be examined to each case of pulmonary tuberculosis found is increasing. In the case of clinics, the numbers of new patients referred for diagnosis is steadily rising.

6. Extra work has been imposed upon chest clinics because of their increased use as case-finding and diagnostic centres. This has already more than offset the decline in active therapy, such as refill clinics. The standard of assessment of tuberculosis patients has become steadily more critical and has thrown an increasing burden on radiology and pathology departments. This trend is likely to continue until tuberculosis becomes a disease of the past.

Non-Tuberculous Cases

7. The present work of chest clinics is not limited to tuberculosis. The majority, perhaps all, do a greater or lesser amount of non-tuberculous work, depending on the attitude of the individual regional boards towards their chest services, and the facilities available—especially general hospital beds—and to some extent the desires and aptitudes of the individual physicians. There is a variety of chest diseases which have received in the past little concentrated attention while other diseases have become of increasing importance. Examples of

the former are bronchitis, emphysema, asthma, bronchiectasis, pneumoconiosis, which cause much chronic invalidism, and, of the latter, carcinoma of the lung. Diseases of the chest, whether requiring medical or surgical treatment, now call for much more intensive and detailed investigation.

Sanatoria and Chest Hospitals

8. The sanatoria also have undergone improvements since 1948. Before 1948 there were outstanding exceptions where the local authorities had provided excellent buildings and every facility. Since then there has been little new building but much general improvement in radiological and laboratory facilities. The general trend has been for the sanatorium physician to take part in chest clinic work, and for the chest physicians to have beds in the sanatoria. While a diminishing number of sanatoria still deal only with tuberculosis, many have become chest hospitals in the fullest sense of the word. In addition to tuberculosis wards they contain wards for acute and chronic non-tuberculous chest disease, out-patient departments (including E.N.T.), thoracic surgical units, departments for the investigation of respiratory function, physiotherapy, and rehabilitation, and with a full complement of visiting staff from other specialties.

9. The main effects of the recent trends in tuberculosis have been or will be on the sanatoria. In the last three years the position has changed notably; waiting-lists for admission are small or non-existent; the range of cases of tuberculosis admitted to sanatoria has widened; the number of those referred for surgery appears to be diminishing, though the place of surgery has not yet become clearly defined; and in males the age group is higher.

The Future

10. The facts outlined above show that for many years to come the problems of the diagnosis, management, and prevention of tuberculosis will provide a large volume of work requiring the attention of skilled teams throughout the country.

11. As in the past, it is certain that many patients suffering from non-tuberculous chest diseases will be referred to chest clinics. It is important that there should be the fullest facilities for their investigation and care, and each clinic should have its own x-ray department working in close association with that of the general hospital.

12. Ideally it is desirable that the chest service should be an integral part of the general hospital system and should have facilities for the diagnosis, treatment, social welfare, and rehabilitation of tuberculous patients as well as for prevention of the disease. Where practicable, the area clinic should be within the curtilage of the hospital. This would be more convenient for patients; it would make for easier liaison; the physician in charge would have beds in the hospital; and he would be available for mutual consultation with his hospital colleagues. The Radiologists Group has expressed its agreement with this principle; it sees no reason to exclude patients who have thoracic disease from the advantages of a general hospital, and believes that physicians who specialize in diseases of the chest should have the same diagnostic and therapeutic facilities as, say, surgeons who specialize in diseases of the genito-urinary tract.

13. There are, of course, circumstances in which such arrangements would be impracticable; for instance, where a tuberculosis hospital admits patients from many areas, or where it is situated at a distance from the clinics. It is, however, essential that there should be close contact between the hospital and clinics, and, in order that there may be a review of cases, clinic staff should visit the hospital regularly for this purpose.

14. In some regions beds are required for the investigation of tuberculosis and other chest conditions in children. Some of the beds at present vacant or becoming vacant might, where necessary, be equipped and staffed for this purpose.

15. The general practitioner has an important part to play in relation to tuberculosis, not only in its early detection, but also in treatment, aftercare, and rehabilitation of tuberculous

patients. It is therefore essential that every teaching hospital should be associated with a chest service team for the purpose of undergraduate and postgraduate education.

Prevention

16. The chest physician should regard himself not only as a member of the hospital team but also as a member of the public health team of his area. As far as preventive and social work is concerned in non-pulmonary forms of tuberculosis, chest physicians should act as a link between the services provided by local authorities and specialists at the general hospital handling these diseases.

17. Although the care and treatment of chest diseases and tuberculosis should be a part of the work of a general hospital, the handling of tuberculosis should be the responsibility of a special team. Whatever progress is made in the treatment of tuberculosis, the fact remains that it is an infectious disease and consequently there has to be provision for dealing with the epidemiological factors involved.

18. If chest clinics become integral parts of general hospitals, it is essential that the preventive and social aspects of tuberculosis should continue to receive close attention. The physician in charge of the clinic at the general hospital should organize and co-ordinate the preventive and social aspects of the work in consultation with the medical officer of health.

19. Co-operation in the epidemiological field and the social care of the patients would be facilitated if medical officers of health were given honorary appointments on the staffs of hospitals. On the other hand, in some groups a medical liaison committee functions well and this committee includes members of the hospital medical staffs, general practitioners, and medical officers of health.

Mass Radiography Units

20. Mass radiography units should be operated as an integral part of the chest service under the direction of senior and experienced physicians. The present policy of some hospital boards of combining several mass radiography units under a single director rather than attaching them to a chest clinic is considered undesirable both for the service and for the director of the unit, whose field of work becomes very restricted in consequence. The directors of mass radiography units should always be actively engaged in the work of the chest clinics.

21. A consultant radiologist should be available to every mass radiography unit to assist in the interpretation of abnormal films and to advise on radiological techniques and radiation hazards. While it is realized that this may be impossible at the moment, this should be the aim if and when a larger number of radiological staff becomes available.

Medical Staffing

22. In determining the appropriate establishment for each chest clinic, it is recommended that the following should be taken as a guide. Geographical conditions will require that the size of the population served by a chest clinic will vary, but it may be regarded as consisting of one or more units of 100,000 population, each requiring approximately fifty to sixty beds, including those for pulmonary tuberculosis, and the following medical establishment: one physician in charge, one assistant physician, and appropriate junior staff.

23. Where the population is substantially above 100,000 and an additional consultant becomes necessary, there should be not more than one assistant chest physician to each consultant.

24. An examination of the present staffing structure gives cause for concern, and the Committee feels that the matter is of such importance as to warrant special comment. This is set out in the Sub-Appendix.

Summary of Memorandum and Appendix

1. Although there is a decline in the mortality from tuberculosis there is as yet no convincing evidence that the incidence of the disease will diminish at the same rate.

2. It is, and will continue to be, necessary to maintain an organized tuberculosis service based on area clinics.

3. It is certain that many patients suffering from non-tuberculous chest diseases will continue to be referred to chest clinics, and it is important that the fullest facilities for their investigation and care should be available to these clinics.

4. It is desirable that the chest service should be an integral part of the general hospital system; whether or not this can be put into effect, the clinic should have access to facilities for the diagnosis, treatment, social welfare, and rehabilitation of tuberculous patients, as well as for prevention of the disease.

5. The facilities available in chest clinics, and the practicability of providing beds for diagnosis and treatment, vary from one area to another, but wherever possible the following pattern should be established and should be under the control of a single team: (a) the area chest clinic, (b) a small number of beds for non-tuberculous cases arising in the clinic, and (c) beds for the treatment of pulmonary tuberculosis.

6. The clinics should continue to be the centre from which the area tuberculosis service is organized, including work in the epidemiological field, and care and aftercare. Non-respiratory tuberculosis should be dealt with by the appropriate specialist, but the general investigation and care of the patient and his family on the social side should be carried out by the clinic.

7. Every teaching hospital should be associated with a chest service team for the purpose of undergraduate and postgraduate education.

8. Mass radiography units should be operated as an integral part of the chest service, and the directors of such units should always be actively engaged in the work of chest clinics.

9. The appropriate medical establishment for a chest clinic covering a population of 100,000 is as follows: one physician in charge, one assistant physician, and appropriate junior staff.

10. (a) The intake of senior registrars should be reduced to a figure comparable to the expected number of consultant vacancies. (b) There should be an increase of about 40% in the present consultant establishment in order to equate the number of consultants in chest diseases with the number in other specialties; for only so can general practitioners and patients be said to have the advantage of consultant care. (c) There should be a corresponding decrease in the S.H.M.O. establishment.

SUB-APPENDIX

Medical Staffing

1. The most recent figures (*British Medical Journal* of June 30, 1956) show that there are 346 consultant chest physicians, 430 S.H.M.O.s, and 49 senior registrars in the "Training Plan" with 11 "other" senior registrars. The ratio of 0.8 consultant per S.H.M.O. is equalled only in the small specialty of infectious diseases, with only 58 consultants. In all other branches, the consultant/S.H.M.O. ratio is well above unity. Chest diseases, with 4.7 of total consultants, carries 16.5% of total S.H.M.O.s.

2. S.H.M.O.s in chest diseases show wide variations both in qualifications and experience and in the degree of responsibility inherent in their duties. Many who work under full consultant supervision are highly qualified and quite ready for consultant status. Many others, of widely varying ages, qualifications, and calibre are doing work involving full responsibility without supervision or with purely nominal oversight by a consultant.

3. Since 1948 there has been a great improvement in the calibre and qualifications of young doctors entering the specialty. Normally a senior registrar entering the specialty possesses, or acquires within a short time, a higher qualification in general medicine. In the early years of the National Health Service they came in with the belief that promotion would follow the pattern normal in other special-

ties—namely, a direct step from senior registrar to consultant. In fact a high proportion of young S.H.M.O.s have entered this grade from that of senior registrar—for the sake of security—whilst looking for a consultant post.

4. Of the S.H.M.O.s, 180 are aged 40 or under, and a further 92 are aged between 40 and 45. Senior registrars are probably all under 40. Apart from any older men of consultant calibre in these grades, the specialty thus includes 321 doctors of 45 or under in S.H.M.O. or senior registrar grades. At least 200 of these men would be justified in the expecting consultant rank within the next five years. The total number of consultant posts likely to become available by retirement is 22 in the next five years, and 56 in the next ten years.

5. It is therefore clear that no young doctor will take up chest diseases as a career unless his sense of vocation over-rides his foresight. Moreover, the impossibility of filling junior posts has now resulted in a number of these posts being advertised at S.H.M.O. rates in the hope of attracting a pair of hands. The specialty is thus being further diluted with S.H.M.O.s, some of whom are unlikely to be suitable for promotion.

6. The Committee therefore emphasizes the conclusion implicit in its earlier remarks. This is not a specialty without a future. It is a fallacy to assume that the fall in tuberculosis death rates and the reduction of sanatorium waiting-lists means that recruitment can cease. The intake of senior registrars should be reduced to a figure comparable to the expected number of consultant vacancies, and these posts should be held at carefully selected centres. The promotion prospects of trained senior men now waiting for consultant posts should be improved by equating the proportion of consultants in chest diseases with that in other specialties. It is therefore recommended that there should be an increase of about 40% in the present consultant establishment, with a corresponding reduction in the establishment of S.H.M.O.s.

APPENDIX V RECOMMENDATIONS OF COAL-GAS POISONING SUBCOMMITTEE

1. The main stop-cock to the gas supply in a house should always be easily reached and well marked.
2. The precautions needed to promote safety in rescuing cases of coal-gas poisoning should be more widely known.
3. Self-acting artificial respirators should be available at every fire station and ambulance station.
4. Research should continue on the practicability of reducing the carbon monoxide content of coal-gas and the influence of this on the incidence of coal-gas poisoning.
5. The Gas Council should continue its efforts to discover a yet more distinctive or pungent smell to make the presence of coal-gas still more obvious.
6. Communal meters should be replaced by individual ones as quickly as possible.
7. The installation of gas-pipes and appliances by private contractors should conform to the standards laid down by the Gas Council, and the appliances supplied should pass suitable tests for safety in use.
8. Attention should specially be paid to flexible tubing and its connexions and any worn or faulty tubing should be replaced.
9. Gas Boards should cut off the supply of gas when there is any reason to believe leaking fittings or unsafe appliances are being used.
10. Safety gas-taps should be fitted to all appliances, and as soon as possible some convention should be adopted by makers of appliances to denote by colour or some other device the tap for oven, hot-plates, etc.
11. The proper spacing of taps to avoid confusion should also be attended to, and blind or partially blind people should have appliances in which the various taps are distinguishable by touch as well as by position.
12. Automatic ignition and/or safety devices which prevent the escape of unburnt gas if the flames are blown out or the

gas is not ignited should be further developed and popularized. Every effort should be made to sell such appliances at prices competitive with those not so fitted. Special efforts should be made to produce for old people who are accident prone a small oven or cooker fitted with such a device, to be made available on the easiest terms possible.

13. The ventilation of old and converted property should receive careful attention.

14. People should be warned of the dangers of stopping up ventilators, etc., when coal-gas appliances are used (quite apart from the general danger to health of this practice).

15. All over the country steps should be taken to bring the hazards from coal-gas to the attention of statutory and voluntary workers among the aged. This could be done through their central co-ordinating bodies, the Women's Voluntary Services, the National Council of Social Service, etc. Meetings should be arranged with the local officers of the Area Gas Boards so that co-operation and collaboration can be achieved.

16. In the same way, doctors, district nurses, health visitors, and others should be asked to notice the gas appliances used by their patients and be made aware of the willingness of the Gas Board to correct any defect observed.

17. All local authorities should do their utmost to see that the gas appliances of old people are properly suited to their requirements, and more use should be made of statutory powers to achieve this result.

18. Educative but not alarmist publicity should be provided through press, radio, and television to indicate the dangers in the use of coal-gas, particularly to the aged and infirm, and also to explain how easily many of these dangers can be avoided. The public should be induced to demand and suppliers urged to provide safety devices which comply with the standards of established safe practice.

APPENDIX VI

AMENDMENT OF BY-LAWS

Amendment of By-laws

1. By amending By-law 16 (1) by the deletion of the word "further" appearing before the word "payment" in the second proviso thereof.
2. By deleting from By-law 70 the words from and including "and for that period" down to the end thereof and substituting therefor "and cease to be a Member of the Council by virtue of his original appointment and there shall be deemed to be a casual vacancy under By-law 63 except in the case of a person appointed under paragraphs (c) or (e) of By-law 53 in which case the vacancy shall remain unfilled."

Amendment of Schedule to By-laws

By amending the Schedule to the By-laws as follows:

In the fifth column opposite the words "Central Consultants and Specialists" in the first column (a) delete the words "1 by the General Medical Services Committee" and substitute "2 by the General Medical Services Committee"; (b) add at the end thereof "(other than the Registrars Group Committee and the Senior Hospital Medical Officers Group Committee); 2 by the Registrars Group Committee; 2 by the Senior Hospital Medical Officers Group Committee."

REGISTRARS GROUP COUNCIL DINNER

The fifth annual dinner of the Registrars Group Council will be held on Friday, May 10, at Kettners Restaurant, Romilly Street, London, W.1. The guests will be Sir Harry Platt, President of the Royal College of Surgeons, and Dr. S. Wand, Chairman of the Council of the B.M.A. Tickets (price 27s. 6d.) are available to all senior registrars and registrars from the Secretary of the Association.

CENTRAL CONSULTANTS AND SPECIALISTS
COMMITTEE

A meeting of the Central Consultants and Specialists Committee was held at B.M.A. House on Thursday, April 4, with Mr. T. HOLMES SELLORS in the chair.

Royal Commission

The Committee decided by a large majority to endorse the recommendation of the Council of the B.M.A. that in present circumstances the Association should not give evidence to the Royal Commission on the Remuneration of Doctors and Dentists.

S.H.M.O.s in Consultant Posts

It was reported that, following the notice in the *Supplement* (February 9, p. 60), a large number of S.H.M.O.s who occupied consultant posts or who claimed to be engaged in consultant work had applied for their cases to be considered with a view to submission to Committee B of the Medical Whitley Council.

Confidential reports were now being sought from the chairmen of hospital staff committees and from referees named by the applicants.

The Executive Committee had considered the appointment of panels in each of the specialties concerned to review the applications, and had decided to nominate a convener in each specialty, leaving the convener some discretion in selecting the personnel of the panel. It had also been decided to invite the S.H.M.O. Group to nominate a representative to serve on each of the panels, the representative to be in a specialty other than that under consideration by the panel. Applications from S.H.M.O.s in Scotland would be referred in the first place to the Central Consultants and Specialists Committee (Scotland).

Remuneration of Whole-time University Medical
Teachers and Research Workers

It was reported that the Executive Committee had considered a report on remuneration prepared by the Non-professional Medical Teachers and Research Workers Group Committee of the B.M.A., and felt that any comparison between doctors in different spheres, as for instance university teachers and hospital medical staff, must be made on the basis of responsibility and experience. In order to clarify the matter, the Executive was inviting representatives of the Group Committee to discuss the report, and also the effect, if any, of the new scales for university teaching staffs announced by the Chancellor of the Exchequer on March 12, before the report was presented to the Council.

Anaesthetists Fees

A memorandum from the Association of Anaesthetists in Great Britain and Ireland on the question of the maximum fees chargeable by anaesthetists to hospital private patients had been considered by the Executive Committee. It had decided to invite representatives of the Anaesthetists Group Committee to discuss the matter before making any recommendations.

Maternity Medical Services

The Executive Committee had considered the draft memorandum of evidence to be submitted to the Cranbrook Committee on maternity services, and had suggested certain minor changes which it had asked the Chairman to raise when the memorandum was presented to the Council.

Professor G. I. STRACHAN said that although the memorandum was a formidable-looking document it boiled down to an expression of Association policy—namely, that the general practitioner should be the hub of the whole maternity service.

Integration of Medical Officers of Health with
the Hospital Service

On a recommendation from the Liaison Committee it was decided to remind regional committees of the desirability of close co-operation between hospital medical staffs and public

health medical officers, including their appointment, in appropriate instances, to membership of medical staff committees if the members of hospital medical staffs so wish. It was agreed also to forward to regional committees the recommendation of Council on this subject (*Supplement*, February 9, p. 56).

With regard to general practitioners and the hospital service, the Liaison Committee resolved that the General Medical Services Committee be informed that in the view of the Liaison Committee there should be an increase in the number of hospital private beds for the use of consultants and general practitioners whenever it could be shown that the facilities were inadequate to meet the demand for private treatment, but the demand for private beds for the use of general practitioners should be pressed as part of the general case for more general-practitioner beds.

Examination of Immigrants

The Liaison Committee supported the action of the Public Health Committee in recommending to the Council that it should reaffirm to the Ministry its view that a dangerous situation was arising from the arrival in this country of immigrants with communicable diseases, and that Government action should be taken in the matter, including a requirement of compulsory chest x-ray examination for all immigrants before entry into the country.

Annual Report of Central Consultants and Specialists
Committee (Scotland)

Dr. ALEXANDER SMITH presented the report. Professor P. C. P. CLOAKE asked what was proposed in regard to the diagnostic centre in Edinburgh. Dr. E. WALKER (Scottish Secretary) replied that it was an experimental centre set up under the aegis of the Nuffield Trust. It was intended to be a place where practitioners could go to obtain consultants' advice. It was purely experimental.

Hospital Medical Staffing

A report on the discussions between the Joint Consultants Committee and the Ministry on the subject of hospital medical staffing was considered. Dr. I. D. EASTON asked whether there was any prospect of the Joint Consultants Committee having further thought on the question of ratios. The CHAIRMAN, in reply, said that the question of ratios had been accepted. The practical difficulties were great where there was a small specialty. Dr. EASTON pointed out that there was an inadequate number of consultant appointments obtainable in those small specialties.

Dr. T. ROWLAND HILL said that the Joint Committee was determined to resist any attempt to introduce into the structure of the Health Service a permanent career grade of officer between the senior registrar and consultant.

Professor CLOAKE submitted that the committee negotiating the matter would be well advised to urge that the S.H.M.O. problem should be treated entirely separately and dealt with in an independent manner. "I think we should ask the Ministry to agree that the S.H.M.O. grade should be allowed to decrease in numbers and eventually disappear, and that any new grade should be small," he concluded.

Professor G. I. STRACHAN reminded the Committee that the whole object of suggesting a new grade was to improve the hospital service and to save senior registrars from unemployment by forming an intermediate step while they were waiting for consultant appointments.

Mr. LAWRENCE ABEL expressed the view that great strength would be gained at the present time if the Committee stated that it refused all further negotiation until there was a review of consultant establishment, and that review had been completed. It should be pointed out that the time had come when the hospital service should no longer be controlled by the Ministry of Health.

After certain drafting amendments, the following resolution, proposed by Mr. LAWRENCE ABEL and seconded by Dr. G. R. VENNING, was carried:

"That this Committee reiterates its opinion that no recommendation be accepted until an agreed review of consultant establishment has taken place."

Hospital Costing Arrangements

A recommendation from the North-west Metropolitan Regional Consultants and Specialists Committee that a protest be lodged with the Ministry in regard to the request to hospital medical staff for information in connexion with hospital costing arrangements was considered. The CHAIRMAN reported that the Ministry had consulted the Joint Committee, which raised no objection. All that hospital medical staff were asked to provide was an estimate, expressed as a percentage of their contract time as allocated to each hospital, of the amount of their time spent in each of the different departments.

Remuneration of S.H.M.O.s

The Committee agreed to approve in principle that the salaries of S.H.M.O.s should amount to 80% of those of consultants.

The remainder of the items on the agenda were deferred until the next meeting.

HOSPITAL MEDICAL STAFFS DEFENCE
TRUST

MEETING OF TRUSTEES

At a meeting of the Trustees of the Hospital Medical Staffs Defence Trust, held on April 4, with Mr. T. HOLMES SELLORS in the chair, consideration was given to a suggestion from the Trustees of the British Medical Guild that a special appeal for additional contributions might be made with a view to helping the Guild in the event of the withdrawal of general practitioners from the N.H.S., should this become necessary, and to assist those general practitioners who suffer financial hardship.

The CHAIRMAN said that a figure of 5% had been suggested.

Mr. J. R. NICHOLSON-LAILEY moved that the Trustees should recommend that all consultants and S.H.M.O.s employed in the National Health Service should agree to contribute to the British Medical Guild Fund a sum equivalent to the levy on general practitioners in the National Health Service.

The resolution was duly seconded and carried. Dr. WAND, Chairman of the Council, took the opportunity of thanking the Committee on behalf of the G.M.S. Committee.

TUNBRIDGE WELLS GUILD MEETING

DR. WAND ON DISPUTE

The Chairman of Council, Dr. S. Wand, addressed a meeting in Tunbridge Wells on April 7 of 150 doctors from all branches of the Health Service. The recommendations of the Council to the Special Representative Meeting (*Supplement*, April 6, p. 149) on withdrawal from the Service, on non-cooperation under present circumstances with the Royal Commission, and on a B.M.A. inquiry into the Health Service were approved by an overwhelming majority on a vote taken by secret ballot.

After referring to statements made in the debate in the House of Lords on April 4 on the Royal Commission (reported in "Medical Notes in Parliament" at p. 894 of this issue), Dr. Wand said: "I say—and I weigh my words very carefully—we have asked that the Government discuss what is in dispute between us. Whatever the outcome, the continuation of this dispute will harm for many years the relationship between the Government and the profession. Is this a good thing for the National Health Service? I say once again that we are only too willing as reasonable people to make every endeavour to settle our differences round a table. If the Government fails to accept this offer we must not be blamed further for any action we may take."

ASSISTANTS AND YOUNG PRACTITIONERS

SUPPORT FOR DEFENCE FUND

The Assistants and Young Practitioners Subcommittee of the G.M.S. Committee met on March 29 under the chairmanship of Dr. F. GRAY.

The DEPUTY SECRETARY (Dr. D. P. Stevenson) outlined the latest developments in the remuneration dispute and reported on the plan for progressive withdrawal from the Service. Various questions were raised on the plan, particularly as it might affect the young practitioner. Dr. P. B. BAILEY suggested that assistants should be invited to contribute to the defence fund, since, as future principals, they were as much concerned as their present principals in the issues at stake. The subcommittee was in agreement with Dr. Bailey's views, and it was resolved:

That, in the opinion of the subcommittee, assistants should be invited to contribute to the special fund being set up in connexion with the profession's remuneration dispute.

Future of General Practice

Dr. R. M. S. MATTHEWS brought forward certain principles which he thought might guide proposals for the reform of general practice, and which he thought the subcommittee might agree to now with a view to putting forward to the parent committee more definite proposals when the remuneration claim had been settled and the way was more open for reform.

After discussion the subcommittee resolved that it was in agreement with the following principles for the evolution of general practice:

- (1) The family doctor should remain the medical adviser and respected friend of the family.
- (2) With widening horizons in medicine, more education, and increasing facilities available, there will always be more that can be done for each patient.
- (3) The family doctor should be the agent for all the resources of the National Health Service, in so far as is practicable.
- (4) There is a welcome integration between family doctors, hospitals, and local authorities in some areas, and this should be encouraged.

It also agreed that further consideration should be given at its next meeting to the following principles:

- (5) Doctors should not have to act as custodians of public funds; particularly is this important with regard to pharmaceutical services.
- (6) Remuneration should be related to the quality of work done as well as the quantity.
- (7) Entry and retirement from general practice should be related to public requirements and, therefore, where necessary facilitated by public funds.

Correspondence

The Next Move

SIR,—The time has come to appeal to the law to adjudicate on the validity of the Spens Reports as the basis of our claim for increased remuneration. The Minister has explicitly rejected our claim based on the Spens recommendations: in his reply to the memorandum submitted to him on September 12 last he said (*Supplement*, December 1, 1956, p. 201), "Ministers remain of the opinion that no contractual obligation such as has been alleged by the Negotiating Committee exists and that no action based on such a claim could succeed." The same attitude is implicit in the Prime Minister's decision to appoint a Royal Commission to report on the question of doctors' pay; no doubt he hopes this will produce a new formula to replace the Spens recommendations, and one more favourable to the Treasury. The profession believes, and always has believed, that the Spens recommendations are the basis of the terms and conditions of service on which it agreed to enter the Health Service: all our claims have been based on this assumption.

We have reached an impasse. We are feeling dangerously frustrated; the general practitioners are planning to resign

from the Health Service *en masse*; the hospital staff are wringing their hands, wondering what dramatic gesture they can make which will not deprive ill patients of proper attention in hospital; meanwhile Spens, like the Cheshire cat, seems to be dissolving into thin air before our very eyes. The Government has cleverly taken the initiative by appointing the Royal Commission, granting a small rise to junior hospital staff, and suggesting that there is a possibility of the rest of us getting a little more in the near future. It would seem, then, we must either wait on the Minister's benevolence (he has turned down arbitration) or "strike"—that is, resign from the Service altogether. But even if we "strike" for an increase in pay, we shall have to negotiate eventually (setting aside for the moment the possibility of our setting up a rival concern), and our case is and must be based on the Spens recommendations; but the Minister denies their validity, so we are back where we started—a fundamental disagreement on the interpretation of Spens.

There is one solution to this which we should try at once before the opportunity is lost; it is a step which will give us the initiative and will enable us to lay our case before an impartial witness *in public*: it is to go to law and take a test case before the courts for adjudication. We must once and for all test the legal validity of the agreements entered into by the profession at the inception of the Health Service and find out whether we have any legal rights at all, or whether we have in fact been the victims of a giant confidence trick. What are the advantages of going to law? In the first place, we take the initiative. Secondly, in the face of a refusal by the Minister to go to arbitration, we demonstrate our good faith with the public by submitting to the only "peaceful" course open to us, before taking the drastic step of resigning *en masse*. Thirdly, we take the first step towards putting our contracts on a firm legal basis, free from ambiguity.

Let us consider the consequences of the verdict. If we win we shall have gained our point and we shall be entitled to a very substantial increase of pay. Here it is worth noting that the Spens recommendations for hospital staffs at the present time amount to something like a 50% increase, compared with the 24% they are claiming. If we lose we shall have lost nothing tangible; the Government is already determined that our case does not exist. We shall, however, have had the benefit of stating our case in detail before the public. We shall have demonstrated that we were lured into the Health Service under false pretences and that what we took for gentlemen's agreements were nothing more than spurious promises. The Minister may gain his legal point that there is no "contractual obligation" to raise our pay; but he will have to explain the very unscrupulous way in which the Government has seen fit to treat a loyal and trusting profession for nearly ten years. In the face of such double-dealing there is little doubt which side will gain the public's sympathy. The stage will then be set for the profession to proclaim its views on a sound basis for negotiation. Furthermore, we shall be able to contemplate further action not on the controversial basis of the Spens recommendations but on the demonstrated fact that we were persuaded to enter the Health Service by a subterfuge.—I am, etc.,

Uxbridge, Middlesex.

RICHARD I. BODMAN.

Withdrawal from N.H.S.

SIR,—We write in support of your correspondents who see clearly that the issue is no longer a claim for increased remuneration: the profession has so lost confidence in the good faith of the Government that the real issue is whether there now exists any basis for a stable relationship between them.

In the past ten years there have been three major clashes with the Government of the day; no one would wish to take any part in a future of which such conflicts were a recurring feature. Yet it is precisely such a future that confronts us; even if the Government were to concede the present claim in full that will not be the end; in two

or three years' time the report of a Royal Commission, whose terms of reference are clearly designed to provide an opportunity of discarding past agreements, will set off a fresh upheaval. If that upheaval be settled, how long will the settlement endure? What guarantees will the Government be able to give more precise or more binding than those they have long laboured to avoid honouring and now propose to disown?

We have to face squarely the fact that no government can give the sort of guarantees we need: no government can ignore political factors or the claims of expediency: no government can afford to examine any proposition of ours on its merits alone. We have also to face the fact that, by and large, governments are less interested in the well-being of the profession than in making use of the technical knowledge we possess at the least possible cost.

If we do not wish to look into a future in which there is no stability, no law or order, no prospect save a continuing debasement of professional standards, there can be only one solution: complete and irrevocable withdrawal from the Health Service as at present constituted, whatever the Government may now do. No one would wish to see the undoubted benefits of the National Health Service lost to the people as a whole, and we urge the General Medical Services Committee to study plans for an alternative service, financed from a fund derived from either voluntary or national insurance and based upon reimbursement of the patient rather than direct payment of the doctor. This, in our view, represents the only sure way, and we ask all who agree to bring it forward at their local meetings. We do realize that unity is more important than perfection, and we are resolved to support any reasonable action that commends itself to the profession as a whole.—We are, etc.,

B. A. ABBOTT.
STANLEY DILLON.
P. M. HIGGINS.

Rugeley, Staffs.

P. M. JAMES.
T. A. MCCLINTOCK.
P. J. MACMONAGLE.

SIR,—In 1948 I wrote a letter to the *Supplement* (December 25, p. 239). At that time I was strongly in favour of wholesale resignation from the Health Service, owing to the inadequate payment which was to be made to doctors who entered it. This "extreme measure" was not looked upon with favour, the general consensus of opinion then being "Let's get the scheme working" and the financial discussions can come later. In fact, our leaders and negotiators were then so busy discussing principles and urging doctors to take part in the scheme that the matter of finance was left to the very end, and appeared, even so, to be discussed in "hushed whispers," as if it were indeed indecent to discuss money. We now have the ironic situation in which Dr. Rogers (one of the chief exponents of "the Service first and money last" at that time) is now the leading protagonist in the present untimely and unseemly attempt to get doctors to withdraw from the Service, an attempt which, even if desirable, is bound to fail for the very reasons which caused the original negotiators to fail—namely, lack of unity and lack of sense of reality.

It is quite one thing to refuse to enter the scheme because the conditions of service and financial rewards are not enough, and another to threaten resignation from it after eight years because of failure to obtain a rise. The very people who are most hard hit by the inadequate system of payment—i.e., those with small lists and no outside appointments—will suffer most in any such withdrawal as is contemplated, for it is improbable that practitioners with full lists will be anxious to withdraw, even though several years of maximum income may have given them some capital which those with smaller lists have been unable to accumulate. Furthermore, most doctors' personal economy is geared to their quarterly cheque, for living and practice expenses, house and motor-car repayments, and, by no means least, school fees. How many can possibly afford to throw this overboard for some ethereal "strike pay" or collection of mythical private fees, and how many would want to? The present system has so put the doctors at the mercy of the

patient in many cases that he is forced to accede to extravagant requests for drugs and dressings for fear of wrecking his economy by losing a few patients, and he will, in my opinion, be most unlikely to antagonize his patients and prejudice his future income from them by withdrawing from the Service. Furthermore, the case for increase in remuneration has been expressed so badly that even those patients who are interested in their doctor's earnings are left with the impression that the average doctor is very well off. It is my opinion that the negotiators of eight years ago failed miserably in their duty to the profession in failing to obtain the proper rewards for service, and that the present attempts to put it right are ill-begotten, ill-timed, and, as before, ill-managed.

What is required now is a complete reconstruction of the whole Service, which can only be achieved by 100% support from the profession—i.e., consultants, hospital medical officers, general practitioners, and all ancillary services, including the nursing profession. Until such drastic and determined action is taken muddle and confusion as before will continue, and what little respect is still held by the public for the profession will be destroyed. It may, of course, be too late for such action, but in my view the deliberations of the Royal Commission should be awaited before resorting to action which, I am sure, can only cause great hardship to those who attempt to withdraw and will destroy whatever is left of the dignity of the profession.—I am, etc.,

R. E. NEWMAN.

Beckenham, Kent.

SIR,—The alternative plan is claimed to be workable. It is also "workaday"—which is the whole trouble. It displays the Maginot Line and pre-1918 "digging-in-along-the-Somme" mentality to perfection, alas! The profession cannot survive a struggle of attrition. The waverers in our midst will have precluded any hope of success in that kind of struggle, as your correspondence already bears witness. The fainthearts must be rallied at once, as otherwise our "selected" areas will resemble colanders. *Blitzkrieg* should be the order of attack, not "ye olde tea shoppe" tactics (it was not a partial eclipse of the sun which rescued the missionary from the aborigines' stewpot—it was total and instant). Attended by their own doctors for a whole month without charge (and what percentage of fees does one really think the masses nurtured on a welfare state for a decade will pay?), getting their private prescriptions honoured at their usual chemist, by ministerial instruction—will there be any incommode person in the land to rail against the Government save the doctors themselves, and they have been doing that for months without number already?

The target is a government that has dishonoured its obligations: we have almost used up all our ammunition, and the final weapon we are withdrawing from our armoury must be carefully aimed. But the wrath of the patient must be applied to its mechanism. The answer is no certification whatsoever—save the obvious—and a total and complete withdrawal of the profession on D-day. We will then be speaking the same language as the Government, and indeed the same as our patients do.—I am, etc.,

M. E. TAPISSIER.

Barnsley, Yorks.

SIR,—Since the Government understands trade union methods only, then obviously these are the methods we must use. Anyone who says otherwise is not being realistic. Having adopted trade union tactics, let us do so properly. Half-hearted measures will only cause us to fail. With regard to resignation, only the general practitioner can do so. The hospital doctor obviously cannot. But the hospital doctor will benefit equally in any pay increases gained. Therefore he must help. Moral support is not enough. Only action is of any value. Let him pay his share. A levy equal to that asked of the G.P.—i.e., 5-6%—should be contributed by every hospital man apart from the most junior. I, for one, am not keen to see the G.P. doing all the work, getting all the worry, and being the target of abuse from Government and patient (as will indeed happen),

while the hospital doctor sits on the sidelines and cheers his colleague to victory.

No mention has been made of action to be taken against those who remain in the Service and treat patients of those who have resigned. Can their action not be considered unethical and treated accordingly?

In the event of my area being chosen for withdrawal, my work will be greatly decreased, but even if it falls to less than half its present volume I will still make my usual income with the proposed scale of charges. Since this will mean more leisure, is it likely that I and my colleagues will want to return to the N.H.S.? I should think that the patients would not object provided the pharmaceutical service remained free, and the Finance Act will let me superannuate myself without Government help.

Finally, a practitioner may be on the lists of several executive councils, and in the event of withdrawal may find himself in private practice in one area and in the N.H.S. in another area. Has this situation been considered, and is it not the sort of situation that can only do us harm? Surely complete 100% withdrawal throughout the country is the only answer.—I am, etc.,

Rutherglen.

A. F. NELSON.

SIR,—As a general practitioner of many years' standing I am much concerned about the proposals which are being recommended to us. I do not hold any brief for the Health Service, which I have never liked, and there is no doubt we have been unjustly dealt with by the Government. But there are many reasons against the proposed withdrawal from the Service. In the first place, the financial situation of the country is critical, and this does not seem to be fully appreciated. Repeated appeals have been made to all sections to exercise restraint in pressing claims for increased remuneration, and surely the medical profession should set an example in placing the interests of the country before its own. Moreover, the scheme is impractical. It would be very difficult to get the proposed fees from our patients, who, rightly or wrongly, would feel that they would be paying twice over for their medical treatment. It is all very well to say that the proposed withdrawal from the Service is not a strike, but the general public will not make such fine distinctions and would certainly regard it as such, and very quickly we should have public opinion against us.

I sincerely hope the profession will seriously reconsider the position and not embark on a scheme the difficulties of which seem to have been underestimated. It is a scheme which is lowering to our dignity as a profession, and which I feel would be disastrous in its consequences.—I am, etc.,

Sheffield.

C. HAROLD WILSON.

Reform of Health Service

SIR,—For the first time since the inception of the National Health Service I am thrilled by the proposals of the B.M.A. Of course what is needed is all-round replanning and adjustment. Mr. Willink, now of Magdalene College, Cambridge, had a blueprint ready which the Labour Government of 1945 disregarded. I suggest that he would be a very useful "prominent citizen" for the proposed revising body.—I am, etc.,

Hove, Sussex.

LILIAS M. JEFFRIES.

Woman Consultant for Women's Hospital

SIR,—At the adjournment debate on Monday, March 25 (*Journal*, April 6, p. 826), Mr. James H. Hoy, Member of Parliament for Leith, drew attention to the serious position which had arisen over the proposed appointment of either a male or female consultant physician at the two women's hospitals in Edinburgh—Bruntsfield Hospital and the Elsie Inglis Memorial Maternity Hospital. Mr. Nixon Browne, Joint Under Secretary of State for Scotland, replying on behalf of the Government, made certain statements which require correction.

Mr. Nixon Browne conceded that the demand is there, but stressed that the work done is limited. He went on to

state that at Bruntisfield Hospital there are only 19 general medical beds available, but did not point out that this represents 5% of all the female medical beds in Edinburgh. In addition to the 19 general medical beds, there are 63 gynaecological and surgical beds which come under the over-all care of the consultant physician. It might be explained that prior to the take-over under the National Health Service there were plans to enlarge and improve the hospital. Mr. Nixon Browne also stated that the consultant physician is used "from time to time" at the Elsie Inglis Hospital. In fact, in a 73-bedded busy maternity hospital there are always at least five in-patients with serious medical complications under the care of the physician, and there are three special out-patient clinics attended by the consultant physician.

Mr. Nixon Browne referred to the regional hospital board as "a responsible statutory body" without mentioning the fact that the board of management of the Southern Hospitals Group, which originally appealed to the Secretary of State against the regional hospital board's decision, is also a statutory body with powers delegated to it under the Act. This appeal was also supported by two other statutory bodies—namely, the Edinburgh Health Executive Council and the local medical committee—as well as by the regional consultants and specialists committee. The fact that out of three statutory bodies one only is referred to as being "a responsible statutory body" would appear to require some explanation.

The arbitrary decision of the regional hospital board has caused widespread dismay in Edinburgh and, indeed, throughout Scotland, and in an endeavour to initiate legislative and/or other action a mass meeting has been organized by all the supporting bodies. The local medical committee strongly supports this effort, to the extent that it is contributing to the expenses of the meeting. Finally, Mr. Nixon Browne pointed out that a woman consultant surgeon was recently appointed to our group, and cited this appointment as evidence that there was no sex prejudice. I should like to make it clear, however, that this surgeon, who was my successor, was appointed to the post at Bruntisfield Hospital only, whereas at the time of my retirement I was also consultant surgeon at the newly established acute male surgical unit at the Longmore Hospital. This latter post went to a male surgeon.—I am, etc.,

Edinburgh, 12.

GERTRUDE HERZFELD.

BRITISH MEDICAL GUILD

Meetings to be Held

BATTERSEA AND WANDSWORTH.—At the Assembly Room, Wandsworth Town Hall, S.W., Tuesday, April 16, 8.30 p.m. Address by Dr. Frank Gray.

HEREFORD.—At Woolhope's Society Room, Public Library, Broad Street, Hereford, Sunday, April 14, 3.15 for 3.30 p.m. Dr. A. V. Russell (Member of Council, B.M.A.) will address the meeting.

Association Notices

Diary of Central Meetings

APRIL

- 16 Tues. Scholarships Subcommittee, Science Committee, 11.30 a.m.
- 16 Tues. Organization Committee, 2 p.m.
- 17 Wed. Occupational Health Committee, 10 a.m.
- 18 Thurs. S.R.M. Agenda Committee, 9.30 a.m.
- 18 Thurs. G.M.S. Committee, 10.30 a.m.
- 25 Thurs. Central Ethical Committee, 2 p.m.
- 25 Thurs. Joint Committee of the B.M.A. and the Magistrates' Association, 2 p.m.
- 26 Fri. Welsh Committee (at Raven Hotel, Shrewsbury), 2.15 p.m.
- 30 Tues. Special Conference of Local Medical Committees, 10 a.m.

MAY

- 1 Wed. Special Representative Meeting, 10 a.m.
- 9 Thurs. Trustees of the Dain Fund, 1 p.m.
- 16 Thurs. G.M.S. Committee, 10.30 a.m.

Branch and Division Meetings to be Held

The following meetings, to which all medical practitioners in the area are invited, will be held to consider the reports of Council and the G.M.S. Committee on the remuneration issue.

COVENTRY DIVISION.—At Out-patient Department, Coventry and Warwickshire Hospital, Tuesday, April 16, 8.30 p.m. Address by Dr. D. P. Stevenson (Deputy Secretary, B.M.A.).

HARROW AND WEMBLEY DIVISIONS.—At Rest Hotel (Carlton Rooms), Kenton Road, Kenton, Monday, April 15, 8.30 p.m. joint meeting. Address by Dr. D. P. Stevenson (Deputy Secretary, B.M.A.).

HENDON DIVISION.—At Lower Welsh Harp Hotel, Edgware Road, N.W., Friday, April 12, 8.30 p.m. Dr. A. Macrae (Secretary, B.M.A.) will be present.

KINGSTON-ON-THAMES DIVISION.—At Nurses' Home, Kingston Hospital, Woburn Avenue, Kingston-on-Thames, Monday, April 15, 8.30 p.m.

NORTH GLAMORGAN AND BRECKNOCK DIVISION.—At Boot Hotel, Aberdare, Sunday, April 14, 3 p.m.

SOUTHPORT DIVISION.—At Assembly Rooms, Prince of Wales Hotel, Monday, April 15, 9 p.m. Dr. E. E. Claxton (Assistant Secretary, B.M.A.) will answer questions.

ALDERSHOT AND FARNHAM DIVISION.—At Northfield Hospital, Aldershot, Thursday, April 18, 8.30 p.m., meeting. Lecture by Mr. C. R. McCash: "Plastic Surgery in an Accident Service."

ASHTON-UNDER-LYNE DIVISION.—At Broadoak Hotel, Ashton-under-Lyne, Wednesday, April 17, 8.30 p.m., A.G.M.

BIRMINGHAM DIVISION.—At Council Chamber, Council House, Birmingham, Tuesday, April 16, 8.25 for 8.30 p.m., meeting. B.M.A. Lecture by Professor Ian Aird: "ABO Blood Groups and Disease."

BRADFORD DIVISION.—(1) At Midland Hotel, Bradford, Sunday, April 14, 6.30 p.m., special meeting to discuss the remuneration claim. (Members only.) (2) At Medical Societies' Room, Bradford Royal Infirmary, Wednesday, April 17, 8.15 p.m., meeting. Lecture by Mr. R. R. Simpson: "Shakespeare and Medicine."

CAMBRIDGE AND HUNTINGDON DIVISION.—At Lecture Room, Addenbrooke's Hospital, Cambridge, Tuesday, April 16, 8.30 p.m., meeting to consider report of Council on remuneration issue.

DONCASTER DIVISION AND DONCASTER MEDICAL SOCIETY.—At Danum Hotel, Doncaster, Tuesday, April 16, 7.30 for 8 p.m.; dinner. Professor C. J. Polson: "External Signs of Violence."

GREENWICH AND DEPTFORD DIVISION.—At St. Alfege's Hospital, Vanbrugh Hill, S.E., Wednesday, April 17, 8.30 p.m., clinical meeting. Members of Woolwich Division are invited.

HYDE DIVISION.—At Lake Section, Ashton-under-Lyne General Hospital, Saturday, April 13, 2.30 p.m., "At Home." Short clinical meeting, with tea, and visit to departments of hospital.

MONMOUTHSHIRE DIVISION.—At St. Mellon's County Club, Tuesday, April 16, 7.45 for 8.15 p.m., dinner-meeting. Speaker: Mr. Eric Robinson. Wives and friends of members are invited.

NORTH-EAST ESSEX DIVISION.—At Red Lion Hotel, Colchester, Monday, April 15, 8 for 8.30 p.m., annual general meeting.

OLDHAM DIVISION.—At Albion Club, Queen Street, Oldham, Monday, April 15, 9 p.m., meeting. Professor C. Fraser Brockington: "A Recent Visit to Soviet Russia."

SCUNTHORPE DIVISION.—At Board Room, Scunthorpe and District War Memorial Hospital, Wednesday, April 17, 8.30 p.m., annual meeting.

SOUTHAMPTON DIVISION.—At Royal South Hants Hospital, Wednesday, April 17, 8.30 p.m., annual general meeting.

STOCKTON DIVISION.—At Stockton and Thornaby Hospital, Monday, April 15, 8.30 p.m., meeting. Lecture by Mr. F. E. Stabler: "Some Experiences with Vaginal Aplasia."

SWANSEA DIVISION.—At Morriston Hospital, Swansea, Tuesday, April 16, 8.15 p.m., meeting.

WINCHESTER DIVISION.—At Nightingale Nurses' Home, Royal Hants County Hospital, Sunday, April 14, 2.30 p.m., meeting. Agenda includes report on remuneration claim, etc.

Meetings of Branches and Divisions

DORSET DIVISION

A meeting was held at the Chest Clinic, Dorchester, on February 1, 1957. Dr. T. V. Cooper was in the chair and 29 members were present. A clinico-pathological conference followed, at which cases presented by Drs. E. B. Jarrett and C. Hollins were discussed, and Dr. T. B. L. Bryan produced photographs of a case of inflammation caused by a garter.

Correction.—In the provisional programme for the Annual Meeting, Newcastle upon Tyne, July 10-19 (*Supplement*, March 30, p. 133), the Section of Occupational Health should have been given as meeting on Tuesday, July 16, not Thursday, July 18; and the Section of Neurology as meeting on Wednesday, July 17, not Tuesday, July 17.

ANNUAL MEETING: NEWCASTLE UPON TYNE, JULY 10-19

SUPPLEMENT TO THE
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GENERAL MEDICAL SERVICES COMMITTEE
REPORT TO ANNUAL CONFERENCE OF
REPRESENTATIVES OF LOCAL MEDICAL
COMMITTEES, 1957

The General Medical Services Committee is an autonomous committee of the B.M.A. empowered under the by-laws of the Association to deal with all matters affecting general practitioners providing general medical services in the National Health Service. A subcommittee, the General Medical Services Subcommittee (Scotland), considers and reports to the parent committee on all matters specially relating to general practitioners providing general medical services under the National Health Service Acts in Scotland. The G.M.S. Committee reports annually to the Conference of Representatives of Local Medical Committees, of which it is the executive, and, when necessary, at other times. The Committee's report for the session 1956-7, which its chairman, Dr. A. TALBOT ROGERS, will present to the conference on June 6, has now been sent to all general practitioners. It records a busy session in which steady progress has been made, apart from in the remuneration claim. This has been the subject of a report (*Supplement*, March 23, p. 123) to a special meeting of the Conference which will take place on April 30.

Representations have been made to the Ministry on all the matters which were referred to the Committee by the Annual Conference last year, in many cases with satisfactory results. Where the outcome has been unsuccessful, it was often because the Committee was satisfied by a frank explanation of the Ministry's difficulties in meeting the request, or because further discussion with the Ministry revealed insuperable disadvantages in the course proposed. The Committee thanks local medical committees for their help and encouragement, and, in particular, for their response to the many calls upon them for information and statistical data of one kind or another.

The report goes on to refer to particular items of the Committee's work, and an account of some of these is given here.

Claire Wand Award

The Annual Conference last year approved the proposals made by the trustees of the Claire Wand Fund for the institution of an award for outstanding services to general practice. Subsequently the Committee received a recommendation from the trustees that the presentation of the award on the first occasion should be made to H. Guy Dain. With the present session of the Committee, Dr. Dain will have com-

pleted 40 years' service on the General Medical Services Committee and its predecessor, the Insurance Acts Committee. In addition, he served in the chair of the latter Committee for 11 years.

This long period of service has contributed so much to the cause of the general practitioner and his work that the Committee feels that the trustees' recognition could not be more highly deserved.

Size of the Central Pool

Negotiations with the Ministry on the size of the Central Pool have continued and the final settlement for the financial year, 1954-5, which amounted to the substantial sum of £44m., was distributed to the profession at the end of last year.

The Committee reports that it is doing all it can to expedite the calculation and distribution of the final settlement moneys for subsequent years. Few of the necessary inquiries can be put in train until after the end of the financial year in question. Inquiries have to be made into practice expenses, income from hospitals, local authorities, and other Government departments; and agreement must be reached on the figure of the number of doctors in the Service.

Nevertheless, the Committee realizes that a lapse of some 21 months, as occurred in calculating the Pool for 1954-5, is far too long, and it reports that it has impressed upon the Ministry the need for dealing more expeditiously with these questions in the future.

Discussions are now proceeding on the size of the Central Pool for 1955-6.

Fees for Part-time Work for Local Authorities

The Council of the B.M.A. informed the Associations of Local Authorities of its wish to review the scale of fees for part-time sessional work undertaken by medical practitioners on behalf of local authorities. These fees were governed by arrangements made with the Local Authorities as long ago as 1947 and 1951.

The County Councils Associations suggested that any revision of these fees was properly a matter for Committee C of the Medical Whitley Council, but, since neither general practitioners nor consultants were represented on that Committee, it was felt that the negotiations should be undertaken on an *ad hoc* basis, as had been the case on previous occasions.

After a good deal of discussion, the situation was met by the appointment of a special subcommittee of Committee C of the Medical Whitley Council which included representa-

tives of both general practitioners and consultants. Agreement was reached in the subcommittee on all the items in the claim, and the Committee is satisfied that the new scale of fees (*Supplement*, December 29, 1956, p. 228) is more in line with present-day conditions.

Monthly Payments

Further discussions that have taken place with the Ministry of Health on the principle of monthly payments for general practitioners are reported. The Ministry, while not unsympathetic, is reluctant to adopt the suggestion unless it can be certain that the additional work involved will not entail any increase in the staffs of executive councils.

The Ministry has undertaken to consult with the Association of Executive Councils, and the Committee, for its part, has reminded the Department that in some areas where monthly payments are now operating no additional staff has been found necessary, and that, in any case, a number of proposals put forward by the Committee—in particular, the abolition of back debits and back credits—should more than compensate for any additional work involved.

Mileage

The Government Mileage Committee issued an interim report on the ordinary portion of the fund in December, 1956. The question of special mileage is to be dealt with in a final report, which will be published as soon as its further investigations have been completed. The views of the Rural Practices Subcommittee on possible methods of distributing special mileage have already been passed to the Mileage Committee.

The G.M.S. Committee states that it has repeatedly impressed upon the Ministry that there could be no question of implementing any major recommendations which the Mileage Committee might make affecting the principles of the present mileage scheme until they had been referred to and discussed by local medical committees and the Annual Conference. The Committee therefore attaches considerable importance to the view of the Mileage Committee that it would be wrong to treat the ordinary and reserved portions of the fund in isolation, and that, in fairness to the doctors concerned, no effect should be given to the recommendations in the interim report until the full report is available.

Subject to this major reservation, however, neither the Committee nor its Rural Practices Subcommittee takes any exception to the recommendations contained in the interim report. Nevertheless the Committee emphasizes that, in view of the limited nature of the report and of the fact that the full implications of the proposals cannot be assessed until the Mileage Committee's observations on special mileage are available, its agreement must be provisional. It was on this basis that the Committee sent the report to local medical committees.

Attention is called to the Mileage Committee's suggestion that, pending the implementation of its main recommendations, the Ministry of Health should take steps to adjust the allocations now made to executive councils from the mileage fund, and hence to rural doctors, in the light of up-to-date returns based on existing criteria. The present calculation is based on returns made by executive councils in 1949. Not only are these returns considerably out-of-date because of the many changes which must have occurred since that date, but the instructions given by the Minister at that time were wrongly interpreted by some executive councils. As it must still be some time before the major recommendations of the report can be put into operation, the Committee takes the view that these discrepancies should be removed and the allocations under the present distribution scheme revised at once. The Ministry of Health has been informed accordingly. The Committee stresses, however, that this decision in no way involves any alteration of the principles of the mileage distribution scheme now in operation, but only in the calculation of the actual payments on the basis of up-to-date and accurate returns.

Group Practice

The Group Practice Loans Committee received in the year ending December 31, 1956, a further 51 applications for loans from the Group Practice Loans Fund. The Committee approved in principle 27 loans totalling £122,220. A further £88,000 came into the fund in April, 1956, being the amount set aside annually for loans to group practices in England and Wales, and in addition about £24,800 was received during the year from groups in repayment of loans already made, making a total for 1956 of £112,800.

From the time the scheme was announced in January, 1954, until December 31, 1956, a total of 239 applications had been received. No application has been approved without a prior visit to the group. By the end of 1956, 100 of these applications had been approved in principle: 46 were for loans for building new group practice premises and 54 were in connexion with the conversion of existing premises to further group practice. The total number of applications which had been rejected was 92, while 26 applications had been withdrawn for various reasons, 9 applications were in abeyance at the request of the groups, and 12 applications were still under consideration at the end of the year.

The following statement sets out the financial position of the Group Practice Loans Fund as at December 31, 1956.

Total amount approved in principle ..	£ 451,942
Total amount advanced to groups ..	306,451
Total amount repaid by groups ..	35,395

The amount of money in the Group Practice Loans Fund at December 31, 1956, was as follows:

Contribution from Central Pool (4 × £88,000)	£ 352,000
Repayments from groups ..	35,395
	£387,395
Less amount advanced to groups ..	306,451
	£80,944

As the total amount approved in principle continued to exceed the amount in the fund, the Group Practice Loans Committee, it is stated, continued to warn applicants that there might be some delay before the money could be made available to them.

The G.M.S. Committee reports that it has examined a suggestion made at the A.R.M. last year that the scope of the interest-free loans for provision of surgery accommodation should be extended to single-handed practitioners and partnerships which are not at present covered by the Group Practice Loans Committee's definition of group practice.

The Committee has concluded that it would not be justified in seeking any extension of the Group Practice Loans Fund at the present time. The aim of the existing scheme is to encourage group practice, and to extend these arrangements to other types of practice could only be effected at the expense of the Central Pool. The yearly contribution of £100,000 to the Group Practice Loans Fund is a first charge on the Central Pool, and any increase in this amount could only reduce the amount remaining in the Pool for distribution in other ways.

Medical Practices Committee Certificates

At the Annual Representative Meeting last year the following motion was referred to the Council of the Association for consideration:

"That this Meeting recommends that Section 35 (9) of the National Health Service Act, 1946, be more clearly defined even to the extent of amending the Act, so that just as the granting of a certificate of valuation protects the practitioner at law, the refusal of such certificates should legally imply that the law has been broken. Furthermore, it recommends that the Medical Practices Committee should be answerable at law for failing to carry out their statutory duties."

The General Medical Services Committee, to whom the Council remitted the matter, reports that it has discussed the issues involved with the Medical Practices Committee.

The Medical Practices Committee takes the view that the particular case which gave rise to the proposals contained in the motion, and which finally ended in the Courts, had a number of unsatisfactory features. In the first place, the certificate had been applied for after the completion of the transaction, and this fact in itself prevented the Committee from issuing a valid certificate, since the Act provides that such certificates can be given in respect only of proposed transactions. Secondly, the valuation department of the Board of Inland Revenue could not agree with the value placed upon the premises concerned, which in fact were residential and which had never substantially been used for practice purposes. The valuation department had considered the question more than once but had nevertheless felt unable to increase its own original valuation. Thirdly, the Medical Practices Committee itself, when explaining why a certificate could not be given, had quoted from the letter from the valuation department and not restricted itself to the exact terms of the Act. Hence, the view expressed by Mr. Justice Vaisey that the Committee had directed its mind to something which was an entirely false point and had nothing to do with Section 35.

Nevertheless, even had it been possible for the M.P.C. to issue a valid certificate, and even if the exact words of the Act had been stated in its letter, that Committee is still not satisfied that it would have been justified in so doing. The M.P.C. does not give a legal decision. The refusal of a certificate carries no other implication than that the M.P.C. is not "satisfied" that one can be issued. Thereafter, no further action is taken by the M.P.C. but only by the Director of Public Prosecutions in the event of a complaint. In such circumstances the M.P.C. may be required to produce its files, but it does not itself initiate action of any kind after refusing to grant the certificate. It was pointed out by the M.P.C. that the refusal of a certificate is no bar to the completion of a transaction, and undoubtedly many such transactions may be unexceptionable. The parties, however, are left without the complete protection which a certificate provides.

So far as the M.P.C.'s own procedure is concerned the Committee understands that care is now taken to see that all refusals of certificates are worded in the precise terms of the Act, as indeed the vast majority have been in the past. In those cases where, because of the prior completion of the transaction, it is not possible to give a valid certificate, the M.P.C., in addition to using its standard letter, may add a statement that were it not so precluded it would or would not have granted a certificate in respect of that particular transaction.

So far as the latter part of the motion set out above is concerned, the M.P.C. expressed the view that, to the best of its knowledge, the Committee is answerable at law for failure to carry out its statutory duty but that that duty goes no further than to grant or refuse a certificate within the terms of the Act.

In view of the explanation given by the Medical Practices Committee, the Committee is satisfied that no further action is necessary.

Machinery for Filling Practice Vacancies

Having discussed this matter fully with the Ministry, the Committee has concluded that there may well be good reasons for not disturbing the existing arrangements. There has been some general improvement and it seems to the Committee that such delays as have occurred in filling practice vacancies are due not so much to any defect in the selection procedure itself but to delays in hearing and announcing the results of appeals against the decision of the Medical Practices Committee. This particular point has been discussed with the Ministry and an assurance obtained that every possible step will be taken to expedite the hearing of appeals and, in particular, to make the results known to all concerned at the earliest possible moment.

On the general issue, apart from the fact that amending legislation would be necessary, the Ministry put forward

certain criticisms which the Committee feels have some substance.

It was clear that early legislation on a matter of this sort was unlikely to be obtainable. The Committee is satisfied that the Ministry is seized of the importance of doing everything possible to speed up the present selection arrangements. The Committee has therefore decided not to pursue the matter further for the present.

Protection of Practices

Some years ago the Committee reached agreement in principle with the Ministry on the steps to be taken to safeguard the practices of general practitioners called up in an emergency. The implementation of the scheme remained subject to a Government decision on the general question of the making up of the balance of civilian pay in war-time. Largely because of the improvement in the international scene, the matter was not pursued at that time.

The arrangements now agreed with the Ministry provide that during an "emergency" recognized by the Minister, after consultation with the profession, a doctor who is absent from his practice will remain on the medical list and will be expected to make deputizing arrangements to enable his practice to be carried on during his absence.

So far as the Central Pool is concerned, since the absentee doctors will remain on the medical list, they will continue to be included in the annual calculation, while the total remuneration received from the Forces will be deducted from the global pool when the final settlement is calculated at the end of the financial year. In addition, the expenses of employing a locum or of making other deputizing arrangements is a practice expense which will be reflected in the overall practice expense ratio when the final settlement is calculated.

When a doctor joins the Forces his list will be frozen in the sense that for financial purposes the number of patients will, during his absence, be fixed at a number equal to the average during the two quarters immediately preceding that in which he joins the Forces. During the doctor's absence, transfers of his patients (other than those who have changed their address) to the list of other doctors will in effect be on a temporary basis. On the absentee doctor's return, executive councils will notify all patients (other than those who have changed their place of residence) who were on his list when he joined the Forces but who have transferred to another doctor during his absence that they will be returned to their own doctor's list unless they wish to continue on the list of the doctor who has been temporarily attending them. If they do not wish to return to their former doctor, the practitioner attending them temporarily will remain responsible for their treatment in all respects but will receive no capitation fees in respect of such patients for twelve months. During this period the fees will be paid to the doctor returning from the Forces.

It is believed that a scheme of this kind will greatly assist the absentee doctor, but it is emphasized that it is only designed for a temporary emergency and any large-scale call-up would call for measures of a different kind.

Emergency Call Service

Following the introduction of an emergency call service organized on commercial lines in the London area early last year, the Committee reports that it set up a special Subcommittee to examine the whole problem of deputizing arrangements, with particular reference to those organized on a commercial basis. After taking legal advice, and as a result of the investigations undertaken by the Subcommittee, the Committee issued a statement (*Supplement*, October 6, 1956, p. 147) that it was satisfied that such schemes did not necessarily run counter to the National Health Service Act and its regulations.

On the general issue the Committee feels that the interests of general practice and the public are best served by providing for proper off-duty and leisure time by means of the more-established and proved methods of group partnership and rota schemes. Nevertheless, in certain areas it may not

always be possible for the individual doctor to participate in such arrangements, and, in consequence, the Committee recognized in its statement that in some circumstances an emergency call service might constitute a suitable supplement to the more usual methods of practice.

The Committee takes the view, however, that they should always conform with the customary arrangements in the other forms of practice, and that they should not be used as an opportunity to escape a contractual obligation to provide a personal and continuing service or to enable a doctor regularly to avoid all emergency and week-end calls. It concludes that the most effective way of dealing with the situation would be for Paragraph 8 (2) (see below) of the Terms of Service to be amended so that a general practitioner would have to obtain the *consent* of the executive council to any standing deputizing arrangements, instead of merely informing the council of the arrangements that had been made.

Paragraph 8 (2) reads as follows:

"A practitioner shall make all necessary arrangements for securing the treatment of his patients where he is unable for any of the causes mentioned above to give treatment personally and shall inform the council of any standing arrangements for that purpose. He shall not absent himself from his practice for more than one week without first informing the council of his proposed absence and of the person or persons responsible for conducting his practice during such absence."

The Committee thinks that amendment of the paragraph would also provide a means for dealing with those cases where, without resort to the emergency call service, a doctor persistently contracts out of night and week-end calls. In addition, it would ensure that measure of professional control which is felt to be necessary.

General Practitioners and the Hospital Service

The Committee states that it has been disturbed for some time at the lack of general-practitioner representation on the boards of governors of teaching hospitals. Representations have been made to the Ministry. The Ministry was informed that the Association is inviting its Branches and Divisions, in consultation with local medical committees, to send to Headquarters the names of suitable general-practitioner representatives for appointment to boards of governors, which will then be submitted to the Minister.

The Ministry has undertaken to consider the Committee's views in making future appointments and to do what it can to increase the number of boards which include a general-practitioner member. In doing so, however, the Ministry made the reservation that it is limited by the fixed proportion of nominated members and the need to secure a proper balance between medical and lay membership. The Committee intends to review the matter again when the vacancies occurring in the early part of this year have been filled.

The Committee reports that the improvement in general-practitioner representation on regional hospital boards in recent years has been maintained, but here again the situation will be kept under review.

General-practitioner Hospital Beds

The Committee has discussed with the Ministry the need for an increase in the number of general-practitioner beds, and, in particular, general-practitioner maternity beds, and reports that the figures for 1955 again show some increase in the total of staffed beds allocated to general practitioners.

There is, however, still much room for improvement, the Committee thinks, particularly in areas where the number of consultant beds is high and patients are given undue encouragement to have their babies in hospital. In this connexion the Committee is doing all it can to secure an improvement in the Weymouth area, where general practitioners so far have no access to hospital beds.

Closure or Change of Usage of Hospitals

The Conference last year referred to the Committee a motion by London which proposed that regional hospital boards and boards of governors of teaching hospitals should

not be permitted to announce the proposed closure of a hospital or a change of use of a hospital unless and until an independent inquiry had been held. The implications of this suggestion are under consideration by the Liaison Committee, where it can be examined in the light of the views of those engaged in the hospital service. The Committee intends to discuss this suggestion with the Ministry as soon as the Liaison Committee has completed its review.

X-ray and Other Diagnostic Facilities

During the past year several instances are reported to have arisen in which, with little or no prior warning, general practitioners have suffered a complete withdrawal of diagnostic facilities normally available to them in local hospitals. The Committee appreciates that these events have been largely precipitated by staff shortages, but nevertheless it feels that such steps should not be taken without consultation with the local medical committees concerned. In addition, it takes the view that in these circumstances the reduced facilities available should be shared to some extent by all those who normally use them and that the general practitioner alone should not be singled out to suffer a complete loss of these important facilities. These views have been brought to the notice of the Ministry.

Trainee General Practitioner Scheme

The Ministry has accepted the recommendations contained in the Report of the Special Subcommittee on the Trainee General Practitioner Scheme, which was approved by the Conference last year. It has now been sent to executive councils with the suggestion that steps should be taken as soon as possible to implement its recommendations.

The Committee has drawn the attention of local medical committees to the regional appeals machinery advocated in the report, and, while the Committee believes that the number of cases of appeal will be small, it hopes that local medical committees will take advantage of this new facet of the scheme. The advisory committee suggested in the report has been constituted. Its personnel included a medical member of the staff of the Ministry of Health, who acts as an observer.

Charges for Prescriptions

Following the Government's announcement of its intention to extend the charges for prescriptions, a deputation from the Committee protested strongly not only against the charges themselves but about the complete lack of consultation on the new proposals. The Association is opposed to charges of any kind, states the report, and the Committee is particularly opposed to the Government's present scheme, which extends the existing charges in a manner which must discriminate against certain categories of patients. In spite of the Committee's protest and of representations made to the Minister by the Council of the Association, the Government has proceeded with its proposals.

Without prejudice to the major principle involved the Committee pointed out to the Ministry that certain aspects of the scheme put needless burdens on dispensing doctors—particularly in connexion with the issue of separate receipts. The Ministry, while taking full account of these criticisms, now maintains that the use of multiple receipt forms would give rise to abuse. The Committee is protesting most vigorously against this further imposition.

Discussions are to take place with the Ministry of Health on the provision of a number of multiple packs which would count as one item only for the purposes of the prescription charge. The Committee hopes that by these means it will be possible to alleviate to some extent the worst discriminatory features of the present scheme of charges.

Drugs for Private Patients

A joint deputation of representatives of the Private Practice and General Medical Services Committees has interviewed the Minister of Health and emphasized the importance which the Association attached to the principle of permitting private patients to receive drugs under the N.H.S.

The Minister—then Mr. Turton—whilst reiterating the view of his predecessor, Mr. Macleod, that such an innovation would not be repugnant to Conservative principles, nevertheless felt unable to commit the Government on this question at the present time. He suggested, however, that it might be possible to make further progress if the Association entered into discussion with his officers on a number of issues which are set out in the following extract from the agreed report of the meeting:

- (1) Working out the size of the problem—i.e., the present number of patients in the country receiving private treatment;
- (2) estimating the likely cost of the concession;
- (3) attempting to devise a suitable administrative procedure for disciplinary prescribing; and
- (4) considering what consequent adjustments might have to be made in the remuneration of general practitioners (and in particular in calculating the basis of the Central Pool).

The Committee has kept in close touch with the Private Practice Committee throughout and there is general agreement that the Minister's invitation should be accepted. The G.M.S. Committee, having regard to the repercussions of the major remuneration dispute, has recommended to the Council of the Association that the invitation be accepted at an appropriate time.

Investigation of Prescribing

The Ministry, it is reported, has agreed to inform the Committee in all cases where it is proposed to instruct pricing bureaux to refer particular substances to executive councils on the grounds that they are not drugs. The initiative taken by the Committee in this matter arises largely as a result of the fact that on many occasions in the past it appeared that pricing bureaux were questioning the prescribing of certain items indiscriminately. The Committee has been assured by the Ministry that the bureaux are normally guided by the reports of the Definition of Drugs Joint Subcommittee and that the fact that it appears that any one substance is being picked out for investigation at a particular time is purely coincidental.

The Committee has also approached the Ministry about the attitude adopted by some regional medical officers towards the prescribing of proprietary preparations. Allegations have been made from time to time that some regional medical officers seek merely to reduce the number of proprietary preparations prescribed irrespective of whether or not economy would be achieved in a particular case. The Ministry has accepted the Committee's point of view and has undertaken to inform regional medical officers accordingly.

Discount on Drugs

Although the Conference last year accepted an offer by the Association of British Pharmaceutical Industry to increase the rates of discount on proprietary preparations from 10% to 20%, it expressed the view that dispensing doctors' prescriptions for drugs on the special list should be priced and paid for on the basis of the cost to the practitioner and not on the cost to the pharmacist.

This matter has now been discussed with the Ministry, which takes the view that there is some justification for the difference in rates of discount largely because of the fact that the doctor does not incur some of the overhead expenses which the chemist must face. The Committee regards this answer as most unsatisfactory and further representations are to be made.

Prescribing Costs

In its report in 1956 the Committee referred to the Ministry's anxiety at the continued increase in the cost of the pharmaceutical services, and suggested that, if the present trends continued, the Minister might be forced to limit the cost which fell upon public funds. The Ministry indicated that it would greatly regret such a step, and suggested that an inquiry might be undertaken to see whether there was not some way in which doctors might be able to do still more to eliminate additional costs without detriment to

their patients. The Committee agreed to discuss the matter further, but made it clear that any search for economy should not be limited to the general-practitioner field. Equally, it emphasized that it was not prepared to enter into discussions on this subject under duress.

The Committee felt that there were serious objections to the proposal that such an inquiry should be carried out solely within the profession, and suggested that a working party consisting of representatives from the profession and the Department would be an appropriate body. The Ministry, however, felt that an inquiry of this nature must be wide in its scope and that it would place officials of the Ministry in an embarrassing position if they were called upon to comment on matters which had political implications. The Committee accepted this point of view and agreed that the inquiry should be undertaken by an independent committee.

It is understood that the inquiry will be concerned with all factors which might influence prescribing, including, for instance, medical education and training, the experience of doctors in hospitals, the influence of hospital practice, the effect of advertising techniques by manufacturers on the medical profession, pharmacists, and the public, and pressure by patients. The Ministry has announced that the personnel of the prescribing committee will consist of a dean of a medical school, two general physicians, a pharmacologist, a pharmacist, a statistician, and five general practitioners.

The Committee has now received an invitation from the Ministry to nominate the five general practitioners, but in present circumstances it feels unable to make the suggested nominations.

Prescribing Statistics

The Ministry, the report states, has for some time been seeking to improve the accuracy of the prescribing data which is circulated to general practitioners. The Committee had hoped that this scheme, which enables a doctor to compare his prescribing costs with those for the area, would greatly assist in economy in prescribing, but unfortunately the data prepared by the Ministry contained many anomalies due to the methods by which the figures were compiled.

In the course of revising these methods the Ministry put forward the proposal that prescription forms should be stamped with the name of each individual doctor. The Committee felt that this proposal might cause considerable difficulties in partnerships, and suggested that it should suffice if the pads of forms for use in partnerships were stamped with the collective name of the firm. Unfortunately the whole system of sorting and pricing prescriptions is based upon the name of the individual practitioner, and any modification in the manner envisaged by the Committee would make it extremely difficult, if not impossible, for the scheme to function.

The Committee with some reluctance agreed to the Ministry's proposal for individual stamping. It is, however, watching the position carefully and it will not hesitate to make a further approach to the Ministry should it become clear that general practitioners are suffering any undue burden as a result of these arrangements.

Revision of Service Committees and Tribunal Regulations

The revision of the disciplinary machinery has now been completed, and the revised regulations, together with an explanatory circular letter, were sent to executive councils on August 21, 1956. The Committee hopes that the amendments to the regulations will considerably improve the working of the disciplinary machinery. It emphasizes the desirability of all doctors against whom official complaints are made seeking advice at the first opportunity. Secretaries of local medical committees are asked to offer their help to any doctor against whom a charge is being brought as soon as they hear of the case.

Responsibility for the Acts and Omissions of a Deputy

The Committee has again considered the view of the Conference last year that the principle of immunity for the acts and omissions of deputies should be extended to locums.

and assistants and that the regulations should be amended to provide that a locum would enter into a contractual relationship with the executive council for a period limited to the absence of the principal from the practice. Legal advice on the implications of this proposal makes it clear that an assistant or locum could be subjected to the same terms of service as the principal only by insisting upon his admission to the medical list—a step which has many obvious and undesirable implications.

Again, in the case of both assistants and locums, the contractual relationship which exists is a personal and private matter and not the concern of any statutory body set up under the National Health Service. In the Committee's view, it would be both illogical and undesirable to impose upon that relationship certain conditions prescribed by an executive council.

By seeking admission to the medical list, the general practitioner enters into a contract by which he accepts overall and continuing responsibility for the patients who join his list. The Committee does not consider it reasonable that the principal, by choosing to delegate his duties to an assistant or a locum, can or should expect to lessen the personal and overriding responsibility to his patients which he accepts under the terms of service.

Finally, the Committee has discussed this matter with the Ministry on many occasions in the past and, apart from any difficulty in securing further amendments to regulations which have so recently been agreed, the Department has made it quite clear that it could not accept the principle that immunity should be extended to assistants and locums.

For these reasons the Committee has to report that—at any rate for the present—it does not feel able to take effective action along the lines put forward by the Conference.

Cranbrook Committee on Maternity Services

The Minister of Health has set up a special committee under the chairmanship of Lord Cranbrook to inquire into the maternity medical services, and the General Medical Services Committee reports that it has appointed a number of representatives to a special committee established by the Council of the Association to prepare a memorandum of evidence. The attention of the Evidence Committee has been drawn to the views expressed by the Conference that the Obstetric List should be abolished, and that there should be uniformity throughout the country of the criteria laid down for the payment of post-natal fees when the patient fails to attend.

Antenatal Care Related to Toxaemia

A memorandum by the Standing Maternity and Midwifery Advisory Committee of the Central Health Services Council on antenatal care related to toxaemia has now been issued by the Ministry. The chairman of boards of governors and of hospital management committees have been asked to arrange meetings of professional representatives from the three branches of the National Health Service to discuss the professional issues raised by the memorandum. It is intended that the views of the three branches of the profession should be conveyed to the administrative bodies concerned in the hospital service, who will then report to the Ministry on the need for any action to be taken centrally. Once this stage is reached the memorandum, which draws attention to the need for the fullest liaison between the hospital, the general practitioner, and the local authority, will be discussed with the Ministry.

Obstetric Emergencies

The Committee has agreed that in an extreme emergency a midwife should be permitted to call the obstetric flying squad at the same time as she calls the general practitioner. Medical officers of health are being asked to ensure that midwives are not given such rigid instructions about the calling of flying squads that they feel unable, even in very obvious cases, to call the squad before sending for the general practitioner.

Assistants and Young Practitioners Subcommittee

The Subcommittee's primary concern is with the problems associated with entry into general practice and the conditions of employment of assistants, and a number of recommendations have been submitted to the parent Committee.

The desirability of a written agreement between principal and assistant has been emphasized on a number of occasions and the Subcommittee has devoted considerable time to a study of the points which it considers should be covered in such an agreement. A model agreement incorporating the Subcommittee's views is being prepared and every effort will be made to publicize the Committee's policy that an agreement on these lines should be entered into in every case.

The Subcommittee has improved its own regional organization. The circumstances of the majority of its electorate make contact with their elected members on the Subcommittee difficult, but it has been found possible this year for local meetings to be held in a number of areas.

Compensation

The Conference last year asked the Committee to find some means whereby practitioners who had failed to establish their claims for practice compensation under the N.H.S. Act within the prescribed time could be recompensed from some special fund. The Committee feels that such a suggestion is not practicable. Steps were taken to ensure that those concerned were notified of the arrangements at the start of the Health Service. Announcements were made in the *British Medical Journal* on 14 occasions, while executive councils wrote to every general practitioner on their medical lists. In addition, no special fund exists which could be used for this purpose, and the Central Pool is the only source from which any payment of this nature could be made. In the circumstances the Committee is unable to suggest any way in which a special payment can be made.

The Conference also passed a number of resolutions on the inadequacy of the existing interest rates paid on compensation moneys and the effect which the declining value of money has had on the real value of the capital sums involved. The Committee has asked the Compensation and Superannuation Committee to look into the issues. It understands that both these questions are under active consideration by that Committee, but that, on the advice of Sir James Millard Tucker, it has been decided to defer further action pending the outcome of the remuneration claim, since to proceed at the present time might well serve to confuse the major issue of the betterment factor.

Superannuation

In a motion which the Conference referred to the Committee last year it was suggested that medical practitioners should be allowed the option of retirement after twenty years' service. This question has already been considered by the Compensation and Superannuation Committee. As the superannuation scheme must remain actuarially sound, the additional cost of earlier pensions would have to be met by increased contributions or by reducing the benefits. For instance, to obtain a pension of 1½% of remuneration at age 45 after 20 years' service a total contribution of about 22.8% per annum would be necessary. If the pension is to be the same as if service had continued for 40 years the contribution would be approximately 45% per annum. Alternatively, if contributions remain the same and a practitioner could retire on a pension at 45 after 20 years' service, the pension could not be higher than about 0.9% of his superannuable remuneration.

A further proposition put forward at the Conference was that the pension of the elderly doctor should be calculated on a minimum basis of fifteen years' service where ten to fifteen years of service had been completed. Here, again, an increased benefit of this sort could be introduced only if other benefits are reduced or contributions of all contributors are increased.

Facilities for Necropsies

Following representations by the Committee the Ministry has agreed that when a general practitioner requests a necropsy the cost of transport from the patient's home to hospital is an expense which may be met by the hospital, provided that the pathologist concerned is first consulted and gives his agreement. Further consideration is being given to proposals which were made at the last Annual Representative Meeting and which would considerably extend the circumstances in which a general practitioner could obtain a post-mortem examination at public expense.

GENERAL MEDICAL SERVICES SUBCOMMITTEE (SCOTLAND)

It is reported that Dr. C. J. Swanson (Aberfeldy) and Dr. Catherine Harrower (Glasgow) were reappointed Chairman and Vice-Chairman respectively for the session 1956-7.

Prescribing Costs

Following representations by the Subcommittee, it has been agreed to appoint a separate committee in Scotland to inquire into prescribing costs, and the remit to this Committee has been extended to include prescribing in the hospital service as well as in general practice.

Problems of Redevelopment Areas

The *ad hoc* Committee which was appointed to examine the question of the use of local authority premises by general practitioners is now concerned with the more complicated problem of redevelopment areas and the effect on general practice of the shift of population in the areas affected. It is proposed that the Committee should meet representatives of the Department of Health and the Scottish Medical Practices Committee to discuss the matter.

Mileage

The Rural Practitioners Subcommittee has resumed discussions on the question of mileage payments in the light of the views contained in the interim report of the English Mileage Committee and has held two meetings recently. Various points with regard to the distribution in Scotland of the mileage fund have been discussed and the Department has been asked to arrange for the Scottish Mileage Committee to resume consideration at an early date of this long-standing problem.

Prescription Charges

On being informed of the new charges for prescriptions, the Subcommittee expressed agreement with the action of the G.M.S. Committee in protesting against the proposals, and accordingly minuted its disapproval of the new charges.

Group Practice Premises (For which Loans have been Granted)

The Subcommittee has expressed agreement with a proposal by the Department to amend the model agreement by inserting a clause to provide that group practice premises could be used for such other purposes as may be provided for in the proposals approved by the Scottish Group Practice Loans Committee.

Medical Service Committees and Tribunal Procedure

The Subcommittee dealing with this subject has resumed its meetings and is examining the draft proposed amendments submitted by the Department. It is hoped to discuss these with the Department at an early date.

PRACTICE PROBLEMS OF NEW HOUSING AREAS

Report of Special Subcommittee

The G.M.S. Committee presents as an appendix to its report the findings of a subcommittee set up to "consider

the problems associated with movement of population and redevelopment generally." The Subcommittee's proposals for dealing with the matter have been approved by the Committee as a basis for exploratory discussions with the Ministry.

Extent of Problem

Replies received from inquiries to local medical committees showed that a number of areas in different parts of the country are affected in varying degrees—ranging from a wholesale displacement of existing centres of population to peripheral areas to schemes which, although involving only comparatively small numbers, yet have a marked effect upon the practices of individual doctors. The steps being taken to protect the interests of the doctors concerned and the degree to which hardship may be suffered vary widely from one part of the country to another.

In spite of these variations, the Subcommittee feels that the problems can, by and large, be dealt with on a common basis and by the use of measures which are of national application.

Measures Suggested for Discussion with Ministry

Instances in which the local housing authority has not confined itself to the provision of surgery accommodation on a particular estate, but has attempted to select the actual doctors who were to be the occupants of the local authority premises were known to the Subcommittee, and it emphasizes that it is not the duty of the housing authority to allocate the doctors who are to practise from those premises. The executive council, in consultation with the local medical committee and in co-operation with the medical practices committee, is responsible for deciding upon the number of doctors who will be needed for the medical needs of a new area. The selection of the doctors who are to practise from the accommodation provided rests with the Medical Practices Committee (in Scotland with the executive council). The Subcommittee feels that this should be made clear.

The Subcommittee thinks that many difficulties in the past have arisen largely because of the failure of the local authorities to give general practitioners, both individually and collectively, early notice of their replanning policy. In the Subcommittee's view the executive council should be informed by the local authority of its redevelopment plans at the earliest possible moment. Similarly, the executive council must at once consult not only the local medical committee but also the general practitioners most intimately concerned.

The Subcommittee also thinks it important that the Medical Practices Committee should be notified at the earliest possible moment of any substantial changes of population which are envisaged. Such information is vital to the Medical Practices Committee when dealing with additions or withdrawals from the medical list and other factors which may affect the classification of the area.

When redevelopment takes the form of demolition and rebuilding on the same site, the Subcommittee states that all possible steps must be taken to protect the existing doctors against encroachment by newcomers who may take advantage of rebuilding. Full protection can only be achieved by a total closure of the area by the Medical Practices Committee until the situation has become stabilized. Equally, where redevelopment takes the form of dispersing a centre of population, the old area must also be closed.

If there is any doubt that the housing authority will provide practice premises only to doctors selected by the Medical Practices Committee the new estate must be classified as a closed area to prevent any influx of "squatters." The Subcommittee understands that in Scotland, where similar problems have been under consideration, the G.M.S. Subcommittee (Scotland) has concluded that, much as it regrets the necessity in any circumstances to close an area, the entire peripheral area surrounding the new estate should also be closed. While not suggesting that similar action should be taken in England and Wales at this stage, the Sub-

committee feels that a large measure of protection can be secured by the close-co-operation of the local authority, particularly as in many instances the authority also owns all the property in the peripheral area. All reasonable steps will have been taken to protect the position of those appointed by the recognized machinery, if the local authority refuses to lease or sell accommodation in the surrounding area except in cases where the executive council and the local medical committee are in agreement, and the new area itself is closed by the Medical Practices Committee.

Doctors living in the old centres of population whose patients have been moved to a new estate have a special claim to be considered for the vacancies if they wish to apply, and the Subcommittee feels strongly that these doctors must be given preference in following their own patients into the new area. The Subcommittee emphasizes the importance of adequate provision being made for new surgery premises where existing surgeries may be demolished as a result of redevelopment. Premises, either permanent or temporary, must therefore be continuously available.

PRIME MINISTER AND PRESIDENT EXCHANGE LETTERS

PHYSICIANS TO CO-OPERATE WITH ROYAL COMMISSION

The following statement, dated April 11, has been received from the Royal College of Physicians.

The Royal College of Physicians at a special *comitia* to-day, after hearing the letters exchanged between Sir Russell Brain, their President, and the Prime Minister; and the President's account of his meetings with the Royal Commission and its Chairman, Sir Harry Pilkington, decided that they wished to co-operate with the Royal Commission on the remuneration of doctors and dentists.

President's Letter

According to *The Times* of April 12, Sir Russell Brain, P.R.C.P., wrote to the Prime Minister about the terms of reference of the Royal Commission on the remuneration of doctors and dentists. He asked for replies to certain questions, but made it clear that in doing so he was "not committing anyone to any particular line of action with regard to the Royal Commission."

Replying on April 11, Mr. Macmillan pointed out that "interpretation of the terms of reference is a matter for the Royal Commission and I cannot in any way formally commit it." Subject to that understanding, he answered the President's questions.

Questions

The President's questions on the terms of reference are recorded in *The Times* as follows.

(1) In clause A the term "other professions" is a vague one, since to-day there is no agreed definition of a profession. Apart from this it is difficult to see why the incomes of other callings should be treated as irrelevant to the economic and social status of the professions. Will the Royal Commission be free to take into account incomes earned not only in "professions," but also in commerce and industry, both as salaries and wages—a point of obvious importance in relation to recruitment to medicine?

(2) Clause B begins: "What, in the light of the foregoing, should be the proper current levels of remuneration?" This has been interpreted as meaning that the Royal Commission would have to limit itself to a consideration of the matters set out in clause A. The fear has been expressed that this is unduly restrictive, and that the Royal Commission having heard evidence on other matters would find that its terms of reference precluded its considerations. I have in mind the matters referred to the Spens Committees—namely, "the desirability of maintaining in the future the

proper social and economic status" of general medical practice and consultant and specialist practice, and their "power to attract a suitable type of recruit to the profession." Hours of work and the responsibility of the work undertaken are also important considerations. Would the Royal Commission be free to make recommendations "in the light" not only of clause A but also of any other evidence which the medical and dental professions might wish to present?

(3) It would seem that any recommendations about future remuneration should take into account how the present levels of remuneration have been arrived at, and this would include a discussion of the recommendations of the Spens Committees and the Danckwerts award. Would the doctors and dentists be free to put before the Commission their view that the remuneration of the professions, now and in future, should be determined on the basis of the Spens recommendations and the Danckwerts award?

(4) On March 11 in the House of Commons, Mrs. Jeger asked the Minister of Health "whether it will be within the terms of reference of the Royal Commission on doctors' and dentists' remuneration to consider the abolition of merit awards." The Minister replied: "The Royal Commission will normally be concerned with levels of remuneration, not with methods as such. Whether or not questions such as that referred to by the honourable member are within its terms of reference must rest with the Commission itself to decide." I should be glad to know whether the Commission has reached a decision on this point, and, if not, when it will have done so.

(5) There is a strong feeling in the medical profession that our colleagues in the Public Health Service should not be excluded from the scope of any review of remuneration. Do the terms of reference of the Royal Commission include them?

Answers

The Prime Minister's replies are reported as follows.

(1) It must be left to the Commission to decide what interpretation should be put on the words "other professions," but I feel sure that they would not wish to adopt any narrow interpretation or refuse to consider any callings which might be cited in evidence before them.

(2) The medical profession would be free to bring points of this kind to the notice of the Commission, and there is nothing in the terms of reference to prevent the Commission from considering them. Indeed, in order to satisfy their terms of reference they would have to consider some at any rate of them. As in the case of other evidence it would be for the Commission to decide what weight to attach to them.

(3) I feel sure that the Commission will be prepared to receive and to take into consideration any expression of views which the medical and dental professions put before them as being in their opinion relevant to the Commission's work.

(4) I cannot say what if anything the Commission have decided; if it becomes possible for them to make any statement on the matter which you raise, they will no doubt do so themselves. But I imagine that they would wish to hear evidence and to make substantial progress with their work before arriving at a view as to whether, and if so how far, their main task of recommending "proper current levels of remuneration" requires them to consider the particular matter which you mention.

Public Health Doctors Excluded

(5) The remuneration of doctors employed by local authorities is excluded from the scope of the Royal Commission's recommendations, but any claim on their behalf through the usual machinery would necessarily be considered in the knowledge of any recommendations of the Commission.

The Prime Minister concludes: "I have consulted Sir Harry Pilkington who agrees with these replies."

PUBLIC STATEMENT BY ROYAL COMMISSION

INTERPRETATION OF TERMS OF REFERENCE

Closely following on the exchange of letters between the President of the Royal College of Physicians and the Prime Minister, the Royal Commission issued a statement to the press, dated April 12, on how it intends to proceed. The statement was as follows.

In view of doubts cast on the interpretation of the terms of reference, the Royal Commission have given urgent consideration to this matter, and think it may be convenient if they announce publicly how they have decided to proceed. They have shown this statement to the sponsoring Ministers, and they understand that it is wholly consistent with the intentions formed by the Government when advising the appointment of the Royal Commission.

(1) The Spens Reports and the Danckwerts Award will be studied by the Commission, and also the Reports of any other Commissions and Committees in so far as they are relevant to the circumstances of the medical and dental professions and to the relationship of those professions to the community as a whole.

(2) The Commission will bear in mind the need for maintaining a proper level of recruitment to the medical and dental professions in competition with other callings, and will consider evidence as to conditions imposed by the nature of the work.

(3) The phrase "other professions" will be interpreted widely so as not to exclude, for example, science and other graduates in industry at all levels.

(4) The Commission are not asked to recommend remuneration for doctors and dentists employed by local authorities; but these doctors and dentists are among the "other members of the medical and dental professions" on whose remuneration evidence will be received for purposes of comparison.

(5) "Other connected occupations" cover a wide range of persons, including on the one hand hospital administrators, and on the other, nurses and medical auxiliaries, whose remuneration will be considered with special reference to differentials.

(6) The Commission will in the light of all this and any other relevant evidence recommend such "current levels of remuneration" as appear to the Commission to be justified.

(7) The Commission's duty to recommend current levels of remuneration calls for recommendations covering, for example, average incomes and the desirable spread between extremes; but it does not call for the construction of detailed schemes of distribution.

(8) After consideration of the desirable current levels of remuneration for doctors and dentists, the Commission will consider whether, and if so what, arrangements should be made to keep that remuneration under review.

In a separate notice the Royal Commission are asking all interested persons or organizations to offer evidence. Preliminary inquiries have shown that the preparation of this evidence will take some of the bodies concerned considerable time. The Commission are anxious to complete their task with the utmost speed consistent with thorough examination of all the relevant issues, and hope that all written evidence and submissions to the Commission will be in their hands within the next three months.

B.M.A. STATEMENT

The B.M.A. issued a statement on April 12, immediately following the publication of the exchange of letters between the President of the Royal College of Physicians and the Prime Minister and after receiving the Royal Commission's statement.

The Association pointed out that it had learned that day for the first time of the exchange of letters. It noted that the Prime Minister's words that "interpretation of the terms of reference is a matter for the Royal Commission, and I cannot in any way formally commit it," and the statement went on to say that the B.M.A. was advised that everything that followed in the Prime Minister's letter was conditioned by this principle. Furthermore, the mere interpretation by the Royal Commission of its terms of reference was insufficient to remedy the "omission from its terms of reference of matters vital to the profession's future." The Council would examine what the Commission had said. But

it appeared at first sight that the need—a most unusual one—for an exchange of letters and for the issue of an explanatory memorandum by the Commission emphasized the necessity for the sort of discussion between the Government and the profession on the terms of reference which the Chairman of the Association's Council, Dr. S. Wand, asked for in his letter to *The Times* (April 8) following the recent debate in the House of Lords.

Scottish News

SCOTTISH HOUSE, EDINBURGH

REOPENING AFTER RECONSTRUCTION

The Association's Scottish House at 7, Drumsheugh Gardens, Edinburgh, which has been undergoing extensive reconstruction, will be formally reopened by the President of the Association, Dr. Alexander Hall, on Tuesday, May 14, at 4.30 p.m. Tea will be served from 3.45 p.m. to 4.30 p.m. Apart from those officially invited to the ceremony there is accommodation for an additional 100 guests. Any members of the Association who would care to attend the reopening ceremony are therefore asked to apply for a ticket to the Scottish Secretary, B.M.A. Scottish House, 7, Drumsheugh Gardens, Edinburgh, 3 (telephone: Central 7184).

MEDICAL PRACTICES COMMITTEE

NEW CHAIRMAN APPOINTED

The Secretary of State for Scotland has appointed Dr. J. T. Baldwin, a former chairman of the Scottish Committee of the Association, as chairman of the Scottish Medical Practices Committee. Dr. Baldwin is at present chairman of the Lothians and Peebles Executive Council. He succeeds Dr. A. F. Wilkie Millar, who has been chairman of the Scottish Medical Practices Committee since its inception in 1948. The G.M.S. Subcommittee (Scotland) has expressed its appreciation of the services rendered by Dr. Wilkie Millar during his term of office, and of the guidance he has given to the Committee, particularly in the early days of the N.H.S.

GENERAL-PRACTITIONER REFRESHER COURSES

Information is being sent by the Department of Health to all general practitioners and assistants on the arrangements made by universities and medical schools for intensive refresher courses in 1957. Leaflets giving details of extended and short courses will be issued by universities from time to time. The conditions under which practitioners may apply for a grant for attendance at these courses, the amount of the grant and allowances, and the procedure for application are set out in the circular.

EAST SUFFOLK MEETING OF G.P.s LAST CHANCE PLEA

A meeting open to all general practitioners in East Suffolk was held recently to discuss the remuneration dispute. Dr. Alexander Brown spoke on the present situation. Reviewing the record of relations between successive governments and the profession, Dr. Brown said: "It is a sad thing that when it employs professional expert people the Government always tries to get them at cut prices. . . . There is a grave danger that if it persists in its present course medicine will cease to attract men and women of the right calibre. But perhaps it is too much to hope that a department, which in the old N.H.I. days attached greater importance to the number of ticks on record cards than to the quality and usefulness of the notes, has changed for the better. Perhaps,

saddest thought of all, it would prefer a second-rate service, controlled by Whitehall, to an independent-minded first-class service."

Coming to the present dispute, Dr. Brown said that it had arisen out of a perfectly justified request to the Ministry for the fulfilment of its promise to stick to Spens as the basis of remuneration. The actual percentage asked was not so important now as what the rejection of the claim implied. Doctors were now in the position of employees whose employer thought he could break promises with impunity. "This is our last chance to prove that we are strong and united enough to compel the employer to keep his promises. It is now a question of principle, not merely of cash." There was only one answer which could be given, concluded Dr. Brown, and that was to resign from a service "which has proved so unworthy of our devotion and not to return to it until we have an agreement which any government would find it impossible to break."

COUNTY BOROUGH OF MIDDLESBROUGH ARBITRATION ON M.O.H.'S SALARY

The County Borough of Middlesbrough refused to accept the regional appeals committee's recommendation made in October, 1955, on an appeal taken to it under the Whitley machinery by the B.M.A. on behalf of the medical officer of health of the borough. I was the only authority that refused to accept and implement a recommendation of a regional appeals committee on the salary of its M.O.H. (*Supplement*, April 7, 1956, p. 136). Not until the end of 1956, and after considerable pressure, did the authority agree to report the dispute to the Minister of Labour and National Service for arbitration. The Industrial Court to whom the difference was referred published its findings on February 22. It awarded the medical officer a salary identical with that recommended by the regional appeals committee in 1955, with similar retrospection to June, 1955, and thereafter according to the recent Whitley agreement set out in M.D.C. circular 27.

RURAL DOCTORS AND PRESCRIPTION CHARGES

COMMENTS ON RATE OF COLLECTION

In his report in the summarized accounts of the Health Service for 1955-6,¹ the Auditor General, Sir Frank Tribe, comments on the amount of prescription charges accounted for by dispensing doctors, numbering about 2,600, in rural areas. These doctors are required to collect and pay over to executive councils the statutory prescription charges. In a review of the returns of prescription charges collected by doctors in 1953, only 24 out of 47 executive councils were satisfied with the rate of collection, the report states. In 1954-5 remittances from all areas averaged about 1.8 prescription charges per patient on doctors' dispensing lists, compared with 3 per patient for the year from patients whose prescriptions were dispensed by chemists. Some cases where remittances have appeared markedly inadequate have been investigated by executive councils. The Ministry, while not satisfied that the average amount of charges per patient being remitted was adequate, had pointed out to Sir Frank Tribe, he reports, that there were various factors to be taken into account when comparing doctors' collections with those of chemists. Doctors, for example, had greater difficulties in contacting the patient. Sir Frank Tribe states that the Ministry has informed him that it proposes to remind executive councils of the need to investigate cases in which the surrender of charges appeared inadequate when some experience has been gained of the effect of the new scale of prescription charges introduced in December, 1956.

¹ National Health Service, *Accounts 1955-6*, 1957. H.M.S.O. London. Price 3s. net.

BUDGET, 1957

RELIEFS ON HIGHER INCOMES

The chief proposals for personal tax relief announced in the Budget on April 9 were:

- (1) An increase in the child allowance from £100 to £125 for a child aged 12 to 16 and to £150 for a child over 16.
- (2) The two-ninths earned income relief to be given on incomes up to £4,005 (instead of £2,025). Above that and up to £9,945 the relief will be one-ninth.
- (3) Certain income-tax allowances to be given on surtax—i.e., £100 for a wife, £100, £125, or £150 for each child, and £60 for a dependent relative or housekeeper.

The reliefs (2) and (3) will apply only to those with incomes over £2,000.

For those with incomes up to £2,000 and paying at the full rate of tax, the additional child allowance for each child aged 12 and over will mean a saving in tax of £10 12s. 6d., and for each child aged 16 and over a saving of £21 5s.

Examples of the savings in tax that will result from the Budget for those with earned incomes of over £2,000 are shown in the following table.

Income (Earned)	Tax Savings				
	Single	Married			
		No Children	2 Children Under 12 (£200 Allowance)	2 Children Over 12 Under 16 (£250 Allowance)	2 Children Over 12, 1 Over 16 (£275 Allowance)
£	£	£	£	£	£
2,250	21	31	47	67	78
2,500	45	55	75	101	114
2,750	68	80	104	130	143
3,000	92	105	130	155	169
3,250	116	133	165	193	207
3,500	139	157	192	222	237
3,750	163	181	216	245	260
4,000	186	205	240	269	284

Correspondence

Consultants and the Dispute

SIR,—In the belief that many general practitioners were critical of the inertia of the consultants and specialists, both centrally and locally, in their approach to the remuneration claim and that there was considerable risk of a widening gap between the consultants and the general practitioners, a meeting of Sheffield consultants and specialists was called on April 8, 1957. The object of the meeting was to ascertain the opinion of consultants and specialists, as it was felt that the local general practitioners would welcome such an expression of views.

The meeting was attended by over 60 consultants and S.H.M.O.s and the following resolution was passed unanimously:

This meeting of consultants and S.H.M.O.s of Sheffield wishes to identify itself with the general practitioners in their fight to maintain the proper social and economical status of the medical profession and will support them morally and financially in their proposed withdrawal from the Service.

It is hoped that the action of the Sheffield consultants and S.H.M.O.s will stimulate their colleagues in other parts of the country to be more vocal in support of the general practitioners and not to let them fight our battles for us.—I am, etc.,

Sheffield.
I. B. SNEDDON,
Honorary Secretary,
Area Consultants Committee.

Voice of Junior Hospital Staff

SIR,—In your leading article entitled "The First Decision" (*Journal*, April 6, p. 810) you expressed some disappointment because no voice was raised in protest against

the dictatorial method by which the salaries of junior hospital staff were recently raised. Surely it is because this sort of dictatorship is better than that which already exists. Most members of junior hospital staff know that if their salary adjustments had been negotiated through the Whitley Committee they would not have been represented at the discussions. Nor, if past experience is any guide, would they have even been consulted. If the B.M.A. and this *Journal* are to hold this view, it is time that internal adjustments are made in order to allow this group of doctors full and proper representation at the level of Whitley negotiation.—I am, etc.,

Wrightington, Lancs.

R. M. FORRESTER.

SIR,—The leading article entitled "The First Decision" (*Journal*, April 6, p. 810) chiding the lack of response of registrars to the Government's side-stepping of Whitley B in awarding a 10% increase in salary to junior hospital staff is highly provocative. Most junior staff recollect the results of the recent negotiations on pay and conditions of service negotiated on our behalf by the B.M.A. through Whitley B, in which an arbitrary scale of board-and-lodging charges was arranged without any safeguards as to the service to be provided. Registrars have no direct representation on the Whitley B or the joint negotiating machinery, so that the recent pay rise has not side-stepped any registrar machinery, because no such machinery exists.

The lack of protest can only be taken as a sign of the ill health of the B.M.A., not of the Health Service. Perhaps when we are allowed to conduct our own negotiations with the Ministry of Health rather than have them conducted for us by the Central Consultants and Specialists Committee we will be more vociferous.—I am, etc.,

London, W.C.2.

J. F. PATRICK.

Organization of General Practice after Resignation

SIR,—Having read the outline of the alternative scheme in the event of resignation from the N.H.S. (*Supplement*, March 23, p. 125), and attended the conference of Honorary Public Relations Secretaries at which this was explained, I would like to express my extreme disquiet at certain aspects of it.

The principal thing is the question of payment for prescriptions. Supposing an average working man or a member of his family were to require treatment with tetracycline for five days at home, say, for pneumonia, the patient would have to find £2 19s. 3d. immediately in order to obtain 24 250-mg. capsules from the chemist. It is extremely doubtful whether any chemist would hand over drugs of this value without having the money immediately. To say that the patient could attempt later to recover the cost from the Government is dodging the issue. The immediate question would be finding this amount of money, which I think all of us must realize would be an impossible task for very many of our patients and could fairly be regarded as almost a withholding of treatment by the doctor. The obvious way out of this would be for doctors who have resigned from the scheme to be permitted to supply such drugs at their discretion and recover the cost from the central defence fund. This question was raised at the conference of public relations officers, and the questioner was told that this would not be permitted. I doubt very much if our leaders can have considered adequately the implications of this decision. If they have, and this is their verdict, they are completely out of touch with reality.

My other criticism is of the scale of proposed charges. However uneconomic they may be to the doctor, I am sure they will appear high to patients, at least in the poorer areas. Since we are allowed to lower or even omit the charges at our discretion, it would surely have been a wise move to make the scale much lower, with a free hand to increase them in the case of patients whom we know can afford to pay a higher fee. There seems no reason why the levy of 3d. per patient per quarter in support of the central defence fund should not be increased to make up for the lower

charge. The gain in public support would more than compensate for this.

I think both these matters can be put right without any loss of face, and without them I cannot believe that we shall win the public to our side. It appears that in their anxiety to make a scheme palatable to doctors there has been a tendency for members of Council to forget the even more important question of duty to our patients.—I am, etc.,

London, W.11.

J. TUDOR-HART.

Consultant Appointments

SIR.—Since trade union practices are in the news, may I point out a closed shop that is developing in our own profession? I refer to geographic discrimination in appointing consultants, especially in the major specialities.

I am not seriously opposed to nepotism at the hospital level (I am in a position here to speak without bias). A preference for the devil you know underlies the whole community structure of mankind. What is more invidious is the tendency in some quarters to replace this type of nepotism, now frowned on officially, by a regional variety. The surgical consultant appointment at the Royal Somewhere Infirmary, for example, now tends to go to Sir Aloysius Pursestring's senior registrar at St. Mildew's, who is next in line in the region for a job. The others are easily disposed of (too old, too young, too academic, not academic enough, too meek, too aggressive, been to the States, not been to the States, they don't take our chaps why should we take theirs, etc.). I have no statistical proof, but a strong impression that this exclusiveness flourishes most in the neighbourhood of our capital cities.

If one works in a "liberal" region, one is additionally frustrated, to put it mildly, to find Sir Aloysius's other senior registrars (of whom he seems to have an inexhaustible supply) coming to one's own humble backyard and picking up jobs under the noses of the local teaching hospital registrars, not one of whom has even been short-listed in Sir Aloysius's region within living memory. This unfair one-way traffic should be stopped—not by closing the doors, but by opening them, so that there is genuine instead of merely nominal country-wide competition for every single vacancy. Seriously, I feel that such a policy would be beneficial, not only to frustrated candidates, but also in the long run to the regions themselves. Parochialism, even of the very highest standard, is always eventually stultifying. I should be grateful, Sir, if you would preserve my anonymity while I continue the search for employment.—I am, etc.,

"CONSULTANT CANDIDATE."

Reform of Health Service

SIR.—The present claim for a 24% increase in general-practitioner remuneration would meet with more public sympathy and support if it were linked with a scheme to improve present-day general practice. If patients were allowed longer and unhurried consultations much of the pressure on the hospital service would be eased and once more the status of the general practitioner would rise. Many ex-private patients and doctors blame the N.H.S. and the capitation system. I do not—I blame the system of distribution of the capitation fees which at present encourages the amassing of large lists of patients (head-hunting). If the maximum permitted size of lists were reduced and the payments heavily loaded in favour of lists of one to two thousand patients, doctors would have more time per patient, and the odd patient who at the moment is given certificates or prescriptions to prevent him leaving the practice would lose his power. The drug bill would fall as education supplemented medication and replaced placation—a result which would interest any Minister of Health in any scheme.—I am, etc.,

Basildon, Essex.

R. T. JONES.

SIR,—I was very interested in the letter from Dr. R. D. France, late of Kingsbridge, about the abuse by patients

its timing, on the opinion of the public. Having formulated the plan, let us postpone putting it into action for twelve months. This will give time for much further thought as well as being a good example to all citizens who are aware of the dangers of inflation. If there are cases of hardship let them during the next twelve months be dealt with by adjustments inside the British Medical Association.—I am, etc.,

Broadstairs, Kent.

MARTIN O. RAVEN.

SIR,—The recognized method of settling trade disputes affecting rates of pay or conditions of service is through the machinery of trade unions. If negotiations between trades unions and employers break down, or if the employers refuse to negotiate, meetings of branches of the unions are called, and on a majority vote strike action is decided upon. If a strike is recognized, and indeed recommended by a trade union, and accepted by a majority vote of the men, every worker has to abide by the decision of the majority even though he may not agree with the majority. Workers in allied trades usually strike in sympathy. No regard is paid to the hardship or dislocation caused to the general public, and the strikers believing in the justice of their cause are prepared to suffer hardship too.

We in the medical profession are not organized in trade unions, and therefore cannot go on strike. We can, however, resign from the National Health Service. Cannot we show the same spirit of solidarity, discipline, and comradeship as do ordinary workers? If the majority of doctors decide to resign, is it too much to ask the minority to resign too? Should not the specialists and consultants actively support their colleagues? I deprecate the "jelly-fish" attitude of our leaders, who are afraid to upset the general public or dislocate the medical services. There should be total and not gradual withdrawal from the Service. A complete stoppage of medical services on a contractual basis (apart from emergency work in hospitals) would end the dispute in a week or at the most two. Disciplinary action should be taken against those doctors who refuse to stand by their colleagues or who refuse to "freeze" their lists until the dispute is settled. Of course there will be hardship both to patients and to doctors. But you cannot make omelettes without breaking eggs.—I am, etc.,

London, N.10.

I. S. FOX.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). A copy of the Library Rules will be forwarded on application to the Librarian at B.M.A. House. The following books have been added to the Library:

- Gesell, A., *et al.*: *Youth: The Years from Ten to Sixteen*. 1956.
 Godwin, G.: *Crime and Social Action*. 1956.
 Gold, V.: *pH Measurements: Their Theory and Practice*. 1956.
 Gray, M.: *The Changing Years*. 1956.
 Harris, H.: *How to Live With Your Nerves—and Like It*. 1956.
 Illingworth, R. S.: *Children and Sleep*. 1956.
 Kemp, R.: *How to Live With Your Duodenal Ulcer*. 1956.
 Moroney, J.: *Surgery for Nurses*. Fourth edition. 1956.
 Newton, C. T. H. (Editor): *Christchurch Hospital Medical Manual*. 1956.
 Nixon, W. C. W.: *Childbirth*. 1955.
 Pyc's *Surgical Handicraft*. Seventeenth edition edited by Hamilton Bailey. 1956.
 Ross, E. L.: *Reduce and Enjoy it Cookbook*. 1955.
 Ross, J. S., and Wilson, K. J. W.: *Foundations of Nursing*. 1956.
 Ross, W.: *Diet to Suit Yourself*. 1955.
 Salmon, E. H.: *Christ Still Healing*. 1956.
 Savage, O.: *How to Live With Your Rheumatism*. 1956.
 Schamroth, L.: *Introduction to Electrocardiography*. 1956.
 Schiffrin, M. J. (Editor): *Management of Pain in Cancer*. 1956.
 Schindler, J. A.: *How to Live 365 Days a Year*. 1955.
 Shaw, C.: *Tuberculosis*. 1955.
 Smout, C. F. V., and McDowall, R. J. S.: *Anatomy and Physiology for Students of Physiotherapy*. Third edition. 1956.
 Spector, W. S. (Editor): *Handbook of Toxicology*. Volume I. 1956.
 Stallworthy, K. R.: *Facts of Mental Health and Illness*. 1956.
 Stimson, B. B.: *Manual of Fractures and Dislocations*. 1956.
 Storey, G. M.: *Thoracic Surgery for Physiotherapists*. 1955.
 Suzuki, M.: *Modern Electrotherapy*. 1956.
 Waelsch, H. (Editor): *Biochemistry of the Developing Nervous System*. 1955.
 West, G. I.: *Dental Assistant's Handbook*. Second edition. 1956.
 Whipple, G. H.: *Dynamic Equilibrium of Body Proteins*. 1956.

BRITISH MEDICAL GUILD

Meetings to be Held

A meeting of the Trustees of the British Medical Guild will be held at B.M.A. House on Wednesday, May 1, immediately following the meeting of Council of the B.M.A.

NORTH MIDDLESEX (HORNSEY AREA).—At Board Room, Hornsey Central Hospital, Park Road, N., Wednesday, April 24, 9 p.m.

Association Notices

Diary of Central Meetings

APRIL

- 24 Wed. Finance Committee, 2 p.m.
 25 Thurs. Central Ethical Committee, 2 p.m.
 25 Thurs. Joint Committee of the B.M.A. and the Magistrates' Association, 2 p.m.
 26 Fri. Venereologists Group Committee, 2 p.m.
 26 Fri. Welsh Committee (at Raven Hotel, Shrewsbury), 2.15 p.m.
 30 Tues. Special Conference of Local Medical Committees, 10 a.m.

MAY

- 1 Wed. Special Representative Meeting, 10 a.m.
 1 Wed. Council (to follow Special Representative Meeting).
 8 Wed. Council, 10 a.m.
 9 Thurs. Trustees of the Dain Fund, 1 p.m.
 16 Thurs. G.M.S. Committee, 10.30 a.m.

Branch and Division Meetings to be Held

BOURNEMOUTH DIVISION.—At Board Room, Royal Victoria Hospital, Boscombe, Friday, April 26, 8.15 p.m., meeting. Address by Dr. C. Justin Clark: "Steroid Treatment in Common Medical Disorders."

EASTBOURNE DIVISION.—At Princess Alice Memorial Hospital, Eastbourne, Tuesday, April 23, 8.30 p.m., meeting. B.M.A. Lecture by Dr. Ffrangcon Roberts: "The Influence of Medicine on Social Life."

EAST NORFOLK DIVISION.—At Museum, Norfolk and Norwich Hospital, Wednesday, April 24, 8 p.m., meeting.

GUILDFORD DIVISION.—At Board Room, Royal Surrey County Hospital, Saturday, April 27, 6.30 to 8.30 p.m., sherry party for doctors and their wives.

HUDDERSFIELD DIVISION.—At Huddersfield Royal Infirmary, Friday, April 26, 8.30 p.m., meeting. B.M.A. Lecture by Dr. Michael Ward: "Conquest of Everest."

NORFOLK BRANCH.—At Nurses' Lecture Hall, Norfolk and Norwich Hospital, Saturday, April 27, 6 for 6.30 p.m., meeting. Address by Mr. Ian Fraser: "Medical Practice in the Soviet Union." Ladies and guests welcome.

NORTH MIDDLESEX DIVISION.—At Committee Room, North Middlesex Hospital, Silver Street, Edmonton, N., Friday, April 26, 8.30 for 8.45 p.m., special meeting to discuss report of Council on remuneration issue.

NORTH-WEST WALES DIVISION.—At Royal Hotel, Caernarvon, Saturday, April 27, 7 p.m., annual general meeting, followed by a dinner, to which ladies and guests are invited. Discussion: "The Work of Her Majesty's Coroner." Guest speaker, Mr. E. Lloyd-Jones.

SOUTH BEDFORDSHIRE DIVISION.—At Board Room, Luton and Dunstable Hospital, Friday, April 26, 9 p.m., meeting to discuss Report of Council on remuneration issue.

SOUTH-EAST ESSEX DIVISION.—At Garon's Banqueting Hall, Friday, April 26, 8.30 p.m., buffet dance.

SOUTH ESSEX DIVISION.—(1) At Railway Hotel, Hornchurch, Tuesday, April 23, 9 p.m., special meeting. (2) At Nurses' Lecture Theatre, Oldchurch Hospital, Romford, Friday, April 26, 9 p.m., meeting. Lecture by Dr. Alexander Russell: "Some Endocrine and Growth Problems in Childhood and Adolescence."

TOWER HAMLETS DIVISION.—At St. Andrew's Hospital, Devons Road, Bow, E., Friday, April 26, 3 p.m., meeting. Mr. E. T. Bailey: "Backache."

WESTMINSTER AND HOLBORN DIVISION.—At Charing Cross Hospital, W.C., Saturday, April 27, 2.30 p.m., clinical meeting.

Meetings of Branches and Divisions

BIRKENHEAD AND WIRRAL DIVISION

A meeting was held on February 8, 1957, at the Arrowe Park Hotel. Dr. I. M. Lipsedge took the chair and 38 members and their ladies attended. The guest speaker, Mr. Hendrie D. Oakshott, gave an address on the constitutional history of Parliament and his own activities as Government whip and member of the House.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY APRIL 27 1957

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British Medical Association

SPECIAL REPRESENTATIVE MEETING

SUPPLEMENTARY REPORT OF COUNCIL

THE DISPUTE ON REMUNERATION

At a special meeting held on April 17 the Council considered recent developments in connexion with the Royal Commission on doctors' and dentists' remuneration—the debate in the House of Lords on April 5 on the terms of reference of the Commission; the letter published in *The Times* of April 8 in which the Chairman of Council made a fresh appeal to the Government to engage in discussions about the matters in dispute with the profession; the correspondence between Sir Russell Brain and the Prime Minister, published on April 12; the subsequent decision of the Committee of the Royal College of Physicians to co-operate with the Royal Commission; and the public statement issued by the Commission and published on April 13. The Council received also a report of the decision of the Government, announced by the Prime Minister on April 16, to increase by 5% from May 1 the basic remuneration of senior hospital medical and dental staff and the aggregate net remuneration of general practitioners.

These matters, and certain later developments, are fully recorded in the supplementary report of the General Medical Services Committee to the Special Conference of Representatives of Local Medical Committees. The supplementary report of the G.M.S. Committee was not available when the Council met, but, by authority of the Chairman of Council, it is appended to this supplementary report of the Council in order that the Representative Body may have up-to-date information about the position.

Having carefully reviewed the situation as it existed on April 17, the Council considered that the changes which had occurred did not provide sufficient reason to alter its recommendations to the Representative Body. It welcomed the letter of the Chairman of Council in *The Times* of April 8, and expressed approval of the Chairman's continuing efforts to bring about conditions in which a satisfactory and peaceful settlement of the dispute might be achieved.

GENERAL MEDICAL SERVICES COMMITTEE

SUPPLEMENTARY REPORT TO SPECIAL CONFERENCE OF LOCAL MEDICAL COMMITTEES*

Recent Developments in Remuneration Claim

The General Medical Services Committee met on April 17 and 18 to consider certain new developments in the remuneration dispute which had taken place since its report to the Special Conference of Local Medical Committees (*Supplement*, March 23, p. 123).

These new developments are as follows.

Chairman of Council's Letter

On April 8 a letter from the Chairman of Council, Dr. S. Wand, was published in *The Times*. He wrote:

May I say, on behalf of the Council of the British Medical Association, how warmly we concur in Lord Jowitt's plea in the House of Lords yesterday that there may be acceptance "far more generally of the principle of arbitration rather than resort to force, pressure, and the like, to win desired ends" in the present dispute between the medical profession and the Government?

May I add that the medical profession is as anxious as the Lord President of the Council that it should be enabled to "move away very shortly from an atmosphere of distrust and accusations of bad faith." It is unfortunate that Lord Moran's appeal for arbitration machinery which could provide the necessary basis for a full examination of the problem went unheeded by the Government, and that he was compelled to say at the end of the debate, "I go away profoundly apprehensive about the future."

Lord Jowitt, in reference to the Royal Commission, pointed out that if the doctors were not reasonably satisfied with the terms of reference under which the arbitrators were going to sit they were not really being given the benefit of arbitration. He went on to say:

"I would beg the noble Earl the Leader of the House to use his influence, as has been done several times, in my knowledge, so that where the terms of the remit are found inadequate to embrace the whole dispute they may be enlarged. That should not be done by letters but regularly, enlarging the terms of the remit and putting the whole matter before the arbitration tribunal."

*The report, of which this is a slightly abridged version, was posted to chairmen and secretaries of local medical committees and to conference representatives on April 20.

He ended by expressing the hope that both doctors and Her Majesty's Government would set an example of reasonableness. I am confident that my Council would respond to such an example on the part of the Government. The matters in dispute are such as reasonable people would normally expect to discuss round a table. I once more ask that the Government should engage with us in such discussions.

Sir Russell Brain's Questions

The following report appeared in the later editions of *The Times* of April 12:

Sir Russell Brain, President of the Royal College of Physicians, wrote on April 5 to the Prime Minister about the terms of reference of the Royal Commission on the remuneration of doctors.

In his letter he said he would be grateful for replies to certain questions, but made it clear that in sending them "I am not committing anyone to any particular line of action with regard to the Royal Commission."

The questions put by Sir Russell Brain and the Prime Minister's answers were published in full in the *Supplement* of April 20 (p. 218).

Statement by Royal College

On April 12 the following statement was issued by the registrar of the Royal College of Physicians:

The Royal College of Physicians at a special Comitia to-day, after hearing the letters exchanged between Sir Russell Brain, their President, and the Prime Minister, and the President's account of his meetings with the Royal Commission and its chairman, Sir Harry Pilkington, decided that they wished to co-operate with the Royal Commission on the remuneration of doctors and dentists.

Statement by Royal Commission

On April 12 the Royal Commission issued a statement to the press indicating how it intended to proceed with its work. The Commission hoped that this would clear up some of the doubts about the interpretation of the terms of reference. The Commission's statement was published in the *Supplement* of April 20 (p. 219).

B.M.A. Comment

The exchange of letters between the President of the Royal College of Physicians and the Prime Minister, and the public statement by the Commission, were referred to in the following statement which was issued by the Association to the press.

The B.M.A. has learned to-day for the first time that there has been an exchange of letters between Sir Russell Brain, the President of the Royal College of Physicians, and the Prime Minister about the terms of reference of the Royal Commission on the remuneration of doctors and dentists.

The Prime Minister in his reply said:

"Interpretation of the terms of reference is a matter for the Royal Commission, and I cannot in any way formally commit it."

The Association is advised that everything which follows in the Prime Minister's letter is conditioned by that overriding principle. The mere interpretation by the Royal Commission of its remit is insufficient to remedy the omission from its terms of reference of matters vital to the profession's future.

The Association has just seen the Commission's statement of how it has decided to proceed with its task. The Council of the Association will, of course, examine this statement.

It would, however, appear at first sight that the need—a most unusual one—for an exchange of letters and for the issue of an explanatory memorandum by the Commission emphasizes the necessity for the sort of discussion between the Government and the profession on the terms of reference which the Chairman of the Association's Council, Dr. S. Wand, asked for in his letter to *The Times* (April 8) following the recent debate in the House of Lords.

Interim Adjustment

On April 16 the Prime Minister made the following statement in the House of Commons.

I wish to make a statement on the remuneration of doctors and dentists.

Before the Royal Commission was appointed I explained that its appointment did not preclude an interim adjustment in ad-

vance of and without prejudice to its recommendations. An adjustment was made in the remuneration of junior hospital staff, both medical and dental, at the beginning of this month, when their remuneration was increased by 10%. In announcing this increase I said that we were considering what should be done by way of an interim adjustment for the other doctors and dentists covered by the Commission's terms of reference. The Government have now decided to increase the basic remuneration of senior hospital medical and dental staff, including consultants and specialists, and all dentists engaged in general dental service, by 5% from May 1 next, and from the same date to add 5% to the aggregate net remuneration of general practitioners—that is, remuneration after the deduction of practice expenses. We propose to consult representatives of the profession as to the best method of distributing this sum between individual practitioners. In the meantime, the Royal Commission have been asked to regard their work as a matter of urgency and they have in fact already, I understand, held six meetings. I hope that the letters I have exchanged with the then President of the Royal College of Physicians, together with the statement issued by the chairman of the Royal Commission, will reassure those who have expressed concern about its terms of reference. I hope now that all concerned will turn their efforts to the task of working out a satisfactory basis for future remuneration and for keeping it under review.

Following the developments outlined above, the Council of the Association at its meeting on April 17 authorized its chairman to engage in discussions with the Minister of Health and the chairman of the Royal Commission in the hope of reaching a peaceful settlement of the dispute.

Latest Developments

In the last few days the Chairman of Council has met Sir Harry Pilkington, chairman of the Commission, on three occasions, once in consultation with the Minister of Health. As a result of this further exchange of views, the Committee is now able to give a clearer picture of what the Royal Commission has in mind and the way in which it proposes to proceed with its task.

In the first place, the chairman of the Commission has offered the following additional statement.

That part of the Royal Commission's task that consists of considering what should be the proper current levels of remuneration of doctors and dentists will include hearing submissions from those professions as to the remuneration which they are now claiming.

At the same time the chairman has made it quite clear that the Commission does not and will not regard itself as an arbitrating or adjudicating body.

Secondly, the chairman of the Commission is writing a letter to the Association of which the material part will be as follows:

It is in the mind of the chairman of the Commission that if it becomes unlikely that evidence can be obtained in time for a report to be published by Easter, 1958, he would so inform the Government and the other interested parties.

These further statements by the chairman of the Commission are to be regarded as having the same force as the public statement issued by the Commission on April 12.

The Committee has also been informed of a further exchange of views between the Chairman of Council and the Minister of Health about the position of doctors in the public health service as a result of which the following letter (April 17) has been written to the Chairman of Council by the Minister.

I told you yesterday morning that I had given much thought to the position of public health medical officers before deciding that their inclusion in the terms of reference of the Royal Commission would cause overwhelming difficulties for all concerned.

I am, however, satisfied that any settlement for National Health Service doctors following the report of the Royal Commission could not fail to be taken into account in considering the position of the local authority doctors. A claim on their behalf through the normal machinery would of necessity be considered in the knowledge both of the Royal Commission's report and of the subsequent settlement, and I am confident that due consideration would be given to both these factors.

Should you at a later date wish to make further representations, I would, of course, consider them.

Committee's Decision

The Committee, anxious as it is to find a peaceful solution to the dispute, has given most earnest consideration to all these new developments. It has taken legal advice on the implications of the statement issued by the Royal Commission and has re-examined its recommendations to the special conference in the light of the position as it now stands.

First, it must be emphasized that the claim has still not been discussed and the so-called adjustment of 5% in general-practitioner remuneration has been unilaterally decided and not negotiated. Arbitration is still refused.

So far as the Royal Commission is concerned, the recent statements only confirm that the Commission is concerned solely with the introduction of new rates of remuneration and in no way with the determination of the fundamental issues now in dispute.

For these reasons the Committee has concluded that the position is fundamentally unchanged and has reaffirmed its previous recommendations to the special conference, which will take place on Tuesday, April 30, as arranged.

Interim Adjustment

The Committee has considered what action should be taken with regard to the Government's decision to make an interim adjustment of 5% in the net remuneration of general practitioners, and makes this further recommendation to the special conference.

That the Minister of Health be informed that, pending a final and satisfactory settlement, it is the wish of the conference that the 5% net increase to the aggregate net remuneration of general practitioners, arbitrarily decided upon by the Government, should be placed in a suspense account.

Chair of the G.M.S. Committee

The Committee wishes to report to the special conference that, because of a sincere difference of opinion between the Chairman and the Committee on the future course of the medico-political policy, the Committee decided that, in the circumstances, it was better for Dr. Talbot Rogers to relinquish his chairmanship.

Dr. Rogers agreed that this was the right and proper course for him to take, and Dr. A. B. Davies has been appointed Chairman for the remainder of the session. A more detailed account of this matter appears in the report on the special meeting of the G.M.S. Committee in this *Supplement* (see next column).

Summary

The Committee regrets that it should be necessary to issue this supplementary report at such short notice, but it feels certain that local medical committees will wish to have an authoritative statement on the Committee's appraisal of the present position.

Above all, the Committee wishes local medical committees and representatives to the special conference to be left in no doubt as to its firm conviction that its previous recommendations must stand until such time as the Government shows its willingness to negotiate or arbitrate upon the matters now in dispute.

NEW CHAIRMAN OF G.M.S. COMMITTEE

At its meeting on April 18 the General Medical Services Committee elected Dr. A. B. DAVIES to the chair for the remainder of the session in succession to Dr. A. Talbot Rogers.

The Committee then proceeded to discuss the latest developments in the remuneration dispute. The conclusions it reached are set out in the supplementary report to the special conference which is published at page 225 of this *Supplement*.

GENERAL MEDICAL SERVICES COMMITTEE

SPECIAL MEETING

A special meeting of the G.M.S. Committee was held in the morning of April 17 to consider recent developments in the remuneration dispute. Dr. A. TALBOT ROGERS was in the chair.

At the outset of the meeting Dr. F. GRAY raised the question of the views expressed by the chairman in putting forward the Committee's policy to the Negotiating Committee at its meeting on March 26 and to the Council of the Association on March 27. Dr. Gray said he realized that the views held by the chairman were perfectly genuine and sincere, but they were not the views of the Committee, and at this grave hour it was essential that the Committee should have a chairman who fully supported its policy and who was prepared at all times to put the Committee's case forward in the most cogent terms.

The CHAIRMAN said he had made it clear at the previous meeting of the Committee that he would feel it his duty to inform the Council of his own views about co-operation with the Royal Commission, in so far as they were derived from his personal contact with the Prime Minister and the Minister of Health, and he in fact put forward the arguments on both sides so that the Council should have an objective account of the matter. If the Committee felt that he had done more than he was entitled to do he was prepared to vacate the chair. He had himself considered resigning the chairmanship, but he felt that this was not the time for the Committee to change its chairman in view of the public reaction, which could well damage the profession's case.

At this point Dr. Rogers vacated the chair to enable the Committee to discuss the matter in his absence. The chair was taken by the Chairman of Council. The Committee then proceeded with its business *in camera*.

At the end of the private session it was announced to Dr. Rogers that the Committee had decided to ask him to relinquish the chair, coupling with it a vote of thanks to him for his services to the profession and the Committee. The vote of thanks was carried with acclamation. Dr. Rogers expressed his regret at leaving the chair at such a moment, but said he felt that it was in the best interests of the Committee that he should do so. He thanked the Committee for its expression of appreciation.

Remuneration Dispute

The CHAIRMAN OF COUNCIL reported that he had been invited by Sir Harry Pilkington to meet him particularly for the purpose of explaining the reasons for the Council's recommendation against co-operation with the Royal Commission, and he had done so on March 29 with the Council's approval.

On April 8 *The Times* had published a letter from him in which he had stated that the matters in dispute were such as reasonable people would normally expect to discuss round a table. He was confident that the Council would respond to any example of reasonableness on the part of the Government, and he asked once again that the Government should engage with the profession in such discussions.

Subsequently Dr. Wand said he, in company with Dr. Rogers and Sir Russell Brain, had received an invitation to see the Minister of Health. Mr. Vosper had merely informed them of the Government's decision to give an interim increase of 5% in remuneration. They had been told that this decision was final and was not open to discussion (apart from its distribution). They had also been informed that the terms of reference of the Royal Commission would not be altered and that the Commission itself would be going ahead with its plans whether the profession decided to give evidence or not.

As regards the position of public health medical officers, the Minister had said that they would have an opportunity of negotiating through their Whitley Council procedure in

The conference accepted resolutions from Wandsworth and Battersea and York recommending that rehabilitation of disabled workers should, wherever possible, take place

within the industry where they were normally employed and urging the Ministry of Labour to encourage the setting up of places of work within industry to provide suitable employment for the disabled. Mr. NIX pointed out that a few large firms had set up rehabilitation workshops.

Dr. J. J. O'DWYER said that it was necessary to get away from the idea that all employers wanted a man to be absolutely fit. It was the constant endeavour of all to ensure that the patient came back to some kind of work as soon as possible, of a kind which gave him satisfaction. Dr. J. B. BLOMFIELD (Leeds) felt that more smaller firms should get together and form units to tackle the problem.

Mr. J. B. LONGMUIR (Institute of Personnel Management) said that the disabled worker should be "prodded" and given progressive work. There was no reason why the injured worker should not be persuaded to try the small firm, where he would have sympathetic understanding and a fair amount of attention. Mr. H. RAMSDEN (York) advocated financial assistance to firms to set up "teaching places" where a disabled person could be taught within industry.

Two difficulties were mentioned by Mr. C. C. HOLT (York): higher management prepared to recognize that, for establishment purposes, where there was a disabled person there might be only half a person; and who was to do the work when the handicapped person had to be away? He thought that the medical profession was doing a good job, and he wanted to see management and trade unions come up to the same standard.

Certificate of Partial Fitness

Wandsworth and Battersea asked for an expression of opinion that a person's return to work after disablement should not be dependent upon a medical certificate of fitness to resume full employment, but that the principle of certification of partial fitness for part-time employment should be adopted.

Dr. BOYES disclaimed any suggestion of an attempt to get a person back to work earlier than was desirable or reasonable, or any implied attempt to exploit the sick worker. He was concerned only with the welfare of the worker. In the case of an industrial rehabilitation unit the medical certificate required was not that the person was fit for work, but that the unit doctor considered he was likely to be fit at the end of the rehabilitation course. Were the difficulties of partial fitness certification for industry so great that they should be allowed to outweigh the advantages of gradual rehabilitation? There were many occasions when a G.P. would be willing for a patient to return part-time, and Dr. Boyes thought that many employers would accept people on that basis.

Mr. STEVENS thought that the Percy Report justified the stand which the T.U.C. had taken over this. It was dangerous to cut across the principles of the national insurance scheme. Mrs. M. ILLINGWORTH (Leeds) still felt that this was something which could come about. In a large organization employees who had been injured or had had an operation were taken back in a part-time capacity on their own job, if suitable, or a lighter one. She appreciated that it would be more difficult in the smaller firms.

Mr. J. H. F. LUDGATE (Ministry of Pensions and National Insurance) pointed out that there would be administrative difficulties over assessment, provision of medical supervision at work, and National Insurance. He queried whether the result would justify the additional administrative costs.

Dr. BLOMFIELD said that general practitioners were often faced with the person who was off work for a few weeks and who could very well go back if he could be employed part-time; it would be in the patient's interest to do so. Dr. RIDDOLLS (York) said that, with the co-operation of the industrial medical officer, in certain firms a man was taken on part-time at a job within his capacity. Mr. R. TYLER (Leeds) remarked that the Act was as hard to shift as the Rock of Gibraltar.

The motion was carried with one vote against. (Observers were precluded from voting.)

Education about Epilepsy

Moving a resolution from York and District, Dr. RIDDOLLS said that a more intensive effort was necessary to inform sufferers from epilepsy of the nature of their disability and to encourage them to secure medical treatment. Many could be controlled efficiently and perform ordinary jobs in industry. Dr. Riddolls called for education on the lines of the "Hurt Mind" programme on television by using modern techniques of radio and television and other methods of public propaganda.

In the discussion on the motion, which was carried, mention was made of the British Epilepsy Association's film *People Apart*, available for showing, and the Ministry of Labour's leaflet for employers and workpeople. It was pointed out that epileptics were employed in Remploi and had been found posts by the Ministry of Labour, but there were a large number of unemployed at the moment.

Summing Up

Dr. VAUGHAN JONES, chairman of the Occupational Health Committee of the B.M.A., summed up the deliberations of the conference. He expressed disappointment that more advisory councils on occupational health had not been set up. It had been stated that these suffered from being advisory and not executive. But in many ways he thought that their present status was an advantage. If they were executive it might become difficult so far as the employers and trade unions were concerned.

Mr. RAMSDEN moved a vote of thanks to the chairman; to the B.M.A. for their hospitality—those attending the conference were entertained to luncheon and tea by the Association; and to Dr. S. J. Hadfield (Assistant Secretary).

PUBLIC HEALTH COMMITTEE

The Public Health Committee met on April 12 at B.M.A. House, with Dr. JOHN B. TILLEY in the chair.

Remuneration Claim

The DEPUTY SECRETARY (Dr. D. P. Stevenson) referred to correspondence which appeared in *The Times* of the same date, between Sir Russell Brain and the Prime Minister (*Supplement*, April 20, p. 218). Sir Russell Brain asked a number of questions of the Prime Minister, one of which was as follows:

There is a strong feeling in the medical profession that our colleagues in the Public Health Service should not be excluded from the scope of any review of remuneration. Do the terms of reference of the Royal Commission include them?

According to the report in *The Times*, the Prime Minister's reply to that question was:

The remuneration of doctors employed by local authorities is excluded from the scope of the Royal Commission's recommendations, but any claim on their behalf through the usual machinery would necessarily be considered in the knowledge of any recommendations of the Commission.

Astonishment was expressed at the fact that Sir Russell Brain had written to the Prime Minister "off his own bat" upon a matter which vitally concerned the Committee's interests. Many members were concerned at the lack of reference to the position of medical officers in the public health service in the document sent to Members of Parliament (*Supplement*, April 6, p. 150).

Dr. TILLEY said that it might be as well to circulate a further document among Members of Parliament pointing out the inconsistency of the Government's attitude. The Government had quite carefully chosen a form of words and they were now disavowing their own words. The words of the terms of reference were now being given a different meaning.

After further discussion it was agreed to recommend to Council that further action should be taken forthwith to

ensure that the present position was appreciated, and Members of Parliament should be given a critical condemnation of the Government's interpretation of the terms of reference.

Notification of Infectious Diseases

Dr. TILLEY reminded the Committee that a resolution had been passed by the A.R.M., 1955, asking that a review of the legislation concerning infectious diseases should be carried out. The Committee had postponed action itself until it had received a formal expression of opinion from the Society of Medical Officers of Health. But no document had been received from that body.

After some discussion it was decided to appoint a sub-committee to go into the whole subject. The following members were appointed: The Chairman; Drs. J. Kelman, J. F. Warin, J. Alun Evans, H. D. Chalke, Llywelyn Roberts, and J. B. S. Morgan, with power to co-opt.

Draft Circulars

The Committee went on to discuss a draft Ministry of Health circular on immunization against diphtheria and whooping-cough. Dr. CHALKE felt it was premature to issue the circular in its present form. There appeared to be an element of panic in it, and, indeed, many of the statements were misleading. It was agreed that the Committee's comments should be sent to the G.M.S. Committee, which was also studying the draft circular.

The Committee also considered a draft circular on poliomyelitis vaccination.

Whitley Committee C

The Committee received reports on the implementation by 99.5% of local authorities of M.D.C. Circular 27, and by 94% of M.D.C. Circular 33. Five appeals had been successfully concluded under Whitley procedure: two at local level, two at regional level, and one was taken to Committee C. Four appeals were awaiting a hearing.

The Committee received reports from the Staff Side of Committee C on the remuneration of medical referees to crematoria, annual leave, subsistence allowances, and sick-pay schemes (M.D.C. Circulars 30 and 31).

Public Health Service Defence Trust

A meeting of the Trustees was held during the afternoon, and dealt with formal business.

MEDICINE IN THE BALANCE

DISCUSSION AT FELLOWSHIP DINNER

After a dinner at the Kensington Palace Hotel on April 12, with Dr. R. HALE-WHITE in the chair, the Fellowship for Freedom in Medicine discussed "Medicine in the Balance." Mr. GILBERT LONGDEN, M.P.; Mr. LINDSAY-FYNN, a member of the Board of Governors of the Royal Free Hospital; and Mr. R. MURLEY opened the discussion.

Freedom from Dictation

In the course of his introductory remarks the CHAIRMAN said that the Fellowship's view of the present dispute with the Government was that it went far deeper than remuneration. The bare fact was that the Government was jettisoning a part of an agreement made in 1948 because it was found to be inconvenient. Surely this was dictation. "If found to be inconvenient. Surely this was dictation. 'how can one partner in the agreement dictated,' he asked, 'how can the other be free?' This was where the Fellowship came in. It was utterly opposed to the methods the Government was adopting. There were some who said that squabbles about money were injuring the dignity of the profession. 'The N.H.S. has already robbed us of most of our dignity,' specially those in general practice, and surely," Dr. Hale-White said, "meek submissiveness to dictation would

scarcely tend to add to the little we have left. On the contrary, once we have submitted to this kind of treatment all our freedom and all our dignity would be gone for ever."

Dr. Hale-White announced that the Fellowship was shortly to publish its scheme for a reformed health service. It would be found that the scheme aimed to restore the highly contagious quality of enthusiasm to the doctor and his patient. It aimed to give the patient the feeling that once again he was an individual. It would also ensure that disputes, like the present one, could not arise in future.

Certain of the scheme's features would undoubtedly be criticized, Dr. Hale-White opined, but he found encouragement in looking back over the years of the Fellowship's life and recalling how it used to be regarded by most people as a body of stick-in-the-mud diehards. "And yet one after another of our policies has now become accepted as 'musts' for the future by the thoughtful among the public and the profession."

State's Business

Mr. LONGDEN said that the nation's bill of health was much cleaner but it was also much bigger. It was, however, a bill worth paying if it achieved its object of seeing to it that no one should get worse only because he could not afford to get better.

Was this admirable object being achieved? Was the medical profession in danger of losing its traditional unselfish integrity and coming to treat National Health patients as if they were privates in an Army sick parade? Was the State interfering too much? It was inevitable that he who paid the piper tended to call the tune, and, having made it the State's business to care for health, it must be conceded the right to mind its business. But that did not include the right to mind the doctor's.

Mr. Longden was sure the Fellowship was right in believing that the best possible safeguard against such a calamity was a healthy private sector in medicine which could act as a yardstick and as a spur. "You accuse the Government of giving no encouragement to private practice," he said. "You believe that one way to encourage it would be to let private patients enjoy the privilege of obtaining prescriptions on the same terms as National Health patients. Yet a year has now passed since a Conservative Minister of Health said that such an idea was not repugnant to Conservative political thought and invited the B.M.A. to take part in detailed discussions with his Department to examine it. That invitation still awaits a reply."

Mr. Longden hoped to be told that night precisely what else was expected of the Government.

Time for Reform

Mr. MURLEY, pursuing the theme of the discussion, said the greater the number of doctors in the National Health Service and the greater the amount of their income derived from it, the heavier was the load on the Exchequer, the greater the inflationary tendency of the Service, the more acute the sense of frustration among doctors, and the more political medicine must become. Anything which restored and encouraged private practice, and which made patient, doctor, and institution less dependent on the State, must make for greater contentment and economy. The Fellowship was certainly no less determined than the B.M.A. that the doctor should be adequately paid for the work he did in a State service. Where they differed, however, was in their advocacy of a type of organization which, by fostering independent practice, would relieve the burden on the Exchequer, enhance the sense of mutual responsibility of doctor and patient, more closely associate financial operational responsibility, and generally restore freedom in medicine.

By setting up a Royal Commission with the present terms of reference the Government had simply shelved the real issues and missed a great opportunity. The whole structure of the N.H.S. should be under critical review, and he personally was deeply disappointed that the B.M.A. seemed to have no alternative scheme to put forward.

Mr. Murley went on to refer to what some regarded as a highly unsatisfactory feature of examinations, such as that

of the Guillebaud Committee, of nationalized industries and services. Investigating committees of this sort were appointed by Ministers whose departments were interested parties; they commonly worked on Ministry premises; and it was not uncommon for them to have a Ministry official as secretary. It was intended as no reflection on the individual members of the Guillebaud Committee when he said that, instead of being pervaded by a healthy impartiality, their report bore all the signs of having been drafted within the Ministry of Health. Sir Fred Messer, for instance, deplored the absence "of people on the committee who were able to assess the value of the evidence it received."

In a Service which was crying out for reform this unenterprising committee had soft-pedalled almost every real criticism which was made in evidence to it, and this was especially true of criticisms of the administrative structure of the Service. The Guillebaud Committee, said Mr. Murley, had failed lamentably in its task, and, by declaring that any reforms would be premature at this stage, it had helped the Service to congeal in its present form, provided politicians of all parties with an excuse for inaction, and surely put the clock back for several years. In the public interest it should be made impossible to set up important committees of investigation in this way, for, as so often in recent times, a Ministry became judge in its own case.

The time, continued Mr. Murley, was clearly ripe for reform. The Fellowship had upheld private practice as a virtue in itself, as a valuable discipline for the doctor and as a yardstick with which to compare the State service. Secondly, it had sought ways and means of providing the G.P. with incentives—a more realistic relationship between payment made and services rendered, and the optional right to the sale of goodwill. The restoration of this right would facilitate entry into practice as well as the change from one practice to another. Thirdly, the provision of drugs and appliances to all patients (private and otherwise) on the same basis stood high in its estimation. It favoured, however, a system akin to the Australian one rather than our own present one. Fourthly, it favoured the stimulation of personal responsibility for some part of the cost of all but the long-term illness, rather than the encouragement of too heavy dependence on the State.

Discussion

Mr. LINDSAY-FYNN gave some instances of extravagance in the spending of hospital funds, and others among the many speakers who took part in the general discussion which followed also referred to the economic aspects of the Health Service. Dr. E. C. WARNER summed up. Mr. Longden had asked if the doctors felt the State was interfering too much in the freedom of the profession. Dr. Warner answered that quite clearly the profession did feel this. Mr. Longden had attributed the nation's improved health in recent years to the N.H.S., but Dr. Warner thought that he had forgotten the contribution of medical scientists in this. One example would suffice to illustrate the point—that of Sir Alexander Fleming. Dame Irene Ward, M.P., had mentioned that before the introduction of the N.H.S. many people did not like to go to their doctor with their complaints: this applied to-day in equal measure, said Dr. Warner, for many felt their doctor had not the time or the facilities to listen to their troubles in the privacy which they would like.

ANNUAL MEETING

ABERDEEN GRADUATES' DINNER

The Aberdeen Graduates' Dinner will be held in Tilley's Restaurant, Newcastle upon Tyne, on Friday, July 12, at 7.30 for 8 p.m. The dinner is open to Aberdeen graduates attending the Annual Meeting or resident locally, and their ladies. Tickets will cost 30s., and early application with remittance should be made to Dr. D. Middleton, 18, Cliffe Park, Sunderland.

TRAINING MEDICAL ADMINISTRATORS NEWCASTLE BOARD'S SCHEME

In seeking an administrative medical officer without previous administrative experience the Newcastle Regional Hospital Board believes it is doing something of a pioneering nature. It recently advertised a post on the staff of the senior administrative medical officer in which facilities for training will be provided by secondment and otherwise. Dr. R. H. M. Stewart, the Board's senior administrative medical officer, explains that it is hoped to secure applications from those whose experience is solely clinical or in public health. The sort of training programme envisaged will include attendance at suitable courses and secondment to general, special, and mental hospitals for varying periods. Very probably, too, the doctor appointed will be lent for periods of about a week to hospital management group centres to gain experience of their work. Opportunity for taking a higher qualification will be offered.

MEDICAL IMPLICATIONS OF NUCLEAR WARFARE METROPOLITAN COUNTIES BRANCH MEETING

The Metropolitan Counties Branch of the B.M.A. is to hold a meeting at B.M.A. House on May 5, at 2.30 p.m., to discuss the medical implications of nuclear warfare. Army specialists will deal with the subjects of organization for collection, screening, and disposal of casualties, and for safeguarding food and water supplies, shelters, etc.; the surgical treatment of casualties with burns and fractures; and the pathological processes of irradiation sickness. Civil defence aspects will be included where appropriate.

Members from Divisions on the fringe of the Metropolitan Counties Branch area will be welcomed.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Royal College of Physicians

SIR,—That a meeting composed only of Fellows—10 being a quorum—should be empowered to dictate the policy of the whole Royal College of Physicians, in such an important matter as that which was published recently (*Supplement*, April 20, p. 218), is disturbing. When it is remembered that the 3,590 members and many thousand licentiates of this College—the two groups which contain all its general practitioners—are automatically excluded not only from attending such a special meeting but even from an annual general meeting, surely this reflects unfavourably on the capacity of the Royal College of Physicians to represent them in medico-political matters, or to help in the future development of the general practice side of the National Health Service. It underlines the great responsibility which rests at the present time with the British Medical Association to do both these things.—I am, etc.,

London, S.W.1.

JOHN H. HUNT.

SIR,—There are many of us who recall the urgency of the struggle when the N.H.S. came into operation in 1948. I believe I am right in saying that a sudden *volte-face* by the then President of the Royal College of Physicians did much to weaken our resistance. Lord Moran, however, in the House of Lords has done us good service this time, and no one can

quarrel with his views. The *Lancet* leading article,¹ amid its devious arguments, twistings, retreats, and adjustments of position, in fact was good enough to state that the same feeling was evoked last week by Lord Moran's statement that the profession has neither been treated justly nor courteously. But the same phased withdrawal is suspected again.

The negotiating body of the consultants and general practitioners has been unable to negotiate. The B.M.A., representing consultants and general practitioners, advises non-cooperation with the Royal Commission. In my area a highly representative meeting instructed our representative to vote for "phased withdrawal and non-cooperation." This is being carried out entirely through pressure brought by the general practitioners who are going to bear any distress, or, worse, any odium, that may arise from support of B.M.A. policy. May I repeat that the B.M.A. represents consultants, specialists, and general practitioners, is democratically elected, and the representatives are democratically instructed by both groups of the profession? Now we learn that Lord Moran's successor, Sir Russell Brain, a member of the Negotiating Committee, has agreed on behalf of the Royal College of Physicians to support the Royal Commission. I ask myself what is his mandate to do so. Neither I nor any member I have spoken to in this area, nor any licentiate, has been asked for his democratic support. And yet the general practitioners are to go into battle on behalf of both sections while the consultants, who have nothing to lose, hear their President (on behalf of whom, may I ask?) knock one of the planks away from the feet of the general practitioners. I remain baffled. Am I the only one? Can you or your readers enlighten me?—I am, etc.,

STANLEY KAYE.

Brighton.

REFERENCE
¹ *Lancet*, 1957, 1, 773.

The Real Issue

SIR,—It is to be hoped that some of the letters appearing in the *Supplement* of April 20 were written some while ago, for the writers seem unaware of what has happened recently. What began as a remuneration claim, put forward for negotiation or arbitration, has, through the refusal of the Government to do either, developed into a struggle to assert the principle that a mutually agreed basis of remuneration must not be unilaterally repudiated, even by a government. This is a matter of vital concern to every member of the community, for without it no wage or salary agreement is of value. It is, quite simply, arbitrary government.

We must keep in mind the basic facts. In view of the passage in the official *Handbook for General Practitioners*, which I quoted in my last letter (*Supplement*, April 6, p. 156), it is impossible for the Government to say that it did not—at March 31, 1955—wholeheartedly accept the Spens formula. Our claim for negotiation or arbitration about the present application of that formula was met by a flat "No" and refusal to discuss, let alone negotiate or arbitrate. Then the Prime Minister—again without discussion or consultation—announced a Royal Commission to devise a new basis of payment. Then, again without discussion—just as he put the extra shilling on prescriptions—he announced a 5% increase and suggested that in view of this gesture we should all get together happily to improve the Service.

Unfortunately no improvement can come until there is a renewal of confidence, and confidence cannot be restored until the Government has agreed to the reasonable and repeated request of Dr. Wand for discussion—for arguing a case before a Royal Commission is neither discussion, negotiation, nor arbitration in any acceptable sense of those words. On this principle doctors and public must stand fast, though the doctors, whose first duty is to their patients and not to the Treasury that collects and pays their fees, are in a very difficult position in fighting for it owing to this dichotomy of interests.

Whether we should undertake phased or total withdrawal or some other method of protest—e.g., refusal to pay income

tax—will presumably be decided at the Special Representative Meeting on May 1, but do let us be clear that the real issue is not 24% on Danckwerts but on how the claim should be considered, and whether governments shall be allowed arbitrarily to withdraw from agreements they have made. It is possible to argue, as *The Times* does, that no such agreement should have been made, but having been made no constitutional Government has the right to repudiate it. If this is the best thing the Government can do with an educated and, I hope, responsible profession it is just inciting employers and workers to be equally unreasonable and unreliable.

I do not know whether the S.R.M. will consider, as it well might, what shall be done with the 5% increase which will be paid on May 1, whether we like it or not; and for once the Prime Minister has said that he would like advice from the profession. If it should be discussed, may I repeat a suggestion I made in the *Manchester Guardian* some while ago—namely, that we should devote the first part of any increase in the central pool to doctors with children, as they are, by and large, those who are worst off? I suggested that we should allot £100 for each child under 12 and £200 for each child over that age. I calculated—without any precise data to go on—that this would probably take just about the 5% that has actually been given. (This has nothing to do with whether it is a proper award, about which I hold strong views.) Such a course would ensure that the award was used to the best advantage; it would show that as doctors we are mindful of human needs and wish to act socially and not selfishly. It would be of national benefit, as it is from these families that many of our best future citizens will come. It would reverse the present dysgenic effect of professional salaries in that—from the biological point of view—doctors and other professional people marry too late and have too few children, while, from the medical aspect, there are few things which help a G.P. to be understanding and kindly more than to have personal experience in his own family of the joys and difficulties of those whom he has to treat. The currency of a family man is, as it were, depreciated, as he has so many more mouths to feed, and this odious award gives us a unique opportunity, without any of us being worse off, to assert the importance of biological facts. Perhaps I should add that all my children are grown up.—I am, etc.,

W. N. LEAK.

Winsford, Cheshire.

Voice of Junior Hospital Staff

SIR,—Your leading article entitled "The First Decision" (*Journal*, April 6, p. 810) notes that there has been a lack of response in your correspondence to the Ministry's recent unilateral adjustment of the salaries of the junior grades of hospital medical staff. It may be that we were stunned into inactivity by the events of the last few weeks; in addition, we are in fact afraid to speak out for fear of incurring disfavour by disturbing our august leaders in their delicate negotiations. Your offer of anonymity for such as we will probably be eagerly seized.

I have sounded many of my colleagues of similar seniority on this subject, and add my view to theirs when I say that this 10% is contemptuously regarded by all grades from senior registrar down. We would be satisfied, were it left to us, with nothing less than the following: (1) An increase of at least 24% in current scales of salary. (2) The allowance, for income-tax purposes, as non-taxable expenses, of bona-fide payments for tuition, such as postgraduate courses; examination fees—everyone knows that entry for the appropriate higher and differential qualifications is a *sine qua non* of most hospital posts; and textbooks and instruments of most hospital posts; and their upkeep. Most registrars spend anything from 30 guineas a year on these wholly necessary adjuncts to their chosen hospital careers. (3) The institution of a continuation into the third and fourth years of annual increments for middle-grade registrars: at least two tenures of two years each are necessary for anyone these days who is seriously pursuing a career in the hospital service; usually one general

contributing to the special levy, giving as his reason that large practices have too high overheads; small practices can afford to subscribe better, he thinks. How idiotic can doctors become? Had the profession done what I have been pleading for in your columns since 1949—had a closed shop so that the majority could enforce obedience on the minority—how cosy we would now feel facing Mr. Macmillan (Mr. Vosper, apparently, no longer counts) from behind a solid wall of 100% obstruction to governmental interference or arbitrary action. Thus let us determine to go ahead, not being content with increased remuneration only, but seeking a better Service, run perhaps on Australian lines, and presided over, as a previous correspondent suggested, by a corporation like the B.B.C. In the meantime, if our withdrawal machinery breaks down, I very humbly suggest again that we become a trade union and be done with it. The old days of the gentlemen's profession and gentlemen's agreements are so patently over that our younger members laugh at the idea. After becoming a trade union we could quickly (many say our present withdrawal is far too slow) talk turkey very aggressively to the Government.

May I again express my appreciation of the work of our negotiators? It is exhausting, irritating work for which this G.P. is very thankful.—I am, etc.,

Dungannon, N.I.

CONN MCCLUSKEY.

Mileage Committee Report

SIR,—It was with some apprehension that I read the interim report of the Mileage Committee. A study of this has failed to convince me that there has been any large-scale expression of dissatisfaction from rural practitioners with their share of the mileage fund, or that, indeed, there would be grounds for such.

The rural practitioners classified as A already receive more than 60% of the fund, whereas class C practices attract only a meagre 7%—little enough when one recalls that, even in the latter type of practice, considerable mileage may be covered, and hence time expended, in travelling between patients who may dwell only two to three miles from one's residence. It is not uncommon to receive perhaps three late calls after the planned round of visits has been completed; and, should these lie in three different directions—as is very likely where a practice lies in the centre of surrounding villages, themselves perhaps only classified as semi-rural—ten or twelve miles can easily be clocked to visit these patients. The mileage received by class C practices in the opinion of many is wholly inadequate; and by elimination of the patients who live between two and three miles the greater part of this would be taken away. Surely this is most unjust.

It is to be hoped that the local medical committees, the G.M.S. Committee, and later the Conference of Local Medical Committees will not hesitate to reject this ill-conceived report. Its acceptance can only add to the burdens already borne by the small-list man. A study of the composition of the Committee does not impress with their qualifications to sit in judgment upon this matter, and it is not without significance that the three representatives of executive councils recorded in the report their "keen disappointment."—I am, etc.,

E. Horsley, Surrey.

B. S. GRANT.

Assurance Profits

SIR,—The short answer to your correspondent Dr. P. H. Sutton (*Supplement*, March 30, p. 145) is that the profits that accrue to life offices from reduced claims by death as a result of the wonderful progress of medical and surgical science and skill go to increase the bonuses to with-profits policy-holders. After all, it is the policy-holders who provide the money and it is to them that the bulk of the profits (in mutual offices the entire profits) go back in increased benefits.—I am, etc.,

London, E.C.2.

R. W. BOSS,

Secretary,
The Life Offices' Association.

Co-operation with the Royal Commission

SIR,—At the moment the medical profession is united to a very large extent, and deems co-operation with the Royal Commission to be out of the question under present circumstances. This view is supported by public health practitioners on the ground that the terms of reference of the Royal Commission do not cover an investigation of their conditions of service. It should therefore be clearly realized by those who advocate co-operation under present circumstances that they are furthering the cause of professional disunity, and incidentally doing a disservice to their public health colleagues.—I am, etc.,

Hamilton.

I. C. MONRO.

Association Notices

Diary of Central Meetings

APRIL

- 30 Tues. Special Conference of Local Medical Committees, 10 a.m.
30 Tues. Central Consultants and Specialists Committee, special meeting, 11 a.m.

MAY

- 1 Wed. Council, special meeting, 9 a.m.
1 Wed. Special Representative Meeting, 10 a.m.
1 Wed. Council (to follow Special Representative Meeting).
8 Wed. Council, 10 a.m.
9 Thurs. Trustees of the Dain Fund, 1 p.m.
9 Thurs. Dermatologists Group, 2 p.m.
10 Fri. Conference of Honorary Secretaries, 10.30 a.m.
10 Fri. Registrars Group Council, 2 p.m.
16 Thurs. G.M.S. Committee, 10.30 a.m.

Branch and Division Meetings to be Held

- BROMLEY DIVISION.—At Royal Bell Hotel, Bromley, Wednesday, May 1, meeting.
CITY DIVISION.—At Committee Room C, B.M.A. House, Tavistock Square, London, W.C., Tuesday, April 30, 8.30 p.m., meeting to consider Annual Report of Council.
CITY OF DUNDEE DIVISION.—At Queen's Hotel, Nethergate, Dundee, Friday, May 3, 9.30 p.m., annual general meeting.
CROYDON DIVISION.—At Shirley Park Hotel, Croydon, Thursday, May 2, 7 p.m., annual dinner dance.
DEWSBURY DIVISION.—At Board Room, General Hospital, Dewsbury, Friday, May 3, 8.30 p.m., annual general meeting.
DUNDEE BRANCH.—At Queen's Hotel, Nethergate, Dundee, Friday, May 3, 8.30 p.m., annual general meeting.
EAST KENT DIVISION.—At Winter Gardens, Margate, Friday, May 3, 8.30 p.m. to 2 a.m., annual supper and ball.
LEWISHAM DIVISION.—At Lewisham General Hospital, (1) Friday, May 3, 8.30 p.m., annual general meeting. (2) Sunday, May 5, 10.30 a.m., clinical meeting.
MARYLEBONE DIVISION.—At Medical Society of London, 11, Chandos Street, W., Tuesday, April 30, 8.30 p.m., A.G.M.
METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Sunday, May 5, 2.30 p.m., in conjunction with the War Office, display on the medical aspects of nuclear explosions, with demonstrations of treatment of casualties. The demonstration will last from one and a half to two hours. The Branch Council welcomes members of other Divisions.

NORTH LANCASHIRE AND WESTMORLAND BRANCH.—At Banquet Chamber, Town Hall, Dalton Square, Lancaster, Wednesday, May 1, 12.30 for 1 p.m., lunch, followed by eighth annual meeting. Presidential Address by Mr. James McFadzean.

READING DIVISION.—At Library, Royal Berkshire Hospital, Reading, Thursday, May 2, 8.30 p.m., combined meeting with legal profession. Medico-legal Forum. Questions of mutual interest will be discussed. Panel, Medical—Dr. P. G. McGrath, Mr. Michael Squires, and Dr. W. G. Tait. Legal—Mr. G. F. Darlow, Mr. Colin Davy, and Mr. G. C. Jones. Chairman, Mrs. M. Salzmann. Guests invited.

ST. PANCRAS DIVISION.—At B.M.A. House, Tavistock Square, London, W.C., Wednesday, May 1, 8.30 p.m., meeting. B.M.A. Lecture by Dr. Roger Bannister: "Physiology of the Mile." Members of the City Division are invited.

SOUTH-WEST ESSEX DIVISION.—At Wanstead Hospital, Hermon Hill, Wanstead, E., Wednesday, May 1, 8.30 p.m., meeting. Mr. H. R. Thompson: "Cancer, Genes, Research, and All That."

SWINDON DIVISION.—At Swindon and North Wilts Victoria Hospital, Friday, May 3, 8.30 p.m., annual general meeting.

ANNUAL MEETING: NEWCASTLE UPON TYNE, JULY 10-19

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 4 1957

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SPECIAL CONFERENCE OF LOCAL MEDICAL COMMITTEES CONSTITUENTS TO BE CONSULTED

A special Conference of Local Medical Committees, called to consider the reports and recommendations of the G.M.S. Committee on the remuneration dispute (see *Supplement*, March 23, p. 123, and April 27, p. 225), met in the Great Hall of B.M.A. House on April 30. Dr. A. BEAUCHAMP was in the chair.

The Conference had before it a report on the latest developments in the situation which had occurred since the publication of the G.M.S. Committee's supplementary report (*Supplement*, April 27, p. 225). These developments consisted in a legal opinion on the effect of the public statements made by the chairman of the Royal Commission and a letter from the Minister of Health, Mr. D. Vosper, M.P., to Dr. S. Wand, chairman of Council of the B.M.A., following on conversations which they held on April 25. The letter was as follows:

Dear Dr. Wand,
I was glad of the opportunity of a long talk with you yesterday and I hope you feel—as I do—that it is that kind of informal and personal discussion which does most to clear away misunderstandings.

First, let me confirm what I said to you when I assured you that, following the report of the Royal Commission, there will be full consultation with the profession before implementation of any of its findings and that such consultation could be of course include any matters relevant to the report or the present dispute.

Second, you seemed to fear some inconsistency between the terms of reference of the Commission and the public statements issued by its Chairman. I can certainly reassure you here too. It is normal that the interpretation of the terms of reference of a Royal Commission should be a matter for its Chairman and the Commission, and you can certainly regard the public statements which have been issued as having full validity.

Finally, I have thought—as you asked—about the position of the public health medical officers. I cannot add anything of substance to what I said in my letter of 17th April on this, but let me repeat that I am sure that any settlement for others following the Commission's report, could not fail to be taken into account in considering the position of these officers and any claim through the normal machinery would of necessity be considered in the light of the report and of any settlement subsequent to it.

I do hope that these remarks, and our talk yesterday, will help to rid us of unnecessary apprehensions.

Yours sincerely,
DENNIS VOSPER.

Committee's Change of Mind
Dr. A. B. DAVIES, chairman of the G.M.S. Committee, in presenting his Committee's report, said that at an emergency meeting held that morning, immediately before the Confer-

ence, his Committee had considered these latest developments and had heard a report from Dr. Wand. As a result, the Committee, by a narrow majority (24 votes to 22), had decided to recommend to the Conference

That in view of the latest developments evidence should now be given to the Royal Commission and a decision on withdrawal from the Service should be deferred.

This recommendation was in substitution of the Committee's recommendation on the agenda

That, in the view of the Conference, in present circumstances it is undesirable that the General Medical Services Committee should co-operate in any way with the Royal Commission on the remuneration of doctors and dentists.

Dr. Davies told the Conference that the new recommendation represented the majority view of the G.M.S. Committee that the new developments shortened the bridge likely to lead to a resolution of the present difficulties.

Dr. WAND gave the Conference an account of recent happenings. He said the public statement by the chairman of the Royal Commission, that that part of the Royal Commission's task which consisted in determining what should be the proper current levels of remuneration of doctors and dentists would include hearing submissions from those professions as to the remuneration they were now claiming, was the first time it had been mentioned that the profession's claim would be before the Commission. Dr. Wand stressed what he felt was an important promise in the Minister's letter, that there would be full consultation with the profession before implementation of the Royal Commission's findings. The Minister, said Dr. Wand, would not promise negotiation because he felt it would be discourteous to the Royal Commission to assume that its report would not be acceptable. Dr. Wand also underlined the Minister's assurance that the public statements by the chairman of the Royal Commission were fully valid.

Turning to the question of the exclusion of public health medical officers from the terms of reference of the Royal Commission, Dr. Wand told the Conference that the Minister had said to him what he had repeated in his letter.

In Dr. Wand's opinion the Government would go no further than it had now gone in meeting the profession's wishes. One thing was clear: the Royal Commission would not act as an arbitration body on the present claim. The Chairman of Council concluded by saying that he would not give a personal opinion on the situation. It was up to "those who have knowledge of the periphery to decide."

Decision Deferred

An amendment by Edinburgh that the decision whether or not to co-operate with the Royal Commission should be reached by way of a referendum of all general practitioners in the N.H.S. was withdrawn.

Whereupon Dr. J. A. PRIDHAM moved, and Dr. F. GRAY seconded,

That the special Conference realizes that local medical committees and the profession generally have not had an opportunity of considering the statement of the chairman of the Royal Commission or the letter from the Minister of Health to the Chairman of Council of the B.M.A., and therefore defers decision on the recommendation to give evidence to the Royal Commission until the Annual Conference in June.

Dr. PRIDHAM, speaking to the amendment, pointed to the division of opinion in the G.M.S. Committee in a hurried meeting. There must be an interval for reflection. Dr. GRAY, seconding, said that the Conference had no need to come to a decision so hastily as the G.M.S. Committee had had to. There was time for representatives to consult their constituents. Dr. A. M. MAIDEN was sure that there was nothing to lose by continuing to say no for the time being, and nothing to gain by saying yes now. Democracy should be allowed to work. As a representative, Dr. D. R. SNELL-GROVE felt he was not in a position to vote for the G.M.S. Committee's recommendation to give evidence to the Royal Commission. He must ask his constituents. Drs. C. M. SCOTT, J. F. MILLER, O. C. CARTER, CATHERINE HARROWER, and ANNIS GILLIE were among those who spoke strongly in favour of Dr. Pridham's amendment, while Drs. A. T. ROGERS, B. CARDEW, J. C. ARTHUR, and ALEX BROWN were among those who spoke in favour of the Committee's recommendation. Dr. I. D. GRANT, chairman of the Representative Body, asked the Conference to vote in favour of referring the matter to its constituents before deciding to give evidence to the Royal Commission. To decide to give evidence, in Dr. Grant's opinion, would be tacitly surrendering to unilateral dictation. The Government had refused to negotiate or discuss anything with the profession. The Royal Commission was thrust on them. "Are we to be servants or equal partners in the Health Service?" Dr. Grant asked. The matter was now one of principle.

Dr. DAVIES earnestly asked the Conference to accept Dr. Pridham's and Dr. Gray's amendment.

The amendment was carried, and it was then carried as the substantive motion in place of the G.M.S. Committee's recommendation.

Interim Adjustment

During the afternoon session the Conference debated the G.M.S. Committee's recommendation that the Government be informed that it was the wish of the Conference that the 5% net increase to the aggregate net remuneration of general practitioners, arbitrarily decided upon by the Government, should be placed in a suspense account.

An amendment by Berkshire that the interim offer of 5% should be accepted without prejudice was eventually carried, together with a rider to it in the form of an amendment by Kent and Canterbury that immediate negotiations should be entered into with the Ministry upon the best way of distributing the 5% so as to give the most effective help to the greatest number of practitioners. The Berkshire amendment was then carried as the substantive motion, with the Kent and Canterbury amendment added as a rider.

Since the *Journal* went to press on the same day as the Conference, a further report of the Conference proceedings will appear in the *Supplement* next week.

CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE

CO-OPERATION APPROVED

The Central Consultants and Specialists Committee passed the following resolutions at its meeting on April 30:

(1) That in view of the changed circumstances arising from the explanation and amplification of the terms of reference of the Royal Commission on Doctors' and Dentists' Remuneration contained (a) in the letter dated April 11 from the Prime Minister to Sir Russell Brain, (b) the statement issued by the chairman

of the Royal Commission on April 12, and (c) the letter dated April 26 from the Minister of Health to Dr. Wand, the Central Consultants and Specialists Committee now approves of co-operation with the Royal Commission, and is glad to find itself in agreement with the General Medical Services Committee in this regard. (Carried unanimously.)

(2) That the Committee, while agreeing to give evidence before the Royal Commission, reaffirms its belief in the justice of its present claim for increased remuneration, and that in the meantime negotiation followed if necessary by arbitration remains the proper method by which this and kindred disputes between the profession and the Government should be settled.

(3) That although recognizing the complexity of the position of public health medical officers, the Committee regrets their exclusion from the terms of reference of the Royal Commission, and promises its full support for any action which can be taken to achieve improvement in their remuneration.

A report of the Special Representative Meeting held on May 1 will appear in the *Supplement* next week, since this issue went to press before the meeting.

CONFLICT IN SWEDEN

MEDICAL STAFF RESIGN

[FROM A CORRESPONDENT]

In a large number of Swedish cities and towns, doctors, architects, judges, and other professional workers have left their positions after due notification. In addition, a blockade has been proclaimed against employer appointment of replacements to fill vacancies due to pensioning, etc. On April 8, more than half the junior staff physicians and all the out-patient clinic doctors in Gothenburg resigned after giving the stipulated one-month period of advance notice.

All Learned Professions

These measures form a part of the present labour controversy between S.A.C.O. (the Central Organization of Academics in Sweden), representing university-trained manpower in the professions—and of which the Swedish Medical Association is an important affiliate—and the municipal employers of Sweden. The conflict is thus concerned with the working conditions of all those in the learned professions, and not merely with similar conditions in the medical profession. Its causes may be briefly summarized as follows:

(1) Since the end of the war employees in public service (central and local government) have suffered a deterioration in their employment benefits as compared with employees in private enterprise.

Where university-trained manpower is concerned, the deterioration in certain cases is not only relative but also absolute. In the autumn of 1956 the central government revised the pay scale for its employees in order to compensate them for a salary lag of several years' standing. Since central and local governments principally follow the same kind of salary-setting system, it was generally expected that municipal employees would receive similar increases. However, the municipalities were willing to grant certain professional categories at the upper end of the pay scale no more than negligible increases, which were far below those approved by the central government. Certain judges, architects, engineers, librarians, and doctors were hardest hit by this restriction.

(2) The local authorities want the organized professional workers to agree to the reduction of their regular salary by 20 to 25% whenever collective bargaining has failed to produce a pay settlement and a labour conflict is imminent. This reduction, which the professional workers are supposed to acknowledge as a legitimate weapon of the municipal employer in such a conflict, would affect all members of S.A.C.O. Yet at the same time the employer would require the same output of work from those who do not take a more

active part in the conflict by virtue of having resigned or given notice of resignation. S.A.C.O. is unwilling to accept these terms.

The present conflict is most strongly marked in Gothenburg, where the resignation of doctors is directed against both open (non-institutionalized) and closed (hospitalized) care. About 100 junior staff physicians and 40 out-patient clinic doctors have left their positions.

Service to the Patients

The medical side of the controversy naturally has its own aspects. For one thing, conflict measures cannot be permitted to endanger the lives and health of the sick. It has therefore been a concern of the medical profession and of S.A.C.O. to make arrangements for consultation and treatment facilities to replace the open care attached to out-patient clinics and hospitals, which of course have been practically shut down as a result of the conflict. The junior staff physicians involved have set up provisional offices where they can receive patients on a private basis. Another emergency arrangement is the private surgical clinic opened by 12 doctors, four of them roentgenologists, who are assisted by 18 nurses. This clinic handles between 300 and 500 patients a day and maintains round-the-clock shifts of doctors for the treatment of minor accident cases. Private consultation facilities in medicine, paediatrics, and psychiatry have also been set up by other doctors who have left their regular employment.

In addition to this shut-down of hospital open care under municipal auspices, closed-care services have been sharply curtailed. Only the most urgent cases are admitted to hospital. In conjunction with Gothenburg's leading hospital, Sahlgrenska, the doctors have set up their own "screening centre," which decides in each case whether a patient must be hospitalized or not. If hospitalization is not considered absolutely necessary, the patient is referred to private practitioners or to the private facilities of junior staff physicians. About half of the junior staff physicians, who ordinarily would have resigned with their colleagues, have been allowed to remain in service so as to perform this screening work, to assist senior staff physicians in treating hospitalized cases, and to take part in on-shift duty. Inasmuch as these duties come under the heading of safeguarding the public interest, S.A.C.O. has made it a condition that no deductions are to be made from their pay. Up to the present time the doctors continuing in regular service have been receiving full pay.

Public Reaction

Though the present conflict is an acute one, it has struck a neat balance between the taking of measures severe enough to put pressure on employers and yet not so severe as to endanger the lives and health of patients. As a result the community at large has not seen fit to impose compulsory settlements on the doctors through legislation—a step that has been threatened in previous conflicts.

PRIVATE PRACTICE COMMITTEE

A meeting of the Private Practice Committee was held at B.M.A. House on April 10, 1957. Dr. A. BROWN was in the chair.

Drugs for Private Patients

It was reported to the Committee that at its last meeting the Council had agreed that at an appropriate time in the future discussion should be initiated with officers of the Ministry of Health on the provision of drugs for private patients.

It was resolved to submit to the Council that the present time was particularly appropriate for representations to be made to the Ministry of Health on the subject of drugs for private patients.

Remuneration Claim

Though the present remuneration claim and dispute with the Government were strictly a matter for those doctors employed within the National Health Service, the Committee considered that there would be many medical practitioners not engaged in any way in the National Health Service who would wish to give tangible support to their colleagues in their present difficulties. It was therefore suggested that it should be made known that all members of the profession, whether engaged in N.H.S. work or not, could subscribe to British Medical Guild funds.

Fees for Examination of Prisoners

A report was received that the Treasury had confirmed that the Prison Commissioners would pay a fee of £3 3s. a session for the examination of prisoners for fitness for Borstal, preventive detention, or corrective training. In the event of examination in single cases only the fee would be 15s. per case, except when an examination and report was of particular intricacy or took an unusual length of time, when the fee would be within the range of £1 5s. to £2 2s.

Parking Difficulties

Following a meeting with officials of the Ministry of Transport it was reported that it seemed doubtful whether there would be agreement to special privileges for any particular section of the community. The Ministry officials' attention had been drawn to the difficulties experienced by doctors in carrying on their practices because of the restrictions on traffic. On the question of emergency calls, however, it was possible that some change in favour of doctors might be effected. The Ministry had undertaken to consider all the points made at the meeting.

N.H.S. Pre-employment Examination

The Committee considered correspondence which had taken place with the Ministry of Health on the fee for a medical examination and report on employees of the National Health Service. It was felt that the position was not satisfactory, and it was agreed that representatives of the Committee should go to the Ministry to take up the matter.

Certificates for Fitness under National Assistance Act

The growing practice of the National Assistance Board in requiring certificates for unfitness for work to support claims for National Assistance had led to criticism from a number of areas. It was proposed to ask the Board to refer these cases to appropriate independent medical boards.

Domiciliary Visits for Ministry of Pensions

It was reported that the Ministry of Pensions and National Insurance had agreed to pay half the normal fee for abortive visits from a date to be announced shortly.

Increased Fees

It was reported that an increased fee of £1 17s. 6d. would be paid for examinations of persons in the following categories: prospective employees, Ordnance Survey Office; candidates for probation training, Home Office; prospective employees, U.K. Atomic Energy Authority; temporary officers, scientific grades, Ministry of Supply; non-industrial staff, National Coal Board.

Arrangements have been completed for paying new allowances to seriously disabled war pensioners. The allowances affect some 77,000, mostly first world war veterans. Those aged 65 or over suffering from 40% or over disablement have an age allowance, depending on the degree of disablement, ranging from 5s. to 15s. a week. Comfort allowances have been raised in some cases from 10s. to 20s. a week, and are payable to some 13,000 pensioners previously ineligible but getting either the unemployment supplement or constant attendance allowance.

TABLE I.—Age Distribution at June, 1956, of Consultants and S.H.M.O.s (Great Britain)

Year of Birth	General Medicine		Diseases of the Chest		Mental Health		Neurology		Paediatrics		Radiology		Radiotherapy		Physical Medicine		Pathology		Infectious Diseases		Dermatology	
	Persons	Sessions	Persons	Sessions	Persons	Sessions	Persons	Sessions	Persons	Sessions	Persons	Sessions	Persons	Sessions	Persons	Sessions	Persons	Sessions	Persons	Sessions	Persons	Sessions
1886	1	6			1	7					1	10										
1887	1	4									1	4			1	3	2	2				
1888	1	1									1	8										
1889	2	35									3	8										
1890	5	92	2	22	4	33					11	4										
1891	17	58	7	63	9	54					6	46	1		1	2	2	12				
1892	11	54	4	44	6	41					8	67			2	2	7	18				
1893	25	80	7	60	11	77					11	94			3	22	6	35				
1894	18	111	10	104	12	101					12	57	1		2	7	11	95				
1895	20	142	9	82	17	127					18	100			1	10	17	114				
1896	29	178	10	89	24	194					31	111	2		2	6	16	147				
1897	30	195	11	108	28	259					36	134	3		3	18	22	103				
1898	27	167	17	169	31	282					41	113	3		11	11	106	7				
1899	30	195	11	108	28	259					41	113	3		11	11	106	7				
1900	52	302	22	217	37	335					64	126	6		9	63	24	161				
1901	40	265	20	187	34	338					33	120	3		33	22	118	160				
1902	29	186	32	343	33	312					22	194	4		3	23	18	163				
1903	37	247	29	300	28	240					29	113	3		3	16	11	87				
1904	39	267	19	195	31	306					32	96	3		3	14	21	180				
1905	35	299	25	236	40	369					22	8			2	8	17	135				
1906	38	265	20	204	40	358					11	115	3		3	28	27	247				
1907	61	468	26	258	38	366					31	102	3		6	45	23	195				
1908	44	312	22	232	44	425					47	105	2		3	31	29	192				
1909	52	363	22	207	32	313					80	126	3		3	20	20	186				
1910	52	413	26	274	39	384					138	19	6		3	22	29	223				
1911	51	361	43	438	41	397					66	161	6		5	29	35	317				
1912	46	339	24	238	50	471					27	253	4		8	28	34	267				
1913	50	444	43	458	38	348					24	248	11		4	2	16	43				
1914	61	503	44	464	50	463					32	326	14		5	34	37	333				
1915	68	518	45	462	52	521					116	27	14		5	52	52	465				
1916	54	420	55	595	45	430					140	34	8		8	55	50	478				
1917	42	331	37	395	41	391					128	21	205		11	72	5	46				
1918	32	219	37	374	36	359					129	20	196		11	116	4	28				
1919	32	216	26	276	36	342					50	23	211		10	106	8	78				
1920	28	185	27	285	38	350					13	130	8		6	58	37	331				
1921	16	85	25	273	23	231					20	208	8		2	22	34	284				
1922	9	83	18	193	32	306					14	144	6		2	22	23	218				
1923	3	26	13	143	16	162					10	96	4		2	11	11	99				
1924	4	27	7	77	8	83					1	11										
1925	2	22	4	44	12	126																
1926			2	22	3	33																
1927			1	11	1	11																
1928					1	11																
Totals	1,178	8,389	793	8,162	1,063	9,967	76	550	253	1,871	536	4,948	167	1,623	104	798	879	7,582	136	1,033	190	1,182

TABLE I—contd.

Year of Birth	Venereology		Ophthal-mology		General Surgery		Anaesthetics		Neuro-surgery		Plastic Surgery		Thoracic Surgery		Ortho-paedic Surgery		Ear, Nose, and Throat Surgery		Obstetrics and Gynaecology		Totals		
	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions	Per-sons	Ses-sions	
1886					1	1															3	13	
1887					2	7										2					25	80	
1888	1	2	1	4	1	2										1					8	55	
1889	2	9			3	7	1	9								1					11	80	
1890			1	4	3	18	2	10													20	143	
1891	1	2	7	28	14	91	1	2			1					2	2	2	8	2	16	24	
1892	3	12	10	62	19	136	7	54								3	10	3	20	7	43	77	
1893	4	18	15	83	23	172	11	83								4	20	6	59	7	52	115	
1894	5	26	15	96	24	143	11	69								1	10	6	41	6	39	132	
1895	2	11	9	62	21	142	16	112								3	11	4	35		65	142	
1896	7	40	13	90	25	206	23	134								4	32	7	42	10	88	147	
1897	6	43	10	68	38	270	27	174								3	11	7	54	11	75	189	
1898	7	54	24	140	25	208	25	206								1	3	2	84	10	82	227	
1899	4	28	30	203	48	357	28	179	1	9						1	5	7	60	12	85	239	
1900	7	44	28	201	47	313	42	274	3	23						6		4	49	11	80	295	
1901	5	37	29	166	42	284	39	285			1	6				9	16	141	21	157	14	358	
1902	10	75	20	129	55	384	43	279	2	17	2	20				1	9	10	88	27	206	441	
1903	5	35	19	129	48	365	34	266			3	19				4	30	14	110	19	160	338	
1904	5	32	14	87	58	481	28	212	1	9	2	21				4	34	11	79	10	73	312	
1905	11	72	21	132	37	253	36	270	1	9	1	9				11		11	86	14	73	293	
1906	5	39	11	85	48	403	37	305	3	29	1	9				3	26	8	58	11	95	303	
1907	6	52	16	93	36	270	25	198	1	9	4	9				3	22	12	116	13	107	310	
1908	7	53	19	145	47	380	41	303	1	9	3	27				3	17	25	216	11	90	349	
1909	4	25	24	144	38	335	32	278	4	41	2	24				3	22	20	178	12	103	285	
1910	9	80	25	167	69	567	32	251	3	31	1	18				3	28	21	195	16	137	354	
1911	8	55	19	121	50	395	38	284	1	11	5	47				4	34	21	197	13	100	411	
1912	4	34	13	97	52	466	41	317	2	20	2	20				6	54	23	217	16	126	324	
1913	5	53	19	111	62	508	46	400	6	58	2	18				6	55	22	191	10	90	407	
1914	10	83	22	156	49	398	45	406	2	18	2	18				4	39	26	228	13	124	451	
1915	7	59	25	181	39	345	64	593	4	36	6	48				6	46	23	216	11	100	485	
1916	3	17	25	170	51	410	50	462	4	28	5	42				6	58	32	294	14	123	515	
1917	4	36	24	154	37	274	61	506	6	62	3	27				6	51	27	255	15	132	483	
1918	2	18	12	84	27	226	43	385			3	20				8	18	181	13	107	19	349	
1919	2	15	17	91	21	171	26	236	2	20						9	60	14	129	12	91	253	
1920	5	45	11	55	18	105	47	425	2	20						4	38	14	128	12	104	302	
1921	2	22	11	56	8	47	32	304			1	9				4	35	11	95	5	42	286	
1922	1	11	9	40	4	30	37	349	2	22						4	38	7	73	11	98	219	
1923	1	10	11	58	2	11	22	215								1		3	31	5	34	171	
1924			7	35			18	171														97	539
1925			4	6	1		11	115														60	313
1926			1	1			4	44														34	155
1927	1	11	1	2			3	20														7	11
1928																						1	
Totals	172	1,261	592	3,736	1,193	9,180	1,131	9,196	53	496	51	417	98	830	428	3,764	385	3,087	590	4,612	10,068	82,684	

an experimental effort, but the Government appears indifferent, and has missed an opportunity to attract to the ranks of the family doctor ardent young men and to ameliorate the status of general practice, the recent decline of which is deplored by so many authoritative writers in medical literature.

Teaching is implicit in the doctor's title and should include instructing patients about health as well as healing. Sir James Walton, on the Medical Planning Commission during the war, was a warm advocate of this reform, stressing it to be our professional function to foster abounding health in an A.1 nation, not merely to patch up a C.3 one. The medical correspondent of *The Times* quoted² in the same vein from the report of the Goodenough Committee, "To the neglect of the promotion of health, medical practice, and consequently medical education, has been concerned primarily with disease, chiefly as it affects individuals." The most influential agent for the inculcation of healthy living is the doctor, who alone is welcomed to the intimacy of family life. He has the opportunity: will the Government ensure him the time for this salutary duty?

In addition to teaching his patients there is a second part to the G.P.'s educational role, a share in the training of the medical student, formerly apprenticed to him. After a lapse of many decades, this function is being restored in a small way, but the competent teacher, already overtaxed with patients, will tend to sacrifice their interests when students share his time.

Defective Conditions in Specialism

These result from the lack of beds and an up-to-date hospital setting for work which has rapidly extended its scope, complexity, and delicacy in the last few decades. The Government should realize that the science of healing, as well as that of destruction, evolves. Britain needs new hospitals as well as factories.

There is the scandal of the waiting-list, a scandal which is even greater than appears, for not only does it defeat a great professional objective, early diagnosis, but among those waiting for admission are many unfortunates who need prompt treatment the urgency of which was not realized at the preliminary consultation.

Paralysis in the development of new major hospitals, including the teaching ones, is a most deplorable brake on progress—on making the blessings of modern science fully available for patients. The obduracy of the Government in this respect is based on the plea for economy. The excuse is not valid, because, instead of complying with its inescapable obligation, it sees fit to disperse minor capital in schemes to modernize, so to say, the existing old-style buildings—an appalling waste of money. Their massive, rigid masonry cannot be converted into what is ideal to-day, nor can current engineering services, which have so vastly improved over the old, be incorporated. How unpardonable to expect nurses to be clean with one place for washing hands and two dozen or more patients in a ward. It may be a sop to the public to use modern paint on walls, new fabrics, furniture and minor equipment looking like a change from the Victorian era into the second Elizabethan, but to the informed users of these premises it is like dressing mutton up as lamb.

We expected advances, great advances, too, when the nation took over the hospitals. Instead, the old hospitals remain and have to find room for a vast increase in new staff, professional and lay: the Government continues to cramp the work of our precious nursing personnel and is hanging round the neck of posterity the costly burden of maintaining aged property unsuitable to radical alteration. Mr. Bagot Oldham, of Liverpool, revealed the disgraceful state of the major hospitals of London and the provinces in *The Times*³ when he compared their antiquated premises with the new ones being built all over the Continent. He says of one, "The whole building is planned to provide a

¹ *Medical World Newsletter*, August, 1956.

² *The Times*, July 20, 1944.

³ *Ibid.*, May 21, 1956.

standard of amenities, equipment, and research which is so far undreamt of in Britain." The day is over for multi-storied blocks in hospital architecture. Light structures of 2 or 3 stories are economically and rapidly assembled. They can be equipped with all that up-to-date technical skill now offers for domestic and scientific needs. They are of flexible construction, adaptable to varied wants of different specialties. As with passing decades such light structures become outmoded, it would be a practical, not a prohibitive, proposition to alter and replace them.

The B.M.A. needs to adopt a dominantly constructive attitude towards the elimination of the shortcomings of the N.H.S., and launch out courageously on enterprises worthy of our noble profession. A grudging spirit or diverting compromise by the Government must be clearly anathema to our leaders. The nation prides itself on fair play, and we must see that every individual gets it in the Health Service.

OCCUPATIONAL HEALTH COMMITTEE

The Occupational Health Committee met on April 17 at B.M.A. House with Dr. J. A. L. VAUGHAN JONES in the chair.

Remuneration Claim

The CHAIRMAN explained the request being made to industrial medical officers to back up the position of general practitioners and hospital medical staff in respect of the remuneration claim. The difficulties of the industrial medical officer were appreciated, but what was desired was an assurance that they would not do anything to prejudice their opposite numbers in other branches of the profession. It was understood that there would be freedom of conscience for the industrial medical officer as for the general practitioner.

The matter was referred to the Association of Industrial Medical Officers for its views.

Use of Antibiotics by Nurses

The Industrial Nursing Subcommittee was asked to have a general discussion with the Royal College of Nursing on the notes of guidance which the latter's occupational health section has been preparing for occupational health nurses. The matter arose out of the question of the administration of drugs and antibiotics by industrial nurses. A member of the Committee said that there was no reason why nurses should not administer many harmless drugs without a doctor's order, but what they should not do was administer antibiotics as a routine.

Term of Office of Chairman

The Committee debated the length of time chairmen of standing committees of the Association should hold office. Dr. L. G. NORMAN and Dr. J. J. O'DWYER thought that a limitation in the period for which the office was held stimulated interest. The Committee decided to express the view that a chairman should hold office, with annual election, for a period of three years and that there should then be an intervening period before he could be re-elected, unless there were exceptional circumstances, when the Committee, by a two-thirds majority, should make a recommendation to Council for the latter to extend the maximum period.

Another internal matter considered was a letter from the Association's Treasurer pointing out the cost of committee meetings and urging economy. Dr. NORMAN, while agreeing that some members needed financial help in order to come to meetings, thought that everything should be done to foster the idea of voluntary service. Subsequent speakers told how one member lost £500 in fees in a year which he would have earned had he not attended Association committees, and of another member whose practice suffered so badly that he had to give up his service to the Association.

Consultation on Regulations

It was agreed that it would be an advantage if statutory regulations and legislation on occupational health were made available for consideration by the Association in the draft stage.

Refresher Courses in Occupational Medicine

Any major expansion of the occupational health service, particularly for smaller establishments, would have to be provided to a large extent by general practitioners, stated a report of the Training Subcommittee, which recommended that adequate facilities should therefore be available to that adequate facilities should therefore be available to general practitioners to take short postgraduate courses not intended to replace the full postgraduate course leading to a diploma in industrial health. The Subcommittee considered that the type of instruction most likely to be helpful was an intensive course of one or two weeks. Government grants should be available for general practitioners to undertake such courses, in the same way that grants for refresher courses were allowed under the National Health Service Acts.

In reviewing this report the Occupational Health Committee had before it a statement that there were no government powers to finance refresher courses in occupational health, which was described as the most fantastic piece of bureaucracy.

The Committee decided to submit the report, which it approved, to the Council, and to ask Council to refer it to the General Medical Services Committee, who, it was hoped, might agree to discuss it with the Ministry of Health, to the Annual Representative Body, and to the Industrial Health Advisory Committee.

Certificates for Short Illnesses

In the light of replies received from Government departments, nationalized industry, and the British Employers' Confederation, it was accepted that there was an endeavour on the part of the employers to meet the situation over the necessity of obtaining medical certificates for short illnesses. In most instances the certificates were not required merely for record purposes but for sickness benefit. The Committee is continuing to investigate this matter.

Ophthalmic Clinics

The Committee decided to invite representatives of the Ophthalmic Group Committee to its next meeting to discuss the National Ophthalmic Treatment Board Association's suggestion that it would be valuable to establish medical eye centres in industry wherever possible. The Group Committee had supported the proposal subject to an economic rent being paid by the ophthalmologists taking part in a scheme and to the work not being restricted to eye-testing but embracing the wider aspects of ophthalmic work arising in connexion with the industry concerned. The Occupational Health Committee accepted these reservations but felt that there were difficulties over a third stipulation made by the Group, that all local ophthalmologists should be given an opportunity to work in the clinics.

Occupational Health Prize

It was reported that the Council had accepted a recommendation from the Science Committee that a prize of £50 be awarded to Dr. C. P. Chivers, of Northwich, for his essay on respiratory function and disease among workers in alkaline dusts, and that a second prize of £10 be awarded to Dr. H. Stott, of Nairobi, for his entry entitled "Pulmonary Disease amongst Sisal Workers." It was stated that the standard of entries for the Association's 1957 Occupational Health Prize had been good, and that in regard to the second award it was much easier to do research in Britain where there were all the facilities; to do a fairly intensive investigation in a factory in Nairobi called for commendation.

HOSPITALITY

A Spanish doctor's son, aged 20, from a seaside village near Barcelona would like to spend July and August in England. The son or daughter of a British doctor would be able to return to Spain during September and October or during the summer of 1958.

A French doctor's daughter, aged 17, would like to spend two months with a British family on an *au pair* basis during the summer holidays.

A German doctor living in Munich would like to arrange a holiday exchange for her son, aged 12. She would receive a British boy during holidays between July 20 and September 1, and would like her son to visit England next year.

A French doctor's daughter from Carhaix, aged 18, would like to arrange a holiday exchange with a British doctor's daughter.

French doctor's daughters, aged 13 and 14, would like to arrange holiday exchanges with British girls, who could visit Brittany in August.

Would anyone interested please get in touch with Brigadier H. A. Sandiford, International Medical Visitors Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Scottish News

APPOINTMENTS TO REGIONAL HOSPITAL BOARDS

The Secretary of State for Scotland has appointed the following new medical members to fill vacancies on the Scottish regional hospital boards arising from the statutory requirement that one-third of the members retire annually:

Northern Region.—Dr. J. Ronald, Inverness; Dr. M. M. Whittet, physician-superintendent, Craig Dunain Hospital, Inverness. *Western Region*.—Dr. J. C. J. Ives, Edinburgh; Major-General J. M. Macfie, Glasgow.

The following medical members have been reappointed:

North-eastern Region.—Dr. R. J. Duthie, Aberdeen. *South-eastern Region*.—Professor G. H. Percival, Edinburgh; Dr. G. C. G. Mercer, North Berwick. *Western Region*.—Dr. W. W. Galbraith, Monkton, Ayrshire.

SCOTTISH HOUSE, EDINBURGH

REOPENING AFTER RECONSTRUCTION

The President of the Association, Dr. Alexander Hall, will formally reopen the Association's Scottish House in Edinburgh on Tuesday, May 14, at 4.30 p.m. Tea will be served from 3.45 p.m. to 4.30 p.m. Any member of the Association who would care to attend the reopening ceremony is asked to apply for a ticket to the Scottish Secretary, B.M.A. Scottish House, 7, Drumsheugh Gardens, Edinburgh, 3 (telephone: Central 7184).

The Secretary of State for Scotland has reappointed the chairmen of the five Scottish regional hospital boards for a further period of three years from April 1 as follows: *Northern Regional Hospital Board*: Mr. Edward Macintosh; *North-eastern Regional Hospital Board*: Dr. May Baird; *Eastern Regional Hospital Board*: Lord Provost Hughes; *South-eastern Regional Hospital Board*: Sir Humphrey Broun Lindsay; *Western Regional Hospital Board*: Captain J. P. Younger.

Correspondence

Royal College of Physicians

SIR,—May I attempt to answer two letters by one? Dr. J. H. Hunt and Dr. S. L. Kaye (*Supplement*, April 27, p. 232) both criticize the Royal College of Physicians, apparently for daring to express an opinion before consulting the British Medical Association.

Dr. Hunt is quite right in stating that the government of the College is in the hands of its Fellows, and it should be made clear that it is the whole body of Fellows and not just a small clique. The College officers and the Council have to report to the general meeting of Fellows at least once a quarter. The opinion of the Royal College of Physicians is, therefore, the corporate opinion of its Fellows, who claim to be (as far as we can in human affairs) a body of responsible persons, whose opinion may be the more valuable because of the method by which they are elected. The meeting to which Dr. Hunt refers was very well attended and the vote was *nemine contradicente*.

The College has never professed to represent general practitioners, or to usurp the functions of the British Medical Association, or to be voicing a postcard vote from its Licentiates; neither does a university consult its graduates before deciding its policy. Nevertheless, Fellows are most concerned that any opinion they express shall be for the good of medicine in its widest possible sense, and shall not penalize one section of the profession in comparison with another.

The machinery of the British Medical Association has all the advantages, and disadvantages, of democracy. Surely there are times when one or the other will achieve the better result, and we should respect each other's opinions instead of descending to bickering and contumely. Or, if no one in the profession is to give an opinion without first discovering the official view of the British Medical Association, will Drs. Hunt and Kaye please devise for us some kind of coloured shirt which we can wear while shouting the appropriate slogans?—I am, etc.,

ROBERT PLATT,

President,
Royal College of Physicians.

London, S.W.1.

The Real Issue

SIR,—I hesitate to add another letter to the many that have been written anent what is called "the doctors' pay dispute," but so many issues have been raised and so many red herrings have been dragged across the trail that the profession, the public, and I fear the Government, have at times lost sight of the one major issue. This is the simple fact that we of the medical profession have been denied the fundamental right in any civilized society of negotiation. We have been presented with a blank refusal or a *fait accompli* and at no time have we been asked, as co-partners in the N.H.S., to sit round a table and discuss the future relationship of our profession with the State.

It is the denial of this simple right, a right common to all walks of society, which has raised the ire of the profession and prepared many thousands of us to fight if necessary for its restoration. I submit, Sir, that the Government could solve this problem to-morrow by an invitation to the profession to "talk it over together."—I am, etc.,

Aberfeldy, Perthshire.

CHARLES J. SWANSON.

SIR,—We, members of the executive committee of the Fellowship for Freedom in Medicine, represent over 2,000 doctors in all branches of medical practice. We wish to make plain the views of the Fellowship on the present dispute with the Government.

The underlying cause of this controversy is the fact that the profession is profoundly dissatisfied with the present National Health Service, which it has faithfully tried to operate for over eight years. The working of the N.H.S. Acts has caused the State to become a controlling third

party between the doctor and his patients: this, together with other factors, has led to a general lowering of standards. The family doctor is, for example, no longer the counsellor of his patients, and he is unable to give the medical attention which he believes to be their due.

The fact that the present dispute has been represented as centring around pay is highly misleading. Having promised arbitration over the terms of service, before the profession entered the N.H.S. in 1948, the Government (which is ultimately the employing authority) has once again refused independent arbitration. Without consultation with the profession a Royal Commission has been set up, with such restricted terms of reference that it cannot even consider let alone make recommendations on the many faults of the Service which are so obvious to those working in it.

We take this opportunity of pointing out that, unless the Government will at all times honour its promises and will allow free and unfettered arbitration in the event of a dispute, the so-called freedom of the profession will become a mere pretence. In these circumstances the quickest and most effective action will be for the doctors to withdraw from the Service and for the time being treat their patients individually. This step will clear the way for building up a new Service embodying the many drastic reforms that are needed.

The Fellowship believes that the profession must make its voice heard now in the clearest possible terms, in the interests of the public, which the doctors of this country have always made their first consideration.—We are, etc.,

BARBARA M. L. ABERCROMBY.

J. M. ALSTON.

C. E. BEARE.

B. BURNS.

R. M. COURTNEY.

MOLLY K. LOGAN DAHNE.

S. F. LOGAN DAHNE.

GUY DAYNES.

NILS ECKHOFF.

W. ETHERINGTON-WILSON.

A. J. GARDHAM.

R. HALE-WHITE.

D. R. HARROCKS.

London, W.1.

D. B. HITCHINGS.

N. C. LAKE.

J. L. MCCALLUM.

REGINALD S. MURLEY.

J. O. M. REES.

G. RETTIE.

G. H. ROSSDALE.

A. V. RUSSELL.

GLADYS SANDES.

D. SILVER.

F. G. TOMLINS.

E. C. WARNER.

SIR,—Having been, in succession, a combatant officer in the Army, general practitioner, consultant, and now superannuated, I can view the present dispute from a somewhat detached position. Being also secretary of my county local medical committee I am also reasonably well informed of what is going on.

My personal opinion, for what it is worth, is that the Government—or Parliament for that matter, as I suspect that all parties have much the same object—wishes to control the National Health Service in the same way as it controls the fighting Services and the Civil Service. The latter Services have no say in their conditions of service or remuneration. Any individual who joins them surrenders his freedom in these respects as soon as he enlists. No question of arbitration between representatives (of the fighting Services at least) and the Government ever arises. This, I think, is the reason why the Government refuses to negotiate, hands out an interim payment of its own devising, and sets up a Commission with no medical members.

If the medical profession is to retain its status, and its tradition of service to the individual sick—rather than to the State, which has neither heart nor soul—it must fight this battle now.—I am, etc.,

London, S.W.19.

F. T. BURKITT.

SIR,—In a dispute it is essential, surely, to realize quite clearly with whom you disagree. In this country Governments come and go relatively infrequently, Ministers of Health rather more frequently. These people, however, are all advised by the "permanent officials," and we therefore have to demonstrate that their advice is wrong if

a really serious dispute, such as ours, develops. The Government of the day must, of course, have the last word, and its decisions can only be influenced by public opinion. Until quite recently it is very probable that the medical profession had the public's sympathy, but the *Sunday Times* of Easter Sunday had an article in which it was stated that the public generally were now of the opinion that the "doctors were going to strike for more pay." Whatever may be said to the contrary, that, I believe, is the general opinion now, and, if so, will lose us this essential lever.

Many of your recent correspondents seem to have lost sight of the core of our case—namely, that we, the doctors, have been refused the right to go to arbitration, while in the same week the trade unions were urged to adopt this course. There is a Royal Commission in being who will have to report its findings publicly, and it seems that some sort of compromise is inevitable. I venture to suggest that the following ideas might meet with fairly general approval, both within and without the medical profession, and incidentally may expedite the work of the Royal Commission: (1) The Government agree to extend the terms of reference of the Royal Commission to include the "consideration of circumstances whereby the medical and dental professions have the right to go to arbitration when the normal negotiating machinery has proved insufficient." (2) If the Government agree to this reference to the Royal Commission, we would withdraw all threat of resignation, etc.

In conclusion, may I say I am in entire sympathy with our negotiators, who have obviously had an extremely hard and anxious time. We all know that the question of remuneration is not really the main issue.—I am, etc.,

R. S. MACHARDY.

Southsea, Hants.

Local Medical Committee's Decision

SIR,—We, the undersigned, are seriously perturbed following the report in the press recently and from information received from our representative on the local medical committee.

At a meeting of Kent Local Medical Committee on April 12 it was decided by an overwhelming majority to support a resolution asking for resignation from the National Health Service, and by a majority vote not to co-operate with the Royal Commission. This we feel truly representative of the views of the majority of the doctors in Kent, and this was in fact the mandate given to our representatives to the Special Conference. An ordinary meeting of the local medical committee was convened for April 25. The agenda circulated to members did not contain any items concerning the dispute, but at the meeting a supplementary agenda was produced with fresh resolutions on the dispute, on which Dr. Talbot Rogers spoke. By an overwhelming vote the local medical committee altered the previous decisions taken at the special meeting.

We, the undersigned, submit that our representatives had no opportunity to consult the electorate, and therefore had no authority whatsoever to alter a mandate previously given. In view of the press publicity given to the alleged changed views of Kent doctors, we feel that this information should be available to the conference before arriving at any decisions.—We are, etc.,

B. HOOGEWERF,

Chairman, Bromley Division.

J. EWART PURVES,

Honorary Secretary, Bromley Division.

C. R. BARRINGTON.

K. M. BARRINGTON.

LEO GILCHRIST.

J. C. WISHART.

Member of Kent Local Medical Committee.

Bromley, Kent.

Withdrawal from N.H.S.

SIR,—Much as I agree with the actions of the Negotiating Committee in the past, and the principle of mass resignation in the future, I fear that resignation this year would be hasty, ill-considered, and likely to meet with a poor response.

In this letter I will try to set out the reasons why I hold this conviction. Phased withdrawal would be satisfactory if it were not for the fact that each phase would have to be separated by three months. A blitzkrieg is essential.

In July, 1958, many of the older practitioners will have completed the ten years in the National Health Service necessary to qualify them for a pension, and will be sending in their notice. Some of them have continued in practice longer than they would otherwise have done to qualify for this pension. They have everything to lose and nothing to gain by premature resignation. They know that in dealing with the Government nothing as important as a pension can be left to charity or chance. Many of these older practitioners are in partnerships, and their junior partners cannot legally resign without them. In any case, no partnership can work unless all the partners do one thing or the other. This hanging on of the older practitioners has also had the effect of preventing a number of younger men from getting practices and partnerships. These doctors would be hard put to it to refuse vacancies created by protest resignations if they were offered.

I am sure, therefore, that the response to a call for resignations this year would be disappointing, and would result in considerable loss of prestige to the profession. Next year, on the other hand, would see the profession strained to breaking point, and much better able to approximate a 100% resignation.—I am, etc.,

NIGEL G. NICHOLSON.

Ashford, Middlesex.

SIR,—In threatening a medical strike in the near future our profession seems to ignore the importance of timing its strokes of policy, a subject of which President Nasser is such a master. *Fas est et ab hoste doceri*. Thanks to the loyal and efficient work of Health Service doctors since the Service began, the public has for it a great affection and in a corresponding degree the profession enjoys its sympathy and good will. A medical strike will change these feelings into furious resentment, to be nursed and fomented until the next general election gives an opportunity of revenge. Much as we may deplore the refusal of arbitration on the Spens claim, we should assist by our evidence the Royal Commission recently appointed, and await its report.—I am, etc.,

W. SAMPSON HANDLEY.

St. Olaves, Norfolk.

SIR,—The present Government seems to have been ill-advised in its relations with the medical profession, but that is no reason for the profession to accept equally poor advice. However one may indulge in word-spinning, the effect of a temporary withdrawal from the National Health Service by general practitioners would be that of a strike, since it is unlikely that many patients would pay directly for a service which they are already financing via the Government.

Withdrawal would more surely affect public opinion adversely at a time when a Royal Commission was in being, and the final antagonism, to my mind, would result from a boycott of this body. To paraphrase Mr. Butler, this is "the best Royal Commission we have," despite its dubious and hurried convening, and even its limited terms of reference seem likely to provide the profession with a better forum and a fairer hearing than we can hope to have as the tempers of official and unofficial spokesmen rise, to the delight of the sensational and less responsible newspapers.

Medical men already appear sufficiently divided to ensure the failure of any attempt to force the Government's hand prior to the Commission's report, so would it not be wiser to behave in a statesmanlike and co-operative manner, which would manifestly compare favourably with the attitude of our administrators?—I am, etc.,

C. K. McDONALD.

London, S.E.13.

SIR,—I am profoundly disturbed to read in your leading article (*Journal*, April 13, p. 873) the sentence that medicine "has sacrificed so much that it seems of little account to sacrifice one of the few things left to it—what is called

"dignity." If this were accepted as a general standard of behaviour where would this country end? I am reminded vaguely of a cartoon figuring King Albert of the Belgians in the first world war. To the remark, "So you see you have lost everything," he replied, "Not my soul." If this is indicative of the attitude of our leaders, then it will be no wonder if the doctor never regains his status in this country.—I am, etc.,

Birmingham, 30.

RUTH LOCKIE.

SIR,—It is, of course, obvious that the object of the profession's proposed withdrawal from the Health Service is to obtain a reversal of the Government's present attitude; but we feel that the B.M.A. scheme, in its present form, has no chance of securing this. In order to succeed, any action must be directed to embarrassment of the Government, and it is quite unrealistic to think otherwise.

There are three main reasons why the present scheme will fail: (1) A B.M.A. spokesman has said in the national press that, whether people pay fees or not, nevertheless they will obtain treatment. This obviously will not embarrass the Government. (2) The B.M.A. scheme says quite definitely that no more N.H.I. certificates will be issued, but that doctors will issue their own private certificates. The Government will then, as it does now in certain circumstances, accept those private certificates as evidence of incapacity, and will pay sickness benefit accordingly. Thus, again, the Government will not be embarrassed. (3) Prescriptions will no longer be written on forms E.C.10, but will be issued on private paper, and the Government will effect a regulation, which it is entitled to do at any time, authorizing chemists to accept these private prescriptions during the period of the emergency, as if they were forms E.C.10. In the process, a number of private patients' prescriptions will be honoured as N.H.S., but these will be so small as not to deter the Government. So, once more, the Government is not embarrassed.

It follows that what the B.M.A. scheme is doing is to run the Government's N.H.S. scheme for it, as before, not at increased remuneration, as we set out to do, but entirely free of charge. The real solution lies in (2) above, for, if all certification other than death certificates be completely stopped, then the maximum damage is done to the N.H.S., with no damage to the treatment of the patient. Then, and then only, will the Government be embarrassed and have to listen to the profession.

To carry the issue to its logical conclusion it is not necessary to resign from the Service. Let every doctor in the Service give notice on July 1 that, as from October 1, he does not consider certification as part of his terms of service, and the Government will be compelled to face the alternative of agreeing to arbitration, or of giving 20,000 doctors three months' notice to quit the N.H.S.—We are, etc.,

Newport, Mon.
Caerleon, Mon.R. J. S. DOHERTY.
W. H. REYNOLDS.

Reform of the Health Service

SIR,—While anxious to support our representatives, we feel that it is wrong that the profession should resort to mass resignation from the Health Service over what is primarily a pay claim. However, we view with distress the Government's failure to honour its pledges and the fact that so far it has done nothing except set up a Royal Commission with terms of reference which only serve to narrow the issue further.

There is widespread dissatisfaction with some aspects of the terms and conditions of service in the National Health Service. It has been pointed out in your columns many times that other countries are reluctant to take the British Health Service as a model, and this must be added to the evidence of your correspondence columns that it is high time we set out to try to provide a better service than the present one. We believe the leaders and representatives of the profession have been slow to appreciate or give ex-

pression to this wider issue. None the less, we greatly welcome the news that the B.M.A. is to set up a committee of inquiry into the National Health Service as a whole. But we submit that the extreme measure of mass resignation from the Service should be kept for any dispute over such wider and more fundamental issues.

We suggest that a possible solution to the present impasse lies in offering to accept the interim increase in remuneration (promised by the Prime Minister) but in making its acceptance subject to the Government's agreement to widen the terms of reference of the Royal Commission and later to meet the profession and discuss any report produced by the committee of inquiry set up by the B.M.A.—We are, etc.,

E. OFFLEY EVANS.
ALEXANDER MURRAY.
Stratford-on-Avon.G. W. SYKES.
H. M. EMRYS-ROBERTS.

SIR,—Your leading article (*Journal*, March 23, p. 690) points out that, in the present dispute with the Government, the future of the medical profession in this country is at stake. It is a general belief that the doctors seek only an agreement on the basis of the two Spens Reports. If this claim is successful and allays all disquiet, your fears for the future of our profession should indeed be increased rather than diminished. Would it not be more statesman-like for the B.M.A. Council to attempt to analyse the present defects of the National Health Service and to enter into discussions with the Minister of Health with the principal object of effecting all-round improvements for both patient and doctor? A planned withdrawal from the Service—if it be necessary at all—would have far greater moral backing if it were obviously based on a desire to reform or even replace the present system, irrespective of whether or not there is an increase in doctors' pay.—I am, etc.,

Brecon.

F. W. NASH.

Private Practice Group

SIR,—Last summer a number of private practitioners, intent on preserving and extending the institution of private practice, met in London. They decided to make themselves the nucleus of what they hoped would become a substantial group, and deputed to an acting executive the task of encouraging its growth. All known private practitioners in Great Britain were approached; many responded with enthusiasm, and these now form, with the original nucleus, a Private Practice Group.

The group believes that on the continuance and prosperity of private practice must depend, to a great extent, the well-being of the profession and the quality of medical service rendered to the whole body of citizens, whether through private or public channels. It further believes that, unless those in private practice defend its interests and speak up for it, no one else will, and doctor and citizen may one day wake to find they have lost by default one of those precious "free institutions"—that of seeking and giving medical advice and help privately, without the participation of the State. The group's immediate aims are: (1) to press for the right of private patients to receive drugs on the same terms as National Health patients; (2) to consider again the possibility of "opting out"; (3) to press for more, and less costly, private beds; (4) to inquire into and, it is hoped, to promote insurance schemes to cover general medical attention. These aims are intended to supplement, but in no way to conflict with, those of the profession as a whole.

It is obvious that the group would not exist unless its members felt that private practice had become something of a Cinderella. It has no wish to be or become a "splinter group," and it is approaching the Organization Committee of the B.M.A. with a view to receiving recognition. Meantime the group desires to increase its membership from among those who believe and have an interest in private practice, although, as general practitioners or consultants, they work also in the National Health Service. May we therefore, through your columns, invite all members of the profession who share our interests and beliefs to join by

communicating with me? There is no subscription, but secretarial expenses have so far been met by donations of a half to one guinea by members.

The members of the acting executive are: L. W. Batten, acting president; I. J. Brock, acting treasurer; A. E. J. Etheridge, acting secretary; W. Russell.—I am, etc.,

JOHN ETHERIDGE,
Acting Secretary,
Private Practice Group.73, Fitzjohn's Avenue,
London, N.W.3.

Public Opinion

SIR,—In letter after letter to this *Journal* one reads about the necessity for enlisting public support and sympathy for our case. Why do we become so craven when we consider the public and their opinion? If you ask the vast majority what they think about the doctors' case with the Government they cannot tell you because they do not know. In my view the opinion of the public is useless unless informed, and it is usually uninformed. And the same goes for the press.—I am, etc.,

Lancaster.

FRANK S. RICKARDS.

Tripartite Administration

SIR,—One is glad to see (*Supplement*, April 13, p. 173) that Council of the B.M.A., while not wholly rejecting tripartite administration, insists that the views of the hospital medical staff shall be dominant in clinical matters and that there shall be no interference by lay administrators in clinical or nursing matters. The concept in the Bradbeer Report to which the A.R.M. took exception in 1955 was "equal tripartite administration" (my italics). This must either mean three men in a boat with nobody at the helm, or three boats. Neither of these seems to be a very suitable means of carrying a patient through his illness.

In insisting on clinical control must we not make quite clear our interpretation of the term "clinical"? Just as the good family doctor gives his patient advice on what to eat and drink, on clothing, warmth, and ventilation, on sleep, work, and play, and even perhaps on his interpersonal relationships, so must all these aspects of the patient's environment remain under medical control when he is admitted to hospital. We are apt to forget the origin of the word "clinical," but few of those nurtured in a less liberal discipline than ours will think of it in terms far removed from the bedside. Therein lies the danger.—I am, etc.,

Morpeth, Northumberland.

C. GUY MILLMAN.

To Which Others?

SIR,—Have you heard about a recent meeting between Ministry officials and the B.M.A., presided over by the Minister himself? It was worth attending, though many things about it puzzled me—for example, the agenda. The first item on it—the size of the pay claim—had been deleted, as had the second, too—namely, details about arbitration. It was explained to me in confidence that these two points had already been decided by someone, so there was no need to discuss them.

The Minister opened the meeting by explaining briefly that it would be worth considering, first, an entirely new item—namely, "whether doctors' salaries should not in fact be reduced." If they reached another deadlock the Treasury might see their way to reduce salaries by a minus quantity, thus satisfying everybody. He went on to say that if by any chance they did manage to reach agreement, he would undertake to appoint an arbitrator who would be asked to determine which side had finally given way. A Ministry official then opened the debate with a quotation from the Spens Report which, he said, they felt to be important: "We leave to others the problem of the necessary adjustment to present conditions. . . . Many successive Ministers, in this and previous governments, in accepting the Spens Report felt that sentence formed at once the bedrock and a springboard for their policy. In their opinion it also covered the present item on the agenda—namely, whether doctors' salaries should not in fact be reduced." He moved to apply

the Spens formula. The B.M.A. spokesman agreed in principle that doctors' salaries should not in fact be reduced and asked for a minus 24% decrease, suggesting this should in future be known as the "non-deterioration factor." The Ministry asked for time to consider the new proposal and moved the next business. The Minister expressed his pleasure at the broad measure of agreement they had reached so far, and announced that the promised arbitrator would be none other than the President of the Royal College himself. In the meantime a Royal Commission would be set up to answer one question and one question only: "To which others?" As he did not expect they would be any more able than he had been to answer that question, and to save them embarrassment, the names of the Commission would not be announced until after they had reported.

This appeared to be a suitable moment to serve tea and pause for reflection. The first reflection came from a trade unionist. He did not think it was fair of the press to go on applying the word "strike" to what the doctors were proposing to do. During a strike no shipbuilder or engineer went on building ships or engineering anything (except another strike) while refusing to take their wages. The doctors' action would be "black" and would bring this noble word into disrepute. And what about the Ministry? Had they made adequate plans to picket doctors' surgeries? The Ministry official said they had got until September 30 to look into the matter. The only ones he had looked into so far had all been full, with a queue down the road. The second reflection was of myself, saying to the trade unionist: "Let's take the politics out of medicine and give doctors and their patients time to convalesce from the recent nightmare." Only then did I realize that we were through the looking-glass.

I got up at once, filled in my offer of resignation, wrote to the L.M.C. agreeing to pay my share to the Guild funds, and then made a vow. I swore by Apollo the physician that if the Government in their wisdom ever pushed me as far as resigning from the present Health Service, which they still look like doing, then I for one would never withdraw my resignation until the agenda for some future meeting, after October 1, was lengthened to include not only the pay claim but "the whole field of publicly administered medical services."—I am, etc.,

Peaslake, Surrey.

G. I. WATSON.

Association Notices

COUNCIL OF THE B.M.A.

Election of 40 Members by Grouped Branches in the British Isles, of 2 Public Health Service Members, and of 1 Woman Member

The following have been elected unopposed for the session 1957-8:

East Yorkshire and Yorkshire Branches: W. E. Dornan, Sheffield.
Ian G. Innes, Hull.
J. A. L. Vaughan Jones, Leeds.
F. M. Rose, Preston.

North Lancashire and Westmorland Branch: D. R. Owen, Chester.

Divisions in Cheshire—Birkenhead and Wirral; Chester; Crewe; Hyde; Macclesfield and East Cheshire; Mid-Cheshire; Stockport; Wallasey: David Brown, Liverpool.

Lancashire Divisions of Merseyside Branch—Liverpool; St. Helens; Stockport; Warrington. Isle of Man Branch: E. A. Gerrard, Manchester.

Lancashire Divisions of South Lancashire and East Cheshire Branch—Ashton-under-Lyne; Bolton; Bury; Leigh; Manchester; Oldham; Rochdale; Salford; Wigan.

[Continued overleaf.]

Derbyshire, Leicester and Rutland, Lincolnshire, and Nottinghamshire Branches:
Midland Branch:

Staffordshire and Worcester and Hereford Branches:
Berks, Bucks and Oxford and Northamptonshire Branches:
Cambs and Hunts, Norfolk, and Suffolk Branches:
Marylebone Division:

Hampstead, St. Pancras, and Westminster and Holborn Divisions:

Chelsea and Fulham, Kensington and Hammersmith, and Paddington Divisions:

Camberwell, Greenwich and Deptford, Lambeth and Southwark, Lewisham, Wandsworth, and Woolwich Divisions:

Bedfordshire, Essex, and Hertfordshire Branches:

Surrey Branch:

Dorset and West Hants and Southern Branches:

Bath, Bristol, and Somerset, Gloucestershire, and Wiltshire Branches:

South-Western Branch:

North Wales and Shropshire and Mid-Wales Branches:

South Wales and Monmouthshire Branch:

Aberdeen, Dundee, Northern Counties of Scotland, and Perth Branches:

Edinburgh and South-East of Scotland and Fife Branches:

Glasgow and West of Scotland Branch (Glasgow Division):

Glasgow and West of Scotland (County Divisions), Border Counties, and Stirling Branches:

Northern Ireland Branch:

The following candidates have been nominated for the Groups in which there are contests:

North of England and Tees-side Branches (two seats):

Divisions of Metropolitan Counties Branch in Middlesex (two seats):

City, South-West Essex, Stratford, and Tower Hamlets Divisions (one seat):

Kent Branch (one seat):

No nomination has been received in respect of Group 21 (Sussex Branch) (one seat).

Voting papers will be issued to the members in these Groups on April 27, 1957.

Public Health Service

The following have been elected unopposed:
H. D. Chalke (London, N.W.4); J. B. Tilley (Newcastle upon Tyne).

Woman Member

Catherine Harrower (Glasgow) has been elected unopposed.

A. MACRAE,
Secretary.

J. Cottrell, Grimsby.
E. C. Dawson, Derby.

D. S. Pracy, Atherstone, Warwickshire.

A. V. Russell, Wolverhampton.

S. F. Logan Dahne, Caversham, Reading.

Alexander Brown, Linton, Cambs.

R. Hale-White, London, N.W.1.

J. L. McCallum, London, W.C.1.

H. H. D. Sutherland, London, W.10.

H. Alexander, London, S.W.18.

A. Staveley Gough, Watford.

L. A. Gibbons, Reigate.

J. O. M. Rees, Guildford.

R. G. Gibson, Winchester.

J. R. Nicholson-Lailey, Taunton.

W. Woolley, Bristol.

S. Noy Scott, Plympton, Devon.

Leslie W. Jones, Anglesey.

Sir Tudor Thomas, Cardiff.

Mary Esslemont, Aberdeen.

J. G. M. Hamilton, Edinburgh.

W. M. Knox, Glasgow.

N. Douglas, Hamilton.

Alexander Scott, Ayr.

N. S. Dickson, Templepatrick, Co. Antrim.

Ian Fraser, Belfast.

J. C. Arthur, Gateshead.

I. M. Jones, Sunderland.

J. W. Ridley, Middlesbrough.

W. Morgan Evans, Hounslow.

A. N. Mathias, London, N.W.2.

J. B. W. Rowe, Harrow.

D. G. Berry, London, E.9.

J. A. Moody, Ilford.

A. Barker, Whitstable.

R. P. Liston, Tunbridge Wells.

B.M.A. FILM COMPETITION, 1957

FINAL REMINDER

Intending competitors are reminded that the closing date for receipt of entry forms for the B.M.A. film competition is June 30, 1957. The last date for the receipt of films is September 30, 1957. Further details may be obtained from the Secretary, B.M.A. House, Tavistock Square, London, W.C.1.

A.R.M. MOTIONS REQUIRING TWO MONTHS' NOTICE

The following motion submitted for consideration by the Representative Body at its forthcoming meeting requires two months' notice under Standing Order 30 of the A.R.M., as it would involve a rescission of Association policy:

Motion by Dumfries and Galloway: That the shortened form of Insurance Examination be abolished.

A motion by Manchester on the subject of the appointment of regional medical secretaries to Association regional offices also requires two months' notice under Standing Order 8 of the A.R.M., as it would involve special expenditure. The motion was published in paragraph 198 of the Annual Report of Council (*Supplement*, April 13, p. 192).

A. MACRAE,
Secretary.

Diary of Central Meetings

MAY

8 Wed. Council, 10 a.m.
9 Thurs. G.M.S. Committee, 10.30 a.m.
9 Thurs. Trustees of the Dain Fund, 1 p.m.
9 Thurs. Dermatologists Group, 2 p.m.
10 Fri. Conference of Honorary Secretaries, 10.30 a.m.
10 Fri. Registrars Group Council, 2 p.m.

Branch and Division Meetings to be Held

BARNET DIVISION.—At Hendon Hall Hotel, Friday, May 10, 8.30 p.m., Barnet General Hospital Ball.

BROMLEY DIVISION.—At Royal Bell Hotel, Bromley, Wednesday, May 8, 8.30 p.m., annual general meeting.

CAMBERWELL DIVISION.—At King's College Hospital, Denmark Hill, S.E., Sunday, May 12, 10.30 a.m., clinical meeting. All medical practitioners in the area of the Division are invited.

EAST HERTS DIVISION.—At Hertford County Hospital, Friday, May 10, 8.30 p.m., annual general meeting.

EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, Herne Bay, Thursday, May 9, 7.30 p.m., dinner; 8.45 p.m., general meeting, followed by annual general meeting.

FOLKESTONE AND DOVER DIVISION.—At Esplanade Hotel, Folkestone, Friday, May 10, 8 p.m., meeting. B.M.A. Lecture by Dr. J. H. Cyriax: "Manipulative Medicine."

GUILDFORD DIVISION.—At Board Room, Royal Surrey County Hospital, Guildford, Thursday, May 9, 8.30 p.m., meeting. Lecture by Dr. G. W. Theobald: "Chronic Backache in a Woman."

HENDON DIVISION.—At Fellows' Restaurant, Royal Zoological Society, Regent's Park, N.W., Thursday, May 9, 7 for 7.30 p.m., annual dinner. Guests invited.

HUDDERSFIELD DIVISION.—At Huddersfield Royal Infirmary, Monday, May 6, 8.15 p.m., business meeting.

MONMOUTHSHIRE DIVISION.—At 20, Stow Hill, Newport, Monday, May 7, 8.30 p.m., annual general meeting.

NORTH MIDDLESEX DIVISION.—At House of Commons, Saturday, May 11, 7.30 for 8 p.m., dinner. (6.30 to 7.30 p.m., officially conducted tours of House of Commons and House of Lords.) Wives of members and guests are invited.

SOUTH-WEST WALES DIVISION.—At Ivy Bush Hotel, Carmarthen, Saturday, May 4, 8 p.m., annual meeting.

TUNBRIDGE WELLS DIVISION.—At Kent and Sussex Hospital, Tunbridge Wells, Monday, May 6, 8.30 p.m., 51st A.G.M.

WEMBLEY DIVISION.—At House of Commons, Saturday, May 11, 6.45 for 8 p.m., dinner to be held jointly with Willesden Division, for members and their ladies.

WEST MIDDLESEX DIVISION.—At Paul's Restaurant, New Broadway, Ealing, W., Thursday, May 9, 7.30 p.m., annual general meeting. 8.30 p.m., Divisional dinner.

WOOLWICH DIVISION.—At Woolwich Memorial Hospital, Shooters Hill, S.E., Tuesday, May 7, 8.30 p.m., meeting. B.M.A. Lecture by Dr. A. Talbot Rogers: "Current Affairs in Medical Politics." Members of Greenwich and Deptford, Lewisham, and Dartford Divisions are invited.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 11 1957

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British Medical Association

SPECIAL REPRESENTATIVE MEETING DECISION DEFERRED

A Special Meeting of the Representative Body of the British Medical Association, held at B.M.A. House on Wednesday, May 1, decided after a long discussion to accept a Council recommendation to defer a decision on withdrawal from the National Health Service and to defer a decision on giving evidence to the Royal Commission which is to inquire into doctors' and dentists' remuneration. Dr. I. D. GRANT was in the chair.

The Council's recommendation was:
(1) That in the opinion of this meeting circumstances have so changed that the position has altered since the Council issued its recommendation to the Representative Body not to give evidence to the Royal Commission; but, realizing that Divisions and the profession generally have not had an opportunity of considering the statements by the Chairman of the Royal Commission or the letter from the Minister of Health to the Chairman of Council, this Special Representative Meeting defers a decision on the question of giving evidence to the Royal Commission until the next meeting of the Representative Body; (2) that the decision on withdrawal of service be deferred.

An amendment to delete the first part of the recommendation, "that in the opinion of this meeting circumstances have so changed that the position has altered since the Council issued its recommendation to the Representative Body not to give evidence to the Royal Commission, but," was defeated by 199 votes to 163.

Other decisions taken by the meeting were: that the Council should institute an inquiry into the whole field of the medical services; that the meeting was dissatisfied with the N.H.S. and desired reform; and that the Council should reinvestigate the introduction of an independent British Medical Service. A motion that the Government should be urged, in association with the profession, to set up a committee to undertake a fundamental review of the N.H.S. was rejected.

Protest Against Press Reports

Dr. S. WAND, Chairman of Council, moved the Council's new recommendation, in place of the original recommendation, which stood on the agenda.

Before speaking to the motion, Dr. Wand made the following comments on press reports of earlier meetings:

"There was a meeting of local medical committees yesterday, which was private, and a private meeting of the General Medical Services Committee. It has been said in the press that I am now in favour of giving evidence to the Royal Commission and that I told the meeting in the morning that that was so. That was not true. I gave a factual statement to the meeting in the morning. I gave no personal opinions at that meeting.

"A later statement refers to a 'refusal to approve Dr. Wand's new plan.' I put up no plan. I have been at great pains as Chairman of Council to indicate no personal views, except to express views of Council, in all my statements and not to anticipate any views of Council or this Representative Body."

Pledges Broken

The original motion of the Council was:

That, in the opinion of the Representative Body, in present circumstances it is undesirable that the Association should co-operate in any way with the Royal Commission on the Remuneration of Doctors and Dentists; (2) that, if at a later date circumstances should so alter as to enable the Representative Body to reconsider its attitude to the Royal Commission, any decision to participate be conditional on the inclusion of all public health medical officers within the terms of reference of the Royal Commission.

Reviewing the history of the dispute, Dr. WAND said they all knew of past Government pledges that the Spens Report was the basis of general-practitioner remuneration. Spens, brought up to date in terms of money, was the basis of the general practitioner's contract with the Government, but this was not written into a legal contract; it was a moral contract.

There had been no negotiations on the recent pay claim and arbitration had been refused by the Government. The profession had been refused discussion on the merits of the claim and was still paid on 1951 values. It had been told that the economy of the country was in such a state that no claim for such a large sum of money could be considered. "The statements of the Chancellor of the Exchequer and the effects of the Budget have disproved that statement fully,"

he said. "The sum of £100 million was put into the pockets of those who wish to spend that money."

"The reply to our claim," Dr. Wand went on to say, "was a Royal Commission and two other acts of dictation—a 10% increase imposed on junior hospital staff and, ultimately, a 5% addition for the practitioner, made subject to distribution factors. For the general practitioner the junior rank benefit will have to come from practitioners with larger lists, so that the amount received by a man with a larger list will necessarily be less than 5%."

"The pledges given to us have been broken and an honourable profession has been treated with contempt. We have been driven by this thoroughly bad treatment into defensive action which has been distasteful to every one of us. That action has been justified by the causes which have led to it and by the results which have been obtained so far."

Recent Events

Outlining the recent history, Dr. Wand said that on April 4 there was a well-informed debate in the House of Lords. Following this debate he wrote a letter which appeared in *The Times* on April 8. He said in his letter that he was sure the Council would respond to an attitude of reasonableness on the part of the Government, and he asked that the Government should engage in discussions about the matters in dispute.

On April 12 the exchange of letters between Sir Russell Brain and the Prime Minister was published. The following day there appeared in the press the explanatory memorandum of the Chairman of the Royal Commission. This was almost without precedent. The Council and the General Medical Services Committee, who had been informed of Dr. Wand's letter, gave their approval for him to endeavour to engage in talks with the Chairman of the Royal Commission and the Minister of Health in order, if possible, to effect a peaceful solution of the dispute.

"Since then," Dr. Wand said, "I have had talks with the Minister of Health and talks with the Chairman of the Royal Commission, but these started only on April 16, when the Minister sent for Sir Russell Brain, Dr. Talbot Rogers, and myself. A well-informed press had told us not only the 'when' but also the 'how much' of the interim adjustment. I used that occasion to open discussions with the Minister in order to try to find some way of effecting a solution. I was invited by Sir Harry Pilkington to see him and took that opportunity, too. As a result, I obtained from him these two statements: that that part of the Royal Commission's task which consists of considering what should be the proper current levels of remuneration of doctors and dentists will include hearing statements from those professions as to the remuneration which they are now claiming—this being the first time that we had had a public statement that our claim was before the Commission—and that it is in the mind of the Chairman of the Commission that if it becomes unlikely that evidence can be obtained in time for a report to be published by Easter, 1958, he would so inform the Government and the other interested parties. That is important in indicating the speed with which the Commission intends to work. If the Chairman indicates that the Royal Commission will take longer than Easter of next year, it would obviously not be inappropriate for us to seek a further interim adjustment in the meanwhile."

"On April 25," Dr. Wand continued, "I asked to see the Minister, after the Easter holidays. As a result of seeing him, he sent a letter which was received the following day, and that letter is before you" (see *Supplement*, May 4, p. 237). "It includes an offer of consultation before the implementation of the Royal Commission's report, adding, 'such consultation could of course include any matters relevant to the report or the present dispute.' That was the first time there appeared any suggestion that the present dispute will at some stage be the subject of consultations with the Minister."

"I took up the validity of the terms of reference. Our legal adviser had in a legal document given an appraisal of

the Royal Commission situation. Technically, the terms of reference remain unaltered, and, in so far as they are inconsistent with them, prevail over the statements made. But in the Minister's letter he said, '... you can certainly regard the public statements which have been issued as having full validity.'

No Further without Fight

"I took up the position of the public health medical officers," Dr. Wand said, "but the Minister stated that they could not be included in the Commission's Report. He told me that the inclusion of public health medical officers from local authorities would not only complicate the matter but would also very considerably prolong the time the Royal Commission would take to report. We received the Minister's letter late last Friday night. It had not been until after April 17 that I had authority to take action."

"Certain things are clear. The Royal Commission will continue. The terms of reference will not be altered. The interim adjustment is fixed and is not negotiable. The Royal Commission will not act as an adjudicating body; that was made perfectly clear to me by its Chairman. Finally, I am quite sure that the Government will now go no further until the Royal Commission has reported unless we engage in a fight, which means withdrawal."

"This dispute has been going on for over a year, but it is only fair to remind you that in the Danckwerts struggle we took a good deal longer than that. We had a number of similar situations during the preliminary to that adjustment. We had the inquiry of Mr. Bevan and we had Mr. Marquand's offer of £2m., but that was not an interim adjustment."

It was clear to Dr. Wand that the withdrawal issue and the Royal Commission were intermingled in such a way that they could not be separated. The present issue was now simple—give evidence or withdraw. The third alternative was to do nothing at all, and he did not think that was in the minds of most of the profession.

Losses and Gains

"Let us look dispassionately at the situation and see what we have gained so far," Dr. Wand continued. "Our claim has not been met. Spens is in the melting-pot. We have the Royal Commission. Against that we can set certain gains which are not inconsiderable. They are not a major victory but they are not inconsiderable advantages. What in February was a completely impregnable door, a firm no. has been broken down to this extent: we have had a broadening of the terms of reference in a way which is probably unprecedented. We have the formula of the Chairman of the Royal Commission, in which the claim is now before the Commission. We have the time limits set by the Chairman of the Royal Commission. We have had 10% adjustment for junior hospital staff and 5% for the remainder—in all £4½m. We have had the Minister's letter in which the validity of the terms of reference as defined by the Chairman of the Royal Commission has been approved. We have been told that we shall have full consultation before the implementation of the findings of the Royal Commission, and we have had a promise of full consultation on the present dispute when the Royal Commission has reported."

"Yesterday the G.M.S. Committee by a very narrow majority passed a resolution which is a recommendation to give evidence. The very narrow majority indicated clearly the disquiet and suspicion in the profession. The Conference yesterday further indicated its disquiet and suspicion by the resolution it passed. The Consultants and Specialists Committee met yesterday and decided that in the changed circumstances it would give evidence."

"Bearing in mind the seriousness of the situation and the need for careful thought, the Council at its meeting this morning determined that it will defer its decision, and that the matter should be deferred for consideration by the whole profession so that it may have an ample opportunity of considering the new situation."

"But whatever decision you make," Dr. Wand concluded, "I remind you that the claim has not yet been met, that the Royal Commission will report in any case, and that whether we give evidence or not there may be changes of our status. Whatever your decision on the question of giving evidence, it does not mean that the struggle is necessarily over. The need for a closing of our ranks and unification is as strong as, even stronger than, ever, and with that the need to increase the financial resources at the disposal of the various defence funds."

Form of Words

Dr. J. A. GORSKY (Westminster) asked what Dr. Wand regarded as reasonable assurances and whether the Council wanted Spens to go into the melting-pot. Dr. WAND replied that he regarded the fact that we came into the Service on Spens as paramount.

Speaking to the amendment to delete the opening words of the Council's recommendation, Dr. B. BURNS (Sheffield) suggested that the recommendation had been worded to get a certain answer. The central issue which the meeting and the profession had to decide was whether conditions had changed since the Council made its original recommendation. In fact, in the letter from the Minister all they had been given was a form of words, just as they had been given a form of words at the crucial moment in 1948. "You swallowed these forms of words whole," he said, "and you were delivered into a paradise where you are the door-mats of the Welfare State. The only criterion to test whether the recent correspondence has any value is, is it enforceable in the courts?"

"The Government had the Spens and Danckwerts Reports in print and the Negotiating Committee's memorandum on the legal aspects of the contract in print. What concession had the profession gained in the information that the Royal Commission would consider these Reports?" asked Dr. BURNS. "Of course it would. What else would it have consulted—a guide to the turf? These 'concessions' were not concessions at all, but phases in a carefully planned process of brain-washing. These promises were the type which had been the daily stock-in-trade of politicians since the technique had first been devised by Machiavelli."

"The purpose of our amendment is to stave off the evil day when the profession will be sold down the river," Dr. BURNS said. "If we give evidence to the Royal Commission, it can be only evidence it already has, and we shall then have discussed an alternative to Spens. Afterwards we will be told that we have abandoned Spens because we have discussed what is to replace it."

Dr. C. M. SCOTT (Barnet), referring to Dr. Burns's reference to a door-mat, said all the Royal Commission had done was add a foot-scraper. All the meeting should do was pass the question back to Divisions, without the opening lines of the recommendation.

Dr. C. P. WALLACE (Guildford) supported the amendment because he felt that the circumstances had not changed. The profession had no alternative employment short of emigration, and if they were denied arbitration they were on the path to serfdom.

Dr. O. C. CARTER (Bournemouth) said history was repeating itself. In 1948 the rout had been led by the then president of the Royal College. This time the Royal College had started a feeling of doubt on the wisdom of withholding evidence from the Royal Commission. He did not think the circumstances between the profession and the Government had changed in the slightest, but there had been a very serious change in the minds of some members of Council. The Divisions must be given an opportunity to reconsider the position, but he feared that they were substituting one phased withdrawal for another; they were preparing not for withdrawal from their resistance to Government dictation, but for withdrawal from the N.H.S. but for a phased withdrawal from their resistance to Government dictation. "If we give in now," Dr. Carter said, "I do not think we shall be able to form any sort of resistance to unilateral action by the Government in connexion with the practice of medicine or any of the features of the profession which we held dear. Of all the evils, the amendment is the least."

Dr. W. N. LEAK (Mid-Cheshire) agreed that the position had not changed. The Government had thrown over a fundamental agreement it had reached with the profession. The profession must have an assurance from the Government on its good faith in agreements entered into voluntarily. After having obtained such an assurance, perhaps the profession could give evidence to the Royal Commission.

He suggested that there were many alternatives other than those mentioned by Dr. Wand. Could they not go to law over the agreement? It had been suggested, too, that the profession should refuse to pay income tax. Why not petition Parliament?

At this stage in the discussion, an attempt was made from the hall to put the amendment to the vote, but the CHAIRMAN felt that there should be a longer discussion before any decision was reached. The meeting thereupon adjourned until the afternoon.

No Arbitration

The discussion on the amendment to the Council's recommendation continued after lunch. Dr. WAND, answering a question from Dr. W. A. HYSLOP (Leeds), said: "I am quite convinced that there will be no arbitration unless the profession is prepared to withdraw its services."

Dr. J. C. ARTHUR (Gateshead) thought that what change there had been in the situation was material. Though superhuman intelligence and Machiavellian cunning had been ascribed to the Government they were, in fact, just ordinary people trying to do their job. The chief strength of representatives was the wholehearted support of the Divisions. Passing the amendment would prevent them applying that strength at the right moment, which would be when the Royal Commission had reported.

Mr. J. R. NICHOLSON LAILEY (Council) suggested that the granting of the "much-maligned 5%" meant that the Government had admitted liability. That had been handed out without negotiation and was a most important aspect.

Dr. J. A. GORSKY (Westminster and Holborn) declared that, constitutionally, neither the Government nor any Minister—not even the Prime Minister—could bind a successor, and until the Government recognized that there was a legal, binding obligation which they had to honour no purpose was served in giving evidence before the Royal Commission. To give evidence would be to prejudice the Association's interests.

Dr. J. BAIRD FORRESTER (Glasgow) suggested that the most important thing was to present a solid front, and as the Consultants and Specialists Committee had decided to give evidence it was only right that the Divisions should reconsider the position, and a decision deferred for the time being.

Calls for a vote to be taken were becoming more persistent, until Dr. H. GUY DAIN (Council) appealed for support for the Council's recommendation. In his view there was little difference between the Commission's report and an arbitration decision, except that the Commission's report would not be binding. The Association would have an effective opportunity to state a case to the Commission. They had been quite determined to withdraw their services if refused arbitration, but the setting up of the Royal Commission went some way towards that objective, and to continue in the suggested course of withdrawal would not get the necessary support.

Dr. WAND said that to take Dr. Gorsky's constitutional point to its logical conclusion would mean that no body such as theirs could ever enter into any kind of a contract with any Government. The second paragraph of the Minister's letter had been severely criticized, but if, as had been alleged, the words were meaningless, then he himself was largely to blame. To say the situation had not changed was not true. The present terms of reference were "fantastically different from the original terms." Further, for the first time, they had the promise not of discussion but of full consultation before implementation of any part of the Commission's report. The wording of the Council's recommendation "is factual, accurate, and proper."

Suggesting that the meeting should pass to the next business—the second part of the Council's recommendation—Dr. WAND confessed to some confusion. First of all, they did not yet know what they were to have to do with the Royal Commission; secondly, they did not know what that Commission would find. Part of the terms of reference included the words "current levels," and they did not know where the "current" would start. Even if the Ministry took up the Royal Commission's finding, the profession did not know

Dr. D. H. ANDERSON (Sheffield), remarking that the stronger their financial position the better, suggested that

Dr. H. H. D. SUTHERLAND (Kensington and Hammer-smith) said he would welcome such a Government-appointed committee as a way to obtain amendments to the Act. Whenever he had spoken to a Minister of Health on the subject he had been told that there would not be Parliamentary time to amend the National Health Service Act for two or three years. This committee was a way to overcome that difficulty.

Dr. WAND, however, urged that the meeting should reject the motion. They had already agreed that the Council should set up a committee of inquiry. "If we do this in association with the Government it becomes one more Governmental committee," he said, "and the Government have already had committees looking into the question. The whole purpose of our earlier motion is that the investigation should primarily be in our hands. It would not be impossible to consider whether the Government should be invited to send observers to our own committee." He said the question of implementing any recommendations would be just as difficult whether the Government set up the committee or whether the profession set it up.

Dr. E. C. WARNER (Marylebone) moved an amendment to the Edinburgh motion making it read "the profession in association with the Government," rather than the other way round, and leaving the initiative in the hands of the profession, and Dr. R. HALE-WHITE (Marylebone) agreed that the motion, without amendment, might suggest that this would be another Government-sponsored committee when, in fact, it was important that the profession should be the controlling influence; but Dr. J. S. NOBLE (Morpeth) recommended the meeting to reject the motion entirely and leave the inquiry to the Council.

Dr. HAMILTON, in reply, said the purpose of the Edinburgh motion was that the Association should stimulate the Government into establishing another Government committee. More people were involved in the N.H.S. than the doctors, and if a fundamental examination of the Service were to be conducted it was vital that at least in part it should be conducted by the consumers who paid for it. One of the most important blocks of opinion submitted to such a committee would be the medical opinion, but that would not be the only opinion.

Dr. C. P. WALLACE (Guildford) suggested that what was important at this juncture was that they should approach the Government in order to get their co-operation in a united committee for the revision of the N.H.S. If the Government co-operated, that would be a step towards implementing any recommendations made.

Dr. W. WOOLLEY (Bristol) urged that both the Edinburgh motion and the amendment should be withdrawn and re-introduced later. The meeting had already agreed that the Council should set up a committee to investigate the services. Until it had reported, what was the purpose of having a joint committee with the Government? Dr. H. D. CHALKE (London) drew attention to a fundamental difference between the committee to be set up by the Council and that proposed by Edinburgh. "The latter deals purely with the N.H.S. and leaves out a large number of members of the public health services," he said. "Are you going to restrict the inquiry to a section of the B.M.A.? There have already been enough attempts to split the profession."

Both the amendment and the Edinburgh motion were defeated.

Dr. R. P. LISTON moved a motion on behalf of Tunbridge Wells instructing the Council to reinvestigate the introduction of an independent British Medical Service, and this was considered with a number of other motions urging that the Association should consider the formulation of an alternative scheme to the N.H.S. Barnsley asked that it should be managed by an independent authority and not directly by Parliament, and Gateshead asked that it should be administered by the doctors themselves.

Dr. LISTON said that in the recent crisis doctors had been asked to withdraw from the N.H.S. into a vacuum. Many practitioners would readily have withdrawn into an alternative scheme, had one existed which met their requirements.

"Within the N.H.S. there is no safeguard against a Government disposed to act either against the patient or the profession," he said. "By the imposition of prescription charges and other charges and by the repudiation of Spens the Government has shown that it can act against both. The controlling factor in the Service is now, and will be in the future, economic. It is in the interests of both the profession and the patient that an alternative service be provided." He added that there would probably be a year's delay in providing an alternative service, but its provision would safeguard the doctors against these recurrent crises.

Mr. G. P. CLELAND (Ayrshire) said there was no safeguard for doctors improving their ancient traditions or even maintaining them if they were tied to the strings of politics. At present, doctors were discouraging their sons from entering the profession. Mr. R. H. J. M. CORBET (Preston) said they wanted an independent body which would guarantee them some continuity of service. There must be an end to broken promises.

Dr. J. C. ARTHUR (Gateshead) said it had been realized that the staged withdrawal scheme was not fully satisfactory, but nothing more could have been done. Gateshead had a long experience of very successful public medical services and they felt that it might be possible to formulate a scheme on the lines of the old public medical services. If doctors left the N.H.S. permanently they would then have another scheme to fall back on. Some members had put forward figures suggesting that such a scheme was financially possible; the provision of lay staff would be a difficulty but it should not be insuperable.

After Dr. H. W. DONOVAN (Birmingham) had suggested that the motion should be passed as a reference to Council, and after Croydon asked to be associated with it, the motion to reinvestigate the introduction of an independent British Medical Service was approved as a reference to Council.

This concluded the business of the meeting. A vote of thanks to the Chairman, moved by Dr. W. N. LEAK, was carried with acclamation.

PROCEEDINGS OF COUNCIL

OPINION DIVIDED

A division of opinion was apparent at a meeting of Council held at 9 a.m. on May 1, an hour before the Special Representative Meeting was due to begin. As a result, the Special Meeting was deferred until 10.30.

The meeting was mainly occupied with the efforts of the Chairman (Dr. S. WAND) to persuade Council to give him guidance on what he should say to the Representative Body: he could make a factual statement only, or he could say that the Council felt that evidence should not be given to the Royal Commission, or he could say that circumstances had so changed that the Council felt that evidence should be given, subject to consultation with the profession. Which statement should he make?

Dr. A. V. RUSSELL, after congratulating the Chairman on his personal efforts in the dispute, which had been largely responsible for the progress made, urged that there should be consultation with the periphery before a decision was taken, and Dr. H. H. D. SUTHERLAND emphasized the difference between giving evidence to the Commission and co-operating with it. Dr. F. GRAY said unless they were careful the Representative Body would find Council standing on its head: Council must not make a hurried decision reversing its recommendation which at present stood on the Agenda for the Special Representative Meeting.

Dr. J. B. TILLEY reminded the Council that it had previously decided not to give evidence unless the public health medical officers were included in the terms of reference. If it were to be decided that they could not now afford to

refuse to give evidence, he asked that the Public Health Committee should have an opportunity of reconsidering the matter.

Dr. I. D. GRANT, Chairman of the Representative Body, urged the Council not to take a snap decision. "This is a very important matter and we cannot come to decisions which affect the whole profession in a rushed and hasty meeting like this," he said.

Dr. GRAY then moved the second half of the Council's recommendation, which ultimately appeared before the Special Meeting, and Dr. H. GUY DAIN moved an amendment adding the opening words, "That in the opinion of this meeting circumstances have so changed that the position has altered since the Council issued its recommendation to the Representative Body not to give evidence to the Royal Commission, but . . ." Dr. GRAY disagreed with the amendment, which he thought was expressing an opinion that circumstances had changed; and Dr. DAIN said he thought circumstances had changed sufficiently for them to ask the profession to look at the question again. Dr. I. M. JONES thought that on the single issue of the public health medical officers they should decline to give evidence unless those doctors were included in the Commission's terms of reference. Other members thought that to introduce the question of public health members, in view of the Government's attitude, would cause deadlock.

Dr. DAIN's amendment was carried by 34 votes to 27. The CHAIRMAN again raised the question of the advice which he should give to the Special Representative Meeting, and several members emphasized that they had not had time to decide whether to give evidence to the Commission. Dr. GRAY said that was the one subject they had not discussed. Dr. RUSSELL moved and Dr. I. M. JONES seconded a motion that at the moment the Council were not prepared to give an opinion on the giving of evidence to the Royal Commission; and the Council was equally divided, 31 votes to 31. The CHAIRMAN said that in the circumstances he would give a purely factual statement to the Representative Body.

Dr. DAIN's amendment was carried as a substantive motion, as was a motion to defer a decision on the question of withdrawal from the National Health Service.

SECOND COUNCIL MEETING

At a meeting of the Council which followed the Special Representative Meeting on May 1, Dr. WAND (in the Chair), asked for and was given authority to pursue Dr. Gorsky's suggestion by seeking the advice of counsel relative to applying for a declaratory judgment on the contractual validity of Spens. Dr. WAND thought that it might be desirable to take the opinion of more than one counsel, and that Dr. Gorsky's assistance should also be enlisted.

On the suggestion of the SECRETARY, it was agreed that a factual statement on the present position be prepared for publication in the *Supplement* and submission to the Representative Body.

It was agreed that the Special Representative Meeting to take the deferred decision on withdrawal from the Service should take place on June 12.

On the motion of Dr. F. GRAY it was agreed that divisional secretaries should be asked to co-operate with the secretaries of local medical committees in the calling of meetings in the divisions.

ROYAL COMMISSION MEETS IN EDINBURGH

The Royal Commission on Doctors' and Dentists' Remuneration has announced that it held a special meeting in Edinburgh on May 2 for preliminary discussions with the Joint Consultants Committee (Scotland) and the Institute of Chartered Accountants in Scotland. This meeting was the eighth held so far by the Royal Commission.

SPECIAL CONFERENCE OF LOCAL MEDICAL COMMITTEES

PROPOSAL FOR WITHDRAWAL DEFERRED

A report of the earlier proceedings of the Special Conference of Local Medical Committees held on April 30 appeared in last week's *Supplement* (p. 237). The Conference continued its debate until 6 p.m., with Dr. A. BEAUCHAMP (Birmingham) in the chair.

Securing Arbitration

Moving a request from Bath that the Government should be again approached with a request for agreed arbitration machinery, such arbitration to follow the request of either side, Dr. A. SUTHERLAND said that the alternative to permanent arbitration machinery was crisis after crisis. It was surely the job of a profession such as medicine to find an intelligent way of settling disputes. They could not be entirely happy about their own reactions to the unfair treatment meted out to them. The breathing space until June should be used by the Arbitration Committee to go again fully into the whole question, as a matter of urgency. Dr. A. V. RUSSELL (Wolverhampton) agreed that it was quite intolerable that there should be disputes of this kind every few years.

After Dr. A. B. DAVIES had pointed out that they had been trying to secure arbitration from the Government for 12 months, the Conference passed the amendment from Bath.

Withdrawal from Service

Dr. F. J. ROBERTSON (Newcastle upon Tyne) moved that withdrawal from the Service should be for the purpose of securing settlement of the pay claim, a legal contract for the future, and the right, by either side, to apply for arbitration. After nearly nine years it was becoming increasingly apparent, he said, that the medical profession had been the victim of the greatest confidence trick of all time.

Dr. DAVIES replied: "We do not wish to restrict ourselves to a 'sole' purpose, even though the 'sole' is in three parts." A motion to pass to the next business was agreed to.

Edinburgh asked that the withdrawal from the Service should be total and not phased. Dr. E. V. KUENSSBERG, moving the amendment, urged the sharp blow of a complete withdrawal and not a phased withdrawal, which might well turn out to be painless except to the doctors. Dr. J. C. ARTHUR (Gateshead) said his area felt that the impact of a total withdrawal would be so much more effective and that greater solidarity of the profession would be secured, and Dr. R. A. PEACOCK (Lanarkshire) agreed that phased withdrawal would be of no benefit at all to the medical profession. Dr. R. W. RAE (Staffordshire) said that it was up to the Committee to advise on the best method. Why should the Conference tie their hands?

Dr. C. W. MARSHALL (Devon and Exeter) reported that the South-West had not been able to muster a vote in favour of withdrawal, because the doctors there did not think that the public was behind them and therefore they felt that it was doomed to failure from the start. Also they could not see how any of these schemes could work without clinical detriment to the patients. Dr. A. V. RUSSELL said that no one intended that patients should suffer any clinical hardship. The doctors were saying that the Government had been a bad employer and after six months they would terminate their employment with this employer.

Dr. I. D. GRANT was of the opinion that phased withdrawal was appeasement. If one went into battle, people would be hurt. He would like there to be total withdrawal. Dr. C. W. WARNER (Liverpool) announced that Liverpool had decided to support phased withdrawal, although they recognized that the threat of complete withdrawal was the finest that could be used. But they did not like using a threat unless they were prepared to carry it out. One-third of general practitioners had known no other form of practice than that of the National Health Service; to secure their

support would be very difficult. The General Medical Services Committee's plan was the only practical one.

Dr. DAVIES pointed out that it was necessary to give three months' notice before leaving the Service. No one doubted that the threat of complete resignation would be the most effective weapon—"but can we do it?" asked Dr. Davies. "Have you the money to make it practical?" The Committee had been asked to draw up some scheme which would be practical and financially possible and had decided that a phased withdrawal was the best thing that could be offered. Complete financial security could be given in the areas where the phased withdrawal took place. The Committee could not give this cover for a complete withdrawal.

Dr. G. N. GROSE (Middlesex) supported the General Medical Services Committee.

The mover accepted an amendment from Gateshead to add the words "provided that an adequate number of doctors express their willingness to resign" to his proposal for a complete withdrawal. The amended proposition was lost.

Buckinghamshire asked that in the event of progressive withdrawal no practitioner should be asked to resign unless 80% of resignations had been collected from his area. Dr. P. J. DELAHUNTY explained that his committee felt that, unless this undertaking was given, a number of doctors would refuse to send in their resignation. It was also felt that to have less than 80% would be fatal.

The amendment from Buckinghamshire was carried.

Withdrawing from Obstetric List

Dr. I. M. DOVE (Blackpool) said that his committee felt that in a fight there should be no blunting of weapons. His amendment called for withdrawal from the obstetric list at the same time as withdrawal from the medical list.

Dr. DAVIES hoped the Conference would not accept this. Publicity had been given to the fact that the doctors would look after all pregnant women; whatever else happened, these women should have a full general-practitioner service. Further, if general practitioners refused, the expectant mothers would filter away into other services. "If you have any ambitions as to the future part which the general practitioner will play in midwifery, you will reject this," Dr. Davies concluded.

Dr. TALBOT ROGERS pointed out that doctors had contracted with a number of expectant mothers. Considerable needless anxiety would be caused to them. The Cranbrook Committee might suggest all sorts of changes in the arrangements for midwifery—general practitioners ought to retain their present position.

The amendment was lost.

The Conference then carried as a substantive motion that part of the General Medical Services Committee's recommendation which proposed that a decision on withdrawal from the Service should be postponed.

Interim Adjustment

Dr. DAVIES put forward the Committee's recommendation that the Government be informed that it was the wish of the Conference that the 5% net increase to the aggregate net remuneration of general practitioners arbitrarily decided upon by the Government should be placed in a suspense account.

An amendment by Sheffield asked that

in view of the arbitrary manner in which the 5% increase has been imposed without prior consultation or agreement with the profession, its existence should be ignored, and no representations concerning its disposal should be made to the Minister.

The amendment was moved by Dr. W. DONNELLY.

Dr. TALBOT ROGERS wondered how long the money could be kept in a suspense account with safety for the doctors. He thought it could not stay beyond the end of the financial year.

Dr. DAVIES suggested that the matter should be referred to the General Medical Services Committee for discussion.

Dr. B. BURNS (General Medical Services Committee) said that the purpose of the Government in the present dispute was to prevent unity of the profession—and it had succeeded very well, ably assisted by the Conference. The Spens recommendations were in full retreat, with the malodorous breath of the party politician on their neck, joined by that of the Conference. The Government, having divided the profession horizontally, were now dividing the general practitioners vertically. "We shall behave like cats in a sack, which is what the Government wants," said Dr. Burns. "Do not fall out at this juncture over money. We have been treated contemptuously by our employers. This pittance must be rejected."

Sheffield's amendment was lost. A further amendment by London to reject the 5% increase was also defeated.

Dr. J. G. L. HARTLEY (Lincoln) said that if this despicable offer was accepted, equally well a cut in salary could be accepted without negotiation. The whole thing should be turned down out of hand. Dr. J. LAWRENCE HENRY (Plymouth) said that it was not possible to refuse to take the 5% and still maintain that doctors were hard up. The money must be taken, and it must be specified that it was only a payment on account. Dr. F. G. TOMLINS (General Medical Services Committee and Young Practitioners Subcommittee) said that the increase should be refused as a matter of principle and not accepted because doctors were badly off. For the young practitioner it was 5% of virtually nothing.

Dr. A. M. MAIDEN (Lindsey) said that at a meeting attended by 67 out of a possible 100 in his area it was agreed that an increase without negotiation should be refused. He would refuse 10% or 15% if it was given without negotiation.

Dr. F. E. GOULD (General Medical Services Committee) said that to reject the money would be to break faith with those who needed it. The recommendation for payment into a suspense account should be accepted. Dr. A. BROWN (General Medical Services Committee) warned that if the question of a suspense account was put forward, there was a risk that general practitioners would not receive their money on the first day of the quarter.

The meeting carried an amendment from Berkshire to the Committee's recommendation, and agreed that the interim offer of 5% should be accepted without prejudice.

Failure to Honour Agreement

Dr. A. J. JOHNSON (Norfolk) thought that the Conference should put on record the feeling with regard to the way the Government had behaved. He moved:

That this Conference deplores the failure of the Government to honour its agreement with the profession in that it has repudiated the Spens Report for general practitioners without the usual consultations and refused arbitration which was promised to the profession.

This was passed unanimously. The Conference also adopted the following resolution from Middlesex:

That so long as Her Majesty's Government refuses to negotiate upon the reasoned claim for an adjustment in remuneration and, in the event of failure to reach agreement, to submit the unresolved dispute to an agreed form of arbitration, the general practitioners of the National Health Service can have no confidence in the Government as their employers.

This, said Dr. R. B. L. RIDGE, conveyed in simple terms the effect which the Conference felt that the Government's behaviour had had on the profession's confidence in it as employer.

Voluntary Levy

A motion from the City of Worcester asked the B.M.A. to arrange for specialists to contribute to the voluntary levy in a similar proportion to that asked from general practitioners. Dr. A. B. MILLIGAN explained that at the meeting where this motion had been passed over 40% of those present were specialists. The motion was carried.

Dr. C. D. MEADOWCROFT (Middlesex) said that all knew that it was the general practitioners who were fighting this battle and if it came to withdrawal they would be the ones

implicated. He felt that as the specialists and other sections of the profession would ultimately benefit from the general practitioners' fight, it was only fair that they should be asked to contribute to the fighting fund.

The Conference agreed to a Middlesex motion that all doctors be asked to contribute to the levy.

Dr. DAVIES hoped local medical committees would continue to contribute to the defence fund. He gave an assurance that any money from whatever source which was not used would be returned *pro rata* to the contribution. The better they were prepared financially, the stronger would be their position.

Dr. G. O. S. REID (Kent and Canterbury) said that 5% was a considerable amount for the young practitioner to contribute. It would be advantageous if this amount could be reduced. He felt that that would mean a bigger response. Dr. M. MUNDY (Middlesex) suggested a quota of 1d. for the doctor with a list of up to 1,000, 2d. for a list of 1,000 to 2,000, and 3d. for 2,000 and over. Dr. G. F. PETTY (Cardiff) reported that the clerk of his executive council refused to collect the levy. Dr. DAVIES pointed out that the clerk was the servant of the council. The medical members could easily obtain a majority to carry a resolution instructing him.

Dr. WAND suggested that in view of the decision of the Conference to defer the question of giving evidence and therefore by implication that of withdrawal, the Conference should defer a decision on the amount of the levy, or better still refer to the General Medical Services Committee the matter of how to increase the sums available in the trust funds. That would give the Committee an opportunity to make a recommendation in June, according to what was then decided. If it was decided to give evidence, it would be necessary to decide whether to have a levy over the next 12 months smaller than the 3d. but substantial. If it was decided to withdraw from the Service, a levy would be needed immediately.

Patients of Practitioners who Resign

Glasgow asked for an expression of opinion on a motion that

arrangements should be made through the machinery of the Guild for all medical practitioners (including assistants) to sign a covenant whereby, if they themselves were not prepared to resign or were not asked to resign, they would undertake not to accept, under the National Health Service, patients of practitioners who had resigned.

Dr. W. W. FULTON, in moving the resolution, felt that there should be a covenant; he felt it would encourage people to resign. Dr. DAVIES said that nothing must be done which impaired the patients' freedom of choice. Subject to that, the General Medical Services Committee accepted the proposal.

Dr. MUNDY said that those who refused to resign said that they did so as a matter of principle. This was one way of testing their principles. If they signed they would be shown gentlemen of principle. If they did not they would be shown up for what they were. Dr. J. M. B. DONALDSON (Belfast) agreed that this would give protection to those who resigned.

Glasgow's motion and others in similar terms were referred to the General Medical Services Committee.

Position of Assistants

Two motions from Birkenhead were carried. The first provided that, in the event of area resignation, payments to principals employing assistants should be at the full rate of the previous quarter only in consideration of their continuing to employ an assistant at the scale of remuneration previously paid. The second urged the profession to use moral suasion to the utmost to ensure that the position of assistants be protected in regard to enjoying a share of any benefits obtained in the present dispute.

Dr. E. G. WATSON said that he put the latter forward at the request of the co-opted assistant member on his committee, who said that there could be a problem in certain areas of the country. Dr. TOMLINS commended the motion.

Dr. P. B. BAILEY (representative of assistants on the General Medical Services Committee) stressed the need to do the right thing by the assistants, and urged the meeting to decide the matter rather than refer it to the Committee.

Obstructive Action

London asked for the organization of obstructive action in relation to the administration of the Health Service upon a progressive scale. Dr. M. SORSBY, speaking to the motion, thought that if there was to be phased withdrawal the rest of the country must do something as well. In areas where practice in the N.H.S. still continued, doctors should adopt measures which would damage the administrative machine. They should refuse to answer letters from regional medical officers or to attend committees. If necessary the medical members of the Medical Practice Committee should be asked to cease work. The administrative machinery could be damaged in this way and the Government would have to capitulate.

Dr. ARTHUR said in some ways this was almost suicidal. Nine was a quorum of an executive council. If the Medical members did not attend the others could appoint a medical man to come into the area. "We must retain as much administrative power as we can," said Dr. Arthur.

The motion was lost.

Dr. A. F. DUNN CARRIE (Manchester) moved, and the Conference agreed, that in the event of withdrawal the position of nominees of local medical committees serving on executive councils, allocation committees, and medical service committees should be clarified and clear instruction issued to ensure uniformity of action on a national basis. Dr. Carrie explained that it would strengthen the power of all members of executive councils.

Legal Action

Dr. MUNDY moved that the Conference instruct the General Medical Services Committee to institute legal proceedings to test the validity of the Minister's view that there was no contractual obligation between the Ministry and the medical profession. There would be little to lose and everything to gain by going to law, he said. "What we want to do is to inflict on the Minister a form of arbitration whether he likes it or not," explained Dr. Mundy, "and the way to do that is to go to law. It will regain us the initiative; it will give us a magnificent form of publicity."

Dr. H. GUY DAIN said: "We may want a decision binding on the Government, but that is not the way to get it. The idea of instructing the General Medical Services Committee to take legal action, whether your legal advisers think there is any chance of winning or not, seems to me sheer madness. If we had been advised that we were likely to gain anything, we would have taken it long ago." A Minister's letter could only be held as binding as long as that Minister was in power. It had to be realized that there was no continuity of influence.

On a count, the only one of the day, the motion was lost. 58 voted in favour and 73 against.

New Health Service Schemes

Walsall proposed a motion expressing the opinion that the only course open to practitioners was a complete withdrawal from the Service, whether or not the claim was conceded, and calling on the General Medical Services Committee to draw up plans for a self-financing service which would embody those principles which maintained the high standards of the profession. Dr. J. M. LEES (Walsall), proposing the motion, said it seemed to him that the Conference was a repetition of 1948. At a meeting in his area, attended by 90 practitioners out of a possible 120, it was felt the time had come when the profession must get out of the control of politicians. Doctors had lost their prestige. They were dictated to by politicians from the Prime Minister to every councillor on the executive council. Patients were not getting good treatment because the doctors were too hurried. If the

health scheme was a success, why had no other country copied it? Were doctors putting their own children into the profession? Ask the teachers at universities what they thought of the quality of the present recruits to the profession. Walsall was not asking for an immediate withdrawal, but that the Committee should plan for a withdrawal. They hoped the Committee would produce something better than the present service.

Dr. RUSSELL said this was not a thing perhaps for the immediate future, but it was certainly a good thing to have clear-cut ideas in their own minds of an alternative service in which they would like to work.

The motion was passed as a reference to the Committee, as was one from Birmingham asking for a plan for general medical services to be provided outside politics and the National Health Service.

Croydon asked the Conference to instruct the Committee to confer with Council on the advisability of setting up a corporation or similar body, composed of men of the highest reputation in all walks of life without political affiliation, to prepare and administer a complete health service so that it might be offered as an alternative to the National Health Service. Such a body, said Dr. J. NEWTON HUDSON, should not be composed of members of the profession. A body as suggested would be capable of formulating and administering a scheme which would be suitable to the doctor's way of thinking.

Dr. WAND said that the Council had recommended the setting up of a committee to look into the National Health Service in all its aspects and it had indicated that it wished to have the help of lay people as well as medical. This motion told a committee not yet set up not only how to go about its business but also what its findings should be. He thought there was no option but to turn it down in its present form and suggested a reference to the Committee. This was agreed.

Distribution of New Moneys

Dr. DONALDSON moved that any new moneys made available to general practitioners should be distributed in such a manner that the less favourably placed practitioners and assistants obtained a greater proportionate increase. The motion was referred to the General Medical Services Committee.

The Conference passed with acclamation a vote of thanks to its chairman, which was proposed by Dr. TALBOT ROGERS.

GENERAL MEDICAL SERVICES COMMITTEE

REPORT TO LOCAL MEDICAL COMMITTEES

The following report has been sent to local medical committees by the chairman of the General Medical Services Committee, Dr. A. B. DAVIES, for consideration before the Annual Conference of Local Medical Committees to be held on June 6.

THE REMUNERATION DISPUTE

As local medical committees will be aware, the General Medical Services Committee, following its meetings on April 17 and 18, issued a supplementary report setting out a number of developments in the remuneration dispute which had taken place since its report to the Special Conference was published on March 21.

Set out below is a summary of the events which have taken place since that report was issued.

Legal Opinion

The following opinion by Counsel on the public statement issued by the Royal Commission was received on April 25:

(1) I have been asked to advise as a matter of urgency on the public statement made by the Commission as to the manner in

which they intend to proceed, and in particular to consider this statement in relation to the Commission's original terms of reference.

(2) The comments which I shall have to make must inevitably suffer from the fact that the technical considerations which appeal to a lawyer are only one factor, and by no means the most important factor, in deciding the issues of policy which now lie before the medical profession. It is easy, as I hope I shall show, to find fault with the Royal Commission's statement, both in itself and in relation to the original terms of reference. But these faults are to some extent a by-product of the manner in which the Royal Commission was brought into being. If the Royal Commission's statement now represents a genuine attempt, inspired and backed by the Government, to secure that the work of the Commission develops into an impartial and comprehensive inquiry into the future basis of doctors' remuneration, there may be the strongest reasons of policy for advising the profession to co-operate with the Commission and make its work a success. The alternative is for the profession to decline co-operation with the Commission and insist on their rights under the Spens Reports and the promises made by the Government in 1948. It is obvious that this alternative means continuing deadlock, since the Government will neither accept the profession's interpretation of the meaning of the Spens Reports or permit the question of interpretation to go to arbitration. If it be the fact that the Spens Reports as interpreted by Mr. Justice Danckwerts are in themselves unreasonable and likely to lead to interminable friction between the profession and the Government, would it not be wiser to co-operate with the Commission, provided that the necessary safeguards are forthcoming, to secure that the Commission's work is truly comprehensive and impartial? That is the question of policy which only the profession and its leaders can decide.

(3) I now turn to the comparatively narrow issues which have been put to me in regard to the statement and the terms of reference. The first and obvious comment is that, from a purely technical point of view the statement is not a substitute for the terms of reference. Technically the terms of reference remain unaltered and, in so far as they are inconsistent with the statement, prevail over it. But this technical point would perhaps not be of great value if the profession were to receive adequate assurances that (whatever the technicalities of the matter) the terms of the statement would be regarded as prevailing over the terms of reference.

(4) The second comment of major importance is that, although the Spens Reports and the Danckwerts Award will be "studied" by the Commission, the Commission will not be bound to give effect to them in their recommendations. In effect, the statement throws Spens and Danckwerts into the melting-pot. The policy implications of this for the medical profession are referred to in paragraph 2 of this opinion.

(5) The fact that the statement purports to be an interpretation of the terms of reference gives rise to a number of ambiguities. Is the effect of paragraphs 1 and 6 of the statement, taken together, to enable the Commission to take account of all relevant evidence as to the proper social and economic status of the medical profession? If so, surely the Commission must be allowed to take account of all other occupations, and not merely of "other professions" and "connected occupations." But if that is the right view of the matter, why is it necessary to indicate, in paragraph 3 of the statement, how the expression "other professions" will be interpreted. The reference to science and other graduates in industry seems to have a limiting effect, and seems to cast doubts on the freedom of the Royal Commission to take into account all other occupations, so far as the Commission think them relevant. Similar observations might be made on paragraphs 4 and 5 of the statement.

(6) To some extent these inconsistencies and ambiguities are a legacy from paragraph (a) of the terms of reference themselves. If the true intention is to ignore the limitations in paragraph (a) of the terms of reference (and this seems to be indicated by the very wide language of paragraph 6 of the statement) then the inconsistencies in the statement itself are perhaps of minor importance.

(7) If the true intention of the Commission is really contained in paragraph 6 of the statement, many of the ambiguities and inconsistencies I have mentioned could be ignored. I think, however, that it would be desirable to obtain satisfactory assurances that the expression "any other relevant evidence" in paragraph 6 of the statement would be construed as meaning any other evidence, of whatsoever nature, relevant to maintaining the proper social and economic status of the profession.

(8) I have pointed out in conference that, both under the terms of reference and under the statement, the Commission are empowered but not bound to propose new arrangements for future

reviews. This is a matter of some importance. But, even if the Commission were bound to propose arrangements for future reviews, there is no guarantee that they would carry out this part of their terms of reference by making recommendations in specific terms. It is always possible for a committee or commission to shelve an awkward problem, however cogently they are directed to deal with it.

Addendum

(9) Since writing the above opinion, I have been informed that Dr. Wand has obtained from the chairman of the Royal Commission a further statement to the effect that the Commission will be prepared to receive submissions from the medical and dental professions in support of the levels of remuneration which they now claim. I understand, however, that the chairman has made it clear that the Commission will not act as an arbitral or adjudicating body on the present claim or on the question whether the claim is justified on the basis of the Spens Reports.

(10) I am asked to consider as a matter of urgency whether this development effects any material change in the situation.

(11) The chairman's new statement, together with the Royal Commission will not consider the essential basis of the present claim—namely, the binding promise of the Government to give effect to the Spens Reports. Presumably, therefore, the Commission will consider the present claim on its merits—but they will consider it as if the Government were under no obligation to implement Spens. This reinforces the fact (already sufficiently clear) that Spens is completely in the melting-pot. On the other hand, the chairman's new statement does give some additional ground for hoping that (Government promises apart) the Commission will have regard to all relevant circumstances.

Letter from Minister

Later on the same day, April 25, the chairman of Council, Dr. S. Wand, had a further discussion with the Minister of Health, who gave certain assurances which he later confirmed in writing in the following letter dated April 26:

Dear Dr. Wand,
I was glad of the opportunity of a long talk with you yesterday and I hope you feel—as I do—that it is that kind of informal and personal discussion which does most to clear away misunderstandings.

First, let me confirm what I said to you when I assured you that, following the report of the Royal Commission, there will be full consultation with the profession before implementation of any of its findings and that such consultation could of course include any matters relevant to the report or the present dispute.

Second, you seemed to fear some inconsistency between the terms of reference of the Commission and the public statements issued by its Chairman. I can certainly reassure you here too. It is normal that the interpretation of the terms of reference of a Royal Commission should be a matter for its Chairman and the Commission, and you can certainly regard the public statements which have been issued as having full validity.

Finally, I have thought—as you asked—about the position of the public health medical officers. I cannot add anything of substance to what I said in my letter of April 17 on this, but let me repeat that I am sure that any settlement for others, following the Commission's report, could not fail to be taken into account in considering the position of these officers and any claim through the normal machinery would of necessity be considered in the light of the report and of any settlement subsequent to it.

I do hope that these remarks, and our talk yesterday, will help to rid us of unnecessary apprehensions.

Yours sincerely,
DENNIS VOSPER.

Subsequent Events

The General Medical Services Committee met at 9 a.m. on the day of the Conference to receive a report from the chairman of Council on what had transpired since its last meeting on April 18—namely, the developments referred to above. The Committee, which had to make its decision before the Special Conference commenced at 10 a.m., decided by a majority of 24 votes to 22 to submit the following recommendation to the Special Conference:

That, in view of the latest developments, evidence should now be given to the Royal Commission and a decision on withdrawal of service deferred.

Subsequently, the Special Conference agreed that the above recommendation should replace the original recommendation made by the Committee—namely,

That, in the view of the Conference, in present circumstances, it is undesirable that the General Medical Services Committee should co-operate in any way with the Royal Commission on the Remuneration of Doctors and Dentists.

An amendment was then put to the meeting in the following form:

That this Special Conference, realizing that local medical committees and the profession generally have not had an opportunity of considering the statement of the chairman of the Royal Commission or the letter (April 26, 1957) from the Minister of Health to the Chairman of Council, therefore defers a decision on the recommendation to give evidence to the Royal Commission until the Annual Conference in June.

This was carried.
Subsequently, the Committee's other original recommendation to the Special Conference on withdrawal was withdrawn and, with the concurrence of the Conference, was replaced by the following motion:

That a decision on withdrawal be deferred.

This was carried.
At a later stage of the Conference, the Committee's third recommendation was placed before the meeting, viz.:

That the Minister of Health be informed that, pending a final and satisfactory settlement, it is the wish of the Conference that the 5% net increase to the aggregate net remuneration of general practitioners, arbitrarily decided upon by the Government, should be placed in a suspense account.

An amendment was then put to the meeting in the following form:

That the interim offer of 5% should be accepted without prejudice.

This was carried also as a substantive motion.
The following amendment was accepted as a rider to the substantive motion:

That immediate negotiations should be entered into with the Ministry upon the best way of distributing this disappointing and inadequate sum so as to give the most effective help it allows to the greatest number of practitioners.

The General Medical Services Committee met again on the termination of the Special Conference and authorized the issue of an immediate report to local medical committees. In addition, the Committee decided to make an immediate approach to the Ministry of Health seeking an early meeting with officers of the Ministry to discuss the question of the distribution of the 5% addition to the net aggregate remuneration of general practitioners.

It will be clear that the effect of the recommendations adopted by the Special Conference is to defer a decision on the question of giving evidence to the Royal Commission and on the G.M.S. Committee's plan for withdrawal until local medical committees and general practitioners have had an opportunity of considering these recent developments. The final decision will be taken by the Annual Conference on June 6.

OVERPRESCRIBING CHARGE DISMISSED

TREATMENT OF PREMENSTRUAL TENSION

The board of referees on March 9 acquitted Dr. Katharina D. Dalton of charges of overprescribing brought by the Ministry of Health. The prescribing concerned hormones for the treatment of patients with the premenstrual syndrome. She was one of the authors of what the board described as the first important paper on the subject in England.

The matter first came before the Middlesex Local Medical Committee last year as the result of an investigation into Dr. Dalton's prescribing during the month of September, 1955. The local medical committee decided that the case against Dr. Dalton had not been proved, but the Minister of Health, dissatisfied with this decision, referred the matter

to the board of referees. The members of the board were Mr. E. F. M. Maxwell (lay member), Dr. A. Beauchamp, and Professor T. N. A. Jeffcoate.

Mr. J. M. Keidan appeared for the Minister and Miss Rose Heilbron, Q.C., for Dr. Dalton. The Medical Defence Union instructed Messrs. Hempsons, solicitors, to act for Dr. Dalton.

Mr. Keidan contended that the hormone preparations ethisterone, progesterone, and methyltestosterone were drugs more expensive than was reasonably necessary. Less expensive treatment would have sufficed. In the event there was no evidence about the methyltestosterone, and no specific argument about it was addressed to the board.

Board's Conclusions

After taking oral and written evidence the board found that ethisterone and progesterone were in the main prescribed for women suffering from the premenstrual syndrome. In ten cases progesterone was prescribed for women suffering from ailments during pregnancy as a prophylactic against toxæmia of childbirth.

The premenstrual syndrome is an established ailment said to affect 40% of women of child-bearing age, and hormone preparations are now an established remedy for it. The first important paper on the subject in England was published in 1953.* Before that the treatment was known in the United States. It is now well known to gynaecologists here; it is described in several textbooks, including some intended for undergraduate medical students, but is not yet well known to general practitioners. It does not remove the cause of the disease: it only controls the symptoms. It is therefore a continuing treatment. Each dose is expensive. Milder symptoms can equally well be controlled by less expensive remedies—diuretics, sedatives, and psychiatry. Consequently the prescription of hormone preparations can be justified only when the symptoms are very severe and other less expensive remedies have been tried without avail.

The board then eliminated various errors that had come into the comparison between Dr. Dalton's and the areal prescribing costs.

Dr. Dalton calculated that 8.5% of the women who came to her for treatment of these symptoms were ultimately given ethisterone or progesterone. She had on her list 1,400 women, of whom 850 would have been of child-bearing age. Of these the number who complained of symptoms indicative of premenstrual syndrome must have been 400, or 47%. It was to be expected that Dr. Dalton would attract to her practice not only more women than the average, but also that the proportion of those women complaining of these symptoms would be higher than the average.

Dr. Dalton, being concerned at the high cost of ethisterone and progesterone, adopted a special method for determining whether or not to prescribe them. She gave to each patient complaining of the symptoms a chart on which were to be recorded the symptoms for the next three months. During this period the patient was given the less expensive treatment consisting in fluid and salt restriction, diuretics, and sedatives. Ethisterone and progesterone were given only in the light of information about both the symptoms and the effect of other treatment over a period of three months.

Since the medicinal art is largely experimental, the efficacy of a remedy has some bearing on the reasonableness of its cost. Dr. R. Greene, one of the witnesses, found that progesterone was effective in 80% of the cases, ethisterone in only 40%, but ethisterone or progesterone in 90%. The medical members of the board were satisfied that the cost incurred in prescribing for these patients was reasonably necessary for their proper treatment.

The board then considered Dr. Dalton's claim to have discovered a connexion between premenstrual symptoms during pregnancy and subsequent toxæmia. An experiment based on her theory had been carried on with her co-operation at the City of London Maternity Hospital since June, 1955, and a graph was produced showing that this

*Greene, R., and Dalton, K., *British Medical Journal*, 1953, 1, 1007.

experiment was followed by a sharp fall in the incidence of toxæmia at that hospital. Similar controlled trials were now being conducted at University College Hospital, London, but the results were not yet available. The board concluded that Dr. Dalton was entitled to use her discretion to prescribe a remedy which would not only relieve the symptoms but also avert the toxæmia of which, as she believed, they were a warning.

Mr. Keidan conceded that Dr. Dalton was neither extravagant nor reckless. But, he said, she diagnosed too many patients as suffering from premenstrual tension and was too ready to turn to progesterone. The board states that it drew the opposite inference from the evidence. Women who heard of progesterone treatment were no longer willing to submit to a disability which they formerly endured without complaint, and Dr. Dalton took great care in diagnosing their symptoms.

"Dr. Dalton's prescribing costs were three times as much as the average. It might appear that if all doctors followed her example the cost of the pharmaceutical services would be trebled, an increase of £100m. a year. But we think, first, the figure for Dr. Dalton's costs in the table would require a very considerable adjustment before it could properly be compared with the average. Second, if progesterone does come into general use there is bound to be a big fall in its cost. There was indeed some evidence that this fall had already begun. Third, if effective but expensive remedies are discovered for common ailments it must be expected that the cost of the pharmaceutical services will go up."

The board decided that the cost of the drugs and appliances ordered by Dr. Dalton in September, 1955, did not exceed what was reasonably necessary for the proper treatment of the persons concerned.

INTERIM ADJUSTMENT OF REMUNERATION

REGULATIONS FOR 5% INCREASE

The Ministry of Health and Department of Health for Scotland have issued regulations implementing the promise of an interim adjustment in remuneration given by the Prime Minister in the House of Commons on April 16. Under these regulations, the remuneration of senior hospital medical staff has been increased by 5% from May 1. The new rates per annum for whole-time appointments (with the old rates in brackets) are given below. Payment for part-time appointments is on a weighted *pro rata* basis.

Consultants: (1) appointed earlier than 31—starting salary £1,890 (£1,800); (2) appointed at 31—starting salary £2,047 10s. (£1,950); (3) appointed at 32 or over—starting salary £2,205 by £131 5s. to £3,255 (£2,100 by £125 to £3,100). The maximum salary with the addition of the maximum distinction award will now total £5,455 (£5,300).

Senior hospital medical officers: (1) appointed earlier than 31—£1,548 15s. (£1,475); (2) appointed at 31—£1,601 5s. (£1,525); (3) appointed at 32 or over—£1,653 15s. by £52 10s. to £2,126 5s. (£1,575 by £50 to £2,025).

General Practitioners

From May 1 5% has also been added to the aggregate net remuneration of general practitioners after the deduction of practice expenses. Special regulations are not required for this. The Ministry proposes that, as indicated by the Prime Minister, the best method of distributing the extra money should be the subject of consultations with representatives of the profession.

Corrections.—In paragraph 175 of the Annual Report of Council (Supplement, April 13, p. 161) Professor Constantine Choremis is erroneously described as Professor of Bacteriology. He is Professor of Paediatrics.

In the report of Mr. R. S. Murley's remarks at the dinner of the Fellowship for Freedom in Medicine (Supplement, April 27, p. 231) the sentence reading "Where they differed, however, was in their advocacy of a type of organization which . . . would . . . more closely associate financial operational responsibility . . ." should have read "more closely associate financial with operational responsibility."

MEDICAL PRACTICES ADVISORY BUREAU

PROBLEMS OF EMPLOYMENT

In his annual report for the year ending December 31, 1956, Dr. L. S. Potter, medical director of the Medical Practices Advisory Bureau of the B.M.A., states that the volume of work in all departments was well maintained during the year, with, if anything, an increasing number of personal interviews.

During 1956, 166 applicants obtained prospective partnerships (assistantships with a view), compared with 172 in 1955 and 139 in 1954; 478 obtained assistantships and traineeships, compared with 468 in 1955 and 449 in 1954. Dr. Potter reports that a significant number of practitioners refrain from offering a "view," even when seeking a partner, as a safeguard against the possible accusation of breaking a promise.

A second inquiry into the incidence of unemployment and under-employment (Supplement, September 15, 1956, p. 127) showed the position to be stable. Involuntary unemployment in the profession as a whole appeared negligible, but Dr. Potter comments that too many are in blind-alley appointments.

Re-establishment in Practice

In his report Dr. Potter mentions the difficulties facing middle-aged or elderly practitioners trying to re-enter practice. During 1956 the Bureau dealt with 170 cases of doctors over 45—roughly one-fifth of the total registered with the Bureau at any one time. There were two main groups: those already practising and wishing to find alternative practices or occupations; and those forced to seek re-entry into another form of practice, including those returning from an overseas career, ex-regular Service officers, those facing compulsory retirement from salaried appointments, and those partially incapacitated. Although the numbers in the age groups 45-54, 55-65, and over 65 are about equal, 80% in the lower group sought entry into general practice or work overseas, whereas in the higher age groups nearly 60% sought administrative work or other miscellaneous appointments. The Bureau has little opportunity to effect introductions to administrative or other appointments, which are normally advertised. However, Dr. Potter believes, since the number of older doctors registered with the Bureau remains fairly constant, that a substantial proportion find a satisfactory solution to their problems.

Emigration

There is little doubt, states the report, that the number of doctors looking for opportunities overseas is increasing. The number of doctors on the books of the Bureau seeking overseas posts or practices rose from 376 at the beginning of 1956 to 594 in February, 1957. Inquiries by letter about prospects overseas rose from 1,109 in 1955 to 1,354 in 1956. Two main reasons for this increase are given: dissatisfaction with conditions of practice and prospects in this country; and the wish to escape heavy taxation, falling standards of living, the cost of education, and to secure better prospects for children. In the Bureau's experience those going to definite posts or practices after proper investigation are usually well satisfied, whereas those taking a chance may well be disillusioned. During 1956 the Bureau dealt with 78 overseas openings, representing an increase of 40% over 1954 and 15% over 1955; 38 of these were filled by the Bureau.

Locums

The number of locums introduced remained fairly average at 2,275, not including arrangements made locally.

The position of doctors visiting this country for post-graduate work and seeking to supplement their resources by remunerative work is causing "some anxiety." Between April and July 92 practitioners from India and Pakistan registered with the Bureau while temporarily resident in this country, and only 17 of these could be placed in tem-

porary appointments. From this the question arises in Dr. Potter's mind whether doctors visiting this country for post-graduate work should not be warned that their chances of supplementing their resources from remunerative work are slender.

HOSPITALITY

German doctors' daughters, aged between 15 and 18, would like to arrange holiday exchanges with British doctors' daughters. A German doctor's son would like to spend five weeks during July/August in Britain. In exchange, a British doctor's son or daughter would be welcome in Saarburg during June/July. German doctor living in Kaufbeuren, between Munich and the Alps, would like to arrange holiday exchange for his daughter, aged 19, for a few months in order that she may study English.

A French doctor would like his two daughters, aged 16, to spend summer holidays with separate families in the same town on an exchange basis. A French doctor's daughter, aged 19, would like to stay with British medical family on an *au pair* basis from June 10 to July 30. A French doctor's daughters, aged 17, would like to visit British medical families in the North of England or Scotland from August 10 to the end of September, as paying guests or on an *au pair* basis.

Would anyone interested please get in touch with Brigadier H. A. Sandiford, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Correspondence

The Changed Picture

SIR,—Astonishment and resentment, to put it very mildly, were one's reactions on reading the account of the Special Representative Meeting. From being merely the discredited dog to be kicked around by all and sundry, we must now, surely, have become the laughing stock of the whole of England. Having decided, largely at the behest of our leaders, to act like an independent and self-respecting body of professional men and thrown down the gauntlet to a defaulting Government and to a Prime Minister who contemptuously offers us a 5% "rise" (like a bone to a dog or to just another bothersome group of workers—"give 'em 5% to keep 'em quiet and divide 'em up"), we now are to climb down, yet again. Why? Because the chairman has been talking to (had an audience with?) the chairman of the Royal Commission with which we were to have nothing to do. He came away with "assurances." It is almost beyond belief that we should once more be fobbed off with assurances, which no man in his senses nowadays will rely on if he can help it—and we can help it. A further precious bit of news is that that egregious Royal College of Physicians has again thrown a spanner into the works, once more to cause resentment and disunity. The issue at stake, Sir, is at the moment a financial one, and having joined the fight on this issue we should single-mindedly unite and fight to the death to win it, for it carries with it, and which is far more important than the money, the preservation of whatever independence we have left. Let us not allow this main object to be lost sight of or tampered with for a moment by tagging on side-issues about this and that which only confuse a lot of well-meaning but vacillating delegates. The financial result of it all affects me personally very little (though I am not one of the "haves"), but the prestige of my profession does concern me very deeply. I am quite convinced, Sir, that if we allow ourselves to be led astray, as we were before, by the, shall we say, peculiar *volte-face* behaviour of our shepherds in high places, the flock will have finally lost for ever, and, indeed, no longer be worthy of, the honour, integrity, dignity, and prestige of a once proud profession.—I am, etc.,

Thame, Oxon.

C. H. BARBER.

Royal College of Physicians

SIR,—Radiologists, pathologists, surgeons, gynaecologists and obstetricians, medical officers of health, editors of medical journals, officials at the Ministry of Health, and others have all played some part at general meetings of the Royal College of Physicians; general-practitioner physicians have not been admitted.

One lives in hope that the constitution of this College is not too rigid to allow family doctors, also, to be represented one day at these general meetings, in Professor Robert Platt's own words, "for the good of medicine in its widest possible sense" (*Supplement*, May 4, p. 244).—I am, etc.,

London, S.W.1

JOHN H. HUNT.

SIR,—The concluding remarks of the President of the Royal College of Physicians in his letter reveal the intellectual level to which the Royal College of Physicians has fallen in recent years.

Throughout the present dispute there has been a desperate appeal by the B.M.A. for unity within the profession, and indeed there can be nothing more damaging to any cause than schism. Yet the President of the Royal College of Physicians naively suggests that the best interests of the medical profession can be served by the Royal College pursuing an entirely independent course without condescending to consult the opinion of an organized body which sincerely strives to serve the whole profession, general and special. What evidence is on record of the Royal College ever having made any significant effort to further the cause of medical practitioners other than to obstruct the painstaking work of the B.M.A.? Did not a similar insularity of behaviour occur in 1948? How much more statesmanlike and diplomatic would its recent actions have been had it sought to serve professional unity rather than its own austere interests?—I am, etc.,

St. Helens, Lancs.

L. CRAWFORD.

SIR,—The letter of the President of the Royal College of Physicians is singularly unsatisfactory. It does not deal with the points of substance raised by Dr. J. H. Hunt (*Supplement*, April 27, p. 232) and it continues the intransigent attitude to informed criticism of the politically intolerable constitution. Dr. Hunt suggested that it is possible for a meeting of 10 Fellows to bind the Royal College of Physicians and to dictate policy on a political matter affecting not only inert and distant Fellows but also 3,590 disfranchised members, many of whom are consultants of mature age. That in fact more than the requisite 10 Fellows attended is immaterial to the issue. The gravamen of the charge is: (1) Can a quorum of 10 Fellows bind 3,590 Members in a political matter? (2) If so, is this tolerable? Any student of history is, of course, familiar with the complacent assumption by members of an oligarchy that they are particularly gifted in some way and thereby fitted to rule. Furthermore, they naturally choose, as the President of the Royal College of Physicians points out, persons like themselves for recruitment of their body. However, it must surely be rare to-day to witness the open derision of such dangerous engines of democracy as a postal vote, so foreign to the traditions of the Royal College of Physicians. Yet let Dr. Hunt take heart: the very publicity of the ingenuous contempt for established democratic institutions will bring its own remedy and this will be the more drastic the longer it is delayed, coming, as clearly it must come, solely from without. Acton's dictum applies to all institutions. The President of the Royal College of Physicians states—rightly in my view—that the B.M.A. has the advantages and disadvantages of democracy (though personally I would hesitate to affirm that it has them "all"). However, the Royal College of Physicians, I submit, has shown that it has most of the discredited disadvantages of narrow oligarchy and few of its advantages. While it is conceded, of course, that there is no completely satisfactory system of government,

yet the reform of the Royal College of Physicians, more nearly to be compatible with the constitution of its country to-day, is long overdue. The Royal College of Physicians has much to learn from the constitution of its younger and, politically at least, far wiser sisters. Dr. Hunt should also be encouraged to learn that the behaviour of the Royal College of Physicians has itself convinced at least one distinguished and politically very experienced person known to me that not only must the Royal College of Physicians be reformed but, furthermore, this reform can come only from without. Lastly, when an appeal for funds is in due course made, let us remember that "redress must precede supply."—I am, etc.,

Sheffield, 1.

JOHN L. EDWARDS.

Advance Payment of Compensation

SIR,—I have read with interest the report (*Journal*, April 27, p. 1011) on a discussion in the House of Commons concerning an appeal for an advance payment of compensation. The case for the applicant, ably presented by Mr. Ronald Bell, Member for South Buckinghamshire, is a good example of a principle for which my committee has fought for many years and on which it has made repeated representations to the Ministry of Health.

Here is a doctor who, because of ill-health, has to take a partner. In the old days he would have sold a share and could have used the capital he received for the purpose for which he now asks for a payment on account of his compensation—namely, the adaptation of his premises for the purpose of partnership practice.

Apart from the fact that this case might well have been dealt with under the concession grudgingly made in 1953, which it now appears was only conceded because in the Government's view it would mean nothing at all, the Parliamentary Secretary in his reply to Mr. Bell not only admits the principle but supports the B.M.A.'s claim that it should be the criterion for making advance payments. Mr. Vaughan-Morgan is stated to have said that "the real test for any advance payments under the proviso was whether, in the days before the Health Service, a doctor would have sold his goodwill to meet expenditure that was now alleged to involve hardship. He would obviously have done so only in very exceptional circumstances, as he would be parting with his means of livelihood."

It is misleading to suggest that a doctor would only part with goodwill in exceptional circumstances. Every time a doctor takes in a partner he is giving up a substantial part of his income, and, as in the days before the Health Service he would have received a capital sum to compensate him for this loss, so now he should receive the appropriate proportion of his compensation. It is no answer to suggest that he should borrow on the security of compensation, as many doctors have been forced to do, because of the unwillingness of the Government to be consistent and apply a principle which they have now publicly accepted.

As chairman of a committee which has had much experience of the way the Department has dealt with claims, I am truly amazed at Mr. Vaughan-Morgan's statement that "the Department had been generous in its interpretation of the provision" (to make advance payments on grounds of hardship). I emphatically dissent from this view, and will merely add that it is easy to make statements of this kind when there is no one present to challenge them.—I am, etc.,

London, W.C.1.

A. N. MATHIAS,
Chairman, Compensation and
Superannuation Committee.

Sanctity of Contract

SIR,—In this controversy between the Government and the medical profession, too many of us are looking over our shoulders. If we feel that a certain course is right, we should go forward unhesitatingly. There is such a course before us now, and, as the issue is purely a moral one, we should have the people behind us.

As a people we used to be proud of the fact that an Englishman's word was held to be as good as his bond all over the world. Latterly, I am told, it has not been valued so highly. It should be our aim to restore the confidence our promises once enjoyed, and in such a matter our Government, whatever its party composition, should set the example. Dictators have been condemned for tearing up treaties as "scraps of paper." We must not permit an English Government to do the same. In 1948 our profession signed a contract with the Government of the day by which, with many misgivings, we agreed on certain terms to try to make the Bevan's N.H.S. work. Out of the negotiations emerged the Spens clause on payment, which both parties to the contract agreed should be binding until, in the words of the Permanent Secretary to the Ministry of Health in 1950 (*Supplement*, March 23, p. 123), "such time as after the usual consultations some other basis is substituted." Now it may be that the Spens agreement was a bad agreement, or badly expressed: it may be that it was intended to be temporary only; it may be that to grant us any increase of pay would be wrong for various reasons. The Government was not forced to act dishonourably; all it had to do was to invite the profession to negotiate new terms, as we have said we are willing to do. The Government waives aside the whole clause, and dictates new terms of service. The deliberate debasement of the sanctity of a contract is quite indefensible; it undermines every promise our Government has made, both at home and abroad. It should rouse every right-thinking Englishman to protest, and we should all be in the van.

A second point which emerges from the Government's action will be appreciated more by the older than by the younger doctors. In spite of Bevan's efforts to look down his nose at our representatives, we did enter the Service on a partnership basis with the Government. To accept dictation now is to accede to a change of status—and we are very nearly accepting a full-time salaried service (except that we are still allowed to pay the full cost of our N.I. stamp), a type of service many of us regard as against the best interests of a national medical service.

I have tried to indicate why we must protest firmly and finally now, and why there should be no difficulty in securing the support of the people as a whole, and even of the doctors.—I am, etc.,

JOHN C. K. CHILCOTT.

Wormley, near Bristol.

Buying and Selling of Practices

SIR,—Before the introduction of the N.H.S. I wrote to the *Supplement* (December 6, 1947, p. 134) indicating my opinion of the danger and undesirability of surrendering our practices. This has now been fully proved, and surely it is time we negotiated for denationalization and the right to repurchase practices if we wish. This is essential if we are to avoid the certainty of becoming puppets of this or any subsequent Government, of whatever colour. This is an important consideration at the present time and would secure the following points: (1) permanent avoidance of a full-time salaried service which is the inevitable sequel to the present N.H.S.; (2) preservation of a sound, healthy doctor-patient relationship which is bound to suffer, sooner or later, in any State service; (3) freedom from bureaucratic control; (4) preservation of interest in and incentive to do good medicine; (5) ability to move to another practice; (6) right to choose a successor; (7) avoidance of medical unemployment and difficulty in entering practice.—I am, etc.,

E. C. OSTLER.

Birmingham, 14.

Voice of Junior Hospital Staff

SIR,—Many letters have been written recently about the attitude of the Government to the medical profession, and the dissatisfaction and lack of faith brought about by this attitude. But within the profession itself there is a great deal of ill-feeling which cannot be voiced properly for fear of "treading on somebody's toes." There are many

people who would rather have "peace at any price" than raise any protest at all. Now this forced suppression is unhealthy and the time is ripe to clear the air and speak some home truths.

Judging by the number of patients attending clinics and the length of some consultants' waiting-lists, there can be no one who would suggest that there are too many consultants. Yet the build-up of registrars continues with a seemingly amazing lack of concern among the hierarchy of the profession. This is perhaps natural but is in no way right. What, therefore, is needed? Integrity, clear thinking, and plain speaking. Nowhere has there been any real suggestion on the part of consultants that the registrars are being badly treated. It only needs these men to voice this opinion strongly and with conviction, and at least some of the battle would be won. It is fully realized that private practices would suffer if there were more consultant posts made, but this is no time for such thoughts. The future of the medical profession is at stake, and unless something is done very soon there will be a split in its ranks which could have catastrophic results for all concerned.

This letter is written with respect to my seniors, and is in no way bitter, but merely a protest against a gross injustice. I have no axe to grind, as at a future date I hope to enter general practice.—I am, etc.,

"A YOUNG DOCTOR."

SIR,—I have watched and waited for letters from newly qualified practitioners in vain. In consequence, I have reached the conclusion that the juniors expect little notice to be taken of their pre-registered voices. However, I still hope to read of their views on the phased withdrawal scheme in future *Journals*. In the meantime, I write to inform the more mature members of our profession, especially those who are satisfactorily well off and sit at home with a "blow you Jack" attitude, that there are the doctors of to-morrow who are far from comfortable. No wonder there is a "westward rush."

How many members of the Central Consultants and Specialists Committee know how junior hospital staff manage to survive? In fact, how many of these themselves can credit their own survival? Recently, in a medical publication, income figures have been quoted for an average general practitioner with 2,200 patients receiving only 2s. 6d. for each consultation. I have failed to calculate the ultra-microscopic amount I receive for each "job" I perform. I am fortunate, I know, in living in married quarters with my wife and son, for, although after the three deductions (N.H.S., superannuation, and emoluments) I only receive just under £3 a week, it would be impossible for me to keep my family if they were in fact living apart from me and I was receiving the extra amount which, at the moment, is being deducted for the roof over their heads, their essential foodstuffs, and linen service. Will the day dawn when the houseman may be forced to do an early morning newspaper "round" to supplement his income?—I am, etc.,

"M.B., Ch.B."

Royton, Lancs.

SIR,—May I wholeheartedly endorse "Registrar's" letter (*Supplement*, April 27, p. 233)? Having spent my two and a half postgraduate years trying to keep a wife and family on house officer's pay, I feel qualified to speak.

Most house appointments allow insufficient time for rest, let alone study, and the income will not permit saving for a course. This would not only require course fees, examination fees, and books, but also food and maintenance for oneself and dependants. There is also the hardship of no income between appointments and the frequency one has to move. One is forced to pay full residential emoluments when many meals are had at home and others are left to frizzle in the oven because one cannot get over to eat them on time. Everyone's answer is not to contemplate marriage until established. Under ideal conditions this is probably true, but, like numerous others in my position, I was involved in the last war and am passing through this

period in my thirties, not twenties. Apart from this, working as hard as I do for as long as I do, I expect a livable wage.

When comparing incomes with other professions, let the remuneration per hour, not per year, be considered. With present standards a house surgeon's remuneration for two appendicectomies is less than he pays for a haircut.—I am, etc.,

"HOUSE OFFICER."

Trainee Assistants

SIR,—After some eight or nine years of existence, the trainee assistant scheme may be said to be still on trial. Many were doubtful of its value even from the start; some still are. Placed before the profession at a time when it was torn by dissension over the merits of the N.H.S., it had a bad start and very few directions were given to those called upon to work it; and yet it appeared to fill a gap in the medical education of the new graduate, and it was a matter of faith as to the possible outcome of this new venture.

As university representatives called upon to assist the local medical committees in the difficult task of selection of trainers from the beginning of the scheme, we feel we are beginning to appreciate the possibility of evolving a useful and practical scheme. It all depends on the trainers. We have had failures, of course, varying from the man who regarded it merely as a method of accepting from the Government an assistant in a busy practice to help him (free of cost) through the heavy periods with a list that was much too long, to the man who had no aptitude for teaching, and no liking for the job.

When a selection committee feels that it has a good trainer available it should continue to use him as long as he remains keen. Trainers in their first year or two should appear before the committee, we suggest, twice a year to talk matters over. This is essential to find out how he is progressing, whether his interest is maintained, and to ascertain his personal relations with his trainee, and with those who may have passed through his hands formerly. It is important for the committee to know all this, especially as they may gather from his comments some idea of his sense of responsibility, and his views in dealing with the task he has undertaken. An experienced trainer will have learnt much from the trainees that have passed through his hands, and thus the committee will wish to retain his services for a reasonable length of time when once he has been found to do the work well.

We feel that too great a gap in years between the trainee and the trainer can be a disadvantage, and the most successful trainers are likely to come from the 35 to 50 group rather than from the older practitioners, but personality and aptitude come first in all cases irrespective of age, though if the gap in age is too great it may be more difficult to bridge it effectively. A committee responsible for selection should seek to build up a team of trainers, some experienced and known to be so, and some just beginning. Among the latter it is largely a matter of trial and error to select the right men, and failures will not be infrequent and must be eliminated when, after a trial or two, the mistake is discovered. This will prevent stagnation, give a wide range for selection of trainers, and at the same time avoid wastage of the most competent trainers.—We are, etc.,

SEYMOUR BARLING.
C. F. V. SMOUT.

Birmingham.

Supply of Oxygen

SIR,—The National Health Service makes heavy weather of the supply of oxygen to patients, and yet it is a simple matter if the Minister would use his power to integrate the three branches of the Health Service for this purpose. The source of supply should be the local hospital, for here the cylinders are under the constant supervision of expert technicians and the ancillary apparatus is ready for immediate use. The transport of this heavy equipment should be the duty of the local ambulance service.—I am, etc.,

Ambleside, Westmorland.

JOHN KERR.

Association Notices

SPECIAL REPRESENTATIVE MEETING

Notice is hereby given that on the requisition of the Council a Special Representative Meeting of the British Medical Association will be held in the Great Hall, B.M.A. House, Tavistock Square, London, W.C.1, on Wednesday, June 12, 1957, at 11 a.m. The business of the meeting is to resume consideration of the further action to be taken by the Association in the present dispute with the Government on medical remuneration.

A. MACRAE,
Secretary.

By Order of the Chairman of
the Representative Body.

Diary of Central Meetings

MAY	
15 Wed.	Forensic Medicine Subcommittee, Private Practice Committee, 2 p.m.
17 Fri.	Public Health Committee, special meeting, 2 p.m.
22 Wed.	Joint Committee of the B.M.A. and Royal College of Nursing, 2 p.m.
23 Thurs.	Central Ethical Committee, 10.30 a.m.
24 Fri.	Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
JUNE	
12 Wed.	Editorial Subcommittee, Joint Formulary Committee, 11 a.m.
12 Wed.	Joint Formulary Committee, 2 p.m.
13 Thurs.	Ophthalmic Group Committee, 2 p.m.
20 Thurs.	G.M.S. Committee, 10.30 a.m.

Branch and Division Meetings to be Held

BARNSELY DIVISION.—At Queen's Hotel, Barnsley, Thursday, May 16, 7.30 for 7.45 p.m., dinner. Members' wives and friends are invited.

BRISTOL DIVISION.—At Small Physics Lecture Theatre, Royal Fort, University of Bristol, Wednesday, May 15, 8.30 p.m., annual general meeting.

CROYDON DIVISION.—At 43, Wellesley Road, Croydon, Tuesday, May 14, 8.30 p.m., annual general meeting. Address by Dr. S. B. Dimson: "Bedwetting."

EAST HERTS DIVISION.—At Red Lion Hotel, Hatfield, Friday, May 17, 9 p.m., dinner dance.

EAST YORKSHIRE BRANCH.—At Quern House, Park Street, Hull, Wednesday, May 15, 7.30 p.m., annual general meeting.

KESTEVEN DIVISION.—At Nurses' Recreation Hall, Grantham and Kesteven General Hospital, Sunday, May 12, 10.30 a.m., annual meeting.

MID-HERTS DIVISION.—At Wellington Court Clinic, Brickett Road, St. Albans, Wednesday, May 15, 8.30 p.m., meeting to discuss the remuneration claim and the Royal Commission.

MONMOUTHSHIRE DIVISION.—At St. Mellons County Club, Friday, May 17, 8 p.m., summer dinner-dance. Guests invited.

NORTHERN IRELAND BRANCH.—At Bostock House, Royal Victoria Hospital, Grosvenor Road, Belfast, Thursday, May 16, 2.30 p.m., clinical meeting; 4 p.m., annual meeting.

READING DIVISION.—At Library, Royal Berkshire Hospital, Wednesday, May 15, 8.30 p.m., annual general meeting.

ST. PANCRAS DIVISION.—At Committee Room C, B.M.A. House, Tavistock Square, London, W.C., Monday, May 13, 8.30 p.m., annual general meeting.

SOUTH-WEST WALES DIVISION.—At Royal Gatehouse Hotel, Tenby, Friday, May 17, 7.30 for 8.30 p.m., B.M.A. dinner-dance.

STAFFORDSHIRE BRANCH.—At North Stafford Hotel, Stoke-on-Trent, Thursday, May 16, 5 p.m., annual meeting. 7 for 7.30 p.m., annual dinner. Ladies and non-medical guests are invited to the dinner.

STRATFORD DIVISION.—At Board Room, Queen Mary's Hospital, Stratford, E., Tuesday, May 14, 8.30 p.m., general meeting.

WANDSWORTH DIVISION.—At St. James' Hospital, Balham, S.W., Thursday, May 16, 8.30 p.m., annual general meeting.

WEMBLEY DIVISION.—At Board Room, Wembley Hospital, Monday, May 13, 9 p.m., annual general meeting. Film show, including "The Medical Witness."

WEST DENBIGH AND FLINT DIVISION.—At Marine Hydro Hotel, Rhyl, Thursday, May 16, 8 p.m., general meeting.

WEST SUFFOLK DIVISION.—At Everard's Hotel, Bury St. Edmunds, Tuesday, May 14, 8.30 p.m., meeting.

WILLESDEN DIVISION.—At Rehabilitation Department, Willesden General Hospital, Harlesden Road, N.W., Friday, May 17, 9 p.m., annual general meeting. All medical practitioners in the area of the Division are invited.

A meeting of Senior Hospital Medical Officers of the Oxford Region will be held at the Nuffield Maternity Home Lecture Theatre, Radcliffe Infirmary, Oxford, on Sunday, May 19, at 3.30 p.m.

THE SUPPLEMENT TO BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 18 1957

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British Medical Association

SPECIAL REPRESENTATIVE MEETING WEDNESDAY, JUNE 12, 1957

REPORT OF THE COUNCIL

THE DISPUTE ON REMUNERATION

The Council's Original Recommendations

1. In the report (*Supplement*, April 6) which it issued to the Special Representative Meeting held on May 1, the Council fully endorsed the proposals of the General Medical Services Committee (*Supplement*, March 23) and submitted the following recommendation to the Representative Body:

Recommendation: That, as there has been no satisfactory settlement of the profession's claim or the submission of that claim to arbitration, (1) the resignations of N.H.S. general practitioners be collected forthwith and held; and (2) the plan for a progressive withdrawal of general practitioners from the National Health Service (as outlined in the Appendix) be put into effect until such time as a satisfactory settlement is achieved or the dispute is referred to arbitration.

2. At that time the Royal Commission on Doctors' and Dentists' Remuneration had been appointed with terms of reference which, on the face of them, required the Commission to make recommendations as to "the proper current levels" of medical and dental remuneration in the National Health Service solely in the light of a comparison of the professional incomes from all sources now received by doctors and dentists in the Service with the incomes received by members of other professions, by other members of the medical and dental professions, and by people engaged in "connected occupations."

3. The Council, after taking expert legal advice on the matter, had concluded that these terms of reference could not be so construed as to ensure the observance by the Commission of the principle enunciated in the terms of reference of the Spens Committees—the principle that the incomes of medical practitioners engaged in a publicly organized health service should be fixed with due regard to the financial expectations of medical practice in the past and to the desirability of maintaining in the future the proper social and economic status of medical practice and its power to attract a suitable type of recruit to the profession.

4. The Prime Minister, in reporting the terms of reference of the Commission to the House of Commons on March 12,

had announced the unilateral decision of the Government to grant an interim increase of 10% from April 1 in the remuneration of hospital junior medical staff—a matter which the Minister of Health on February 20 had proposed as one for negotiation in the appropriate Whitley Council Committee. The Prime Minister had announced also his intention of making a further statement in due course on an interim adjustment for the other doctors covered by the Commission's terms of reference.

5. In the light of the situation as it then existed, the Council on March 27 adopted a second recommendation in the following terms for submission to the S.R.M. on May 1:

Recommendation: (1) That, in the opinion of the Representative Body, in present circumstances it is undesirable that the Association should co-operate in any way with the Royal Commission on the Remuneration of Doctors and Dentists; (2) that, if at a later date circumstances should so alter as to enable the Representative Body to reconsider its attitude to the Royal Commission, any decision to participate be conditional on the inclusion of all public health medical officers within the terms of reference of the Royal Commission.

The Council's Supplementary Report

6. In its Supplementary Report to the S.R.M. on May 1 the Council referred to certain later developments which were recorded in the Supplementary Report of the G.M.S. Committee to the Special Conference of Local Medical Committees (*Supplement*, April 27). On April 4 the terms of reference of the Royal Commission had been criticized in a debate in the House of Lords. On April 8, referring to this debate in a letter published in *The Times*, the Chairman of Council had made the following appeal:

"The matters in dispute are such as reasonable people would normally expect to discuss round a table. I once more ask that the Government should engage with us in such discussions."

On April 12, after an exchange of letters between Sir Russell Brain and the Prime Minister, the Royal Commission had issued a public statement in which they had announced their intention to study the Spens Reports and the Danckwerts

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Award; to bear in mind the need for maintaining a proper level of recruitment to the profession, and to consider evidence as to the conditions imposed by the nature of the work; to interpret the phrase "other professions" widely so as not to exclude, for example, science and other graduates in industry; to include doctors employed by local authorities only for purposes of comparison; to interpret "connected occupations" as covering a wide range of persons, including hospital administrators on the one hand, and, on the other, nurses and medical auxiliaries (with special reference to differentials); and to recommend current levels of remuneration "in the light of all this and any other relevant evidence."

7. Four days later—on April 16—the Prime Minister had announced, again without prior discussion with the profession, the Government's decision to increase by 5% from May 1 the basic remuneration of hospital senior medical staff and the aggregate net remuneration of general practitioners.

8. On April 17 both the Council and the G.M.S. Committee had expressed approval of the Chairman of Council continuing his efforts to bring about conditions in which a satisfactory and peaceful settlement of the dispute might be achieved, but on that date the Council had not regarded the changes which had already occurred as providing sufficient reason to alter its recommendations to the S.R.M.

Further Developments

9. As a result of the further efforts of the Chairman of Council, permission was received from the Chairman of the Royal Commission (by telephone on April 20, with written confirmation on April 24) to publish the following additional statements:

(1) That part of the Royal Commission's task that consists of considering what should be the proper current levels of remuneration of doctors and dentists will include hearing submissions from those professions as to the remuneration which they are now claiming.

(2) It is in the mind of the Chairman of the Commission that if it becomes unlikely that evidence can be obtained in time for a report to be published by Easter, 1958, he would so inform the Government and the other interested parties.

The Chairman of the Commission added that these further statements had the same force as the public statement issued by the Commission on April 12. In connexion with the first of the additional statements, he made it clear that the Commission would not arbitrate or adjudicate on the present claim.

10. On April 25 Counsel's opinion (*Supplement*, May 11, p. 260) was received on the public statement of the Royal Commission. It will be seen that Counsel advised that adequate assurances should be obtained that the terms of the public statement would be regarded as prevailing over the terms of reference. Later on April 25 the Chairman of Council received certain assurances in a discussion with the Minister of Health, who confirmed them the next day in the following letter:

Dear Dr. Wand,

I was glad of the opportunity of a long talk with you yesterday and I hope you feel—as I do—that it is that kind of informal and personal discussion which does most to clear away misunderstandings.

First, let me confirm what I said to you when I assured you that, following the report of the Royal Commission, there will be full consultation with the profession before implementation of any of its findings and that such consultation could of course include any matters relevant to the report or the present dispute.

Second, you seemed to fear some inconsistency between the terms of reference of the Commission and the public statements issued by its Chairman. I can certainly reassure you here too. It is normal that the interpretation of the terms of reference of a Royal Commission should be a matter for its Chairman and the Commission, and you can certainly regard the public statements which have been issued as having full validity.

Finally, I have thought—as you asked—about the position of the public health medical officers. I cannot add anything of substance to what I said in my letter of April 17 on this,

but let me repeat that I am sure that any settlement for others, following the Commission's report, could not fail to be taken into account in considering the position of these officers and any claim through the normal machinery would of necessity be considered in the light of the report and of any settlement subsequent to it.

I do hope that these remarks, and our talk yesterday, will help to rid us of unnecessary apprehensions.

Yours sincerely,
DENNIS VOSPER.

The Events of May 1

11. Not all the information recorded above had been known to the Council when its Supplementary Report to the S.R.M. on May 1 was issued to the Divisions and Branches on April 20. When the Council met on the morning of May 1 it was informed of still more recent developments. On the previous day the Central Consultants and Specialists Committee had adopted unanimously a resolution approving of "co-operation with the Royal Commission." Earlier on April 30 the G.M.S. Committee, after a necessarily hurried discussion, had decided by a very narrow majority (24 votes against 22) to recommend to the Special Conference of Local Medical Committees "that, in view of the latest developments, evidence should now be given to the Royal Commission and a decision on withdrawal of service deferred." Since, however, the Local Medical Committees, and the general practitioners in the Service, had had no opportunity of expressing their views on the latest developments, the Special Conference had decided to defer decisions to the Annual Conference on June 6, both on withdrawal of service and on the question of presenting evidence to the Commission.

12. In the light of the situation as it existed on May 1, the Council adopted the following recommendations, which were approved by the S.R.M. on the same day:

(1) That in the opinion of this Meeting circumstances have so changed that the position has altered since the Council issued its recommendation to the Representative Body not to give evidence to the Royal Commission; but, realizing that Divisions and the profession generally have not had an opportunity of considering the statements by the Chairman of the Royal Commission or the letter (April 26, 1957) from the Minister of Health to the Chairman of Council, this Special Representative Meeting defers a decision on the question of giving evidence to the Royal Commission until the next meeting of the Representative Body. (2) That a decision on withdrawal of service be deferred.

Decisions Referred to the Representative Body

13. The Council submits no recommendation to the S.R.M. on June 12. It offers no opinion as to whether the recent change in the position is such as to justify a change in the policy which it originally recommended. It thinks it right that the profession at large should have an opportunity of studying the position as it now exists, and it invites the Representative Body to take decisions in accordance with the prevailing views of the Association's members as ascertained in the Divisions and Branches.

Position of Public Health Medical Officers

14. In accordance with a decision of the A.R.M., 1956, the Council has urged the Ministry of Health to set up a special committee—a Public Health "Spens" Committee—to inquire into the remuneration of doctors employed by local authorities. When the appointment of the Royal Commission was announced it appeared to the Council that, if it eventually became possible for the Association to give evidence to the Commission, this would provide the desired opportunity for the remuneration of public health doctors to be examined in relation to that of their colleagues in general and in hospital practice. It was for this reason that the Council adopted the second part of the recommendation quoted in paragraph 5 above.

15. Repeated efforts have been made to effect the inclusion of these doctors within the terms of reference of the Commission, but without success. It has been

explained that the fact that the public health doctors are not remunerated solely from the central Exchequer—one of the considerations which influenced the Negotiating Committee of the profession when it decided not to include them in the claim presented to the Minister of Health and the Secretary of State for Scotland—produces complications of such a nature as to make their inclusion impracticable.

16. Should the Representative Body be satisfied that, were it not for the exclusion of the public health medical officers, the right course would now be to present evidence to the Commission, it will be for the Representative Body to decide whether the inclusion of these medical officers should still be regarded as an indispensable condition of the submission of evidence by the Association.

17. The Public Health Committee will hold a special meeting on May 17, the result of which will be published in the *British Medical Journal* at the earliest possible date, and will be available to the Special Representative Meeting on June 12.

18. At its meeting on May 8 the Council reaffirmed its determination to use every endeavour to secure justice for the public health doctors, whatever decision might be taken regarding the submission of evidence to the Royal Commission.

PROCEEDINGS OF COUNCIL

The Council of the British Medical Association met at B.M.A. House on May 8, with Dr. S. WAND in the chair.

The Chairman reported with regret the deaths of John Armstrong and Walter Lidwell Harnett, former members of Council.

The General Medical Services Committee having appointed Dr. A. B. DAVIES as its chairman in place of Dr. A. Talbot Rogers, Dr. Davies became, *ex officio*, a member of Council.

Election of Council, 1957-8

It was reported that, in the contested elections, there had been the following results:

North of England and Tees-side Branches (two seats):

Dr. J. C. ARTHUR, Gateshead.

Dr. I. M. JONES, Sunderland.

Divisions of Metropolitan Counties Branch in Middlesex (two seats):

Dr. A. N. MATHIAS, London.

Dr. J. B. W. ROWE, Harrow.

City, South-west Essex, Stratford, and Tower Hamlets Divisions (one seat):

Dr. J. A. MOODY, Ilford.

Kent Branch (one seat):

Dr. A. BARKER, Whitstable.

Council decided that, though the nomination of Dr. W. B. HEYWOOD-WADDINGTON was late, it should be accepted in respect of the Sussex Branch, no other nominations having been received.

Representative of Army Medical Services on Council

It was agreed to recommend to the Representative Body that Major-General R. MURPHY, late R.A.M.C., be elected to represent the Army Medical Services on the Council in place of Major-General J. C. A. DOWSE, whose term of office ended at the conclusion of the present session.

Nomination of President

Considerable discussion took place on the motion of Dr. A. BEAUCHAMP and Mr. D. S. PRACY that in order to carry out the instruction of the Representative Body to elect the President on a national basis the Council should, before or at the time of accepting the invitation of a Branch or Divi-

sion, determine the method of selection and nomination of the President for the year under consideration. To this Dr. F. GRAY and Dr. W. WOOLLEY had tabled an amendment that Council should make a nomination before accepting such an invitation to hold the Annual General Meeting in a particular area. A further amendment by the Organization Committee was in similar terms, with the addition of the words:

In doing so the Council shall pay due regard to the nature of the regional area in which the meeting is to take place and any views expressed by those sending the invitation.

Dr. F. GRAY thought that the old system had worked well in the past, but it had been thought likely to operate unfairly in the future in view of the limited number of places where the meetings could be held. As had been pointed out in January, that a host area should have one of its members as President gave it great encouragement. Unless Council chose the President in the first place, it would be said by every likely area that a national President was being chosen because there was nobody worthy of the office in those areas. In his view, nothing could be more calculated to insult than the adoption of the Organization Committee's amendment.

Dr. A. V. RUSSELL said that it should be remembered that on many occasions the national figure chosen would turn out to be also a prominent figure in the host area, while Dr. F. M. ROSE pointed out that unless there was a stipulation that the provincial areas were also to be taken into consideration there would arise the danger of the Presidency being an office reserved to those places with adequate accommodation for the meetings.

In the opinion of Dr. E. C. DAWSON, the old method had been by far the best, and to alter it would certainly result in someone being insulted or hurt. Perhaps the Council could ask the Representative Body to reconsider its instruction. The difficulties arising from the giving of notice to implement that suggestion were mentioned by Dr. I. D. GRANT (chairman of the Representative Body), who, nevertheless, expressed sympathy with Dr. Dawson's views, as the President could almost be called the king-pin in making the meeting a success.

Dr. R. GIBSON (chairman of the Organization Committee) said that the difference between Dr. Gray and himself lay in each thinking the other's idea was a calculated insult.

In view of the cleavage of opinion existing the CHAIRMAN suggested that the Council might consider the second part of the original motion—that the Council should consider the nomination for the office in 1960. It might be that once it had been worked in one area the conflict might cease. In the meantime the rest could, perhaps, be put in "cold storage" for the time being, as whatever was done was sure to upset someone.

Dr. W. E. DORNAN supported Dr. Gray's amendment. The Representative Body had expressed itself in no uncertain terms, and had had the backing of considerable evidence of the tendency to have a President from, in particular, coast towns, leaving important centres such as Hull, Leeds, Nottingham, and Leicester "without the pale." In addition, London and the provincial teaching centres would be completely ignored.

After some further debate, Dr. Gray's amendment was carried as a substantive motion, it being decided to defer consideration of nomination for 1960 until the next session.

Royal College of Midwives Building Appeal

After Mr. L. DOUGAL CALLANDER (Treasurer) had pointed out that to make a contribution by covenant would cost the Association only 35 guineas a year, Council approved a recommendation of the Science Committee to contribute a sum of £250 to the Fund.

Finance Committee

Presenting his report and the draft financial statement, the TREASURER informed the Council that the membership had reached the record figure of 70,152, and added that without

the resultant improvement in receipts there might have been a loss on the year's working. Total income had been £288,000. The fall in net rent resulted from various causes over which they had no control, and fuel costs had increased because of the longer winter in the year under review. Interest on investments showed a rise as a result of the investment of surplus money in Treasury Bills instead of letting it lie in current account and letting the bank get the interest. Mr. Callander warned, however, that Treasury Bill interest had fallen considerably in the last few months, and had fallen to below 4% last week for the first time in a considerable period.

On the expenditure side most of the increase was represented by the cost-of-living bonus to the staff, while the Public Relations Department's cost had also greatly increased as a result of it not calling on the Defence Trust for some £3,000 to £4,000 as in previous years.

Turning to the balance sheet, the Treasurer drew attention to the increase in the accumulated funds from £635,000 to £644,000, to which had to be added the General Reserve of £30,000. As required by the Companies Act, fixed assets were shown at their written-down value, which, on the last revaluation of a minimum of £750,000, represented a considerable hidden reserve. The market value of their investments at the end of the financial year was £171,672, and the Sinking Fund policies would provide capital sums of £100,000 in 1966, 1974, and 1991 respectively.

The draft annual financial statement was approved, subject to audit.

The expense of the medical abstracts was raised by Dr. C. J. C. BRITTON, who described it as a drain on the funds of the Association.

The *Abstracts of World Medicine* had no prestige value at all, and gave no service not already provided by similar publications.

Dr. J. G. M. HAMILTON pointed out that in the past the Council had always taken a contrary view and he hoped it would continue to do so. That the Association provided a service of value to the world of medicine was confirmed by the increased sales and prospects in North America. The improvement in circulation there was by no means finished.

Mr. CALLANDER confessed that both he and the Journal Committee had been worried about the deficit, but, though the service had but a limited field, the trend was to reduce the loss by improved sales, which had increased appreciably in the last 18 months. He hoped that the service might be allowed to continue for at least another year before further consideration was given to the matter.

A plea that an overall view might be taken was made by Dr. E. A. GREGG, who reminded Dr. Britton that the publications must be looked upon as a whole.

It was agreed that further information on the subject should be provided at the November meeting, after which the remainder of the report of the Finance Committee was agreed.

Estates Committee

The chief item in this report was the Committee's recommendation concerning the Burton Street project, Mr. Callander telling the Council that it had to take one of the most important of decisions, involving the spending of many thousands of pounds. He recalled that the decision to develop Burton Street had been confirmed some years ago by the A.R.M., and when, in 1952, it was learned that the existing leaseholder was in difficulties over developing the site the Estates Committee had been instructed to ascertain from the Bedford Estate whether the Association could acquire the lease.

After negotiation, the Bedford Estate had offered a lease to determine in the year 2125, when the lease of the present building also terminated. Under that lease, the Association could partly develop the site made available when the existing houses on it were demolished, in a manner approved by the town-planning authority and by the Bedford Estate. The Committee at that time had been thinking of a building

with flats for members of the Association, a library, and general offices at an estimated cost of £150,000, and in 1954 an agreement was completed by which the Association was required to commence building by March, 1958. To that agreement there had been two "escape" clauses, one operating if the Association did not obtain the planning permission of the L.C.C., and the other operating if, after reasonable steps had been taken, the Association did not obtain vacant possession. After prolonged negotiation, planning consent was obtained, not for a five- but for a four-story building. There were now only four tenants left in Burton Street, and none of those tenancies presented difficulty or much delay.

The Estates Committee was now asking the Council to give the "green light" on the basis of the figures contained in the report, which would, however, be more favourable to the Association if the Bank Rate was reduced, as seemed to be highly likely now. Even on the present basis it would be possible to finance the Burton Street project without very much annual burden on the Association's normal funds. After taking the Council through a detailed analysis of the finance involved, the Treasurer said that their surveyor had advised that the total cost of the project should be not more than £200,000. When complete, the building would provide 20,000 sq. ft. of office room, including storage space in the basement which would also command a good rental.

With the present demand for office accommodation in the Bloomsbury area they need not fear not being able to let their space at considerable rentals, rentals which would give a return of 6½% with the present Bank Rate, and slightly more with a 5½% Bank Rate. That was a better return than was obtainable from trustee securities. The project meant investing in bricks and mortar instead of in such securities.

Apart from those set aside for specific reserves, the Estates Committee felt it unwise to sell the investments, but to obtain the balance needed by way of overdraft or loan. The Association held considerable Sinking Fund policies, the first of which fell in 1966, and the suggestion was to borrow the cost of the building from an insurance company. The interest on a loan of £200,000 could be more or less covered by income from rents, and at the end of seven or eight years the first Sinking Fund policy could be used to repay £100,000. That would halve the liability.

The Burton Street site could, therefore, be financed without endangering the financial position of the Association, while still preserving their investments as a protection against emergencies which faced them at present or which might face them in the near future. "What is required is vision," Mr. Callander told the Council, vision such as Sir Robert Bolam had shown in connexion with the present building.

Real Estate Business

Dr. I. D. GRANT, while congratulating the Treasurer on his excellent presentation of the report, was worried about the British Medical Association going into the real estate business. The initial idea had been to provide bedrooms for members and, possibly, a library extension. That had been "washed out" and for it had been substituted a building of four stories, not five—a block of flats and offices which would be let off on a purely commercial basis to whosoever would rent them. They were clearly and definitely taking the Association into the real estate business, which he did not think the right job for a medical organization.

It was evident that a definite commitment had been entered into with the Bedford Estate, but could not the Estate be approached to see how much it would cost in compensation to call the deal off? After all, if the site value was rising all the time there might not be great difficulty in getting an arrangement, and it would then be for the Council to decide whether or not money would be wisely spent in "crying off." In his opinion, such a body as the British Medical Association, which was not profit-making,

should have its funds in securities which could be utilized as and when required.

"The damages could be astronomical," he was told by the Treasurer. It all depended on how the Bedford Estate would react. The matter could be taken to court and damages awarded. The Association were paying £1,000 a year ground rent, and should it turn out that the Estate could get only, say, £750 a year from another lessee, the Association could be liable for the amount represented by 168 years at £250 a year. There would also be architects' fees of anything from £6,000 to £8,000 to pay in any case, plus legal costs of any action. Their legal adviser, while not being able to give a definite figure, thought that the sum involved would be anything "above five figures."

The project found a vigorous supporter in Dr. E. A. GREGG. Development of the site would be of great advantage to the Association, and, when completed, the building itself would provide sufficient income to meet its cost. "If you back out," he warned, "the alternative is that, adjoining this very fine block of buildings which we already have, there will be erected some abominable block of council flats—flats which could be built as high as the L.C.C. think fit." The only criterion was that it should be able to be done in such a way as not to throw any great burden on the Association's finances. "Once satisfied about that, there is every reason to go on with the project."

Further support came from Dr. D. BROWN, who thought that the new building would "complete Sir Edward Lutyens's concept." If the Association had not gone into the real estate business years ago, what would have been the present financial burden? The project was a method of saving, at the end of which they would have a building worth £1m. In addition to using the 1966 Sinking Fund policy, they should also use that maturing in 1974 and so reduce the amount of interest payable. Nor could he see any reason considered the scheme such a wonderful one that perhaps members of the Association—especially those to whom compensation was due—might like to invest in it. They would get 5½% on their money, secured by an asset worth £750,000.

Dr. J. G. M. HAMILTON's advice was "to back-pedal." It was neither part of the Association's aim to go in for real estate nor did he think it a good investment. If the present building was not sufficient to house their various activities they should either take over some of the space now commercially rented or else rent more space outside the building. He also deplored the proposed use of the Sinking Fund policies, and the financial policy in this regard seemed to be based only on an expectation of Government action—some day—in regard to leaseholds and freeholds. Unless those policies were used as originally intended they would never attain the objective of the Association of a reserve of £250,000. Even if the first Sinking Fund policy was replaced, the cost would be about £1,000 a year. He objected both to the form of the investment and the method by which it was proposed to finance it.

While not impressed "with the terrible picture that has been painted of council flats," Dr. Hamilton said that although at present there was an enormous demand for offices and flats in London a very great deal of such building was in progress and projected. As a result, they might find themselves with a "white elephant" on their hands in regard to letting.

Remarking that the Association had been in the real estate business for some years, Dr. ALEX. BROWN said that, sooner or later, accommodation had to be found for departments that were already overcrowded. To house them in frontal accommodation already tenanted would cost so much that an increase in subscriptions would be inevitable, whereas the Burton Street building would provide the necessary space for them as well as enhance the amenities of the present building.

Dr. F. M. ROSE also supported the plan. He had seen many instances where someone had not taken such an opportunity and had retrieved his mistake later only at

much greater cost. No mention had been made of garage accommodation in the new building, and he hoped this would be seen to. The present garage space was overtaxed. "We should go forward with the scheme cheerfully and hopefully, and not with the forebodings of our Scottish colleagues."

The scheme was described as "good business" by Mr. J. R. NICHOLSON-LAILEY. The Council had the responsibility of seeing that money was wisely spent, and in days of inflation they were always looking over their shoulder lest expenditure should first catch up with and then overtake income. The Association was constantly expanding, and many necessary services were not at present offered to members because of lack of space. If the site were given up and expansion later became necessary, they would find they were then encompassed by other buildings. They might then even have to leave their present site altogether, which would be even more expensive.

Dr. H. H. D. SUTHERLAND said that even if they went ahead with the scheme they had not, then and there, to make up their minds about the many alternative uses there were for the use of the building. They had the opportunity to do something suitable and useful with the land, which would add to the prestige of the B.M.A. and to its income.

Mr. A. DICKSON WRIGHT told the Council that he had had a lot to do with trustee stocks, and he instanced the fall in railway stock since it was issued on nationalization. Every argument was in favour of the present investment.

Dr. A. N. MATHIAS thought there was little ground for Dr. Hamilton's fears of a white elephant. It was true that much office building was and would be undertaken in London, but the first places to become white elephants would be those where communications were bad. In Tavistock Square and the immediate vicinity they were in a unique position, being within walking distance of three main-line termini, two of which were to be electrified under the railway modernization plan. The project was a most valuable business investment.

Dr. W. M. KNOX recalled that when the project was first discussed the B.M.A. had been much wealthier, and as it had been put forward then as something which would add to the members' amenities, and not as a purely financial building speculation, he had been in favour of it. There were many factors which could throw Mr. Callander's budget out of balance. The Treasurer had assumed that there would be full letting all the time, and that the office staff would increase so much in the next ten or fifteen years as to require more accommodation. Neither eventuality might come to pass. It was purely a real estate venture, and nobody dealing in real estate at present would look at a return of even 6½%. They considered that anything less than 12% would not be a paying proposition.

In the eyes of Dr. ANNIS GILLIE, the Association had an opportunity of offering accommodation to those engaged in medical and paramedical activities. A grouping of organizations with common interests was in the interests of such tenants and in the interests of the Association, as it meant there would never be a lack of tenants.

No Fears

Replying, Mr. CALLANDER said that the provision of garage space in the type of building envisaged was now a general condition for granting planning permission. It would be easy to arrange to take out another Sinking Fund policy when the first one matured—it was something which, perhaps, the Council might immediately consider—and the premium cost would be about £1,000 a year, as had been stated. Having gone into all the details he would say no more than that the Council need have no fears about the financial aspects of the scheme.

The Estates Committee's recommendation to proceed with the development of the Burton Street site in accordance with the plans for which planning consent had been received was carried by a large majority.

The Council also approved the Committee's second recommendation:

That approval be given in principle to the scheme for financing the building operations by means of a loan repayable in part or in whole from the Sinking Fund policies.

It was reported that the Birmingham Regional Office would be available in May, and the remainder of the Report was agreed.

Royal Commission—Public Health Services

At this stage Council dealt with a point arising from the Minutes which had earlier been raised by Dr. H. D. CHALKE, who had asked what, if any, action had been taken to implement the Public Health Committee's Resolution:

That as soon as possible a further letter be sent to Members of both Houses of Parliament . . . drawing particular attention to the arbitrary decision of the Government that the terms of reference of the Royal Commission exclude all doctors in the public health service.

Dr. MACRAE explained the reasons why no action had been taken.

Dr. CHALKE thought it most unfortunate, because he could tell the Council that the public health doctors were already very dissatisfied with the B.M.A., and this incident might well prove to be the last straw. The changed attitude of the B.M.A., and particularly of the Council, was most regrettable. He was doing his best to fight the dissatisfaction and only hoped that the general repercussions would not prove almost fatal to the good associations, and even the membership, of the public health services with the B.M.A.

The CHAIRMAN said that he had spoken to Dr. J. B. Tilley on the subject a few days previously, and had understood from him that there was to be a meeting of the Public Health Committee on May 17. Would Dr. Chalke like consideration to be deferred until after that meeting?

Dr. CHALKE replied that he had no authority to do anything except to warn Council of the possible consequences of the ignoring of the resolution. He was told by the Chairman that the "ignoring" had not been deliberate, and that, in any case, the terms of any letter sent now might be different from those of one sent after the meeting of May 17.

Dr. A. V. RUSSELL thought that, though the position might have changed somewhat, the Public Health Committee had been given a definite promise, and a promise should be kept. The public health doctors had every reason to be extremely disturbed about what was happening. The letter should be sent so that M.P.s, and the Government through them, would realize that the Association was by no means pleased with the Government's attempt to fragment the profession and exclude from the inquiry an important section of it.

Dr. G. W. IRELAND wished that their public health friends would look at the matter slightly differently. Their problem was a very real one, but if the present line was pursued it would spoil not only the B.M.A.'s case but their own. The public health section should not feel that the Association had broken a promise—the position was much more complicated than was realized.

Dr. W. E. DORNAN said that the imposition by the Government of a Royal Commission and of increments of varying percentages were both arbitrary acts. It had also been stated that the Commission would have nothing to do with the public health service remuneration except in so far as it could be used as evidence against the claim of the profession as a whole.

If an approach was made without their being fully informed, they exposed themselves to the adverse comments of many M.P.s. He proposed that nothing should be done until after the Special Representative Meeting.

Further discussion of the position of the public health section ended in the Council deciding, with four dissentient votes, to leave the matter in the hands of the Chairman of Council until after the meeting of the Public Health Committee on May 17, when, in consultation with the chairman

of that Committee, he should take whatever action he thought right, the Public Health Committee being assured, meanwhile, that the Council would use every endeavour to secure justice for the doctors concerned, whether or not it was decided to give evidence to the Royal Commission.

Science Committee

It was reported that the award of ordinary research scholarships worth £200 each to Charles Roland Leeson and Thomas Sydney Leeson, both of Cardiff, was the first known to have been made to identical twins.

Health Services in the Future

Initiating a short discussion on how best to implement the resolution passed at the S.R.M. of May 1, calling for a committee to inquire "into the whole field of medical services in the light of the experience gained of the National Health Service since 1948" (*Supplement*, May 11, p. 255), the CHAIRMAN suggested that perhaps he might be permitted to engage in such consultations as would enable him to present a document to Council showing a proposed constitution of the Committee. If they debated it in Council with "nothing to bite on" they might get involved in a decision which might later be regretted. For himself, he thought that a substantial number of laymen should be included.

Dr. GRAY agreed that the main thing would be the lay element—people whose names carried the greatest weight in the country. The committee should be such as would put the Royal Commission in the shade. He favoured the Chairman going ahead on the lines suggested.

Dr. GRANT thought that Dr. Wand should bring before Council on June 12 his suggestions as to the lay chairman and the rest. It would then be for Council to give him some guidance. To do otherwise would be asking too much of their Chairman. A further point to be considered, said Dr. WAND, was whether or not the Ministry of Health should be asked to send observers, or nominate a member, or give evidence to the committee. Dr. MATHIAS's opinion was that a chairman should first be chosen, whose advice would then be of immense help in the formation of the rest of the committee.

It was agreed that the Chairman should proceed on the lines which he had suggested.

The proceedings terminated at 6 p.m.

GENERAL MEDICAL SERVICES COMMITTEE

A meeting of the General Medical Services Committee was held at B.M.A. House on May 9. Dr. A. B. DAVIES occupied the chair.

Remuneration Dispute

The CHAIRMAN opened the meeting with an appeal to members to keep their observations on the remuneration question brief and to avoid going over old ground. At the last meetings it appeared that the Committee was completely torn asunder and a little heat and bitterness had been engendered. He hoped that that time had passed and if they could focus their attention on their common object it would be to the good of them all and their cause.

On the subject of how meetings should be addressed, it was felt that a recital of the facts as they stood at the date of the conference, leaving local medical committees to draw their own conclusions, would lead to sterile meetings. Two types of resolution could be discussed—one, that the position had so altered as to enable co-operation to take place, and the other that despite recent events there had been no substantial change.

Dr. HOWIE WOOD inquired what the reaction had been so far and if there was anything further to report on what might be called the "Wand front." Dr. B. BURNS presumed that if they remained neutral at meetings they were opposing the policy of the B.M.A. The resolution at the representative meeting on the day after the conference

clearly showed that the Association had decided that the position had changed. The CHAIRMAN suggested that they should be guided by their own previous decision by which, by 24 votes to 22, they resolved that evidence should be given to the Royal Commission.

Giving a Lead

Dr. H. G. DAIN felt that the Committee had had to decide whether or not it was in favour of evidence being given to the Commission, and by a small majority it had decided that it was. What was most important was that they should take a decision, not, he hoped by 24 votes to the 22, but unanimously, that evidence should be given to the Commission. The whole profession should be persuaded that it was right in present conditions for evidence to be given and that it should appear that they had a united profession in favour of that particular action. He thought it was their responsibility to give a lead.

Dr. F. GRAY, while agreeing on the need for unity, disagreed with the method proposed. The Council had decided that it could not give a lead, and Dr. Dain was proposing that the Committee should do so. What was the position of members of the Committee who were members of the Council? He could not think of anything calculated to do more harm than the course Dr. Dain had proposed. Dr. J. C. ARTHUR deprecated hysterical talk about the profession being split from top to bottom. The split was on such a narrow issue that it did not really matter.

Dr. DAIN formally proposed:

That this Committee is of the opinion that under the existing circumstances to-day, the profession should give evidence to the Royal Commission.

Dr. GRAY moved an amendment:

That this Committee decides to take the same action as the Council, namely, not to give a lead to the profession.

In a discussion on procedure, Dr. S. WAND thought that the forthcoming annual conference should be invited to come to a decision on the question of giving evidence to the Royal Commission which had been deferred by the special conference. Despite what had been said, there was a clear cleavage of opinion in the profession. There was a split; there was no doubt about it. Their objectives were to retain the status of the profession and to pursue their claim. The split was in the methods to be adopted to gain the objectives. They must be prepared to re-organize their forces according to the situations of the moment, and they might have to change their tactics with lightning rapidity. When the decision had been made it would indicate their future strategy and tactics, and once it had been made they had got to keep together as a united force and there must be no bitterness or recrimination. If the views on what were the right tactics were different each side should respect the other, but, having debated and decided what the form of the tactics would be, they should be absolutely united. They might have to face ultimately a challenge to their status as a result of the Royal Commission's findings, or a failure to get proper satisfaction for their claim. That might come in a year or in less time than that. They must use that breathing space to reunite the profession. When they spoke to those in the periphery they must make it clear that once a decision had been made there must be unification and a closing of the ranks. Nothing would be gained by saying, "If we had done so-and-so, it would have been different," because the situation was changing with lightning rapidity and they had to meet the challenge as it came.

Dr. BURNS, opposing anyone who supported giving evidence to the Royal Commission, said that it was the logical next step in the formation of a salaried service. It was incomprehensible to him that the Chairman of Council should believe that they were anywhere near arbitration. He did not believe that a shrewd negotiator such as Dr. Wand could believe that they had got anywhere. He felt it was necessary for the Committee to give a firm lead to the profession. He did not think they could

evade their responsibilities, and they should not necessarily adhere to a snap decision made in a few minutes at a previous meeting. They should have the same opportunity as those in the periphery of deciding what was to happen and not be bullied into any position. The Chairman of Council had said that the profession was split. He should know. The profession was split from top to bottom, and the Council had forfeited the confidence of half of those in the profession. Once they gave evidence to the Royal Commission they had taken the next logical step in the direction of a salaried service.

Dr. WAND said it still remained open to them to decide whether the amount of change was sufficient for evidence to be given or not, but he did not want confusion about the fact of the change. Whether the change had been sufficient to mean that evidence should be given or not was something on which he had not given a positive opinion.

Dr. F. M. ROSE thought they must come to a decision and give a definite lead on the question and not rely on the fact that they had given some sort of lead to the special conference. It was in the light of what happened at the Conference that they must look at the facts. It was quite obvious that things were going a certain way, and they would be foolish to tie themselves to their previous decision just because it was a previous decision.

Dr. M. SORSBY said that they must make some sort of decision to reunite the profession. Not only was the profession split but so were they. How much could they salvage from the wreck? The main issue was whether or not evidence should be given before the Commission. The question of the 24% had gone by the board for the time being. The profession was very angry about that. They had accepted the 5% proposal and the profession was angry about that. He wished to know if the advice of a constitutional lawyer had been sought, and what was his opinion on whether, if they gave evidence to the Royal Commission, they were, in fact, committing the profession to being a party to a revision of the Spens Reports and the Danckwerts award.

Dr. B. CARDEW did not think that the profession would be impressed by the unanimity of the Committee if voting on the question was, say, 30 to 15. Although he would have liked to see the Committee give a lead, he must support Dr. Gray.

Dr. TALBOT ROGERS commended the view that the question was in the hands of those in the periphery and also the suggestion of the Chairman that it was possible to debate the problem from one of two approaches. As a matter of fact, the two approaches were contradictory and it was for the meeting concerned to accept or reject.

Dr. HOWIE WOOD felt that they must find some means of unifying themselves before they went to the Conference. To have anything like a split vote again would be absolutely futile. Although many of them would like to support Dr. Dain they felt that he had not chosen the right method of securing their object. He would like them to get across to the Conference in some way, possibly through the Chairman, that there was no question of defeatism in the Committee if it was decided to give evidence to the Commission. They must take up the concession which had been obtained by Dr. Wand that there would be full consultation at the end of the Commission, and, if necessary, take up the point that the question of a withdrawal from the Service had only been postponed from now until later on. It was of cardinal importance that they should hearten their supporters.

Dr. C. M. SCOTT thought that they were split and would be split for a long time. His only concern was with the possible way out of the mess. He thought the Committee had a fine chance of retrieving some face if it considered going into the constitutional issue again. The difficulty was that no one knew if the Council was the big boy or whether the General Medical Services Committee was the big boy. A certain number of people sat on both bodies. They had got to find some way of trying to save face, and he thought the only possible way in which they could

retrieve anything was to make some kind of stand at the moment even if that were only to the extent of putting a considerable amount into lawyers' fees to take a case at law.

The CHAIRMAN asked for the exact wording of Dr. Gray's amendment. Dr. GRAY said that the amendment would be: "That this meeting agrees with the Council of the Association that it will not give a lead to the profession before the Conference." He put that forward in the interests of unity in the profession. It was obvious that if they had a straight vote on whether evidence should be given or not there would be a split in the Committee if nowhere else. Dr. C. J. SWANSON suggested altering the amendment to read: "That this Committee adheres to the decision of the Council and leaves it to the profession or the Conference to make a decision with regard to giving evidence."

Dr. Gray's amendment was carried and agreed upon as a substantive motion with three dissentients.

Legal Opinion

Dr. C. M. SCOTT proposed:

That this Committee now decide to seek the highest legal opinion with a view to a test case in the Courts on the validity of our contract.

Dr. WAND thought it could be accepted that the matter would be fully pursued in the light of Dr. Gorsky's speech at the Special Representative Meeting (*Supplement*, May 11, p. 254). There would probably be a consultation between counsel, and he could assure Dr. Scott that no stone would be left unturned. If they had a small chance of success they would go on.

Dr. SORSBY said that Dr. Scott was saying that they should find out whether what was contained in the Ministry's handbook—that the Spens Report and the Danckwerts award were accepted by the Government—meant that that was a legally binding contract with the Government. If that was correct and they then gave evidence to the Royal Commission, were they not in fact saying that they were a party to changing what the Government had accepted in Spens and Danckwerts? If they gave evidence and were party to a change in Spens and Danckwerts the Government had won hands down and had got them in a corner for ever.

The CHAIRMAN: Does the Committee agree to both these angles being approached? (Agreed.)

Distribution of Interim Increase

Dr. J. T. BALDWIN said that the three means suggested by the Ministry for distributing the 5% interim increase in remuneration were by no means exhaustive. It was felt that those with smaller lists should have some preference. Dr. DAIN suggested that a simple method of distributing the money would be to give every principal on the list £100. That would have the effect of giving the small-list man £100 as well as the big-list one.

Dr. GRAY said that Dr. Dain was proposing another basic salary. Dr. Baldwin's proposal was to benefit the small-list man. Dr. Gray suggested that they should give a very substantial rise in the initial practice allowance. For that special class he suggested that they should ask for the full 24% rise to be given. Those were the people starting from scratch, in designated areas, and the initial practice allowance, in the majority of cases, was all they had got to live on to start with. Dr. CARDEW thought it was impracticable to hand out money as a lump sum. He suggested that they might load the first 1,000 patients with 2s. Dr. A. BROWN said that if they altered the method of loading they were altering the policy of the Conference.

Supplementary Payments

A resolution from the Cumberland Local Medical Committee which had the support of the Rural Practices Subcommittee of the G.M.S. Committee was before the Committee. The resolution was as follows:

That in allocating supplementary payments to executive councils in future the sum shall be not on the total number of

persons on practitioners' lists in the executive council area, but in proportion to the total amount of annual payments to practitioners.

Dr. C. F. R. KILLICK said it was felt that the rural practitioner was restricted because there was not the population available for his list such as there was in urban areas. Those on a capitation basis for dispensing got 9s. 6d. per head against the chemists' tariff of £1 2s. The mileage payment was, in a sense, a compensation payment in place of patients. Dr. TALBOT ROGERS thought there had been no injustice to the rural practitioners. They had been dealt with not only fairly but generously.

Dr. BURNS considered that any decision arrived at should be based on arithmetic and not on emotion. Could they be told the figures of total payments in towns and in the country? He had a suspicion that there were many practitioners in the rural areas who were on a very good thing with mileage and dispensing. He did not think that when discussing the final settlement they should involve themselves in a private welfare State.

Dr. A. D. STOKER pointed out that the rural practitioner was faced with much greater expense than the urban one. The extra mileage grant had been swallowed up in the increase in motoring costs. It was manifestly unfair that the very men who supplied the evidence for the increased supplementary payments should be those who garnered the smallest harvest. He suggested that the dispensing capitation rates were a complete dead loss. He did not understand how anyone could afford to dispense on those rates.

The CHAIRMAN said that they were committed to their existing policy, which was determined by the working party in consultation with the Government side. Unless a resolution was carried by the Committee and confirmed by the Conference, and then taken up by the working party with the Ministry, the policy would stand.

Dr. KILLICK said that a resolution was down on the conference agenda on the subject. He was quite satisfied with that. Dr. CARDEW thought that the working party might well approach the Government to add 5%, if not 10%, to the trainee practitioner's salary. A precedent had been created by the offer of 10% to the junior hospital staff and 5% to all other doctors. He thought there was a moral commitment to look after the trainee practitioner, and he suggested that the working party should press for 10%. Dr. BURNS said that that was not the function of the working party.

It was agreed that this point should be pursued with the Ministry.

Term of Office of Chairmen of Council and Committees

Resuming in the afternoon, the Committee considered the proposal of the Organization Committee that the office of Chairman of Council should be held for a maximum of five years, election, in the first place, being for an initial period of three years; and that a chairman of a committee should be elected annually by that committee, with a maximum period of six years. The CHAIRMAN intimated that the Council had been informed that the Central Consultants and Specialists Committee had decided that this was a matter for each committee to decide for itself.

It would, thought Dr. TALBOT ROGERS, be unwise to define an exact limit to the period of office, and in any case it should be discretionary. Dr. GRAY wished to go further and to say that the Organization Committee's proposal was "wholly inappropriate." A committee was quite capable of looking after its own affairs without having regulations laid down for it in that way. He moved to that effect, and it was agreed.

Stock Orders

It was reported that the National Pharmaceutical Union was willing to discuss stock orders with the Committee, and it was decided that the Chairman, Secretary, and two other representatives to be chosen by the Chairman should enter into discussions with the union.

Specialist Treatment for Service Personnel

The Committee considered the following addendum which the Ministry wished to add to its previous instructions on the subject:

Except in an emergency, any specialist attendance or hospital treatment for Service personnel is to be obtained from Service resources, wherever possible. Arrangements should normally be made through the medical officer of the unit to which the patient is attached.

This was to apply in cases "more than two miles from the nearest Service medical facilities."

Dr. MATHIAS said that the Ministry was asking the profession to do the Ministry's administrative work. The average doctor did not know where a man's nearest Service hospital was, and the answer was that if the man was fit to travel he should be returned to his unit. If not, and if he required hospitalization, he should go to the nearest local hospital.

With this the Committee agreed.

Assistants and Young Practitioners Subcommittee

On behalf of the G.M.S. Committee the CHAIRMAN thanked Dr. R. M. S. MATTHEWS for a memorandum entitled "Prospects in General Practice." Dr. Matthews was congratulated on his efforts to throw light on this important problem.

Prescribing of Proprietary Preparations

Describing as "unfortunate" a letter from the National Pharmaceutical Union ascribing some errors in prescribing to illegible handwriting of the doctor prescribing, the CHAIRMAN said that it was the legal duty of a chemist, if in doubt about the interpretation of a prescription, to ring up the doctor in question, and the Secretary was instructed to reply in those terms.

Tuberculosis in Industry

As there were ethical, industrial, and other aspects to the problem, the Committee agreed that a request from industrial medical officers, made through the Ministry, that chest consultants should inform industrial medical officers direct when pulmonary tuberculosis was diagnosed at a chest clinic, should be referred to the Public Health and Industrial Health Committees.

Tranquillizer Drugs

A request from the Kingston-upon-Hull Local Medical Committee that these drugs should be obtainable on prescription only was referred to the Science Committee with the recommendation that the drugs should be put in Schedules 1 or 4.

Investigation of Prescribing

Referring to a letter received from the Ministry of Health pressing for nominations to a special committee to investigate prescribing, the CHAIRMAN said that the committee had expressed its willingness to co-operate in the investigation. It was agreed to send the following names to the Ministry: Drs. F. E. Gould, H. C. Faulkner, M. Sorsby, A. B. Stoker, and A. M. Maiden. It was also agreed to leave to the Chairman the selection of a nominee to represent Wales.

Clinical Assistantships—National Temperance Hospital

The decision of the Paddington Group Hospital Management Committee to terminate the employment of the present paid clinical assistants and, instead, to create a similar number of honorary posts was discussed by the Committee.

Dr. GRAY said that of the six assistants, four had not been "especially busy." Of the other two, one saw an average of over 40 patients at each session, and the other case was comparable. In any event, it was difficult to understand why the honorary appointments were to be made if the work was not there. His unofficial information was that the Management Committee was proposing to make a "paper saving" of £1,050 a year and to spend the money in other directions.

Dr. WAND advised an approach to the regional hospital board. They had been told on many occasions that the

Ministry was unwilling to interfere with the autonomy of regional or other boards, and it would be completely hopeless to approach the Ministry before going to the board.

The Committee agreed to take up the dispute with the regional hospital board.

Hospital Facilities for General Practitioners

Consideration was given to the action of the South-West Middlesex Hospital Management Committee in deciding:

That minor operations only can be undertaken by general practitioners in general-practitioner hospitals without reference to the appropriate consultant. Such minor operations to be only those which could be carried out in the general practitioner's own surgery.

Dr. TALBOT ROGERS called for resistance, as there were quite a number of minor operations that a general practitioner could adequately carry out in a hospital with which he had good relations and to which he had access. The tendency was for more and more minor surgery to be carried out in hospital, not because it was impossible to perform it in the surgery but because conditions and facilities in hospital were so much better.

The Committee decided to support the local view "in the first case," and to write to that effect to the Management Committee.

Scottish News

CO-OPERATION WITH ROYAL COMMISSION

EDINBURGH PHYSICIANS' DECISION

At a quarterly meeting held on May 7, the Royal College of Physicians of Edinburgh unanimously passed a resolution that the College agrees to co-operate with the Royal Commission on the remuneration of doctors and dentists and will submit evidence.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Royal College of Physicians

SIR,—I am sorry if a little levity purposely introduced into my last sentence (*Supplement*, May 4, p. 244) has given offence or has run the risk of obscuring the essential seriousness of my message. I was concerned to point out that to a profession as to a nation there are other dangers than disunity. There is the danger that no man or minority may dare to speak his mind.—I am, etc.,

London, S.W.1.

ROBERT PLATT,
President,
Royal College of Physicians.

SIR,—Its president's letter (*Supplement*, May 4, p. 244) does nothing to allay the apprehension and resentment that the recent action of the Royal College of Physicians has aroused in many general practitioners. Until April 12 the whole profession was united, with the Joint Negotiating Committee as the expression of that unity, in its opposition to the Government's curt, evasive, unstatesmanlike handling of the remuneration claim. The bodies associated in that Committee, the Joint Consultants Committee and the General Medical Services Committee, and the Association were unanimous in their decision that, at that time, co-operation with the Royal Commission was inadvisable. By its representation in the Joint Consultants Committee the College was a party to that decision.

The then president of the College approached the Prime Minister, and secured from him assurances which were not wholly unsatisfactory, and communicated these to the College, which decided that co-operation had now become

advisable. Had it contented itself with trying to convert its allies to its way of thinking there would have been no cause for complaint. But it did not do so. It made public its changed opinion and its decision to co-operate with the Royal Commission without consulting or even informing its allies. It separated itself from the rest of the profession and destroyed the former unity. The College may have had the right to take independent action, but occasions may arise when the exercise of such rights can only be detrimental to the common cause. This, surely, was just such an occasion. The College's action has made us, at least, two general practitioners, dubious of the wisdom, in any future dispute with the Government, of entrusting our case to an alliance one member of which is so willing to make on its own decisions which would have been better taken and announced by the profession as a whole.—We are, etc.,

Rugby.
Preston.

H. G. FLOYD.
R. P. HENDRY.

Co-operation with Royal Commission

SIR,—Shades of 1948! And we get nearer to a State salaried medical service. The same cracks appear in an apparently solid front, with the same timing, and from the same sources. The Royal College of Physicians has been criticized (*Supplement*, April 27, p. 232), and in his reply (*Supplement*, May 4, p. 244) Professor R. Platt clarifies the government of that body and goes on to say that the Royal College never professed to represent the general practitioner. But how comes it that his predecessor was jointly concerned in negotiation with the Minister on what was basically a G.P. problem? Presumably Professor Platt's analogy of university and graduate concerns the Licentiates only, as experienced G.P.s would not accept that relationship to the College, however good Fellows they may be, or whatever their method of election.

If it is open to all to advise on shirt colours for the College, then, as it has been stated that its policy is that of co-operating with the Government of the day, the obvious colour is blue until the next election. I had thought that the *raison d'être* of the College was for the advancement of medicine, which does not involve being honorary civil servants.

In spite of the various comings and goings and letters between our representatives and the Ministers, the issue still is that the Government refuses to discuss Spens as interpreted by Mr. Justice Danckwerts, and further refuses to substitute reasonable arbitration machinery.

Confusion is added to the scene by Dr. Wand's statement to the Special Conference of Local Medical Committees (*Supplement*, May 4, p. 237). He apparently attaches importance to the Minister's promise of full consultation before implementing any findings of the Royal Commission, but surely Spens promised more than this, and what possible reason have we to trust the Government on any form of words which cannot be proved in open court? Then Dr. Wand goes on to say that the Royal Commission would not act as an arbitration body. What then are we waiting for? We are fighting for arbitration and we are not getting it. The opinion is held by many that to give evidence to the Royal Commission immediately jeopardizes Spens.

In brief, has the situation changed one iota? I maintain that it has not and we should spend a little less time in that unseemly scramble to accept and distribute a miserable 5% and devote ourselves to the realities of this serious situation in the next few weeks. The future of medicine may well depend on our courage. Dr. Wand—whose herculean effort for practitioners in the past must be acclaimed and applauded by all—surely has his tongue in his cheek when he says it is up to those who have knowledge of the periphery to decide. The periphery has little knowledge of what is going on behind the scenes, but it is a fact that, until the recent ditherings of Headquarters, by and large the great majority of the profession was for withdrawal from the Service as the only way of dealing with an employer that we dare not trust.

In our deliberations we should try and answer these few questions: (1) Is the Royal Commission (whatever its terms of reference) arbitration? (2) Has it been advised to give a ruling on the rightness or legality of Spens? (3) Does the promise of full consultation with the profession before implementation of the Royal Commission's findings mean anything at all, or is it merely another form of words?—I am, etc.,

Sheffield.

ANDREW STEPHEN.

SIR,—Although I am not in the Service and as a taxpayer I regret any increase in its costs, I had intended to subscribe to the Defence Fund; for the attitude of the Ministry of Health filled me with indignation. But the terms of reference, as now announced, are sufficiently wide, and the names of the Royal Commissioners make us confident of a fair hearing: I hope, therefore, that the B.M.A. will give all the help it can and will not call for any resignations, at all events until the report has been published. From our standpoint I believe this to be a good policy, and might it not be regarded as more patriotic? I know that other senior men think as I do, and I feel sure that if the B.M.A. decides to co-operate we shall have to a much greater extent the sympathy of the man in the street, who does not find it easy to understand or to agree with an intransigent attitude.—I am, etc.,

Beckenham, Kent.

W. MAXWELL PENNY.

Reform of the Health Service

SIR,—Owing to the present clash between the profession and the Government over our claim for increased remuneration it may be interesting to know about our colleagues on the other side of the world and how they faced a possible similar predicament. I have just returned from a most enjoyable and instructive visit to Australia and New Zealand. During the two weeks before the Olympic Games I was invited to several clinical meetings at the Royal Melbourne Hospital. These were very well attended, and I was impressed by the high standard and the keenness and enthusiasm of those present. Later I had an opportunity of meeting several of the general practitioners in Melbourne. The tendency now is to form themselves into a group practice, each group being practically self-contained and carrying out their work in the highest traditions of private practice.

The profession in Australia, as is well known, were averse to a National Health Service and preferred to keep their freedom and their independence. Their status is very high, and deservedly so, as they do very good work and command good fees—the ordinary charge for a visit is 17s. 6d. (Australian currency). Fees for confinements are in the region of £10 10s. to £12 12s. (Australian currency). War pensioners invalided out of the Services are treated under special Australian Government arrangements.

In New Zealand the picture is quite different. Each individual pays 1s. 6d. in the £ on their income for social security. The first endeavour to introduce benefits in respect of family doctor services was made in 1941. Doctors were offered a capitation fee of 15s. per head per annum together with a commuted payment for potential mileage calculated on the distance between the doctor's residence and the place of residence of the patient. The response to this offer was enlightening. No more than about 50 doctors agreed to work the capitation system, and the largest number of patients on the combined capitation lists did not exceed 80,000. This was not unexpected, as the profession had condemned the capitation system as unsuitable except for lower income-tax groups as provided in the old National Health Insurance Scheme. The Government was committed under the Social Security Act to provide medical services for all, and found it necessary to compromise on family doctor services on a fee-for-service basis, and on November 1, 1941, general medical services were introduced under one of the following systems: *The refund system*.—This involved payment of the doctor's fee (usually

10s. 6d.) at the time. On production of the doctor's receipt the patient could obtain a refund from the Health Department at the statutory rate of 7s. 6d. per visit or consultation. *The direct claim and token system*.—Under this system the patient signed the prescription form and the doctor claimed the statutory amount of 7s. 6d. from the Health Department—also mileage at 1s. 3d. per mile each way. Under this system, instead of accepting the statutory fee of 7s. 6d., the doctor charged 10s. 6d. Of this he collected 7s. 6d. from the fund upon the patient's signature under the direct claim arrangements, and in addition collected the balance of 3s. or 5s. from the patient personally. This additional levy became known as the "token" payment.

Night calls or Sunday calls were under all these systems charged at the rate of 12s. 6d. Of recent years most of the doctors are using the direct claim and token system. Even under these systems there have been a few instances of trivial and unnecessary calls on the doctors, which entails a certain amount of prescribing, but on the whole New Zealand may be congratulated on their general-practitioner arrangements, and the doctors are happy and interested, and their status is high, and there is no sense of frustration.

Here is indeed a situation where the mother can learn from the child, and perhaps the present impasse would be solved by adopting the New Zealand system or some modification of it. It is rather ironical to think that in Britain we accepted a capitation fee of 17s. per patient per annum in 1948, when in New Zealand it had been sharply rejected by the profession there, seven years earlier, when money was more valuable.—I am, etc.,

London, N.8.

G. H. WOOD.

SIR,—Amid the dreary squalor of the pay squabble (for it is none other, despite attempts to dignify it as a struggle for principles) there is a point of view which has received scant attention from the profession. It seems hardly to have occurred to anyone to ask why our demands for increased pay have been refused.

Presumably the Government is well aware that we were got into the Service by a combination of bribery and threats: also that our case, based on the promise contained in "Spens," is unanswerable. If this be so there must be very strong reasons which compel the Government to repudiate the pledge given by its predecessor. In the broadest sense the factors which influence the Government must lie in the difference between our case as seen in isolation and as seen in the context of the general economy of the country. What are these factors, and to what extent do our arguments bear on them?

It seems odd that a body of individuals trained in scientific thinking should be content to reach a decision, and to decide on action, after hearing only one side of the case. Yet by and large this would appear to be what we have done. To the intelligent layman our attitude must recall that of the trade union leader who, if recent report can be believed, declared boldly that he was not interested in the future of the country, he was only concerned to get the best terms for his members. Now comes the heartening prospect of a B.M.A. investigation of the N.H.S. Let us hope that in dealing with matters which do not immediately affect our pockets it will be manifest to all that we can be both objective and well informed.—I am, etc.,

Sherborne.

ALAN EDELSTEN.

Capitation Fee System

SIR,—I have been following the correspondence in your columns regarding the remuneration claim with great interest, and can only conclude from the number and vehemence of the letters that there is widespread discontent among many doctors about the National Health Service. My own view is that the Government merely whispered that immediately to heel if the profession merely whispered that it might prefer a full-time salaried service for general practitioners instead of the present completely fatuous capita-

tion system with all its attendant wrongs, such as overloaded lists, "head-hunting," inadequate and out-of-date surgery accommodation and equipment, and so forth. Obviously, if the country cannot afford the present set-up, how much less could it afford to provide surgery premises, receptionists, clerks, in addition to doctors' salaries? If the Government wished to employ the doctor's wife, too, it would have to pay the "rate for the job," not have her services thrown in with her husband's as at present because he cannot afford to employ a secretary.

What a pity that such a splendid idea as the National Health Service should be the cause of such bitterness among its most important participants.—I am, etc.,

Gateshead, 11.

T. L. C. DALE.

SIR,—Mr. A. Wilfrid Adams (*Supplement*, May 4, p. 241) attributes the ills of general practice in the N.H.S. to the large list. May I be permitted to express my profound disagreement? He implies that G.P.s with lists of 2,500 or less practise adequate medicine, whereas those with more than this apocalyptic number do not. Is there one jot of evidence for this generalization? It would be an unrealistic and impertinent G.P. who announced, in Mr. Adams's terms, that the busiest and most sought-after consultants were guilty of curt procedure, inadequate diagnosis, and atrophied talents. Surely criticism of standards in general practice is not limited to the few with large lists, but is levelled at N.H.S. general practice as a whole. I beg of Mr. Adams that he will be objective enough to seek aetiological factors common to the whole field, and not prejudice our hopes by lending his authority to ill-considered clichés.

We need not seek far for the common factors. The capitation fee method of payment has led to the progressive degradation of general practice since the days of Lloyd George. It ensures that income is inversely proportional to the quality of work, equipment, and premises, regardless of size of list. Why treat pneumonia and heart failure at home when time and petrol can be saved by sending them to hospital? Its effect on the doctor-patient relationship is equally disastrous. We all derive satisfaction from the handling of real emergencies, but a call at 3 a.m. to a child bitten by bed-bugs does not cement any bond. And, only last week, I paid an urgent visit at midnight to a man who had gone out for a walk before the doctor arrived. Can incidents such as these induce more than resentment and distaste? And there is no redress except to rid oneself of the patient and his contemptible capitation fee.

The ideal of "one patient, one doctor" is acceptable to everybody except the one doctor. Witness the mushroom growth of off-duty rotas. But undoubtedly it is a great convenience to the administrator—when the locum incurs a complaint, what easier than to deduct the fine from the cheque of the "one doctor," who was perhaps hundreds of miles away at the time? Can anyone with his hand on his heart claim that such responsibility for the acts and omissions of deputies exists except in the distorted reasoning of men who spend more time in committees than in medicine?

Experts travel from the uttermost ends of these islands to pontificate on whether five-shillingsworth of powder is food or drug. If a food—that is, the doctor has forgotten to mention low sodium—the G.P. has the cost docked from his cheque. Mr. Adams recommends it; the G.P., in good faith, prescribes it; the patient swallows it. Unthinkable to charge Mr. Adams or the patient for it, but the tyranny of the capitation fee provides the perpetual victim, and this by a pseudo-legal process which should stink in the nostrils of a nation which prides itself on justice.

There is only one other common factor—the freedom of the pharmacy. Would it not be sufficient to provide essential treatment free of charge? Must the nation be for ever incited to hypochondriasis and waste? Is it in

anyone's interest that the patient may blackmail the doctor to pander to greed and ignorance?

If, therefore, there is to be a sincere attempt to revive family practice, the G.P. must be remunerated in relation to the patients he attends, and not those he avoids: he must be protected against bureaucratic malevolence; he must be permitted to devote his time to the sick and not to defending the Exchequer against the more pertinacious beneficiaries of the Welfare State. And, since we are being frank, the hospital service must be rendered efficient, so that its vast expenditure is justified by the acceptance of emergencies as a duty and not a condescension.

Mr. Adams's solution, to reduce the maximum list to the average list, is synonymous with a salaried service; if this is what he wants, he should say so, and not beat about the bush. But let me remind him that Australia looked at our service, and produced something better. Payment for services rendered, necessary treatment, control of abuse by both doctor and patient—these are the hallmarks of a healthy and responsible nation.

It has at last dawned on the B.M.A. Council that it has the duty to investigate the disease which is afflicting British medicine, of which the present pay dispute is only the presenting symptom. If it pursues this course with courage, integrity, and speed, the Association may yet recover from the events of the past few days. But let it never be forgotten that any service in which the patient has rights but no responsibilities, and the doctor responsibilities but no rights, is doomed to failure, just as all but the ideologically obsessed must surely know that the present service has failed.—I am, etc.,

Sheffield, 10.

B. BURNS.

Private Practice Group

SIR,—As one of those attending the original meeting last summer, to which Dr. John Etheridge refers in his letter (*Supplement*, May 4, p. 246), I would like to support his appeal to those practitioners interested in the preservation of private practice to join the group. Now, once again, it would seem that the future of general practice is in the melting-pot, and many of us who are not too disillusioned to believe otherwise have hopes that a better N.H.S. may arise from the dispute now going on. I firmly believe that its success depends in part on the existence of a powerful "competitor" in the shape of private practice. The continued existence of the latter depends, in its turn, on the economic stability of the country as a whole, and partly on the achievement of those aims of the group set out in Dr. Etheridge's letter.—I am, etc.,

London, N.W.3.

OLIVER PLOWRIGHT.

Doctors and the Health Service

SIR,—An excellent little article by Mr. A. Wilfrid Adams (*Supplement*, May 4, p. 241). I strongly recommend that this article be printed in pamphlet form and made available to doctors. I should be delighted to post one of these to 20 or more of my intelligent patients. Only by an informed public opinion can we compel the Government to provide an adequate health service.—I am, etc.,

Old Cumnock, Ayrshire.

ALEX MACK.

Unemployment of Women Doctors

SIR,—The recent action of the Birmingham Public Health Authority in dismissing 27 part-time women doctors has caused considerable hardship. Many of these doctors are now unemployed. It is becoming increasingly difficult for married women, who are necessarily tied to their homes, to obtain suitable medical work. This leads to a great wastage of able medical personnel.

There are many aspects of public health work, in particular, which give opportunities for married women both to exercise their professional skill and give a service to the community which would benefit the country as a whole. If part-time medical work becomes more scarce it will

raise the question as to whether medicine is a desirable career for women in the future. It would be interesting to know whether the same difficulties are being met in other areas.—We are, etc.,

JUNE B. BROWN.
HELEN C. HUMPHREYS.
MARY GLOVER.
Birmingham.

MOLLY ST. JOHNSTON.
GLADYS E. STRANG.

Testing Opinion

SIR,—A plebiscite aimed at discovering the actual views of the profession is overdue. As matters now stand, those who have the greatest gifts of persuasive oratory sway meetings, and so cause a false impression of local unity to be sent to Headquarters. The average doctor is vocally un-demonstrative, but his opinion is none the less important. Let our leaders ascertain the viewpoint of us all by a carefully constructed, broadly based questionnaire. This is a truly democratic approach, and can only lead to strengthening the profession's hand in bringing pressure to bear on the Government.—I am, etc.,

Teignmouth.

GEORGE A. F. QUINNELL.

The Next Move

SIR,—I am writing to express my strong support of Dr. Richard I. Bodman's letter (*Supplement*, April 13, p. 207) urging an appeal to the law. There is nothing to lose, and it would at least, as he points out, provide an excellent opportunity of bringing our case more widely before the public and of exposing the underhand behaviour of the Government. It might also, perhaps, result in the legal enforcement of arbitration, and so provide an alternative way out of a situation which we all deplore but which has been none of our choosing.—I am, etc.,

Chichester.

BRIAN H. VAWDREY.

Item-of-service Payment

SIR,—In the present dissatisfied state of the medical profession it is often suggested that the National Health Service would be improved if it was based on an item-of-service remuneration, rather than a capitation system. There is, however, a serious danger in the "item-of-service" principle, in that the less discriminating, though sincere, members of the profession might be subtly encouraged to make more investigations than a given case would warrant, while the less scrupulous would do so in any case; for the dividing line between conscientious attention to a patient, and over-investigation of his case, is one which is easily crossed when it is to a doctor's advantage to do so.

The best practitioner is not necessarily the one with the largest number of items of service per patient, nor the one who is always up to date in the properties of the latest antibiotic, but the one who combines a good general knowledge of medicine with a great understanding of his fellow-creatures and their frailties, one who not only treats the sick, but by constructive advice also shows them how to keep well. In the course of time his practice will be freed from most of the trivial calls which are the bane of the present system, and he will also become instrumental in helping to construct a community which thinks more in terms of harmonious health than those of disease. It follows that, although he will be giving more of his time to each patient than the doctor who just issues a prescription and says, "Next, please," the total of his items of service will be considerably less.

It would therefore seem that the best practice of medicine would be encouraged in a capitation system where lists are limited to a maximum of, say, 2,500, giving a doctor sufficient time to devote to each patient. To make such a system economically sound while not encouraging large lists, the present arrangements could be modified so that the higher capitation rate after the first 500 would be extended to cover all those up to 2,000 instead of 1,500, while the

rate of the last 500 should be on a descending scale, coming down to a point somewhat lower than the rate for the first 500.

Although no system can be free from pitfalls, I think the above modifications would bring a considerable improvement into the present service, while still leaving a reasonable amount of scope for private practice, and would be more conducive to the practice of good medicine than an item-of-service system or a State-salaried service.—I am, etc.,

Slough, Bucks.

H. TUDOR EDMUNDS.

Mileage Fund

SIR,—While we are all very busy taking the Government to task for diplomatic wriggling or downright sharp practice I turn over my dossier referring to the allocation of mileage to rural practitioners collected over the last seven years, but indeed going back to National Health Insurance days. In my small scattered practice in 1950 I was getting £540 mileage per year. With the stroke of a pen this was reduced by £160—I became semi-rural, but the work and the expense remained the same. Since then has my expense remained the same? We all say it has not, hence our claims against the Government. But my claim is not against the Government, it is inside our profession. There must be a lot of disgruntled doctors like myself who would like a fairer share of that ghastly global sum, and who are not gunning for the Government.—I am, etc.,

Hexham.

RICHARD BELL.

Emergency Call Service

SIR,—Some little time ago the General Medical Services Committee expressed doubts on the legality of the Emergency Call Service which had been organized in the London area. Later the Committee issued a statement (*Supplement*, October 6, 1956, p. 147) that it was satisfied that such schemes did not run counter to the National Health Service Act and its regulations. In spite of this it would now appear that the G.M.S. Committee is intent on maintaining its dog-in-the-manger attitude by recommending (*Supplement*, April 20, p. 213) that our terms of service be amended so that a general practitioner would have to obtain the consent of the executive council to any standing deputizing arrangements for more than one week, instead of, as at present, merely informing it of such arrangements.

This hits at the very heart of the G.P.'s freedom to run his practice in whatever way he thinks fit while conforming to the regulations of the Service. If this recommendation is carried it would be difficult to exclude ordinary friendly rota systems lasting more than one week from the requirement of having to have the consent of the executive council. More rules and regulations would be made and, of course, we have to be complied with. It seems fantastic that our leaders should actually ask for our terms of service to be made more onerous—to the point of making us go cap in hand to the authorities for the right to organize our well-earned leisure-hours. I want to retain the right to inform the executive council that I shall be on holiday and have made the necessary locum arrangements for the period, and I trust that my fellow G.P.s feel the same way. I hope that the Annual Conference of Representatives of Local Medical Committees will turn down this thoroughly bad recommendation from the G.M.S. Committee.—I am, etc.,

Plymouth.

B. J. PECK.

Charge Dismissed

SIR,—A study of the smaller things in life will sometimes shed light on larger matters, and I submit that a careful perusal of your last issue will help us all to make up our minds on the grave principles and policies which we are discussing now.

You have, in the most admirable "dead-pan" way, printed some explosive material under the relatively innocuous heading "Overprescribing Charge Dismissed" (*Supplement*, May 11, p. 261), which refers to the accusations

against Dr. Katharina D. Dalton. Counsel for the Minister of Health, appealing against the local medical committee's dismissal of the charges, conceded that Dr. Dalton was neither extravagant nor reckless. "But," he said, "she diagnosed too many patients as suffering from premenstrual tension. . . ."

It is almost unnecessary to write more; where will these people stop? At present it looks as if they will stop when the Service is controlled hook, line, and sinker by the administrative side, and no nonsense about clinical responsibility from the medical side—one would be able no longer to refer to it as a profession. And yet the profession itself knows not its own mind when its "employer" breaks its word, and its leaders are satisfied by assurances from Ministers when the whole crisis has arisen because these same Ministers have broken previous assurances. Sir, one boggles! Thank God clinical work is a satisfying thing in itself; unfortunately my wife and children are unable to live on such insubstantial fare.—I am, etc.,

Bushey, Herts.

D. G. WILSON.

H.M. Forces

Major-General A. Sachs, C.B., C.B.E., R.A.M.C., T.A., has been appointed Honorary Colonel, 44 (H.C.) Infantry Division, R.A.M.C., in succession to Colonel (Honorary Brigadier) G. J. V. Crosby, C.B.E., T.D., whose tenure has expired.

Colonel W. H. Wolstenholme, O.B.E., T.D., R.A.M.C., T.A., has been appointed Honorary Surgeon to the Queen, in succession to Brigadier A. L. Crockford, C.B.E., D.S.O., M.C., T.D., who has been transferred to the T.A.R.O.

Colonel N. C. Oswald, T.D., R.A.M.C., T.A., has been appointed Honorary Physician to the Queen, in succession to Colonel F. R. Langmaid, O.B.E., T.D., who has been transferred to the T.A.R.O.

Air Commodore G. W. McAleer has been appointed Honorary Physician to the Queen in succession to Air Marshal Sir James MacC. Kilpatrick, K.B.E., C.B., who has retired from the R.A.F.

Colonel W. D. Hughes, C.B.E., Q.H.P., late R.A.M.C., has been appointed Commandant and Director of Studies, R.A.M. College, and has been granted the temporary rank of Major-General.

Captain F. A. S. Harris, R.A.M.C., has been awarded the Queen's Commendation for Brave Conduct in recognition of brave conduct in Tripoli.

ROYAL NAVY

Surgeon Commanders T. S. Osborne and G. M. Baird have retired.
Surgeon Lieutenant K. P. O'Byrne to be Surgeon Lieutenant-Commander.

REGULAR ARMY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel (Honorary Colonel) H. J. R. Thorne, D.S.O., having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers, retaining the honorary rank of Colonel.

Lieutenant-Colonel S. G. M. Lynch, having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers, retaining the rank of Lieutenant-Colonel.

Major I. MacPhail, from Active List, to be Major.
Captain (Honorary Major) V. G. Radcliffe has ceased to belong to the Reserve of Officers, retaining the honorary rank of Major.

Class III.—Captain (Honorary Major) C. E. Brown, having attained the age limit of liability to recall, has ceased to belong to the Reserve of Officers, retaining the honorary rank of Major.
Captain (Honorary Major) R. W. Doy, from Reserve of Officers, to be Captain (Honorary Major).
Captains (Acting Majors) P. Freedman and B. Nolan, from Army Emergency Reserve of Officers, National Service List, to be Captains, relinquishing the acting rank of Major.

ARMY EMERGENCY RESERVE OF OFFICERS

ROYAL ARMY MEDICAL CORPS

Major (Acting Lieutenant-Colonel) J. A. Simons has been granted the acting rank of Colonel.

Captain (Acting Major) G. Clementson, from Army Emergency Reserve of Officers, to be Captain, relinquishing the acting rank of Major.

Association Notices

ELECTION OF COUNCIL, 1957-8

The following are the results of the election of members of Council in those Groups where there were contests:

Group 1 (North of England and Tees-side Branches)

J. C. Arthur (Gateshead) ..	594	Elected
I. M. Jones (Sunderland) ..	508	Elected
J. W. Ridley (South Bank, Yorks) ..	316	
No. of voting papers issued ..	1,965	
No. returned ..	818	
Spoiled papers ..	4	

Group 12 (Divisions of Metropolitan Counties Branch in Middlesex)

W. Morgan Evans (Hounslow) ..	328	
A. N. Mathias (London, N.W.2) ..	394	Elected
J. B. W. Rowe (Harrow) ..	334	Elected
No. of voting papers issued ..	2,086	
No. returned ..	580	
Spoiled papers ..	9	

Group 14 (City, South-west Essex, Stratford, and Tower Hamlets Divisions)

D. G. Berry (London, E.9) ..	111	
J. A. Moody (Ilford, Essex) ..	242	Elected
No. of voting papers issued ..	1,005	
No. returned ..	357	
Spoiled papers ..	4	

Group 20 (Kent Branch)

A. Barker (Whitstable) ..	385	Elected
R. P. Liston (Tunbridge Wells) ..	158	
No. of voting papers issued ..	1,400	
No. returned ..	546	
Spoiled papers ..	3	

A. MACRAE,
Secretary.

The Council on May 8, under the authority given to it by By-law 62 (2), appointed W. B. Heywood-Waddington (Littlehampton) to fill the vacancy in Group 21 (Sussex Branch).

Diary of Central Meetings

MAY

21 Tues.	Amending Acts Committee, 2 p.m.
23 Thurs.	Central Consultants and Specialists Executive Committee, 10 a.m. and 2 p.m.
23 Thurs.	Central Ethical Committee, 10.30 a.m.
24 Fri.	Assistants and Young Practitioners Subcommittee, G.M.S. Committee, 2 p.m.
31 Fri.	S.R.M. Agenda Committee, 10.30 a.m.

Branch and Division Meetings to be Held

ALDERSHOT AND FARNHAM DIVISION.—At Northfield Hospital, Aldershot, Thursday, May 23, 8.30 p.m., special meeting. All medical practitioners in the area of the Division are invited.

BARNLEY DIVISION.—At Queen's Hotel, Barnsley, Monday, May 20, 8.30 p.m., meeting of all medical practitioners in the area of the Division.

BIRMINGHAM DIVISION.—At Botanical Gardens, Edgbaston, Birmingham, Thursday, May 23, 7.30 for 8 p.m., dinner; 9 p.m., annual dance.

BRADFORD DIVISION.—At Medical Societies' Room, Bradford Royal Infirmary, Wednesday, May 22, 8.30 p.m., special meeting of all medical practitioners in the area of the Division.

CITY DIVISION.—At Committee Room C, B.M.A. House, Tavistock Square, W.C., Tuesday, May 21, 8.30 p.m., annual general meeting. Dr. A. Talbot Rogers: "Controversial Issues in the N.H.S." Any B.M.A. Members, but especially those of St. Pancras Division, are invited, together with spouses or other guests.

CROYDON DIVISION.—At St. Peter's Hall, Ledbury Road, S. Croydon, Friday, May 24, 8.30 p.m., general meeting to be held in conjunction with Croydon Local Medical Committee. All medical practitioners in the area of the Division are invited.

DUMFRIES AND GALLOWAY DIVISION.—At Caley Hotel, Gatehouse of Fleet, Sunday, May 19, 3 p.m., annual general meeting. Address by Professor John Bruce: "Impressions of my Russian Visit, 1956." Members' wives and friends are invited.

KINGSTON-ON-THAMES DIVISION.—At Nurses' Home, Kingston Hospital, Wolverson Avenue, Kingston-on-Thames, Tuesday, May 21, 8.30 p.m., annual general meeting.

MAIDSTONE DIVISION.—At Old Barn, Sandling, near Maidstone, Wednesday, May 22, 8.30 p.m., clinical meeting. Dr. P. N. Swift: "The Acute Chest in the Child."

MANCHESTER DIVISION.—At the Fallowfield Hotel, Wilbraham Road, Manchester, Tuesday, May 21, 8.30 p.m., A.G.M.

NORTH MIDDLESEX DIVISION.—At Committee Room, North Middlesex Hospital, Silver Street, Edmonton, N., Tuesday, May 21, 8.45 p.m., annual general meeting.

NORTH STAFFS DIVISION.—At Grand Hotel, Hanley, Tuesday, May 21, supper meeting. Talk by Mr. B. S. Carter: "Deafness in the Pre-school Child."

OXFORD DIVISION.—At Ashurst Clinic, Littlemore, Oxford, Wednesday, May 22, 8.15 p.m., meeting. Symposium: "Preventive Psychiatry." Discussion to be opened by Dr. R. W. Armstrong.

SALISBURY DIVISION.—At Obstetric and Gynaecological Waiting-room, Salisbury General Hospital, Thursday, May 23, 8.30 p.m., annual general meeting, preceded by general meeting of all medical practitioners in the area of the Division.

SHEFFIELD DIVISION.—At General Lecture Theatre, No. 1, Sheffield University, Tuesday, May 21, 8 p.m., meeting of all medical practitioners in the area of the Division; 9 p.m., Divisional meeting.

SHROPSHIRE AND MID-WALES BRANCH.—At Board Room, Royal Salop Infirmary, Shrewsbury, Thursday, May 23, 8.30 p.m., joint meeting with Salop Local Medical Committee.

SOUTH STAFFS DIVISION.—At Medical Lecture Hut, Royal Hospital, Wolverhampton, Tuesday, May 21, 8.30 p.m., general meeting, jointly with Wolverhampton Local Medical Committee.

SOUTH WALES AND MONMOUTHSHIRE BRANCH.—At Gelli Aur (Golden Grove) Farm Institute, Carmarthenshire, Thursday, May 23, 3 p.m., social meeting for members and their ladies.

TROWBRIDGE DIVISION.—At Roundway Hospital, Devizes, Sunday, May 19, 11 a.m., annual general meeting.

WEST HERTS DIVISION.—At Crown Hotel, Garston, Wednesday, May 22, 8.30 p.m., annual general meeting.

WIGAN DIVISION.—At Lewis's Restaurant, Wallgate, Wigan, Friday, May 24, annual general meeting.

YORK DIVISION.—At York Medical Society's Rooms, 23, Stonegate, York, Saturday, May 25, 8 p.m., joint meeting with York Local Medical Committee, to which all medical practitioners in the area of the Division are invited, followed by annual general meeting for members only.

Meetings of Branches and Divisions

MOMBASA DIVISION

A meeting was held at the Pandya Memorial Clinic on March 14, 1957. Dr. Haynes was in the chair and 16 members were present. Dr. Rosenwald gave an address on "Co-operation Between the Public Health Department and the Medical Practitioner."

SOUTH-EASTERN COUNTIES DIVISION

A meeting was held at Peel Hospital on March 10, 1957. Dr. A. Y. Adam was in the chair, and 48 members were present. A resolution was passed by 47 votes to 1: "(1) That this Division views with grave concern the Government's decision to set up a Royal Commission to examine the remuneration of doctors in the National Health Service. (2) That the publication of the conclusions of such a Royal Commission is likely to be delayed for a matter of years, during which time the financial hardships of many members of the profession will remain unrelieved. (3) That the conclusions of the Royal Commission, whether favourable or unfavourable to the profession, would not exonerate the Government from honouring its present obligations to the profession, based on the Spens Report, by which both the profession and the Government are morally bound. (4) That this Division will support any decisions of the British Medical Association aimed at expediting the present just claims of the profession."

Corrections.—The solicitors to the Emergency Call Service have informed us that the references (*Supplement*, April 13, p. 166, and April 20, p. 213) to "an emergency call service organized on commercial lines in the London area," and to "deputizing arrangements . . . organized on a commercial basis," have led people to believe that the Emergency Call Service is a body carrying on business for profit. By its constitution the Emergency Call Service cannot distribute profits to its members, and any surplus profits not required for reserves must go to charity. We take this opportunity of expressing our regret for any inconvenience which our reference may have occasioned.

In the report of the Special Representative Meeting (*Supplement*, May 11, p. 249), Dr. R. P. Liston's motion reported under the heading "Deferment of Decision" as "That this Meeting invites Council to call meetings of all Divisions . . ." should read "That this Meeting instructs Council . . ." The motion on behalf of Tunbridge Wells under "Review of National Health Service" instructing Council to reinvestigate the introduction of an independent British Medical Service was moved by Dr. C. Glaisher and not Dr. R. P. Liston.

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

LONDON SATURDAY MAY 25 1957

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British Medical Association

SUPPLEMENTARY ANNUAL REPORT OF COUNCIL, 1956-7

Every member is asked to keep this Supplement, with the earlier ones of February 23 and April 13, until the subjects have been discussed by his Division

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PRELIMINARY

Service Representatives on the Council

243. The terms of office of the present representatives of the Army Medical Services and the Medical Branch of the Royal Air Force on the Council expire at the end of this session.

Recommendation: That the following be elected Representatives of the Army Medical Services and the Medical Branch of the Royal Air Force on the Council for the period 1957-60: the Royal Air Force on the Council for the period 1957-60: Army Medical Services: Major-General R. Murphy, C.B.E.; Medical Branch of the Royal Air Force: Air Vice-Marshal W. E. Barnes, C.B.E.

Representatives of the Association at Conferences of Other Bodies

244. The Council appointed the following to represent the Association at the conferences named: West German Medical Association Annual Meeting, June, 1957: the President (Dr. Alexander H. Hall); European League for Mental Hygiene Annual Meeting, Copenhagen, August, 1957: Dr. Doris Odum; Annual (Centenary) Meeting of the Danish Medical Association, Copenhagen, August, 1957: the President-Elect (Mr. Weldon P. T. Watts); Association of Public Health Inspectors Annual Conference, Eastbourne, September, 1957: Dr. K. O. A. Vickery.

Royal College of Midwives Building Appeal

245. The Council has made a donation of 245 guineas, payable under a seven-year covenant, to the Royal College of Midwives Building Appeal Fund.

COMPENSATION AND SUPERANNUATION

Compensation

(Continuation of para. 59 of Annual Report)

246. The Council has given further thought to the question of implementing resolutions 156, 157, and 158 of the A.R.M., 1956, in the light of the present situation with regard to the remuneration claim. The Council agreed that if the Representative Body decides that evidence is to be given to the Royal Commission there will no longer be any reason for deferring discussions on compensation. In that event, therefore, the Council will make immediate representations to the Minister of Health on the following points: (a) betterment of compensation; (b) increased rate of interest; (c) payment of compensation on demand; and (d) revision of criteria for advance payment on hardship grounds.

Attributable Illness

247. A memorandum dealing with the question of attributability in relation to the injury allowance payable under

the National Health Service (Superannuation) Regulations, 1955, is being prepared in connexion with the following resolution of the A.R.M., 1956:

301. **Resolved:** That the Council be asked to examine the question of attributable illness in reference to all members of the profession.

HOSPITAL AND CONSULTANT SERVICES

Geriatric Units: Treatment and Rehabilitation of Chronic Disablement

248. The Council has noted the following resolutions of the A.R.M., 1956, and will take appropriate action as opportunity permits:

288. **Resolved:** That while strongly supporting the views of the Association as incorporated in the recommendations of the Geriatric Joint Subcommittee, the Council be urged to keep these matters continually under review and to take further urgent action to seek to secure their implementation by the Ministry at an early date.

290. **Resolved:** That this Meeting considers that it is vitally important that there should be adequate geriatric consultants available in all areas.

Consideration has also been given to the following resolution of the A.R.M.:

291. **Resolved:** That the following motion be referred to the Council for consideration:

That this Meeting requests the Council to explore the possibility of the chronic sick and Part III accommodation being brought under the local health authority.

The Council considers it undesirable that hospital treatment of the chronic sick should be divorced from the hospital service, but reaffirms its view that there are considerable advantages in hospital beds for the chronic sick and Part III accommodation being in close proximity and sometimes in the same building, particularly in rural areas. This policy was advocated in paragraph 54 of the report of the Geriatric Joint Subcommittee, set out below, and in the view of the Council is the more practical way of dealing with the problem:

54. To serve the large number of "borderline" cases the establishment of joint-user institutions to be used together by regional hospital boards and welfare authorities is often advantageous: this avoids the unnecessary stress to the old people of moving into unfamiliar surroundings, and also eases staffing problems.

National Major Casualties Service

249. The Council has noted the following resolution of the A.R.M., 1956:

344. **Resolved:** That this Meeting considers that the Council should discuss with the Government the formation of a major "casualties service" covering the whole country, with special reference to the position of medical practitioners.

In 1954 the Ministry advised hospital boards of the desirability of formulating plans to deal with major casualties, such as those which might arise from air or railway disasters, and reports received from Regional Consultants and Specialists Committees indicate that in most areas such plans have been made on a hospital group and regional basis.

The Ministry has been asked whether it is satisfied that the scheme prepared by hospital authorities provides adequately for co-ordination with adjoining authorities, with general practitioners, and with other services, such as ambulance, police, and fire services.

Closure or Change of User of Hospitals

250. Instances still occur of hospital boards proceeding with plans for closing or changing the user of a hospital without making it apparent that they are prepared to give due weight to the views of the profession and the local community. The Ministry has accordingly been asked to remind hospital boards of the advice given to them in 1949 in Circular R.H.B. 49/132, and in particular of the necessity for early consultation with the profession, and of the wisdom of holding an open meeting at which the public could be

given an explanation of the proposals and an opportunity of expressing their views.

OCCUPATIONAL HEALTH

Short Postgraduate Courses in Occupational Health

(Continuation of para. 111 of Annual Report)

251. The Council has approved a memorandum on this subject drawn up by the Occupational Health Committee (see Appendix VII) and has forwarded it to the Government departments concerned, with a view to discussion on the implementation of the proposals in the document.

Certificates for Short Illnesses

(Continuation of para. 115 of Annual Report)

252. The Council has considered the replies from the bodies approached in connexion with Minute 72 of the A.R.M., 1956. It seems clear that the employers' side of industry is sympathetic to the Association's views on the abolition of medical certificates for short illnesses and is endeavouring to meet the situation so far as practicable. However, in general, these certificates are required to cover sickness payment and paid holiday benefit and not merely for record purposes. It has been decided to inform the Trades Union Congress of the observations received from the employers' side and to invite its comments.

Conference of Advisory Councils on Occupational Health

(Continuation of para. 120 of Annual Report)

253. Resolutions on the subject of "The Employment of Disabled Persons in Industry" passed at the Conference of Advisory Councils on Occupational Health, held at B.M.A. House on April 9, have been forwarded to the Ministries of Health, Labour and National Service, and Pensions and National Insurance, to the British Employers' Confederation, and to the Trades Union Congress. The Council has agreed that the Association shall again act as host for the next Conference, which will be held in the spring of 1958.

ARBITRATION MACHINERY

254. The Council has considered the following resolution of the A.R.M., 1956:

327. **Resolved:** That further efforts be made to secure a more satisfactory alternative to the Industrial Court as a means of settling disputes by arbitration.

The Industrial Disputes Tribunal does not at present provide an alternative to the Industrial Court for professional organizations which are not constituted as trade unions. The amendment of the Industrial Disputes Order, under which the Industrial Disputes Tribunal is constituted, is now under consideration by the Ministry of Labour and National Service, and representations have been made to the Ministry with a view to the inclusion of the Association among the bodies to be consulted in any review of the existing arrangements.

PUBLIC HEALTH

Remuneration of Public Health Medical Officers

(Continuation of para. 122 of Annual Report)

255. By the beginning of May, all except four of the local authorities in the United Kingdom had notified implementation of the agreement in Committee C on the remuneration of public health medical officers from April 1, 1956.

Remuneration for Part-time Work for Local Authorities in England and Wales

(Continuation of para. 125 of Annual Report)

256. By the beginning of May, 140 out of the 145 local health authorities in England and Wales (96.5%) had notified full implementation of the agreement in Committee C on the above subject. The Council has decided that advertisements

shall not be accepted for publication in the *British Medical Journal* after the end of April from authorities which have not fully accepted and implemented this agreement.

Integration of the Preventive Medical Service with the Hospital Service

(Continuation of para. 127 of Annual Report)

257. The views of the Council on the appointment of public health medical officers as honorary consultants on hospital staffs and as members of hospital medical advisory committees have been forwarded to the Ministry of Health. Under the agreed constitution of the Joint Consultants Committee, it was necessary to consult with that Committee before communicating with the Ministry of Health on this matter and the Council regrets that, in the meantime, the Minister reached a decision not to adopt the recommendation of the Guillebaud Committee on the matter.

Notification of Infectious Diseases

(Continuation of para. 131 of Annual Report)

258. A statement of suggestions for the revision of the legislation concerning the notification of infectious diseases has been received from the Society of Medical Officers of Health. The Council regrets the delay in action on the resolution relating to the subject which was passed by the A.R.M., 1955, but, knowing that the Society has had the matter under review for some time, it felt that the Society's appointment of a special Subcommittee of the Public Health Committee to consider and report on the whole question of infectious diseases, the resolution of the A.R.M., 1955, and the statement from the Society of Medical Officers of Health.

Annual Leave for Public Health Medical Officers

(Continuation of para. 137 of Annual Report)

259. The Staff Side of Committee C has reported that it does not regard the present as an opportune time to raise with the Management Side the question of revising the agreement on annual leave for public health medical officers. The Council has accepted the view of the Staff Side and considers it undesirable to press at this stage the matter raised in resolution 78 of the A.R.M., 1956.

Whitley Appeals Supported by the Association

260. Eleven Whitley Appeals have been lodged by public health medical officers during the past year with the support of the Association. Five were successful and none was lost, although one was ruled to be outside the proper scope of the Whitley Appeals machinery. Another appeal was withdrawn after being notified for hearing at the regional level as the aggrieved medical officer had been offered by his employing authority, and had accepted, a considerable increase in salary. At May 9, four appeals were still under consideration.

Status of Chief Public Health Inspectors

261. Representatives of the Association were appointed to co-operate with representatives of the Society of Medical Officers of Health in informal discussions with the Ministry of Health on the implications of the granting of chief officer status to chief public health inspectors. The question arose from a decision of one county borough council to make the public health inspector in charge department, with the chief public health committee for all duties directly responsible to the health committee for all duties performed by the inspectorate. The Ministry has agreed to take the matter up with the local authority concerned.

Subsistence Allowances for Public Health Medical Officers in England and Wales

262. The Council has received a report of the agreement in Committee C on increased rates of subsistence allowances,

etc., for public health medical officers. These increases were operative from April 1, 1956. Negotiations are still proceeding with a view to a national agreement in Scotland on subsistence and car allowances.

Sick Pay Schemes for Public Health Medical Officers

263. The Council has also received a report of the agreement in Committee C on revised sick pay schemes for public health medical officers in England, Wales, and Scotland. These were promulgated in letters sent to all local authorities in the autumn of 1956.

Appointment of Medical Officers of Health without Advertisement

(Continuation of para. 128 of Annual Report)

264. The Ministry of Health has indicated that, as the ultimate responsibility for the appointment of a medical officer of health rests with the local authority, the Minister could not properly undertake to consult a second body before reaching a decision on an application from a local authority to dispense with the requirement that the post should be advertised. However, the Minister is willing to keep the Association informed of the few instances where he dispenses with the requirement of public advertisement.

With regard to the specific instances raised with the Ministry where there was no public advertisement of mixed appointments as medical officer of health of a Metropolitan Borough and L.C.C. divisional medical officer, the Ministry explained that as it was suitable in arrangements of this kind to appoint an officer already in the service of one of the authorities concerned, no useful purpose would be served in such cases in seeking a wider selection of candidates.

The Council considers that, in accordance with the policy of the Association and in the interests of all concerned, medical officers over the whole country should be aware when any appointment in the public health service falls vacant and should be given an opportunity to apply. It has been pointed out to the Ministry that the Association is concerned not only because notification of the vacant M.O.H. appointments in London were limited to medical officers of the L.C.C., but were further restricted to one particular grade of such officers. These were not cases where a whole-time officer of one authority was taking over as part of his whole-time duties an appointment with another authority. New whole-time mixed appointments were being made and there seems no reason why they should not have been publicly advertised. The Ministry has been informed of the Council's views and has been asked to give further consideration to the Association's representations, having regard to the fact that in such matters it is the accepted principle that there shall be consultation with interested parties before a decision is reached.

Draft Ministry of Health Circulars on Diphtheria and Whooping-cough Immunization and Poliomyelitis Vaccination

265. The Ministry of Health requested observations on draft circular letters to local health authorities dealing with the above subjects. The circular about diphtheria and whooping-cough immunization referred to the advice which the Minister had received from the Central Health Services Council on the procedure which could be recommended for immunization against these diseases under the N.H.S. Act, following the publication of a report by the Committee of the Medical Research Council on Inoculation Procedures and Neurological Lesions. The view expressed to the Ministry on behalf of the Association was that undue emphasis was being laid on the minute risk of provoking poliomyelitis in using antigens in combination, and it was pointed out that this minute risk will be further reduced as the programme of immunization against poliomyelitis proceeds. It was suggested that the circular could have an unfortunate adverse effect on the diphtheria immunization campaign at a time when it was vitally important that the

prophylaxis of this and other diseases should proceed as widely as possible. The Ministry was advised to lay greater stress on the fact that local health authorities, on the advice of their medical officer of health, should make their own decision on the use or otherwise of combined antigens, and it was suggested that, in all the circumstances, it would be premature to issue the circular at this stage pending further consideration of the matter.

The circular on poliomyelitis vaccination outlined the proposals for the next stage in the Government's programme. The Ministry was informed that the Association considers it undesirable to announce plans for further stages in the poliomyelitis vaccination scheme until the end of the present stage is in sight. It was recommended that, in the meantime, special and immediate provision should be made for vaccinating those with a special risk—for example, persons going abroad.

MEDICAL ETHICS

"Ethical Code Relating to Consultations and Cognate Matters"

(Continuation of para. 141 of Annual Report)

266. The Council has completed its revision of "Ethical Rules Relating to Consultations and Other Matters" and submits the revised version in Appendix VIII. The following are the principal alterations:

Title

The title has been amended to "Ethical Code Relating to Consultations and Cognate Matters." Reference is made immediately after the heading to the ultimate responsibility of individual practitioners for their actions.

Medical Consultations in Practice

Para. 1. The following sentence has been added at the end of this paragraph: "In domiciliary consultations it is desirable that both practitioners should meet and in other circumstances similar arrangements should obtain wherever practicable."

Para. 6. The following words formerly appeared at the end of this paragraph: "He may give to the patient or to the patient's representatives such information as he judges appropriate to the position." These have now been replaced by the following: "He should exercise great discretion as to the information he gives to the patient or the patient's representatives and, in particular, he should not disclose to the patient any details of any medications which he has advised."

Para. 8. This paragraph formerly stated: "Except in emergency the arrangements for any future or other consultation or additional investigation shall be left to the initiative of the attending practitioner." The following new wording has been introduced: "Arrangements for any future consultations or additional investigation should be effected only with the foreknowledge and co-operation of the attending practitioner."

Other Intraprofessional Obligations

Para. 2. This section now includes the following statement: "Under the Code of Ethics of the profession a practitioner ought not to accept as his patient (except with the consent of the colleague concerned) . . . any patient or member of the patient's household whom he has attended within the previous two years in the capacity of assistant or locum tenens." The period formerly stated was five years. The Council takes the view that in the event of an assistant or locum tenent himself being appointed as successor to the practice, as principal he then becomes the "colleague concerned."

Guidance for Professional Conduct in Relation to Dentists

Agreement has been reached with the British Dental Association on the following changes:

New Paragraphs

"(3) Where the dentist has reason to believe that the patient has some constitutional disorder and considers some major dental procedure is necessary he should consult the patient's doctor before carrying out such treatment."

"(4) Where there is a conflict of opinion between a doctor and dentist concerning the diagnosis and/or treatment of the condition of a patient they should consult with each other to reach an agreement which is satisfactory to both."

"Where the conflict of opinion remains unresolved the patient should be so informed and invited to choose one of the alternatives or assisted to obtain other professional advice."

Old Paragraph deleted

"(3) Where for any reason the patient's doctor considers that the patient should be sent to a dentist other than his own or where a further dental opinion is sought the patient's usual dentist should be informed."

"Note: Apart from simple dental treatment—i.e., in the presence of a dental condition which might affect the general health of the patient or necessitate a major dental operation—the dentist should consult the patient's doctor before carrying out such treatment."

Recommendation: That the Revised "Ethical Code Relating to Consultations and Cognate Matters" be approved.

PRIVATE PRACTICE

Drugs for Private Patients

(Continuation of para. 142 of Annual Report)

267. In view of the changing circumstances since the publication of the Annual Report, the Council has decided that now is an appropriate time to initiate discussions with officers of the Ministry on the four points referred to in paragraph 142. The Minister is to be informed that the Council wishes to take advantage of his offer to initiate such discussions, on the understanding that they are on an exploratory basis.

In the selection of the Association's representatives for the talks with the Minister's officers, due regard will be paid to the instruction contained in Minute 55 of the A.R.M., 1956.

List of Fees

268. The Council has considered the following resolution of the A.R.M., 1956:

350. **Resolved:** That a small booklet, listing briefly all statutory, agreed or recommended "item-of-service" fees, be made available, for issue on request to any members of the Association.

The Council appreciates that a booklet listing fees for various services would, when first issued, be a useful addition to the Association's publications. Unfortunately, the continual revision of such fees would probably make the booklet valueless in a comparatively short time. This difficulty is already seen in the *Medical Practitioners' Handbook*, which, incidentally, contains a fairly comprehensive list of statutory, agreed, and "item-of-service" fees, as does the *Year Book*. Added to this is the need for economy; a separate booklet giving information on fees additional to that which may be found in the *Medical Practitioners' Handbook* and the *Year Book* would not be cheap to produce. In any case, as new fees are negotiated details are published in the *Supplement to the British Medical Journal* and information on individual agreements is already readily available on application to the Office. The Council has therefore decided not to publish a booklet such as that referred to in the above resolution.

Remuneration Claim—Support for N.H.S. Practitioners

269. There will undoubtedly be a number of private practitioners who will wish to give some financial support to N.H.S. practitioners in their dispute with the Government over remuneration. In the report of the proceedings of the Private Practice Committee in the *Supplement to the British Medical Journal* of May 4, 1957, attention was therefore drawn to the fact that it is open to all members of the profession, whether engaged in the N.H.S. or not, to provide such support.

Examinations for the British Red Cross Society and St. John Ambulance Association

270. The Council has decided not to seek an increase in the examination fees now paid by the British Red Cross Society and St. John Ambulance Association. Regarded solely as remuneration, the fees are inadequate, but in the opinion of the Council the payment made should be looked upon as an honorarium and not as remuneration.

Domiciliary Visits for Ministry of Pensions and National Insurance

271. As a result of representations made by the Council the Ministry of Pensions and National Insurance has agreed to pay half the normal fee for an abortive domiciliary visit.

Remuneration of Approved School Medical Officers

272. A scale for the remuneration of medical officers of approved schools on a capitation basis was agreed with the Home Office in 1949. In 1956 an increase in each step in this scale was requested by the Council. Subsequently the department decided to dispense with the capitation method and to adopt the scale for establishments maintained by local authorities which was approved in December, 1956, by the Committee B of the Medical Whitley Council. The Home Office has advised managers of approved schools that the new arrangements should be introduced as from January 1, 1957, or whichever later date may be convenient.

Admiralty Surgeons and Agents

273. At the request of the Council the Admiralty has revised the scale of fees for Admiralty Surgeons and Agents. The department's proposals have been approved and the increases will come into effect very shortly.

Increases in Fees

274. The following increases have been obtained as from February 1, 1957, in fees for medical examinations and reports on prospective employees for the authorities named: (a) Ordnance Survey Office, 12s. 6d. to £1 17s. 6d. (b) Home Office Probation Division, £1 5s. to £1 17s. 6d. (c) U.K. Atomic Energy Authority, £1 5s. to £1 17s. 6d. (d) Ministry of Supply, £1 5s. to £1 17s. 6d. (e) National Coal Board, £1 5s. to £1 17s. 6d. The Treasury has confirmed that the £1 5s. to £1 17s. 6d. The Treasury has confirmed that the examination of prisoners for fitness for Borstal, preventive detention, or corrective training. In a single case only the fee will be 15s. except when the examination and report are of particular intricacy or take an unusual length of time, when it will be within the range of £1 5s. to £2 2s. The old daily maximum of £3 15s. has now been removed.

Family Planning Association Sessional Fees

275. Following representations by the Council, the Family Planning Association has advised its local branches to adopt the "local authorities" sessional scale which came into effect as from January 1, 1957.

FINANCE

276. The Balance Sheet and Income and Expenditure Account for the year 1956, as audited by Messrs. Price, Waterhouse and Co., appear as an Appendix to this Report (Appendix IX).

ESTATES

277. After protracted negotiations and material revision of the original plans submitted, the Council has obtained town-planning consent of the London County Council to the Burton Street project.

The new plans envisage a building of a basement and four stories, the top floor set back in order to conform with the daylight code of the local authority. Office and storage accommodation of over 20,000 sq. ft. will be available, and major alterations to the garage block will be made, which will improve the amenities of the building generally, and, in particular, provide better car-parking facilities.

The Council has carefully considered the financial implications of the proposed building, and professional advice has been taken in regard to costs and the probable rental income from the accommodation available for letting. It is esti-

mated that the cost of a building for which planning consent has been received will be between £170,000 and £200,000, and the rental income will give the Association a return of over 6½%, before deduction of tax.

Approval in principle has been given by the Council to a scheme proposed by the Estates Committee which will make it possible for the building operations to be financed without throwing undue liability upon the day-to-day revenue of the Association and without diminishing the liquid reserves which, the Council has decided, should be held to meet any unforeseen emergency.

After vacant possession has been obtained of the remaining flats in the houses still occupied, the development of the Burton Street site will proceed on the plans approved. It is anticipated that the building will be completed by the later months of 1959.

SCIENCE

Association Scholarships

278. The following research scholarships, tenable for one year from October 1, 1957, have been awarded:

Ernest Hart Memorial Scholarship (£300).—Martin Avigdor Birnstingl, St. Bartholomew's Hospital, London, for research in the following subject: The pathological anatomy of the pancreatic ducts, with particular reference to the aetiology of chronic pancreatitis.

Walter Dixon Memorial Scholarship (£300).—Emanuel Tuckman, St. Mary Cray, Kent, for research into acute gastrointestinal disease as met with in general practice, including a study of the clinical features, of the value of treatment in individual patients, and also its value in the epidemiological control.

Four Ordinary Research Scholarships (£200).—Cyril Walter Crane, Surbiton, Surrey. To establish whether the negative nitrogen balance with hypoalbuminaemia often seen in steatorrhoea and other types of malabsorption is due to the failure of either (1) the breakdown of ingested protein or (2) the absorption of amino-acids from the gut.

Georges Henry Jantet, St. Thomas's Hospital, London. To continue with the Surgical Unit of St. Thomas's Hospital the investigation of the role and state of the lymphatics in different diseases.

Charles Roland Leeson, Cardiff, for research into the histochemistry and fine structure (electron microscopy) of salivary glands under physiological and experimental conditions.

Thomas Sydney Leeson, Cardiff, for research into the fine structure of the developing kidney of the rabbit.

Insale Memorial Scholarship (£250).—Pamela Jewell, London, for research into the cultivation of the *Treponema pallidum*, with a view to studying the host-parasite relationship and the action of antibiotics on the organism.

ORGANIZATION

Membership of Council—Vacancies

(Continuation of para. 196 of Annual Report)

279. Paragraph 196 covers a recommendation by the Council in respect of a vacancy arising among the "13" members of Council by reason of the appointment of one of them to the Chair.

A further point has occupied the attention of the Council—namely, the situation which would arise in the event of a "casual" vacancy occurring among the "13." As the By-laws now stand the filling of such a vacancy would involve the calling of a Special Representative Meeting for the purpose of the election—a cumbersome and expensive procedure. Various alternative methods of simplifying the procedure have been explored and the most satisfactory of these appears to be that nominations should be sought and the election be conducted by postal vote. In the framing of the necessary alterations of the By-laws to give effect to this proposal, further anomalies in connexion with the filling of casual vacancies among the "13" and other groups of members of Council elected by the Representative Body have been revealed. Accordingly, counsel has been consulted and he proposes that in order to regularize the whole position the By-laws should be so amended as to provide that the procedure for filling the vacancies should be such as "shall be prescribed by the Representative Body," leaving

the details of the procedure to be covered, as is now customary, in the Standing Orders of the Representative Body. This proposal has been accepted by the Council and the necessary amendments of the By-laws and Representative Body Standing Orders have been prepared by counsel. The Council recommends:

Recommendation: That the By-laws should be so amended as to provide that any election for the purpose of filling a casual vacancy arising among the members of the Council elected by the Representative Body shall be in manner prescribed by that Body; and that the Standing Orders of the Representative Body be so modified as to provide that the election shall be conducted by postal vote.

(The necessary amendments of the By-laws and Representative Body Standing Orders are contained in Appendix X.)

S. WAND,
Chairman of Council.

APPENDIX IIA

RESOLUTIONS OF A.R.M., 1956—SUMMARY OF ACTION TAKEN

Compensation and Superannuation

Subject	Action Taken
Advance payment of compensation and increase of rate of interest (Mins. 156, 157, and 158).	Representations to be made to the Minister of Health if the Association decides to give evidence to the Royal Commission. (Para. 246.)
Attributable illness (Min. 301).	A memorandum is being prepared. (Para. 247.)

Hospital and Consultant Services

Geriatric units: treatment and rehabilitation of chronic disablement (Mins. 288, 290, and 291).	Council will take appropriate action on A.R.M. Minutes 288 and 290 as opportunity permits. With regard to Min. 291 Council reaffirms its policy that hospital beds for the chronic sick and Part III accommodation should be in close proximity. (Para. 248.)
National major casualties service (Min. 344).	Ministry has been asked whether hospital board plans for dealing with major casualties provide adequately for co-ordination with adjoining areas, with general practitioners, and with police, fire, and other services. (Para. 249.)

Occupational Health

Certificates for short illnesses (Min. 72).	The employers' side of industry appears to be willing to co-operate so far as practicable. Comments of Trades Union Congress now being sought. (Para. 252.)
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Arbitration Machinery

Improved arbitration machinery (Min. 327).	Council has sought opportunity of consultation on amendment of Industrial Disputes Order. (Para. 254.)
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Public Health

Annual leave for public health medical officers (Min. 78).	After consultation with the Staff Side of Committee C, the Council considers it would be inopportune to raise the matter at this stage. (Para. 259.)
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Private Practice

Statutory and "item-of-service" fees (Min. 350).	Council is satisfied that publication of a booklet is inadvisable. (Para. 268.)
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APPENDIX VII

SHORT POSTGRADUATE COURSES IN OCCUPATIONAL HEALTH

Report by Occupational Health Committee

1. A considerable expansion of the occupational health service is highly desirable and may well come about in the relatively near future. It seems clear that any major expansion of the service, particularly for smaller establishments, will have to be provided to a large extent by general practitioners. Adequate facilities should therefore be available for general practitioners holding part-time occupational health appointments, or about to take up such appointments, to take short postgraduate courses. Such courses should not, and indeed could not, replace the full postgraduate course leading to a Diploma in Industrial Health.

2. The type of postgraduate instruction in occupational health most likely to be helpful to general practitioners is an intensive course of one or two weeks. Experience has shown that there is both a need and a demand for courses of this kind, but the expense involved in attendance remains a considerable problem. Not only has the general practitioner to pay the fee for the course but he has also to provide a locumtenent for his practice. Having regard to the interest of the Government in the establishment of a comprehensive occupational health service, it is considered that Government grants should be made available for general practitioners to undertake occupational health courses, in the same way that grants for refresher courses are allowed to general practitioners under the National Health Service Acts. These grants should cover the course fee, reasonable travelling and subsistence expenses, and payment towards the cost of a locumtenent.

3. As alternatives to an intensive course of a week or a fortnight, courses could be arranged of one half-day per week, or three or four week-ends, during a term. While courses of this character would to a large extent overcome the present financial obstacles to attendance, they cannot be considered to be as satisfactory as short intensive courses. Courses covering several week-ends would impose a heavy strain on teaching staff.

4. Suggestions regarding the content and teaching methods for short courses are set out below:

Duration 1-2 Weeks; Students 8-12

A. Objects.—To introduce doctors to medical work in industry so that they may use the time they devote to this work to the best advantage. In the one or two weeks available it is possible to give the newcomer a general idea of a doctor's work in industry. Techniques alone are not enough; an effort should be made to provide an essential background to the subject. In particular the opportunities for preventive work should be stressed.

B. Content.—The following general subjects are suggested: (1) Orientation: The aims of an occupational health service and its relation to the National Health Service and to other social services in the community. (2) The Factory: Its functions, its organization, its management, and its personnel. The place of the doctor. The legal requirements for health, safety, and welfare. How to examine the working environment and assess working conditions, in co-operation with other experts. Other places of work will be dealt with similarly. (3) Treatment at the place of work: Its nature and extent and the organizational and training problems involved. Accommodation and equipment. (4) The nurse's work in industry. (5) Medical examinations; their purpose and content. (6) Records: what to keep and how to keep them; their purpose and value. (7) Accidents in industry—industrial safety. (8) The principles of the prevention of industrial disease illustrated in detail from local industries. (9) Skin disease in industry. (10) The care of special working groups—that is, young people, women, the elderly. (11) The placement of the handicapped; the working of the Disabled Persons Employment Act. (12) Clinical lectures on common diseases designed to emphasize the place of work in their management—that is, coronary disease, peptic ulcer, epilepsy, diabetes, etc. (13) Sources of information—people, organizations, and literature.

C. Method.—(1) Lectures with questions and discussion. (2) An occasional seminar if the composition of the class warrants it—that is, if it contains enough men with some experience of industrial medicine. (3) Demonstrations—safety and rescue appliances. (4) Visits: These should be specially selected and compliances. (5) Dis- visits should be planned to illustrate specific subjects. (6) Discussions (perhaps at places of work) with works manager, personnel manager, shop steward, if suitable people are available.

D. Personnel.—Initially these courses should be organized by the heads of departments of industrial health in Glasgow, London, Manchester, and Newcastle. The following may be asked to assist in the teaching: (1) experienced industrial medical officers; (2) factory inspectors; (3) certain clinical teachers; and (4) others in the area (including laymen) whom the course organizer regards as having a special contribution to make.

APPENDIX VIII

ETHICAL CODE RELATING TO CONSULTATIONS AND COGNATE MATTERS

Ultimate responsibility in all these matters rests with the individual concerned, but practitioners finding themselves in any difficulty in deciding upon their course of action, or in doubt as to the safeguards necessary, are advised to seek guidance from the Secretary of the Association. Anyone departing from this code must be prepared, if challenged, to answer for his conduct before a professional tribunal.

I. Medical Consultations in Practice

1. A practitioner consulted is a practitioner who, with the acquiescence of the practitioner already in attendance, examines a patient under this practitioner's care and, either at a meeting of the two practitioners or by correspondence, co-operates in the formulation of diagnosis, prognosis, and treatment of the case. The term "consultation" means such a co-operation between practitioners. In domiciliary consultations it is desirable that both practitioners should meet and in other circumstances similar arrangements should obtain wherever practicable.

2. It is the duty of an attending practitioner to propose a consultation where indicated, or to acquiesce in any reasonable request for consultation expressed by the patient or his representatives.

3. The attending practitioner should nominate the practitioner to be consulted, and should advise accordingly, but he should not unreasonably refuse to meet a registered medical practitioner selected by the patient or by the patient's representatives, although he is entitled, if such is his opinion, to urge that the practitioner selected has not the qualifications or the experience demanded by the particular requirements of the case.

4. The arrangements for consultation should be made or initiated by the attending practitioner. The attending practitioner should ascertain in advance the amount of the fee, if any, to be paid to the practitioner consulted, and should inform the patient or his representatives that this should be paid at the time of the consultation.

5. In cases where the consultant and the attending practitioner meet and personally examine the patient together, the following procedure is generally adopted and should be observed, unless in any particular instance there is substantial reason for departing from it: (a) All parties meeting in consultation should be punctual, and if the attending practitioner fails to keep the appointment the patient, consulted, after a reasonable time, may examine the patient, and should communicate his conclusions to the attending practitioner in writing and in a sealed envelope. (b) If the consultation takes place at the patient's residence, the attending practitioner should, on entering the room of the patient, precede the practitioner consulted, and after the examination the attending practitioner should be the last to

leave the room. (c) The diagnosis, prognosis, and treatment should be discussed by the practitioner consulted and the attending practitioner in private. (d) The opinion on the case and the treatment as agreed should be communicated to the patient or the patient's representatives where practicable by the practitioner consulted in the presence of the attending practitioner. (e) It is the duty of the attending practitioner loyally to carry out the measures agreed at, or after the consultation. He should refrain from making any radical alteration in these measures except upon urgent grounds or after adequate trial.

6. If for any reason the practitioner consulted and the attending practitioner cannot examine the patient together, the attending practitioner should send to the practitioner consulted a brief history of the case. After examining the patient, the practitioner consulted should forward his opinion, together with any advice as to treatment, in a sealed envelope addressed to the attending practitioner. He should exercise great discretion as to the information he gives to the patient or the patient's representatives and, in particular, he should not disclose to the patient any details of any medicaments which he has advised.

In cases where the attending practitioner accepts the opinion and advice of the practitioner consulted he should carry out the measures which have been agreed between them; where, however, the attending practitioner finds he is in disagreement with the opinion and advice of the practitioner consulted he should by suitable means communicate his disagreement to the practitioner consulted.

7. Should the practitioner consulted and the attending practitioner hold divergent views, either on the diagnosis or on the treatment of the case, and should the attending practitioner be unwilling to pursue the course of action advised by the practitioner consulted, this difference of opinion should be communicated to the patient or his representatives by the practitioner consulted and the attending practitioner jointly, and the patient or his representatives should then be advised either to choose one or other of the suggested alternatives or to obtain further professional advice.

Note.—In the following circumstances it is especially desirable that the attending practitioner should endeavour to secure consultation with a colleague: (a) When the propriety has to be considered of performing an operation or of adopting some course of treatment which may involve considerable risk to the life of the patient or may permanently prejudice his activities or capacities and particularly when the condition which it is sought to relieve by this treatment is not itself dangerous to life; (b) when any procedure likely to result in death of a foetus or of an unborn child is contemplated, especially if labour has not commenced; (c) when continued administration of any drug of addiction is deemed desirable for the relief of symptoms of addiction; (d) when there is reason to suspect that the patient (1) has been subjected to an illegal operation, or (2) is the victim of criminal poisoning or criminal assault.

8. Arrangements for any future consultation or additional investigation should be effected only with the foreknowledge and co-operation of the attending practitioner.

9. The practitioner consulted shall not attempt to secure for himself the care of a patient seen in consultation. It is his duty to avoid any word or action which might disturb the confidence of the patient in the attending practitioner. The practitioner consulted should not communicate with the patient or the patient's representatives subsequent to the consultation except with the consent of the attending practitioner.

10. The attending practitioner should carefully avoid any remark disparaging the skill or judgment of the practitioner consulted.

11. Except by mutual consent the practitioner consulted shall not supersede the attending practitioner during the illness with which the consultation was concerned (see also Section II).

Financial Statement

Balance Sheet—December 31, 1956

	1956 £	1955 £
Accumulated Fund:		
Balance at January 1, 1956	635,711	617,543
<i>Add:</i> Provisions of prior years no longer required:		
Taxation	5,557	3,573
Stock Depreciation	—	3,000
Surplus for year (in 1955, after transferring £30,000 to General Reserve)	8,458	11,595
Balance at December 31, 1956	649,726	635,711
General Reserve	30,000	30,000
Reserve for future taxation	1,024	15,115
Current Liabilities and Provisions:		
Amounts and accrued expenses	81,081	53,038
1957 subscriptions (including Current Taxation)	63,759	69,507
Provisions towards:	21,006	1,818
Dilapidations and redecoration of premises	22,194	28,506
Pensions	12,312	10,373
Cost of Joint Annual Meeting, 1959	10,000	5,000
Special Legal Costs	5,000	—
	215,352	173,236
	<u>£896,102</u>	<u>£854,062</u>
		S. WAND, Chairman of Council.
		L. DOUGAL CALLANDER, Treasurer.

Notes:—(1) The Association is a company limited by guarantee, the liability of members being limited (except as provided in paragraph 6 of the Memorandum of Association) to one guinea each.
(2) The Association has entered into contracts for capital expenditure on premises under which £7,400 will become payable.

L. DOUGAL CALLANDER, Treasurer.

ended on that date.

In our opinion the above balance sheet and the annexed income and expenditure account give a true and fair view of the state of the Association's affairs as at December 31, 1956, and of its income and expenditure for the year with them and with the said information and explanations which we considered necessary. In our opinion the Association has kept proper books and received proper branch returns, and the said accounts, which are in agreement with them and with the said information and explanations, give in the prescribed manner the information required by the Companies Act, 1948.

PRICE WATERHOUSE & CO.,
Chartered Accountants.

S. WAND, Chairman of Council.

AUDITORS' REPORT TO THE MEMBERS OF THE BRITISH MEDICAL ASSOCIATION
We have obtained all the information and explanations which we considered necessary. In our opinion the Association has kept proper books and received proper branch returns, and the said accounts, which are in agreement with them and with the said information and explanations, give in the prescribed manner the information required by the Companies Act, 1948.

ANGUS MACRAE, Secretary.

S. WAND, Chairman of Council.

AUDITORS' REPORT TO THE MEMBERS OF THE BRITISH MEDICAL ASSOCIATION
We have obtained all the information and explanations which we considered necessary. In our opinion the Association has kept proper books and received proper branch returns, and the said accounts, which are in agreement with them and with the said information and explanations, give in the prescribed manner the information required by the Companies Act, 1948.

ANGUS MACRAE, Secretary.

Income and Expenditure Account for the Year ended December 31, 1956

	1956 £	1955 £
Secretarial and Financial Departments	126,277	114,774
Medical Practices Advisory Bureau	12,068	11,657
Library	13,704	11,616
Public Relations	12,632	6,748
Empire Medical Advisory Bureau and International Medical Visitors Bureau	7,533	7,013
Film Library	1,135	1,009
Scottish Offices	18,490	15,880
Regional Offices	15,119	13,185
Central Meetings Expenses	2,005,888	1,818,882
Capitation Grants	22,225	20,402
Scholarships, Prizes, and Lectures	14,582	13,777
Subscriptions and Delegations to International Organizations and Overseas Branches	3,776	3,376
Hospitality to Medical Conferences and Delegations	8,438	5,635
Pensions and Grants to former employees	1,803	1,776
House Services, including Catering	3,803	2,364
Financial Charges, including Auditors' Remuneration (£683 (1955—£690) and Interest on Loans, Nil (1955, £35))	6,203	5,993
Maintenance and Depreciation of Office Furniture and Equipment	2,834	2,589
Sundry Expenses	5,002	4,990
	652	199
	<u>£272,903</u>	<u>£243,248</u>
Less: Grant received towards cost of Central Medical Recruitment Committee	11,908	10,100
Net Surplus on Publications (including "British Medical Journal," "Family Doctor," "Special Journals," "Abstracts of World Medicine," and Books)—subject to Taxation as below	1,405	30,090
		40,190
Provision towards cost of Joint Annual Meeting, Edinburgh, 1959	13,313	£203,058
Provision for Special Legal Costs	2250,580	5,000
Taxation—based on—	6,000	5,000
Surplus for year on publications (includes Profits Tax)	—	14,545
Income for year from properties and investments	13,452	14,033
		28,578
		30,000
Transfer to General Reserve	14,082	11,595
Surplus for year carried to Accumulated Fund (in 1955, after transferring £30,000 to General Reserve)	8,458	—
(Note—Depreciation (including Sinking Fund Instalment) amounting to £12,401 (1955—£12,477) has been allocated to the appropriate headings of expenses.)		
	<u>£287,140</u>	<u>£283,231</u>

II. Other Intraprofessional Obligations

Under the code of ethics of the profession a practitioner ought not to accept as his patient (except with the consent of the colleague concerned):

1. Any patient or member of a patient's household whom he has previously attended either as a consulting practitioner or as a deputy for a colleague.
2. Any patient or member of the patient's household whom he has attended within the previous two years in the capacity of assistant or locumtenent.
3. Any patient who at the time of the application is under active treatment by a colleague, unless he is personally satisfied that the colleague concerned has been notified by the patient or his representatives that his services are no longer required.
4. Any patient who so applies because his regular medical attendant is temporarily unavailable. In such case he should render whatever treatment may for the time be required, and should subsequently notify the patient's regular attendant of the steps he has taken.
5. Notwithstanding paragraph 3 above, when a practitioner in whatever form of practice is asked for advice or treatment by a patient and has reason to believe that the patient is already under medical care and that the request is made without the knowledge of the attending practitioner, it is the duty of the practitioner so approached to urge the patient to permit him to communicate with the attending practitioner. Should the patient refuse this proposal and if the circumstances are exceptional the practitioner is at liberty to examine the patient and to tell the patient his findings and conclusions, but, save for any emergency which exists, he shall not accept the patient for treatment.

III. Guidance for Professional Conduct in Relation to Dentists

(As agreed with the British Dental Association)

Consultations

1. Where a patient, in the opinion of his medical attendant, needs dental treatment, the patient should be referred in all but exceptional circumstances to his own dentist. In the event of the patient having no regular dentist, there is no objection to a doctor recommending a dentist of his own choice.
 2. When on behalf of one of his patients a doctor wishes to consult a dentist, the doctor should communicate in the first instance with the patient's own dentist. In the event of the patient having no regular dentist there is no objection to the doctor consulting the dentist of his own choice.
 3. Where the dentist has reason to believe that the patient has some constitutional disorder and considers some major dental procedure is necessary he should consult the patient's doctor before carrying out such treatment.
 4. Where there is a conflict of opinion between a doctor and a dentist concerning the diagnosis and/or treatment of the condition of a patient, they should consult with each other to reach an agreement which is satisfactory to both. Where the conflict of opinion remains unresolved, the patient should be so informed and invited to choose one of the alternatives or assisted to obtain other professional advice.
- Anaesthetics.**—Where an anaesthetic is advised by the dentist, it is competent for him to select the anaesthetist, but, if such anaesthetist is not the patient's doctor, no objection should be taken to the patient inviting his doctor to be present. Where the operation proposed is a major one, or if it is known to the dentist that the patient is under medical care, the dentist should consult the patient's doctor upon the operation proposed and should invite him to be present if the patient so desires. Similarly, where the patient is under dental care and the doctor advises opera-

tive or other major treatment arising from the patient's dental condition, the dentist should be consulted. On the completion of any dental operation, and especially if there is any reason to think that post-operative complications may ensue, the patient should be advised to consult the dentist immediately if such complications arise and the dentist should take all reasonable steps to facilitate such consultation.

IV. Examining Medical Officers

For the purpose of this code an examining medical officer is a practitioner undertaking the examination of a patient of another practitioner at the request of a third party with the exception of examinations under statutory requirements. Paragraphs 2 and 3 below do not apply to examinations in connexion with superannuation, pre-employment, or proposals for life or sickness assurance.

1. An examining practitioner must be satisfied that the individual to be examined consents, personally or through his legal representative, to submit to medical examination, and understands the reason for it.

2. When the individual to be examined is under medical care, the examining practitioner shall cause the attending practitioner to be given such notice of the time, place, and purpose of his examination as will enable the attending practitioner to be present should he or the patient so desire.

(Preferably such notice should be sent to the attending practitioner through the post, or by telephone, but in certain circumstances a communication might properly be conveyed by the patient.)

Exceptions to this are: (a) When circumstances justify a surprise visit. (b) When circumstances necessitate a visit within a period which does not afford time for notification.

Where the examining practitioner has acted under (a) or (b) he shall promptly inform the attending practitioner of the fact of his visit and the reason for his action.

3. If the attending practitioner fails to attend at the time arranged the examining practitioner shall be at liberty to proceed with the examination.

4. An examining practitioner must avoid any word or action which might disturb the confidence of the patient in the attending practitioner and must not, without the consent of the attending practitioner, do anything which involves interference with the treatment of the patient.

5. An examining practitioner shall confine himself strictly to such investigation and examination as are necessary for the purpose of submitting an adequate report.

6. Any proposal or suggestion which an examining practitioner may wish to put forward regarding treatment shall be first discussed with the attending practitioner either personally or by correspondence.

7. When in the course of an examination there come to light material clinical findings, of which the attending practitioner is believed to be unaware, the examining practitioner shall, with the consent of the patient, inform the attending practitioner of the relevant details.

8. An examining practitioner shall not utilize his position to influence the person examined to choose him as his medical attendant.

9. When the terms of contract with his employing body interfere with the free application of this code, an examining medical officer shall make honest endeavour to obtain the necessary amendment of his contract himself or through the British Medical Association.

APPENDIX IX**BALANCE SHEET AND INCOME AND EXPENDITURE ACCOUNT**

(Printed on pp. 288 and 289)

APPENDIX X**AMENDMENTS OF BY-LAWS AND A.R.M. STANDING ORDERS****By-laws**

1. By substituting in paragraph (c) of By-law 53 for the words "at the Representative Meeting being elected as to ten" the words "elected by the following bodies as to ten" (being persons who have been Members of the Representative Body for at least three years immediately preceding their respective elections).
2. By adding after By-law 56 the following new heading and By-law:

"Mode of Election by Representatives of Constituencies, etc."

"56A. The election of thirteen Members of Council referred to in paragraph (c) of By-law 53 shall take place between the time at which the Annual Representative Meeting commences and the time at which that meeting (including adjournments) terminates. The mode of nomination of candidates for election and of conducting the election shall be such as shall be prescribed by the Representative Body."

3. By deleting from By-law 59 the words "or by the Representatives of Constituencies".

4. By substituting in paragraph (1) of By-law 60 for the words "or the Representatives of Constituencies" the words "or the Members of Council elected by the bodies referred to in paragraph (c) of By-law 53".

5. By deleting from paragraph (2) of By-law 62 the words from and including "by means of an election by the body authorized to elect" down to the end of such paragraph and substituting therefor "as if it were a casual vacancy under the next following By-law, or may itself appoint a Member of the Association to fill the vacancy and the person filling the vacancy shall retain his office as if he had been duly elected at the proper time by the body which failed to elect".

6. By substituting in paragraph (1) of By-law 63 for the words "elected by the Representatives of Constituencies" shall be filled by the Chairman of the Representative Body" the words "referred to in paragraph (c) of By-law 53 shall be filled by the Chairman of the Representative Body by the appointment of a person who is and has been for at least three years immediately preceding his appointment a member of the Representative Body."

7. By inserting after paragraph (1) of By-law 63 the following new paragraph:

"(2) A casual vacancy occurring in the Council four months or longer before the Annual Representative Meeting amongst the Members of Council referred to in paragraph (c) of By-law 53 shall be filled by the body which appointed the Member of Council whose place shall have so become vacant. The mode of nomination of candidates and of conducting the election shall be such as shall be prescribed by the Representative Body."

8. By renumbering paragraph (2) of By-law 63 as paragraph (3) and inserting therein after the words "Public Health Service Member" the words "any casual vacancy (whenever occurring) on the Council amongst the Medical Officers representing the medical branches of the Armed Forces shall be filled by the said Chairman by the appointment of a person qualified under paragraph (e) of By-law 53".

9. By renumbering paragraph (3) of By-law 63 as paragraph (4) by deleting the word "so" from immediately before the word "occurred" in the said paragraph and by renumbering paragraph (4) as paragraph (5).

Proposed New Standing Order of Representative Body

Election of Members of Council referred to in By-law 53 (c) other than at the time of the Annual Representative Meeting:

(1) Nomination of candidates for election under By-law 53 (c) otherwise than at the time of the Annual Representative Meeting shall be in writing by not less than two of the Members of the Body entitled to elect upon the prescribed form and sent to the Returning Officer at the Head Office on or before an appointed day of which not less than fourteen days' notice shall be given in the *Journal*.

(2) If only one candidate is nominated he shall be deemed to be elected immediately after the said date.

(3) If more than one candidate is nominated voting papers containing the names of the candidates duly nominated shall be sent by post by the Returning Officer to each member of the Body concerned. Every paper shall be returned to the Returning Officer at the Head Office on or before an appointed day, of which not less than fourteen days' notice shall be given in the *Journal*.

CONFERENCE OF HONORARY SECRETARIES OF DIVISIONS AND BRANCHES

"You are the most important people in the Association," honorary secretaries of Divisions and Branches were told by Dr. S. WAND (Chairman of Council), welcoming them to their annual all-day conference at B.M.A. House on May 10. The meeting was presided over by Dr. V. COTTON-CORNWALL (honorary secretary, Merseyside Branch), the conference chairman, who was supported on the platform by Mr. L. DOUGAL CALLANDER (treasurer), Dr. RONALD GIBSON (chairman, Organization Committee), and Dr. A. MACRAE (secretary), in addition to Dr. WAND.

Continuing, Dr. Wand said that the honorary secretaries were the key men, and it was to them that Headquarters looked for proper action at the periphery whenever a decision was taken. It was very important that he should bring them up to date on some of the facets of the remuneration dispute. First, he would commend to them the *B.M.J.* reports of the meeting of the Special Conference of Local Medical Committees on April 30, and of the Special Representative Meeting of May 1. They gave a fair picture of what had happened.

Surfeit of Democracy

Wide differences of opinion had been inaccurately described as a split. It was true that at present there was a 50-50 division of opinion in the profession, but it was entirely at one in seeking to achieve its objective. Only on the method of achievement was there a difference of view. Keeping that clearly in their minds would enable them to reach decisions and get a unity in the profession that would not otherwise be possible. Those differences of opinion must not lead to bitterness. There must be a mutual respect for each other's opinions, and the immediate objective must be to marry the differing opinions and heal any breach that might have occurred.

In some quarters, the happenings of the last few weeks had been canvassed as defeat, but he could not agree with that. The situation had changed with such lightning rapidity that various lines of approach had had to be examined, but a democratic body could not always move with equal speed. "We, as an Association, suffer from a surfeit of democracy," the Chairman of Council told his audience. "We cannot move quickly, because we must get information and support from a periphery of 70,000 members."

In his own opinion, the Danckwerts award was achieved in great part as a result of authority being given to certain people to act as they thought best in changing circumstances. Decisions and tactics arrived at by a closed organization

like the Ministry of Health, meeting behind closed doors, could only with great difficulty be countered by a democratic machine that took months to work. He hoped they would bear that in mind when decisions had to be taken in the future, and that they would realize that the reasons prompting those decisions were good and proper and would be for the good of the profession.

Armed Truce

They were now faced with a clear-cut decision whether or not to give evidence before the Royal Commission. If it was decided to give evidence they would then enter into an armed truce; if the decision went the other way they must go on with the withdrawal scheme, as not to withdraw in such circumstances would be to occupy a position of weakness.

In the last few weeks, each side had gained tactical victories. The Government had won one by the setting up of the Royal Commission, which had succeeded in its purpose of dividing and confusing the profession, and Spens and Danckwerts were in the melting-pot. On the other hand, the Association had succeeded in creating the feeling that all was not well with the Health Service. Again, they had previously been told that there would be no consideration of their claim on its merits at all; there had since been an interim adjustment of £4½m. which, though small, had broken down the door to some extent. In addition, the Commission's terms of reference had been amended in such a way as to make them completely different in many respects.

Further, the Minister—and Dr. Wand was assured that from their point of view it was constitutionally correct—had confirmed the validity of the new terms of reference. Mr. Vosper had also given a written undertaking that, following the Royal Commission's Report, no change would take place until after full consultation with the profession. "There is a great difference between consultation and full consultation." Another point was that the Commission had said that the profession's claim would be before it and would therefore be in writing in the records of the Commission, and in its report. Therefore, for the first time they had their claim before that body, together with a promise of full consultation before implementation of that Report, and on the present claim. "As compared with the position only four or five weeks ago, these are very material advantages."

Dr. Wand admitted that secretaries were in some difficulty as a result of the Council's refusal to express an opinion, nor would any opinion come from the General Medical Services Committee. Wherever he had spoken, he himself had been careful to give a factual statement, because what was wanted was an honest opinion, and not one swayed by emotion, from those who, in the events of withdrawal, would bear the brunt—the general practitioners.

Struggle may Come

During the next few months, in particular, the secretaries had a very important job. First, they had to see that the Divisions and Branches remained unified, and that the doctors remained determined to see the dispute brought to a conclusion that they could accept. "An armed truce does not mean that the struggle is over," declared Dr. Wand. "Even if we decide to give evidence the struggle clearly might come in the next few months after the Royal Commission has reported." That struggle might be on an issue of even greater importance than any other—that of status. "The time is coming when we have seriously to consider not whether we withdraw from the Service for a short time, but whether we can continue to serve in such a service at all" (applause).

Dr. Wand went on to warn the secretaries that whatever happened at the next Special Representative Meeting (on June 12) there would be recriminations. "Someone in the middle will have to take the rap from both sides, and that will probably be the Council," he told them, adding somewhat wryly, "and, particularly, perhaps, the Chairman." Nevertheless, whatever the bitterness evoked by whatever

decision was reached, the secretaries had the extremely important duty of eliminating it. "No matter what the decision, the objectives will remain: first, status; second, the claim—and in that order."

In conclusion, he wished to pay them all a tribute for the great work which they did, and for their self-sacrifice. He knew how much self-sacrifice it meant to a busy doctor to give up his all too little spare time for the work. The Association was tremendously indebted to them, and "on behalf of the 70,000 members of the Association, may I thank you very much for your work."

Burial of Spens

Dr. K. W. BEETHAM (East Yorkshire) had three questions to ask. Would not the giving of evidence to the Royal Commission be "to attend the burial of Spens"? Would it not be taken as acceptance of Government dictation? As 60% of the membership never attended peripheral meetings, was not any plan for withdrawal likely to fail?

Dr. WAND thought that the answer to the third question could best be answered by finding out from local secretaries of the Guild just how the levies were coming in. That would give some indication of the views of the "unknown quantity." The Royal Commission was set up by Her Majesty, through the Government, and to say that the Association gave official approval did not enter into the question at all. Whether or not they thought Spens would be buried by the giving of evidence depended on what strength they gave to the words "full consultation."

Because of the Government's written undertaking, Spens remained the basis until the Government made representations to the Association that Spens was no longer valid. Nor would it be improper for the Government to set up a body to advise on whether or not Spens should remain the basis. The Association could, after all, found their evidence on Spens remaining the basis, and if the Commission declined to accept that view it would be necessary for the Association to struggle to establish that their view, and not that of the Commission, should be adopted. If they decided to give evidence it might be not the end but only the beginning of the struggle. It was because of that that it was so necessary to get unity within the profession.

Medical Officers of Health

Answering Dr. M. P. MARTIN (Worcester), who asked what was being done to safeguard the interests of medical officers of health, and to prevent their "inadequate remuneration being used as evidence against any increase for other members of the profession," Dr. Wand said that on each occasion that he had met the Minister and the Chairman of the Royal Commission he had mentioned those officers. The difficulty was that they were not remunerated from governmental sources. Those who had to deal with a single local authority knew what difficulties there were. When two or three local authorities were acting together the difficulties were greatly increased, and when it came to dealing with local authority associations the difficulties became extreme.

Local government autonomy was also involved, and he believed that the Minister had been quite uninfluenced by the dispute when he had said that the inclusion of the public health medical officers would not only make the deliberations of the Royal Commission more difficult but would so prolong its work as to make their inclusion impracticable. The Minister had written that when the Commission had published its findings it would be right and proper for the medical officers of health to go to Whitley.

Different Bodies

Dr. G. CORMACK (Newcastle upon Tyne) believed that their difficulties had been increased by decisions being taken by different bodies within the profession which were not in accord with B.M.A. policy. "It would appear to rise from the extraordinary, ramshackle structure of the Association,

which allows an autonomous body to exist within what should be a well-integrated organization." Had the Council any strong views on reorganization which would prevent that in future?

After outlining the history of the structure, Dr. WAND said that, although admittedly curious, it had been thought that common sense would avoid difficult situations. To have one side in a fight composed of a large number of people and different bodies made it much easier for the other side, but it was difficult to see how the ideal of a single body could be achieved.

To Dr. MELLISH-OXLEY (East Suffolk), who declared that it was wrong to compromise one's own principles when dealing "with a Government that had clearly shown itself to be without principles at all," Dr. WAND replied that the decision would rest with the Special Representative Meeting. He would rest with the Special Representative Meeting. He would not do so now. It was for the periphery to make up its own mind, without persuasion from anybody. By skilful rhetoric it was possible to sway the minds of people one way or the other, particularly those without full information. If, after they had made up their minds, they still wished him to pursue whatever line of action they thought best, he could assure them "that I will take it up with the vigour which I have always used in these matters. But, first, I want the opinion of the periphery."

He told Dr. J. S. MOFFATT (Border Counties), who referred to Dr. Gorsky's suggestion at the S.R.M. that the Association should seek a declaratory judgment in the high court on the validity of Spens as a contract, that the matter was already before their solicitor, who had in preparation a document, which must obviously be very carefully drawn, to present to counsel, who had been chosen. Dr. Gorsky would be invited to take part in the discussions.

There was loud applause when the CHAIRMAN thanked Dr. Wand for his address "and for the lucidity with which he has answered questions."

Brains Trust

A number of questions of special interest to secretaries were introduced, first of all by the members of the panel, Mr. CALLANDER, Dr. GIBSON, and Dr. MACRAE.

"All the work in connexion with the remuneration dispute needs money," said Mr. CALLANDER, and though he had told the S.R.M. that he would find the money for that claim the fact remained that the Association's funds were not as good as they had been twelve months previously.

The secretaries were the most important people in the drive for membership, to which, alone, he could look for funds, and he appealed to them once again to scrutinize the non-membership lists. Last year they had increased the membership by 1,200, which, with an average subscription of four guineas, meant a considerable addition to the Association's finances. A particularly watchful eye should be kept on the newly qualified men.

"I thank you very sincerely for your help, but there is still room for improvement. We are not at saturation point yet, and we can still get in two, three, or four thousand more medical members."

Dr. GIBSON, too, expressed, on behalf of his Committee, appreciation for the work done in the past, and hoped that they would let the Organization Committee know of any way in which it could help them in their work. Laying stress on the importance to his Committee of secretaries' annual reports, he pointed out that last year, out of 217 Divisions, 31 had not sent in a report, and that of the 31, 20 had not sent in a report in the previous year. The annual reports were of great importance to the Treasurer, and to the Organization Committee in its quest for overall efficiency.

The question of young members had concerned the Committee a lot during the previous year, and those members must be made to realize that the Organization Committee was there to help them in their individual problems. Though the general membership had gone up, that of young members

had decreased by 4%. This was not good, as the future membership of the Association depended on the young recruits.

The Committee was preparing a memorandum on the possibility of establishing a junior members' forum, but secretaries, too, could play their part by holding special functions for the young members, by putting them on executive committees, and by holding their own forums. Most important of all, they should be dealt with as individuals. He suggested that in each Division a member of the executive committee—say, the assistant secretary—should act as liaison officer.

Dr. MACRAE had only two matters to bring to the attention of the conference. First, there was a growing tendency for Division and Branch secretaries to dictate to regional offices, by telephone, notices of meetings, and also committee documents. When meetings were called at short notice that might be inevitable, but otherwise he suggested that there was less risk of error if the post was used. It was also less expensive.

Secondly, one divisional executive committee had adopted a resolution that notices of divisional meetings should be accompanied by stencilled copies of the minutes of the previous meeting. When perhaps only 10 or 20% of the membership attended the meetings in any case, that procedure hardly seemed necessary. Normally, the secretary produced handwritten minutes, which were read and then signed by the chairman as a true record. Dr. Macrae made it clear that his remarks did not apply to ethical inquiries, when it was obligatory in certain circumstances that a record of the meeting should be sent to every member.

Division Funds

The remarks of the three members of the panel elicited a number of questions. Dr. B. RAEBURN (South Lancashire) asking whether small sums could not be available from Headquarters to assist in entertainment that might help membership. He was told that Mr. Callander would be the first to agree to do it—if the funds were available. The present position was, however, that he might have to ask for more money from the membership very soon. Nevertheless, the point was important, though to carry it out was not at present financially practicable.

As Dr. Wand could not be present in the afternoon, a question was addressed to him about the British Medical Guild, which he described as the executive and not the policy-making body. Its function was to carry out Association policy in circumstances in which, were the Association to do so, it would be regarded as undertaking trade union activities. The Guild was the action body.

As a local Guild chairman, Dr. S. SMITH (Tower Hamlets) thought he could get a better consensus of opinion from the Guild than from Branch meetings. In view of the S.R.M. resolution about the future policy in regard to the National Health Service, would it not be a good idea, he asked, if, during the interim period when the Guild machinery was not otherwise being used, it could be used for discussions on the subject so as to enable local groups to formulate policy? In addition, it might lead to bringing non-members into membership of the Association and in that way be used to consolidate the profession.

In reply, Dr. Wand said that the Guild machinery must be kept going, first for discussion, and second—and more important—to promote unity among doctors in an area.

Hospital Gazetteer

The afternoon session began with a discussion on the need for the B.M.A. to compile a hospital gazetteer particularly for the use of applicants for junior hospital posts.

Dr. A. B. GILMOUR (house officer and formerly President of the British Medical Students' Association), opening the discussion, emphasized the need for a comprehensive document which would give applicants for junior hospital posts information on such things as size of hospitals, staff, specialties, special clinical facilities, the nature of clinical duties,

and experience in the posts quoted, residential and recreational facilities, and some indication of the quality of the jobs. Things had changed following the introduction of the N.H.S. and the 1950 Medical Act. There was now a rush by all new graduates for the arbitrarily restricted number of "approved" posts. He said that there was evidence that the establishment of such posts was guided not so much by the suitability of the post as by the authority's desire to fill it.

The status of hospital doctors had fallen immensely since nationalization. Administrators were not interested in the responsibilities and hours of work undertaken by junior doctors without corresponding privileges. It was often difficult for senior medical staff to support their assistants. Therefore some body should interest itself in the welfare of the newly qualified, and who better than their professional association? The American Medical Association published a list of approved internships: why should the B.M.A. member not be able to consult a "B.M.A. book"? Dr. Gilmour said that, to him, the most cogent argument for undertaking such a task was the fact that it would be definite evidence of the B.M.A.'s interest in its newest members. A likely effect on hospital authorities would be to cause those lacking in some respects to reform post-haste, and be kept up to the mark by frequent reprints of the gazetteer. Such action would help newcomers to the profession when they were most lonely and vulnerable.

Dr. J. H. E. MOORE (honorary secretary, Yorkshire Branch and Leeds Division) reminded the meeting that, whereas those who had held house appointments in the past had done so voluntarily and received no return except their board and lodging, younger practitioners who qualified since 1953 had been compelled to do 12 months' house-officer service. They received some pay, but they also contributed towards their board-and-lodging expenses. They were anxious to make the best use of their time, and felt that information on professional opportunities and residential amenities in hospitals should be easily available and published on a national scale. Dr. Moore pointed out that, although the G.M.C. published some information and both the Leeds and Manchester Regional Hospital Boards published lists of available appointments, indicating those which were recognized for higher qualifications, students were anxious to have some assessment of the professional prestige and amenities of these hospitals. The Organization Committee had carried out a pilot experiment with this in view. Surveys had been carried out in the Hull area by Dr. I. G. Innes, in the Gloucester area by Dr. H. G. Dowler, and by himself in the Leeds area. Dr. L. S. Potter had analysed results, and the Organization Committee was to consider extending the survey over the whole country.

In his own survey, Dr. Moore said, he visited hospitals in his area, and by talking to some of the residents at each had formed some ideas on what matters they regarded as particularly important. They looked first for hospitals offering good professional experience under chiefs and registrars taking an active interest in their work. The hospital should be large enough to carry a house staff of about 12 residents, and the medical staff should be accommodated in separate quarters away from the matron's and administrative offices, with separate dining-, sitting-, and guest-rooms. There should be a minimum standard for catering. It was important that married quarters (not necessarily in the hospital grounds) should be available in every area for registrars. Regular off-duty times were most important—two half-days a week and a full week-end from noon on Saturday to 9 a.m. on Monday every two or three weeks would be reasonable and could be covered by other residents. At present residents were often required to be in the hospital an average of 145 hours per week.

Dr. POTTER said that he was satisfied from experience of a number of informal meetings of junior hospital residents that there was a demand for a gazetteer. In compiling the pilot survey the help of honorary secretaries had been invaluable. Dr. Potter felt that if this was worth doing at all it was worth doing well, and this would require the co-

operation of honorary secretaries—he was sure he could count on this.

Dr. GIBSON told the conference that his committee was convinced of the need for a gazetteer.

Towards 100% Membership

Opening the discussion on this subject, Dr. J. S. NOBLE (honorary secretary, Morpeth Division) suggested that the problem of interprofessional relations between the craft groups and the salary grades of the profession should be explored as a method of stimulating interest and producing professional unity. The pay claim having failed to produce the latter, he felt that consideration of the future of medicine and of the profession might be a greater spur to many doctors. Dr. Noble traced the development of the present-day occupational schism and mentioned the resultant overlap, conflict, and frustration between the specialists, general practitioners, and public health doctors, and remarked on the possible tendency to wastage of medical manpower. This problem was not a personal one to the profession alone but was also obstructive to the satisfactory development of the Health Service. The answer could be found only by the B.M.A., but if the B.M.A. did not find it someone else would try to.

Much work of late had been passed to the autonomous bodies for the sake of efficiency, but the tendency to wait for their lead must be reversed, and this could be done only at Division level. Many Divisions already had committees representative of all branches of the Health Service. This must be extended and the profession made conscious of its internal relationships. The B.M.A.'s committee of inquiry into the Health Service must have guidance from the rank and file, Dr. Noble said. This could be really effectively given only from the Divisions and through the Representative Body.

Speaking of the minorities, Dr. Noble said that the small groups—registrars and young practitioners—must be given the impression as well as the fact that justice was done and that the B.M.A. was theirs. The idea of a "bosses' union" or a "G.P.s' club" must go, and he called for direct access for these groups to the Council and not through senior committees. The Health Service had reached the stage of stock-taking. It must either develop or regress. In the speaker's opinion the B.M.A. alone had the knowledge and experience to guide it. If it did not do this, the politicians would. He believed that an approach along these lines would catch the imagination of every interested doctor and reassert the B.M.A. in the eyes of the profession and the nation.

Roll of Fellows

Dr. J. E. MORRISON (honorary secretary, Stirling Branch) described the procedure it was proposed to follow and the criteria to be adopted in connexion with the new "Roll of Fellows of the Association." He stressed the fact that, though the approval of Council would have to be obtained and an official record maintained at Headquarters, this was essentially a local award—an honour conferred on a member by his colleagues for outstanding service to his Division or Branch. The initiative would ordinarily be taken by the executive committee or Branch council, but the nomination must be approved by a three-quarters majority in a meeting of the Division. It was anticipated that usually the award would be given to doctors while they were still in active practice, but there was no reason at all why those who had given notable service in the past should not be included. Service on central committees could be taken into account, but the important criteria were 10 years' continuous membership of the Association and the holding of office or offices locally for seven years. Dr. Morrison reminded the conference that the honour would be of less value if it were given lightly.

The conference concluded with a vote of thanks to the chairman, proposed by Dr. F. A. BELAM. Dr. C. VIPONT BROWN (honorary secretary, Manchester Division) was elected chairman of the conference for 1958.

Scottish News

SCOTTISH HOUSE OF THE B.M.A.

REOPENING BY THE PRESIDENT

For the past 30 years two adjoining houses in Drumsheugh Gardens, Edinburgh, have served as the headquarters of the B.M.A. in Scotland. Plans to modernize the office accommodation in these houses and to provide a common-room, dining-room, reading-room, and other amenities for members were not completed until 1951. Since then the work of adaptation has been proceeding by stages and is now very nearly complete.

Last week, on May 14, the President of the Association, Dr. ALEXANDER HALL, reopened Scottish House at a ceremony to which about 150 guests had been invited by the chairman and members of the Scottish Committee. The chairman of the Committee, Dr. W. M. KNOX, presided at

this gathering and introduced Dr. Hall, who heartily congratulated the Committee on the results of their work—"these handsome and well-equipped premises of which the Association may well be proud." The B.M.A., the President continued, with its members in every quarter of the Commonwealth and Colonies, could well claim to be the mouthpiece of the medical profession, even if it did often speak with a Scottish accent. Its functions could be simply stated as scientific and educational, medico-political and social. "These new premises will help us to discharge each of these functions more effectively. As the centre not only for medical men and women in Scotland, but for those from across the Border and from over the seas, for those making a brief stay in Edinburgh, and for those making a more prolonged stay for the purpose of postgraduate studies, the new Scottish House will afford amenities long desired."

Reconstruction

Touching on the dispute between the medical profession and the Government, Dr. Hall said that the practice of medicine and politics could never be married in anything but an unholy alliance. It was no secret that the medical profession recently had been profoundly shocked and disturbed to find that the agreement on its terms and conditions of service could be and had been set aside for no other reason than political expediency. "When we say we seek to maintain the honour and dignity of the profession we are not speaking in any selfish or concealed sense. We know that, unless the practice of medicine is in the hands of men and women thoroughly grounded in the basic principles of their science and free to express and apply their art zealously according to their individual interpretation of it, the best service will not be forthcoming and esteem and trust will vanish. . . . We ask from the Government, as the ultimate employing and controlling authority of the Health

Service in all its branches, such just and secure terms and conditions as will enable those already in the Service to maintain and improve their standards and, what is equally important, will attract recruits of talent, integrity, and enterprise."

The physical and mental health of the people would determine the standard of living which they could attain, said Dr. Hall, and in the maintenance of that health and vigour the medical profession had a major role to play. The Minister of Health and the Ministry should expound to the full the doctrine of health as a national investment and should be the champions of the profession when the health department came under the fire of the Treasury guns. "Give us the proper working conditions and we shall do the job," Dr. Hall declared. "By foresight, prudence, and perseverance the Association has adapted the structure of this building into a noble and valuable asset. It can offer these same qualities to the Government to help bring about the reconstruction manifestly needed of the Health Service."

Dr. E. A. CORMACK, chairman of the committee responsible for the rebuilding of Scottish House, proposing the vote of thanks to the President, paid tribute to all those who had a hand in the work, especially Mr. W. H. Kininmonth, the architect, and invited the guests to inspect the building.

Amenities for Members

The ground floor is now given over entirely to accommodation intended for day-to-day use by members. In one corner of the large and elegant common-room there is to be a bar. Meals are soon to be served in a small dining-room, and at the back of the house there is a quiet and comfortable reading-

room. The first floor has a large meeting-room and a smaller committee room, and the second floor provides the office accommodation needed by the Scottish Secretary, Dr. E. R. C. Walker, and his staff. Offices on the top floor are occupied by the Medical Insurance Agency. Modern decorative ideas have been most successfully applied throughout the house. Several of the public rooms are beautified by carved wooden mantelpieces, now for the first time seen in their true splendour after the removal of the coats of paint which had previously disfigured them.

Later in the evening of May 14 visitors who had come from afar to attend the reopening of Scottish House were the guests at a dinner at the North British Hotel given by Dr. and Mrs. W. M. KNOX—a most enjoyable ending to what Dr. S. WAND, Chairman of Council, described as "a very great day."

Mr. J. R. Hanan, New Zealand Minister of Health, in a recent address to the biennial conference of the New Zealand Branch of the B.M.A., referred to the sharp increase in the social security pharmaceutical bill from £1,558,000 in 1948 to £4,039,000 in 1956; it was expected to exceed £2 a head of the population in 1957. He foresaw the establishment of controls if doctors did not consider prescribing costs, having due regard to medical need first.



(Scottish Publications, Ltd.)

Part of the Members' Common-room.

PUBLIC HEALTH COMMITTEE

RECENT EVENTS REVIEWED

A special meeting of the Public Health Committee was held at B.M.A. House on May 17, with Dr. J. B. TILLEY in the chair.

Letter to Members of Parliament

Dr. A. MACRAE, Secretary of the Association, explained why a further letter had not been sent to Members of both Houses of Parliament. The Committee at its meeting on April 12 had asked for this letter to be sent and the Council had agreed. Dr. Macrae apologized that action had been suspended on the resolution.

Dr. H. D. CHALKE repeated what he had said in Council that he thought that what had happened was most unfortunate. The question of their position in the B.M.A., and indeed a suggestion to dissociate themselves from the B.M.A., was in the minds of a large number of members of the public health service. Dr. W. G. HARDING pointed out that the public health service had been "forgotten" in the legal opinion on the terms of reference of the Royal Commission given to the Joint Negotiating Committee. He remembered reminding Sir Russell Brain and being told that the Joint Consultants Committee had "forgotten" about their public health colleagues. In the first letter to Members of Parliament there was no mention of public health practitioners. "We have been forgotten once again," said Dr. Harding. The Society of Medical Officers of Health could not make pronouncements on medico-political matters, and he felt the Committee had never once been able to have its views adequately considered.

Dr. J. F. WARIN thought that at the time the Ministry of Health were sympathetic to inclusion of public health doctors, and he was satisfied that the Committee did what it could. It passed two resolutions, one offering full support to the profession—that received full publicity—and a second expressing grave concern that there was any question of not including public health doctors. The Committee asked that the latter should receive immediate publicity, but the Chairman of Council decided that it was not advisable at that stage. "I am very concerned that in a matter of such importance it could be possible for one person to be in that sort of situation," said Dr. Warin. "If this Committee is going to act for the public health service in medico-political matters, I think there has to be a difference in the future."

The General Medical Services Committee had autonomous powers, which the Public Health Committee lacked. He hoped there would be a discussion on the position at a future meeting.

Dr. J. B. S. MORGAN felt that general practitioners in particular were very sympathetic to public health practitioners. Since 1948 the former had realized that public health was not a competitive but a complementary service. "Do not let us get this out of focus," said Dr. Morgan. "I feel that Dr. Wand and many others have done their best to get public health doctors included." Dr. K. S. MAURICE SMITH (General Medical Services Committee) assured the Committee that the General Medical Services Committee was very sympathetic. Dr. F. A. BELAM said that there had been serious sins of omission. For the Council to accept a recommendation and pass a resolution and then dishonour it seemed to him to be deplorable.

The CHAIRMAN thought that those who had spoken had voiced the sense of frustration of everyone that steps which the Committee had recommended and had hoped would be taken had not been taken. He was sure that the question of the machinery was something which should be considered. He was told that the Committee had not wanted autonomy in 1948. It might be that the Committee would wish to reconsider this.

The Committee decided to consider as a matter of urgency at a future meeting an alteration of the machinery for representing the public health service in the Association.

Mr. JOHN PRINGLE (Public Relations Officer) recalled that the resolution about sending a letter to members of both

Houses of Parliament was passed by Council 14 days before the Special Representative Meeting. It would have taken several days to get the statement printed. On the day on which the resolution was passed the Chairman of Council was engaged in discussions with the Chairman of the Royal Commission and the Minister of Health. Events were moving extremely fast, and they continued to move with extreme speed up to the very day of the Representative Meeting. The resolution had said that the letter should be sent "as soon as possible." There was no question of the resolution being ignored. But to have sent out the letter a few days before the Representative Body made a decision might have put the Association in an extremely embarrassing position, and therefore Mr. Pringle took the view that nothing was to be gained by it at that time. It seemed to him that when the Representative Body had met it would still be open, and indeed it was open now, to have another letter sent.

Dr. J. KELMAN said he had not supported the original resolution because he had thought that to send another letter was like saying: "P.S.—We forgot the public health service." The major blunder came when both the Committee's original motions, the first offering full support to their colleagues, the second asking for full support, did not get immediate publicity. It had been felt strongly that, unless the announcement was in the press immediately, the opportunity would be gone. He considered that had Dr. Wand fully appreciated the strength of feeling of the Public Health Committee he would not have done as he did, but it had to be remembered that what had happened had left a sense of dissatisfaction and frustration. Dr. Kelman read a resolution from the Scottish Branch of the Society of Medical Officers of Health on the desirability of breaking the link with the B.M.A. unless the Association gave autonomy to the Public Health Committee. If the Committee had had that autonomy, he commented, it could have made its announcement before the Government made theirs.

Royal Commission

The Committee held a long discussion on future action to be taken in relation to the Royal Commission. Dr. WARIN suggested that the Chairman of Council together with the chairman of the Committee should seek an interview with the Chairman of the Royal Commission, because, although the Prime Minister and the Minister of Health had said that the public health doctors were excluded, so far as Dr. Warin was aware the Chairman of the Royal Commission had not made any definite statement. The terms of reference had been interpreted as applying to general practitioners and consultants, but in plain English they really meant all doctors, including those in public health undertaking Part III duties. It would not do any harm to ask why the Commission refused to include the public health doctors. Assuming that no satisfaction was obtained, the two chairmen should discuss with the Minister of Health two possibilities—the extension of the functions of the Royal Commission to include consideration of the remuneration of public health doctors after completion of its present remit, or the immediate setting up of an independent inquiry into the remuneration of public health doctors, as requested long ago by the Association.

Having exhausted all the possibilities, the Committee would have to decide what course to take at the Special Representative Meeting. One course was to dig in and say: "This is a vital matter to us and we are not prepared to budge from the last resolution" (that any decision to co-operate with the Royal Commission should be conditional on the inclusion of all public health medical officers within the terms of reference). He felt that this would do great harm to the relationships between the branches of the profession and would undo a great deal of the good which the Committee had done in recent years. He felt it would be more helpful to say that as things had developed the Committee now felt that in the interests of the profession as a whole, if the only matter that was left between co-operation and non-cooperation was the inclusion of public health

doctors, the profession should co-operate. If they did that they would get a great deal of understanding and good will from their colleagues, but he thought that they would do more than that. If the profession gained something from co-operation, then ultimately the public health service would do so as well.

Dr. HARDING said that so far no senior representative of the public health section of the profession had had direct dealings with the Government. Dr. COLIN-RUSS warned that there was nothing the Government would like more than to see the profession split. A split would do the profession as a whole no good and the public health people a disservice. "We must avoid a split at all costs," he declared.

"Why am I always the bridesmaid, never the blushing bride?" quoted Dr. CHALKE. "We are always the bridesmaid," he continued. "We are never 'standing at the altar.' I am sick and tired of this. The wishy-washy and apparently turncoat attitude of the Council and this Committee is incomprehensible. The profession is becoming the laughing stock of the country—the Government knows it has got us. It seems very like the 'great betrayal' of 1911. The chameleon-like committees of the B.M.A. change colour. We are expected to follow their change of colour because unless we do it 'might split the profession.' What nonsense!" It was a vital matter for the public health service and the profession. He was certain that the public health doctors would not be thrown to the wolves by the Representative Body.

Dr. J. A. STIRLING said that the Royal Commission was dealing with two matters: the present betterment claim—and with that the public health section had nothing to do—and what should be done to keep the remuneration of doctors under review, with which the public health doctors were concerned. He thought that the Committee should adhere to its original resolution and let the matter be decided by the Special Representative Meeting. The CHAIRMAN pointed out that the Commission was considering proper levels of remuneration; that was nothing to do with the cost-of-living increase.

Dr. S. C. GAWNE said that if it was generally thought that it would be in the interests of the profession as a whole, including the public health section, to give evidence, that section could not say: "We are holding out." He thought that something should be said about the public health section's remuneration, past and present, in the evidence to the Commission. Dr. MORGAN thought that the B.M.A. had succeeded in changing the terms of reference over the whole ground, except the public health section. The Committee should take every possible step to see that the public health doctors were included.

Dr. KELMAN stressed that the public health section were asking the general practitioners to withdraw their services on the narrow point that the public health service was not included in the terms of reference. The Committee must act in a practical and statesmanlike way. If they went to the general practitioners, how much support could they produce as evidence? Less than 50% of the public health doctors had contributed to the defence fund—that was how much they cared.

After some further discussion three motions, proposed by Dr. WARIN, and seconded by Drs. Kelman, Gawne, and Morgan respectively, were agreed to. They were as follows.

- (1) That the Public Health Committee reaffirms the vital importance to the whole medical profession of the inclusion of public health doctors within the terms of reference of the Royal Commission.
- (2) That the Public Health Committee requests the Chairman of Council, together with the chairman of the Public Health Committee, to seek an urgent interview with the Chairman of the Royal Commission to discuss the interpretation of the terms of reference in so far as they affect public health doctors.
- (3) That if an approach to the Chairman of the Royal Commission is unsatisfactory, then the Chairman of Council, together with the chairman of the Public Health Committee, be requested to seek immediate interview with the Minister of Health in order to discuss two alternative possibilities: (a) the extension of the functions of the Royal Commission to include the consideration

of the remuneration of public health doctors after the completion of their present remit; (b) the immediate setting up of an independent inquiry into the remuneration of public health doctors, as is already requested.

Dr. STIRLING moved an amendment to a fourth motion by Dr. Warin. This amendment urged the Special Representative Meeting, consisting as it did of representatives of all branches of the profession, to adopt the resolution of Council of March 27 (*Supplement*, April 6, p. 149) not to give evidence unless public health doctors were included in the terms of reference, or as an alternative to affirm that the decision to participate in the Royal Commission should be conditional on the Government agreeing to set up an independent inquiry into the remuneration and conditions of service of public health medical officers concurrently with the sitting of the Royal Commission. Dr. Stirling thought that if this was not done at the present time the public health section would become the submerged tenth.

Dr. ELSPETH M. WARWICK said that she had had considerable contact within her area and had knowledge of what was going on elsewhere, and she did not think that there was the slightest doubt that the Representative Body would be in no mood for conditions which would postpone a decision further. In her own area the doctors were not in a temper to procrastinate further. Dr. PETER EDWARDS, referring to the Minister's statement about considering any claim from public health officers "through the normal machinery" in the light of the Royal Commission's report and any settlement subsequent to it, said that the Committee should press for a change in those normal channels. Dr. KELMAN said that circumstances had altered since the resolution had been passed which Dr. Stirling wanted the Committee to reiterate.

On a division, four members voted for the amendment and twelve against, and one abstained.

After further discussion the Committee agreed, by eleven votes to two, with one abstention, to a further amendment proposed by Dr. ALUN EVANS, seconded by Dr. COLIN-RUSS.

That the Council be informed that it is the view of the Public Health Committee that it should be left to the Special Representative Meeting, taking full account of resolutions (1), (2), and (3) above, to decide for or against the giving of evidence to the Royal Commission in the best interests of the profession at large.

This was carried unanimously as a substantive motion.

No Approach to M.P.s

Mr. PRINGLE then asked whether the Committee still wanted a letter to be sent to Members of both Houses of Parliament. He pointed out that the previous letter was sent at a time when there was a complete breakdown of negotiations.

It was agreed that a letter should not be sent.

Other Matters

A number of items on the Committee's agenda had to be deferred owing to the time taken in the remuneration discussions. Comments on a draft circular to local authorities on accidents in the home were referred to the G.M.S. Committee, whose attention was drawn to the B.M.A.'s publication on coal-gas poisoning. Proposals for the amendment of the Food Hygiene Regulations were referred to a subcommittee and a question on death certificates was referred to the Central Ethical Committee.

CIVIL DEFENCE
INCREASED FEES

The Home Office has authorized, as from January 1, 1957, certain increased fees to registered medical practitioners under civil defence arrangements. A fee not exceeding £2 2s. (instead of £1 11s. 6d.) is payable for a one-hour lecture on first aid or home nursing to members of the Civil Defence Corps, and a fee of £1 17s. 6d. (instead of £1 5s.) may be paid for the examination of a candidate instructor attending a rescue section instructors' course at one of the Home Office civil defence schools.

Correspondence

Royal College of Physicians

SIR,—The President of the Royal College of Physicians, in his letter (*Supplement*, May 18, p. 275), again ignores the damaging points raised by Dr. John H. Hunt (*Supplement*, April 27, p. 232). Experienced observers will inevitably conclude that this is because the points are unanswerable and the constitution indefensible. Gratitude is hereby expressed to the President for making these facts so clearly deducible. The spirited enunciation of the rights of minorities at first glance appears enlightened and liberal, but, in the context, is seen to be merely a succinct expression of the oligarchical views of the Council of the College—rightly termed by the President a “minority”—though he omits to mention their entrenched position. It is not doubted that minorities must be represented, but in the last 120 years successive Parliaments have ordained that majorities also require representation. It is accordingly submitted that the political rights of 3,590 members must eventually prevail.—I am, etc.,

Sheffield, 1.

JOHN L. EDWARDS.

SIR,—I am glad to read in the *Supplement* of May 18 (p. 275) that Professor Robert Platt has tried to explain the last sentence in his original letter (*Supplement*, May 4, p. 244). I would respectfully point out to him that the danger of disloyalty to our brethren is much greater than the inability of the minority to speak its mind. The profession is in its present plight because of the independent action of the Comitia of the Royal College of Physicians, apparently without the knowledge of the Council of the B.M.A.—I am, etc.,

Hampton, Middlesex.

G. C. L. WOODROFFE.

The Changed Picture

SIR,—You have already been good enough to allow space for both the writers separately to express their views in your columns. Both have recommended withdrawal in one form or other as our strongest weapon in negotiation. For a time it seemed that this view had general support, but now it is obvious that, without in our opinion any real change in the position, opinion is divided. From a simple claim for the implementation of the Spens recommendations involving the payment of an increase of 24% many side issues have evolved, many carefully arranged by the Government to divide us, and others introduced by our own kind who seem to have lost sight of the real issues. Why then has this deviation occurred?

In the first instance the profession entered the N.H.S. because it understood that its pay would always keep pace with the cost of living. Such an arrangement would apparently be to our disadvantage should the cost of living ever again fall. Now it would appear that both the main political parties refuse to accept this arrangement. We alone in the community claim the right of automatic exemption from the effects of any change in living costs. Small wonder then that both parties are unhappy about it.

Accepting, then, for the moment that the politicians alone in the community claim the right to disregard their promises, what right have we to make this claim? Certainly when we came into the Service we had the right, since had we not entered it we should have secured our own financial future by raising our fees. It would, however, appear to us that we have the same right now only while we have the alternative of leaving this Service and again securing our financial status for ourselves. In our opinion, therefore, it is imperative that we should make it quite clear to Government, Opposition, and country alike that we can and will continue to provide medical service to the community and continue to support ourselves and our families against this rising cost of living, even if the N.H.S. has to be altered, put under new management, or even abolished.

With this clearly established, it is immaterial whether we do or do not co-operate with the Royal Commission, or any other red herring that the Government may produce at a later date. If its findings support us we may accept them even if the Government refuses to do so. If not, then we should disregard them and take definite steps towards withdrawal, by which means, or by the threat of which means, alone we shall force the Government to give us our rights; or else we should establish them for ourselves. Always let us remember that the N.H.S. cannot manage without us, but we undoubtedly can manage without it, for all that we need is ourselves and our surgeries. Expensive and usually unnecessary drugs may have to go back to being used for real emergencies, but that is probably a good thing.

By all means, then, let us hear what the Royal Commission has to say, but let us regard the lapse of time as a period of grace during which we should strengthen our Guild, and collect the 3d. per patient which we may dearly need at a later date. If, as a result of the Commission's findings, we feel that we can then allow our representatives to open negotiations with the Government, let us then be sure that not only are our original demands met but that this situation may not arise again and leave us even less prepared to meet it. Further, we should be sure that if our work increases from any cause, including a diminution in our own numbers which would at present seem inevitable, we should be compensated for it. Under the present terms we should not be.—We are, etc.,

G. N. FOX.

C. A. PRAGNELL.

Newton Ferrers, Southall.

SIR,—As the representative of unestablished principals on the General Medical Services Committee, having been unable to attend the fateful meeting of the Committee held at 9 a.m. on April 30 (*Supplement*, May 11, p. 260), may I comment on recent events? The decision of the G.M.S. Committee by a very small majority (which incidentally would have been smaller had I been able to attend) to reverse its previous decision and recommend giving evidence to the Royal Commission, and that of Council on the next day, giving its opinion that “circumstances had changed,” are astonishing both in timing and in content. Both meetings were obviously far too hurried for proper consideration of such important issues, and in any case no decision reversing or recommending reversal of previous policy should have been taken immediately before the Conference and Special Representative Meeting, thus giving representatives no opportunity to consult their constituents on the new policy. In the event, the confusion among representatives is now well known, and they are to be congratulated on doing the only proper thing and deferring the matter for consideration by the profession as a whole.

Thus the main issues have yet to be decided. Surely the essential point is that the profession came into the N.H.S., in spite of many misgivings, because the Government of the time claimed that it was offering a binding contract (Spens) and the profession was persuaded into believing this. Moreover, subsequent Governments, including the present one, have regarded the contract as valid and have agreed that it shall remain so “until such time as after the usual consultations some other basis is substituted” (*Supplement*, March 23, p. 123).

We must separate the past and present from the future. As to the past and present, from 1948 until now the profession has been working for the Government under the Spens contract, and therefore remuneration for the past and present—i.e., for each year since 1951—must be based on Spens. We must insist that the Government fulfil their side of this contract. Preferably, we should take our case to the courts, but should the highest legal advice be against this, or should the legal claim fail, we must insist on arbitration on our moral claim. It is clear that the Royal Commission is not an arbitrating body, and in any case it will not decide how to interpret Spens but how to replace it. The Government's intransigence has shown that the only way we can

insist on this fundamental right to arbitration is by withdrawal from the Service, and this we must do, unless the Government agrees to our interpretation of Spens or to Government arbitration. This is quite irrespective of whether evidence is to be given to the Royal Commission as to the level of future remuneration.

The position with regard to the future is different. If the profession were to agree with the Government that there should be a change in the basis or level of remuneration, there might be a case for setting up a committee composed of persons agreed by both sides with agreed terms of reference. The profession has not expressed an opinion as to whether there should be such a change in remuneration, and the present Royal Commission does not meet either of the above requirements in spite of the recent “assurances.” We should not give evidence until we agree to such a change in remuneration and until these minimum requirements are met. Even if these requirements are met, unless a legally binding contract between the profession and the Government can be based on the findings of the Royal Commission, the profession should think very carefully both before giving evidence and before trusting any Government again for its remuneration or terms of service. No Government can bind its successor, and all Governments treat doctors as just another group of technicians whose services are to be obtained at the lowest possible cost. The promises of British Governments are now apparently not worth the paper they are written on. If the Royal Commission's findings prove inconvenient to the Government in ten years' time, what is to prevent another Royal Commission being set up to adjust our remuneration (downwards) again?

Would we not be wiser, for this and many other reasons, for which there is insufficient space here, to insist on obtaining our remuneration from the person who knows our worth and needs and values our services—i.e., the patient? In order that the highest standards of treatment shall be available to all sections of the people, including the poor, we must first work out a scheme whereby the patient reclaims most of his fee from some insurance body. There are several examples of such schemes in operation in other countries, notably Australia, and the Council, in carrying out its intended view of the Health Services, should consider these with a view to formulating a scheme for use in this country and, when approved by the profession, negotiating with the Government on the necessary amendments to the N.H.S. The Government will be far more willing to listen to us if it sees from our present conduct that we are prepared to use force when necessary to safeguard our essential rights and freedoms.—I am, etc.,

London, E.4.

F. G. TOMLINS.

SIR,—Surely it was unnecessary for Council to lose its dignity and join the unedifying scramble caused by the Government choosing to throw a few crumbs to the profession. The haste with which a special representative meeting has been called suggests that it also has fallen for the bait.

It was obvious that an attempt would be made to cause disunity by a few apparent concessions just previous to the meetings of April 30 and May 1. Having survived that division, albeit by the skin of our teeth, the position has altered in that the initiative has returned to us. Until then we had left ourselves no room for manoeuvre. We are now free again. The Government has no more crumbs to scatter without making a major concession.

Let us make no decision now. Let us stay away from the Royal Commission. Let the play go on without the star. We have had previous experience of the disasters that can arise by co-operating “without prejudice.” The recent happenings have discouraged the faint-hearted and confused the many who doubt the ability of the B.M.A. ever to give a consistent lead. Let us wait at least six months and use the interval to do that organization in the periphery and centrally that is so necessary. We are not likely to get any further concession unless we force it, so we have nothing to lose by delay and everything to gain. Unless we obtain the right

of negotiation now we will never do so in the future. Remuneration is not now the issue. The issue is whether we shall remain in the N.H.S. as a partner.—I am, etc.,

Wolverhampton.

R. S. V. MARSHALL.

SIR,—You do no good service either to the profession or to those whose duty it will eventually be to negotiate on its behalf by proclaiming in your leading article (*Journal*, May 11, p. 1106) that the “Spens Reports are now a dead letter so far as the Government is concerned.” This statement merely repudiates all the correspondence and negotiations which have recently taken place as meaningless nonsense.

Ever since this dispute began the profession have been waving the letter from the Ministry of Health in front of the Government in which it was laid down that Spens remains the basis of our remuneration until such time as after due consultation another basis is substituted. The Government is now taking the steps which that letter envisages. If you wave the letter you must not grumble if the Government acts on it. After informing itself by means of a Royal Commission the Government will proceed to the consultations. No better way of ensuring that these will be unfavourable to us can be envisaged than by making statements suggesting that all is lost before we start.

The Spens Report written in 1946 speculated on what medical practice was going to be like in the National Health Service which was going to start two years later. Reading it now, it is only remarkable that it is not even more out of date than in fact it is. It lays down valuable principles and others which are quite useless and in fact have never been applied. It obviously needs revision and renovation. But to suggest that a report which has been the basis of our remuneration for the last nine years is a dead letter to one party in the dispute before anything else is substituted is a gross distortion of fact. Spens has poisoned relations between the Government and the B.M.A. ever since the Danckwerts Award. By its rigid adherence to Spens in its present form the B.M.A. has lost enormously in prestige as the chief negotiating body of the profession. Spens needs to be pruned and improved, not killed. By supporting a new and better Spens the Association can work its way back into the confidence both of the Government and of its members.

Arbitration is not the answer. In January it was carefully explained to our Division by two members of Council that arbitration was contrary to the policy of Council; it was time-wasting; and it would need an alteration in the Act to make it available to the whole profession. Council only changed its policy on arbitration because it wanted to embarrass the Prime Minister after he had made a speech advocating its use.—I am, etc.,

London, N.W.1.

JOHN W. WIGG.

Testing Opinion

SIR,—Do you not think that the time has come to stop the farce of having any more local meetings on the problems which are immediately affecting us, and to get down to brass tacks and really find out what members think? At the last meeting held in this area to decide these vital issues there were some 60 members present out of a possible 250, and I should say that next time there will be considerably less. Surely the facts are now known to everyone, and they should be in a position to give their opinion without any further haranguing by committee or council representatives. The Association should immediately communicate with all members by post, and they should be asked to give their opinion on the vital issues. The Association would then be in possession of the real opinion of the profession at this juncture. It would have saved a great deal of trouble if this method had been adopted months ago. There is no doubt that the B.M.A. machinery has been far too clumsy to handle the affairs of the past few months, and obviously requires complete revision.—I am, etc.,

London, S.W.16.

D. G. ALLEN.

BRITISH MEDICAL GUILD

Meetings to be Held

COVENTRY.—At Out-patient Department, Coventry and Warwickshire Hospital, Tuesday, May 28, 8.30 p.m. Address by Dr. A. Beauchamp.

Association Notices

A.R.M. MOTIONS AFFECTING POLICY

The following Motions which, if adopted, will involve Association policy have been submitted for inclusion in the 1957 Annual Representative Meeting Agenda. Under By-law 47 they require six weeks' notice in the *Journal*.

Service Committee and Tribunal Regulations

Amendment by South Staffordshire: That Service Committee and Tribunal Regulations should be amended to permit legal representation to both complainant and respondent.

Amendment by South Staffordshire: That there should be a final appeal to the Courts from a decision of the Minister in disciplinary cases against medical practitioners.

Fee for Short Report Form for Life Assurance Examination

Motion by Dorset: That this Meeting considers that the fee for a short examination for Life Assurance should be £1 ls. (The present fee for this short form of report is 15s.)

Change of Division

Motion by Rugby: That the By-laws be amended as follows:

Firstly: By-law 5 (a) to be deleted *in toto*.

Secondly: By-law 14 (1) be amended as follows: (1) At the beginning, after the words "subject as hereinafter provided", add "in By-law 14 (a)". (2) Delete at the end from "provided always that any member . . ." to " . . . in which he resides".

Thirdly by inserting the following new By-law 14 (a):

"Change of Division. 14 (a) If owing to ease of access, professional association, or other reason, a member (whose address for the time being in the Register of Members of the Association is within Great Britain or Northern Ireland) would prefer to become a member of some Division other than that of which he is, by reason of his address, an Ordinary Member, he shall on written application to the Secretary of the Association forthwith be transferred to and become an Ordinary Member of the Division of his choice and of no other."

A. MACRAE,
Secretary.

Diary of Central Meetings

MAY

- 30 Thurs. Medical Staffing Subcommittee, Central Consultants and Specialists Committee, 11.30 a.m.
31 Fri. S.R.M. Agenda Committee, 2 p.m.

JUNE

- 6 Thurs. Annual Conference of Representatives of Local Medical Committees, 10 a.m.
12 Wed. Council, 9.30 a.m.
12 Wed. Special Representative Meeting, 11 a.m.
12 Wed. Council (at conclusion of Special Representative Meeting).
13 Thurs. Editorial Subcommittee, Joint Formulary Committee, 11 a.m.
13 Thurs. Joint Formulary Committee, 2 p.m.
13 Thurs. Ophthalmic Group Committee, 2 p.m.
14 Fri. Overseas Committee, 2.15 p.m.
20 Thurs. G.M.S. Committee, 10.30 a.m.

Branch and Division Meetings to be Held

BATH, BRISTOL, AND SOMERSET BRANCH.—At Bristol General Hospital, Wednesday, May 29, 8.30 p.m., clinical meeting in conjunction with Bristol Division.

BIRMINGHAM DIVISION.—At 36, Harborne Road, Edgbaston, Birmingham, Thursday, May 30, 8.30 p.m., annual meeting.

BRADFORD DIVISION.—At Medical Societies' Room, Bradford Royal Infirmary, Wednesday, May 29, 8.15 p.m., A.G.M.

BROMLEY DIVISION.—At Selsdon Park Hotel, Wednesday, May 29, 7.30 for 8 p.m., annual dinner and dance.

BUCKINGHAMSHIRE DIVISION.—At Griffon Hotel, Amersham, Friday, May 31, 8.30 p.m., meeting.

EASTBOURNE DIVISION.—At the George Hotel, Alfriston, Tuesday, May 28, 7 for 7.30 p.m., dinner; 8.30 p.m., meeting, to which all medical practitioners in the area of the Division are invited.

EAST YORKSHIRE BRANCH.—At Unitarian Church, Park Street, Hull, Thursday, May 30, 8.45 p.m., meeting to which all medical practitioners in the area of the Division are invited.

ENFIELD AND POTTERS BAR DIVISION.—At St. Michael's Hospital, Chase Side Crescent, Enfield, Friday, May 31, 8.30 for 8.45 p.m., 7th annual meeting.

GLASGOW DIVISION.—At Glasgow Regional Office, 234, St. Vincent Street, Glasgow, Thursday, May 30, 8.30 p.m., meeting.

GOOLE AND SELBY DIVISION.—At the White Elephant, Snaith, Thursday, May 30, 7.30 p.m., annual general meeting.

HAMPSTEAD DIVISION.—At Central Library, Finchley Road, Tuesday, May 28, 8.30 p.m., annual general meeting.

HARROW DIVISION.—At Tithe Farmhouse, South Harrow, Sunday, May 26, 3.45 p.m., general meeting to which all medical practitioners in the area of the Division are invited.

HASTINGS DIVISION.—At Nurses' Home, Royal East Sussex Hospital, Hastings, Tuesday, May 28, 8.15 p.m., A.G.M.

HERTFORDSHIRE BRANCH.—At Conservative Hall, Waddington Road, St. Albans, Sunday, May 26, 3 p.m., meeting with Hertfordshire Local Medical Committee. All medical practitioners in the area are invited.

HUDDERSFIELD DIVISION.—At Board Room, Huddersfield Royal Infirmary, Tuesday, May 28, 8.15 p.m., special meeting to which all medical practitioners in the area of the Division are invited.

ISLE OF WIGHT DIVISION.—At Unity Hall, Newport, Tuesday, May 28, 3.15 p.m., meeting to which all medical practitioners in the area of the Division are invited; 4 p.m., A.G.M.

LAMBETH AND SOUTHWARK DIVISION.—At Nurses' Lecture Hall, Lambeth Hospital, Brook Drive, Kennington Road, S.E., Tuesday, May 28, 8.15 p.m., annual general meeting. (Open to non-members from 9 p.m. Dr. H. Alexander will speak.)

LANCASTER DIVISION.—At Royal King's Arms Hotel, Lancaster, Tuesday, May 28, 8.30 p.m., annual general meeting.

LEWISHAM DIVISION.—At Committee Room, Lewisham General Hospital, High Street, Lewisham, S.E., Friday, May 31, 8.30 p.m., meeting.

LIVERPOOL DIVISION.—At Liverpool Medical Institution, Tuesday, May 28, 8.30 p.m., general meeting in conjunction with local medical committee, to which all medical practitioners in the area of the Division are invited.

MANCHESTER DIVISION.—At Central Hall, Oldham Street, Manchester, Tuesday, May 28, 8.30 p.m., meeting in conjunction with Manchester Local Medical Committee. All medical practitioners in the area are invited.

MARYLEBONE DIVISION.—At Medical Society of London, 11, Chandos Street, W., Tuesday, May 28, 8.45 p.m., special meeting to which all medical practitioners in the area of the Division are invited.

METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Tuesday, June 18, 3 p.m., annual general meeting. President's address by Dr. J. W. McCarthy.

NORTH STAFFS DIVISION.—At Pathology Department, North Staffordshire Royal Infirmary, Stoke-on-Trent, Tuesday, May 28, 8 p.m., annual general meeting.

REIGATE DIVISION.—At Reigate Hill Hotel, Monday, May 27, 8.30 p.m., annual general meeting.

SOUTH ESSEX DIVISION.—At Railway Hotel, Hornchurch, Tuesday, May 28, 9 p.m., special meeting to which all medical practitioners in the area of the Division are invited.

SOUTH LANCASHIRE AND EAST CHESHIRE BRANCH.—At Grand Hotel, Manchester, Wednesday, May 29, 12 for 12.30 p.m., luncheon; 2 p.m., annual meeting.

SOUTH MIDDLESEX DIVISION.—At Anchor Hotel, Shepperton, Monday, May 27, 9 p.m., general meeting to which all medical practitioners in the area of the Division are invited.

SOUTHERN BRANCH.—At Portsmouth Council Chambers, Clarence Parade, Southsea, Saturday, June 1, 2.30 p.m., 81st annual meeting.

SOUTH-WESTERN BRANCH.—At Oldway, Paignton, Saturday, June 1, 1 for 1.15 p.m., lunch for members and their ladies; 2.30 p.m., 112th annual meeting. Inaugural address by Dr. R. M. S. McConaghey: "Epidemiology in Devon"; 4 p.m., tea; 4.45 p.m., address by Dr. Hugh Clegg (Editor, *British Medical Journal*): "State Medicine in Ancient Greece"; 7.30 for 8 p.m., annual dinner (guests are invited).

TOWER HAMLETS DIVISION.—At Mile End Hospital, Bancroft Road, E., Friday, May 31, 3 p.m., clinical meeting.

TUNBRIDGE WELLS DIVISION.—At Mount Ephraim Hotel, Tunbridge Wells, Sunday, June 2, 3 p.m., meeting to which all medical practitioners in the area of the Division are invited.

WANDSWORTH DIVISION.—At Out-patient Department, St. James' Hospital, Sarsfield Road, Balham, S.W., Wednesday, May 29, 8.30 p.m., clinical meeting.

WARRINGTON DIVISION.—At Orthopaedic Out-patient Department, Warrington Infirmary, Friday, May 31, 8.30 p.m., joint meeting with local medical committee.

WEST SUFFOLK DIVISION.—At Everard's Hotel, Bury St. Edmunds, Tuesday, May 28, 8.30 p.m., meeting to be held in conjunction with local medical committee. All medical practitioners in the area are invited.

ANNUAL MEETING: NEWCASTLE UPON TYNE, JULY 10-19

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

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British Medical Association

GENERAL MEDICAL SERVICES COMMITTEE
SUPPLEMENTARY REPORT TO LOCAL
MEDICAL COMMITTEES

REMUNERATION—INTERIM ADJUSTMENT

It will be remembered that the Special Conference of Local Medical Committees on April 30 resolved that the interim 5% addition to the net aggregate remuneration of general practitioners be accepted without prejudice, and that immediate negotiations should be entered into with the Ministry of Health upon the best way of distributing it so as to give the most effective help to the greatest number of practitioners.

Discussions on this matter have now taken place, and details of the proposed distribution are set out in the following letter which has recently been received from the Ministry of Health.

Interim Adjustment for General Medical Practitioners

I am writing on behalf of the Minister—and of the Secretary of State for Scotland, who wishes to be associated in this—to confirm that he would be happy to agree to the arrangements we discussed with you at our meeting on May 15, for distributing the increase of 5% in the aggregate net remuneration of general medical practitioners.

Having considered together a number of possible methods of distribution which would fit in with the recommendations of the Working Party in 1952, you suggested, with our full concurrence, that the method of choice, for an interim adjustment, would be an increase of 6d. on the capitation fee (bringing it to 17s. 6d. per annum) and of 1s. 6d. on the loading (bringing it to 11s. 6d. per annum).

As some small groups of doctors might not get sufficient help from this method alone, we all came to the conclusion that in addition initial practice allowances should be increased by 25% and supplementary annual payments—and hardship where these are still in existence—by 20%. We also together concluded that the amount at present allowed for the salary of trainee general practitioners should be increased by £75, making a total (excluding the training grant and the car allowance, each of £150) of £850 instead of the present £775.

On this basis, we would be very ready to ask executive councils to make by July 31 additional payments to general medical practitioners in respect of these increases in the capitation fees and loadings for the months of May and June.

The detailed implementation of the increases in initial practice allowances, supplementary annual payments, and hardship payments and in the allowance for trainee practitioners is bound to take a little more time, though we naturally want to settle these matters as quickly as can be done. We would propose, if you confirmed that this would be your wish, to ask executive councils to include in the quarterly payments which are made to general medical practitioners at the end of September retrospective adjustments of these particular payments to cover also the two months of May and June. You appreciated, I know, that in the short time which is available it would not be possible for executive councils to include these detailed adjustments in the special interim payment which we would ask them to make as early as possible in July.

Without Prejudice

The General Medical Services Committee is anxious that these proposals, which follow the broad principles laid down by the Working Party in 1952, should be submitted to the Annual Conference on June 6 for approval in order that the interim adjustment may be distributed to practitioners by July 31.

The Committee wishes to make it quite clear that it is submitting these proposals on the understanding that they are without prejudice to any final form of distribution which may be agreed when the present remuneration dispute is finally resolved.

It will be noted that in the letter from the Ministry reference is made to an increase in the salary of trainee general practitioners. Other assistants are not of course covered by the interim 5% adjustment, as they are not in direct contract with executive councils. For this reason the

Committee believes it right that any adjustment of assistants' salaries should be left for consideration by individual principals.

The Committee believes that these arrangements do enable the most effective help to be given to the greatest number of practitioners, and it accordingly recommends:

Recommendation: That the 5% increase in the net aggregate remuneration of general practitioners be distributed as follows:

- (1) That the initial practice allowance be increased by 25%;
- (2) That the supplementary annual payments and hardship payments be increased by 20%;
- (3) That the present loading be increased by 1s. 6d., bringing it to 11s. 6d. per annum;
- (4) That the present capitation fee be increased by 6d., bringing it to 17s. 6d. per annum.

A. B. DAVIES,
Chairman.

REGISTRARS GROUP COUNCIL

NEW NAME ADOPTED

The constitution of the Group, hospital medical staffing, standards of accommodation, and the problems of transitional senior registrars were the chief items under discussion at a meeting of the Registrars Group Council held at B.M.A. House on May 10.

Constitution

Opening the discussion on the constitution, the chairman, Mr. R. BREARLEY, reported that the Central Consultants and Specialists Committee had approved the proposals of the Registrars Group Executive Committee which would ensure representation of all members of hospital junior staff and the proposal that the Group Council should be renamed the Hospital Junior Staffs Central Committee. The day-to-day work of this committee would be carried out by a hospital junior staffs central executive committee. The executive committee would receive from and appoint to the Central Consultants and Specialists Committee two representatives to facilitate adequate liaison between the two committees.

Dr. A. G. STEPHENSON (Birmingham) moved Birmingham's counter-proposal that the number of representatives to each should be four. Though this was doubling the number of Group representatives, said Dr. Stephenson, they would be representing 3½ times as many people as before. Mr. R. LOWE (South-east Scotland) opposed the increased representation on the grounds that it was a tacit acceptance of the present method, and he was supported by Dr. H. WATSON (Eastern Scotland), who thought that as long as there were two the council would have a mouthpiece. Four could no more force a vote than could two. In addition, Dr. Watson suggested that, as the members of the Central Consultants and Specialists Committee were very busy men, it might meet the purpose if their representatives were invited to attend the Hospital Junior Staffs Committee executive committee only when, and while, relevant subjects were under discussion.

It was agreed that there should be an exchange of two representatives as recommended, and the recommendation that the Hospital Junior Staffs Committee executive committee should retain the right of direct access to the Council of the Association in the event of disagreement with the Central Consultants and Specialists Committee was also agreed to.

The Group Council then discussed suggestions for the regional organization of the hospital junior staffs. It was proposed that each region should make its own arrangements for the election of a regional committee and the appointment of representatives to serve upon the Hospital Junior Staffs Central Committee.

Whitley Committee B

The Central Consultants and Specialists Committee's refusal to agree to a request that a registrar representative should be present in Whitley Committee B when matters concerning registrars were under discussion was considered. The Group Council unanimously adopted a motion proposed by Mr. Lowe:

That this Group Council instructs its executive committee to put before, first, the Central Consultants and Specialists Committee and, if necessary, the Council of the British Medical Association its resolution that it be represented on a subcommittee of Whitley B formed to deal with matters concerning hospital junior staff.

The view was also expressed that registrars should be represented in discussions between the Ministry and the Joint Consultants Committee on matters of special interest to them. Appreciation was recorded of the occasions when the Joint Consultants Committee had received registrars and had taken note of their views.

Royal Commission

The Group Council then turned its attention to resolutions from Wales and Birmingham that the interests of registrars would best be served if they were able to present their own evidence to the Royal Commission on the remuneration of doctors and dentists. They were in favour of evidence being given to the Commission, and decided that if the Association should not give evidence means would have to be found whereby their views could be expressed.

Hospital Medical Staffing

The CHAIRMAN reported that he and Drs. J. E. Forster and G. R. Venning had been received by the Joint Consultants Committee in April to put forward the Group Council's views on the present discussions on hospital medical staffing. They had told the Joint Consultants Committee that registrars were not in favour of the creation of any new grade, but urged, as an immediate measure, that time-expired senior registrars should be retained on a rising salary scale, and that there should be a review of hospital establishments. These views had received the support of the Joint Consultants Committee. The Group Council proceeded to pass a resolution noting that there is now no substantial difference of view between it and the Joint Consultants Committee on the problems of hospital medical staffing, and urging the early implementation of the steps outlined above.

Standards of Accommodation

Consideration was given to a resolution from the Liverpool Regional Group:

The Liverpool Group regrets that the Board and Lodging Subcommittee of Whitley Committee B has so far not invited a registrar representative to be present at its discussions on standards of accommodation.

Dr. J. E. FORSTER (Liverpool) said that at its February meeting he had told the Central Consultants and Specialists Committee that the Group Council wanted to send a representative to the subcommittee, but had still failed to receive an invitation. His fear was that something might be decided by the subcommittee without their representative being present. He suggested writing direct to the chairman of the subcommittee—without going through the Central Consultants and Specialists Committee—to see if he would like to see them on the subject.

Dr. W. J. ATKINSON (North-east Metropolitan) thought that that would be the simplest method, and Mr. Lowe suggested that with it could be coupled the previous motion calling for representation on a subcommittee of Whitley Committee B. Mr. Lowe described it as a matter that could be made a test case on the general principle of representation. The motion was carried.

Transitional Appointments

Anxiety was expressed about the fate of time-expired senior registrars who were holding transitional appointments. It was explained that the Ministry had given a general undertaking that so far as possible time-expired senior registrars should not be lost to the Service, and boards had power to continue their appointments in a transitional capacity. It was reported that in more than one region these transitional appointments were being looked on as supernumerary appointments, the original appointments being filled by new senior registrars. This appeared to be a dangerous trend.

The North-east Scotland Regional Group raised the matter of the difficulty registrars had in providing many copies of their applications when applying for consultant appointments. It was felt that a single application should be sufficient; hospital authorities having clerical facilities for reduplicating could well undertake this work and save the applicant the unnecessary and frequently repeated expense.

The draft annual report of the work of the Registrars Group for the year 1956-7 was agreed to. This will be circularized and available in the regions to all registrars. Dr. G. PALLIS was elected to fill the vacancy on the executive committee caused by Dr. Binks's appointment to a consultant post.

Following the meeting of the Group Council the registrars' annual dinner was held at Kettner's Restaurant. The guests of honour were Sir Harry Platt, P.R.C.S., and Dr. S. Wand, Chairman of the B.M.A. Council. Dr. R. M. Forrester, a former chairman of the Registrars Group Council, was also present.

GENERAL PRACTICE REFORM ASSOCIATION

ANNUAL MEETING

The third annual general meeting of the General Practice Reform Association was held on May 4. In his opening address the chairman of the executive committee, Dr. A. C. J. SAUDEK, hoped that the Royal Commission would consider not only levels but also methods of remuneration, and would give special attention to assistants and small-list practitioners.

The meeting passed resolutions welcoming the appointment of the Royal Commission and the fact that it would be prepared to consider evidence on remuneration of assistants in general practice. It also passed a resolution on the distribution of the 5% interim increase to general practitioners to the effect that those with lower incomes should receive a higher percentage; and another resolution that the minimum share for a junior partner in an N.H.S. practice should not be less than one-half of the largest share, and that an incoming partner's share should be required to reach parity or near parity with other partners in not more than five years.

TOO MANY DOCTORS IN KENYA

BRANCH COUNCIL'S WARNING

According to a report from the council of the Kenya Branch of the B.M.A., medical practitioners have been entering Kenya in such numbers that a situation has been reached where they are unable to find immediate employment. The Branch council advises all those wishing to practise in Kenya to make careful inquiries beforehand, and to have a definite promise of employment before entering the country. It is stated that the situation applies to all parts of the country, and to both Europeans and Asians; it applies particularly to general practitioners, but also to a lesser extent to specialists. The day of the "squatter" is considered to be past unless he has a large amount of capital to last him while he is getting established.

The honorary secretary of the Kenya Branch (Mr. Andrew Hicks, P.O. Box 20022, Nairobi, Kenya, E. Africa) would be pleased to answer personal queries.

GENERAL MEDICAL SERVICES COMMITTEE ELECTION OF DIRECT REPRESENTATIVES, 1957-8

The following direct representatives upon the General Medical Services Committee have been elected unopposed for the Groups mentioned:

- Group A1**
Dr. J. T. Baldwin (Penicuik, Midlothian).
- Group A2**
Dr. C. J. Swanson (Aberfeldy, Perthshire).
- Group A3**
Dr. W. M. Knox (Glasgow).
- Group A4**
Dr. R. C. Hamilton (Kilmarnock).
- Group C**
Dr. G. D. W. Adamson (Loxley).
Dr. B. Burns (Sheffield).
- Group E**
Dr. Miles Parkes (Crewe).
- Group G**
Dr. E. W. Goodwin (Leicester).
Dr. A. D. Stoker (Winstar, Derby).
- Group H**
Dr. A. B. Davies (Walsall).
- Group I**
Dr. F. A. Smorftt (Southam, Warwick).
- Group L**
Dr. S. Noy Scott (Plympton).
- Group M**
Dr. K. S. Maurice-Smith (Ely).
- Group N**
Dr. H. S. Howie Wood (Isle of Wight).
- Group O**
Dr. J. C. Cameron (Wallington).
- Group P**
Dr. R. Green (Hurstpierpoint, Sussex).
- Group Q**
Dr. A. Talbot Rogers (Bromley, Kent).
- Group R**
Dr. W. Morgan Evans (Hounslow).
Dr. A. N. Mathias (Cricklewood).
- Group S**
Dr. H. N. Rose (Ilford, Essex).
Dr. C. M. Scott (New Barnet, Herts).
- Group T**
Dr. M. Sorsby (London, E.5).
Dr. H. H. D. Sutherland (London, W.10).
- Group U**
Dr. J. M. B. Donaldson (Belfast).

In the contested Groups—namely, B, D, F, J, and K—the results were as follows:

- Group B**
Dr. T. S. Blaiklock (Morpeth). *Elected.*
Dr. F. Lishman (Crook, Co. Durham). *Elected.*
Dr. F. J. Stevenson (Carlisle).
- Group D**
Dr. I. Affleck (Kearsley, Lancs). *Elected.*
Dr. F. S. Catto (Manchester). *Elected.*
Dr. J. J. Devlin (Fleetwood). *Elected.*
Dr. W. E. Bowden (Warrington).
Dr. I. M. Dove (Blackpool).
- Group F**
Dr. T. J. Hargest (Clydach, Swansea). *Elected.*
Dr. G. P. Williams (Holyhead). *Elected.*
Dr. W. D. Williams (Burry Port, Carm).
- Group J**
Dr. C. F. R. Killick (Wilton, Somerset). *Elected.*
Dr. W. B. S. Crawford (Bath).
- Group K**
Dr. R. W. McConnel (Wendover, Bucks). *Elected.*
Dr. A. Wilson (Northampton).

Dangerous Drugs Act: Withdrawal of Authority

The Home Office announces that Dr. Robert Archibald Herschell Morison (Barrow-in-Furness) is no longer authorized to be in possession of or to prescribe those drugs to which the Dangerous Drugs Regulations apply.

HOSPITAL BOARD APPOINTMENTS

The Minister of Health has appointed or reappointed the following medical members to boards of governors of teaching hospitals and regional hospital boards, mainly to fill vacancies caused by retirement in rotation of one-third of the members, until March 31, 1960.

London Teaching Hospitals

St. Bartholomew's.—Reappointed: Dr. C. F. Harris, Mr. J. B. Hume, Mr. E. G. Tuckwell.
London.—Reappointed: Dr. J. Graham, Dr. G. T. Hankey. New: Dr. W. Evans, Professor Dorothy S. Russell.
Royal Free.—Reappointed: Miss Gladys Hill, Miss K. G. Lloyd-Williams, Miss A. M. C. MacPherson. New: Mrs. Una C. Ledingham.
University College.—Reappointed: Sir G. R. MacRobert, Professor W. Smith. New: Sir James Kilpatrick.
Middlesex.—New: Dr. A. J. B. Goldsmith, Professor C. A. Keele, Mr. B. R. M. Johnson, Mr. D. H. Patey.
Charing Cross.—Reappointed: Dr. D. H. Campbell, Dr. E. Grundy, Mr. H. G. E. Williams. New: Mr. N. C. Tanner.
St. George's.—Reappointed: Dr. C. B. Henry, Mr. E. R. Smith. New: Dr. H. W. Gordon.
Westminster.—Reappointed: Mr. A. L. Abel, Mr. H. E. Harding, Mr. E. S. Lee, Professor R. J. V. Pulvertaft.
St. Mary's.—Reappointed: Mr. A. G. Cross, Professor R. Cruickshank, Dr. G. B. Mitchell Heggs, Dr. S. L. Simpson. New: Dr. D. H. Brinton, Dr. W. D. W. Brooks.
Guy's.—Reappointed: Dr. M. Campbell, Sir William Kelsey Fry. New: Mr. G. F. Gibberd.
King's College.—Reappointed: Brigadier H. L. Glyn Hughes, Sir Cecil Wakeley.
St. Thomas's.—Reappointed: Professor T. P. Kilner, Sir Max Page, Mr. A. J. Wrigley.
Hammersmith, West London, and St. Mark's.—Reappointed: Dr. R. Cove-Smith, Sir Allen Daley, Dr. C. E. Dukes, Sir Francis Fraser.
Hospital for Sick Children.—Reappointed: Dr. G. H. Newns, Dr. B. Schlesinger, Mr. D. I. Williams. New: Dr. R. E. Bonham Carter, Dr. J. A. Scott.
National Hospital for Nervous Diseases.—Reappointed: Sir Russell Brain, Dr. J. St. C. Elkington, Dr. M. Kremer.
Royal National Throat, Nose, and Ear.—Reappointed: Mr. J. C. Hogg, Mr. G. H. Howells. New: Dr. T. V. L. Critchlow.
Moorfields.—New: Mr. G. G. Penman.
Bethlem Royal and Maudsley.—Reappointed: Dr. C. P. Blacker.
St. John's Hospital for Diseases of the Skin.—Reappointed: Miss J. K. Aitken, Dr. S. C. Shanks. New: Dr. L. Forman.
Hospitals for Diseases of the Chest.—Reappointed: Sir Russell Brock, Dr. J. L. Livingstone, Dr. K. Robson, Dr. V. C. Thompson.
Royal National Orthopaedic.—Reappointed: Dr. C. H. Lack, Dr. R. Nassim.
National Heart.—Reappointed: Dr. H. A. Bulman. New: Dr. T. F. Cotton.
St. Peter's, St. Paul's, and St. Philip's.—Reappointed: Mr. A. R. C. Higham. New: Mr. H. G. Hanley.
Royal Marsden.—Reappointed: Dr. P. E. T. Hancock.
Queen Charlotte's and Chelsea.—Reappointed: Mr. H. G. E. Arthur, Mr. J. B. Blaikley, Dr. C. Newman.
Eastman Dental.—Reappointed: Brigadier R. A. Broderick, Sir William Kelsey Fry. New: Professor C. F. Ballard.

Provincial Teaching Hospitals

United Newcastle upon Tyne.—Reappointed: Dr. C. N. Armstrong.
United Leeds.—Reappointed: Professor D. Chamberlain. New: Professor A. S. Johnstone.
United Sheffield.—Reappointed: Dr. J. Wilkie. New: Mr. J. C. Anderson.
United Cambridge.—Reappointed: Miss J. E. Bottomley, Mr. A. S. H. Walford.
United Oxford.—Reappointed: Colonel L. K. Ledger, Dr. A. R. H. Williamson. New: Mr. R. G. Macbeth, Mr. J. A. Stallworthy.
United Bristol.—Reappointed: Professor R. J. Brocklehurst, Professor T. F. Hewer. New: Dr. C. D. Evans, Mr. A. Miller.
United Cardiff.—Reappointed: Dr. L. H. Howells. New: Mr. H. R. Harley.

United Birmingham.—Reappointed: Mrs. B. M. W. Dobbie, Professor F. A. R. Stammers.
United Manchester.—Reappointed: Professor W. I. C. Morris, Professor Sir Harry Platt. New: Dr. J. F. Wilkinson.
United Liverpool.—Reappointed: Professor W. M. Frazer, Professor C. A. Wells. New: Dr. E. Wyn Jones.

Regional Hospital Boards

Newcastle.—Reappointed: Dr. C. N. Armstrong, Dr. R. E. Jowett, Mr. R. S. Venters.
Leeds.—Reappointed: Dr. W. A. Hyslop, Mr. G. W. Watson.
Sheffield.—Reappointed: Dr. G. H. Gibson, Mr. J. L. A. Grout, Dr. C. S. O'Flynn.
East Anglia.—Reappointed: Professor A. L. Banks, Dr. K. J. Grant.
North-west Metropolitan.—Reappointed: Dr. E. C. Warner, Miss K. G. Lloyd-Williams. New: Professor F. C. Wilkinson.
North-east Metropolitan.—Reappointed: Dr. T. Rowland Hill, Dr. J. A. Moody, Mr. R. W. Reid.
South-west Metropolitan.—Reappointed: Sir William Kelsey Fry, Dr. V. F. Hall, Dr. W. G. Masfield. New: Mr. H. W. L. Molesworth.
South-west Metropolitan.—Reappointed: Mr. A. L. Abel, Sir Geoffrey Todd.
Oxford.—Reappointed: Mr. C. Gledhill.
South-western.—Reappointed: Professor R. J. Brocklehurst, Dr. L. C. Hill, Professor A. V. Neale.
Wales.—Reappointed: Provost A. T. Jones, Dr. E. W. Jones, Mr. E. K. R. Thomas.
Birmingham.—Reappointed: Dr. J. H. Sheldon, Professor A. P. Thomson.
Manchester.—Reappointed: Professor V. F. Lambert, Dr. R. W. Luxton, Dr. M. Parkes, Professor Sir Harry Platt.
Liverpool.—Reappointed: Professor W. M. Frazer, Professor H. L. Sheehan.

APPOINTMENT OF CHAIRMEN OF
REGIONAL BOARDS AND BOARDS OF
GOVERNORS

The Minister of Health has made the following appointments or reappointments as chairmen of regional hospital boards and boards of governors of teaching hospitals. The appointments, which date from March 31, 1957, are for three years.

Leeds Regional Hospital Board.—Major J. C. Hunter.
South-west Metropolitan Regional Hospital Board.—Mr. A. G. Linfield.
Oxford Regional Hospital Board.—Sir George Schuster.
Birmingham Regional Hospital Board.—Mr. E. W. Thompson.
United Newcastle upon Tyne Hospitals.—Sir Walter Drummond.
United Leeds Hospitals.—Sir George Martin.
United Sheffield Hospitals.—Alderman A. Ballard.
United Cambridge Hospitals.—Mr. Roger H. Parker.
United Oxford Hospitals.—Sir David Lindsay Keir.
United Cardiff Hospitals.—Alderman Thomas Evans.
United Birmingham Hospitals.—Mr. Evan A. Norton.
St. Bartholomew's Hospital.—Sir George Aylwen.
London Hospital.—Sir John Mann.
University College Hospital.—Sir Alexander Maxwell.
Middlesex Hospital.—Lord Astor of Hever.
Charing Cross Hospital.—Lord Inman.
St. George's Hospital.—Viscount Ingleby.
Westminster Hospital.—Lord Nathan of Churt.
St. Mary's Hospital.—Mr. Edgar E. Lawley.
Guy's Hospital.—Lord Cunliffe.
King's College Hospital.—The Marquess of Normanby.
St. Thomas's Hospital.—Sir Arthur J. P. Howard.
Hammersmith, West London, and St. Mark's Hospitals.—Sir Desmond Morton.
Royal National Throat, Nose, and Ear Hospital.—Mr. Ernest Edward Taylor.
St. John's Hospital for Diseases of the Skin.—Mr. J. A. M. Ellison-Macartney.
Hospitals for Diseases of the Chest.—Sir John Little Gilmour.
Royal National Orthopaedic Hospital.—Sir Henry R. K. Floyd.
National Heart Hospital.—Mr. J. M. Oakley.
St. Peter's, St. Paul's, and St. Philip's Hospitals.—Mr. Laurence E. D. Bevan.
Royal Marsden Hospital.—Mr. J. M. Wallace.

MEDICAL PRACTICES COMMITTEE

AMENDMENT OF CLASSIFICATION OF AREAS

The following areas have been reclassified by the Medical Practices Committee as "designated":

Durham.—*Durham Rural District. *Bishop Auckland (except Bishop Auckland Town).
Lancashire.—*Fyldeley.
London.—Borough of Camberwell: *Coburg, Addington, St. George's, North Peckham and Marlborough Wards. *West and Town Hall Wards. Borough of Lambeth: *Prince's and Oval Wards.
Middlesex.—Borough of Wood Green: *Noel Park and Town Hall Wards. *Urban District of Ruislip-Northwood.
Northamptonshire.—*Rushden.
Wiltshire.—*Swindon (except Walcot).
Stoke-on-Trent.—*Smallthorne and Norton District.
Glamorganshire.—*The Townships of Treorchy, Llwynypia, Ferndale, Tylorstown, Wattstown, and Ynyshir (Rhondda Municipal Borough).

The following areas have been reclassified as "intermediate":

Cheshire.—Little Sutton, Borough of Ellesmere Port and Whitby (Chester District).
Durham.—Urban District of Hetton.
Kent and Canterbury.—Borough of Maidstone: Urban District of Sevenoaks.
Leicestershire and Rutland.—Melton Mowbray (except Bottesford and Somerby).
London.—Borough of Battersea: Bolingbroke, Thornton and Broomwood Wards and the Nightingale Ward (combined). Borough of Islington: St. Mary and St. Peter's Wards.
Middlesex.—Borough of Uxbridge: Urban District of Sunbury-on-Thames.
Norfolk.—Rural District of Marshland.
Northamptonshire.—Oundle District. Wellingborough District. Corby (including Great Easton), Higham Ferrers and Raunds.
Birmingham.—Perry Barr.
Kingston-upon-Hull.—South District.
Smethwick.—Whole of County Borough.
Southampton.—Whole of County Borough.
Southend-on-Sea.—Southend and Thorpe Bay.
Denbighshire and Flintshire.—Rhosllanerchrugog.
Glamorganshire.—Rhondda Municipal Borough (except Trehafod, Treorchy, Llwynypia, Ferndale, Tylorstown, Wattstown and Ynyshir). Urban District of Maesteg.
Monmouthshire and Newport.—Urban District of Bedwellty. Municipal Borough and Rural District of Monmouth.
Pembrokeshire.—Fishguard and Goodwick.

The following areas have been reclassified as "restricted":

Buckinghamshire.—Iver.
Devon and Exeter.—Cullompton (Tiverton Rural District).
Essex.—Rural District of Maldon.
Hampshire.—Mudford. That portion of the Borough of Christchurch immediately east of "Stanpit" which is within a radius of approximately half a mile from the point on the sea-front known as "Sandhills".
Kent and Canterbury.—Rural District of Maidstone.
London.—Borough of St. Pancras: Whitfield Ward.
Salop.—Ellesmere.
Somersetshire.—Rural District of Long Ashton. Urban District of Burnham-on-Sea.
Suffolk (East).—Stoven (Wainford District).
Sussex (East).—Rural District of Chichester.
Wiltshire.—Walcot area of Swindon.
Croydon.—Addiscombe Ward (South Parliamentary Division).
Glamorganshire.—Resolven (Neath Rural District).

The Ministry of Health has issued a revised edition of the booklet of lists of proprietary preparations classified in categories 1, 5, and 6, following further decisions by the Joint Committee on Prescribing and the Standing Joint Committee on the Classification of Proprietary Medicines. The list replaces that issued in November, 1954, and the alterations and additions issued in April, 1955, and April, 1956. Copies have been sent to executive councils for distribution to doctors and chemists.

PUBLIC HEALTH MEDICAL OFFICERS

REVISED CAR ALLOWANCES

In view of the recent decrease in the price of petrol Committee C of the Medical Whitley Council has agreed on a revision of the increased motor-car allowances for public health medical officers which came into force in January as a result of petrol rationing and the increased price. The revised lower rates come into force as from May 1 and are set out in M.D.C. Circular No. 34 to local authorities in England and Wales.

DRUGS FOR PRIVATE PATIENTS

APPROACH TO MINISTRY

At its meeting on May 8 the Council of the Association unanimously agreed to a recommendation of the Private Practice Committee, presented by its chairman, Dr. ALEXANDER BROWN, that the Minister of Health should now be informed that the Council wishes to take advantage of his offer to initiate discussions between the Association and officers of the Ministry on the question of drugs for private patients. The Minister's offer was on the understanding that the discussions should be on an exploratory basis. The Private Practice Committee made its recommendation after considering the arguments put before the Council at its meeting on March 27 for and against the G.M.S. Committee's recommendation "that at an appropriate time in the future discussions be initiated with officers of the Ministry of Health on the provision of drugs for private patients." The Private Practice Committee remained convinced that the appropriate time was now.

The following have been invited by Dr. S. WAND, Chairman of Council, to accompany him to the Ministry: Dr. ALEXANDER BROWN, Dr. A. B. DAVIES, Dr. LINDSEY BATTEN, and Dr. A. N. MATHIAS. The Ministry has been asked to arrange a date for the meeting.

BUREAUS' CHANGE OF TITLE

EMPIRE TO COMMONWEALTH

At the meeting of the Council of the B.M.A. on May 8 it was decided that the title of the Empire Medical Advisory Bureau should be changed to Commonwealth Medical Advisory Bureau, and that of the International Medical Visitors Bureau to International Medical Advisory Bureau.

Questions Answered

We publish below a selection of those questions and answers which seem of general interest. It is regretted that it is not possible to supply answers to all questions submitted.

Treatment for Road Accidents

Q.—I am sometimes called to give emergency treatment to victims of road accidents. The local police tell me that no claim can be made for fees for attending such accidents. Is this so?

A.—The position is clearly stated in the B.M.A. *Medical Practitioners' Handbook*.¹ A doctor is not precluded from charging for attendance, and therefore the statement attributed to the local police is not correct.

REFERENCE

¹ *Medical Practitioners' Handbook*, 1954, p. 155. British Medical Association, London.

HOSPITALITY

A German's doctor's son, aged 18, would like to exchange visits with a British boy between the end of July and the end of August. The British boy would have an opportunity of shooting with the doctor while staying in Munich.

A French doctor's son, aged 15, from Marseilles, would like to visit a medical family in August in the London area. A British boy could visit France in June or July.

A French doctor (from Strasbourg) and his wife would like to arrange an exchange or stay as a paying guest with a medical family in the London area for two weeks from June 25 while visiting hospitals in London.

Would anyone interested please get in touch with Brigadier H. A. Sandiford, International Medical Advisory Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Scottish News

EXAMINATION OF PERSONS SUSPECTED
OF BEING DRUNK IN CHARGE OF
MOTOR VEHICLES

Following representations from the Scottish Committee, the Crown Agent has agreed that as from June 1 procurators-fiscal will pay doctors who carry out examinations of persons suspected of being drunk in charge of motor vehicles the following fees: (1) For an examination which takes place in the daytime up to 8 p.m., a fixed fee of £2 2s. (2) For an examination which takes place between 8 p.m. and 9 a.m., a fixed fee of £3 3s.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Weakness of Multiple Representation

SIR,—The state of confusion and disunity into which the profession has fallen over the remuneration issue has shown again the lamentable weakness of multiple representation. Apart from various other bodies, including the royal colleges and the Medical Practitioners' Union, which presume to represent some or all of the profession, the B.M.A. itself has not less than three heads: the autonomous General Medical Services and Consultants and Specialists Committees, as well as the Council, or rather the Representative Body, for the Council must defer determination of policy to the R.B., an assembly which meets only annually or for a special purpose. Even that is not the end to the division of authority, for the G.M.S. Committee is responsible to the Conference of Local Medical Committees which are statutory and outside the Association; and the Central Consultants and Specialists Committee is subordinate to the Joint Consultants Committee, which is also outside the Association and composed mainly of nominees of the colleges, while the Public Health Committee is in part drawn from the Society of Medical Officers of Health.

It would be difficult to imagine a more confused and impractical state of affairs. It cannot be said that though illogical it works, because it is obvious that it does not. It lays the profession wide open to defeat on any issue. While it continues, the doctors of this country might as well reconcile themselves without further argument to dictation by the State as to their terms of employment in the N.H.S. and to disregard of any reforms they may propose. As a result we have witnessed recently the same sad sequence of events as in 1948: the brave assertion of rights and principles; the compromising unilateral action of a college president obsessed with belief in a traditional duty to advise

the Government; uncoordinated declarations of various bodies; wilting of the will of leaders before Ministerial assurances; throwing over of principles in the name of "statesmanship"; confused debates in the Council and committees, the Conference, and the R.B.; withdrawal of leadership; and doubtless we will see defeat of the original intentions, and ultimately the dismay and disgust of the rank and file.

Unfortunately, the Constitution Committee of the Association, after four years of deliberation, has proposed only to leave this state of disunity as it is. Yet the need to remedy it is urgent and the remedy appears to be obvious in reconstitution of the structure and authority of the Council. If the G.M.S., Central Consultants and Specialists, and Public Health Committees were brought into full representation in the Council and the Council given the ultimate power in policy and in action on all matters affecting the whole profession, authority would be co-ordinated and canalized so that the Association could act effectively and promptly, as the conditions of to-day require. Further, the Association should assert its authority, based on its democratic character and its membership of 80% of the practising doctors in Britain, alone to represent the profession, for joint committees with the undemocratically constituted royal colleges have clearly proved to be a source of weakness, not of loyalty and strength. In the light of recent events no less than those of 1948, is it too much to hope that reform of representation in this kind of way may be made without further delay?—I am, etc.,

Bournemouth.

N. ROSS SMITH.

Organized Pressure

SIR,—Organized labour year after year succeeds in getting increased remuneration to compensate for rises in the cost of living. It is only too clear that unorganized labour, such as we doctors, must organize ourselves similarly to ensure protection against the effects of inflation so long as that is allowed to endure.

Many doctors maintain that, being superior to the ordinary citizen, it is beneath us to support our trade union and to be prepared to strike. They cannot have it both ways. If we are so superior we should be remunerated accordingly without argument by an admiring nation; but the Health Service has shown no sign of recognizing this. If not, and we are like other men and women, we are merely being obstinate not to adopt effective tactics to protect our interests as doctors are doing, I believe, in Sweden.

The Government says it will not, as some employers do, automatically adjust our remuneration to inflationary change: the implication is that it is prepared to yield only to pressure exerted through the usual channels—namely, periodic organized pressure backed by the will to strike.—I am, etc.,

Workop, Notts.

M. HAYDON-BAILLIE.

Reform of Health Service

SIR,—There are probably many people who would agree that a contributory scheme organized by the medical profession, whether covering only general-practitioner services or extending to specialist services, would be preferable to the present National Health Service in many ways. As an economist, however, I feel that some of your correspondents who have put forward suggestions for such a scheme recently have underestimated the difficulties.

Dr. R. P. Hendry (*Supplement*, April 6, p. 157) suggests that at present the ordinary person is paying only 10d. a week through his National Insurance stamp towards the cost of the National Health Service and only 1d. a week to the general-practitioner pool. This is misleading, for he is paying other taxes that fully cover the cost of the Service, only a small part of which is financed by the contribution from the National Insurance fund. Nevertheless, I think there would be those who would be willing to join such a scheme, even though it meant paying twice, just as many parents now make great sacrifices to have their children educated at the

schools of their choice. Many, however, would have to think very carefully before joining such a scheme when they are already heavily taxed to pay for the National Health Service.

To allow general practitioners a capitation fee of 30s. per patient would involve a family of four in a cost of £6 a year (more in fact if allowance is made for administrative and practice expenses) without drugs. Such a scheme could only work on a large scale if withdrawal were to wreck the present National Health Service, or if the Government chose to amend the latter or granted special tax concessions, which those not using it. Given appropriate tax remissions, which are possible, there is no reason why the ordinary worker in this country could not pay directly for his medical services, and the existence of an alternative to the National Health Service would ensure that the latter provided efficient service.—I am, etc.,

London, N.W.1.

J. JACKSON.

Withdrawal from the Health Service

SIR,—From the tumult and the shouting of the last few months three fundamental points emerge: (1) We have a genuine grievance in the amount we are paid, in the method of payment, and the means whereby an increase can be effected. (2) There is a widespread sense of dissatisfaction among general practitioners on the whole structure and working of the Service, and there is a case for radical reform. (3) The Government has handled the whole matter very badly. The term gross mismanagement could well be applied.

We have made it clear to the Government that we will not accept summary treatment, and in this we have had the backing of the public and the press. The Government has acknowledged its mistake in the granting of an interim increase and the setting up of a Royal Commission with wide terms of reference. We would do well to accept this as a victory and a starting-point for further negotiation. The militant action envisaged in the thoroughly bad plan for a phased withdrawal can only result in loss of public support, and, under the present circumstances, loss of professional dignity. Let our leaders eschew further talk of withdrawal, consolidate the ground they have gained, and co-operate to the full with the Commission. Toughness can very easily become obstinacy.—I am, etc.,

Leicester.

LOGAN MITCHELL.

Present Position

SIR,—It is being bandied about freely that our leaders have let us down again, that the Royal College started the rot again, and that our chosen representatives have softened and weakened. Instead, is it not true to say that we are amateurs in political manoeuvre, our knowledge of business management is slender, and our trade union discipline is non-existent? We can be thankful that we are not politicians and grateful that we are not trade-unionists, but it is desperately unfortunate that our business organization is not considerably stronger. Would I.C.I., Lever Brothers, or B.W. have been content to have reports from secretaries that those who attended local meetings had agreed, albeit almost unanimously, to support the recommendations of the central committees? We submit that the answer is "No," and that each of these business organizations would have required evidence of good faith in the form of a good

Our lack of financial backing, in the form of a good fighting fund, produces our greatest weakness. The voluntary levy forms, on which we promise to pay 5% of income, have not been signed and delivered in adequate numbers for our purpose, and this has not been due entirely by any means to the apathy of the individual. Our business organization appears to us to have failed centrally and locally. It failed centrally at the beginning, because confusion was caused by the original letter to each general practitioner including only one levy form, when it should have been realized that very many of us would require two or three such forms. The central failure continued because one man

does not appear to have been given the single job of obtaining information about the number of levy forms signed and handed to the local secretaries, of reminding constantly the local secretaries that they had jobs to do—more and more frequently and urgently to the unsatisfactory areas—and eventually perhaps of asking whether the supporting motions were valueless or whether it was the local officers who were worthless.

As the general practitioners were expected to fight both for themselves and for the consultants, it was evident centrally and locally, to general practitioners and consultants alike, that the latter would need to make their practical contribution, but the effort to obtain this financial support does not appear to have been determined, though we know that individual consultants, as ever, are contributing willingly and generously. Our organization appears to have failed likewise locally, if reports be true that one borough local medical committee has had delivered three voluntary levy forms and that a county local medical committee has collected 10% of forms; for it is evident that, where some trouble has been taken to get the forms signed and collected, considerably better results have been obtained, as in Lancashire with 50%, Warrington, where we have a reputation for solidarity, with 90%, and the excellent Bolton's 95%. We are a liberal profession and take time to make up our minds; having made up our minds and agreed to support a certain line of action, we need then to be reminded, if necessary again and again, that we must support that line of action in a practical and financial way.

In spite of the failures of our business organizations centrally and locally, it must be remembered that the leaders of the B.M.A. came to the top because of their abilities in matters of administration, medical politics, negotiation, etc., while on the other hand we had fondly hoped that the leaders of the Royal Colleges reached their lofty pinnacles for different reasons and would therefore be more willing to leave medical politics to more democratic bodies. The Royal College of Surgeons appears to have accepted this view and the infant College of General Practitioners has eschewed politics from its start. It may be therefore that the Royal College of Physicians is not blameless, but reports of a 30% practical support by general practitioners and only individual support by consultants reaching the chairman of Council are hardly likely to maintain his confidence and strength of purpose or encourage our representatives to prop and stay him and our other leaders against the shifting sands of political manoeuvre.

Time is running on and confusion and dissension are creeping in, but the rot may yet be stopped by getting the remainder of the levy forms signed and collected and by a fresh appeal to local medical committees to swell the central fund. There is no weapon more respected by politicians than a good fighting fund, especially when it comes from the rank and file. There is a rumour that the Government might forbid executive councils to collect and hand over the levy. Would they dare? If they were so foolhardy, nothing would do more to harden our resolve, but the mere knowledge that we were holding these completed forms would be an indication to them of our determination and the best weapon in our armoury.—We are, etc.,

Warrington.

W. E. BOWDEN.
P. O'BRIEN.

SIR,—The medical profession seems to be so confused as to forget the main issue over minor ones. The fact still remains that the fundamental contract, may it be legal or moral, between the Government and the profession has been one-sidedly and unreasonably broken by the Government. The Royal Commission was suddenly sprung upon us by the Government without any prior consultation and in a way calculated to confound and surprise the doctors. Certain minor concessions, none of them legally binding, far less binding on the Government than the Spens Report, have been obtained to sweeten the pill and lull us into apathy. Let us be quite clear that if the Government chooses to

break a major agreement with an important profession without any valid reason, what possible trust could be placed on any further promises from, or agreements with, such a Government?

The sad fact is that, in the face of such obvious injustice and contemptuous treatment, it has not been possible to arouse the medical profession to unified action, and even our leaders do not seem to agree. Is it not the deplorable truth that fear of financial difficulties, meanness in paying their voluntary levy, and lack of courage in general have driven the medical profession against their better conscience to act without character and rather following the poor dictates of expediency? Courage and unity among us would have aided our profession far better, and incidentally helped the nation greatly. Are any steps being taken to prepare for unified action when the inevitable results of our folly will arise? I have never felt more humiliated as a member of the medical profession than at this juncture.—I am, etc.,

W. Wickham, Kent.

R. COLBY.

Hospital Spens

SIR,—There can be little doubt that Sir Russell Brain's action at a critical time in the profession's dispute with the Government has precipitated a sequence of events that can only lead to complete submission of a great profession to dictation. The only ray of hope is the fact that the G.M.S. Committee is still fairly evenly divided on the matter of giving evidence and might yet be bold enough to cut its losses and break away from an alliance which has produced such embarrassing and distressing results.

It has been apparent throughout that most hospital medical officers have been uneasy about the original recommendations of Council, and I submit that the explanation lies in the fact that the Spens recommendations for hospital staffs were buried three years ago. The 1954 remuneration award, accepted by the Whitley Staff Side under the chairmanship of the same Sir Russell Brain, in one stroke dealt a lethal blow to the 30-page document still said by some to be the remuneration bible of hospital medical staffs, from A award consultants down to junior house officers. Reading the report again to-day it is interesting to note that the senior registrar—to name one example—is tied to a 1938-9 (non-resident) salary scale of £900 to £1,200, to be adjusted with changes in the value of money, etc., and additionally he should enjoy tax-free expenses necessarily and reasonably incurred in the performance of his duties. As a result of the 1954 award, said to be a Spens "adjustment" to bring hospital staffs into line with the 100% betterment of Danckwerts, the senior registrar (non-resident) scale became £1,100 to £1,400; in other words, a betterment, ignoring superannuation, of 22% to 17.5%. So far as expenses are concerned, the senior registrar to-day is still unable to get anything even for his subscription to a defence society. The basic scale of the whole-time consultant shows much the same sort of thing. The 1938-9 Spens scale of £1,500 to £2,500 became in 1954 £2,100 to £3,100, or a betterment, again ignoring superannuation, of 40% to 24%. Furthermore, fees for domiciliary consultations, provided for in Spens, were permitted for a matter of months, then mysteriously stopped and resumed again eighteen months ago as a result of a fantastic agreement in Whitley which excluded payment for the first eight in any quarter.

It is therefore hardly surprising that many hospital medical officers are anxious to join the queue to give evidence to the Royal Commission; "Pilkington" must be better than nothing at all. Perhaps it is not too late for the general practitioner to realize that in joining this undignified queue he surrenders something very much alive—his Spens as interpreted by Mr. Justice Danckwerts. I would suggest that the correct move now would be for the G.M.S. Committee to advise continued resistance to giving evidence, to withdraw from the joint claim, which in any case has not been looked at, and to submit a new claim for an increase of 30% with effect from April 1, 1957,

based on the Danckwerts interpretation of the G.P. Spens. Accompanying the claim there might be an ultimatum that, unless the Government agreed to negotiations within 14 days, steps would be taken to advise withdrawal of all general practitioners from the Service at short—repeat, short—notice. Resignations could then be collected without any fear of a stab in the back from any quarter and put into effect with short notice at a time favourable to the profession. The phased withdrawal plan already outlined merely gave our shrewd employers six months' notice of a blow with a feather, ample time indeed to mess up all our plans and keep us fighting among ourselves.—I am, etc.,

Hull.

K. W. BEETHAM.

Living Wage

SIR,—In medicine, contract practice is of very long standing. In mining districts there was the colliery doctor, paid by a few coppers deducted from each wage packet, and friendly societies appointed their club doctor at 2s. 6d. per member per annum. Mr. Lloyd George took this figure as the index for medical remuneration on the introduction of the National Insurance Act. He was oblivious of the fact that the doctor was stepping off the poor man's back into the rich man's pocket—a secret of the trade. The best of doctors were eager to work without any remuneration in the hospitals.

The object of each Government has been to secure the best possible medical service at the lowest possible cost. The main factor in this service is the general practitioner, who, by his training, is rather altruistic than economic and so much the more liable to suffer injustice. Mr. Macmillan is an artful dodger who, ignoring orthodoxy even in dealing with the appointment of a Royal Commission, offers us a 5% increase in the hope of dividing our ranks. Let us not be deceived. In industrial areas most of us collected our accounts from our poorest patients by weekly instalments of not less than 1s. per week. Till the Danckwerts award we were receiving, not 1s. per week from our poorest patients, but 4d. per week from all.

In a leading article of the *Bolton Evening News*, with a circulation of 86,100, an editor under the heading "How to Treat Doctors?" writes: "The whole plan to walk out of the service always looked more like a piece of propaganda than a practical proposition. The shock treatment has worked." The price of this paper was 4d. till 1917, then 1d. till 1940, 1½d. till 1951, and 2d. till June, 1956, when it increased by 25% to 2½d. Since 1951 it has increased by 66.6%, and this is typical of the attitude of the general public whom we serve towards us who serve it so well. Many of us were excluded from the superannuation scheme and also from the N.H.I. pensions. We have spent large sums on the education of our families and need more than a living wage to provide for the future, however short that time may be.—I am, etc.,

Bolton, Lancs.

W. HARVEY BENNETT.

The Fourth Course

SIR,—As I see it, we have before us two separate and distinct problems: (1) whether or not to give evidence to the Royal Commission; (2) whether or not to withdraw from the N.H.S. this year.

In your otherwise excellent leading article (*Journal*, May 11, p. 1106) you say three courses seem open to us. Surely there is a fourth—that we give evidence, albeit reluctantly, to the Royal Commission, and at the same time continue to organize an early withdrawal of general practitioners from the N.H.S. The Royal Commission will go on, whether we like it or not, and in the fullness of time will present a report; the Royal College of Physicians and the Central Consultants and Specialists Committee will give evidence; the Government will consider, though not necessarily implement, its findings. Our evidence may not enable the Commission to reach sound conclusions, but it could hardly be ignored altogether. Giving evidence, in the circumstances,

does not imply a welcome for the Commission, nor approval of its terms of reference, nor bind us to accept its findings. We should go on pressing for our public health colleagues to be included. We must make it abundantly clear that, in our view, the Commission's findings will be of possible relevance only to future remunerative problems; the Spens recommendations (and Danckwerts interpretation) quite clearly remain appropriate for resolving the present (June, 1956) claim, for there have as yet been no consultations regarding any alternative basis. Our withdrawal should be in sorrow, not in anger—though, goodness knows, we have cause enough for that. We will not strike; we are merely giving ample notice to a thoroughly discourteous, untrustworthy, arbitrary employer, and exercising our ordinary rights as citizens to switch to a similar job under new employers—the British Medical Service and private patients. Our action is not to enforce 24%, nor to enforce anything at all for that matter; it is merely taking the only way we see out of an impasse not of our making. We sincerely believe we should receive 24% more, but we are not dogmatic about it. We are anxious to negotiate, the Government refuses—it will not even follow its own excellent advice and submit the dispute to arbitration, which even at the eleventh hour we would accept. We fight for the principle, not for the pounds.

The Prime Minister has intimated that he thinks the 5% increase should take care of the present, and the Royal Commission of the future; we think that this arbitrary increase of our 1951 remuneration by only 5% in 1957 smacks of the contemptuous dictation; we have no enthusiasm for the Commission.

Until recently, we were firmly united with a clear goal. Since the recent "confessions" we seem hopelessly divided and confused. Let us try to evaluate our concessions: (1) The Royal Commission itself is no boon to the profession; we never asked for it, we do not want it, we would cheerfully forgo it—any juggling, with the strings attached, can therefore cut no ice at all, and how trivial the juggling anyway. The terms of reference remain unchanged, though they are to be ignored with official blessing. The Commission will listen to (but not adjudicate or arbitrate on) our present claim. We will receive advance notice of that fact if the Commission is going to drag on for well over a year. We will be fully consulted before the findings are implemented—no concession here, as this had already been specified in the oft-quoted letter of 1950. (2) Most fically promised in the oft-quoted letter of 1950. (2) Most of us get a 5% increase; did even the most pessimistic feel we would be offered so little, after so long, or so grudgingly? Does anyone seriously think our financial advisers were 380% out in their calculations? The Government would certainly have pointed out this trifling error long since.

I feel very strongly that we general practitioners in not withdrawing in the near future; our self-restraint in not submitting a justifiable claim in 1953-4-5 failed materially to help our country then; it has seriously handicapped our pay claim now. To await the Royal Commission's report and subsequent "full consultations," maybe in 1958, 1959, or even 1960, is to invite—nay, almost to ensure—further financial disasters, and also, by inference, to admit our present claim was ill-founded. The date will probably need changing perhaps to November 4, 1957 (Monday seems a better day to start our new freedom), and various amendments to the original withdrawal scheme, including all those on the agenda of the S.R.M. of May 1, will need careful and confidence have sideration. Undoubtedly our unity and confidence can profit from our lessons of 1948, and now show firmness of purpose and the courage of our convictions, or we can continue to drift haplessly into Harold Macmillan's locker. "There is a tide in the affairs of men, which, taken at the flood, leads on to fortune." Time and tide wait for no man; here is our opportunity; let us seize it whilst yet we may, for none can tell what new crises may befall ere the Royal Commission has run its course.

In conclusion, may I suggest we need feel no qualms of conscience nor fear for the future? We answered our

country's call for a wage freeze for five years before staking a carefully compiled claim, and then requesting negotiation or arbitration. The Government stalled for eight months before attempting the time-tested tactics of the tyrant—confuse, divide, conquer, a Royal Commission, and a 5% interim adjustment—as great a red herring, and as derisory an increment, as ever there was. Let us give evidence to the Royal Commission, notice to the executive council, thought to the British Medical Service, and facts to the man-in-the-street, and leave him to judge whose action has been the more honourable.—I am, etc.,

Rugby.

R. P. HENDRY.

Doctors and the Health Service

SIR,—I was rather astonished in reading an article on doctors and the health service, by Mr. A. Wilfrid Adams (*Supplement*, May 4, p. 241), to find the phrase, "The Government allots up to 3,500 patients per doctor." I am not quite sure what kind of world Mr. Adams is living in if he really does believe that any government has power under the National Health Service to allot patients to a doctor. It is presumably for the doctor himself to secure the patients. I would, however, agree that there is a need for a reduction in the existing lists and I would very much hope that out of the current discussions on doctors' remuneration some reduction can be achieved, but, after all, this is very largely a matter for the profession itself. If they insist upon a flat rate increase in their pay there would be little encouragement to doctors to reduce the size of their lists.

Mr. Adams also refers in this article to the load of work on general practitioners. I feel it would be of very real interest to know rather more about the effect of the National Health Service on general practitioners as a whole so far as their working load is concerned. Possibly the British Medical Association have information from some of the inquiries they have carried out that would let us know, for example, whether there has been on the average any increase in the number of calls made by a patient upon a doctor. As a layman I do find it rather difficult to relate many doctors' complaints about the number of calls made upon them by patients with their continual and very proper insistence that patients should not hesitate to get in touch with them at an early stage or any illness.—I am, etc.,

London, S.W.1.

ARTHUR BLENKINSOP, M.P.

Royal College of Physicians

SIR,—Professor Robert Platt's attempt (*Supplement*, May 4, p. 244) to answer two letters by one must be regarded as a total failure. He has answered neither. The point at issue can be simplified by separating it into two parts, first, common courtesy, and, secondly, common sense.

The remuneration claim was initiated by representatives of G.P.s, and consultants and specialists, hearing of the claim, asked to be associated with it. When a critical stage in the furtherance of this claim was reached, Sir Russell Brain chose to take independent action without even formally informing the G.P. representatives prior to the press announcements. This is lack of common courtesy. Secondly, it has been obvious that the most vital asset the profession could have was unity, and that if any fracture of this unity was to occur it might do so on the line between consultants and G.P.s. It was perfectly clear that the most strenuous efforts should have been made to avoid any semblance of this. Sir Russell Brain chose to imperil our vital unity at a critical time. This, Sir, is lack of common sense.—I am, etc.,

London, W.13.

R. E. OLIVER.

Dr. Doris Pindar was elected first woman chairman of the Sheffield Division of the B.M.A. at the annual general meeting of the Division on April 5. She joined the Sheffield Division in 1922 on qualification. She is a former secretary of the Division, and present secretary of the local medical committee.

Association Notices

Diary of Central Meetings

JUNE

6 Thurs.	Annual Conference of Representatives of Local Medical Committees, 10 a.m.
12 Wed.	Council, 9.30 a.m.
12 Wed.	Special Representative Meeting, 11 a.m.
12 Wed.	Council (at conclusion of Special Representative Meeting).
13 Thurs.	Editorial Subcommittee, Joint Formulary Committee, 11 a.m.
13 Thurs.	Joint Formulary Committee, 2 p.m.
13 Thurs.	Ophthalmic Group Committee, 2 p.m.
14 Fri.	Tuberculosis and Diseases of the Chest Group Committee, 11 a.m.
14 Fri.	Overseas Committee, 2.15 p.m.
18 Tues.	Planning Subcommittee, Occupational Health Committee, 10 a.m.
20 Thurs.	G.M.S. Committee, 10.30 a.m.
26 Wed.	Medical Education Committee, 2 p.m.
28 Fri.	Infectious Diseases Subcommittee, Public Health Committee, 2 p.m.

JULY

3 Wed.	Welsh Committee (at Shrewsbury), 2.15 p.m.
10 Wed.	Annual Representative Meeting (at Newcastle upon Tyne), 10 a.m.
11 Thurs.	Annual Representative Meeting (at Newcastle upon Tyne), 9.30 a.m.
12 Fri.	Annual Representative Meeting (at Newcastle upon Tyne), 9.30 a.m.
13 Sat.	Council (at Newcastle upon Tyne), 9 a.m.
13 Sat.	Annual Representative Meeting (at Newcastle upon Tyne), 10 a.m.
15 Mon.	Annual Representative Meeting (at Newcastle upon Tyne), 10 a.m.
15 Mon.	Annual General Meeting (at Newcastle upon Tyne), 12.30 p.m.
15 Mon.	Council (at Newcastle upon Tyne), at conclusion of A.R.M.
15 Mon.	Adjourned Annual General Meeting and President's Address (at Newcastle upon Tyne), 8.15 p.m.

Branch and Division Meetings to be Held

BARNSELY DIVISION.—At Queen's Hotel, Barnsley, Monday, June 3, 8.45 p.m., annual general meeting.

BOLTON DIVISION.—At Gymnasium, Bolton Royal Infirmary, Tuesday, June 4, 8.30 p.m., meeting in conjunction with Bolton Local Medical Committee.

CUMBERLAND DIVISION.—At County Hotel, Carlisle, Sunday, June 2, 3 p.m., meeting to which all medical practitioners in the area of the Division are invited. Dr. J. G. M. Hamilton will answer questions.

DERBY DIVISION.—At Wilderslowe, Derbyshire Royal Infirmary, Thursday, June 6, 8.15 p.m., general meeting.

DONCASTER DIVISION.—At Danum Hotel, Doncaster, Monday, June 3, 8.45 p.m., annual general meeting.

DORSET DIVISION.—At the Clinic, Glyde Path Road, Dorchester, Tuesday, June 4, 8.30 p.m., special meeting to which all medical practitioners in the area of the Division are invited. The annual general meeting will follow.

EAST KENT DIVISION.—At Chez Laurie Restaurant, Thanet Way, near Herne Bay, Thursday, June 6, 8.30 p.m., special Divisional meeting. There will also be a discussion on Health Education about Cancer to be opened by Dr. M. S. Harvey.

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Thursday, June 6, 8.30 p.m., annual general meeting.

HENDON DIVISION.—At Hendon Hall Hotel, N.W., Tuesday, June 4, 8.45 p.m., annual medico-political meeting.

KENSINGTON AND HAMMERSMITH DIVISION.—At Large Hall, Kensington Town Hall, W., Tuesday, June 4, 8.30 p.m., general meeting to be held jointly with Chelsea and Fulham Division. Address by Dr. H. H. D. Sutherland. All medical practitioners in the area of the Divisions are invited.

LANCASTER DIVISION.—At Lancaster Moor Hospital, Saturday, June 8, 8 p.m., meeting. B.M.A. Lecture by Mr. A. Lawrence Abel: "Carcinoma of the Rectum" (illustrated).

LEEDS DIVISION.—At Littlewood Hall, General Infirmary at Leeds, Wednesday, June 5, 8 p.m., annual general meeting.

LEICESTERSHIRE AND RUTLAND BRANCH.—At Grand Hotel, Wednesday, June 5, 8.45 p.m., annual general meeting.

LIVERPOOL DIVISION.—At Liverpool Medical Institution, Tuesday, June 4, 8.30 p.m., special meeting.

METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Tuesday, June 18, 3 p.m., annual general meeting. President's address by Dr. J. W. McCarthy.

MID-HERTS DIVISION.—At Wellington Court Clinic, Bricklet Road, St. Albans, Thursday, June 6, 8.30 p.m., annual general meeting. Address by Dr. J. C. Sleight: "Anterior Poliomyelitis and other Immunization Procedures in this Divisional Area."

NORTH WALES BRANCH.—At Colwyn Bay Hotel, Saturday, June 1, 3 p.m., annual meeting. Presidential address by Dr. K. W. Evans: "The Art of Medicine."

NORWICH DIVISION.—At Museum, Norfolk and Norwich Hospital, Tuesday, June 4, 8.15 p.m., meeting to which all medical practitioners in the area of the Division are invited.

SHROPSHIRE AND MID-WALES BRANCH.—At Board Room, Royal Salop Infirmary, Shrewsbury, Tuesday, June 4, 8.30 p.m., general meeting.

SOUTHAMPTON DIVISION.—At Out-patient Department, Royal South Hants Hospital, Southampton, Tuesday, June 4, 8.30 p.m., special general meeting in conjunction with local medical committee to which all medical practitioners in the area of the Division are invited.

SOUTH-EAST ESSEX DIVISION.—At Queen's Hotel, Westcliff-on-Sea, Tuesday, June 4, 8.30 p.m., meeting in conjunction with local medical committee to which all medical practitioners in the area of the Division are invited.

SOUTH STAFFS DIVISION.—At Medical Lecture Hut, Royal Hospital, Wolverhampton, Tuesday, June 4, 8.30 p.m., A.G.M.

SOUTH-WEST ESSEX DIVISION.—At Nurses' Lecture Theatre, Whipps Cross Hospital, Leytonstone, E., Wednesday, June 5, 8.30 p.m., meeting. "Brains Trust on General Practice." Panel: Dr. L. W. Batten, Mr. James Cope, Dr. J. R. Ellis, Dr. J. H. Hunt, and Dr. A. A. G. Lewis.

SWANSEA DIVISION.—At Swansea General Hospital, Thursday, June 6, 8 p.m., annual meeting.

TROWBRIDGE DIVISION.—At Roundway Hospital, Devizes, Sunday, June 2, 11 a.m., special general meeting in conjunction with Wiltshire Local Medical Committee.

WANDSWORTH DIVISION.—At Cornet of Horse Hotel, 51, Lavender Gardens, Lavender Hill, S.W., Tuesday, June 4, 8.30 for 8.45 p.m., open meeting for all medical practitioners in Wandsworth and Battersea. Address by Dr. H. Alexander.

WEMBLEY DIVISION.—At Board Room, Wembley Hospital, Tuesday, June 4, 9 p.m., extraordinary meeting to which all medical practitioners in the area of the Division are invited.

WEST MIDDLESEX DIVISION.—At Nelson Room, Ealing Town Hall, W., Friday, June 7, 8.30 p.m., extraordinary general meeting.

WEST NORFOLK DIVISION.—At Globe Hotel, King's Lynn, Thursday, June 6, 12.30 p.m., annual general meeting. Lunch will follow.

Meetings of Branches and Divisions

DUMFRIES AND GALLOWAY DIVISION

A meeting was held on March 10 in the Cresswell Maternity Hospital. Dr. R. N. Rutherford took the chair and 41 members were present. Professor D. M. Dunlop spoke on "New Drugs." Dr. R. N. Rutherford again took the chair at a special meeting of the Division called on April 14 to discuss the remuneration crisis. Thirty-three members attended. Drs. A. Scott and Neil Douglas answered questions.

GLASGOW DIVISION

The annual meeting was held in the Glasgow Regional Office on March 22, 1957. Mr. John Dunbar was in the chair and 32 members were present. The following officers were elected for 1957-8:

Chairman.—Dr. J. S. McLaren Ord.
Vice-chairmen.—Drs. W. S. Gardner, J. Inglis Cameron, and R. L. Cormie.
Honorary Secretary.—Dr. J. Baird Forrester.
Deputy Honorary Secretary and Honorary Treasurer.—Dr. M. M. Garrey.

Dr. I. D. Grant gave a summary of the remuneration negotiations to date, and Drs. W. M. Knox and Kate Harrower added their comments. A general discussion followed.

MALTA BRANCH

The annual general meeting was held on February 6, 1957, at St. Luke's Hospital, Malta. Twenty-six members were present. The retiring president, Professor V. G. Griffiths, in his review of the events of the past year spoke of the stand of the Maltese medical profession against the introduction of a full-time State-salaried medical service, and of the help—both moral and financial—received from B.M.A. Headquarters. He hoped that the report of the resulting Medical Services Commission would serve as a charter for the profession.

The following officers were elected for 1957:

President.—Professor G. P. Xuereb.
Vice-president.—Dr. V. Tabone.
Honorary Secretary and Treasurer.—Dr. Ph. Micallef.

TANGANYIKA TERRITORY BRANCH

The annual general meeting was held on February 27, 1957, at the Women's Service League Headquarters. The following officers were elected:

President.—Dr. G. M. Daya.
Vice-president.—Dr. W. G. Kerr.
Honorary Secretary.—Dr. M. Q. Khan.
Honorary Treasurer.—Dr. V. Blackman.

ANNUAL MEETING: NEWCASTLE UPON TYNE, JULY 10-19

SUPPLEMENT TO THE
BRITISH MEDICAL JOURNAL

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British Medical Association

ANNUAL MEETING—NEWCASTLE UPON TYNE, JULY 10-19, 1957

President-Elect: WELDON WATTS, A.F.C., M.S., F.R.C.S.Ed.

Local General Secretary: G. W. ANDERSON, M.B., B.S., 21, Lyndhurst Road, Benton, Newcastle upon Tyne, 12.

Science Secretaries: IAN RANNIE, M.B., Ch.B., B.Sc., Department of Pathology, Royal Victoria Infirmary, Newcastle upon Tyne, 1; J. I. MUNRO BLACK, M.D., M.S., F.R.C.S., 47, Clayton Road, Jesmond, Newcastle upon Tyne, 2.

Executive Clerk: Miss B. E. MIDDLEMISS, B.M.A. Regional Office, 7, Windsor Terrace, Newcastle upon Tyne, 2.

Tel. 812527.

PROGRAMME

The 125th Annual Meeting of the British Medical Association will be held in Newcastle upon Tyne from Wednesday, July 10, to Friday, July 19, inclusive.

The Annual Representative Meeting will be held in the City Hall; it will begin on Wednesday, July 10, and will continue on Thursday, Friday, Saturday, and Monday, July 11, 12, 13, and 15.

On the evening of Tuesday, July 9, there will be a Cocktail Party for Representatives and their Ladies, arranged by the Newcastle upon Tyne Division and the North of England and the Tees-side Branches. This will be held in the Old Assembly Rooms.

A combined Dinner for Representatives and their Ladies will take place at the Old Assembly Rooms on Thursday, July 11, followed by a Dance.

The Overseas Luncheon has been arranged for Friday, July 12, at 1 p.m. in the Old Assembly Rooms.

On Sunday, July 14, there will be three excursions: (1) All-day excursion to the Roman Wall which will be accompanied by guides from the Department of Roman-British Archaeology, King's College, University of Durham. (2) All-day trip to the Farne Islands. (3) Half-day excursion to Durham Cathedral. In the evening a Symphony Concert, sponsored by Abbott Laboratories Ltd., will be given in the City Hall.

The Adjourned Annual General Meeting and President's Address will take place in the City Hall on the evening of Monday, July 15, and the President's Reception which follows will be held in the Old Assembly Rooms.

The Annual Scientific Meeting and associated functions occupy the period from Monday, July 15, to the evening of Friday, July 19.

The Official Religious Service will be held in St. Nicholas' Cathedral on the afternoon of Tuesday, July 16. The address will be given by the Right Reverend the Lord Bishop of Durham.

There will be a Roman Catholic Service at 11.30 a.m. on Saturday, July 13, at St. Mary's Cathedral.

A Jewish Service will be held on Saturday, July 13, at 10 a.m. at the Leazes Park Road Synagogue.

The Annual Dinner of the Association will be held in the Old Assembly Rooms on Tuesday, July 16.

There is to be a full social programme, including a Civic Reception on Wednesday evening, July 17, and a University Reception on Thursday evening, July 18.

The Annual Breakfast of the Christian Medical Fellowship will be held on Tuesday, July 16, at 8.15 a.m.

Several special visits and excursions are being arranged for ladies accompanying members.

The usual Golf Competitions will take place on July 17 and 18.

The Overseas Conference will be held in the afternoon of Wednesday, July 17.

The Reception Bureau for Registration will be open in the Stephenson Building, King's College, on Monday, July 15, at 9 a.m.

From July 15 to 19 there will be a programme of surgical operations and clinical demonstrations in the Royal Victoria Infirmary shown by colour television on a closed circuit. The technical arrangements will be sponsored by Smith, Kline and French Laboratories Ltd. (see p. 317).

Three Plenary Scientific Sessions have been arranged as follows: Wednesday, July 17, at 10 a.m., subject "The Management of Hypertension"; Thursday, July 18, at 10 a.m., subject "The Management of Hypertension"; Friday, July 19, at 10 a.m., subject "The Management of Hypertension".

2.30 p.m., subject "The Present Status of Prophylactic Immunization"; Friday, July 19, at 9.30 a.m., subject "Care of the Dying."

In addition, three Round-Table Conferences will be held concurrently on Wednesday, July 17, from 9 to 9.45 a.m.

The nineteen Scientific Sections will hold meetings, including a special session of the Sections of Obstetrics and Gynaecology and of General Practice on "Obstetrics and General Practice" to be held on Monday, July 15, at 3 p.m. (Details are given below.)

The Scientific Exhibition will be held in the Stephenson Building and will be open daily on July 15 to 19; a wide field of medical interests will be covered.

The Annual Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications will also be in the Stephenson Building. The Exhibition will be open from 9 a.m. to 6 p.m. on July 15 to 19.

The Ladies' Club will be situated in the Medical School, King's College, and will be open throughout the Meeting.

HOTEL ACCOMMODATION

The following is a list of hotels in Newcastle upon Tyne and district at which accommodation is still available for the period of the Annual Meeting. Members wishing to reserve accommodation are asked to write direct to the hotel, stating that they are attending the B.M.A. Meeting. The Association cannot accept responsibility for any of the prices stated below. These are the tariffs ruling at the moment and are subject to alteration without notice. Applicants should therefore verify the tariffs when making their reservations. Members who have not already done so are strongly advised to make their reservations without delay.

For hostel accommodation all requests should be made to the Executive Clerk, B.M.A. Regional Office, 7, Windsor Terrace, Newcastle upon Tyne, 2, and not direct to the hostel.

Name and Address of Hotel	Tel. No.	No. of Rooms	Miles Distant	Tariff, 1957	
				B/B	Weekly Inclusive
<i>City Hotels</i>				<i>Gns.</i>	
Crown Hotel, Clayton Str.	2-6421	87		25 -	---
Douglas Hotel, Grainger Str.	2-7008	50		22/6	11-12
Embassy Hotel, Jesmond Rd.	81-1475	38		24/6	---
Imperial Hotel, Jesmond Rd.	81-3933	42		25/6	---
<i>Seaside Hotels</i>					
Grand Hotel, Tynemouth	N. Shields 1360	32	10	25/- -32/6	12-13
Seaburn Hotel, Roker, Sunderland	Whitburn 3225	18	12	30 -	14½
<i>Country Hotels</i>					
Royal Hotel, Hexham, North'd	Hexham 1070	15	20	21/-	9-10
Abbey Hotel, Hexham, North'd	Hexham 304	33	20	18/6-21/-	9-10
<i>Hotels in Neighbouring Towns</i>					
Palatine Hotel, Sunderland	Sunderland 3793	50	12	21/-	14½
Royal County Hotel, Durham City	Durham 2481	34	15	30/-	14½
Three Tuns Hotel, Durham City	Durham 3601	17	15	30/-	14½
<i>University Halls of Residence</i>					
Henderson Hall (men only)		70	2	21/-	---
Ethel Williams Hall (men or women)		74 S.	2	21/-	---

S. = Single.

BRITISH RAILWAYS: SEAT AND SLEEPER RESERVATIONS

Members travelling to Newcastle by rail are advised to make their reservations as soon as possible. The District Passenger Manager, British Railways, Newcastle upon Tyne, will be pleased to assist.

CARAVAN PARK

Arrangements have been made at Newcastle for a special caravan site for members attending the annual meeting with their caravans. The site will be at King's College Athletic Union Ground, Cochrane Park, Newcastle upon Tyne, 6. Apart from a limited amount of hard standing and some on rough grass, there will be facilities for obtaining water and disposing of refuse. Hot and cold washing facilities and showers, with dressing-rooms and drying-rooms, will be available in the pavilion, where there will be a children's playroom and light refreshments can be ordered. The site, which is near Henderson Hall, one of the hostels of the University of Durham, is close to shops and a frequent bus service into the centre of the town.

Applications for space should be made in advance to Dr. W. Hunter, c/o B.M.A., North of England Branch Office, 7, Windsor Terrace, Newcastle upon Tyne, 2, stating name and address, registration number of car, and date of arrival and departure. The charge is 6s. a night, which must be paid at the time of application. Alternative accommodation is available for Caravan Club Members at Whitley Bay Club site on the sea front at Old Hartley, 10 miles from Newcastle.

REGULATIONS REGARDING DRESS

Academic Dress is to be worn at the President's Address, the President's Reception, the Official Religious Service, the Roman Catholic Service, the Civic Reception, and the University Reception.

Robes may be hired from Messrs. Ede & Ravenscroft, Ltd., 93, Chancery Lane, London, W.C.2, or Messrs. Gray & Son (Robemakers), Ltd., Saddler Street, Durham. Early application is advised, as the supply of gowns is limited, and it is suggested that the gowns be sent to the home address of the individual concerned. It is hoped to have a representative of the local robemakers available at the University during the Annual Meeting.

Evening Dress (Tails or Dinner Jacket), with Decorations, is to be worn at the President's Reception, Civic Reception, University Reception, and Annual Dinner. Evening Dress without Decorations should be worn at the Representatives' Dinner and the Representatives' Dance.

REGISTRATION

Although there is now no registration fee charged, it is still necessary for members attending the Annual Meeting to register.

Members of the Representative Body should register at the A.R.M. Inquiry Office, City Hall Entrance. Ladies (except women members) should register at the Ladies' Club, Medical School, King's College. Members and overseas visitors should register at the Reception Bureau, Stephenson Building, King's College, on or after July 15.

TICKETS

No tickets for functions or excursions can be issued in advance, with the exception of the Annual Dinner (details of which are given below).

All tickets for functions up to Sunday, July 14, will be available for Representatives at the A.R.M. Inquiry Office, City Hall Entrance, on July 9, 10, 11, 12, and 13, and for ladies at the Ladies' Club, Medical School, King's College.

Tickets for all other functions after Sunday, July 14, will be available from Monday, July 15, at the Reception Bureau, Stephenson Building, or at the Ladies' Club.

Badges

Members will not be admitted to Plenary Sessions, Round-table Conferences, Scientific Sections, Colour Television, or Exhibitions unless wearing badges. They should therefore visit the Reception Bureau, Stephenson Building, as soon as possible after arrival in Newcastle, to obtain their hand-book, badges, and tickets.

Officers of Scientific Sections and other office-holders should inquire for special badges at the Reception Bureau.

ANNUAL DINNER

Special Notice

The Annual Dinner at Newcastle upon Tyne this year will take place on Tuesday, July 16, in the Old Assembly Rooms, Westgate Road. This follows the successful innovation made at Brighton last year, when the Dinner was held on the Tuesday instead of the Thursday as had been customary. The maximum number which the room can take is 350.

Members are strongly advised to book their seats as soon as possible, in order to avoid disappointment later. The price per ticket is £2 10s., including cocktails, wines, and liqueurs.

Applications, with the appropriate payment, should be made to the Financial Comptroller, B.M.A. House, Tavistock Square, London, W.C.1, and will be dealt with in the order in which they are received. In the event of applications exceeding the capacity of the room, money sent will be returned.

If any tickets are still available at the time of the meeting they will be obtainable at the Registration Bureau, Stephenson Building.

Members wishing to be seated with any friends should give particulars when applying. Cheques should be made payable to "The British Medical Association."

CATERING ARRANGEMENTS

A three-course luncheon (price 5s.) will be served daily in the Grand Assembly Rooms (King's College Dining Hall), College Road, from 12.30 to 2 p.m. from July 10 to 13 and from 12.15 to 2.15 p.m. from July 15 to 19. In addition, during the Annual Representative Meeting there will be a buffet luncheon available from 12.30 to 2 p.m. in the Library of the Sutherland Dental School, Northumberland Road (opposite the City Hall). Morning coffee and afternoon tea will also be served there for Representatives.

Coffee-rooms will be available in the Stephenson Building, King's College, for visitors to the Exhibitions and those attending the scientific meetings.

Light refreshments will also be available in the Ladies' Club throughout the Meeting.

THE MEDICAL INSTITUTE

Honorary membership of the Medical Institute (a doctors' social club), at 7, Windsor Terrace, Newcastle upon Tyne, 2, has been kindly offered to members attending the Annual Meeting. Members wishing to avail themselves of these facilities are asked to wear their badges.

REPRESENTATIVES' SUNDAY EXCURSIONS

Visit to Farne Islands

An enjoyable sea trip to a rare-bird sanctuary and a home of seals: its associations with St. Cuthbert and Grace Darling give it an added interest. Intending visitors would be well advised to bring a mackintosh and strong footwear.

Visit to Roman Wall

The tour will include a visit to Chester Fort and a Roman fort at Housesteads. The Roman country lying between the North Tyne and South Tyne is very beautiful and interesting. Archaeology students of the University will act as guides.

Visit to Durham Cathedral and Castle

In addition to looking round the Cathedral, there will be a special opportunity of visiting the Dormitory, which is of historical interest. Those who wish will be able to attend Evensong in the Cathedral at 3.30 p.m.

EDINBURGH GRADUATES' DINNER

The Edinburgh Graduates' Dinner will be held in the Royal Station Hotel, Neville Street, Newcastle upon Tyne, on Saturday, July 13, at 7 for 7.30 p.m. All Edinburgh graduates attending the A.R.M., or resident in the area, together with their ladies and guests, will be welcome.

Tickets (25s. each, exclusive of wines) may be had on application, with remittance, to Dr. E. R. C. Walker, 7, Drumsheugh Gardens, Edinburgh, 3.

GLASGOW GRADUATES' DINNER

The Glasgow Graduates' Dinner will be held in the Britannia Rooms, Tilley's Restaurant, Newcastle upon Tyne, on Saturday, July 13, at 7.45 for 8.30 p.m. The dinner is open to Glasgow graduates who are attending the Annual Meeting, their ladies, and guests. Tickets will cost 30s. each, including cocktails, but excluding wines. Numbers are limited to 120, and early application, with appropriate remittance, should be made to Dr. J. T. McCutcheon, British Medical Association, Glasgow Regional Office, 234, St. Vincent Street, Glasgow, C.2. (Dress—Dinner Jackets.)

WELSH DINNER

The Welsh Dinner will be held at the Royal Turk's Head Hotel, Grey Street, Newcastle upon Tyne, at 7.30 p.m. on Friday, July 12. All Welsh Representatives, Welsh graduates, and others with Welsh associations, accompanied by their ladies, will be welcome at this dinner. Tickets, 25s. per head (exclusive of wines), may be obtained on application, with remittance, to Dr. I. M. Jones, 3, Parkside, East Herrington, Sunderland.

ABERDEEN GRADUATES' DINNER

The Aberdeen Graduates' Dinner will be held in Tilley's Restaurant, Newcastle upon Tyne, on Friday, July 12, at 7.30 for 8 p.m. The dinner is open to Aberdeen graduates (attending the A.R.M. or resident locally) and their ladies. Tickets will cost 30s. Early application, with remittance, should be made to Dr. D. Middleton, 18, Cliffe Park, Sunderland.

IRISH GRADUATES' DINNER

The Irish Graduates' Dinner will be held in the Medical Institute, 7, Windsor Terrace, Newcastle upon Tyne, on Wednesday, July 10, at 7.30 for 8 p.m. All Irish graduates are welcome. Tickets (25s. each, including cocktails but excluding wines) may be had on application, with remittance, to Dr. P. J. M. Van Miert, Royal Victoria Infirmary, Newcastle upon Tyne. (Limited to 30.)

CHRISTIAN MEDICAL FELLOWSHIP ANNUAL BREAKFAST

The Annual Breakfast of the Christian Medical Fellowship will be held in the Banqueting Hall of the Royal Station Hotel, Newcastle upon Tyne, on Tuesday, July 16, at 8.15 a.m. The Chairman will be Mr. Weldon Watts (President-Elect of the B.M.A.). Dr. Robert G. Cochrane, Adviser in Leprosy, Ministry of Health; Consulting Leprologist, Tropical Diseases Hospital, St. Thomas's Hospital, and St. John's Hospital; formerly Principal and Director of Christian Medical College, Vellore, will speak on "Changing Standards in Medical Practice." The proceedings will terminate at 9.15 a.m. Those intending to be present are asked to notify Dr. W. Condie, Pierremont, 36, Sunderland Road, Heworth, Gateshead, 10, Co. Durham.

GUILD OF SS. LUKE, COSMAS AND DAMIAN

There will be a Mass for Catholic doctors attending the B.M.A. Meeting at St. Mary's Cathedral (opposite the Central Station), Clayton Street, Newcastle, at 11.30 a.m. on Saturday, July 13. An address will be given by the Very Rev. G. P. Dwyer, D.D., Ph.D., Catholic Missionary Society. Academic Dress will be worn, and robing will take place in the County Hotel. Following this there will be a reception and luncheon in the County Hotel (also opposite the Central Station). Members and wives will be welcome. Tickets, price 8s. 6d., may be obtained from the A.R.M. Inquiry Office.

ANNUAL BALL OF DURHAM COUNTY BRANCH OF BRITISH RED CROSS SOCIETY

The Annual Ball of the Durham County Branch of the British Red Cross Society will be held in the Great Hall

of Durham Castle on Friday, July 12, from 9 p.m. to 2 a.m. Tickets, 25s. each, including supper, or 15s. each for the dance only. Any B.M.A. members wishing to attend are asked to apply for tickets by July 5 to Mrs. S. Annand, Springwell House, Whitesmoks, Durham.

CAR-PARKING FACILITIES

Car-parking facilities in the neighbourhood of the City Hall are limited; there is a large British Legion car park on the north side of the City Hall, which should provide reasonable accommodation. It is not anticipated that there will be any difficulty in parking cars near the Stephenson Building. Members are advised that Claremont Road is a main bus route, and car-parking there is strictly prohibited. Windscreens labels may be obtained at the Reception Bureau, and members bringing their own cars are advised to use these labels to facilitate car-parking.

SCIENTIFIC MEETING, JULY 15-19

PLENARY SESSIONS IN CHEMISTRY BUILDING, LECTURE THEATRE I, KING'S COLLEGE

Wednesday, July 17, 10 a.m.: "The Management of Hypertension"

Chairman: Professor MAX L. ROSENHEIM (London).
Speakers: Dr. ROBERT COOPE (Liverpool); Professor JOHN McMICHAEL (London); Mr. E. G. TUCKWELL (London); Dr. JOHN H. HUNT (London).

Official Reporter: Dr. S. C. TRUELOVE.

Thursday, July 18, 2.30 p.m.: "The Present Status of Prophylactic Immunization"

Chairman: Sir JOHN CHARLES (London).
Speakers: Professor R. CRUICKSHANK (London); Dr. J. GRANT (Gateshead); Dr. T. FRANCIS, jun. (Michigan, U.S.A.); Professor C. H. STUART-HARRIS (Sheffield); Dr. P. M. D'ARCY HART (London).

Official Reporter: Dr. W. C. COCKBURN.

Friday, July 19, 9.30 a.m.: "Care of the Dying"

Chairman: Dr. T. H. BATES (Newcastle upon Tyne).
Speakers: Dr. I. D. GRANT (Glasgow); Professor A. G. R. LOWDON (Newcastle upon Tyne); Mr. C. J. L. THURGAR (Newcastle upon Tyne); Dr. R. BODLEY SCOTT (London); THE LORD BISHOP OF DURHAM.

ROUND-TABLE CONFERENCES

Wednesday, July 17, from 9 to 9.45 a.m. in the Stephenson Building

I. INJURIES RESULTING FROM ROAD ACCIDENTS

Meeting-place: Room F10.

Chairman: Mr. J. I. MUNRO BLACK (Newcastle upon Tyne).

Panel: Mr. G. F. ROWBOTHAM (Newcastle upon Tyne), Mr. FENION BRAITHWAITE (Newcastle upon Tyne), Mr. W. GISSANE (Birmingham), Professor JOHN BOYES (Newcastle upon Tyne), Professor T. Pomfret Kilner (Oxford).

II. ARRANGED BY THE SECTION OF OBSTETRICS AND GYNAECOLOGY

Meeting-place: Room F13.

Chairman: Professor HARVEY EVERS (Newcastle upon Tyne).

Panel: Mr. C. K. WARRICK (Newcastle upon Tyne), Dr. WILLIAM WALKER (Newcastle upon Tyne).

There will be a free discussion on the following subjects: Some Causes of Public Alarm and Anxiety: Irradiation in the Antenatal Period, Rubella and Virus Infection, Rh Interreaction.

III. ARRANGED BY THE SECTION OF PHYSICAL MEDICINE: LOW BACK PAIN

Meeting-place: Room F1.

Chairman: Dr. HUGH BURT (London).

Panel: Dr. D. R. L. NEWTON (London), Mr. N. W. ROBERTS (Liverpool), Dr. S. JOSEPHS (Newcastle upon Tyne), Mr. I. N. MACIVER (Newcastle upon Tyne), Mr. W. MILLS (Birmingham).

SCIENTIFIC SECTIONS

All sessions will be held in the Stephenson Building or Chemistry Building, King's College. Morning sessions are from 9.30 a.m. to 12 noon, and afternoon sessions from 2.30 to 5 p.m., except on July 15.

MEDICINE

President: Professor F. J. NATTRASS, M.D., F.R.C.P. (Farnham).

Vice-Presidents: C. N. ARMSTRONG, M.D., F.R.C.P. (Newcastle upon Tyne); H. G. MCGREGOR, M.D., M.R.C.P. (Brighton); J. G. SCADDING, M.D., F.R.C.P. (London).

Hon. Secretaries: GORDON F. EDWARDS, M.B.E., M.B., M.R.C.P., 1, Park Crescent, Roundhay, Leeds, 8; R. B. THOMPSON, M.D., M.R.C.P., The Medical School, King's College, Newcastle upon Tyne, 1.

Official Reporter: Dr. S. C. TRUELOVE.

Chemistry Building, Lecture Theatre I.

Tuesday, July 16.—9.30 a.m. Combined session with Sections of Surgery and Cardiology, on Arterial Embolism. General introduction, Dr. WILLIAM EVANS (London); Diagnosis of Limb Embolism, Sir JAMES LEARMONTH (Edinburgh); Cerebral Embolism, Professor CHARLES ROB (London); Cerebral Embolism, Dr. H. A. DEWAR (Newcastle upon Tyne); Mesenteric Embolism, Dr. ALAN A. KLASS (Winnipeg, Canada); Long-term Anticoagulant Therapy, Dr. CATHERINE C. BURT (Edinburgh).

Room F10, Stephenson Building.

Wednesday, July 17.—2.30 p.m. Symposium on Cortisone in General Practice. Speakers will include Professor S. J. HARTELL (Leeds), Professor G. A. SMART (Newcastle upon Tyne), Dr. I. W. B. GRANT (Edinburgh), and Dr. R. B. THOMPSON (Newcastle upon Tyne).

SURGERY

President: A. DICKSON WRIGHT, M.S., F.R.C.S. (London).

Vice-Presidents: Professor DIGBY CHAMBERLAIN, Ch.M., F.R.C.S. (Leeds); HAROLD C. EDWARDS, C.B.E., M.S., F.R.C.S. (London); JOHN GILMOUR, M.S., F.R.C.S. (Newcastle upon Tyne); GEORGE A. MASON, V.R.D., F.R.C.S. (Newcastle upon Tyne).

Hon. Secretaries: DAVID TIBBS, M.C., F.R.C.S., 128, Moorside North, Fenham, Newcastle upon Tyne; J. F. R. WILHYCOMBE, M.Chir., F.R.C.S., 22, Parkside, Cambridge.

Official Reporter: Mr. R. E. HORTON.

Chemistry Building, Lecture Theatre I.

Tuesday, July 16.—9.30 a.m. Combined session with Sections of Medicine and Cardiology on Arterial Embolism. Room S21, Stephenson Building.

Wednesday, July 17.—2.30 p.m. Combined session with Section of Radiology on Radiological Investigation of the Biliary Tract: Dr. SCOTT PARK (Glasgow), Mr. DUDFIELD ROSE (Newcastle upon Tyne), Dr. J. D. DOW (London), Mr. DICKSON WRIGHT (London). 5 p.m., Treatment of Burns; Professor W. E. M. WARDILL (Bagdad), Dr. KHALID NAJI (Bagdad), Mr. J. HERBERT JOHNSTON (Liverpool).

Room S17, Stephenson Building.

Thursday, July 18.—9.30 a.m. The Diagnosis and Treatment of Carcinoma of Stomach: Clinical Aspects in Diagnosis, Mr. JOHN GILMOUR (Newcastle upon Tyne); Radiology, Dr. G. A. S. LLOYD (London); Gastroscopy, Mr. HERMON TAYLOR (London); Exfoliative Cytology, Dr. R. O. K. SCHADE (Newcastle upon Tyne); Treatment, Professor DIGBY CHAMBERLAIN (Leeds).

OBSTETRICS AND GYNAECOLOGY

President: Professor H. HARVEY EVERS, M.S., F.R.C.S., F.R.C.O.G. (Newcastle upon Tyne).

Vice-Presidents: Professor W. I. C. MORRIS, F.R.C.S.Ed., F.R.C.O.G. (Manchester); Professor W. C. W. NIXON, M.D., F.R.C.S., F.R.C.O.G. (London); FRANK STABLER, M.D., F.R.C.S., F.R.C.O.G. (Newcastle upon Tyne); JOHN STALL-WORTHY, F.R.C.S., F.R.C.O.G. (Oxford).

Hon. Secretaries: WILFRID MILLS, T.D., F.R.C.S., M.R.C.O.G., 99, Harborne Road, Edgbaston, Birmingham, 15; LINTON SNAITH, M.D., M.S., F.R.C.S., F.R.C.O.G., 2, Osborne Villas, Newcastle upon Tyne, 2.

Official Reporter: Mr. S. BENDER.

Chemistry Building, Lecture Theatre I.

Monday, July 15.—3 p.m. Combined session with Section of General Practice. Part I.—Toxaemia of Pregnancy. Openers: Dr. KATE HARROWER (Glasgow) and Mr. O. V. JONES (Bangor). Invited Speaker: Dr. JOHN FISHER (Abingdon). Part II.—The G.P.'s Responsibility in Gynaecology. Openers: Dr. A. J. G. NEWTON (Morpeth) and Dr. J. K. RUSSELL (Newcastle upon Tyne). Invited Speaker: Dr. A. DESMOND STOKER (Winstar).

Room F13, Stephenson Building.

Tuesday, July 16.—9.30 a.m. Placental Insufficiency: Dr. G. T. JOHNSON (Newcastle upon Tyne). Prolonged Labour: Professor W. C. W. NIXON (London), Mr. ALISTAIR GUNN (London), Professor A. S. DUNCAN (Cardiff). Unusual Uses of the Flying Squad: Mr. FRANK STABLER (Newcastle upon Tyne), Dr. ROBERT TENNENT (Glasgow).

Room F13, Stephenson Building.

Wednesday, July 17.—9 a.m. Round-table Conference: Some Causes of Public Alarm and Anxiety; Irradiation in the Antenatal Period; Rubella and Virus Infections; Rh Interreaction. Chairman, Professor HARVEY EVERS.

Room S17, Stephenson Building.

2.30 p.m., Combined session with Sections of Child Health and Preventive Medicine on Puberty and Its Problems. Chairman: Dr. J. B. TILLEY (Newcastle upon Tyne). Openers: Professor LESLIE BANKS (Cambridge), Dr. D. V. HUBBLE (Derby), Dr. T. N. MCGREGOR (Edinburgh).

ANAESTHETICS

President: H. H. PINKERTON, M.B., F.R.F.P.S., F.F.A.R.C.S. (Glasgow).

Vice-Presidents: R. P. HARBORD, M.D., F.F.A.R.C.S., D.A. (Leeds); JOAN MILLAR, M.B., F.F.A.R.C.S., D.A. (Newcastle upon Tyne), Professor E. A. PASK, O.B.E., M.D., F.F.A.R.C.S. (Newcastle upon Tyne).

Hon. Secretaries: J. A. G. HORTON, M.B., F.F.A.R.C.S., D.A., Department of Anaesthetics, Royal Victoria Infirmary, Newcastle upon Tyne, 1; CYRIL F. SCURR, M.V.O., M.B., F.F.A.R.C.S., D.A., Department of Anaesthetics, Westminster Hospital, London, S.W.1.

Official Reporter: Dr. C. F. SCURR.

Room F1, Stephenson Building.

Wednesday, July 17.—2.30 p.m. Deaths Related to Anaesthesia: Introduction and General Aspects of the Problem, Dr. JOHN GILLIES (Edinburgh); Anaesthesia for Patients with Intestinal Obstruction, Dr. H. J. V. MORTON (London); Anaesthesia for Emergency Obstetrics, Dr. W. D. WYLIE (London); Anaesthetic Fatalities in Relation to the Use of Relaxant Drugs, Dr. A. R. HUNTER (Manchester).

Room S21, Stephenson Building.

Thursday, July 18.—9.30 a.m. Barbiturate Toxicity and Coma: Treatment of Barbiturate Poisoning without Convulsant Drugs, Dr. ERIC NILSSON (Lund, Sweden); Experimental Evaluation of Bemegride, Dr. T. J. THOMSON (Glasgow); Abnormal Responses to Barbiturates, Dr. J. W. DUNDEE (Liverpool); Clinical Experience with Buthalitone Sodium, Dr. P. H. SIMMONS (London); General discussion opened by Dr. B. R. M. JOHNSON (London).

CARDIOLOGY

President: Professor J. CRIGHTON BRAMWELL, M.D., F.R.C.P. (Manchester).

Vice-Presidents: OSCAR BRENNER, M.D., F.R.C.P. (Birmingham); H. A. DEWAR, M.D., F.R.C.P. (London upon Tyne); WILLIAM EVANS, D.Sc., M.D., F.R.C.P. (London); W. G. A. SWAN, M.D., F.R.C.P. (Newcastle upon Tyne).

Hon. Secretaries: WALLACE BRIGDEN, M.D., F.R.C.P., 139, Harley Street, London, W.1; FREDERIC JACKSON, M.B., M.R.C.P., 18, North Avenue, Gosforth, Newcastle upon Tyne, 3.

Official Reporter: Dr. WALLACE BRIGDEN.

Chemistry Building, Lecture Theatre I.

Tuesday, July 16.—9.30 a.m. Combined session with Sections of Medicine and Surgery on Arterial Embolism. Room S20, Stephenson Building.

Wednesday, July 17.—2.30 p.m. The Treatment of Resistant Heart Failure, Dr. OSCAR BRENNER (Birmingham); The Use and Abuse of the Electrocardiogram, Dr. CURTIS BAIN (Harrogate); The Role of Quinidine in the Treatment of the Arrhythmias, Dr. PAUL WOOD (London); Rheumatic Carditis in Children To-day, Dr. WALLACE BRIGDEN (London); Survival after Cardiac Infarction, Dr. FREDERIC JACKSON (Newcastle upon Tyne); a colour film, "The Jugular Venous Pulse," Dr. PATRICK MOUNSEY (London).

CHILD HEALTH

President: Professor WILFRID GAISFORD, M.Sc., M.D., F.R.C.P. (Manchester).

Vice-Presidents: Professor DONALD COURT, M.D., M.R.C.P., D.C.H. (Newcastle upon Tyne); REGINALD LIGHTWOOD, M.D., F.R.C.P., D.P.H. (London); CHARLES PINCKNEY, M.B., F.R.C.P. (London).

Hon. Secretaries: GEORGE DAVISON, M.D., F.R.C.P., D.C.H., Shincliffe, Station Road, Cradlington, Northumberland; STANLEY D. V. WELLER, M.D., M.R.C.P., D.C.H., 50, Southborough Road, Bickley, Kent.

Official Reporter: Dr. P. R. EVANS.

Room S17, Stephenson Building.

Wednesday, July 17.—2.30 p.m. Combined meeting with Sections of Obstetrics and Gynaecology and Preventive Medicine. Puberty and its Problems.

Room F16, Stephenson Building.

Thursday, July 18.—9.30 a.m. Combined meeting with Section of General Practice. Acute Respiratory Infection. Part I.—Openers: Professor DONALD COURT (Newcastle upon Tyne), Dr. J. FRY (Beckenham). Invited Speaker: Dr. A. J. LAIDLAW (Worcester). Part II.—Openers: Dr. J. F. GOODALL (Skipton), Professor C. H. STUART-HARRIS (Sheffield).

Friday, July 19.—2.30 p.m. Part I.—Round-table Conference: Collagen Disorders. Chairman: Dr. R. LIGHTWOOD (London). Panel: Dr. BARBARA ANSELL (London), Dr. C. O. CARTER (London), Dr. ALAN HILL (Stoke Mandeville), Dr. G. A. ROSE (London). Part II.—General Discussion: Iatrogenic Disease in Childhood. Chairman: Dr. C. PINCKNEY (London). Speakers: Dr. A. WHITE FRANKLIN (London), Dr. ALICE STEWART (Oxford), Dr. KENNETH CAMERON (London), Dr. MARY CROSSE (Birmingham).

DERMATOLOGY

President: J. FERGUSON SMITH, M.D., F.R.F.P.S. (Glasgow).

Vice-Presidents: R. MASON BOLAM, M.D. (Newcastle upon Tyne); A. GIRDWOOD FERGUSON, M.D., M.R.C.P.Ed., F.R.F.P.S. (Glasgow); I. B. SNEDDON, M.B., F.R.C.P. (Sheffield).

Hon. Secretaries: R. MASON BOLAM, M.D., The North Cottage, Adderstone Crescent, Jesmond, Newcastle upon Tyne, 2; PETER BORRIE, M.D., M.R.C.P., 115A, Harley Street, London, W.1.

Official Reporter: Dr. J. T. INGRAM.

Room T1, Stephenson Building.

Wednesday, July 17.—2.30 p.m. Acne Vulgaris, Dr. A. J. ROOK (Cambridge); Vesicular Eruptions of the Hands, Dr. STEPHEN GOLD (London) and Dr. A. GIRDWOOD FERGUSON (Glasgow); Neurodermatitis, Dr. S. T. ANNING (Leeds).

GENERAL PRACTICE

President: H. F. WATTSFORD, M.B., B.S. (Newcastle upon Tyne).

Vice-Presidents: JOHN BEYNON, T.D., M.B., B.S. (Brighton); MONA MACNAUGHTON, M.B., Ch.B. (Newcastle upon Tyne); S. WAND, M.B., Ch.B. (Birmingham).

Hon. Secretaries: R. J. F. H. PINSENT, M.D., 1, Mayfield Road, Handsworth, Birmingham; ANDREW SMITH, M.B., B.S., Rose Villa, Whickham, Newcastle upon Tyne.

Chemistry Building, Lecture Theatre I.
Monday, July 15.—3 p.m., Joint Session with Section of Obstetrics and Gynaecology. I. Toxaemia of Pregnancy. II. The G.P.'s Responsibility in Gynaecology.

Room F 16, Stephenson Building.

Wednesday, July 17.—2.30 p.m., Joint Session with Section of Preventive Medicine. Illness of School Child. Part I:—Openers: Dr. R. W. ELDRIDGE (Lancashire County Council), Infectious Diseases amongst Schoolchildren—the Exclusion of Cases and Contacts. Dr. G. K. HODGKIN (Redcar), Observations in the Rotation of Infectious Diseases in General Practice. Invited Speaker: Dr. E. G. BREWIS (Newcastle upon Tyne). Part II:—Openers: Dr. A. MODEL (Stockport), The Child who Refuses to go to School; Dr. G. S. ROBERTSON (Liverpool), The Emotional Problems of the School Child.

Thursday, July 18.—9.30 a.m., Joint Session with Section of Child Health on Acute Respiratory Infection.

HISTORY OF MEDICINE

President: Sir ZACHARY COPE, M.D., M.S., F.R.C.S. (London).

Vice-Presidents: DOUGLAS GUTHRIE, M.D., F.R.C.S. (Edinburgh); C. E. KELLETT, M.D., F.R.C.P. (Shotley Bridge); J. DUDFIELD ROSE, M.B., F.R.C.S. (Newcastle upon Tyne).

Hon. Secretaries: N. M. MATHESON, M.R.C.P., F.R.C.S., F.A.C.S., Ashford Hospital, Ashford, Middlesex; ROBERT MOWBRAY, M.D., M.R.C.P., D.C.H., 220, Gilesgate, Durham. Room F 10, Stephenson Building.

Tuesday, July 16.—9.30 a.m. Mark Akenside, Sir JOHN CHARLES (London). Cholera Epidemics in Newcastle, Professor JOHN BOYES (Newcastle); John Snow's Place in History, Dr. M. H. A. DAVISON (Newcastle); The Influence of Leyden upon the Edinburgh Medical School, Dr. D. J. GUTHRIE (Edinburgh); The *De Dissectione* of Charles Estienne, Dr. C. E. KELLETT (Newcastle).

Exhibition of Medical Books, King's College Library.

Exhibition of Medical Art, Hatton Gallery, King's College. Visit to the Cathedral Library, Durham. (Date to be announced at the Sectional Meeting.)

NEUROLOGY

President: HUGH GARLAND, T.D., M.D., F.R.C.P. (Leeds).

Vice-Presidents: WALPOLE LEWIN, M.S., F.R.C.S. (Oxford); J. W. ALDREN TURNER, D.M., F.R.C.P. (London).

Hon. Secretaries: R. W. GILLIATT, D.M., M.R.C.P., 51, Harley Street, London, W.1; J. N. WALTON, M.D., M.R.C.P., 5, Dilston Terrace, Gosforth, Newcastle upon Tyne, 3.

Official Reporter: Dr. J. N. WALTON.

Room F 13, Stephenson Building.

Wednesday, July 17.—2.30 p.m. Symposium on Epilepsy: Modern Views on Classification, Dr. DENIS WILLIAMS (London); Value of the Electroencephalogram in Diagnosis, Dr. DENIS HILL (London); Anticonvulsant Therapy, Dr. HOUSTON MERRITT (New York); Pitfalls and Success in the Surgical Treatment of Focal Epilepsy, Dr. WILDER PENFIELD (Montreal); Epilepsy as a Social Problem—a Summing-up, LORD COHEN OF BIRKENHEAD.

Thursday, July 18.—9.30 a.m. Symposium on Cerebral Vascular Disease: Recent Advances in Knowledge of Cerebral Vascular Disease, Dr. RAYMOND D. ADAMS (Boston, Mass.); Medical Management of Subarachnoid Haemorrhage, Dr. J. MACDONALD HOLMES (Stafford); Radiological Investigation in Cases of Cerebral Vascular Disease, Dr. JAMES BULL (London); The Surgical Treatment of Spontaneous Intracranial Haemorrhage, Mr. MURRAY FALCONER (London); The Management of "Strokes," Dr. F. A. ELLIOTT (London).

OCCUPATIONAL HEALTH

President: J. J. O'DWYER, C.B.E., M.B., D.P.H. (London).

Vice-Presidents: GEORGE BUCHANAN, B.L., L.R.C.P.S., D.P.H., D.I.H., D.T.M.&H., D.P.A. (Glasgow); CHARLES CRESDEE, M.R.C.S., L.R.C.P. (Huddersfield); G. E. GRAVES PEIRCE, M.B., F.R.C.S. (London).

Hon. Secretaries: DAVID GULLICK, M.B., B.S., Mount View, Western Road, Stevenage, Herts; R. I. MCCALLUM, M.D., M.R.C.P., Nuffield Department of Industrial Health, the Medical School, King's College, Newcastle upon Tyne, 1.

Official Reporter: Dr. R. S. F. SCHILLING.

Room S 17, Stephenson Building.

Tuesday, July 16.—9.30 a.m. The Management of Pneumoconiosis in General Practice: opening speakers, Dr. A. MEIKLEJOHN (Glasgow), Dr. J. C. GILSON (Llandough), Dr. R. A. TREVETHICK (Sheffield), Dr. FENWICK LISHMAN (Crook, Co. Durham).

OPHTHALMOLOGY

President: J. S. ARKLE, O.B.E., M.B., F.R.C.S. (Newcastle upon Tyne).

Vice-Presidents: GEORGE BLACK, M.B., F.R.C.S. (Leeds); ALEX G. CROSS, M.D., F.R.C.S. (London); H. VERNON INGRAM, O.B.E., T.D., M.B., D.O.M.S. (Newcastle upon Tyne); A. E. P. PARKER, M.B., F.R.C.S. (Middlesbrough).

Hon. Secretaries: DEREK AINSLIE, M.D., F.R.C.S., D.O.M.S., 87, Harley Street, London, W.1; JAMES M. L. HOWAT, M.B., D.O.M.S., D.O., 3, Tankerville Terrace, Newcastle upon Tyne, 2.

Official Reporter: Mr. REDMOND SMITH.

Room S 20, Stephenson Building.

Tuesday, July 16.—9.30 a.m. Chiasmal Disease. Openers: Professor NORMAN DOTT (Edinburgh); Dr. A. MOONEY (Dublin). Invited Speakers: Dr. J. McLELLAND (Edinburgh); Dr. C. F. ROLLAND (Carlisle); Mr. J. SLOAN ROBERTSON (Glasgow); Recent Advances in the Diagnosis and Treatment of Glaucoma, Mr. R. J. H. SMITH (London); Ocular Changes in the Leukaemias, Mr. P. D. TREVOR ROPER (London); Cataract Surgery under Chlorpromazine Hydrochloride, Mr. H. VERNON INGRAM (Newcastle upon Tyne).

ORTHOPAEDICS

President: C. GORDON IRWIN, M.B., F.R.C.S. (Newcastle upon Tyne).

Vice-Presidents: JOHN BASTOW, M.D., F.R.C.S. (Bath); JOHN CHARNLEY, M.B., F.R.C.S. (Manchester); J. KENNETH STANGER, M.B., F.R.C.S. (Newcastle upon Tyne).

Hon. Secretaries: L. W. PLEWES, C.B.E., M.D., F.R.C.S. (Ed.), Blake Hall, Kensworth, Dunstable, Beds; JOHN V. TODD, M.Ch.Orth., F.R.C.S., 20, The Grove, Gosforth, Newcastle upon Tyne, 3.

Official Reporter: Mr. L. W. PLEWES.

Room T 10, Stephenson Building.

Wednesday, July 17.—2.30 p.m. Pain in the Arm, Mr. ROBERT ROAF (Liverpool), Mr. J. KENNETH STANGER (Newcastle upon Tyne), Dr. MICHAEL KREMER (London); Reconstructive Surgery of the Upper Limb Following Poliomyelitis, Mr. ALEX MILLER (Glasgow); Fractures of the Patella, Mr. JOHN V. TODD (Newcastle upon Tyne).

OTO-RHINO-LARYNGOLOGY

President: W. I. DAGGETT, M.A., F.R.C.S. (London).

Vice-Presidents: R. E. JOWETT, M.D., M.R.C.P., D.L.O. (Sunderland); R. G. MACBETH, D.M., M.A., F.R.C.S. (Oxford); F. MCGUCKIN, M.D., F.R.C.S. (Newcastle upon Tyne).

Honorary Secretaries: J. D. K. DAWES, B.Sc., M.D., F.R.C.S., 10 Kingsland, Newcastle upon Tyne; L. R. S. TAYLOR, F.R.C.S., 55, Harley Street, London, W.1.

Official Reporter: Mr. C. M. JOHNSTON.

Room S 20, Stephenson Building.

Thursday, July 18.—9.30 to 11 a.m. Chairman, Mr. W. I. DAGGETT; The Scope of Surgery in the Management of Deafness. Opening Speaker, Mr. I. B. THORBURN (Blackpool); Invited Speaker, Mr. F. MCGUCKIN (Newcastle). Film of Otosclerosis by Dr. GEORGE F. SHAMBAUGH

(Chicago). 11.30 a.m. to 12 noon, Film by Professor PIETRANTONI (Milan): Les Otites Chroniques.

Friday, July 19.—2.30 to 3.30 p.m. Chairman, Mr. R. G. MACBETH (Oxford). Epistaxis. Opening Speaker, Mr. J. P. STEWART (Edinburgh). Invited Speaker, Dr. H. A. DEWAR (Newcastle upon Tyne). 4 to 5 p.m., Chairman, Mr. R. E. JOWETT, Sunderland. Presenting Symptoms and Signs of Malignant Disease of the Upper Respiratory Tract. Opening Speaker, Mr. W. A. MILL (London). Invited Speakers, Mr. R. D. OWEN (Cardiff); Mr. J. I. MUNRO BLACK (Newcastle upon Tyne).

An Exhibition on the Comparative Anatomy of the Larynx by Dr. O. GRAY (Haslemere) will be shown on Thursday and Friday adjacent to the meeting room of the Section.

PHYSICAL MEDICINE

President: HUGH BURT, M.B., F.R.C.P. (London).

Vice-Presidents: GUY BEAUCHAMP, M.B., Ch.B. (London); JAMES CYRIAX, M.D., M.R.C.P. (London); J. B. STEWART, M.B., D.Phys.Med. (Marlborough); A. ZINOVIEFF, M.R.C.S., L.R.C.P., D.Phys.Med. (Durham).

Hon. Secretaries: A. T. RICHARDSON, M.B., M.R.C.P., D.Phys.Med., the Royal Free Hospital, Gray's Inn Road, London, W.C.1; M. THOMPSON, M.D., M.R.C.P., Department of Physical Medicine, the Royal Victoria Infirmary, Queen Victoria Road, G.P.O. Box No. 141, Newcastle upon Tyne, 1.

Official Reporter: Dr. D. R. L. NEWTON.

Room F 1, Stephenson Building.

Wednesday, July 17.—9 a.m. Round-table Conference: Low Back Pain.

Room F 13, Stephenson Building.

Friday, July 19.—2.30 p.m. Symposium on Steroid Therapy in the Rheumatic Diseases. Opener, Dr. G. R. FEARNLEY (Gloucester), Systemic Steroid Therapy in the Chronic Rheumatic Diseases. Invited Speakers, Dr. JAMES CYRIAX (London), Hydrocortisone in Lesions at the Shoulder and the Elbow; Dr. M. THOMPSON (Newcastle upon Tyne), Intra-articular Steroid Therapy. Occasional Paper: Dr. A. ZINOVIEFF (Durham), Results of Rehabilitation of Injured Miners. Symposium on Painful Feet: Joint Openers. Dr. A. T. RICHARDSON (London), The Painful Heel; Dr. GUY BEAUCHAMP (London), The Painful Foot.

PLASTIC SURGERY

President: Professor T. POMFRET KILNER, C.B.E., D.M., F.R.C.S. (Oxford). *Vice-Presidents:* D. N. MATTHEWS, O.B.E., M.D., M.Ch., F.R.C.S. (London); MORTIMER H. SHAW, M.B., F.R.C.S. (Leeds).

Honorary Secretaries: F. I. HERBERT, M.B., F.R.C.S., 23, Linden Road, Gosforth, Newcastle upon Tyne, 3; W. GROSSMANN, M.D., L.D.S.R.C.S., 79, Harley Street, London, W.1.

Official Reporter: Room F 10, Stephenson Building.

Thursday, July 18.—9.30 a.m. Occasional Papers: (1) Haemangiomas, Mr. D. N. MATTHEWS (London); (2) Repair of Hand Injury, Mr. MORTIMER SHAW (Leeds); (3) Investigation of Children with Speech Defects, With Particular Reference to Nasality, Mr. J. S. CALNAN (Oxford).

PREVENTIVE MEDICINE

President: J. B. TILLEY, M.D., D.P.H. (Newcastle upon Tyne).

Vice-Presidents: Professor E. M. DUNLOP, M.C., M.A., M.D., F.R.S. (Newcastle upon Tyne); J. F. WARIN, M.D., D.P.H. (Oxford); ELSPETH WARWICK, M.B., D.P.H. (Nottingham).

Hon. Secretaries: J. ALUN EVANS, M.R.C.S., L.R.C.P., D.P.H., 5, Crossfield Avenue, West Winds, Porthcawl, Glam.; R. C. M. PEARSON, M.D., M.R.C.P. (Ed.), D.P.H., Health Department, Town Hall, Newcastle upon Tyne, 1.

Official Reporter: Dr. J. F. WARIN.

Room S 17, Stephenson Building.

Wednesday, July 17.—2.30 p.m. Combined Meeting with Sections of Obstetrics and Gynaecology and Child Health. Puberty and its Problems.

Room F 16, Stephenson Building.

Wednesday, July 17.—2.30 p.m. Joint Session with Section of General Practice. Illness of the School Child.

PSYCHIATRY

President: Professor ALEXANDER KENNEDY, M.D., F.R.C.P., M.R.C.P. (Edinburgh).

Vice-Presidents: LOUIS MINSKI, M.D., F.R.C.P., D.P.M. (Sutton, Surrey); Professor MARTIN ROTH, M.D., M.R.C.P., D.P.M. (Newcastle upon Tyne); IAN SKOTTOWE, M.D., M.R.C.P., D.P.M. (Oxford).

Hon. Secretaries: ROBERT ORTON, M.D., M.R.C.P. (Ed.), D.P.M., Royal Victoria Infirmary and King's College Medical School, Department of Psychological Medicine, Queen Victoria Road, Newcastle upon Tyne, 1; D. A. POND, M.D., M.R.C.P., D.P.M., Yew Trees, Dover House Road, Roehampton, S.W.15.

Official Reporter: Dr. J. L. CRAMMER.

Room F 16, Stephenson Building.

Tuesday, July 16.—9.30 a.m. Symposium on Tranquilizers, Dr. D. R. LAURENCE (London), Dr. L. C. COOK (Dartford), Dr. E. H. KITCHING (Manchester).

RADIOLOGY

President: S. WHATELY DAVIDSON, M.D., F.R.C.P., F.F.R. (Newcastle upon Tyne).

Vice-Presidents: PAIGE ARNOLD, M.D. (Sunderland); R. A. KEMP HARPER, M.D., F.R.C.P. (Ed.), F.R.F.P.S., F.F.R., D.R. (London); W. S. SHEARER, M.B., F.R.C.S. (Ed.), D.R. (Edinburgh).

Hon. Secretaries: B. D. HOUSTON, M.B., B.S., D.M.R., "Roanhead," Melbury Road, Newcastle upon Tyne, 7; ARTHUR JONES, M.D., M.R.C.P., D.M.R.T., Radiotherapy Department, St. Bartholomew's Hospital, London, E.C.1.

Room S 21, Stephenson Building.

Wednesday, July 17.—2.30 p.m. Combined session with Section of Surgery on Radiological Investigation of the Biliary Tract.

COLOUR TELEVISION

There will be a daily programme of closed-circuit colour television from the Royal Victoria Infirmary to the Gymnasium, King's College, sponsored and produced by Smith, Kline and French Laboratories Ltd. The programme will consist of clinical demonstrations and surgical operations by members of the staffs of the Medical School, King's College, University of Durham, and the Royal Victoria Infirmary, Newcastle upon Tyne.

Monday, July 15.—12.15–1.15 p.m. Chairman, Mr. J. S. ARKLE. Cases of Corneal Grafts, Mr. H. VERNON INGRAM. Cases of Plastic Lenticular Implants and Contact Lenses, Mr. L. H. LAKE. Cataract Extraction by the Intracapsular Method, Mr. H. VERNON INGRAM, Mr. P. J. L. HUNTER, Dr. M. H. ARMSTRONG DAVISON. 1.15–2.15 p.m. Chairman, Dr. C. N. ARMSTRONG. Some Disorders of Thyroid Function, Dr. F. T. FARMER, Professor G. A. SMART, Mr. C. J. L. THURGAR.

Tuesday, July 16.—12.15–12.45 p.m. Chairman, Professor F. J. NATTRASS. Muscular Dystrophy, Dr. J. N. WALTON, Mr. W. H. STANTON. 12.45–1.15 p.m. Chairman, Professor G. A. SMART. The Treatment of Arthritis, with Special Reference to Intra-articular Injections, Dr. M. THOMPSON, Dr. N. CARDOE. 1.15–2.15 p.m. Chairman, Professor A. G. R. LOWDON. Compression of the Median Nerve in the Carpal Tunnel, Dr. H. G. MILLER, Mr. J. K. STANGER.

Wednesday, July 17.—12.30–12.55 p.m. Chairman, Dr. J. FERGUSON SMITH (Glasgow). The Treatment of Some Common Skin Disorders, Dr. R. MASON BOLAM, Dr. B. WILSON, 12.55–1.20 p.m. Chairman, Professor S. D. M. COURT. Primary Tuberculosis of Skin and Mucous Membranes, Dr. F. J. W. MILLER, Dr. M. D. TAYLOR. 1.20–1.50 p.m. Peripheral Vascular Disease, Dr. D. J. TIBBS, Mr. D. N. WALDER. 1.50–2.15 p.m. Chairman, Mr. JOHN GILMOUR. Partial Gastrectomy by the Billroth I Method, Professor A. G. R. LOWDON.

Thursday, July 18.—12.15–12.45 p.m. Chairman, Dr. H. G. MILLER. Cleft Lip and Palate, Mr. J. R. G. EDWARDS, Miss M. E. MORLEY. 12.45–1.15 p.m. Chairman, Dr. M. THOMPSON. (1) Early Gait Training in Hemiplegia, Miss N. BOLAM, Miss P. LYTTLETON. (2) Treatment of a Fractured Neck of Humerus, Miss M. JENKINS, Mrs. N. ROBINSON. 1.15–1.50 p.m. Chairman, Professor G. A. SMART. The Diagnosis of Sex, Dr. C. N. ARMSTRONG, Dr. A. R. HORLER. 1.55–2.15 p.m. Chairman, Mr. J. I. MUNRO BLACK. Otol-sclerotic Deafness, Mr. F. MCGUCKIN.

Friday, July 19.—12.15–1.15 p.m. Chairman, Mr. J. V. TODD. The Diagnosis and Treatment of the Torn Cartilage in the Knee, Mr. C. GORDON IRWIN, Mr. J. K. STANGER, Mr. P. N. ROBSON.

B.M.A. FILMS

It is hoped to show a programme of films in the Stephenson Building (Room F13) from 5 to 6 p.m. on July 15, 16, and 18, and from 5.15 to 6 p.m. on July 17. The programme will include the following films and detailed timings will be available at the Meeting:

ARTERIAL GRAFTING, by PETER MARTIN, F.R.C.S.
THE MEDICAL WITNESS.

HAEMORRHOIDS OR PILES, by A. LAWRENCE ABEL, F.R.C.S., and H. G. UNGLEY, F.R.C.S.

A PTOSIS OPERATION, by H. B. STALLARD, F.R.C.S., and Medical Illustration Dept., Institute of Ophthalmology.
THE MOTION PICTURE IN MEDICAL EDUCATION, American Medical Association.

SOME ASPECTS OF ACCESSIBLE CANCERS: (a) Lip, Tongue, and Mouth; (b) Larynx; Ministry of Health.

SIALOGRAPHY TECHNIQUE, Manchester Royal Infirmary.
CARDIAC BYPASS, Dept. of Medical Illustration, Westminster Hospital.

SCIENTIFIC EXHIBITION

Stephenson Building, King's College

(List of exhibits with stand numbers)

- Department of Surgery, Queen's University, Belfast. Nutritional aspects of gastric surgery: human.
- Department of Surgery, Queen's University, Belfast. Nutritional aspects of gastric surgery: experimental.
- Sunderland Royal Infirmary. Dressing system in a casualty department.
- King's College and Royal Victoria Infirmary, Newcastle upon Tyne. Papular urticaria caused by fleas.
- St. George's Hospital, London. Auscultation of the heart illustrated by phonocardiography.
- Bradford A and B Group Hospitals and Bradford Institute of Technology. A study of the degeneration with age of the human intervertebral disk.
- Department of Photography and Illustration, Westminster Hospital Medical School, London. "B.M.A. Exhibition stands."
- Department of Medical Illustration, Hospital for Sick Children, Great Ormond Street, London. Highlights of paediatric surgery.
- Dental School, Newcastle upon Tyne. Oral syphilis.
- Nuffield Department of Industrial Health, King's College and Royal Victoria Infirmary, Newcastle upon Tyne. (a) The causes and costs of hand injuries; (b) Atmospheric pollution from diesel omnibuses.
- Ministry of Supply, Chorley, Lancs. Universal en-training unit for use in the determination of air contaminants.
- Newcastle Regional Hospital Board. Proposed new general hospital for West Cumberland.
- King's College and Royal Victoria Infirmary, Newcastle upon Tyne. The cytodiagnosis of gastric carcinoma.
- College of General Practitioners, North-East England Faculty. (1) Relative incidence of certain diseases in groups. (2) Bornholm disease. (3) Suggestions on desirable modifications in lectures to students to ensure some introduction to general practice.
- Royal Navy Medical School, Royal Navy Physiological Laboratory. Physiological problems associated with diving and underwater swimming.

17. Royal Air Force Medical Branch: (a) Scaled model of the human centrifuge. (b) An apparatus for research into the breakdown of highly skilled performance. (c) Anaesthetic apparatus incorporating a new vaporizer. (d) Eye vision—test type R.A.F. pattern internally illuminated.

18. Institute of Dermatology, St John's Hospital for Diseases of the Skin, London. Pigmented lesions of the skin.

19. Departments of Pathology and Physical Chemistry, University of Durham. Electron microscopy and Medicine.

20. Department of Gynaecology, Durham University. Gynaecological teaching display.

21. Department of Surgery, King's College, University of Durham, and Royal Victoria Infirmary, Newcastle upon Tyne. Vascular insufficiency in human calf muscle.

22. St. Thomas's Hospital, London. Aortic stenosis.

23. Manchester Royal Infirmary. The "slipped" disk.

24. Manchester Royal Infirmary. Pernicious anaemia—a changing picture.

25. Medical Groups of the Royal Photographic Society and the Institute of British Photographers. Some aspects of photography in medicine.

26. Nuffield Department of Plastic Surgery, the Churchill Hospital, Oxford. An advance in surgical technique—the provision of skin cover.

27. Vacant.

28. Royal Victoria Infirmary, Newcastle upon Tyne. An electromagnetic foreign-body locator.

29. Institute of Clinical Research, The Middlesex Hospital, London. Sarcoidosis.

30. Charing Cross Hospital, London. Comprehensive management of children with cerebral palsy.

31. Medical School, King's College, University of Durham, and Royal Victoria Infirmary, Newcastle upon Tyne. Fractures of the calcaneum.

32. Institute of Psychiatry, Maudsley Hospital, London. Diagnosis and treatment of temporal lobe epilepsy.

33. Victoria Hospital, Swindon, and Odstock Hospital, Salisbury. (1) Rehabilitation flat for disabled housewives.

(2) Thermo-electric clothing for post-traumatic vasospastic conditions.

34. Princess Mary Maternity Hospital, Newcastle upon Tyne. Flying squad (Newcastle upon Tyne obstetric emergency service).

35. The Gordon Hospital, London. Diverticulitis.

36. Institute of Cancer Research, the Royal Marsden Hospital, London. Haematuria.

37. Welsh National School of Medicine. Chronic pulmonary beryllium disease.

SPECIAL EXHIBITION

4. The Pharmaceutical Society of Great Britain. Poliomyelitis vaccine.

EXHIBITION OF PHARMACEUTICAL PRODUCTS, INSTRUMENTS, APPLIANCES, AND MEDICAL PUBLICATIONS, STEPHENSON BUILDING, KING'S COLLEGE

List of Exhibitors	Official Stand No.
Abbott Laboratories Ltd., 3, Wadsworth Road, Perivale, Greenford, Middlesex	1
Ames Co. Ltd., Nuffield House, Piccadilly, W.1	5
Bayer Products Ltd., Neville House, Eden Street, Kingston-on-Thames	20
C. L. Bencard Ltd., Minerva Road, Park Royal, N.W.10	41
Board of Registration of Medical Auxiliaries, Tavistock House North, Tavistock Square, W.C.1	42
Boots Pure Drug Co. Ltd., 37, Station Street, Nottingham	6
British Medical Journal	12
British Oxygen Gases Ltd., Bridgwater House, Cleveland Row, St. James's, S.W.1	33
Burroughs Wellcome and Co., 183–193, Euston Road, N.W.1	4
Butterworth and Co., Ltd., 88, Kingsway, W.C.2	36
Cambridge Instrument Co. Ltd., 13, Grosvenor Place, S.W.1	44
Camden Chemical Co. Ltd., 61, Gray's Inn Road, W.C.1	23
Calmic Ltd., Crewe Hall, Crewe	46
Ciba Laboratories Ltd., Horsham, Sussex	2

JUNE 8, 1957

Courtaulds Ltd., 30–32, Newgate Street, E.C.1	51
Crookes Laboratories Ltd., Gorst Road, Park Royal, N.W.10	47
Cuxson Gerrard and Co. Ltd., Oldbury, Birmingham	49
Domestos Ltd., College Works, Albion Row, Newcastle on Tyne, 6	55
Down Bros. and Mayer and Phelps Ltd., 32–34, New Cavendish Street, W.1	30
Ellis Son and Paramore Ltd., Spring Street Works, Sheffield, 3	53
Energen Foods Co. Ltd., Pound Lane, N.W.10	50
Ethicon Ltd., 126, Fountainbridge, Edinburgh	43
Family Doctor	60
Genito-Urinary Mnfg. Co. Ltd., 28a, Devonshire Street, W.1	28
Glaxo Laboratories Ltd., Greenford Road, Greenford, Middlesex	3
I.C.I. Ltd., Pharmaceuticals Division, Fulshaw Hall, Wilmslow, Cheshire	8
Kimberly-Clark Ltd.	39 & 40
H. K. Lewis and Co. Ltd., 136, Gower Street, W.C.1	17
Eli Lilly and Co. Ltd., Basingstoke, Hants	25
E. and S. Livingstone Ltd., 15–17, Teviot Place, Edinburgh, 1	11
London Association for Hospital Services, Tavistock House South, Tavistock Square, W.C.1	52
London Hospital (Ligature Dept.) Ltd., London Hospital, Whitechapel, E.1	19
May and Baker Ltd., Dagenham, Essex	27
New Equipment Ltd., Croxdale, Co. Durham	48
A. and G. Nicholas, 117, Buckingham Avenue, Slough, Bucks.	38
N.O.T.B. Association Ltd., Tavistock House North, Tavistock Square, W.C.1	56
Parke, Davis and Co. Ltd., Staines Road, Hounslow, Middlesex	22
Peacocks (Surgical and Medical Equipment) Ltd., 22–28, Collingwood Street, Newcastle upon Tyne, 1	34 & 57
Reckitt and Colman Ltd., Pharmaceutical Dept., Dansom Lane, Hull, Yorks	35
Roche Products Ltd., 15, Manchester Square, W.1	37
G. D. Searle and Co. Ltd., Lane End Road, High Wycombe, Bucks	31
Smith and Nephew Ltd., Bessemer Road, Welwyn Garden City, Herts	15
Ed. Taylor Ltd., Monton Fields Road, Monton, Eccles, Manchester	45
Sandoz Products Ltd., Pharmaceutical Dept., 134, Wignmore Street, W.1	14
Smith Kline and French Laboratories Ltd., 130, Cold-harbour Lane, S.E.5	10
C. F. Thackray Ltd., 10, Park Street, Leeds, 1	54

TIME-TABLE OF MEETINGS

- R.—Events available for members of Representative Body and Ladies accompanying them.
L.—Events primarily arranged for Ladies.
U.—Events for all Members and Ladies accompanying them.
*—Academic Robes should be worn.

Tuesday, July 9

- 4.30 to 6.30 p.m.—Annual Representative Meeting Inquiry Office open at City Hall.
4.30 to 6.30 p.m.—Ladies' Club open, Medical School, King's College.
8.30 to 10.30 p.m.—R. Cocktail Party (by invitation of the Newcastle upon Tyne Division and North of England and Tees-side Branches) at the Old Assembly Rooms, Westgate Road.

Wednesday, July 10

- 9.00 a.m.—Annual Representative Meeting Inquiry Office open at the City Hall.
9.00 a.m.—Ladies' Club open, Medical School, King's College.
9.30 a.m.—Annual Representative Meeting starts at the City Hall.
10.15 a.m. to 1.00 p.m.—L. Visit to Washington Old Hall and Church of the Venerable Bede, Jarrow. (By private car.)
11.00 a.m.—Welcome by the Lord Mayor of Newcastle upon Tyne at the City Hall.
2.00 to 6.00 p.m.—L. Excursion to Delaval Hall and Tyne-mouth. (Tea at Bath Assembly Rooms by invitation of the Tynemouth Division.) (For 60.) Inclusive ticket, 6s.

7.30 for 8 p.m.—Irish Dinner, Medical Institute, 7, Windsor Terrace. Ticket 25s. (including cocktails but excluding wines).

Thursday, July 11

- 9.00 a.m.—Annual Representative Meeting Inquiry Office open.
9.30 a.m.—Ladies' Club open.
9.30 a.m.—Annual Representative Meeting.
10.00 a.m. to 1.00 p.m.—L. Visit to Durham Cathedral. (Coffee by invitation of the Durham Division.) (For 30.) Inclusive ticket, 6s.
11.00 a.m. to 4.30 p.m.—L. All-day excursion to Otterburn, with visit to Otterburn Mills (picnic lunch). (For 40.) Inclusive ticket, 17s. 6d.
7.30 p.m.—R. Dinner for Representatives and Ladies, Old Assembly Rooms, Westgate Road. (For 350.) Ticket 27s. 6d., including aperitifs.
9.30 p.m. to 12.30 a.m.—R. Representatives' Dance, Old Assembly Rooms. (For 500.) Ticket 7s. 6d.

Friday, July 12

- 9.00 a.m.—Annual Representative Meeting Inquiry Office open.
9.30 a.m.—Ladies' Club open.
9.30 a.m.—Annual Representative Meeting.
10.00 a.m. to 2.00 p.m.—L. Excursion to Works of Thomas Hedley and Co. Ltd., Soap and Detergent Manufacturers. (Lunch by kind invitation of the Directors.) (For 60.)
1.00 p.m.—Overseas Luncheon, Old Assembly Rooms (by invitation).
3.00 p.m.—L. Exhibition of Durham quilting; tea by invitation of Mrs. Munro Black.
3.30 p.m.—L. Garden Party by kind invitation of Mrs. Kenneth Stanger at Ettridge Lodge, The Grove, Gosforth. (For 50.)
5.30 p.m.—Cocktail Party for Women Representatives and medical women accompanying Representatives, Northern Women's Hospital, 1A, Osborne Avenue (by invitation of the North-eastern Association of Medical Women's Federation).
7.00 p.m.—R. Theatre. (Tickets will be arranged for the Theatre Royal.)
7.00 for 7.30 p.m.—Aberdeen Graduates' Dinner, Tilley's Restaurant. Ticket 30s.
7.30 p.m.—Welsh Dinner, Royal Turk's Head Hotel. Ticket 25s.

Saturday, July 13

- 9.00 a.m.—Annual Representative Meeting Inquiry Office open.
9.00 a.m.—Council Meeting, Royal Station Hotel.
9.30 a.m.—Ladies' Club open.
10.00 a.m.—Annual Representative Meeting.
10.00 a.m.—Jewish Service, Leazes Park Road Synagogue.
10.30 a.m. to 6.30 p.m.—L. All-day excursion to Alnwick, visiting Alnwick Castle (picnic lunch). (Tea by invitation of the North Northumberland Division at White Swan Hotel.) (For 40.) Inclusive ticket 17s. 6d.
10.30 a.m.—L. Conducted Tour of Laing Art Gallery for special exhibition of local silver, glass, etc.
11.30 a.m.—* Roman Catholic Service, St. Mary's Cathedral, Clayton Street; Reception and Luncheon to follow at the County Hotel.
7.00 for 7.30 p.m.—Edinburgh Graduates' Dinner, Royal Station Hotel. Ticket 25s.
7.45 for 8.30 p.m.—Glasgow Graduates' Dinner, Tilley's Restaurant. Ticket 30s.
8.30 to 11.00 p.m.—L. Evening Reception at Ethel Williams Hall, Longbenton, with display of Scottish and Irish dancing. (Men also invited.) (For 100.)

Sunday, July 14

- 9.30 a.m. to 6.00 p.m.—R. All-day excursion to the Roman Wall. (For 200.) Ticket 30s., inclusive of lunch and tea and transport.
10.00 a.m. to 6.00 p.m.—R. All-day excursion to the Farne Islands. (For 40.) Tea by invitation of the North Northumberland Division. Ticket 32s. 6d., inclusive of lunch and transport.
2.00 to 6.00 p.m.—R. Afternoon excursion to Durham Cathedral and Castle. Tea by invitation of the Durham Division. (For 60.) Ticket 6s.
8.30 to 10.30 p.m.—Concert at the City Hall by the London Mozart Players: conductor, Harry Blech; soloists, Muriel Smith and Campoli (concert sponsored by Abbott Laboratories Ltd.).

Monday, July 15

- 9.00 a.m.—Annual Representative Meeting Inquiry Office open.
 9.00 a.m.—Scientific Exhibition opens in Stephenson Building, King's College.
 9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications opens at the Stephenson Building.
 9.00 a.m.—Reception Bureau for registration opens at the Stephenson Building.
 9.30 a.m.—Ladies' Club open, Medical School, King's College.
 10.00 a.m.—Annual Representative Meeting.
 10.30 a.m. to 1.00 p.m.—L. Visit to Trinity House, Bessie Surtees' House, and Guild Hall. (For 40.) Ticket 2s. 6d.
 11.00 a.m.—L. Visit to Washington Old Hall and Church of the Venerable Bede, Jarrow. (By private car.) Luncheon by invitation of Mrs. Kidd.
 12.30 p.m.—Annual General Meeting at the City Hall.
 p.m.—Council Meeting, Royal Station Hotel. (On conclusion of A.R.M.)
 12.15 to 2.15 p.m.—Colour Television, Gymnasium, King's College.
 2.30 p.m.—L. Visit to Infantile Paralysis House, Osborne Road. (Tea by invitation of Mrs. F. J. W. Miller.)
 3.00 p.m.—Special Session of Sections of Obstetrics and Gynaecology and General Practice: "Obstetrics and General Practice," in Chemistry Building, Lecture Theatre I, King's College.
 3.30 p.m.—L. Garden Party at Blagdon Hall (by kind invitation of Lady Ridley). (For 25.)
 5.00 to 6.00 p.m.—B.M.A. Films, Stephenson Building (Room F13).
 8.15 p.m.—U.* Adjourned Annual General Meeting and President's Address at the City Hall.
 9.30 p.m.—U.* President's Reception, Old Assembly Rooms, Westgate Road.

Tuesday, July 16

- 8.15 a.m.—Annual Breakfast of the Christian Medical Fellowship, Royal Station Hotel.
 9.00 a.m.—Reception Bureau open for registration, Stephenson Building.
 9.00 a.m.—Scientific Exhibition open, Stephenson Building.
 9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open at the Stephenson Building.
 9.30 a.m.—Ladies' Club open, Medical School, King's College.
 9.30 a.m. to 12 noon.—Scientific Sections, Stephenson Building and Chemistry Building.
 10.00 a.m. to 2.00 p.m.—L. Excursion to Works of Thomas Hedley and Co. Ltd., Soap and Detergent Manufacturers. (Lunch by kind invitation of the Directors.) (For 36.)
 10.30 a.m.—L. Exhibition of Durham quilting; and Coffee Party by invitation of Mrs. Munro Black.
 12.15 to 2.15 p.m.—Colour Television, Gymnasium, King's College.
 2.30 p.m.—U.* Robing for Official Religious Service, Cathedral Library (Mosley Street entrance).
 3.00 p.m.—U.* Official Religious Service, St. Nicholas' Cathedral. Address by the Rt. Rev. the Lord Bishop of Durham.
 5.00 to 6.00 p.m.—B.M.A. Films, Stephenson Building (Room F13).
 7.30 p.m.—U. Annual Dinner at the Old Assembly Rooms, Westgate Road. (For 350.) Ticket £2 10s., including cocktails, wines, and liqueurs. (See note on p. 313.)

Wednesday, July 17

- 9.00 a.m.—Reception Bureau open for registration, Stephenson Building.
 9.00 a.m.—Scientific Exhibition open, Stephenson Building.
 9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open at the Stephenson Building.
 9.00 a.m. to 9.45 a.m.—Round-table Conferences, Stephenson Building.
 9.30 a.m.—Ladies' Club open, Medical School, King's College.
 10.00 a.m. to 6 p.m.—L. All-day excursion to I.C.I. Nylon Factory at Wilton Park. (Luncheon and Tea by kind invitation of the Directors of Imperial Chemical Industries Ltd.) (For 60.) Transport ticket 10s. 6d.
 10.00 a.m.—Leinster and Childe Golf Competition, Northumberland Golf Club, Gosforth, Newcastle upon Tyne.

- 10.00 a.m.—Notts Ladies' Challenge Golf Competition, Benton Park Golf Club, Arcot Hall, Cramlington.
 10.00 a.m. to 12 noon.—Scientific Plenary Session—Chemistry Building, Lecture Theatre I, King's College: "The Management of Hypertension."
 10.30 a.m.—L. Conducted Tour of Laing Art Gallery for special exhibits of local silver and glass.
 12.30 to 2.15 p.m.—Colour Television, Gymnasium, King's College.
 2.30 p.m.—Scientific Sections, Stephenson Building.
 2.30 to 3.30 p.m.—President's official tour of Scientific Exhibition, Stephenson Building.
 3.00 p.m.—Overseas Conference, Council Room, King's College. Annual Report of the Secretary of the Overseas Committee, followed by general discussion.
 3.30 p.m.—L. Afternoon Tea and Chamber Music by invitation of Mrs. W. G. A. Swan, 6, Jesmond Park West.
 5.00 p.m.—"At Home" for Overseas Representatives and Delegates, Sutherland Hall, Medical School, King's College (by invitation).
 5.15 to 6.00 p.m.—B.M.A. Films, Stephenson Building (Room F13).
 8.30 p.m. to 12 midnight.—U.* Civic Reception and Ball, Old Assembly Rooms.

Thursday, July 18

- 9.00 a.m.—Reception Bureau open for registration, Stephenson Building.
 9.00 a.m.—Scientific Exhibition open, Stephenson Building.
 9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances, and Medical Publications open at the Stephenson Building.
 9.30 a.m.—Ladies' Club open, Medical School, King's College.
 9.30 a.m. to 12 noon.—Scientific Sections, Stephenson Building.
 10.00 a.m.—Treasurer's Cup Golf Competition, Northumberland Golf Club, Gosforth, Newcastle upon Tyne.
 12.15 to 2.15 p.m.—Colour Television, Gymnasium, King's College.
 1.30 p.m.—L. Small parties to visit gardens in the district, Stocksfield, Corbridge, etc. (By private car.)
 2.00 to 5.30 p.m.—L. Excursion to Hexham, visiting Hexham Abbey. (Tea by invitation of the Hexham Division.) (For 30.) Inclusive ticket 7s. 6d.
 2.30 to 5.00 p.m.—Scientific Plenary Session, Chemistry Building, Lecture Theatre I, King's College: "The Present Status of Prophylactic Immunization."
 4.00 p.m.—L. Tea Party by invitation of Miss Pybus, White Knights, Bellgrove. (For 20.)
 5.00 to 6.00 p.m.—B.M.A. Films, Stephenson Building (Room F13).
 8.00 to 8.15 p.m.—U.* Congregation of University of Durham to award Honorary Degrees, Sutherland Hall, Medical School, King's College.
 8.30 to 10.30 p.m.—U.* University Reception, King's Hall, King's College.

Friday, July 19

- 9.00 a.m.—Reception Bureau open for registration, Stephenson Building.
 9.00 a.m.—Scientific Exhibition open, Stephenson Building.
 9.00 a.m.—Exhibition of Pharmaceutical Products, Instruments, Appliances and Medical Publications open at the Stephenson Building.
 9.30 a.m.—Ladies' Club open, Medical School, King's College.
 9.30 a.m. to 12 noon.—Scientific Plenary Session, Chemistry Building, Lecture Theatre I, King's College: "Care of the Dying."
 12.15 to 1.15 p.m.—Colour Television, Gymnasium, King's College.
 2.30 to 5.00 p.m.—Scientific Sections, Stephenson Building.

HOSPITALITY

A Norwegian doctor's son and nephew aged 13 would like to visit Britain for six weeks from about June 20, the British boys returning to Norway for six weeks and staying partly in the mountains and partly in Oslo. They would like to visit separate families in the same neighbourhood.

Would anyone interested get in touch with Brigadier H. A. Sandiford, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

NEWCASTLE UPON TYNE
METROPOLIS OF THE NORTH-EAST

BY

S. MIDDLEBROOK, M.A.*

Strangers who expect to find Newcastle upon Tyne a typical industrial town are pleasantly surprised, especially if they approach from the south. The city stands on a sloping site which falls abruptly to the river, and the first view of it as it springs suddenly into sight from any of the cluster of high-level crossings which bridge the trough between Newcastle and Gateshead can be quite breath-taking. Below are the ships at the Quayside and a sea of roofs in the Sandhill and the Close, while standing out boldly on the crest of the escarpment are the blackened four-square Norman keep, the fifteenth-century flying spire of the cathedral, the stepped renaissance spire of All Saints Church, the dignified Georgian south front of the Moot Hall, and the austere concrete mass of the County Hall behind. Here, in this jumble of old and new, is the core of the original walled borough, the lower part on the escarpment and riverside, the upper part hidden by the skyline.

Metropolitan Air

The Central Station, perhaps the finest single work of the local architect John Dobson, with its sweeping curves and striking portico, is equally impressive. The main streets to which it gives access have a civic dignity and unity of style which remind one of Bath and Edinburgh. The city also has a metropolitan air, in spite of its comparatively small population of 300,000, for nowadays it is mostly given over to commerce, and has become the chief shopping and entertainment centre not only for the million or so people who live on industrial Tyneside but for the "geordies" and countryfolk in the two adjoining counties. The centre has a fresh, clean look, and there are

*Author of *Newcastle upon Tyne: its Growth and Achievement*, 1950. Kemsley Press.

more trees than one usually finds in a northern town. More open spaces too, notably at Barras Bridge and its environs, from which the tree-lined Great North Road runs across the thousand-odd acres of the Town Moor, where the freemen have enjoyed rights of herbage "time out of mind."

Strategic Site

The importance of Newcastle in history is due to its command of the Tyne crossing, its nearness to the frontier, its easy access to the sea, and its central position in the northern coalfield. The strategic advantages of the site were the chief factor in the earlier stages of its growth, and the

economic in the later. The town began as a frontier post, when the Romans built a bridge where the present swing bridge crosses the Tyne and a fort on the site covered by the present castle. *Pons Aelius*, as the post was called, formed part of the Roman Wall which extended from Wallsend to Bowness - on - Solway. Both bridge and fort fell into ruin in Saxon times but were rebuilt by Robert Curthose, eldest son of William the Conqueror, about 1080. His *novum castellum* or "new castle" gave the town the name it has retained ever since. The mediaeval borough grew up about the bridge and the castle, its heart being the Sandhill close to the bridge-end.

The town walls were not built until the time of the Scottish wars. From 1400, when Newcastle became "a county of itself," with the right (which it still has) to have a sheriff of its own, Newgate became the town gaol, whence condemned criminals

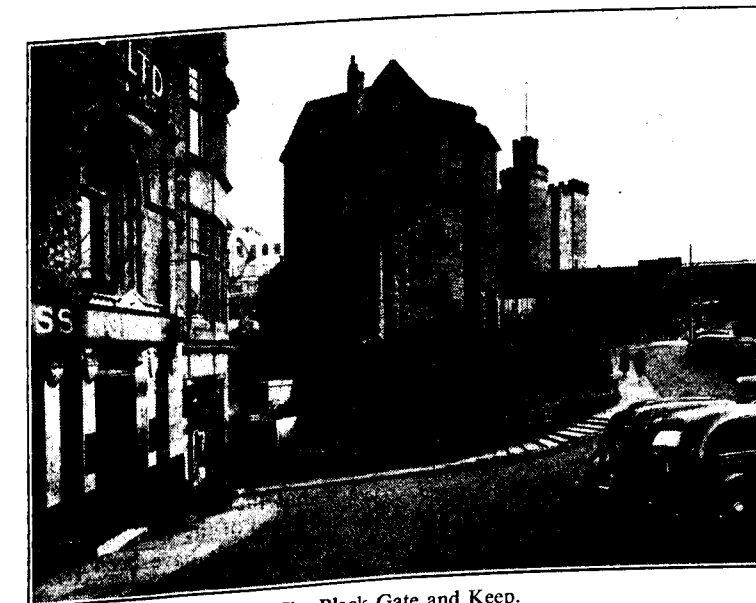
were led in carts along Gallowgate to the scaffold on the Town Moor. Comparatively few historic buildings and monuments have survived from these early centuries, but among those of special interest are the twelfth-century keep, the thirteenth-century Black Gate, and part of the castle wall; the churches of St. John, St. Andrew, and St. Nicholas (a cathedral since 1882); one or two stretches of town wall with a few towers and turrets; and the mutilated remains of the Black Friars.

Growth of Industry

A unique feature of the growth of Newcastle is the long overlap of its military and its industrial history, for, although



The Medical School.



The Black Gate and Keep.

the town continued to play an important role as fortress and supply base till the time of the Jacobite rebellions, the local coalfield was worked as early as the twelfth century, and before the end of the Middle Ages was beginning to supply the London market. The Reformation gave a big impetus to the industry, and in the seventeenth and eighteenth centuries led to the establishment on Tyneside of a variety of coal-using industries. Evidence of the town's increasing prosperity during this period can be seen in Surtees House in the Close; in the Guildhall and Trinity House, both rebuilt in the seventeenth century and much altered or extended since; in the Old Assembly Rooms in Westgate Road (1776); in All Saints Church, rebuilt by David Stephenson in 1796; and the Moot Hall (1810). From 1763 the town began to burst through its mediaeval limits, the town wall and gates which had remained intact till then being for the most part gradually demolished during the next sixty years.

A landmark in the replanning of the town's commercial heart, and part of its battle against disease, was the filling in of the Lort Burt Dene, which for centuries had cut the town in two. By the eighteenth century the dene had become little better than an open sewer, described by one contemporary as "a vast nauseous hollow" and by another as "a place of filth and dirt." Between 1784 and 1789 Dean Street and Mosley Street were constructed on the filled-in lower part of the dene, and between 1834 and 1839 Richard Grainger, a builder, with John Dobson as architect, constructed Grey Street on the levelled upper part. Grey Street, crowned by Grey's Monument, with its stepped skyline, harmoniously designed blocks, and its long falling curve broken by the portico of the Theatre Royal, is the finest street in the city. Grainger and Dobson also co-operated in other works, and the stamp of style these two public-spirited men gave to central Newcastle, though later badly blotched at the shop level, is clearly evident to-day.

Many public parks have been opened, and, more significantly still, in the present century the Corporation has made a serious attack on the housing problem, though slum areas remain. At the same time the increasing industrial integration of Tyne, Wear, and Tees is already opening a new chapter in the history of the city by transforming the former capital of Tyneside into the metropolis of the whole North-East coast region.

Public Health

One of many consequences of the economic revolution which began on Tyneside in Tudor and Stuart times was that it compelled the Newcastle Common Council to tackle the problem of public health from a relatively early date. The congestion of population in the maze of "narrow, dark stinking alleys" which filled the lower part of the town became steadily worse, until in the eighteenth century it was probably denser than in any other borough in the kingdom outside London. As in other towns, dirt, tainted water, lack of sewers, uncleared dunghills and overcrowding brought recurrent epidemics of smallpox, and later of cholera, while typhus took a heavy annual toll in "the fever districts," as the townsfolk fatalistically called the

poorer quarters. Even as late as 1873 the death rate was higher than that of any other provincial English town except Manchester and Liverpool.

Progress was at first tragically slow. Repeated outbreaks of pestilence in the later years of Elizabeth's reign led to the appointment of "a town physician," a post which was maintained till 1701. The first small reservoirs were constructed at the end of the seventeenth century, but complaint of "the want of water" persisted for another 170 years. It is, however, only since 1873, when the first medical officer of health was appointed, that a really radical improvement in public health has been achieved, in spite of a fourfold increase in population during the last hundred years. Water supplies are now drawn from as far afield as the Cheviots.

Hospitals

Hospitals (almshouses) of the mediaeval type continued to be founded until the early nineteenth century—for example, the Holy Jesus Hospital (1682) and the Keelmen's Hospital (1701), both of which have survived—but it was not until midway through the eighteenth century that the first hospitals of modern type were opened. Several of the best-known medical institutions in modern Newcastle date from this time. The Infirmary (now the Royal Victoria Infirmary) was founded in 1751, the third oldest in the north of England; the Princess Mary Maternity Hospital, a combination of a lying-in hospital and a lying-in charity, in 1760-1; St. Nicholas Hospital, originally a "madhouse" in Bath Lane for pauper lunatics, in 1767; the Dispensary where vaccination

was introduced for the first time in 1801, after an unusually severe outbreak of smallpox, in 1777; and the hospital for infectious diseases now at Walkergate, as the direct successor of a typhus hospital in Bath Lane, in 1804. It should also be noted that it was a first terrifying "visitation" of cholera in 1831-2 that led to the foundation of the School of Medicine and Surgery now incorporated in the King's College division of the University of Durham. Most of the earlier buildings occupied by these various institutions have gone—the old infirmary and the old lunatic asylum only in the last few years—but the former typhus hospital can still be seen in the courtyard of the Rutherford College of Technology.

Other hospitals have been established more recently, including Hunter's Moor, the Dental School and Hospital, and the important and extremely well-equipped Newcastle General Hospital in Westgate Road, which has developed from the former workhouse infirmary.

The clinical school of the Medical School, King's College, consists of the Royal Victoria Infirmary with 680 beds and an annual out-patient attendance of nearly 400,000, the Princess Mary Maternity Hospital with 106 beds and an annual attendance of over 16,000 cases, and the Babies' Hospital (24 cots and 11 mothers' beds). Students also have admission to the Newcastle General Hospital (838 beds) and the hospitals for mental and infectious diseases.

The illustrations of the Medical School and the Black Gate and Keep are by courtesy of Messrs. Andrew Reid and Co. Ltd., and that of Grey Street by courtesy of Messrs. Philipson and Son Ltd., both of Newcastle upon Tyne.



Grey Street about 1914.

GENERAL MEDICAL COUNCIL

194TH SESSION

The General Medical Council held its 194th session in London on May 28. The President, Sir DAVID CAMPBELL, presided.

PRESIDENT'S ADDRESS

The proceedings opened with an address by the PRESIDENT. Sir David Campbell began by referring to the report of the curriculum committee,* which the Council would be considering that afternoon. If adopted, its recommendations would supersede those adopted in 1947.

The President said that the memorandum issued by the Minister of Health and the Secretary of State for Scotland on a provisional scheme for registration of medical auxiliaries appeared to cover the points raised by the Council in its observations on earlier proposals made by the Department, and therefore the executive committee had not thought it necessary to make any further comment.

Relations with Commonwealth

The remainder of the President's address dealt with the relations of Great Britain to the other countries from the Commonwealth in the sphere of medical education and registration.

In member countries of the British Commonwealth, said Sir David, a number of bodies had been constituted on the lines of the General Medical Council. One of the most important in the past quarter of a century had been the Medical Council of India, which was established by the Indian Medical Council Act, 1933. On December 30, 1956, this Act was repealed and a new Act took its place. The Indian Medical Council Act of 1956 followed the same general lines as the original Act, but a number of new powers were conferred on the council. Perhaps the most important of these was the power to keep a register of medical practitioners, which would contain the names of all persons who for the time being were enrolled on any State medical register and who possessed any of the recognized medical qualifications indicated in the Act. By a new provision the Medical Council of India had power to prescribe standards of postgraduate medical education for the guidance of Indian universities, and to advise universities in the matter of securing uniform standards for such education.

South Africa

The President reported that in March he and Dr. E. R. Boland had visited the medical school of Makerere College, Uganda, in response to a request from the principal of the College. The College had previously been inspected by Council visitors in 1951. "We found," said Sir David, "that the deficiencies pointed out by the former visitors in staff, teaching facilities, and accommodation, as well as the lack of status of the qualifications in the Territories and the lack of status of the diplomates, had nearly all been remedied. We were impressed by the spirit and atmosphere of the school as a whole, and we reported to the executive committee that the qualification granted by the College was worthy of recognition for the purposes of provision and full registration in the United Kingdom." The executive committee had accepted that recommendation.

From East Africa the President proceeded to Capetown on what he described as a "good-will mission" to visit as its guest the South African Medical and Dental Council. He went on to Durban, where he spent some time in the new medical school of the University of Natal, and then on to visit the South African Institute for Medical Research in Johannesburg and the University of Pretoria. The President told the Council that he was impressed by the medical school of the University of Natal, which was founded to give a medical education to students of non-European stock, and by "the energy, ability, and enthusiasm of the full-time teaching staff, who were doing their utmost to make the school a success. When the South African Medical and Dental Council invite us to recognize the degrees granted by that medical school, I would have no hesitation in advising the executive committee to accede to that request."

Singapore and Hong Kong

From South Africa the President travelled to Singapore and Hong Kong. It would be impossible, he said, in a brief address to give an account of the major developments that had taken place in the Faculty of Medicine of the University of Malaya since it was reopened in 1946 after the Japanese occupation. New departments had been provided for anatomy, parasitology, surgery, and orthopaedic surgery; an urban health centre was nearing completion which would house the department of social medicine and public health; and a new department of pathology was in process of construction. A number of new chairs had been founded. A fine children's hospital and new maternity hospital had been built, and a new residential college to accommodate 300 medical students had been opened. The University of Malaya had instituted a diploma in public health, and also provided postgraduate courses for those intending to specialize in surgery. It had a scheme to train specialists in midwifery and gynaecology, but although the new maternity hospital had 300 beds and an adequate staff the Royal College of Obstetricians and Gynaecologists had not thought fit to consider any of the posts in the hospital as suitable for this purpose, a decision causing great disappointment in the University.

Sir David Campbell said that the courses of instruction in the Hong Kong University Faculty of Medicine continued to fulfil the requirements of the General Medical Council, but there were gaps to be filled and defects to be remedied, although improvements had been made. There was a fine new maternity hospital, and a new department of pathology was being constructed, but there was urgent need for better provision for teaching biochemistry, pharmacology, and paediatrics, for a new out-patient department, and for increased staff generally. If the establishment laid down for each department was at full strength, the staff would be adequate, but the financial arrangements made by the Government based on an annual budget made this almost impossible. The greatest need, therefore, was for increased financial provision based on a quinquennial or at least a triennial budget.

The President concluded by saying that in some of the countries he visited there was a striking gap between men holding senior medical posts and the junior staff. It was imperative, if the medical service in these countries was to develop on modern lines, that the gap should be filled by doctors trained locally as specialists in medicine, surgery, and midwifery, yet willing to submit themselves to any standard of examination demanded in this country. They were desperately anxious to do so. Sir David said it would be a good thing for this country and for the Commonwealth if bodies which granted higher qualifications were to follow the example of the General Medical Council and approve the medical schools of the Commonwealth countries with whom reciprocity was held as places where the candidates for their examinations could be trained.

CURRICULUM COMMITTEE REPORT: REVISION OF RECOMMENDATIONS AS TO THE MEDICAL CURRICULUM

In May, 1955, the General Medical Council established a curriculum committee for the purpose of considering the revision of the recommendations on the medical curriculum adopted by the Council in February, 1947. The PRESIDENT, Sir David Campbell, as chairman of the Curriculum Committee, introduced its draft recommendations to the Council at the afternoon session on May 28. These were adopted by the Council and we print them in full at page 327 of this Supplement. Below we report the Council's debate on the committee's draft document.

*A leading article on the committee's recommendations, which were adopted by the Council, appears at p. 1351 of the Journal.

General and Pre-Medical Education

Commenting on the first part, Professor H. R. DEAN said it was striking that it took schools two years to teach the required standard in physics, chemistry, and biology, whereas boys who took the preliminary examinations at medical schools very often got through them in a year. That was unfortunate in the sense that it lengthened the medical curriculum and cut short the period of general education.

The PRESIDENT agreed with Professor Dean, but pointed out that it was necessary to face up to the situation as it existed at the present time.

The recommendations on general and pre-medical education were approved.

Professional Education

Dealing with the second part—professional education—Professor J. H. F. BROTHERSTON congratulated the Curriculum Committee on a very thoughtful document, and welcomed its form as “an enabling statute which gives freedom to experiment.” At the same time, he wondered whether it was still necessary to specify a period of not less than two months for residential clinical instruction in midwifery. He accordingly suggested that the words “not less than two months” be deleted and the words “sufficient time” substituted. The specification of the exact period of time was out of keeping with the general spirit of the document. He noted with some regret the disappearance of a specific mention of therapeutics in association with pharmacology. Therapeutics should be brought into the curriculum as playing an important part in the education of students.

Dr. J. G. MCCRIE associated himself with Professor Brotherston's welcome of the document, and also with his doubt whether the specification of “not less than two months” was necessary. He would have suggested replacing it by the words “a part of the time devoted to . . .” At the same time he suggested that there was no need even to specify a period of not less than 15 months in the aggregate for clinical clerkships in medicine, surgery, and paediatrics.

Mr. V. J. F. LACK said that obstetric departments had always found it difficult to persuade universities or hospitals to house their students for the necessary two months. “We have fought for a long time to get a decent period of residence so that obstetrics students can see the work of the obstetrics department which takes place largely at night,” he said. If a loophole were made and obstetrics students were not housed, in his view their obstetric education would be in danger.

Professor H. R. DEAN said he approved the recommendation that instruction in pathology and bacteriology should be given in association with clinical studies, because medicine and pathology were, after all, really one subject. But he pointed out the great danger which would ensue if close correlation between anatomy, physiology, and pathology were not secured. At Cambridge there was a course in pathology and bacteriology which, although not compulsory, was taken by almost every medical student before taking the examination in anatomy and physiology. Close correlation was of great advantage to the student. It was not until many students were asked to see the changes in a diseased kidney or lung that they suddenly realized they did not know what a normal organ looked like. He also emphasized the great importance of having an elementary knowledge of general pathology and bacteriology, because it was necessary for an understanding of preventive medicine.

Professor P. J. MOIR expressed disappointment that no consideration had been given to the pre-registration year. The way in which that year might be used could have a considerable influence in undergraduate teaching. In the University of Leeds it was felt that it eliminated the need for long clerkships in medicine and surgery. It must be the responsibility of the licensing body to see that the pre-registration year was really fulfilling the function it was supposed to do. Courses could be so arranged that less influence would be given to certain of the more practical parts, and the time

would be used in the teaching of more fundamental matters. Dr. G. A. CLARK said he was glad to hear the suggestion that the pre-registration year should be the responsibility of the medical schools. So many people recently had endeavoured to thrust the responsibility on the Ministry of Health. It could be correlated with undergraduate teaching, but in his view the writ of the General Medical Council did not run to the pre-registration year. It was not the Council's responsibility.

Professor T. N. A. JEFFCOATE said that he, together with other members of the Curriculum Committee, had been opposed to mentioning any specific periods of time to be spent on subjects if it could be avoided, but many members of the Committee felt that one of the important features in training was the old system of apprenticeship. He had a certain sympathy with those who suggested that the specific period of not less than two months, so far as midwifery was concerned, should be dropped. At the same time, it had to be recognized that when an individual was qualified he was entitled to practise midwifery, and there was a duty to the public to see that practitioners were safe in the obstetrics art. Obstetric teaching had been reduced to simple proportions, but most people who had anything to do with obstetrics would agree that it was impossible to teach even the simple matters of safety unless the student was resident for a reasonable period of time. He submitted that it would be dangerous if no minimum period were stipulated in that respect.

Dr. J. G. MCCRIE said that a number of people with whom he had discussed the problem seemed to be satisfied that a shorter period than two months would suffice in which to learn a sufficient amount of midwifery, and the University of Sheffield had had in mind the introduction of a shorter period than two months. Mr. R. A. STONEY expressed the view that it was useless to take a student as a resident in a hospital for a period of less than two months. Professor J. H. F. BROTHERSTON moved the deletion of the words “not less than two months” and the substitution of the words “sufficient time.” Professor D. J. A. KERR seconded the amendment.

Sir HAROLD BOLDERO said that he was one of the members of the Committee who desired the removal of the set periods, but in his view it should be a two-stage process. The number of cases required had been removed, and he suggested that the wise course would be to wait for some years until the freedom had been shown to be quite safe before deleting the words “not less than two months.” Some bodies might interpret “sufficient time” as no residence at all. He was opposed to the amendment. The amendment was defeated.

The PRESIDENT referred to Professor Brotherston's point on therapeutics, and said he was in sympathy with it, but under the heading pharmacology it was stated that instruction should be given in the mode of action of drugs, their distribution and fate in the body, their possible toxic effects, and their therapeutic uses. Therefore it would appear to be adequately covered. In reply to the point raised by Professor Dean, there was nothing to prevent a school teaching the elements of pathology and bacteriology along with or before anatomy and physiology. So far as the pre-registration period was concerned, that was not the business of the Council. It was a matter for the licensing bodies.

The recommendations on professional education were approved.

Professional Examinations

Dr. J. G. MCCRIE drew members' attention to the recommendation that “no part of the final or qualifying examination should be taken before the end of four academic years, and the examination should not be completed before the end of five academic years of professional education.” While, he said, the recommendation would be appreciated in so far as it was designed to prevent a completely piecemeal approach, there was a body of opinion which was worried about the effect on the student of the terrible obstacle of one examination at the end of the fifth or sixth year. It

had been suggested by his own university (Sheffield) among others that there might be three sessional examinations, one at the end of the fourth year, one at the end of the fifth year, and one at the end of the sixth year. The earliest would consist largely of pathology, bacteriology, and pharmacology, but it was felt that even that might contain something called “clinical science.” The marks would be taken into account when the student came up for the final. Similarly, at the end of the fifth year a similar procedure would be adopted. In his view the Council could reasonably leave the question to the Licensing Bodies themselves as one of the experiments which they might carry out.

Professor A. P. THOMSON pointed out that the recommendation to which Dr. McCrie objected referred to the final or qualifying examination in medicine, surgery, and midwifery and gynaecology. He was perfectly free to do exactly as he suggested. The PRESIDENT agreed, and added that pathology was a branch of medicine but was not a part necessarily of the final examination. Dr. MCCRIE said he was glad to have that reassurance.

The recommendations on professional examinations were approved.

On the motion of the PRESIDENT the draft recommendations on the Medical Curriculum were adopted by the Council.

MEDICAL DISCIPLINARY COMMITTEE

The Medical Disciplinary Committee of the General Medical Council met on May 29, with the President, Sir DAVID CAMPBELL, in the chair.

Applications for Restoration

There were two applications for restoration to the Register. The Committee acceded to the application of CHARLES KINGSLEY COLWILL, and directed that his name be restored, but rejected the application of WILLIAM ARTHUR NASON.

Cases Adjourned for Judgment

In the case of WILLIAM FRANK CRUICKSHANK, registered as of Broxy Cottage, Westmuir, Brechin, Angus, M.B., U. Glasgow, 1936, who had had judgment postponed in U. Glasgow, 1936, May, 1955, May, 1956, and July, 1956, following a conviction for being drunk and disorderly, findings of failing without reasonable cause to attend his surgery and disregarding his duties as a medical practitioner under the National Health Service over a considerable period, and (in respect of the postponement in July, 1956) of a charge in January, 1956, of driving a motor-car when under the influence of drink. The Committee postponed judgment until May, 1958.

JOHN MILLAR MATTHEW, registered as of 176, Farley Road, Selsdon, Surrey, M.R.C.S. Eng., 1931, M.B., U. Camb., 1932, appeared for postponed judgment. Last May he had been found to have been convicted, in 1948 and 1954, of two series of charges concerning dangerous drugs, and, in February, 1956, of driving a motor-car when under the influence of drink or drugs. The Registrar was not directed to erase Dr. Matthew's name from the Register, and this closed the case.

JAMES WATSON RICHMOND, registered as of Rosskeen, Kelt, Fife, M.B., U. Glas., 1929, made an interim appearance, judgment having been postponed for two years in May, 1956, following convictions in that year of assault and conducting himself in a disorderly manner and committing a breach of the peace. Three testimonials were presented. The PRESIDENT announced that the Committee noted with satisfaction the letters and would await Dr. Richmond's further appearance before them at their meeting in May, 1958.

Adultery Arising out of Professional Relationship

KENNETH LEOPOLD GEORGE NOBBS, G.M., registered as of 3, Cotman Gardens, Edgware, Middlesex, M.B., U. Lond.,

1936, M.R.C.P.Ed. 1950, was charged that, being registered under the Medical Acts, he, in or about March, 1954, entered into professional relationship with Mrs. Joan Phyllis Drágmár Hills; that on August 27, 1956, he committed adultery with her, and that he was found guilty of adultery with her by decree of the Divorce Court, and that in relation to the facts alleged he was guilty of infamous conduct in a professional respect. Dr. Nobbs was represented by Mr. N. L. Taylor, of Messrs. Hempsons, solicitors to the Medical Defence Union.

Mr. Widgery said that the charge arose out of Dr. Nobbs's adultery with Mrs. Hills, who was one of his patients. Mr. Hills brought divorce proceedings on the grounds of his wife's adultery and obtained a decree which was made absolute on January 29. Mr. Hills was a police constable. He married in 1951. In June, 1953, he and his wife went to live at 41, Gainsborough Gardens, Edgware. In March the following year they became patients of Dr. Nobbs, but did not transfer to his National Health Service list until February, 1955. In a letter to the Council Dr. Nobbs said that Mrs. Hills transferred off his list on August 23, 1956, so it might well be that the executive council did not receive notification from the new doctor until September 3. Since March, 1954, Dr. Nobbs had treated Mr. and Mrs. Hills on a number of occasions. Mr. and Mrs. Hills became friendly with Dr. Nobbs. They met him socially. Throughout this time Dr. Nobbs was separated from his wife.

In August, 1956, Mrs. Hills told her husband that she wanted to take a position as receptionist to Dr. Nobbs. Mr. Hills raised no objection. It was because of this, she told her husband, she wanted to transfer from Dr. Nobbs's list, and her name was in fact transferred on September 3, although she made application on August 23. Mr. Hills filed a petition on September 15, 1956, on the grounds that his wife committed adultery with Dr. Nobbs, in particular on August 27. The case was undefended. Mr. Widgery produced the confession statement made by the doctor and Mrs. Hills.

In a letter to the Registrar, Dr. Nobbs said that Mrs. Hills was transferred off his list on August 24, 1956. He admitted that he was found guilty, but he now sought to say the first time adultery was committed was on January 18, 1957. Mr. Widgery submitted that it was not open to Dr. Nobbs to argue before the Committee that he did not commit adultery on August 27. The Medical Act, Section 33 (2), stated that a finding of fact by a court in matrimonial proceedings should be conclusive evidence of the fact found, and the Divorce Court found that Dr. Nobbs had committed adultery on August 27.

Mr. James P. F. Hills, the husband of Mrs. Hills, gave confirmatory evidence of the social relationship which developed between him and his wife and Dr. Nobbs. He did not object to his wife becoming Dr. Nobbs's receptionist in August, 1956. On the night of August 26-27, his wife told him she was in love with Dr. Nobbs and in spite of his persuasions she went off with Dr. Nobbs. Subsequently he heard that his wife was ill with phlebitis and Dr. Nobbs told him he was looking after her.

Dr. Nobbs, giving evidence, was asked by Mr. Leigh Taylor: “It is alleged that you committed adultery with Mrs. Joan Hills. That is correct, is it not?” Dr. Nobbs replied: “In the long run, yes.” He told how he was awarded the George Medal in the Air Force and how he became medical specialist to the Far East Air Force. He was invalided out in 1953. It could be said that his marriage became a war casualty. There came a time early in July, 1956, when he realized that he was in love with Mrs. Hills, and it did not take long to realize that she reciprocated. He applied for jobs overseas, but none of these came off. Asked about the transfer of Mrs. Hills from his list Dr. Nobbs said that the reason was not that she was to become his receptionist; it was in fact that he thought she should no longer be on his list.

In further examination Dr. Nobbs was asked to what extent he personally gave treatment to Mrs. Hills when she had phlebitis, and he replied that it was purely first-aid, when he was on the spot.

In cross-examination Dr. Nobbs denied committing adultery before August 26-27. In regard to Mrs. Hills's transfer from his list, Dr. Nobbs said: "It was not that we had any intention of adultery. Our whole idea was to prevent any such occurrence. It was purely that I was not treating her properly. I could not treat her objectively."

Mrs. Nobbs, the wife of Dr. Nobbs, who had asked that she might give evidence on his behalf, told the Committee that her husband was very lonely when he lived at the Edgware house and he was unable to get full employment. Every morning he read from his bible. The fault was entirely hers for living at Tring.

Mr. Leigh Taylor read a number of testimonials to Dr. Nobbs's character, submitting that these made it plain that he was the best type of medical man, and was not the sort of person that one could lightly cast out from any society. That which occurred arose in no way out of the professional relationship but out of a social relationship which was, the evidence showed, unusually close in this case. That was admitted by Mr. Hills, said Mr. Taylor. He submitted that in the nature of things friendship sometimes would go too far. If that happened between a doctor and his patient the doctor would have sinned, but what was the professional sin in those circumstances? There was not one jot of evidence that Dr. Nobbs had ever at any time at all abused the professional relationship in its narrower sense, that was to say on the occasion on which he had treated Mrs. Hills, or that he used his position as a doctor to make any advances to Mrs. Hills or influence her in any way. Mr. Taylor asked the committee to consider whether this was not a case of a man with great potentialities for good within the profession who could be permitted to live down what had occurred.

Mr. Widgey said that the best that could be said was that there might have been a gap of four days when Mrs. Hills was technically not Dr. Nobbs's patient, at any rate for the purpose of the Health Service regulations, before the proved adultery took place. He submitted that this could not be any answer to a charge of this nature.

The PRESIDENT announced that the Committee had determined that the facts alleged against Dr. Nobbs had been proved to their satisfaction. The Committee found him guilty of infamous conduct in a professional respect in relation to these facts and directed the Registrar to erase his name from the Register. Dr. Nobbs had 28 days in which to appeal to the Privy Council.

Allegations of Canvassing

The Committee considered the case of NANCY WINIFRED HOLLOWAY, registered as of Curridge, Newbury, Berks, against whom it was charged that at various times between October, 1954, and March, 1956, she had canvassed for patients. In three of the six charges, Mr. Leigh Taylor, of Messrs. Hempsons, solicitors, who appeared for the complainant, Dr. J. A. Richards, of the same district, did not offer any evidence. Dr. Holloway, who was represented by Mr. E. B. McLellan, instructed by Messrs. Le Brasseur and Oakley, solicitors to the Medical Protection Society, denied the charges.

Evidence in the first charge was given by Mrs. Joyce Strong, who said that soon after she, her husband, and two children had moved to their present address in Hempstead Norris, Berks., Dr. Holloway had called, saying she had known a Mrs. Strong, also with two children, and had wondered if it was the same family. Dr. Holloway had then asked if she was registered and whether the baby had been immunized. Mrs. Strong replied that she was registered with Dr. Richards, who was dealing with the immunization.

Questioned by Mr. McLellan, Mrs. Strong said that Dr. Holloway had known immediately that Mrs. Strong was not her former friend, and that thereafter the two women had talked of the children and the question about immunization had cropped up in the course of that friendly conversation.

Mrs. Violet Alice Burgess, of Orr, Berkshire, said that soon after moving from two cottages at Orr Common with her husband and nine children Dr. Holloway had called

and had at once said that she thought Mrs. Burgess was again pregnant. She had asked, "How many kids have you got?" Mrs. Burgess replied that she had not got any "kids" but that the children about the house were hers. Dr. Holloway had then left.

Mrs. Burgess agreed with Mr. McLellan that she was annoyed both by the reference to a pregnancy and to the use of the word "kids." Dr. Holloway had identified herself as soon as she arrived but had not at any stage suggested that Mrs. Burgess should become her patient. The call had been made only five or six days after the Burgess family had moved into the house.

Evidence was given by Mrs. Helen Bennett Grossert that Dr. Holloway had called on her about a fortnight after she had gone to her present address and had said, "I would like to see your cards." Mrs. Grossert introduced her husband, who was asked by Dr. Holloway to sign them. She had then taken them away with her. Dr. Holloway informed them that she had been the doctor to the previous occupiers. A fortnight before Christmas, 1956, Dr. Holloway had telephoned to say that she was bringing a document for Mrs. Grossert to sign, to the effect that her previous statement of complaint was wrong. Mrs. Grossert had not signed.

She denied the suggestion that as a result of the recent loss of a child in tragic circumstances she and her husband had "medical matters" very much on their minds, and that as soon as Dr. Holloway had announced herself they had said "they might as well get fixed up" with her. She admitted that, as newcomers to the district, they would have wished to have registered with a doctor. The Grossert family were still registered with Dr. Holloway.

Denying all the charges, Dr. Holloway told the Committee that she had been registered since 1923 and had practised for 34 years. During the past 15 years she had practised in and around Newbury and had never previously had complaints made against her. It had been the identity of name and size of family that had led her "out of curiosity" to pay a visit, but as soon as she had seen Mrs. Strong she had realized she was not the Mrs. Strong she had known. It was quite possible that, as a matter of habit, she had said something about immunization, but after a short conversation she had withdrawn.

She had called on Mrs. Burgess in an effort to help some people who were trying to buy "some rotten old cottages on Orr Common" which she knew the Burgesses had previously occupied. She emphatically denied having said anything about pregnancy to Mrs. Burgess. She had remarked that the bungalow must be very crowded when she had asked Mrs. Burgess how many "kids have you got," and being told there was nine. She already knew that the Burgesses were registered with Dr. Richards, but had neither suggested nor intended to suggest that they should change to her.

She had been paying a visit near to the Grosserts and had called to say good-bye to the former occupiers of the house, not knowing they had already left. Immediately on seeing her, Mrs. Grossert had said, "Oh, you're the doctor—we might as well get fixed up," and on returning with the cards had told Dr. Holloway about the drowning of her child. The telephone conversation was the consequence of Dr. Holloway having heard that the Grosserts had said she had annoyed them. She had naturally wanted to know if they still wished to be registered with her. She had never canvassed any of the witnesses or anyone else. She had a substantial practice "all she could cope with," and proposed to retire in about a year, at the end of the ten-year qualifying period for pension under the N.H.S.

After consideration *in camera* the PRESIDENT announced that the Committee found Dr. Holloway not guilty of the charges laid against her.

Names Not Erased

In the following cases of postponed judgment the Committee decided not to direct the Registrar to erase the names from the Register:

ANDREW FRANCIS AMERHERST GALLIEN, registered as of 20, Orchard Drive, Giffnock. Postponed from June, 1956,

following convictions at the Glasgow Sheriff Court in 1954 and 1956 of driving under the influence of drink or drugs. ROBERT LINDSAY, registered as of 8, St. Ninian Drive, Inverness. Postponed from May, 1955, and June, 1956, following convictions at Inverness and Sheffield of breach of the peace, resisting arrest, and being found drunk. JAMES MCKENZIE, registered as of 255, Rochdale Road, Middleton, Manchester. Postponed from May, 1955, following convictions at Middleton Magistrates' Court and at Manchester Assizes of unlawfully procuring drugs. ROBERT PHILIP STRANG, registered as c/o Messrs. Hempsons, 33, Henrietta Street, London, W.C.2. Postponed from May, 1955, following conviction at the Central Criminal Court of causing grievous bodily harm by shooting.

Judgment Postponed

Judgment was further postponed, to November, 1957, in the case of JOSEPH JOHN MCMENEMY, registered as of Burnside, Bargeddie, Glasgow, convicted in 1954 and 1955 at Airdrie and York of driving and of being in charge of a motor vehicle while under the influence of drink. It was stated that Dr. McMenemy's present whereabouts were not known. He was last known to be working in a hospital overseas.

Judgment was further postponed, to May, 1958, in the case of PATRICK FRANCIS MACDONALD, registered as c/o A. MacDonald, solicitor, Main Street, Granard, Co. Longford, convicted in 1950, 1952, and 1956 at Heywood, Manchester, and St. Helens Magistrates' Courts of being drunk and incapable, of disorderly behaviour in a highway while drunk, and of being in charge of a motor-car when under the influence of drink.

GENERAL MEDICAL COUNCIL RECOMMENDATIONS AS TO THE MEDICAL CURRICULUM

I. RECOMMENDATIONS AS TO GENERAL AND PRE-MEDICAL EDUCATION

The following examinations should be passed by every student before admission to the course of professional education:

(1) A recognized preliminary examination in general education.

The minimum standard of general education required of an applicant should be that attested by the possession of a certificate bearing evidence that he has passed a matriculation or entrance examination of a university of Great Britain and Northern Ireland, or of the Republic of Ireland, or other examination recognized by such a university, or by a medical corporation, as equivalent thereto.

(2) An examination or examinations in the following subjects conducted or recognized by the licensing body concerned: (a) Physics (theoretical and practical). (b) Chemistry (theoretical and practical). (c) Biology (theoretical and practical).

Note.—Applicants may offer themselves for examination in biology either before or after admission to the course of professional education.

II. RECOMMENDATIONS AS TO PROFESSIONAL EDUCATION

The period of professional study should be a period of not less than five academic years and should include instruction in the subjects specified below.

It is desirable that interdepartmental teaching should be encouraged throughout the whole period of professional study.

The memorizing and reproduction of factual data should not be allowed to interfere with the primary need for fostering the critical study of principles and the development of independent thought.

SUBJECTS

1. *Human Anatomy, Physiology, and Biochemistry.*—Instruction in human anatomy, physiology, and biochemistry should include instruction in histology and embryology.

Notes.—(1) It is desirable to emphasize the interrelation of structure and function, to provide adequate experience of dissection of the human body, and to demonstrate the anatomy of the living body. (2) Every effort should be made to secure close correlation in the teaching of anatomy, physiology, and biochemistry, and to stress wherever opportune the importance of these subjects in their clinical application. (3) Instruction should be given in the elements of normal psychology. (4) In order to ensure that students are fit to continue the work which they have undertaken, there should be an adequate test or examination in normal structure and function not more than two academic years after the student has entered on the period of professional education.

2. *Medicine (including Child Health and Paediatrics, Social and Preventive Medicine, and Psychological Medicine) and Surgery.*—Instruction in medicine and surgery should include: (a) Systematic instruction in the principles and practice of medicine and surgery, especially in relation to the prevention, diagnosis, and treatment of disease and to the maintenance of the highest standards of health. (b) Clinical clerkships in medicine, surgery, and paediatrics for a period of not less than 15 months in the aggregate.

Notes.—(1) It is desirable that for a part of the time of clinical clerkship the student should reside in hospital or conveniently near by. (2) It is desirable that the student should be given opportunities to learn something of the work of the general practitioner. (3) During his study of all clinical subjects the attention of the student should be continuously directed by his teachers to the importance of the interrelation of the physical, psychological, and social aspects of disease. (4) Though instruction in the various specialties in medicine and surgery should be directed in the main to the attainment of sufficient knowledge to ensure familiarity with common conditions, their recognition and treatment, the value of utilizing a specialty to demonstrate general principles should be borne in mind. (5) Instruction should be given in the principles of preventive medicine, and on the influence of heredity and environment in its widest sense on health and disease. Where appropriate the various agencies established by local authorities as part of the public health and social welfare services should be utilized for this purpose. (6) Instruction in psychological medicine should be carried out mainly in a psychiatric department, where neuroses and psychoneuroses can be studied, and should include demonstrations at a mental hospital and at a mental deficiency institution.

3. *Midwifery and Gynaecology.*—Instruction should include: (a) Systematic instruction in the principles and practice of midwifery and gynaecology. (b) Clinical instruction in midwifery and gynaecology, and attendance on the practice of a maternity hospital or of the maternity wards of a general hospital, and on in-patient and out-patient gynaecological practice. (c) Not less than two months of the time devoted to clinical instruction in midwifery should be spent by the student in residence either in a maternity hospital, or in a hostel attached to a maternity hospital or the maternity wards of a general hospital, during which period the student should personally conduct an adequate number of cases of labour.

Note.—Instruction should emphasize antenatal and postnatal care, the management of normal labour and of its minor complications, the impact of pregnancy on general disease and of general disease on pregnancy, and the care of the newborn infant. The management of major abnormalities of labour should be taught in principle rather than in detail.

4. *Pathology and Bacteriology.*—Instruction in pathology and bacteriology should be given in association with clinical studies. In addition to the systematic study of pathology and bacteriology, and to a short period as assistant in the conduct of autopsies, the student should be given ample opportunity to attend clinico-pathological conferences.

5. *Pharmacology*.—Instruction, which should include practical laboratory work, should be given in the mode of action of drugs, their distribution and fate in the body, their possible toxic effects, and their therapeutic uses.

Note.—It is desirable that students should be acquainted with the principles governing the design and interpretation of clinical trials.

6. *Legal and Ethical Obligations of Registered Medical Practitioners, and Forensic Medicine*.—Instruction should be given in the statutory obligations of registered medical practitioners, in the principles of medical ethics, and in forensic medicine.

III. RECOMMENDATIONS AS TO PROFESSIONAL EXAMINATIONS

A. General Conduct of Examinations

1. Candidates in all their examination work should be carefully supervised.
2. The examination in each subject should include written, oral, and (where appropriate) practical and clinical tests.
3. The written answers of each candidate should be marked by at least two examiners.
4. In all oral and clinical examinations at least two examiners should take part in the examination of each candidate, and the marks should be a joint adjudication.
5. Examiners should be empowered to take into account the duly attested records of the candidate throughout his course of study.

B. Appointment of, and Circulation of Information to, Examiners

6. It is desirable that examiners should serve for at least three consecutive years.
7. Every examiner should upon his appointment receive from the body or board by whom he is appointed a copy of these recommendations, and every examiner in medicine, surgery, or midwifery and gynaecology should upon his appointment receive a copy of the latest general report of the inspector in the relevant subject.

C. Scope of Examinations

8. Candidates should be examined in anatomy, physiology, biochemistry, medicine, surgery, midwifery and gynaecology, pathology, bacteriology, and pharmacology.
9. Examinations in the subjects included under Medicine in the recommendations, and in the various specialties in Medicine and Surgery, may be separate examinations, or may form part of the examinations in medicine and surgery.
10. The final or qualifying examination should be in medicine, surgery, and midwifery and gynaecology.

D. Final or Qualifying Examination in Medicine, Surgery, and Midwifery and Gynaecology

(i) Admission to Examination

11. No part of the final or qualifying examination should be taken before the end of four academic years, and the examination should not be completed before the end of five academic years of professional education.

(ii) Conduct of Examination

12. All clinical examinations should be held in properly equipped hospitals or examination halls. There should be provided for all clinical examinations a sufficient number and variety of patients.
13. In the clinical examinations an uninterrupted period of at least one hour in medicine, and at least half an hour in surgery, should be allowed to the candidate for the examination of, and report on, his principal case. In all clinical examinations the examiners should observe the candidate make his examination, or require him to demonstrate his methods and findings.
14. In medicine, in surgery, and in midwifery and gynaecology, no candidate should be allowed to pass who is rejected in the clinical examination.

15. A candidate rejected in any subject of the final or qualifying examination should, before he is readmitted to examination therein, be required to produce satisfactory evidence that he has during the interval pursued the study of the subject in which he was rejected.

ASSISTANTS AND YOUNG PRACTITIONERS SUBCOMMITTEE

A meeting of the Assistants and Young Practitioners Subcommittee of the General Medical Services Committee was held at B.M.A. House on May 24. Dr. F. GRAY was in the chair.

A letter was received from Dr. D. Hines offering his resignation from the Subcommittee owing to his appointment to a permanent post.

Distribution of 5% Interim Adjustment

The question of the distribution of the 5% interim adjustment was considered by the subcommittee, and on the motion of Dr. F. G. TOMLINS, seconded by Dr. QUEST, it was resolved that in the opinion of the subcommittee there should be an additional loading of 2s. for the first 1,500 patients.

The CHAIRMAN said that the decision would be reported to the General Medical Services Committee.

Dr. TOMLINS also moved:

That this subcommittee deplores the Government's arbitrary and inadequate interim award of 5% increase in net remuneration to all general practitioners, and regrets that an invidious distinction has been made between general practitioners and hospital staff.

"I deplore this arbitrary giving out of an increase," Dr. Tomlins said; "I am sure it is inadequate, and I, personally, consider it is an insult." Dr. R. M. S. MATTHEWS seconded the motion, which was carried.

Finally, Dr. TOMLINS moved "that this Subcommittee desires a review of general-practitioner remuneration with a view to the more equitable distribution of that part of the pool which is intended to cover expenses." The chief trouble with general-practitioner remuneration, he said, was the failure to distribute the expense factor in an equitable manner. Dr. R. A. A. R. LAWRENCE seconded the motion, which was carried.

Distribution of Patients in General Practice

The CHAIRMAN thanked Dr. Matthews for the trouble which he had taken in preparing lists showing the distribution of patients in general practice. Although, as Dr. H. ROSE pointed out, without qualification some of the facts might be misleading, Dr. Matthews showed that two-thirds of all patients were on lists of over 2,500; doctors over 45 years old, approximately half the total, had 11/20 of the total patients; and on lists of over 3,600 there were ten million patients, approximately a quarter of the registered population.

Evolution of General Practice

The subcommittee considered the principle submitted by Dr. MATTHEWS that remuneration should be related to the quality of work done as well as the quantity.

Dr. Matthews said that he personally did not want a full-time salaried service, and he desired to dispel the myth that young doctors were clamouring for a whole-time salaried service. The first way to improve the quality of the service, suggested Dr. Matthews, was by the reduction of maximum lists. Over and above that he would advocate an expense allowance. "I would raise the capitation fee according to the doctor's age," he continued, "and I should like to hear discussed the loading of the capitation fee on a doctor's degrees. I should have payment for items of service, payment for work out of hours, extras for minor surgery, and extras for hospital attendance."

Dr. I. M. QUEST said he was in favour of a fee per item of service. Dr. TOMLINS moved that a recommendation should

go to the General Medical Services Committee (1) that the subcommittee considered that there should be a representative of the assistants and unestablished practitioners on the committee which the Council had been instructed to set up to examine the working of the N.H.S.; and (2) the principle that remuneration should be related to the quality of work done as well as the quantity be placed on the agenda for the next meeting of the subcommittee to be held on June 28, and members be asked to send in practical suggestions.

Dr. LAWRENCE seconded the motion, which was carried.

Trainee General Practitioner Scheme

The subcommittee considered a letter from Dr. P. B. BAILEY reviewing the report of the subcommittee on the trainee general practitioner scheme and suggesting points which required clarification. Dr. Bailey suggested that there was nothing to be gained from the trainee scheme which could not be gained from the ordinary assistantship scheme. That was, he said, the main issue. It was difficult to see the purpose of the scheme, which was, in his view, open to abuse. Dr. MATTHEWS, supporting Dr. Bailey up to the hilt, said: "I think that the trainee assistant scheme needs to be abolished."

Dr. QUEST suggested that experience was the best teacher a young practitioner could have, and supported Dr. Bailey. Dr. KATHLEEN ADAMS suggested that it was difficult to generalize. "I did a trainee assistantship," she said, "and I was very grateful to the principal, who could not have been fairer." Dr. C. W. GRANT said that he also did a trainee assistantship with a very good principal. Although he did not, perhaps, learn any more than he would have learned had he taken an ordinary assistantship, at least the scheme had increased the number of assistantships available. Dr. LAWRENCE said that in its present form he was against the trainee scheme because it was open to abuse. He also pointed out that in almost every case where a trainee spoke in favour of his trainer he still had a relationship with his former employer.

Dr. TOMLINS said that the scheme ought to be supported because it provided extra assistantships. Dr. LAWRENCE said that from a survey which he had made in Derbyshire it appeared that it was always the large-list practices which took trainees. Therefore, in present circumstances he emphasized that it left far too much open to abuse in practices of that size. Dr. GRANT said it was not the case in Perthshire that the large-list doctors had trainees. It was rather the small-list practitioners who had trainees.

The discussion was deferred until the next meeting.

FORENSIC MEDICINE

The Forensic Medicine Subcommittee of the Private Practice Committee met on May 15 under the chairmanship of Dr. R. D. TEARE.

Fees Payable by Coroners

It was reported that the relevant associations of local authorities were proposing to draw the attention of their constituents to the desirability of considering the preparation of a schedule of fees and disbursements for payment by the coroner. In this connexion they also proposed to recommend an allowance of 1s. a mile beyond a radius of two miles when a medical practitioner travels at the request of the coroner to view a body where it has been found. The Subcommittee recommended that the model schedule already approved by Council should be sent to the Divisions and Branches concerned as a basis for negotiations with the local authorities.

It was decided to recommend to the parent Committee the acceptance, subject to certain safeguards, of an offer by the Home Office to make amending rules to allow medical practitioners carrying out necropsies at the request

of the coroner to receive travelling expenses at the rate of 1s. for each mile beyond a radius of two miles.

"Drunk-in-charge"

It was reported that in some parts of the country it was now the custom for the police to rely predominantly on the evidence of police officers in cases of persons charged with being drunk in charge of a motor vehicle, medical opinion being required only to ensure that the prisoner was fit to be detained and that his symptoms were not due to illness. A member had reported that he had been told by the police that in order to decide these two points it was not necessary for him to examine the man. The Subcommittee wished to stress that in all these cases a comprehensive examination should be made. It would be extremely unwise for a medical practitioner to attempt to say whether a man was ill or whether he was fit to be detained unless he had first taken a careful history and made a full examination. The Subcommittee considered this matter of such importance that it proposed to bring it to the notice of all concerned.

Other matters which were considered included the place of forensic medicine in the medical curriculum; medical certificates required for purposes of cremation; and the status of mortuary attendants.

CRICKET

B.M.A. v. LAW SOCIETY

AT HURLINGHAM, MAY 26

LAW SOCIETY

G. Oakley, c. Shneerson, b. McEwan	10
G. Williams, c. Clarke, b. McEwan	5
R. de Lattre, b. McEwan	3
J. Dennis, not out	96
M. Richardson, l.b.w., b. Clarke	32
S. Mundy, b. Clarke	0
E. Singleton, c. Barwell, b. Clarke	13
O. Nichols, b. Clarke	6
T. Outhwaite, l.b.w., b. McEwan	4
J. Dean, b. Clarke	0
T. Keane, l.b.w., b. Clarke	8
Extras	6

Total 183
BOWLING.—McEwan 4-42; Clarke 6-83.

B.M.A.

P. C. Rushton (London Hospital), l.b.w., b. Dean	7
G. Shneerson (St. Mary's Hospital), c. Mundy, b. Nichols	21
G. Barwell (Guy's Hospital), c. Singleton, b. Dean	50
W. P. Harrison (Dublin), not out	78
P. Cardew (St. George's Hospital), not out	21
Extras	8

Total (for 3 wks) 185

C. B. Clarke (Guy's Hospital), P. Fawcner-Corbett (St. Thomas's Hospital), T. Mathews (Middlesex Hospital), T. McEwan (London Hospital), H. E. R. Chew (London Hospital), and J. Dew (London Hospital) did not bat.

At the request of the profession's representatives the Minister of Health has asked executive councils to arrange for general practitioners in the N.H.S. to recover on application the medical records of their own deceased patients if they wish to use the records for research purposes. Doctors must undertake to keep the envelopes and cards safe during the three-year period in which they would normally have been kept by the executive council, to keep such records separate from those of living patients, and to return them immediately if the executive council asks for them.

general practitioners should have a powerful policy, a removal of the apathy and fear of loss of practice and finances, the only practical solution is to form a federation (if the words trade union are unpleasant) registered with the Registrar of Friendly Societies, with a proper constitution, a direct levy, disciplinary powers, and with objects of one or more of the statutory objects. In this way I believe there can be unanimity and strength at a general practitioner level. If any dispute reaches deadlock for various reasons and is reported in writing to the Minister of Labour, then such disputes must be referred to the Industrial Disputes Tribunal, without the *impasse* of a Royal Commission, under the Industrial Courts Act, 1909, and the Industrial Disputes Order, 1951.

I feel this is the only way to remove the apathy and general feeling of disquiet aroused by the threat of withdrawal, the stillbirth of the Medical Guild, and the reversal of policy which we have witnessed within the last two months.—I am, etc.,

Bradford.

G. HIPPS.

SIR.—Colonel C. H. Barber's letter (*Supplement*, May 11, p. 263) is very true, but too late by ten years. We know now that we should never have allowed Aneurin Bevan to stampede us into the present N.H.S. The profession was unanimous against it at first, but, alas, as now, our leaders had "second thoughts." It is too late now; the position is irreversible. We are now actually in a State service—thoroughly Government-controlled. The one thing which determined this was the loss of the goodwill of our practices, just as it is also at the back of the apathy and consequent lack of success of the whole system; but I fear this is also irreversible. This too has made it necessary for the newly qualified man to come humbly, cap in hand, and beg for a practice. Strange that men previously found assistantships and partnerships with ease.

I am a senior man, and I was able to go on while in general practice to higher degrees and practise a specialty at the same time. This also is no longer possible, for the whole population has become, and the medical profession has now practically become, entirely hospital-minded. Thus we are not now much different to the medical officer of health; there is not much left for us to treat save the most trivial things, which probably would do just as well without us, only that the patient requires his certificates.

Sorry for being so pessimistic, but we have read articles on the changing face of medicine, and I suppose we shall just have to adapt ourselves to the march of events, but it would be a pity if at the same time our pecuniary reward dwindled too far.—I am, etc.,

Chigwell, Essex.

N. BEATTIE.

SIR.—Once again the distant rumble of log-rolling and the faint unmusical twang of wire-pulling is heard in the land, but the poor gullible G.P. hardly cocks an ear. It seems a long time ago now, though it is only a few months, when the profession were united in demanding the full implementation of Spens or else. Now 5% and a kind letter from Mr. Vosper have changed us from fiery revolutionaries to docile sheep.

There are only three ways in which the G.P. can improve his status, financial and otherwise: (1) Return to private practice. (2) Withdraw from the N.H.S. in favour of a health insurance scheme not under the control of the politicians. (3) Form his own trade union with compulsory membership for all in general practice, and with a salaried layman as secretary to negotiate for him. Many unkind remarks are made about the T.U.C. leaders, but at least they get results for their members, and in double quick time.

I do not expect any of these courses to be adopted, now or in the future. I anticipate a steady and inexorable fall in our status to the level of the elementary schoolteacher, the bank clerk, and the unestablished civil servant.—I am, etc.,

Bromley.

KIRKLAND WEIR.

Present Position

SIR.—May I ask what the profession is doing with this most valuable time that has been given it—that is, till the Royal Commission makes its report? Then we will have to face the big guns again—guns that have routed us twice in nine years. Using this precious time properly, we could save the profession; if we idle, then without a doubt all will be lost, and lost irrevocably.

What does the profession want? I know, more money; but the monetary question will be settled by the Royal Commission or the courts, so that it is useless to concentrate further on it. We must realize that salary cannot indefinitely be divorced from status. If our status dwindles—as it is doing—then inexorably our income will drop. Let us have a clear idea about all these things, and purge our thoughts of all sophisms, wishful thinking, and contradictory ideas.

Do we realize that our leaders went to parley with the Government without knowing the desires, feelings, and opinions of the corpus of the profession? Nor do they yet know them. How then can our leaders voice our opinions? They may not be too clear of their own. Further, there is a danger here—human nature being as it is—that they may plump for what suits their own particular circumstances. None of us can be entirely disinterested, nor can we completely suppress our own ego, with the best will in the world and all honourable intentions.

But what do the doctors in general want? De Jouvenel has said: "The mind of man needs, like his heart, objects of affection; they land him in the same evasions; all that he wants to see in any phenomenon are those aspects which flatter and exalt him, not those which offend and mortify him. He dissociates what life has made inseparable, praises the cause and condemns the consequences, applauds the end and repudiates the means, affirms an idea and denies its corollary." These illogicalities are more marked than ever to-day, the age of common man, hall-marked as it is by the twin vices of envy (so clearly prophesied by Nietzsche as the distinguishing mark of this century, the prospect of which filled his noble soul with gloom) and sentimentality (Belloc characterized sentimentality as the attempt to reconcile the contradictories)—to-day when clear thinking has been made almost an impossibility. The man in the street wants his Welfare State, but jibs at paying for it; wishes to hand over to the State the very responsibilities that make him a man, and yet expects to retain the dignities of man; equates equality with freedom. But in our learned profession we fare no better: we wish a State medical service, but no bureaucracy; we affirm the idea of a completely free Service for all, but deny the corollaries that flow therefrom; we enjoy the security of regular cheques from the Government, but expect to be free at the same time. We all heard in our childhood the proverb: "You cannot eat your cake and have it at the same time": alas, we have forgotten all the wisdom of our fathers.

En passant, I would like to note here the ugly vice envy, and hope that we keep it well in mind when we talk so glibly at our meetings about relying on the public to see us through, and expecting them to fight our wars for us. I wonder how many of the public we would have behind us if they were asked to pay directly (by addition to their stamp charge) the 24% we hoped to get. I suggest that our leaders set out, concisely and briefly, the alternatives before the profession and the consequences—as far as can be gauged—of the several choices. Then let the rank and file debate them—preferably in groups of not more than thirty doctors—and send their decisions to the leaders.

In closing I would like to appeal to my colleagues to hold fast to whatever is decided, having the courage of their convictions. Let us cease from humbug, pusillanimity, and self-degradation. We talk in hushed tones with raised eyebrows about what somebody or other paid for a consultation or operation in some foreign country—e.g., America—but show no surprise at what so many pay for television sets in England. We have done enough crawling in the past

ten years. Finally I would point out that in the order of nature everything dies which is not sustained by an intense and brutal love of self; tenderness of heart, going to the length of self-denial, spells self-inflicted death to any profession or social institution. De Tocqueville (writing of the end of the *Ancien Régime*) has shown us the monarchy turning into its own prosecutor for its crimes, and calling down on itself a wrath from which it has no wish to protect itself. It lacked the will to live: "Go and tell the Swiss not to fire."—I am, etc.,

Feltham, Middx.

R. C. ROONEY.

Drug Capitation Fee

SIR.—I note that the recent G.M.S. Committee report (*Supplement*, May 18, p. 274) makes no mention of raising the drug capitation fee as part of the interim increase, and should be glad to know that these dispensing practitioners are not forgotten. Furthermore, if it should be decided in due course to give evidence to the Royal Commission, I trust that the case for a large increase in the dispensing capitation fee will be presented separately, on its merits, and not as part of our general argument.

Incidentally, in the disbursement of the final settlement for each year, it has always seemed to me very odd that these rural dispensing practitioners, who by their grossly inflated drug bills help to produce the surplus, receive no extra share of the same; nor are mileage payments considered in the sharing-out of the final settlement. As Dr. C. F. R. Killick stated in the same report, the mileage payment is, in a sense, a compensation payment in place of patients. How, then, can these payments be excluded in the name of justice, then, can these payments be paid out as a percentage of the capitation, plus mileage, plus dispensing fees.—I am, etc.,

Aylesford, Hants.

JOHN S. HAPPEL.

Parking Restrictions

SIR.—In view of the proposed restrictions on parking, and the introduction of parking meters, I would like to know how this will affect the practising doctor or surgeon on call in the metropolis. To date, I have been fined thrice for leaving my car outside my own premises, despite drawing the magistrate's attention to the ambiguous statement by Mr. Dalton to representatives of the B.M.A.'s Private Practice Committee (*Supplement*, December 4, 1954, p. 212).

I find it almost impossible to attend the urgent cases in London, without being seriously hampered by the restrictions now in force, and would suggest that the Association brings the matter again before the Commissioner of Police in order that a special recognition might be granted to the practising physician, and this to be done by a sign on his car, or the licence, such methods of recognition to be issued by the metropolitan police to those entitled to its use, and thus save any likelihood of its abuse.

I would like you to publish this letter so that doctors in practice in the heart of London may express their views on this matter.—I am, etc.,

London, W.2.

E. SUTHERLAND-RAWLINGS.

Constitution of B.M.A.

SIR.—At a meeting recently held in this area there were some 30 members present out of a possible 170, and I agree with Dr. D. G. Allen (*Supplement*, May 25, p. 299) that the B.M.A. machinery requires complete revision. After talking with many individual doctors I am convinced that the small percentages attending Divisional meetings are not due to apathy. These meetings are so often held at a time when the average busy doctor is engaged in earning his living, and even if it is possible for him to attend an occasional meeting he has not the time to serve on the numerous committees which organize our affairs. In consequence our representation is limited to retired practitioners, or those specially favoured in that they do not have to devote their whole time to earning a living.

The recently published report of the Committee on the Constitution of the B.M.A. (*Supplement*, February 23, p. 73), which was accepted by the Council, reveals a complete unawareness of modern trends, and a tendency on the part of the Council to cling to an organization conceived in the Victorian era to meet circumstances completely different from those which exist to-day. As a result negotiations have dragged on over a period of years. The Council produced such an ill-conceived plan as the "phased withdrawal," which it then attempted to persuade the rank and file to accept. This was a complete reversal of democratic procedure. We should now be discussing in the Divisions the evidence which may have to be given to the Royal Commission, and certainly plans for the reform of the National Health Service. If the Council follows its usual procedure these matters will be presented to the members of the B.M.A. as a *fait accompli*.

It would surely be to our advantage to have whole-time paid representatives who could discuss with individual members not only such matters as pay, but act as a co-ordinating link between the various branches of the Service. There are perhaps 40,000 doctors participating in the Service, and if every doctor was prepared to pay £5 a year we could be served by 80 representatives, who could be either doctors, lawyers, or accountants. Each would represent 500 doctors, whom, in a crisis such as the present, they could visit individually in less than two months. In this way a much quicker assessment of the feelings of the profession could be made, and, further, they would have the time to produce plans and take speedy action to put these into effect.—I am, etc.,

Sittingbourne, Kent.

K. W. HARDY.

H.M. Forces

Colonel W. J. Officer, O.B.E., late R.A.M.C., has been appointed Director of Medical Services, and has been granted the temporary rank of Major-General.

Surgeon Captain R. S. Rudland, V.R.D., R.N.V.R., has been awarded a Clasp to the R.N.V.R. Decoration.

The following appointments and mentions in dispatches have been announced in recognition of distinguished services in Malaya for the period July 1 to December 31, 1956:

M.B.E. (Military Division).—Major M. A. C. Dowling and Major (Temporary) A. M. Wiley, R.A.M.C.

Mentioned in Dispatches.—Major L. F. Q. MacLaine, R.A.M.C.

A *Supplement* to the *London Gazette* has announced the following awards:

Third Clasp to the Territorial Efficiency Decoration.—Major E. C. Ellis, T.D., R.A.M.C., Retired.

Second Clasp to the Territorial Efficiency Decoration.—Colonel F. H. Blackburn, T.D.; Lieutenant-Colonels H. Leiper, T.D., and M. I. Silverton, T.D., R.A.M.C.

Territorial Efficiency Decoration.—Colonel J. H. Prain; Majors (Honorary Lieutenant-Colonels) F. J. S. Bowman (Retired), R. L. Holt, O.B.E. (now T.A.R.O.), Major (Acting Lieutenant-Colonel) M. F. Ronayne, O.B.E., Captain (Honorary Major) J. Rowatt (Retired), R.A.M.C.

ROYAL NAVY

Surgeon Commander E. E. Malone has retired. Surgeon Lieutenant H. J. A. Hahn to be Surgeon Lieutenant-Commander.

ROYAL NAVAL VOLUNTEER RESERVE

Surgeon Lieutenant-Commander (D) F. G. Hardman has been transferred to the Medical Branch in the rank of Surgeon Lieutenant-Commander.

Surgeon Lieutenant-Commanders M. D. Edwards and E. G. Shaw have retired.

Surgeon Lieutenants J. N. Anderson, B. C. Morson, G. W. Hickish, and A. Bell to be Surgeon Lieutenant-Commanders.

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel R. D. Menzies has retired on retired pay (Reserve Liability).

Majors R. M. Johnstone, M.B.E., M.C., and P. C. Mitchell, M.C., T.D., to be Lieutenant-Colonels.

Short Service Commission.—Major L. W. H. Bertie has relinquished his commission on completion of service, and has been granted the honorary rank of Major.

Association Notices

Diary of Central Meetings

JUNE	
12 Wed.	Council, 9.30 a.m.
12 Wed.	Special Representative Meeting, 11 a.m.
12 Wed.	Council (at conclusion of Special Representative Meeting).
13 Thurs.	Editorial Subcommittee, Joint Formulary Committee, 11 a.m.
13 Thurs.	Joint Formulary Committee, 2 p.m.
13 Thurs.	Ophthalmic Group Committee, 2 p.m.
14 Fri.	Overseas Committee, 2.15 p.m.
17 Mon.	S.H.M.O.s Group Executive Committee, 2 p.m.
18 Tues.	Planning Subcommittee, Occupational Health Committee, 10 a.m.
20 Thurs.	G.M.S. Committee, 10.30 a.m.
26 Wed.	Medical Education Committee, 2 p.m.
28 Fri.	Assistants and Young Practitioners Subcommittee, General Medical Services Committee, 2 p.m.
28 Fri.	Infectious Diseases Subcommittee, Public Health Committee, 2 p.m.
JULY	
3 Wed.	Welsh Committee (at Shrewsbury), 2.15 p.m.
10 Wed.	Annual Representative Meeting (at Newcastle upon Tyne), 10 a.m.
11 Thurs.	Annual Representative Meeting (at Newcastle upon Tyne), 9.30 a.m.
12 Fri.	Annual Representative Meeting (at Newcastle upon Tyne), 9.30 a.m.
13 Sat.	Council (at Newcastle upon Tyne), 9 a.m.
13 Sat.	Annual Representative Meeting (at Newcastle upon Tyne), 10 a.m.
15 Mon.	Annual Representative Meeting (at Newcastle upon Tyne), 10 a.m.
15 Mon.	Annual General Meeting (at Newcastle upon Tyne), 12.30 p.m.
15 Mon.	Council (at Newcastle upon Tyne), at conclusion of A.R.M.
15 Mon.	Adjourned Annual General Meeting and President's Address (at Newcastle upon Tyne), 8.15 p.m.
18 Thurs.	G.M.S. Committee, 10.30 a.m.
25 Thurs.	Ingleby Evidence Committee, 11.30 a.m.
25 Thurs.	Joint Committee of B.M.A. and Magistrates' Association, 2 p.m.
26 Fri.	Staff Side, Committee C, Medical Whitley Council (at 14, Russell Square, W.C.), 10 a.m.
26 Fri.	Full Committee C, Medical Whitley Council (at 14, Russell Square, W.C.), 11.30 a.m.
29 Mon.	Industrial Nursing Subcommittee, Occupational Health Committee, 2.30 p.m.

Branch and Division Meetings to be Held

CITY DIVISION.—At Fellows' Restaurant, Zoological Society, Regent's Park, N.W., Thursday, June 13, 7.15 for 8 p.m., annual dinner. Guest of honour, Mr. A. Dickson Wright.

GUILDFORD DIVISION.—At Royal Surrey County Hospital, Guildford, Friday, June 14, 8.30 p.m., annual general meeting. Election of officers, etc.

HAMPSTEAD DIVISION.—At Board Room, Hampstead General and North-west London Hospital, Haverstock Hill, N.W., Tuesday, June 11, 8.30 p.m., annual general meeting. Non-members are invited to attend.

MERSEYSIDE BRANCH.—At Messrs. Pilkington Bros. Ltd., St. Helens, Wednesday, June 12, 12.30 for 1 p.m., lunch; 2 p.m., annual general meeting.

METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Tuesday, June 18, 3 p.m., annual general meeting. President's address by Dr. J. W. McCarthy.

SURREY BRANCH.—At the Guildhall, Guildford, Surrey, Tuesday, June 11, 2.30 p.m., 40th annual meeting. Presidential address by Dr. J. O. M. Rees: "Professional Independence."

Meetings of Branches and Divisions

ABERDEEN AND KINCARDINE COUNTIES DIVISION

The following officers have been elected for 1957-8:

Chairman.—Dr. J. H. Wardrop.
Vice-chairman.—Dr. I. M. Scott.
Honorary Secretary.—Dr. J. M. Gill.

ASHTON-UNDER-LYNE DIVISION

The annual general meeting was held on April 15. The following officers were elected:

Chairman.—Dr. A. T. Wilson.
Vice-chairman.—Dr. A. M. Gallagher.
Honorary Secretary.—Dr. J. A. Fiddian.
Honorary Treasurer.—Dr. D. Malloch.

BIRKENHEAD AND WIRRAL DIVISION

A meeting was held at the Arrowe Park Hotel on April 12, 1957. Dr. I. Lipsedge took the chair, and 34 members attended. The guest speaker, Mr. Ralston Paterson, spoke on "Medicine in Russia," and afterwards showed coloured slides of Russian cities, and answered questions.

BLACKBURN DIVISION

The annual general meeting was held on April 9, 1957. The following officers were elected:

Chairman.—Dr. R. Pendlebury.
Vice-chairman.—Dr. F. C. Simpson.
Honorary Secretary and Treasurer.—Dr. F. C. Reidy.

BOLTON DIVISION

The annual meeting was held on April 9, 1957, in the Bolton Royal Infirmary. Forty-six members were present. The following officers were elected for 1957-8:

Chairman.—Dr. E. P. Johnson.
Vice-chairman.—Dr. I. Affleck.
Secretary and Treasurer.—Dr. M. S. Rowley.

BUCKS DIVISION

At the annual general meeting the following officers were elected for 1957-8:

Chairman.—Dr. R. M. Solomon.
Vice-chairman.—Dr. D. Paton.
Secretary and Treasurer.—Dr. M. F. Gillison.

CAMBERWELL DIVISION

The annual general meeting was held in Dulwich Hospital on April 11, 1957. Thirty members attended. Professor Milnes Walker, aided by Mrs. Milnes Walker, gave a lecture on a trip round the world illustrated with slides and films. The following officers were elected:

President.—Dr. H. J. Andersen.
Vice-president.—Dr. R. J. Rosborough.
Honorary Secretary.—Dr. W. B. J. Pemberton.

EAST DENBIGH AND FLINT DIVISION

The annual meeting was held at the Blossoms Hotel, Chester, on April 4, 1957. The following officers were elected:

Chairman.—Dr. B. D. Chowdhury.
Vice-chairman.—Dr. M. Quinlan.
Secretary and Treasurer.—Dr. J. B. Dobson.

RUGBY DIVISION

The annual general meeting was held at the Grand Hotel, on March 27, 1957. Mr. F. J. C. Matthews was in the chair, and 26 members attended. The following officers were elected:

Chairman.—Mr. F. J. C. Matthews.
Vice-chairman.—Dr. F. R. Brebner-Smith.
Immediate Past Chairman.—Dr. D. J. Jones.
Honorary Secretary and Treasurer.—Dr. R. P. Hendry.

ST. HELENS DIVISION

The annual general meeting was held on March 27, 1957, at the Providence Hospital. Dr. N. J. W. Thompson was in the chair and nine members were present. The following officers were elected:

Chairman.—Dr. N. J. W. Thompson.
Honorary Secretary and Treasurer.—Dr. L. Crawford.

SOUTHAMPTON DIVISION

The annual general meeting was held on April 17, 1957. The following officers were elected for 1957-8:

Chairman.—Dr. P. G. Todd.
Vice-chairman.—Dr. R. S. Russell Smith.
Secretary and Treasurer.—Dr. J. G. McDowell.

SUTHERLAND DIVISION

At the annual general meeting the following officers were elected:

Chairman.—Dr. E. Lindsay.
Vice-chairman.—Dr. K. A. Macrae.
Honorary Secretary and Treasurer.—Dr. E. J. R. Primrose.
Immediate Past Chairman.—Dr. A. D. Macleod.

TROWBRIDGE DIVISION

At the annual general meeting the following officers were elected for 1957-8:

Chairman.—Dr. J. A. Falk.
Vice-chairman.—Dr. S. N. Varian.
Honorary Secretary.—Dr. P. A. H. Rivett.

WAKEFIELD DIVISION

The annual general meeting was held at Clayton Hospital on March 21, 1957. The following officers were elected:

Chairman.—Dr. J. D. Bottomley.
Vice-chairman.—Dr. H. Knowles.
Honorary Secretary and Treasurer.—Dr. J. D. Sutcliffe.

SUPPLEMENT TO THE
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British Medical Association

ANNUAL CONFERENCE OF REPRESENTATIVES OF
LOCAL MEDICAL COMMITTEES

The Annual Conference of Representatives of Local Medical Committees was held at B.M.A. House on June 6 at 10 a.m. and concluded at 6.30 p.m. Dr. A. BEAUCHAMP (Birmingham) was in the chair. During the course of the meeting Dr. A. N. MATHIAS (London) was elected unopposed to the Chairmanship of the Conference for the next session.

Report of the General Medical Services Committee
on Remuneration

Dr. A. B. DAVIES (Chairman of the General Medical Services Committee), in moving that the reports of the General Medical Services Committee on remuneration be received, said that it was really an adjournment of the received, said that it was really an adjournment of the Special Conference held on April 30. It would be recalled that the General Medical Services Committee met at 9 a.m. on April 30, and after hearing a statement from Dr. Wand, the Chairman of Council, after considering the Minister's last letter to Dr. Wand, and counsels' legal opinion, and after a necessarily short debate, the General Medical Services Committee decided by a narrow majority of 24 to 22 to submit an altered resolution to the Conference. An amendment which he had then supported was passed by the Conference deferring the decision until June 6, in order to give local medical committees and the whole profession an opportunity of considering the new situation. A decision on withdrawal was also deferred.

The sudden developments must have been confusing to representatives, and a dense fog seemed to descend. Five weeks had elapsed and much thought and consideration had been given to the problems. There was now, perhaps, a period of greater calm, and, whatever might be decided, everyone could see the target more clearly—the target 24%. Actually it was now 25%. Together with that target was the necessity to consider a satisfactory method for the future of settling claims.

"Let us now reunite where we have been divided," said Dr. Davies. "Let us consolidate and build up our fighting funds and go forward as a united profession with a renewed determination to achieve ultimate justice."

Royal Commission

Dr. H. GUY DAIN (Birmingham) moved that, in view of the statements made publicly by the Chairman of the Royal

Commission and assurances given to the Chairman of Council by the Minister of Health in his letter of April 26, the meeting was satisfied that advantage had been gained and that evidence should now be given to the Royal Commission.

He drew attention to the fact that whereas a year ago, and as late as the beginning of the year, the problem was merely a monetary problem—that of making up the diminished value of the pound since the remuneration was fixed in 1951—and the reaction of the Ministry was a blank refusal to look at the claim. It was a completely unreasonable position to take up with a body of responsible people such as the medical profession, and it not unnaturally excited a great deal of anger amongst doctors. Their anger was increased by the Government's decision to set up a Royal Commission, again without consultation with the profession, as a means of dealing with the situation and as a means of preventing the profession having arbitration.

The first remit of the Royal Commission was entirely unsatisfactory. From the moment when it became evident that the profession was prepared to take action, and had gone to the length of recommending doctors to withdraw from the Service if something reasonable were not done, steps were taken towards some modification of the Commission's terms of reference. The Chairman of the Commission and the Prime Minister had given undertakings that certain things would be done which were not within its original ambit. It was due largely to the persuasion of Dr. Wand that that position was attained. Again due to the efforts of Dr. Wand, it had been indicated by the Minister of Health that, whatever the Royal Commission found, it would not be implemented until the profession had been properly consulted.

It was to be hoped that the Conference would now feel that the circumstances were such that it would be right for the profession to give evidence. There were still a number of doctors who were not satisfied that the changes were such that the profession ought to alter its position, but there were, on the other hand, so many who were satisfied that the changes were sufficient for the profession to modify its attitude and to give evidence. It was hoped that the former would therefore stand down from their view if the majority were in favour of giving evidence so that the

profession could go forward with its job, which was only now beginning, as a united profession.

Public Health Doctors

There was the difficulty regarding public health doctors. Now that the situation and circumstances had altered, they were claiming the right to come in and be dealt with by the Commission. Since they were not paid by the Treasury they did not come into the same category as general practitioners in the Service, and if their problems were to be considered—and the Association would insist that they were at the proper time—it would delay the finding of the Royal Commission for a very long period. Therefore, Dr. Dain said he hoped that their friends in the public health service would not talk about being thrown to the dogs if the Association did not press for the consideration of their case at the present time.

Dr. L. F. EVANS (Bolton) moved an amendment to the effect that the Conference would not support any action which led to the acceptance of the position whereby the Royal Commission considered the status and remuneration of only one part of the profession. In that and all other respects public health doctors were essentially a part of the profession. In excluding them the Government was driving another wedge into the profession. A wedge had already been driven in between the consultants and general practitioners, and he asked the Conference seriously to consider the position before throwing out the public health medical officers.

Dr. S. WAND (Chairman of Council) drew attention to the report of the meeting of the Public Health Committee in the *Supplement* to the *B.M.J.* (May 25, p. 296). He drew particular attention to the resolutions which were passed at that meeting and said it was important that members of the Conference should read those resolutions before they voted.

The amendment was lost.

Advantage Gained

An amendment to delete the words "this meeting is satisfied that advantages have been gained and that" was moved by Dr. C. M. SCOTT (G.M.S. Committee). He suggested that there were still a considerable number of practitioners who did not believe that advantages had been gained. In his view the profession had lost the round and in honesty it should say so. Dr. A. V. RUSSELL (Wolverhampton) supported the amendment. He asked whether the evidence which it was proposed to give had already been prepared. Dr. DAVIES replied that the General Medical Services Committee had made no preparations at all to give evidence.

Dr. RUSSELL asked whether it was possible to give the Conference any idea of how long it would take to prepare such evidence. Dr. DAVIES, in reply, said that any answer to that question would be in the nature of guesswork. It must be borne in mind that there were the summer holidays and the Annual Representative Meeting coming shortly. Conservatively it would take four months at least to prepare evidence. Dr. RUSSELL said that the two answers showed clearly that there need be no rush to co-operate with the Royal Commission, as seemed to be the idea at the Special Conference. There was little doubt that the majority of people in the periphery felt that conditions had forced the profession into the position of giving evidence. The majority of people in the periphery also felt that, although it might be necessary to give evidence, no advantage had been gained.

Dr. A. M. MAIDEN (G.M.S. Committee), in seconding the amendment, said that many practitioners were doubtful about what precise advantages had been gained, and it was felt that the deletion of the words suggested would clarify the motion. Dr. DAIN accepted the amendment in the hope that it would lead to a unanimous vote.

The amendment was carried.

Legal Contract

A motion by Sheffield, that until the validity of Spens as a legal contract be determined by the courts a decision on the question of appearance before the Royal Commission should be deferred, was considered at the same time. Dr. W. DONNELLY (Sheffield) said that since the Special Conference the profession had become more convinced than ever that the validity of Spens as a legal contract was a matter on which no one seemed to be very clearly informed. Since the beginning of the present dispute the leaders had time and time again reminded the profession that it was fighting to maintain the Spens recommendations as the foundations on which remuneration should be calculated. Counsel's opinion was obtained on the correspondence from the Chairman of the Royal Commission and the Ministry of Health, and the opinion in each case was that the function of the Commission was to put the Spens recommendations "into the melting-pot." Yet the *Handbook for General Practitioners*—a Government publication purporting to lay down the terms of service—stated that the central pool from which the remuneration was derived was calculated according to the Spens recommendations of 1946. Many members of the profession now felt that the abandonment of the Spens recommendations would be a breach of the terms on which they entered the Service, and that it would be foolish indeed to abandon them without at least making certain that the recommendations of the Spens Committee were not legally enforceable. The appearance before a Commission which was set up for no other purpose than to find an alternative to Spens was automatically a retreat from their only form of security and must, of necessity, be construed as an abandonment by the profession of its position. "Spens may be in the melting-pot," he concluded, "but do not let the medical profession put the lid on."

Dr. WAND reported that, on the advice of solicitors, a consultation had been held with Sir Andrew Clark, Q.C., Mr. Gerald Gardiner, Q.C., and Mr. S. B. R. Cooke. Although a full legal opinion was awaited, the following was a general statement of their opinion:

The matter has been very carefully considered in consultation with leading counsel, who have advised us that it would not be in the best interests of the medical profession to descend into the arena of the Courts of Justice and that it is much better that the matter should be handled on a political level or, now, before the Royal Commission.

The Birmingham motion moved by Dr. Dain, as amended by Drs. Scott and Maiden's amendment, was carried.

Withdrawal Deferred

A motion by Worcester that a decision on withdrawal of service be deferred was opposed by Dr. P. J. DELAHUNTY (Buckinghamshire), who moved that the arrangements for a progressive withdrawal of service commencing on October 1, 1957, be proceeded with and that in the meantime evidence be given to the Royal Commission. The confidence of the periphery—the practising and hard-working doctors—had been shattered by the action of their leaders, he said. Members of the profession were stunned by the action taken on April 30, but a clear-cut decision at the Conference followed by immediate action might revive that enthusiasm shown a month ago. "I warn you," continued Dr. Delahunty, "that putting off the fight will destroy any hope of recruiting another force next year or the year after." If evidence were given to the Royal Commission and action were postponed, it was tantamount to co-operating with the Government and recognizing the Government's right to decide the case.

Dr. J. C. ARTHUR (Gateshead) said he could not too strongly deprecate the defeatist talk. "We are not betrayed or beaten," he said, and asked Representatives to look at the matter from a realistic point of view. He did not regard the Government as being especially evil. It had shown pig-headed obstinacy, a good deal of discourtesy, and a lot of stupidity; but it had not been very clever. He did not

desire to play down the opponents of the profession, but, provided the profession held together and kept up its spirits, it could not fail; and the time to hold together was when the Royal Commission had reported. If that report contained anything which cut across Spens, then he felt sure the profession would fight.

Dr. A. V. RUSSELL said that he had a great deal of sympathy with what Dr. Delahunty had said; on the other hand, if the profession decided to give evidence before the Commission it could not at the same time withdraw from the service. It was an armistice in a war. "If we could collect and hold resignations in case of a possible flare-up of hostility next year, I think we should be very wise to do so," he concluded.

Dr. J. LEAHY TAYLOR (Northampton), in supporting Dr. Delahunty, said that a decision was taken to withdraw from the service because the profession was denied the normal machinery of democracy—negotiation and arbitration. The profession was still denied that. Instead it was offered something else, without consultation—something which, irrespective of what it might lead to, neither side was bound to observe. Until such time as there was arbitration it was difficult to see any reason for altering the plans for withdrawal. The profession should give evidence as regards future remuneration, but insist on arbitration for the past and present. Dr. N. NELSON (Dundee) suggested that Easter next year might be a good date to consider notice of withdrawal.

Dr. B. BURNS (G.M.S. Committee) said that an important event had taken place since the last meeting—namely, that the Socialist Medical Association had met in conjunction with representatives of the Labour Party and had announced their intention of imposing a salaried whole-time service when returned to power. He asked Representatives to mark the word "impose." The question was whether the profession had learned the lesson of 1948 and 1911 or whether it was just as ready as ever to move into a false position. "What we want to know is whether you have the will, not to mention the wit, to fight against the imposition of a salaried service," he said, "because that is what you are going to be presented with in the near future." There were dangerous years had been working resolutely towards a salaried service. There were the foolish men who thought far more of their next quarterly cheque than of their freedom. There were the cowardly men who would not answer the call for courage—and they were even more dangerous than the first group. Then there were always the men who would come to the microphone and state that the profession was wavering. They did it in 1911 and they did it in 1948. What was more, the profession always managed to waver. "I have never seen a body of men so keen to waver," said Dr. Burns, "and it does not do you credit. You have this opportunity to-day to refuse to waver. You may not have another opportunity." Dr. F. G. TOMLINS (G.M.S. Committee, Assistants and Young Practitioners Subcommittee) supported the amendment. The Government, he said, must make good its promise as an earnest of good faith. If it was allowed to get away with it the profession was not likely to fight it again. The work had been done and the profession must be paid on the basis of the promise made.

The Worcester proposition was agreed to.

Legal Action

Dr. P. HOLLIDAY (Wiltshire) formally moved that the Association should more fully explore possibilities of taking legal action against the Government. Dr. M. MUNDY (Middlesex), seconding the motion, said that in his view the opinion of counsel should be disregarded and the Association should go ahead with legal action. Dr. J. L. HENRY (Plymouth) supported the motion. If the Association succeeded it would put an end to bickering every few years, he said. If, on the other hand, the Association failed, it would be a question of paying costs, but at least the profession would know that Spens was of no value.

The motion was carried.

A motion was considered, submitted on behalf of Stirling and Clackmannan, that the time to test the validity in the High Court of the general practitioner's contract under Spens be dependent on the chance of success. Dr. A. S. BIGGART, in moving it, said that if the Association had a very good case it should go ahead straightaway and try it out. If the case were not good it might perhaps be better to put it before the courts just before the Royal Commission's report was due. If there were then no agreement with the Government, the case could stand. If, on the other hand, there were agreement, then the case could be dropped.

The motion was lost.

Dr. W. W. FULTON moved on behalf of Glasgow that as there was a difference between Scots and English law, and in particular in the law of contract, the opinion and advice of Scots legal authorities be obtained on the contractual validity of Spens as applied to Scots practitioners. He assured Representatives that it was not an example of Scottish nationalism. A more favourable position existed in Scotland, and if it could be exploited it would affect over 4,000 doctors, apart from having great prestige value. In Scotland a contract could not be evaded because the form was incorrect. If its substance were sensible it could be enforced. A successful action in Scotland would doubtless affect practitioners in England and Wales.

The motion was carried.

Negotiating Machinery

Dr. WAND, opposing a motion by Dunbartonshire to the effect that all future negotiations on the present remuneration should be conducted by the General Medical Services Committee only, said that the issue had widened considerably beyond the remuneration claim. As the motion was worded it could only mean that the G.M.S. Committee had to keep all other bodies out of the dispute when it came to discussion on the present remuneration claim, and that included the Council of the Association. The Council had other responsibilities; it was concerned with people other than general practitioners, and he suggested that if such a motion were carried it would not mean disunity but rather disintegration. The important thing at the present time was to clear the ground so that the profession could reorganize its forces. Dr. DAVIES supported Dr. Wand. The motion had, he said, been submitted with rather superficial thoughts if it were intended to be flattering merely to the G.M.S. Committee and its leaders. There were times when the G.P.s required the whole weight and authority of the Association behind them.

The motion was lost.

Dr. J. C. MACARTHUR (Lanarkshire) moved:

That this Conference recommends that the negotiating machinery be revised with a view to establishing effective co-ordination between the several branches of the profession, and the prevention of unilateral action by any one branch.

The motion was intended, he said, to preserve the unity of the profession and of the Association. One of the factors which had struck him at recent meetings was how strongly the practitioners in the periphery felt the results of the failure of the negotiating committee to speak with one voice.

Dr. DAVIES pointed out that it was surely the responsibility of the Council of the Association. He was prepared to accept the motion as a reference to the G.M.S. Committee and ultimate consideration of the Council. (Agreed.)

Chairman of Conference

At this stage the SECRETARY, Dr. A. Macrae, announced that Dr. A. N. MATHIAS had been returned unopposed as the Chairman of the next session.

Dr. A. N. MATHIAS, in a brief response, thanked Representatives for the honour which had been accorded him, and assured them that he would do his best to follow the example which had been set by his predecessors.

Distribution of 5% Interim Adjustment

Dr. DAVIES moved:

That the 5% increase in the net aggregate remuneration of general practitioners be distributed as follows:

- (a) That the initial practice allowance be increased by 25%;
- (b) That the supplementary annual payments and hardships payments be increased by 20%;
- (c) That the present "loading" be increased by 1s. 6d., bringing it to 11s. 6d. per annum;
- (d) That the present capitation fee be increased by 6d., bringing it to 17s. 6d. per annum.

He recalled that at the Special Conference on April 30 the Committee was instructed to enter into immediate negotiations with the Ministry upon the best way of distributing the disappointing and inadequate sum so as to give most effective help to the greatest number of practitioners. Those instructions had been carried out, following the broad principles laid down by the original working party, and the recommendations were submitted without prejudice to any final form of distribution at the end of the dispute. Within those limits the Committee had little elbow room, but decided in common justice to give the maximum amount to those who obviously needed it most. Therefore 25% was handed to those in receipt of the initial practice allowance. That 25% was regarded as some indication to the Government of how the profession assessed the claim for the whole profession. In addition it was suggested that those in receipt of the supplementary annual payments and the hardship payments should receive 20%.

As regards the remaining money, it was considered right and proper that everyone should get something, and, following the instructions given at the Special Conference, the distribution set out in the motion was suggested. At the same time representations were made concerning the trainee assistants' salary, and the Ministry was persuaded to increase their remuneration by 10%—that is, increasing the salary of assistants by £75 to £850. Representations were also made that car allowance in respect of trainees should also be increased. No answer had yet been received on that, but it was thought that the Ministry was considering it sympathetically. Dr. Davies appealed to principals to consider the fairness of making an increase of an equivalent nature in the salaries of assistants.

Executive councils were being asked to make the additional payments on July 31 for the two months of May and June. Payments on initial practice allowances and supplementary annual payments would take a little longer, but on October 1 executive councils were being asked to pay five months' arrears under the new distribution of the proposed interim payments to the recipients of I.P.A. and S.A.P. The recipients of the I.P.A. and S.A.P. combined were a relatively small proportion and would not consume a great proportion of the money. In response to cries of "How much?" Dr. D. P. STEVENSON, the Deputy Secretary, was asked to produce such information as was available after the luncheon adjournment.

An amendment by Worcester that the possibility be examined whereby the recent interim 5% increase in remuneration be collected from practitioners and paid into the Defence Funds until the present dispute was settled was defeated. Dr. N. NELSON (Dundee) moved that the 5% increase which had already been accepted by the Special Conference should be added to the central pool and distributed to the profession under the present distribution scheme. He suggested that the profession should wait and see what the ultimate award would be before settling the distribution. There should be no argument about the distribution of such a small sum.

Dr. DAVIES agreed that there should be no argument about such a small sum. But he claimed on behalf of the G.M.S. Committee that it had complied with instructions within the limits of the size of the amount of money and of the regulations. Dr. H. H. D. SUTHERLAND (G.M.S. Com-

mittee), opposing the Dundee amendment, said that such a disappointing sum should not be divided into minute amounts, but should be used to support the claim for the 24%. Dr. A. S. BIGGART (Stirling and Clackmannan) withdrew an amendment standing in the name of his Committee and supported the Dundee amendment. The top-paid hospital medical staff had been given a 5% increase and the junior hospital staff an increase of 10%. Why should not the top-paid general practitioner get his 5%? He was giving far more of his income to the levy and to the Defence Trust than the lower-paid practitioner. He agreed that the poorer general practitioner needed more than the top-paid practitioner, and if the Government also thought that, it should provide some extra money for the poorer general practitioner.

Dr. F. GRAY (G.M.S. Committee) said that some doctors were feeling the pinch more than others, and the proposition endeavoured to give them what they needed. If all the money was put on capitation fees the top-list man would get £175 instead of, under the proposed scheme, £162; a difference only of £13. It was, in his submission, a very fair way of dealing with the problem to take that small amount from the top-list man and give something really substantial to those who were in need.

Dr. NELSON asked whether money was being used other than that covered by the 5% interim payment. Dr. DAVIES said that in order to make the distribution it had been necessary to use a very small amount of the final settlement money as a cushion. It was difficult to work in farthings, and the G.M.S. Committee and the Ministry had agreed that rounded figures were appropriate. To get round figures it had been decided to use a very small proportion of the final settlement money. In reply to Dr. SUTHERLAND, who asked whether, if the Conference turned down the G.M.S. Committee's proposition it would delay payment of the money, Dr. DAVIES said in that event the interim payment of 5% would not be paid on July 31. It would be deferred.

A suggestion by the CHAIRMAN that a vote on the amendments and the main motion might be deferred until Representatives had had an opportunity of hearing the figures was adopted.

Special Levy

Dr. G. N. GROSE (Middlesex), in moving that all possible steps should be taken centrally and locally to strengthen the Guild organization and to increase the numbers contributing to the special levy, said he felt strongly that the Guild organization had not been functioning as well as it ought in the last few months. If the profession found it necessary to fight next year, it was necessary to have the means with which to do so.

Dr. R. SELBY (Cheshire) moved by way of amendment that the levy of 3d. per patient per quarter be abandoned, and agreements thereunder be declared null and void and returned to the doctors concerned. He said he did so for three reasons: (1) the urgency had passed; (2) many practitioners were not anxious to give what they felt was a blank cheque; and (3) the relatively poor response to the appeal.

Dr. CATHERINE HARROWER (G.M.S. Committee) pointed out that the 3d. levy was tacked on to the question of phased withdrawal. Phased withdrawal was not now probable, but it was desirable that the Defence Trust should go on. It was decided that the levy of 3d. per head per quarter per patient would be kept in a separate fund, and used only for the one purpose—namely, for subsidizing doctors who were selected to withdraw in the phased withdrawal. The money not used for that purpose would be returned. The Defence Trust Funds were completely different. If the 3d. levy were continued the proceeds would go into a separate fund.

Dr. W. W. FULTON (Glasgow) suggested that the conference should decide straightaway the question of the special levy. If money were needed for a future fight, then it should be asked for under the conditions obtaining at that time. Dr. P. J. DELAHUNTY suggested that the matter

should be deferred until the question of whether the profession would enter another fight was settled. Dr. DAVIES supported Dr. Harrower. The policy of the G.M.S. Committee was to stimulate and to increase normal contributions to the Defence Trust. As regards the special levy, no present recommendation was made, but it would be recalled that at the Special Conference and at the Special Representative Meeting he moved that authority should be given to the Council to take appropriate action, at any time thought fit, to increase both the normal funds and any special funds which were regarded as necessary at the time.

The amendment by Cheshire was carried.

The amendment, as a substantive motion, was carried.

The CHAIRMAN accepted a motion from Lanarkshire to the effect that the Conference, while agreeing to give evidence to the Royal Commission, was determined to pursue by all practical and effective means a settlement of the present remuneration claim. In moving it, Dr. D. L. KERR said his Committee felt that the methods by which the claim might be pursued were vague. It was desirable to explore ways and means whereby the Government might be influenced in some way.

The motion was carried.

An amendment moved by Dr. J. D. F. NORMAN (Leicestershire and Rutland) that all possible steps should be taken centrally and locally to strengthen the Guild organization was carried as a substantive motion.

Alternative Service

A motion by Croydon was tabled in the following terms:

That in view of the profession's complete loss of confidence in the handling of the medical service by the Government and in its intention to implement its pledges to the profession, this Conference instructs the General Medical Services Committee, in consultation with the Council of the British Medical Association, to invite a body of men and women of the highest national reputation, without political affiliation and of pre-eminently lay composition, to elaborate a complete medical service for the nation, to be ready to be offered as an alternative to the present service, if, as a result of the findings of the Royal Commission or for any other cause at some later date, the profession decides to withdraw from the National Health Service.

Dr. J. NEWTON HUDSON, in moving it, said that if an alternative service were ready, and the Government together with the public knew about it, the profession would be in a strong position. At the same time, if the profession generally knew that such a course was being adopted, it would be a strong factor in strengthening the Guild. A predominantly lay body was proposed because it was desirable that no suggestion should be made that the profession was favouring its own interests.

Dr. P. HOLLIDAY (Wiltshire), in supporting the motion, suggested it would help if the recommendation were linked in some way with the agreement to co-operate with the Royal Commission. If the findings of the Royal Commission were unsatisfactory, the scheme would then be ready to put into operation.

Dr. WAND pointed out that the Council had already approved a body more or less of the character of that suggested to look at the National Health Service, but the purpose of the motion appeared to be somewhat different. It was to provide the alternative medical service in the event of a withdrawal from the National Health Service, and he suggested that lay men and women of national reputation could not be asked, and if they were would decline, to serve on a Committee whose purpose was to assist the profession in a matter which was bound to have political implications.

Dr. WAND asked whether Croydon would be satisfied if the principle behind the motion were referred to the G.M.S. Committee for consideration. Dr. HUDSON accepted the suggestion in that spirit. Dr. DAVIES adding that he was prepared to accept it on behalf of the G.M.S. Committee.

A motion by Essex that publicity in regard to the profession's remuneration claim should be directed to the

public in simple terms and on simple issues was moved by Dr. H. N. ROSE. It did not, he said, imply any great criticism of the Association's publicity department, but it did suggest that the methods employed were rather complicated. It was felt that some of the publicity put out was above the heads of the ordinary public.

The motion was carried.

Defence Trusts

On the motion of Dr. CATHERINE HARROWER, Deputy Treasurer of the National Insurance Defence Trust and General Medical Services Defence Trust, the report on action taken by the trustees since the last report to the Conference was received and approved. A motion that the report of contributions received from local medical committees up to March 30, 1957, be received and approved was also carried. She added that 67 committees had now reached 100% contributions.

A motion moved on behalf of Sheffield by Dr. W. DONNELLY, that steps should be taken in all areas to ensure that all members of the profession subscribed to the Defence Trust, was carried.

Interim Adjustment Debate Resumed

The Conference reverted to consideration of the distribution of the 5% interim adjustment upon which a decision was deferred until after the luncheon adjournment.

Dr. DAVIES made it clear that there could be no question of pursuing any policy without the approval and confirmation of the Conference. It was not possible to calculate the exact amount of new money to come from the Exchequer until the number of doctors on the lists of executive councils was available, but it was probable that it would be actually in excess of £2.5m. Very approximately, for Great Britain and for a period of 12 months, the initial practice allowance would cost £11,000; hardship payments and supplementary annual payments together would cost £22,000; the Exchequer superannuation figure would be £142,000; the capitation fees would cost £1,200,000, and the loadings would cost £1,500,000—bringing the total to £2,875,000. There was a difference, therefore, between the two amounts of something up to £375,000. The proposal was that that amount should be paid out now from money set aside from the current year's pool. There was no question of taking out any money which had been spent in the past, nor was money from the present final settlement (1956-7) involved, and, as the final settlement for the current year (1957-8) was likely to be at least £5m., there was plenty to spare. In other words, there was no question of the Committee spending money already owing to the doctors. They were getting a little more in advance.

The amendment by Dundee (see p. 338) was lost.

A motion was accepted from Plymouth, moved by Dr. J. L. HENRY, that, since the scheme proposed involved the use of money not included in the 5% increase and was of doubtful legality, voting thereon should be deferred. Dr. Henry said there were a number of people who felt dissatisfied about the way in which the money was distributed. When the matter was considered by Plymouth it was thought that the voting would be unanimously in favour of the scheme, because they did not know there was any controversial sum involved. Important matters such as the one now under discussion should always be disclosed beforehand, so that local medical committees did not instruct their representatives how to vote in ignorance of vital factors. Dr. A. MCGLASHAN (Manchester) seconded the motion. It seemed peculiar, he said, that a sum to make up £375,000 could be picked out of the kitty two years in advance.

Dr. F. GRAY (G.M.S. Committee) said that the Conference on the previous occasion stated emphatically that it did not want to defer distribution. He said he wondered whether any member was prepared to say that his constituents would like the loading to be not 1s. 6d. but 1s. 0.253d. They would surely prefer an even figure. That meant taking the

sum of £370,000 and getting it paid in advance. It was better to have the sum in round figures, and if the Conference wanted to make an adjustment later it could still do so. Dr. J. T. BALDWIN (G.M.S. Committee) said the 5% was money which was added to the pool. The pool then became increased by that amount and was distributed in accordance with the arrangements made under the distribution scheme. If there was any left over it was distributed as the final settlement.

Dr. A. TALBOT ROGERS (G.M.S. Committee) said that when agreement was reached on the method of paying out the final settlement equally on loadings and capitation fees the Committee never expected the sum to be distributed to be anything like the figures now shown. There was evidence that the Ministry was agreeing that the sum which would not otherwise be available for two years could be paid now if the profession so desired. Of the £375,000, only £33,000 was going to the special groups. The remaining £340,000-odd was being distributed to the same doctors in much the same proportions as they would get it if they waited for two years for it to come in the final settlement. They were being offered money now rather than in two years' time.

The amendment was lost.

Dr. F. G. TOMLINS (G.M.S. Committee, Assistants and Young Practitioners Subcommittee) moved that in place of proposals (c) and (d) of the distribution plan there be paid to each principal providing unrestricted general medical services a new loading on the lower range of the list. He said that the essence of the matter was the question of expenses. The small practitioner had a high expenses ratio, and that ratio had become even higher since the Danckwerts Award. Spens recommended that there should be some extra payment to cover expenses where they formed an unusually high proportion of the sum involved. That was the case with the small-list practitioner.

Dr. R. M. S. MATTHEWS (Assistants and Young Practitioners Subcommittee), in seconding the motion, reminded the Conference that his Subcommittee gave loyal support to the G.M.S. Committee in the action which they took in the remuneration dispute. The questions of unity, dignity, and status were, in his view, interwoven, and his Subcommittee was determined that the status of the profession would not suffer. Any increase available should be divided by the total number of doctors on the list and the average given to every doctor. The proposals were very generous in intention to principals whose lists were in the lower ranges and to the young self-establishing practitioner with an initial practice allowance. There was, however, a third group comprising doctors under 60 years of age in 1953 who had previously received fixed annual payments. Those annual payments would expire in 1958. A quarter of the doctors on the list were in the lower ranges, and only 700 doctors had benefited by recommendations (a) and (b) on the I.P.A. and S.A.P. Dr. N. NELSON (Dundee) suggested that it might be easier to take the total sum which went to every executive council and divide it equally between all doctors.

Dr. DAVIES replied that that proposal was made to the G.M.S. Committee and it was found to be quite impracticable. The G.M.S. Committee was very grateful for the support given by the Assistants and Young Practitioners Subcommittee and commended its enthusiasm to the rest of the profession. The G.M.S. Committee would be happy to meet its proposals, but it was quite impossible under the present regulations.

Dr. J. T. BALDWIN supported the amendment. It had been widely held throughout the profession, he said, that one complaint with regard to the distribution of the central pool was that it did not take proper cognizance of the fact that the practitioner with the small list had a higher percentage of expenses than the practitioner with the large list.

Dr. TOMLINS, in reply, stressed that his proposal was that the net remuneration should be distributed on the number of patients and that expenses should be more fairly distributed. It was an interim measure to meet an interim situation.

The amendment was lost.

The motion of the General Medical Services Committee was carried.

Annual Report of the General Medical Services Committee

Dr. DAVIES, in moving that the annual report of the General Medical Services Committee be received, said that during the session the chief items had been remuneration, the publication of the report on the disciplinary machinery, and the Government's interim report of the Mileage Committee. A new committee on practice accommodation in redevelopment areas had been set up, and a report had been published on trainee assistants which had received the approval of the Ministry. Throughout the session normal close co-operation had been maintained with the Medical Practices Committee, the College of General Practitioners, and the British Dental Association, and, through the Liaison Committee, with the Consultants and Specialists, Public Health, and Private Practice Committees.

Dealing with the central pool, on December 31 last year a final settlement of £4½m. was received for the year 1954-5. For the current year he was pleased to report that the Committee had persuaded the Ministry to advance the time for the final settlement by one-quarter, and it was hoped that the final settlement for the year 1955-6 would be received on October 1, 1957. He could not give the actual amount, but it would certainly be as much as £4½m. As a rough guide it meant, in effect, that on October 1 the average practitioner with the average-size list would receive about £200. The Committee was concerned about large amounts apparently lying idle for long periods, and the attention of the Ministry had already been called to the matter.

The Committee had been pressing for monthly payments for a number of years, and he was pleased to be able to report that at last they had been secured. Executive councils would shortly be advised. Another point concerned travelling subsistence in the case of interviews. For general practitioners it was at an inferior rate compared with members of the hospital services. That had been corrected. The lower fee for temporary residents had now been raised as a result of representations at the Ministry from 5s. to 8s. 6d., and it was hoped that this would remove many of the difficulties in regard to holiday camps. Dr. Davies reminded representatives that the interim report on mileage was that of a Government committee. It had been received at long last after sitting for several years. The G.M.S. Committee had its own special committee on the problems of rural practitioners. The total amount of money available for mileage remained the same as before. The Committee considered it best to allow its Rural Practitioners Committee to decide its own policy, and the G.M.S. Committee had therefore accepted that committee's recommendations.

The Committee had continued and repeated its efforts to get general-practitioner representatives on all regional boards and boards of governors of teaching hospitals. Although some disappointment had been experienced, representations were being pursued as regards future appointments. General-practitioner clinical assistants in the hospital service comprised the only section of the Health Service which had received no increase since the beginning of the Act. It was gratifying to report that an increase of 5% had now been obtained for them without prejudice to the full claim at the end of the dispute. Figures showed that there was some improvement in the number of general-practitioner beds in the year 1956 over the previous year. There was still room for improvement.

On prescribing and dispensing the official attitude of the G.M.S. Committee remained the same—namely, absolute opposition to all charges for prescriptions. There was a special difficulty raised by the rural practitioners which was considered sympathetically—namely, the obligation to put on large numbers of separate receipts where numbers of separate items were supplied at the same time. At a meeting the previous week at the Ministry the G.M.S. Com-

mittee had persuaded the Ministry to consider an alternative method of writing one receipt.

The Committee had agreed to go jointly with the Private Practice Committee and the Chairman of Council to have an exploratory meeting with the Ministry on the matter of drugs for private patients. The Committee was asked to make nominations for a new committee set up by the Government on prescribing costs. During the conflict on the claim a decision was taken to have nothing to do with this committee, but at the last meeting of the G.M.S. Committee it was decided to co-operate with the Ministry to the extent of submitting several nominations for inclusion on the special committee.

As to the Service Committees and Tribunal Regulations, an exhaustive survey had taken place which had lasted several years. The recommendations which the Conference approved last year were also approved by the Ministry and had been embodied in the regulations. The Committee had co-operated with the maternity services by preparing evidence for submission to the Cranbrook Committee. The Assistants and Young Practitioners Subcommittee formed a valuable part of the G.M.S. machinery, and had produced for the consideration of the Committee some splendid memoranda and documents.

Dr. Davies then referred to a matter which was not in the report. It concerned the *National Formulary*. The G.M.S. Committee, together with other branches of the profession, played its part in preparing that book. It was the official *National Formulary*, together with the *British Pharmacopoeia* and the *British Pharmaceutical Codex*. A new publication was about to be issued—it took two and a half years to prepare a new edition—and it would be in Latin titles and Latin subtitles. In compliance with requests a new venture in the form of a pharmacological classification had been prepared. It would be in English, and very largely in the metric system. Its financial success, he was informed, was already assured, because there had been large orders from overseas.

Final Settlement

A motion by Birkenhead was moved by Dr. E. G. WATSON that, since the final settlement had become such a substantial proportion of total remuneration (the last payment being approximately 8% of remuneration), the expense factor should be distributed to a greater extent with the capitation fee: by raising the capitation fee by 1s. or 1s. 6d. per year, the final settlement would be reduced to a much more reasonable figure and doctors would be paid a greater proportion of their expenses nearer the time at which they were incurred. He contended that a much greater proportion of practice expenses should be distributed in the capitation fee quarterly. In seconding the motion, Dr. M. MUNDY (Middlesex) said there was real hardship among many members of the profession, and the motion would go a long way to mitigate that hardship. Dr. DAVIES said that the G.M.S. Committee was fully cognizant of the difficulty and had already made representations to the Ministry on it. Dr. WATSON, in reply, said that the amount of money was so large that the Government had no excuse for deferring payment for nearly two years.

The motion was carried.

Dr. H. DICKIE (Northumberland) moved that in allocating supplementary payments to executive councils in future the sum shall be not on the total number of persons on practitioners' lists in the executive council's area but in proportion to the total amount of annual payments to practitioners. He said that in his area there were a number of doctors who lived in the wilds, and they did a great deal of doctoring and travelling. Their income was by no means derived entirely from capitation fees. They had very heavy expenditure, and it was felt that if the supplementary grant were given to doctors, not as a percentage of capitation fee but as a percentage of the total moneys paid to each general practitioner by each executive council, it would make a fairer method of distribution.

Dr. A. TALBOT ROGERS moved by way of amendment that the Government be informed that the present method of distribution of the final settlement appeared to the Conference to be no longer satisfactory, and that the G.M.S. Committee be instructed to prepare in advance of next year's Conference and in the light of the best evidence then available an equitable scheme for the future. The amendment was seconded by Dr. C. F. R. KILLICK (G.M.S. Committee).

Dr. F. GRAY (G.M.S. Committee) agreed that there was a case to be looked into. The rural practitioners had made one case and the Young Practitioners Subcommittee had another—namely, that, of the total pool, over £20m. was paid for expenses, but that money was not distributed according to the expenses. The young practitioners had passed a resolution asking the G.M.S. Committee to examine the question and not to come to a hasty decision, and he commended their wisdom to the Conference. The amendment seemed to prejudice the position by saying the present method was unsatisfactory. That was one of the things to be inquired into. Dr. DAVIES agreed that the assumption that the present method was no longer satisfactory was debatable. Apart from that there was no reason why it should not be accepted by the G.M.S. Committee.

Dr. TALBOT ROGERS said that the words used had been chosen carefully. If it did not appear to be no longer satisfactory there would be no need to look into it at all. It was necessary to say now to the Government that the profession did not feel that it could continue indefinitely under the present scheme, otherwise another year would be lost.

The amendment was carried.

The amendment, as a substantive motion, was carried.

In moving that interest should be paid on all moneys relating to the Central Pool in any one financial year which are still unpaid six months after the end of that year, Dr. P. J. DELAHUNTY (Buckinghamshire) said that 21 months was a long time to wait for the balance of annual income. A large number of doctors worked on a bank overdraft. Why should they pay interest to a bank on money which should have been in their account 21 months earlier?

The motion was carried.

A motion by Caernarvonshire, that it was considered that small-list practitioners were unfairly penalized by the loading of capitation fees from 500-1,500, as so many were well below the upper figure and were genuinely prevented by external factors from increasing their lists, and that therefore loading should be on patients from 1-1,000, provided that the total list was not less than 500, was considered.

The motion was lost.

Dain Fund

Dr. H. GUY DAIN presented the annual report of the Trustees of the Dain Fund, which is published at page 345 of this *Supplement*. It was, he said, an excellent report showing a year of great usefulness.

Claire Wand Fund

Dr. WAND presented the report of the Trustees of the Claire Wand Fund.

The first Award would be made, following the presentation of the report, to Dr. Dain. That was, he said, most appropriate. With regard to the Essay Competition, the quality of the essays was of a very high standard and the judging was not yet complete. The Conference agreed that the Council should be asked if it was willing for the prizes to be given at the adjourned annual general meeting of the Association in Newcastle upon Tyne.

No suggestions had been received on what other activities the Fund might sponsor. Dr. Wand felt sure that among general practitioners there must be some thoughts which would lead the Fund to make very good use of the moneys available.

procedure for filling practice vacancies was accepted as a reference to the G.M.S. Committee. That also covered an amendment by Denbighshire and Flintshire.

Emergency Call Service

Dr. F. M. ROSE, on behalf of Lancashire, expressed concern at the introduction of an Emergency Call Service and requested the General Medical Services Committee to give urgent consideration to the adequacy of deputizing arrangements throughout the country with a view to the preparation of a model scheme for the implementation of local rota systems in all districts. He suggested that the growth of the Emergency Call Service in London was a symptom of some failure on the part of the G.M.S. Committee. It would not have grown so rapidly as it had if it did not meet a need, and that need was present in many parts of the country. It was the duty of the G.M.S. Committee to prepare a model scheme which could be issued to local medical committees for their consideration.

The motion was accepted as a reference to the Committee.

General Practitioners and the Hospital Service

Dr. DAVIES accepted as a reference a motion by Oxford that the reduction of medical representatives on hospital boards and hospital management committees to 25% was to be regretted, and that the G.M.S. Committee should be requested to ask the Minister to reconsider the recommendations of the Guillebaud Committee.

A motion by Gateshead, moved by Dr. J. C. ARTHUR, that the matter of closure or change of usage of hospitals be regarded as one of extreme urgency was carried.

Trainee General Practitioner Scheme

A motion moved by Dr. J. B. FULTON (Cheshire) opposing the setting up of appeals machinery in any form was considered. He said he did not believe that any reviewing committee could possibly better the committee's views on the people for whom the request was made. Dr. DAVIES replied that in the past there had been cases where applicants had been rejected without any reason, and there had been no appeal. The present appeals machinery was working very well indeed.

The motion was lost.

Another motion by Cheshire that a trainer should be allowed trainee assistants for a maximum period of two years continuously, followed by an interval of one year without a trainee after which training might be resumed following review, was moved by Dr. J. B. FULTON. He said it would seem that certain practitioners who had a number of trainee assistants appeared to hold a rather special position *vis-à-vis* the rest of the medical community. Dr. P. J. DELAHUNTY (Buckinghamshire) called for a rejection of the motion, pointing out that the men were selected by local medical committees and their practices were examined. Dr. F. GRAY (G.M.S. Committee) expressed the hope that the motion would be rejected. "If you have a good teacher he should go on teaching," he said. "If he is not a good teacher he should not be allowed to teach at all."

The motion was lost.

A motion by Devon and Exeter that the remuneration of trainees, and in particular their car allowance, should be increased *pari passu* with the increases in general was agreed.

In moving on behalf of Essex "That this Conference considers that any general practitioner who applies to be a trainer should, on the first application, have his premises inspected and demonstrate his practice organization to a suitable visitor appointed by his local medical committee," Dr. H. M. ROSE said that often the practitioner's premises were not well known. Therefore it might be an advantage to the committee to have such information before making

the selection of the trainer. Dr. DAVIES said that it was a matter for local decision and discretion by local medical committees.

The motion was lost.

A second motion by Essex to the effect that a trainee should be expected to complete his training appointment was accepted by the G.M.S. Committee.

Prescribing and Dispensing

The report of the General Medical Services Committee dealing with prescribing and dispensing was approved, and a motion that the Conference pass to the next business was carried.

Service Committees and Tribunal Regulations

The Conference agreed that 13 motions standing in the name of Kent and Canterbury should be referred to the G.M.S. Committee.

Responsibility for Acts and Omissions of Deputy

Dr. W. DONNELLY (Sheffield) moved by way of amendment that the Conference rejects the General Medical Services Committee's explanation of its failure to act in the matter of immunity against the acts and omissions of deputies.

Dr. H. GUY DAIN, opposing the amendment, said that it was not true that the G.M.S. Committee had failed to act. It had acted and had obtained the same position for the doctor, his deputy, assistants, and locums as would be held in a civil court.

Dr. B. BURNS (G.M.S. Committee) said that the G.M.S. Committee had failed to bring in a single new item. If the Conference was to have precise instructions neglected in that fashion there would seem to be little purpose in having a conference.

The amendment was carried, and the amendment, as a substantive motion, was carried.

Vaccination and Immunization

A suggestion by Worcester that the Ministry should be approached to request hospital authorities to use notepaper of a size suitable to fit into Form E.C.5 unfolded or with a maximum of one fold was accepted as a reference to the G.M.S. Committee.

Maternity Medical Services

That the Maternity Medical Services payment should be increased, and that the amount of work to qualify for that payment be also increased, was the subject of a motion moved by Dr. C. W. MARSHALL (Devon and Exeter). The minimum amount of work laid down for qualification had never been considered to be realistic by obstetricians. Dr. DAVIES pointed out that if the midwifery fees were increased they would have to come out of the central pool at the expense of capitations and loans. While his attitude broadly was sympathetic, it would be more appropriate to defer the question until the remuneration claim was completed and when the Cranbrook Committee had reported. Dr. W. H. HAYES (Bristol) said that it was necessary to fight immediately for an increase in the fee, and it should not come out of the central pool.

The motion was carried.

A motion by Oxford, that, whenever a patient booked for confinement under the care of a general practitioner was admitted to a maternity hospital as an emergency, the full fee should be paid, regardless of whether the patient was in labour or not, was accepted as a reference to the G.M.S. Committee.

Certification

An amendment moved by Dr. J. C. ARTHUR (Gateshead) that the matter of four-weekly certificates be further pursued was carried as a substantive motion. Similarly, a

motion by Gateshead that "vague" certificates should be supplied in a form which would facilitate posting was accepted as a reference to the G.M.S. Committee.

Superannuation

Dr. J. C. ARTHUR (Gateshead) moved that the question of pension or early retirement merits further consideration and requires clarification. His committee considered that it would be possible for something to be drawn up in the shape of what insurance companies called an "attractive proposition." Dr. DAVIES said it sounded desirable, but a superannuation fund must remain solvent. If new benefits were desired it would be necessary to increase contributions or reduce existing benefits. Dr. H. J. GILBERT (Durham) agreed that the suggestion should be pushed ahead and supported the amendment.

Dr. ARTHUR said he realized that the proposition must be actuarially sound, but it was desirable that it should be in the form of a scheme so that its worth could be assessed.

The amendment was carried as a substantive motion.

Remainder of Annual Report

The remainder of the annual report of the General Medical Services Committee was approved.

Matters not Referred to in Annual Report

Function of Representatives

The Conference rejected a motion by Bath that it should be made clear that representatives of local medical committees at conferences were representatives and not delegates. Local medical committees should be given *carte blanche* to decide how they wished their representatives to act, said Dr. DAVIES.

Consultation with the Profession

Dr. W. G. MURRAY-BROWNE (Gloucestershire) moved that a uniform policy be adopted in limiting the electorate between adjacent executive council areas when expressions of opinion of all general practitioners were being sought. There were, he said, 350 members, and of that number no less than 100 were able to exercise anything up to four votes because they lived on the edges of the county. That was wrong and did not give proper representation.

Dr. DAVIES said it would be wrong to limit a practitioner to having a vote in one area only.

The motion was carried.

Elections to Committee

The SECRETARY announced that the following six candidates had been elected members of the General Medical Services Committee: Drs. J. C. ARTHUR, A. BROWN, I. G. INNES, A. M. MAIDEN, J. A. PRIDHAM, and F. M. ROSE. A hearty vote of thanks to the Chairman, Dr. A. BEAUCHAMP, proposed by Dr. W. M. KNOX, was carried with acclamation, and the Conference terminated at 6.40 p.m.

CONFERENCE DINNER

At the conclusion of the Conference representatives adjourned to the Savoy Hotel, where they entertained the Chairman and members of the General Medical Services Committee, the officers of the Association, and other guests to dinner. Dr. A. BEAUCHAMP presided. The toast of the General Medical Services Committee was proposed by Dr. R. B. L. RIDGE, and Dr. A. B. DAVIES, Chairman of the Committee, responded. Dr. C. J. SWANSON proposed the toast of the Chairman of the Conference, and Dr. BEAUCHAMP replied.

The collection taken for the Dain Fund realized the sum of £208.

THE DAIN FUND

REPORT OF THE TRUSTEES

The trustees of the Dain Fund report that during the year ended April 30 assistance has been given in sixteen cases, the grants amounting to £1,458 15s. Of these, thirteen were cases which the Trustees have been helping over a period of years. All the children are making good progress at their schools or universities.

New Cases

Three new cases have been undertaken by the Trustees and it is anticipated that help will be required for several years for each child. The grants totalled £308.

A doctor's widow with three children of school age asked for help with educational expenses. A local fund has been set up, but meanwhile it has been possible, in co-operation with the Ladies' Guild of the Royal Medical Benevolent Fund, to meet the school fees for the year 1956-7 for the eldest child, a boy, in his last year at preparatory school.

A doctor's widow required help with the university fees and expenses of her youngest son. A grant was made available for the academic year 1956-7 and assistance is also being given by the Royal Medical Foundation of Epsom College and the Sir Richard Stapeley Fund.

A grant to meet the summer term fees and expenses was made to a doctor's widow for her son who is in his last year at preparatory school. This allowed her time to make arrangements to send him to a senior school in September and to sort out her financial position.

Cases Concluded

Three of the cases which the Trustees have been assisting should be concluded this year. Satisfactory arrangements have been made in each case for their future education. The first is a student who has been undergoing a two-year polytechnic course before going to medical school. Subject to gaining exemption from 1st M.B. in the July examinations she has been accepted by the medical school and has been promised a county scholarship to cover expenses. Grants from the Dain Fund amounted to £60. The second case is that of a schoolboy who was assisted with a grant of £150 to enable him to complete his final year at school. He has now commenced medical studies and his expenses are covered by grants from the education authority and the local medical committee. The third is a schoolgirl who has been assisted by the Fund for the past two years and who is sitting the entrance examination to a school which is State-aided and endowed. The child's headmistress is confident that she will pass the examination. Gifts from the Fund have amounted to £100 and assistance has also been given in this case by the local medical committee.

Local Medical Committees' Help

The report shows that practically every case assisted by the Dain Fund is likely to require help over a number of years. It is for this reason that the Trustees earnestly hope that subscribers to the Fund will continue their valuable support. The Trustees are very glad to report that local medical committees have again given most generous donations to the Fund and have on many occasions assisted individual cases with special and direct additional grants. During the year 67 committees contributed £1,844 between them. The Trustees express their warm appreciation of this help.

The Trustees also express their best thanks to the Royal Medical Benevolent Fund and their Ladies' Guild and the Royal Medical Foundation of Epsom College for the help and advice which has been extended to the Dain Fund during the year.

The Trustees remind individual members of the profession that valuable help can be given to the Fund by completing a form of covenant for seven years or by sending a donation to the secretary.

APPEAL WON FOR MEDICAL OFFICER OF HEALTH

The British Medical Association successfully appealed to a Regional Whitley Appeal Committee against the decision of Coventry City Council to place its medical officer of health on the minimum scale of the appropriate range of salaries laid down by agreement in Committee C of the Medical Whitley Council.

The B.M.A. contended that the duties of the appointment warranted a considerably higher salary than the minimum. Among the duties are those of medical referee of the local authority's crematorium and a scheme for the provision of welfare facilities which had been recently included in the administrative responsibilities of the health department.

After hearing the case the Regional Appeal Committee recommended an increase in the medical officer's remuneration which would place him more than half-way up the scale in the appropriate range.

CENTRAL HEALTH SERVICES COUNCIL AND STANDING ADVISORY COMMITTEES MEMBERSHIP

The Minister of Health has made the following appointments and reappointments of medical members of the Central Health Services Council and Standing Advisory Committees for the period ending March 31, 1960:

Central Health Services Council.—New: Dr. T. M. Cuthbert; Professor R. Platt (during office as President of the Royal College of Physicians). Reappointed: Professor R. V. Bradlaw; Professor Digby Chamberlain; Mr. O. M. Duthie; Dr. F. M. Rose; Dr. J. G. Scadding.

Standing Medical Advisory Committee.—New: Sir Arthur Gemmell; Professor R. Platt. Reappointed: Professor Digby Chamberlain; Mr. O. M. Duthie; Dr. F. M. Rose; Dr. J. G. Scadding; Dr. G. W. H. Townsend.

Standing Dental Advisory Committee.—Reappointed: Professor R. V. Bradlaw; Dr. A. M. Horsnell; Dr. J. A. Moody; Dr. T. G. Ward.

Standing Ophthalmic Advisory Committee.—New: Mr. A. B. Nutt. Reappointed: Mr. J. H. Doggart; Mr. O. M. Duthie.

Standing Nursing Advisory Committee.—Reappointed: Dr. A. Elliott.

Standing Maternity and Midwifery Advisory Committee.—Reappointed: Mr. Arnold Walker.

Standing Mental Health Advisory Committee.—New: Dr. F. E. Pilkington. Reappointed: Dr. E. J. M. Bowlby.

Standing Tuberculosis Advisory Committee.—Reappointed: Dr. F. Ridehalgh; Dr. J. G. Scadding; Dr. G. W. H. Townsend.

Standing Cancer and Radiotherapy Advisory Committee.—Reappointed: Sir Harold Boldero; Dr. C. E. Dukes; Professor R. Milnes Walker; Mr. J. A. Stallworthy; Sir Clement Price Thomas; Mr. C. J. L. Thurgar; Professor B. W. Windeyer.

HOSPITALITY

Three Swiss doctors' daughters, each aged 17, wish to arrange holiday exchanges with British doctors' daughters between August and September.

A Swiss doctor's daughter, at present attending a language school in Bournemouth, would like to stay with a British medical family on an *au pair* basis, helping in the house or with children, from August 5 until December 15.

A French doctor and his wife would like to stay with a British medical family in the London area as paying guests for the months of August and September. A French doctor's son, aged 18, would like to visit Scotland in October on an exchange basis, the British boy spending September in Dordogne.

Would anyone interested please get in touch with Brigadier H. A. Sandiford, International Medical Visitors' Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Rural Practitioners and Interim Increase

SIR,—The Danckwerts Award gave doctors certain increases in their remuneration, and retrospective payments for the three years prior to the award, but it is not generally realized that it was agreed by our own representatives with the Minister of Health that, when those retrospective payments were made, they should be based on capitation and temporary resident payments only, and that drug capitation payments and mileage payments should be ignored. This resulted in all rural practitioners receiving far less than they should. Thus, for the year ending March, 1950, the average urban practitioner received a retrospective payment amounting to 11.3% of his remuneration, while the class "A" rural practitioner received only 7.9%, and still less than this if drug capitation payments had also entered into the calculation (see G.M.S. Committee Report 1956-7, Appendix B, Sub-appendix C, para. 8). Under the above scheme of distribution rural practitioners have already lost a considerable sum of money, and though our representatives were aware of this iniquity in 1953, they acquiesced in the same method of distribution of the "additional remuneration" which was paid in 1956. So we have lost some more. There is now an offer of a 5% increase in the global sum paid to doctors in general practice. Shall we rural doctors get 5% on 100% of our N.H.S. income? Or will it be perhaps 5% on 70% of our income as it has been in the past?

There seems to me to be no good reason for increasing the salaries of urban general practitioners at the expense of their country colleagues, and I trust that our representatives will now take the necessary steps to correct the injustice.—I am, etc.,

Leysburn, Yorks.

DAVID R. L. PEILL.

Private Practice Group

SIR,—In the *Supplement* of May 4 (p. 246) Dr. J. Etheridge announced the formation of a Private Practice Group, which aims to defend the interests of those who are engaged in private practice: the first of the objects of this Group is to press for the right of private patients to receive drugs on the same terms as National Health patients.

I am writing on behalf of this Fellowship to say how pleased we are to see the formation of this very active group of doctors who are interested in the welfare of private practice: many of us are disappointed that the Private Practice Committee of the B.M.A. has done so little to help in the objects which have stimulated the formation of this new Group.

The Fellowship is concerned with the preservation of the highest standards of medical practice, both inside and outside the National Health Service, and is not concerned with private practice alone. We hope that this new Group will have as one of its functions the formation within the B.M.A. of a group of those who are determined to see that the Association does realize the importance of independent practice—outside the N.H.S.—I am, etc.,

London, W.1.

E. C. WARNER,
Honorary Secretary,
Fellowship for Freedom in Medicine.

Appoint a Negotiator

SIR,—Very recently all G.P.s in this area were invited to a meeting to consider the co-operation of the profession with the Royal Commission and deferment of the resignation policy. Although some 130 doctors were notified to attend, only 20 were present. No negotiators could be expected to act with any degree of authority or confidence when this extraordinary lack of enthusiasm is revealed.

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Bargaining with politicians and civil servants is a tough and specialized job, and, with the utmost respect for the good intentions of our leaders, I would submit that they have not the training, experience, or toughness to compare with the shrewd, dynamic business-executive type, who is capable of negotiating with ministries with considerable success. Examples of the success of this type of negotiator in spheres other than medical are not unknown.

I therefore put forward the suggestion that the medical profession (most particularly the G.P.s) should take immediate steps to engage on a part-time basis a person of the highest ability and of strong personality, who would, for a most attractive remuneration (in the region of £10,000 for a most attractive remuneration (in the region of £10,000 per annum—a mere 10s. per annum for each G.P.), be prepared to fight for us on equal footing with politicians and civil servants. That such persons are available there is no doubt. Very many of my colleagues agree with this idea. I hope the profession as a whole will support and indeed insist on this as early as possible, since the only real hope for unity in our profession lies in skilful and inspiring leadership of the highest order. Perhaps the greatest crisis in our profession has yet to come when we enter into full discussion with the Government regarding the report of the Royal Commission. We should lose no time in selecting and briefing our negotiators.—I am, etc.,

L. E. LUCAS.

Huddersfield.

The Battle of the N.H.S.

SIR,—The battle of the N.H.S., in which you find yourselves at present engaged, has really been lost before the opposing forces moved into battle position—the Government force into a position of strong defence, the profession's force into one favourable for attack. A stalemate with a promise peace is indeed the only possible solution, and the outlook for the future can only be an indifferent one, for factors almost beyond control have made certain this conclusion.

Such factors include the one mentioned by Dr. F. T. Burkitt (*Supplement*, May 4, p. 244)—namely, the traditional control of pay and conditions in other branches of the Governmental service, a form of control which brooks no rank and file say in these important matters. Another such factor is that process of socialization which results in a levelling down and will in time reduce the former "haves" towards a median point, while at the same time raising the former "have nots" toward that same point. This process has been going on practically unheeded for years. Indeed it goes on within the profession itself. Thus, even although things are now "bad" for the medical profession, compared with teachers and policemen things are not so bad, and indeed even yet the members of the profession are, relatively speaking, well off (in the Soviet Union, I understand, physicians are nowhere near the top in so far as pay is concerned).

Quite apart from these two considerations, that process of equalization goes on also at the international level. Thus colonial or "have" powers are constantly being scaled down, while former colonies acquire new status and importance. Thus a Nasser can with impunity tweak the noses of the British lion and the French eagle, and get away with it. This very process has reduced the Empire (in spite of a recent hydrogen blast) to a shadow of its former self. This process will continue, resulting in an overcrowded land, a land of sagging opportunity, to a land where the deluded are being led by some to believe that there exists for them a welfare-State paradise of some kind, which can afford the best health protection in the world, the finest hospitals, and enough of them, as well as a well-paid, well-manned, and well-trained profession. The article by Mr. A. W. Adams (*Supplement*, May 4, p. 241) emphasizes how far short of this paradise you actually are.

It may well be then the best compromise to recognize the truth, and realize the odds, and then to shrug the shoulder and accept the weary load—or do as others have done, and many still are doing, try to get out, while there is yet time

and the means left. It is unfortunately true that at times of hardship for sections of the people, Great Britain's concern, as evidenced by practical countermeasures, has fallen far short of what it might have been. How much worse it is for the individual! The group may get more consideration in proportion to its power. Thus as a former Highlander I know how the Highlands and Islands have been dealt with by successive Governments. As a child at school, I remember hearing discussed the woeful plight of the crofters and fishermen in the Highlands and Islands. I believe people in power are still talking about solutions, but where are the people? They have gone, or are going, to parts unknown. It is a very old story. Is it any wonder that the individual realized that few really cared? My own former county of Ross and Cromarty has lost thousands upon thousands in the years that have passed, and indeed to-day its population is much less than it was a hundred years ago. If these people had not been the cream of the crop it would still have been bad for Britain. The fact that they were the finest of people makes it the worse for the motherland. But other countries, now in the ascendant, have gained their worth. In those lands they receive the recognition, a well-paid job, and a chance in life they deserved "at home." Why were such not considered? The answer of course is complex, but the core of truth is that the then "haves" who are now rapidly becoming the "have nots" controlled that fair land for self-interest, and in the case of the Highlands and Islands for the sporting society from the south. To such as those the people were less important than the deer and the sheep which now people the hills and the glens.

Until communities in Great Britain exercise their corporate right as communities in that larger community of the nation on behalf of all, and in helping not the least of them, this process of decay will continue inevitably, inexorably—yet another reason why the battle of the N.H.S. will not solve the inherent problem for victor or loser.—I am, etc.,

Worcester, Mass., U.S.A.

KENNETH I. E. MACLEOD.

Waste of Paper

SIR,—The latest letter from the Minister of Health concerning dispensing doctors tells us that Form E.C.57 has been revised. There are now to be three forms, in different colours, to cover amounts up to 3s. So far so good. The Minister is obviously anxious to save paper and to use only one form as a receipt for 3s., whereas hitherto we have had to use three 1s. forms. But paragraph 4 says: "You are requested to use the revised forms as soon as you receive them and *not* [his italics] to give receipts on the old form. *Any stocks you hold of the old form should be destroyed*" (my italics). When I read this I weighed our stock of the old form: it came to nearly 10 oz. (283 g.).

Now if we assume that there are 20,000 general practitioners in the country, and that a tenth of them are dispensing doctors, and if we assume, further, that each of these doctors has 10 oz. (283 g.) of the old forms in hand, it means that the total weight of these forms in doctors' surgeries all over England amounts to nearly 1½ tons (1,524 kg.). To this must be added the total weight of these forms with the dispensing chemists all over the country, and also the total weight of such forms in the various Government stationery offices and storage depots. I feel sure that the final figure would be about six tons (6,096 kg.): it may well be very much more.

I know that when compared with the oceans of paper which are used daily in Whitehall these six tons (6,096 kg.) must seem but a tiny drop, but to simple people like myself it seems a colossal figure. I would agree that it is probably uneconomical to put this paper to any other use: but why not put it to the use for which it was intended? What is the hurry to use the new forms before using up the existing stocks of the old ones?

What makes one so angry is that successive Chancellors of the Exchequer frequently make complacent statements that government expenditure has been cut to the utmost and that nothing more can be saved. How little do they

know! And yet this example of senseless and brutish waste occurs at a time when the Health Service is costing so much that it is unable to pay its doctors an adequate wage.—I am, etc.,

Duffield, Derbyshire.

STEPHEN WIGHT.

The Changed Picture

SIR,—The prolonged gestation of the B.M.A. negotiations has ended in a pseudocyclic anticlimax. If the profession in this country is ever to recover its prestige from this farcical situation, there will certainly be no credit due to our negotiators. At the very time when we, in this Division, were being exhorted to stand firm and support the avowed policy of the Association, Dr. Wand was negotiating a *volte face* with Mr. Vosper.

There is indeed a "changed picture," and the rank and file of the B.M.A. are determined that the change must be radical. In future the right hand of the Association must know what the left hand is doing. It is imperative that democracy should be allowed to work and that there should be no more hole-and-corner negotiations or interviews. If the B.M.A. is to give evidence before the Royal Commission we must be assured that the case presented is fair and just to all sections of the medical community.—We are, etc.,

R. CUBITT. J. W. SCHOLEY.
C. W. BIRKS. E. G. WILSON.
A. A. HALL. H. WILSON.
D. LONSDALE.

Sleaford, Lincs.

Pro Infantibus

SIR,—I am a retired G.P. and occasionally have acceded to requests to do a few surgeries for fellow practitioners. Sometimes, after a parent and child have passed from the surgery and through the outer door on to the road, I have had to ask myself, "Did I put that child's age and 'pro infant' on the scrip?" and have felt a little uneasy about it. The appearance of the blue-grey section of the *Formulary* has suggested to me that it would be a good idea if pads of blue-grey forms E.C.10 were issued for "pro-infant" prescriptions. The distinctive colour would be a safety measure against forgetfulness. Perhaps the suggestion merits more than mere consideration.—I am, etc.,

Bradford, Yorks.

ALLEN GLENN.

International Medicine

SIR,—While conducting a village surgery, a Hungarian refugee who had been in this country since February came to me and wished me to let her have a prescription for "serpasil." She thereupon showed me an ancient prescription, the only word of which was legible being the name serpasil. I could find no suspicion of blood pressure and with great difficulty made her understand that she was not getting the prescription. She then showed me an old photograph, which I guessed correctly was that of her mother, who in fact needed the serpasil. I then got hold of her husband, who spoke a few words of English, and with his help elicited the following information.

The woman and many others like her had, since their arrival in this country, found our National Health Service a minor gold mine. She had got her mother to send her Hungarian prescription over here, hence the difficulty in deciphering it.

This prescription was written in our script as the Hungarian physician had written it. She had with the aid of this been able to send monthly supplies of the drug at a shilling a time to her mother. Also three pairs of elastic stockings and other items. They told me that there was nothing unusual in this. Many refugees did it. I think it is even possible that she told the doctors whom the prescription was for, if they could have understood her. I may add that she was not even registered with any doctor.

I wonder how many others have had similar experience? If it is many, it is small wonder the Health Service does not pay.—I am, etc.,

Oundle.

VINCENT GRANTHAM.

General Practice in Hospitals

SIR,—In the June issue of the *Practitioner* there appears an excellent brief article analysing the treatment of sunburn given to 171 patients in the casualty department of Torbay Hospital during the three-month period July to September, 1955.

I wonder what the Torquay G.P.s think about this? How many of these cases were referred to hospital by a G.P.? And why? Is it possible that all or most of them attended the hospital in the first instance? They are certainly casualty cases, but did the casualty officer give them first-aid and then advise consulting a G.P.? How many cases, if any, required admission to hospital? And how many would have been more comfortably treated by a G.P.—being visited in their homes or hotels if necessary? There used to be a recognized rule that hospitals would not treat minor injuries or diseases except in real emergency or on reference by a G.P. Is this rule obsolete? If not, how many hospitals throughout the country are unaware of it or ignore it?

The interests of the individual patient are of course always paramount, but I venture to suggest that true answers to the above questions would be of interest to the committee to be set up by the Council of the B.M.A. to inquire "into the whole field of medical services in the light of experience gained of the National Health Service since 1948" (see report of S.R.M., *Supplement*, May 11, p. 255).—I am, etc.,

London, N.W.8.

ALISTAIR FRENCH.

REFERENCE

¹ Hastings, D. A., *Practitioner*, 1957, 178, 734.

Doctors and the Health Service

SIR,—Mr. Arthur Blenkinsop (*Supplement*, June 1, p. 309) wants to know more about our "working load." Perhaps the records of one single-handed country doctor may interest him.

I have a list of a little over 2,000. In the period January 1 to May 31, 1957, a period without a major epidemic, 869 individuals consulted me; I paid 1,250 visits and held 2,392 consultations in the surgery, a total of 3,642 items of service. Many of my colleagues with big lists in smoky cities must have done twice as much. How would other professions feel about this sort of "work load"? I cannot imagine a solicitor conducting 3,642 interviews in five months, being continuously on call and liable to a complaint and a fine if his clients were not satisfied with his efforts. Yet in medicine, as in law, good advice is not given by tired men in a hurry.

Under the N.H.S., to make a living general practitioners must take on more work than they can properly do. It is not merely that there is no incentive to better work; we are forced to do second-rate medicine so that we can afford to bring up and educate our families. This is the prostitution of an honourable profession. I like to feel that my patients can consult me with no financial barriers between us, and gladly suffer the ninety-nine trivial complaints that must be heard so that the one serious condition is brought to me in an early stage while it is still curable. But the system breaks down when the doctor is too busy to give the time to those that need it. The British public is getting its family doctors on the cheap and the public suffers from the system as much as do the doctors. Good medical care is not bought at cut prices. If the Government cannot afford to pay us the proper rate for the job it is not fit to employ a learned profession into whose hands is entrusted the health of the people.—I am, etc.,

Haddenham, Bucks.

R. P. C. HANDFIELD-JONES.

Multiple Representation

SIR,—I have read with interest what I must describe as Dr. A. L. Victor Russell's circumlocutory letter (*Supplement*, June 8, p. 330). How can anyone be responsible for anything until he knows what is required of him? We are ever ready in the B.M.A. to blame others for our own deficiencies. In my district during the last year there have

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been a number of B.M.A. and Guild meetings, but at not one of these meetings has an attendance of even 25% been achieved. How can any body be considered as representative while this apathy prevails? It is like asking an army to fight not knowing how many will turn up on the day, or even on which side it proposes to fight.—I am, etc.,

F. E. GRAHAM-BONNALIE.

Cheriton Bishop, Devon.

B.M.A. LIBRARY

The Library service is available to all members of the Association resident in Great Britain and Northern Ireland (and by special arrangement to members of the Irish Medical Association). A copy of the Library rules will be forwarded on application to the Librarian at B.M.A. House.

The following books have been added to the Library:

- Adams, J. C.: Outline of Fractures: Including Joint Injuries. 1957.
Barnes, J.: Care of the Expectant Mother. 1956.
Cameron, J. C.: British Paediatric Association, 1928-1952. 1955.
Chlorpromazine and Mental Health: Proceedings of the Symposium held under the auspices of Smith, Kline, and French Laboratories, June 6, 1955. 1955.
Chusid, J. G., and McDonald, J. J.: Correlative Neuroanatomy and Functional Neurology. Eighth edition. 1956.
Ciba Foundation Symposium: Paper Electrophoresis. 1956.
Color Atlas of Oral Pathology. Prepared under the auspices of the U.S. Naval Dental School. 1956.
Crowe, F. W.: Multiple Neurofibromatosis. 1956.
Cushman, B.: Strabismus: Diagnosis and Treatment. 1956.
Dack, G. M.: Food Poisoning. Third edition. 1956.
Diethelm, O.: Etiology of Chronic Alcoholism. 1955.
Dorcas, R. M. (Editor): Hypnosis and its Therapeutic Applications. 1956.
Dunn, L. C., and Dobzhansky, T.: Heredity, Race, and Society. 1955.
Epstein, E.: Skin Surgery. 1956.
Ford, E. B.: Genetics for Medical Students. Fourth edition. 1956.
Fraser, Sir I. (Editor): Conquest of Disability. 1956.
Gardner, L. I. (Editor): Adrenal Function in Infants and Children: A Symposium. 1956.
Glaser, J.: Allergy in Childhood. 1956.
Glover, E.: On the Early Development of Mind. 1956.
Graham, J. R.: Treatment of Migraine. 1955.
Graham, P.: Care and Feeding of Twins. 1956.
Green, D. E. (Editor): Currents in Biochemical Research. 1956.
Hackett, G. S.: Joint Ligament Relaxation Treated by Fibro-osseous Proliferation. 1956.
Hahn, P. F. (Editor): Therapeutic Use of Artificial Radioisotopes. 1956.
Harrington, M. (Editor): Hypertensive Drugs. 1955.
Harris, L. J.: Vitamins in Theory and Practice. Fourth edition. 1955.
Henderson, Sir D., and Gillespie, R. D.: Textbook of Psychiatry. Eighth edition. 1956.
Hill, L. W.: Treatment of Eczema in Infants and Children. 1956.
Jewsbury, E. C. O.: Royal Northern Hospital, 1856-1956. 1956.
Krupp, M. A., et al.: Physician's Handbook. Ninth edition. 1956.
McCance, R. A., and Widdowson, E. M.: Breads White and Brown: Their Place in Thought and Social History. 1956.
"Minitax": Doctor's Pocket Guide to Taxation. Second edition. 1956.
Mullett, C. F.: Bubonic Plague and England: An Essay in the History of Preventive Medicine. 1956.
Ostlere, G., and Bryce-Smith, R.: Anaesthetics for Medical Students. Third edition. 1956.
Quarles van Ufford, W. J.: Therapy of Bronchial Asthma. 1956.
Roberts, H.: Anaesthesia for Midwives. 1955.
Royal College of Physicians: Minimal Pulmonary Tuberculosis found by Mass Radiography. (Prophylactic Tuberculosis Survey by V. H. Springett and A. J. Eley.) 1956.
Schaefer, G.: Tuberculosis in Obstetrics and Gynecology. 1956.
Schwimmer, M., and Schwimmer, D.: Role of Algae and Plankton in Medicine. 1955.
Shedlovsky, T. (Editor): Electrochemistry in Biology and Medical Physics. 1955.
Stacy, R. W., et al.: Essentials of Biological and Medical Physics. 1955.
Tanner, J. M., and Inhelder, B.: Discussions on Child Development. 1956.
Tredgold's Textbook of Mental Deficiency. Ninth edition by R. F. Tredgold and K. Soddy. 1956.
Wallen, R. W.: Clinical Psychology: The Study of Persons. 1956.
Weber, F. P.: Interesting Cases and Pathological Considerations. 1956.
Whitla's Dictionary of Medical Treatment. Ninth edition by R. S. Allison and T. H. Crozier. 1957.
Wilkinson, G. S.: Road Traffic Offences. Second edition. 1956.
Wright, H.: Sex: An Outline for Young People. Third edition. 1956.
Yoffey, J. M., and Courtice, F. C.: Lymphatics, Lymph, and Lymphoid Tissue. 1956.

A reciprocal agreement on social security between the U.K. and Sweden came into force on June 1. Under the agreement (the first fully reciprocal one with a country outside the Commonwealth) Sweden makes its health services available for all British nationals, including tourists. The agreement also covers cash benefits for unemployment, sickness, maternity, old age, widowhood, orphanhood, and industrial injury. A social security convention between the U.K. and Belgium was signed on May 20 and will come into operation when it has been ratified by both Governments. Under the convention contributions paid under both countries' social insurance schemes would be taken into account when claiming benefits in either country. Belgium will provide medical benefits for citizens of the U.K. and the Colonies either employed or receiving British retirement pensions in Belgium.

H.M. Forces

ARMY

Major-General F. C. Hilton-Sergeant, C.B., C.B.E., Q.H.P., late R.A.M.C., has retired on retired pay (Reserve Liability).
Brigadier (Temporary Major-General) F. McL. Richardson, D.S.O., O.B.E., late R.A.M.C., to be Major-General.
Brigadier R. A. Bennett, Q.H.P., late R.A.M.C., to be Major-General (Supernumerary).
Colonel L. R. H. Keatinge, O.B.E., late R.A.M.C., to be Brigadier.
Colonel J. H. G. Hunter, late R.A.M.C., has retired on retired pay.
Lieutenant-Colonel D. T. Swift, O.B.E., from R.A.M.C., to be Colonel.

TERRITORIAL ARMY

ROYAL ARMY MEDICAL CORPS

Lieutenant-Colonel (Acting Colonel) T. F. Redman, T.D., has relinquished the acting rank of Colonel.
Lieutenant-Colonels A. Willcox, T.D., and E. F. Baines, T.D., have been granted the acting rank of Colonel.
Majors A. S. Bookless and D. W. Mayman have been granted the acting rank of Lieutenant-Colonel.
Majors J. Wood-Wilson, T.D., and S. Freeman, T.D., having attained the age limit, have retired, retaining the rank of Major.
Major G. D. Thompson, T.D., has retired, retaining the rank of Major.
Majors C. G. Rob, M.C., and H. Dickie, T.D., have resigned their commissions, retaining the rank of Major.
Major P. Jacobs, from T.A.R.O., to be Major.
Captains (Acting Majors) J. H. H. Oliver, N. B. Crisp and T. N. Reynolds to be Majors.
Captains R. A. Goodhead, L. G. R. Wand, F. J. Dunn, W. B. Ashby, and W. E. Hurford to be Majors.
Captains R. A. N. Petrie, J. A. R. Parker, T. W. A. Glenister, C. C. Crampton, A. C. Coulthard, and J. S. Barrett, M.C., have been granted the acting rank of Major.
Captain J. S. Inkster, from Reserve of Officers, Class III, to be Captain, and has been granted the acting rank of Major.
Lieutenant (War Substantive Captain) P. F. Boreham, from Emergency Commission, to be Captain, and has been granted the acting rank of Major.

ROYAL AIR FORCE

Wing Commanders J. R. Cellars, A.F.C., R. H. Pratt, C. C. Barker, A.F.C., J. C. Taylor, O.B.E., W. T. Buckle, and E. S. Sidney to be Group Captains.
Flight Lieutenants D. J. Muller, E. Stokoe, A. L. C. Packham, and R. H. Brown have been transferred to the Reserve, retaining the rank of Squadron Leader.
Flight Lieutenant P. Cauthery to be Squadron Leader.
Barbara D. Wilberforce and C. M. C. Smelt to be Squadron Leaders.

ROYAL AUXILIARY AIR FORCE

Flight Lieutenant R. Summers to be Squadron Leader.

ROYAL AIR FORCE VOLUNTEER RESERVE

Squadron Leaders J. C. McC. Browne, W. D. Doey, and E. A. K. Hoppins have relinquished their commissions, retaining their rank.
Flight Lieutenants W. D. Davey, A. G. Edwards, J. Guthrie, R. P. Parkinson, G. R. Steed, R. W. Stevenson, G. B. Barbour, and J. Taylor have relinquished their commissions, retaining the rank of Squadron Leader.

HER MAJESTY'S OVERSEAS CIVIL SERVICE

The following appointments have been announced: A. G. M. Davies, M.B., Ch.B., D.M.R.D., Specialist Radiologist, Uganda; P. W. Hutton, M.D., M.R.C.P., D.T.M.&H., Senior Specialist, Uganda; W. C. D. Lovett, M.D., D.P.H., D.T.M.&H., Senior Medical Officer, Tanganyika; R. C. Nauth-Misir, M.B., B.S., D.P.H., Venereal Diseases and Dermatologist, British Guiana; M. P. C. Brun, M.S., F.R.C.S., Surgeon Specialist, Mauritius; M. R. Potter, M.B., B.S., Medical Officer, Federation of Nigeria; G. Wolfenden, M.B., B.Ch., Medical Officer, Kenya; S. G. Gordon, M.B., B.S., D.T.M.&H., Deputy Director of Medical Services, Eastern Nigeria; Bernice M. Hulse, L.M.S.S.A., Chest Physician, British Honduras; S. E. Onwu, M.B., Ch.B., D.T.M.&H., Director of Medical Services, Eastern Nigeria; R. A. Browne, M.B., Ch.B., D.A., Assistant Anaesthetist, Barbados; R. J. Coogan, L.R.C.P.&S.I., and L.M., D.P.H., Medical Officer of Health, Medical Department, Jamaica; Antoinette I. Hallett, M.B., B.S., D Obst.R.C.O.G., Lady Medical Officer, Somaliland; C. A. M. Procope, M.R.C.S., L.R.C.P., Medical Officer, Trinidad.

Association Notices

Diary of Central Meetings

JUNE	
17 Mon.	S.H.M.O.s Group Executive Committee, 2 p.m.
18 Tues.	Planning Subcommittee, Occupational Health Committee, 10 a.m.
19 Wed.	A.R.M. Agenda Committee, 2.30 p.m.
20 Thurs.	General Medical Services Committee, 10.30 a.m.
25 Tues.	Psychological Medicine Group Committee, 2 p.m.
26 Wed.	Medical Staffing Subcommittee (Central Consultants and Specialists Committee), 10 a.m.
26 Wed.	Medical Education Committee, 2 p.m.
27 Thurs.	Journal Committee, 2 p.m.
28 Fri.	Central Ethical Committee, 10.30 a.m.
28 Fri.	Assistants and Young Practitioners Subcommittee, General Medical Services Committee, 2 p.m.
28 Fri.	Infectious Diseases Subcommittee, Public Health Committee, 2 p.m.

JULY

3 Wed.	Welsh Committee (at Shrewsbury), 2.15 p.m.
10 Wed.	Annual Representative Meeting (at Newcastle upon Tyne), 10 a.m.
11 Thurs.	Annual Representative Meeting (at Newcastle upon Tyne), 9.30 a.m.
12 Fri.	Annual Representative Meeting (at Newcastle upon Tyne), 9.30 a.m.
13 Sat.	Council (at Newcastle upon Tyne), 9 a.m.
13 Sat.	Annual Representative Meeting (at Newcastle upon Tyne), 10 a.m.
15 Mon.	Annual Representative Meeting (at Newcastle upon Tyne), 10 a.m.
15 Mon.	Annual General Meeting (at Newcastle upon Tyne), 12.30 p.m.
15 Mon.	Council (at Newcastle upon Tyne), at conclusion of A.R.M.
15 Mon.	Adjourned Annual General Meeting and President's Address (at Newcastle upon Tyne), 8.15 p.m.
18 Thurs.	G.M.S. Committee, 10.30 a.m.
25 Thurs.	Ingleby Evidence Committee, 11.30 a.m.
25 Thurs.	Joint Committee of B.M.A. and Magistrates' Association, 2 p.m.
26 Fri.	Staff Side, Committee C, Medical Whitley Council (at 14, Russell Square, W.C.), 10 a.m.
26 Fri.	Full Committee C, Medical Whitley Council (at 14, Russell Square, W.C.), 11.30 a.m.
29 Mon.	Industrial Nursing Subcommittee, Occupational Health Committee, 2.30 p.m.

Branch and Division Meetings to be Held

CAMBERWELL DIVISION.—Thursday, June 20, summer outing. Visit to Dorking by motor coach from St. Olave's Hospital, Rotherhithe, S.E., at 12 noon. Visit to Bencard Laboratories.

CARDIFF DIVISION.—At B.M.A. House, 195, Newport Road, Cardiff, Monday, June 17, 8 p.m., annual general meeting.

EAST SOMERSET DIVISION.—At Swan Hotel, Wells, Thursday, June 20, 8 p.m., annual general meeting. Preceded by the usual informal dinner at 7 p.m.

GLOUCESTERSHIRE BRANCH.—At Wheatstone Hall, Brunswick Road, Gloucester, Thursday, June 20, 6.15 p.m. Address by Mr. Robert V. Cooke: "Thyroid Disease in Medical and Surgical Practice."

HARROGATE DIVISION.—At Royal Bath Hospital, Harrogate, Wednesday, June 19, 8.30 p.m., annual general meeting.

METROPOLITAN COUNTIES BRANCH.—At B.M.A. House, Tavistock Square, London, W.C., Tuesday, June 18, 3 p.m., annual general meeting. President's address by Dr. J. W. McCarthy.

MID-ESSEX DIVISION.—Sunday, June 23, 10.30 a.m., visit to new Public Health Laboratory, Chelmsford and Essex Hospital, London Road, Chelmsford. Talk by Dr. R. Pilsworth: "New Virus Diseases in Great Britain," followed by demonstration of methods used in their diagnosis.

SOUTH ESSEX DIVISION.—At Railway Hotel, Hornchurch, Friday, June 21, 9 p.m., annual general meeting.

YORKSHIRE BRANCH.—At Public Library, Vernon Road, Scarborough, Wednesday, June 19, 3 p.m., annual meeting.

Meetings of Branches and Divisions

CITY OF DUNDEE DIVISION

The annual general meeting was held on May 3, 1957. The following officers were elected for 1957-8:

Chairman.—Dr. F. B. Proudfoot.
Vice-chairman.—Mr. J. F. O. Mitchell.
Immediate Past Chairman.—Mr. W. D. Giffen.
Honorary Secretary.—Dr. J. M. Langlands.
Honorary Treasurer.—Dr. G. M. Grant.
Honorary Public Relations Secretary.—Dr. Marjory Hogg.

CROYDON DIVISION

At the annual general meeting held at Wellesley Road on May 14, 1957, the following officers were elected:

Chairman.—Mr. V. Wilkinson.
Vice-chairman.—Dr. Edith Newling.
Chairman-elect.—Dr. P. O'Flynn.
Honorary Secretary.—Dr. G. Hirst.
Assistant Honorary Secretary.—Dr. J. T. Hanna.
Honorary Treasurer.—Dr. W. H. Hardy.

DARTFORD DIVISION

The annual meeting was held on May 2. The following officers were elected:

Chairman.—Dr. G. R. Ford.
Honorary Secretary.—Dr. C. Bolton.
Honorary Treasurer.—Dr. W. Reverson.
Vice-chairman.—Dr. H. C. Calvey.
Immediate Past Chairman.—Dr. G. B. Stratton.

DUNDEE BRANCH

The annual general meeting was held on May 3, 1957. The following officers were elected for 1957-8:

President.—Dr. M. M. Stewart.
President-elect.—Dr. D. C. Clark.
Immediate Past President.—Dr. R. S. McKenzie.
Vice-presidents.—Mr. A. Buchan and Dr. I. B. L. Weir.
Honorary Secretary.—Dr. A. F. Catto.
Honorary Treasurer.—Dr. G. M. Grant.

GLOUCESTERSHIRE BRANCH

At the annual general meeting held on May 9 the following officers were elected:

President.—Dr. R. Harvey.
President-elect.—Dr. C. de Vere Shortt.
Honorary Secretary and Treasurer.—Dr. H. G. Scott-Kerr.
Honorary Assistant Secretary.—Dr. R. H. Ellis.

METROPOLITAN COUNTIES BRANCH

A lecture demonstration was held at B.M.A. House on May 5 on "Medical Implications of Nuclear Warfare," by courtesy of the Director-General, Army Medical Services. Major-General W. D. Hughes introduced the speakers. Colonel T. M. R. Ahern discussed organization for disposal and screening of casualties; Lieutenant-Colonel R. E. Watson demonstrated immobilization of fractures; Lieutenant-Colonel R. Hunt discussed treatment of burns, and Lieutenant-Colonel P. D. Stewart effects of radiation; Lieutenant-Colonel D. H. D. Burbridge discussed implications of food and water contamination, sanitation, etc. It is stated that the War Office is prepared to hold similar demonstrations in other Branches if requested.

MIDDLE EAST BRANCH

A meeting was held in Beirut on May 13, 1957. Sir Russell Brock lectured on "Basic Principles in the Diagnosis of Lung Diseases" to an audience of 70, and then answered questions for half an hour. The lecture was followed by a cocktail party which was attended by the British Ambassador to the Lebanon.

PORTSMOUTH DIVISION

The annual meeting was held at the Queen Alexandra Hotel on May 7, 1957. The following officers were elected for 1957-8:

Chairman.—Dr. H. K. Childs.
Vice-chairman.—Dr. J. R. Rickett.
Honorary Secretary.—Dr. V. H. Martindale.
Honorary Treasurer.—Dr. P. W. Wells.

SOUTH-EASTERN COUNTIES DIVISION

The annual meeting was held at the Station Hotel, Newtown St. Boswells, on April 21. Twenty-one members were present. The following officers were elected:

Chairman.—Dr. G. W. Balfour.
Vice-chairman.—Dr. P. Henderson.
Honorary Secretary and Treasurer.—Dr. E. H. Duff.

TUNBRIDGE WELLS DIVISION

The annual general meeting was held on May 2, 1957. The following officers were elected for 1957-8:

Chairman.—Dr. R. P. Liston.
Vice-chairman.—Dr. J. W. Crawford.
Honorary Secretary.—Dr. J. L. Donnelly.
Honorary Treasurer.—Mr. H. McN. Symons.
Honorary Assistant Secretary.—Dr. P. A. Crowley.

SUPPLEMENT TO THE
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British Medical Association

SPECIAL REPRESENTATIVE MEETING

A Special Representative Meeting was held in the Great Hall, B.M.A. House, on June 12 at 11 a.m. Dr. I. D. GRANT was in the chair.

The CHAIRMAN reported that the Agenda Committee had in three cases arranged in groups a number of motions which covered substantially the same ground, and had selected in each group one motion on which it proposed that discussion should take place. Representatives of the constituencies concerned had been informed of the proposals.

A report by Dr. A. BEAUCHAMP, chairman of the Conference of Representatives of Local Medical Committees, on the Conference held on June 6 (*Supplement*, June 15, p. 335) was received.

Dispute on Remuneration

In moving that the report of the Council on the dispute on remuneration be received, the Chairman of Council, Dr. S. WAND, said that, following a resolution moved by Dr. Gorsky at the Special Representative Meeting on May 1 (*Supplement*, May 11, p. 254), the question of taking legal action on the contractual validity of Spens had been considered by two leading counsel and another counsel in conference. Dr. Gorsky was present at the conference. The outcome was that in present circumstances counsel regarded it as not being in the best interests of the profession that such form of action should be taken, and that was a firm decision.

With regard to public health practitioners, the Public Health Committee met on May 17 and passed four resolutions (*Supplement*, May 25, p. 297). Interviews with the Minister of Health and the Chairman of the Royal Commission had taken place and had been completely fruitless. Neither of the two suggested alternatives was obtained. The Minister indicated that the fact that public health doctors were paid from local authority funds made the position very difficult, and even if it were found possible to include the public health practitioners it would greatly prolong the time which it took the Royal Commission to report.

Evidence to Royal Commission

Dr. G. S. R. LITTLE (Greenwich and Deptford) moved that the meeting approve the previous recommendation of

the Council that in present circumstances it was undesirable that the Association should co-operate in any way with the Royal Commission on the remuneration of doctors and dentists. He said that his Division took the view that first thoughts were the best, and the first thoughts of the Council were that evidence should not be given to the Royal Commission. There were very good reasons for so thinking. No Government need accept the findings of any Royal Commission, and the Commission did not in any way resemble an arbitration body. The profession came into the Service on the basis of Spens, and if it were not legally valid it had taken the Government eight years to discover it. Whatever came out of the Royal Commission would not resemble Spens and would be very much less attractive. Any question of clarifying the terms of reference, approaches to the Prime Minister and other Ministers, although well-meaning no doubt, were not moving the matter forward. They were clouding the real point at issue.

Dr. J. S. HAPPEL (Winchester) formally moved by way of amendment that the Association should give evidence to the Royal Commission. Suggesting that attempts to secure unity within the profession could be bought at too high a price, Dr. R. P. LISTON (Tunbridge Wells) said that lip service had been paid to it over the years, but it had turned out to be a mirage which so many people always thought it would be. "But surely in the past months our vision has become clearer, and we now see affairs in their true light," he said. "We demand and call out for fearless and resolute leadership in Association affairs," he concluded. We should assure our leader to-day that he had our complete confidence and trust in presenting a factual presentation of our unanswerable case to the Royal Commission.

Dr. C. P. WALLACE (Guildford) agreed that the Association was facing a situation which called for resolute leadership, and he paid tribute to the magnificent work which Dr. Wand had done for the Association. Dr. Wallace said he was not, however, quite so happy about the Council over which Dr. Wand presided. There were those who had been critical of the autonomous committees because it was feared that in time the Council of the Association, instead of being an independent and authoritative body, would become a rubber stamp. It was the duty of a committee such

as the General Medical Services Committee, which boasted autonomy, to arrive at a decision and to express that decision. If there were a minority who felt that they could not continue to serve on that committee, it was their duty to resign; but the committee should never refuse to give a lead. Those remarks applied infinitely more to the Council of the Association.

Dr. J. W. TAYLOR (Aberdeen and Kincardine Counties) expressed the view that it was advisable for the Association to give evidence before the Royal Commission. Apart from anything else, it would be discourteous not to give evidence. If no evidence were given by the profession the Royal Commission would ultimately present findings on incomplete knowledge. Dr. A. V. RUSSELL (Council), supporting the amendment, said that the decision to give evidence to the Royal Commission had now become inevitable. He disagreed with what Dr. Wallace had said on the question of leadership to the extent that a month earlier there happened to be a fifty-fifty division in Council, and any Chairman who gave a lead in those circumstances would in his view have been acting quite improperly. There was little doubt that the vast majority of constituents in the periphery were in favour of giving evidence, and, that being so, there was no alternative. But he urged the meeting to remember three things. Sir Harry Pilkington had stated that the Royal Commission was not an arbitration body nor a judicial tribunal; Mr. Macmillan had publicly stated that the Government would not necessarily be bound to accept any recommendation of the Commission; and, finally, whatever came out of the Commission it had no bearing on the present outstanding dispute with the Government.

Mr. H. H. LANGSTON (Winchester) suggested that, if evidence were to be given, "we should give it, having firmly made up our minds that it is highly desirable that we should do so, and that we have really a good case to make," he said. Dr. J. A. GORSKY (Westminster) said that if Scottish practitioners agreed to take a test case in the Scottish courts any decision to give evidence before the Royal Commission at the Special Representative Meeting became invalid, because a case before a judicial body must inevitably put any decision to give evidence before the Commission in abeyance. Whether or not he succeeded in persuading representatives not to give evidence, Dr. Gorsky appealed to them to forget the issue of remuneration. The appointment of a Royal Commission was a device on the part of the Government to stop a particular issue, that issue being that Spens had never been repudiated and had in fact been accepted. If evidence were given before the Royal Commission he felt certain that the profession would be a party to repudiating Spens. No evidence should be given before the Royal Commission until a decision had been arrived at in Scotland, and on that basis the question could again be considered.

Dr. J. A. PRIDHAM (Council) said that, despite what had happened, he was still unconvinced that the profession ought to give evidence. He hoped that representatives would inform their constituents that recent events had surely shown that the power of the Government over the profession was very nearly complete. "Could we hear less about autonomy and more about unity? Could not doctors and branches begin to sink their differences and unite, in view of the common danger? This is our 'Dunkirk.' We have not won a victory and we have not yet been defeated; but danger looms ahead."

Dr. G. CORMACK (Newcastle) said he supported the amendment that evidence should be given. He was perturbed by the unfortunate position of public health practitioners. It seemed deplorable that any Government should drive a learned profession such as medicine into a position in which one section of its membership was to be left out in the cold. The excuse had been given that it would be difficult because local authorities were involved. If local authorities constituted the real difficulty it was all the more reason for having an integrated national health service in which the

public health doctors played their part. Dr. W. N. LEAK (Mid-Cheshire) asked whether the profession could not agree to give evidence, but state, at the same time, that it reserved its rights under Spens. Dr. C. R. G. BARRINGTON (Bromley), speaking against the amendment, suggested that no other profession or union would put up with the treatment which had been meted out to the medical profession. If the profession agreed to give evidence it would be another step down the ladder.

Dr. WAND, Chairman of Council, in reply to an earlier question, said that counsel had said that they could see no reason why, in the circumstances, evidence should not be given, but that it must be clearly stated that it would be without prejudice to the profession's rights to require the Government at a later stage to fulfil its moral obligations in the matter.

Dr. LITTLE, in reply, said that there seemed to be an attitude on the part of some Representatives that the profession did not want to give evidence but that it had better give evidence. Why? There was no reason at all. He asked the meeting to say that its considered opinion was that in the circumstances the profession did not desire to give evidence before the Royal Commission. Dr. HAPPEL (Winchester), in reply, referred to Dr. Gorsky's point advising delay while the position of contract law in Scotland was considered, and said that evidence should be given before the Royal Commission started making up its mind. Delay might prove disastrous.

The amendment was carried and adopted as a substantive motion.

The following amendment, handed in at the meeting, was carried without discussion: To add at the end of the substantive motion, "On the understanding that it is given without prejudice to the profession's right to press for fulfilment of the Government's moral obligations inherent in the public and private assurances given by it and its predecessors to doctors taking part in the National Health Service."

Public Health Doctors

Dr. R. P. HENDRY moved on behalf of Rugby that evidence should be given to the Royal Commission, provided a suitable agreed procedure is adopted (not later than December 31, 1957) for reviewing the remuneration of doctors in the public health service. In his view the Royal Commission could be turned to very great advantage. Public health doctors had always wanted some reasonable basis for their remuneration, and now there was a chance to do something about it. "We must not rat on our public health colleagues," he said.

Dr. J. C. ARTHUR (Gateshead) supported the amendment. Some speakers appeared to have taken the attitude that the profession was giving evidence because it could not do anything else. It was doing nothing of the kind. Far from being beaten the profession had not yet even fought. The profession was in a position to make conditions, and in his view one of those conditions should be to support public health colleagues. There should be some inquiry promised which would satisfy the public health practitioners and the remainder of the profession before evidence was given before the Royal Commission. Dr. R. W. MCCONNEL (Bucks) also supported the amendment.

The following amendment, handed in at the meeting, was moved by Dr. J. A. STIRLING (Public Health Service):

After the words "Royal Commission" add "only on condition that either (a) all doctors in the public health service be included within the scope of the terms of reference of the Royal Commission or (b) that an undertaking is given by the Government to the British Medical Association that an independent inquiry into the remuneration and status of all public health medical officers will be set up immediately."

Dr. Stirling said that the council of the Society of Medical Officers of Health a short time ago expressed the view that unless something definite was done for public health practi-

tioners they would irrevocably be classed as local government officers and not as part of the medical profession. Every time the public health practitioners had gone to the Industrial Court one more nail had been put into their coffin tying them to local government. Secondly, there had been refusal to bring public health doctors within the province of the Royal Commission; and, thirdly, no independent inquiry had been set up to investigate the questions of status and remuneration of the public health medical officers. At the Annual Representative Meeting at Glasgow a B.M.A. committee was set up which, broadly speaking, was to deal with the unification of the profession, and at Brighton the Meeting unanimously passed a resolution asking the Government to set up a committee of inquiry into the status and remuneration of the public health service. That was submitted months ago and was doubtless lying somewhere in Whitehall. The Council of the Association passed a resolution to the effect that evidence should not be given to the Royal Commission unless its terms of reference were altered to include public health medical officers. The Council, to be a thinking body, surely realized the implication of that resolution when it passed it. The logical conclusion was to carry the amendment which he had moved.

Dr. J. S. G. BURNETT (Public Health Service) said a doctor was penalized in being classed as a local government officer. The Government's decision in respect of the local authority medical service and the Royal Commission was announced after a spontaneous and unsolicited intervention by local government associations. Finally, he believed that the threat of a salaried service was now imminent, and he had tried to indicate what were the implications of a salaried service. He suggested that, in the political and economic set-up of the country at the present time, neither social medicine nor curative medicine were fundamental issues. The factor before the Government was how cheaply could this country provide a national medical service.

The CHAIRMAN expressed the view that the amendment went further than the amendment moved on behalf of Rugby. In those circumstances when the debate was concluded he would seek the opinion of the Meeting on the amendment moved by Dr. Stirling.

Dr. A. V. RUSSELL (Wolverhampton), supporting the amendment, reminded the meeting that a decision had been taken to give evidence to the Royal Commission on the understanding that certain things would happen. They should not break a promise given to another section of the profession. Dr. W. MORGAN EVANS (Middlesex, South) said that the amendment now made the position of the public health doctors perfectly clear, and he asked the meeting to support it. Dr. J. MADDISON (Public Health Service) said that the findings of the Royal Commission, without evidence from the British Medical Association, would receive little respect and consideration when published. If the Association made the inclusion of the public health service a condition of giving evidence, the Government would be hard put to refuse.

Dr. J. E. MILLER (Glasgow) pointed out that a most regrettable factor was that the terms of the present amendment were almost identical with those of the resolution passed by the Public Health Committee and on which the Chairman of Council acted in seeking an interview with the Minister of Health. The very requests being made had already been rejected by the Government. It had refused to include public health medical officers within the terms of the Royal Commission, and had refused to commit itself to setting up an independent inquiry into the remuneration of public health officers. With that information before it, it seemed obvious that the meeting must decide whether the decision of the Government should be accepted, and to go ahead leaving the public health officers behind. He submitted that no respectable professional people would consider such action. He asked Representatives to remember that in the past various sections of the profession had been wooed from different angles by the Government, and, if the

profession now gave evidence without the public health practitioners, who knows what other part of the profession would be the next to be chopped off?

Dr. J. G. M. HAMILTON (Edinburgh) expressed the hope that the meeting would not pass the amendment. There was a considerable degree of confused thinking being expressed. To tie in the question of the remuneration of public health doctors with the giving of evidence to the Royal Commission was, in his opinion, quite ridiculous. The Government could not care less whether the profession did or did not give evidence, therefore any conditions imposed by the profession would be ineffective. A different approach must be made. The attainment of the profession's objectives—namely, a review and a proper adjustment of the remuneration of public health practitioners and the question of status—did not, he suggested, go along the line of attempting to attach conditions to the giving of evidence before the Royal Commission.

Dr. W. N. LEAK (Mid-Cheshire) endorsed the remarks of Dr. Hamilton. He had not so far heard any reason why the Whitley Council machinery should be superseded by special investigation. Dr. J. S. M. ORD (Glasgow) supported the amendment and pointed out that the Royal Commission would be so conversant with the figures that they would be used in comparison against the remainder of the profession. Dr. A. M. GOLDTHORPE (South-east Essex) said it did not matter whether the profession gave evidence before the Royal Commission or not, but it mattered greatly whether they let down their colleagues in public health.

Dr. I. M. JONES (Council) said that for some time now there had been three courses open to the profession. The first was to give evidence before the Royal Commission; the second was to withdraw from the service; and the third was not to withdraw from the service. There had been no real disagreement that the last course of doing nothing was quite impracticable. Why, then, must the profession put itself in an untenable position by trying to attach conditions to the giving of evidence which it knew it was quite impossible to fulfil? Did Representatives really believe that the profession would withdraw from the Service on the issue under discussion? The amendment did not point the way to helping public health doctors. Dr. A. BROWN (Cambridge) supported Dr. Hamilton and Dr. Jones. Dr. A. BARKER (Council) said he hoped the amendment would be rejected. He was in great sympathy with the public health doctors, but was not sure that the amendment expressed the view of the Public Health Committee. At the last meeting of the Public Health Committee, held on May 17, an amendment to the effect that the profession should not give evidence to the Commission unless the public health medical officers were included was rejected by twelve votes to four votes with one abstention. Surely if the Public Health Committee members themselves were in doubt about the wisdom of such action it would be most unwise for the meeting to pass the amendment. Dr. G. CORMACK (Newcastle) said that whether or not the profession gave evidence was not a matter which would directly determine the terms of service of the public health practitioners. Furthermore, he doubted whether it would be possible to make an issue of it within the profession.

Introduction of Dr. S. C. Sen

Before adjourning for lunch the CHAIRMAN introduced to the meeting Dr. Sen, Past-President of the Indian Medical Association and a member of the Council of the World Medical Association. Dr. SEN, in a brief response, said the most cordial relations existed between the British Medical Association and the Indian Medical Association. He had listened with great interest to the debate and could confirm that the problems facing the profession in India were similar to those in Britain. He desired sincerely to thank the Association for its kindness.

The meeting adjourned for lunch.

Resumed Debate

Dr. H. D. CHALKE (Public Health Committee) said he was astonished to hear Dr. Hamilton's remarks concerning confused thinking and threats. Many Representatives would recall how Dr. Hamilton spoke at Glasgow and Brighton on the question of unity of the profession. Here was an opportunity to show that the profession was united. If the profession went ahead on its own, casting adrift the public health practitioners, the latter would then go forward on their own; but it was an opportunity for the profession to do something as a whole.

Dr. J. B. TILLEY (Chairman, Public Health Committee) said he desired to make it quite clear that those in the public health section of the profession would welcome a united front, for therein lay the salvation of the profession. No one should think that the Public Health Committee would not be delighted if the amendment were carried. But it was necessary to put the points of view which prevailed in the meeting of the Public Health Committee. When agreement was reached on the Committee's resolution it was realized that to make a statement of that sort alone was not sufficient, and Dr. Wand and he went to see the Chairman of the Commission and the Minister of Health. In the amendment it was suggested that evidence should be given only if one or other of two possibilities were tied to the giving of evidence. Great efforts had been made to get the Chairman of the Royal Commission and the Minister to agree to either of these possibilities, and he desired publicly to state how much those in the public health service were indebted to the Chairman of Council for the way in which he presented the case both to Sir Harry Pilkington and to the Minister. However, neither he nor Dr. Wand, with all his skill, could get a shadow of a promise from either of them that they would include the public health doctors in the Royal Commission. Thus a decision had been taken to leave the matter to the Special Representative Meeting. The Public Health Committee had not met since Dr. Wand and he saw the Minister and the Chairman of the Royal Commission, so no decision had been reached on what action, if any, the public health doctors could take. It was for the Meeting to decide whether it was in the best interests of the profession to give evidence, omitting one branch, or whether it should stand united and possibly achieve nothing.

Dr. WAND, Chairman of Council, pointed out that general practitioners and hospital medical staff were engaged in a dispute with the Government. The dispute of the public health officers was primarily with local authorities. That was recognized as long ago as March, 1956, in a statement issued by the Negotiating Committee, which was handling the dispute until recently. The situation was clearly set out and was not challenged at that time or since. Representatives had heard that the Public Health Committee itself refused to accept the amendment now before the Meeting. The profession at large had the public health medical officers' interests at heart, and everything possible would be done to help them. It might be possible to help them in some other way. Dr. Tilley had stated that it was his intention to present to the Royal Commission the sort of evidence which would have been presented to a court of inquiry had it been set up. The Minister made it clear that the payment of the public health medical officers by local authorities was a very great difficulty, and that, if the local authorities and the medical officers of health came and asked him for a court of inquiry, he would give it sympathetic consideration. The medical officers of health wanted it, but local authorities did not want it. The dispute therefore must be aligned more towards local health authorities than towards the Ministry of Health. Those were the facts.

The amendment, if passed, would mean that evidence would not be given to the Royal Commission, because he was sure that the Minister felt powerless, in the absence of any agreement by local authorities on the point, to include the public

health medical officers in the remit of the Royal Commission.

Dr. STIRLING, in reply, said that surely the purpose of the Royal Commission was to review the levels of remuneration of the profession in the future and not just the present claim. It was appreciated that local authorities were responsible for the payment of public health practitioners' salaries, but it should be borne in mind that the Government paid a 50% grant. With regard to the Whitley Council, the public health doctors had been to industrial courts on four occasions and had been classed as local government officers. He saw no hope of that position changing. The question raised concerning withdrawal from the service was in his submission a red herring. Withdrawal from the service was not being discussed, and the question did not arise.

Dr. Barker had referred to the Public Health Committee's resolution. The first part of the resolution made it clear that the Committee considered it imperative that public health doctors should be included in the Royal Commission's terms of reference, and in its wisdom it simply left the decision to the Special Representative Meeting; but the Council of the Society of Medical Officers of Health, representing all branches of the public health service, wanted something more positive, so it suggested that a positive proposal should be submitted to the Meeting—namely, that public health practitioners should either be included in the remit of the Royal Commission or be given an independent inquiry. A great deal had been said about sympathy and resolutions which was not practical. If unity were desired in the profession sympathy was not enough. Finally, he could not recollect the Council of the Association having repudiated its promise to the public health practitioners that evidence would be given only if all members of the service were included.

Dr. Stirling's amendment was lost.

The Rugby amendment was also lost.

Validity of Spens

The Meeting proceeded to consider an amendment by Gloucestershire, moved by Dr. H. G. DOWLER, that Council be instructed to give evidence before the Royal Commission only provided that proceedings were first initiated to test the validity of the Spens Reports in the courts. Dr. Dowler said there was a feeling amongst some people that the Association and the profession had to some extent lost the initiative. The Royal Commission had been imposed upon the profession against its will, and a demand for arbitration had been turned down. Giving evidence to the Royal Commission to some people carried the implication that the profession was prepared to drop Spens. The Chairman of Council had stated that, in the opinion of learned counsel, taking legal action would not be in the best interests of the profession. It would be interesting to know what was meant by "best interests." If it meant that there was a very poor chance of the profession winning its case, it was relatively unimportant. Whatever the outcome of taking legal action might be, it would be to the advantage of the profession.

Dr. B. BURNS (Sheffield) said that Sheffield was not satisfied that the last word had been said on the validity of Spens. Everybody must realize that no settlement with the Government was worth a moment's consideration unless it included the right to arbitration. Dr. Gorsky and others had been telling the profession that for years but it had been preoccupied with money. The policy of every Government had clearly been consistently to deny what was assumed as an automatic right by every other section of the community and which was the essence of the dispute. The job before the profession was to bring about a situation in which it was able by law to extract justice from a defaulting employer. At the last Special Representative Meeting speakers stated that the Royal Commission was a form of arbitration, and the fact that they took the trouble to make

that statement meant that they realized that it was a very important point. When the Meeting heard from authoritative lips that it was a form of arbitration they cheered. They were tranquillized and no doubt felt warm inside. "Do you really think that if the Government had the slightest intention of submitting to arbitration it would have gone to so much trouble to refuse it?" he asked. The Royal Commission was the Government's method of avoiding arbitration, and even if the Commission recommended arbitration the Government would not accept it, otherwise it would have agreed with it before. Dr. Burns suggested that the public had very good reason to be grateful to the medical profession, yet when the politicians brazenly broke faith with the profession by means of a sequence of shady tricks, was there a public outcry on behalf of the profession? There was not a murmur. "I feel that we have earned a greater measure of loyalty from our patients than this," he said. "It seems that the welfare state breeds a type of mentality in which there is no room for anything but self-interest." "Please do not be stampeded into helping the Royal Commission to write off Spens too quickly," urged Dr. Burns. "If Spens is valid we can afford to discuss the future at our leisure. If it is not valid, then we were enticed into the Service by a confidence trick and the Government has forfeited any right to our co-operation."

Dr. G. E. MOLONEY (Oxford) appealed to Representatives not to abandon any legal rights which they knew they possessed and sell their birthright of Spens for a mess of pottage in the form of the Royal Commission. Dr. GORSKY said he was still unrepentant. The Government had appointed a Royal Commission to prevent the profession going to the courts. Nothing could be lost by going to the courts and asking for a declaration on the validity of the agreement both in England and in Scotland. Dr. J. AUBREY IRELAND (Shropshire and Mid-Wales) said that, unless the validity of Spens was tested in the courts, the great danger was that Spens would be allowed to go by default.

The CHAIRMAN asked at this stage for all matters relating to Spens and counsels' opinion to be treated as confidential. Dr. WAND said that because they had to debate such matters in full daylight they might show their hands in a way which could embarrass those who acted on behalf of the profession. That was the reason for the Chairman's request that the matters should be treated confidentially.

Following the debate *in camera* the Gloucestershire amendment was lost, as was an amendment by Sheffield in similar terms. The original amendment by Winchester as amended was carried as a substantive motion.

Dr. J. H. STRANGER (North Glamorgan and Brecknock) felt that, in view of the assurance that the validity of Spens could be challenged at some later date, no useful purpose would be served in taking further his Division's motion, which stressed that a declaration of validity should be contested in the courts, but not to the exclusion of giving evidence to the Royal Commission.

Dr. A. M. MAIDEN (Lincoln) moved:

That this Representative Meeting requests the Council of the Association to have the validity of "Spens" as a legal contract with respect to the general practitioner in the National Health Service determined by the courts.

There were similar motions by the Oxford and City Divisions.

It was agreed on the suggestion of Dr. WAND that the discussion should be taken as being *in camera*.

Replying to the discussion, Dr. MAIDEN said he had not heard any valid reason for not putting the case to the courts. If nothing came of it, they would have got a great deal of publicity for the fact that there had been a shameful abrogation of doctors' rights.

The motion was lost.

Safeguarding Public Health Doctors' Interests

The meeting accepted a motion from Sunderland urging Council to ensure that the interests of all doctors engaged in

the public health service were safeguarded. Dr. I. M. JONES said that it enabled representatives to express the sympathy which all felt for the plight of the public health doctors. Dr. L. LAMONT (Edinburgh) moved that the Association should, in any discussion connected with the findings of the Royal Commission, and by all available means, press for the safeguarding of the position of public health doctors relative to that of other members of the profession.

The following motion by South Bedfordshire was also carried:

That, if the findings of the Commission are accepted, immediate steps be taken to ensure that public health medical officers should receive comparable improvement in their terms and conditions of service.

Salisbury withdrew its motion, which stated that while being prepared to give evidence before the Royal Commission the meeting regretted the exclusion of public health medical officers and would not be prepared to negotiate a settlement that did not include medical officers of health. Dr. WAND said that this was something about which the meeting had no knowledge; they did not know whether the report of the Commission would make it possible to do what was suggested.

Dr. A. W. RIDDOLLS (York) moved:

That the remuneration of public health doctors should be considered as being under review, and so should not be regarded by the Royal Commission as a criterion for decisions on general-practitioner remuneration.

He explained that the motion was framed on the assumption that the terms of reference would not be widened to include public health doctors and that the Association agreed to give evidence. Dr. H. D. CHALKE (Council) warned that others would be judged by the low salaries given to public health doctors.

The motion was carried.

Right to Arbitration

Dr. WALLACE (Guildford) said that it was essential that they should re-express their claim for arbitration. "In a position such as we find ourselves in," said Dr. Wallace, "in a monopoly service where the Government is our taskmaster and our pay-master, it is essential, if we are to remain free, that we should get the right to arbitration. Be under no delusion—the Royal Commission is poles apart from arbitration."

Dr. H. GUY DAIN (Council) said that he was as keen as anybody that they should have the right to arbitration. But the profession was in a peculiar position. It was employed by the House of Commons. In the past the Government had made a mistake—it allowed the doctors to go to arbitration with Mr. Justice Danckwerts, and that judgment was accepted by the House of Commons. No Government was prepared to allow that anybody should ever again take the House of Commons to arbitration.

Dr. Dain suggested that the Representative Body should consider what kind of action it would support in order to see that in future doctors got some security if they were to continue in Government service. They had no security. The profession was not bound in any way to accept the report of the Royal Commission, nor was the Government. A new way must be found out of this impasse. It was practically impossible, constitutionally, for any Government, whatever its politics, to go to arbitration. The problem of the direct employment by the House of Commons of a large profession was a new one which should be solved in a way which offered security and fair terms for the future.

Dr. RUSSELL (Council) said that doctors were not employed by the House of Commons. General practitioners were in contract with local executive councils. Consultants and specialists had a contract with regional hospital boards. Dr. Russell remembered Dr. Dain, as far back as 1950, saying that if they did not get arbitration they must be prepared to leave the National Health Service, because arbitra-

tion was the most important thing. "Before Danckwerts we were prepared to come out, and that was why we got arbitration," said Dr. Russell. "We can do nothing but good in passing this resolution." Dr. WALLACE (Guildford) denied that arbitration was constitutionally impossible. He did not know of any change in the constitution of this country since the Danckwerts Award.

The following resolution from Guildford was carried:

That the Royal Commission should not be regarded as arbitration in any way, but that evidence should be given while insisting on arbitration as the final court of appeal.

Another motion, from Torquay, which was accepted, stated the profession should agree to give evidence, especially stressing the need for negotiation in all disputes and arbitration in all cases where negotiation failed.

Dispensing Fee and Mileage

Dr. J. S. HAPPEL (Winchester) moved that the Royal Commission be invited to consider the dispensing capitation fee and mileage fund entirely on their merits. He pointed out that since the dispensing capitation fee was fixed at 9s. 9d. the cost of drugs had shot up and the value of drug stock had increased. Time had now to be spent collecting the 1s. charge and giving receipts and rendering accounts to the executive council, and doctors had been advised to insure against loss by theft of the money while it was in their possession. The mileage fund had remained at £2m. for over five years. The cost of a gallon of petrol in 1950, the year on which the fund was based, was 3s.; it was now 5s.

Dr. WAND warned that this was dangerous ground. If this motion was carried it would mean that the Royal Commission would begin to consider distribution of the moneys. They might even consider ways in which doctors were to be paid, whether by capitation fees or in other ways. This was not a matter for submission to the Royal Commission.

The motion was lost.

Government's Dictatorial Attitude

The meeting adopted the following motion from Hyde:

That notwithstanding the decision to give evidence, this Meeting deplores the dictatorial attitude of the Government and its failure to arbitrate or negotiate.

Full Consultations

Moving a motion from Herts, seeking an assurance that full consultation would take place immediately between the Minister and the profession when the Royal Commission reported, Dr. D. L. GULLICK posed a situation in which the Government decided that it was not expedient to implement the report in five or ten years. His Division wanted to tie the Government to meeting the profession whether it decided to implement the report or not.

The motion was carried.

Belfast's Special Circumstances

Belfast Division asked that on account of its special circumstances it should give evidence independently to the Royal Commission. The Division's representative, moving the motion as a reference to Council, explained that Belfast and Northern Ireland was a partially independent area in which a high proportion of the doctors were B.M.A. members. They were under a separate Act, but their remuneration and terms of service were similar in many ways to the English and Scottish Acts.

The motion was adopted as a reference to Council.

Public Health Remuneration

A motion from Harrow, carried as a reference to Council, expressed the conviction that the Royal Commission could easily recommend proper remuneration for local authority

medical officers by taking their present salaries as a base rate and indicating what sum added thereto from the national exchequer would raise their salaries to a level comparable with the remuneration of other doctors in the National Health Service. Dr. ROWE explained that the object of the motion was to bring the fact to the attention of the Commission so that it might consider what ought to be the remuneration of public health doctors.

Withdrawal Decision Deferred

A motion from North-east Suffolk stated that a decision on withdrawal from the Service should be deferred.

Dr. J. D. D. BOSWELL (North-east Suffolk), moving it, said: "We in Suffolk may be 'silly Suffolk' or we may be realistic Suffolk. We find our local meetings are not well supported. We find our levy is not as well supported as it should be. And we are dubious of the effect of a withdrawal with the changing circumstances." Mr. S. F. LOGAN DAHNE (Council) said that deferment would give a chance to promote that unity which was essential and a chance also to perfect the Guild organization and increase its funds, which again was essential. It would also give the Association a chance to prepare better alternative health schemes. The vital battle would not take place until after the report of the Royal Commission. "I should like the press to stop using the word 'strike,'" continued Dr. Dahne. "It is an abominable word—and they know that we shall not strike. We shall continue to work for our patients and not work for the Government. That is not a 'strike.'"

The Representative Body agreed to defer a decision on withdrawal.

Statement by Chairman of Council

Dr. WAND then made a statement. He said that he had again been in consultation with the Minister of Health and had asked him to consider a further interim adjustment should the Royal Commission decide that it could not report before next Easter. Dr. Wand read to the Meeting the following letter that he had had from the Minister.

When you came to see me on May 23 we talked about my letter to you of May 15, and you asked whether I could elaborate what I said in the third paragraph as to the Government's attitude in the event of the Report of the Royal Commission being unduly delayed. I fear it is hardly possible for me to go much beyond what I have already said. I could, however, add that, should the Chairman of the Royal Commission announce that it is unlikely that evidence can be obtained in time for the Commission's report to be published by Easter, 1958—and I believe he has promised to do this should the circumstances arise—then I would certainly consider any representations your Council might make, including a claim for a further interim adjustment. But you will, I know, understand that it is impossible for me to commit myself in any way at this stage, when neither we nor you can have any idea what might happen in the interim or what such a claim might amount to.

Dr. Wand described the letter as a very thin opening of that particular door, but added that it did indicate that the Government would consider a further interim claim from the profession at that moment at the latest. He thought it would be appropriate to tell the representatives, now that the meeting had given a lead, his view on how he thought matters stood. "It may be that this decision will be interpreted as the end of hostilities," continued Dr. Wand. "That is not so. Our dispute with the Government remains unresolved. Our objectives remain: our status, our relationship with the Government, and our claim. In my view," said Dr. Wand, "you have declared an armed truce." The profession had shown its willingness to avoid unnecessary conflict, but that must not be regarded as a decision of weakness. They must still be prepared to take the most vigorous action. There was still the danger of a full-time salaried service.

The breathing-space must be used to strengthen themselves and to achieve unity. They had always been in a difficulty

in these particular matters because, with their democratic machinery, they had to bring things out into the open, which other bodies did not have to do. The Government could make decisions quickly and behind closed doors. There had been differences of opinion in the past, but what was wanted now was not recrimination but unification. "With your help and trust your Council will not fail you," concluded Dr. Wand.

Withdrawal from Service

Dr. M. W. EDDINGS (Portsmouth) moved:

That the question of withdrawal from the National Health Service should be deferred until after the preliminary report of the Royal Commission or not later than May, 1958.

Dr. N. NELSON (Dundee City) wanted the Meeting to discuss the position at Easter, 1958. Dr. WAND said that this was an anticipatory resolution which could cause embarrassment to those at the centre. He suggested that the matter could be left to those who dealt with the matter on the profession's behalf.

The motion was lost.

Rugby called for withdrawal not later than January 6, 1958, unless the present claim was referred to arbitration or a realistic interim adjustment of (say) 14% was granted forthwith, and it was agreed by the Government as a binding legal contract that the final settlement should be retrospective at least to the date the present claim was notified to the Minister. The Rugby motion further stated that if a final settlement was not reached by January 1, 1959, the interim adjustment should then be increased to 18% and by 4% annually thereafter. Speaking to the 18% and by 4% annually thereafter. Speaking to the motion, Dr. HENDRY said that the Royal Commission was set up to consider future remuneration. The present claim should be considered on the current basis of agreement. The fact that the profession had held off for something like five years and then staked a large claim instead of staking a small claim every year had caused the difficulties. Asking that the Association should press for a realistic interim award, Dr. Hendry pointed out that 14% was half what it had asked for. It was the profession and not the Government which had made all the concessions over the years.

The motion was lost.

The CHAIRMAN suggested that as the time was getting late the Meeting would not wish to discuss motions on the relative merits of a mass or progressive withdrawal. From among the motions on this subject it was agreed that one from South Warwickshire should be debated.

That the machinery and method of withdrawal be kept under constant review.

Dr. C. E. G. GILL (Cardiff) said that there were many "angry men" among them, and not without cause. They had been dismayed at the action of the Government. It had forfeited the confidence of doctors, and it was the Government's responsibility to the country to restore that confidence by fair dealing. The profession must organize its shift service basis, but for a remodelling of the whole health service.

The South Warwickshire motion was carried.

A motion from Newcastle upon Tyne calling for an *ad hoc* committee to be formed at once to review the proposed withdrawal scheme was withdrawn. A similar motion, pressed by Rugby, was lost.

Alternative Health Service

A motion from Blackpool and Fylde stated:

That, pending the report of the Royal Commission and the outcome of the promised full consultation between the Government and the profession, the B.M.A. Council should continue with plans for a withdrawal of service and also proceed urgently with preparations for an alternative health scheme.

Dr. A. M. TOMLINSON explained that his Division wanted to be sure that there would be an alternative health scheme

into which doctors could withdraw if the occasion arose in the future. Dr. R. G. GIBSON (Council) said that the Winchester Division thought that a plan should be formed for the alternative health service, but more important was that both centrally and in the periphery they should get down to some action which would bring about a united profession. At the moment the Association's democratic machinery had left them at the mercy of the autocratic machinery of the Royal Colleges. Dr. R. W. McCONNEL (Buckinghamshire) said that a skeleton plan would give them a lever if the report of the Royal Commission was very bad. Dr. A. B. DAVIES, Chairman of the General Medical Services Committee, said that it was already an instruction to Council to prepare an alternative health service. He thought the motion could be referred to Council without further discussion.

Dr. TOMLINSON, replying, said that there should be some alternative scheme ready for the time when the Royal Commission reported.

His Division's motion was carried.

Special Levy

Dr. B. BURNS (Sheffield) moved:

That a special levy be maintained for the purpose of establishing an adequate defence fund for general practitioners, and that steps be taken to establish comparable funds for the other branches of the profession.

He explained that the aim of the Sheffield motion was to divorce the special levy from the plan for withdrawal. They felt that it would be the height of folly to wait until a few weeks before withdrawal was contemplated and then ask for large sums. The fund must be adequate to assure the more timid and also to destroy the timid arguments which were used. He suggested that contributions could be in the form of loans. Dr. Burns felt that if the consultants intended to stick to the Joint Negotiating Committee he wanted to know why. The profession had learned in 1957 the lesson which it should have learned in 1948. "We should not run any more risk of having our unity destroyed by the Royal Colleges at a crucial moment," said Dr. Burns. If necessary the general practitioners must go forward alone. Mr. S. F. LOGAN DAHNE (Council), supporting the motion, pointed out that if every member of the profession gave the cost of one packet of cigarettes a week it would be £270,000 a year. Dr. W. E. DORNAN (Council) said that many members of the Representative Body and the profession were conscious of the fact that if they desired to practise decent medicine the profession must be prepared to withdraw from the National Health Service. The profession had shown clearly that it was not ready at the moment to do this, and Dr. Dornan thought that one of the main reasons was that some of the waverers were not satisfied that there was enough money to ensure that the Guild would be a fighting machine. He was dismayed at the proposal (by the Conference of Local Medical Committees) that the present scheme should be abandoned.

Dr. DAVIES, Chairman of the General Medical Services Committee, said that his Committee was in entire agreement about the intention behind these trusts, but only last week the Conference—the body which subscribed the bulk of the money—decided that the special levy should be abandoned. Dr. RUSSELL (Council) said that whether they eventually had phased or mass withdrawal, they would need money, and it seemed that now would be a suitable time to collect it.

The motion was carried.

Policy-making Body

A motion from Northamptonshire asked the meeting to state that it was imperative that decisions of policy should be taken by the profession as a whole, as expressed by the Representative Body. Mr. E. E. T. TAYLOR thought that the separate interests of the profession could indicate their

views to the Association and let the Representative Body decide on matters of high policy. Dr. J. S. NOBLE (Blyth; Morpeth) considered this a very important problem. It was regrettable that it should come up so late in the day. Every morsel of policy was prepared and handed out to Representatives by one or other sectional committee, working it out in its own sectarian line. Every member of the meeting should go back to his Division and put this matter across. The motion was carried.

Dr. I. M. JONES (Sunderland) moved that all future negotiations on remuneration problems should be conducted by Council on behalf of the profession. Recalling that recently there had been wide differences in the profession on the course of action that should be pursued, Dr. Jones agreed that it was of course right and proper for these divergencies of opinion to be aired. But democracy also demanded that the will of the majority should be done. More and more people in all walks of life were against multiple organizations in matters of remuneration. Dr. Jones criticized the action of the Comitia of the Royal College of Physicians, a body in which only Fellows could vote and in which a quorum was only 10, and raised the matter of the relationship of the Central Consultants and Specialists Committee to the Royal Colleges. Dr. Jones said that the motion was not concerned with the wider issue of autonomy, but was concerned only with remuneration. Ten years ago to suggest any other course than that which he was suggesting would have been regarded as unthinkable. The Council was the executive of the Association.

Mr. H. H. LANGSTON (Winchester) sounded a note of caution, while Dr. J. BALLANTINE (Coventry) said that the B.M.A. was one body and therefore should speak with one voice.

Dr. J. W. COOK (Dunbartonshire) moved an amendment that in all matters affecting general practitioners any future negotiations on the present remuneration claim should be conducted on their behalf by the General Medical Services Committee only. His Division felt that so long as the consultants and specialists were likely to be represented by Presidents of the Royal Colleges, they could not co-operate with them in any matter affecting general-practitioner remuneration. His Division had more faith in the General Medical Services Committee than in the Council as a negotiating body, as the former was more closely in touch with general-practitioner thought and feeling in the matter of remuneration. Dr. A. V. RUSSELL (Council) pointed out that the General Medical Services Committee was a standing committee of Council. The Representative Body was the policy-making body—or should be. The work of the General Medical Services Committee for the profession was above praise, but he still considered that the Representative Body was the policy-forming body and the Council the executive. A committee of Council consisting of representatives of all sections of the profession would be the best way of tackling any problems which might arise in the future. He hoped the meeting would turn down the amendment. Dr. CORMACK (Newcastle upon Tyne), pointing to the implications, suggested it would be better to refer the matter to Council. The policy of the Royal College of Physicians, he added, was representative of a very small handful of London consultants.

Dr. A. SMITH (Lanarkshire) thought that if there were faults in this dispute these were not entirely the faults of the consultants and specialists. He believed that even minorities had a right to their opinion. If the proposal was pressed it would disintegrate the Association in such a way as it had never been disintegrated before. This kind of talk would do neither the Association nor its autonomous bodies any good at all.

The amendment was defeated and Sunderland's motion was carried.

The meeting rejected a motion by Rugby calling for an expression of opinion that it was improper for any of the constituent bodies associated together to form the autonomous committee to take any action except through that committee or with its prior knowledge and consent, and

that acceptance of this principle by such bodies should be a condition precedent to admission to these committees. Dr. HENDRY said that there should be a "no sabotage" clause; bitter experience had shown the necessity for it.

Revision of Negotiating Machinery

A motion from Lanarkshire stated:

That prior to future negotiations with the Government, the Council be instructed to revise the negotiating machinery, with a view to establishing effective co-ordination between the various branches of the profession, and preventing unilateral action by any one branch.

The Lanarkshire representative who moved this reported that it was unanimously supported by all branches of the profession at the meeting of his Division.

The motion was carried.

Pressing the Claim

Dr. P. S. STEEN (South Essex) moved that the remuneration claim should be proceeded with regardless of the terms of reference of the Royal Commission. Although they had agreed to give evidence, he said, their remuneration claim still stood.

The motion was adopted, as was one from Barnsley, that the Association should continue to press for the implementation of the Spens Reports until such time as another arrangement was made.

British Medical Guild

The meeting passed two motions moved by Dr. F. M. ROSE (Council) on behalf of Preston. The first asked Council to authorize the British Medical Guild to take special action throughout each Division with a view to stimulating action by way of meetings, etc., in the Division. The second instructed Council to request the Guild to institute an inquiry to learn whether there was evidence of financial hardship amongst members of the profession as a whole. Dr. Rose said that the Guild was in contact with doctors who were genuinely in distress and could obtain information which would not otherwise be got.

Dr. R. M. WARREN (Southampton), moving a motion which instructed Council to investigate closely all practical steps by which the interests of the profession might be defended in the event of an impasse with the Government following the report of the Royal Commission, said that there was ample time to discuss and, he hoped, agree on the plans. The motion was carried.

Health Service Reform

Perth proposed that as a report of a committee of inquiry into the National Health Service sponsored by the Government was likely to meet wider acceptance than one solely sponsored by the B.M.A. and thus likely to yield more fruitful results on a long-term basis, the Association should urge the Government to set up a committee to examine the future of the National Health Service. The Perth representative suggested that this motion was a practical means of stopping those exacerbations of financial pathology which assaulted the body politic every five years.

An amendment from the floor proposed that the terms of reference of the Royal Commission should enable, as the time was appropriate, a reappraisal and if necessary reform of the whole Service. Dr. L. J. STOLL (Hampstead) said they would like the public to know that doctors were not only concerned with the question of remuneration. Dr. LEAK (Mid-Cheshire) said that the Royal Commission was only concerned with remuneration. If they agreed to the amendment it would mean that they thought the Commission was a fit body to go into this question.

The amendment was lost and so was the motion.

Interim Award

Bishop Auckland asked the meeting to consider that the 5% interim award should be paid on the entire superannuable income. Dr. F. LISHMAN said that his Division

felt that the present proposed distribution was unfair to the rural practitioners with small lists.

The motion was defeated.

A motion from South Shields expressed the opinion that the interim payment of 5%, compared with the claim for a 24% gross increase, was entirely inadequate and that the Council should strive to initiate negotiations or, failing this, arbitration, with a view to increasing the interim payment forthwith.

Dr. J. N. SWAINSTON said that the purpose of the motion was to point out that doctors were hard up at the moment, that they wanted the money now, not next Easter or some time later.

The South Shields motion was carried.

The meeting also endorsed a motion from Leeds that efforts should be made to secure a more adequate interim adjustment pending the report of the Royal Commission.

A further motion accepted from Bradford stated:

This meeting, whilst noting with some satisfaction the changes announced affecting the scope of the Royal Commission, which should now make it possible to co-operate with the Commission, recognizes that these improvements and the proffered financial gain of 5% have only been achieved by fighting, and this meeting reasserts its decision to go on fighting until an adequate pay award is actually made.

A motion from Newcastle upon Tyne proposed that a committee be set up "to inquire why the B.M.A. has never lived up to its reputation of being 'the strongest trade union in the world'" and to suggest what changes should be made. The mover said that his Division thought there was something wrong when a Minister of the Crown could treat the representatives of the profession in the way he did—and the truth was that the Association was not ready for a trial of strength.

The motion was lost.

Vote of Thanks

The Meeting concluded with a vote of thanks to Dr. I. D. GRANT for his conduct in the chair, proposed by Dr. H. D. CHALKE.

PROCEEDINGS OF COUNCIL

A meeting of the Council was held at B.M.A. House on Wednesday, June 12, at 9 a.m. preceding the Special Representative Meeting at 11 a.m. The Chairman of Council, Dr. S. WAND, was in the chair.

The CHAIRMAN announced with regret the death of Dr. George Buchan, who was a member of Council from 1924 until 1931, and had held office as president and as chairman of the council of the Society of Medical Officers of Health.

Remuneration Dispute

At the suggestion of the Chairman the Council agreed that the discussion on the remuneration dispute should not be reported.

The resolutions passed at the Annual Conference of Representatives of Local Medical Committees on June 6 (Supplement, June 15, p. 335) were considered. Dr. J. A. L. VAUGHAN JONES asked whether Council was supposed to approve the resolutions or simply receive them. In his view they should merely be received and nothing else done about them, otherwise it would be binding the Special Representative Meeting in advance to decisions on which they alone should decide. The CHAIRMAN, in reply, said that the resolutions would be received as information.

The Council agreed that legal opinion should be obtained on the fourth resolution—namely, "That, as there is a difference between Scots and English law, and in particular in the law of contract, the opinion and advice of Scots legal authorities be obtained on the contractual validity of Spens as applied to Scots practitioners."

Dealing with the opinion of counsel already obtained on the contractual validity of Spens, the CHAIRMAN reported that leading counsel were firmly of the opinion that no legal

action should be taken by the Association. It was agreed that this opinion should be accepted and that it should be kept as a confidential document.

Dr. J. L. MCCALLUM moved that Council should seek another legal opinion. Dr. H. H. D. SUTHERLAND seconded. The CHAIRMAN pointed out that the opinion to which he had referred was not the first opinion which the Association had taken on the matter. Dr. E. A. GREGG said there was no advantage whatever in collecting counsels' opinion. He suggested that the profession had sufficient grounds on the questions of honour and decency to ask the Government to carry out that which it had led the profession to believe it would carry out.

The motion was lost.

On the question of public health practitioners, Dr. WAND reported on an interview which Dr. Tilley and he had with the Minister of Health. His own feeling was that absolutely nothing was gained, because the Minister could concede nothing without the agreement of the local authorities. His impression was that the Minister had not been unsympathetic but rather bound.

Dr. I. D. GRANT suggested that the Representative Body should be told that the Royal Commission was not recognizable as an arbitrating body. The CHAIRMAN said that in his view this had been made clear in public speeches. The Government was not bound by the findings of the Royal Commission, therefore it was obvious that the profession could not be. Dr. A. BEAUCHAMP suggested that if it were stated categorically that the profession was not bound by the findings it would alter the climate of the Royal Commission when evidence was given. Surely an effort should be made to create the right climate.

The CHAIRMAN said he had it in mind to make a short personal evaluation of the position to the Representative Body indicating that the fight was not yet over. (Agreed.)

Request for Autonomy

The following letter from the Secretary of the Society of Medical Officers of Health was placed before Council:

I am desired by the council of the Society, which met to-day, to request that the British Medical Association create an autonomous section which would be responsible for negotiations and for public statements on public health matters.

The CHAIRMAN expressed the hope that the matter would be deferred until he had had an opportunity of talking it over with Dr. C. Metcalfe Brown and Dr. Chalke. "If you have three horses pulling something you get somewhere," he said. "But the moment you get three horses pulling in different directions you get complete disintegration—and here is the possibility of the third horse."

Dr. H. D. CHALKE said that the request was the culmination of many things. He also wanted the three horses to pull together, but so far they had not. He expressed the hope that the matter would not be deferred very long, because public health doctors were seething with discontent.

Dr. J. B. TILLEY said that the Public Health Committee of the Association, apart from the Society of Medical Officers of Health, proposed to consider the question of autonomy. He was the first to agree that one body should negotiate on behalf of the three branches of the profession, but if one branch were to be left with less powers than the others, then the matter must be very carefully considered. The Society was asking the Association to consider giving the public health branch of the profession working in the National Health Service the same status as that enjoyed by the General Medical Services Committee and the Consultants and Specialists Committee. The Public Health Committee would consider it.

Dr. J. C. ARTHUR asked whether, if public health doctors obtained autonomy, they would be prepared to use it in what seemed to him to be the only effective way—namely, by resigning, if necessary, as a body from their jobs. If they were prepared to do so, he felt sure they would get support.

Dr. TILLEY said there had been no suggestion that general practitioners should resign on behalf of public health doctors. That, of course, would be ridiculous. The request came as the result of a desire of a minority branch of the profession to have the same privileges within the Association as the other two major branches. Dr. A. BARKER asked how necessary it was to defer the problem. In his view the Public Health Committee had a real problem which was similar to that which led to the autonomy of the other two committees—namely, that in their present status it was not able fully to act on behalf of public health medical officers. It would seem that there was no argument by which the autonomy could be opposed, and it was a matter which could quickly be decided.

Dr. G. W. IRELAND suggested that so important a matter should not be discussed at a short meeting. He hoped that his public health colleagues would not regard his suggestion that consideration of it be postponed as in any sense antagonistic.

The CHAIRMAN asked Council whether the matter could be left to the Public Health Committee. (Agreed.) Both Dr. Tilley and Dr. Chalke well knew that Council and himself had been at great pains to do everything possible to get the public health position resolved. Dr. TILLEY acknowledged that the Chairman of Council, at the interview with the Minister, did all that any man could have done to put the case of the public health practitioners. Mr. H. H. LANGSTON suggested that the time was appropriate for the Council to ask each of the autonomous bodies to consider in what way greater unity of action could be achieved between them, other committees, and the Council.

The CHAIRMAN said that the matter would probably arise later in the day.

Public Health Committee

Dr. TILLEY presented the report of the Public Health Committee. The Committee, he said, felt that it was and still remained in the best interests of the profession that public health doctors should be included in the terms of reference of the Royal Commission. The Association had stated that the level of remuneration in the public health service was not adequate, and that there should be an independent review.

Dr. Tilley reported the resolutions on the question of giving evidence to the Royal Commission that his Committee had passed at its recent meeting (*Supplement*, May 25, p. 296). The remainder of the Public Health Committee's report was of a formal nature.

Dr. J. B. W. ROWE suggested that the Public Health Committee should now get down to the task of finding some way in which public health doctors might divorce themselves totally from local authority control, because that would give substance to the policy that public health practitioners should be remunerated as doctors and not as local authority servants with a medical qualification. Dr. CHALKE said that an independent inquiry was desired into the whole background of public health.

The Council adjourned at 10.50 a.m. until the end of the Representative Meeting.

RESUMED COUNCIL MEETING

Following the Special Representative Meeting, the Council resumed its sitting.

Evidence to Royal Commission

The Chairman, Dr. S. WAND, asked the Council whether, in view of the decision taken by the Representative Body to give evidence to the Royal Commission, he should be prepared to see its Chairman. Dr. Wand recalled that Sir Harry Pilkington had approached him with a view to a discussion on certain ways in which the Commission should go about its work. Dr. Wand had told Sir Harry why the Association at that time was not going to co-operate. It was agreed that the Chairman of the Royal Commission

should be informed that the Chairman of Council would now be pleased to see him if he still wished.

General Medical Services Committee

In presenting the report of the General Medical Services Committee, Dr. A. B. DAVIES said that his Committee was a standing committee of the Association. It was also the executive of the Conference of Local Medical Committees and must act on the instructions of that body. But it always presented its decisions to Council and asked for Council's support. If there was any disagreement Council sent the matter back. "And so we work in harmony." The Committee's report described the action it took on the remuneration dispute and other matters. The report was adopted.

Other Health Schemes

The Amending Acts Committee was authorized to continue its study of other national health services. The Committee's report, presented by its chairman, Dr. H. H. D. SUTHERLAND, stated that the Committee was studying the schemes in operation in Australia and New Zealand, and proposed to study others in operation in European countries. It believed that as a result of this study it would be possible to evolve an alternative scheme or schemes, which would be free from party political control, would give greater freedom to the public and profession in the provision of medical attendance, and would appeal to the Government by reason of reduced cost.

Mileage for Post-mortem Examinations

Council approved a recommendation from the Private Practice Committee to accept the Home Office offer to include in the Coroners (Fees and Allowances) Rules an allowance of 1s. a mile outside two miles for practitioners undertaking post-mortem examinations for coroners, subject to this acceptance being without prejudice to any claim through the Whitley Council for the removal, in exceptional circumstances, of the 20s. limit, and that agreement on the proviso that this higher rate of mileage would not be made a ground for changes in the rate of travelling expenses payable to medical witnesses at inquests and would not preclude representations on some future occasion.

Death Certificates

The report of the Central Ethical Committee was approved. Dr. R. FORBES, chairman of the Committee, said that a proposal was considered from the General Register Office that the medical certificate on cause of death should include a voluntary question to the doctor regarding recent pregnancy. The Committee agreed with the view expressed in the General Medical Services Committee that the Registrar-General should be reminded that, when information about the cause of death was required, it was already the practice to ask general practitioners for further information, and it would seem to be the proper procedure for the question about pregnancy to be included in this information if required.

Co-ordination

Mr. H. H. LANGSTON moved that, in order that action by the various sections of the profession should be better co-ordinated and unified, the Council should agree to set up a committee to examine and report. Mr. J. R. NICHOLSON-LAILEY seconded. Dr. H. D. CHALKE stressed that the question was not confined to the remuneration issue. The tendency was increasing for certain committees to make pronouncements without consultation with Council as a whole. He thought it high time that some committee should be set up to consider not only co-ordination in negotiation but also the state of the whole fabric, which was getting rotten.

Mr. LANGSTON explained that he had tried to produce a form of words that really could cover all aspects of intra-sectional relationships, and this seemed as broad as it could be.

The motion was carried.

B.M.A. Member Honoured

The Council sent its congratulations to Major Marcus Arthur Clark Dowling, R.A.M.C., who had been awarded the M.B.E. for distinguished services in Malaya.

Special Council Meeting

The Council agreed to hold a special meeting on June 26 to consider various matters, including the machinery for giving evidence to the Royal Commission.

CENTRAL CONSULTANTS AND SPECIALISTS COMMITTEE

A meeting of the Central Consultants and Specialists Committee was held at B.M.A. House on Thursday, June 13. Mr. T. HOLMES SELLORS was in the chair.

Report of Executive

Evidence to Royal Commission

In presenting the report of the Executive Committee, the CHAIRMAN said that it had discussed in outline the evidence suitable for presentation to the Royal Commission. The aim was to present a draft memorandum of evidence to the Committee on July 25.

Dr. T. ROWLAND HILL added that the basic draft evidence was now all complete.

Remuneration of Full-time University Medical Teachers and Research Workers

The two following recommendations were approved: That the Full-time Non-professional Medical Teachers and Research Workers Group Committee be informed (1) that, while sympathizing with the views expressed in relation to remuneration in clinical and non-clinical departments, the Central Consultants and Specialists Committee remained of the opinion that there should be some differentiation of the opinion that there should be made clear, in that part clinical posts; (2) that it should be made clear, in that part of the memorandum which dealt with the question of financial recognition of increased responsibility, that where an individual was receiving an N.H.S. merit award he should not also be eligible for additional responsibility payment from the university.

Overseas Medical Services

The Committee considered a memorandum by Professor Charles Wells relating to proleptic appointments, and the CHAIRMAN reported that the Executive Committee, having heard Professor Wells, agreed that there were many good points in the memorandum. At the same time there were a number which were rather impracticable, and it was felt that the Committee should consider the matter further. Professor P. C. P. CLOAKE proposed that the memorandum should be sent to the Joint Consultants Committee for consideration and advice. Mr. R. BREARLEY suggested that the scheme should be viewed as another way of helping to run down the senior registrar figure to a proper level. Mr. LAWRENCE ABEL proposed that the scheme be given approval in principle. Mr. H. H. LANGSTON said he was not satisfied that two years overseas would give the valuable training envisaged for a man ultimately taking up an appointment in the National Health Service.

The proposal to seek the advice of the Joint Consultants Committee was adopted.

House Officer Appointments

The CHAIRMAN reported that the Executive Committee had considered a resolution of the annual general meeting of the British Medical Students Association, submitted by the Organization Committee, pressing for the universal synchronization of the date of commencement of house appointments throughout the country so that full registration might be obtained with the minimum of delay. In view of the fact that where hospital authorities had tried to synchronize their house appointments with qualifying

dates it had proved to be impracticable, it was recommended that the Organization Committee be informed that on those grounds the Committee did not support the proposal. The recommendation was agreed to.

Hospital Residents' Hours of Work

The Executive Committee considered views expressed by the Medical Students and Newly Qualified Practitioners Subcommittee of the Organization Committee dealing with hours of work and off-duty time for hospital resident medical staff. These included a recommendation that sufficient hospital residents should be appointed so that each hospital resident doctor should work less than 168 hours a week, and expressed the view that the Central Consultants and Specialists Committee was not sufficiently seized of the urgency of the problem. The Executive Committee noted with regret the view held by the Medical Students and Newly Qualified Practitioners Subcommittee, and considered that it was ill-founded. The Executive Committee also suggested that, in considering the question of the hours of duty and off-duty times of hospital resident staff, the subcommittee should recognize the impracticability of dealing with the situation without regard to the whole hospital staffing problem. The hospital staffing problem must be related to the requirements of the profession in other branches.

Professor CLOAKE said it was monstrous if a man was confined to hospital officially from Monday evening until Saturday midday. It should be laid down as one of the principles of service for housemen that they should be allowed two hours off duty for exercise each day or be allowed to accumulate it for two days. Mr. BREARLEY suggested that the whole of the matter might be referred back to the Executive Committee for further consideration, and he also suggested that the Executive Committee's response to it should be more factual, more constructive, and more sympathetic. Professor G. I. STRACHAN said it would be a pity if trade union matters of that sort were brought into hospitals. Anything which interfered with the present elasticity would be regrettable. With regard to the suggestion that it should be referred to the Executive Committee, he felt that it might be more appropriate if it were referred to his Staffing Subcommittee.

The CHAIRMAN agreed, and suggested that Professor Strachan might care to invite some representatives of the newly qualified practitioners to supply some facts and figures.

It was agreed that the question of arrangements for leave and locums for housemen should be referred to the Joint Consultants Committee for consideration.

Whole-time Consultants: Payment for Teaching Duties

The CHAIRMAN reported that, arising out of the request of the Welsh Regional Consultants and Specialists Committee that the question of payment of whole-time consultants for teaching duties should be investigated, the Executive had obtained information from a number of boards of governors on the existing practice. The information made it clear that it was normally implicit in the contracts of whole-time consultants that they should undertake teaching duties, but that, while teaching was borne in mind in assessing the duties of a post, no specific time was allowed for teaching duties as distinct from other duties. In a majority of cases fees were paid for formal lectures, but the Executive was informed that that practice was not universal.

Dr. SMITH pointed out that consultants were paid for teaching before the Health Service, but they were no longer paid. It would be of assistance if the position could be fully explored to see whether any token payment or recognition could be made. Dr. I. RANNIE said the attention of the Committee should be drawn to the other side of the problem—the whole-time university teacher who was doing hospital work. He was paid at a much lower rate of remuneration than the whole-time N.H.S. consultant, and received nothing extra for doing hospital work. Mr. W. S. LEWIN said that in Oxford all systematic lectures were paid whether the lecturer was whole-time or part-time. The whole-timer was not paid extra for teaching in out-patients

and on ward rounds. The explanation given was that it was a teaching hospital appointment, and when working out whether a man should be whole-time or not it was assumed that part of the whole time was used in teaching. On the other hand, when the part-timer was assessed it was assumed that it was for clinical work in hospital, and that if in addition he did teaching rounds then he was paid extra.

Professor CLOAKE said that two or three years ago at his university payment for part-time clinicians was taken away on the grounds that, in the assessment of hours under the National Health Service, teaching was known to be part of the duties of the officer, and therefore to be taken into consideration in allotting him the number of sessions.

In response to a suggestion by the CHAIRMAN, Dr. RANNIE said that it should be possible to obtain the information necessary to provide a full picture through his Committee.

Liaison Between S.H.M.O.s Group and C.C. and S. Committee

Having considered a suggestion by the S.H.M.O.s Group Executive Committee that closer liaison between the Group and the Central Consultants and Specialists Committee should be effected by the appointment of an S.H.M.O. representative or observer on the Executive, the Committee decided that it was unable to accept the principle that special groups should be entitled to direct representation on its Executive. However, as hitherto, representatives of the S.H.M.O. Group would be invited to attend meetings of the Executive when items of particular concern to S.H.M.O.s were under consideration. The Central Consultants and Specialists Committee would be willing to appoint representatives to the S.H.M.O.s Group Council should that council so desire.

Joint Consultants Committee

The Chairman's report on the work of the Joint Consultants Committee was considered and approved.

Hospital Medical Staffing

Representatives of the S.H.M.O.s and Registrars Groups attended the last meeting of the Joint Committee to discuss the Ministry's latest proposals on hospital medical staffing. The S.H.M.O. Group representatives voiced their strong objections to the Ministry's proposal to create a new assistant grade into which the existing S.H.M.O.s and "time-expired" senior registrars should be assimilated. The S.H.M.O. Group representatives emphasized that the grade proposed by the Ministry would in effect extend the S.H.M.O. grade to all specialties and perpetuate its anomalies and injustices on a larger scale than at present. The S.H.M.O. representatives also urged that the Joint Committee should now repudiate the agreement upon the scope of the S.H.M.O. grade and inform the Ministry that it could not consent to the creation of any new S.H.M.O. posts pending a solution of the existing problems associated with the S.H.M.O. grade. The Registrars Group representatives deplored the suggestion that there should be yet another intermediate grade of hospital medical staff.

Memorandum on Study Leave

Professor CLOAKE presented a memorandum by the Study Leave Subcommittee, and the CHAIRMAN expressed thanks on behalf of the Committee to Professor Cloake for the memorandum, which, he said, had been produced in almost record time. Mr. LANGSTON suggested that, in view of the great variation, the Ministry should be asked for a new and more precise circular in order that those concerned could see what were their rights in connexion with study leave. Secondly, the Ministry should be pressed to allocate to boards a far greater sum towards expenses. In his experience it was often the same people who took study leave, and there should be some encouragement to those who had not taken any.

Mr. LEWIN said it would be interesting to hear what Professor Cloake felt should be the financial basis in the future. He understood that at present there was no allocation of money at all for study leave as such, and that

all that existed was permission for a board to spend some money out of the annual grants. It was difficult to see how the position would improve until such time as there was agreement with the Ministry that a certain sum of money should be allocated for study leave and for no other purpose and, if possible, that the unexpended portion could be carried on from year to year. Dr. ROWLAND HILL suggested that the matter ought to come before the Royal Commission in due course, and should be considered by the Committee dealing with the preparation of evidence, because it ought to influence the Commission in its judgment.

Professor CLOAKE agreed that the Ministry ought to be asked to consider the whole question of study leave and to issue a detailed document. The Ministry's previous document threw cold water on the study-leave problem as a whole. He also agreed that the Ministry should be pressed to return to the earmarked grant for study leave. Until it did so on substantially more generous lines, the problem would undoubtedly continue in all hospitals.

It was agreed that the memorandum, which was approved with slight modification, should be submitted to the Joint Committee.

Chairman and Deputy Chairman for Session 1957-8

On the motion of Professor STRACHAN, Mr. T. HOLMES SELLORS was unanimously re-elected Chairman for the Session 1957-8; and on the motion of Mr. LANGSTON, Dr. T. ROWLAND HILL was unanimously elected Deputy Chairman for the Session 1957-8.

Executive

The following members were appointed to the Executive: Mr. A. Lawrence Abel, Professor P. C. P. Cloake, Mr. A. Staveley Gough, Mr. H. H. Langston, Mr. W. S. Lewin, Mr. J. R. Nicholson-Lailey, Dr. S. Cochrane Shanks, and Professor G. I. Strachan, together with the Chairman and Deputy Chairman and two members to be appointed by the Central Consultants and Specialists Committee (Scotland).

Joint Consultants Committee

The members of the Executive elected to serve on the Joint Consultants Committee for the session 1957-8 were the Chairman and Deputy Chairman, with Mr. H. H. Langston, Mr. J. R. Nicholson-Lailey, and Professor G. I. Strachan.

Evidence to Royal Commission

The CHAIRMAN reported that the Annual Conference of Local Medical Committees was held on June 6, and read the decisions which were reached at that conference (see *Supplement*, June 15, p. 335).

Comments from regional consultants and specialists committees regarding points to be included in evidence to the Royal Commission were considered, and it was agreed that they should be referred to the Executive, together with any other opinions which were submitted. Commenting on the suggestion from Birmingham that there had been a lack of co-operation between branches of the profession involved in the recent claim, and inadequate consultation by the central negotiators with the main body of consultants at the periphery, Professor CLOAKE said it was felt that such important issues should at least go for information and expression of view to regional consultants and specialists committees.

Reconstitution of the Registrars Group

Proposals for the reconstitution of the Registrars Group were considered. The proposals were substantially the same as those submitted to and provisionally approved by the Central Consultants and Specialists Committee on February 7. In accepting a recommendation that the Hospital Junior Staffs Central Executive Committee should receive from and appoint to the Central Consultants and Specialists Committee two representatives to facilitate adequate liaison between the two committees, it was agreed that Professor

Strachan and Mr. Hanley should be appointed, with Mr. Langston and Dr. Cullinan as deputies.

Title of Central Consultants and Specialists Committee

After a short discussion, and having considered the views of regional committees, the Committee agreed that the present title should remain unchanged.

National Insurance Certificates for Out-patients

A resolution from the Birmingham Regional Consultants and Specialists Committee disapproving of the posting of notices in out-patient departments to the effect that National Insurance certificates would be given to patients was referred to the G.M.S. Committee. Dr. A. TALBOT ROGERS pointed out that the matter should be looked at from the point of view of the patient rather than from the point of view of the hospital. Professor CLOAKE said that the resolution referred to putting up notices in out-patient departments which encouraged patients to ask the consultants for the certificate. The consultant did not know whether the doctor whom the patient saw originally had declined to give a certificate.

Part-time Services for Government Departments

The CHAIRMAN reported that, as a result of representations made on the instructions of the Committee, the Civil Service Commission had agreed that the fee payable to consultants for the medical examination of candidates for establishment in the Home Civil Service and the Foreign Service—where the examination was difficult or lengthy—should be increased to ten guineas.

ANNUAL MEETING, JULY 15-19

The Newcastle upon Tyne Hospital Management Committee has invited members of the Neurology, Ophthalmology, or the Radiology Sections to visit the radiological wing of the new department of neurological surgery at the Newcastle General Hospital on July 16 at 4.30 p.m. Tea will be provided. The wing is specifically designed and equipped for neuro-radiological investigations and forms the first completed part of this new department. Members concerned are asked to give their names to the Reception Bureau, Stephenson Building, by 2 p.m. on that day. Transport will be arranged from St. Nicholas' Cathedral immediately following the church service.

The Prudhoe and Monkton Hospital Management Committee has invited members to visit the Prudhoe and Monkton Hospital, Prudhoe Hall, Prudhoe-on-Tyne, Northumberland, one of the leading mental deficiency hospitals, situated about 10 miles from Newcastle on the Hexham road (via Blaydon), at 2 p.m. on July 15. Interested members are asked to get in touch with the medical superintendent, Dr. G. McCoull (telephone No. Prudhoe 471), before July 15.

ASSOCIATION OF POLICE SURGEONS OF GREAT BRITAIN

The sixth annual convention of the Association of Police Surgeons of Great Britain was held at Lytham St. Annes, from May 23 to 25.

The speakers were Mr. W. J. H. Palfrey, Assistant Chief Constable, Lancashire Constabulary; Mr. J. di V. Nahum; Dr. G. B. Manning, area pathologist; Dr. T. H. Blench, group secretary; and Dr. H. Rosenberg, police surgeon, West Sussex. Dr. Walter Hedgcock, Assistant Secretary, British Medical Association, showed a film, "The Medical Witness."

At the annual general meeting the following officers were elected for 1957-8:—President: Dr. R. D. Summers; Honorary Treasurer: Dr. V. J. O'Toole; Honorary Secretary: Dr. C. H. Johnson.

TRIBUTE TO CHAIRMAN

OVERSEAS COMMITTEE'S LUNCHEON

On June 14 the Overseas Committee of the B.M.A. gave a luncheon in honour of its retiring chairman, Mr. J. L. GILKS. Those present included the President, the Chairman of Council, and the Secretary. In proposing the health of Mr. Gilks the CHAIRMAN OF COUNCIL recalled that Mr. Gilks had been a member of the Overseas Committee since 1935 and its chairman for 19 years. Dr. Wand said that this must be almost unique in the annals of the B.M.A. Mr. GILKS replied briefly and thanked the Chairman of Council, the members of the Committee, and the secretariat for their kindness to him during his long chairmanship, which he had much enjoyed.

HOSPITAL MEDICAL STAFFS DEFENCE TRUST

MEETING OF TRUSTEES

A meeting of the Trustees of the Hospital Medical Staffs Defence Trust was held at B.M.A. House on Thursday, June 13. Mr. L. DOUGAL CALLANDER (treasurer) reported that the Trust Fund stood at £19,604, and agreed to a suggestion that a reminder should be sent out to those who had not contributed since the new rate of subscriptions. It was agreed that regions should have the names of all subscribers to the Trust, and should encourage non-subscribers to subscribe possibly by handing them a copy of the original letter which was sent out. At the same time pressure should be exerted through the regions to get the Defence Trust a larger degree of contributions.

HOSPITALITY

A German doctor's son and daughter, aged 18 and 17, would like to arrange a holiday exchange with a British doctor's children from July 20 to August 25. A German doctor's son, aged 17, would like to arrange exchange with a British doctor's son for 6-8 weeks.

A Swiss doctor's son, aged 16, would like to visit Britain for the month of July as paying guest or on an *au pair* basis. He would prefer to stay by the sea or help on a farm doing odd jobs, otherwise would help teach French or German. A Swiss doctor from Zurich would receive British girl on an *au pair* basis to look after three children.

An Austrian doctor's sons, aged 19 and 15, would like to arrange exchange with British doctors' sons. They would like to visit Britain from July 1 to September 1 and receive British boys at their summer home at Atter See, near Salzburg, in 1958 (a Protestant family).

An Italian doctor's daughter, aged 18 (from Rome), would like to arrange a holiday exchange.

A French doctor living partly in France and partly in Morocco would like a British girl to stay *au pair* and look after three children, helping with their studies, particularly their English. He would like the British girl to stay a year.

Would anyone interested get in touch with Brigadier H. A. Sandford, International Medical Advisory Bureau, B.M.A. House, Tavistock Square, London, W.C.1.

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.

Correspondence

The General-practitioner Obstetrician

SIR,—About this time last year (*Supplement*, June 9, 1956, p. 347) you assisted the London Regional Obstetric Committees by giving publicity to a letter of mine to the effect that, save in exceptional circumstances, practitioners who qualified after January 1, 1951, and who wished to be included in the London list of general-practitioner obstetricians would, as a condition of admission to that list, be required to have held a resident house job in obstetrics for a period of six months. It was then indicated that any applications received prior to May 1, 1957, would be considered in the light of the conditions which obtained prior to that date. At the instance of the London Obstetric Committees I would again ask for the hospitality of your columns to remind all prospective applicants that the new requirements are now being put into effect.—I am, etc.,

London, S.E.1.

J. A. SCOTT,

Chairman,
London Local Obstetric Committee.

Item-of-service Payment

SIR,—In your full report of the last meeting of the Assistants and Young Practitioners Subcommittee (*Supplement*, June 8, p. 328) under the heading "Evolution of General Practice" there is a slight error giving an impression of irresponsible extravagance. While wishing to retain the capitation fee, loaded according to the age of doctor and possibly to professional degrees, I suggested an expense allowance (probably best given as a loading on the lower ranges), and only over and above capitation fees and loadings would I press for payments for some items of service—i.e., work out of hours, for minor surgery, and for hospital attendance.—I am, etc.,

Romford, Essex.

R. M. S. MATTHEWS.

Status of the Profession

SIR,—Curiously, stupidly, the medical profession is employed not by patients concerned with the quality of the service rendered but with a Government concerned with obtaining the service as cheaply as possible. In the circumstances we need an artificial control of the employer to substitute for the normal mutual controls of contented payment for contenting service. While the profession strives to give of its best to the patient our employer is striving to do his worst. Our councils are flouted, our over-enthusiastic prescriptions fined, our pleas for arbitration ignored. Furthermore, a whole-time service wherein all will be worse is a strong possibility.

There can be no doubt that if we do indeed think of the status of the profession, both now and in the clearly foreseeable future, the desperate need for finding a measure which will give our negotiators "teeth" stands out with alarming clarity. This measure must be (1) coercive against the Ministry; (2) harmless to the patient; (3) applicable by all branches and members of the profession.—I am, etc.,

Derby.

R. LUNT.

Influenza Pandemic

SIR,—The general public seems to be under the impression that nothing can be done to prevent the calamity that is threatened by the advance of influenza from the Far East. On the contrary, there is a great deal that the Government could do; by acting at once they might save hundreds of thousands of lives.

The facts to be faced are, first, that in all influenza epidemics all the family doctors have far more patients on their visiting lists than they can possibly see, and they have very long queues outside their surgeries. And it is quite impossible to distinguish the cases among those wait-

ing that are serious from those that are trivial, and from those who do not want to see a doctor at all but only want a certificate. In those circumstances a great many patients who ought to be examined put off consulting their doctor, and in many cases where the patient does attend at the surgery the examination has to be postponed, often with fatal results six months later. Secondly, in an epidemic the doctors are working extremely long hours; they have to work all day even if they have been up all night; and they are doing work that wears their nerves to shreds. Sooner or later they go down with influenza or are broken by overwork and the situation then becomes desperate because it is quite impossible to get any locums. All that the surviving practitioners can do is to take the calls as they come in, and they and the patients who are seriously ill are at the mercy of unscrupulous people who jump the queue by sending urgent messages, and half-wits who send for the doctor not because they need treatment but because they want a certificate. The inevitable result of all these delays and frustrations is that a great many lives which might have been saved are lost.

An influenza epidemic of the same virulence as in 1918 would kill far more patients now than it did then—and the public have quite forgotten how many it did kill. It would be worse now, partly because there are far more patients wanting National Insurance certificates, and partly because the number of patients who consult a doctor for trivial complaints—and even send for him—is a hundred times greater now than it was in 1918. There are, therefore, three urgent requirements. First, the Government should work out a scheme to send locums to take the place of doctors who are ill and to provide assistants to take the night work in districts where the doctors are working night and day. Secondly, it must be explained to the Government that for many years certificates have been costing lives, and that in epidemics they cost a great many lives. The Government could avoid this danger and save a great deal of the doctors' time by giving the health visitors and district nurses authority to sign National Insurance certificates—at any rate, the intermediate certificates. Unless somebody can sign certificates on behalf of the doctor the whole National Insurance scheme will break down in the next bad epidemic; that is quite certain. But of course that is a very minor matter compared with the loss of life that would be caused in an epidemic by enforcement of the present regulations. The only people who know what happened in the 1918 epidemic are the doctors who went through it, and the only doctors who can say what would happen under present conditions are those survivors who are still in practice. There have been no bad epidemics for thirty years or more, so perhaps an old practitioner may be allowed to make one more suggestion. The third and very urgent requirement is to organize the reserves of doctors, health visitors, and other trained nurses. There are large reserves in the factory and school medical services, and elsewhere, and the Government ought to work out a scheme to mobilize them in an emergency in their district so that they could help the family doctors.—I am, etc.,

Wetherby, Yorks.

R. L. KITCHING.

Remuneration Claim

SIR,—With reference to the present deplorable split in the medical profession with regard to the remuneration claim, much has been said in Parliament, in the press, and even at B.M.A. meetings about not embarrassing the Government in view of the present financial situation of the country. It is amazing that anyone can swallow this as an excuse, if one considers that, according to official figures, £2,500,000,000 were spent in this country last year on drink, gambling, tobacco, and entertainment, and that over a million television sets were sold.

Much more than 30 years ago I remember my father and his fellow civil servants applying for an increase in their pre-1914 pension rates and being told that, while there was every sympathy with their case, in view of the increased cost

of living the Treasury felt that the economic situation of the country did not warrant an increase, and so it has always been during my lifetime unless the aggrieved body was backed by a powerful trade union.

At most B.M.A. meetings much was said about winning the support of the public and setting a good example. I do not believe the greater proportion of the public are in the very least interested in the finances of the medical profession so long as they receive the certificates and bottles of medicines they require. Nor do I believe, as was suggested, that our example of forbearance would carry any weight at all. In Parliament and in the press emphasis is always laid on the fact that the average doctor receives £2,222 a year and the fact that the average doctor receives £2,222 a year and a mysterious £1,200 for practice expenses. The press and the public understand from these figures that the majority of doctors receive this alleged average. I think the B.M.A. of doctors receive this alleged average. I think the B.M.A. might have done more to challenge these very dubious figures. Figures that cannot be challenged are that the majority of doctors have up to now received only a miserable 17s. a year for the care of each patient for 24 hours a day, 365 days a year, and out of this sum has to come all practice expenses, cars, assistants' and secretary's salaries, telephones, postage, upkeep of surgeries, etc. Very few of the public are aware of this. It seems to have been deliberately concealed.

In New Zealand I believe a consultation costs 10s. 6d., of which the patient pays 2s. 6d. In Australia I believe 17s. 6d. a visit is charged, plus mileage, while in New York a doctor charges far more. Eighty years ago my maternal grandfather in Dublin paid one guinea a visit. His doctor occasionally paid a second visit without extra fee and occasionally even a third visit, but the fees were always reckoned in guineas. Lettson, the famous eighteenth-century Quaker doctor, is reputed to have made £5,000 a year.

According to the figures given by Mr. Vosper, the Minister of Health, there are 5,500 general practitioners with lists of under 1,500. This number exceeds the number of doctors with between 2,500 to 3,500 (the maximum), their number being 5,385. Another 5,218 have lists of between 1,500 and 2,500. One of my friends and colleagues informed me recently that he had 1,200 patients on his list and his gross income was £1,600, but practice expenses amounted to £1,200. He does a very full day's work and recently he was called out of his bed three times in one night. Fortunately for him, he has a pension and other sources of income.—I am, etc.,

Rainham, Kent.

W. U. DESMOND LONGFORD.

Medical Ethics

SIR,—I write in a mood composed (though the last seems hardly the right word) of mingled irritation and bewilderment, and would ask this question: Do medical ethics still exist among the specialist-consultant class of our colleagues? I have just had the following experience, and, while I am aware that there are ethical committees, I feel that the publicity of your columns may have more effect.

My wife was rung up this morning by a National Health Service patient, an obviously ignorant young woman, who asked her to ask me to leave out a prescription for her which her husband would collect. She had been seeing an eye specialist (a university lecturer and attached to a large teaching hospital), who had been treating her for some symptoms of her condition might be a "sinus." The patient had been told by "sister" (the maternity nurse) that she should per- haps see the doctor (myself). My wife told the patient that I would certainly not leave a prescription without seeing her —such has been my rule whenever possible—and that in any case I would be getting a report from the oculist. The patient's reply was that that would not be so, as she had seen the oculist in his capacity as a "private doctor" (what- ever that may mean). I am not blaming the patient—she is shielded by her ignorance.

I may be old-fashioned in some of my ideas—I have been in general practice now for over thirty years—but I have always understood that, emergencies apart, a consultant

only saw a patient with or on the recommendation of the family doctor, and sent him a report afterwards. I may be wrong, but I have the feeling that there has been a certain slacking off in this procedure since the National Health Service started. Is it because consultants, who formerly depended on the patients we general practitioners sent them for their living, now receive the bulk of their income as a salary from the National Health Service? Some of them certainly took a new lease of life when it began. We have heard a lot these days of the lowering of the "status" and "dignity" of our profession. Such conduct as I have instanced above certainly does not to my mind raise either, but this I leave to you, Sir, and my colleagues to judge.—I am, etc.,

St. Boswells.

EDWIN CLARK.

Peripheral Events

SIR,—When we go up to London we who live outside that great city are sometimes referred to by those who sit in authority at B.M.A. House as "the periphery." If peripheries, like abysses, have edges, then we in Devon and Cornwall may be said to be at the very edge of the periphery. May one who thus resides in the outermost pale beg humbly for a few lines in your admirable *Journal*, in order to express a very strong feeling which we have down here?

Sir, we feel it would be an added attraction to your *Journal* if each issue gave a page of your valuable space to current events of importance which are occurring in the Branches and Divisions. For example, such events as annual meetings of Branches, when attended, as they sometimes are, for the instruction at the periphery by those from the hub, are often worthy of record and would certainly prove of interest to large sections of your readers. Such news items might also give a modicum of lightness to a journalistic effort which at present seems to some of us rather sombre. I am sure you would welcome the opinion of others on this suggestion.—I am, etc.,

Torquay.

B. VENN DUNN,
Past President and Honorary Secretary,
South-western Branch, B.M.A.

Doctors and the Health Service

SIR,—The letter from Mr. Arthur Blenkinsop (*Supplement*, June 1, p. 309) seems to me to be illustrative of the politician's unwillingness or inability to see what the other fellow is getting at. This is an attitude all too familiar to those of us who hear political debates on the radio, or read about them in the daily press. Surely he does not think that Mr. Wilfrid Adams (*Supplement*, May 4, p. 241) and the rest of us believe that the Government "allots" us patients. Any charity on Mr. Blenkinsop's part would have made it clear to him that Mr. Adams made a typing error and wrote "allots" for "allows."

This particular point, however, has not been the cause of my writing. I am driven to comment on his last phrase, the sense of which is in no way altered by its removal from its context "... their [the doctors'] continual and very proper insistence that patients should not hesitate to get in touch with them at an early stage of any illness." I would be interested to hear other practitioners' comments on this. At present I consider myself fortunate that the vast majority of my patients have sufficient sense of personal responsibility not to act as the planners would have them do.—I am, etc.,

Four Oaks, Warwicks.

F. R. GOODWIN.

Interim Adjustment

SIR,—I was amazed and disgusted to read the acrimonious remarks made by Dr. J. Tudor Pembleton in his letter concerning the 5% interim adjustment for general practitioners (*Supplement*, June 8, p. 330). His invidious reference to small-list practitioners as "the unsuccessful" and "the mediocre" showed a complete lack of understanding of their problems and was an ignominious attack on their pro-

fessional abilities. Dr. Tudor Pembleton is to be congratulated if he is a diligent and successful full-list practitioner, but his "Damn you, Jack" inference is to be condemned as a most unprofessional, selfish attitude.

Dr. Tudor Pembleton is to be reminded that those who do not do a full day's work are sometimes influenced by factors outside their control. Nevertheless, a full day's practice expenses are incurred.

In conclusion, I would point out one fallacy in Dr. Tudor Pembleton's specious argument of the moral survival of the fittest—that is, it is often the apparently "successful" practitioner who is the mediocre.—I am, etc.,

London, E.17.

B. S. BENDETH.

Association Notices

G.M.S. COMMITTEE

ASSISTANTS AND YOUNG PRACTITIONERS SUBCOMMITTEE

Elections will be held in August to appoint representatives of assistants and unestablished principals to the Assistants and Young Practitioners Subcommittee of the General Medical Services Committee for the session 1957-8. The newly appointed Subcommittee will come into office on September 1, 1957.

For the purposes of election England and Wales are divided into five regions: (1) South-west and Wales, (2) South-east, (3) North-west and Midlands, (4) North-east, and (5) London and Home Counties. The General Medical Services Subcommittee (Scotland) appoints two representatives for that country as a whole.

Each region is based upon a regional office of the Association and elects two direct representatives to the Subcommittee—one assistant and one unestablished principal. The G.M.S. Committee appoints six of its members to serve on the Subcommittee. One assistant and one unestablished principal from the Subcommittee are co-opted to the G.M.S. Committee.

The electorate and membership of the Subcommittee, apart from the representatives of the G.M.S. Committee, are restricted to the following classes of practitioner:

- (i) Assistants in general practice.
- (ii) Practitioners engaged predominantly in general practice as principals (including those in partnership) whose total gross professional income does not exceed £1,500 per annum.

Assistants

The electoral roll for assistants is compiled from the Association's records, and each eligible assistant should by now have received a letter from the secretary of the Committee advising him that unless he signifies to the contrary his name will be automatically included in the new roll. Any assistant who does not receive such a letter but believes himself to be eligible for inclusion in the roll should communicate with the Secretary, B.M.A. House, Tavistock Square, London, W.C.1, not later than Wednesday, July 3.

Unestablished Principals

Applications are invited from principals whose total gross professional income does not exceed £1,500 and whose names are not already included in the electoral roll. Such applications should be made not later than Wednesday, July 3, on the form set out below.

Nominations

"Electoral rolls will, as indicated above, be closed on July 3. On July 10 a copy of the revised roll for his area will be sent to each eligible assistant or unestablished principal, asking for the submission of nominations not later than July 31. If there is a contest in any particular area, voting papers will then be issued.

For the use of unestablished principals only

GENERAL MEDICAL SERVICES COMMITTEE ASSISTANTS AND YOUNG PRACTITIONERS SUBCOMMITTEE UNESTABLISHED PRINCIPALS

I
(Block letters, please)
of
hereby apply for inclusion in the electoral roll of unestablished principals.

I declare that I am engaged predominantly in general practice as a principal with a total gross professional income not exceeding £1,500 per annum,

and I undertake to inform the secretary of the Committee at B.M.A. House of any change in my status which affects my eligibility for membership of the electorate.

Signed

Date

TO BE RETURNED NOT LATER THAN FIRST POST ON
JULY 3, 1957.

Diary of Central Meetings

JUNE

- 24 Mon. Registrars Group Executive, 2 p.m.
- 26 Wed. Council, 2 p.m.
- 25 Tues. Psychological Medicine Group Committee, 2 p.m.
- 26 Wed. Medical Staffing Subcommittee (Central Consultants and Specialists Committee), 10 a.m.
- 26 Wed. Medical Education Committee, 2 p.m.
- 27 Thurs. Compensation and Superannuation Committee, 2 p.m.
- 27 Thurs. Journal Committee, 2 p.m.
- 28 Fri. Assistants and Young Practitioners Subcommittee, General Medical Services Committee, 2 p.m.

JULY

- 10 Wed. Annual Representative Meeting (at Newcastle upon Tyne), 10 a.m.
- 11 Thurs. Annual Representative Meeting (at Newcastle upon Tyne), 9.30 a.m.
- 12 Fri. Annual Representative Meeting (at Newcastle upon Tyne), 9.30 a.m.
- 13 Sat. Council (at Newcastle upon Tyne), 9 a.m.
- 13 Sat. Annual Representative Meeting (at Newcastle upon Tyne), 10 a.m.
- 15 Mon. Annual Representative Meeting (at Newcastle upon Tyne), 10 a.m.
- 15 Mon. Annual General Meeting (at Newcastle upon Tyne), 12.30 p.m.
- 15 Mon. Council (at Newcastle upon Tyne), at conclusion of A.R.M.
- 15 Mon. Adjourned Annual General Meeting and President's Address (at Newcastle upon Tyne), 8.15 p.m.

Branch and Division Meetings to be Held

- BARNET DIVISION.—At Old Fold Manor Golf Club, Hadley Green, Barnet, Thursday, June 27, 8 p.m., annual meeting.
- BOURNEMOUTH DIVISION.—At Board Room, Royal Victoria Hospital, Boscombe, on Friday, June 28, 8.15 p.m., meeting. Address by Dr. P. K. Robinson: "Complications of Cervical Spondylosis."
- BRISTOL DIVISION.—At Bristol General Hospital, Wednesday, June 26, 8.30 p.m., clinical meeting.
- HERTFORDSHIRE BRANCH.—At Old Fold Manor Golf Club, Hadley Green, Barnet, Thursday, June 27, 8.30 p.m., annual general meeting, followed by films.
- READING DIVISION.—At Phyllis Court, Henley-on-Thames, Friday, June 28, 7.30 for 8 p.m., summer dance.
- SOUTH MIDDLESEX DIVISION.—At Casino Hotel, Tagg's Island, Hampton Court, Wednesday, June 26, 8 p.m. to 12 midnight, cocktail party. Members, their wives, and friends are invited.
- SOUTH WALES AND MONMOUTHSHIRE BRANCH.—At Lecture Room, B.M.A. Welsh House, 195, Newport Road, Cardiff, Thursday, June 27, 3 p.m., 87th annual meeting. Presidential Address by Dr. M. G. Williams: "Incidents in General Practice."
- SUSSEX BRANCH.—At Warne's Hotel, Worthing, Wednesday, June 26, 1 for 1.30 p.m., luncheon, followed by annual meeting.

Correction.—In the Annual Meeting programme (*Supplement*, June 8, p. 311) the price of tickets for the Welsh Dinner is given as 25s. This should be 27s. 6d.

SUPPLEMENT TO THE BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 29 1957

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British Medical Association

AGENDA OF ANNUAL REPRESENTATIVE MEETING, JULY 10, 11, 12, 13, AND 15, 1957, IN THE CITY HALL, NEWCASTLE UPON TYNE

CHAIRMAN: Dr. I. D. GRANT, Glasgow

PRELIMINARY BUSINESS

Items 1 to 7 relate to preliminary business.

REPORT OF AGENDA COMMITTEE

Grouping of Motions and Amendments: Order of Business

8. The Committee has arranged in groups certain Motions and Amendments which cover substantially the same ground and has selected in each group one Motion or Amendment (marked with an asterisk) on which it proposes that discussion should take place. The Representatives of the Constituencies concerned have been informed of these proposals in accordance with Standing Order 21(iii).

The Council decided that an extra day should be added to the Report of the Constitution Committee, and that this Report should form the first item of the business of the preliminary Meeting. Before this business is taken certain preliminary items of the Agenda should be completed. The Committee proposes, therefore, that the debate on the Report of the Constitution Committee should be taken after Item 13 under "Preliminary" and that the remaining items of the Agenda under this heading—namely, items 14-18—should be taken immediately after the completion of the debate on the Constitution Committee Report.

The Committee Recommends:

Recommendation: (1) That the business under "Constitution of the Association" be taken immediately after Item 13 of the Agenda;

(2) That the business under "Overseas," "Commonwealth Medical Advisory Bureau," and "International Medical Advisory Bureau" be taken at 11 a.m. on Friday, July 12;

(3) That "Other Motions by Divisions," if not previously dealt with, be considered as the first business on Monday, July 15, after the Official Vote of Thanks;

(4) That, with these exceptions, the order of the business be as set out in the Agenda.

STANDING ORDERS

9. **Motion** by the Chairman: That the Standing Orders (Doc. A.R.M. 5) as circulated with this Agenda be adopted as the Standing Orders of the Meeting.

10. **Amendment** by St. HELENS: That, from the commencement of this A.R.M. and for its duration, Standing Order 31 be amended so as to reduce the time limit of speeches to ten minutes, five minutes, and three minutes respectively.

PRELIMINARY

11. **Motion** by the Chairman of Council (S. Wand) on behalf of the Council: That the Annual and Supplementary Reports of Council under "Preliminary" (Docs. A.R.M. 2, paras. 1-21, and A.R.M. 3, paras. 243-245) and the Summary of Action Taken on the Resolutions of the A.R.M. 1956 (Appendices II and IIA) be received.

Election of Vice-President

12. **Motion** by the Chairman of Council: That Thomas Clarence Routley, C.B.E., LL.D., D.Sc., M.D., F.R.C.P.(C.), of Toronto, be elected a Vice-President of the Association in recognition of his distinguished services to the Association.

Annual Meeting, 1958—Election of President

13. **Motion** by the Chairman of Council: That Arthur Peregrine Thomson, M.C., M.D., F.R.C.P. (Birmingham), be elected as President of the Association for 1958-9.

Remuneration Policy

14. **Motion** by GLOUCESTERSHIRE: That, as moral obligations have evidently ceased to be obligatory, every effort shall be made in future negotiations on terms of service in the N.H.S. to ensure that only such terms as are enforceable in law shall be accepted on behalf of the profession.

15. **Motion** by EAST YORKS: That in view of the need for constant vigilance on matters relating to salaries and conditions of service, the Council be instructed to set up a whole-time department for the provision of advice upon

drawing up of terms of service and negotiation of salaries for all branches of the profession.

Reports to Divisions Concerning A.R.M. Resolutions

16. **Motion** by the Chairman of Council: (1) That Minute 237 of the A.R.M. 1954 (quoted in para. 19 of Annual Report of Council) be rescinded; (2) That when a resolution is passed at a Representative Meeting, the Division or Divisions concerned be informed when a final decision on the subject-matter of the resolution has been reached.

Service Representatives on the Council

17. **Motion** by the Chairman of Council: That the following be elected Representatives of the Army Medical Services and the Medical Branch of the Royal Air Force on the Council for the period 1957-60: Army Medical Services, Major General R. Murphy, C.B., C.B.E.; Medical Branch of the Royal Air Force, Air Vice-Marshal W. E. Barnes, C.B.E.

Remainder of Report under "Preliminary"

18. **Motion** by the Chairman of Council: That the remainder of the Annual and Supplementary Reports of Council under "Preliminary" be approved.

CONSTITUTION OF THE ASSOCIATION

19. **Motion** by the Chairman of the Constitution Committee (H. H. Langston) on behalf of the Council: That the Annual Report of Council under "Constitution of the Association" (Doc. A.R.M. 2, para 206) and the report of the Constitution Committee to the Representative Body (Appendix I—Doc. A.R.M. 2A) be received.

20. **Motion** by LIVERPOOL: That this Meeting feels that, owing to so much time having been spent on the question of remuneration, most doctors will not have been able to give sufficient attention to the consideration of the Report on the Constitution of the Association. It therefore urges that discussion of the Report be deferred until the A.R.M. of 1958.

*21. **Motion** by ENFIELD AND POTTERS BAR: That the Report of the Constitution Committee be debated at the Annual Representative Meeting but that final decisions on the recommendations therein be deferred.

22. **Motion** by HAMPSHIRE: That the Report of the Constitution Committee should be discussed but no decision taken until the Annual Representative Meeting of 1958.

PERIPHERAL ORGANIZATION

The Basic Unit—The Division

23. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 1: That the Divisions as at present constituted should form the basic unit of the Association's constitution and that no change of area should be effected except on the initiative or with the consent of the Divisions themselves.

24. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 2: That while ease of access for members is of paramount importance in determining Division areas, the importance of maintaining a close relationship with local statutory or functional bodies and other local professional groups should not be overlooked.

The Branch

25. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 3: That in order to maintain the unity of the profession within the Association in the changed circumstances created by the establishment of a National

Health Service, the second tier unit—that is, the Branch—should be reconstituted on a regional basis. The regions should, as far as possible, follow those of the Regional Hospital Boards under the National Health Service.

26. **Amendment** by ENFIELD AND POTTERS BAR: That the choice of regional hospital board boundaries to determine the areas of the new Branch Councils will not best serve the interests of the Association.

27. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 4: That the Branch, as reconstituted, should have as its main object the fostering and maintenance of the unity of the profession within its area. Its functions should, in effect, be those of the present Branch Council, modified and extended to meet present-day conditions. For this reason the Branch would not ordinarily hold meetings of the individual members in its area. Its main duty would be to call together its constituent Divisions, or the professional groups within its area, for an exchange of views. It would reserve the right to call a meeting of individual members on a particular occasion if deemed necessary or expedient.

28. **Amendment** by NORTH LANCASHIRE AND WESTMORLAND: That the Recommendation be amended by the deletion of the third sentence and the substitution for the final sentence of "The Branch would continue to hold an Annual Meeting of the individual members in its area and would reserve the right to call a meeting of individual members on other occasions if deemed necessary or expedient." (The recommendation would then read:

"That the Branch, as reconstituted, should have as its main object the fostering and maintenance of the unity of the profession within its area. Its functions should, in effect, be those of the present Branch Council, modified and extended to meet present-day conditions. Its main duty would be to call together its constituent Divisions, or the professional groups within its area, for an exchange of views. The Branch would continue to hold an Annual Meeting of the individual members in its area and would reserve the right to call a meeting of individual members on other occasions if deemed necessary or expedient.")

29. **Amendment** by WINCHESTER: That the words "For this reason the Branch would not ordinarily hold meetings of the individual members in its area" be omitted and that there be inserted "For this reason the Branch need not necessarily hold an Annual General Meeting but may continue to hold meetings of its individual members", and that the last sentence of the recommendation be deleted. (The recommendation would then read:

"**Recommendation 4:** That the Branch, as reconstituted, should have as its main object the fostering and maintenance of the unity of the profession within its area. Its functions should, in effect, be those of the present Branch Council, modified and extended to meet present-day conditions. For this reason the Branch need not necessarily hold an Annual General Meeting but may continue to hold meetings of its individual members. Its main duty would be to call together its constituent Divisions, or the professional groups within its area, for an exchange of views.")

30. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 5: That the functions of the Branch, as reconstituted, should be as follows, and that the necessary amendments to the By-laws be made to give effect to these proposals:

- (1) To foster and maintain the unity of the profession within its area by means of exchange of views.
- (2) To take appropriate and immediate action in support of any section of the profession within its area when requested to do so.

(3) To report such action to Headquarters with a view to active measures by the whole profession if necessary.

(4) To co-ordinate the work of the Divisions within its area.

(5) To manage the affairs of inactive Divisions and promote their activity.

(6) To organize special groups of Divisions for special purposes.

(7) To provide the Divisions with funds, out of grants from Headquarters.

(8) To undertake responsibility for the establishment and the maintenance of efficient public relations machinery in the Divisions within its area; and if necessary to establish Branch machinery.

(9) To report to Council as to local conditions, without prejudice to other existing channels of communication.

(10) To maintain an effective liaison with the member(s) of Council representing the constituency.

(11) To elect members of the Association when, and only when, referred by a Division within its area.

31. **Amendment** by GLOUCESTERSHIRE: That it be not a function of a Branch to provide the Divisions with funds (as stated in sub-paragraph (7) of the recommendation), but that such funds be made by direct grant from Headquarters.

32. **Amendment** by NORTH LANCASHIRE AND WESTMORLAND: That the recommendation be amended by the deletion in sub-paragraph (11) of the words "when, and only when."

33. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 6: That Article 3 and By-laws 5, 6, and 7 be altered to provide that the election of new members shall ordinarily be by Divisions with the right of reference to Branch Councils, save that in the case of newly qualified applicants election shall be by the Council.

34. **Amendment** by WINCHESTER: That pending the necessary alteration of the Articles and By-laws, Council be instructed to implement without delay the recommendation of the Constitution Committee that members of the Association should ordinarily be elected by the Divisions.

35. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 7: That the scheme for regrouping of Divisions to form Branches on a regional basis set out in Appendix B to the Committee's Report be approved.

36. **Amendment** by EAST KENT: That the recommendation be referred back for further study with particular reference to the desirability of separating the Metropolitan Divisions from Group 7 of the revised arrangement.

*37. **Amendment** by WANDSWORTH: That the area of the Metropolitan Counties Branch, and the present grouping of the Divisions within the area of the Branch, should remain unchanged.

38. **Amendment** by METROPOLITAN COUNTIES: That the area of the Metropolitan Counties Branch should remain as it is at present.

39. **Amendment** by FIFE: That the Representative Body approve the desire of the Fife Branch to retain its identity as a Branch.

Constituencies for Election of "Forty" Members of Council

40. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 8: That the revised grouping of Home Branches to form constituencies for the direct election of members of Council (Appendix C of Report) be approved; and that By-law 53 be amended so as to increase the number of such directly elected members from 40 to 41.

41. **Amendment** by DERBY: That the Council be requested to devise a scheme to ensure that members of any reconstructed Council be representative of the geographical distribution of the Branches.

42. **Amendment** by SWANSEA: That, because of the peculiar geographical difficulties in the South Wales and Monmouthshire Branch, the number of elected members of Council be increased by one, who shall be elected by the Aberystwyth, South-west Wales, and Swansea Divisions.

THE REPRESENTATIVE BODY

Constitution of Representative Body

Size of the Representative Body

43. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 9: (a) That the number of Representatives of Home Divisions in the Representative Body be reduced by an amount which will ensure an overall membership of that body of approximately 350. (b) That the scheme for the formation of Home Constituencies for the appointment of Representatives to the Representative Body, set out in Appendix D to the Report, be substituted for that laid down in By-law 39; and (c) That By-law 39 be amended accordingly.

44. **Amendment** by BOURNEMOUTH: That this Representative Body believes that disadvantages outweigh any possible advantage in cutting the size of the Representative Body, and wishes that other means be first tried to make the working of the Representative Body more efficient.

45. **Amendment** by MANCHESTER: That inasmuch as it is proposed to cut the size of the Representative Body by approximately one-quarter, this Meeting considers that no Division should have its representation cut by more than that amount.

46. **Amendment** by DORSET: That this Meeting considers that where a constituency has 100 members or more there should be at least two representatives.

47. **Amendment** by BRISTOL: That the Recommendation be amended by the addition of the following sub-paragraph: (d) That the effects of (a), (b), and (c) shall not take place until the A.R.M. of 1960.

48. **Amendment** by ENFIELD AND POTTERS BAR: That the Constitution Committee be instructed to consider whether the Representative Body should be reconstituted to embrace the Conference of Local Medical Committees and the Conference of Regional Consultants and Specialists Committees, with provision for both sectional and plenary sessions.

Card Vote

49. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 10: That By-law 49 be amended to provide that if, on a vote having been taken, a vote by card is demanded by one-third of the Representatives present, the vote shall be taken by card.

(By-law 49 provides that a vote by card shall be taken if "demanded by a majority of the Representatives present.")

50. **Amendment** by RUGBY: That Recommendation 10 be amended by the insertion of the words "and voting" after "Representatives present."

Representation of Special Interests in the Representative Body

51. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 11: That By-laws 38-44 (which deal with the composition of and election to the R.B.) should be amended to provide for the election of four members of the Association by the Central Consultants and Specialists Committee as Representatives in the R.B.

Quorum of the Representative Body

52. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 12: That the quorum of the Representative Body (at present "at least one-half of the number of Representatives appointed to attend the Meeting") should be reduced to 75 such Representatives.

53. **Amendment** by SOUTH STAFFORDSHIRE: That the quorum of the Representative Body should be at least one-third of the number of Representatives appointed to attend the Meeting.

54. **Amendment** by BOURNEMOUTH: That this R.B. is not prepared to agree that a quorum of 75 members could safely and efficiently reflect the view of the profession, and it adheres to the figure of 50% if recommendation 9 of the Committee is adopted, but would accept one-third if the size of the R.B. remains as at present.

The Conduct of Business at Representative Meetings*Functions and Powers of the Agenda Committee*

55. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 13: That the existing constitution of the Agenda Committee, as laid down in S.O. 21 of the Representative Body, is satisfactory and should be retained.

Meetings of Agenda Committee

56. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 14: That S.O. 21 of the Representative Body be amended to provide that the Agenda Committee shall meet during each day's session of the Representative Body, at a time to be arranged, to review progress and the business outstanding, and to advise the Chairman.

Grouping of Motions

57. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 15: That the powers of the Agenda Committee under S.O. 21 of the R.B. in respect of the grouping of motions or amendments be extended to enable it to submit a motion in a common form in cases where it considers that the principle covered by the motions in the group is not adequately stated in any single motion; such extension of power to be without prejudice to the right of any Representative to speak to his original motion as an amendment to the common form motion.

58. **Amendment** by LIVERPOOL: That the words "subject to such motions being listed thereafter" should be inserted after "any single motion" so that the recommendation reads:

That the powers of the Agenda Committee under S.O. 21 of the R.B. in respect of the grouping of motions or amendments be extended to enable it to submit a motion in a common form in cases where it considers that the principle covered by the motions in the group is not adequately stated in any single motion, subject to such motions being listed thereafter; such extension of power to be without prejudice to the right of any Representative to speak to his original motion as an amendment to the common form motion.

59. **Amendment** by SOUTH STAFFORDSHIRE: That the recommendation be amended by the substitution of the word "suggest" for "submit" in line 4; and the substitution for the last sentence of the words: "If all the Representatives agree the composite motion shall replace all the original motions."

(The recommendation would then read:

"That the powers of the Agenda Committee under S.O. 21 of the R.B. in respect of the grouping of motions or amendments be extended to enable it to suggest a motion in a common form in cases where it considers that the principle covered by the motions in the group is not adequately stated in any single motion. If all the Representatives agree the composite motion shall replace all the original motions.")

Priority Motions

60. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 16: That the Agenda Committee be empowered, as necessity arises, to give priority to motions on questions of outstanding importance and to arrange for these to be debated at specified times.

Pruning of Agenda

61. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 17: That elimination from the Agenda of the Representative Meeting of motions submitted by Divisions on matters which have already been the subject of action by Central Committees is not advisable; and that Divisions should retain the right to submit to the Representative Body motions on any matters which they consider of sufficient importance for debate.

Order of Agenda

62. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 18: That the procedure laid down in S.O. 21 of the Representative Body should be strictly observed.

63. **Amendment** by BOURNEMOUTH: That this R.B. is not satisfied that the order of business, as normally set out in the Agendas, is arranged in the most fair and convenient way, and instructs the Agenda Committee to consider setting out a time-table for the presentation of Committee Reports, or alternatively considering the desirability of placing the two largest reports, General Medical Services Committee and Central Consultants and Specialists Committee, after other Committee Reports have been dealt with.

Time Limit of Speeches

64. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 19: That the Chairman of a Committee may on request to the Chairman before presenting his Report, and with the permission of the Meeting, be granted an extension of time up to half the period allowed under S.O. 31 for presentation of the Report, save that in exceptional circumstances he may be granted such further extension of time as the Meeting itself shall predetermine.

Presentation of Reports by Chairmen of Committees

65. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 20: That the procedure laid down in S.O. 24 of the R.B. for presentation of Reports should be adhered to strictly and that the practice of moving the adoption of individual paragraphs of the Report of Council to which amendments are proposed, before the amendment is moved, should be discontinued except in the circumstances indicated in the Standing Order.

GENERAL MEETINGS OF THE ASSOCIATION*Extraordinary General Meeting*

66. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 21: That the Articles of the Association be altered by adding at the end of Article 24 the following words: "for the purpose of considering any matter other than a matter which affects the general control and direction of the policy and affairs of the Association."

(As amended the Article would read:

"24. The Council may whenever it thinks fit, and (without prejudice to the provisions of the Companies Act, 1948) it shall upon a requisition made in writing as herein after provided by any one hundred or more Members convene an Extraordinary General Meeting for the purpose of considering any matter other than a matter which affects the general control and direction of the policy and affairs of the Association.")

THE ANNUAL SCIENTIFIC MEETING

67. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 22: That modification of the existing arrangements for holding the Annual Meeting of the Association having been examined and found impracticable, the existing arrangements be retained.

A Second Scientific Meeting

68. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 23: That a Second Scientific Meeting of the Association be held at an appropriate time during the year; and that the Council be empowered to draw up and to put into operation a scheme for such a meeting.

69. **Amendment** by SOUTHAMPTON: That Recommendation 23 be amended by the insertion after the word "year" of the words "in one of the smaller provincial centres."

THE COUNCIL*Constitution*

70. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 24: That no change should be made in the constitution of, and the methods of election to, the Central Council of the Association.

71. **Amendment** by EAST HERTS: That all members of Council (excepting those elected by Overseas Branches, by the Public Health Service, and by women members) should be elected by Representatives of Divisions, and not largely by members of grouped Branches as at present.

72. **Amendment** by SOUTH STAFFORDSHIRE: That members of Council should be returned by single member constituencies.

73. **Amendment** by RUGBY: That this Meeting considers that one young practitioner should be appointed to the B.M.A. Council annually to hold office for two years (the method of election to be determined by the young practitioners).

74. **Amendment** by BOURNEMOUTH: That consideration should be given to the reconstitution of Council so that it should have the ultimate authority, on behalf of the Association, in all matters of policy and action affecting the whole profession.

PRESENTATION OF COMMITTEE REPORTS TO THE COUNCIL

75. **Motion** by the Chairman of the Constitution Committee: That paras. 119 and 120 of the Report of the Constitution Committee be approved.

76. **Amendment** by RUGBY: That Chairmen of Committees (Standing or Special) who are not members of the Council should be allowed, if they so wish, to present their Committee Reports to Council in person.

COMMITTEES AND STANDING COMMITTEES

77. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 25: That steps be taken to amend the Schedule to the By-laws in respect of the following Standing Committees in the manner indicated:

Charities Committee: To add to the membership two representatives of the younger members of the profession nominated as to one each by the Central Consultants and Specialists and General Medical Services Committees; and the duly appointed representative of the B.M.A. on the Joint Committee of Epsom College.

Private Practice Committee: To substitute for the first sentence in the existing reference the following: "To consider and report on matters affecting the profession in the field of private general or consulting practice."

Public Health Committee: To substitute for the first sentence in the existing reference the following: "To consider and report on questions relating to preventive medicine and the public health services."

Central Consultants and Specialists Committee

78. **Motion** by MANCHESTER: That the Central Consultants and Specialists Committee should be reconstituted so as to give adequate representation to all grades of hospital medical staffs, and that it be referred to the Council to prepare the necessary amendment to the Schedule of the By-laws to give effect to this proposal.

Finance and Journal Committees

79. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 26: That steps be taken to amend Standing Order 52 of the Representative Body by the deletion of the reference to the Finance and Journal Committees.

Scottish Committee

80. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 27: That the proposed change of title from "Scottish Committee" to "Scottish Council" be approved and that the Schedule to the By-laws be amended accordingly.

Liaison Between Committees

81. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 28: That By-law 80 be amended to provide that every Committee shall, in respect of any matter before it which is of special interest to another Committee of the Association, consult that other Committee. In the event of disagreement no action shall be taken without reference to the Council.

THE POWERS OF THE AUTONOMOUS BODIES

82. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 29: (a) That the existing relationship of the autonomous bodies to the Association should be

continued, subject to ratification annually by the Representative Body of the powers of these bodies. (b) That the arrangement under which the Joint Committee between the Central Consultants and Specialists Committee of the B.M.A. and the Royal Colleges and the Scottish Royal Medical Corporations acts as the negotiating body with the Government in respect of those engaged in the hospital and specialist service under the N.H.S. should be continued.

83. **Amendment** by ST. HELENS: That the Constitution Committee be instructed to investigate the possibility of replacing the present system of autonomous bodies by one which will more efficiently safeguard the unity of the profession.

84. **Amendment** by BOURNEMOUTH: That this R.B. is of the opinion that as the R.B. has given the General Medical Services Committee and the Central Consultants and Specialists Committee authority not only of discussion, but also of action, the proceedings of the Representative Body are unnecessarily clogged and time wasted by discussing details in these Committee Reports, or matters on which action has already been taken.

CONSTITUTION AND ORGANIZATION OF SPECIAL GROUPS

85. **Motion** by the Chairman of the Constitution Committee: That the following Recommendation of the Committee be adopted:

Recommendation 30: (a) That no new Group should be formed, but if the need should arise for consideration of problems relating to any special interest the need should be met by the formation of a Subcommittee of the appropriate Standing Committee. (b) That the constitution of the Senior Hospital Medical Officers and Registrars Groups be amended to provide that the Executive Committees of these Groups should function as Subcommittees of the Central Consultants and Specialists Committee; and that these Subcommittees should include members of the Groups elected on a regional basis, together with a minority of members appointed by the Central Consultants and Specialists Committee.

*86. **Amendment** by SWANSEA: That the recommendation be amended by the deletion of sub-paragraph (b).

87. **Amendment** by MANCHESTER: That this Meeting rejects the proposal that the Senior Hospital Medical Officers and Registrars Group Executive Committees become Subcommittees of the Central Consultants and Specialists Committee.

88. **Amendment** by SOUTH STAFFORDSHIRE: That the constitution of the Registrars Group be amended as follows:

(1) That the Registrars Group Council be renamed the Hospital Junior Staffs Central Committee, and (a) that its day-to-day work be carried out by a Hospital Junior Staffs Central Executive Committee; (b) that the H.J.S.C. Committee should receive from, and appoint to, the Central Consultants and Specialists Committee two representatives to facilitate adequate liaison between the two Committees; (c) that the H.J.S.C. Committee (being a B.M.A. Committee) should retain the right of direct access to the Council of the Association in the event of disagreement with the Central Consultants and Specialists Committee.

(2) That the Regional Registrars Group be renamed the Hospital Junior Staffs Regional Group and that (a) all grades of hospital junior staffs be entitled to attend and take part in regional meetings; (b) so far as possible, regional group committees should include representatives of all grades of hospital junior medical staffs, provided that the number of house officers should not exceed two.

(3) That officers below the grade of registrar be entitled to serve on the Hospital Junior Staffs Central Committee if so elected by regions.

(4) That officers below the grade of registrar be entitled to send a deputation to the Hospital Junior Staffs Central

Committee when matters of particular concern to them are under consideration.

Approval of Report

89. **Motion** by the Chairman of the Constitution Committee: That the Report of the Constitution Committee, as amended, be approved.

Congratulations on Committee Report

90. **Motion** by RUGBY: That this Meeting congratulates the Committee on the Constitution of the Association on the thoroughness of their investigation, the clarity of their report, and the soundness of their conclusions.

A.R.M. Procedure

91. **Motion** by NEWCASTLE UPON TYNE: (a) That Representatives at Representative Meetings of the B.M.A., when considering resolutions or amendments affecting essentially one section of the profession, should pay full respect to the views put forward by Committees representing those individual groups. (b) That, in order to avoid splits within the profession, machinery should be introduced in order that recommendations made by interested Committees should not be reversed at Representative Meetings without giving opportunity for further discussion, at periphery level, by those sections of the profession most concerned in the outcome of controversial resolutions or amendments.

ORGANIZATION

92. **Motion** by the Chairman of the Organization Committee (Ronald Gibson) on behalf of the Council: That the Annual and Supplementary Reports of Council under "Organization" (Docs. A.R.M. 2, paras. 193-205, and A.R.M. 3, para. 279) and proposals for Amendments of By-laws and A.R.M. Standing Orders (Appendices VI and X) be received.

Date of Annual Representative Meeting

93. **Motion** by the Chairman of the Organization Committee: That the following Recommendation of the Council (para. 195 of Annual Report) be adopted:

That the existing procedure under which the date of the A.R.M. is determined be retained.

Membership of Council—Vacancies

94. **Motion** by the Chairman of the Organization Committee: That the following Recommendations of the Council (paras. 196 and 279 of Annual and Supplementary Reports) be adopted:

(1) That in the event of one of the "13" members of Council elected under By-law 53(c) by the elected Representatives at the Representative Meeting being appointed to the Chair of the Council, a vacancy among the "13" shall be deemed not to have arisen, and that By-law 70 be amended accordingly.

(2) That the By-laws should be so amended as to provide that any election for the purpose of filling a casual vacancy arising among the members of the Council elected by the Representative Body shall be in manner prescribed by that Body; and that the Standing Orders of the Representative Body be so modified as to provide that the election shall be conducted by postal vote.

95. **Amendment** by WORCESTER AND BROMSGROVE: That in the event of a vacancy arising among the "13" members of Council elected by the Representative Body, the vacancy be filled without further ballot by the unsuccessful candidate obtaining the greatest number of votes at the last previous election.

Resident Medical Secretaries to Association Regional Offices

96. **Motion** by the Chairman of the Organization Committee: That para. 198 of the Annual Report of Council be approved.

97. **Amendment** by MANCHESTER: That notwithstanding the decision of Council, and the arguments set forth in Section 163 of the Annual Report of Council for 1955-6, this Meeting requests Council to appoint Resident Medical Secretaries, acceptable to the members of the region concerned, to those areas possessing a Regional Office.

98. **Amendment** by LIVERPOOL: That notwithstanding the decision of Council and the arguments set forth in Section 163 of the Annual Report, this Meeting requests Council to appoint Resident Medical Secretaries, acceptable to the members of the region concerned, to those areas possessing a Regional Office, where so desired.

Autonomous Bodies

99. **Motion** by the Chairman of the Organization Committee: That the following Recommendation of the Council be adopted:

That the autonomous powers of the General Medical Services Committee and the Central Consultants and Specialists Committee be renewed in respect of the year 1957-8.

That the Representative Body looks to these Committees to ensure (1) that no action be taken by either which may prejudice the interests of another part of the profession without full prior consultation with the appropriate interests, and (2) that their autonomous powers will be used so as to expedite and not delay the work of the Association.

100. **Amendment** by RUGBY: That the first para. of the Recommendation be amended to read, "That the autonomous powers of the General Medical Services Committee and the Central Consultants and Specialists Committee be renewed ONLY in so far as they affect the purely domestic affairs of those Committees and NOT in respect of activities in which other branches of the profession are concerned."

101. **Amendment** by TORQUAY: (1) That in order to preserve the unity of the profession and to present as far as possible a united front, all decisions of the autonomous bodies affecting the national policy of the profession be communicated to the Representative Body or its Council before they are implemented. (2) That the Royal Colleges and the College of General Practitioners be asked, without prejudice, to co-operate in the same way.

102. **Motion** by GUILDFORD: That in the opinion of this Meeting it is improper for any individual member of a joint negotiating committee of the Association to take independent action on matters under discussion without the prior consent of the whole committee.

103. **Motion** by DERRY: That this Meeting expresses once again the earnest hope that in future any medical committee or council (or similar body) which advises, or acquiesces in or council (or similar body) which advises, or acquiesces in any major change in medico-political policy, will either take steps to ascertain the views of the profession as a whole, or else to make it clear beyond peradventure that the opinion expressed is solely that of the individuals forming the committee, etc., and by no means necessarily that of the profession as a whole.

Compounded Subscription to Association of Newly Qualified Practitioners

104. **Motion** by the Chairman of the Organization Committee: That the following Recommendation of the Council (para. 201 of Annual Report) be adopted:

That By-law 16(1) be so amended as to remedy the present inconsistency in respect of the compounded subscription payable by newly qualified practitioners.

Amendments to By-laws

105. **Motion** by the Chairman of the Organization Committee: That the following recommendation of the Council be adopted:

That the By-laws of the Association be altered in the manner shown in Appendix VI.

Remainder of Report under "Organization"

106. **Motion** by the Chairman of the Organization Committee: That the remainder of the Annual and Supplementary Reports of Council under "Organization" be approved.

Assistance from Central Funds for Social Activities

107. **Motion** by CLEVELAND: That any Branch or Division which is not in possession of an established Voluntary Fund should be precluded from assistance from central funds for social activities the cost of which cannot be met from the annual capitation grant allocated by the Council.

Change of Divisions

108. **Motion** by RUGBY: That the By-laws be amended as follows:

Firstly: By-law 5(a) be deleted *in toto*.

Secondly: By-law 14(1) be amended as follows: (1) At the beginning, after the words "subject as hereinafter provided," ADD "in By-law 14(a)." (2) Delete at the end from "provided always that any member . . ." to " . . . in which he resides."

Thirdly: by inserting the following new By-law 14(a): "Change of Division. 14(a) If owing to ease of access, professional association or other reason, a member (whose address for the time being in the Register of Members of the Association is within Great Britain or Northern Ireland) would prefer to become a member of some Division other than that of which he is, by reason of his address, an Ordinary Member, he shall on written application to the Secretary of the Association forthwith be transferred to and become an Ordinary Member of the Division of his choice and of no other."

(By-laws 5(a) and 14(l) read:

"5(a) (1) Any Member whose address as registered for the time being in the Register of Members of the Association is within Great Britain or Northern Ireland may apply to become an Ordinary Member of a Division other than that in whose area he resides on one of the grounds hereinafter mentioned. Every such application shall be forwarded to Head Office accompanied by a statement of the reason or reasons therefor and shall (together with such reason or reasons) forthwith be notified by Head Office to the Secretaries of the Divisions concerned. If within one month from the receipt of such notification either such Division shall send to Head Office any objection to such proposed change of Division or if there be doubt whether adequate reasons exist for such proposed change the matter shall be decided by the Council but subject as aforesaid such proposed change shall become effective at the expiration of the said period.

(2) The grounds on which any such application may be made are:

(a) that for any reason the member concerned can attend meetings of the Division of which membership is sought with greater convenience than meetings of the Division in which he resides, or

(b) that the member concerned has a greater community of professional interest with other Members of the Division of which membership is sought than with Members of the Division in which he resides.

(3) The result of any such application shall be notified forthwith by Head Office to the Secretary of each of the Divisions concerned and (where appropriate) the necessary entries shall forthwith be made in the Register of Members of the Association."

"14(1) Subject as hereinafter provided for all the purposes of the Regulations and the By-laws the persons for the time being named in the Register of Members of the Association whose respective addresses are situated at places within the area of any Division, Corporate Branch, or Corporate Group and no others shall be deemed to be the Ordinary Members of that Division, Corporate Branch, or Corporate Group, and the persons for the time being Ordinary Members of the Divisions comprised in a Branch and no others shall be deemed to be the Ordinary Members of that Branch and the persons whose names are for the time being distinguished in the Register of Members of the Association as Public Health Service Members and no others shall be deemed to be the Public Health Service Members. Provided always that any Member who has become a member of a Division other than that in which he resides in manner provided in By-law 5(a) hereof shall be a

member of such first mentioned Division and shall not be a member of the Division in which he resides.")

Motions Requiring Alterations of Articles and By-laws

109. **Motion** by RUGBY: That if a motion adopted by the Representative Body requires for its implementation an alteration to the Articles and/or By-laws, a draft of the proposed alteration should be forwarded to the sponsoring Division for comment before publication. After publication thereof in the Annual Report of Council, it should be possible for any Division, after due notice, to move an amendment thereto which, if carried, would not delay implementation for a further year.

Pre-registration Year Appointments

110. **Motion** by BLYTH: That the A.R.M. request the General Medical Council to include a period of work with an approved general practitioner as one of the appropriate appointments during the pre-registration year.

Membership Subscription during Pre-registration Year

111. **Motion** by GLASGOW: That the subscription for membership of the British Medical Association during the pre-registration year or portion thereof should be 10s. 6d.

Subscriptions for Whole-time Salaried Officers

112. **Motion** by DERBY: That the annual subscription to the B.M.A. for whole-time salaried officers be reduced from 6 to 4 guineas because of the anomalies that arise over income-tax payments.

(Foregoing Items 111 and 112 were not received in time to give the notice in the B.M.J. Supplement necessary under Article 39(2) for motions involving amendments of By-laws. If passed they will need formal notice and confirmation by a future Representative Meeting in order to become effective.)

WALES

113. **Motion** by the Chairman of the Welsh Committee (A. Maddock Jones) on behalf of the Council: That the Annual Report of Council under "Wales" (Doc. A.R.M. 2, para. 217) be received.

114. **Motion** by the Chairman of the Welsh Committee: That the Annual Report of Council under "Wales" be approved.

SCOTLAND

115. **Motion** by the Chairman of the Scottish Committee (W. M. Knox) on behalf of the Council: That the Annual Report of Council under "Scotland" (Doc. A.R.M. 2, paras. 207-216) be received.

116. **Motion** by the Chairman of the Scottish Committee: That the Annual Report of Council under "Scotland" be approved.

MEDICAL BENEVOLENCE

117. **Motion** by the Chairman of the Charities Committee (H. M. Golding) on behalf of the Council: That the Annual Report of Council under "Medical Benevolence" (Doc. A.R.M. 2, para. 218) be received.

118. **Motion** by the Chairman of the Charities Committee: That the Annual Report of Council under "Medical Benevolence" be approved.

Ladies Guild

119. **Motion** by EAST AND MID-LOTHIAN: That the Council be asked to refer in its Annual Report to the very helpful work of the Ladies Guild of the Royal Medical Benevolent Fund.

MEDICAL FILMS

120. **Motion** by the Chairman of the Film Committee (R. P. Liston) on behalf of the Council: That the Annual Report of Council under "Medical Films" (Doc. A.R.M. 2, para. 219) be received.

General Film on Rehabilitation

121. **Motion** by the Chairman of the Film Committee: That para. 219 of the Annual Report of Council be approved.

122. **Amendment** by TORQUAY: That, in view of the Report of the Piercy Committee and the apparent lack of knowledge by members of the medical profession of the potentialities of aftercare and rehabilitation, this Meeting regrets that the Council is unable to report progress on the production of the general film on Rehabilitation.

Remainder of Report under "Medical Films"

123. **Motion** by the Chairman of the Film Committee: That the remainder of the Annual Report of Council under "Medical Films" be approved.

HOSPITAL AND CONSULTANT SERVICES

124. **Motion** by the Chairman of the Central Consultants and Specialists Committee (T. Holmes Sellors) on behalf of the Council: That the Annual and Supplementary Reports of Council under "Hospital and Consultant Services" (Docs. A.R.M. 2, paras. 68-103, and A.R.M. 3, paras. 248-250) and the Memorandum on the Future of the Chest Services (Appendix IV) be received.

Medical Membership of Hospital Boards

125. **Motion** by MARYLEBONE: That this Meeting deplores the recent reduction of medical members on Hospital Boards and Management Committees, as this deprives the public of adequate medical opinion.

126. **Motion** by TORQUAY: That the number of medical members on regional hospital boards and hospital management committees should not exceed 33% and should not be less than 25%.

Senior Hospital Medical Officers and Registrars

127. **Motion** by STRATFORD: That this Representative Meeting is concerned with the prospects and future of registrars and S.H.M.O.s, and the supply and distribution of consultants. It asks Council to look at the problem afresh in consultation with doctors of the grades concerned and to report back to the Representative Body.

Internal Administration of Hospitals and S.H.M.O.s

128. **Motion** by the Chairman of the Central Consultants and Specialists Committee: That paras. 71 and 77 of the Annual Report of Council be approved.

*129. **Amendment** by LIVERPOOL: That, with reference to paragraphs 71 and 77 of the Annual Report of Council, this Meeting is of the opinion that Council, when it has received resolutions from the Representative Body deciding the policy of the Association, must, if it receives contrary advice from any of the Committees to which the resolution has been referred for comment, ask the R.B. to reconsider the matter and not make statements of contrary policy in the Annual Report of Council.

130. **Amendment** by RUGBY: That, with reference to paragraph 71 of the Annual Report of Council, if for any reason Council is unprepared to accept a resolution of the Representative Body as official policy of the Association, it should seek a reversal of such policy by constitutional means and not simply by expressing its disapproval in the report of Council.

131. **Amendment** by SOUTH SHIELDS: That, with reference to para. 77 of the Annual Report of Council, this Meeting confirms the policy previously adopted in relation to S.H.M.O.s and instructs the Council to take active steps to secure implementation, particularly of the following resolutions of the A.R.M., 1956:

251. **Resolved**: That a review of S.H.M.O.s is now overdue. It should be undertaken by a newly constituted central committee of agreed composition. The criteria should be known and accepted in advance.

258. **Resolved**: That this Meeting recommends that the salary of the S.H.M.O. grade should be raised to 80% of the consultant salary throughout the whole scale.

261. **Resolved**: That all S.H.M.O.s engaged in consultant work unsupervised should be remunerated at consultant rates.

132. **Amendment** by READING: (1) That, with reference to para. 77 of the Annual Report of Council, in view of the fact that over 800 S.H.M.O.s have been fully supported by their consultant colleagues in their claim for consultant rates of pay, the question of a general review of all S.H.M.O.s' personal grading be taken up with the Minister as a matter of urgency. (2) That this Meeting remains dissatisfied with the present arrangements for scrutinizing new S.H.M.O. posts before these are advertised, and therefore resolves that no further S.H.M.O. appointments be made pending the new hospital staffing structure. (3) That negotiations be reopened forthwith with the Minister to implement the principle that S.H.M.O.s' salary should be 80% of the consultants' maximum.

133. **Amendment** by SOUTHAMPTON: That, with reference to para. 77 of the Annual Report of Council, this Meeting strongly recommends that the salary of the S.H.M.O. grade, or of any other grade equivalent thereto which may be perorpetuated under any other new medical staff structure, should be fixed at 80% of the consultant salary throughout the scale.

134. **Motion** by DERBY: That this Meeting notes with approval the expressed opinion of the Central Consultants and Specialists Committee (Supplement, April 13, 1957, page 207) that senior hospital medical officers be paid a salary of 80% of that for consultants throughout the scale, and requires the Council to take all possible steps to bring this into effect.

Shortage of Medical Auxiliaries

135. **Motion** by WILLESDEEN: That this Meeting regrets that the pay of medical auxiliaries in the hospital service is so low that they are leaving the N.H.S., so that it is impossible to give adequate facilities to practitioners for the investigation of patients, and existing facilities are being withdrawn; and calls on Council to do all that is in its power to remedy this situation.

*136. **Motion** by WINCHESTER: That Council continue to press upon the Ministry the urgency of improving the conditions of service and pay of radiographers.

137. **Motion** by LEWISHAM: That this Meeting views with concern the national shortage of radiographers due to the present levels of remuneration, this matter to be discussed as a matter of urgency with the responsible authorities to prevent further deterioration in the radiological service.

Distinction Awards

138. **Motion** by the Chairman of the Central Consultants and Specialists Committee: That para. 78 of the Annual Report of Council be approved.

*139. **Amendment** by MANCHESTER: That apart from very exceptional cases, no further merit awards should be made, but that instead there should be substituted a system of responsibility payments.

140. **Amendment** by SOUTH ESSEX: That the following Minute 239 of the A.R.M., 1956, be referred back to the Council for further consideration:

239. **Resolved**: That in the opinion of this Meeting, the Council should consider the desirability of abolishing the Merit Award Scheme for members of hospital staffs, unless in very exceptional cases, and replacing it by a system allowing for responsibility payments.

141. **Motion** by GUILDFORD: That in any revision of the publicly administered medical services there should be no secrecy about any special payments made for merit or other grants.

Remuneration of Hospital Medical Staff

142. **Motion** by MANCHESTER: That this Meeting considers that, taking into account the board and lodging charges, the 5% award to senior hospital staff and the 10% award to junior hospital staff, this latter section of the profession still remains absolutely and relatively underpaid.

143. **Motion** by SOUTH STAFFORDSHIRE: That hospital junior staff should have representation on the Staff Side of Whitley B when matters concerning their terms and conditions of service are being negotiated.

Domiciliary Consultations by Whole-time Consultants

144. **Motion** by the Chairman of the Central Consultants and Specialists Committee: That para. 81 of the Annual Report of Council be approved.

*145. **Amendment** by GREENWICH AND DEPTFORD: That this Annual Representative Meeting urges that the payment of fees to whole-time specialists for the first eight domiciliary consultations in a quarter be further pressed.

146. **Amendment** by SWANSEA: That this Meeting regrets that the resolutions of the A.R.M., 1956, under Minutes 272 and 273 have not been implemented.

147. **Motion** by LANCASTER: That extra allowances for domiciliary consultations over 10 miles in rural areas should be reviewed.

Board-and-Lodging Charges

148. **Motion** by the Chairman of the Central Consultants and Specialists Committee: That para. 85 of the Annual Report of Council be approved.

149. **Amendment** by MANCHESTER: That this Meeting recommends that when residence is a condition of service, and especially in the case of pre-registration house officers, board and lodging should be provided for.

150. **Amendment** by MANCHESTER: That this Meeting deplores the board-and-lodging charge agreement which was reached without proper consultation with the representatives of hospital resident staff, and recommends as a matter of urgency that the Staff Side should initiate such consultations before agreement is reached on standards of accommodation.

151. **Amendment** by LIVERPOOL: That this Meeting deplores the long delay of the Ministry in carrying out its promise to review those cases in which the actual cost of board and lodging has been assessed by the Hospital Management Committee and the Regional Hospital Board at a lesser sum than that which is being charged under the provisions of the circular dealing with board-and-lodging charges.

152. **Amendment** by EAST YORKS: That this Meeting recommends (a) that charges for hospital residents' board and lodgings should not exceed 21s. per week; (b) that in the case of a married hospital resident who has to provide a home for his family outside the hospital, board and lodgings should be provided free of charge.

Mileage Rates

153. **Motion** by CITY OF DUNDEE: That, with reference to para. 88 of the Annual Report of Council, in view of the present level of running costs and in comparison with the costs at the time when the present rates were established, a permanent increase should be made.

Constitution of the Central Consultants and Specialists Committee

154. **Motion** by the Chairman of the Central Consultants and Specialists Committee: (1) That the constitution of the Central Consultants and Specialists Committee be amended to provide for the appointment of two members by each of the following: (a) the General Medical Services Committee, (b) the Registrars Group Committee, (c) the S.H.M.O.s Group Committee; and (2) that the Schedule to the By-laws be amended accordingly.

Acute Mental Illness

155. **Motion** by SOUTHAMPTON: That when the Mental Health Act is amended the position of the duly authorized officers should be re-examined.

Geriatric Units: Treatment and Rehabilitation of Chronic Disablement

156. **Motion** by WORCESTER AND BROMSGROVE: That in order properly to co-ordinate the hospital service to the chronic sick and the welfare service to the infirm, representations be made at the highest level to facilitate the assumption by Hospital Management Committees and Local Authorities of joint financial responsibility for borderline cases.

National Major Casualty Service

157. **Motion** by MID-CHESTER: That this Meeting is not satisfied with the co-operation between the hospital and general practitioner in regard to medical casualty service.

Remainder of Report under "Hospital and Consultant Services"

158. **Motion** by the Chairman of the Central Consultants and Specialists Committee: That the remainder of the Annual and Supplementary Reports of Council under "Hospital and Consultant Services" be approved.

Remuneration Claim

159. **Motion** by EAST YORKS: That any future increase in moneys for hospital medical staffs in consequence of either the Pay Claim or the findings of the Royal Commission should be so distributed that Resolutions 258, 272, and 273 of the A.R.M., 1956, are fully satisfied. Also, part of such additional moneys be set aside for the purpose of providing a tax-free allowance to whole-time hospital medical officers who (a) provide a private telephone partly for the use of the National Health Service and (b) pay subscriptions to recognized medical societies and learned societies for the purpose of keeping up to date in the arts of medical practice and (c) attend scientific meetings and conferences for the purpose of improving their knowledge of the specialty they practise.

(Resolutions 258, 272, and 273 of the A.R.M., 1956, read as follows:

258. **Resolved**: That this Meeting recommends that the salary of the S.H.M.O. grade should be raised to 80% of the consultant salary throughout the whole scale.

272. **Resolved**: That the Association should press for the payment of domiciliary consultation fees to whole-time specialists up to the permitted maximum.

273. **Resolved**: That the B.M.A. deplores that the Ministry of Health differentiates between domiciliary visits done by whole-time and part-time consultants. The non-payment clause for the first eight visits in each quarter should be abolished and the differential payment for distant visits should be paid to whole-time and part-time consultants.)

Consultants and Specialists and Central Defence Fund

160. **Motion** by BLACKPOOL AND FYLDE: That this Annual Representative Meeting instructs Council to devise a scheme whereby consultants and specialists can make their financial contribution to the Central Defence Fund.

Domiciliary Chiropody under N.H.S.

161. **Motion** by NORTH-EAST ESSEX: That domiciliary chiropody should become a facility under the National Health Service.

Standard Charge to Patients for Food

162. **Motion** by NORTH-EAST ESSEX: That there should be a standard charge made for all patients above school age when in hospital towards the cost of their food.

Blood Transfusions and Private Patients

163. **Motion** by BUCKINGHAMSHIRE: That blood for transfusion should be made available for private patients, wherever they are situated.

Consultants in Training and General Practice

164. **Motion** by CAMBRIDGE AND HUNTINGDON: That consultants in training should be encouraged to spend a period in general practice during their training.

Constitution of Joint Consultants Committee

165. **Motion** by SHEFFIELD: That the representatives appointed by the Central Consultants and Specialists Committee to the Joint Consultants Committee should always include one whole-time consultant, one consultant from a provincial non-teaching hospital, and one S.H.M.O.

Staff Side of Whitley Committee B

166. **Motion** by LIVERPOOL: That this Meeting is dissatisfied with the present unrepresentative constitution of the Staff Side of Whitley Committee B. In the past negotiations have been undertaken on behalf of sections of the profession of which none of the Committee is a member. It recommends that in future Whitley Committee B should always consult or co-opt representatives of any group whose terms and conditions of service are being negotiated.

OCCUPATIONAL HEALTH

167. **Motion** by the Chairman of the Occupational Health Committee (J. A. L. Vaughan Jones) on behalf of the Council: That the Annual and Supplementary Reports of the Council under "Occupational Health" (Docs. A.R.M. 2, paras. 107-120, and A.R.M. 3, paras. 251-253) and the Report on Short Postgraduate Courses in Occupational Health (Appendix VII) be received.

Remuneration of Whole-time Industrial Medical Officers

168. **Motion** by the Chairman of the Occupational Health Committee: That the following Recommendation of the Council (para. 107 of Annual Report) be adopted:

That the section on the remuneration of whole-time industrial medical officers in the statement on "Remuneration and Terms of Service for Industrial Medical Officers," approved by the Representative Body in 1955, be revised to read as follows:

	Range
Assistant medical officers ..	£1,400 to £1,700
Medical officers ..	£1,600 to £2,500
Senior medical officers ..	£2,250 to £3,250
Chief medical officers or directors of medical services	From £3,500 according to the size of the undertaking and the responsibilities involved.

The salary in each grade should be reviewed at intervals not exceeding two years, and a practitioner in each grade would normally be expected to reach the upper limit of the range after about ten years of satisfactory service. A practitioner giving outstanding service would be expected to receive more rapid advancement.

The Association regards these salary ranges as suitable for pensionable appointments. Where no pension scheme is in operation the salary should be adjusted accordingly.

Remuneration of Part-time Industrial Medical Officers

169. **Motion** by the Chairman of the Occupational Health Committee: That the following Recommendation of the Council (para. 107 of Annual Report) be adopted:

That the recommended salary scale for part-time industrial medical officers in the statement on "Remuneration and Terms of Service for Industrial Medical Officers," approved by the Representative Body in 1955, be revised to read as follows:

Hours per Week	Minimum Annual Salary	Hours per Week	Minimum Annual Salary
Up to 1 ..	£100	9 to 10 ..	£700
1 " 2 ..	175	10 " 11 ..	750
2 " 3 ..	250	11 " 12 ..	800
3 " 4 ..	325	12 " 13 ..	850
4 " 5 ..	400	13 " 14 ..	900
5 " 6 ..	475	14 " 15 ..	950
6 " 7 ..	550	15 " 16 ..	1,000
7 " 8 ..	600	16 " 18 ..	1,050
8 " 9 ..	650	18 " 20 ..	1,100

Remainder of Report under "Occupational Health"

170. **Motion** by the Chairman of the Occupational Health Committee: That the remainder of the Annual and Supplementary Reports of Council under "Occupational Health" be approved.

Industrial Managements and Medical Examinations

171. **Motion** by BUCKINGHAMSHIRE: That this Meeting condemns any contract entered into by industrial management which gives absolute right to a "lay person" to be present at a medical examination, including re-testing of colour vision.

INTERNATIONAL RELATIONS

172. **Motion** by the Chairman of the International Relations Committee (J. A. Pridham) on behalf of the Council: That the Annual Report of Council under "International Relations" (Doc. A.R.M. 2, paras. 226-232) be received.

173. **Motion** by the Chairman of the International Relations Committee: That the Annual Report of Council under "International Relations" be approved.

BRITISH MEDICAL JOURNAL

174. **Motion** by the Chairman of the Journal Committee (J. G. M. Hamilton) on behalf of the Council: That the Annual Report of Council under "British Medical Journal" (Doc. A.R.M. 2, para. 156) be received.

175. **Motion** by the Chairman of the Journal Committee: That the Annual Report of Council under "British Medical Journal" be approved.

FAMILY DOCTOR

176. **Motion** by the Chairman of the Family Doctor Committee (O. C. Carter) on behalf of the Council: That the Annual Report of Council under "Family Doctor" (Doc. A.R.M. 2, para. 157) be received.

177. **Motion** by the Chairman of the Family Doctor Committee: That the Annual Report of Council under "Family Doctor" be approved.

FINANCE

178. **Motion** by the Treasurer (L. Dougal Callander) on behalf of the Council: That the Annual and Supplementary Reports of Council under "Finance" (Docs. A.R.M. 2, paras. 158-165, and A.R.M. 3, para. 276) and Appendix IX and the Financial Statement for the year ending December 31, 1956 (Doc. A.R.M. 3A), be received.

179. **Motion** by the Treasurer: That the Annual and Supplementary Reports of Council under "Finance" be approved.

ESTATES

180. **Motion** by the Chairman of the Estates Committee (L. Dougal Callander) on behalf of the Council: That the Annual and Supplementary Reports of Council under "Estates" (Docs. A.R.M. 2, paras. 166-167, and A.R.M. 3, para. 277) be received.

181. **Motion** by the Chairman of the Estates Committee: That the Annual and Supplementary Reports of Council under "Estates" be approved.

PUBLIC HEALTH

182. **Motion** by the Chairman of the Public Health Committee (J. B. Tilley) on behalf of the Council: That the Annual and Supplementary Reports of Council under "Public Health" (Docs. A.R.M. 2, paras. 121-137, and A.R.M. 3, paras. 255-265) be received.

Married Women Doctors and Public Medical Appointments

183. **Motion** by GATESHEAD: That, with reference to para. 135 of the Council's Report, further consideration should be given to the question of maternity leave for married women doctors.

Remainder of Report under "Public Health"

184. **Motion** by the Chairman of the Public Health Committee: That the remainder of the Annual and Supplementary Reports of Council under "Public Health" be approved.

Review of Remuneration of Public Health Medical Officers

185. **Motion** by GLASGOW: That in view of the fact that public health practitioners have been excluded from the terms of reference of the Royal Commission, the full consultation that has been promised after the Royal Commission has reported shall include a review of the remuneration of public health doctors.

Health Visitors

186. **Motion** by GREENWICH AND DEPTFORD: That this Annual Representative Meeting urges that health visitors should work in closer co-operation with general practitioners and should not give advice to patients except with the family doctor's knowledge and consent.

SCIENCE

187. **Motion** by the Chairman of the Science Committee (J. R. Nicholson-Lailey) on behalf of the Council: That the Annual and Supplementary Reports of Council under "Science" (Docs. A.R.M. 2, paras. 168-183, and A.R.M. 3, para. 278) and the Recommendations of the Special Coal-Gas Poisoning Subcommittee (Appendix V) be received.

The Library

188. **Motion** by the Chairman of the Science Committee: That the following Recommendation of the Council be adopted:

That, in view of the financial position of the Association, the payment by the Association of outward postage on library books borrowed by members be discontinued as a temporary measure.

189. **Amendment** by DORSET: That, with reference to para. 172 of the Annual Report of Council, this Meeting considers that the action taken by Council on Item 95 of the Agenda of the A.R.M., 1956, is unsatisfactory, and requests Council to reconsider its opinion.

190. **Motion** by FURNESS: That this Meeting deplores the fact that postage is charged both ways on books borrowed from the Central Library and calls upon the Council to give immediate consideration to reducing the postage charge to members to one way only.

Remainder of Report under "Science"

191. **Motion** by the Chairman of the Science Committee: That the remainder of the Annual and Supplementary Reports of Council under "Science" be approved.

GENERAL MEDICAL SERVICES

192. **Motion** by the Chairman of the General Medical Services Committee (A. B. Davies) on behalf of the Council: That the Annual Report of Council under "General Medical Services" (Doc. A.R.M. 2, paras. 22-58) be received.

The Remuneration Claim

193. **Motion** by LIVERPOOL: That this Meeting is of the opinion that the policy of penalizing small lists should cease and that the interim award should be applied towards loading the first 500 capitation fees on all lists, whatever their size.

Protection of Practices Scheme

194. **Motion** by the Chairman of the General Medical Services Committee: That para. 25 of the Annual Report of Council be approved.

195. **Amendment** by NORTH-EAST ESSEX: That the Protection of Practices Scheme should be extended to provide protection for general practitioners when there is a massive call-up of them, as in wartime.

Practice Accommodation

196. **Motion** by NORTH-EAST ESSEX: That in the exploratory discussions with the Ministry of Health on the question of practice accommodation, particularly in redevelopment areas, the question of the tenancy terms for *suites in health centres* on new housing estates should be included.

Loans for Provision of Surgery Accommodation

197. **Motion** by CAMBRIDGE AND HUNTINGDON: That the following motion, referred by the A.R.M., 1956, for consideration by the Council, be approved with the addition of the words "when funds from the Group Practice Loans become available":

That the Minister of Health be pressed to increase the scope of interest-free loans for the provision of new surgery accommodation, to include all practitioners, either in single practice or in partnership, where such application is endorsed by the local medical committee and executive council.

Mileage

198. **Motion** by the Chairman of the General Medical Services Committee: That para. 28 of the Annual Report of Council be approved.

199. **Amendment** by MORPETH: That the A.R.M. deplores the delay in the completion of the work of the Mileage Committee, in view of the hardship caused in certain areas.

Emergency Call Service

200. **Motion** by the Chairman of the General Medical Services Committee: That para. 29 of the Annual Report of Council be approved.

201. **Amendment** by BLYTH: That the A.R.M. condemns the emergency call services organized on commercial lines, in view of the interference in the free choice of doctor and the obvious encouragement of a full-time salaried service.

202. **Amendment** by WANDSWORTH: That this Meeting strongly disapproves of any resolution which empowers the Minister to impose further restrictions for making deputizing arrangements of general practitioners.

203. **Amendment** by CUMBERLAND: That this Meeting opposes the conclusion that consent of the executive council be required for a general practitioner's standing deputizing arrangements, except where the deputizing service is a commercially organized service.

204. **Amendment** by SWINDON: That the terms of service should be so amended as to make it incumbent upon the general practitioner to obtain the advice of the local medical committee on, and not the consent of the executive council to, any standing deputizing arrangements he proposes to make.

205. **Motion** by GATESHEAD: That with reference to para. 29 of the Council's Report the suggestion to amend the regulations be approved.

206. **Motion** by NORTH MIDDLESEX: That this Meeting requests Council to consider the formation of a B.M.A. Scheme for an Emergency and Relief Service for General Practitioners in the National Health Service.

Obstetric Beds for General Practitioners

207. **Motion** by MID-CHESHIRE: That the Council should continue to press for provision of more obstetric beds for general practitioners.

Trainee General-practitioner Scheme

208. **Motion** by the Chairman of the General Medical Services Committee: That para. 33 of the Annual Report of Council be approved.

209. **Amendment** by ABERDEEN AND KINCARDINE COUNTIES: That this Meeting is dissatisfied with the decision of Council regarding Minute 200 of A.R.M. of 1956, and instructs Council to press for the adoption of this resolution.

210. **Motion** by BLYTH: That the A.R.M. considers the Council should press the general adoption of the recom-

mendations of the Special Subcommittee on the Trainee General-practitioner Scheme as accepted by the Minister of Health.

Charges for Prescriptions

211. **Motion** by MID-CHESHIRE: That a further protest should be made to the Minister with a view to getting prescription charges removed.

General-practitioner Beds

212. **Motion** by MID-CHESHIRE: That, with reference to para. 42 of the Annual Report of Council, this Meeting emphasizes the view expressed in Minute 183 of the A.R.M., 1956, and requests the Council to pursue the matter as one of urgency.

Diagnostic Facilities

213. **Motion** by NORTH GLAMORGAN AND BRECKNOCK: That this Meeting stresses the need for the provision of ancillary diagnostic services for the general practitioner, so as to reduce pressure on hospitals, and as a means of reducing hospital costs.

National Insurance Certificates

214. **Motion** by the Chairman of the General Medical Services Committee: That para. 50 of the Annual Report of Council be approved.

*215. **Amendment** by GATESHEAD: That further efforts be made to implement the 1956 resolution as to four-weekly certificates.

216. **Amendment** by SOUTH ESSEX: That the following Minute 218 of the A.R.M., 1956, be referred back to the Council for further consideration:

That medical practitioners should, at their discretion, be permitted to issue first or any subsequent National Insurance Certificates for a period of up to four weeks.

National Service Medical Boards

217. **Motion** by the Chairman of the General Medical Services Committee: That para. 51 of the Annual Report of Council be approved.

218. **Amendment** by CITY OF DUNDEE: That the chairman of the National Service Medical Board should communicate with the general practitioner concerned when a man is found to be unfit for National Service, giving the reason.

Service Committee and Tribunal Regulations

219. **Motion** by the Chairman of the General Medical Services Committee: That para. 55 of the Annual Report of Council be approved.

220. **Amendment** by SOUTH STAFFORDSHIRE: That Service Committee and Tribunal Regulations should be amended to permit legal representation to both complainant and respondent.

221. **Amendment** by SOUTH STAFFORDSHIRE: That there should be a final appeal to the Courts from a decision of the Minister in disciplinary cases against medical practitioners.

222. **Motion** by NORTH STAFFORDSHIRE: That this Meeting reaffirms that it should be a requirement of the Regulations that proceedings against a doctor before a Service Committee should only be in respect of a breach of the Regulations and the doctor be notified, in advance of the inquiry, of the Regulation of which he is alleged to be in breach.

223. **Motion** by NORTH STAFFORDSHIRE: That this Meeting inform the Minister of Health that grossly undue delay is occurring in the notification of appeal tribunal findings to the interested parties and demands that such delay should be cut to a minimum.

224. **Motion** by NORTH STAFFORDSHIRE: That this Meeting is of the opinion that costs should be awarded against unsuccessful applicants to appeal tribunals, as provided for in the Regulations.

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General-practitioner Refresher Courses

225. **Motion** by GREENWICH AND DEPTFORD: That this Annual Representative Meeting deplores the inadequacy of payments made to general practitioners attending refresher courses, and urges that these be increased to at least 25 guineas per week.

Remainder of Report under "General Medical Services"

226. **Motion** by the Chairman of the General Medical Services Committee: That the remainder of the Annual Report of Council under "General Medical Services" be approved.

Capitation Fee for Persons over 65

227. **Motion** by EXETER: That a higher capitation fee be paid for persons over the age of 65.

Remuneration: Loading of Capitation Fee for London Area

228. **Motion** by HENDON: That the Council be invited to give consideration to the effecting of an arrangement for the loading of the Capitation Fee to meet the higher cost of living in the London area.

General Practitioners and Antenatal Care

229. **Motion** by HARROW: That it be a principle of Association policy that general practitioners who wish to undertake the antenatal care of their own patients shall be entitled to do so and that regional hospital boards be requested to ensure that the staffs of their constituent hospitals do not make the booking of the confinements of those patients in hospital conditional upon antenatal care being provided at their own or local authority clinics.

Fees for Maternity Medical Services

*230. **Motion** by BATH: That this Meeting is of the opinion that the fees for maternity services are inadequate and that they should be substantially raised forthwith.

231. **Motion** by LONDONDERRY: That in view of the arduous nature of the work and its importance in maintaining public esteem for general practice this Meeting urges the Council of the British Medical Association to bear in mind the need for adequate remuneration in the maternity medical service.

Pharmaceutical Literature

232. **Motion** by SOUTH ESSEX: That the co-operation of the pharmaceutical industry be sought in the preparation of standardized literature of a concise nature in respect of products prescribable on Forms E.C.10.

233. **Motion** by LEWISHAM: That this Meeting deprecates the quantity of pharmaceutical advertisement sent to doctors, and requests the Council to approach the pharmaceutical manufacturers to consider means of limiting this and channeling the available advertising in a more useful method; and all unsolicited samples should be banned.

Medical Records

234. **Motion** by LEWISHAM: That this Meeting recommends that Council set up a committee to consider how to improve Forms E.C.5 and E.C.6 (N.H.S.), and to make recommendations.

Envelopes for Medical Records

235. **Motion** by KENSINGTON AND HAMMERSMITH: That the Ministry of Health be asked to provide a modified form of medical record envelope for filing continuation form of medical record envelope for filing the per-cards and hospital reports, pending the receipt of the permanent envelope from the executive council. A blank manent envelope from the top left-hand corner removed record envelope with the top left-hand corner removed would be suitable.

Blood Transfusion and Rh Factor

236. **Motion** by MID-CHESHIRE: That in view of the apparent wastage of rare blood, such as O negative, there should be a uniform system for obtaining blood grouping and Rh factor in cases of pregnancy.

Insulin Syringes

237. **Motion** by LANCASTER: That insulin syringes should be made available, 5 ml. graduated in 0.1 ml.

COMPENSATION AND SUPERANNUATION

238. **Motion** by the Chairman of the Compensation and Superannuation Committee (A. N. Mathias) on behalf of the Council: That the Annual and Supplementary Reports of Council under "Compensation and Superannuation" (Docs. A.R.M. 2, paras. 59-67, and A.R.M. 3, paras. 246-247) be received.

Compensation

239. **Motion** by HARROW: That if negotiations for payment of compensation in a lump sum fail, the Government be pressed to pay off all practice compensation due by allowing remission of all tax on income until the total compensation has been paid.

Earlier Pensions

240. **Motion** by the Chairman of the Compensation and Superannuation Committee: That para. 61 of the Annual Report of Council be approved.

241. **Amendment** by SWANSEA: That Minute 163 of the A.R.M., 1956, be referred back to the Council for further consideration.

242. **Amendment** by HARROGATE: That pension benefit should be available to practitioners at any time after ten years' service, the pension being proportionate to the amount contributed.

Remainder of Report under "Compensation and Superannuation"

243. **Motion** by the Chairman of the Compensation and Superannuation Committee: That the remainder of the Annual and Supplementary Reports of Council under "Compensation and Superannuation" be approved.

Compensation and Partnerships

244. **Motion** by GATESHEAD: That further efforts be made to secure to doctors payment of that part of their compensation to which they can be shown to be entitled on taking another doctor into partnership.

Pension Arrangements for Consultants

245. **Motion** by MARYLEBONE: That the present pension arrangements for consultants should be re-examined.

PRIVATE PRACTICE

246. **Motion** by the Chairman of the Private Practice Committee (Alexander Brown) on behalf of the Council: That the Annual and Supplementary Reports of Council under "Private Practice" (Docs. A.R.M. 2, paras. 142-155, and A.R.M. 3, paras. 267-275) be received.

Drugs for Private Patients

247. **Motion** by the Chairman of the Private Practice Committee: That para. 142 of the Annual Report of Council be approved.

248. **Amendment** by MARYLEBONE: That this Meeting calls on the Government to put an end at an early date to the breach of faith whereby drugs are withheld from private patients.

Medical Examination of Elderly Drivers

*249. **Motion** by LANCASTER: That, with reference to para. 144 of the Annual Report of Council, the question of the medical examination of elderly drivers should be reopened.

250. **Motion** by MID-CHESHIRE: That this Meeting reaffirms the view expressed in Minute 65 of the A.R.M., 1956, and instructs the Council to reopen the matter with the Accident Offices Association.

Certificates in Respect of Absent Voters

251. **Motion** by the Chairman of the Private Practice Committee: That para. 147 of the Annual Report of Council be approved.

252. **Amendment** by RUGBY: That this Meeting is still dissatisfied with Form R.P.F.7 as now amended, and presses for full implementation of Minute 71 of A.R.M., 1956.

Accidents Compensation

253. **Motion** by MID-CHESHIRE: That the Council be requested to arrange with the Medical Insurance Agency an appropriate insurance policy covering injury or loss of life incurred by doctors in attending accidents.

Remuneration of Medical Officers of Private and Public Schools

254. **Motion** by the Chairman of the Private Practice Committee: That the following Recommendation of Council (para. 154 of Annual Report) be adopted:

That where practitioners are appointed to undertake special routine medical examination of scholars at private or public boarding schools, and to advise the school authorities generally on matters of health and hygiene, the remuneration should not be less than £1 15s. per scholar per annum for duties outside the National Health Service.

Remainder of Report under "Private Practice"

255. **Motion** by the Chairman of the Private Practice Committee: That the remainder of the Annual and Supplementary Reports of Council under "Private Practice" be approved.

Shortened Form of Insurance Examination

256. **Motion** by DUMFRIES AND GALLOWAY: That the shortened form of insurance examination be abolished.

257. **Motion** by DORSET: That this Meeting considers that the fee for a short examination for life assurance should be £1 1s.

Fees for Certificates for Notifiable Diseases

*258. **Motion** by HENDON: That in the opinion of the Representative Body the fees payable for the notification of infectious diseases, vaccinations, and immunizations should be increased forthwith and that the Council be requested to take appropriate steps to secure this object at an early date.

259. **Motion** by HARROW: That negotiations be instituted to increase the present fees payable by local authorities for the notification of infectious diseases, vaccinations, and immunizations.

Poisons List

260. **Motion** by RUGBY: That synthetic oestrogens be included in the Poisons List in Schedule 4.

Parking of Doctors' Cars

261. **Motion** by KENSINGTON AND HAMMERSMITH: That this Meeting is concerned at the difficulties of parking a car in present-day traffic conditions when a doctor is using a car in the course of his professional commitments, and, bearing in mind that additional problems will arise on the introduction of parking meters, instructs the Council to make urgent representations to the Ministry of Transport to assist doctors in their ever-increasing traffic problems.

MEDICAL ETHICS

262. **Motion** by the Chairman of the Central Ethical Committee (R. Forbes) on behalf of the Council: That the Annual and Supplementary Reports of Council under "Medical Ethics" (Docs. A.R.M. 2, paras. 138-141, and A.R.M. 3, para. 266) and the Revised Ethical Code relating to Consultations and Cognate Matters (Appendix VIII) be received.

Ethical Code Relating to Consultations and Cognate Matters

263. **Motion** by the Chairman of the Central Ethical Committee: That the following Recommendation of the Council be adopted:

That the revised "Ethical Code Relating to Consultations and Cognate Matters" (Appendix VIII to the Supplementary Report) be approved.

Remainder of Report under "Medical Ethics"

264. **Motion** by the Chairman of the Central Ethical Committee: That the remainder of the Annual and Supplementary Reports of Council under "Medical Ethics" be approved.

Members of Profession and Evidence in Courts of Law

265. **Motion** by EAST YORKS: That this Meeting deprecates the increasing tendency for members of the profession to appear in the Court of Law and give evidence which is prejudicial to the competence and prestige of other medical practitioners, when the evidence is a matter of opinion which is not based on personal knowledge of the case.

General Practitioners and Dentists' Premises

266. **Motion** by MARYLEBONE: That the following resolution adopted by the Central Ethical Committee in December, 1950, be referred to the Council for consideration with a view to its rescission:

That in the interest of maintaining high ethical standards, general practitioners and dentists should, wherever practicable, avoid sharing the same premises for professional purposes.

OVERSEAS

267. **Motion** by the Chairman of the Overseas Committee (J. L. Gilks) on behalf of the Council: That the Annual Report of Council under "Overseas" (Doc. A.R.M. 2, paras. 220-223) be received.

268. **Motion** by the Chairman of the Overseas Committee: That the Annual Report of Council under "Overseas" be approved.

COMMONWEALTH MEDICAL ADVISORY BUREAU

269. **Motion** by the Chairman of the Committee of Management of the Commonwealth Medical Advisory Bureau (A. M. A. Moore) on behalf of the Council: That the Annual Report of Council under "Commonwealth Medical Advisory Bureau" (Doc. A.R.M. 2, para. 224) be received.

270. **Motion** by the Chairman of the Committee of Management of the Commonwealth Medical Advisory Bureau: That the Annual Report of Council under "Commonwealth Medical Advisory Bureau" be approved.

INTERNATIONAL MEDICAL ADVISORY BUREAU

271. **Motion** by the Chairman of the Committee of Management of the International Medical Advisory Bureau (A. M. A. Moore) on behalf of the Council: That the Annual Report of Council under "International Medical Advisory Bureau" (Doc. A.R.M. 2, para. 225) be received.

272. **Motion** by the Chairman of the Committee of Management of the International Medical Advisory Bureau: That the Annual Report of Council under "International Medical Advisory Bureau" be approved.

PUBLIC RELATIONS

273. **Motion** by the Chairman of the Public Relations Committee (H. Guy Dain) on behalf of the Council: That the Annual Report of Council under "Public Relations" (Doc. A.R.M. 2, paras. 184-191) be received.

Remuneration Claim

274. **Motion** by WORCESTER AND BROMSGROVE: That this Meeting notes with appreciation the efforts of the Public

Relations Officer (Mr. John Pringle) in connexion with the recent remuneration claim.

275. **Motion** by WEST SUFFOLK: That a public press campaign be planned to show the doctor's position in the present dispute, and, if necessary, space should be bought in the popular press for this purpose.

276. **Motion** by NORTH GLAMORGAN AND BRECKNOCK: That the negotiating body be instructed to initiate a wider public campaign to explain and organize support for the doctors' remuneration claim.

Remainder of Report under "Public Relations"

277. **Motion** by the Chairman of the Public Relations Committee: That the remainder of the Annual Report of Council under "Public Relations" be approved.

REFORM OF THE NATIONAL HEALTH SERVICE

278. **Motion** by the Chairman of the Amending Acts Committee (H. H. D. Sutherland) on behalf of the Council: That the Annual Report of Council under "Reform of the National Health Service" (Doc. A.R.M. 2, paras. 104-106) be received.

Code of Conduct for Patients

279. **Motion** by the Chairman of the Amending Acts Committee: That para. 104 of the Annual Report of Council be approved.

280. **Amendment** by MANCHESTER: That complaints against doctors be not accepted by executive councils unless accompanied by a deposit, which may be forfeit if the complaint proves to be unjustifiable.

Remainder of Report under "Reform of the National Health Service"

281. **Motion** by the Chairman of the Amending Acts Committee: That the remainder of the Annual Report of Council under "Reform of the National Health Service" be approved.

ARBITRATION MACHINERY

282. **Motion** by the Chairman of Council: That the Supplementary Report of Council under "Arbitration Machinery" (Doc. A.R.M. 3, para. 254) be received.

283. **Motion** by the Chairman of Council: That the Supplementary Report of Council under "Arbitration Machinery" be approved.

284. **Motion** by MARYLEBONE: That this Meeting recommends the appointment of an impartial, independent, non-political body to deal with disputes when Whitley and Ministry decisions are unacceptable to the profession.

ARMED FORCES

285. **Motion** by the Chairman of the Armed Forces Committee (J. C. A. Dowse) on behalf of the Council: That the Annual Report of Council under "Armed Forces" (Doc. A.R.M. 2, para. 192) be received.

286. **Motion** by the Chairman of the Armed Forces Committee: That the Annual Report of Council under "Armed Forces" be approved.

OTHER ASSOCIATION ACTIVITIES

287. **Motion** by the Chairman of Council: That the Annual Report of Council under "Other Association Activities" (Doc. A.R.M. 2, paras. 233-242) be received.

Catering

288. **Motion** by WINCHESTER: That Council be instructed to undertake alterations to the dining-room to bring it up to the standard worthy of the Association and of its guests, particularly from overseas.

Remainder of Report under "Other Association Activities"

289. **Motion** by the Chairman of Council: That the remainder of the Annual Report of Council under "Other Association Activities" be approved.

OTHER MOTIONS BY DIVISIONS AND BRANCHES*Traffic Problems and Accident Risks*

290. **Motion** by MARYLEBONE: That this Meeting urge the Government to accelerate its plans to deal with major traffic problems with a view to reducing the hazards of life and limb.

Committee of Inquiry into Medical Services

291. **Motion** by EXETER: That the B.M.A. Committee appointed to institute an inquiry into the whole field of medical services should obtain the views of the profession by a postal questionnaire.

292. **Motion** by READING: (a) That in the view of this Meeting the Council, in conducting its inquiry into the whole field of medical services as instructed by the S.R.M. on May 1, 1957, should consider as a possible method of improvement the forms of health services in operation in other countries. (b) That this Meeting believes that in order to prevent constantly recurring crises of confidence between the medical profession and the Government in the future, there must be permanent machinery for arbitration and review of terms and conditions of service when needed. (c) That the removal of medicine from being the pawn of party politics and vote catching is essential by the setting up of a permanent Medical Guild, Corporation, or Commission to organize medical services.

Intraprofessional Understanding

293. **Motion** by WINCHESTER: That Council be instructed to establish a Central Department to promote and foster intraprofessional relationship and understanding.

Personal Medical Card

294. **Motion** by INVERNESS-SHIRE: That the Council consider proposals for the introduction of a "personal medical card," such card to be suitable for carrying on the person and to contain important medical data such as blood group, liability to diseases such as diabetes, epilepsy, and haemophilia, and sensitivity to drugs such as penicillin and sera.

Inflammable Clothing

295. **Motion** by LEEDS: That the manufacture and sale of dangerously inflammable clothing should be prohibited as soon as possible.

Report on Cruelty to and Neglect of Children

296. **Motion** by DORSET: That the Representative Body is of the opinion that the recommendations in Sections 130 and 131 of the Report of the Joint Committee of the British Medical Association and the Magistrates' Association on "Cruelty to and Neglect of Children" should be deleted from B.M.A. policy.

(Paras. 130 and 131 of the Report read:

"130. Some degree of family case work necessarily falls to a local authority in carrying out its duties under the Children Act, particularly in the ordinary course of dealing with investigation and inquiry about applications for care. At this stage, local authorities should do everything in their power to help the family to solve its own problems. There is, however, no express provision in the Children Act which empowers local authorities to incur expenditure specifically on preventive work. Such preventive work as is undertaken is carried out by visiting officers in the normal course of their duties under the Children Act, the Children and Young Persons Act, the Children and Young Persons (Amendment) Act, and in co-operation with other services as recommended in the joint circular of July, 1950, already referred to.

"131. It is therefore recommended that the provisions of the Children Act should be extended to empower the children's department of the local authority expressly to incur expenditure on preventive work, and encouragement should be offered to them to use this power. Their

officers would then be able to spend a definite proportion of their time on this important aspect and their early efforts might well mean a cut in expenditure by the local authority in connexion with its other responsibilities, for as a result of intensive case work it might be possible to keep a family together and prevent the necessity of taking a child into the care of the local authority.")

ELECTIONS

297. **Elect:** Chairman; Deputy Chairman; Treasurer; 10 Members of Council by R.B.; 2 Members of Council by Representatives of Scottish Constituencies; 1 Member of Council by Representatives of Constituencies in Wales (including Monmouthshire); and Members of Standing Committees and of A.R.M. Agenda Committee.

MINUTES

298. **Motion:** That the chairman be empowered, on behalf of the Meeting, provisionally to approve the Minutes of this Meeting.

299. Any other business.

ANNUAL MEETING

EDINBURGH GRADUATES' DINNER

The Edinburgh Graduates' Dinner will be held in the Royal Station Hotel, Neville Street, Newcastle upon Tyne, on July 13 at 7 for 7.30 p.m. All Edinburgh graduates attending the A.R.M. or resident in the area, together with their ladies and guests, will be welcome. Tickets (25s. each, exclusive of wines) may be had on application with remittance to Dr. E. R. C. Walker, 7, Drumsheugh Gardens, Edinburgh, 3.

OPHTHALMIC GROUP COMMITTEE

The Ophthalmic Group Committee met on June 13 with Mr. O. GAYER MORGAN in the chair.

Sessional Fee for School Ophthalmic Work

It was reported that the agreed fee for ophthalmic work in the school health service as notified to local education authorities in Ministry of Education Administrative Memorandum No. 303 of October 21, 1948, was £6 6s. for sessions of three hours and *pro rata* for shorter sessions. Following the new agreement with the local authority associations which came into effect as from January 1, 1957, and which increased the fee for consultant work for local authorities from £4 4s. to £5 5s. for sessions of 1½ to 2½ hours, the Ministry of Education was asked to make a proportionate adjustment in the fee of £6 6s.

The Ministry of Education had replied that, since there was now proper Whitley machinery for the consideration of the remuneration of medical practitioners under contract with local authorities, consideration of the revision of the fee should take place through the Whitley Council and not direct with the Department.

The Group Committee considered an extract from the agreement with the local authority associations, and decided that the matter should not be pursued for the present.

Future of the Ophthalmic Services

Consideration of a report on the future of the ophthalmic services as finally approved by the Chairman of the Group Committee and the President of the Faculty of Ophthalmologists following the last meeting of the Committee was deferred until the next session to enable reports to be received from regional meetings which had discussed the report and a précis to be prepared of the points raised.

Sight-testing Fee

Consideration was given to a letter from the Ministry of Health stating that it was for the Royal Commission to interpret its terms of reference, but, subject to this point, the Ministry thought that ophthalmic medical practitioners were not excluded from consideration by the Commission and that it was open to the profession to draw the Commission's attention to this group and ask for a recommendation to cover it.

It was agreed to write again to the Ministry and to defer further consideration of the matter until the next meeting. A document reviewing the position should be prepared, and, if necessary, a special meeting called.

Use of General Practitioner's Surgery

The Group Committee considered an extract from the minutes of the Central Ethical Committee which stated that it was quite usual for an ophthalmic medical practitioner to examine patients who wished to be seen at their own doctor's surgery. The practice was particularly prevalent in country districts where the only convenient alternative might be for the patient to go to an optician. It was, of course, necessary to ensure that there was no breach of the regulations and that the freedom of choice of the patient was maintained. If a general practitioner made his consulting-room available to an ophthalmic medical practitioner he should similarly make it available to all other ophthalmic practitioners within a given radius who might wish to take advantage of such facilities. The Central Ethical Committee reaffirmed its strong disapproval of a dispensing optician attending a general practitioner's surgery.

The Group Committee agreed that so long as the principle of freedom of choice was preserved there was no objection to the practice referred to, and it was further agreed to recommend the Central Ethical Committee to amend its final resolution to read "That the Committee reaffirm its strong disapproval of any optician attending a general practitioner's surgery."

N.O.T.B. Clinics in Industry

The Occupational Health Committee had considered the views of the Ophthalmic Group Committee on the letter from the National Ophthalmic Treatment Board Association inviting co-operation in extending the facilities for ophthalmic examinations at industrial establishments, the Ophthalmic Group Committee having expressed support for the proposal, subject (1) to an economic rent being paid by ophthalmologists who took part in the scheme; (2) to the work not being restricted to sight-testing but embracing the wider aspects of ophthalmic work arising in connexion with the industry concerned; (3) to an opportunity being given to all local ophthalmologists to work in the clinics.

The Occupational Health Committee expressed its support for the first two provisos, but felt that there would be both administrative and clinical objections to giving all local ophthalmologists an opportunity to work in a clinic of the kind proposed. Such clinics could normally be held only at infrequent intervals in the very largest industrial establishments. In those industrial concerns where there was a particular eye hazard and more frequent eye clinics might be justified, there would be considerable advantages if the same ophthalmologist attended all clinics.

The Group Committee decided to defer consideration of the matter to enable a report to be prepared on discussions on the subject which took place about seven years previously.

Blindness Certification

The Committee further considered the case of a member who, on returning from the Commonwealth, wished to undertake blind certification on behalf of the local authority, but, because he was not regarded as of consultant status, the county medical officer of health was not prepared to make use of his services. A letter had been received from

the Ministry of Health stating that there was no legal definition of consultant status, but the only clear evidence that an individual doctor had that status was that he held or had held a consultant post. The Ministry suggested that the Group Committee might like to inform the county council that it regarded the member's past appointment as equivalent to a consultant post in this country. The letter added that the Ministry would not seek to maintain that no one could be of consultant status unless he held or had held a consultant post in this country, but only that a man's hospital appointment, present or past, must have been at consultant level.

The Group Committee decided to write to the county council informing it that it regarded the member's past appointment as equivalent to a consultant post in this country, and to send the county council a copy of the Ministry's letter.

Licensing of Civil Aircraft Pilots

The Group Committee further considered the matter of eye examinations in connexion with the licensing of civil aircraft pilots. It was suggested that the Ministry of Transport and Civil Aviation might be prepared to accept an optician's report as satisfactory when deciding that a person's visual qualities were adequate for piloting an aircraft.

The Group Committee decided to draw to the attention of the Ministry the fact that its requirements contained no reference to whether a candidate for a licence had any disease of the eyes.

Pay-bed Accommodation

The Group Committee considered a letter from a member, who said that when ophthalmologists entered the National Health Service the B.M.A. advised them to cross out item 4 on the contract which had to do with attending patients under Section 5 (i). He wondered whether consultants entering the Service after the appointed day had been warned or whether they unwittingly signed without deleting the paragraph. If so, they had laid themselves open to having to treat patients who had all the facilities of private patients but paid no surgeon's fee. The Group Committee felt that the question was wider than just an ophthalmic one, and referred the matter to the Central Consultants and Specialists Committee for its comments.

Pupils at Fee-paying Schools

The Group Committee considered, and, with amendments, approved, a draft letter to be sent to the Society of School Medical Officers, the Incorporated Association of Headmasters, and the Association of Headmistresses.

Statutory Registration of Opticians

Following its inquiry whether an indication could be given of when a Bill would be introduced for the statutory registration of medical auxiliaries, the Committee considered the reply from the Ministry of Health, which said that it was not aware that any medical points were outstanding following the discussions which had taken place, but that if the Ministry was informed of any it would consider them in drafting the Bill. The Group Committee deferred consideration of the subject until the next meeting, when it would be given priority on the agenda.

Range of Spectacles for Hospital Out-patients

A letter from the Ministry of Health stated that it would not be reasonable to expect hospitals to provide a wider choice of frames than the Supplementary Ophthalmic Service, since the latter supplied about ten times as many pairs of glasses as the former, and that it was proposed to consult the Standing Ophthalmic Advisory Committee on the suggestions made in the Group Committee's letter and acquaint the Group Committee of the result in due course.

Measurement of Spectacle Frames

The Group Committee decided to make no comment on a letter from the British Standards Institution which stated that the preparation of a British Standard for spectacle frames had been authorized by the Ophthalmic Standards Committee of the British Standards Institution and asking for views on the methods which had been used for the measurement of spectacle frames.

Leaflet for Issue to New Graduates

The Group Committee considered a draft leaflet on the subject of eye examinations for issue to new graduates. It was decided to forward a copy to the N.O.T.B.A. asking for its views upon it, the N.O.T.B.A. having originally suggested the idea.

Supplementary Ophthalmic Services Handbook

The Group Committee decided to refer to a sub-committee appointed to compare the draft revised handbook with the old handbook a letter from a member asking for special consideration to be given to the paragraph relating to reference back to the general practitioner of patients who do not reach a satisfactory standard of vision or in whom some abnormality of the eyes is present or suspected.

Reminder Notices

A letter from a member enclosed copies of correspondence between the clerk to the Hull Ophthalmic Services Committee and the Ministry of Health relating to reminder notices sent by ophthalmic opticians to hospital eye service patients. The letter said that the Ministry letter of May 16 embodied so definite and surprisingly unequivocal a statement as might merit wider publication. The letter from the member referred to ophthalmic opticians who received forms H.E.S.1 for dispensing—e.g., those issued from the school clinics—for patients whom they had not previously sight-tested and were in the habit of sending "reminder notices" to those patients for sight-testing. It invited the Group Committee to consider whether it should ask the Ministry to discontinue the issue of "reminder notices" in respect of such patients.

The Ministry letter referred to stated: "... a patient under the care of the hospital eye service should continue to receive ophthalmic treatment from that source if in the view of the hospital ophthalmologist this is the proper course. The Minister has been advised by his Standing Ophthalmic Advisory Committee that while a patient who had been referred to the hospital eye service might be returned to the Supplementary Ophthalmic Service for the supply of glasses at the discretion of the hospital ophthalmologist who examined him, in all other cases he should remain within the hospital eye service for any treatment, glasses, or observation necessary." The Group Committee agreed to write to the Ministry expressing its full support for this and the hope that more official action would be taken on it.

Supply of Glasses

Attention was drawn to the fact that in a revision of form O.S.C.3 the Ministry of Health used the old phraseology "take it to any ophthalmic optician or dispensing optician who has undertaken the supply of glasses under the National Health Service." It was stated that the same phrase appeared on form O.S.C.2. It was agreed to ask the Ministry to use wherever applicable the phrase "any optician who provides dispensing services under the Act."

TRADE UNION MEMBERSHIP

The following is a list of local authorities which are understood to require employees to be members of a trade union or other organization:

Metropolitan Borough Councils.—Fulham, Southwark.
Non-County Borough Councils.—Crewe.

METROPOLITAN COUNTIES BRANCH PRESIDENT'S ADDRESS

The newly elected president of the Branch, Dr. J. W. MCCARTHY, chose "The Problem of Pain" as the subject of his address, delivered on the occasion of the 99th annual general meeting of the Metropolitan Counties Branch held at B.M.A. House on June 18.

In answer to the question, "What is pain?" Dr. McCarthy suggested that a broad division might be to classify it as psychic and somatic. Somatic was the type of pain which originated as an impulse from a noxious stimulus in the skin, subcutaneous tissue, muscles, bone, and viscera, and psychic might be said to originate in the frontal lobes of the brain. Somatic pain might be subdivided broadly into superficial pain, deep pain, and mixed pain. Pain was, then, in general a warning that things were not all right with the body, and was a stimulation that something should be done about it. It was in most cases the reason that medical aid was at first invoked, and the general practitioner was nearly always the first to be approached.

Interpretation of Pain

The correct interpretation of pain must be the aim and the goal of every doctor, but particularly the general practitioner, because his decision in the beginning must have a vital bearing on the course of the disease. He was helped, of course, by his knowledge of the patient, because no two races, no two families, no two individuals reacted in the same way to pain, and previous knowledge of the individual and his or her particular reaction was extremely useful. In effect, the patient said to the doctor, "I have a pain here, doctor, and I want it cured." It sounded easy and in many cases it was easy—easy, that is, to cure the pain, but that of course did not solve the problem. Before attempting to cure the pain it was necessary to find out or endeavour to find out the cause, and that is where the true clinician with his experience and knowledge was seen at his best. He had to investigate every aspect of the pain, its distribution, its character, its duration, its relation to previous pains, its reaction to food, exertion, position, its mode and time of onset. Most important, he had to decide at once whether it was serious or trivial, whether it was urgent and something that required perhaps immediate operation. He could not always allow himself to give the patient relief at once, for he might mask a perforation or an acute appendix. Having made his diagnosis, he was at the present time armed as he never was before with remedies. Dealing with the question of intractable pain, Dr. McCarthy said that in approaching that difficult subject the patient could of course be kept drugged, and practitioners were well armed with drugs for so doing; but he suggested that a little more attention might be paid to the surgical relief of intractable pain. In the United States there were clinics which dealt with that branch of surgery.

Turning to the question of psychic pain, Dr. McCarthy asked whether it was as real as somatic pain. In his view it was just as real and just as painful and much more difficult to treat. Where did it begin and where did it end? It was not possible really to assess the part which was played in pain by the mind. Referring finally to the moral aspect of pain, some patients and perhaps some doctors, he said, had been troubled from time to time about the good that it did to their souls to suffer pain in this life. That was all very noble and much to be admired, but it was not necessary to undergo pain to save one's soul. That position had been made very clear to many people this year by the answers which the Pope gave to questions submitted to him by the Italian Society of the Science of Anaesthetics.

Election of Officers of the Branch for 1957-8

Dr. Annis Gillie was elected unopposed president-elect for the session 1957-8, and Drs. Joan Chappell, R. B. L. Ridge, Samuel Smith, and R. H. Moore were elected vice-presidents. Dr. Lena W. Williams was elected, unopposed, honorary treasurer, and Drs. L. J. Stoll and J. Wiseman were elected joint honorary secretaries.

Questions Answered

Preliminary Trip to U.S.A.

Q.—I intend to emigrate to the U.S.A., and must make a preliminary trip to find out the situation with regard to employment and to try to get fixed up. Could I claim this trip as an expense against income tax?

A.—Expenditure on a journey of this nature cannot be said to be incurred for the purposes of an existing practice or in the carrying out of the duties of an employment. It can be regarded only as a personal expenditure prior to the acceptance of any future employment, and as such is not the subject of any form of income-tax allowance.

Scottish News

PART-TIME LOCAL AUTHORITY WORK IN SCOTLAND REVISED FEES

Committee C of the Medical Whitley Council has agreed on a new scale of fees for medical practitioners undertaking part-time work for local authorities in Scotland. It recommends that general practitioners should receive £3 12s. 6d. per session (normally one and half to two and a half hours) for regular weekly individual, occasional, or additional sessions and emergency attendances, a reduced fee of £2 7s. 6d. to be payable for sessions not normally exceeding one hour. Revised fees are also set out in the enclosure to M.D.C. circular No. 35 for certification of persons of unsound mind and mental defectives, examination of boarded-out children and boarded-out mental defectives, examinations and reports by medical officers to fire brigades, medical examination for superannuation, elementary lectures to the public on first-aid, home nursing, etc., and vaccination and immunization records. For other services the rate should be arranged after consultation between the local authority and the local Branch or Division of the B.M.A. The revised scheme should take effect from January 1, 1957.

Fees payable to visiting medical officers to establishments maintained by local authorities and mileage allowances in respect of duties referred to in the circular are still under consideration by Committee C.

DEPUTATION TO SECRETARY OF STATE

A deputation from the Scottish Committee of the B.M.A. (Dr. G. W. Ireland, Dr. Wilkie Millar, and Dr. E. R. C. Walker) met Mr. John S. Maclay, the Secretary of State for Scotland, on June 19 in order to give their views on the staffing of the Bruntsfield and Elsie Inglis Hospitals for women. Mr. Maclay promised to communicate with the Association shortly regarding the matter discussed.

The Australian Federal Minister for Health, Dr. CAMERON, has forecast a more comprehensive Australian health insurance scheme. On his return from the General Assembly of W.H.O. at Geneva he stated that Canada and the U.S.A., which he had also visited, were improving their health insurance schemes. As more people joined, it was easier to make health insurance more attractive, and improvements could be made in the Australian scheme as a result of information gained overseas.

Correspondence

Because of heavy pressure on our space, correspondents are asked to keep their letters short.

Jamaica Medical Service

SIR.—The Jamaica Government is seeking to recruit British doctors on contract terms, so as to prevent the breakdown of their medical service. The terms, in summary, are: £900 by £50 to £1,050; £1,250 by £50 to £1,400; £1,500 by £50 to £1,600. The point of entry depends on the experience of the applicant. There is also a gratuity in lieu of pension rights, and furnished quarters at a rental of 10% of salary. These terms are the same as those paid to general duty medical officers of the permanent medical service, with the exception (1) as the permanent service is pensionable the above gratuity is not paid; (2) quarters on rental are not usually provided for locally recruited general duty officers. Some officers of this category in country hospitals do, however, get this facility.

Some weeks ago the press announced that 25 posts (about one post in four) of the establishment were vacant. If the resignations continue at the previous rate, soon it will be one post in three. At the time of the press announcement the Minister of Health was quoted as saying that he intended to advertise for ten doctors abroad—the rest of the posts would be "kept" for Jamaicans. This latter pious resolve recalled the fact that the Jamaicans had been in these posts—which were now being "kept"—and had left them because the Government would not pay them an adequate salary. Indeed, had they not left them there would now be hardly one vacancy and no necessity to advertise abroad, using, curiously enough, as inducement, the very same scale of salaries which has led to the hazardous condition of the service. As the numbers of doctors diminished, the Minister's medical administrators' skill of doing much with little increased to meet the emergency, but, skilful as they are, there is a limit to this prestidigitation. Of the position of the patient during this display of administrative technique, it is not profitable here to inquire.

It may be illustrative of conditions in Jamaica now to quote the experience of another department—that of agriculture. About two months ago the press announced that in six weeks five veterinary surgeons had left the service—one-third, the second third, of their effective veterinary staff. The press gave the impression, on what authority was not made clear, that £1,200 would be offered as the minimum salary for recruits instead of £900.

A doctor who thinks of coming to Jamaica would wish to know, among other things, the cost of living and the rate of income tax, compared with those of the United Kingdom. The answer is given most succinctly in an information leaflet sent by the University College Hospital (in Jamaica) to applicants from Britain who apply for medical staff appointments here. It reads as follows:

The cost of living is somewhat higher than in the United Kingdom, but income tax is on a slightly lower scale. Secondary education in Jamaica is extremely expensive, and in fact almost every necessity of a normal urban existence costs more here than in England—except petrol and cigarettes.

The Government of Jamaica admits that the salaries it is offering are inadequate, for a letter received by the B.M.A., Jamaica Branch, May 4, 1957, from a Ministry official had this penultimate paragraph:

With respect to salaries, I am informed by the Honourable Minister that it is deemed to be impracticable to consider revision of doctors' salaries separately from other technical and professional branches of the Government Service—and that the Ministry of Finance is being asked to undertake a comprehensive examination of the salaries of all Government technical personnel.

In October, 1956, Dr. Ian Grant, Chairman of the Representative Body of the B.M.A., London, visited Jamaica. He

led deputations of the Jamaica Branch to the Chief Minister and also to the Minister of Health. The text of his argument was that the Jamaica Government does not pay adequate salaries to the doctors in its service, and, that being the case, the service was in danger of collapsing. That danger is at last obvious to the Government, and to meet it, having failed in one market, they are trying to get what they seek in another market. Doctors in Britain, therefore, ignorant of the circumstances, are offered terms so wretchedly unrelated to local conditions that even now the "revision [of the terms] is under comprehensive examination." The B.M.A., Jamaica Branch, suggests to doctors who would like to come to Jamaica to wait until the results of the "comprehensive examination" are known. We do not think they would have to wait many weeks. The situation in the medical department is too precarious to admit of long delay to a solution of the crisis, one way or another.—I am, etc.,

VERNON F. ANDERSON,
Honorary Secretary,
Jamaica Branch, B.M.A.

Whitfield Town, Jamaica.

Reform of Health Service

SIR.—One of the fundamental forces which guides and stimulates human activity is incentive. Let us not pretend that doctors differ from other humans in this respect. I believe that almost all the weaknesses of the National Health Service stem from the methods by which remuneration is distributed and that a total reform and revitalization of the N.H.S. can be achieved through this medium alone. The present system was agreed by our leaders in 1948 at a time when they may have considered that its disadvantages were outweighed by the protection provided by Spens against inflation. Such an agreement is no longer valid, and the time is ripe for us to open negotiation on new methods of distribution while the Royal Commission considers the general level of remuneration for the profession as a whole.

Under the present system the incentives are to provide the minimum service to the maximum number of patients, using the smallest amount of equipment and operating from the poorest possible premises. If in addition, to avoid the repeated observation of patients with self-limiting illnesses, remedies of excessive potency are prescribed, and all other patients are referred to hospital, the field is clear to get out and earn more from part-time appointments, and one is left with little worry or responsibility. Avarice, incompetence, laziness, and unscrupulousness are rewarded; diligence, skill, and interest spell longer hours for less reward. The fact that this devitalizing system has not reduced the profession to the moral depths speaks well for the doctor as an individual. The answer is surely to invert the whole structure and rebuild it. The keystone must be reward of diligence, skill, and service to the patient, with incentive to be well equipped and to increase in ability.

I suggest that the following steps should be taken at the earliest opportunity to save the tottering structure and encourage the doctor to regain his self-respect: (1) Advanced G.P. services paid for on a fee-for-service basis on the lines of the present maternity service should be introduced at intervals to cover the type of case which could reasonably be treated either by the G.P. or by the hospital service; the decision in each case would depend on the doctor's assessment of the particular problem, as it does now. A suitable list of services for the first year would be: (a) acute infections of the lung in adults; coronary thrombosis; cerebral vascular accidents; congestive cardiac failure; acute rheumatic fever; acute nephritis—the fee could be arbitrarily fixed or paid per visit up to an agreed maximum; (b) minor surgery with a fixed scale of fees. (2) Coincidentally the basic capitation fee would be reduced. This reduction would be based on the anticipated cost of the fee-for-service scheme, less a proportion of the saving in cost to the hospital service. (3) The actual expenses incurred by each doctor or partnership, based on the figure accepted by the Commissioners for Inland Revenue, would be paid, with an upper limit fixed

in proportion to the previous year's income. (4) Earnings from sources outside the N.H.S. would have no place in the calculation of remuneration within the Service. (5) There would be no prescription tax on essential drugs, but the tax on other drugs would be increased to offset this. The criterion would be whether the drug prescribed is of value in the management of a scheduled organic disease from which the patient is suffering.

I suggest that these measures alone would so profoundly alter the N.H.S. that it would become the envy of other nations rather than an object of scorn and ridicule, with inestimable benefits to the sick person; the competent doctor, and the national Exchequer.—I am, etc.,

Grenoside, Yorks.

IAN A. WOOD.

Senior Registrars in Dermatology

SIR,—Undoubtedly senior registrars in dermatology have had a difficult time during the past five years, and too many have waited too long for consultant posts. As a consequence applicants are not coming forward to fill senior registrar posts as they fall vacant, and, in teaching hospitals in particular, this is seriously embarrassing the service to the patient and the teaching of the undergraduate. It is particularly disappointing that men holding senior registrar posts in general medicine, for many of whom the prospect of a consultant appointment must be small, should not turn to a specialty like dermatology where their general medical training would give them definite advantages. Many of us would be pleased to have such recruits to dermatology, even without previous dermatological experience.

Fortunately in the past year, and at an increasing rate, consultant posts in dermatology are becoming vacant, and in the next five years vacancies, together with new posts, should make the prospects for such men good. It will be sad if we have not trained men ready to take these posts, and I feel that a little foresight is necessary now, a looking forward rather than backward to the bad old days.—I am, etc.,

Leeds, 1.

JOHN INGRAM.

General Practitioners and the Hospital Service

SIR,—At the Conference of Local Medical Committees a motion by Gateshead that the matter of closure or change of usage of hospitals be regarded as one of extreme urgency was carried (*Supplement*, June 15, p. 344). The need for urgent action is illustrated by the present dispute in Edinburgh over the staffing of the Bruntsfield and Elsie Inglis Women's Hospitals, which were founded specifically for the care of women and children by women doctors. The South-Eastern Regional Hospital Board has advertised a vacancy for a consultant physician, either male or female, and has also recently appointed a male surgical registrar.

This change of policy is strongly opposed by the medical profession and by the public, and the dispute should never have reached its present acute stage if the board had acted in accordance with the advice given in the Ministry of Health circular R.H.B. 49/132 (referred to in para. 250 of the Supplementary Report of Council, *Supplement*, May 25, p. 282). Unfortunately, it appears that no such circular was issued to regional hospital boards by the Department of Health in Scotland, who did however publish in 1952 a report by a joint subcommittee of the Medical, Hospital, and Specialist Services and General Practitioner Services Standing Advisory Committees on the general practitioner and the hospital service,¹ from which the following statements are quoted: "Those responsible for the organization of the hospital and specialist services should . . . constantly have in mind the repercussions which their policy may have upon general practice" (para. 22); "The regional hospital boards should also make the fullest use of local medical committees . . . for purposes of consultation (para. 23); and "policy must be constantly governed by a full and unqualified recognition of the fundamental importance of efficient general practice to the whole structure of the health service" (para. 24).

It is therefore a valid criticism of the regional hospital board that it has not at any time consulted the local medical committees regarding a change of policy of real concern to general practitioners and their patients in relation to the women's hospitals in the region. The board cannot have been unaware of its obligations in this respect, as the chairman of the joint subcommittee responsible for the report quoted is the present chairman of the regional hospital board. The Edinburgh Local Medical Committee has, since becoming aware of the board's intention, made strong representations both by letter and by deputation to the board, with no apparent effect. The committee's representatives also took part in a deputation received by the Secretary of State for Scotland on Friday, June 14, the outcome of which is awaited with interest.

The issue involved is of more than local significance, and the dispute is another symptom of "the faulty structure of the N.H.S. and of the consequent unsatisfactory relationship between doctors working in it and those who administer it" to which you refer in your leading article entitled "To-day and To-morrow" (*Journal*, June 8, p. 1349).—I am, etc.,

Edinburgh, 12.

E. A. CORMACK,
Vice-chairman, Edinburgh Local
Medical Committee.

REFERENCE

¹ Department of Health for Scotland and Scottish Health Services Council. *The General Practitioner and the Hospital Service*, 1952. H.M.S.O., Edinburgh.

Drugs for Private Patients

SIR,—Having read with interest the dispute with various Governments on the question of supply of drugs to private patients, the following simple solution comes to my mind. Possibly it is too simple to be followed. The average amount spent per patient per annum for drugs and dressings under the general-practitioner service of the National Health Service could easily be worked out on a national basis. This figure could then be allowed as an allowance to those members of the public who wish to be treated as private patients. This allowance could easily be withdrawn monthly, six-monthly, or as otherwise arranged, from a bank or post office. Some enterprising insurance company might even be persuaded to convert this allowance into a policy which enables the patient to claim the actual expense of the drugs when, and if, they are prescribed. This figure could be reviewed yearly and increased or decreased as, if, and when required. This repayment in hard cash should stop the complaint that those that subscribe to the health scheme in taxes are getting nothing back in return with which to pay for their drugs and dressings. This scheme could go even further and make an allowance for services of the doctor, etc.—I am, etc.,

Hessle, Yorks.

A. B. FIELDSEND.

Public Health Doctors and Royal Commission

SIR,—Your leading article in the *Journal* of April 13 (p. 872), referring to the terms of reference of the Royal Commission, stated:

The profession has been informed with customary curtness that they exclude medical officers of health, although according to the words used they should be included. This arbitrary dismissal of a section of the medical profession is surely in itself enough to convince doctors that they should not—in present circumstances—co-operate with the Royal Commission. To do so would be to betray some of our colleagues.

The circumstances at that time were the same as at present—namely, that public health medical officers could wait for the findings of the Royal Commission which had no reference to them, and in the light of the Commission's findings for others have another go in Whitley Council C.

It is useless to indulge in recrimination. It is fairly obvious who let the whole profession into it in 1948, and are still at it to-day—those who play the local authority and Minister's game in refusing to accord even *honorary* status to public health medical officers. Some of my colleagues threaten to resign from the B.M.A., which would suit the

local authorities who are trying to get out of Whitley Council C. Personally, I think that this is the best thing that could have happened, in that it provides us with a golden opportunity to go it on our own within the accepted formula but without the unreal and unilateral allegiance to the interests of specialists and general practitioners. The Management Side has been delighted to argue that we cannot be compared with G.P.s and specialists—which is true.

We should now shift to the much surer ground in law that we are required by statute to be not only doctors but to hold special qualifications. Indeed, as compared with our colleagues in medicine and in local government, we are in an especially privileged position in our own right. The positioning is perfect at the present moment for a direct claim in Committee C on such premises. Neither the Minister, in the Management Side, nor the B.M.A. (other interests) is in any position to stop us.—I am, etc.,

Kirkcaldy.

JAMES R. W. HAY.

Doctors and the Health Service

SIR,—I admit the misuse of "allots" kindly exposed by your correspondent, Mr. Arthur Blenkinsop (*Supplement*, June 1, p. 309), in my article under the above heading (*Supplement*, May 4, p. 241). "Allots" would have expressed what was intended. More still, I wish to thank him for his compliment to our profession in writing to the Editor of the *British Medical Journal*, and, with his influential position as a Member of Parliament, expressing the opinion that the present maximum of a doctor's list is too high. This endorses my contention that more time is one of the essentials needed to enable doctors to give the attention they would like to their patients. He, doubtless, is conscious of the exacting nature of medical work, the result of no two cases being alike either in the manifestation of a disease or in its victim. Each is an individual problem. In dealing with such, experience proves that the patient derives most good who gets careful diagnosis, a well-founded forecast of the illness, and thorough treatment; but these take their toll on the doctor's time. "Spot" diagnosis may have its occasional place, but a sound and deliberate approach to subtle and complex matters is widely preferred; and short-circuiting of complete examination invokes disasters, which, where human life is concerned, may be irrevocable.

Further, Mr. Blenkinsop pertinently inquires for statistical evidence of the effect of the National Health Service on family doctors as a whole in regard to their working load. Pending more accurate data from the British Medical Association, may I submit the following? Some remember that, before the war, doctors found it hard to cope with their work adequately. Since then the population has increased (in 1937 46 millions, and in 1956 49 millions), and the doctors have decreased (in 1937 25,930, and in 1956 21,445). The fact that 97% of the population is now legally entitled to a doctor's services imposes considerably increased demands on them. It is true that, before the Act, few citizens were without succour of some sort; indeed, many "panel" doctors, though well aware there was "no money in it," readily included responsibility for treatment of the lesser members of a family. But the significant difference between pre- and post-1948 in regard to the burden of practice is that, in a considerable minority, the doctor's relation to his patients was far less exacting, and even in serving the majority he had to comply with fewer regulations, less form-filling, etc. Further, Mr. Blenkinsop is curious as to why medicals these days complain about excessive calls by patients and yet always stress the importance of early diagnosis. Conditions developing under the National Health Service, however, may suffice to explain the apparent inconsistency. They are often tired from exacting overwork, conscious that much of it goes to patching up a C3 population and too little time remains for instilling the principles of healthy living. Incidentally, as is common knowledge, there has arisen in recent months a special monetary grievance aggravating their general uneasiness about defects in the Service. Is it, on reflection, a matter

for surprise if occasionally their self-restraint gives way to irritability over extra calls?

But it is most encouraging to the profession to have a layman writing to the *Journal*, and, while answering the points he raised, we would enlist his further interest because the British Medical Association is resuming the work of the Medical Planning Commission, incomplete since 1942. Quackery has been ousted, notably thanks to the amazing triumphs of scientific medicine over infective disease; but now another group of disorders has become prominent, the largely avoidable ills. Their elimination is a new goal for medicine. The logical, effective, and, in the long run, economical doctoring of these is not by the costly, customary remedies curing, or, all too often, only palliating, but by eradicating predisposing causes, the outcome of this era. Those who suffer, especially the younger generation, are mostly the victims of their own ignorance, and need indoctrinating in the cultivation of health which fosters self-respect and morale. *En route* to this ideal, increased recruitment of doctors will be an intermediate need, though once a health conscience has been developed nationally the call on doctors and on hospitals will automatically lessen.

In upgrading the status of family practice, planners will do best who postulate doctors of average ability serving patients of fair appreciation. The competent doctor soon "spots" the odd impostor and so can the law. It may be left to tactful administrators to watch the interests of the brilliant or the less forthcoming and give them scope. Specialties have come, and some go, fast; but the family doctor will remain, an indispensable figure in human society.

While praising the admirable advances in the means of succour since 1948, we are at the same time confronted by discreditable defects. Grave dissatisfaction both of patient and doctor remains and tends to destroy the faith of the one and full-hearted performance by the other. A fully efficient National Health Service calls for completion of the conditions necessary for good work by a noble profession for the common weal, in which enterprise we beg the supporting interest of Mr. Blenkinsop.—I am, etc.,

Bristol, 2.

A. WILFRID ADAMS.

Constitutional Issue

SIR,—At the Special Representative Meeting on May 1 I stated that the issue between the profession and the Government was a constitutional one. My opinion has been strengthened by a statement made by a member of the Cabinet, Mr. Harold Watkinson, Minister of Transport, when addressing the Surrey Branch of the B.M.A. at Woking on June 11. "Don't assume," he said, "that this Royal Commission is a sort of delaying tactic or a means of putting a barrier between you and your rights. I think you have a very powerful case." He added that the doctors should not be afraid to put it to the test of a very impartial Royal Commission. Warning doctors not to overplay their hand, the Minister said: "Governments are strange kittle-kattle. You can drive them a certain distance, but if you drive them into a corner they can be stubborn."

May I analyse the Minister's statement? The first part states that the medical profession has a very powerful case, from which it can be implied that the case has been considered. The Minister then advises us to put it to the test of the Royal Commission, the findings of which the Government is not bound to accept. Since we have a powerful case we should not be afraid to put it to the test of an impartial judiciary whose decision both sides would be bound to accept.

If the Minister had merely made his appeal to the profession to put its case to the Royal Commission and had left it at that point there could be no cause for concern. The last part of his statement nevertheless causes grave misgiving because it appears to contain a threat. The *Shorter Oxford Dictionary* defines "kittle-kattle" as people difficult to manage. What a strange remark to be made by a Cabinet Minister.

What does the Minister mean to convey to the profession when he warns doctors not to overplay their hand? Does he mean that if we do not give evidence before the Royal Commission the Government will become stubborn? Will it be driven into a corner if we seek access to and the protection of the courts in respect of our common law rights? The words of Mr. Watkinson on June 11 add emphasis to your statement in your leading article (June 22, p. 1463): "Whatever the Government may think it has achieved, it cannot congratulate itself on the grave and widespread dissatisfaction it has provoked among doctors working in Britain's much-vaunted National Health Service." To which I would add the last lines from the essay *On Liberty* by John Stuart Mill: "A State which dwarfs its men, in order that they may be more docile in its hands, even for beneficial purposes, will find that with small men no great real thing can really be accomplished; and that the perfection of the machinery to which it has sacrificed everything will in the end avail it nothing, for want of that vital power which, in order that the machine might work more smoothly, it has preferred to banish."—I am, etc.,

London, W.8.

J. ARTHUR GORSKY.

Association Notices

TITLE OF GOLD COAST BRANCH

Notice is hereby given by the Council to all concerned that the title of the Gold Coast Branch has been changed to the Ghana Branch.

A. MACRAE,
Secretary.

Diary of Central Meetings

JULY

- 1 Mon. Medical Education Committee, 4 p.m.
- 3 Wed. Welsh Committee (at Shrewsbury), 2.15 p.m.
- 5 Fri. Central Consultants and Specialists Executive, 10.30 a.m.
- 10 Wed. Annual Representative Meeting (at Newcastle upon Tyne), 10 a.m.
- 11 Thurs. Annual Representative Meeting (at Newcastle upon Tyne), 9.30 a.m.
- 12 Fri. Council (at Newcastle upon Tyne), 9 a.m.
- 12 Fri. Annual Representative Meeting (at Newcastle upon Tyne), 10 a.m.
- 13 Sat. Annual Representative Meeting (at Newcastle upon Tyne), 10 a.m.
- 15 Mon. Annual Representative Meeting (at Newcastle upon Tyne), 10 a.m.
- 15 Mon. Annual General Meeting (at Newcastle upon Tyne), 12.30 p.m.
- 15 Mon. Council (at Newcastle upon Tyne), at conclusion of A.R.M.
- 15 Mon. Adjourned Annual General Meeting and President's Address (at Newcastle upon Tyne), 8.15 p.m.
- 24 Wed. Non-professional Group Committee, 2 p.m.
- 25 Thurs. Central Consultants and Specialists Committee, 10.30 a.m.
- 25 Thurs. Ingleby Evidence Committee, 11.30 a.m.
- 25 Thurs. Joint Committee of B.M.A. and Magistrates' Association, 2 p.m.
- 26 Fri. Staff Side, Committee C, Medical Whitley Council (at 14, Russell Square, W.C.), 10 a.m.
- 26 Fri. Full Committee C, Medical Whitley Council (at 14, Russell Square, W.C.), 11.30 a.m.
- 29 Mon. Industrial Nursing Subcommittee, Occupational Health Committee, 2.30 p.m.

Branch and Division Meetings to be Held

- BURTON-ON-TRENT DIVISION.—At the Stanhope Arms, Bretby, Tuesday, July 2, 7.30 p.m., annual general meeting.
- CHELSEA AND FULHAM DIVISION.—At Fulham Town Hall, S.W., Tuesday, July 2, 8.45 p.m., annual general meeting.
- CHESTERFIELD DIVISION.—At Board Room, Chesterfield Royal Hospital, Tuesday, July 2, 8.45 p.m., general meeting.
- DORSET DIVISION.—At Askers Roadhouse, near Bridport, Tuesday, July 2, 8.30 p.m., general meeting.
- EASTBOURNE DIVISION.—At Princess Alice Memorial Hospital, Eastbourne, Friday, July 5, 8.30 p.m., annual general meeting.
- EAST SUFFOLK DIVISION.—At Board Room, Angelsea Road Wing, Ipswich and East Suffolk Hospital, Thursday, July 4, 8.30 p.m., meeting.
- KENT BRANCH.—At Embassy Rooms, Welling, Thursday, July 4, 12 noon, annual general meeting, 1 p.m., lunch.

MID-HERTS DIVISION.—At St. Michael's Manor, St. Albans, Wednesday, July 3, 8 for 8.30 p.m., meeting. B.M.A. Lecture by Dr. F. E. Camps.

NORTH STAFFS DIVISION.—At Hospital Management Committee Board Room, North Staffordshire Royal Infirmary, Stoke-on-Trent, Tuesday, July 2, 8 p.m., meeting.

REIGATE DIVISION.—At Reigate Hill Hotel, Tuesday, July 2, 8.30 p.m., meeting.

SOUTH MIDDLESEX DIVISION.—At Casino Hotel, Tagg's Island, Monday, July 1, 9 p.m., general meeting.

SOUTHAMPTON DIVISION.—At Royal South Hants Hospital, Wednesday, July 3, 8.30 p.m., general meeting.

STRATFORD DIVISION.—At Board Room, Queen Mary's Hospital, Stratford, E., Tuesday, July 2, 8.45 p.m., special general meeting.

WEST SUFFOLK DIVISION.—At Everard's Hotel, Bury St. Edmunds, Tuesday, July 2, 8.30 p.m., meeting.

WEST SUSSEX DIVISION.—At 2, Longfellow Road, Worthing, Sunday, July 7, 4 p.m., annual general meeting.

WINCHESTER DIVISION.—At the Guildhall, Winchester, Saturday, July 6, "At Home," 7 p.m., Reception: 7.45 p.m., Professor W. T. Williams: "Medical Aspects of the Life of Sherlock Holmes"; 8.30 p.m., Supper. Ladies and guests invited.

The annual meeting of the Welsh Group of S.H.M.O.s will be held at B.M.A. House, 195, Newport Road, Cardiff, on Saturday, July 6, at 2.30 p.m.

Meetings of Branches and Divisions

BARNSTAPLE DIVISION

At the annual general meeting the following officers were elected for 1957-8:

Chairman.—Dr. R. E. King.
Vice-chairman.—Dr. J. A. Ritchie.
Honorary Secretary.—Dr. S. G. Brook.
Treasurer.—Mr. K. G. W. Saunders.

DEWSBURY DIVISION

The annual general meeting was held on May 3, 1957. The following officers were elected:

Chairman.—Dr. S. M. Newman.
Vice-chairman.—Dr. M. W. Artherton.
Immediate Past Chairman.—Dr. C. E. Stuart.
Honorary Secretary and Treasurer.—Dr. G. F. Green.

FIFE BRANCH

The following officers were elected on May 12:

President.—Dr. D. Macdonald.
Vice-president.—Dr. Agnes I. Greig.
President-elect.—Dr. P. Aitken.
Honorary Secretaries.—Dr. A. M. Girvan and Dr. H. B. Muir.
Honorary Assistant Secretary.—Dr. W. B. Preston.

LAMBETH AND SOUTHWARK DIVISION

At the annual meeting the following officers were elected for 1957:

Chairman.—Lieutenant-Colonel G. K. Graham.
Vice-chairman.—Dr. W. K. Targett.
Honorary Secretary.—Dr. S. Brest.
Assistant Honorary Secretary.—Dr. J. A. Gavin.

MALAYA BRANCH

The annual general meeting was held on April 19 at the Institute for Medical Research, Kuala Lumpur. Dr. B. R. Sreenivasan was in the chair and 31 members attended. The following officers were elected for 1957-8:

President.—Dr. E. S. R. Alfred.
Immediate Past President.—Dr. B. R. Sreenivasan.
Honorary Secretary.—Mr. W. Gordon.
Honorary Treasurer.—Dr. R. J. Grove-White.

A resolution was passed confirming the decision of the Branch Council that a liaison committee between the Alumni Association and the Branch should work for the formation of a unified association this year. Dr. Sreenivasan spoke on "The Integrity of Medicine."

NORTH LANCASHIRE AND WESTMORLAND BRANCH

The eighth annual meeting was held at Lancaster on May 1. Over 50 members received a civic welcome by the Mayor of Lancaster when they assembled for lunch in the Banqueting Chamber of the Town Hall. The following officers were elected for 1957-8:

President.—Mr. J. McFadzean.
Vice-presidents.—Drs. G. D. Thompson and H. Southworth.
Honorary Secretary.—Dr. J. Wilkie.

REIGATE DIVISION

The annual general meeting was held on May 27. The following officers were elected:

Chairman.—Dr. L. A. Gibbons.
Vice-chairman.—Mr. N. E. Pitt.
Honorary Secretary and Treasurer.—Dr. J. R. Partridge.

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